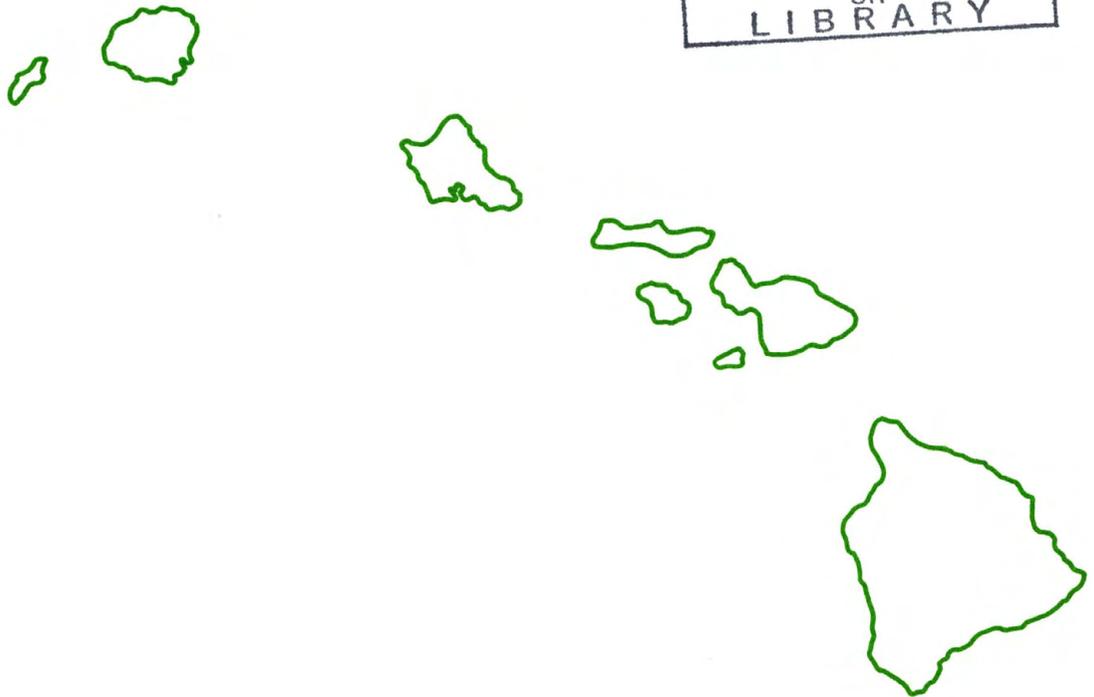
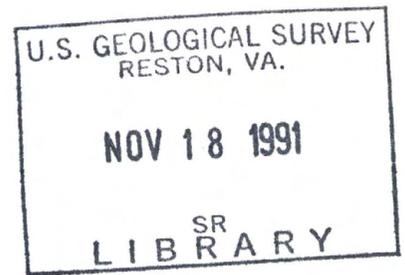


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Water Resources Data Hawaii and other Pacific Areas Water Year 1990

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-90-1
Prepared in cooperation with the State of Hawaii Department
of Land and Natural Resources, Division of Water Resource
Management and with other agencies

CALENDAR FOR WATER YEAR 1990

1989

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	7				1	2	3	4						1	2
8	9	10	11	12	13	14	5	6	7	8	9	10	11	3	4	5	6	7	8	9
15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
														31						

1990

JANUARY							FEBRUARY							MARCH						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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28	29	30	31				25	26	27	28				25	26	27	28	29	30	31

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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15	16	17	18	19	20	21	13	14	15	16	17	18	19	10	11	12	13	14	15	16
22	23	24	25	26	27	28	20	21	22	23	24	25	26	17	18	19	20	21	22	23
29	30						27	28	29	30	31			24	25	26	27	28	29	30

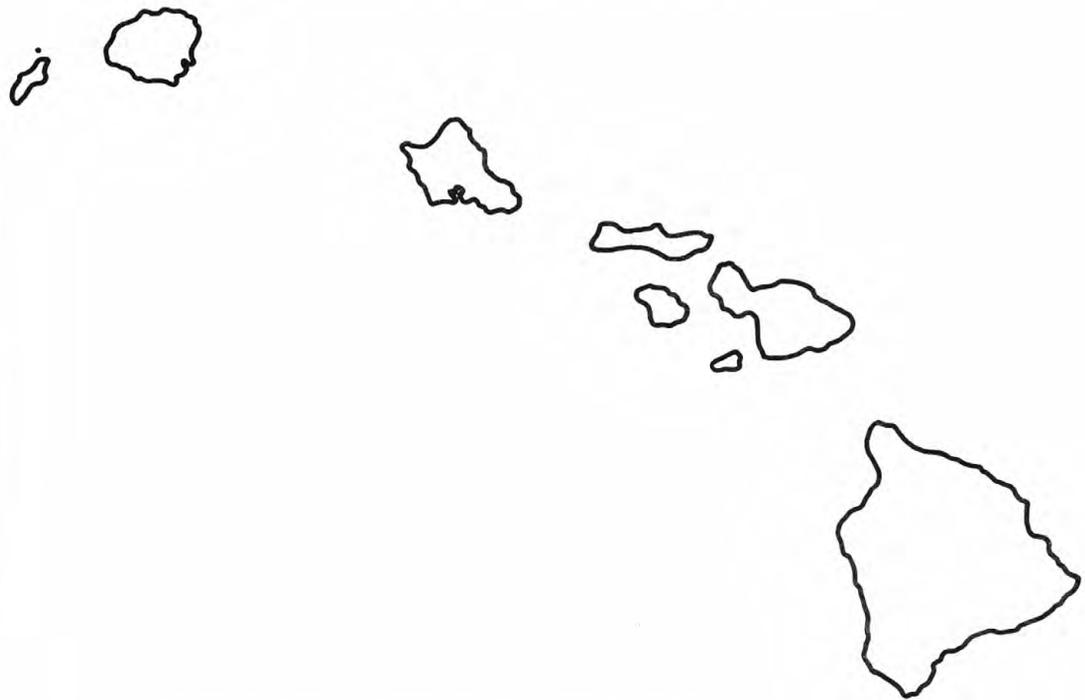
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29	30	31					26	27	28	29	30	31		23	24	25	26	27	28	29
														30						



Water Resources Data Hawaii and other Pacific Areas Water Year 1990

Volume 1. Hawaii

by I. Matsuoka, G.A. Tateishi, M.G. Lum, and V.E. Kunishige



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-90-1

Prepared in cooperation with the

State of Hawaii Department of Land and Natural Resources,

Division of Water Resource Management and with other agencies

U.S DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in Hawaii
and other Pacific Areas write to
District Chief, Water Resources Division
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1991

PREFACE

This volume of the annual hydrologic data report of Hawaii and other Pacific Areas is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface and ground-water data collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Hawaii and other Pacific Areas are contained in two volumes:

- Volume 1. Hawaii
- Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Eugene S. Capellas	James K. Kanno
Lodie P. Celebrado	Frank M. Romualdo
Leonora L. Fukuda	Roy I. Taogoshi

This report was prepared in cooperation with the State of Hawaii, the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, American Samoa, and with other agencies under the general supervision of William Meyer, District Chief, Hawaii.

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16. Abstract (Limit: 200 words) Water resources data for the 1990 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams and springs; and water levels and water quality in wells. This report, volume 1, contains discharge records for 83 gaging stations; water quality for 15 gaging stations, 20 partial-record flow stations, and 129 wells; and water levels for 45 observation wells. Also included are 107 crest-stage partial record stations, 27 miscellaneous partial-record-sites, and 6 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.			
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SURFACE-WATER AND WATER-QUALITY STATIONS
IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

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

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IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

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Letters after well number designate type of data:
(c) chemical, (t) water temperature, (w) water level

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(2-0021-01)	220057159210301	(w)	216
(2-0044-13)	220018159444702	(ctw)	217
(2-0044-14)	220019159444801	(w)	218
(2-0044-15)	220016159442701	(ctw)	219
(2-0120-01)	220136159205501	(ct)	270
(2-0120-02)	220134159205401	(w)	220
(2-0145-10)	220148159453501	(ct)	270
(2-0145-11)	220148159453502	(w)	220
(2-0320-01)	220354159205601	(w)	221
(2-0320-03)	220354159205602	(ctw)	222
(2-0345-04)	220341159453901	(ctw)	223
(2-0545-01)	220530159450401	(ct)	270
(2-0622-02)	220631159224301	(ct)	282
(2-0818-01)	220827159185401	(w)	224
(2-0818-02)	220826159185401	(ct)	270
(2-1020-03)	221038159203801	(ctw)	225
(2-1125-01)	221141159252501	(ct)	226
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(6-5224-02)	205243156243201 (ct).....	276
(6-5330-09)	205329156305502 (ct).....	276
(6-5330-10)	205329156305501 (ct).....	276
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1990

Volume 1

INTRODUCTION

Water resources data for the 1990 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams, ditches, and springs; and water-levels and water quality of wells. This report, Volume 1, contains discharge records for 83 gaging stations; water quality for 15 gaging stations, 20 partial-record flow stations, and 129 wells; and water levels for 45 observation wells. Also included are 107 crest-stage partial-record stations, 27 miscellaneous partial-record sites, and 6 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

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 bases. 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-90-1." For archiving and general distribution, the reports for water years 1971-74 are also indentified 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 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) 541-2655.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii have had cooperative agreements for the systematic collection of streamflow and ground water-level 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, Manabu Tagomori, Deputy for Water Resources Management.
Hawaii Department of Transportation, Edward Y. Hirata, Director.
City and County of Honolulu, Board of Water Supply, Kazu Hayashida, Manager and Chief Engineer.
City and County of Honolulu, Department of Public Works, Sam Callejo, Director and Chief Engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army and the Public Works, U.S. Navy.

The following organizations aided in collecting records:

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

SUMMARY OF HYDROLOGIC CONDITIONS

Runoff during the 1990 year was excessive (upper 25 percent of record) at the index station on the island of Maui, and was in the normal range at the stations on the islands of Kauai, Oahu, and Hawaii. The monthly mean flow for all index stations was deficient (lower 25 percent of record) for the month of December, normal for the month of July, and excessive for the month of September.

The annual mean discharge at East Branch of North Fork Wailua River near Lihue, Kauai was 93 percent of the 1951-80 annual median, 78 percent at Kalihi Stream near Honolulu, Oahu, 145 percent at Honopou Stream near Huelo, Maui, and 93 percent at Waiakea Stream near Mountain View, Hawaii.

Monthly and yearly mean discharges of the four index stations are compared with their medians in figure 1.

Dissolved-solids concentrations at the six NASQAN (National Stream Quality Accounting Network) stations showed no significant change during the 1990 year from the previous year. Samples collected every other month showed dissolved-solids concentrations ranged from 20 to 325 mg/L (milligrams per liter) during 1990. Waikele Stream at Waipahu, Oahu, had the highest concentration values.

Average dissolved-oxygen concentrations ranged from 83 to 100 percent saturation. Waimea River was lowest at 83 percent.

Concentrations of trace metals were less than the maximum contaminant levels established by EPA (Environmental Protection Agency). Fecal coliform densities decreased at four of the six NASQAN sites in Hawaii. Waikele Stream at Waipahu, Oahu had the highest fecal coliform density. The geometric-mean values were:

<u>NASQAN Station</u>	<u>Fecal Coliform</u> <u>(colonies per 100 milliliters)</u>	
	<u>1989</u>	<u>1990</u>
Waimea River at Waimea, Kauai	830	478
Waikele Stream at Waipahu, Oahu	6,500	5,500
Kalihi Stream at Kalihi, Oahu	5,900	3,400
Halawa Stream near Halawa, Molokai	259	383
Kahakuloa Stream at Kahakuloa, Maui	6	69
Wailuku River at Hilo, Hawaii	144	120
<u>Benchmark Station</u>		
Honolii Stream near Papaikou, Hawaii	122	69

Analyses of water samples taken at more than 130 basal water-table wells generally did not show significant changes in chloride concentration.

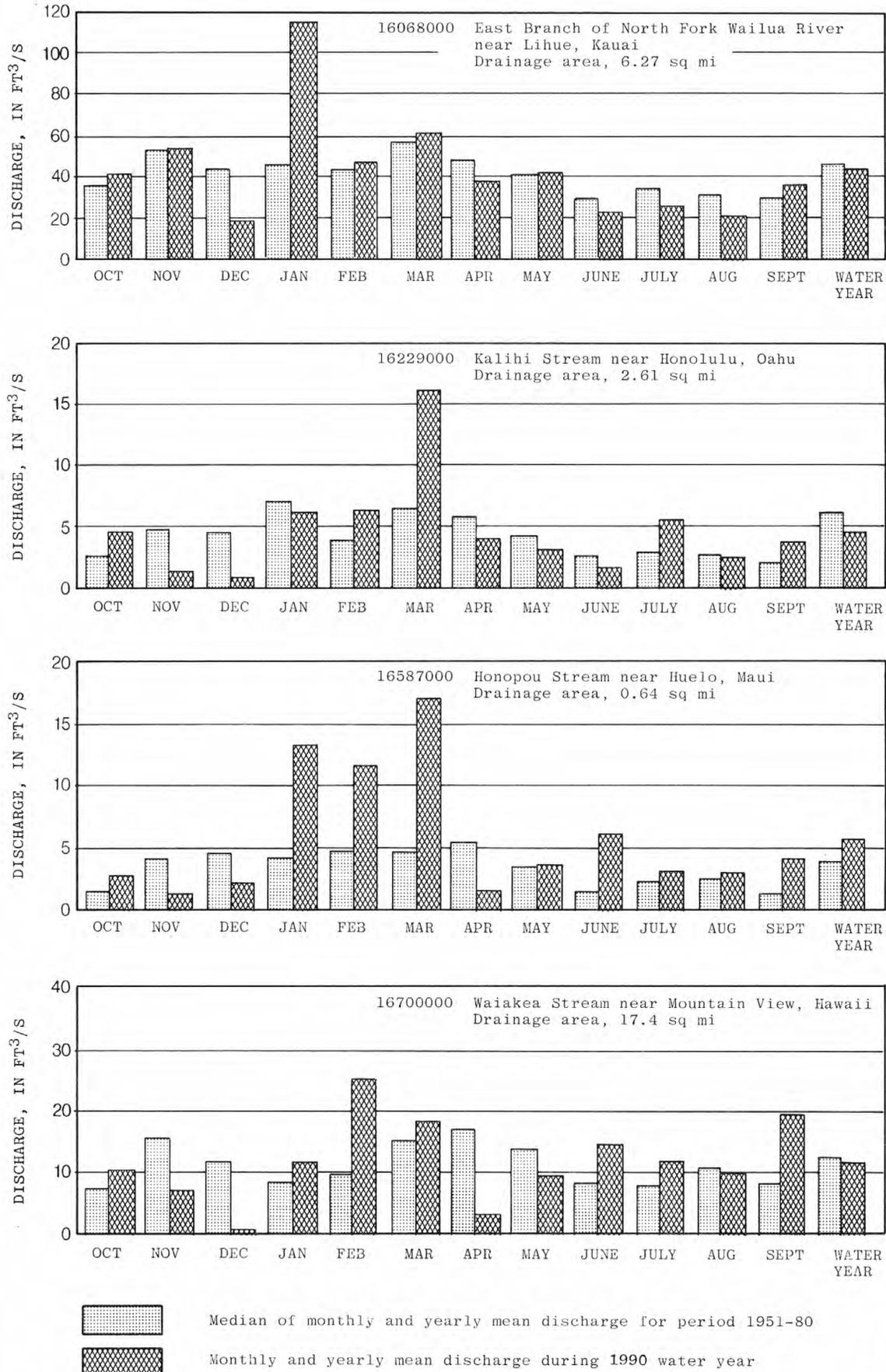


Figure 1.--Discharge during 1990 water year compared with median discharge for period 1951-80 for four representative gaging stations.

DEFINITION OF TERMS

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

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

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

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

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

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, 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 \pm 0.5°C on M-Endoagar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded 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 \pm 0.2°C on M-FC agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliter of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacterial 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 \pm 0.5°C on KF Streptococcus agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Benthic organisms (invertebrates) are the group of animals living in or on the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

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.

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

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."

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 milliliters 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.

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.

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.

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

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

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.
2. When water temperature records include observations taken one or more times daily.
3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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

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

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

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

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

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

Dissolved is that material in a representative water sample which passes through a 0.45 micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

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.

Microgram 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.

Microgram per liter ($\mu\text{g/L}$, $\mu\text{G/L}$) 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.

Milligram 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.

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.

Periphyton is the assemblage of micro-organisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, the periphyton also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

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} radio-active disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

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

Phytoplankton compose the plant part of the plankton. They are usually microscopic, and their movement is subject to water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials into the surrounding water, the phytoplankton have a profound effect on 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 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 a siliceous shell. Their concentrations are expressed as number of cells per milliliter (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 per milliliter (cells/mL) of sample.

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.

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 microsiemens 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 microsiemens). 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.

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.

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

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

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

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

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.

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

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 Nephelometric turbidity units (NTU).

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

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

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

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

DOWNSTREAM ORDER AND STATION NUMBER

Records are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all main-stream stations are listed before the first main-stream station. Stations on tributaries to tributaries are listed in a similar manner. In the lists of gaging stations and water-quality stations in the front of this report the rank of tributaries is indicated by indentation, each indentation 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 indicated downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000 which appears just to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "200000." In this report, the records are listed in downstream order by islands. Locations of the stations are shown in figures 2, 4, 6, 8, and 10.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

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

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

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

To distinguish wells within a minute grid, two 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.

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

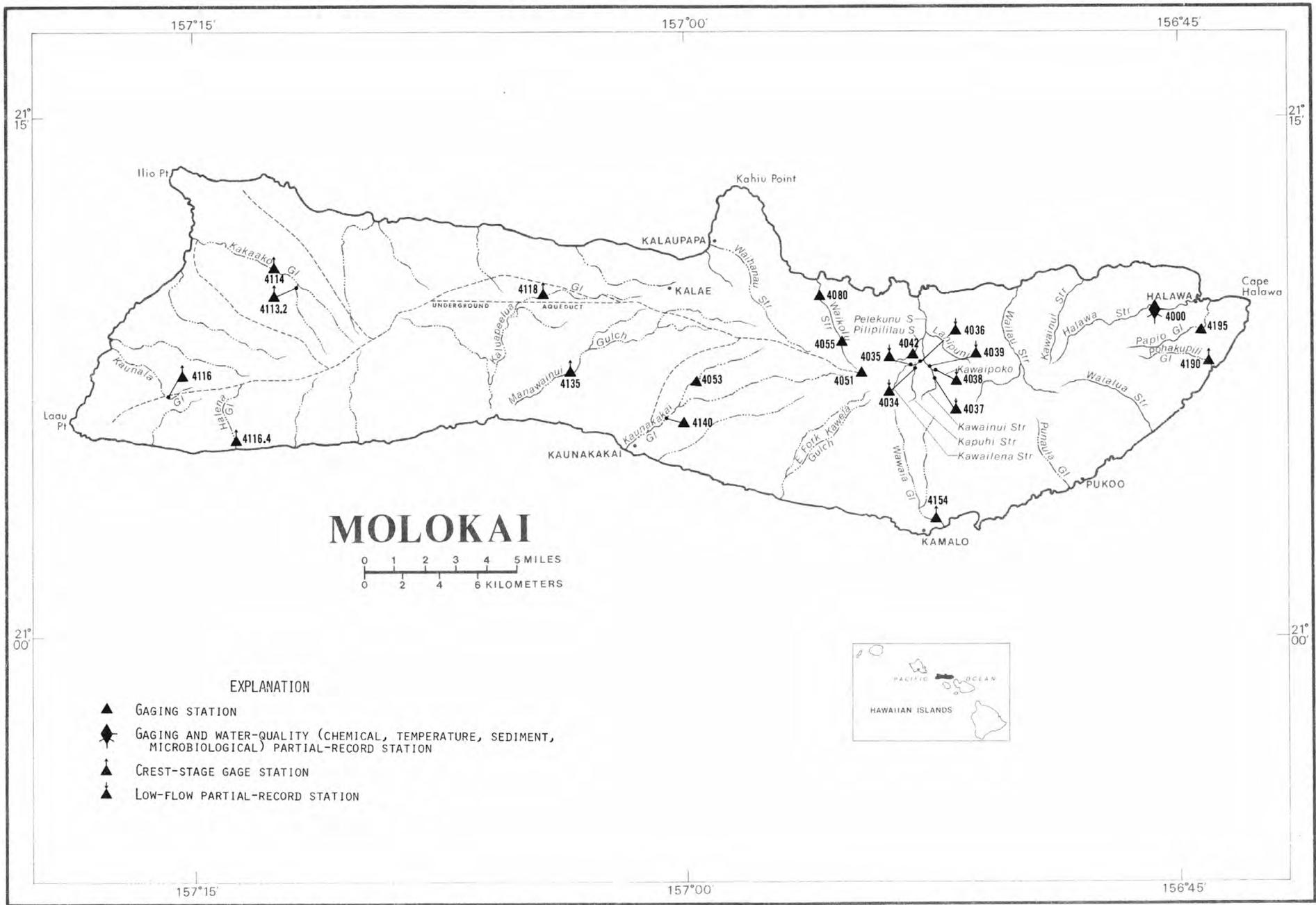


Figure 6.--Locations of gaging, water-quality, and partial-record stations on Molokai.

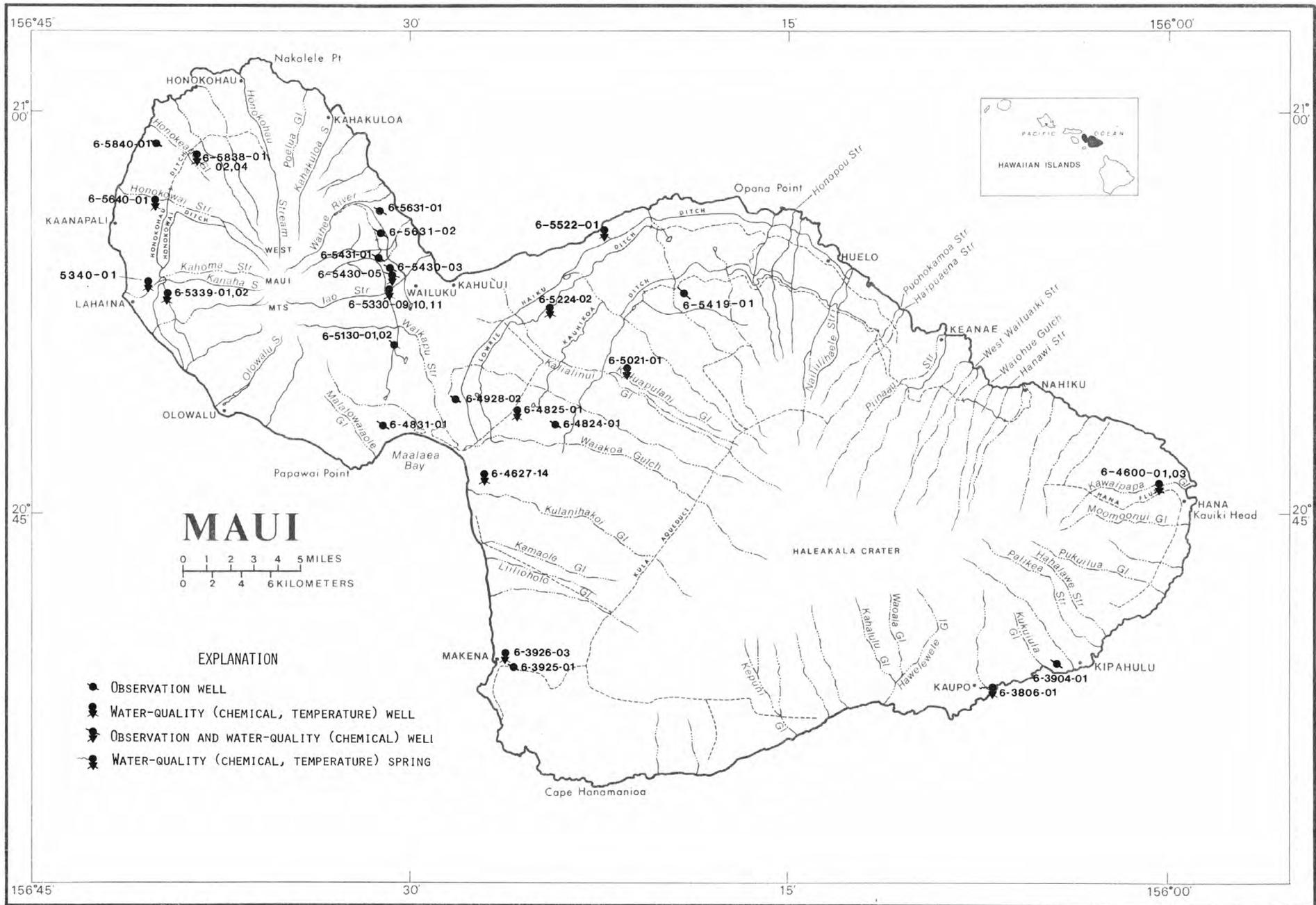


Figure 9.--Locations of observation wells and ground-water quality sampling sites on Maui.

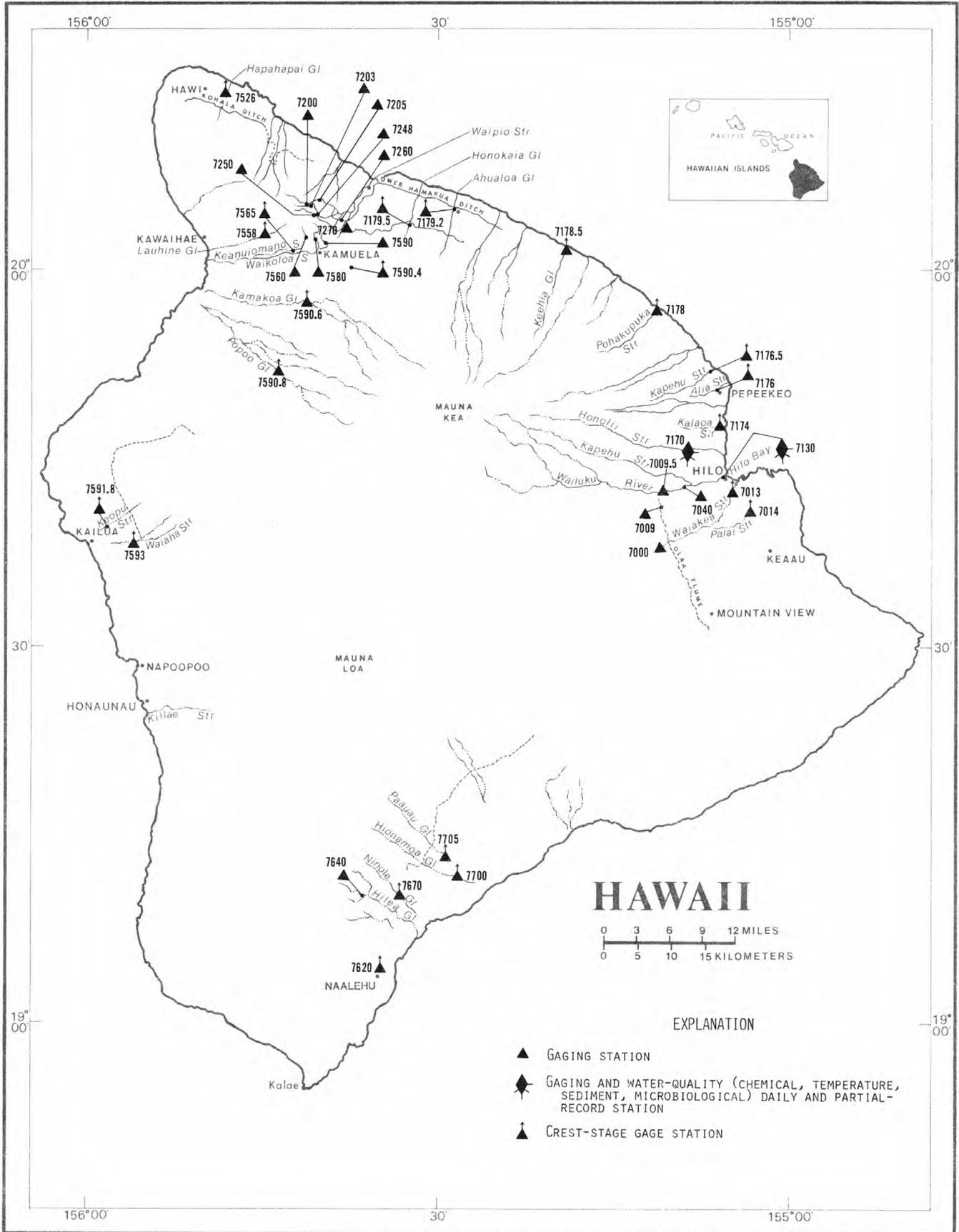


Figure 10.--Locations of gaging, water-quality, and partial-record stations on Hawaii.

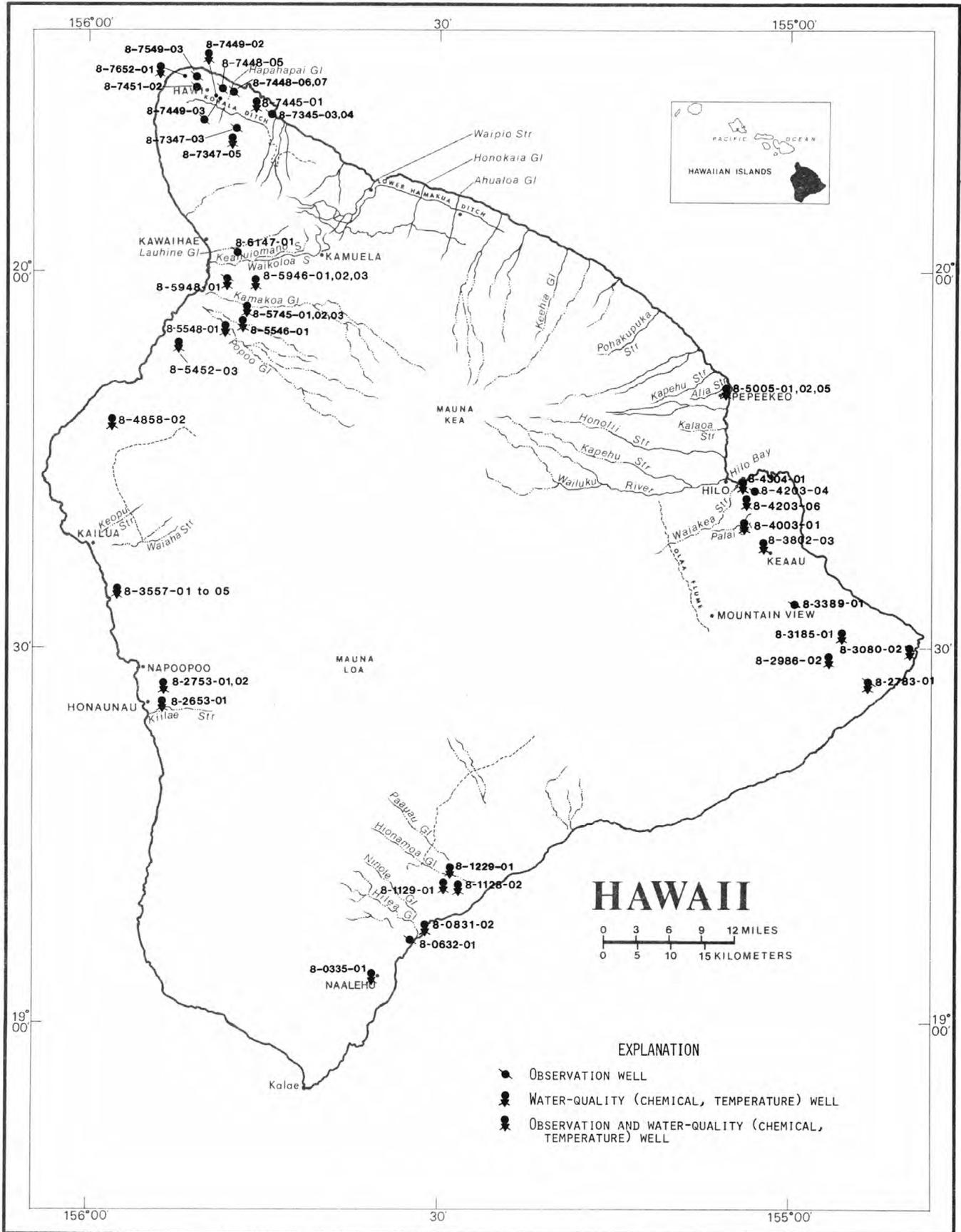


Figure 11.--Locations of observation wells and ground-water quality sampling sites on Hawaii.

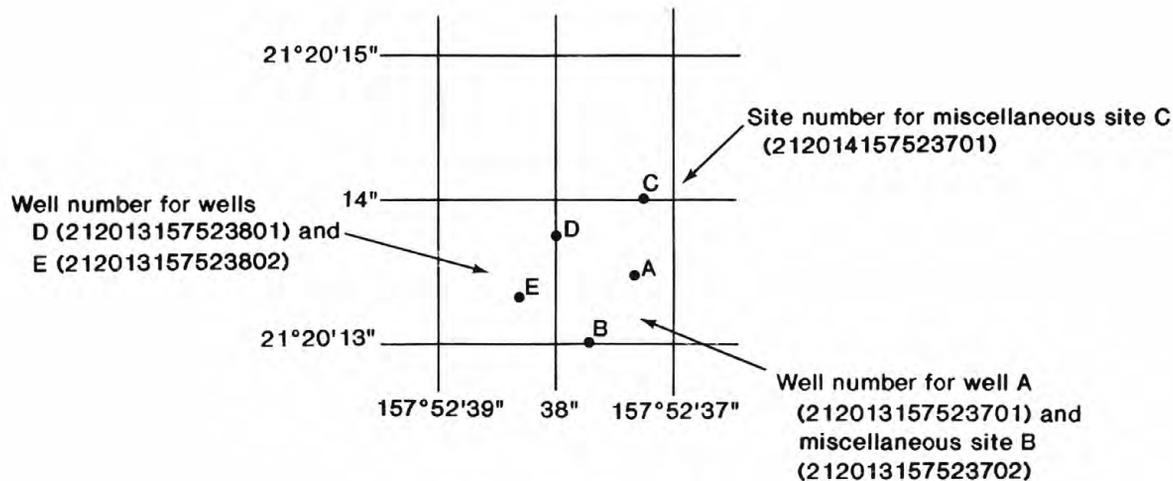


Figure 12.--Sketch showing system for numbering wells and miscellaneous sites.

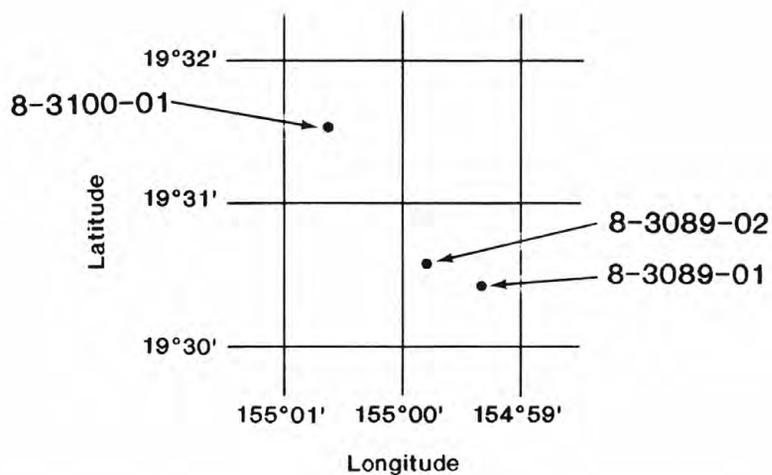


Figure 13.--Sketch showing local well numbering system.

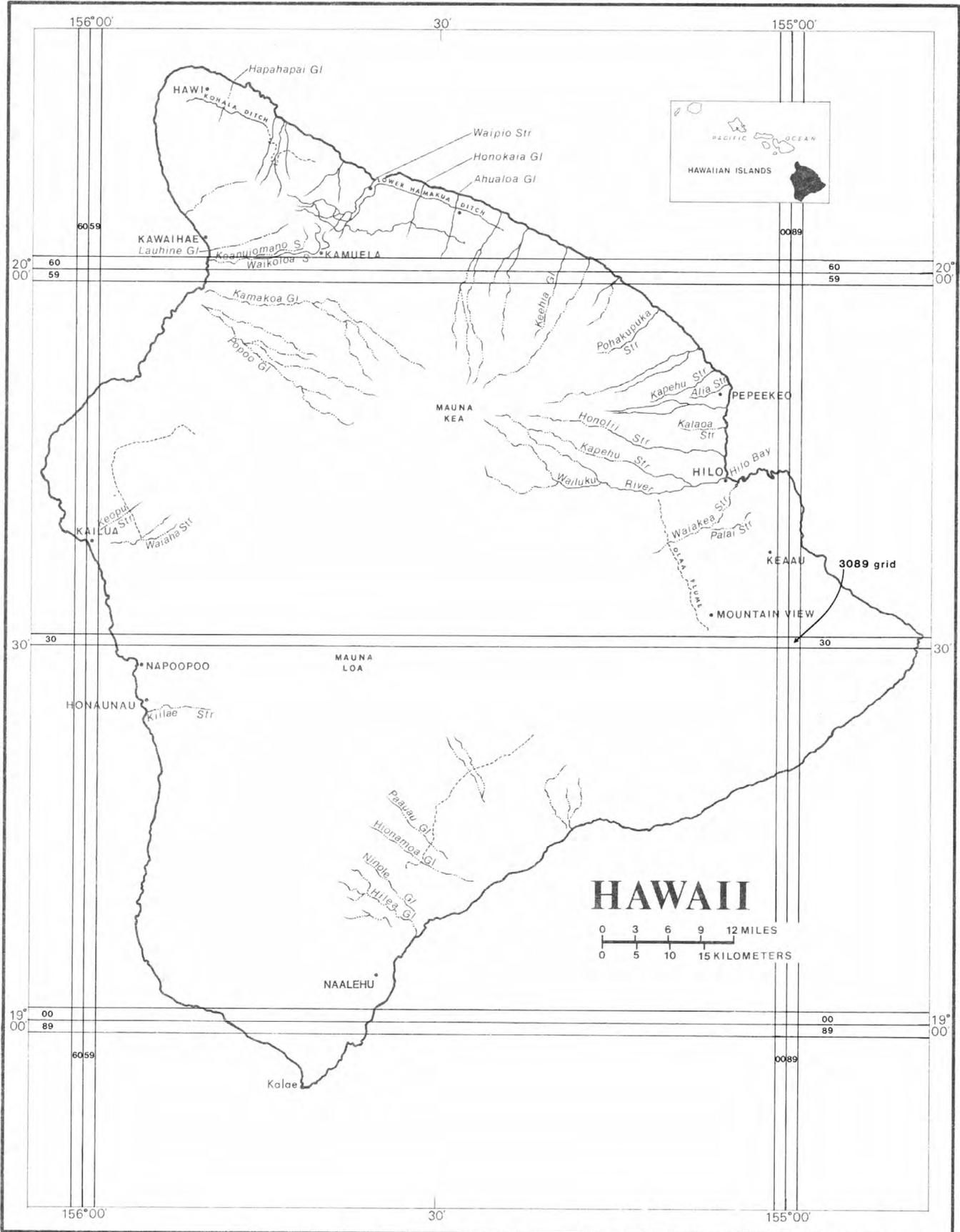


Figure 14.--Map of Hawaii showing system for numbering local well numbers.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely to 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.

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 of 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 stop 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 basis 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 station 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. 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 discharge 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 station where changes to 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"). 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 station 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.

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 temperature, 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 record 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.

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.

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. Large streams have a small diurnal 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 several verticals in the cross section, or a single 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 time 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>WSP</u>	<u>Water</u>	<u>WSP</u>	<u>Water</u>	<u>WSP</u>
<u>year</u>	<u>No.</u>	<u>year</u>	<u>No.</u>	<u>year</u>	<u>No.</u>
1964	1966	1967	2016	1970	2160
1965	1966	1968	2016		
1966	1996	1969	2150		

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

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

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

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

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

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

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire 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</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Calendar</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Calendar</u> <u>year</u>	<u>WSP</u> <u>No.</u>	<u>Calendar</u> <u>year</u>	<u>WSP</u> <u>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	2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

ACCESS TO WATSTORE DATA

The National WATer Data STOrage and REtrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from each of the Water Resources Division's district offices (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting 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) pertains to 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, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for 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. Picke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
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- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
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- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
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- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
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- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
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- 3-B2. *Introduction to ground-water hydraulics, a programmed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
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- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
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- 5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
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- 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.

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 upstream from Kokee-Mohihi Road crossing, 2.5 mi east of Kokee Lodge, and 12.5 mi north of Waimea.

DRAINAGE AREA.--3.95 mi².

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,420 ft, by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft downstream at different datum.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--73 years (water years 1912, 1914, 1920-90), 34.8 ft³/s (25,210 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft³/s and maximim (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 21	1900	3,850	9.75	Mar. 6	1800	*8,180	*13.56

Minimum discharge, 3.1 ft³/s, Aug. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	e4.4	e7.0	6.6	19	374	e17	72	13	20	5.7	4.7
2	5.8	e4.4	e4.5	14	178	37	e16	438	12	18	5.2	3.8
3	4.5	e4.3	e4.4	15	101	27	e14	228	11	10	5.0	4.5
4	4.4	e6.0	e4.3	7.9	46	20	106	36	10	8.4	7.5	3.7
5	5.3	e15	e4.2	11	27	21	25	49	10	7.8	7.3	5.5
6	4.4	e9.0	e4.2	6.6	33	e700	18	61	10	7.1	7.3	8.5
7	4.0	e9.0	e4.1	5.0	52	e900	13	65	9.8	8.2	5.9	6.9
8	3.8	e11	e4.1	6.3	21	e450	134	60	8.9	16	20	14
9	3.7	e10	e100	7.5	16	e300	29	23	8.4	11	24	107
10	4.2	e8.0	e20	5.3	14	e100	17	18	7.8	16	10	33
11	4.8	e7.0	e10	4.3	13	e45	16	16	7.4	18	6.3	9.4
12	4.1	e13	e78	3.9	13	e30	12	19	7.1	17	5.2	11
13	3.7	e20	76	3.7	11	e20	11	25	6.8	8.9	5.0	69
14	3.7	e50	15	32	10	e17	9.8	21	13	7.0	4.5	13
15	5.6	46	9.2	226	9.7	e15	9.2	43	12	6.4	4.2	7.3
16	7.4	e13	7.6	598	16	e13	8.7	48	39	6.2	4.0	5.8
17	4.5	e8.0	6.9	87	113	e12	8.3	334	22	68	3.7	5.2
18	3.7	e21	6.1	222	22	e11	8.0	257	13	65	3.6	8.5
19	3.7	26	7.1	61	25	e10	7.5	136	17	17	4.2	6.1
20	15	49	17	113	63	e9.2	7.2	56	21	8.8	14	4.9
21	65	21	7.9	802	22	e8.6	6.8	54	11	6.9	20	4.4
22	25	e8.0	5.9	225	14	e8.2	6.7	75	9.8	6.1	11	4.0
23	19	e6.0	5.1	205	12	e7.9	6.5	76	8.0	5.7	6.8	12
24	e10	e5.4	4.6	87	11	e7.7	6.5	47	7.1	8.7	4.8	55
25	e7.0	e5.0	5.0	38	28	e7.6	6.4	52	8.3	8.9	4.0	13
26	e6.0	e4.8	8.1	28	28	e7.6	6.3	31	12	6.7	3.7	6.6
27	e5.0	e4.7	5.2	27	90	e8.0	6.7	21	15	19	3.5	5.2
28	e4.6	e4.6	4.4	23	55	e12	63	18	8.8	42	3.5	4.7
29	e4.5	e6.0	29	20	---	e25	72	16	8.6	11	3.3	5.1
30	e4.5	e17	24	22	---	e12	223	14	22	7.6	3.2	5.1
31	e4.4	---	8.2	19	---	e13	---	13	---	6.5	5.0	---
TOTAL	255.7	416.6	497.1	2932.1	1062.7	3228.8	890.6	2422	369.8	473.9	221.4	446.9
MEAN	8.25	13.9	16.0	94.6	38.0	104	29.7	78.1	12.3	15.3	7.14	14.9
MAX	65	50	100	802	178	900	223	438	39	68	24	107
MIN	3.7	4.3	4.1	3.7	9.7	7.6	6.3	13	6.8	5.7	3.2	3.7
AC-FT	507	826	986	5820	2110	6400	1770	4800	733	940	439	886

CAL YR 1989 TOTAL 16950.5 MEAN 46.4 MAX 1650 MIN 3.6 AC-FT 33620
WTR YR 1990 TOTAL 13217.6 MEAN 36.2 MAX 900 MIN 3.2 AC-FT 26220

e Estimated

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA

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

DRAINAGE AREA.--1.79 mi².

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 near Waimea.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharge, which are fair. No diversion upstream.

AVERAGE DISCHARGE.--49 years (water years 1921-31, 1953-90), 22.0 ft³/s (15,940 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 23	0800	*2,690	*6.46	Mar. 6	2130	2,080	5.67

Minimum discharge, 1.8 ft³/s, Sept. 2, 4, 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	2.8	2.9	2.9	43	84	8.8	11	2.9	4.8	6.7	1.8
2	3.6	2.8	2.6	3.4	108	20	8.4	34	2.8	4.2	4.0	1.7
3	3.0	2.6	2.4	4.5	125	10	e7.8	40	2.6	3.4	3.2	1.8
4	6.0	3.1	2.4	4.0	56	7.2	e30	8.8	2.6	2.8	2.9	1.7
5	9.4	8.0	2.3	3.2	55	7.2	e9.0	5.8	2.6	2.6	2.7	17
6	4.6	4.5	2.3	3.0	53	376	e6.0	7.2	2.6	2.3	2.6	7.0
7	3.5	4.5	2.2	2.8	44	417	e5.0	5.8	2.4	2.3	2.5	4.0
8	3.0	5.2	2.2	2.8	16	252	e40	10	2.3	2.3	2.8	3.5
9	2.9	4.8	52	2.4	11	182	e15	5.5	2.4	13	3.8	57
10	25	3.4	8.0	2.4	9.2	34	e10	3.8	2.3	21	3.6	20
11	12	3.0	4.2	2.3	8.4	18	9.6	3.2	2.3	12	2.7	5.1
12	4.8	8.6	3.5	2.2	7.2	13	4.5	2.9	2.0	12	2.5	3.2
13	3.4	11	10	2.2	6.0	9.2	3.2	3.2	2.2	5.1	2.6	49
14	3.1	31	5.2	16	5.2	8.4	2.9	3.4	20	5.8	2.4	7.9
15	9.1	31	3.5	43	4.8	8.0	2.8	3.5	12	14	2.5	4.1
16	74	9.2	3.0	161	5.0	7.2	2.6	3.5	48	10	3.8	3.1
17	15	5.5	2.9	33	10	5.5	2.4	20	39	6.3	2.6	2.8
18	5.7	6.4	2.8	23	9.2	5.0	2.3	57	8.0	30	2.2	11
19	4.3	8.0	30	26	11	4.5	2.3	31	5.0	8.5	2.0	4.2
20	8.1	15	14	141	25	4.2	2.0	18	6.0	4.2	4.9	2.9
21	14	7.2	5.5	155	10	3.8	2.0	7.2	9.2	3.1	5.3	3.8
22	23	5.0	3.8	134	6.0	3.5	2.0	7.2	5.2	2.7	7.3	6.4
23	120	4.0	3.2	e513	4.8	3.2	2.0	19	3.8	2.5	4.0	22
24	12	3.5	3.0	55	4.2	3.2	2.4	11	3.2	5.5	2.7	36
25	16	3.2	2.9	21	5.5	3.0	2.6	10	3.4	4.2	2.4	9.3
26	6.6	3.0	2.9	24	6.4	3.0	2.6	8.8	4.5	3.1	2.7	4.4
27	4.6	2.9	2.8	22	11	3.0	4.5	4.8	4.8	8.0	2.2	3.9
28	3.7	2.8	2.6	17	18	3.2	36	4.0	3.8	37	1.9	4.0
29	3.4	3.2	2.9	34	---	11	17	3.4	3.4	6.1	1.8	3.2
30	3.2	3.2	2.9	31	---	5.0	38	3.4	4.8	3.6	1.7	2.8
31	2.9	---	2.8	19	---	5.5	---	3.0	---	62	1.8	---
TOTAL	412.9	208.4	193.7	1506.1	677.9	1519.8	283.7	359.4	216.1	304.4	96.8	304.6
MEAN	13.3	6.95	6.25	48.6	24.2	49.0	9.46	11.6	7.20	9.82	3.12	10.2
MAX	120	31	52	513	125	417	40	57	48	62	7.3	57
MIN	2.9	2.6	2.2	2.2	4.2	3.0	2.0	2.9	2.0	2.3	1.7	1.7
AC-FT	819	413	384	2990	1340	3010	563	713	429	604	192	604

CAL YR 1989 TOTAL 11669.1 MEAN 32.0 MAX 1010 MIN 1.9 AC-FT 23150
WTR YR 1990 TOTAL 6083.8 MEAN 16.7 MAX 513 MIN 1.7 AC-FT 12070

e Estimated

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	HARD- NESS TOTAL (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
OCT 30...	1130	3.3	28	7.9	15.0	5	0.81	0.72	3.7	60
FEB 06...	1030	37	24	5.8	13.5	4	0.70	0.53	2.8	58
APR 10...	1030	4.2	25	6.1	13.5	5	0.84	0.80	3.2	55
JUL 05...	1000	2.6	34	6.5	18.0	7	1.1	1.1	3.8	52

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 30...	0.7	0.30	4.0	<1.0	5.7	<0.10	5.7	<0.100	270	1
FEB 06...	0.6	0.40	1.0	<1.0	5.2	<0.10	1.9	<0.100	260	9
APR 10...	0.6	0.20	4.0	<1.0	5.9	<0.10	6.1	<0.100	280	2
JUL 05...	0.6	0.30	4.8	<1.0	5.0	0.10	6.2	<0.100	250	2

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

HAWAII, ISLAND OF KAUAI

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

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

DRAINAGE AREA.--57.8 mi².

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 above mean sea level (Department of Water, County of Kauai bench mark). Prior to Oct. 5, 1911, nonrecording gage at site 1.0 mi downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum.

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

AVERAGE DISCHARGE.--49 years (water years 1911-17, 1945-68, 1970-72, 1976-90), 128 ft³/s (92,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft³/s, Feb. 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft³/s on basis of slope-area measurements at gage heights 10.28 ft and 18.7 ft; 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, from floodmarks, discharge, 29,100 ft³/s, from rating curve extended above 2,200 ft³/s on basis of slope-area measurement at gage height 19.05 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 21	2130	*25,200	*18.16	Mar. 6	2400	16,400	15.48
Minimum discharge, 7.9 ft ³ /s, June 24-26, 29, 30, July 6, 7.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e14	13	e14	14	168	626	35	192	10	12	29	11
2	e15	13	e14	14	463	114	31	375	10	12	10	10
3	e14	13	e14	16	486	53	20	748	9.8	12	8.6	11
4	e22	e25	e14	17	278	32	78	137	9.7	9.1	8.4	11
5	e23	e45	14	15	240	21	78	82	10	8.5	8.7	10
6	e19	e30	14	15	222	3090	27	84	11	8.2	8.7	31
7	e15	e28	15	15	242	4020	16	73	11	8.4	8.7	15
8	e14	e35	15	14	167	1600	85	78	11	9.0	8.5	12
9	e15	e25	328	14	125	912	82	60	10	10	11	183
10	e150	e22	85	14	111	360	30	33	10	28	14	87
11	45	e21	29	14	106	214	33	22	10	35	11	31
12	18	e22	19	14	105	168	26	15	9.7	22	9.7	12
13	16	e35	209	14	94	127	26	15	9.6	20	9.4	73
14	15	e25	43	66	83	84	22	16	14	11	9.5	64
15	15	347	21	411	73	139	19	25	32	11	9.5	15
16	40	60	15	1290	15	77	16	32	55	28	9.4	11
17	65	29	14	528	81	55	11	305	131	14	11	9.5
18	17	21	14	351	59	45	10	559	39	106	9.8	9.9
19	15	e23	14	243	38	37	10	256	14	55	9.6	17
20	14	e35	48	649	92	31	10	140	12	16	10	11
21	18	e22	20	6730	72	25	9.7	57	13	11	16	11
22	80	e18	16	2850	30	21	9.5	41	15	9.0	16	11
23	253	e17	15	1940	16	18	9.4	104	10	8.6	16	14
24	67	e16	14	1180	13	16	9.8	77	8.5	8.6	12	110
25	22	e16	14	384	14	14	9.5	46	8.1	11	10	62
26	19	e15	14	253	27	13	10	54	8.8	10	9.7	18
27	15	e15	14	225	32	13	14	25	10	9.2	9.9	11
28	14	e15	14	180	128	13	73	14	11	76	9.7	10
29	14	e15	14	157	---	80	142	12	8.7	39	9.3	10
30	14	e15	17	212	---	45	335	11	8.5	14	9.1	9.3
31	13	---	16	160	---	24	---	11	---	75	9.3	---
TOTAL	1090	1031	1121	17999	3580	12087	1286.9	3699	530.4	706.6	341.5	900.7
MEAN	35.2	34.4	36.2	581	128	390	42.9	119	17.7	22.8	11.0	30.0
MAX	253	347	328	6730	486	4020	335	748	131	106	29	183
MIN	13	13	14	14	13	13	9.4	11	8.1	8.2	8.4	9.3
AC-FT	2160	2040	2220	35700	7100	23970	2550	7340	1050	1400	677	1790

CAL YR 1989 TOTAL 85752.5 MEAN 235 MAX 8480 MIN 6.6 AC-FT 170100
WTR YR 1990 TOTAL 44373.1 MEAN 122 MAX 6730 MIN 8.1 AC-FT 88010

e Estimated

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
OCT											
17...	1130	68	80	6.7	23.0	3.4	762	8.1	94	830	3000
DEC											
12...	1030	18	120	6.6	19.0	1.2	760	8.0	87	540	750
FEB											
14...	1100	83	92	7.8	17.0	1.0	766	6.7	69	100	360
APR											
16...	1000	18	120	7.8	23.0	1.0	765	5.8	67	660	470
JUN											
12...	1000	10	150	8.1	25.5	0.50	765	7.2	88	310	210
AUG											
21...	1000	14	158	8.0	26.0	0.80	763	7.5	92	1300	460

DATE	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONATE (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)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM DIS-SOLVED (MG/L AS K)	BICARBONATE DIS-SOLVED (MG/L AS HCO3)	CARBONATE DIS-SOLVED (MG/L AS CO3)	ALKALINITY (MG/L AS CaCO3)
OCT											
17...	28	0	3.8	4.6	5.9	31	0.5	0.60	35	0	29
DEC											
12...	45	0	6.1	7.3	7.4	26	0.5	0.60	56	0	46
FEB											
14...	32	0	4.6	5.0	6.0	29	0.5	0.50	39	0	32
APR											
16...	46	1	6.1	7.4	7.7	27	0.5	0.60	55	0	45
JUN											
12...	59	0	7.4	9.8	8.9	25	0.5	0.60	75	0	61
AUG											
21...	61	0	8.1	9.9	9.1	24	0.5	0.70	76	0	62

DATE	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)	SOLIDS, RESIDUE AT 180 DEG. C (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
17...	<1.0	7.1	0.10	18	63	--	--	<0.100	0.020	0.010	0.50
DEC											
12...	2.0	9.1	<0.10	22	80	82	0.11	<0.100	<0.010	<0.010	0.20
FEB											
14...	2.0	8.3	0.10	18	63	64	0.09	0.100	<0.010	<0.010	<0.20
APR											
16...	1.9	11	<0.10	22	83	84	0.11	0.100	<0.010	0.010	<0.20
JUN											
12...	1.7	14	0.20	24	92	103	0.13	<0.100	0.030	0.010	0.20
AUG											
21...	1.2	16	<0.10	25	88	108	0.12	<0.100	0.010	<0.010	0.40

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

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUMINUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYLLIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
OCT 17...	0.040	0.010	<0.010	70	<1	< 2	<0.5	<1.0	1	<3	3	200
DEC 12...	0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
FEB 14...	<0.010	<0.010	<0.010	40	<1	2	<0.5	<1.0	<5	<3	<10	66
APR 16...	<0.010	<0.010	<0.010	<10	<1	<2	<0.5	<1.0	1	<3	1	39
JUN 12...	0.030	0.020	<0.010	--	--	--	--	--	--	--	--	--
AUG 21...	0.020	<0.010	0.010	<10	<1	3	<0.5	<1.0	<1	<3	2	52

DATE	TIME	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 17...	1130	<1	<4	4	<0.1	<10	2	<1	<1.0	25	<6	11
FEB 14...	1100	<10	<4	6	<0.1	<10	<10	<1	<1.0	30	<6	8
APR 16...	1000	<1	<4	9	<0.1	<10	1	<1	<1.0	37	<6	<3
AUG 21...	1000	<1	<4	11	<0.1	<10	1	<1	<1.0	48	<6	4

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DEPTH AT SAMPLE LOCATION, TOTAL (FEET)	SAMPLE LOCATION, CROSS SECTION (FT FM R BK)	SPE-CIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRES-SURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)
OCT 17...	1030	1.85	3.0	80	6.7	23.0	762	8.0	93
OCT 17...	1031	1.62	13.0	80	6.7	23.0	762	8.0	93
OCT 17...	1032	1.26	23.0	80	6.7	23.0	762	8.1	94
OCT 17...	1033	1.24	33.0	80	6.7	23.0	762	8.1	94
OCT 17...	1034	1.02	43.0	80	6.7	23.0	762	8.0	93

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 17...	1130	10	1.8	100	APR 16...	1000	3	0.15	100
DEC 12...	1030	8	0.40	100	JUN 12...	1000	2	0.06	100
FEB 14...	1100	2	0.45	100	AUG 21...	1000	8	0.30	100

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

16036000 MAKAWELI RIVER NEAR WAIMEA

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

DRAINAGE AREA.--26.0 mi².

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft³/s capacity ditch diverts water from upstream of the station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--47 years, 86.4 ft³/s (62,600 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 21	2000	*21,000	*14.92	No other peak greater than base discharge.			

Minimum discharge, 8.6 ft³/s, Aug. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	16	20	22	e150	85	39	e19	12	13	27	10
2	27	16	20	22	e250	34	31	e20	12	16	18	9.9
3	18	16	19	24	e350	26	24	e18	11	11	15	9.6
4	19	26	19	18	e300	23	29	e17	11	11	14	9.6
5	30	41	19	17	e320	25	28	e16	11	11	13	101
6	17	30	19	17	e270	581	26	e15	11	11	12	24
7	16	28	18	17	e150	1360	21	e15	12	11	11	15
8	15	31	18	16	e90	1170	21	e18	11	12	11	13
9	15	26	163	16	54	860	24	e17	15	74	15	179
10	95	22	34	16	49	348	24	e16	11	55	12	87
11	35	22	26	16	45	218	39	e15	11	30	11	18
12	18	24	26	16	43	112	25	e15	11	20	13	14
13	16	35	29	15	40	76	22	e16	11	14	13	118
14	15	30	25	28	37	43	21	e15	80	25	11	28
15	22	69	23	54	35	39	21	e15	34	85	17	21
16	63	35	20	154	34	33	21	e15	89	30	13	14
17	45	29	19	74	37	31	20	15	107	13	11	12
18	23	27	18	33	34	29	20	76	29	103	10	43
19	20	28	56	41	34	27	19	52	17	26	10	14
20	24	32	47	408	39	27	19	56	19	14	57	12
21	55	25	26	3410	36	25	19	22	62	11	33	23
22	122	24	23	1870	34	24	19	18	19	11	43	21
23	308	22	22	1910	37	23	19	42	13	10	15	15
24	80	20	20	e500	33	22	67	28	12	38	12	77
25	122	20	20	e150	36	21	e18	29	19	14	13	26
26	47	20	20	e200	35	21	e17	24	15	11	11	15
27	19	20	20	e400	29	21	e19	17	13	75	9.7	17
28	18	20	20	e170	28	26	e18	15	12	210	9.7	13
29	18	20	20	e140	---	60	e17	13	16	27	9.2	11
30	18	22	20	e120	---	24	e20	14	13	19	8.8	11
31	17	---	20	e90	---	22	---	13	---	187	9.3	---
TOTAL	1379	796	869	9984	2629	5436	727	696	719	1198	487.7	981.1
MEAN	44.5	26.5	28.0	322	93.9	175	24.2	22.5	24.0	38.6	15.7	32.7
MAX	308	69	163	3410	350	1360	67	76	107	210	57	179
MIN	15	16	18	15	28	21	17	13	11	10	8.8	9.6
AC-FT	2740	1580	1720	19800	5210	10780	1440	1380	1430	2380	967	1950

CAL YR 1989 TOTAL 47728 MEAN 131 MAX 3500 MIN 14 AC-FT 94670
WTR YR 1990 TOTAL 25901.8 MEAN 71.0 MAX 3410 MIN 8.8 AC-FT 51380

e Estimated

HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

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

DRAINAGE AREA.--18.5 mi².

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

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

GAGE.--Water-stage recorder. Datum of gage is 222 ft 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 higher.

REMARKS.--Records good. Koula ditch diverts 3.0 mi upstream for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--66 years (water years 1918-20, 1928-90), 85.5 ft³/s (61,940 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 21	1930	*8,580	*8.66	Mar. 7	0430	4,170	6.57

Minimum discharge, 16 ft³/s, June 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	20	20	22	192	37	45	32	25	20	26	21
2	21	20	20	22	382	35	35	34	23	19	18	19
3	20	21	21	23	509	33	40	31	23	17	17	19
4	32	62	21	21	378	31	43	24	23	17	19	19
5	34	58	21	22	420	29	38	24	24	17	17	148
6	20	27	21	23	367	564	31	25	24	17	17	29
7	20	26	21	21	207	1670	27	24	25	18	17	18
8	20	31	20	21	122	825	27	29	25	18	18	48
9	20	28	234	21	95	680	27	25	25	46	21	363
10	200	22	29	20	84	430	29	24	24	57	17	86
11	44	23	22	20	78	339	30	24	24	25	18	21
12	22	25	21	20	71	127	27	24	23	19	20	18
13	20	28	20	21	68	75	26	25	19	16	18	154
14	20	31	20	34	72	59	26	24	54	34	18	48
15	23	38	20	37	37	50	26	24	23	197	22	34
16	133	25	20	44	40	44	26	23	73	49	18	19
17	37	22	20	29	40	41	26	24	77	20	18	22
18	23	21	20	20	36	41	25	34	24	148	18	48
19	23	21	22	55	35	40	25	59	18	33	19	18
20	28	25	21	590	34	38	25	44	29	19	74	21
21	95	21	20	2330	32	37	25	23	65	17	36	54
22	53	21	20	1220	31	35	25	24	23	17	40	36
23	348	20	20	1630	30	34	26	53	18	18	17	37
24	91	20	20	458	29	34	47	33	17	62	18	96
25	136	20	20	166	29	33	23	32	22	19	19	36
26	32	21	21	253	31	32	25	26	19	17	19	20
27	24	20	21	481	30	32	31	23	19	93	17	24
28	22	20	21	200	28	44	33	23	18	307	18	19
29	21	21	21	173	---	80	28	23	19	33	18	18
30	21	21	21	139	---	30	35	27	19	23	18	18
31	21	---	22	101	---	33	---	24	---	108	21	---
TOTAL	1644	779	861	8237	3507	5612	902	888	844	1520	671	1531
MEAN	53.0	26.0	27.8	266	125	181	30.1	28.6	28.1	49.0	21.6	51.0
MAX	348	62	234	2330	509	1670	47	59	77	307	74	363
MIN	20	20	20	20	28	29	23	23	17	16	17	18
AC-FT	3260	1550	1710	16340	6960	11130	1790	1760	1670	3010	1330	3040

CAL YR 1989 TOTAL 46305 MEAN 127 MAX 3090 MIN 16 AC-FT 91850
WTR YR 1990 TOTAL 26996 MEAN 74.0 MAX 2330 MIN 16 AC-FT 53550

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 upstream from Wailua Falls and 4.3 mi north of Lihue.

DRAINAGE AREA.--22.4 mi².

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

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

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

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

AVERAGE DISCHARGE.--73 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-90), 116 ft³/s (84,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft³/s, Apr. 15, 1963, gage height, 22.90 ft, from rating curve extended above 13,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft³/s, Aug. 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1630	7,540	15.16	Jan. 23	1130	*13,700	*16.76

Minimum discharge, 4.1 ft³/s, Aug. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170	72	31	55	307	186	38	118	11	6.0	68	5.2
2	104	78	8.9	49	440	91	37	157	8.1	14	43	32
3	48	74	8.4	60	613	30	56	227	6.8	6.2	33	23
4	60	398	8.0	50	592	25	112	72	6.2	5.7	45	7.8
5	94	401	7.8	50	531	26	134	55	6.0	5.7	33	82
6	58	175	7.6	57	502	249	99	54	6.1	5.1	22	37
7	56	141	7.4	43	338	1410	76	35	7.5	5.1	16	7.4
8	75	150	7.2	32	210	631	80	14	6.9	5.1	13	11
9	53	145	106	31	169	694	79	13	13	46	6.7	587
10	343	108	21	31	148	702	71	8.7	12	74	6.1	197
11	189	99	22	30	137	628	78	8.0	7.5	47	5.0	71
12	130	133	42	30	126	280	61	7.8	6.6	25	4.8	53
13	114	134	42	30	108	205	57	16	5.7	13	5.4	213
14	108	164	38	38	73	185	55	20	24	22	4.9	133
15	108	244	38	80	52	159	56	20	10	216	5.1	129
16	630	131	37	176	52	140	42	17	27	82	8.6	82
17	232	101	36	116	81	133	11	17	45	30	4.9	71
18	110	94	35	55	47	131	8.3	37	12	198	4.6	196
19	65	90	38	105	39	108	8.0	31	6.7	79	4.4	100
20	79	99	47	998	44	85	7.8	72	15	42	74	114
21	232	83	27	2430	52	80	7.6	18	91	30	56	173
22	97	83	8.2	2070	59	75	7.4	13	51	25	120	143
23	599	73	7.1	2590	85	47	7.3	43	52	23	81	98
24	243	69	6.5	930	83	15	49	51	40	75	68	211
25	439	67	5.9	408	97	13	15	25	33	35	80	130
26	165	64	5.9	450	86	12	8.0	26	13	24	69	71
27	135	60	18	995	78	10	7.4	9.9	7.7	136	45	54
28	121	39	50	416	100	22	20	7.9	12	436	6.5	26
29	109	11	61	339	---	109	25	7.4	12	85	4.8	15
30	89	23	49	280	---	26	124	15	6.9	76	4.8	9.9
31	62	---	48	219	---	23	---	11	---	177	4.4	---
TOTAL	5117	3603	874.9	13243	5249	6530	1436.8	1226.7	561.7	2048.9	947.0	3082.3
MEAN	165	120	28.2	427	187	211	47.9	39.6	18.7	66.1	30.5	103
MAX	630	401	106	2590	613	1410	134	227	91	436	120	587
MIN	48	11	5.9	30	39	10	7.3	7.4	5.7	5.1	4.4	5.2
AC-FT	10150	7150	1740	26270	10410	12950	2850	2430	1110	4060	1880	6110

CAL YR 1989 TOTAL 84328.1 MEAN 231 MAX 6000 MIN 5.9 AC-FT 167300
WTR YR 1990 TOTAL 43920.3 MEAN 120 MAX 2590 MIN 4.4 AC-FT 87120

HAWAII, ISLAND OF KAUAI

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 downstream from Waikoko Stream, 8.1 mi west of Wailua, and 8.4 mi northwest of Lihue.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,070 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--25 years, 23.1 ft³/s (16,740 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft³/s, Jan. 21; minimum daily, 15 ft³/s, Feb. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	18	16	18	23	22	21	22	20	20	21	18
2	20	18	16	18	23	20	21	23	19	20	21	18
3	20	18	16	18	25	19	21	24	19	20	20	18
4	21	23	16	18	24	19	22	21	19	20	21	18
5	20	22	16	19	24	20	21	20	19	19	20	20
6	19	20	16	18	24	24	20	20	20	19	20	19
7	20	20	16	17	21	27	20	20	19	19	20	18
8	20	21	16	17	19	25	20	20	20	19	20	20
9	19	20	20	17	19	26	20	20	19	22	20	24
10	23	19	17	17	18	26	20	20	19	21	19	21
11	19	18	17	17	18	25	20	19	19	20	19	20
12	20	19	17	17	17	22	19	20	18	21	18	19
13	20	19	18	17	15	21	19	20	18	20	19	21
14	19	20	18	19	18	21	19	20	21	21	19	20
15	19	20	18	21	19	20	19	20	20	24	20	20
16	22	18	18	24	19	20	19	19	21	22	19	19
17	20	18	17	21	20	20	19	20	21	21	19	e19
18	19	18	17	20	19	20	19	21	20	23	18	e21
19	20	18	19	23	19	20	19	21	20	21	19	e19
20	20	18	18	27	19	19	19	20	21	20	22	e19
21	22	18	18	29	19	19	18	20	24	20	21	e23
22	21	18	17	25	19	19	18	20	21	20	21	e21
23	24	17	17	28	19	19	19	22	20	20	20	e21
24	22	17	17	23	19	19	21	21	20	21	20	e24
25	22	17	17	20	19	19	19	21	21	20	20	e22
26	20	17	17	24	19	19	19	20	20	20	19	e21
27	19	17	17	26	20	19	20	20	21	23	19	e22
28	18	17	17	22	20	20	21	20	21	24	19	e21
29	18	17	17	21	---	21	20	20	20	21	19	e20
30	18	17	17	20	---	20	23	21	20	22	18	e20
31	18	---	18	19	---	20	---	20	---	24	18	---
TOTAL	623	557	531	640	557	650	595	635	600	647	608	606
MEAN	20.1	18.6	17.1	20.6	19.9	21.0	19.8	20.5	20.0	20.9	19.6	20.2
MAX	24	23	20	29	25	27	23	24	24	24	22	24
MIN	18	17	16	17	15	19	18	19	18	19	18	18
AC-FT	1240	1100	1050	1270	1100	1290	1180	1260	1190	1280	1210	1200

CAL YR 1989 TOTAL 7511.0 MEAN 20.6 MAX 34 MIN 4.3 AC-FT 14900
WTR YR 1990 TOTAL 7249 MEAN 19.9 MAX 29 MIN 15 AC-FT 14380

e Estimated

HAWAII, ISLAND OF KAUAI

41

16062000 STABLE STORM DITCH NEAR LIHUE

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

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

GAGE.--Water-stage recorder and sharp-crested weir. Elevation of gage is 710 ft, by barometer.

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

AVERAGE DISCHARGE.--53 years (water years 1938-90), 10.4 ft³/s (7,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft³/s, Apr. 3, 1948; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 38 ft³/s, Sept. 9; no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.00	.00	.00	.00	.06	.10	.14	.08	.17	.00	8.6
2	.00	.00	.00	.00	.00	.00	.08	.20	.08	.15	.00	9.2
3	.01	.00	.00	.00	.00	.00	.08	.17	.08	.08	.00	8.6
4	.01	.49	.00	.00	.03	.00	.18	.08	.08	.00	.00	8.0
5	.01	.06	.00	.00	.04	.00	.19	.06	.08	.00	.00	27
6	.00	.03	.00	.01	.03	.09	.12	.06	.08	.00	.00	12
7	.01	.01	.00	.01	.00	.19	.06	.04	.08	.01	.00	10
8	.00	.01	.00	.02	.00	.15	.12	.09	.09	.03	.00	18
9	.00	.00	.06	.03	.00	.17	.10	.06	.08	.20	.00	38
10	.11	.00	.00	.03	.00	.18	.08	.02	.08	.14	.00	14
11	.10	.00	.00	.01	.00	.16	.05	.02	.08	.04	.00	.77
12	.03	.00	.01	.00	.00	.15	.03	.03	.08	.07	.00	.67
13	.03	.00	.10	.00	.00	.10	.03	.05	.09	.02	.00	.88
14	.03	.01	1.2	.08	.00	.10	.03	.04	.19	.06	.00	.58
15	.02	.00	.27	.14	.00	.05	.02	.03	.13	.31	.04	.57
16	.14	.00	.22	.34	.00	.03	.00	.02	.17	.06	.00	.45
17	.00	.00	.22	.16	.00	.03	.00	.10	.19	.05	.00	.40
18	.00	.00	.22	.11	.00	.03	.01	.16	.13	.29	.00	.39
19	.00	.00	.22	.17	.00	.03	.03	.13	.12	.06	.00	.39
20	.00	.00	.16	.31	.00	.01	.03	.06	.17	.01	.23	.39
21	.00	.00	.15	.61	.00	.00	.03	.03	.26	.00	.12	.43
22	.00	.00	.15	.12	.00	.00	.03	.11	.11	.00	2.5	.34
23	.03	.00	.15	.19	.00	.00	.03	.19	.08	.00	2.3	.30
24	.02	.00	.15	.06	.00	.00	.16	.11	.08	.02	.36	.47
25	.04	.00	.15	.02	.00	.00	.00	.12	.18	.00	.72	.34
26	.01	.00	.15	.02	.00	.00	.00	.09	.13	.00	1.0	.27
27	.00	.00	.09	.04	.01	.00	.01	.08	.17	.21	.86	.28
28	.00	.00	.08	.00	.00	.11	.14	.08	.16	.19	2.8	.22
29	.00	.00	.08	.00	---	.17	.08	.08	.15	.00	6.4	.18
30	.00	.00	.01	.00	---	.03	.22	.12	.12	.04	7.7	.15
31	.00	---	.00	.00	---	.02	---	.09	---	.18	9.1	---
TOTAL	0.62	0.61	3.84	2.48	0.11	1.86	2.04	2.66	3.60	2.39	34.13	161.87
MEAN	.020	.020	.12	.080	.004	.060	.068	.086	.12	.077	1.10	5.40
MAX	.14	.49	1.2	.61	.04	.19	.22	.20	.26	.31	9.1	38
MIN	.00	.00	.00	.00	.00	.00	.00	.02	.08	.00	.00	.15
AC-FT	1.2	1.2	7.6	4.9	.2	3.7	4.0	5.3	7.1	4.7	68	321

CAL YR 1989 TOTAL 624.70 MEAN 1.71 MAX 67 MIN .00 AC-FT 1240
WTR YR 1990 TOTAL 216.21 MEAN .59 MAX 38 MIN .00 AC-FT 429

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 upstream from mouth and 7.2 mi northwest of Lihue.

DRAINAGE AREA.--6.27 mi².

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

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

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--75 years (water years 1913-14, 1916-17, 1920-90), 48.4 ft³/s (35,070 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.-- Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 23	0930	*3,110	*7.00	No other peak greater than base discharge.			
Minimum discharge, 14 ft ³ /s, Jan. 10-14.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	25	21	17	59	120	37	41	27	23	23	15
2	32	25	21	16	81	35	32	112	25	22	22	26
3	27	24	20	19	97	29	33	130	23	20	22	19
4	28	218	20	16	107	26	80	43	22	21	26	16
5	40	172	19	16	91	27	109	34	21	20	21	36
6	31	55	19	16	92	122	48	33	22	18	19	22
7	39	44	18	15	65	248	37	32	21	17	18	20
8	32	48	18	15	53	138	78	39	21	17	19	30
9	27	41	42	15	47	169	48	31	21	28	22	126
10	144	35	21	14	44	144	38	27	20	30	19	64
11	51	32	19	14	43	113	34	26	19	25	17	31
12	35	53	21	14	38	70	31	28	19	26	17	26
13	31	76	40	14	35	57	29	32	18	22	17	43
14	29	189	20	20	32	55	28	27	29	22	17	27
15	28	103	18	42	30	47	27	30	21	35	23	35
16	43	52	17	179	32	41	26	25	29	24	18	24
17	30	42	17	49	49	37	25	47	32	21	16	23
18	26	39	17	41	31	34	24	87	23	46	16	32
19	28	39	17	59	28	32	24	53	20	27	16	23
20	32	38	17	257	28	31	23	36	21	21	48	24
21	48	34	16	628	26	29	22	30	46	19	48	61
22	39	32	16	371	25	28	22	40	25	18	40	44
23	125	29	16	763	24	27	22	59	22	19	23	39
24	47	28	16	238	23	26	26	42	20	26	21	94
25	61	27	15	123	31	25	22	49	27	22	22	52
26	38	26	15	134	25	24	21	37	23	18	21	34
27	35	24	15	172	32	23	21	30	24	35	18	42
28	31	23	15	93	31	41	36	28	22	76	17	30
29	30	23	15	78	---	73	36	27	22	26	16	27
30	28	22	17	70	---	35	109	29	22	25	16	25
31	27	---	16	57	---	33	---	26	---	32	16	---
TOTAL	1296	1618	594	3575	1299	1939	1148	1310	707	801	674	1110
MEAN	41.8	53.9	19.2	115	46.4	62.5	38.3	42.3	23.6	25.8	21.7	37.0
MAX	144	218	42	763	107	248	109	130	46	76	48	126
MIN	26	22	15	14	23	23	21	25	18	17	16	15
AC-FT	2570	3210	1180	7090	2580	3850	2280	2600	1400	1590	1340	2200

CAL YR 1989 TOTAL 24172 MEAN 66.2 MAX 1350 MIN 15 AC-FT 47950
WTR YR 1990 TOTAL 16071 MEAN 44.0 MAX 763 MIN 14 AC-FT 31880

16069000 WAILUA DITCH NEAR KAPAA

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

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

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

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

AVERAGE DISCHARGE.--53 years (water years 1938-90), 16.0 ft³/s (11,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft³/s, June 4, 1937; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft³/s, Jan. 24; minimum daily, no flow, June 8-11, Aug. 24-26, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	20	14	29	11	10	12	15	27	23	22	16
2	23	20	14	29	11	10	12	15	26	23	22	16
3	23	20	14	29	11	10	11	15	26	23	22	15
4	22	21	17	29	11	9.8	11	15	26	23	21	16
5	16	22	19	28	11	9.8	12	15	8.1	23	21	17
6	19	22	19	28	11	9.8	12	15	.19	24	21	6.4
7	23	22	19	28	11	9.8	13	15	.05	24	21	5.2
8	22	21	19	27	11	10	13	15	.00	24	21	14
9	22	20	19	27	11	10	14	15	.00	24	21	17
10	22	20	19	27	11	10	14	15	.00	21	16	17
11	22	19	19	26	11	10	14	15	.00	20	12	16
12	22	18	19	26	11	10	15	15	19	21	12	21
13	21	12	19	25	11	10	15	15	30	21	12	12
14	21	6.2	19	25	11	10	15	14	29	21	11	8.2
15	20	6.2	19	25	11	10	15	14	29	22	11	8.6
16	17	6.2	19	26	11	10	15	14	28	22	10	9.0
17	18	6.2	19	27	11	10	15	14	28	23	10	8.8
18	20	6.1	19	27	11	10	15	14	28	23	9.5	8.7
19	21	6.0	19	27	11	10	15	15	27	22	9.0	8.0
20	21	5.9	19	28	11	13	15	15	27	21	8.6	7.0
21	22	5.8	19	28	10	15	15	15	27	21	8.5	7.0
22	23	10	19	32	10	15	15	23	27	21	8.5	7.0
23	24	16	19	33	10	14	15	28	26	21	2.8	6.8
24	25	17	19	34	10	14	15	28	26	21	.00	6.8
25	26	17	19	33	10	14	15	28	25	21	.00	6.8
26	26	18	19	32	10	14	15	28	25	21	.00	6.6
27	20	18	19	31	10	13	15	27	25	21	8.1	6.6
28	21	19	22	31	10	13	15	27	24	22	16	6.5
29	21	16	30	30	---	12	15	27	24	22	6.8	6.4
30	22	14	30	18	---	12	15	27	24	22	.00	6.4
31	22	---	30	11	---	12	---	27	---	22	7.9	---
TOTAL	670	450.6	608	856	300	350.2	423	580	611.34	683	371.70	313.8
MEAN	21.6	15.0	19.6	27.6	10.7	11.3	14.1	18.7	20.4	22.0	12.0	10.5
MAX	26	22	30	34	11	15	15	28	30	24	22	21
MIN	16	5.8	14	11	10	9.8	11	14	.00	20	.00	5.2
AC-FT	1330	894	1210	1700	595	695	839	1150	1210	1350	737	622

CAL YR 1989 TOTAL 5267.1 MEAN 14.4 MAX 30 MIN 5.0 AC-FT 10450
WTR YR 1990 TOTAL 6217.64 MEAN 17.0 MAX 34 MIN .00 AC-FT 12330

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 upstream from confluence with South Fork, 3.7 mi southwest of Kapaa, and 5.0 mi north of Lihue.

DRAINAGE AREA.--17.9 mi².

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

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

GAGE.--Water-stage recorder. Elevation of gage is 18 ft, from topographic map.

REMARKS.--Records good. Wailua ditch (station 16069000) diverts upstream for irrigation of sugarcane in vicinities of Kapaa and Wailua.

AVERAGE DISCHARGE.--38 years, 123 ft³/s (89,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft³/s, Nov. 12, 1955, gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks, from rating curve extended above 3,700 ft³/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft³/s, Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	2200	4,470	7.28	Jan. 23	1000	*5,070	*7.68

Minimum discharge, 6.6 ft³/s, July 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	41	28	16	192	261	81	89	31	20	51	21
2	71	39	28	14	246	81	70	233	25	24	37	47
3	58	37	28	18	320	61	77	354	21	15	29	43
4	60	512	28	15	325	55	159	91	20	9.7	36	28
5	95	431	27	14	294	56	192	64	19	9.2	26	70
6	79	162	26	14	282	256	101	60	19	8.0	21	38
7	75	123	25	13	205	702	62	51	20	7.1	18	25
8	71	137	24	13	157	381	127	64	21	7.4	17	8.0
9	55	114	94	14	139	454	88	53	27	56	21	249
10	312	95	38	12	129	447	67	42	26	39	25	138
11	143	86	28	11	127	379	63	40	28	27	31	42
12	81	122	25	11	116	190	57	44	30	23	31	29
13	68	148	54	10	103	145	54	47	22	13	31	91
14	62	302	26	15	91	131	51	39	48	17	30	38
15	64	257	22	67	67	118	49	46	20	111	46	49
16	156	129	22	359	71	94	46	34	36	38	37	27
17	72	103	21	111	107	86	44	52	48	16	30	37
18	47	96	20	54	70	80	43	128	25	90	29	96
19	43	93	20	125	63	74	42	74	17	36	28	54
20	49	96	23	735	64	69	39	66	21	17	114	68
21	115	84	19	1490	60	66	38	44	117	12	120	148
22	72	74	18	1060	56	63	34	54	40	11	112	102
23	411	43	17	1660	54	60	33	94	24	12	41	74
24	125	41	16	662	53	57	83	69	19	33	40	195
25	215	38	16	316	69	52	34	63	33	19	43	112
26	86	34	16	372	61	48	30	51	23	13	34	71
27	71	31	17	536	67	48	29	36	27	73	29	90
28	60	30	16	273	73	79	54	32	27	228	26	63
29	55	29	15	227	---	163	53	30	30	45	23	55
30	50	27	15	203	---	69	236	37	22	53	19	51
31	44	---	14	167	---	65	---	28	---	136	21	---
TOTAL	3065	3554	786	8607	3661	4890	2136	2209	886	1218.4	1196	2159.0
MEAN	98.9	118	25.4	278	131	158	71.2	71.3	29.5	39.3	38.6	72.0
MAX	411	512	94	1660	325	702	236	354	117	228	120	249
MIN	43	27	14	10	53	48	29	28	17	7.1	17	8.0
AC-FT	6080	7050	1560	17070	7260	9700	4240	4380	1760	2420	2370	4280

CAL YR 1989	TOTAL	60017	MEAN	164	MAX	3500	MIN	10	AC-FT	119000
WTR YR 1990	TOTAL	34367.4	MEAN	94.2	MAX	1660	MIN	7.1	AC-FT	68170

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'44", long 159°23'55", Hydrologic Unit 20070000, on left bank 0.4 mi upstream from mouth, 0.6 mi northeast of Wailua Reservoir, and 4.9 mi west of Kapaa.

DRAINAGE AREA.--0.65 mi².

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 above mean sea level (by stadia survey).

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

AVERAGE DISCHARGE.--30 years, 2.67 ft³/s (1,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft³/s, Jan. 31, 1975, gage height, 5.58 ft, from rating curve extended above 415 ft³/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft³/s, Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	2100	92	2.52	Sept. 2	1330	*374	*4.22
Jan. 22	0030	130	2.83				

Minimum discharge, 0.58 ft³/s, Aug. 30 to Sept. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	2.0	2.3	1.5	4.4	5.9	2.4	1.8	1.3	.89	.83	.58
2	2.5	2.0	2.2	1.4	4.5	2.8	2.3	2.1	1.3	.92	.79	.24
3	1.7	1.9	2.2	1.4	4.6	2.5	2.3	3.2	1.2	.86	.79	2.6
4	1.6	14	2.2	1.3	5.0	2.5	3.1	1.9	1.2	.89	.82	1.7
5	2.5	15	2.1	1.3	4.7	2.5	3.8	1.8	1.2	.86	.80	1.7
6	2.3	5.8	2.1	1.3	4.5	3.5	2.8	1.7	1.2	.85	.75	1.5
7	2.3	4.6	2.0	1.3	4.3	7.5	2.5	1.6	1.2	.79	.72	1.4
8	2.3	4.1	1.9	1.3	4.1	4.5	3.5	1.7	1.2	.79	.72	1.3
9	2.0	3.8	2.9	1.2	3.9	5.3	2.8	1.5	1.2	.92	.76	3.0
10	5.8	3.5	2.0	1.2	3.9	4.7	2.6	1.5	1.2	.91	.71	2.4
11	3.3	3.3	1.9	1.2	3.7	4.1	2.5	1.5	1.1	.89	.65	1.9
12	2.7	3.6	1.9	1.2	3.5	3.7	2.4	1.4	1.1	.92	.65	1.8
13	2.5	3.7	2.0	1.2	3.3	3.5	2.3	1.4	1.1	.86	.65	2.1
14	2.4	9.8	1.8	1.4	3.2	3.4	2.3	1.4	1.2	.85	.65	1.8
15	2.2	7.4	1.8	1.6	3.1	3.2	2.2	1.3	1.1	.80	.75	1.8
16	2.3	4.5	1.7	2.5	3.2	3.0	2.1	1.3	1.1	.80	.69	1.6
17	2.2	4.1	1.7	2.1	3.4	2.9	2.1	1.4	1.1	.79	.65	1.6
18	2.1	3.8	1.7	1.5	2.9	2.8	2.0	1.7	.98	.98	.65	1.6
19	2.0	3.7	1.7	1.9	2.9	2.8	2.0	1.5	.93	.84	.65	1.5
20	2.0	3.4	1.7	8.2	2.9	2.7	2.0	1.5	.93	.79	.87	1.5
21	2.3	3.3	1.6	28	2.8	2.7	1.9	1.4	1.2	.78	.87	1.5
22	2.0	3.1	1.6	26	2.8	2.7	1.9	1.5	1.0	.72	1.1	1.4
23	3.8	2.8	1.6	33	2.7	2.6	1.9	1.4	.94	.72	.77	1.4
24	2.5	2.8	1.6	17	2.6	2.6	1.9	1.5	.93	.75	.72	1.7
25	2.7	2.7	1.5	e10	2.8	2.5	1.8	1.4	.93	.72	.72	1.5
26	2.4	2.7	1.5	e11	2.5	2.5	1.8	1.4	.93	.72	.65	1.3
27	2.3	2.6	1.5	e13	2.5	2.5	1.7	1.3	1.0	.87	.65	1.5
28	2.2	2.5	1.5	e7.0	2.5	2.8	1.7	1.3	.97	1.4	.65	1.3
29	2.2	2.5	1.5	e5.8	---	2.9	1.6	1.3	.94	.88	.65	1.3
30	2.1	2.4	1.4	e5.0	---	2.5	2.3	1.3	.92	.85	.59	1.3
31	2.1	---	1.4	e4.2	---	2.5	---	1.3	---	.99	.58	---
TOTAL	76.0	131.4	56.5	196.0	97.2	102.6	68.5	48.3	32.60	26.60	22.50	71.58
MEAN	2.45	4.38	1.82	6.32	3.47	3.31	2.28	1.56	1.09	.86	.73	2.39
MAX	5.8	15	2.9	33	5.0	7.5	3.8	3.2	1.3	1.4	1.1	24
MIN	1.6	1.9	1.4	1.2	2.5	2.5	1.6	1.3	.92	.72	.58	.58
AC-FT	151	261	112	389	193	204	136	96	65	53	45	142

CAL YR 1989 TOTAL 1604.5 MEAN 4.40 MAX 80 MIN 1.2 AC-FT 3180
WTR YR 1990 TOTAL 929.78 MEAN 2.55 MAX 33 MIN .58 AC-FT 1840

e Estimated

HAWAII, ISLAND OF KAUAI

16077000 MAKALEHA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--53 years (water years 1938-90), 6.74 ft³/s (4,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft³/s, Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft³/s, Jan. 16; minimum daily, 0.23 ft³/s, Feb. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	8.8	8.3	9.1	.26	2.3	.46	2.3	.67	9.7	9.0	7.1
2	8.8	8.5	8.2	9.5	.32	1.1	.49	1.7	.65	9.0	3.8	14
3	11	8.4	8.5	9.8	.34	.72	.52	2.1	.63	9.2	3.8	8.5
4	11	16	8.3	8.8	.55	.58	1.6	1.6	.64	11	3.4	8.8
5	10	17	8.2	9.2	.59	.55	1.6	1.4	.64	11	2.5	14
6	9.4	7.5	8.3	8.7	.49	.69	1.1	1.1	4.1	6.1	2.3	11
7	9.6	2.2	8.4	8.0	.38	1.9	.84	.93	6.0	1.3	2.0	9.8
8	9.2	1.9	8.3	9.5	.30	1.5	1.2	.79	5.7	1.1	1.4	12
9	8.7	1.8	6.0	8.3	.25	1.6	10	.60	5.8	.84	1.3	18
10	6.4	1.5	1.1	7.9	.23	1.5	14	.55	5.6	.73	3.2	11
11	2.5	1.4	.88	7.7	.23	1.1	12	.68	5.2	.71	3.7	1.4
12	2.0	1.4	.83	7.8	3.2	4.0	8.1	.61	5.0	.67	3.5	1.2
13	1.8	1.5	.71	7.7	8.2	11	1.2	.72	5.9	.60	5.8	1.1
14	1.6	5.7	.55	11	8.0	13	1.1	.62	3.8	.55	7.8	1.0
15	1.4	5.3	.50	16	7.8	12	.97	.70	.80	.55	8.1	.91
16	8.1	2.1	.49	22	8.0	10	3.4	.69	.72	4.8	6.9	.86
17	11	1.3	.46	12	9.4	6.1	7.6	.72	.60	10	8.6	6.5
18	9.8	.92	.45	8.4	8.3	1.2	7.5	.81	.52	12	6.2	11
19	12	.78	3.3	2.4	7.9	1.1	7.9	.79	.41	9.7	5.5	9.3
20	13	.70	7.9	5.2	8.1	1.0	8.5	.76	.35	9.2	12	11
21	14	.68	6.9	11	5.1	.83	8.2	.71	.34	8.4	16	17
22	13	.59	6.7	13	1.2	.72	8.5	.77	6.6	7.5	13	13
23	9.9	.57	7.0	9.9	1.1	.64	8.1	.76	9.1	9.0	8.8	12
24	1.3	.55	7.3	6.3	1.1	.52	9.9	.76	5.8	12	9.0	17
25	1.2	.55	7.4	2.4	.99	.44	8.8	.77	4.6	10	8.8	8.4
26	1.1	.54	7.6	1.3	.73	.37	9.0	.75	3.6	8.8	7.8	2.2
27	1.0	6.5	7.8	.81	.73	.35	9.8	.75	4.5	14	5.7	2.2
28	.81	11	7.7	.58	.74	.40	13	.75	5.6	14	7.4	2.0
29	.77	9.1	10	.44	---	.45	13	.78	10	11	7.0	1.7
30	.72	8.5	9.9	.37	---	.41	8.8	.76	10	12	6.7	1.7
31	4.0	---	8.9	.30	---	.40	---	.69	---	13	7.7	---
TOTAL	200.00	133.28	176.87	235.40	84.53	78.47	187.18	28.42	113.87	228.45	198.7	235.67
MEAN	6.45	4.44	5.71	7.59	3.02	2.53	6.24	.92	3.80	7.37	6.41	7.86
MAX	14	17	10	22	9.4	13	14	2.3	10	14	16	18
MIN	.72	.54	.45	.30	.23	.35	.46	.55	.34	.55	1.3	.86
AC-FT	397	264	351	467	168	156	371	56	226	453	394	467

CAL YR 1989 TOTAL 1567.55 MEAN 4.29 MAX 19 MIN .17 AC-FT 3110
WTR YR 1990 TOTAL 1900.84 MEAN 5.21 MAX 22 MIN .23 AC-FT 3770

HAWAII, ISLAND OF KAUAI

47

16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06'09", long 159°22'28", Hydrologic Unit 20070000, on right bank 500 ft downstream from intake and 4.0 mi 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 above mean sea level (by stadia survey). Prior to Nov. 26, 1936, at site 61 ft upstream at datum 2.52 ft higher.

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

AVERAGE DISCHARGE.--72 years (water years 1918-20, 1922-90), 6.18 ft³/s (4,480 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 23 ft³/s, Oct. 10, 11; minimum daily, 0.05 ft³/s, Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	4.7	4.0	5.3	.31	19	.55	17	2.2	1.2	4.2	3.0
2	19	4.6	.31	6.1	.31	8.7	14	18	1.8	.64	3.4	9.3
3	9.8	4.5	3.6	7.7	3.6	3.6	20	15	.99	.50	3.0	13
4	11	21	4.7	4.9	6.6	3.5	14	7.5	.93	.50	3.1	5.5
5	12	15	4.6	4.3	15	3.4	6.3	.79	.86	.50	3.0	.07
6	9.6	11	4.6	4.1	9.7	6.8	5.8	.66	.69	.50	2.4	.05
7	13	11	4.6	4.0	9.0	14	5.6	.60	.69	.55	2.3	.07
8	12	11	4.5	4.8	18	9.7	5.9	.64	.66	.52	2.2	.07
9	8.9	11	14	3.9	19	10	4.9	3.3	.63	.61	2.1	.35
10	23	11	16	3.7	18	9.9	4.8	13	3.3	.58	1.9	.09
11	23	10	17	2.1	14	6.2	4.7	14	6.3	.53	1.7	.07
12	14	10	14	1.8	5.9	.66	4.8	17	6.5	.50	1.5	.07
13	2.3	11	.35	3.4	.54	.60	4.9	18	5.7	.50	2.2	.09
14	1.6	13	.23	7.3	.50	.62	4.9	7.8	13	.56	5.3	.09
15	.56	11	.23	14	.50	.50	4.9	4.4	14	.54	9.7	.11
16	.51	11	.23	21	.45	.50	8.2	4.3	9.5	1.7	6.0	.07
17	.50	11	.23	17	.53	.50	6.9	4.4	1.6	6.2	3.4	.09
18	4.2	8.3	7.9	8.2	.29	.59	6.6	4.3	1.2	15	4.9	.09
19	7.0	1.2	8.9	2.8	3.1	9.6	6.1	3.8	1.1	8.6	6.1	.12
20	10	.69	4.3	2.4	4.6	16	5.2	3.5	.89	4.1	14	.13
21	13	.50	4.9	3.7	4.6	14	5.1	3.3	.84	3.6	5.8	.26
22	13	12	5.0	4.5	4.6	14	5.0	7.9	.69	4.1	.39	.20
23	15	16	4.0	4.8	4.6	13	4.9	15	.62	3.7	.26	.16
24	11	12	4.0	2.2	4.6	13	7.0	15	.60	8.1	.23	.40
25	.39	4.8	4.0	1.7	4.7	14	5.2	15	.60	4.7	.23	.19
26	.35	15	4.2	3.1	4.6	14	4.8	14	.60	3.4	.23	.19
27	.35	8.5	4.3	4.3	10	13	5.5	14	.65	11	4.2	.19
28	7.4	.36	4.2	9.3	16	.79	14	7.0	.50	13	4.1	.19
29	14	3.9	7.2	17	---	.82	16	2.2	.47	6.9	3.7	.20
30	14	5.3	7.5	17	---	.44	18	2.3	2.6	5.6	3.4	.19
31	9.8	---	4.8	9.7	---	.42	---	2.1	---	4.2	3.6	---
TOTAL	298.26	270.35	168.38	206.1	183.63	221.84	224.55	255.79	80.71	112.63	108.54	34.60
MEAN	9.62	9.01	5.43	6.65	6.56	7.16	7.48	8.25	2.69	3.63	3.50	1.15
MAX	23	21	17	21	19	19	20	18	14	15	14	13
MIN	.35	.36	.23	1.7	.29	.42	.55	.60	.47	.50	.23	.05
AC-FT	592	536	334	409	364	440	445	507	160	223	215	69

CAL YR 1989 TOTAL 3019.70 MEAN 8.27 MAX 31 MIN .17 AC-FT 5990
WTR YR 1990 TOTAL 2165.38 MEAN 5.93 MAX 23 MIN .05 AC-FT 4300

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 below wasteway gates, and 4.8 mi northwest of Kealia.

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

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

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

AVERAGE DISCHARGE.--66 years (water years, 1923-25, 1928-90), 4.41 ft³/s (3,200 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 45 ft³/s, Jan. 16; minimum daily, 0.13 ft³/s, Nov. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	3.0	2.7	3.9	7.0	12	14	1.1	5.5	5.1	6.1	2.7
2	9.1	2.7	2.5	5.0	13	4.7	10	1.1	6.6	5.0	5.2	15
3	6.8	2.5	2.3	4.2	5.4	5.0	11	.85	4.0	3.4	8.4	10
4	6.2	13	2.2	3.2	5.3	4.1	21	5.0	3.6	5.6	13	5.3
5	6.3	13	2.2	3.0	4.4	5.9	7.2	7.1	3.4	4.9	6.4	16
6	5.0	4.0	2.0	2.9	3.6	14	2.3	11	3.5	2.8	5.2	6.2
7	3.7	6.9	2.0	2.0	3.3	7.7	1.5	14	3.2	3.4	3.9	8.0
8	4.1	7.7	1.9	3.2	4.4	5.2	9.9	21	3.1	2.7	12	14
9	3.4	8.0	6.3	2.1	5.8	6.2	4.5	8.1	3.1	9.0	13	22
10	10	6.0	3.2	1.6	5.5	6.2	4.4	5.8	2.8	7.9	8.8	13
11	6.0	4.8	2.4	1.5	6.8	4.8	6.0	5.5	2.7	6.1	4.3	8.1
12	4.1	7.0	3.4	1.4	5.6	5.4	5.1	11	2.5	9.9	3.7	5.9
13	3.9	6.0	5.9	1.4	4.7	7.0	4.6	17	2.5	4.0	3.5	8.6
14	3.6	5.3	3.4	3.6	4.1	11	4.1	12	7.1	4.9	3.2	5.4
15	3.2	.18	2.8	19	3.8	8.7	3.7	18	3.6	3.2	7.5	10
16	2.9	.13	2.6	45	4.9	6.2	3.4	8.4	4.7	3.4	4.0	4.8
17	2.7	2.4	2.4	11	16	5.5	3.2	18	5.8	12	3.7	9.9
18	2.7	5.9	2.2	19	5.4	4.9	3.0	9.2	3.5	25	2.9	10
19	3.4	5.7	2.2	17	4.2	4.5	2.8	6.3	2.7	9.2	5.9	5.2
20	7.3	5.8	3.0	15	4.9	9.1	2.7	2.4	5.3	4.5	29	8.1
21	11	5.5	2.0	19	3.9	4.6	2.6	2.1	11	3.6	21	15
22	9.8	4.4	1.9	13	3.4	3.9	2.5	6.9	4.6	3.4	17	8.4
23	7.6	3.8	1.8	15	3.2	3.6	2.4	9.9	3.9	4.2	6.1	10
24	5.5	3.6	1.7	9.5	3.2	3.3	4.0	5.0	2.9	12	5.8	20
25	7.9	5.9	1.9	6.2	16	3.6	2.7	5.9	4.1	4.7	6.9	9.0
26	6.5	4.7	3.2	7.1	7.3	12	2.3	2.2	4.2	3.2	5.0	6.0
27	5.4	3.4	2.0	7.3	12	6.3	2.7	1.5	13	13	3.7	11
28	3.9	3.1	1.8	4.7	12	27	37	2.9	4.5	18	3.3	5.3
29	5.0	2.9	3.2	5.6	---	24	41	4.7	3.8	6.9	3.0	4.5
30	3.8	3.2	4.8	5.0	---	11	17	5.4	4.7	13	2.8	4.0
31	3.2	---	3.3	3.0	---	13	---	4.6	---	18	3.4	---
TOTAL	174.0	150.51	85.2	260.4	179.1	250.4	238.6	233.95	135.9	232.0	227.7	281.4
MEAN	5.61	5.02	2.75	8.40	6.40	8.08	7.95	7.55	4.53	7.48	7.35	9.38
MAX	11	13	6.3	45	16	27	41	21	13	25	29	22
MIN	2.7	.13	1.7	1.4	3.2	3.3	1.5	.85	2.5	2.7	2.8	2.7
AC-FT	345	299	169	517	355	497	473	464	270	460	452	558
CAL YR 1989	TOTAL 2472.59	MEAN 6.77	MAX 56	MIN .13	AC-FT 4900							
WTR YR 1990	TOTAL 2449.16	MEAN 6.71	MAX 45	MIN .13	AC-FT 4860							

HAWAII, ISLAND OF KAUAI

49

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

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

PERIOD OF RECORD.--December 1936 to September 1983, October 1984 to current year.

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

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

AVERAGE DISCHARGE.--52 years (water years 1938-83, 1986-90), 2.57 ft³/s (1,860 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft³/s, June 1, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.01 ft³/s, Jan. 21; minimum daily discharge, no flow for most of the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.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	.01	.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
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1989 TOTAL 0.29 MEAN .001 MAX .26 MIN .00 AC-FT .6
WTR YR 1990 TOTAL 0.01 MEAN .000 MAX .01 MIN .00 AC-FT .02

HAWAII, ISLAND OF KAUAI

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

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

DRAINAGE AREA.--1.9 mi².

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 above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--32 years (water years 1959-90), 11.9 ft³/s (8,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft³/s, July 23, 1989, gage height, 7.69 ft; minimum, 1.8 ft³/s, Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 04	2230	*1,560	*6.45	Jan. 21	2000	912	5.28
Nov. 14	0600	1,190	5.84	Jan. 23	0930	950	5.36

Minimum discharge, 5.2 ft³/s, Jan. 12-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	6.8	6.6	6.9	13	22	11	33	8.3	7.3	8.3	6.1
2	14	6.7	6.4	9.2	28	8.6	9.9	31	8.2	6.9	7.7	39
3	9.1	6.5	6.4	7.5	33	7.4	9.9	19	7.7	6.5	10	9.8
4	12	82	6.2	6.8	25	7.0	28	12	7.5	6.6	10	7.5
5	12	72	6.2	6.5	19	7.2	21	10	7.3	6.5	8.3	11
6	8.9	12	6.2	6.0	14	35	13	12	7.1	6.1	7.5	7.9
7	8.0	9.7	6.1	5.7	11	55	12	13	6.9	6.2	7.2	7.9
8	7.5	10	6.0	5.7	9.3	37	22	20	7.4	5.9	9.7	13
9	7.3	11	15	5.5	8.8	42	13	11	6.9	13	8.2	28
10	14	8.7	6.8	5.4	8.6	26	9.6	9.2	6.7	9.6	7.4	17
11	8.4	8.0	6.3	5.4	8.8	19	8.7	8.8	6.5	9.6	7.0	9.5
12	7.4	19	8.7	5.3	8.2	12	8.2	8.8	6.4	9.0	6.9	8.6
13	7.5	22	10	5.2	7.8	10	7.8	11	6.4	9.0	6.7	9.1
14	7.1	259	6.6	10	7.4	9.4	7.5	9.1	7.7	8.7	6.5	8.1
15	6.9	35	6.3	18	7.2	8.8	7.2	12	7.1	7.4	6.9	12
16	6.7	16	6.2	44	7.2	8.0	7.0	8.6	7.3	7.7	6.4	8.0
17	6.6	11	6.0	11	9.4	7.6	6.9	9.3	11	11	6.2	12
18	6.8	10	6.0	9.9	7.4	7.2	6.7	17	7.4	25	6.1	12
19	7.3	9.2	6.1	22	6.8	7.0	6.5	15	6.8	11	7.3	8.7
20	9.0	8.7	6.1	56	6.6	8.4	6.4	10	8.7	8.3	19	8.2
21	12	8.3	5.8	166	6.4	7.0	6.4	9.0	16	7.6	13	8.7
22	20	7.9	5.8	54	6.4	6.8	6.3	11	8.6	7.4	20	8.1
23	21	7.6	5.7	133	6.2	6.6	6.2	44	7.7	7.3	8.6	10
24	11	7.4	5.7	30	6.0	6.6	6.4	16	7.1	12	8.9	27
25	10	8.2	7.8	16	12	6.6	6.1	18	7.8	7.3	7.9	10
26	8.3	7.6	6.5	15	7.4	6.8	6.1	12	8.0	6.8	7.9	8.9
27	7.8	7.1	5.8	22	9.3	6.6	7.5	9.9	8.8	19	7.0	10
28	7.3	6.9	5.6	12	12	21	49	9.2	7.3	19	6.7	8.2
29	7.9	6.7	5.6	13	---	16	85	8.8	6.7	9.0	6.5	7.7
30	7.2	7.1	7.0	13	---	8.6	97	8.7	6.7	11	6.3	7.6
31	6.9	---	6.5	10	---	8.6	---	8.4	---	12	6.6	---
TOTAL	296.9	698.1	208.0	736.0	312.2	445.8	498.3	434.8	234.0	299.7	262.7	349.6
MEAN	9.58	23.3	6.71	23.7	11.1	14.4	16.6	14.0	7.80	9.67	8.47	11.7
MAX	21	259	15	166	33	55	97	44	16	25	20	39
MIN	6.6	6.5	5.6	5.2	6.0	6.6	6.1	8.4	6.4	5.9	6.1	6.1
AC-FT	589	1380	413	1460	619	884	988	862	464	594	521	693

CAL YR 1989 TOTAL 6283.4 MEAN 17.2 MAX 298 MIN 5.6 AC-FT 12460
WTR YR 1990 TOTAL 4776.1 MEAN 13.1 MAX 259 MIN 5.2 AC-FT 9470

16103000 HANAIEI RIVER NEAR HANAIEI

LOCATION.--Lat 22°11'31", long 159°27'57", Hydrologic Unit 20070000, on right bank 2.6 mi southeast of Hanalei School and 4.9 mi upstream from mouth.

DRAINAGE AREA.--19.1 mi².

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

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 35.8 ft above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, nonrecording gage at site 0.2 mi 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 (sta. 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream upstream to North Branch of North Fork Wailua River for irrigation. China ditch upstream diverts for irrigation of taro in vicinity of Hanalei.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--27 years (water years 1964-90), 219 ft³/s (158,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s, Apr. 19, 1974, gage height, 14.28 ft, from rating curve extended above 9,600 ft³/s; minimum, 31 ft³/s, Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 4	2200	*19,600	*13.15	Jan. 21	2030	14,000	11.76

Minimum discharge, 83 ft³/s Jan. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	113	99	121	315	1030	167	431	132	122	150	100
2	100	109	98	121	646	191	146	1020	125	121	135	96
3	143	107	97	122	632	151	147	842	118	109	140	96
4	128	1610	96	100	526	133	500	239	114	110	147	94
5	133	573	95	98	491	141	288	195	111	106	130	205
6	122	212	94	96	423	1430	184	205	113	108	120	125
7	115	170	93	90	271	1440	153	216	109	118	112	119
8	114	181	92	95	200	918	568	241	111	108	140	213
9	108	158	192	89	174	904	266	171	110	272	144	735
10	345	136	101	87	161	558	180	147	105	225	124	331
11	152	127	94	86	158	416	154	142	103	157	109	157
12	121	180	195	85	146	234	141	160	101	151	111	142
13	114	191	246	84	134	192	134	167	100	126	108	251
14	116	1250	105	151	125	324	127	146	152	149	105	150
15	131	409	98	445	117	207	122	172	118	317	129	169
16	157	193	99	1390	128	160	117	143	154	148	107	128
17	120	159	95	273	320	148	113	447	187	184	101	204
18	109	155	92	325	140	139	109	560	127	352	100	241
19	118	150	96	347	128	131	107	356	109	174	109	138
20	148	157	97	1050	141	138	105	228	140	138	281	138
21	362	138	90	3110	119	123	104	197	285	125	229	224
22	858	142	89	1370	110	117	104	246	144	119	210	167
23	544	120	89	2340	107	112	103	413	123	118	129	228
24	205	116	88	593	105	108	141	256	112	160	132	506
25	222	120	89	316	216	106	104	288	138	124	128	204
26	164	114	91	419	150	122	100	205	121	109	117	153
27	144	107	87	542	220	111	102	167	125	235	107	184
28	133	104	86	274	202	236	262	153	115	445	104	142
29	127	103	99	241	---	307	482	144	116	150	102	129
30	121	104	116	221	---	152	1490	147	119	147	100	120
31	116	---	102	182	---	162	---	135	---	337	106	---
TOTAL	5683	7508	3300	14863	6605	10641	6820	8579	3837	5364	4066	5889
MEAN	183	250	106	479	236	343	227	277	128	173	131	196
MAX	858	1610	246	3110	646	1440	1490	1020	285	445	281	735
MIN	93	103	86	84	105	106	100	135	100	106	100	94
AC-FT	11270	14890	6550	29480	13100	21110	13530	17020	7610	10640	8060	11680

CAL YR 1989 TOTAL 110368 MEAN 302 MAX 4770 MIN 86 AC-FT 218900
WTR YR 1990 TOTAL 83155 MEAN 228 MAX 3110 MIN 84 AC-FT 164900

HAWAII, ISLAND OF KAUAI

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 upstream from Wainiha powerplant intake, and 6.0 mi southwest of Hanalei.

DRAINAGE AREA.--10.2 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 960 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--35 years (water years 1953-55, 1959-90), 141 ft³/s (102,150 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s, Apr. 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft³/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 32 ft³/s, Oct. 21-23, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft, from floodmarks, discharge, about 40,000 ft³/s, from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s: and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 22	1800	3,720	5.27	Mar. 6	2130	5,330	5.79
Jan. 21	1900	*7,170	*6.26				

Minimum, 48 ft³/s, Sept. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	61	58	78	300	704	141	160	74	101	87	55
2	66	61	57	89	487	148	92	733	66	81	76	52
3	60	60	56	82	580	95	105	538	60	68	72	53
4	65	105	56	69	366	76	233	119	60	68	79	49
5	68	133	55	76	471	119	140	94	66	61	68	228
6	63	106	55	68	342	1720	85	116	71	57	65	97
7	63	86	55	56	199	1570	70	92	61	66	57	72
8	61	108	55	58	109	934	140	135	76	71	75	181
9	58	73	151	55	91	768	103	85	e74	261	94	536
10	200	63	66	53	89	336	85	68	e68	180	65	202
11	69	61	59	52	86	217	77	66	e64	106	57	78
12	61	73	82	55	78	98	65	79	e60	101	70	72
13	58	70	130	55	67	79	62	94	e58	76	61	228
14	63	204	68	113	63	112	60	80	191	111	59	87
15	81	149	62	326	60	92	59	87	136	304	106	97
16	103	80	60	1250	75	71	58	89	221	85	64	63
17	65	69	58	219	154	66	57	335	183	127	57	98
18	61	99	56	229	89	64	57	492	87	261	53	139
19	84	101	91	328	98	61	57	290	78	99	65	65
20	113	108	70	637	126	61	57	175	108	70	193	82
21	197	78	58	1560	78	59	56	95	210	63	131	143
22	313	88	56	750	67	57	58	145	80	60	145	96
23	477	66	54	1140	62	57	61	253	72	61	62	174
24	147	64	54	279	61	56	149	129	68	113	82	276
25	156	64	53	142	96	55	60	e170	115	75	78	100
26	79	62	53	243	85	57	57	132	90	62	64	68
27	70	60	53	265	156	57	68	79	79	249	55	114
28	66	59	52	137	161	160	159	70	76	326	55	68
29	65	61	63	191	---	196	124	70	82	78	54	63
30	63	61	65	168	---	93	355	e84	87	78	51	61
31	62	---	68	133	---	116	---	e76	---	393	65	---
TOTAL	3234	2533	2029	8956	4696	8354	2950	5230	2821	3912	2365	3697
MEAN	104	84.4	65.5	289	168	269	98.3	169	94.0	126	76.3	123
MAX	477	204	151	1560	580	1720	355	733	221	393	193	536
MIN	58	59	52	52	60	55	56	66	58	57	51	49
AC-FT	6410	5020	4020	17760	9310	16570	5850	10370	5600	7760	4690	7330

CAL YR 1989 TOTAL 68705 MEAN 188 MAX 3070 MIN 52 AC-FT 136300
WTR YR 1990 TOTAL 50777 MEAN 139 MAX 1720 MIN 49 AC-FT 100700

e Estimated

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 upstream from Mauka ditch intake and Right Branch, and 4.5 mi northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi².

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,150 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--67 years (water years 1914-24, 1927-52, 1961-90), 16.5 ft³/s (11,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft³/s, Oct. 28, 1981, gage height, 13.2 ft, from rating curve extended above 68 ft³/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft³/s, Mar. 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1930	*2,120	*7.70	Mar. 6	1700	1,670	6.95

Minimum discharge, 0.29 ft³/s, Jan. 11-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	4.2	1.1	3.5	61	e89	5.3	16	5.9	4.5	17	3.0
2	4.1	3.8	1.1	2.4	66	14	11	9.0	4.9	6.1	12	2.9
3	144	3.6	1.0	1.1	71	6.0	8.8	e30	3.3	3.8	8.0	2.7
4	14	12	.96	.73	21	4.9	4.9	4.1	3.0	3.4	8.5	3.1
5	6.3	12	.91	.57	67	4.7	105	4.6	4.1	3.3	7.4	29
6	5.5	5.2	.87	.45	24	238	8.4	2.9	3.8	2.9	6.2	4.6
7	6.0	3.7	.83	.39	13	74	5.9	8.4	3.5	2.7	5.7	4.5
8	4.9	11	.79	.38	8.9	46	5.1	6.7	6.3	27	5.9	11
9	5.0	11	12	.36	7.2	29	5.9	3.7	3.4	44	4.9	129
10	26	3.7	1.7	.34	7.1	67	4.4	2.6	2.6	55	4.4	7.5
11	6.3	3.1	.94	.34	5.9	46	3.8	8.6	2.4	7.5	4.0	5.1
12	4.4	2.9	.78	.29	5.1	14	3.5	6.7	2.2	48	6.7	4.8
13	4.4	2.9	.77	.31	4.6	11	3.3	8.9	2.2	15	5.9	13
14	6.2	3.1	.72	.33	4.1	37	3.0	80	5.2	29	8.1	20
15	3.9	8.2	.65	48	3.8	45	2.8	18	6.8	99	14	5.5
16	3.9	3.2	.58	122	3.5	10	2.7	6.9	40	12	5.3	4.6
17	3.3	2.4	.54	82	9.9	8.0	2.5	19	29	12	5.1	66
18	6.4	2.2	.51	21	4.1	6.8	2.4	8.4	7.5	71	3.5	13
19	18	2.2	.52	82	3.2	6.3	2.3	8.1	5.0	15	25	13
20	34	2.1	.59	21	3.0	5.8	2.2	6.5	33	8.6	21	141
21	31	1.9	.48	7.8	2.7	5.1	2.2	5.8	22	17	7.7	90
22	17	1.8	.47	5.1	2.5	4.8	2.2	7.5	7.0	13	4.8	15
23	12	1.7	.44	4.0	2.4	4.4	2.0	53	5.4	13	4.4	14
24	63	1.6	.43	4.3	2.2	4.2	15	7.2	25	29	31	44
25	25	1.6	.42	9.5	31	6.2	24	17	33	12	16	12
26	10	1.5	3.8	57	8.9	6.2	3.3	6.5	7.5	7.2	9.5	21
27	6.6	1.4	1.1	21	7.6	49	2.3	5.2	6.5	112	5.2	27
28	6.0	1.3	.58	7.8	20	32	2.0	4.4	7.0	24	4.4	9.2
29	13	1.2	.46	8.4	---	15	1.8	4.0	6.0	13	3.8	7.0
30	5.2	1.2	3.8	5.0	---	6.2	1.6	12	6.4	18	3.5	54
31	4.6	---	8.8	6.1	---	5.3	---	4.4	---	36	3.3	---
TOTAL	516.0	117.7	48.64	523.49	470.7	900.9	249.6	386.1	299.9	764.0	272.2	776.5
MEAN	16.6	3.92	1.57	16.9	16.8	29.1	8.32	12.5	10.0	24.6	8.78	25.9
MAX	144	12	12	122	71	238	105	80	40	112	31	141
MIN	3.3	1.2	.42	.29	2.2	4.2	1.6	2.6	2.2	2.7	3.3	2.7
AC-FT	1020	233	96	1040	934	1790	495	766	595	1520	540	1540

CAL YR 1989 TOTAL 7108.84 MEAN 19.5 MAX 255 MIN .42 AC-FT 14100
WTR YR 1990 TOTAL 5325.73 MEAN 14.6 MAX 238 MIN .29 AC-FT 10560

e Estimated

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 east of Wahiawa Post Office, and 7.1 mi north of Waipahu.

DRAINAGE AREA.--4.04 mi².

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 above mean sea level.

REMARKS.--Records good. Prior to 1960, diversions from reservoirs upstream for use at Schofield Barracks.

AVERAGE DISCHARGE.--28 years (water years, 1961-62, 1965-90), 21.9 ft³/s (15,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s, Apr. 15, 1963, gage height, 11.33 ft, from rating curve extended above 1,100 ft³/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1900	*1,310	*5.47	Mar. 6	2300	1,140	5.18

Minimum discharge, 0.38 ft³/s, Jan. 11-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	6.2	1.9	5.5	40	106	7.9	6.3	13	10	13	3.8
2	9.5	5.7	1.9	8.3	79	34	7.9	12	17	15	14	3.5
3	260	5.5	1.7	6.1	64	9.7	23	40	6.0	8.7	9.4	3.2
4	81	5.3	1.7	2.4	33	6.8	8.4	7.0	4.7	7.0	11	3.0
5	18	20	1.7	1.5	21	6.3	103	4.3	5.3	6.3	10	14
6	14	5.9	1.6	.93	38	266	14	4.3	6.8	5.9	8.8	12
7	14	5.3	1.5	.72	17	200	9.2	14	4.6	5.3	7.2	13
8	11	5.9	1.5	.57	10	120	7.7	9.1	5.5	4.9	7.5	39
9	13	14	16	.52	8.7	53	9.0	5.9	5.4	70	6.7	192
10	110	6.3	5.8	.45	8.8	33	7.7	4.1	3.9	14	6.6	19
11	25	4.6	2.4	.42	8.6	42	6.1	6.2	3.3	11	5.9	10
12	14	4.1	1.6	.39	7.1	21	5.5	14	3.1	43	7.1	14
13	12	3.9	1.3	1.1	6.2	17	5.2	7.8	3.3	25	7.0	19
14	19	5.4	1.2	1.1	5.5	22	4.7	144	3.8	17	5.5	22
15	12	8.3	1.1	26	5.1	83	4.5	46	9.8	43	14	9.6
16	14	7.2	.96	258	4.5	17	4.2	12	123	14	6.7	8.9
17	9.1	3.9	.96	164	10	13	3.9	22	103	9.8	5.5	102
18	8.9	3.2	.91	46	8.6	11	3.8	15	28	175	5.0	24
19	24	3.1	.84	95	4.5	9.9	3.6	15	16	32	15	12
20	42	3.1	1.3	40	4.0	9.1	3.4	19	30	18	35	119
21	47	3.0	1.2	17	3.8	8.1	3.3	15	36	16	24	135
22	13	2.7	.80	10	3.4	7.8	3.9	7.4	15	20	8.0	27
23	11	2.5	.63	7.2	3.3	7.1	3.3	118	11	16	6.1	40
24	31	2.3	.61	6.6	3.4	6.7	3.5	17	17	37	16	37
25	41	2.2	.61	6.4	55	7.4	e15	12	77	27	8.5	19
26	18	2.2	.67	27	19	6.7	e5.5	9.6	19	12	22	20
27	10	2.2	.76	37	6.9	67	3.7	7.9	13	67	6.7	37
28	8.2	2.1	1.2	13	18	67	3.1	6.4	12	31	5.0	16
29	11	2.0	.96	6.6	---	41	2.9	5.5	12	27	4.6	12
30	8.5	2.0	1.0	5.4	---	12	2.6	9.1	16	16	4.1	85
31	6.9	---	7.9	4.4	---	8.9	---	6.7	---	29	3.9	---
TOTAL	934.1	150.1	64.21	799.60	496.4	1319.5	289.5	622.6	623.5	832.9	309.8	1071.0
MEAN	30.1	5.00	2.07	25.8	17.7	42.6	9.65	20.1	20.8	26.9	9.99	35.7
MAX	260	20	16	258	79	266	103	144	123	175	35	192
MIN	6.9	2.0	.61	.39	3.3	6.3	2.6	4.1	3.1	4.9	3.9	3.0
AC-FT	1850	298	127	1590	985	2620	574	1230	1240	1650	614	2120

CAL YR 1989 TOTAL 10872.21 MEAN 29.8 MAX 439 MIN .61 AC-FT 21570
WTR YR 1990 TOTAL 7513.21 MEAN 20.6 MAX 266 MIN .39 AC-FT 14900

e Estimated

16211600 MAKAHA STREAM NEAR MAKAHA

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

DRAINAGE AREA.--2.31 mi².

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 above mean sea level (Waianae Plantation bench mark).

REMARKS.--Records good. Honolulu Board of Water Supply wells upstream of gage were put into production this year. Recording rain gage located at station.

AVERAGE DISCHARGE.--31 years, 1.98 ft³/s (1,430 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft³/s, Jan. 6, 1982, gage height, 7.40 ft, from floodmarks, from rating curve extended above 51 ft³/s on basis of slope-area measurements at gage heights 6.50 ft and 7.40 ft; no flow at times.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 16	1330	*545	*4.68	Mar. 6	2030	330	3.92

Minimum discharge, no flow on many days, Oct.-Dec.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.18	.00	.72	2.1	26	2.8	1.2	1.2	.58	.35	.27
2	.03	.14	.00	.72	2.0	15	2.5	1.6	1.1	.83	.33	.27
3	.64	.13	.00	.70	2.8	8.7	2.3	11	1.1	1.3	.32	.27
4	.19	.13	.00	.70	1.9	6.4	2.2	2.5	1.4	1.3	.40	.32
5	.00	.13	.00	.69	1.6	5.0	2.1	1.9	1.2	1.2	.59	.38
6	.00	.12	.00	.69	1.7	36	1.9	1.6	1.1	1.2	.29	.49
7	.00	.09	.00	.68	3.0	26	1.7	2.2	1.0	1.2	.29	.63
8	.00	.09	.01	.72	1.9	12	1.6	1.9	1.1	1.2	.29	.78
9	.00	.08	1.8	1.1	1.5	8.3	2.7	1.4	.97	1.2	.57	.84
10	.22	.08	.21	.90	1.4	6.0	1.9	1.2	.93	1.2	.29	.88
11	.00	.09	.10	.81	1.7	4.5	1.6	1.5	1.2	1.2	.28	.87
12	.00	.09	.08	.75	1.7	3.8	1.5	1.8	.89	1.2	.27	.81
13	.00	.10	6.4	.72	1.3	3.3	1.4	2.0	.86	1.2	.26	.89
14	.00	.10	2.2	.77	1.2	13	1.4	4.0	.95	1.2	.26	.76
15	.00	2.1	1.6	1.7	1.1	33	1.3	2.6	.81	1.3	.26	.76
16	.00	.24	1.2	124	1.1	12	1.3	3.1	.79	1.2	.25	.80
17	.00	.00	1.0	110	13	7.7	1.3	3.6	.79	1.2	.25	.86
18	.00	.00	.89	38	4.4	4.3	1.3	2.6	.91	1.2	.26	.79
19	.00	.00	.81	20	3.1	3.3	1.3	2.3	.80	.81	.27	.84
20	.00	.00	1.8	16	3.5	4.7	1.2	2.1	.76	.29	.28	.87
21	.00	.00	1.5	12	2.3	3.1	1.2	1.8	.87	.30	.28	.86
22	.00	.00	1.9	9.1	1.9	2.7	1.2	1.6	.87	.30	.29	.86
23	.00	.00	1.4	7.2	1.6	2.4	1.2	3.0	.72	.28	.28	.88
24	.00	.00	.64	5.5	1.5	2.3	1.2	2.0	.73	.38	.28	.86
25	.00	.00	.59	3.5	11	2.1	1.3	1.6	.71	.39	.26	.86
26	.00	.00	.58	3.0	12	3.6	1.1	1.5	.72	.35	.28	.86
27	.00	.00	.65	2.7	5.6	11	1.3	1.6	.65	.58	.26	.84
28	.00	.00	.79	2.5	7.3	7.5	1.1	1.2	.67	.77	.28	.86
29	.00	.00	.78	2.2	---	4.2	1.6	1.5	.62	.53	.27	.88
30	.00	.00	.75	2.0	---	3.5	.99	1.2	.61	.47	.26	.90
31	.11	---	.72	1.8	---	3.1	---	1.2	---	.42	.27	---
TOTAL	1.23	3.89	28.40	371.87	95.2	284.5	47.49	70.3	27.03	26.78	9.37	22.04
MEAN	.040	.13	.92	12.0	3.40	9.18	1.58	2.27	.90	.86	.30	.73
MAX	.64	2.1	6.4	124	13	36	2.8	11	1.4	1.3	.59	.90
MIN	.00	.00	.00	.68	1.1	2.1	.99	1.2	.61	.28	.25	.27
AC-FT	2.4	7.7	56	738	189	564	94	139	54	53	19	44

CAL YR 1989 TOTAL 817.48 MEAN 2.24 MAX 117 MIN .00 AC-FT 1620
WTR YR 1990 TOTAL 988.10 MEAN 2.71 MAX 124 MIN .00 AC-FT 1960

HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA

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

DRAINAGE AREA.--4.29 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 690 ft, from topographic map.

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

AVERAGE DISCHARGE.--33 years, 10.9 ft³/s (7,900 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1715	1,530	8.14	Sept. 20	1830	*1,610	*8.26
Jan. 16	1600	1,140	7.38				

Minimum discharge, no flow, Dec. 27-29, Jan. 12-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	1.4	.84	1.3	22	100	2.7	.96	1.6	2.4	4.6	.76
2	1.7	1.3	.77	3.3	30	25	2.4	2.8	1.7	1.9	4.7	.67
3	158	1.2	.73	1.5	37	6.7	2.9	30	1.5	1.9	3.0	.63
4	33	1.1	.69	.89	22	4.3	2.4	3.7	1.1	1.2	2.7	.61
5	18	6.1	.69	.53	18	3.4	36	1.9	1.1	.98	2.4	2.3
6	3.9	1.6	.64	.36	24	60	6.4	1.5	1.2	.83	2.2	2.5
7	6.2	1.2	.58	.24	8.6	78	3.2	1.4	1.0	.78	1.9	1.4
8	6.2	1.4	.50	.10	5.2	37	3.3	1.3	.99	.98	1.9	1.0
9	2.7	2.4	9.7	.07	4.3	21	2.7	1.3	.97	80	1.8	35
10	56	1.8	2.4	.18	4.3	17	2.6	1.1	.81	7.2	1.6	3.2
11	11	1.1	.96	.08	4.8	23	1.9	.95	.73	4.2	1.5	1.7
12	4.4	.93	.64	.00	3.2	8.6	1.8	.95	.74	10	1.6	1.3
13	3.1	.93	.55	.00	2.7	6.2	1.6	5.7	.79	5.5	1.6	1.8
14	7.7	.83	.54	.00	2.3	11	1.4	52	1.1	3.7	1.5	2.2
15	3.5	1.2	.42	4.8	2.0	43	1.4	13	1.2	47	2.5	2.0
16	2.4	1.2	.31	207	1.8	7.0	1.3	4.1	7.5	7.9	2.0	1.3
17	2.0	.88	.29	164	4.8	4.8	1.2	8.4	18	4.1	1.5	17
18	2.5	.71	.25	36	4.1	4.0	1.1	4.4	3.2	22	1.2	4.7
19	4.6	.79	.38	82	2.0	3.5	1.1	4.3	2.1	5.4	1.2	2.1
20	13	.77	1.1	31	1.8	3.2	1.1	3.9	8.6	3.3	9.9	115
21	14	.65	.77	11	1.7	2.8	.99	2.1	12	3.0	3.3	25
22	3.4	.59	.49	6.0	1.5	2.5	1.0	1.8	3.8	5.1	2.0	6.5
23	2.6	.69	.28	4.1	1.4	2.3	.93	37	2.3	2.9	1.5	5.0
24	21	.69	.15	4.1	1.3	2.1	1.4	4.9	1.9	4.8	12	7.9
25	24	.68	.08	3.8	35	3.2	9.4	3.0	11	6.5	3.1	15
26	4.9	.69	.01	34	12	2.3	2.2	2.6	3.8	2.6	4.2	4.9
27	2.9	.67	.00	23	4.0	62	1.5	2.1	2.7	65	2.2	6.1
28	2.1	.64	.00	8.7	8.0	15	1.1	1.9	2.8	17	1.5	3.5
29	2.5	.68	.00	5.8	---	8.0	.91	1.6	2.6	7.7	1.1	2.5
30	2.4	.82	.24	4.3	---	4.1	.81	1.6	2.7	4.4	.93	20
31	1.6	---	.84	3.2	---	3.2	---	1.7	---	26	.80	---
TOTAL	424.5	35.64	25.84	641.35	269.8	574.2	98.74	203.96	101.53	356.27	83.93	293.57
MEAN	13.7	1.19	.83	20.7	9.64	18.5	3.29	6.58	3.38	11.5	2.71	9.79
MAX	158	6.1	9.7	207	37	100	36	52	18	80	12	115
MIN	1.6	.59	.00	.00	1.3	2.1	.81	.95	.73	.78	.80	.61
AC-FT	842	71	51	1270	535	1140	196	405	201	707	166	582

CAL YR 1989 TOTAL 5620.85 MEAN 15.4 MAX 357 MIN .00 AC-FT 11150
WTR YR 1990 TOTAL 3109.33 MEAN 8.52 MAX 207 MIN .00 AC-FT 6170

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 upstream from bridge on Highway 90 and 0.3 mi southwest of sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi².

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--37 years (water years 1953-59, 1961-90), 40.9 ft³/s (29,600 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	2200	*3,590	*6.99	Jan. 16	1800	3,120	6.59

Minimum discharge, 17 ft³/s, Aug. 31, and on several days in Sept.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	28	24	26	49	153	30	30	22	24	35	18
2	33	27	24	25	67	113	36	26	21	23	26	19
3	862	26	24	26	82	50	44	50	21	22	23	18
4	282	25	24	26	83	38	35	37	21	22	21	19
5	57	29	24	26	56	34	77	27	21	22	21	20
6	45	30	25	25	67	180	50	27	21	21	20	19
7	38	28	28	25	47	415	35	27	21	21	20	17
8	44	28	25	25	39	132	31	25	21	20	20	17
9	42	27	61	24	35	84	29	25	22	102	19	63
10	228	29	32	24	34	66	29	25	24	38	19	34
11	94	27	27	24	62	74	28	24	22	30	20	21
12	53	25	25	24	36	53	27	24	22	26	22	18
13	42	24	25	24	33	44	27	24	20	35	19	18
14	82	23	24	30	31	38	26	97	20	28	20	18
15	81	39	24	46	30	107	25	79	20	63	19	18
16	61	31	24	530	29	52	25	42	20	49	19	19
17	45	26	24	397	28	39	25	32	40	30	18	37
18	39	26	25	128	33	35	26	37	29	52	18	41
19	39	25	27	157	31	33	25	32	24	43	18	22
20	54	26	27	128	28	32	24	31	22	28	22	99
21	65	26	25	63	28	31	27	28	36	24	25	136
22	41	25	24	47	27	30	33	27	33	24	22	37
23	34	26	24	39	27	29	28	76	25	24	19	25
24	34	25	24	45	29	29	24	50	24	23	20	31
25	79	27	24	44	191	28	29	32	26	31	26	36
26	42	27	26	43	74	30	28	30	34	25	22	29
27	35	26	25	109	41	103	25	33	24	63	23	24
28	33	24	25	58	38	69	28	27	23	85	19	24
29	36	24	25	43	---	57	31	23	23	36	18	21
30	34	24	24	37	---	39	30	22	24	31	18	40
31	29	---	25	34	---	33	---	22	---	48	17	---
TOTAL	2723	803	814	2302	1355	2250	937	1091	726	1113	648	958
MEAN	87.8	26.8	26.3	74.3	48.4	72.6	31.2	35.2	24.2	35.9	20.9	31.9
MAX	862	39	61	530	191	415	77	97	40	102	35	136
MIN	29	23	24	24	27	28	24	22	20	20	17	17
AC-FT	5400	1590	1610	4570	2690	4460	1860	2160	1440	2210	1290	1900

CAL YR 1989 TOTAL 20231 MEAN 55.4 MAX 862 MIN 17 AC-FT 40130
WTR YR 1990 TOTAL 15720 MEAN 43.1 MAX 862 MIN 17 AC-FT 31180

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHAU--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to September 1981.

WATER TEMPERATURE: April 1973 to September 1981.

SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

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

REMARKS.--In addition to the sediment record, water-quality samples are collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm, Dec. 1, 1980; minimum, 30 micromhos/cm, Apr. 19, 1974.

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

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 1 mg/L, Mar. 16, 20-22, 1989, July 10, 1990.

SEDIMENT DISCHARGE: Maximum daily, 32,900 tons, Apr. 19, 1974; minimum daily, 0.06 ton, Mar. 21, 22, 1989.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 958 mg/L, Oct. 3; minimum daily mean, 1 mg/L, July 10.

SEDIMENT DISCHARGE: Maximum daily, 5,960 tons, Oct. 3; minimum daily, 0.10 ton, Aug. 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT DIS- SOLVED SATUR- ATION)	OXYGEN, (PER- CENT DIS- SOLVED SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT											
24...	1010	31	437	7.2	23.5	4.6	764	7.1	83	740	2500
DEC											
12...	1040	25	447	7.0	21.5	5.6	758	7.1	81	K5700	--
FEB											
27...	0945	42	321	7.2	20.0	5.3	764	8.0	88	9800	8300
MAY											
01...	0900	28	540	7.1	25.0	1.8	766	7.2	87	17000	1800
JUL											
09...	1000	115	83	6.8	22.0	50	765	8.3	95	8300	20000
AUG											
28...	0850	19	405	6.6	22.0	1.1	762	--	--	5000	600

DATE	TIME	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 WATER DIS IT FIELD MG/L AS HCO3
OCT										
24...	1010	78	20	13	11	55	60	3	2.3	71
DEC										
12...	1040	78	12	13	11	61	62	3	2.8	80
FEB										
27...	0945	58	10	10	8.0	44	61	3	2.1	58
MAY										
01...	0900	89	26	14	13	68	62	3	2.7	76
JUL										
09...	1000	15	2	2.6	2.1	9.6	56	1	0.90	16
AUG										
28...	0850	66	--	11	9.3	54	63	3	2.2	--

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKA- LINITY WAT DIS TOT IT MG/L AS CACO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 24...	0	58	19	84	0.10	50	270	275	0.37	--
DEC 12...	0	66	20	79	0.10	59	282	293	0.38	--
FEB 27...	0	48	14	57	0.20	40	210	209	0.29	--
MAY 01...	0	62	25	95	<0.10	59	325	321	0.44	--
JUL 09...	0	13	2.9	15	0.20	8.6	59	51	0.08	--
AUG 28...	--	--	19	87	0.20	54	265	281	0.36	1.40

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHATE, TOTAL (MG/L AS PO4)	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)
OCT 24...	1.20	0.050	0.030	0.20	--	0.190	--	0.170	0.130	0.40
DEC 12...	1.60	0.070	0.060	0.20	--	0.220	--	0.170	0.190	0.58
FEB 27...	1.10	0.040	0.040	<0.20	--	0.130	--	0.090	0.110	0.34
MAY 01...	1.50	0.040	0.010	1.5	--	0.190	--	0.170	0.170	0.52
JUL 09...	0.300	0.040	0.010	1.1	--	0.260	--	0.030	0.020	0.06
AUG 28...	1.40	0.030	0.040	0.30	1.7	0.190	0.55	0.190	0.170	0.52

DATE	TIME	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 24...	1010	30	<1	7	<0.5	<1.0	<1	<3	4	77	1
FEB 27...	0945	60	<1	6	<0.5	<1.0	<5	<3	<10	88	<10
MAY 01...	0900	<10	<1	6	<0.5	2.0	<1	<3	2	25	<1
AUG 28...	0850	10	1	5	0.6	<1.0	2	<3	1	41	<1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENIUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 24...	<4	96	<0.1	<10	3	1	<1.0	97	24	<3
FEB 27...	<4	83	<0.1	<10	<10	<1	<1.0	74	22	<3
MAY 01...	<4	69	<0.1	<10	<1	1	<1.0	100	34	<3
AUG 28...	<4	40	<0.1	<10	1	<1	<1.0	75	33	<3

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

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHO--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 24...	1010	15	1.3	100	MAY 01...	0900	6	0.45	100
DEC 12...	1040	11	0.74	100	JUL 09...	1000	121	38	92
FEB 27...	0945	14	1.6	98					

16213000 WAIKELE STREAM AT WAIPAHO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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	40	18	3.1	28	11	.79	24	8	.52
2	33	27	2.4	27	11	.84	24	7	.49
3	862	958	5960	26	11	.80	24	8	.52
4	282	321	511	25	9	.60	24	10	.63
5	57	23	3.6	29	11	.88	24	10	.66
6	45	11	1.4	30	11	.87	25	11	.72
7	38	9	.90	28	10	.78	28	11	.83
8	44	67	8.2	28	11	.85	25	12	.83
9	42	e59	6.7	27	8	.62	61	69	17
10	228	350	365	29	7	.58	32	25	2.2
11	94	72	21	27	8	.61	27	15	1.2
12	53	19	2.7	25	9	.58	25	11	.76
13	42	16	1.8	24	8	.56	25	8	.54
14	82	254	94	23	9	.53	24	9	.57
15	81	111	33	39	19	2.4	24	8	.55
16	61	72	15	31	21	1.7	24	7	.43
17	45	38	4.6	26	16	1.1	24	8	.51
18	39	28	2.9	26	11	.75	25	7	.49
19	39	20	2.2	25	10	.67	27	7	.55
20	54	25	3.8	26	10	.69	27	9	.69
21	65	31	5.5	26	9	.62	25	7	.48
22	41	20	2.3	25	8	.54	24	7	.48
23	34	16	1.5	26	9	.65	24	7	.48
24	34	21	1.9	25	4	.30	24	6	.40
25	79	39	8.9	27	5	.34	24	5	.35
26	42	21	2.4	27	9	.62	26	5	.42
27	35	18	1.7	26	9	.63	25	9	.62
28	33	17	1.6	24	9	.62	25	11	.75
29	36	17	1.6	24	9	.59	25	7	.44
30	34	20	1.8	24	8	.55	24	6	.40
31	29	18	1.5	---	---	---	25	5	.40
TOTAL	2723	---	7074.00	803	---	22.66	814	---	35.91
	JANUARY			FEBRUARY			MARCH		
1	26	6	.40	49	17	2.7	153	71	51
2	25	7	.47	67	13	2.4	113	36	13
3	26	6	.40	82	16	3.6	50	17	2.2
4	26	6	.43	83	10	2.6	38	14	1.4
5	26	5	.35	56	6	1.0	34	5	.47
6	25	5	.37	67	22	4.6	180	289	549
7	25	5	.32	47	4	.48	415	309	571
8	25	4	.24	39	2	.21	132	54	20
9	24	5	.33	35	5	.50	84	22	5.1
10	24	5	.33	34	5	.48	66	16	2.9
11	24	16	1.0	62	59	18	74	20	4.1
12	24	10	.63	36	36	3.6	53	12	1.7
13	24	6	.38	33	12	1.1	44	12	1.4
14	30	9	1.2	31	6	.53	38	11	1.1
15	46	33	5.7	30	5	.41	107	36	12
16	530	723	2950	29	4	.30	52	18	2.6
17	397	686	820	28	3	.20	39	6	.67
18	128	228	90	33	6	.54	35	5	.47
19	157	e381	270	31	2	.20	33	9	.78
20	128	e523	200	28	4	.33	32	7	.64
21	63	e144	26	28	3	.24	31	6	.49
22	47	24	3.1	27	6	.43	30	3	.27
23	39	10	1.1	27	4	.29	29	6	.44
24	45	14	1.8	29	4	.35	29	9	.72
25	44	14	1.7	191	826	681	28	9	.67
26	43	20	4.3	74	28	6.5	30	7	.53
27	109	80	27	41	8	.88	103	48	18
28	58	20	3.2	38	6	.62	69	22	4.4
29	43	12	1.4	---	---	---	57	13	2.2
30	37	8	.79	---	---	---	39	8	.87
31	34	6	.53	---	---	---	33	8	.68
TOTAL	2302	---	4413.47	1355	---	734.09	2250	---	1270.80

e Estimated

16213000 WAIKELE STREAM AT WAIPAHO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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)
1	30	8	.66	30	9	.69	22	14	.81
2	36	18	2.1	26	7	.51	21	10	.60
3	44	25	3.0	50	31	6.0	21	11	.61
4	35	15	1.5	37	20	1.9	21	10	.60
5	77	53	16	27	17	1.2	21	11	.60
6	50	22	3.1	27	14	1.0	21	10	.56
7	35	13	1.2	27	13	.93	21	10	.58
8	31	10	.88	25	10	.64	21	12	.69
9	29	7	.55	25	12	.84	22	23	1.4
10	29	7	.57	25	11	.75	24	29	1.8
11	28	8	.58	24	11	.69	22	19	1.2
12	27	7	.51	24	15	.99	22	14	.85
13	27	7	.51	24	15	.99	20	10	.56
14	26	7	.51	97	58	19	20	10	.57
15	25	8	.52	79	36	8.4	20	9	.48
16	25	e7	.44	42	11	1.3	20	10	.55
17	25	6	.43	32	14	1.4	40	24	3.1
18	26	7	.51	37	21	2.3	29	13	.99
19	25	8	.50	32	9	.79	24	13	.83
20	24	6	.37	31	8	.64	22	10	.59
21	27	5	.36	28	8	.58	36	25	2.5
22	33	6	.53	27	9	.62	33	16	1.4
23	28	6	.43	76	45	15	25	12	.82
24	24	5	.33	50	25	3.6	24	11	.72
25	29	15	1.2	32	14	1.2	26	15	1.2
26	28	7	.54	30	14	1.2	34	25	2.2
27	25	6	.42	33	e18	1.6	24	20	1.3
28	28	12	.94	27	15	1.1	23	16	1.0
29	31	11	.89	23	12	.76	23	17	1.0
30	30	6	.46	22	12	.70	24	13	.85
31	---	---	---	22	13	.79	---	---	---
TOTAL	937	---	40.54	1091	---	78.11	726	---	30.96
		JULY		AUGUST			SEPTEMBER		
1	24	11	.71	35	16	1.4	18	4	.19
2	23	15	.92	26	14	.98	19	5	.27
3	22	15	.91	23	7	.46	18	6	.31
4	22	14	.87	21	8	.49	19	6	.31
5	22	14	.84	21	9	.48	20	6	.33
6	21	14	.77	20	7	.39	19	6	.32
7	21	15	.83	20	7	.36	17	7	.30
8	20	16	.86	20	7	.37	17	6	.28
9	102	54	25	19	8	.44	63	85	25
10	38	1	.11	19	8	.43	34	32	3.2
11	30	8	.67	20	6	.30	21	12	.67
12	26	9	.63	22	10	.64	18	12	.57
13	35	14	1.3	19	5	.27	18	14	.68
14	28	8	.58	20	5	.31	18	14	.67
15	63	27	7.8	19	2	.10	18	15	.70
16	49	10	1.4	19	5	.26	19	18	.94
17	30	7	.58	18	6	.30	37	27	3.4
18	52	21	4.3	18	5	.24	41	26	3.0
19	43	9	1.1	18	6	.31	22	17	1.0
20	28	8	.64	22	10	.61	99	239	339
21	24	8	.50	25	7	.47	136	448	207
22	24	7	.44	22	6	.33	37	33	3.5
23	24	44	2.8	19	6	.31	25	17	1.2
24	23	58	3.5	20	14	1.1	31	24	2.1
25	31	21	1.8	26	17	1.4	36	20	2.2
26	25	11	.73	22	4	.26	29	14	1.1
27	63	19	7.6	23	5	.33	24	14	.86
28	85	157	35	19	6	.29	24	12	.79
29	36	63	6.5	18	5	.25	21	12	.70
30	31	11	.87	18	5	.24	40	33	4.8
31	48	41	7.2	17	5	.22	---	---	---
TOTAL	1113	---	117.76	648	---	14.34	958	---	605.39
YEAR	15720		14438.03						

e Estimated

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft upstream from lower bridge on Highway 90, 0.6 mi northwest of Pearl City, and 2.0 mi northeast of Waipahu.

DRAINAGE AREA.--26.4 mi².

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 above mean sea level.

REMARKS.--Records fair. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--38 years, 34.0 ft³/s (24,630 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft³/s, revised, Oct. 28, 1981, gage height, 22.46 ft, from rating curve extended above 1,100 ft³/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft³/s on several days in 1984 and 1985.

REVISIONS.--The maximum discharge for the water years 1982 to 1989 have been revised to 27,900 ft³/s, Oct. 28, 1981, and the gage height for the water years 1983 to 1989 have been revised to 22.46 ft. as a result of typographical error.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1800	*9,720	*15.12	Jul. 9	0430	3,770	10.52
Jan. 16	1830	2,710	9.33				

Minimum discharge, 1.5 ft³/s, Sep. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e7.2	2.9	2.3	3.0	45	234	e12	2.3	e3.1	2.1	13	1.6
2	e7.0	2.7	2.3	2.6	46	104	e10	2.3	e3.0	2.0	8.3	1.6
3	1780	2.7	2.3	2.6	57	33	e9.7	22	e2.8	2.0	4.7	1.6
4	210	2.7	2.3	2.5	63	17	9.4	8.9	e2.7	1.9	3.0	1.7
5	30	2.7	2.2	2.6	43	15	14	3.3	e2.7	1.9	2.3	1.7
6	e14	2.7	2.3	2.6	52	219	17	2.5	e2.4	1.9	2.1	1.7
7	e16	2.6	2.3	2.6	26	427	9.3	2.7	e2.3	1.9	1.9	1.7
8	e14	2.6	2.3	2.7	13	128	6.3	2.5	e2.2	1.9	1.9	1.7
9	e13	2.6	27	2.7	9.6	64	5.5	2.5	e2.1	484	1.8	5.5
10	157	2.5	2.6	2.8	9.3	42	5.3	2.5	e2.0	35	1.7	3.4
11	44	2.6	2.5	2.7	20	42	3.7	2.5	e2.0	21	1.7	1.8
12	e15	2.5	2.5	2.8	e9.0	27	3.0	2.5	2.0	8.9	1.7	1.6
13	e14	2.5	2.4	2.8	e8.6	e19	2.7	2.4	1.9	12	2.1	1.6
14	e17	2.5	2.4	6.1	e8.0	e18	2.5	35	1.9	5.7	2.2	1.6
15	e25	3.0	2.4	7.0	e7.6	80	2.5	24	1.9	142	1.7	1.6
16	e21	2.5	2.4	413	e7.0	e22	2.5	9.1	1.9	39	1.7	1.6
17	e12	2.5	2.4	327	e7.2	e17	2.4	8.6	22	14	1.6	67
18	e8.0	2.5	2.5	85	e6.9	e16	2.4	9.5	12	45	1.6	15
19	7.0	2.5	2.5	164	e6.6	e15	2.4	5.3	5.6	24	1.7	3.9
20	26	2.5	2.4	92	e6.4	e14	2.4	4.7	3.2	9.8	1.7	141
21	24	2.5	2.4	40	e6.3	e13	2.4	4.1	9.9	5.9	1.7	59
22	11	2.5	2.4	20	e6.2	e12	2.3	3.3	9.5	8.3	1.6	14
23	6.8	2.4	2.4	11	e6.2	e11	2.3	62	4.1	5.2	1.6	6.5
24	46	2.4	2.5	11	e6.2	e13	2.4	22	2.8	4.9	2.5	22
25	47	2.4	2.5	9.2	146	e11	2.4	8.6	14	7.8	4.0	25
26	11	2.4	6.5	18	54	e10	2.4	e5.6	15	4.5	1.8	11
27	6.6	2.3	2.5	60	18	99	2.4	e5.0	6.1	178	1.7	5.7
28	4.4	2.3	2.5	31	23	40	2.4	e4.5	4.6	83	1.7	4.5
29	3.6	2.3	2.5	18	---	27	2.4	e4.0	3.0	26	1.7	3.1
30	4.9	2.3	2.5	10	---	e18	2.3	e3.7	2.3	12	1.6	71
31	3.5	---	2.5	8.1	---	e14	---	e3.3	---	32	1.6	---
TOTAL	2606.0	76.1	103.5	1365.4	717.1	1821	148.7	281.2	151.0	1223.6	79.9	480.7
MEAN	84.1	2.54	3.34	44.0	25.6	58.7	4.96	9.07	5.03	39.5	2.58	16.0
MAX	1780	3.0	27	413	146	427	17	62	22	484	13	141
MIN	3.5	2.3	2.2	2.5	6.2	10	2.3	2.3	1.9	1.9	1.6	1.6
AC-FT	5170	151	205	2710	1420	3610	295	558	300	2430	158	953

CAL YR 1989 TOTAL 23230.3 MEAN 63.6 MAX 2720 MIN 1.8 AC-FT 46080
WTR YR 1990 TOTAL 9054.2 MEAN 24.8 MAX 1780 MIN 1.6 AC-FT 17960

e Estimated

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi upstream from confluence with South Halawa Stream and 2.7 mi northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi².

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

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

GAGE.--Water-stage recorder. Elevation of gage is 320 ft, from topographic map.

REMARKS.--Records good except for period when lowest intake was plugged, which are fair. Recording rain gage located at station.

AVERAGE DISCHARGE.--40 years (water years 1930-32, 1954-90), 4.99 ft³/s (3,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft³/s, Feb. 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft³/s; maximum gage height, 13.46 ft, May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 570 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1830	*836	*9.69	No other peak greater than base discharge.			

Minimum discharge, No flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.40	.00	.00	7.9	82	1.9	.10	.16	.11	1.8	.04
2	.01	.27	.00	.00	8.0	31	1.6	.07	.11	.04	1.5	.02
3	78	.16	.00	.00	12	8.7	1.5	4.9	.11	.03	.90	.02
4	33	.09	.00	.00	9.0	4.0	1.4	1.5	.11	.03	.61	.01
5	13	.05	.00	.00	5.4	2.5	12	.68	.09	.01	.44	.01
6	4.1	.03	.00	.00	5.2	15	5.8	.46	.06	.01	.33	.01
7	1.6	.04	.00	.00	2.9	58	3.1	.39	.04	.01	.24	.01
8	.98	.04	.00	.00	1.6	28	2.5	.36	.03	.01	.15	.01
9	6.3	.03	.00	.00	1.1	16	9.0	.30	.02	59	.10	3.4
10	34	.03	.00	.00	1.0	8.7	2.7	.21	.01	4.7	.07	1.0
11	17	.03	.00	.00	.82	6.2	1.7	.14	.02	2.0	.04	.41
12	4.3	.03	.00	.00	.66	3.9	1.3	.09	.02	1.7	.03	.26
13	2.1	.02	.00	.00	.49	2.7	.99	5.9	.02	3.7	.03	.25
14	33	.01	.00	.00	.34	21	.77	20	.01	1.2	.03	.08
15	17	.01	.00	.01	.24	93	.66	7.5	.01	17	.01	.04
16	5.7	.01	.00	87	.15	12	.57	2.4	.01	5.1	.02	.03
17	3.0	.01	.00	90	.14	5.2	.53	5.1	2.9	1.9	.02	3.2
18	2.1	.01	.00	35	.19	3.2	.43	2.0	1.7	9.9	.02	.96
19	S4.6	.00	.00	38	.35	2.5	.38	1.3	.84	4.3	.02	.41
20	e4.2	.00	.00	25	.24	1.9	.34	.80	.55	1.9	3.1	22
21	e3.5	.00	.00	9.9	.15	1.6	.30	.75	.89	1.2	1.3	10
22	e1.6	.00	.00	4.2	.10	1.3	.26	.65	.95	1.3	.62	1.8
23	e.82	.00	.00	2.1	.07	1.1	.22	16	.51	.68	.40	1.6
24	12	.00	.00	4.1	.05	.88	.20	4.5	.34	1.9	1.1	5.5
25	5.0	.00	.00	3.1	27	1.3	.23	1.8	.29	2.4	2.6	2.5
26	1.9	.00	.00	2.9	18	6.9	.35	1.0	.38	1.0	1.2	1.0
27	.98	.00	.00	10	10	60	.32	.66	.39	32	.87	.63
28	.60	.00	.00	4.4	28	13	.22	.46	.28	18	.44	.40
29	8.7	.00	.00	2.2	---	8.0	.16	.32	.19	5.6	.25	.25
30	1.3	.00	.00	1.4	---	4.1	.11	.23	.17	2.4	.13	2.1
31	.62	---	.00	.91	---	2.6	---	.16	---	3.3	.07	---
TOTAL	301.02	1.27	0.00	320.22	141.09	506.28	51.54	80.73	11.21	182.43	18.44	57.95
MEAN	9.71	.042	.000	10.3	5.04	16.3	1.72	2.60	.37	5.88	.59	1.93
MAX	78	.40	.00	90	28	93	12	20	2.9	59	3.1	22
MIN	.01	.00	.00	.00	.05	.88	.11	.07	.01	.01	.01	.01
AC-FT	597	2.5	.00	635	280	1000	102	160	22	362	37	115

CAL YR 1989 TOTAL 2751.13 MEAN 7.54 MAX 238 MIN .00 AC-FT 5460
WTR YR 1990 TOTAL 1672.18 MEAN 4.58 MAX 93 MIN .00 AC-FT 3320

16226200 NORTH HALAWA STREAM NEAR HONOLULU

LOCATION.--Lat 21°23'04", long 157°54'22", Hydrologic Unit 20060000, on right bank 0.5 mi north of Halawa quarry, 1.7 mi east of Aiea High School, and 1.9 mi east of Aiea.

DRAINAGE AREA.--4.01 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 160 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--7 Years, 5.06 ft³/s (3,910 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft³/s, Dec. 31, 1987, gage height, 11.25 ft, no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1815	*880	*10.65	No other peak greater than base discharge.			
Minimum discharge, No flow on many days.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.38	.01	.00	7.9	95	2.3	.08	.11	.04	1.8	.04
2	.02	.21	.01	.00	8.0	35	1.9	.06	.11	.03	1.3	.03
3	93	.14	.01	.00	12	9.5	1.7	4.6	.07	.02	.65	.03
4	25	.08	.01	.00	9.6	4.6	1.8	2.0	.05	.02	.38	.03
5	9.8	.06	.01	.00	5.7	3.0	12	.87	.04	.02	.22	.08
6	3.7	.04	.01	.00	5.5	17	6.8	.64	.03	.02	.10	.08
7	1.6	.04	.01	.00	3.4	77	3.9	.58	.04	.02	.04	.09
8	.85	.04	.01	.00	1.8	32	3.3	.53	.04	.01	.02	.13
9	5.4	.05	.03	.00	1.2	18	9.2	.42	.04	66	.01	3.1
10	26	.04	.01	.00	1.0	9.8	3.5	.30	.04	5.9	.01	1.2
11	11	.04	.01	.00	.87	6.7	2.1	.19	.04	2.5	.01	.45
12	3.8	.04	.01	.00	.68	4.4	1.4	.13	.03	1.2	.03	.29
13	2.1	.04	.01	.00	.47	3.0	1.1	6.2	.03	4.0	.04	.38
14	22	.03	.01	.00	.32	19	.88	20	.04	1.2	.03	.13
15	12	.05	.01	.00	.19	110	.72	8.7	.03	20	.03	.09
16	4.5	.04	.01	111	.10	14	.61	3.4	.10	6.5	.03	.10
17	2.3	.04	.01	114	.08	6.6	.56	5.7	2.4	2.3	.03	2.9
18	1.7	.04	.01	39	.08	4.4	.48	2.9	1.8	12	.04	1.2
19	3.7	.04	.01	43	.26	3.5	.42	1.8	.91	6.0	.05	.46
20	3.6	.03	.01	29	.19	2.6	.38	1.1	.51	2.5	2.3	27
21	2.7	.04	.01	13	.11	2.0	.33	.92	.63	1.2	1.2	10
22	1.4	.04	.01	5.4	.08	1.6	.30	.77	1.1	1.5	.57	1.9
23	.81	.03	.00	2.7	.06	1.0	.25	17	.50	.84	.40	1.3
24	11	.03	.00	4.3	.07	.94	.21	5.7	.34	2.1	.86	4.7
25	5.4	.03	.00	3.4	32	1.2	.16	2.5	.32	3.3	2.9	2.4
26	2.0	.03	.00	3.0	21	4.4	.25	1.4	.24	1.1	1.2	1.0
27	1.0	.03	.00	9.9	9.7	74	.34	.77	.35	37	1.0	.63
28	.57	.03	.00	4.4	27	14	.27	.52	.20	21	.50	.41
29	8.8	.03	.00	2.5	---	9.0	.18	.34	.13	6.5	.22	.22
30	1.6	.02	.00	1.5	---	4.8	.12	.25	.08	2.9	.09	1.5
31	.63	---	.00	1.0	---	3.3	---	.15	---	3.4	.05	---
TOTAL	268.00	1.78	0.24	387.10	149.36	591.34	57.46	90.52	10.35	211.12	16.11	61.87
MEAN	8.65	.059	.008	12.5	5.33	19.1	1.92	2.92	.34	6.81	.52	2.06
MAX	93	.38	.03	114	32	110	12	20	2.4	66	2.9	27
MIN	.02	.02	.00	.00	.06	.94	.12	.06	.03	.01	.01	.03
AC-FT	532	3.5	.5	768	296	1170	114	180	21	419	32	123

CAL YR 1989 TOTAL 3269.95 MEAN 8.96 MAX 298 MIN .00 AC-FT 6490
WTR YR 1990 TOTAL 1845.25 MEAN 5.06 MAX 114 MIN .00 AC-FT 3660

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1983 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,230 mg/L (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990.

SEDIMENT DISCHARGE: Maximum daily, 4,730 tons (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,060 mg/L, Jan. 16; no flow for many days.

SEDIMENT DISCHARGE: Maximum daily, 735 tons, Jan. 16; no flow for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION (PER- CENT)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)
NOV												
13...	1115	0.06	236	7.8	23.0	0.30	758	6.4	75	--	--	--
JAN												
16...	1105	122	--	--	--	--	--	--	--	--	--	--
16...	1115	130	--	--	--	--	--	--	--	--	--	--
16...	1518	446	--	--	20.0	--	--	--	--	--	--	--
17...	1205	185	--	--	20.0	--	--	--	--	--	--	--
18...	1248	32	--	--	20.5	--	--	--	--	--	--	--
19...	0914	20	--	--	20.5	--	--	--	--	--	--	--
19...	1400	36	--	--	20.5	--	--	--	--	--	--	--
23...	1145	3.0	183	8.1	21.0	6.0	752	7.9	90	--	--	--
FEB												
14...	1040	--	191	7.7	19.0	1.2	760	8.5	92	110	--	--
MAR												
26...	1310	1.0	175	8.0	22.0	1.6	761	8.1	93	--	--	--
APR												
24...	1245	0.18	200	7.6	23.5	1.0	759	7.8	92	--	--	--
JUN												
14...	1000	0.04	200	7.5	22.5	0.40	761	6.4	74	--	--	--
JUL												
26...	1230	1.0	150	7.7	24.0	0.90	758	8.2	98	150	--	--
AUG												
13...	1325	0.03	207	7.2	24.5	0.30	759	6.6	80	--	--	--
SEP												
19...	1120	0.40	165	7.6	24.5	0.40	760	8.1	97	160	45	7.5

DATE	TIME	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)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
SEP												
19...	1120	6.4	15	41	1	1.0	52	4.3	19	<0.10	23	95

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)
FEB	14...	1040	--	5	<0.100	<0.20	<0.010	--	--	--	--	--
JUL	26...	1230	--	<1	<0.100	0.30	<0.010	--	--	--	--	--
SEP	19...	1120	108	0.13	<1	<0.100	0.30	0.040	40	30	<1	<1

DATE	TIME	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)
SEP	19...	1120	<2	<10	<0.5	<1	<1.0	<1	<1	<1	<3	1

DATE	TIME	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
SEP	19...	90	52	<1	<1	<10	<4	70	19	<0.10	<0.1	<1	<10

DATE	TIME	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV- ERABLE GRAVI- METRIC (MG/L)
SEP	19...	1	<1	<1	<1	<1	<1.0	48	<6	<10	<3	2.7	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
SEP	19...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT. REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)
SEP	19...	<0.01	<0.010	<0.010	<0.01	<0.0	<0.010	<0.010	<0.01	<0.01	<0.01

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

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	METHYL TRI- THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2,4,5-T TOTAL (UG/L)
SEP 19...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
JAN 16...	1105	514	169	86	JAN 18...	1248	10	0.86	90
16...	1115	502	176	86	19...	0914	8	0.43	91
16...	1518	2330	2810	44	19...	1400	21	2.0	85
17...	1205	235	117	76					

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

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)
	OCTOBER			NOVEMBER			DECEMBER		
1	.02	5	.00	.38	e9	.01	.01	e5	.00
2	.02	5	.00	.21	e9	.00	.01	e4	.00
3	93	577	637	.14	e9	.00	.01	e3	.00
4	25	173	15	.08	e9	.00	.01	2	.00
5	9.8	42	1.9	.06	e8	.00	.01	e2	.00
6	3.7	5	.06	.04	e8	.00	.01	e1	.00
7	1.6	4	.02	.04	e8	.00	.01	e1	.00
8	.85	10	.02	.04	e8	.00	.01	e1	.00
9	5.4	25	.50	.05	e8	.00	.03	10	.00
10	26	85	8.3	.04	e8	.00	.01	e9	.00
11	11	14	.49	.04	e8	.00	.01	e9	.00
12	3.8	6	.06	.04	e8	.00	.01	e8	.00
13	2.1	6	.03	.04	e8	.00	.01	e8	.00
14	22	88	9.0	.03	e7	.00	.01	e7	.00
15	12	e37	1.4	.05	e7	.00	.01	e7	.00
16	4.5	8	.10	.04	e7	.00	.01	e6	.00
17	2.3	7	.04	.04	e7	.00	.01	e6	.00
18	1.7	7	.03	.04	e7	.00	.01	e5	.00
19	3.7	e19	.25	.04	e7	.00	.01	e5	.00
20	3.6	8	.08	.03	e7	.00	.01	e4	.00
21	2.7	8	.06	.04	e7	.00	.01	e3	.00
22	1.4	18	.07	.04	e7	.00	.01	e2	.00
23	.81	14	.03	.03	e7	.00	.00	e1	.00
24	11	70	6.2	.03	e7	.00	.00	0	---
25	5.4	27	.50	.03	e6	.00	.00	0	.00
26	2.0	8	.05	.03	e6	.00	.00	0	.00
27	1.0	5	.01	.03	e6	.00	.00	0	.00
28	.57	e5	.01	.03	e6	.00	.00	0	.00
29	8.8	e16	.99	.03	e6	.00	.00	0	.00
30	1.6	e10	.04	.02	e6	.00	.00	0	.00
31	.63	e9	.02	---	---	---	.00	0	.00
TOTAL	268.00	---	682.26	1.78	---	0.01	0.24	---	---
	JANUARY			FEBRUARY			MARCH		
1	.00	0	.00	7.9	8	.22	95	227	75
2	.00	0	.00	8.0	9	.20	35	79	9.3
3	.00	0	.00	12	9	.30	9.5	25	.65
4	.00	0	.00	9.6	9	.21	4.6	23	.30
5	.00	0	.00	5.7	15	.23	3.0	e15	.12
6	.00	0	.00	5.5	e15	.22	17	56	9.9
7	.00	0	.00	3.4	e14	.13	77	113	31
8	.00	0	.00	1.8	e13	.06	32	9	.89
9	.00	0	.00	1.2	e12	.04	18	1	.05
10	.00	0	.00	1.0	e11	.03	9.8	1	.03
11	.00	0	.00	.87	e10	.02	6.7	3	.05
12	.00	0	.00	.68	e9	.02	4.4	4	.05
13	.00	0	.00	.47	e9	.01	3.0	1	.01
14	.00	0	.00	.32	7	.01	19	25	12
15	.00	0	.00	.19	e4	.00	110	315	138
16	111	1060	735	.10	e2	.00	14	8	.40
17	114	158	51	.08	6	.00	6.6	1	.02
18	39	22	2.9	.08	e14	.00	4.4	2	.02
19	43	e25	4.3	.26	e13	.01	3.5	1	.01
20	29	11	.91	.19	e13	.01	2.6	2	.01
21	13	15	.50	.11	e13	.00	2.0	2	.01
22	5.4	11	.16	.08	e13	.00	1.6	2	.01
23	2.7	6	.05	.06	e12	.00	1.0	2	.00
24	4.3	10	.13	.07	11	.00	.94	1	.00
25	3.4	11	.10	32	68	11	1.2	2	.01
26	3.0	16	.11	21	19	1.3	4.4	e32	3.7
27	9.9	6	.15	9.7	e17	1.1	74	e191	83
28	4.4	6	.07	27	e37	3.7	14	e16	.64
29	2.5	5	.03	---	---	---	9.0	e13	.32
30	1.5	5	.02	---	---	---	4.8	e10	.13
31	1.0	3	.01	---	---	---	3.3	e8	.07
TOTAL	387.10	---	795.44	149.36	---	18.82	591.34	---	365.70

e Estimated

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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
1	2.3	e6	.04	.08	e4	.00	.11	e4	.00	
2	1.9	5	.03	.06	6	.00	.11	e5	.00	
3	1.7	8	.04	4.6	27	.45	.07	e7	.00	
4	1.8	15	.06	2.0	78	.46	.05	10	.00	
5	12	e33	2.2	.87	e10	.02	.04	e11	.00	
6	6.8	3	.06	.64	e10	.02	.03	e12	.00	
7	3.9	4	.05	.58	e10	.02	.04	e13	.00	
8	3.3	6	.05	.53	e10	.01	.04	e14	.00	
9	9.2	e20	1.1	.42	e10	.01	.04	e15	.00	
10	3.5	7	.07	.30	e10	.01	.04	e17	.00	
11	2.1	7	.04	.19	e10	.00	.04	e18	.00	
12	1.4	6	.02	.13	e10	.00	.03	e20	.00	
13	1.1	6	.02	6.2	e16	.97	.03	e21	.00	
14	.88	5	.01	20	e18	1.2	.04	e21	.00	
15	.72	4	.01	8.7	3	.08	.03	e13	.00	
16	.61	e3	.00	3.4	1	.01	.10	e8	.00	
17	.56	e3	.00	5.7	6	.11	2.4	5	.03	
18	.48	e3	.00	2.9	3	.02	1.8	3	.02	
19	.42	e2	.00	1.8	2	.01	.91	4	.01	
20	.38	e2	.00	1.1	e3	.01	.51	e7	.01	
21	.33	e2	.00	.92	e2	.01	.63	11	.02	
22	.30	e1	.00	.77	e2	.00	1.1	9	.03	
23	.25	e1	.00	17	34	3.8	.50	e7	.01	
24	.21	e1	.00	5.7	10	.16	.34	e6	.00	
25	.16	1	.00	2.5	5	.03	.32	e5	.00	
26	.25	e1	.00	1.4	3	.01	.24	e5	.00	
27	.34	e2	.00	.77	e3	.01	.35	e4	.00	
28	.27	e2	.00	.52	e3	.00	.20	e4	.00	
29	.18	e3	.00	.34	e3	.00	.13	e3	.00	
30	.12	e4	.00	.25	e3	.00	.08	e3	.00	
31	---	---	---	.15	3	.00	---	---	---	
TOTAL	57.46	---	3.80	90.52	---	7.43	10.35	---	0.13	
		JULY			AUGUST			SEPTEMBER		
1	.04	e2	.00	1.8	2	.01	.04	e1	.00	
2	.03	e2	.00	1.3	2	.01	.03	e1	.00	
3	.02	e2	.00	.65	1	.00	.03	e1	.00	
4	.02	e2	.00	.38	e1	.00	.03	e1	.00	
5	.02	e2	.00	.22	e1	.00	.08	e1	.00	
6	.02	e1	.00	.10	e1	.00	.08	e1	.00	
7	.02	e1	.00	.04	e1	.00	.09	e1	.00	
8	.01	e1	.00	.02	e1	.00	.13	e1	.00	
9	66	433	249	.01	e1	.00	3.1	e11	.19	
10	5.9	e17	.29	.01	e1	.00	1.2	3	.01	
11	2.5	5	.04	.01	e1	.00	.45	e2	.00	
12	1.2	3	.01	.03	e1	.00	.29	e2	.00	
13	4.0	210	1.4	.04	1	.00	.38	e2	.00	
14	1.2	e33	.16	.03	e1	.00	.13	e2	.00	
15	20	71	7.2	.03	e1	.00	.09	e1	.00	
16	6.5	20	.44	.03	e1	.00	.10	e1	.00	
17	2.3	7	.05	.03	e1	.00	2.9	21	.48	
18	12	7	.24	.04	e1	.00	1.2	4	.02	
19	6.0	7	.12	.05	e1	.00	.46	e1	.00	
20	2.5	4	.03	2.3	e5	.03	27	167	67	
21	1.2	e3	.01	1.2	2	.01	10	29	1.0	
22	1.5	e4	.02	.57	e2	.00	1.9	e15	.08	
23	.84	e4	.01	.40	e1	.00	1.3	e14	.05	
24	2.1	5	.03	.86	e2	.01	4.7	e29	.38	
25	3.3	7	.06	2.9	e4	.03	2.4	e21	.14	
26	1.1	2	.01	1.2	1	.00	1.0	e11	.03	
27	37	157	57	1.0	e1	.00	.63	e6	.01	
28	21	18	1.3	.50	e1	.00	.41	e3	.00	
29	6.5	3	.06	.22	e1	.00	.22	e2	.00	
30	2.9	3	.02	.09	e1	.00	1.5	8	.08	
31	3.4	1	.01	.05	e1	.00	---	---	---	
TOTAL	211.12	---	317.51	16.11	---	0.10	61.87	---	69.47	

e Estimated

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi upstream from Kamaikai Stream and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi².

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--76 years (water years 1915-90), 6.62 ft³/s (4,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft³/s, Nov. 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft³/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft³/s, Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1600	*878	*7.77	No other peak greater than base discharge.			

Minimum discharge, 0.46 ft³/s, Dec. 26, Jan. 9-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	1.7	.89	1.4	11	81	5.7	2.4	2.0	1.4	4.5	1.5
2	1.3	1.6	.79	1.3	11	31	5.4	3.1	1.9	1.3	3.9	1.4
3	50	1.6	.79	.91	12	14	5.5	6.2	1.7	1.4	3.3	1.4
4	10	1.5	.84	.82	8.7	9.9	4.8	2.8	1.7	1.4	3.0	1.4
5	4.2	1.4	.81	.83	7.7	8.0	11	2.4	1.8	1.2	3.0	1.7
6	2.7	1.5	.79	.75	6.9	13	6.0	2.3	1.7	1.1	2.6	1.4
7	2.2	1.4	.79	.70	5.4	33	5.2	3.0	1.6	1.0	2.6	1.4
8	2.0	1.4	.82	.73	4.6	20	4.5	2.5	1.7	1.8	2.5	1.9
9	2.0	1.8	2.7	.64	4.1	13	6.2	2.1	1.6	30	2.2	8.9
10	9.0	1.4	1.1	.57	3.8	10	4.7	2.1	1.5	3.4	2.2	2.1
11	2.8	1.3	.92	.60	3.8	8.7	4.4	1.9	1.5	2.3	2.0	1.7
12	2.2	1.4	.83	.58	3.5	7.5	4.1	1.8	1.4	3.1	2.3	2.0
13	2.0	1.3	1.0	.59	3.2	6.9	3.7	2.0	1.4	2.2	2.0	1.9
14	2.3	1.5	.84	.59	3.1	17	3.6	8.0	1.5	1.9	2.1	1.7
15	4.3	1.8	.75	6.1	2.8	74	3.5	4.4	1.4	9.2	2.5	1.4
16	2.0	1.4	.82	35	2.6	18	3.3	3.0	2.6	3.0	2.1	1.4
17	1.8	1.4	.84	22	3.0	12	3.1	4.8	4.0	3.2	1.9	19
18	2.2	1.2	.72	11	2.6	9.4	3.0	3.3	2.2	13	1.7	3.8
19	3.9	1.1	.76	28	2.4	8.7	3.1	3.0	1.9	4.7	5.4	2.7
20	3.7	1.1	2.1	18	2.3	8.4	3.0	2.7	1.7	3.1	4.4	10
21	3.0	1.1	.90	8.6	2.2	7.0	2.9	2.5	1.6	3.6	3.0	6.1
22	2.2	1.1	.79	6.0	2.1	6.0	2.8	2.5	1.6	2.9	2.2	3.4
23	2.2	.98	.83	4.6	2.0	5.8	2.7	7.4	1.5	2.5	1.9	4.0
24	7.5	1.0	.84	7.6	1.9	5.4	2.9	3.7	1.6	2.8	3.1	4.5
25	3.7	.99	.84	5.4	22	4.9	2.6	2.9	2.4	2.3	2.0	3.2
26	3.3	.94	.76	5.5	12	6.7	2.6	2.7	1.6	2.0	2.6	2.6
27	2.2	1.0	.80	5.9	9.1	32	2.4	2.4	1.4	41	2.1	2.8
28	2.0	.99	.75	4.7	23	12	2.2	2.2	1.5	13	1.9	2.3
29	2.6	.95	.72	4.1	---	8.0	2.2	2.0	1.4	6.1	1.8	2.1
30	1.8	1.0	.67	3.4	---	7.4	2.1	e1.9	1.6	5.0	1.8	14
31	1.8	---	1.1	3.1	---	6.4	---	e1.9	---	5.6	1.6	---
TOTAL	145.2	38.85	28.90	190.01	178.8	505.1	119.2	95.9	53.0	176.5	80.2	113.7
MEAN	4.68	1.29	.93	6.13	6.39	16.3	3.97	3.09	1.77	5.69	2.59	3.79
MAX	50	1.8	2.7	35	23	81	11	8.0	4.0	41	5.4	19
MIN	1.3	.94	.67	.57	1.9	4.9	2.1	1.8	1.4	1.0	1.6	1.4
AC-FT	288	77	57	377	355	1000	236	190	105	350	159	226

CAL YR 1989 TOTAL 2990.45 MEAN 8.19 MAX 278 MIN .67 AC-FT 5930
WTR YR 1990 TOTAL 1725.36 MEAN 4.73 MAX 81 MIN .57 AC-FT 3420

e Estimated

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974 to current year.

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (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
NOV 29...	0950	1.0	161	8.6	19.5	37	5.9	5.4	13	43	0.9
FEB 28...	1150	14	120	7.8	18.0	28	4.6	4.0	12	48	1
APR 30...	0930	2.0	140	6.9	21.0	33	5.1	5.0	14	47	1
SEP 28...	1125	2.2	150	7.8	22.0	39	7.2	5.0	14	43	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV 29...	0.80	32	5.0	21	<0.10	14	85	0.11	<0.100	260	9
FEB 28...	0.60	22	4.4	23	<0.10	12	74	0.10	<0.100	80	9
APR 30...	0.60	27	5.0	23	<0.10	14	83	0.11	<0.100	190	12
SEP 28...	0.80	37	5.0	19	<0.10	13	86	0.12	--	160	24

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

16229300 KALIHI STREAM AT KALIHI
(National stream-quality accounting network station)

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 70 ft, from topographic map. Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

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

AVERAGE DISCHARGE.--28 years, 10.6 ft³/s (7,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s, Apr. 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft³/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0.16 ft³/s, June 24, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft from floodmarks, present site and datum, discharge, 6,350 ft³/s, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1645	*1,090	4.18	No other peak greater than base discharge.			
Minimum discharge, 0.94 ft ³ /s, Dec. 9, 25-30.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	2.9	1.2	3.5	24	122	6.5	3.4	2.4	2.0	4.8	2.1
2	2.1	2.7	1.2	3.1	26	52	6.2	3.5	2.4	2.1	4.1	2.1
3	157	2.7	1.1	1.5	30	20	6.8	9.3	2.3	1.8	3.4	2.1
4	28	2.7	1.1	1.3	17	13	7.0	3.4	2.3	1.7	3.2	2.2
5	9.5	2.7	1.1	1.2	13	11	14	3.3	2.6	1.7	3.4	2.8
6	4.7	2.8	1.1	1.3	11	28	7.6	3.2	2.5	1.6	3.0	2.0
7	3.8	2.4	1.1	1.2	8.3	85	6.2	4.5	2.4	1.6	2.9	1.8
8	5.4	2.6	1.1	1.2	6.0	53	5.7	3.2	2.7	1.7	2.9	2.4
9	5.0	3.0	1.1	1.1	5.2	26	7.1	2.9	2.1	3.9	2.8	1.7
10	18	2.3	1.6	1.2	7.1	17	5.6	2.9	2.1	4.5	2.8	2.6
11	4.7	2.3	1.3	1.1	5.4	13	5.1	2.8	2.0	2.9	2.5	2.1
12	3.5	2.4	1.2	1.2	4.5	10	4.9	2.6	2.1	3.8	3.0	3.0
13	3.4	2.3	1.3	1.2	4.0	9.3	4.7	2.9	2.1	2.7	2.5	3.6
14	5.7	2.2	1.2	3.4	3.6	20	4.5	10	2.4	2.5	2.8	2.2
15	11	4.8	1.2	14	3.4	99	4.6	6.0	2.4	14	3.2	1.9
16	3.3	2.4	1.2	93	3.2	23	4.8	4.6	9.7	4.0	2.5	2.2
17	2.8	2.1	1.2	62	3.5	15	4.9	9.9	10	4.3	2.2	4.0
18	3.1	2.0	1.1	24	3.1	12	4.7	5.3	3.4	23	2.1	5.0
19	5.7	1.9	1.1	45	2.8	11	4.7	5.0	2.8	6.4	4.4	3.3
20	6.0	1.7	2.8	33	2.9	9.5	4.8	3.8	3.6	3.8	6.5	11
21	5.0	1.8	1.3	14	2.6	8.6	4.5	3.6	2.5	4.0	4.2	7.1
22	3.5	1.7	1.3	8.1	2.5	7.4	4.1	3.6	2.3	3.9	3.0	3.6
23	3.4	1.6	1.2	5.3	2.5	6.8	4.1	10	2.3	3.2	2.7	7.8
24	9.9	1.5	1.1	20	3.7	6.3	4.5	4.6	2.6	4.3	4.2	9.0
25	5.7	1.4	1.0	8.1	84	6.0	3.8	3.6	4.6	3.1	2.9	4.4
26	4.5	1.3	.99	8.3	24	6.1	3.6	3.2	2.5	2.7	3.1	3.7
27	3.2	1.3	.99	8.5	12	47	3.6	2.9	2.2	65	2.5	4.1
28	2.9	1.3	.97	6.2	26	20	3.6	2.7	2.2	20	2.3	3.2
29	3.4	1.4	.97	5.0	---	12	3.6	2.5	2.1	8.2	2.1	3.0
30	2.7	1.3	1.0	4.0	---	9.1	3.2	2.8	2.5	5.7	2.0	26
31	2.6	---	3.6	3.6	---	7.7	---	2.2	---	6.4	2.1	---
TOTAL	332.5	65.5	49.62	385.6	341.3	785.8	159.0	134.2	90.1	251.6	96.1	183.3
MEAN	10.7	2.18	1.60	12.4	12.2	25.3	5.30	4.33	3.00	8.12	3.10	6.11
MAX	157	4.8	1.1	93	84	122	14	10	10	65	6.5	40
MIN	2.1	1.3	.97	1.1	2.5	6.0	3.2	2.2	2.0	1.6	2.0	1.8
AC-FT	660	130	98	765	677	1560	315	266	179	499	191	364

CAL YR 1989 TOTAL 5387.42 MEAN 14.8 MAX 431 MIN .97 AC-FT 10690
WTR YR 1990 TOTAL 2874.62 MEAN 7.88 MAX 157 MIN .97 AC-FT 5700

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	
OCT	24...	1230	6.1	226	8.2	24.0	2.9	762	7.8	92	6600	9000	62
FEB	27...	1330	8.6	221	8.1	19.5	2.8	762	9.1	99	5200	6000	62
MAY	01...	1130	3.3	240	8.3	24.0	1.6	764	9.3	110	3900	4100	58
AUG	28...	1130	3.6	205	6.8	23.5	0.70	761	--	--	960	1500	52
DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 WATER DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	ALKA-LINITY WAT DIS TOT IT (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	
OCT	24...	5	12	7.8	23	44	1	1.2	70	0	58	9.0	28
FEB	27...	11	12	7.7	23	44	1	1.0	62	0	51	10	32
MAY	01...	6	10	8.0	24	47	1	1.3	64	0	52	17	37
AUG	28...	2	9.6	6.7	19	44	1	1.1	61	0	50	5.9	30
DATE	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)	NITRO-GEN, NO2+NO3 DIS-SOLVED TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	
OCT	24...	<0.10	17	136	134	0.18	--	0.190	0.030	0.020	0.40	--	0.070
FEB	27...	0.10	18	140	136	0.19	--	0.400	0.010	0.010	<0.20	--	0.040
MAY	01...	<0.10	14	137	144	0.19	--	0.100	0.010	<0.010	0.40	--	0.070
AUG	28...	<0.10	16	122	119	0.17	0.100	0.100	0.020	0.020	0.20	0.30	0.050
DATE	PHOS-PHATE, TOTAL (MG/L AS PO4)	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)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	
OCT	24...	--	0.050	0.040	0.12	20	<1	4	<0.5	<1.0	<1	<3	3
FEB	27...	--	0.030	0.030	0.09	90	<1	5	<0.5	<1.0	<5	<3	<10
MAY	01...	--	0.060	0.050	0.15	<10	<1	4	<0.5	1.0	<1	<3	2
AUG	28...	0.09	0.040	0.020	0.06	10	<1	4	<0.5	<1.0	1	<3	2

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 24...	190	1	<4	8	<0.1	<10	1	<1	<1.0	98	<6	4
FEB 27...	110	<10	<4	8	<0.1	<10	<10	<1	<1.0	89	<6	<3
MAY 01...	180	<1	<4	8	<0.1	<10	<1	<1	<1.0	100	<6	<3
AUG 28...	210	<1	<4	7	<0.1	<10	1	<1	<1.0	84	<6	4

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 24...	1230	8	0.13	100	MAY 01...	1130	5	0.05	100
FEB 27...	1330	6	0.14	100	AUG 28...	1130	3	0.03	--

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

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

LOCATION.--Lat 21°20'57", long 157°49'40", Hydrologic Unit 20060000, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mi downstream from reservoir 2 wasteway, and 3.5 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi².

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

REVISED RECORDS.--WSP 985: 1921-35(M). WSP 1319: 1931. WSP 1569: Drainage area. WSP 1639: 1931, 1935.

GAGE.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level. Prior to Sept. 7, 1915, nonrecording gage at same site at datum 0.03 ft lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

REMARKS.--Records good. Low-flow regulation by reservoirs 2, 3, and 4, capacities, 21 acre-ft, 34 acre-ft, and 1,630 acre-ft, respectively. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

AVERAGE DISCHARGE.--74 years (water years 1915-16, 1918-20, 1922-90), 7.00 ft³/s (5,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft³/s, Jan. 16, 1921, gage height, 8.74 ft, from floodmarks, from rating curve extended above 420 ft³/s by test of model of station site; minimum, 0.09 ft³/s, Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1600	*246	*3.47	No other peak greater than base discharge.			

Minimum discharge, 0.92 ft³/s, Dec. 11, Jan 12,13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	2.4	1.5	1.4	5.8	45	9.1	5.9	3.6	2.0	4.0	1.9
2	2.0	2.4	1.6	1.5	4.7	17	9.1	5.6	3.4	1.9	3.4	1.9
3	28	2.4	1.6	1.3	5.1	9.6	8.9	6.5	3.5	1.8	3.1	1.9
4	6.6	2.4	1.5	1.2	4.7	8.4	8.8	5.4	3.7	1.9	2.9	1.8
5	3.0	2.6	1.5	1.2	5.0	8.4	11	5.3	3.5	1.9	3.0	2.1
6	2.8	2.3	1.5	1.1	4.5	12	8.6	5.3	3.3	1.7	2.7	2.0
7	2.7	2.2	1.5	1.2	3.9	24	8.3	5.0	3.1	1.6	2.9	2.0
8	2.6	2.3	1.5	1.1	3.6	15	8.1	4.9	3.2	1.9	2.7	2.4
9	2.8	2.2	2.9	1.0	3.5	12	8.5	4.7	3.0	4.5	2.7	3.6
10	6.1	2.1	1.8	1.0	3.8	11	8.0	4.6	2.9	2.1	2.6	2.1
11	3.1	2.1	1.4	1.0	3.4	11	7.8	4.5	2.8	1.8	2.5	1.8
12	2.7	2.1	1.3	.96	3.2	10	7.7	4.4	2.7	2.1	2.4	2.1
13	2.8	2.2	1.6	.98	3.2	9.4	7.5	4.7	2.6	1.8	2.5	2.3
14	3.1	2.1	1.4	1.1	3.1	19	7.4	6.3	2.6	1.7	2.5	1.9
15	3.5	2.5	1.3	4.4	3.0	63	7.2	5.2	2.6	13	2.7	1.8
16	2.8	2.1	1.4	19	2.9	17	7.0	4.6	3.1	4.1	2.5	1.9
17	2.4	1.9	1.3	11	3.5	14	6.8	5.2	3.0	3.8	2.2	11
18	2.8	1.9	1.3	5.1	3.0	13	6.6	4.7	2.5	7.2	2.2	2.7
19	3.0	2.1	1.3	7.2	2.8	12	6.5	4.6	2.4	4.2	3.0	2.4
20	3.3	1.8	1.5	6.4	2.9	12	6.3	4.5	2.7	3.6	2.9	6.6
21	2.9	1.8	1.3	4.1	2.8	11	6.2	4.2	2.4	3.6	2.5	3.7
22	3.1	1.8	1.3	3.3	2.7	11	6.1	4.1	2.2	3.6	2.4	1.9
23	3.0	2.1	1.3	3.1	2.6	10	6.2	4.7	2.2	3.4	2.4	2.9
24	4.9	1.8	1.3	4.6	2.9	9.7	6.5	4.2	2.3	3.5	2.9	4.3
25	3.5	1.7	1.3	4.0	13	9.5	6.0	4.0	2.5	3.2	2.5	2.8
26	3.0	1.9	1.3	5.3	7.8	10	5.6	4.0	2.1	3.3	2.5	2.5
27	2.7	1.8	1.2	4.5	5.6	20	5.5	3.9	2.1	21	2.3	3.0
28	2.6	1.8	1.2	3.4	8.9	11	5.5	3.7	2.1	5.4	2.1	2.5
29	2.7	2.0	1.2	2.7	---	10	5.4	3.7	2.0	3.4	2.0	2.3
30	2.6	1.7	1.2	3.0	---	9.6	5.4	3.8	2.0	3.3	2.0	6.8
31	2.5	---	1.4	2.9	---	9.3	---	3.6	---	4.5	2.0	---
TOTAL	122.2	62.5	44.7	110.04	121.9	463.9	217.6	145.8	82.1	122.8	81.0	88.9
MEAN	3.94	2.08	1.44	3.55	4.35	15.0	7.25	4.70	2.74	3.96	2.61	2.96
MAX	28	2.6	2.9	19	13	63	11	6.5	3.7	21	4.0	11
MIN	2.0	1.7	1.2	.96	2.6	8.4	5.4	3.6	2.0	1.6	2.0	1.8
AC-FT	242	124	89	218	242	920	432	289	163	244	161	176

CAL YR 1989 TOTAL 3579.2 MEAN 9.81 MAX 234 MIN 1.2 AC-FT 7100
WTR YR 1990 TOTAL 1663.44 MEAN 4.56 MAX 63 MIN .96 AC-FT 3300

16240500 WAIAKEAKUA STREAM AT HONOLULU

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

DRAINAGE AREA.--1.06 mi².

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

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

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

REMARKS.--Records good. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream. Occasional small diversions for irrigation upstream.

AVERAGE DISCHARGE.--72 years (water years 1914-20, 1926-90), 5.09 ft³/s (3,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s, Jan. 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s. Current peak discharges are derived from rating curve extended above 1,760 ft³/s on the basis of slope-area measurement at gage height 5.28 ft; minimum, 0.6 ft³/s, June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1530	*381	*3.46	No other peak greater than base discharge.			

Minimum discharge, 2.4 ft³/s, Dec. 23-Jan. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	3.7	2.8	2.7	9.5	40	4.1	4.0	4.2	2.8	5.0	2.9
2	3.9	3.6	2.7	3.0	7.1	13	5.2	3.9	3.6	3.2	4.2	2.9
3	26	3.6	2.7	3.1	9.0	6.8	4.8	4.9	3.4	2.9	3.8	2.8
4	6.0	3.6	2.7	3.1	6.1	5.6	4.1	3.4	3.2	2.7	4.3	2.8
5	4.8	3.5	2.7	3.1	5.3	5.3	11	3.4	3.4	2.7	3.9	3.3
6	4.0	3.5	2.6	3.1	4.6	12	5.2	4.1	3.2	2.6	3.6	3.0
7	3.8	3.4	2.7	3.0	4.0	16	4.6	4.5	3.1	2.6	3.5	3.1
8	3.8	3.6	2.6	2.9	3.6	10	4.1	3.8	3.1	8.1	3.4	3.5
9	4.3	3.4	4.1	2.9	3.6	6.5	5.9	3.3	3.1	7.2	3.3	6.2
10	6.7	3.3	2.7	2.9	4.1	5.5	4.1	3.2	3.0	3.2	3.2	3.2
11	3.8	3.3	2.6	2.9	4.0	5.6	3.9	3.2	3.0	2.9	3.1	3.0
12	3.6	3.3	2.6	2.9	3.8	4.9	3.8	3.1	2.9	4.0	3.1	3.6
13	3.6	3.3	3.3	2.9	3.3	4.8	3.7	3.4	2.9	3.2	3.1	3.3
14	3.7	3.3	2.6	3.0	3.2	9.0	3.5	11	3.0	2.9	3.3	2.9
15	4.2	3.4	2.5	9.8	3.1	20	3.5	5.2	2.9	11	3.4	2.9
16	3.4	3.2	2.5	34	3.0	5.9	3.4	3.7	3.8	4.2	3.4	3.0
17	3.5	3.1	2.5	19	3.7	4.9	3.4	9.4	4.1	5.6	4.3	11
18	4.1	3.1	2.5	7.7	3.1	4.6	3.3	4.5	3.5	12	3.1	3.7
19	9.6	3.1	2.5	14	3.0	4.5	3.3	3.9	3.2	4.6	7.9	3.1
20	6.7	3.1	2.8	8.4	3.2	4.1	3.3	3.7	3.3	3.7	6.4	11
21	4.8	3.1	2.5	5.0	3.0	4.1	3.2	3.8	3.1	5.2	5.2	6.4
22	5.7	3.1	2.5	4.1	3.0	3.9	3.2	3.6	2.9	3.5	3.7	3.5
23	4.7	3.0	2.5	3.6	2.9	3.8	3.2	7.3	3.0	4.0	3.3	5.0
24	15	2.9	2.4	5.1	3.5	3.8	3.6	4.0	2.9	5.3	5.0	3.8
25	8.4	2.9	2.4	4.7	19	3.7	3.5	3.6	4.3	4.0	4.6	3.3
26	6.4	2.9	2.4	11	7.1	4.4	3.2	3.4	3.3	3.4	6.2	3.2
27	4.7	2.9	2.4	6.3	9.1	13	3.2	3.3	4.2	23	3.8	3.5
28	4.5	2.9	2.4	4.6	13	9.4	3.1	3.1	3.1	7.3	3.5	2.9
29	4.5	2.9	2.4	4.3	---	5.6	3.1	3.2	3.0	5.2	3.2	2.7
30	3.9	2.9	2.4	3.6	---	4.6	3.0	4.2	2.9	4.5	3.1	9.8
31	3.8	---	2.4	3.3	---	4.4	---	3.5	---	7.0	3.0	---
TOTAL	180.2	96.9	81.4	190.0	150.9	249.7	120.5	132.6	98.6	164.5	123.9	125.3
MEAN	5.81	3.23	2.63	6.13	5.39	8.05	4.02	4.28	3.29	5.31	4.00	4.18
MAX	26	3.7	4.1	34	19	40	11	11	4.3	23	7.9	11
MIN	3.4	2.9	2.4	2.7	2.9	3.7	3.0	3.1	2.9	2.6	3.0	2.7
AC-FT	357	192	161	377	299	495	239	263	196	326	246	249

CAL YR 1989 TOTAL 2575.2 MEAN 7.06 MAX 107 MIN 2.4 AC-FT 5110
WTR YR 1990 TOTAL 1714.5 MEAN 4.70 MAX 40 MIN 2.4 AC-FT 3400

HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft upstream from mouth, 2.7 mi southwest of Kailua, and 4.3 mi southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi².

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. Elevation of gage is 80 ft, from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft upstream at different datums.

REMARKS.--Records good. Maunawili ditch diverts 1.5 mi upstream for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--34 years (water years 1914-15, 1959-90), 5.17 ft³/s (3,745 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 1	1830	*445	*5.16	No other peak greater than base discharge.			

Minimum discharge, 1.6 ft³, Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	3.3	2.3	2.5	6.2	82	4.9	4.5	3.7	2.8	2.6	2.0
2	2.6	3.2	2.7	2.4	5.1	29	4.8	4.6	3.5	2.8	2.6	2.2
3	20	2.9	2.6	2.0	5.0	18	4.1	5.3	3.3	2.7	2.5	2.1
4	5.3	2.7	2.2	2.0	5.0	14	3.9	4.7	2.9	2.7	2.6	1.9
5	3.5	3.2	2.7	2.0	4.5	13	10	5.0	3.4	2.7	2.7	2.3
6	3.3	3.1	2.9	1.9	4.2	15	7.7	5.2	3.1	2.4	2.5	2.4
7	3.4	3.2	2.9	1.9	4.4	15	5.3	4.8	3.2	2.4	2.5	2.2
8	4.2	3.0	3.0	1.9	4.4	11	5.4	4.7	3.4	3.3	2.4	2.4
9	4.8	2.3	5.6	1.9	4.4	9.2	7.9	4.3	3.4	6.1	2.4	2.7
10	7.1	2.2	3.6	2.0	4.4	8.3	6.4	4.1	3.7	2.9	2.2	2.0
11	3.9	2.2	3.0	2.1	4.7	8.5	6.1	4.2	3.8	2.6	2.6	1.8
12	4.0	2.2	2.8	2.1	4.0	8.4	5.0	4.3	3.6	2.5	2.6	1.9
13	4.0	2.7	3.3	2.1	4.0	8.7	5.1	4.6	3.5	2.3	2.5	2.0
14	4.2	2.4	3.0	2.3	4.9	9.7	5.5	4.6	3.2	2.5	2.4	1.9
15	3.6	2.7	2.6	4.3	4.8	16	5.4	3.9	3.1	2.9	2.5	1.8
16	3.2	2.4	2.2	32	4.2	7.2	5.0	3.5	3.5	2.6	2.4	1.9
17	3.3	2.3	2.2	18	4.3	6.2	5.1	4.1	3.4	2.7	2.5	3.4
18	3.2	2.2	2.1	8.6	4.7	6.3	5.1	3.6	3.4	3.3	2.8	2.0
19	3.5	2.2	2.0	30	4.9	6.3	5.5	4.2	2.8	2.4	3.2	1.8
20	3.6	2.3	5.5	20	5.0	6.2	5.1	4.1	2.7	2.2	2.6	2.1
21	3.4	2.9	2.6	13	4.8	5.9	5.4	3.8	2.7	3.1	2.3	2.6
22	3.6	2.6	2.3	11	4.1	5.3	5.2	4.4	2.7	3.1	2.5	2.4
23	3.2	2.7	2.2	8.8	4.0	5.6	5.0	3.9	2.8	2.7	2.9	3.0
24	3.4	2.6	2.2	9.1	4.4	6.6	5.3	3.6	2.9	2.3	2.7	2.3
25	3.2	2.4	2.1	7.9	40	6.2	4.8	3.7	2.8	2.1	3.0	2.2
26	3.3	2.8	2.1	6.5	15	6.1	5.6	3.6	2.6	2.1	3.2	2.2
27	3.2	2.7	2.1	5.2	10	9.7	5.4	3.9	2.6	3.2	2.7	2.3
28	3.4	2.5	2.3	4.8	19	6.1	5.2	3.9	2.7	2.7	2.2	2.2
29	4.3	2.8	2.2	5.0	---	5.7	5.1	3.5	2.6	2.4	1.9	2.0
30	3.3	2.4	2.2	5.1	---	5.5	4.5	3.7	2.4	2.3	1.8	4.1
31	3.2	---	2.2	5.1	---	5.0	---	4.1	---	2.8	2.0	---
TOTAL	131.0	79.1	83.7	223.5	194.4	365.7	164.8	130.4	93.4	85.6	78.3	68.1
MEAN	4.23	2.64	2.70	7.21	6.94	11.8	5.49	4.21	3.11	2.76	2.53	2.27
MAX	20	3.3	5.6	32	40	82	10	5.3	3.8	6.1	3.2	4.1
MIN	2.6	2.2	2.0	1.9	4.0	5.0	3.9	3.5	2.4	2.1	1.8	1.8
AC-FT	260	157	166	443	386	725	327	259	185	170	155	135

CAL YR 1989 TOTAL 2865.5 MEAN 7.85 MAX 193 MIN 2.0 AC-FT 5680
WTR YR 1990 TOTAL 1698.0 MEAN 4.65 MAX 82 MIN 1.8 AC-FT 3370

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'22", long 157°47'44", Hydrologic Unit 20060000, on left bank 0.3 mi south of Hawaiian Memorial Park cemetery, 1.0 mi northwest of Pali Golf Course, and 1.3 mi south of Castle High School.

DRAINAGE AREA.--1.11 mi².

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--7 years (water years 1984-90) 1.56 ft³/s (1,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft³/s, Nov. 10, 1986, gage height, 11.65 ft from rating curve extended above 100 ft³/s on basis of slope-conveyance computation; minimum, 0.03 ft³/s for several days in November, December 1984 and January 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 1	0415	*486	*7.35				

Minimum discharge, 0.31 ft³/s, Dec. 21, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.72	.67	.72	.92	1.6	50	.86	.99	.81	.59	.58	.75
2	.72	.67	.73	.57	.58	1.1	.95	1.1	.78	.63	.54	.70
3	32	.70	.71	.51	.47	.62	.87	.93	.78	.62	.53	.72
4	1.3	.64	.70	.48	.39	.64	.87	.81	.75	.64	.51	.75
5	.84	.55	.70	.53	.38	.60	4.5	.85	.77	.63	.52	.78
6	.86	.50	.69	.53	.39	1.3	.84	.81	.75	.65	.49	.80
7	.64	.64	.72	.52	.45	3.9	.79	.91	.63	.60	.51	.94
8	1.5	.74	.71	.54	.52	.69	.79	.93	.76	1.2	.46	1.2
9	1.4	.71	5.6	.57	.54	.66	.87	.91	.77	4.0	.46	2.0
10	5.0	.73	.48	.60	.63	.66	.77	.96	.78	.57	.47	.44
11	.75	.76	.50	.63	.52	.69	.77	.98	.74	.62	.45	.46
12	.80	.78	.53	.69	.56	.74	.74	.96	.71	.60	.48	.52
13	1.0	17	.63	.71	.60	.83	.78	1.0	.64	.59	.56	.64
14	3.0	6.6	.52	1.1	.57	.78	.76	1.1	.68	.57	.59	.78
15	1.7	1.1	.53	6.0	.62	1.3	.78	.88	.66	.56	.60	.77
16	.85	.49	.50	27	.66	.70	.79	.95	.77	.55	.59	.81
17	.69	.49	.51	.81	.77	.78	.86	1.3	.72	.66	.60	3.9
18	.93	.55	.51	.77	.43	.82	.85	.81	.70	.61	.63	.38
19	.82	.58	4.0	24	.50	.92	.83	.86	.67	.53	1.1	.41
20	.80	.54	8.1	1.7	.63	.85	.81	.81	.72	.52	.77	2.1
21	.78	.59	.49	.56	.46	.87	.81	.88	.59	.58	.73	5.0
22	.74	.61	.42	.76	.47	.88	.88	.87	.65	.56	.73	.52
23	.62	.69	.44	.77	.47	.91	.83	1.5	.64	.55	.77	.70
24	.63	.72	.44	2.4	.55	1.1	.93	.70	.66	.53	.71	.40
25	.64	.67	.41	.60	40	.97	.91	.73	.80	.56	.73	.41
26	.80	.68	.44	.70	1.3	2.1	.85	.77	.63	.58	.96	.53
27	.84	.67	.54	.54	3.1	12	.91	.79	1.0	2.0	.81	.45
28	.74	.69	.47	.49	9.1	.97	.85	.82	.60	.62	.79	.47
29	5.1	.82	.47	.45	---	.83	.87	.86	.59	.57	.75	.46
30	.59	.72	.48	.49	---	.81	.86	.80	.65	.59	.76	1.5
31	.63	---	.72	.58	---	.82	---	.79	---	.55	.73	---
TOTAL	68.43	42.30	33.41	77.52	67.26	90.84	28.78	28.36	21.40	23.63	19.91	30.29
MEAN	2.21	1.41	1.08	2.50	2.40	2.93	.96	.91	.71	.76	.64	1.01
MAX	32	17	8.1	27	40	50	4.5	1.5	1.0	4.0	1.1	5.0
MIN	.59	.49	.41	.45	.38	.60	.74	.70	.59	.52	.45	.38
AC-FT	136	84	66	154	133	180	57	56	42	47	39	60

CAL YR 1989 TOTAL 1026.01 MEAN 2.81 MAX 124 MIN .41 AC-FT 2040
WTR YR 1990 TOTAL 532.13 MEAN 1.46 MAX 50 MIN .38 AC-FT 1060

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1983 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

Remarks.--Water quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,230 mg/L, Apr. 19, 1984; minimum daily mean, 1 mg/L on several days in 1988.

SEDIMENT DISCHARGE: Maximum daily mean, 966 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 813 mg/L, Oct. 3; minimum daily mean, 3 mg/L, May 28, Aug. 9.

SEDIMENT DISCHARGE: Maximum daily mean, 200 tons, Oct. 3; minimum daily, less than 0.01 ton, Aug. 9.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	
NOV										
14...	1205	0.88	240	6.7	24.5	12	754	5.5	67	--
DEC										
19...	1030	0.69	230	6.6	23.0	3.5	756	5.6	66	150
JAN										
24...	1040	4.3	155	6.8	21.5	54	752	8.6	99	--
FEB										
15...	1400	0.86	206	6.9	25.5	2.0	759	8.4	103	130
MAR										
01...	0950	21	120	--	20.0	90	--	--	--	--
28...	1230	1.2	280	6.5	25.0	2.5	763	6.6	80	--
MAY										
01...	0930	1.6	205	7.9	22.5	20	762	5.8	67	--
JUN										
14...	1000	E1.0	215	7.4	21.5	13	760	6.7	76	--
JUL										
25...	0920	0.59	210	7.4	23.5	2.5	758	8.4	100	220
AUG										
14...	1330	0.60	220	7.6	24.5	1.6	759	5.8	70	--
SEP										
17...	1315	E0.80	360	6.5	26.0	70	757	6.3	78	23

DATE	TIME	HARD- NESS TOTAL (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)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
DEC											
19...	1030	67	14	7.8	20	39	1	1.0	16	23	<0.10
SEP											
17...	1315	100	31	5.4	15	23	0.7	7.9	44	24	<0.10

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

E Estimated.

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEHOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	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)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
DEC 19...	1030	21	138	136	0.19	3	0.500	<0.20	--	0.020
FEB 15...	1400	--	--	--	--	6	0.400	<0.20	--	0.020
MAR 01...	0950	--	--	--	--	113	0.200	0.20	0.40	0.070
JUL 25...	0920	--	--	--	--	<1	0.500	<0.20	--	<0.010
SEP 17...	1315	10	182	165	0.25	100	2.60	2.6	5.2	0.080

DATE	TIME	ALUM- INIUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INIUM, DIS- SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC 19...	1030	240	<10	<1	<1	<100	11	<10	<0.5	<1	<1.0
SEP 17...	1315	5400	60	<1	1	<100	6	<10	<0.5	<1	<1.0

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)
DEC 19...	<1	<1	1	3	2	2	910	71	1	<1	<10
SEP 17...	31	<1	4	<3	3	1	14000	11	3	<1	<10

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)
DEC 19...	<4	210	190	<0.10	0.3	<1	<10	3	1	<1	<1
SEP 17...	<4	240	36	<0.10	<0.1	1	<10	19	<1	<1	<1

DATE	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)
DEC 19...	<1	<1.0	78	<6	30	20	0.7	<1	<0.010	<0.1	--
SEP 17...	<1	<1.0	130	<6	50	<3	6.3	<1	<0.010	<0.1	0.90

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

HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH OF KAMOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)
DEC 19...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010
SEP 17...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	0.02	0.01	<0.010
DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT. REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/L)
DEC 19...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
SEP 17...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
DATE	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 19...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 17...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16265600 RIGHT BRANCH OF KAMOOLII STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)
	OCTOBER			NOVEMBER			DECEMBER		
1	.72	e24	.05	.67	e10	.02	.72	37	.07
2	.72	e25	.05	.67	e10	.02	.73	e36	.07
3	32	813	200	.70	e11	.02	.71	e35	.07
4	1.3	e63	.24	.64	e10	.02	.70	e34	.06
5	.84	e25	.05	.55	e9	.01	.70	e33	.06
6	.86	11	.03	.50	e9	.01	.69	e32	.06
7	.64	e9	.02	.64	e11	.02	.72	e31	.06
8	1.5	e32	.64	.74	e10	.02	.71	e31	.06
9	1.4	e111	2.0	.71	e10	.02	5.6	182	21
10	5.0	172	28	.73	e10	.02	.48	e26	.03
11	.75	e10	.02	.76	e10	.02	.50	e21	.03
12	.80	e11	.02	.78	e10	.02	.53	e17	.02
13	1.0	e14	.06	17	383	30	.63	e11	.02
14	3.0	84	2.8	6.6	478	103	.52	e9	.01
15	1.7	e31	.22	1.1	60	.33	.53	e8	.01
16	.85	e10	.02	.49	e28	.04	.50	e8	.01
17	.69	e10	.02	.49	e26	.03	.51	e7	.01
18	.93	e13	.04	.55	e23	.03	.51	e6	.01
19	.82	e12	.03	.58	e21	.03	4.0	100	41
20	.80	e11	.02	.54	e20	.03	8.1	542	118
21	.78	e10	.02	.59	e21	.03	.49	e19	.02
22	.74	e9	.02	.61	e22	.04	.42	e14	.02
23	.62	e9	.02	.69	e23	.04	.44	e12	.01
24	.63	e10	.02	.72	e24	.05	.44	e10	.01
25	.64	e10	.02	.67	e25	.05	.41	e9	.01
26	.80	e11	.02	.68	e26	.05	.44	e8	.01
27	.84	e13	.03	.67	e28	.05	.54	e10	.03
28	.74	e10	.02	.69	e29	.05	.47	e8	.01
29	5.1	70	2.6	.82	e38	.09	.47	e8	.01
30	.59	e11	.02	.72	e38	.07	.48	e8	.01
31	.63	e11	.02	---	---	---	.72	e11	.07
TOTAL	68.43	---	237.14	42.30	---	134.23	33.41	---	180.87
	JANUARY			FEBRUARY			MARCH		
1	.92	e15	.11	1.6	108	.88	50	347	185
2	.57	e10	.02	.58	e36	.06	1.1	e22	.09
3	.51	e10	.01	.47	e19	.03	.62	e10	.02
4	.48	e10	.01	.39	e12	.01	.64	e9	.02
5	.53	e10	.01	.38	e12	.01	.60	e10	.02
6	.53	e10	.01	.39	e12	.01	1.3	e24	.25
7	.52	e10	.01	.45	e12	.02	3.9	71	3.5
8	.54	e10	.02	.52	e12	.02	.69	e13	.02
9	.57	e10	.02	.54	e12	.02	.66	e9	.02
10	.60	e10	.02	.63	e13	.02	.66	e9	.02
11	.63	e10	.02	.52	e11	.02	.69	e10	.02
12	.69	e10	.02	.56	e12	.02	.74	e10	.02
13	.71	e10	.02	.60	e14	.02	.83	e11	.02
14	1.1	44	.31	.57	e12	.02	.78	e11	.02
15	6.0	163	4.9	.62	15	.03	1.3	e19	.08
16	27	971	165	.66	e13	.02	.70	e11	.02
17	.81	e33	.08	.77	e15	.04	.78	e10	.02
18	.77	e37	.09	.43	e9	.01	.82	e10	.02
19	24	e545	130	.50	e10	.01	.92	e10	.02
20	1.7	e64	.42	.63	e11	.02	.85	e10	.02
21	.56	e46	.07	.46	e9	.01	.87	e10	.02
22	.76	e48	.10	.47	e9	.01	.88	e10	.02
23	.77	50	.10	.47	e9	.01	.91	e10	.02
24	2.4	135	2.3	.55	e16	.06	1.1	e12	.04
25	.60	e15	.02	40	207	34	.97	e14	.04
26	.70	e11	.02	1.3	20	.09	2.1	e43	1.2
27	.54	e10	.01	3.1	e85	2.3	12	e229	31
28	.49	e9	.01	9.1	e234	11	.97	e32	.09
29	.45	e9	.01	---	---	---	.83	e24	.05
30	.49	e9	.01	---	---	---	.81	34	.07
31	.58	e8	.01	---	---	---	.82	e24	.05
TOTAL	77.52	---	303.76	67.26	---	48.77	90.84	---	221.82

e Estimated

HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued
SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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
1	.86	21	.05	.99	15	.05	.81	8	.02	
2	.95	28	.07	1.1	29	.16	.78	6	.01	
3	.87	96	.23	.93	21	.07	.78	7	.01	
4	.87	149	.35	.81	8	.02	.75	7	.01	
5	4.5	94	7.4	.85	7	.02	.77	7	.02	
6	.84	11	.02	.81	9	.02	.75	10	.02	
7	.79	e9	.02	.91	14	.03	.63	11	.02	
8	.79	14	.04	.93	6	.02	.76	13	.03	
9	.87	14	.04	.91	4	.01	.77	8	.02	
10	.77	7	.01	.96	10	.03	.78	6	.01	
11	.77	9	.02	.98	5	.01	.74	5	.01	
12	.74	7	.01	.96	4	.01	.71	18	.04	
13	.78	6	.01	1.0	6	.02	.64	26	.05	
14	.76	e6	.01	1.1	22	.08	.68	42	.08	
15	.78	7	.01	.88	9	.02	.66	36	.06	
16	.79	5	.01	.95	10	.03	.77	37	.09	
17	.86	7	.02	1.3	29	.29	.72	17	.04	
18	.85	6	.01	.81	4	.01	.70	14	.03	
19	.83	6	.01	.86	7	.02	.67	10	.02	
20	.81	7	.02	.81	4	.01	.72	12	.03	
21	.81	e7	.02	.88	10	.02	.59	7	.01	
22	.88	7	.02	.87	23	.06	.65	6	.01	
23	.83	5	.01	1.5	43	.47	.64	5	.01	
24	.93	5	.01	.70	5	.01	.66	7	.01	
25	.91	4	.01	.73	7	.01	.80	9	.02	
26	.85	6	.01	.77	14	.03	.63	8	.01	
27	.91	6	.02	.79	6	.01	1.0	33	.15	
28	.85	e6	.02	.82	3	.01	.60	22	.03	
29	.87	7	.02	.86	5	.01	.59	33	.05	
30	.86	9	.02	.80	5	.01	.65	243	.41	
31	---	---	---	.79	6	.01	---	---	---	
TOTAL	28.78	---	8.52	28.36	---	1.58	21.40	---	1.33	
		JULY			AUGUST			SEPTEMBER		
1	.59	13	.02	.58	12	.02	.75	6	.01	
2	.63	7	.01	.54	8	.01	.70	8	.02	
3	.62	8	.01	.53	7	.01	.72	8	.02	
4	.64	5	.01	.51	9	.01	.75	15	.03	
5	.63	9	.01	.52	11	.02	.78	18	.04	
6	.65	11	.02	.49	7	.01	.80	11	.02	
7	.60	7	.01	.51	9	.01	.94	9	.02	
8	1.2	58	.40	.46	7	.01	1.2	12	.04	
9	4.0	56	1.9	.46	3	<.01	2.0	85	1.2	
10	.57	30	.05	.47	5	.01	.44	30	.03	
11	.62	21	.04	.45	7	.01	.46	12	.02	
12	.60	30	.05	.48	14	.02	.52	11	.02	
13	.59	17	.03	.56	10	.02	.64	5	.01	
14	.57	15	.02	.59	7	.01	.78	23	.05	
15	.56	20	.03	.60	8	.01	.77	17	.03	
16	.55	12	.02	.59	14	.02	.81	12	.03	
17	.66	26	.05	.60	7	.01	3.9	110	5.3	
18	.61	27	.04	.63	7	.01	.38	28	.03	
19	.53	16	.02	1.1	24	.13	.41	24	.03	
20	.52	15	.02	.77	10	.02	2.1	93	1.1	
21	.58	15	.02	.73	5	.01	5.0	102	7.4	
22	.56	10	.02	.73	4	.01	.52	19	.03	
23	.55	9	.01	.77	12	.03	.70	28	.08	
24	.53	8	.01	.71	16	.03	.40	13	.01	
25	.56	9	.01	.73	9	.02	.41	11	.01	
26	.58	12	.02	.96	19	.06	.53	19	.03	
27	2.0	70	1.2	.81	13	.03	.45	12	.02	
28	.62	12	.02	.79	9	.02	.47	8	.01	
29	.57	9	.01	.75	10	.02	.46	10	.01	
30	.59	20	.04	.76	11	.02	1.5	31	.36	
31	.55	7	.01	.73	7	.01	---	---	---	
TOTAL	23.63	---	4.13	19.91	---	0.63	30.29	---	16.01	
YEAR	532.13		1158.79							

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

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEHOHE

LOCATION.--Lat 21°23'42", long 157°48'44", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from mouth, 1.4 mi southwest of Castle High School, and 1.9 mi south of Kaneohe Post Office.

DRAINAGE AREA.--0.44 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1960-63 (low-flow measurements), 1965-71, 1971-84 (annual maximum), April 1984 to current year. Prior to April 1984, the station was located 400 ft upstream.

GAGE.--Water-stage recorder and wooden control. Elevation of gage is 200 ft (from Corps of Engineers).

REMARKS.--Records fair. Honolulu Board of Water Supply diverts water from tunnel in drainage area.

AVERAGE DISCHARGE.--10 years (water years 1968-71, 1985-90), 1.34 ft³/s (971 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft³/s, Nov. 26, 1970 (gage height, 6.18 ft for datum and site then in use), from rating curve extended above 10 ft³/s on basis of slope-area measurement at gage height 6.09 ft; minimum, 0.03 ft³/s on many days 1984-85.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 182 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1545	*132	*1.86				

Minimum discharge, 0.50 ft³/s, Sept. 14, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.86	1.0	.84	.77	1.4	5.5	1.8	.91	1.3	1.3	1.2	1.2
2	.84	1.0	.79	.83	1.2	3.1	1.6	1.4	1.4	1.3	1.2	1.2
3	6.5	1.0	.83	.74	1.1	2.5	1.9	1.8	1.4	1.3	1.2	1.0
4	1.4	1.0	.80	.72	.92	2.6	1.6	1.4	1.3	1.2	1.1	1.2
5	1.1	1.1	.97	.71	1.1	2.4	1.3	1.2	1.2	1.2	1.1	1.4
6	1.1	1.0	.82	.75	.93	2.6	1.7	1.3	1.4	1.2	1.1	1.2
7	.93	1.3	.84	.74	1.0	3.0	1.7	1.3	.94	1.0	1.1	1.0
8	.93	.99	.79	.76	.84	2.6	2.0	1.4	1.3	1.2	1.1	1.3
9	1.0	1.2	1.3	.70	e.90	2.2	2.1	1.4	1.1	7.3	1.1	2.6
10	1.5	1.2	.89	.71	e.85	2.4	1.7	1.1	1.3	1.6	1.1	1.3
11	.98	1.0	.81	.69	e.80	2.3	2.0	1.1	1.5	1.4	1.2	1.1
12	1.0	1.0	.80	.68	e.75	2.4	2.0	1.3	1.3	1.3	1.1	1.1
13	.97	1.3	.80	.69	e.78	2.4	1.9	1.1	1.1	1.4	1.1	1.1
14	1.2	1.2	.85	.79	e.86	2.4	1.8	1.2	1.3	1.3	1.1	.72
15	1.5	1.1	.82	1.5	.79	4.1	1.8	1.5	1.1	1.2	1.1	1.1
16	1.0	1.0	.83	2.7	.77	2.4	1.5	1.4	1.6	1.3	1.1	1.2
17	.99	1.0	.86	1.2	.82	2.3	1.7	1.2	1.6	1.3	1.1	1.7
18	1.0	.95	.77	1.0	.98	2.4	1.6	.84	1.3	1.3	1.1	1.3
19	.99	.98	1.0	3.8	.92	2.3	1.8	1.4	1.4	1.0	1.6	1.1
20	.98	1.0	1.5	2.2	.74	2.0	1.8	1.3	1.4	1.1	1.2	3.4
21	.93	1.0	.98	1.4	.89	1.6	1.4	1.5	1.5	1.4	1.1	2.0
22	.93	.93	.89	1.1	.76	1.9	1.3	1.6	1.3	1.4	1.1	1.7
23	.92	1.0	.84	1.1	.87	2.0	1.6	2.2	1.4	1.1	1.2	1.4
24	1.0	.91	.78	1.5	.78	2.0	1.7	1.3	1.3	1.1	1.2	1.2
25	.92	.89	.91	1.2	3.1	2.1	1.3	.82	1.5	1.2	1.3	1.4
26	.91	.87	.80	1.6	1.8	1.7	1.5	.95	1.5	1.2	1.3	1.4
27	.91	.89	.83	.97	1.6	2.7	1.4	1.4	1.3	1.7	1.1	1.1
28	.92	.89	.89	.94	3.3	2.1	1.0	1.4	1.3	1.4	1.2	.92
29	3.1	.86	.78	1.0	---	1.7	.69	1.4	.95	1.2	.99	1.0
30	1.1	.88	.85	.88	---	1.6	.69	1.1	1.2	1.2	.96	1.4
31	1.0	---	.74	.97	---	1.7	---	1.4	---	1.2	.96	---
TOTAL	39.41	30.44	27.20	35.34	31.55	75.0	47.88	40.62	39.49	45.3	35.41	40.74
MEAN	1.27	1.01	.88	1.14	1.13	2.42	1.60	1.31	1.32	1.46	1.14	1.36
MAX	6.5	1.3	1.5	3.8	3.3	5.5	2.1	2.2	1.6	7.3	1.6	3.4
MIN	.84	.86	.74	.68	.74	1.6	.69	.82	.94	1.0	.96	.72
AC-FT	78	60	54	70	63	149	95	81	78	90	70	81

CAL YR 1989 TOTAL 524.77 MEAN 1.44 MAX 27 MIN .74 AC-FT 1040
WTR YR 1990 TOTAL 488.38 MEAN 1.34 MAX 7.3 MIN .68 AC-FT 969

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1984 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: April 1984 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since April 1984.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L, July 22, 1987; minimum daily mean, 2 mg/L, Mar. 2-4, 1985, Feb. 2, 3, 1988.

SEDIMENT DISCHARGE: Maximum daily, 342 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days each year.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 121 mg/L, Oct. 3; minimum daily mean, 3 mg/L, on many days.

SEDIMENT DISCHARGE: Maximum daily, 16 tons, Oct. 3; minimum daily, 0.01 ton on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, (MM OF SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)
NOV												
15...	1220	1.2	170	6.9	--	21.0	4.0	753	7.9	90	--	--
DEC												
18...	1000	0.82	150	6.8	--	20.0	0.30	756	6.9	77	280	47
JAN												
25...	1230	1.4	161	7.6	--	20.5	1.4	753	8.2	92	--	--
FEB												
14...	1015	0.94	160	7.4	--	19.5	1.0	760	8.0	87	210	--
MAR												
26...	0920	1.3	170	6.8	--	20.0	1.0	762	8.3	91	--	--
APR												
26...	1305	1.4	150	6.4	--	21.0	1.0	761	8.3	93	--	--
JUN												
13...	1015	1.1	150	7.5	--	21.0	0.40	761	8.5	96	--	--
JUL												
25...	0945	1.2	147	7.1	--	20.5	0.40	757	8.9	99	700	--
AUG												
13...	1330	1.1	140	7.7	25.5	24.0	0.30	761	8.0	95	--	--
SEP												
18...	1115	1.2	160	8.1	--	22.0	1.2	758	8.1	93	530	43

DATE	TIME	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)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)
DEC												
18...	1000	9.3	5.7	13	37	0.8	0.80	47	3.0	17	<0.10	30
SEP												
18...	1115	8.5	5.2	13	39	0.9	1.3	47	2.7	17	<0.10	30

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

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	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)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
DEC 18...	1000	97	107	0.13	12	0.200	<0.20	--	0.020	20	<10	<1
FEB 14...	1015	--	--	--	4	0.200	<0.20	--	0.020	--	--	--
JUL 25...	0945	--	--	--	<1	<0.100	0.20	--	0.020	--	--	--
SEP 18...	1115	93	106	0.13	<1	0.100	0.30	0.40	0.030	90	30	1

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
DEC 18...	1000	<1	<100	<2	<10	<0.5	<1	<1.0	1	1	1	<3
SEP 18...	1115	1	<100	<2	<10	<0.5	<1	<1.0	<1	<1	<1	<3

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)
DEC 18...	2	2	100	23	1	<1	<10	<4	20	7	<1.0	0.2
SEP 18...	1	<1	170	30	<1	<1	<10	<4	60	5	<0.10	<0.1

DATE	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 18...	<1	<10	<1	<1	<1	<1	<1	<1.0	54	<6	10	5
SEP 18...	<1	<10	1	<1	<1	<1	1	<1.0	52	6	<10	3

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-DYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
DEC 18...	0.4	<1	<0.010	<0.1	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01
SEP 18...	0.9	<1	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01

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

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	2, 4-DP TOTAL (UG/L)	2, 4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)
DEC 18...	<0.01	<0.01	<0.010	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 18...	<0.01	<0.01	<0.010	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRI- THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2, 4, 5-T TOTAL (UG/L)
DEC 18...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 18...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEHOE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)
	OCTOBER			NOVEMBER			DECEMBER		
1	.86	e4	.01	1.0	e6	.02	.84	e4	.01
2	.84	e4	.01	1.0	e6	.02	.79	e4	.01
3	6.5	121	16	1.0	e5	.02	.83	e4	.01
4	1.4	52	.20	1.0	e5	.01	.80	e4	.01
5	1.1	e24	.07	1.1	e5	.02	.97	e5	.02
6	1.1	e11	.04	1.0	e5	.01	.82	e4	.01
7	.93	e6	.02	1.3	e8	.03	.84	e4	.01
8	.93	e6	.01	.99	e6	.02	.79	e4	.01
9	1.0	e8	.03	1.2	e5	.02	1.3	16	.18
10	1.5	e16	.11	1.2	e5	.02	.89	e5	.01
11	.98	e7	.02	1.0	e5	.01	.81	e4	.01
12	1.0	e6	.02	1.0	e5	.01	.80	e5	.01
13	.97	e6	.02	1.3	e7	.03	.80	e5	.01
14	1.2	e12	.05	1.2	e6	.02	.85	e5	.01
15	1.5	21	.26	1.1	8	.02	.82	e5	.01
16	1.0	e10	.03	1.0	e8	.02	.83	e4	.01
17	.99	e7	.02	1.0	e7	.02	.86	e4	.01
18	1.0	e10	.03	.95	e7	.02	.77	e4	.01
19	.99	e7	.02	.98	e7	.02	1.0	38	.66
20	.98	e6	.02	1.0	e6	.02	1.5	28	.28
21	.93	e6	.02	1.0	e6	.02	.98	e7	.02
22	.93	e6	.02	.93	e6	.01	.89	e4	.01
23	.92	e6	.02	1.0	e6	.02	.84	e4	.01
24	1.0	e7	.02	.91	e5	.01	.78	e4	.01
25	.92	e7	.02	.89	e5	.01	.91	e4	.01
26	.91	e7	.02	.87	e5	.01	.80	e4	.01
27	.91	e6	.01	.89	e5	.01	.83	e4	.01
28	.92	e5	.01	.89	e4	.01	.89	e4	.01
29	3.1	51	2.4	.86	e4	.01	.78	e3	.01
30	1.1	e6	.02	.88	e4	.01	.85	e5	.01
31	1.0	e6	.02	---	---	---	.74	e4	.01
TOTAL	39.41	---	19.57	30.44	---	0.50	27.20	---	1.42
	JANUARY			FEBRUARY			MARCH		
1	.77	e4	.01	1.4	12	.06	5.5	e115	2.9
2	.83	e5	.01	1.2	e5	.02	3.1	e42	.35
3	.74	e3	.01	1.1	e6	.02	2.5	e37	.25
4	.72	e3	.01	.92	e5	.01	2.6	e32	.23
5	.71	e3	.01	1.1	e5	.02	2.4	e28	.19
6	.75	e3	.01	.93	e6	.01	2.6	e33	.25
7	.74	e3	.01	1.0	e6	.02	3.0	e39	.44
8	.76	e3	.01	.84	e5	.01	2.6	e21	.15
9	.70	e3	.01	e.90	e5	.01	2.2	e18	.11
10	.71	e3	.01	e.85	e5	.01	2.4	e15	.10
11	.69	e3	.01	e.80	e5	.01	2.3	e13	.08
12	.68	e3	.01	e.75	e5	.01	2.4	e11	.07
13	.69	e4	.01	e.78	e5	.01	2.4	9	.06
14	.79	e4	.01	e.86	e5	.01	2.4	6	.04
15	1.5	e23	.25	.79	e4	.01	4.1	31	.59
16	2.7	47	.74	.77	e4	.01	2.4	5	.03
17	1.2	e5	.02	.82	e4	.01	2.3	9	.06
18	1.0	e5	.01	.98	e4	.01	2.4	11	.07
19	3.8	82	1.1	.92	e5	.01	2.3	5	.03
20	2.2	e13	.08	.74	e5	.01	2.0	3	.02
21	1.4	9	.03	.89	e5	.01	1.6	3	.01
22	1.1	e7	.02	.76	e5	.01	1.9	e3	.02
23	1.1	e6	.02	.87	e5	.01	2.0	e3	.02
24	1.5	31	.22	.78	e5	.01	2.0	e3	.02
25	1.2	20	.07	3.1	e6	.97	2.1	e3	.02
26	1.6	e14	.06	1.8	e17	.09	1.7	e8	.04
27	.97	e7	.02	1.6	e16	.08	2.7	10	.11
28	.94	e7	.02	3.3	e46	.53	2.1	9	.05
29	1.0	e6	.02	---	---	---	1.7	3	.02
30	.88	e6	.01	---	---	---	1.6	e3	.01
31	.97	e5	.01	---	---	---	1.7	e3	.02
TOTAL	35.34	---	2.84	31.55	---	2.00	75.0	---	6.36

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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	1.8	e3	.02	.91	e4	.01	1.3	e3	.01	
2	1.6	e3	.02	1.4	e6	.02	1.4	e3	.01	
3	1.9	e4	.02	1.8	e16	.10	1.4	e4	.01	
4	1.6	e4	.02	1.4	e8	.03	1.3	e4	.01	
5	1.3	e4	.01	1.2	e7	.02	1.2	e4	.01	
6	1.7	e6	.04	1.3	e7	.02	1.4	e4	.02	
7	1.7	e7	.03	1.3	e7	.02	.94	e4	.01	
8	2.0	e9	.05	1.4	e6	.02	1.3	e5	.02	
9	2.1	33	.28	1.4	e6	.02	1.1	e5	.02	
10	1.7	e11	.05	1.1	e6	.02	1.3	e5	.02	
11	2.0	e10	.05	1.1	e6	.02	1.5	e5	.02	
12	2.0	e10	.05	1.3	e5	.02	1.3	e6	.02	
13	1.9	e10	.05	1.1	e5	.02	1.1	6	.02	
14	1.8	e9	.05	1.2	e6	.02	1.3	e6	.02	
15	1.8	e9	.04	1.5	e5	.02	1.1	e6	.02	
16	1.5	e9	.03	1.4	e6	.02	1.6	e6	.02	
17	1.7	e8	.04	1.2	9	.05	1.6	e6	.03	
18	1.6	e8	.03	.84	e5	.01	1.3	e6	.02	
19	1.8	e8	.04	1.4	e6	.02	1.4	e6	.02	
20	1.8	e7	.04	1.3	e7	.03	1.4	e6	.02	
21	1.4	e7	.03	1.5	e9	.04	1.5	e6	.02	
22	1.3	e7	.02	1.6	e11	.05	1.3	e6	.02	
23	1.6	e7	.03	2.2	21	.16	1.4	e6	.02	
24	1.7	e6	.03	1.3	e8	.03	1.3	e6	.02	
25	1.3	e6	.02	.82	e7	.02	1.5	e6	.02	
26	1.5	6	.02	.95	e6	.02	1.5	e6	.02	
27	1.4	e6	.02	1.4	e5	.02	1.3	e6	.02	
28	1.0	e5	.01	1.4	e5	.02	1.3	e6	.02	
29	.69	e5	.01	1.4	e4	.02	.95	e6	.02	
30	.69	e5	.01	1.1	e3	.01	1.2	e6	.02	
31	---	---	---	1.4	3	.01	---	---	---	
TOTAL	47.88	---	1.16	40.62	---	0.91	39.49	---	0.55	
		JULY			AUGUST			SEPTEMBER		
1	1.3	e6	.02	1.2	e8	.02	1.2	e6	.02	
2	1.3	e6	.02	1.2	e7	.02	1.2	e7	.02	
3	1.3	e6	.02	1.2	e7	.02	1.0	e7	.02	
4	1.2	e6	.02	1.1	e7	.02	1.2	e7	.02	
5	1.2	e6	.02	1.1	e7	.02	1.4	e9	.03	
6	1.2	e6	.02	1.1	e7	.02	1.2	e6	.02	
7	1.0	e6	.02	1.1	e7	.02	1.0	e7	.02	
8	1.2	e9	.04	1.1	e7	.02	1.3	e9	.04	
9	7.3	103	13	1.1	e7	.02	2.6	e36	.61	
10	1.6	e6	.02	1.1	e7	.02	1.3	e7	.02	
11	1.4	e6	.02	1.2	e7	.02	1.1	e6	.02	
12	1.3	e6	.02	1.1	e7	.02	1.1	e6	.02	
13	1.4	e6	.02	1.1	e6	.02	1.1	e6	.02	
14	1.3	e6	.02	1.1	e6	.02	.72	e5	.01	
15	1.2	e6	.02	1.1	e6	.02	1.1	e5	.02	
16	1.3	e6	.02	1.1	e6	.02	1.2	e5	.02	
17	1.3	e6	.02	1.1	e6	.02	1.7	e19	.22	
18	1.3	e8	.03	1.1	e6	.02	1.3	10	.03	
19	1.0	e8	.02	1.6	e10	.05	1.1	e10	.03	
20	1.1	e7	.02	1.2	e7	.02	3.4	50	1.2	
21	1.4	e7	.03	1.1	e7	.02	2.0	e14	.10	
22	1.4	e7	.03	1.1	e5	.02	1.7	e8	.04	
23	1.1	e7	.02	1.2	e5	.02	1.4	e8	.03	
24	1.1	e7	.02	1.2	e5	.02	1.2	e8	.03	
25	1.2	e6	.02	1.3	e5	.02	1.4	e8	.03	
26	1.2	e6	.02	1.3	e6	.02	1.4	e9	.03	
27	1.7	e16	.13	1.1	e6	.02	1.1	e9	.03	
28	1.4	e8	.03	1.2	e6	.02	.92	e9	.02	
29	1.2	e8	.03	.99	e6	.02	1.0	e9	.02	
30	1.2	e8	.03	.96	e6	.02	1.4	e11	.05	
31	1.2	e8	.03	.96	e6	.02	---	---	---	
TOTAL	45.3	---	13.80	35.41	---	0.65	40.74	---	2.79	
YEAR	488.38		52.55							

e Estimated

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Hydrologic Unit 20060000, on left bank 300 ft downstream from Luluku Stream, 1.0 mi southwest of Castle High School, and 1.9 mi northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi².

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--13 years, 11.5 ft³/s (8,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft³/s, Dec. 31, 1987, gage height, 5.72 ft, from rating curve extended above 200 ft³/s; minimum, 0.25 ft³/s, on several days in October 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 1	0530	*366	*3.43				

Minimum discharge, 1.6 ft³/s, Oct. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	9.5	7.5	9.0	17	119	13	11	9.7	8.2	7.7	6.3
2	7.3	9.0	7.3	8.3	14	29	13	12	9.5	8.4	7.5	6.3
3	73	8.8	7.1	7.4	14	20	13	13	9.5	8.3	7.2	5.9
4	21	8.7	7.3	7.1	12	18	13	10	9.2	8.0	7.1	6.5
5	12	8.7	7.7	6.9	12	17	16	10	9.2	8.1	7.1	7.0
6	10	8.5	7.2	6.9	11	20	15	10	9.3	8.1	6.8	6.2
7	9.2	8.8	7.2	6.8	11	32	14	11	8.8	7.7	7.0	5.9
8	9.0	8.5	7.0	6.8	10	19	14	10	9.1	9.1	6.8	6.8
9	12	9.2	22	6.6	9.9	17	15	10	8.9	65	6.6	14
10	25	8.6	8.8	6.6	10	16	13	9.8	9.1	11	6.7	7.2
11	9.6	8.2	7.5	6.5	10	16	13	9.7	9.3	9.8	6.8	6.4
12	9.1	8.4	7.4	6.3	9.8	15	13	9.5	9.1	10	6.8	6.4
13	9.7	27	8.1	6.4	9.5	15	12	9.1	9.0	9.3	6.9	6.5
14	13	20	7.1	7.0	9.5	15	12	11	9.1	9.1	7.0	6.0
15	19	14	7.1	22	9.3	26	12	10	8.9	9.3	6.8	6.2
16	11	9.6	7.2	61	9.2	16	12	9.6	10	9.0	6.7	6.3
17	9.8	8.8	7.2	19	11	15	12	12	11	9.3	6.4	20
18	11	8.4	6.9	13	9.9	14	11	9.5	10	12	6.3	8.1
19	10	8.1	10	71	9.3	15	12	10	10	9.0	9.0	7.1
20	10	8.1	34	27	9.8	14	11	9.7	10	8.4	9.3	14
21	9.4	8.2	9.0	16	9.3	14	11	9.6	10	9.5	7.3	17
22	9.2	7.9	8.0	13	9.1	13	11	9.8	10	9.1	6.7	8.3
23	9.2	7.7	7.6	13	9.0	13	11	14	10	8.3	6.6	8.5
24	10	7.7	7.4	19	8.9	14	12	10	10	8.1	7.0	7.2
25	9.8	7.6	7.6	13	82	14	11	9.1	11	7.4	6.6	7.1
26	9.5	7.6	7.6	14	27	14	11	9.8	9.4	7.1	7.2	7.6
27	8.8	7.8	7.5	12	18	42	11	9.7	11	14	6.6	7.2
28	8.8	7.7	8.2	11	41	16	10	9.7	8.8	9.9	6.9	6.4
29	34	8.1	7.3	11	---	14	9.8	9.7	8.2	8.1	6.4	6.3
30	12	7.9	7.6	10	---	14	9.5	9.6	8.3	8.1	6.3	11
31	9.9	---	8.0	10	---	13	---	9.7	---	8.0	6.1	---
TOTAL	429.1	287.1	277.4	453.6	422.5	649	366.3	317.6	285.4	334.7	216.2	245.7
MEAN	13.8	9.57	8.95	14.6	15.1	20.9	12.2	10.2	9.51	10.8	6.97	8.19
MAX	73	27	34	71	82	119	16	14	11	65	9.3	20
MIN	7.3	7.6	6.9	6.3	8.9	13	9.5	9.1	8.2	7.1	6.1	5.9
AC-FT	851	569	550	900	838	1290	727	630	566	664	429	487

CAL YR 1989 TOTAL 5881.0 MEAN 16.1 MAX 293 MIN 6.9 AC-FT 11660
WTR YR 1990 TOTAL 4284.6 MEAN 11.7 MAX 119 MIN 5.9 AC-FT 8500

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.--Water-quality samples were also collected at this site. Construction of houses (Brookview Subdivision) is also going on this year at this site, on right bank.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L, Mar. 18, 1980; minimum daily mean, 1 mg/L on several days in 1988, 1990.

SEDIMENT DISCHARGE: Maximum daily, 1,380 tons, Mar. 18, 1980; minimum daily, 0.01 ton, Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 405 mg/L, Nov. 27; minimum daily mean, 1 mg/L (estimated) on several days.

SEDIMENT DISCHARGE: Maximum daily, 136 tons, Oct. 3; minimum daily, 0.02 ton (estimated), May 13.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD- NESS TOTAL (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 AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)		
NOV																				
13...	1250	7.6	210	7.9	25.0	0.70	757	8.5	104	--										
DEC																				
18...	1330	6.6	220	6.9	22.5	1.6	756	7.8	91	120										
JAN																				
24...	1100	29	152	8.3	22.0	10	753	7.9	92	--										
FEB																				
14...	1300	--	183	7.8	22.0	1.8	763	8.5	97	60										
MAR																				
27...	1245	24	190	6.5	24.0	5.0	765	8.0	95	--										
APR																				
27...	1000	11	200	6.9	25.0	1.0	760	8.8	107	--										
JUN																				
14...	1100	8.4	200	7.5	26.0	2.0	763	8.9	110	--										
JUL																				
24...	1330	6.9	180	7.9	27.0	1.0	760	5.4	68	200										
AUG																				
14...	1030	6.9	180	7.9	27.0	1.7	763	7.7	97	--										
SEP																				
20...	1030	10	180	7.0	26.0	2.5	760	8.6	106	740										

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	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)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
DEC 18...	1330	20	103	112	0.14	4	0.400	0.30	0.70	0.010
FEB 14...	1300	--	--	--	--	4	0.300	0.20	--	<0.010
JUL 24...	1330	--	--	--	--	<1	0.300	0.60	0.90	0.020
SEP 20...	1030	21	101	120	0.14	1	0.300	0.40	0.70	0.020

DATE	TIME	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC 18...	1330	140	20	<1	<1	<100	4	<10	<0.5	<1	<1.0
SEP 20...	1030	150	20	<1	<1	<100	3	<10	<0.5	<1	<1.0

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)
DEC 18...	<1	<1	<1	<3	1	5	310	35	1	<1	<10
SEP 20...	<1	<1	<1	<3	2	1	360	30	<1	<1	<10

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)
DEC 18...	<4	50	6	<1.0	<0.1	<1	<10	<1	1	<1	<1
SEP 20...	<4	90	5	<0.10	<0.1	1	<10	2	1	<1	<1

DATE	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV- ERABLE GRAVI- METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)
DEC 18...	<1	<1.0	67	<6	10	11	1.1	<1	<0.010	<0.1	--
SEP 20...	<1	<1.0	71	<6	<10	4	2.0	<1	<0.010	<0.1	<0.01

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

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	
DEC 18...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	
SEP 20...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	
			FONOFOS (DY- FONATE) WATER	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/L)	
DEC 18...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	
SEP 20...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	
			NAPH- THA- LENES, POLY- CHLOR.	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 18...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01	
SEP 20...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01	

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	DISCHARGE (TONS/DAY)
	OCTOBER			NOVEMBER			DECEMBER		
1	7.8	15	.32	9.5	31	.80	7.5	12	.25
2	7.3	26	.52	9.0	58	1.4	7.3	9	.17
3	73	215	136	8.8	76	1.8	7.1	8	.16
4	21	65	4.2	8.7	110	2.6	7.3	12	.23
5	12	27	.86	8.7	39	.92	7.7	15	.31
6	10	15	.41	8.5	14	.32	7.2	15	.30
7	9.2	48	1.2	8.8	10	.24	7.2	42	.82
8	9.0	63	1.5	8.5	27	.62	7.0	19	.36
9	12	22	.83	9.2	18	.44	22	23	1.8
10	25	169	12	8.6	8	.18	8.8	15	.36
11	9.6	e124	4.0	8.2	14	.31	7.5	15	.29
12	9.1	177	4.4	8.4	67	1.5	7.4	14	.27
13	9.7	177	4.6	27	124	12	8.1	11	.24
14	13	44	2.6	20	70	4.4	7.1	43	.80
15	19	148	7.8	14	54	2.0	7.1	59	1.1
16	11	149	4.3	9.6	11	.29	7.2	54	1.1
17	9.8	322	8.5	8.8	8	.19	7.2	47	.90
18	11	280	8.1	8.4	5	.11	6.9	15	.27
19	10	158	4.4	8.1	8	.17	10	13	.54
20	10	181	5.1	8.1	8	.18	34	24	4.0
21	9.4	220	5.6	8.2	e9	.19	9.0	8	.20
22	9.2	124	3.1	7.9	10	.21	8.0	7	.15
23	9.2	255	6.4	7.7	10	.21	7.6	6	.13
24	10	227	6.1	7.7	9	.18	7.4	10	.19
25	9.8	130	3.4	7.6	9	.19	7.6	14	.29
26	9.5	168	4.3	7.6	12	.24	7.6	10	.21
27	8.8	167	4.0	7.8	405	8.5	7.5	6	.12
28	8.8	229	5.5	7.7	178	3.7	8.2	4	.09
29	34	320	35	8.1	30	.64	7.3	3	.06
30	12	194	6.1	7.9	10	.22	7.6	7	.15
31	9.9	201	5.4	---	---	---	8.0	10	.22
TOTAL	429.1	---	296.54	287.1	---	44.75	277.4	---	16.08
	JANUARY			FEBRUARY			MARCH		
1	9.0	6	.16	17	21	1.0	119	84	36
2	8.3	e5	.12	14	7	.27	29	48	3.8
3	7.4	5	.10	14	7	.27	20	32	1.7
4	7.1	5	.11	12	6	.20	18	23	1.1
5	6.9	6	.11	12	7	.23	17	22	1.0
6	6.9	4	.08	11	8	.23	20	32	1.7
7	6.8	3	.06	11	7	.19	32	32	3.4
8	6.8	4	.08	10	7	.18	19	17	.89
9	6.6	7	.12	9.9	7	.20	17	15	.68
10	6.6	8	.13	10	6	.18	16	10	.45
11	6.5	6	.11	10	7	.19	16	14	.58
12	6.3	7	.12	9.8	6	.17	15	9	.35
13	6.4	7	.13	9.5	6	.14	15	9	.38
14	7.0	8	.16	9.5	7	.18	15	27	1.1
15	22	22	1.6	9.3	7	.17	26	20	1.6
16	61	43	11	9.2	6	.16	16	9	.38
17	19	e19	1.0	11	11	.32	15	7	.26
18	13	30	1.1	9.9	7	.20	14	8	.32
19	71	44	11	9.3	7	.17	15	7	.29
20	27	21	1.5	9.8	6	.17	14	8	.30
21	16	20	.85	9.3	7	.17	14	6	.24
22	13	14	.51	9.1	6	.16	13	7	.25
23	13	17	.59	9.0	8	.20	13	8	.30
24	19	21	1.1	8.9	10	.24	14	6	.24
25	13	18	.62	82	71	16	14	6	.22
26	14	28	.98	27	37	2.7	14	7	.28
27	12	9	.29	18	25	1.2	42	25	3.0
28	11	9	.26	41	28	3.3	16	13	.60
29	11	8	.24	---	---	---	14	8	.29
30	10	9	.25	---	---	---	14	8	.31
31	10	9	.24	---	---	---	13	7	.25
TOTAL	453.6	---	34.72	422.5	---	28.79	649	---	62.26

e Estimated

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DAY	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT	MEAN	MEAN	SEDIMENT
	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE	DISCHARGE	CONCENTRATION	DISCHARGE
	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)	(CFS)	(MG/L)	(TONS/DAY)
APRIL									
1	13	14	.50	11	3	.10	9.7	e5	.13
2	13	11	.40	12	11	.36	9.5	e5	.13
3	13	5	.19	13	11	.42	9.5	e5	.13
4	13	5	.19	10	4	.11	9.2	e5	.12
5	16	8	.41	10	2	.06	9.2	e5	.12
6	15	10	.43	10	e1	.03	9.3	e5	.11
7	14	11	.41	11	e1	.03	8.8	e4	.10
8	14	269	9.9	10	e1	.03	9.1	e4	.10
9	15	14	.59	10	e1	.03	8.9	e4	.10
10	13	10	.35	9.8	e1	.03	9.1	e4	.11
11	13	13	.47	9.7	e1	.03	9.3	e6	.14
12	13	3	.10	9.5	e1	.03	9.1	15	.38
13	12	4	.14	9.1	e1	.02	9.0	8	.18
14	12	5	.15	11	e1	.03	9.1	10	.24
15	12	2	.05	10	e1	.03	8.9	7	.16
16	12	7	.21	9.6	e1	.03	10	9	.25
17	12	12	.38	12	e8	.30	11	11	.35
18	11	15	.47	9.5	e5	.13	10	13	.37
19	12	14	.43	10	e5	.14	10	18	.50
20	11	19	.58	9.7	e5	.13	10	10	.27
21	11	11	.34	9.6	e5	.13	10	6	.17
22	11	7	.22	9.8	e5	.13	10	6	.16
23	11	8	.25	14	10	.41	10	8	.22
24	12	10	.31	10	e5	.14	10	9	.26
25	11	7	.22	9.1	e4	.11	11	9	.28
26	11	12	.36	9.8	e5	.13	9.4	8	.21
27	11	14	.40	9.7	e5	.13	11	10	.30
28	10	3	.07	9.7	e5	.13	8.8	10	.24
29	9.8	3	.09	9.7	e5	.13	8.2	9	.19
30	9.5	4	.10	9.6	e5	.13	8.3	10	.22
31	---	---	---	9.7	e5	.13	---	---	---
TOTAL	366.3	---	18.71	317.6	---	3.77	285.4	---	6.24
JULY									
1	8.2	13	.28	7.7	7	.16	6.3	9	.15
2	8.4	9	.21	7.5	6	.12	6.3	10	.17
3	8.3	10	.23	7.2	5	.10	5.9	e10	.15
4	8.0	11	.23	7.1	7	.13	6.5	8	.14
5	8.1	121	2.7	7.1	7	.14	7.0	7	.14
6	8.1	15	.33	6.8	8	.14	6.2	7	.12
7	7.7	14	.28	7.0	7	.14	5.9	e8	.12
8	9.1	19	.54	6.8	9	.16	6.8	8	.15
9	65	105	43	6.6	13	.22	14	12	.53
10	11	33	1.0	6.7	13	.23	7.2	9	.17
11	9.8	23	.61	6.8	8	.14	6.4	22	.37
12	10	22	.58	6.8	7	.13	6.4	19	.33
13	9.3	31	.77	6.9	9	.16	6.5	16	.28
14	9.1	27	.67	7.0	9	.17	6.0	21	.33
15	9.3	20	.50	6.8	8	.16	6.2	50	.84
16	9.0	26	.62	6.7	11	.19	6.3	38	.66
17	9.3	59	1.5	6.4	11	.19	20	39	2.7
18	12	35	1.1	6.3	9	.15	8.1	17	.37
19	9.0	24	.58	9.0	15	.37	7.1	21	.39
20	8.4	17	.39	9.3	14	.35	14	20	.90
21	9.5	34	.88	7.3	9	.19	17	20	1.2
22	9.1	40	.97	6.7	8	.15	8.3	6	.13
23	8.3	38	.85	6.6	9	.16	8.5	12	.27
24	8.1	26	.58	7.0	11	.21	7.2	10	.19
25	7.4	12	.23	6.6	11	.20	7.1	5	.10
26	7.1	9	.17	7.2	18	.36	7.6	5	.11
27	14	14	.68	6.6	15	.27	7.2	30	.58
28	9.9	9	.23	6.9	7	.13	6.4	e6	.10
29	8.1	15	.34	6.4	15	.26	6.3	5	.09
30	8.1	52	1.1	6.3	30	.51	11	10	.33
31	8.0	21	.46	6.1	14	.23	---	---	---
TOTAL	334.7	---	62.61	216.2	---	6.22	245.7	---	12.11
YEAR	4284.6		592.80						

e Estimated

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE

LOCATION.--Lat 21°24'21", long 157°48'31", Hydrologic Unit 20060000, on right bank 0.8 mi west of Castle High School, 1.2 mi northwest of Hawaiian Memorial Park Cemetary, and 2.4 mi northwest of Pali Golf Course.

DRAINAGE AREA.-- 0.40 mi².

PERIOD OF RECORD.-- October 1987 to current year.

GAGE.-- Water-stage recorder.

REMARKS.-- Records good.

AVERAGE DISCHARGE.--3 years, 2.66 ft³/s (1,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft³/s, Dec. 31, 1987, gage height, 5.18 ft, from rating curve extended above 8.7 ft³/s; minimum, 1.5 ft³/s, July 18, 19, 1989.

EXTREMES FOR CURRENT PERIOD.--Water year 1988. Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 12	0415	175	4.77	Mar. 25	0245	139	4.33
Dec. 31	2230	*207	*5.18	Nov. 26	0800	123	4.12

Minimum discharge, 1.6 ft³/s, on several days in Oct. and Nov.

Water year 1989. Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 6	0145	140	4.34	June 1	1415	*152	*4.49
Apr. 8	2230	115	4.00				

Minimum discharge, 1.5 ft³/s, on July 18, 19.

Water year 1990. Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1600	*86	*3.58	Oct. 29	0430	*86	*3.58

Minimum discharge, 1.6 ft³/s, on many days.

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.1	1.9	27	3.0	2.2	2.3	2.5	2.7	1.9	2.1	2.7
2	2.3	2.2	1.9	5.4	2.8	2.1	2.3	2.5	2.8	1.9	2.4	2.6
3	1.7	2.9	1.9	5.6	2.7	2.2	2.6	2.9	3.0	1.9	3.6	2.5
4	1.7	1.9	2.0	3.2	4.3	2.1	4.9	2.5	2.7	2.0	2.3	2.4
5	2.9	4.6	2.0	3.1	2.8	2.1	3.9	2.9	2.7	2.0	2.3	2.3
6	1.8	3.1	2.0	3.1	3.0	2.2	2.1	2.5	2.7	2.1	2.4	2.2
7	1.9	4.0	2.0	2.9	2.9	2.1	2.2	3.1	2.4	2.1	2.6	2.2
8	1.8	2.3	2.4	2.9	2.9	2.1	2.2	2.4	2.5	2.2	2.4	2.2
9	1.8	2.1	2.3	2.8	2.7	2.1	2.2	2.4	2.5	2.3	2.4	2.4
10	1.7	1.9	2.3	4.4	2.5	2.1	2.2	2.5	2.3	2.0	2.5	2.7
11	2.1	1.8	2.2	2.8	2.5	2.1	2.2	2.5	2.2	2.0	2.9	2.5
12	2.0	1.8	23	2.8	2.5	2.1	2.2	3.2	2.2	2.0	2.6	1.9
13	1.7	1.8	6.6	2.9	2.5	2.3	2.3	3.5	2.2	2.0	2.4	1.9
14	1.7	2.5	4.2	2.7	2.5	2.9	2.3	2.9	2.1	2.1	2.6	2.1
15	1.9	2.1	2.9	2.5	2.6	2.3	2.2	3.9	2.1	2.0	2.5	3.5
16	1.8	1.8	2.8	2.6	2.6	2.9	2.4	2.1	2.1	2.0	2.5	1.9
17	1.8	6.4	5.1	4.3	2.6	2.4	2.4	2.0	2.1	2.0	3.1	1.8
18	1.8	3.4	6.2	5.7	2.6	2.8	2.4	2.0	2.1	2.1	2.1	1.8
19	1.8	2.1	17	2.6	2.6	2.3	2.4	2.0	2.1	2.1	2.2	1.8
20	1.8	3.2	4.2	2.6	2.6	2.1	2.5	2.0	2.2	2.0	2.2	1.8
21	1.8	2.9	3.3	2.7	2.6	2.2	2.5	2.1	2.2	2.0	2.2	2.0
22	2.1	2.3	2.8	2.6	2.7	2.3	2.5	2.1	2.2	2.0	2.2	1.9
23	1.8	2.2	2.9	2.6	2.9	2.2	2.5	2.1	2.3	2.0	2.2	3.1
24	2.0	2.2	3.0	2.5	2.3	4.6	2.5	2.1	2.2	2.0	2.2	2.8
25	2.0	2.1	2.6	3.2	2.7	6.7	3.0	2.1	2.2	2.3	2.2	2.7
26	2.0	2.0	2.8	2.8	2.3	2.2	3.2	2.1	2.3	2.1	2.2	2.6
27	1.9	1.9	2.7	3.1	2.2	2.1	2.4	2.2	2.3	2.2	2.5	7.2
28	1.8	1.9	2.5	8.9	2.2	2.1	2.7	2.3	2.1	2.4	2.5	8.8
29	1.8	2.3	2.5	7.0	2.2	2.0	2.5	2.2	1.9	2.4	2.6	5.2
30	1.8	1.9	5.6	3.2	---	2.2	2.4	2.3	1.9	2.2	2.7	4.1
31	1.8	---	29	3.0	---	2.2	---	2.5	---	2.2	2.7	---
TOTAL	58.8	75.7	154.6	133.5	77.3	76.3	76.4	76.4	69.3	64.5	76.3	85.6
MEAN	1.90	2.52	4.99	4.31	2.67	2.46	2.55	2.46	2.31	2.08	2.46	2.85
MAX	2.9	6.4	29	27	4.3	6.7	4.9	3.9	3.0	2.4	3.6	8.8
MIN	1.7	1.8	1.9	2.5	2.2	2.0	2.1	2.0	1.9	1.9	2.1	1.8
AC-FT	117	150	307	265	153	151	152	152	137	128	151	170

WTR YR 1988 TOTAL 1024.7 MEAN 2.80 MAX 29 MIN 1.7 AC-FT 2030

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	2.4	2.5	2.8	e2.4	4.8	2.6	2.7	12	2.0	2.7	2.2
2	3.9	2.5	2.6	2.9	e10	6.4	2.5	2.6	1.9	2.0	2.9	2.3
3	3.3	2.6	2.3	3.1	e6.0	6.0	5.0	2.4	1.7	1.9	2.6	2.2
4	2.5	8.3	2.3	3.0	e3.4	2.9	9.6	2.3	1.7	1.9	2.7	2.1
5	2.1	3.2	2.3	e2.8	e3.1	3.4	4.1	2.4	1.8	2.0	2.6	2.3
6	1.9	2.8	15	e2.7	e2.9	3.1	5.6	2.2	1.7	1.8	2.5	2.3
7	1.9	2.3	2.5	e2.7	e2.8	2.8	10	2.2	1.8	1.7	2.6	2.3
8	1.9	2.2	2.3	e2.6	e2.7	2.6	30	2.2	1.9	1.8	2.6	2.2
9	1.8	2.2	2.3	e2.7	e2.7	2.5	14	2.2	1.9	1.8	2.5	2.3
10	1.7	2.1	2.2	e2.7	e3.9	2.4	3.5	2.2	1.8	1.9	2.4	2.3
11	1.8	2.1	2.2	e6.4	8.3	2.6	2.7	2.2	2.1	1.9	2.4	2.3
12	2.1	2.1	3.2	e4.0	3.0	3.2	11	2.2	2.3	1.7	2.3	2.2
13	2.0	2.7	2.4	e3.8	2.6	2.7	4.5	2.3	2.3	1.9	2.4	2.1
14	2.0	2.1	2.2	e3.3	2.3	2.7	3.6	2.2	2.0	1.9	2.4	2.1
15	1.9	2.1	2.2	e3.0	2.2	2.5	3.5	2.1	2.0	1.8	2.3	2.0
16	2.2	2.1	5.9	e2.8	2.2	2.6	3.4	2.2	2.1	1.6	2.4	1.9
17	2.3	2.2	3.7	e2.8	2.3	2.8	3.1	2.2	2.0	1.6	2.4	2.0
18	2.1	2.1	3.3	e2.7	2.4	2.6	3.2	2.2	2.0	1.5	2.4	2.0
19	2.1	2.2	3.1	e2.7	2.3	2.5	3.1	2.6	2.0	1.6	2.8	2.1
20	2.2	2.2	3.0	e2.8	2.3	2.5	3.1	2.3	2.0	4.4	3.8	2.2
21	3.4	2.2	3.0	e2.7	6.3	2.4	3.2	2.2	2.0	3.9	2.7	2.1
22	3.9	2.1	3.0	e2.6	2.6	2.5	3.2	2.2	2.0	3.0	2.2	2.1
23	2.7	2.7	3.4	e2.6	2.5	2.4	3.2	2.1	1.9	2.7	2.1	2.0
24	3.1	2.3	3.0	e2.6	2.4	2.1	3.3	2.2	1.9	2.9	2.2	2.0
25	2.5	4.0	3.0	e2.6	2.2	2.6	3.3	2.1	1.9	2.7	2.1	2.1
26	2.5	6.9	2.8	e2.5	2.1	2.3	3.3	2.1	1.9	2.6	2.1	2.1
27	2.5	2.6	2.7	e2.5	2.2	2.3	5.4	2.2	1.8	2.4	2.1	2.0
28	2.4	2.4	2.9	e2.5	5.3	2.3	3.6	2.1	1.9	2.7	4.0	2.0
29	2.4	5.2	3.0	e2.5	---	2.3	3.5	2.0	1.9	2.8	2.2	2.0
30	2.6	2.6	2.9	e2.5	---	2.3	3.1	1.9	2.0	2.5	2.1	1.9
31	2.5	---	2.8	e2.4	---	2.4	---	2.7	---	2.5	2.1	---
TOTAL	76.2	85.5	100.0	90.3	95.4	89.5	163.2	69.7	68.2	69.4	77.6	63.7
MEAN	2.46	2.85	3.23	2.91	3.41	2.89	5.44	2.25	2.27	2.24	2.50	2.12
MAX	4.0	8.3	15	6.4	10	6.4	30	2.7	12	4.4	4.0	2.3
MIN	1.7	2.1	2.2	2.4	2.1	2.1	2.5	1.9	1.7	1.5	2.1	1.9
AC-FT	151	170	198	179	189	178	324	138	135	138	154	126

CAL YR 1988 TOTAL 997.3 MEAN 2.72 MAX 27 MIN 1.7 AC-FT 1980
WTR YR 1989 TOTAL 1048.7 MEAN 2.87 MAX 30 MIN 1.5 AC-FT 2080

e Estimated

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.8	2.1	2.1	2.6	11	2.2	2.1	1.7	2.2	1.9	2.0
2	1.9	1.8	2.2	2.0	2.2	3.5	2.2	2.1	1.7	2.3	1.9	2.0
3	10	1.8	2.2	2.0	2.4	3.0	2.1	2.4	1.7	2.3	1.9	2.0
4	2.7	1.8	2.2	2.0	2.2	2.8	2.2	1.9	1.7	2.3	1.9	2.1
5	2.3	1.8	2.2	2.0	2.3	2.8	2.3	2.0	1.7	2.3	1.9	2.3
6	2.1	1.8	2.2	2.0	2.2	3.4	2.4	1.9	1.7	2.3	1.9	2.1
7	1.9	1.9	2.2	1.9	2.2	3.7	2.4	2.0	1.8	2.3	1.9	2.0
8	2.0	2.0	2.3	2.0	2.2	2.8	2.3	1.9	1.8	2.5	2.0	1.9
9	2.5	2.0	4.7	1.9	2.2	2.7	2.4	2.0	1.8	e13	2.0	1.8
10	4.3	1.8	1.8	1.9	2.2	2.6	2.2	2.0	1.9	e5.0	2.0	1.6
11	2.1	1.8	1.7	1.9	2.2	2.5	2.2	2.0	1.9	e3.0	2.0	1.7
12	2.0	1.9	1.8	1.9	2.3	2.5	2.2	2.1	1.8	e2.5	1.9	1.8
13	2.2	2.7	1.8	2.0	2.3	2.6	2.2	2.1	1.9	e2.4	2.0	2.0
14	2.5	1.7	1.7	2.3	2.3	2.5	2.2	2.6	1.9	e2.4	1.9	2.1
15	3.6	2.0	1.7	5.1	2.3	2.7	2.2	1.7	1.9	e2.3	1.9	2.2
16	2.3	1.6	1.7	6.0	2.3	2.4	2.2	1.7	2.0	e2.3	1.9	2.2
17	2.2	1.7	1.7	2.7	2.9	2.4	2.2	1.9	2.0	e2.2	1.9	2.3
18	2.4	1.9	1.9	2.7	2.6	2.4	2.2	1.8	1.9	e2.4	1.9	2.0
19	2.4	1.9	3.9	6.1	2.8	2.4	2.3	1.8	2.1	e2.2	2.3	2.0
20	2.4	1.9	3.9	2.6	3.0	2.3	2.4	1.8	1.9	e2.1	2.2	2.2
21	2.4	1.9	2.0	2.6	3.2	2.3	2.5	1.9	2.0	e2.1	2.2	2.0
22	2.4	2.0	1.9	2.6	3.3	2.3	2.4	1.9	1.9	e2.0	2.0	1.6
23	2.4	2.0	1.9	2.7	3.6	2.3	2.3	2.7	1.9	e1.9	1.9	1.7
24	2.5	2.0	1.9	3.1	4.0	2.3	2.7	1.7	2.0	e1.9	2.0	1.6
25	2.4	2.0	1.8	2.2	9.0	2.2	2.0	1.6	2.1	1.8	1.9	1.7
26	2.2	2.0	1.9	2.1	3.0	2.8	1.9	1.6	2.0	1.8	2.1	1.7
27	2.2	2.0	2.0	2.2	3.1	3.8	1.9	1.6	2.3	2.4	2.0	1.6
28	2.1	2.0	2.0	2.1	7.4	2.7	1.9	1.6	2.0	1.9	2.0	1.7
29	6.3	2.1	1.8	2.2	---	2.3	1.9	1.6	2.3	1.9	2.0	1.6
30	2.0	2.2	1.9	2.1	---	2.3	1.9	1.7	2.3	2.0	2.0	1.7
31	1.9	---	2.0	2.1	---	2.3	---	1.7	---	1.9	2.0	---
TOTAL	84.6	57.8	67.0	79.1	84.3	90.6	66.4	59.4	57.6	81.9	61.3	57.2
MEAN	2.73	1.93	2.16	2.55	3.01	2.92	2.21	1.92	1.92	2.64	1.98	1.91
MAX	10	2.7	4.7	6.1	9.0	11	2.7	2.7	2.3	13	2.3	2.3
MIN	1.9	1.6	1.7	1.9	2.2	2.2	1.9	1.6	1.7	1.8	1.9	1.6
AC-FT	168	115	133	157	167	180	132	118	114	162	122	113

CAL YR 1989 TOTAL 996.4 MEAN 2.73 MAX 30 MIN 1.5 AC-FT 1980
WTR YR 1990 TOTAL 847.2 MEAN 2.32 MAX 13 MIN 1.6 AC-FT 1680

e Estimated

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--July 1988 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV 13...	1450	2.2	190	7.5	23.5	2.5	757	8.5	101	--
DEC 18...	1130	1.9	190	7.9	21.0	3.2	759	8.7	98	560
JAN 23...	1400	2.6	195	7.4	22.0	3.0	753	8.5	99	--
FEB 15...	1200	2.2	210	6.8	22.0	3.8	765	8.4	96	K1600
MAR 26...	1230	2.3	190	7.8	23.0	3.5	763	8.3	97	--
APR 25...	1400	2.2	188	7.6	22.0	1.2	759	8.6	99	--
JUN 13...	1350	1.9	200	7.6	24.0	2.9	762	8.3	99	--
JUL 25...	0915	1.9	187	7.4	21.5	3.1	759	8.6	98	1300
AUG 13...	1125	2.0	200	8.0	22.5	3.5	762	8.3	96	--
SEP 18...	0925	2.1	187	7.4	22.0	5.5	760	8.5	98	5300

DATE	TIME	HARD-NESS TOTAL (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)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC 18...	1130	55	11	6.6	17	40	1	1.0	58	4.0	21
SEP 18...	0925	57	12	6.6	17	39	1	1.1	61	4.3	26

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 18...	1130	<0.10	32	124	128	0.17	<1	<0.100	<0.20	0.020
FEB 15...	1200	--	--	--	--	--	13	<0.100	0.20	0.020
JUL 25...	0915	--	--	--	--	--	7	<0.100	<0.20	0.030
SEP 18...	0925	<0.10	31	119	135	0.16	6	<0.100	0.20	0.020

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM, DIS-SOLVED (UG/L AS CD)
DEC 18...	1130	280	10	<1	<1	<100	4	<10	<0.5	<1	<1.0
SEP 18...	0925	270	20	<1	<1	<100	3	<10	<0.5	<1	<1.0

< 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).

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
DEC 18...	1	<1	1	<3	1	1	790	170	1	<1	<10
SEP 18...	<1	<1	<1	<3	1	<1	820	66	<1	<1	<10

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELENIUM, TOTAL RECOVERABLE (UG/L AS SE)	SELENIUM, DIS- SOLVED (UG/L AS SE)
DEC 18...	<4	100	51	<0.10	<0.1	<1	<10	2	<1	<1	<1
SEP 18...	<4	140	72	<0.10	<0.1	<1	<10	2	<1	<1	<1

DATE	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRONTIUM, DIS- SOLVED (UG/L AS SR)	VANADIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOVERABLE (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORDYRIFOS, TOTAL RECOVERABLE (UG/L)
DEC 18...	<1	<1.0	65	8	<10	12	1.0	<1	<0.010	<0.1	--
SEP 18...	<1	<1.0	67	7	<10	4	2.5	2	<0.010	<0.1	0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2, 4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)
DEC 18...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010
SEP 18...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010

DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXY- CHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
DEC 18...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
SEP 18...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLY- CHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2, 4, 5-T TOTAL (UG/L)
DEC 18...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 18...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24'46", long 157°49'33", Hydrologic Unit 20060000, on left bank 1.7 mi west of Kaneohe Post Office and 1.8 mi southwest of Heeia.

DRAINAGE AREA.--0.97 mi².

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to September 1977, October 1982 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, nonrecording gage and Apr. 28, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datums.

REMARKS.--Records good. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--42 years (water years 1944-77, 1984-90), 2.20 ft³/s (1,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft³/s May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft³/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft³/s July 20, 1957, Sept. 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 340 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1800	*700	*3.49	No other peak greater than base discharge.			

Minimum discharge, 1.4 ft³/s, on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.9	1.7	1.7	2.1	24	2.3	1.8	1.7	1.7	1.7	1.7
2	1.6	1.8	1.7	1.7	2.0	8.2	2.2	1.8	1.7	1.7	1.7	1.7
3	27	1.8	1.7	1.7	2.1	4.2	2.2	2.1	1.6	1.7	1.6	1.6
4	4.6	1.8	1.7	1.7	2.1	3.2	2.1	2.0	1.6	1.7	1.7	1.6
5	2.7	1.8	1.7	1.7	2.0	2.8	2.1	1.9	1.6	1.7	1.6	1.7
6	2.2	1.7	1.7	1.6	1.9	3.1	2.1	1.8	1.6	1.7	1.6	1.7
7	2.0	1.7	1.7	1.6	1.8	6.2	2.1	1.8	1.6	1.7	1.5	1.7
8	2.0	1.7	1.7	1.6	1.7	3.5	2.1	1.7	1.6	1.8	1.5	1.7
9	2.0	1.8	2.2	1.6	1.7	3.1	2.7	1.7	1.6	21	1.5	2.1
10	2.4	1.7	1.7	1.6	1.7	2.7	2.3	1.7	1.6	1.9	1.5	1.7
11	2.1	1.7	1.6	1.6	1.7	2.5	2.1	1.7	1.6	1.6	1.5	1.6
12	2.0	1.7	1.7	1.6	1.7	2.4	2.0	1.7	1.6	1.6	1.6	1.7
13	1.9	1.8	1.7	1.6	1.6	2.4	1.9	1.7	1.6	1.5	1.5	1.6
14	2.0	1.7	1.6	1.6	1.6	4.9	1.9	1.9	1.6	1.5	1.5	1.6
15	3.3	1.8	1.6	2.5	1.6	27	1.9	2.1	1.6	1.4	1.6	1.5
16	2.2	1.7	1.6	12	1.6	4.7	1.9	1.9	1.5	1.4	1.6	1.6
17	2.0	1.7	1.6	5.0	1.7	3.5	1.9	1.9	1.6	1.4	1.7	1.9
18	2.0	1.7	1.6	3.5	1.6	2.9	1.8	1.8	1.6	1.5	1.7	1.6
19	2.0	1.7	1.9	16	1.7	2.0	1.8	1.9	1.6	1.6	1.7	1.6
20	1.9	1.7	2.5	7.0	1.8	2.2	1.8	1.7	1.7	1.6	1.7	29
21	1.9	1.7	1.9	3.7	1.8	2.1	1.8	1.7	1.7	1.6	1.7	4.9
22	1.8	1.7	1.8	2.7	1.8	2.1	1.8	1.8	1.7	1.6	1.7	2.2
23	1.8	1.6	1.7	2.4	1.8	2.1	1.8	2.8	1.7	1.6	1.7	1.9
24	2.3	1.7	1.7	2.7	1.7	2.2	1.9	2.1	1.7	1.5	1.8	1.9
25	2.3	1.7	1.7	2.4	9.3	2.2	1.9	1.9	1.7	1.5	1.7	1.9
26	2.0	1.6	1.7	2.2	5.2	3.3	1.8	1.8	1.7	1.5	1.7	1.9
27	1.9	1.7	1.7	2.2	3.5	13	1.8	1.7	1.7	2.2	1.6	1.9
28	1.8	1.6	1.7	2.3	9.0	3.3	1.8	1.7	1.7	2.1	1.6	1.8
29	3.8	1.7	1.7	2.2	---	2.8	1.8	1.7	1.7	2.0	1.6	1.9
30	2.2	1.7	1.7	2.1	---	2.5	1.8	1.7	1.7	1.8	1.6	2.1
31	2.0	---	1.7	2.1	---	2.4	---	1.7	---	1.7	1.6	---
TOTAL	93.3	51.6	53.9	95.9	69.8	153.5	59.4	57.2	49.2	70.8	50.3	83.3
MEAN	3.01	1.72	1.74	3.09	2.49	4.95	1.98	1.85	1.64	2.28	1.62	2.78
MAX	27	1.9	2.5	16	9.3	27	2.7	2.8	1.7	21	1.8	29
MIN	1.6	1.6	1.6	1.6	1.6	2.0	1.8	1.7	1.5	1.4	1.5	1.5
AC-FT	185	102	107	190	138	304	118	113	98	140	100	165

CAL YR 1989 TOTAL 1310.3 MEAN 3.59 MAX 143 MIN 1.6 AC-FT 2600
WTR YR 1990 TOTAL 888.2 MEAN 2.43 MAX 29 MIN 1.4 AC-FT 1760

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1982 to September 1985, October 1986 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: December 1983 to September 1984, July 1987 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since December 1983.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L (estimated), Apr. 8, 1989; minimum daily mean, 1 mg/L, on many days in 1984, 1988, 1989, 1990.

SEDIMENT DISCHARGE: Maximum daily, 1,800 tons (estimated), Apr. 8, 1989; minimum daily, less than 0.01 ton on many days in 1984, 1988, 1989, 1990.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,360 mg/L (estimated), Oct. 3; minimum daily mean, 1 mg/L on several days.

SEDIMENT DISCHARGE: Maximum daily, 596 tons (estimated), Oct. 3; minimum daily, less than 0.01 tons on several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV										
13...	1125	1.7	148	7.6	22.0	0.90	754	8.7	101	--
DEC										
18...	0930	1.7	145	7.9	19.0	1.4	763	8.8	95	280
JAN										
16...	1000	12	--	--	--	--	--	--	--	--
16...	1040	16	--	--	--	--	--	--	--	--
16...	1345	13	--	--	21.0	--	--	--	--	--
16...	1435	34	--	--	20.0	--	--	--	--	--
16...	1500	26	--	--	20.0	--	--	--	--	--
16...	1630	35	--	--	--	--	--	--	--	--
17...	1000	4.7	--	--	--	--	--	--	--	--
17...	1130	4.7	--	--	--	--	--	--	--	--
17...	1425	5.1	--	--	--	--	--	--	--	--
18...	1345	3.5	--	--	--	--	--	--	--	--
19...	1450	59	--	--	--	--	--	--	--	--
19...	1505	--	--	--	--	--	--	--	--	--
19...	1520	41	--	--	--	--	--	--	--	--
19...	1540	63	--	--	--	--	--	--	--	--
19...	1630	45	--	--	--	--	--	--	--	--
19...	1700	36	--	--	--	--	--	--	--	--
21...	0950	4.1	--	--	--	--	--	--	--	--
23...	1145	2.3	158	7.4	20.5	2.6	750	8.4	95	--
23...	1230	2.6	--	--	21.0	--	--	--	--	--
24...	0855	4.1	--	--	--	--	--	--	--	--
24...	1104	3.0	--	--	20.0	--	--	--	--	--
24...	1110	3.0	--	--	20.0	--	--	--	--	--
FEB										
15...	1130	1.6	150	7.8	20.0	1.5	759	8.9	98	440
17...	1230	1.8	--	--	19.5	--	--	--	--	--
25...	1430	2.6	--	--	--	--	--	--	--	--
25...	1445	22	--	--	19.0	--	--	--	--	--
25...	1530	1.8	--	--	18.5	--	--	--	--	--
MAR										
26...	1030	2.2	150	7.8	20.5	1.4	759	8.6	96	--
APR										
25...	1100	1.1	142	7.8	22.0	2.0	756	8.4	97	--
JUN										
13...	1015	1.5	150	7.7	21.0	1.0	768	8.8	98	--
JUL										
26...	1145	1.5	140	7.1	21.0	0.40	755	8.6	97	210
AUG										
14...	1000	1.6	92	7.7	21.0	0.60	757	8.6	97	--
SEP										
17...	1015	2.4	145	7.0	21.0	15	755	8.8	100	K8100

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

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	HARD- NESS TOTAL (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 AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	
DEC 18...	0930	45	8.4	5.7	12	37	0.8	0.70	3.0	15	<0.10
SEP 17...	1015	41	7.8	5.2	11	36	0.7	1.2	2.6	16	<0.10

DATE	TIME	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 AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
DEC 18...	0930	28	92	100	0.13	12	0.100	0.30	0.40	0.020
FEB 15...	1130	--	--	--	--	5	0.100	<0.20	--	0.020
JUL 26...	1145	--	--	--	--	<1	<0.100	<0.20	--	0.010
SEP 17...	1015	25	79	95	0.11	32	<0.100	0.60	--	0.100

DATE	TIME	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC 18...	0930	180	20	<1	<1	<100	3	<10	<0.5	<1	<1.0
SEP 17...	1015	1800	40	<1	<1	<100	3	<10	<0.5	<1	2.0

DATE	TIME	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)
DEC 18...	<1	<1	1	<3	1	2	430	59	1	<1	<10	
SEP 17...	4	<1	3	<3	3	1	3700	61	<1	<1	<10	

DATE	TIME	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)
DEC 18...	<4	30	14	<0.10	<0.1	<1	<10	<1	<1	<1	<1	
SEP 17...	<4	180	12	<0.10	<0.1	<1	<10	6	1	<1	<1	

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)
DEC 18...	<1	<1.0	51	<6	<10	5	0.3	<1	<0.010	<0.1	--
SEP 17...	<1	<1.0	49	<6	10	4	4.0	<1	<0.010	<0.1	<0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2, 4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)
DEC 18...	<0.010	<0.010	0.080	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010
SEP 17...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010

DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/L)
DEC 18...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
SEP 17...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2, 4, 5-T TOTAL (UG/L)
DEC 18...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 17...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
JAN					JAN				
16...	1000	2780	90	99	19...	1540	3330	566	94
16...	1040	1350	58	--	19...	1630	3760	457	99
16...	1345	2430	85	--	19...	1700	1410	137	--
16...	1435	4240	389	--	21...	0950	17	0.19	--
16...	1500	1250	88	--	23...	1230	7	0.05	--
16...	1630	4740	448	96	24...	0855	368	4.1	98
17...	1000	47	0.60	--	24...	1104	66	0.53	--
17...	1130	64	0.81	--	24...	1110	61	0.49	--
17...	1425	60	0.83	--	FEB				
18...	1345	12	0.11	--	17...	1230	17	0.08	--
19...	1450	1450	231	--	25...	1430	9	0.06	--
19...	1505	5640	--	88	25...	1445	1410	84	--
19...	1520	6850	758	--	25...	1530	6	0.03	--

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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	1.6	e5	.02	1.9	e8	.04	1.7	e2	.01
2	1.6	e5	.02	1.8	e8	.04	1.7	e2	.01
3	27	e1360	596	1.8	e8	.04	1.7	e2	.01
4	4.6	116	1.8	1.8	e7	.04	1.7	e2	.01
5	2.7	e14	.10	1.8	e7	.03	1.7	e1	.01
6	2.2	11	.07	1.7	e7	.03	1.7	e1	.01
7	2.0	e9	.05	1.7	e7	.03	1.7	e1	<.01
8	2.0	e8	.04	1.7	e7	.03	1.7	1	<.01
9	2.0	e7	.04	1.8	e7	.03	2.2	234	2.3
10	2.4	e10	.07	1.7	e6	.03	1.7	e16	.08
11	2.1	e7	.04	1.7	e6	.03	1.6	e13	.06
12	2.0	e7	.04	1.7	e6	.03	1.7	12	.05
13	1.9	e7	.04	1.8	e8	.04	1.7	e6	.03
14	2.0	e7	.04	1.7	e12	.06	1.6	e5	.02
15	3.3	e30	.92	1.8	e12	.06	1.6	e5	.02
16	2.2	e8	.05	1.7	e12	.06	1.6	e5	.02
17	2.0	e7	.04	1.7	12	.05	1.6	e5	.02
18	2.0	e7	.04	1.7	10	.04	1.6	e5	.02
19	2.0	e7	.04	1.7	e9	.04	1.9	e26	.42
20	1.9	e7	.04	1.7	e8	.03	2.5	e193	3.0
21	1.9	e7	.03	1.7	e7	.03	1.9	e8	.04
22	1.8	e7	.03	1.7	e6	.03	1.8	e7	.04
23	1.8	e7	.03	1.6	e5	.02	1.7	e7	.03
24	2.3	e10	.08	1.7	e5	.02	1.7	e7	.03
25	2.3	e8	.05	1.7	e4	.02	1.7	e7	.03
26	2.0	e7	.04	1.6	e4	.02	1.7	e7	.03
27	1.9	e7	.04	1.7	e3	.02	1.7	e7	.03
28	1.8	e7	.03	1.6	e3	.01	1.7	e7	.03
29	3.8	e48	2.5	1.7	e3	.01	1.7	e7	.03
30	2.2	e10	.06	1.7	e2	.01	1.7	e7	.03
31	2.0	e9	.05	---	---	---	1.7	e7	.03
TOTAL	93.3	---	602.44	51.6	---	0.97	53.9	---	6.47
	JANUARY			FEBRUARY			MARCH		
1	1.7	e7	.03	2.1	e8	.04	24	729	74
2	1.7	e7	.03	2.0	e7	.04	8.2	45	1.2
3	1.7	e6	.03	2.1	e7	.04	4.2	15	.17
4	1.7	e6	.03	2.1	e7	.04	3.2	13	.11
5	1.7	e6	.03	2.0	e7	.04	2.8	9	.07
6	1.6	e6	.03	1.9	e7	.04	3.1	14	.19
7	1.6	e6	.03	1.8	e7	.03	6.2	85	3.2
8	1.6	e6	.03	1.7	e7	.03	3.5	7	.07
9	1.6	e6	.03	1.7	9	.04	3.1	7	.06
10	1.6	e6	.03	1.7	8	.04	2.7	8	.06
11	1.6	e6	.03	1.7	6	.03	2.5	5	.04
12	1.6	e6	.03	1.7	7	.03	2.4	6	.04
13	1.6	e6	.03	1.6	6	.03	2.4	6	.04
14	1.6	e6	.03	1.6	6	.03	4.9	112	5.7
15	2.5	e167	2.1	1.6	e5	.02	27	e971	166
16	12	895	53	1.6	4	.02	4.7	31	.40
17	5.0	72	.99	1.7	11	.05	3.5	16	.15
18	3.5	20	.19	1.6	3	.01	2.9	9	.07
19	16	727	72	1.7	2	.01	2.0	7	.04
20	7.0	e87	1.9	1.8	4	.02	2.2	13	.08
21	3.7	19	.19	1.8	5	.02	2.1	152	.86
22	2.7	e13	.09	1.8	18	.09	2.1	239	1.4
23	2.4	8	.05	1.8	12	.06	2.1	170	.97
24	2.7	68	.73	1.7	7	.03	2.2	22	.13
25	2.4	10	.06	9.3	514	24	2.2	6	.04
26	2.2	e9	.05	5.2	74	1.2	3.3	30	.71
27	2.2	e8	.05	3.5	29	.31	13	304	29
28	2.3	e8	.05	9.0	123	4.2	3.3	14	.16
29	2.2	e8	.05	---	---	---	2.8	3	.02
30	2.1	e7	.04	---	---	---	2.5	5	.03
31	2.1	e7	.04	---	---	---	2.4	6	.04
TOTAL	95.9	---	132.00	69.8	---	30.54	153.5	---	285.05

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

e Estimated

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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
1	2.3	5	.03	1.8	154	.74	1.7	4	.02	
2	2.2	e5	.03	1.8	5	.02	1.7	8	.04	
3	2.2	e5	.03	2.1	8	.05	1.6	3	.01	
4	2.1	e5	.03	2.0	5	.03	1.6	4	.02	
5	2.1	e4	.03	1.9	7	.03	1.6	4	.02	
6	2.1	e4	.02	1.8	6	.03	1.6	9	.04	
7	2.1	e4	.02	1.8	12	.06	1.6	8	.04	
8	2.1	e4	.02	1.7	34	.16	1.6	6	.03	
9	2.7	e12	.11	1.7	4	.02	1.6	4	.02	
10	2.3	e9	.05	1.7	4	.02	1.6	4	.02	
11	2.1	e8	.05	1.7	3	.02	1.6	3	.02	
12	2.0	e8	.04	1.7	5	.02	1.6	3	.01	
13	1.9	e8	.04	1.7	10	.05	1.6	3	.01	
14	1.9	e7	.04	1.9	13	.07	1.6	e2	.01	
15	1.9	e7	.04	2.1	10	.06	1.6	2	.01	
16	1.9	e7	.04	1.9	4	.02	1.5	3	.01	
17	1.9	e7	.03	1.9	3	.02	1.6	3	.01	
18	1.8	e6	.03	1.8	3	.01	1.6	2	.01	
19	1.8	e6	.03	1.9	2	.01	1.6	3	.02	
20	1.8	e6	.03	1.7	5	.02	1.7	2	.01	
21	1.8	e6	.03	1.7	5	.02	1.7	1	<.01	
22	1.8	e5	.03	1.8	4	.02	1.7	2	.01	
23	1.8	e5	.03	2.8	30	.44	1.7	3	.01	
24	1.9	e6	.03	2.1	6	.03	1.7	3	.01	
25	1.9	8	.04	1.9	4	.02	1.7	3	.02	
26	1.8	5	.03	1.8	4	.02	1.7	5	.02	
27	1.8	6	.03	1.7	4	.02	1.7	6	.03	
28	1.8	5	.02	1.7	2	.01	1.7	5	.02	
29	1.8	6	.03	1.7	5	.02	1.7	5	.02	
30	1.8	67	.32	1.7	5	.02	1.7	4	.02	
31	---	---	---	1.7	4	.02	---	---	---	
TOTAL	59.4	---	1.33	57.2	---	2.10	49.2	---	0.55	
		JULY			AUGUST			SEPTEMBER		
1	1.7	3	.01	1.7	3	.02	1.7	3	.01	
2	1.7	3	.01	1.7	4	.02	1.7	3	.01	
3	1.7	2	.01	1.6	3	.01	1.6	2	.01	
4	1.7	3	.02	1.7	1	.01	1.6	4	.02	
5	1.7	5	.02	1.6	1	<.01	1.7	4	.02	
6	1.7	e9	.04	1.6	1	<.01	1.7	3	.02	
7	1.7	e17	.08	1.5	1	<.01	1.7	3	.02	
8	1.8	29	.14	1.5	1	<.01	1.7	8	.03	
9	21	629	151	1.5	2	.01	2.1	e12	.10	
10	1.9	56	.30	1.5	1	.01	1.7	5	.02	
11	1.6	21	.09	1.5	1	<.01	1.6	5	.02	
12	1.6	10	.04	1.6	1	<.01	1.7	5	.02	
13	1.5	7	.03	1.5	2	.01	1.6	7	.03	
14	1.5	6	.02	1.5	2	.01	1.6	7	.03	
15	1.4	52	.20	1.6	3	.01	1.5	5	.02	
16	1.4	8	.03	1.6	3	.02	1.6	5	.02	
17	1.4	2	.01	1.7	5	.02	1.9	152	2.4	
18	1.5	3	.01	1.7	6	.03	1.6	9	.04	
19	1.6	1	<.01	1.7	3	.02	1.6	10	.04	
20	1.6	1	<.01	1.7	3	.01	29	1140	435	
21	1.6	2	.01	1.7	2	.01	4.9	58	1.0	
22	1.6	2	.01	1.7	6	.03	2.2	42	.24	
23	1.6	11	.05	1.7	3	.01	1.9	e35	.18	
24	1.5	5	.02	1.8	4	.02	1.9	e14	.08	
25	1.5	2	.01	1.7	4	.02	1.9	6	.03	
26	1.5	1	<.01	1.7	2	.01	1.9	4	.02	
27	2.2	61	1.1	1.6	2	.01	1.9	3	.02	
28	2.1	14	.08	1.6	2	.01	1.8	e3	.02	
29	2.0	8	.04	1.6	3	.01	1.9	e4	.02	
30	1.8	3	.01	1.6	3	.01	2.1	9	.06	
31	1.7	3	.02	1.6	4	.02	---	---	---	
TOTAL	70.8	---	153.44	50.3	---	0.43	83.3	---	439.55	
YEAR	888.2		1654.87							

e Estimated

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Hydrologic Unit 20060000, on left bank 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.99 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft, from topographic map. Honolulu Board of Water Supply).

REMARKS.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pumps and/or diverts small amount of water from the stream.

AVERAGE DISCHARGE.--7 years, 3.13 ft³/s (2,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 486 ft³/s, Dec. 31, 1987, gage height, 5.28 ft; minimum, 0.58 ft³/s on several days in September, October, November 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum(*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1800	*338	*4.54	No other peak greater than base discharge.			

Minimum discharge, 2.69 ft³/s, Oct. 1-2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	e4.8	e4.4	e4.6	5.1	25	5.0	4.7	4.4	4.0	4.2	3.4
2	3.4	e4.7	e4.5	e4.5	4.4	11	5.0	4.7	4.4	3.9	4.0	3.4
3	36	e4.7	e4.7	e4.5	4.5	6.8	4.9	4.9	4.3	3.9	3.9	3.4
4	8.2	e5.8	e5.0	e4.5	4.4	5.7	4.8	4.6	4.3	3.9	3.8	3.4
5	5.1	e5.0	e4.6	e4.4	4.4	5.3	5.5	4.6	4.4	3.9	3.8	3.6
6	4.3	e4.8	e4.6	e4.4	4.2	6.9	5.2	4.6	4.3	3.9	3.7	3.4
7	4.0	e4.7	e4.6	e4.4	4.1	8.9	5.1	4.6	4.3	3.9	3.8	3.4
8	5.8	e4.7	e4.6	e4.4	4.1	6.6	5.5	4.5	4.3	4.3	3.7	3.5
9	5.3	e5.4	e6.4	e4.4	4.1	5.9	5.7	4.5	4.3	15	3.6	6.8
10	6.5	e5.0	e5.2	e4.4	4.1	5.5	5.2	4.5	4.3	4.4	3.6	3.7
11	4.6	e4.9	e4.9	e4.3	4.1	5.2	5.0	4.5	4.3	4.1	3.6	3.5
12	4.2	e4.9	e4.8	e4.3	4.0	5.1	4.9	4.5	4.3	4.2	3.6	3.4
13	4.1	e4.8	e4.8	e4.3	4.1	5.0	4.8	5.6	4.3	4.1	3.6	3.5
14	7.9	e4.8	e4.8	e4.3	4.4	6.1	4.8	7.9	4.3	3.9	3.6	3.5
15	4.9	e4.7	e4.8	e5.0	3.9	17	4.8	5.2	4.3	3.9	3.6	3.4
16	4.4	e4.7	e4.8	e17	3.9	6.4	4.8	4.8	4.3	3.9	3.6	3.4
17	4.3	e4.7	e4.8	e7.4	4.5	5.4	4.8	4.7	4.3	3.9	3.6	8.5
18	4.2	e4.7	e4.8	e6.8	4.0	5.1	4.8	4.7	4.2	4.0	3.6	4.0
19	4.1	e4.6	e4.8	e26	3.9	5.0	4.8	4.6	4.2	3.8	3.8	3.7
20	4.1	e4.6	e4.8	e7.4	3.9	5.0	4.7	4.6	4.3	3.8	4.0	13
21	e4.1	e4.6	e4.7	e5.9	3.9	4.8	4.6	4.5	4.2	3.9	3.7	8.9
22	e4.1	e4.6	e4.6	e5.2	3.9	4.8	4.6	4.6	4.1	3.8	3.6	4.6
23	e4.0	e4.6	e4.5	4.6	3.9	4.7	4.6	6.5	4.1	3.8	3.6	4.2
24	e6.7	e4.5	e4.5	5.0	3.9	5.7	4.8	4.9	4.1	3.8	3.9	4.8
25	e4.7	e4.5	e4.5	4.6	14	5.2	4.7	4.7	4.2	3.8	3.6	4.1
26	e4.5	e4.5	e4.5	4.5	7.6	6.7	4.6	4.6	4.6	3.7	3.6	3.8
27	e4.5	e4.5	e4.5	4.2	7.2	17	4.6	4.6	4.3	6.7	3.6	3.7
28	e5.6	e4.5	e4.8	4.0	12	7.0	4.6	4.5	4.1	4.5	3.6	3.6
29	e5.0	e4.5	e4.6	3.9	---	6.1	4.6	4.5	4.1	4.0	3.5	3.6
30	e4.9	e4.5	e4.5	4.0	---	5.5	4.6	4.5	4.0	4.6	3.5	3.8
31	e4.8	---	e4.6	4.1	---	5.2	---	4.4	---	4.4	3.4	---
TOTAL	181.8	142.3	147.0	181.3	140.5	225.6	146.4	149.6	127.9	137.7	114.3	133.0
MEAN	5.86	4.74	4.74	5.85	5.02	7.28	4.88	4.83	4.26	4.44	3.69	4.43
MAX	36	5.8	6.4	26	14	25	5.7	7.9	4.6	15	4.2	13
MIN	3.4	4.5	4.4	3.9	3.9	4.7	4.6	4.4	4.0	3.7	3.4	3.4
AC-FT	361	282	292	360	279	447	290	297	254	273	227	264

CAL YR 1989 TOTAL 2070.3 MEAN 5.67 MAX 36 MIN 3.4 AC-FT 4110
WTR YR 1990 TOTAL 1827.4 MEAN 5.01 MAX 36 MIN 3.4 AC-FT 3620

e Estimated

HAWAII, ISLAND OF OAHU

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 upstream from confluence with North Fork, 3.0 mi southwest of Waiahole School, and 4.0 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi².

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records fair. Honolulu Board of Water Supply diverts water from wells in drainage area.

AVERAGE DISCHARGE.--28 years, 1.37 ft³/s (990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft³/s, Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft³/s; no flow, July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sep. 17	0900	*31	*1.86				

Minimum discharge, 24 ft³/s for several days in Jan..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.28	e.30	e.27	e.26	e.31	e1.8	.29	.27	.29	.29	.31	.56
2	e.28	.29	e.27	e.26	e.29	e.50	.29	.27	.29	.29	.29	.56
3	e1.1	.29	e.27	e.26	e.29	e.35	.29	.34	.29	.29	.29	.56
4	e.41	.32	e.27	e.26	e.29	e.31	.29	.29	.29	.29	.29	.56
5	e.35	.29	e.27	e.26	e.29	e.30	.29	.29	.29	.29	.29	.56
6	e.34	.29	e.27	e.26	e.30	e1.0	.29	.29	.29	.29	.29	.56
7	e.31	.29	e.27	e.26	e.29	e1.0	.29	.29	.29	.29	.29	.56
8	e.35	.29	e.27	e.26	e.29	e.40	.29	.29	.29	.50	.29	.56
9	e.38	.29	e.42	e.26	e.29	e.34	.32	.29	.29	3.0	.29	.65
10	e.39	.29	e.30	e.24	e.29	e.32	.29	.29	.29	.31	.29	.56
11	e.32	.29	e.28	e.24	e.29	e.30	.29	.29	.29	.31	.29	.56
12	e.32	.29	e.28	e.24	e.29	e.29	.29	.29	.29	.31	.29	.56
13	e.32	.29	e.28	e.24	e.29	e.29	.27	.31	.29	.31	.29	.56
14	e.58	.29	e.28	e.24	e.29	e.40	.28	.64	.29	.31	.29	.56
15	e.33	.29	e.28	e.36	e.29	e1.7	.29	.29	.29	.30	.29	.56
16	e.32	e.29	e.28	e1.1	e.29	e.40	.29	.29	.29	.29	.29	.56
17	e.32	e.29	e.28	e.45	e.29	.29	.29	.29	.29	.29	.29	1.9
18	e.32	e.28	e.28	e.35	e.29	.29	.28	.29	.29	.31	.29	.60
19	e.31	e.28	e.28	e1.5	e.28	.29	.28	.29	.29	.29	.30	.58
20	e.30	e.28	e.27	e.70	e.28	.29	.29	.29	.34	.29	.31	1.7
21	e.30	e.28	e.27	e.40	e.28	.29	.29	.29	.30	.32	.29	.87
22	e.30	e.28	e.27	e.30	e.28	.29	.29	.29	.29	.30	.29	.60
23	e.29	e.28	e.27	e.28	e.28	.29	.29	.53	.29	.29	.29	.59
24	e.44	e.28	e.27	e.27	e.28	.30	.43	.29	.29	.29	.36	.69
25	e.30	e.28	e.27	e.26	e1.2	.29	.32	.29	.29	.29	.29	.81
26	e.30	e.28	e.27	e.28	e.35	.74	.29	.29	.29	.29	.29	.60
27	e.30	e.28	e.27	e.26	e.45	1.2	.29	.29	.32	.98	.32	.56
28	e.29	e.28	e.27	.26	e.96	.39	.27	.29	.29	.32	.49	.56
29	e.36	e.28	e.27	.26	---	.31	.26	.29	.29	.31	.56	.56
30	e.31	e.28	e.26	.24	---	.29	.26	.29	.29	.33	.56	1.0
31	e.30	---	e.26	.24	---	.29	---	.29	---	.44	.56	---
TOTAL	11.12	8.61	8.62	11.05	9.89	15.54	8.77	9.61	8.79	13.01	10.15	20.67
MEAN	.36	.29	.28	.36	.35	.50	.29	.31	.29	.42	.33	.69
MAX	1.1	.32	.42	1.5	1.2	1.8	.43	.64	.34	3.0	.56	1.9
MIN	.28	.28	.26	.24	.28	.29	.26	.27	.29	.29	.29	.56
AC-FT	22	17	17	22	20	31	17	19	17	26	20	41

CAL YR 1989 TOTAL 144.62 MEAN .40 MAX 6.9 MIN .20 AC-FT 287
WTR YR 1990 TOTAL 135.83 MEAN .37 MAX 3.0 MIN .24 AC-FT 269

e Estimated

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 upstream from confluence with South Fork, 2.8 mi southwest of Waiahole School, and 4.3 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 639.00 ft above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good except for estimated daily discharges, which are fair. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--28 years, 1.54 ft³/s (1,120 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jul. 9	0500	*26	*1.45				

Minimum discharge, 0.53 ft³/s, Apr. 13-16, May 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.78	e.82	.79	.71	.75	1.9	.59	.54	.65	.65	e.76	.97
2	.77	.82	.80	.70	.73	.81	.59	.54	.65	.65	.68	.98
3	1.3	.83	.80	.70	.70	.74	.57	.65	.65	.66	.67	.98
4	.88	.85	.81	.70	.70	.72	.57	.56	.65	.66	.67	.98
5	.78	.84	.80	.70	.71	.71	.57	.56	.65	.67	.68	.99
6	.78	.84	.79	.69	.77	1.2	.57	.55	.65	.66	.68	.99
7	.76	.83	.79	.69	.77	1.2	.56	.56	.64	.65	.68	1.0
8	.77	.83	.78	.68	.78	.76	.55	.55	.64	.67	.69	1.0
9	.89	.82	.94	.66	.77	.75	.58	.54	.65	2.7	.69	1.0
10	.92	.82	.78	.67	.77	.72	.55	.55	.64	.81	.69	1.0
11	.77	.82	.76	.67	.77	.71	.54	.55	.64	.79	.68	1.0
12	.77	.83	.76	.67	.77	.71	.54	.56	.63	.79	.68	1.0
13	.77	.82	.75	.66	.76	.71	.54	.56	.63	.78	.67	1.0
14	.97	.82	.74	.66	.75	1.1	.54	.68	.63	.77	.67	1.0
15	.79	.83	.74	.78	.75	1.9	.53	.58	.63	.77	.67	1.0
16	.78	.82	.74	1.2	.74	.79	.53	.55	.63	.77	.65	1.0
17	.76	.82	.75	.94	.74	.77	.54	.55	.64	.76	.65	1.7
18	.79	.81	.75	.74	.72	.76	.54	.55	.63	.76	.64	1.0
19	.77	.81	.75	1.5	.71	.74	.54	.55	.64	.67	.64	1.0
20	.76	.81	.74	e1.1	.71	.75	.54	.56	.69	.61	.64	1.6
21	.78	.81	.73	e.90	.71	.75	.54	.55	.65	.73	.63	1.2
22	.76	.81	.72	e.82	.71	.75	.54	.57	.64	.73	.63	1.0
23	.75	.81	.73	e.76	.71	.75	.54	.75	.64	.72	.62	1.0
24	1.0	.80	.72	e.73	.71	.77	.64	.58	.64	.72	.66	1.1
25	.80	.81	.72	e.72	1.3	.75	.59	.57	.64	.72	.63	1.1
26	.78	.82	.71	e.70	.79	.88	.55	.59	.64	.72	.62	1.0
27	.76	.82	.72	.70	.88	1.5	.54	.60	.66	1.1	.68	1.0
28	.75	.81	.72	.68	1.2	.67	.54	.60	.65	.80	.88	1.0
29	e.85	.81	.71	.68	---	.62	.54	.61	.64	.75	.94	1.0
30	e.82	.81	.70	.67	---	.60	.54	.63	.65	e.73	.95	1.3
31	e.82	---	.70	.68	---	.59	---	.65	---	e.82	.96	---
TOTAL	25.43	24.60	23.44	23.86	21.88	27.08	16.64	17.99	19.31	24.79	21.68	31.89
MEAN	.82	.82	.76	.77	.78	.87	.55	.58	.64	.80	.70	1.06
MAX	1.3	.85	.94	1.5	1.3	1.9	.64	.75	.69	2.7	.96	1.7
MIN	.75	.80	.70	.66	.70	.59	.53	.54	.63	.61	.62	.97
AC-FT	50	49	46	47	43	54	33	36	38	49	43	63

CAL YR 1989 TOTAL 294.01 MEAN .81 MAX 5.3 MIN .49 AC-FT 583
WTR YR 1990 TOTAL 278.59 MEAN .76 MAX 2.7 MIN .53 AC-FT 553

e Estimated

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 downstream from forest-reserve boundary, 1.0 mi south of Kahaluu School, and 1.6 mi west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi².

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft, from topographic map.

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--16 years, 6.19 ft³/s (4,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft³/s, Mar. 14, 1982, gage height, 7.52 ft, from rating curve extended above 100 ft³/s; minimum, 1.1 ft³/s, Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1600	*504	*5.84	Jul. 9	0200	174	4.48
Jan. 19	1600	167	4.44				

Minimum discharge, 5.0 ft³/s, Aug. 25, 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	6.4	6.0	6.0	6.5	27	5.8	5.9	5.9	5.7	5.5	5.5
2	6.6	6.3	6.0	5.9	6.5	12	5.7	5.9	5.9	5.7	5.4	5.5
3	43	6.3	6.1	5.9	6.4	7.9	5.7	6.3	5.9	5.6	5.3	5.4
4	9.2	6.4	6.2	5.8	6.3	7.0	5.7	5.9	5.9	5.6	5.4	5.4
5	7.3	6.3	6.1	5.8	6.3	6.7	5.8	5.9	5.9	5.6	5.3	5.5
6	6.9	6.3	6.1	5.8	6.3	12	5.7	5.9	5.9	5.6	5.3	5.4
7	6.7	6.3	6.1	5.8	6.2	13	5.7	5.9	5.8	5.6	5.3	5.4
8	8.8	6.3	6.1	5.8	6.1	8.2	5.7	5.9	5.8	6.1	5.3	5.5
9	8.5	6.4	7.6	5.8	6.1	7.5	6.0	5.8	5.8	20	5.3	5.6
10	8.5	6.3	6.3	5.8	6.1	7.0	5.7	5.8	5.8	6.0	5.3	5.5
11	7.1	6.3	6.1	5.7	6.3	6.7	5.8	5.8	5.8	5.7	5.3	5.5
12	6.9	6.3	6.1	5.7	6.1	6.4	5.8	5.8	5.8	5.7	5.2	5.4
13	6.9	6.3	6.1	5.8	6.0	6.4	5.8	6.1	5.8	5.6	5.2	5.5
14	10	6.2	6.1	5.8	5.9	9.2	5.8	7.7	5.8	5.5	5.2	5.4
15	7.2	6.2	6.1	7.2	5.9	24	5.8	6.2	5.8	5.4	5.2	5.4
16	6.9	6.1	6.1	24	5.9	7.8	5.7	6.1	5.8	5.5	5.1	5.4
17	6.8	6.1	6.1	10	6.0	6.7	5.7	6.1	5.8	5.4	5.2	13
18	6.8	6.1	6.1	7.6	5.9	6.3	5.7	6.1	5.8	5.5	5.2	5.7
19	6.6	6.1	6.1	30	5.9	6.1	5.7	6.1	5.8	5.4	5.2	5.5
20	6.6	6.1	6.1	14	5.9	5.9	5.6	6.1	5.9	5.4	5.3	14
21	6.6	6.1	5.9	8.2	5.9	5.7	5.6	6.0	5.8	5.5	5.2	7.3
22	6.5	6.1	5.9	7.1	5.8	5.7	5.6	6.1	5.7	5.5	5.2	5.9
23	6.4	6.1	5.9	6.7	5.8	5.6	5.7	7.0	5.6	5.4	5.2	5.8
24	7.3	6.1	5.9	6.7	5.8	6.3	6.1	6.1	5.6	5.4	5.3	5.9
25	6.7	6.1	5.9	6.4	12	5.9	6.1	6.1	5.6	5.4	5.2	6.3
26	6.6	6.1	5.9	6.4	7.5	6.2	5.8	5.9	5.6	5.3	5.0	5.7
27	6.5	6.1	5.9	6.3	7.4	15	5.7	5.9	5.8	7.9	5.1	5.6
28	6.4	6.1	5.9	6.1	9.8	6.9	5.8	5.9	5.6	5.9	5.4	5.6
29	6.6	6.1	5.9	6.1	---	6.3	5.8	5.9	5.7	5.5	5.4	5.5
30	6.4	6.1	6.0	5.9	---	6.0	5.7	5.9	5.7	5.5	5.4	7.6
31	6.4	---	5.9	5.9	---	5.8	---	5.9	---	6.1	5.4	---
TOTAL	256.3	186.1	188.6	246.0	182.6	269.2	172.8	188.0	173.4	190.0	163.3	186.7
MEAN	8.27	6.20	6.08	7.94	6.52	8.68	5.76	6.06	5.78	6.13	5.27	6.22
MAX	43	6.4	7.6	30	12	27	6.1	7.7	5.9	20	5.5	14
MIN	6.4	6.1	5.9	5.7	5.8	5.6	5.6	5.8	5.6	5.3	5.0	5.4
AC-FT	508	369	374	488	362	534	343	373	344	377	324	370

CAL YR 1989 TOTAL 3154.4 MEAN 8.64 MAX 101 MIN 5.9 AC-FT 6260
WTR YR 1990 TOTAL 2403.0 MEAN 6.58 MAX 43 MIN 5.0 AC-FT 4770

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank 0.3 mi downstream from Waiekeke Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi².

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Waiahole tunnel diverts from two tributaries upstream for irrigation in vicinity of Waipahu. Recording rain gage located at station.

AVERAGE DISCHARGE.--30 years (water years 1961-90), 8.72 ft³/s (6,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft³/s, Feb. 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft³/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft³/s, Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1530	*920	*5.32	No other peak greater than base discharge.			
Minimum discharge, 2.4 ft ³ /s, Jan. 5-13.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	4.4	3.1	2.9	e12	e150	9.9	5.3	4.7	3.4	4.9	2.8
2	5.3	4.2	3.1	3.1	e20	e45	9.5	5.9	4.3	3.2	4.3	2.8
3	100	4.2	3.1	2.8	e15	e14	9.2	28	4.1	3.0	3.9	2.7
4	15	8.7	3.0	2.6	e11	e9.0	13	6.4	4.1	3.0	3.8	2.7
5	6.9	5.0	2.9	2.4	e18	e7.0	23	5.2	4.1	3.0	3.6	2.9
6	8.1	4.2	2.9	2.4	e12	e29	10	4.5	4.0	2.9	3.4	2.6
7	6.5	3.9	2.9	2.4	e9.0	e25	8.6	4.3	4.0	2.8	3.5	2.5
8	5.5	4.0	2.9	2.4	e7.0	e12	7.8	4.3	3.9	17	3.4	2.7
9	5.3	3.9	5.7	2.4	e6.0	e11	8.4	4.2	3.8	18	3.3	15
10	7.1	3.7	3.4	2.4	e5.9	e18	7.5	4.0	3.8	4.5	3.2	3.4
11	5.3	3.7	3.0	2.4	e5.4	e20	7.0	4.1	3.8	3.7	3.2	2.8
12	4.9	3.8	2.9	2.4	e5.2	e9.0	7.1	4.0	3.7	7.1	3.1	2.7
13	4.9	4.3	3.3	2.4	e5.0	e7.8	6.8	4.6	3.7	5.1	3.1	2.6
14	7.7	4.8	3.0	2.7	e4.8	35	6.2	36	3.6	3.9	3.7	2.7
15	8.5	5.8	2.9	14	e4.5	110	6.1	11	3.6	3.6	3.9	2.6
16	5.7	4.1	2.9	97	e4.4	23	5.9	6.4	3.7	3.4	3.1	2.5
17	5.1	3.9	2.9	79	e8.0	16	5.7	7.0	3.9	3.5	3.0	5.8
18	5.5	3.6	2.9	e28	e5.6	13	5.4	5.7	3.6	8.1	2.9	4.0
19	7.2	3.5	3.0	e130	e4.5	12	5.1	5.7	3.7	4.2	3.6	2.8
20	9.2	3.5	3.1	e60	e4.2	11	5.0	5.8	5.0	3.7	5.0	65
21	7.3	3.5	2.9	e22	e3.9	9.5	4.9	4.9	5.8	4.6	4.1	33
22	5.4	3.4	2.9	e11	e3.8	9.0	4.8	5.9	3.8	4.7	3.5	5.9
23	4.9	3.2	2.9	e10	e3.6	8.1	4.7	27	3.4	3.8	3.2	5.0
24	7.3	3.2	2.7	e9.4	e3.5	16	6.1	7.0	3.3	4.3	5.8	4.4
25	9.7	3.3	2.7	e9.0	e15	12	5.5	5.8	4.1	4.0	3.6	5.6
26	5.7	3.3	5.7	e25	e10	18	4.8	5.2	3.4	3.5	3.5	4.2
27	5.1	3.2	3.4	e10	e8.4	83	4.5	5.0	5.7	7.5	3.2	4.4
28	5.1	3.1	3.2	e9.0	e60	25	4.6	4.9	3.9	5.0	3.0	3.8
29	5.3	3.1	3.0	e7.5	---	16	4.5	4.7	3.6	5.0	3.0	3.3
30	4.7	3.1	2.9	e6.6	---	13	4.4	4.8	3.6	4.3	2.9	4.3
31	4.5	---	3.1	e6.0	---	11	---	4.6	---	14	3.3	---
TOTAL	300.7	119.6	98.3	569.2	275.7	797.4	216.0	242.2	119.7	167.8	111.0	207.5
MEAN	9.70	3.99	3.17	18.4	9.85	25.7	7.20	7.81	3.99	5.41	3.58	6.92
MAX	100	8.7	5.7	130	60	150	23	36	5.8	18	5.8	65
MIN	4.5	3.1	2.7	2.4	3.5	7.0	4.4	4.0	3.3	2.8	2.9	2.5
AC-FT	596	237	195	1130	547	1580	428	480	237	333	220	412

CAL YR 1989 TOTAL 3884.4 MEAN 10.6 MAX 200 MIN 2.7 AC-FT 7700
WTR YR 1990 TOTAL 3225.1 MEAN 8.84 MAX 150 MIN 2.4 AC-FT 6400

e Estimated

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft upstream from Kawa Stream, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi².

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

REVISED RECORDS.--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft, from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--31 years (water years 1960-90), 37.1 ft³/s (26,880 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1700	2,040	5.28	Sep. 21	0500	1,930	5.16
Sep. 20	1830	*2,570	*5.83				

Minimum discharge, 17 ft³/s, several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	23	21	20	39	276	26	29	25	21	36	21
2	31	22	21	19	64	81	25	29	25	21	31	22
3	235	21	21	18	63	48	27	73	24	20	28	21
4	61	80	20	18	46	39	24	29	23	19	27	21
5	43	41	20	18	54	34	110	27	23	20	25	27
6	30	31	19	17	50	115	35	25	23	19	23	22
7	29	28	19	17	36	92	30	24	23	19	23	21
8	26	31	19	17	31	53	28	24	22	47	22	23
9	24	30	31	17	29	53	32	23	22	96	21	102
10	30	27	21	17	29	80	26	22	22	31	21	27
11	24	26	20	17	27	87	25	23	21	24	20	23
12	24	25	19	17	25	46	25	22	21	42	21	22
13	22	26	20	17	24	39	24	23	21	31	21	23
14	26	26	19	17	23	70	23	119	21	27	21	26
15	42	35	19	88	23	163	22	44	21	82	29	20
16	25	26	19	166	22	49	22	30	22	30	21	19
17	22	24	18	106	29	39	21	34	25	25	20	56
18	25	24	18	48	24	34	e21	27	21	58	19	28
19	29	24	18	228	22	31	e21	26	20	27	23	24
20	40	23	18	98	21	28	e20	25	32	24	33	359
21	46	23	18	49	20	26	20	24	34	34	23	231
22	27	23	18	38	20	25	20	25	24	29	21	52
23	26	23	18	32	19	24	20	83	22	25	20	42
24	e90	22	17	31	19	28	78	35	22	28	47	41
25	57	22	17	29	76	32	122	32	27	25	29	37
26	32	22	30	80	42	25	40	29	22	23	28	33
27	28	22	20	49	32	73	29	27	28	68	25	35
28	29	21	20	33	66	46	27	27	23	38	22	34
29	33	21	19	30	---	36	25	26	22	34	22	38
30	25	21	18	26	---	28	24	27	22	32	21	54
31	24	---	24	25	---	26	---	25	---	53	21	---
TOTAL	1275	813	619	1402	975	1826	992	1038	703	1072	764	1504
MEAN	41.1	27.1	20.0	45.2	34.8	58.9	33.1	33.5	23.4	34.6	24.6	50.1
MAX	235	80	31	228	76	276	122	119	34	96	47	359
MIN	22	21	17	17	19	24	20	22	20	19	19	19
AC-FT	2530	1610	1230	2780	1930	3620	1970	2060	1390	2130	1520	2980

CAL YR 1989 TOTAL 18420 MEAN 50.5 MAX 557 MIN 17 AC-FT 36540
WTR YR 1990 TOTAL 12983 MEAN 35.6 MAX 359 MIN 17 AC-FT 25750

e Estimated

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft downstream from intake, 1.5 mi west of Kahana, and 1.7 mi southwest of Punaluu.

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

REVISED RECORDS.--WSP 1719: 1954-55.

GAGE.--Water-stage recorder. Elevation of gage is 200 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--37 years, 7.38 ft³/s (5,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft³/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft³/s, Mar. 1; minimum daily, 0.10 ft³/s, Oct. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	18	8.1	10	4.1	7.4	7.9	8.4	4.5	4.0	11	13
2	13	15	12	9.1	6.6	16	7.5	6.7	3.9	9.3	8.9	9.9
3	7.4	12	13	8.3	9.9	10	6.6	12	4.2	8.9	7.9	11
4	14	14	10	7.8	5.8	8.1	5.9	8.2	9.1	7.5	6.2	9.9
5	13	11	8.6	7.3	5.2	7.0	7.7	6.2	11	6.5	10	7.5
6	9.9	16	7.8	7.0	4.3	6.8	16	5.0	7.8	6.2	13	6.5
7	16	11	10	5.3	6.4	6.4	14	4.2	5.9	6.0	13	8.9
8	16	8.7	14	7.9	14	9.8	12	12	5.0	10	13	12
9	12	7.9	9.6	8.1	16	6.9	9.4	13	9.0	11	11	5.5
10	7.7	7.4	12	5.5	14	8.6	7.8	11	13	11	6.8	9.7
11	5.0	7.0	7.6	4.2	12	13	13	14	11	9.6	7.4	12
12	4.6	13	6.0	9.6	9.6	13	14	9.2	12	8.1	11	12
13	4.1	14	5.0	11	8.5	8.6	11	7.1	11	6.7	11	8.6
14	3.9	11	4.8	8.1	7.4	6.7	9.6	8.7	8.0	6.0	8.1	6.6
15	7.7	8.0	4.5	8.9	7.0	3.7	8.6	13	6.7	5.2	11	11
16	14	5.9	4.4	12	6.4	11	8.3	9.6	6.0	8.9	12	11
17	13	8.7	4.3	12	5.6	17	7.8	7.8	5.6	14	12	7.9
18	14	13	4.2	8.1	7.9	13	7.0	6.7	5.2	12	9.4	13
19	8.9	10	8.4	6.0	7.8	11	6.1	5.9	7.7	13	7.4	9.4
20	6.3	8.0	10	9.1	7.5	9.4	9.4	8.1	11	9.9	11	6.2
21	10	6.3	8.2	12	15	8.1	9.2	11	6.6	7.7	11	15
22	15	5.4	6.6	7.3	13	10	9.9	8.6	5.9	9.8	8.5	12
23	10	3.7	8.4	5.8	12	16	10	5.4	12	11	11	15
24	13	10	13	5.3	12	13	8.6	7.2	11	7.3	11	10
25	13	13	13	4.5	9.5	8.5	12	12	11	6.4	8.3	6.9
26	16	10	15	3.8	4.0	6.9	11	8.8	8.8	5.8	7.2	5.1
27	15	7.0	13	9.4	3.7	14	12	7.4	10	8.0	11	9.6
28	12	5.5	9.3	9.7	3.9	12	15	8.1	7.6	10	13	12
29	10	7.2	7.9	7.0	---	10	15	10	5.4	12	13	11
30	12	10	11	5.8	---	9.1	11	7.8	4.3	10	13	9.2
31	16	---	15	4.8	---	8.1	---	5.9	---	10	12	---
TOTAL	345.5	297.7	284.7	240.7	239.1	309.1	303.3	269.0	240.2	271.8	320.1	297.4
MEAN	11.1	9.92	9.18	7.76	8.54	9.97	10.1	8.68	8.01	8.77	10.3	9.91
MAX	16	18	15	12	16	17	16	14	13	14	13	15
MIN	3.9	3.7	4.2	3.8	3.7	3.7	5.9	4.2	3.9	4.0	6.2	5.1
AC-FT	685	590	565	477	474	613	602	534	476	539	635	590

CAL YR 1989 TOTAL 3888.33 MEAN 10.7 MAX 19 MIN .27 AC-FT 7710
WTR YR 1990 TOTAL 3418.6 MEAN 9.37 MAX 18 MIN 3.7 AC-FT 6780

HAWAII, ISLAND OF OAHU

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 west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi².

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

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

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 212 ft, from topographic map.

REMARKS.--Records good except for estimated discharges, which are fair. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--37 years, 17.8 ft³/s (12,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft³/s, July 17, 1974, gage height, 7.60 ft, from rating curve extended above 170 ft³/s on basis of slope-area measurements at gage heights 5.77 ft and 7.60 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 770 ft³/s, Oct 3, gage height, 3.12 ft; minimum, 1.40 ft³/s, Jan 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	6.6	10	10	20	e128	16	13	16	13	8.8	3.3
2	6.0	7.5	6.7	11	22	e39	16	16	16	7.7	10	8.0
3	108	8.7	5.3	11	20	e26	16	32	15	7.7	11	5.8
4	21	43	7.5	11	21	e23	17	15	11	9.2	12	6.4
5	19	17	8.9	11	24	e22	52	15	8.7	9.7	8.3	10
6	15	9.5	9.7	11	24	e56	11	16	11	10	5.2	10
7	7.7	12	7.4	12	18	e50	11	16	13	10	5.0	7.3
8	6.4	13	3.7	7.8	9.7	e29	11	9.4	14	8.1	5.3	4.8
9	8.9	15	16	7.8	7.3	e32	19	7.7	10	25	6.2	20
10	21	14	6.2	10	9.2	e45	16	8.8	5.9	10	7.9	7.6
11	15	13	10	11	11	e43	11	7.3	8.2	9.2	7.3	5.0
12	14	7.7	11	6.5	12	e23	9.7	11	6.8	11	4.7	4.9
13	15	7.2	13	5.5	12	21	11	13	7.7	12	6.7	8.7
14	17	11	12	8.7	13	47	13	25	11	12	9.1	11
15	21	18	12	56	13	96	14	13	12	30	6.7	5.9
16	7.7	15	12	63	14	29	14	14	13	11	5.0	4.9
17	7.0	12	12	44	15	16	14	16	14	5.7	5.2	21
18	6.9	6.9	12	23	12	16	15	16	14	10	7.3	5.0
19	11	9.7	8.6	96	9.7	17	15	16	11	7.0	10	7.9
20	14	11	6.7	44	12	18	12	14	11	8.8	9.4	83
21	9.8	13	8.7	23	4.5	18	11	11	14	12	7.2	18
22	4.9	14	10	22	6.4	15	10	14	12	9.6	8.3	10
23	13	15	8.2	20	7.3	8.7	10	28	7.0	7.5	6.2	7.2
24	27	8.9	4.8	19	7.4	14	28	17	7.7	11	14	15
25	18	6.4	7.6	19	36	18	22	8.7	7.6	12	9.8	16
26	9.0	8.5	9.3	23	26	21	12	11	9.2	12	10	15
27	9.2	12	7.8	16	28	29	10	13	11	22	5.9	9.6
28	11	13	11	13	46	23	6.8	12	11	12	4.5	6.7
29	14	11	12	15	---	19	6.8	9.2	12	7.8	3.6	7.0
30	9.9	8.0	9.0	15	---	17	9.7	12	13	8.8	3.7	21
31	5.4	---	8.6	16	---	17	---	15	---	15	4.3	---
TOTAL	495.8	367.6	287.7	661.3	460.5	975.7	440.0	445.1	333.8	356.8	228.6	366.0
MEAN	16.0	12.3	9.28	21.3	16.4	31.5	14.7	14.4	11.1	11.5	7.37	12.2
MAX	108	43	16	96	46	128	52	32	16	30	14	83
MIN	4.9	6.4	3.7	5.5	4.5	8.7	6.8	7.3	5.9	5.7	3.6	3.3
AC-FT	983	729	571	1310	913	1940	873	883	662	708	453	726

CAL YR 1989 TOTAL 7745.5 MEAN 21.2 MAX 322 MIN 3.7 AC-FT 15360
WTR YR 1990 TOTAL 5418.9 MEAN 14.8 MAX 128 MIN 3.3 AC-FT 10750

e Estimated

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank 0.8 mi downstream from Sacred Falls, 1.6 mi west of Punaluu Beach Park, and 1.7 mi south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi².

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 110 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--23 years, 4.39 ft³/s (3,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft³/s, Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft³/s on basis of slope-area measurements at gage heights 8.85 ft and 10.0 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum(*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2015	*264	*7.57				

Minimum discharge, No flow, Dec. 22-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	.75	.11	2.1	7.1	69	1.2	2.8	1.7	1.3	4.3	.47
2	.82	.63	.06	1.5	17	8.6	1.2	6.1	1.6	1.6	3.1	.50
3	32	.55	.05	.99	12	4.0	2.5	17	.94	1.1	1.5	.41
4	5.4	17	.04	.53	5.7	3.0	.94	1.2	.79	1.0	1.8	.35
5	11	3.7	.03	.36	15	2.3	12	.77	.73	.94	1.3	4.5
6	2.4	1.2	.02	.32	6.8	43	1.6	.57	1.0	.78	1.1	1.0
7	1.2	.85	.02	.21	3.6	17	.98	2.0	.80	.60	1.0	.85
8	1.1	.89	.01	.12	2.4	12	.80	1.5	.62	8.3	1.7	1.6
9	1.0	2.3	11	.12	1.6	8.9	9.5	1.8	.54	17	.92	23
10	7.2	.69	.79	.13	1.5	16	1.2	.67	.48	5.9	.81	1.8
11	1.4	.45	.22	.07	1.9	8.9	.82	.78	.42	1.7	.62	.78
12	.79	.38	.11	.05	1.4	3.7	1.1	1.6	.40	7.2	.65	.58
13	.87	.41	2.9	.03	.98	4.0	1.4	5.2	.31	3.6	.68	2.1
14	7.5	2.5	.32	.03	.83	28	.63	22	2.7	1.7	1.9	.71
15	13	18	.12	25	.68	46	.51	8.9	.77	2.3	3.9	.45
16	2.2	1.6	.06	36	.65	5.0	.43	3.6	4.3	1.6	.89	.47
17	.95	.63	.05	24	12	3.1	.37	6.5	4.4	4.1	.64	8.8
18	4.1	.40	.04	14	1.9	2.3	.32	2.3	1.2	8.1	.47	1.6
19	4.9	.31	.02	43	1.6	1.8	.29	4.3	1.4	2.1	3.1	2.3
20	4.9	.31	.02	12	2.6	2.2	.28	2.4	7.1	1.4	8.2	38
21	4.1	.24	.02	4.2	.96	1.4	.50	2.1	5.3	7.7	4.0	7.2
22	1.5	.19	.01	6.7	.61	1.1	.58	5.0	1.5	5.2	1.2	1.8
23	7.0	.16	.00	3.3	.49	.93	.33	16	1.1	2.1	.79	2.2
24	15	.14	.00	4.2	.41	1.8	6.3	2.5	1.6	9.3	13	6.1
25	10	.13	.00	2.1	35	5.0	5.8	2.1	3.6	2.8	2.1	4.4
26	2.7	.11	.22	7.8	14	9.8	.93	1.7	1.4	1.4	1.8	1.3
27	1.3	.10	.51	4.5	19	22	.53	1.3	14	14	1.1	1.8
28	1.1	.09	4.2	2.3	34	17	.39	1.1	2.5	4.9	.92	1.2
29	9.8	.07	.33	3.0	---	3.1	.37	.94	1.7	3.5	.72	.89
30	1.2	.15	.68	1.9	---	1.8	.28	1.7	1.8	2.9	.60	7.2
31	.90	---	5.8	1.6	---	1.4	---	1.5	---	8.4	.56	---
TOTAL	163.93	54.93	27.76	202.16	201.71	354.13	54.08	127.93	66.70	134.52	65.37	124.36
MEAN	5.29	1.83	.90	6.52	7.20	11.4	1.80	4.13	2.22	4.34	2.11	4.15
MAX	32	18	11	43	35	69	12	22	14	17	13	38
MIN	.79	.07	.00	.03	.41	.93	.28	.57	.31	.60	.47	.35
AC-FT	325	109	55	401	400	702	107	254	132	267	130	247

CAL YR 1989 TOTAL 2026.70 MEAN 5.55 MAX 108 MIN .00 AC-FT 4020
WTR YR 1990 TOTAL 1577.58 MEAN 4.32 MAX 69 MIN .00 AC-FT 3130

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank 75 ft upstream from Pupukea Military Road and 3.5 mi southeast of Maunawai.

DRAINAGE AREA.--3.13 mi².

PERIOD OF RECORD.--June 1963 to current year. Occasional low-flow measurements, water years 1961 and 1963.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Elevation of gage is 590 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--27 years, 10.6 ft³/s (7,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s, Jan. 30, 1975, gage height, 10.06 ft, from rating curve extended above 42 ft³/s on basis of slope-area measurement at gage height 10.06 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 1	1400	*1,240	*7.82	Mar. 6	1730	1,000	7.39

Minimum discharge, 0.24 ft³/s, Jan. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.8	.63	8.4	13	241	6.6	1.7	2.3	1.5	3.2	1.0
2	2.0	1.9	.51	2.3	36	49	6.2	1.9	2.3	1.6	2.7	.93
3	29	1.1	.47	1.8	33	20	6.7	16	2.1	1.6	2.2	.88
4	22	1.1	.47	1.4	24	11	5.5	3.9	1.9	1.3	2.0	.86
5	12	17	.47	1.1	23	8.2	15	2.0	1.9	1.2	1.9	1.0
6	17	2.2	.47	.81	20	181	7.0	1.7	1.9	1.2	1.8	1.2
7	5.0	1.7	.48	.65	12	73	4.9	3.0	1.8	1.1	1.6	1.3
8	2.8	1.2	.52	.53	8.2	58	4.5	7.7	1.7	1.1	1.6	1.8
9	2.3	1.3	23	.55	6.1	39	6.5	4.1	1.6	56	1.6	9.3
10	19	1.5	6.8	.59	5.6	29	4.8	1.9	1.5	10	1.5	4.1
11	12	.92	1.5	.53	5.6	32	3.9	1.7	1.5	5.9	1.4	1.6
12	4.1	.79	1.2	.38	4.6	17	3.6	4.4	1.4	8.0	1.5	1.1
13	2.4	.77	2.2	.30	3.7	13	3.4	3.0	1.4	7.9	1.6	1.8
14	10	.76	2.2	.27	3.0	47	3.3	44	1.6	3.1	1.5	2.6
15	5.5	14	1.1	16	2.6	165	3.1	20	1.8	2.5	2.1	1.3
16	2.3	7.5	.87	157	2.3	30	3.0	7.7	9.0	3.5	2.1	1.1
17	1.7	1.5	.77	69	12	20	2.9	22	14	1.9	1.4	11
18	1.7	1.0	.71	27	12	16	2.8	8.2	5.1	11	1.2	6.7
19	3.2	.90	.66	68	3.6	13	2.7	10	2.4	5.8	1.4	2.1
20	7.7	1.2	.67	33	3.0	12	2.5	12	4.4	2.4	8.7	26
21	15	1.2	.70	16	2.6	11	2.5	5.6	5.3	1.9	5.5	17
22	4.2	.80	.64	14	1.9	8.8	2.4	4.4	3.1	3.6	2.4	3.9
23	9.1	.68	.57	9.0	1.7	7.8	2.3	24	1.8	2.2	1.5	2.7
24	8.4	.63	.55	7.8	1.5	7.2	2.5	9.1	1.6	9.7	7.0	7.2
25	21	.62	.52	7.3	39	12	5.5	4.9	8.8	11	4.0	4.0
26	7.6	.59	.52	6.0	32	7.2	2.8	3.9	3.6	2.7	2.5	2.2
27	4.8	.58	.58	16	26	48	1.9	3.3	2.3	12	1.9	1.8
28	3.6	.62	.61	8.1	53	56	1.7	2.9	2.6	13	1.3	1.6
29	6.9	.57	1.1	5.7	---	15	1.7	2.6	1.7	9.5	1.1	1.4
30	6.3	.70	1.5	5.6	---	9.0	1.6	2.5	1.6	3.7	1.0	1.4
31	3.3	---	13	3.2	---	7.6	---	2.3	---	3.3	1.0	---
TOTAL	253.9	68.13	65.99	488.31	391.0	1263.8	123.8	242.4	94.0	201.2	72.2	120.87
MEAN	8.19	2.27	2.13	15.8	14.0	40.8	4.13	7.82	3.13	6.49	2.33	4.03
MAX	29	17	23	157	53	241	15	44	14	56	8.7	26
MIN	1.7	.57	.47	.27	1.5	7.2	1.6	1.7	1.4	1.1	1.0	.86
AC-FT	504	135	131	969	776	2510	246	481	186	399	143	240

CAL YR 1989 TOTAL 4966.32 MEAN 13.6 MAX 352 MIN .47 AC-FT 9850
WTR YR 1990 TOTAL 3385.60 MEAN 9.28 MAX 241 MIN .27 AC-FT 6720

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waiialua School, and 7.3 mi southwest of Kahuku School.

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

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

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

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map. Prior to May 13, 1965, at datum 2.00 ft higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft higher.

REMARKS.--Records fair. Small diversion upstream.

AVERAGE DISCHARGE.--32 years, 18.5 ft³/s (13,400 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 16	1530	2,660	7.10	Mar. 6	2100	3,100	7.56
Mar. 1	1500	*3,200	*7.66				

Minimum discharge, no flow, Sept. 4, 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	1.7	.48	8.4	7.6	877	e7.5	2.0	3.0	1.7	4.5	.02
2	54	1.5	.37	3.4	41	168	e6.4	2.2	2.9	1.5	3.4	.02
3	65	1.9	.32	1.9	43	47	e6.8	18	2.7	1.4	3.1	.01
4	8.9	15	.28	1.4	42	e15	e6.0	7.6	2.4	1.2	2.4	.01
5	34	4.9	.25	1.1	27	e9.0	17	3.4	2.3	1.0	2.3	.00
6	7.1	3.0	.23	.69	21	653	14	2.5	2.2	.84	2.1	.01
7	3.7	2.3	.17	.42	12	309	e5.2	3.0	2.1	.68	1.7	.02
8	3.1	2.2	39	.31	8.2	153	e4.6	8.0	1.9	.56	1.5	.04
9	37	2.2	11	.23	6.1	83	e4.7	6.7	1.6	102	1.0	e10
10	27	1.9	3.3	.17	5.7	48	e4.9	2.9	1.5	13	.68	e4.5
11	7.1	1.3	1.5	.13	5.8	49	e4.3	2.4	1.4	10	.55	e1.7
12	3.8	1.2	.97	.13	5.5	e20	e4.1	4.5	1.3	6.3	.57	e1.2
13	7.5	1.1	e3.0	.10	4.4	e13	e4.0	4.0	1.2	12	.65	e1.1
14	9.8	10	e2.0	.09	3.8	48	3.9	86	1.5	5.5	.62	2.3
15	3.8	11	1.4	11	3.3	464	3.6	38	2.0	3.7	.60	1.8
16	2.5	3.9	.72	499	3.0	55	3.4	14	7.1	4.2	.87	1.0
17	2.1	2.0	.46	243	6.0	31	3.1	42	18	2.7	.09	7.6
18	3.1	1.4	.30	46	13	23	3.0	17	7.9	8.6	.05	12
19	5.4	1.3	.22	178	4.8	e19	2.9	11	4.0	10	.03	3.4
20	13	1.5	.17	85	3.6	e17	2.7	29	3.6	4.2	3.2	38
21	5.5	1.2	.14	23	3.2	e12	2.6	10	6.8	2.7	3.0	42
22	5.1	.91	.12	19	2.5	e9.4	2.6	7.2	4.5	3.9	1.0	7.3
23	5.5	.79	.11	12	2.2	e8.2	2.4	42	2.8	3.0	.18	3.8
24	23	.68	.06	8.7	2.0	e7.6	2.5	20	2.1	5.7	1.9	11
25	8.1	.57	.04	8.3	95	e14	4.7	8.9	7.0	20	3.5	7.1
26	4.1	.51	.03	6.1	78	e7.8	4.5	6.1	6.3	5.0	.65	3.4
27	2.8	.48	.02	13	38	82	2.7	4.8	2.9	9.2	.34	2.3
28	2.8	.48	.02	7.8	142	122	2.3	4.1	4.0	24	.11	1.7
29	4.6	.50	.02	5.8	---	26	2.1	3.6	2.7	13	.04	1.4
30	2.7	.54	.60	5.6	---	15	1.9	3.2	2.2	6.6	.02	1.2
31	2.0	---	5.5	4.2	---	e9.0	---	3.1	---	4.2	.02	---
TOTAL	367.1	77.96	72.80	1193.97	629.7	3414.0	140.4	417.2	111.9	288.38	40.67	165.93
MEAN	11.8	2.60	2.35	38.5	22.5	110	4.68	13.5	3.73	9.30	1.31	5.53
MAX	65	15	39	499	142	877	17	86	18	102	4.5	42
MIN	2.0	.48	.02	.09	2.0	7.6	1.9	2.0	1.2	.56	.02	.00
AC-FT	728	155	144	2370	1250	6770	278	828	222	572	81	329

CAL YR 1989 TOTAL 13570.66 MEAN 37.2 MAX 1350 MIN .02 AC-FT 26920
WTR YR 1990 TOTAL 6920.01 MEAN 19.0 MAX 877 MIN .00 AC-FT 13730

e Estimated

HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 200600000, on left bank 4.3 mi northeast of Leilehua High School in Wahiawa and 8.1 mi east of Waiialua School.

DRAINAGE AREA.--2.98 mi².

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--31 years, 13.9 ft³/s (10,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft³/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft³/s on basis of slope-area measurements at gage heights 6.74 ft and 10.12 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 16	1600	*2,010	*7.66	Mar. 9	2030	1,870	7.46

Minimum discharge, 0.13 ft³/s, Dec. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	2.4	.58	8.7	19	256	4.6	1.1	3.5	4.6	6.6	1.3
2	4.7	2.2	.58	4.0	34	26	4.4	8.9	4.6	3.7	9.1	1.2
3	81	2.0	.54	3.0	34	9.0	6.6	67	3.6	4.0	4.6	1.0
4	41	29	.45	2.0	27	6.0	4.7	7.8	2.5	2.6	3.6	1.0
5	7.2	37	.40	1.5	19	5.0	57	4.0	2.4	2.2	3.8	2.9
6	13	4.8	.37	.95	38	257	9.4	3.4	2.4	2.0	3.2	5.9
7	4.0	3.9	.34	.61	11	67	4.8	3.4	2.4	1.7	2.8	3.5
8	3.2	3.0	.32	.49	6.5	60	3.8	5.6	2.2	1.4	2.7	2.6
9	3.0	8.7	.23	.50	5.3	26	15	5.7	1.8	34	3.4	65
10	78	5.0	7.3	.40	5.0	43	6.1	3.8	1.6	9.1	2.4	9.4
11	15	2.5	2.4	.34	4.9	32	3.6	2.4	1.4	8.9	2.1	3.4
12	4.9	1.9	1.3	.41	5.3	12	3.0	7.5	1.3	7.1	1.9	2.2
13	3.4	1.7	1.5	.34	3.8	8.6	2.6	7.2	1.3	11	1.9	4.5
14	13	1.5	4.0	.27	3.1	80	2.4	78	1.2	5.8	1.8	5.0
15	6.7	11	1.7	86	2.7	118	2.2	32	3.7	7.9	4.9	2.4
16	4.5	7.4	.95	270	2.4	13	2.0	9.7	7.4	8.3	4.3	1.8
17	3.3	2.9	.64	180	16	8.6	1.9	20	21	4.3	2.2	19
18	2.3	1.7	.47	50	11	6.9	1.8	9.8	6.8	26	1.7	9.4
19	4.6	1.4	.39	125	4.6	6.0	1.7	8.0	4.0	9.6	1.5	3.4
20	15	1.4	.37	38	4.5	5.6	1.6	12	9.8	4.8	17	65
21	16	1.3	.35	13	5.3	4.9	1.5	6.6	15	6.1	9.8	31
22	5.0	1.1	.30	8.0	2.8	4.3	1.6	5.6	6.9	12	4.3	6.6
23	9.5	.93	.26	9.2	2.1	3.9	1.6	58	3.5	5.4	2.4	4.2
24	28	.82	.23	6.0	1.9	3.6	3.0	11	2.9	9.0	23	16
25	39	.74	.20	7.4	55	6.6	11	5.9	10	16	8.8	10
26	8.2	.66	.17	9.5	30	7.2	4.4	5.8	7.3	4.8	5.2	5.5
27	5.1	.61	.16	18	26	106	2.2	4.5	5.5	48	3.7	4.0
28	3.6	.61	.14	7.4	51	41	1.6	3.7	6.6	25	2.5	4.9
29	8.2	.58	.66	5.2	---	13	1.3	3.1	4.3	7.5	1.9	2.9
30	5.9	.58	1.5	6.7	---	6.9	1.2	2.9	4.3	5.7	1.6	16
31	3.0	---	2.9	4.7	---	5.4	---	3.7	---	18	1.4	---
TOTAL	447.4	139.33	54.47	867.61	431.2	1248.5	168.6	408.1	151.2	316.5	146.1	311.0
MEAN	14.4	4.64	1.76	28.0	15.4	40.3	5.62	13.2	5.04	10.2	4.71	10.4
MAX	81	37	23	270	55	257	57	78	21	48	23	65
MIN	2.3	.58	.14	.27	1.9	3.6	1.2	1.1	1.2	1.4	1.4	1.0
AC-FT	887	276	108	1720	855	2480	334	809	300	628	290	617

CAL YR 1989 TOTAL 7034.79 MEAN 19.3 MAX 603 MIN .14 AC-FT 13950
WTR YR 1990 TOTAL 4690.01 MEAN 12.8 MAX 270 MIN .14 AC-FT 9300

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 downstream from Hipuapua Stream and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi².

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map. Prior to June 25, 1923, at site 350 ft 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 higher.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--66 years (water years 1918-31, 1939-90), 29.6 ft³/s (21,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s, Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s, about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 16	1430	*2,120	*8.60	No other peak greater than base discharge.			
Minimum discharge, 3.0 ft ³ /s, Oct. 9.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	7.1	7.9	50	50	482	6.9	6.9	18	6.7	17	4.8
2	30	6.2	3.9	45	25	64	17	22	14	17	13	4.7
3	27	5.7	5.8	11	52	27	48	106	6.4	6.4	19	8.2
4	11	5.7	8.6	13	19	28	19	8.1	5.8	7.1	30	8.8
5	20	5.2	3.8	12	22	26	52	36	7.3	8.7	24	23
6	12	4.7	3.2	7.3	18	83	8.7	28	22	5.0	9.3	6.8
7	23	4.5	5.3	5.6	17	140	6.1	44	7.9	4.3	29	19
8	54	4.7	3.8	5.1	8.6	51	6.1	110	5.9	88	9.6	46
9	88	225	164	14	7.5	27	6.2	11	9.4	24	7.1	66
10	19	41	15	7.7	14	17	5.2	6.7	8.1	30	6.1	17
11	9.0	8.4	6.1	5.1	13	17	4.2	25	7.3	8.0	5.4	9.7
12	7.2	7.0	26	5.7	9.6	18	3.9	8.6	5.3	27	5.5	11
13	6.4	10	147	13	6.8	12	3.7	37	4.4	11	11	25
14	5.8	6.4	10	5.3	6.1	10	4.0	79	4.8	20	31	7.7
15	104	18	6.2	204	5.3	144	4.2	24	51	40	29	17
16	42	16	5.2	254	4.9	15	3.5	9.8	77	16	17	8.5
17	7.7	6.9	4.8	277	32	9.8	3.2	69	40	16	6.5	93
18	14	5.5	4.4	74	21	8.7	3.0	11	13	59	9.6	19
19	83	5.3	4.2	416	7.9	7.7	5.8	40	28	17	44	12
20	34	5.1	50	78	16	32	7.2	30	39	39	37	64
21	27	4.7	33	29	5.7	19	7.7	55	16	49	16	46
22	15	4.5	9.1	147	4.7	16	7.1	11	27	16	7.4	9.5
23	63	4.3	5.7	69	4.3	7.0	6.6	41	28	15	5.8	17
24	137	4.1	4.9	21	4.3	6.2	41	59	13	21	32	72
25	55	4.2	4.8	15	430	8.2	47	28	10	20	14	9.7
26	28	4.2	4.9	19	248	5.7	8.0	16	9.8	8.5	41	7.2
27	12	4.1	5.2	18	162	5.1	5.1	11	18	54	35	18
28	31	3.6	8.9	20	373	7.6	4.0	8.3	7.5	58	26	7.1
29	37	3.4	4.7	16	---	5.7	3.5	7.4	50	29	7.4	5.7
30	11	6.6	4.0	11	---	8.1	3.2	25	10	18	5.9	40
31	8.0	---	71	9.9	---	5.8	---	8.6	---	47	5.3	---
TOTAL	1080.1	442.1	641.4	1877.7	1587.7	1313.6	351.1	982.4	563.9	785.7	555.9	703.4
MEAN	34.8	14.7	20.7	60.6	56.7	42.4	11.7	31.7	18.8	25.3	17.9	23.4
MAX	137	225	164	416	430	482	52	110	77	88	44	93
MIN	5.8	3.4	3.2	5.1	4.3	5.1	3.0	6.7	4.4	4.3	5.3	4.7
AC-FT	2140	877	1270	3720	3150	2610	696	1950	1120	1560	1100	1400

CAL YR 1989 TOTAL 14713.9 MEAN 40.3 MAX 757 MIN 3.2 AC-FT 29190
WTR YR 1990 TOTAL 10885.0 MEAN 29.8 MAX 482 MIN 3.0 AC-FT 21590

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT												
24...	1330	116	30	6.4	24.0	21.5	16	759	8.2	93	1700	1800
DEC												
05...	1200	3.8	56	6.7	23.5	20.0	3.4	757	7.8	86	280	130
JAN												
23...	1230	60	36	6.7	22.0	19.5	12	752	8.8	97	440	1300
APR												
24...	1200	52	52	6.9	24.5	20.0	2.9	757	8.6	95	550	2200
JUL												
17...	1100	8.5	46	7.0	25.5	23.0	5.0	758	8.2	96	72	600

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 WATER DIS IT MG/L AS HCO3	CAR- BONATE WATER DIS IT MG/L AS CO3	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3
OCT											
24...	4	2	0.54	0.66	4.0	66	0.9	0.40	3	0	3
DEC											
05...	8	1	1.3	1.2	7.0	63	1	0.60	9	0	7
JAN											
23...	5	3	0.80	0.76	4.8	64	0.9	0.50	3	0	3
APR											
24...	8	3	1.1	1.2	7.1	65	1	0.50	6	0	5
JUL											
17...	7	1	1.0	0.99	6.2	65	1	0.50	7	0	6

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED PER AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
24...	<1.0	6.4	<0.10	2.2	20	--	--	<0.100	0.020	0.020	0.50
DEC											
05...	2.0	11	<0.10	8.8	43	36	0.06	<0.100	0.010	0.020	<0.20
JAN											
23...	2.0	7.4	<0.10	3.7	35	22	0.05	<0.100	0.030	0.020	0.30
APR											
24...	1.2	11	<0.10	6.7	30	32	0.04	<0.100	<0.010	0.010	0.40
JUL											
17...	1.5	12	<0.10	5.2	38	31	0.05	<0.100	0.040	0.050	0.30

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

HAWAII, ISLAND OF MOLOKAI

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16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
OCT 24...	0.100	<0.010	0.020	330	<1	4	<0.5	<1.0	<1	<3	1	470
DEC 05...	0.060	0.040	0.020	--	--	--	--	--	--	--	--	--
JAN 23...	0.040	0.020	0.020	250	<1	7	0.6	1.0	<1	<3	<10	230
APR 24...	0.030	0.010	<0.010	50	<1	7	<0.5	<1.0	<1	<3	1	58
JUL 17...	0.020	<0.010	<0.010	100	<1	6	<0.5	1.0	<1	<3	1	160

DATE	TIME	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 24...	1330	<1	<4	3	<0.1	<10	1	<1	<1.0	9	<6	12
JAN 23...	1230	<10	<4	3	0.3	<10	<10	<1	1.0	10	<6	<3
APR 24...	1200	<1	<4	4	<0.1	<10	1	<1	<1.0	16	<6	<3
JUL 17...	1100	<1	<4	4	<0.1	<10	<1	<1	<1.0	16	<6	6

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 24...	1330	16	5.0	93	APR 24...	1200	13	1.8	98
DEC 05...	1200	5	0.05	100	JUL 17...	1100	3	0.07	100
JAN 23...	1230	10	1.6	100					

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

16404200 PILIPILILAU STREAM NEAR PELEKUNU

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

DRAINAGE AREA.--0.49 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--22 years, 1.63 ft³/s (1,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft³/s, Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft³/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft³/s, Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 17	1230	*360	*3.66	No other peak greater than base discharge.			

Minimum discharge, 0.72 ft³/s, Sept. 24, 25, 27-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.94	.89	.84	1.9	2.9	17	2.2	1.4	1.5	1.3	.89	.80
2	.94	.84	.80	1.7	3.4	6.1	2.2	1.5	1.4	1.3	.89	.80
3	.99	.84	.84	1.1	4.5	4.5	2.2	4.1	1.3	1.2	.99	.80
4	1.1	.84	.80	1.1	3.0	3.8	2.1	1.8	1.3	1.2	.94	.76
5	.94	.84	.76	.99	2.5	3.7	2.1	3.4	1.4	1.2	.94	.84
6	1.6	.84	.76	.94	2.4	4.0	2.0	2.2	1.4	1.2	.99	.80
7	.99	.84	.76	.89	2.3	6.9	2.0	2.2	1.3	1.1	.99	.80
8	1.3	.84	.76	1.3	2.0	5.8	2.0	2.4	1.3	1.2	.89	.84
9	2.3	.80	10	1.6	2.0	3.8	2.1	1.9	1.3	1.2	.84	.94
10	1.1	.80	1.2	.99	2.0	3.4	2.0	1.6	1.2	1.2	.84	.80
11	.99	.80	.89	.94	2.0	3.1	2.0	1.7	1.2	1.1	.84	.80
12	.94	.80	2.5	.89	1.9	3.0	1.9	1.7	1.2	1.2	.84	.80
13	.94	.80	9.3	.89	1.9	2.9	1.9	2.4	1.2	1.1	.84	.80
14	.94	.80	1.9	.89	1.8	3.3	1.8	2.6	1.3	1.1	.84	.76
15	.94	1.2	1.3	4.3	1.7	9.8	1.8	1.9	1.6	1.1	.89	.76
16	.94	.94	1.1	28	1.7	3.5	1.7	1.7	4.2	1.0	.84	.84
17	.94	.84	.99	63	5.5	3.1	1.7	2.0	2.2	1.1	.84	1.3
18	.89	.80	.94	9.0	2.9	3.0	1.7	2.0	1.9	1.2	.94	.89
19	.99	.80	.94	9.8	2.3	2.9	1.8	2.7	2.1	1.0	.94	.84
20	.94	.80	1.9	6.3	2.9	3.1	1.7	2.4	1.6	.99	.89	.89
21	.94	.80	1.9	4.8	2.0	2.8	1.7	2.3	1.5	.94	.89	.84
22	.89	.80	1.2	4.8	1.9	2.6	1.7	1.9	1.5	.94	.84	.80
23	.94	.76	1.0	4.3	1.8	2.5	1.6	1.8	1.6	.89	.84	.80
24	.94	.76	.99	3.7	2.0	2.4	2.2	1.7	1.5	1.0	.89	.76
25	.94	.80	.94	3.1	15	2.4	1.7	1.6	1.4	.94	.84	.76
26	.89	.80	.94	3.3	8.6	2.3	1.6	1.6	1.3	.94	.94	.76
27	.89	.80	.89	3.1	5.4	2.3	1.6	1.6	1.3	1.3	.94	.76
28	.89	.80	.89	2.8	6.0	2.3	1.6	1.5	1.3	1.1	.89	.76
29	.94	.82	.89	2.6	---	2.2	1.6	1.5	1.4	1.0	.84	.76
30	.89	1.0	.84	2.4	---	2.2	1.5	1.4	1.2	.94	.84	.80
31	.89	---	1.5	2.4	---	2.2	---	1.4	---	.89	.80	---
TOTAL	31.69	25.09	51.26	173.82	94.3	122.9	55.7	61.9	45.9	33.87	27.45	24.66
MEAN	1.02	.84	1.65	5.61	3.37	3.96	1.86	2.00	1.53	1.09	.89	.82
MAX	2.3	1.2	10	63	15	17	2.2	4.1	4.2	1.3	.99	1.3
MIN	.89	.76	.76	.89	1.7	2.2	1.5	1.4	1.2	.89	.80	.76
AC-FT	63	50	102	345	187	244	110	123	91	67	54	49

CAL YR 1989 TOTAL 941.33 MEAN 2.58 MAX 152 MIN .76 AC-FT 1870
WTR YR 1990 TOTAL 748.54 MEAN 2.05 MAX 63 MIN .76 AC-FT 1480

HAWAII, ISLAND OF MOLOKAI

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16405100 MOLOKAI TUNNEL AT EAST PORTAL

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft, from tunnel plans.

REMARKS.--Records fair. 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 in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--24 years, 4.28 ft³/s (3,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft³/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 33 ft³/s, Mar. 1; minimum daily, 0.70 ft³/s, Jan. 24-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	5.3	18	21	33	5.0	3.8	5.1	3.7	e2.6	e3.7
2	1.6	1.5	3.5	11	21	17	4.5	3.9	6.1	5.7	e3.4	e3.6
3	1.6	1.5	3.3	1.1	26	6.7	8.3	20	4.4	3.9	e3.4	e3.7
4	3.8	1.5	3.6	.80	14	6.8	5.5	9.1	4.2	4.1	e3.7	e3.6
5	2.3	1.5	4.1	2.4	10	7.4	4.5	22	4.8	2.6	e3.6	e3.6
6	9.8	1.5	4.0	3.3	9.8	20	3.7	19	6.6	3.0	e3.6	e3.7
7	4.4	1.5	3.9	2.7	11	30	3.7	16	5.1	3.1	e4.9	e3.6
8	3.9	2.4	3.8	2.9	5.1	26	4.6	9.2	4.5	4.3	e4.5	e3.8
9	17	3.1	18	8.0	4.2	8.3	5.5	4.5	4.6	4.0	e4.0	e5.6
10	3.6	3.1	7.0	5.6	4.9	6.9	4.0	2.9	4.3	3.9	e3.8	e5.6
11	2.2	3.1	4.1	5.2	5.5	8.3	3.4	4.2	4.1	3.9	e3.7	e3.9
12	1.8	3.1	16	6.1	5.3	6.9	2.5	6.3	4.1	3.8	e3.8	e3.6
13	1.7	3.0	15	4.4	6.0	5.2	2.4	17	3.9	e3.9	e3.7	e3.6
14	1.6	3.0	1.4	4.0	5.8	6.8	2.3	17	5.0	e3.8	e3.6	e3.7
15	1.5	8.5	1.7	13	5.7	29	2.3	6.4	7.7	e3.8	e3.5	e3.5
16	1.5	7.0	2.7	26	5.5	8.7	2.8	5.6	32	e3.7	e4.2	e4.0
17	1.5	4.5	2.5	e22	17	4.7	3.1	12	16	e3.7	e3.9	e9.4
18	1.5	3.7	3.2	e14	17	4.0	3.1	8.3	12	e9.0	e3.8	e4.8
19	1.8	3.4	3.5	e12	8.9	4.7	3.2	19	16	3.9	e4.2	e4.3
20	3.6	3.6	11	e9.0	17	8.2	3.3	15	7.1	4.2	e4.5	e6.2
21	3.9	3.2	15	e1.9	5.0	8.0	3.4	12	6.2	4.5	e4.0	e4.5
22	2.1	3.1	4.4	e6.8	4.0	5.5	4.7	4.5	6.8	4.4	e3.8	e4.0
23	1.9	3.1	2.0	e2.0	3.6	5.4	4.0	5.1	12	4.0	e3.5	e3.8
24	4.4	3.1	1.6	e.70	3.6	5.2	11	3.8	7.8	4.6	e3.5	e4.0
25	5.4	3.1	1.5	e.70	30	5.1	6.6	3.6	6.8	5.8	e3.6	e3.8
26	2.8	3.1	1.5	e4.1	31	5.0	4.6	4.1	4.4	4.1	e5.0	e3.6
27	2.2	3.1	1.6	e15	26	5.9	4.1	4.1	3.7	17	e5.1	e3.5
28	1.9	3.0	2.3	e11	27	6.1	3.9	4.1	3.4	e5.2	e5.2	e3.6
29	1.7	3.0	4.7	e10	---	5.1	3.9	3.7	8.3	e6.6	e3.9	e3.5
30	1.7	5.1	3.9	e5.8	---	4.8	3.8	4.8	4.8	e3.2	e3.8	e3.4
31	1.8	---	9.3	7.5	---	6.2	---	4.6	---	e3.3	e3.7	---
TOTAL	98.1	95.0	165.4	237.00	350.9	310.9	127.7	275.6	221.8	144.7	121.5	125.2
MEAN	3.16	3.17	5.34	7.65	12.5	10.0	4.26	8.89	7.39	4.67	3.92	4.17
MAX	17	8.5	18	26	31	33	11	22	32	17	5.2	9.4
MIN	1.5	1.5	1.4	.70	3.6	4.0	2.3	2.9	3.4	2.6	2.6	3.4
AC-FT	195	188	328	470	696	617	253	547	440	287	241	248

CAL YR 1989 TOTAL 2181.9 MEAN 5.98 MAX 32 MIN 1.1 AC-FT 4330
WTR YR 1990 TOTAL 2273.80 MEAN 6.23 MAX 33 MIN .70 AC-FT 4510

e Estimated

16405300 MOLOKAI TUNNEL AT WEST PORTAL

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft, 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 in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--25 years, 6.80 ft³/s (4,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft³/s, Apr. 8, 9, 1986, Jan. 2, 26, 1988, and Mar. 3, 1989; minimum daily, 1.8 ft³/s, Oct. 15, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37 ft³/s, Mar. 1, June 16; minimum daily, 3.1 ft³/s, Jan. 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	4.5	8.0	22	26	37	8.4	7.1	8.0	6.9	4.6	6.6
2	5.2	4.5	6.1	17	24	22	7.9	7.3	10	8.4	6.2	6.5
3	5.2	4.5	5.6	4.0	33	10	11	23	7.9	7.0	6.1	6.6
4	7.3	4.3	5.8	3.2	19	10	9.3	12	7.6	6.7	6.8	6.4
5	6.1	4.3	6.5	4.8	14	9.8	8.1	27	8.0	6.5	6.5	6.4
6	13	4.3	6.5	5.8	13	24	7.2	23	10	6.3	6.5	6.5
7	9.0	4.3	6.5	5.3	15	34	7.2	21	8.8	6.2	8.8	6.4
8	6.2	4.7	6.4	4.8	7.7	32	8.0	13	7.8	6.3	8.3	6.7
9	23	5.6	21	12	6.9	13	9.3	8.3	7.9	7.4	7.1	10
10	7.2	5.4	12	9.0	7.2	11	7.4	6.4	7.5	6.9	6.8	10
11	5.6	5.4	7.2	7.7	8.6	12	7.0	7.1	7.2	7.7	6.7	6.9
12	5.2	5.4	19	9.9	7.7	11	5.8	9.2	7.1	7.3	6.7	6.5
13	4.9	5.2	21	7.4	9.3	8.5	5.6	20	6.9	7.6	6.6	6.4
14	4.9	5.2	4.0	6.9	8.6	9.3	5.4	22	8.0	7.0	6.4	6.5
15	4.9	9.6	4.4	15	8.6	34	5.4	10	8.3	6.8	6.2	6.3
16	4.9	9.6	5.6	32	8.6	12	5.8	9.0	37	6.7	7.5	7.2
17	4.9	7.2	5.4	28	19	7.2	6.2	16	22	6.7	7.0	17
18	4.9	6.1	5.9	18	21	6.6	6.2	11	15	11	6.7	8.6
19	5.2	6.1	6.2	16	12	6.9	6.4	22	21	6.9	7.4	7.8
20	7.2	6.1	13	11	21	9.2	6.6	19	11	7.2	8.2	11
21	7.4	6.1	21	4.6	8.3	11	6.6	16	9.7	7.4	7.1	8.3
22	5.6	5.8	8.2	9.5	6.9	8.8	8.1	7.7	10	7.3	6.7	7.0
23	5.4	5.8	4.7	4.7	6.4	8.8	7.4	8.0	15	6.9	6.3	6.8
24	7.4	5.8	4.5	3.1	6.1	8.6	14	6.9	12	6.7	6.2	7.1
25	8.9	5.8	4.3	3.1	32	8.6	12	6.9	11	8.6	6.4	6.8
26	5.8	5.8	4.3	6.8	35	8.4	8.4	6.9	7.4	7.2	9.0	6.5
27	5.2	5.8	4.3	18	29	9.1	7.8	7.2	6.9	18	9.2	6.3
28	4.7	5.6	4.9	14	31	9.3	7.6	7.2	6.4	9.6	9.2	6.4
29	4.7	5.6	7.7	13	---	8.6	7.6	6.9	11	12	7.1	6.2
30	4.7	6.9	6.9	8.5	---	8.0	7.4	8.0	8.3	5.7	6.7	6.1
31	4.9	---	12	11	---	9.2	---	8.1	---	5.8	6.6	---
TOTAL	204.7	171.3	258.9	336.1	444.9	417.9	231.1	383.2	324.7	238.7	217.6	223.8
MEAN	6.60	5.71	8.35	10.8	15.9	13.5	7.70	12.4	10.8	7.70	7.02	7.46
MAX	23	9.6	21	32	35	37	14	27	37	18	9.2	17
MIN	4.7	4.3	4.0	3.1	6.1	6.6	5.4	6.4	6.4	5.7	4.6	6.1
AC-FT	406	340	514	667	882	829	458	760	644	473	432	444

CAL YR 1989 TOTAL 3437.0 MEAN 9.42 MAX 39 MIN 4.0 AC-FT 6820
WTR YR 1990 TOTAL 3452.9 MEAN 9.46 MAX 37 MIN 3.1 AC-FT 6850

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi².

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

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft, from topographic map. Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

REMARKS.--Records good. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--29 years (water years 1961, 1963-90), 6.81 ft³/s (4,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft³/s, Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft³/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft³/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 9	1000	*1,960	*5.44	Jan. 16	2000	1,780	5.27

Minimum discharge, 0.35 ft³/s, Jan. 15, Feb. 15-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.0	1.1	6.0	6.4	138	1.1	1.0	1.0	1.0	1.6	.45
2	1.2	1.0	1.0	8.2	8.3	7.6	1.1	.90	1.2	1.4	.90	.45
3	1.2	1.0	1.0	4.3	19	1.7	2.1	37	1.0	.90	.90	.45
4	1.5	1.0	1.0	4.2	4.0	2.0	1.1	1.7	1.0	.90	.75	.45
5	1.2	1.0	.83	3.4	2.1	2.1	1.0	28	1.0	.90	.75	.55
6	7.1	1.0	.72	.90	2.1	7.1	1.0	11	1.2	.90	.90	.55
7	1.6	1.0	.69	.90	2.9	40	1.0	4.9	1.0	.90	.75	.55
8	1.9	1.0	.66	4.2	1.1	22	1.0	8.4	1.0	.75	.65	.55
9	15	1.0	89	12	.90	2.6	1.3	1.2	1.0	.75	.65	.90
10	1.3	1.0	1.0	.60	1.1	1.8	1.1	1.0	1.0	.90	.55	.45
11	1.2	1.0	.72	.51	1.4	2.7	1.0	1.2	.90	.75	.55	.45
12	1.2	1.0	11	.55	.89	2.2	1.2	1.9	.90	.65	.55	.55
13	1.2	1.0	73	.55	.58	2.6	1.2	14	.90	.65	.55	.55
14	1.2	1.0	4.9	.49	.47	1.5	1.2	9.4	.90	.65	.45	.65
15	1.2	2.3	2.3	31	.37	80	1.2	2.0	4.4	.65	.65	.65
16	1.2	1.3	.64	224	.37	1.7	1.2	1.2	31	.55	.55	.65
17	1.2	1.0	.61	398	51	1.3	1.2	4.1	4.8	.55	.45	9.7
18	1.1	1.0	.54	28	4.5	1.3	1.2	1.9	2.8	1.4	.55	.45
19	1.1	1.1	.45	54	.64	1.4	1.2	7.9	4.7	1.3	.55	.55
20	1.2	1.0	4.2	15	5.1	1.7	1.2	3.6	1.2	.65	.55	1.2
21	1.3	1.0	3.7	8.5	.64	1.4	1.3	3.0	1.0	.65	.55	.45
22	1.2	1.0	1.2	21	.55	1.2	1.4	1.2	1.2	.65	.55	.45
23	1.2	.97	1.1	9.5	.63	1.2	1.3	1.4	3.3	.65	.55	.45
24	1.6	.94	.92	4.9	.68	1.2	5.8	1.2	1.8	1.8	.55	.55
25	1.6	1.0	.82	4.2	130	1.2	1.7	1.2	1.2	.90	.55	.55
26	1.2	1.0	.76	6.2	38	1.2	1.0	1.2	1.0	.90	.82	.45
27	1.1	.90	.84	4.9	21	1.2	1.0	1.2	1.0	4.4	.55	.45
28	1.1	.90	.74	3.3	29	1.2	1.0	1.2	1.0	1.7	.55	.55
29	1.0	.95	.78	3.9	---	1.5	1.0	1.2	2.3	2.2	.45	.55
30	1.0	1.2	.63	1.5	---	1.1	1.0	1.2	1.2	1.6	.45	.45
31	1.0	---	1.8	1.8	---	1.1	---	1.0	---	1.0	.45	---
TOTAL	58.3	31.56	208.65	866.50	333.72	334.8	40.1	157.30	77.90	33.55	19.82	25.65
MEAN	1.88	1.05	6.73	28.0	11.9	10.8	1.34	5.07	2.60	1.08	.64	.85
MAX	15	2.3	89	398	130	138	5.8	37	31	4.4	1.6	9.7
MIN	1.0	.90	.45	.49	.37	1.1	1.0	.90	.90	.55	.45	.45
AC-FT	116	63	414	1720	662	664	80	312	155	67	39	51

CAL YR 1989 TOTAL 3238.29 MEAN 8.87 MAX 847 MIN .13 AC-FT 6420
WTR YR 1990 TOTAL 2187.85 MEAN 5.99 MAX 398 MIN .37 AC-FT 4340

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 upstream from mouth and 4.4 mi southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi².

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft 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 higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream both to and from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--30 years (water years 1961-90), 16.9 ft³/s (12,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft³/s, Apr. 8, 1989, gage height, 8.50 ft, from rating curve extended above 26 ft³/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft³/s, Nov. 1, 2, 1926, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 9	1000	2,250	5.38	Jan. 16	1930	*2,800	*5.69

Minimum discharge, 6.8 ft³/s, Dec. 6-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	9.9	7.9	14	14	307	12	12	14	11	9.9	7.7
2	11	9.7	7.4	21	16	34	13	11	14	13	8.9	7.7
3	11	9.7	7.6	14	32	19	15	75	13	12	8.9	7.6
4	11	9.7	7.4	13	12	17	13	14	13	12	8.8	7.7
5	11	9.4	7.2	13	9.9	18	13	54	13	12	8.8	7.8
6	17	9.4	6.8	8.6	9.9	25	13	42	13	11	8.9	7.9
7	12	9.4	6.8	8.4	10	81	13	35	12	11	9.4	7.8
8	12	8.9	6.8	11	8.7	50	13	33	12	12	8.9	8.1
9	28	7.9	149	26	8.4	19	14	18	12	11	8.5	8.7
10	11	7.9	11	8.9	8.5	15	13	16	12	10	8.4	8.9
11	11	7.6	9.5	8.5	8.8	15	13	17	12	10	8.4	8.6
12	11	7.6	21	8.3	8.2	14	13	18	12	10	8.3	8.5
13	11	7.6	115	8.2	8.2	14	13	33	12	9.9	8.2	8.5
14	10	7.6	16	8.1	7.9	13	13	35	12	9.9	8.8	8.5
15	10	9.6	12	56	7.7	163	13	18	14	9.9	8.7	8.6
16	10	8.9	10	415	7.5	17	12	16	59	9.9	8.2	8.6
17	10	8.1	9.8	539	84	16	12	24	22	10	8.0	24
18	10	7.9	9.7	50	15	15	12	17	16	11	8.1	10
19	11	7.9	9.4	87	8.6	14	12	23	20	11	8.4	9.4
20	11	8.1	14	30	14	16	12	19	14	9.6	8.2	9.4
21	10	7.6	13	20	8.4	14	12	22	12	9.4	8.0	9.1
22	10	7.6	10	36	8.0	13	12	19	12	9.4	7.9	8.9
23	9.9	7.6	10	21	8.0	12	12	18	16	9.4	7.7	9.2
24	10	7.6	9.7	15	8.1	12	17	16	14	11	7.9	9.0
25	11	7.6	9.6	14	216	12	14	15	12	9.7	7.7	8.9
26	10	7.6	9.6	15	113	12	12	14	12	9.8	8.7	8.8
27	9.9	7.4	9.4	15	61	11	12	18	11	17	9.5	8.7
28	9.9	7.4	9.2	13	92	11	12	15	11	11	8.5	8.7
29	9.9	7.4	8.8	13	---	13	12	14	15	12	8.0	8.8
30	9.9	7.9	8.4	10	---	12	12	14	12	10	7.9	9.2
31	9.9	---	9.8	9.9	---	12	---	13	---	9.2	7.9	---
TOTAL	350.4	248.5	551.8	1529.9	813.8	1016	384	708	448	334.1	262.4	273.3
MEAN	11.3	8.28	17.8	49.4	29.1	32.8	12.8	22.8	14.9	10.8	8.46	9.11
MAX	28	9.9	149	539	216	307	17	75	59	17	9.9	24
MIN	9.9	7.4	6.8	8.1	7.5	11	12	11	11	9.2	7.7	7.6
AC-FT	695	493	1090	3030	1610	2020	762	1400	889	663	520	542

CAL YR 1989 TOTAL 13380.5 MEAN 36.7 MAX 3810 MIN 6.5 AC-FT 26540
WTR YR 1990 TOTAL 6920.2 MEAN 19.0 MAX 539 MIN 6.8 AC-FT 13730

HAWAII, ISLAND OF MOLOKAI

129

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing, 1.3 mi northeast of Kaunakakai Post Office, and 1.7 mi upstream from mouth.

DRAINAGE AREA.--6.57 mi².

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

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft, from topographic map.

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

AVERAGE DISCHARGE.--40 years (water years 1951-90), 1.89 ft³/s (1,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft³/s, Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft³/s on basis of slope-area measurements at gage heights 7.22 ft and 9.30 ft; no flow most of the time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 9	1200	560	5.40	Jan. 17	1300	*2,000	*7.96
Dec. 13	0700	287	4.64	Feb. 25	2030	349	4.84

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	136	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	42	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	10	7.3	.00	18	.00	.00	.00	.00
4	.00	.00	.00	.00	1.5	2.1	.00	1.1	.00	.00	.00	.00
5	.00	.00	.00	.00	.04	.51	.00	6.6	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.99	.00	.15	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	18	.00	1.4	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	26	.00	.01	.00	.00	.00	.00
9	.00	.00	58	.00	.00	2.9	.00	.00	.00	.00	.00	.00
10	.00	.00	2.8	.00	.00	.11	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	1.1	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	49	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	2.2	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	54	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	162	.00	3.8	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	570	6.1	.06	.00	.00	.01	.00	.00	.00
18	.00	.00	.00	76	10	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	36	.01	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	24	1.4	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	2.3	9.6	.09	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	1.1	14	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	6.3	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	1.4	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.10	126	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	65	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	16	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	16	.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	0.00	0.00	116.50	899.40	252.14	293.77	0.00	27.26	0.01	0.00	0.00	0.00
MEAN	.000	.000	3.76	29.0	9.00	9.48	.000	.88	.000	.000	.000	.000
MAX	.00	.00	58	570	126	136	.00	18	.01	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	231	1780	500	583	.00	54	.02	.00	.00	.00

CAL YR 1989 TOTAL 2016.45 MEAN 5.52 MAX 643 MIN .00 AC-FT 4000
WTR YR 1990 TOTAL 1589.08 MEAN 4.35 MAX 570 MIN .00 AC-FT 3150

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 downstream from wooden bridge on Highway 45 and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi².

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft, from topographic map.

REMARKS.--Records good. Diversion upstream for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--27 years, 0.872 ft³/s (632 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s, Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft³/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 210 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 25	1930	*206	*4.00				

Minimum discharge, 0.14 ft³/s, Sept. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	.39	.26	.49	.69	41	.94	.59	.55	.51	.39	.20
2	3.8	.39	.26	1.1	.69	10	.94	.74	.51	.47	.32	.20
3	1.7	.39	.26	.39	.87	4.8	1.2	3.2	.47	.55	.29	.20
4	.69	.39	.26	.29	.64	3.5	1.1	.84	.47	.59	.32	.20
5	3.8	.32	.26	.26	.55	2.8	1.7	1.0	.47	.59	.43	.20
6	.74	.32	.26	.26	.59	2.9	1.0	.89	.51	.55	.32	.20
7	.85	.29	.23	.23	.51	6.1	.89	.94	.55	e.55	.35	.20
8	1.6	.29	.20	.23	.47	2.6	.89	3.3	.47	e1.4	.35	.43
9	6.0	1.7	6.3	.23	.47	2.1	.89	.89	.47	e.43	.26	.98
10	1.1	1.4	.95	.20	.47	1.9	.84	.69	.47	e.46	.26	.35
11	.69	.39	.35	.20	.59	1.8	.79	.64	.47	e.40	.23	.20
12	.59	.29	.32	.20	1.6	1.7	.79	.69	.47	e.43	.26	.20
13	.55	.72	3.1	.23	.91	1.6	.79	1.0	.43	e.41	.26	.23
14	.51	.51	.55	.23	.55	1.6	.79	1.2	.43	e.50	.29	.20
15	.51	.39	.32	1.8	.43	3.3	.79	.79	.47	e.58	.47	.23
16	1.3	.43	.29	5.6	.39	1.7	.74	.64	1.3	e.35	.29	.20
17	.51	.32	.26	3.8	.47	1.5	.74	1.5	.79	.35	.26	1.5
18	.47	.29	.26	1.5	.59	1.4	.74	.79	.55	.61	.23	.35
19	.92	.29	.26	23	.43	1.4	.79	1.1	.51	.35	.26	.26
20	.74	.29	1.6	6.0	.47	1.6	.79	1.1	.74	.35	.84	.26
21	.59	.26	1.0	2.0	.43	1.4	.74	.96	.59	.74	.29	.23
22	.47	.26	.59	13	.39	2.0	.74	.69	.54	.47	.23	.20
23	.43	.26	.35	5.7	.39	1.2	.74	.74	.64	.32	.23	.24
24	1.3	.26	.32	1.8	.43	1.1	.79	1.2	.55	.32	.48	.96
25	1.1	.26	.43	1.4	36	1.1	.79	.74	.43	.39	.26	.29
26	.55	.29	.59	1.1	15	1.1	.74	.64	.43	.35	.29	.20
27	.43	.26	.59	.89	4.9	1.0	.74	.59	.39	.57	.32	.23
28	.51	.26	.39	.79	24	1.0	.69	.55	.39	.55	.43	.23
29	1.7	.26	.26	.69	---	1.0	.69	.55	.73	.80	.26	.16
30	.55	.26	.26	.64	---	1.0	.64	.55	.69	.43	.23	.40
31	.51	---	1.3	.64	---	.94	---	.55	---	.64	.20	---
TOTAL	40.71	12.43	22.63	74.89	93.92	108.14	25.44	30.29	16.48	16.01	9.90	9.93
MEAN	1.31	.41	.73	2.42	3.35	3.49	.85	.98	.55	.52	.32	.33
MAX	6.0	1.7	6.3	23	36	41	1.7	3.3	1.3	1.4	.84	1.5
MIN	.43	.26	.20	.20	.39	.94	.64	.55	.39	.32	.20	.16
AC-FT	81	25	45	149	186	214	50	60	33	32	20	20

CAL YR 1989 TOTAL 780.19 MEAN 2.14 MAX 53 MIN .20 AC-FT 1550
WTR YR 1990 TOTAL 460.77 MEAN 1.26 MAX 41 MIN .16 AC-FT 914

e Estimated

16501200 OHEO GULCH AT DAM NEAR KIPAHULU

LOCATION.--Lat 20°40'17", long 156°03'17", Hydrologic Unit 20020000, on right bank 31 ft upstream from dam, 1,000 ft downstream from the confluence of Palikea and Pipiwai Streams, 0.8 mi upstream from mouth, and 1.0 mi north from Kipahulu Church.

DRAINAGE AREA.--8.06 mi².

PERIOD OF RECORD.--July 1, 1988 to current year. Forty-eight years of records are available for the right branch drainage, 1.3 mi upstream (Palikea Stream, 16501000) for periods prior to Sept. 30, 1983.

GAGE.--Water-stage recorder. Datum of gage is 420 ft above mean sea level (from topographic map).

REMARKS.--Records fair. No diversion upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,770 ft³/s, Dec. 6, 1988, from rating curve extended above 6,020 ft³/s, on basis of slope-area measurement at gage height 7.35 ft; minimum, 0.54 ft³/s, Sept. 19, 20, 1988.

EXTREMES FOR CURRENT PERIOD.--July to September 1988. Peak discharges greater than base discharge of 3,770 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sep. 27	1100	*1,400	*4.92				

Minimum discharge, 0.54 ft³/s, Sep. 19, 20.

Water year 1989. Peak discharges greater than base discharge of 3,770 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 6	1400	*8,770	*8.20	Apr. 2	0400	4,170	6.60
Jan. 11	2230	4,010	6.52	Apr. 7	1730	3,850	6.44

Minimum discharge, 0.72 ft³/s, Mar. 28, 29.

Water year 1990. Peak discharges greater than base discharge of 3,770 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	1900	5,100	6.99	Jan. 19	0530	5,020	6.96
Oct. 24	0030	*6,020	*7.35				

Minimum discharge, 0.60 ft³/s, Dec. 19, 20, 24, 25.

HAWAII, ISLAND OF MAUI

16501200 OHEO GULCH AT DAM NEAR KIPAHULU--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										2.1	e1.1	1.1
2										2.8	e20	.90
3										2.2	e5.0	.86
4										3.3	e2.0	.72
5										46	e1.6	2.8
6										42	e7.0	5.7
7										98	e2.1	1.5
8										32	e1.3	1.7
9										41	e1.2	1.2
10										9.2	e1.1	1.1
11										24	e140	1.3
12										43	e10	1.4
13										9.5	e5.0	1.0
14										55	e6.0	.57
15										6.0	e5.0	5.6
16										3.5	e7.0	2.3
17										2.4	e12	.90
18										3.7	8.1	.75
19										1.7	5.3	.63
20										1.4	19	.66
21										e15	19	2.1
22										e3.0	21	3.4
23										e1.6	6.1	8.4
24										e1.3	3.6	5.7
25										e1.3	2.6	4.3
26										e1.1	2.1	49
27										e1.1	1.8	200
28										e2.4	2.1	40
29										e5.0	1.4	20
30										e8.0	2.3	10
31										e1.3	1.7	---
TOTAL										469.9	323.5	375.59
MEAN										15.2	10.4	12.5
MAX										98	140	200
MIN										1.1	1.1	.57
AC-FT										932	642	745

e Estimated

16501200 OHEO GULCH AT DAM NEAR KIPAHULU--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2.0	e2.2	5.3	95	2.9	7.0	135	5.9	18	4.7	5.7	49
2	e1.7	e2.2	3.7	37	2.5	233	697	5.2	7.8	2.8	167	317
3	e1.5	e2.6	3.2	63	6.3	562	37	3.3	35	10	15	105
4	e1.3	e700	2.6	73	4.4	628	6.6	2.6	8.0	23	62	59
5	e1.1	e70	2.3	60	4.7	57	216	2.6	137	360	9.7	33
6	1.0	e5.0	989	230	190	126	7.5	2.7	127	279	91	9.3
7	5.0	e3.2	205	395	11	85	316	3.8	7.8	13	57	32
8	2.1	e2.8	60	387	4.7	19	49	6.4	10	17	7.0	6.9
9	1.4	e10	7.1	346	3.2	5.6	11	37	7.8	5.8	5.1	4.6
10	1.2	e8.0	4.8	783	5.4	3.8	5.4	39	4.5	37	3.8	5.3
11	4.5	e6.0	23	908	6.4	7.4	3.4	41	3.3	98	5.1	3.3
12	40	e3.5	84	301	7.7	28	2.4	7.5	2.6	8.1	11	29
13	6.2	e40	50	634	4.1	5.8	79	289	2.2	202	29	73
14	e150	e60	7.8	553	2.7	4.4	186	194	2.5	233	17	6.5
15	e15	e5.0	4.4	619	2.1	2.8	6.2	413	2.0	84	41	3.6
16	e1.9	e3.0	25	275	1.7	4.3	3.4	175	7.1	36	16	31
17	e7.0	e5.2	25	320	1.5	2.4	2.3	70	20	33	9.7	127
18	e4.2	e3.5	5.9	100	1.3	1.9	1.8	8.8	11	7.5	8.6	40
19	e3.0	e10	3.8	15	2.6	1.5	2.0	24	4.0	224	45	116
20	e3.4	e6.0	3.3	165	1.5	1.3	179	36	6.2	299	578	36
21	e2.7	e90	89	127	1.2	1.3	146	6.9	22	96	213	12
22	e2.1	e170	33	49	6.8	1.3	138	462	26	626	25	6.1
23	e1.9	e300	46	102	215	1.2	491	227	7.9	117	32	3.8
24	e13	73	84	73	177	1.8	459	457	5.3	53	18	5.4
25	e3.2	59	101	8.8	81	1.9	46	91	3.5	47	6.8	4.6
26	e5.6	64	297	6.6	5.3	5.6	7.3	32	3.4	61	4.8	3.8
27	e3.2	9.7	317	5.2	2.7	1.9	6.0	35	2.9	36	3.6	3.7
28	e5.4	6.4	452	4.3	33	.82	24	6.7	3.2	162	3.9	10
29	e3.6	10	636	8.8	---	1.5	189	59	3.1	223	2.8	54
30	e2.6	18	733	3.9	---	.95	14	177	2.0	45	4.8	7.5
31	e2.4	---	216	3.3	---	75	---	153	---	7.6	3.6	---
TOTAL	299.2	1748.3	4519.2	6750.9	788.7	1879.47	3466.3	3073.4	503.1	3450.5	1502.0	1197.4
MEAN	9.65	58.3	146	218	28.2	60.6	116	99.1	16.8	111	48.5	39.9
MAX	150	700	989	908	215	628	697	462	137	626	578	317
MIN	1.0	2.2	2.3	3.3	1.2	.82	1.8	2.6	2.0	2.8	2.8	3.3
AC-FT	593	3470	8960	13390	1560	3730	6880	6100	998	6840	2980	2380

WTR YR 1989 TOTAL 29178.47 MEAN 79.9 MAX 989 MIN .82 AC-FT 57880

e Estimated

HAWAII, ISLAND OF MAUI

16501200 OHEO GULCH AT DAM NEAR KIPAHULU--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	550	5.5	1.9	237	489	159	1.2	7.5	5.7	3.6	9.3	1.5	
2	151	4.5	1.0	306	607	175	5.0	20	3.3	8.8	5.3	1.3	
3	8.7	3.9	.84	46	774	27	22	47	2.9	3.3	9.2	2.2	
4	468	4.1	.77	9.0	328	8.3	11	16	3.2	3.1	5.4	2.3	
5	236	3.7	.75	38	378	10	259	31	1.7	2.6	3.7	132	
6	157	7.1	.83	7.8	233	206	22	15	3.6	2.2	5.6	55	
7	36	5.6	4.0	3.9	148	674	89	9.7	2.9	1.9	5.8	12	
8	90	5.1	.98	2.3	14	461	6.6	104	7.0	74	3.0	9.7	
9	117	52	82	3.4	7.6	193	4.2	9.0	2.5	35	2.3	98	
10	215	187	7.3	1.7	7.1	344	3.0	10	2.8	114	1.9	75	
11	15	9.8	3.5	1.7	5.6	204	2.3	25	2.9	8.3	1.8	8.2	
12	7.0	5.2	2.3	2.4	5.1	90	1.9	6.7	1.7	83	3.4	6.6	
13	13	5.1	9.7	53	3.9	51	1.6	4.3	2.2	13	3.4	123	
14	5.9	3.7	2.4	28	3.0	10	2.4	6.7	18	53	2.0	52	
15	67	4.1	1.4	7.9	110	5.7	1.5	9.9	117	81	10	9.5	
16	21	17	1.1	3.6	7.0	4.1	1.1	4.8	777	9.2	8.4	6.1	
17	6.5	5.0	.90	71	4.1	3.7	.90	5.6	252	4.8	7.1	76	
18	12	3.6	.75	92	14	4.4	.81	23	67	54	5.0	214	
19	17	3.4	.63	1270	4.6	3.1	1.5	130	145	34	7.2	175	
20	39	3.2	5.6	228	3.1	2.7	2.8	161	280	14	4.7	356	
21	35	3.5	3.0	21	2.4	3.5	5.7	30	69	41	2.8	111	
22	14	2.0	1.1	319	2.1	2.4	3.6	5.9	24	44	2.1	10	
23	492	1.4	.78	307	1.8	1.8	3.1	5.0	30	9.0	3.7	7.6	
24	1230	1.2	.65	60	20	1.5	156	85	50	9.3	90	67	
25	143	1.1	2.2	183	268	1.4	180	35	83	10	51	7.1	
26	45	.96	1.0	177	220	1.2	65	10	9.2	4.8	45	4.9	
27	14	.85	.81	195	45	2.1	16	20	7.9	202	30	6.3	
28	94	.93	2.2	89	13	1.5	6.9	7.4	9.1	16	7.7	6.0	
29	171	.93	15	77	---	6.1	11	4.8	9.2	8.1	4.0	5.4	
30	11	11	2.1	47	---	1.8	3.7	10	5.1	18	2.4	140	
31	7.0	---	6.2	112	---	2.4	---	3.3	---	49	1.8	---	
TOTAL	4488.1	362.47	163.69	3999.7	3718.4	2661.7	890.81	862.6	1994.9	1014.0	345.0	1780.7	
MEAN	145	12.1	5.28	129	133	85.9	29.7	27.8	66.5	32.7	11.1	59.4	
MAX	1230	187	82	1270	774	674	259	161	777	202	90	356	
MIN	5.9	.85	.63	1.7	1.8	1.2	.81	3.3	1.7	1.9	1.8	1.3	
AC-FT	8900	719	325	7930	7380	5280	1770	1710	3960	2010	684	3530	
CAL YR 1989	TOTAL 27626.03	MEAN 75.7	MAX 1230	MIN .63	AC-FT 54800								
WTR YR 1990	TOTAL 22282.07	MEAN 61.0	MAX 1270	MIN .63	AC-FT 44200								

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi².

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

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

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--68 years (water years 1923-90), 23.8 ft³/s (17,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft³/s, Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft³/s by physical model of station site; minimum, 0.90 ft³/s, Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 23	2330	*2,380	*7.70	Jan. 19	0530	2,000	6.99
Jan. 1	0130	1,700	6.41	Jan. 22	1700	1,900	6.80
Jan. 17	1900	1,860	6.73				

Minimum discharge, 1.8 ft³/s, Dec. 27-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	4.3	2.7	162	196	334	6.7	3.3	6.5	9.8	6.2	5.2
2	11	3.9	2.5	151	326	262	6.5	3.2	6.1	25	5.6	4.8
3	4.2	3.6	2.3	34	250	62	27	167	6.8	12	11	4.6
4	3.8	3.4	2.2	15	88	25	11	27	7.7	8.7	7.2	4.8
5	3.7	3.3	2.2	8.6	54	36	6.7	85	8.7	8.1	8.1	18
6	3.6	3.2	2.3	4.5	89	195	5.7	44	12	7.2	15	27
7	3.5	3.2	2.2	3.5	99	471	5.2	18	6.7	7.0	12	13
8	3.4	3.4	2.1	11	19	280	4.8	47	12	12	7.4	7.7
9	6.6	3.9	6.0	43	14	62	4.8	7.1	7.0	8.3	6.7	28
10	26	2.9	3.4	8.8	23	23	4.6	5.5	6.1	12	6.2	49
11	4.5	2.8	2.4	6.7	15	16	4.2	4.8	5.4	9.0	5.1	8.3
12	3.6	2.7	2.2	17	11	12	4.0	4.2	5.0	18	12	12
13	3.4	2.7	2.1	7.0	9.8	10	4.4	3.8	4.9	8.6	13	7.0
14	3.2	2.6	4.0	4.0	9.3	9.4	11	4.5	10	8.9	6.0	36
15	3.1	2.6	2.6	127	8.8	19	4.5	10	31	7.6	6.8	14
16	3.0	2.6	2.3	44	8.4	13	4.0	4.6	230	6.9	7.6	29
17	3.0	2.8	2.2	453	37	11	3.8	11	86	6.9	7.2	162
18	3.0	2.8	2.2	116	26	10	3.7	25	66	12	16	150
19	4.2	2.7	2.1	572	9.8	9.3	5.8	81	105	20	16	30
20	5.8	3.0	2.1	83	8.1	19	6.2	176	90	15	6.8	23
21	5.3	4.2	2.1	16	7.4	16	10	57	19	9.7	5.7	9.3
22	3.6	3.1	2.1	155	6.8	9.9	14	10	16	9.7	5.0	14
23	228	2.7	2.0	107	6.4	8.7	6.0	14	16	7.4	7.0	10
24	398	2.5	2.0	13	6.5	8.0	5.6	72	31	12	16	8.9
25	29	2.5	2.0	7.2	25	7.3	4.6	33	25	13	13	7.0
26	13	2.5	1.9	7.8	76	6.8	4.1	15	10	9.9	117	6.6
27	20	2.6	1.9	12	28	6.8	3.8	22	8.5	57	73	6.9
28	15	2.5	1.9	15	80	6.3	3.7	9.7	8.1	15	25	7.7
29	8.7	2.4	2.6	25	---	11	3.5	7.8	12	13	9.5	109
30	6.0	2.4	2.6	41	---	7.0	3.4	8.5	11	8.5	6.9	99
31	4.9	---	6.8	72	---	9.1	---	6.8	---	7.4	5.9	---
TOTAL	838.2	89.8	183.5	2342.1	1537.3	1975.6	193.3	987.8	869.5	385.6	465.9	974.8
MEAN	27.0	2.99	5.92	75.6	54.9	63.7	6.44	31.9	29.0	12.4	15.0	32.5
MAX	398	4.3	68	572	326	471	27	176	230	57	117	162
MIN	3.0	2.4	1.9	3.5	6.4	6.3	3.4	3.2	4.9	6.9	5.0	4.6
AC-FT	1660	178	364	4650	3050	3920	383	1960	1720	765	924	1930

CAL YR 1989 TOTAL 17050.2 MEAN 46.7 MAX 927 MIN 1.9 AC-FT 33820
WTR YR 1990 TOTAL 10843.4 MEAN 29.7 MAX 572 MIN 1.9 AC-FT 21510

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi².

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

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

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

REMARKS.--Records fair. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--70 years (water years 1915, 1917, 1923-90), 35.5 ft³/s (25,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s, Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft³/s by logarithmic plotting; minimum, 0.5 ft³/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 23	2300	*3,470	*9.52	Feb. 2	0230	1,920	7.72
Jan. 1	0130	2,180	8.06	Mar. 2	0300	2,070	7.92
Jan. 17	1800	2,810	8.82	Sept. 17	0400	2,470	8.42

Minimum discharge, 2.4 ft³/s, Dec. 25-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	6.8	4.2	163	143	464	9.3	4.6	11	13	8.1	25
2	27	6.1	3.1	132	328	323	9.4	4.2	10	26	7.2	10
3	7.1	5.6	2.9	35	196	64	32	216	12	14	20	7.6
4	5.7	5.2	2.7	20	59	32	18	36	11	11	9.4	7.5
5	6.1	4.9	2.6	15	37	35	15	97	15	10	11	34
6	5.6	5.3	2.9	10	71	169	12	44	15	8.9	20	41
7	7.5	4.8	3.5	8.3	87	396	9.0	23	9.9	8.4	15	20
8	6.8	5.9	2.7	21	26	267	7.8	49	16	15	9.2	13
9	14	5.5	27	59	21	50	8.2	15	9.6	9.4	8.8	35
10	22	4.2	9.2	18	24	26	7.1	11	8.7	14	7.2	61
11	6.7	3.9	4.0	14	29	21	6.4	10	7.7	11	6.3	14
12	5.6	3.7	3.3	23	16	17	6.0	8.5	7.3	23	14	18
13	5.0	3.6	31	13	12	14	7.3	7.7	7.4	11	12	65
14	4.7	3.5	8.4	9.5	10	12	18	9.9	15	11	6.9	39
15	4.4	3.6	4.6	142	9.2	22	6.6	19	34	9.3	8.7	20
16	4.9	4.1	3.8	93	8.4	15	6.0	8.8	226	11	8.7	34
17	4.1	6.0	3.4	635	51	12	5.7	19	87	9.4	9.0	255
18	4.2	4.4	3.1	159	29	12	5.6	32	65	17	23	139
19	6.5	6.1	2.9	363	11	10	9.4	96	112	25	20	35
20	7.8	6.6	3.0	82	9.0	24	8.2	232	92	22	8.8	22
21	7.2	6.8	3.2	28	8.0	28	13	72	26	15	7.1	15
22	4.5	4.4	3.7	107	7.4	14	17	23	22	15	6.6	17
23	268	3.6	3.0	124	6.8	11	8.1	28	20	11	8.2	18
24	465	3.3	2.7	22	8.3	9.6	7.3	91	33	18	18	12
25	31	3.5	2.6	15	28	8.9	6.2	41	30	16	17	9.8
26	18	4.7	2.6	12	73	8.1	5.7	24	16	16	113	9.0
27	19	4.8	3.3	14	37	8.5	5.4	30	13	61	95	8.8
28	22	3.6	2.9	16	88	8.3	5.1	17	12	21	39	9.7
29	14	3.3	4.2	19	---	20	4.8	14	15	16	16	121
30	9.5	3.2	30	33	---	10	4.5	14	14	10	11	131
31	7.8	---	82	55	---	14	---	11	---	10	9.1	---
TOTAL	1038.7	141.0	268.5	2459.8	1433.1	2125.4	284.1	1307.7	972.6	488.4	573.3	1246.4
MEAN	33.5	4.70	8.66	79.3	51.2	68.6	9.47	42.2	32.4	15.8	18.5	41.5
MAX	465	6.8	82	635	328	464	32	232	226	61	113	255
MIN	4.1	3.2	2.6	8.3	6.8	8.1	4.5	4.2	7.3	8.4	6.3	7.5
AC-FT	2060	280	533	4880	2840	4220	564	2590	1930	969	1140	2470

CAL YR 1989 TOTAL 18916.3 MEAN 51.8 MAX 1160 MIN 2.6 AC-FT 37520
WTR YR 1990 TOTAL 12339.0 MEAN 33.8 MAX 635 MIN 2.6 AC-FT 24470

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft upstream from Wailoa ditch intake, 2.2 mi southwest of Huelo, and 2.5 mi west of Kailua.

DRAINAGE AREA.--0.64 mi².

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

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--79 years (water years 1912-90), 4.77 ft³/s (3,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft³/s, Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft³/s by test of model of station site; minimum, 0.02 ft³/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 23	2300	352	3.22	Mar. 1	1430	488	3.41
Jan. 15	1230	1,520	4.52	Mar. 6	0830	*1,740	*4.74
Feb. 2	0130	372	3.07				

Minimum discharge, 0.60 ft³/s, Oct. 8-11, Dec. 5-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.6	1.3	13	36	81	2.0	.91	2.2	2.8	2.0	1.6
2	1.0	1.6	.73	12	32	28	2.4	.85	2.3	5.9	1.8	1.6
3	.91	1.5	.71	4.0	29	10	5.1	3.3	2.2	2.7	6.1	1.5
4	.90	1.4	.69	3.1	17	8.6	2.1	1.2	2.2	2.4	2.2	1.5
5	.93	1.4	.66	2.6	14	16	1.7	5.2	2.8	2.4	3.1	4.6
6	1.8	1.4	.61	2.0	14	150	1.6	2.4	4.0	2.1	5.2	3.1
7	1.0	1.3	.60	1.8	11	50	1.5	1.9	2.4	2.0	3.0	3.2
8	2.1	1.5	.60	5.1	7.8	44	1.5	21	5.6	2.9	1.9	1.9
9	6.3	1.5	8.0	13	6.8	16	1.4	1.9	1.9	2.1	2.1	6.8
10	1.2	1.2	1.2	3.0	7.7	11	1.4	1.7	1.8	2.0	1.8	5.3
11	.98	1.1	.79	3.4	6.6	9.5	1.3	1.6	1.7	1.7	1.6	1.7
12	.90	1.1	.86	3.0	4.9	7.8	1.2	1.4	1.6	5.2	3.0	3.4
13	.96	1.0	15	2.3	4.5	6.6	1.3	1.3	1.6	1.7	2.1	6.0
14	.88	1.0	1.6	2.1	4.1	5.7	5.9	1.6	3.7	1.7	1.5	8.3
15	.81	1.6	1.1	86	3.7	23	1.3	1.3	9.9	2.6	1.8	2.8
16	.79	3.0	.99	29	3.3	5.7	1.2	1.2	28	1.9	1.8	8.4
17	.79	1.3	.90	41	19	4.9	1.1	2.4	9.9	1.8	1.5	12
18	.79	1.0	.90	20	8.3	4.5	1.1	2.9	8.4	4.0	2.7	10
19	1.5	1.2	.81	48	4.1	3.9	1.6	3.4	14	2.8	6.8	4.0
20	1.4	1.2	1.3	14	3.5	11	1.7	9.5	35	2.3	1.5	3.2
21	1.3	1.5	1.3	8.8	3.2	6.4	2.3	7.9	6.3	1.8	1.4	2.8
22	.82	.95	.90	25	3.0	3.9	3.8	2.2	5.7	1.8	1.3	2.6
23	19	.89	.79	16	2.9	3.3	1.4	2.7	5.3	1.4	2.1	3.0
24	16	.79	.79	7.8	3.2	3.2	1.2	9.3	6.5	3.0	5.6	2.8
25	2.9	.80	.76	6.6	8.9	3.0	1.1	5.0	6.0	4.0	2.1	2.1
26	1.9	.79	.69	5.5	31	2.9	1.0	2.7	3.6	2.3	9.3	2.0
27	1.8	.79	.69	6.1	14	2.7	1.0	6.9	3.3	17	11	1.9
28	9.0	.71	.69	6.0	23	2.7	1.0	3.3	3.1	4.2	3.8	1.8
29	6.1	.69	2.1	6.6	---	3.5	.90	2.6	4.8	3.9	2.1	9.2
30	1.9	1.3	2.3	8.2	---	2.2	.90	2.8	3.4	2.5	1.8	8.1
31	1.7	---	15	16	---	2.6	---	2.3	---	2.4	1.7	---
TOTAL	89.36	37.11	65.36	421.0	326.5	533.6	53.00	114.66	189.2	97.3	95.7	127.2
MEAN	2.88	1.24	2.11	13.6	11.7	17.2	1.77	3.70	6.31	3.14	3.09	4.24
MAX	19	3.0	15	86	36	150	5.9	21	35	17	11	12
MIN	.79	.69	.60	1.8	2.9	2.2	.90	.85	1.6	1.4	1.3	1.5
AC-FT	177	74	130	835	648	1060	105	227	375	193	190	252

CAL YR 1989 TOTAL 3211.03 MEAN 8.80 MAX 305 MIN .60 AC-FT 6370
WTR YR 1990 TOTAL 2149.99 MEAN 5.89 MAX 150 MIN .60 AC-FT 4260

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft, from topographic map.

REMARKS.--Records fair. No estimated daily discharges. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--25 years, 3.21 ft³/s (2,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft³/s, Mar. 31, 1982, Apr. 12, 1986; minimum daily, 0.11 ft³/s, Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft³/s on Feb. 2-3, Mar. 7-8, June 16; minimum daily, 0.47 ft³/s on Dec. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	1.8	8.9	10	11	3.2	.94	3.3	3.8	2.2	1.6
2	1.6	1.4	1.0	9.6	12	11	3.1	.94	3.2	4.1	2.0	1.8
3	1.8	1.3	.72	6.6	12	9.6	3.9	5.0	3.1	3.6	2.0	1.4
4	1.4	1.2	.65	4.5	9.4	8.4	3.9	e6.8	3.1	3.3	1.6	1.4
5	1.3	1.1	.58	3.6	8.1	7.7	3.2	e5.6	3.2	3.2	1.6	3.2
6	2.4	1.0	.52	2.8	7.9	9.0	2.9	e3.6	3.1	3.1	2.0	3.6
7	3.0	1.0	.52	2.4	9.4	12	2.6	e2.8	2.8	2.9	2.3	3.1
8	2.9	.94	.47	2.8	7.9	12	2.4	e9.6	3.0	3.2	e1.8	2.2
9	5.6	.94	3.4	7.0	7.3	9.4	2.3	e4.0	2.6	3.2	e1.9	3.3
10	3.2	.86	3.9	4.8	7.0	8.4	2.2	e2.5	2.4	2.9	e1.4	5.4
11	2.0	.79	1.6	3.9	6.6	7.7	2.0	e2.3	2.2	3.0	e1.2	3.1
12	1.6	.72	1.8	4.6	6.2	7.3	2.0	e2.1	2.0	3.2	e2.3	3.0
13	1.4	.72	8.6	3.6	5.7	6.8	1.8	e1.9	2.0	2.9	e2.6	6.0
14	1.3	.79	5.8	3.1	5.2	6.5	2.0	e2.4	2.4	2.4	e2.2	3.7
15	1.2	.97	3.0	6.2	4.8	6.8	1.8	e1.9	3.6	2.2	e1.4	3.0
16	1.0	1.6	2.0	6.9	4.5	6.6	1.6	e1.8	12	2.2	e1.4	3.6
17	.94	2.0	1.6	11	5.4	6.0	1.6	e2.6	10	2.2	e1.2	9.2
18	.86	1.3	1.3	10	9.6	5.5	1.4	e3.7	8.2	2.8	e1.8	8.8
19	.86	1.2	1.1	10	7.7	5.1	1.4	e5.4	9.3	2.3	e5.2	7.0
20	1.0	1.4	1.4	9.2	6.2	5.1	1.4	e7.6	8.2	2.0	e1.3	5.1
21	.94	1.2	1.6	7.7	5.4	5.2	1.4	e7.0	7.2	1.8	e1.2	3.7
22	.79	1.0	1.2	8.0	4.6	4.5	1.6	e6.2	6.5	1.8	1.1	3.3
23	2.4	.86	1.0	9.8	4.2	4.1	1.4	5.2	6.2	1.6	1.0	3.0
24	9.8	.72	.86	7.5	4.5	3.8	1.3	7.0	6.3	2.0	1.2	2.5
25	6.0	.72	.79	6.8	7.5	3.7	1.2	5.8	6.2	2.0	1.4	2.3
26	3.6	.65	.72	6.2	10	3.3	1.1	5.1	5.4	1.8	2.4	2.0
27	2.4	.65	.72	5.8	8.4	3.4	1.1	5.7	4.9	5.9	6.3	2.0
28	2.2	.65	.65	5.5	7.9	3.4	1.0	4.8	4.5	3.4	5.5	2.0
29	2.4	.58	.65	5.2	---	4.1	1.0	4.1	4.5	2.9	3.0	5.9
30	2.4	.92	1.6	6.0	---	3.4	.94	3.8	4.2	3.7	2.2	9.2
31	1.8	---	2.7	6.8	---	3.7	---	3.6	---	3.1	1.8	---
TOTAL	71.69	30.78	54.25	196.8	205.4	204.5	58.74	131.78	145.6	88.5	66.5	115.4
MEAN	2.31	1.03	1.75	6.35	7.34	6.60	1.96	4.25	4.85	2.85	2.15	3.85
MAX	9.8	2.0	8.6	11	12	12	3.9	9.6	12	5.9	6.3	9.2
MIN	.79	.58	.47	2.4	4.2	3.3	.94	.94	2.0	1.6	1.0	1.4
AC-FT	142	61	108	390	407	406	117	261	289	176	132	229

CAL YR 1989 TOTAL 1621.12 MEAN 4.44 MAX 15 MIN .47 AC-FT 3220
WTR YR 1990 TOTAL 1369.94 MEAN 3.75 MAX 12 MIN .47 AC-FT 2720

e Estimated

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi².

PERIOD OF RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 780 ft, from topographic map.

REMARKS.--Records fair. No appreciable diversion upstream.

AVERAGE DISCHARGE.--7 years (1984-90), 67.3 ft³/s (48,760 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft³/s, Jan. 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft³/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft³/s for several days in October and November 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft³/s, Dec. 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 8	2400	2,460	5.75	Jan. 17	0200	*3,370	*6.67
Dec. 9	1230	2,740	6.04	Mar. 1	0630	2,310	5.58

Minimum discharge, 20 ft³/s, Nov. 26, Dec. 6, 8-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	29	26	89	139	680	37	28	100	46	71	34
2	23	26	22	78	96	276	65	23	54	89	53	31
3	25	26	23	49	124	138	84	152	45	48	92	36
4	21	26	23	46	71	102	63	54	40	39	74	43
5	37	e25	21	31	77	124	42	95	46	45	64	59
6	62	e25	25	26	84	202	34	90	54	34	99	34
7	29	e24	22	25	62	195	31	65	44	31	91	58
8	187	e23	21	25	44	195	27	173	69	88	57	54
9	280	e26	192	101	39	107	26	66	42	47	49	101
10	73	e24	60	49	48	76	26	65	40	43	44	106
11	49	e23	37	70	47	81	25	50	34	33	50	48
12	40	e22	30	49	34	64	24	39	32	53	74	e52
13	34	e21	38	33	30	54	26	34	31	33	63	e49
14	31	22	26	29	32	48	44	56	32	46	46	e100
15	30	89	25	61	29	98	28	102	47	53	62	e49
16	27	44	24	164	27	54	26	48	152	41	54	e76
17	26	29	23	515	69	46	24	69	73	44	47	142
18	26	26	22	224	40	42	25	63	76	48	73	85
19	86	32	21	132	32	39	50	97	114	64	82	55
20	73	26	35	129	36	40	36	191	103	45	59	44
21	51	26	57	93	29	37	34	183	58	59	45	37
22	33	23	30	109	28	33	52	76	76	39	36	35
23	146	22	26	116	27	31	56	69	86	33	38	50
24	212	21	25	76	34	30	39	139	124	77	104	37
25	114	22	24	61	221	29	29	109	120	68	45	33
26	74	21	30	53	219	28	26	74	55	50	196	31
27	54	21	29	69	110	30	25	108	45	217	192	29
28	50	21	24	54	188	34	24	65	42	112	99	27
29	40	24	23	44	---	51	23	59	86	81	60	59
30	33	34	35	44	---	52	23	80	58	82	46	111
31	30	---	30	61	---	57	---	48	---	64	39	---
TOTAL	2020	823	1049	2705	2016	3073	1074	2570	1978	1852	2204	1705
MEAN	65.2	27.4	33.8	87.3	72.0	99.1	35.8	82.9	65.9	59.7	71.1	56.8
MAX	280	89	192	515	221	680	84	191	152	217	196	142
MIN	21	21	21	25	27	28	23	23	31	31	36	27
AC-FT	4010	1630	2080	5370	4000	6100	2130	5100	3920	3670	4370	3380

CAL YR 1989 TOTAL 28821 MEAN 79.0 MAX 763 MIN 21 AC-FT 57170
WTR YR 1990 TOTAL 23069 MEAN 63.2 MAX 680 MIN 21 AC-FT 45760

e Estimated

HAWAII, ISLAND OF MAUI

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--LAT 20°56'21", long 156°32'59", Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi².

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to Dec. 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--6 years, 86.9 ft³/s (62,960 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 9,660 ft³/s, Jan. 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft³/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 22 ft³/s, Jan. 18-22, 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 17	0130	*5,400	*6.00	Mar. 1	1130	3,150	5.00

Minimum discharge, 36 ft³/s, Dec. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e48	e49	42	84	118	765	50	55	85	54	80	51
2	e50	e47	39	73	80	93	94	45	52	109	55	49
3	e52	e45	51	49	83	65	124	245	48	56	123	55
4	e60	e44	42	50	50	63	70	48	48	49	66	60
5	e90	e43	39	43	55	93	55	88	55	57	61	74
6	e80	e43	55	39	81	180	49	79	67	47	111	54
7	e52	e42	46	38	53	172	48	61	49	46	70	72
8	e180	e42	40	37	45	140	47	256	88	180	53	97
9	e200	e46	186	95	47	62	49	49	53	64	53	165
10	e56	43	43	48	53	59	47	67	52	54	50	128
11	e54	43	39	67	54	78	46	51	48	47	61	53
12	e50	43	39	47	43	59	45	45	49	67	93	57
13	e48	42	90	39	41	53	49	45	48	51	73	56
14	e48	43	42	38	54	51	77	84	50	96	61	119
15	e80	93	39	102	42	120	48	111	57	85	e56	54
16	e68	49	38	395	41	56	45	48	155	65	e52	79
17	e52	45	38	616	181	53	45	68	69	64	e68	168
18	e82	42	38	80	56	52	46	70	68	62	82	88
19	e140	47	38	118	46	50	57	73	106	101	122	68
20	e90	43	42	64	45	67	52	119	162	71	71	58
21	e72	44	46	46	42	55	51	151	54	123	55	51
22	e56	42	38	70	41	50	69	53	59	54	51	55
23	e150	41	37	67	40	49	84	65	74	49	68	68
24	e160	41	37	43	48	50	63	166	102	74	85	55
25	e80	42	37	45	271	50	47	81	81	71	53	53
26	e60	41	62	46	128	48	45	61	51	59	225	55
27	e50	40	43	51	146	50	44	112	54	320	210	52
28	e100	40	38	45	317	49	44	56	50	130	79	49
29	e90	40	42	43	---	56	43	53	84	84	54	94
30	e56	45	52	46	---	65	51	71	64	90	52	124
31	e50	---	62	53	---	60	---	49	---	65	50	---
TOTAL	2504	1350	1520	2677	2301	2913	1684	2625	2082	2544	2443	2261
MEAN	80.8	45.0	49.0	86.4	82.2	94.0	56.1	84.7	69.4	82.1	78.8	75.4
MAX	200	93	186	616	317	765	124	256	162	320	225	168
MIN	48	40	37	37	40	48	43	45	48	46	50	49
AC-FT	4970	2680	3010	5310	4560	5780	3340	5210	4130	5050	4850	4480

CAL YR 1989 TOTAL 35778 MEAN 98.0 MAX 1060 MIN 37 AC-FT 70970
WTR YR 1990 TOTAL 26904 MEAN 73.7 MAX 765 MIN 37 AC-FT 53360

e Estimated

16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi².

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 upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--41 years (1940-42, 1948-70, 1976-90), 17.9 ft³/s (12,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft³/s, Jan. 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft³/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft³/s, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 8	2400	1,020	6.27	Jan. 16	2000	*2,980	*8.73
Dec. 9	1200	932	6.12				

Minimum discharge, 5.7 ft³/s, Dec. 25-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	8.5	11	32	30	272	9.0	8.8	17	9.8	16	9.6
2	8.6	8.1	6.9	26	23	47	18	9.5	11	27	11	8.9
3	8.9	7.8	7.9	13	18	19	44	63	9.0	13	43	7.9
4	15	7.7	12	9.6	11	16	13	12	8.8	9.8	16	10
5	25	7.5	6.9	11	9.8	19	9.9	20	9.7	18	13	12
6	19	7.4	14	7.7	15	52	9.1	21	15	9.0	20	22
7	10	7.3	12	6.9	18	67	8.3	12	8.9	7.9	17	14
8	73	7.3	8.7	6.4	9.4	53	8.0	95	26	32	10	19
9	79	8.9	78	33	8.9	17	9.3	12	13	13	8.5	63
10	12	8.4	13	16	12	13	9.6	15	10	8.6	8.1	60
11	11	7.3	7.6	12	13	13	7.8	15	10	7.9	7.7	11
12	9.0	7.1	6.7	12	8.8	12	7.6	9.3	9.6	12	17	11
13	8.7	7.3	45	7.3	7.5	11	7.5	9.2	9.1	12	19	13
14	8.6	8.6	10	6.6	7.2	10	17	27	8.9	9.6	12	22
15	16	32	7.3	68	7.0	77	9.4	27	8.5	14	10	9.9
16	11	18	6.7	203	6.7	16	7.9	11	51	11	11	15
17	9.1	11	6.4	257	56	11	7.6	22	23	11	8.5	71
18	14	8.0	6.2	37	19	10	8.2	18	13	14	22	27
19	42	8.0	6.0	65	9.9	9.5	13	29	44	23	47	13
20	21	7.7	6.7	28	8.9	27	11	29	63	22	13	11
21	15	7.5	10	13	7.5	18	9.4	43	15	48	11	8.8
22	9.6	7.4	6.6	19	7.0	9.9	16	12	12	13	8.1	8.1
23	50	7.0	6.1	30	6.7	9.1	9.1	18	16	9.3	22	14
24	52	6.9	5.9	11	10	8.7	12	60	19	15	24	10
25	16	7.7	5.8	9.5	92	9.7	9.6	17	19	15	11	9.2
26	11	7.0	8.5	9.2	109	8.3	7.9	16	9.4	9.9	47	8.5
27	10	6.7	14	8.7	104	8.3	7.6	41	9.8	93	56	8.9
28	28	6.6	7.7	9.8	190	8.3	7.3	16	8.3	46	31	7.4
29	21	6.5	15	9.2	---	10	7.2	11	21	33	10	11
30	9.8	8.1	16	9.0	---	15	7.1	14	13	19	8.8	26
31	8.8	---	10	11	---	13	---	10	---	14	8.1	---
TOTAL	640.5	265.3	384.6	996.9	825.3	889.8	328.4	722.8	511.0	599.8	566.8	542.2
MEAN	20.7	8.84	12.4	32.2	29.5	28.7	10.9	23.3	17.0	19.3	18.3	18.1
MAX	79	32	78	257	190	272	44	95	63	93	56	71
MIN	8.4	6.5	5.8	6.4	6.7	8.3	7.1	8.8	8.3	7.9	7.7	7.4
AC-FT	1270	526	763	1980	1640	1760	651	1430	1010	1190	1120	1080

CAL YR 1989 TOTAL 10149.5 MEAN 27.8 MAX 523 MIN 4.1 AC-FT 20130
WTR YR 1990 TOTAL 7273.4 MEAN 19.9 MAX 272 MIN 5.8 AC-FT 14430

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	
OCT	18...	1130	18	61	7.7	25.5	21.0	1.5	751	8.2	93	130	1100
DEC	11...	1230	7.0	80	7.8	21.0	18.0	0.40	747	8.1	87	20	760
FEB	06...	1200	9.5	70	7.8	23.5	19.5	0.40	756	8.8	97	1700	560
APR	02...	1100	8.5	80	7.7	24.0	19.0	0.40	753	8.8	96	K11	230
JUN	25...	1100	17	53	7.1	24.5	20.0	1.5	754	8.8	98	40	450
AUG	13...	1130	15	54	7.4	24.0	21.0	2.0	755	8.4	95	55	670

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 WATER DIS IT FIELD MG/L AS HCO3	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	
OCT	18...	15	0	2.9	1.9	6.2	46	0.7	0.70	20	0	16
DEC	11...	22	0	4.3	2.8	7.5	41	0.7	0.90	29	0	23
FEB	06...	18	0	3.5	2.3	7.3	45	0.7	0.80	22	0	18
APR	02...	22	0	4.2	2.8	8.0	41	0.7	2.4	29	0	24
JUN	25...	13	0	2.5	1.7	5.8	47	0.7	0.70	16	0	13
AUG	13...	12	0	2.5	1.5	5.8	49	0.7	0.70	15	0	12

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, 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)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	
OCT	18...	2.0	7.4	<0.10	16	46	48	0.06	0.120	0.010	0.010	<0.20
DEC	11...	2.0	9.2	<0.10	19	56	61	0.08	0.130	0.010	<0.010	<0.20
FEB	06...	2.0	9.4	0.10	18	62	55	0.08	0.120	<0.010	<0.010	0.50
APR	02...	1.8	12	<0.10	19	71	65	0.10	<0.100	<0.010	<0.010	<0.20
JUN	25...	1.5	9.0	0.20	12	44	41	0.06	<0.100	<0.010	<0.010	1.4
AUG	13...	1.3	9.3	<0.10	11	39	40	0.05	<0.100	0.020	0.020	0.40

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

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
OCT 18...	0.030	0.030	0.040	50	<1	3	<0.5	<1.0	<1	<3	2	70
DEC 11...	0.030	0.010	0.020	--	--	--	--	--	--	--	--	--
FEB 06...	0.020	0.010	0.010	20	<1	6	<0.5	<1.0	<5	<3	<10	12
APR 02...	0.030	0.030	<0.010	20	<1	6	<0.5	1.0	<5	<3	<10	8
JUN 25...	0.010	<0.010	<0.010	--	--	--	--	--	--	--	--	--
AUG 13...	0.030	0.020	<0.010	80	<1	6	<0.5	<1.0	<1	<3	1	79

DATE	TIME	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 18...	1130	<1	<4	<1	0.2	<10	1	<1	<1.0	19	<6	7
FEB 06...	1200	<10	<4	<1	0.3	<10	<10	<1	<1.0	25	<6	3
APR 02...	1100	<10	<4	1	0.3	<10	<10	<1	1.0	27	<6	6
AUG 13...	1130	<1	<4	1	<0.1	<10	1	<1	<1.0	16	<6	6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM R BK)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, SATURATION (PERCENT)
OCT 18...	1135	0.5	61	7.7	21.0	751	8.2	93
18...	1136	3.0	61	7.7	21.0	751	8.2	93
18...	1137	6.0	61	7.7	21.0	751	8.2	93
18...	1138	9.0	61	7.7	21.0	751	8.2	93
18...	1139	11.5	61	7.7	21.0	751	8.2	93

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DIS-SOLVED, CHARGE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DIS-SOLVED, CHARGE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 18...	1130	4	0.19	100	APR 02...	1100	0	0.0	100
DEC 11...	1230	2	0.04	100	JUN 25...	1100	3	0.14	100
FEB 06...	1200	6	0.15	100	AUG 13...	1130	3	0.12	100

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

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 west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Stream, and 0.9 mi upstream from mouth.

DRAINAGE AREA.--5.22 mi².

PERIOD OF RECORD.--October 1962 to December 1989 (discontinued).

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

GAGE.--Water-stage recorder. Elevation of gage is 90 ft, from topographic map.

REMARKS.--Records poor. Diversions upstream by Pioneer Mill Co. for irrigation of sugarcane and from Kanaha Stream by Maui County Board of Water Supply for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--26 years (water years 1964-89), 3.48 ft³/s (2,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft³/s, July 11, 1965, gage height, 11.03 ft, from rating curve extended above 332 ft³/s on basis of slope-area measurements at gage heights 7.39 ft, 7.58 ft, 8.07 ft, 9.12 ft, and 11.03 ft; no flow many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 13, 1960, discharge, 7,750 ft³/s, by slope-area measurement, 0.6 mi upstream from station.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 8	2400	*665	*7.25	Dec. 9	1200	650	7.22

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	---	---	---	---	---	---	---	---	---
2	.00	.00	.00	---	---	---	---	---	---	---	---	---
3	.12	.00	.00	---	---	---	---	---	---	---	---	---
4	.00	.00	.00	---	---	---	---	---	---	---	---	---
5	.00	.00	.00	---	---	---	---	---	---	---	---	---
6	.00	.00	.00	---	---	---	---	---	---	---	---	---
7	.00	.00	.00	---	---	---	---	---	---	---	---	---
8	48	.00	.00	---	---	---	---	---	---	---	---	---
9	76	.00	67	---	---	---	---	---	---	---	---	---
10	.00	.01	.12	---	---	---	---	---	---	---	---	---
11	.00	.00	.00	---	---	---	---	---	---	---	---	---
12	.00	.00	.00	---	---	---	---	---	---	---	---	---
13	.00	.00	.00	---	---	---	---	---	---	---	---	---
14	.00	.00	.00	---	---	---	---	---	---	---	---	---
15	.00	14	.00	---	---	---	---	---	---	---	---	---
16	.00	.00	.00	---	---	---	---	---	---	---	---	---
17	.00	.00	.00	---	---	---	---	---	---	---	---	---
18	.00	.00	.00	---	---	---	---	---	---	---	---	---
19	.00	.00	.00	---	---	---	---	---	---	---	---	---
20	.00	.00	.00	---	---	---	---	---	---	---	---	---
21	1.2	.00	.00	---	---	---	---	---	---	---	---	---
22	.00	.00	.00	---	---	---	---	---	---	---	---	---
23	14	.00	.00	---	---	---	---	---	---	---	---	---
24	20	.00	.00	---	---	---	---	---	---	---	---	---
25	2.5	.00	.00	---	---	---	---	---	---	---	---	---
26	.00	.00	.00	---	---	---	---	---	---	---	---	---
27	.00	.00	.00	---	---	---	---	---	---	---	---	---
28	.00	.00	.00	---	---	---	---	---	---	---	---	---
29	.00	.00	.00	---	---	---	---	---	---	---	---	---
30	.00	.00	.00	---	---	---	---	---	---	---	---	---
31	.00	---	.00	---	---	---	---	---	---	---	---	---
TOTAL	161.82	14.01	67.12	---	---	---	---	---	---	---	---	---
MEAN	5.22	.47	2.17	---	---	---	---	---	---	---	---	---
MAX	76	14	67	---	---	---	---	---	---	---	---	---
MIN	.00	.00	.00	---	---	---	---	---	---	---	---	---
AC-FT	321	28	133	---	---	---	---	---	---	---	---	---

CAL YR 1989 TOTAL 3040.38 MEAN 8.33 MAX 260 MIN .00 AC-FT 6030

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft upstream from Olaa Flume Road, 7.3 mi northwest of Mountain View, and 8.0 mi southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi².

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

REVISED RECORDS.--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No diversion upstream. Large part of flow comes from 3 tunnels.

AVERAGE DISCHARGE.--60 years, 11.7 ft³/s (8,480 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 19	1900	*86	3.36				

Minimum, 0.08 ft³/s, Dec. 28-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	2.3	4.8	41	14	4.8	1.3	15	16	15	7.7
2	10	11	2.1	2.7	50	12	4.6	1.4	14	16	14	7.7
3	14	11	2.0	2.4	56	14	4.8	1.2	13	14	14	8.5
4	12	9.9	1.8	2.1	55	13	4.7	1.0	12	13	13	9.8
5	11	15	1.7	1.7	52	12	4.3	.95	11	12	12	16
6	13	12	1.5	1.4	50	17	4.0	.95	11	11	11	20
7	12	11	1.5	1.0	48	23	4.5	.85	9.9	10	10	20
8	12	11	1.3	.90	42	32	4.7	1.5	9.3	10	10	22
9	11	10	1.4	3.0	37	35	4.0	1.1	8.8	9.2	9.4	22
10	11	9.6	1.2	2.0	32	41	3.8	1.1	8.2	9.0	9.0	21
11	9.7	9.0	1.0	1.7	28	44	3.4	1.3	7.5	8.3	8.7	19
12	9.0	8.4	.95	2.7	28	40	3.2	1.1	6.9	8.5	11	19
13	8.5	7.8	.85	3.0	24	34	3.0	1.0	6.4	7.9	11	18
14	8.1	7.2	.75	3.0	20	30	2.9	3.0	6.6	7.9	9.4	17
15	7.6	6.6	.65	3.2	17	27	2.9	3.0	6.4	7.8	10	16
16	7.1	6.2	.60	2.9	16	24	2.5	2.4	9.7	7.5	9.9	16
17	6.9	5.7	.52	2.5	14	20	2.3	2.2	18	7.0	9.8	20
18	6.9	5.5	.44	2.7	13	18	2.1	3.2	16	11	9.4	25
19	6.4	5.1	.40	30	12	16	2.1	6.3	16	14	8.9	30
20	6.6	4.8	.36	e28	10	15	2.0	17	19	13	8.4	35
21	6.7	4.5	.36	e27	9.4	13	1.7	27	19	13	8.1	e22
22	6.9	4.2	.32	e26	8.7	12	1.7	24	20	14	7.7	e20
23	14	4.0	.28	e25	7.8	11	1.9	22	19	13	7.6	25
24	13	3.8	.24	e24	7.9	9.8	3.3	24	22	13	8.9	29
25	13	3.5	.20	e23	7.2	8.9	2.3	26	23	13	8.9	27
26	12	3.3	.16	e22	6.3	8.1	2.0	23	22	12	9.4	23
27	12	3.1	.28	26	6.2	7.2	1.8	22	22	13	9.6	21
28	11	2.9	.12	23	9.6	6.5	1.7	20	20	14	9.3	19
29	15	2.7	.08	22	---	6.3	1.6	19	19	15	8.9	18
30	13	2.5	.08	22	---	5.6	1.4	18	17	15	8.5	18
31	12	---	.12	24	---	5.3	---	16	---	15	8.2	---
TOTAL	322.4	213.3	25.56	365.70	708.1	574.7	90.0	292.85	427.7	363.1	309.0	591.7
MEAN	10.4	7.11	.82	11.8	25.3	18.5	3.00	9.45	14.3	11.7	9.97	19.7
MAX	15	15	2.3	30	56	44	4.8	27	23	16	15	35
MIN	6.4	2.5	.08	.90	6.2	5.3	1.4	.85	6.4	7.0	7.6	7.7
AC-FT	639	423	51	725	1400	1140	179	581	848	720	613	1170

CAL YR 1989 TOTAL 4969.46 MEAN 13.6 MAX 41 MIN .08 AC-FT 9860
WTR YR 1990 TOTAL 4284.11 MEAN 11.7 MAX 56 MIN .08 AC-FT 8500

e Estimated

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 downstream from tunnel entrance, 3.3 mi northwest of Kaumana School, and 6.5 mi southwest of Hilo Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,970 ft, from topographic map.

REMARKS.--Records good. County of Hawaii, Department of Water Supply, diverts by 16-in. pipeline 50 ft upstream for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978.

AVERAGE DISCHARGE.--16 years, 6.44 ft³/s (4,670 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft³/s, Jan. 8, 1975; minimum daily, 0.02 ft³/s, Mar. 24, 26-30, Apr. 1, 1983, Sept. 19, 1984, for many days in 1985, and Dec. 26, 27, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 11 ft³/s, Mar. 8, 9; minimum daily, 0.02 ft³/s, Dec. 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.63	1.9	.20	.10	4.7	2.8	1.1	.15	.68	1.8	3.1	.44
2	5.4	2.7	.15	1.4	6.3	4.0	.44	.20	.28	1.3	2.1	.84
3	6.3	2.8	.15	3.1	6.5	4.1	.15	.20	.44	1.0	1.3	.15
4	6.1	1.0	.15	3.2	6.1	3.8	.15	.20	.60	.52	.52	.20
5	6.5	1.1	.15	2.6	5.2	3.4	.15	.20	.44	.68	.44	2.2
6	6.0	1.7	.15	1.8	4.7	4.2	.15	.20	.60	.84	.10	6.3
7	4.7	1.8	.15	1.4	5.8	8.1	.10	.28	.60	.44	.20	6.5
8	4.0	1.0	.20	1.4	5.4	11	.10	.44	.44	.20	.10	5.2
9	3.0	2.0	.20	.65	4.4	11	.10	.28	.36	.15	.15	4.1
10	1.7	1.0	.20	.04	3.4	9.7	.07	.20	.20	.10	.28	3.6
11	.68	.76	.20	.04	3.1	9.7	.07	.20	.10	.44	.15	3.2
12	1.6	2.2	.28	.04	3.0	8.8	.10	.28	.05	.60	.10	3.6
13	2.5	2.5	.28	.20	4.0	8.3	.10	.20	.05	.28	1.2	3.8
14	1.1	1.0	.20	.44	4.9	7.0	.10	.28	.07	.20	1.8	4.4
15	.44	.44	.20	.28	4.4	6.1	.10	.28	.07	.28	1.2	4.1
16	.44	.44	.28	.20	3.6	4.7	.10	.28	.36	.68	1.5	3.6
17	.44	.52	.28	.15	3.4	4.0	.10	.20	3.8	.60	2.1	4.1
18	.44	.44	.28	.07	3.1	4.1	.10	.28	7.2	.28	2.0	6.0
19	1.2	.44	.28	1.9	3.0	3.8	.10	.44	7.0	2.7	.92	7.2
20	.84	.44	.10	4.4	3.1	3.6	.10	2.4	5.6	4.7	2.0	8.3
21	.84	.44	.03	4.0	3.0	3.5	.10	6.3	5.8	4.9	1.5	8.1
22	1.0	.44	.03	4.0	2.5	3.2	.15	8.1	5.6	4.0	.44	6.3
23	2.6	.28	.03	3.8	1.9	3.1	.15	6.5	4.9	3.4	.15	5.1
24	5.1	.20	.03	3.6	.92	3.0	.15	6.3	5.1	3.2	.60	5.1
25	5.2	.20	.03	3.8	.84	2.5	.15	6.7	6.7	3.6	3.2	4.7
26	5.4	.20	.02	3.6	1.4	1.9	.15	6.7	7.0	3.0	4.1	3.8
27	4.2	.20	.02	3.4	1.3	1.6	.10	5.4	6.1	1.8	3.1	3.5
28	3.8	.20	.03	3.2	.92	1.2	.10	4.1	5.6	1.4	2.8	3.1
29	3.2	.20	.05	3.1	---	1.1	.10	3.0	4.1	1.6	2.0	3.0
30	4.0	.20	.04	3.2	---	1.1	.10	2.1	3.2	4.0	.92	3.1
31	3.5	---	.05	3.6	---	1.1	---	1.5	---	3.5	.68	---
TOTAL	92.85	28.74	4.44	62.71	100.88	145.5	4.73	63.89	83.04	52.19	40.75	123.63
MEAN	3.00	.96	.14	2.02	3.60	4.69	.16	2.06	2.77	1.68	1.31	4.12
MAX	6.5	2.8	.28	4.4	6.5	11	1.1	8.1	7.2	4.9	4.1	8.3
MIN	.44	.20	.02	.04	.84	1.1	.07	.15	.05	.10	.10	.15
AC-FT	184	57	8.8	124	200	289	9.4	127	165	104	81	245

CAL YR 1989 TOTAL 1584.61 MEAN 4.34 MAX 13 MIN .02 AC-FT 3140
WTR YR 1990 TOTAL 803.35 MEAN 2.20 MAX 11 MIN .02 AC-FT 1590

HAWAII, ISLAND OF HAWAII

147

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

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

PERIOD OF RECORD.--February 1981 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,700 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--9 years, 4.83 ft³/s (3,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 23 ft³/s, Apr. 10, 1986; minimum daily, 0.03 ft³/s, Mar. 23, 24, 31, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft³/s, Jan. 19, Feb. 2; minimum daily, 0.62 ft³/s, Dec. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	4.1	1.6	5.9	11	6.2	3.7	2.9	4.7	4.8	5.1	4.3
2	5.1	4.1	2.0	4.3	13	5.0	3.5	3.5	4.5	5.5	5.0	4.2
3	5.9	4.0	2.2	4.4	12	5.4	4.0	3.2	4.4	4.8	4.8	4.9
4	5.8	4.3	2.0	4.6	11	5.2	3.7	2.8	4.4	4.6	4.8	5.0
5	6.6	5.8	1.7	4.2	8.9	5.0	3.3	2.6	4.6	4.5	4.6	8.7
6	5.4	4.5	1.7	3.9	8.2	7.1	3.4	2.2	4.6	4.4	4.5	8.1
7	5.1	4.2	1.4	3.7	8.7	8.9	3.2	2.1	4.4	4.3	4.7	6.2
8	4.8	4.2	1.5	3.6	6.9	10	3.4	4.6	4.4	4.5	5.3	5.7
9	4.6	4.0	1.7	4.5	6.4	7.9	3.0	3.6	4.1	4.5	4.6	5.9
10	5.3	4.0	2.0	4.0	5.8	8.8	3.0	3.7	4.0	4.9	4.5	5.8
11	4.6	4.0	1.9	3.6	5.5	8.6	3.2	4.0	3.8	4.3	4.4	5.6
12	4.3	3.9	1.8	4.7	5.3	6.8	3.6	3.7	3.7	5.0	4.9	6.0
13	4.2	3.9	1.8	4.6	5.1	6.0	3.1	3.6	3.7	4.4	5.4	5.9
14	4.2	3.9	1.5	4.4	4.9	5.6	3.1	4.7	4.4	5.0	4.6	5.8
15	4.5	3.7	1.3	4.3	4.8	5.3	3.6	4.6	4.5	5.2	5.3	5.4
16	4.2	3.6	1.2	4.2	4.6	5.0	3.2	4.0	5.8	4.8	5.0	5.4
17	4.0	3.5	1.3	3.9	4.5	4.8	2.9	3.9	7.6	4.4	5.1	7.6
18	4.2	3.6	1.2	4.0	4.4	4.7	2.9	4.8	6.7	6.1	4.7	9.0
19	3.9	3.5	1.1	13	4.4	4.6	2.9	5.4	6.3	6.5	4.9	10
20	4.2	3.5	1.1	12	4.3	4.5	3.0	7.5	6.5	5.7	4.9	10
21	4.3	3.4	1.0	7.9	4.3	4.4	3.0	11	5.9	5.8	4.6	7.0
22	4.5	3.4	.91	6.8	4.3	4.3	3.2	7.8	6.5	5.4	4.6	6.0
23	6.2	3.3	.83	6.6	4.3	4.2	2.7	6.5	5.7	5.2	4.9	6.5
24	5.2	3.1	.75	5.8	4.7	4.1	4.1	6.9	8.0	6.0	7.1	8.0
25	5.4	3.1	.70	5.9	4.7	4.0	3.4	7.4	7.6	5.9	5.4	7.0
26	4.8	3.0	.66	6.1	4.4	4.0	3.3	5.9	6.0	5.1	5.7	6.0
27	4.6	2.8	.62	5.6	4.3	3.9	3.2	6.0	6.9	4.9	5.3	5.5
28	4.6	2.7	.64	5.4	5.2	3.8	3.1	5.5	5.5	5.3	4.8	5.5
29	5.0	2.6	1.0	5.5	---	3.9	3.0	5.1	5.2	6.2	4.6	5.0
30	4.6	2.3	1.4	6.5	---	3.7	2.9	5.4	5.0	5.9	4.5	5.0
31	4.3	---	2.1	6.8	---	3.7	---	4.9	---	5.5	4.4	---
TOTAL	151.4	110.0	42.61	170.7	175.9	169.4	97.6	149.8	159.4	159.4	153.0	191.0
MEAN	4.88	3.67	1.37	5.51	6.28	5.46	3.25	4.83	5.31	5.14	4.94	6.37
MAX	7.0	5.8	2.2	13	13	10	4.1	11	8.0	6.5	7.1	10
MIN	3.9	2.3	.62	3.6	4.3	3.7	2.7	2.1	3.7	4.3	4.4	4.2
AC-FT	300	218	85	339	349	336	194	297	316	316	303	379

CAL YR 1989 TOTAL 1944.71 MEAN 5.33 MAX 15 MIN .62 AC-FT 3860
WTR YR 1990 TOTAL 1730.21 MEAN 4.74 MAX 13 MIN .62 AC-FT 3430

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office. Prior to Nov. 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi², of which 81 mi² probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

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

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Hawaii County Department of Water Supply diverts about 6 ft³/s upstream for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River upstream 1938-63.

AVERAGE DISCHARGE.--59 years (water years 1929-39, 1942-47, 1949-90), 280 ft³/s (202,900 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft³/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 19	2130	*14,200	*16.84	No other peak greater than base discharge.			

Minimum discharge, 2.8 ft³/s, Dec. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	763	e130	12	250	e3000	469	27	13	e110	106	106	201
2	e500	e90	9.6	348	e5500	292	23	21	e95	143	105	138
3	e700	e75	11	252	e5000	259	33	24	e80	111	92	94
4	e825	e135	9.3	156	e2000	231	47	18	e75	95	84	107
5	e725	e530	9.0	116	885	188	34	16	e90	80	67	854
6	e375	e250	9.2	70	968	388	30	17	e120	71	59	830
7	e280	e175	15	58	e2100	e1900	29	17	e75	64	59	364
8	e200	e120	28	51	699	e4100	33	79	e70	72	80	244
9	e150	e110	35	69	459	903	26	55	e45	76	55	278
10	e230	e260	22	57	344	925	24	43	50	87	39	268
11	e140	e90	13	43	274	972	21	98	47	51	35	251
12	e90	e60	9.3	117	226	654	40	65	45	118	49	257
13	e70	e50	7.2	88	187	421	13	48	43	102	336	321
14	e75	e35	7.1	106	154	303	11	61	49	110	111	271
15	e135	e25	6.0	79	132	238	16	103	109	107	145	223
16	e85	e20	5.3	85	110	194	14	61	179	96	122	200
17	e50	e25	5.4	61	94	159	13	52	717	81	156	643
18	e60	e20	4.8	63	82	131	9.3	83	430	206	109	e1800
19	e45	e20	4.9	e9000	73	111	7.5	204	311	499	145	e2800
20	e40	e25	6.4	e4000	62	93	8.4	e450	301	375	177	e3500
21	e85	e25	4.2	843	53	77	8.9	e1300	345	288	109	824
22	e50	e20	3.8	550	46	67	23	e850	283	219	94	515
23	e850	20	3.4	595	40	58	16	e500	215	174	102	366
24	e350	18	3.2	442	83	51	79	e750	331	219	243	281
25	e500	16	3.2	438	260	45	51	e900	303	195	260	217
26	e350	14	3.1	426	141	37	34	e480	231	146	129	205
27	e240	13	3.2	339	105	34	24	e450	297	137	146	217
28	e230	12	43	267	154	32	21	e325	200	142	134	180
29	e415	11	56	250	---	43	18	e230	148	296	83	216
30	e245	13	17	323	---	34	14	e210	112	169	62	286
31	e160	---	13	418	---	30	---	e170	---	130	49	---
TOTAL	9113	2407	382.6	19960	23231	13439	748.1	7693	5506	4765	3542	16951
MEAN	294	80.2	12.3	644	830	434	24.9	248	184	154	114	565
MAX	850	530	56	9000	5500	4100	79	1300	717	499	336	3500
MIN	40	11	3.1	43	40	30	7.5	13	43	51	35	94
AC-FT	18080	4770	759	39590	46080	26660	1480	15260	10920	9450	7030	33620

CAL YR 1989 TOTAL 156483.6 MEAN 429 MAX 8500 MIN 3.1 AC-FT 310400
WTR YR 1990 TOTAL 107737.7 MEAN 295 MAX 9000 MIN 3.1 AC-FT 213700

e Estimated

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

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft upstream from Wailuku bridge and 0.2 mi west of Hilo Post Office.

DRAINAGE AREA.--256 mi², of which 81 mi² probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 to September 1979, June 1980 November 1987, October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 80 ft, from topographic map.

REMARKS.--Records good. Hilo Electric Light Co. diverts upstream for Hydro-plant use.

AVERAGE DISCHARGE.--11 years (water years 1978, 1979, 1981-87, 1990), 420 ft³/s (304,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,800 ft³/s, Dec. 13, 1987, gage height, 38.66 ft, from floodmarks and from rating curve extended above 6,840 ft³/s on basis of slope-area measurements at gage heights 23.30 ft, 34.57 ft, and 38.66 ft; minimum, 4.6 ft³/s, July 17, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,500 ft³/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 19	2230	*31,800	*22.30	Sept. 20	2230	9,700	12.64
Feb. 3	0430	13,900	14.66				

Minimum discharge, 15 ft³/s, Dec. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1260	162	24	704	4120	1070	34	34	158	235	310	358
2	789	117	20	826	7040	549	25	45	123	307	245	285
3	887	93	19	660	6510	470	45	51	99	222	208	110
4	1030	169	19	334	2550	432	81	39	93	158	186	162
5	896	669	16	230	1600	325	57	25	120	125	141	1780
6	470	318	17	139	1890	769	35	27	158	95	112	1550
7	361	220	26	81	2710	2380	41	22	94	76	105	580
8	252	153	47	45	1130	5210	48	142	93	94	165	391
9	192	141	110	93	810	1780	31	71	54	167	133	539
10	297	332	42	80	612	1640	23	38	36	200	81	477
11	177	116	34	39	484	1880	32	135	27	144	66	452
12	117	78	50	202	385	1180	45	49	28	344	64	470
13	89	63	44	200	310	800	40	21	24	160	667	660
14	95	46	41	224	242	580	33	31	25	171	144	600
15	173	33	38	153	210	452	44	150	164	169	283	432
16	108	30	37	177	158	364	42	38	393	136	214	376
17	66	33	34	97	130	289	31	22	1480	100	304	1230
18	76	27	33	81	101	226	25	43	835	402	171	2250
19	58	25	31	11600	78	184	20	376	540	1090	192	3490
20	49	26	30	5320	59	144	18	557	616	813	337	4510
21	110	23	30	1560	45	112	20	1730	728	540	179	1380
22	62	22	30	1100	30	85	66	1110	540	400	128	875
23	1070	43	29	1070	27	65	49	652	397	328	186	666
24	443	42	28	875	52	51	181	975	930	418	460	681
25	638	36	26	1000	556	41	157	1150	950	376	700	446
26	435	30	26	900	235	35	106	620	652	265	317	361
27	298	28	28	765	136	34	77	580	888	242	370	414
28	289	26	68	790	272	28	61	424	560	266	310	319
29	521	24	204	648	---	69	50	292	410	808	190	471
30	310	20	74	850	---	55	39	286	301	525	136	610
31	200	---	79	1140	---	43	---	214	---	414	99	---
TOTAL	11818	3145	1334	31983	32482	21342	1556	9949	11516	9790	7203	26925
MEAN	381	105	43.0	1032	1160	688	51.9	321	384	316	232	897
MAX	1260	669	204	11600	7040	5210	181	1730	1480	1090	700	4510
MIN	49	20	16	39	27	28	18	21	24	76	64	110
AC-FT	23440	6240	2650	63440	64430	42330	3090	19730	22840	19420	14290	53410

CAL YR 1989 TOTAL 230185 MEAN 631 MAX 10700 MIN 16 AC-FT 456600
WTR YR 1990 TOTAL 169043 MEAN 463 MAX 11600 MIN 16 AC-FT 335300

e Estimated

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	
OCT	30...	0815	319	41	6.3	21.5	19.0	2.1	755	9.0	98
DEC	04...	0845	19	75	6.7	19.0	18.0	0.20	755	9.2	98
FEB	20...	0830	64	60	6.5	18.0	17.0	2.7	755	9.4	98
APR	16...	0800	44	68	6.5	20.0	19.0	0.40	755	9.0	98
JUN	25...	1000	1100	34	6.1	18.0	17.5	22	755	9.3	98
AUG	27...	0915	385	39	6.2	19.0	18.0	5.6	755	9.2	98

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)	
OCT	30...	700	1600	14	1	2.8	1.7	2.5	27	0.3	0.50
DEC	04...	24	430	29	0	5.9	3.4	4.8	26	0.4	0.60
FEB	20...	35	590	--	--	--	--	--	--	--	--
APR	16...	120	260	26	0	5.2	3.1	4.1	24	0.4	2.3
JUN	25...	170	K3100	12	--	2.4	1.5	2.6	31	0.3	0.30
AUG	27...	250	7700	14	--	2.8	1.7	2.5	27	0.3	0.40

DATE	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	
OCT	30...	16	0	13	2.0	2.9	<0.10	9.7	37	31
DEC	04...	35	0	28	3.0	4.6	0.10	18	62	58
FEB	20...	22	0	18	2.0	3.9	0.10	--	48	--
APR	16...	36	0	29	2.3	5.6	<0.10	17	53	58
JUN	25...	--	--	--	1.6	3.6	0.10	7.8	28	27
AUG	27...	--	--	--	1.6	3.3	<0.10	9.1	17	30

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

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)
OCT 30...	0.05	0.120	0.020	0.060	0.40	0.010	0.010	<0.010
DEC 04...	0.08	0.170	<0.010	0.010	<0.20	0.010	<0.010	<0.010
FEB 20...	--	0.100	<0.010	0.020	<0.20	<0.010	<0.010	<0.010
APR 16...	0.07	0.200	<0.010	0.020	<0.20	<0.010	0.030	0.030
JUN 25...	0.04	<0.100	<0.010	0.020	1.8	<0.010	0.020	<0.010
AUG 27...	0.02	<0.100	0.060	0.040	0.30	0.020	<0.010	<0.010

DATE	TIME	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
DEC 04...	0845	20	<1	<2	<0.5	<1.0	1	<3	4	19	6
FEB 20...	0830	--	<1	--	--	--	--	--	--	--	--
JUN 25...	1000	60	<1	<2	<0.5	1.0	<1	<3	2	100	1
AUG 27...	0915	60	<1	<2	<0.5	<1.0	<1	<3	2	79	<1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 04...	<4	1	<0.1	<10	<1	<1	<1.0	39	<6	<3
FEB 20...	--	--	<0.1	--	--	--	--	--	--	--
JUN 25...	6	4	0.4	<10	2	<1	<1.0	19	<6	<3
AUG 27...	<4	3	0.5	<10	<1	<1	<1.0	23	<6	4

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 30...	0815	5	4.3	100	APR 16...	0800	1	0.12	100
DEC 04...	0845	3	0.15	100	JUN 25...	1000	4	12	100
FEB 20...	0830	1	0.17	100	AUG 27...	0915	12	12	97

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

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwika, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft, 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 upstream at different datum.

REMARKS.--Records good. No diversion upstream. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft³/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--24 years, 129 ft³/s (93,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft³/s May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft³/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft³/s Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 19	2200	*11,100	*16.82	No other peak greater than base discharge.			

Minimum discharge, 11 ft³/s, Dec. 26-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	611	52	18	307	1530	357	27	33	58	62	78	88
2	197	47	17	320	1950	135	22	56	50	116	71	77
3	216	43	17	233	1460	208	51	37	47	75	63	50
4	707	120	17	140	548	153	65	34	58	56	68	62
5	182	251	16	102	351	100	52	46	83	49	52	762
6	112	146	15	68	592	374	41	46	94	43	47	353
7	93	86	18	47	823	1100	38	37	62	38	43	92
8	69	70	29	36	155	1680	31	193	62	76	74	68
9	81	106	31	75	102	416	23	80	45	71	50	138
10	98	111	24	71	79	404	21	88	38	107	39	152
11	64	59	20	49	65	427	20	129	34	88	36	135
12	50	50	17	125	60	215	19	66	31	146	74	147
13	48	48	16	105	49	110	17	47	30	79	209	211
14	54	42	15	113	43	81	17	79	75	88	57	215
15	70	38	14	85	43	66	24	92	105	68	108	115
16	53	36	14	81	36	63	21	52	317	61	106	112
17	41	34	13	56	34	55	18	43	725	56	119	512
18	50	31	13	88	30	48	17	93	273	338	68	1120
19	41	28	12	3690	27	42	16	194	150	497	65	1040
20	52	29	12	1290	24	38	23	349	259	206	85	1260
21	76	29	12	217	23	34	23	732	207	143	59	183
22	57	28	12	166	21	31	95	304	161	98	52	112
23	500	26	12	217	20	28	41	153	117	85	88	105
24	162	24	11	189	54	26	141	389	327	144	313	121
25	191	22	11	246	161	24	84	373	288	116	196	77
26	129	22	11	199	109	22	66	133	149	82	137	66
27	89	20	11	144	64	21	52	174	268	88	141	104
28	110	20	46	173	144	20	43	114	122	122	99	78
29	125	18	55	155	---	56	35	82	92	251	68	121
30	78	18	32	254	---	32	29	102	71	114	55	131
31	59	---	33	409	---	28	---	72	---	98	47	---
TOTAL	4465	1654	594	9450	8597	6394	1172	4422	4398	3661	2.67	7807
MEAN	144	55.1	19.2	305	307	206	39.1	143	147	118	89.3	260
MAX	707	251	55	3690	1950	1680	141	732	725	497	313	1260
MIN	41	18	11	36	20	20	16	33	30	38	36	50
AC-FT	8860	3280	1180	18740	17050	12680	2320	8770	8720	7260	5490	15490

CAL YR 1989 TOTAL 65443 MEAN 179 MAX 2520 MIN 11 AC-FT 129800
WTR YR 1990 TOTAL 55381 MEAN 152 MAX 3690 MIN 11 AC-FT 109800

HAWAII, ISLAND OF HAWAII

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16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)
OCT 30...	0645	82	31	6.2	20.0	18.0	7.5	724	8.9	99
DEC 04...	0700	16	87	7.1	18.0	17.0	0.30	724	9.0	98
FEB 20...	0700	26	64	6.7	17.0	16.0	0.40	724	9.2	98
APR 16...	0630	25	70	6.7	19.0	17.0	1.0	724	9.0	98
JUN 25...	0830	395	19	5.6	17.0	16.0	6.2	724	9.1	97
AUG 27...	0800	148	23	6.0	18.0	16.5	3.5	724	9.2	99

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)
OCT 30...	460	520	12	2	2.3	1.4	1.9	26	0.2	0.20
DEC 04...	K8	130	41	1	8.7	4.6	4.2	18	0.3	0.40
FEB 20...	K9	K14	26	0	5.3	3.0	3.2	21	0.3	0.30
APR 16...	50	190	29	3	6.2	3.4	3.5	20	0.3	0.30
JUN 25...	180	K2300	5	--	0.91	0.66	1.6	40	0.3	0.10
AUG 27...	350	1100	7	--	1.5	0.90	1.6	31	0.3	0.20

DATE	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
OCT 30...	12	0	10	2.0	2.2	<0.10	7.2	16	23
DEC 04...	49	0	40	1.0	3.6	<0.10	23	79	70
FEB 20...	39	0	32	2.0	3.1	0.10	17	57	53
APR 16...	32	0	26	1.5	3.6	<0.10	19	50	54
JUN 25...	--	--	--	1.3	2.6	0.20	2.8	6	13
AUG 27...	--	--	--	1.0	2.4	<0.10	3.9	11	16

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

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT 30...	0.02	<0.100	<0.010	0.030	0.20	0.020	0.020	<0.010
DEC 04...	0.11	<0.100	<0.010	0.050	0.20	0.030	0.030	0.040
FEB 20...	0.08	<0.100	<0.010	0.070	<0.20	0.010	0.180	0.190
APR 16...	0.07	<0.100	<0.010	0.030	<0.20	0.010	0.080	0.090
JUN 25...	0.01	<0.100	0.050	0.050	2.4	0.020	0.040	<0.010
AUG 27...	0.02	<0.100	0.050	0.080	0.30	0.020	0.040	0.030

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT 30...	0645	80	<1	4	<0.5	2.0	1	<3	1	180	<1
FEB 20...	0700	20	<1	<2	1	3.0	<5	<3	<10	32	<10
JUN 25...	0830	120	<1	<2	<0.5	1.0	1	<3	4	180	<1
AUG 27...	0800	150	<1	<2	<0.5	1.0	1	<3	3	320	<1

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 30...	<4	3	<0.1	<10	1	<1	<1.0	16	<6	5
FEB 20...	<4	2	<0.1	<10	<10	<1	<1.0	34	<6	9
JUN 25...	5	6	0.5	<10	1	<1	<1.0	7	<6	4
AUG 27...	<4	5	0.2	<10	1	<1	<1.0	12	<6	9

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 CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL, DIS-SOLVED (UG/L AS U)
DEC 04...	0700	0.7	<0.4	1.0	1.1	0.8	1.1	0.08	0.02

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SEDI- MENT, SUS- PENDED (MG/L)	DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, SUS- PENDED (MG/L)	DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 30...	0645	7	1.5	100	APR 16...	0630	3	0.20	100
DEC 04...	0700	3	0.13	100	JUN 25...	0830	5	5.3	100
FEB 20...	0700	1	0.07	100	AUG 27...	0800	4	1.6	100

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155° 40'58", Hydrologic Unit 20010000, on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi².

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No diversion upstream.

AVERAGE DISCHARGE.--26 years, 14.9 ft³/s (10,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft³/s, Nov. 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft³/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft³/s, Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1977, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 440 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	2100	580	5.50	Sept. 17	0400	*610	*5.60

Minimum discharge, 0.38 ft³/s, Dec. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.2	.86	2.5	39	125	14	1.1	e15	37	e7.0	1.7
2	1.6	1.1	.79	10	41	e70	6.5	1.4	e15	74	e7.0	1.4
3	2.2	.92	.65	17	41	e75	32	23	e10	26	e8.0	21
4	1.4	.81	.65	26	24	e65	18	24	e12	7.3	e7.5	33
5	13	.81	.61	8.7	33	e60	12	46	e8.0	4.3	e4.0	43
6	23	.85	.56	4.0	54	e50	5.1	38	e9.0	2.9	e4.0	14
7	3.3	.93	.67	2.3	47	e80	2.6	53	e12	2.3	e20	3.9
8	2.2	1.0	.70	10	6.1	e90	1.9	67	e20	e7.0	e7.0	2.6
9	14	1.1	42	80	3.4	e20	1.5	12	e15	e4.5	e5.0	12
10	4.6	.93	14	16	2.7	e12	1.3	e14	e8.0	e4.0	e5.0	42
11	2.0	.73	2.8	48	2.2	e20	1.1	e15	e7.0	e15	e4.0	7.2
12	1.5	.67	1.8	45	1.8	e25	.94	e6.0	e7.5	e4.0	e6.0	21
13	1.2	.61	2.8	5.5	1.5	e18	.79	e5.5	e6.0	e6.0	e8.0	12
14	1.1	.56	3.0	2.9	1.5	e10	.73	e5.5	8.9	e5.0	e5.0	21
15	.98	.56	1.9	3.8	1.4	e20	.82	e5.0	10	e4.5	e10	15
16	.89	1.3	1.5	3.9	1.2	e25	1.2	e5.0	72	e5.0	e15	40
17	.78	17	1.2	99	1.2	e10	1.4	e4.5	57	e12	e8.0	84
18	.88	7.5	1.0	66	1.5	e8.0	1.8	e4.5	37	e50	e4.0	58
19	6.2	3.1	.83	25	1.4	e6.0	28	e20	19	e30	e4.0	39
20	22	5.2	.74	32	2.1	e4.0	41	e40	58	e20	e5.0	7.9
21	19	6.1	.73	6.6	1.8	e3.5	30	e100	24	e8.0	e3.5	6.1
22	6.6	3.4	.66	3.8	1.5	e3.0	70	e25	29	e5.0	e3.0	4.9
23	22	3.8	.57	4.8	1.2	e2.5	15	e15	35	e5.5	31	3.4
24	16	7.0	.51	2.7	54	e2.0	8.1	e30	58	e12	49	12
25	24	2.6	.46	2.2	67	e1.5	3.2	e40	47	e40	32	3.2
26	15	1.8	.43	1.8	32	e1.0	2.2	e20	21	e10	35	2.3
27	4.7	1.5	.46	6.2	10	e.80	1.7	e45	40	e15	33	7.7
28	3.0	1.2	.43	14	66	.73	1.4	e40	33	e18	13	36
29	2.2	1.1	3.9	15	---	17	1.2	e15	65	e20	4.8	49
30	1.8	.93	7.3	128	---	11	1.0	e30	28	e10	2.8	26
31	1.5	---	3.7	68	---	30	---	e12	---	e8.0	2.1	---
TOTAL	220.33	76.31	98.21	760.7	540.5	866.03	306.48	762.5	786.4	508.3	352.7	630.3
MEAN	7.11	2.54	3.17	24.5	19.3	27.9	10.2	24.6	26.2	16.4	11.4	21.0
MAX	24	17	42	128	67	125	70	100	72	74	49	84
MIN	.78	.56	.43	1.8	1.2	.73	.73	1.1	6.0	2.3	2.1	1.4
AC-FT	437	151	195	1510	1070	1720	608	1510	1560	1010	700	1250

CAL YR 1989 TOTAL 5405.27 MEAN 14.8 MAX 254 MIN .32 AC-FT 10720
WTR YR 1990 TOTAL 5908.76 MEAN 16.2 MAX 128 MIN .43 AC-FT 11720

e Estimated

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155° 40'59", Hydrologic Unit 20010000, on right bank 0.2 mi upstream from Upper Hanakua ditch intake and 4.4 mi north of Kamuela.

DRAINAGE AREA.--0.45 mi².

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

REVISED RECORDS.--WDR HI-80-1: 1969-79(P).

GAGE.--Water-stage recorder. Elevation of gage is 4,090 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--22 years, 4.29 ft³/s (3,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft³/s, Nov. 18, 1979, gage height, 8.32 ft, from rating curve extended above 33 ft³/s on basis of slope-area measurement at gage height 8.32 ft; minimum, 0.01 ft³/s, Mar. 10-15, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	2130	116	2.85	Sept. 17	0330	*139	*3.09

Minimum discharge, 0.09 ft³/s, Dec. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.56	.41	.27	.48	8.8	38	4.6	2.2	5.4	9.6	3.6	2.9
2	.53	.35	.23	2.2	6.6	23	3.1	1.8	5.4	22	3.6	2.8
3	.58	.31	.23	3.6	10	24	10	2.4	3.9	7.3	4.0	8.7
4	.52	.27	.22	5.8	4.7	20	5.9	12	5.1	3.9	3.4	9.2
5	4.3	.27	.20	2.6	6.3	17	3.8	9.6	2.9	3.8	1.8	12
6	4.4	.35	.20	1.0	8.3	16	2.6	14	3.4	3.5	1.7	4.7
7	1.3	.33	.22	.50	17	27	1.8	11	5.5	3.5	9.3	2.6
8	.66	.38	.16	.39	2.1	31	1.3	25	8.0	3.6	3.7	2.1
9	3.3	.53	12	24	.84	4.8	.89	4.4	4.5	2.0	2.2	4.0
10	1.3	.40	3.4	5.1	.64	2.8	.70	4.5	2.9	1.8	2.1	11
11	.58	.31	.73	8.9	.60	5.2	.62	5.5	2.8	4.9	1.8	2.9
12	.44	.27	.41	16	.60	7.5	.57	2.9	3.0	13	2.5	6.3
13	.37	.23	.37	2.3	.52	4.1	.55	2.9	2.6	3.0	4.9	4.0
14	.32	.23	.42	2.1	.50	2.3	.54	2.9	3.6	2.2	2.0	5.8
15	.31	.20	.29	1.8	.50	4.5	.50	2.9	4.2	2.0	5.5	5.8
16	.28	.38	.22	1.3	.50	7.4	.56	2.7	20	2.5	7.0	11
17	.27	4.9	.18	18	.47	2.9	.75	2.2	13	5.1	3.7	21
18	.29	2.8	.16	24	.39	2.4	1.0	2.2	8.9	16	1.5	13
19	2.5	1.1	.15	5.1	.33	1.9	7.8	9.3	4.9	8.5	1.7	7.7
20	6.8	2.2	.13	8.7	.33	1.0	13	18	16	6.7	2.4	3.3
21	5.0	2.5	.12	2.4	.34	.81	7.1	32	6.5	3.3	1.0	3.4
22	2.8	1.2	.12	.85	.26	.70	22	9.6	9.0	2.2	1.4	2.6
23	6.7	1.4	.12	1.5	.23	.63	4.1	3.4	10	2.3	8.9	2.4
24	5.2	2.9	.10	.74	9.2	.60	3.7	10	17	7.5	12	4.7
25	6.1	.90	.10	.50	8.6	.56	3.7	15	12	12	8.2	1.8
26	4.5	.53	.10	.40	19	.51	3.6	7.4	6.1	5.6	9.7	1.8
27	2.0	.42	.10	.53	3.6	.39	3.5	19	12	8.2	9.2	3.4
28	1.3	.35	.09	3.6	8.6	.36	3.1	15	8.2	8.7	4.5	12
29	.74	.30	.63	2.9	---	6.1	2.6	4.7	18	9.5	3.0	13
30	.54	.27	1.6	29	---	4.4	2.3	13	6.7	5.6	2.9	7.1
31	.46	---	.72	20	---	8.1	---	5.0	---	4.6	2.9	---
TOTAL	64.95	26.99	23.99	196.29	119.85	265.96	116.28	272.5	231.5	194.4	132.1	193.0
MEAN	2.10	.90	.77	6.33	4.28	8.58	3.88	8.79	7.72	6.27	4.26	6.43
MAX	6.8	4.9	12	29	19	38	22	32	20	22	12	21
MIN	.27	.20	.09	.39	.23	.36	.50	1.8	2.6	1.8	1.0	1.8
AC-FT	129	54	48	389	238	528	231	541	459	386	262	383

CAL YR 1989 TOTAL 1539.74 MEAN 4.22 MAX 67 MIN .09 AC-FT 3050
WTR YR 1990 TOTAL 1837.81 MEAN 5.04 MAX 38 MIN .09 AC-FT 3650

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 downstream from Kawaiiki Stream intake and 4.4 mi north of Kamuela.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,020 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Ditch diverts from Kawainui and Kawaiiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station.

AVERAGE DISCHARGE.--26 years, 7.28 ft³/s (5,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft³/s, Nov. 2, 1967; no flow, Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft³/s, for several days; minimum daily, 0.20 ft³/s, Dec. 25-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	.94	.72	2.5	17	e18	16	.94	e12	e15	e6.5	2.0
2	1.7	.84	.62	8.5	16	e17	11	1.3	e10	e17	e6.0	1.7
3	1.9	.72	.62	16	17	e17	17	4.9	e8.0	e14	e7.0	7.8
4	1.4	.62	.56	17	16	e16	15	15	e10	e10	e7.0	18
5	7.9	.67	.50	12	16	e16	14	16	e7.0	e6.0	e4.5	18
6	15	.89	.45	5.2	16	e17	7.7	16	e8.0	e4.0	e4.0	14
7	4.1	.84	.56	2.4	17	e17	3.1	15	e10	e3.5	e12	5.6
8	2.4	1.0	.42	1.6	11	e18	2.0	16	e12	e6.0	e8.0	3.5
9	7.2	1.4	6.6	18	4.4	e10	1.4	e12	e9.0	e4.0	e6.0	13
10	6.1	.89	13	16	3.1	e8.0	1.2	e10	e7.0	e3.5	e5.5	17
11	2.1	.72	3.4	17	2.3	e12	.94	e14	e6.5	e10	e4.5	11
12	1.4	.67	1.8	18	1.5	e14	.84	e8.0	e8.0	e15	e6.0	17
13	.94	.62	2.6	11	1.2	e12	.72	e7.5	e10	e5.0	e8.5	14
14	.78	.56	3.2	3.4	1.1	e8.0	.67	e7.0	8.8	e4.0	e5.5	15
15	.72	.56	1.7	4.8	1.1	e10	.84	e7.0	10	e4.0	e9.0	15
16	.67	1.6	1.0	6.1	.89	e12	1.5	e6.5	16	e4.5	e12	18
17	.62	17	.72	10	.78	e8.0	1.7	e5.0	16	e9.0	e8.0	17
18	.67	11	.56	18	1.3	e7.0	2.6	e4.5	15	e17	e5.0	17
19	5.1	4.3	.42	16	1.1	e6.0	14	e15	14	e15	e4.5	15
20	17	9.0	.34	17	1.7	e5.5	17	e16	14	e12	e4.5	9.6
21	15	10	.34	11	1.8	e5.0	14	e17	15	e9.0	e3.5	8.1
22	15	4.7	.31	4.1	e1.5	e4.0	17	e12	15	e6.0	e3.0	7.1
23	18	5.3	.28	7.0	e1.0	e3.0	15	e9.0	15	e6.5	17	5.3
24	15	11	.24	3.1	e12	e2.5	11	e12	16	e10	18	12
25	18	3.2	.20	2.0	e10	e2.0	3.8	e14	15	e15	18	4.3
26	15	2.0	.20	1.5	e16	e1.5	2.3	e10	15	e8.0	17	3.0
27	6.5	1.4	.20	1.8	e8.0	e.70	1.6	e15	16	e12	18	9.5
28	3.8	1.2	.20	15	e12	.78	1.2	e12	e15	e14	15	11
29	2.3	.89	2.0	14	---	15	.94	e9.0	e16	e15	7.1	17
30	1.6	.78	11	18	---	15	.84	e14	e14	e10	3.8	15
31	1.3	---	4.4	17	---	17	---	e10	---	e7.5	2.6	---
TOTAL	190.90	95.31	59.16	315.0	208.77	314.98	196.89	331.64	363.3	291.5	257.0	341.5
MEAN	6.16	3.18	1.91	10.2	7.46	10.2	6.56	10.7	12.1	9.40	8.29	11.4
MAX	18	17	13	18	17	18	17	17	16	17	18	18
MIN	.62	.56	.20	1.5	.78	.70	.67	.94	6.5	3.5	2.6	1.7
AC-FT	379	189	117	625	414	625	391	658	721	578	510	677

CAL YR 1989 TOTAL 3017.60 MEAN 8.27 MAX 20 MIN .20 AC-FT 5990
WTR YR 1990 TOTAL 2965.95 MEAN 8.13 MAX 18 MIN .20 AC-FT 5880

e Estimated

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 upstream from Alakahi Stream and 3.6 mi north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

AVERAGE DISCHARGE.--22 years, 4.86 ft³/s (3,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft³/s, Aug. 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15 ft³/s, Mar. 8; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	.28	.00	.24	7.4	13	6.8	.07	8.0	10	7.8	1.8
2	.68	.18	.00	1.5	6.9	12	5.0	.18	8.2	12	7.7	.77
3	.91	.09	.00	3.8	7.4	12	8.3	1.7	6.3	10	8.1	3.9
4	.71	.03	.00	5.1	6.7	12	7.1	5.6	6.6	7.8	7.3	9.3
5	3.1	.03	.00	4.7	6.5	11	6.6	6.8	4.8	4.8	4.9	9.6
6	6.7	.05	.00	2.5	7.2	11	4.3	7.4	6.6	4.0	4.5	7.5
7	2.7	.07	.00	1.4	8.8	12	2.0	8.3	6.1	3.9	8.4	3.5
8	1.4	.07	.00	.32	5.4	15	1.1	9.6	8.4	4.9	7.6	2.1
9	2.7	.17	2.3	7.5	3.0	11	.63	6.8	7.3	4.3	4.4	6.0
10	3.2	.07	4.8	5.7	e2.0	7.5	.37	6.8	4.3	3.7	2.8	9.6
11	1.2	.00	1.6	5.9	e1.5	8.2	.22	6.1	3.4	3.7	2.7	6.1
12	.63	.00	.47	7.6	e1.0	9.8	.09	2.7	2.9	8.5	3.2	8.3
13	.34	.00	.60	4.4	e.80	8.2	.02	1.4	4.4	6.0	8.2	7.3
14	.20	.00	1.2	1.8	e.60	4.2	.00	1.1	4.1	3.0	4.8	7.4
15	.14	.00	.37	1.6	e.50	5.5	.02	2.8	5.2	1.8	8.2	7.8
16	.09	.01	.10	2.7	e.30	9.1	.16	2.0	8.6	2.5	9.4	10
17	.03	4.0	.01	5.1	e.20	5.9	.24	1.3	9.0	6.3	8.1	12
18	.03	3.8	.00	10	e.15	4.2	.46	2.4	8.7	8.3	4.0	9.7
19	.85	1.6	.00	6.3	e.10	3.7	4.5	6.0	7.7	8.3	3.2	9.5
20	5.3	2.8	.00	7.4	e.10	2.6	7.2	9.5	8.1	8.0	6.4	6.1
21	5.8	3.4	.00	5.0	e.05	1.9	6.3	12	8.7	6.6	3.5	5.0
22	3.0	1.9	.00	2.3	e.03	1.5	9.1	8.3	9.3	4.7	2.3	4.8
23	6.7	1.8	.00	3.4	e.01	1.0	6.6	6.3	9.3	5.8	8.1	3.5
24	5.7	3.6	.00	1.9	3.4	.46	5.2	8.7	11	7.2	9.6	6.6
25	6.8	1.3	.00	.96	6.7	.27	3.1	9.7	11	8.8	9.5	3.0
26	6.2	.50	.00	.55	8.4	.16	2.3	9.0	9.5	7.9	9.6	2.6
27	3.4	.23	.00	.40	6.3	.08	.66	10	11	8.1	11	4.7
28	2.2	.11	.00	4.5	7.4	.06	.33	10	9.7	8.5	8.6	6.6
29	1.2	.02	.04	4.8	---	5.7	.17	8.6	12	9.1	4.8	9.9
30	.69	.00	2.2	7.6	---	6.0	.06	10	9.6	8.5	3.0	8.4
31	.42	---	1.2	8.6	---	7.5	---	8.1	---	8.1	2.8	---
TOTAL	73.97	26.11	14.89	125.57	98.84	202.53	88.93	189.25	229.8	205.1	194.5	193.37
MEAN	2.39	.87	.48	4.05	3.53	6.53	2.96	6.10	7.66	6.62	6.27	6.45
MAX	6.8	4.0	4.8	10	8.8	15	9.1	12	12	12	11	12
MIN	.03	.00	.00	.24	.01	.06	.00	.07	2.9	1.8	2.3	.77
AC-FT	147	52	30	249	196	402	176	375	456	407	386	384

CAL YR 1989 TOTAL 1611.96 MEAN 4.42 MAX 21 MIN .00 AC-FT 3200
WTR YR 1990 TOTAL 1642.86 MEAN 4.50 MAX 15 MIN .00 AC-FT 3260

e Estimated

HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155° 40'25", Hydrologic Unit 20010000, on right bank 25 ft upstream from upper Hamakua ditch intake and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi².

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,900 ft, from topographic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--26 years, 7.03 ft³/s (5,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s, Apr. 7, 1989, gage height, 10.28 ft, from rating curve extended above 28 ft³/s on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft; minimum, 0.03 ft³/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 120 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	2100	122	4.43	Sept. 17	0330	*157	*4.75

Minimum, 0.50 ft³/s, Dec. 27-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.5	1.0	2.1	14	46	7.3	1.5	22	18	7.1	2.5
2	1.5	1.4	1.0	2.8	10	35	5.7	1.7	24	36	6.9	2.3
3	1.6	1.2	1.0	5.7	15	39	20	9.9	19	16	8.0	12
4	6.1	1.1	1.0	8.1	7.8	33	7.8	9.4	17	5.3	7.7	16
5	14	1.2	.90	5.7	8.9	28	6.5	20	13	4.0	4.4	20
6	9.7	1.2	.85	2.9	14	27	4.7	20	14	3.2	4.3	8.8
7	3.4	1.2	.90	2.1	26	33	2.9	26	19	2.8	19	4.0
8	2.4	1.2	.83	1.6	6.6	43	2.4	30	33	4.7	7.3	3.3
9	4.6	1.2	13	33	4.7	9.0	2.1	6.1	22	4.7	4.0	6.4
10	4.3	1.2	6.9	11	2.8	6.1	1.8	9.7	13	3.8	3.2	20
11	1.8	1.1	3.3	12	2.1	9.6	1.6	6.1	13	6.6	2.7	5.0
12	1.4	1.0	2.0	28	1.8	13	1.8	3.2	12	24	3.5	9.2
13	1.2	1.0	1.6	5.4	1.6	8.5	1.4	2.5	9.0	5.5	11	6.6
14	1.1	.95	1.5	2.8	1.4	5.5	1.4	2.7	4.8	3.4	4.5	7.6
15	1.0	.90	1.4	2.8	1.4	7.6	1.9	3.3	5.0	2.8	11	8.2
16	1.0	.95	1.2	4.0	1.2	12	2.4	2.5	28	3.5	15	20
17	.92	4.9	1.0	17	1.2	4.3	2.4	2.4	21	9.2	9.2	31
18	.92	5.0	.95	41	1.2	3.1	2.8	4.1	14	24	3.9	14
19	3.1	2.8	.90	9.2	1.2	2.6	15	14	7.0	16	4.0	14
20	10	4.4	.75	17	1.7	2.2	20	42	22	13	6.6	5.4
21	9.5	4.6	.75	6.2	2.1	2.1	15	43	11	6.1	4.0	5.0
22	5.0	2.8	.70	3.5	1.2	1.8	29	11	17	4.3	3.4	4.9
23	13	2.5	.65	4.7	1.0	1.6	5.8	5.7	17	4.9	12	4.0
24	9.9	4.5	.65	2.9	12	1.5	4.2	18	33	14	18	8.0
25	10	2.5	.60	2.3	17	1.4	2.8	25	24	27	14	3.8
26	8.5	1.7	.55	1.8	28	1.4	2.4	14	11	12	16	3.1
27	4.6	1.4	.50	1.6	6.8	1.2	2.1	32	24	15	17	5.2
28	3.4	1.3	.50	4.7	17	1.5	1.7	19	14	19	7.5	19
29	2.6	1.2	.70	5.6	---	11	1.4	8.3	33	22	4.2	24
30	2.1	1.0	3.5	14	---	7.2	1.4	50	12	11	3.3	13
31	1.7	---	2.8	32	---	14	---	19	---	9.9	2.8	---
TOTAL	142.04	58.90	53.88	293.5	209.7	412.2	177.7	462.1	527.8	351.7	245.5	306.3
MEAN	4.58	1.96	1.74	9.47	7.49	13.3	5.92	14.9	17.6	11.3	7.92	10.2
MAX	14	5.0	13	41	28	46	29	50	33	36	19	31
MIN	.92	.90	.50	1.6	1.0	1.2	1.4	1.5	4.8	2.8	2.7	2.3
AC-FT	282	117	107	582	416	818	352	917	1050	698	487	608

CAL YR 1989 TOTAL 3014.37 MEAN 8.26 MAX 172 MIN .50 AC-FT 5980
WTR YR 1990 TOTAL 3241.32 MEAN 8.88 MAX 50 MIN .50 AC-FT 6430

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 upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft, from topographic map.

REMARKS.--Records fair except for periods when the control was partially submerged and for estimated daily discharges, which are poor. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--16 years, 11.7 ft³/s (8,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft³/s, Apr. 14, 1989; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 55 ft³/s, May 21; minimum daily, no flow, Dec. 6, 20, 24-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	.60	.12	.09	7.4	47	32	.33	24	30	e9.0	1.6
2	.57	.44	.10	.10	9.5	43	13	.51	34	44	e8.5	1.1
3	.49	.37	.08	1.4	29	43	19	8.8	20	e25	e12	19
4	.50	.32	.07	6.5	22	40	.96	22	13	e7.0	e10	e15
5	15	.35	.06	10	10	33	4.1	34	2.3	e6.0	e7.0	e25
6	13	.32	.00	3.7	.42	32	.48	39	2.1	e5.0	e7.5	e9.0
7	6.4	.09	.06	1.6	16	24	.27	35	1.9	e4.0	e30	e6.0
8	3.7	.07	.04	1.6	.34	44	.16	41	17	e7.0	e10	e5.5
9	2.0	.06	14	46	1.9	9.6	.12	14	17	e7.5	e7.0	e7.0
10	.88	.05	12	16	4.0	1.5	.11	14	5.1	e6.5	e6.0	e25
11	.68	.04	1.4	9.4	2.7	13	.10	21	3.7	e9.0	e5.0	e7.5
12	.57	.03	.11	15	.99	23	.09	12	2.4	e35	e4.0	e12
13	.51	.03	.35	2.3	.09	14	.29	3.4	2.5	e8.0	e3.0	e8.5
14	.49	.01	.21	1.6	.08	.32	.34	1.3	2.0	e7.0	e2.0	e9.0
15	.83	.01	.09	4.4	.09	13	3.2	.59	2.0	e5.0	e1.0	e10
16	.47	.35	.08	2.7	.07	29	4.1	.20	26	e6.5	e.75	e12
17	.37	10	.07	18	.21	6.6	1.3	.13	17	e15	e.65	e15
18	.35	8.1	.07	22	.37	.67	.39	1.6	13	e40	e.60	e10
19	.96	2.7	.03	2.5	.35	.19	14	25	3.6	e25	e.50	e10
20	7.0	1.6	.00	5.0	.26	.13	11	46	19	e20	e.45	e9.0
21	12	.74	.06	.53	.08	.10	12	55	18	e10	e.40	e7.0
22	8.8	1.1	.05	.22	.07	.09	41	34	25	e8.0	.20	e5.5
23	19	.98	.01	.26	.06	.22	9.5	17	21	e8.5	.66	e4.0
24	7.6	3.2	.00	.15	13	1.2	.46	30	40	e18	8.4	e3.5
25	7.8	1.3	.00	.11	23	1.1	.22	34	34	e40	29	e3.0
26	4.5	.26	.00	.23	22	.90	.15	34	25	e16	25	e2.5
27	2.4	.08	.00	.73	6.1	.45	.27	46	38	e20	38	e2.0
28	4.1	.07	.00	1.2	21	.13	.45	38	24	e30	23	e1.5
29	2.6	.06	.00	.90	---	12	.34	32	36	e35	3.8	e1.0
30	1.9	.05	.11	21	---	9.4	.20	41	22	e15	1.8	e.50
31	1.0	---	.43	24	---	33	---	21	---	e12	1.3	---
TOTAL	128.47	33.38	29.60	219.22	191.08	475.60	169.60	701.86	510.6	525.0	256.51	247.70
MEAN	4.14	1.11	.95	7.07	6.82	15.3	5.65	22.6	17.0	16.9	8.27	8.26
MAX	19	10	14	46	29	47	41	55	40	44	38	25
MIN	.35	.01	.00	.09	.06	.09	.09	.13	1.9	4.0	.20	.50
AC-FT	255	66	59	435	379	943	336	1390	1010	1040	509	491

CAL YR 1989 TOTAL 5200.35 MEAN 14.2 MAX 58 MIN .00 AC-FT 10310
WTR YR 1990 TOTAL 3488.62 MEAN 9.56 MAX 55 MIN .00 AC-FT 6920

e Estimated

HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge and 4.0 mi northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts above into Waimea Reservoir for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--13 years, 2.32 ft³/s (1,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft³/s, Apr. 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.44 ft³/s, Mar. 1; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.44	.01	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.06	.00	.00	.00	.02	.00	.00
3	.00	.00	.00	.00	.00	.03	.03	.00	.00	.01	.00	.01
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.01	.00	.00	.00	.00	.00	.05	.02	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.05	.04	.09	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.28	.00	.01	.00	.01	.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	.01
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	.38	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.07	.00	.00	.00	.00	.00	.00	.00	.05
18	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01
20	.00	.00	.00	.01	.00	.00	.00	.00	.00	.01	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.19	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.01	.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	.04	.00	.00
26	.00	.00	.00	.00	.02	.00	.00	.02	.00	.03	.01	.00
27	.00	.00	.00	.00	.00	.00	.00	.02	.01	.01	.03	.00
28	.00	.00	.00	.00	.01	.00	.00	.01	.00	.04	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.03	.00	.04
30	.00	.00	.00	.00	---	.04	.00	.00	.00	.00	.00	.03
31	.00	---	.00	.00	---	.05	---	.00	---	.00	.00	---
TOTAL	0.01	0.00	0.00	0.11	0.03	1.33	0.13	0.37	0.01	0.20	0.04	0.15
MEAN	.000	.000	.000	.004	.001	.043	.004	.012	.000	.006	.001	.005
MAX	.01	.00	.00	.07	.02	.44	.05	.19	.01	.04	.03	.05
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.02	.00	.00	.2	.06	2.6	.3	.7	.02	.4	.08	.3

CAL YR 1989 TOTAL 5.25 MEAN .014 MAX 1.6 MIN .00 AC-FT 10
WTR YR 1990 TOTAL 2.38 MEAN .007 MAX .44 MIN .00 AC-FT 4.7

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi upstream from Oolamakapehu Gulch and 1.7 mi northwest of Kamuela.

DRAINAGE AREA.--2.51 mi².

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft 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 upstream at different datum.

REMARKS.--Records good. Parker Ranch pipeline diverts upstream at elevation 4,250 ft. Hawaii Department of Water Supply diverts by pipeline 0.3 mi upstream at elevation 3,400 ft for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973.

AVERAGE DISCHARGE.--34 years, 8.41 ft³/s (6,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft³/s, Aug. 7, 1958, gage height, 10.76 ft, site and datum then in use, from rating curve extended above 70 ft³/s by test of model of station site; no flow at times in 1968, 1971-90.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 1	0930	*207	*4.09				

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	26	92	7.2	.00	4.2	15	.00	.00
2	.00	.00	.00	.00	16	43	4.3	.00	11	43	.05	.00
3	.00	.00	.00	.00	27	56	20	.00	7.2	17	.11	3.4
4	.00	.00	.00	.00	13	51	6.9	3.9	7.7	.46	.84	6.2
5	9.9	.00	.00	1.1	12	40	4.7	17	4.0	.04	.00	13
6	15	.00	.00	.00	19	40	2.4	29	3.6	.01	.00	5.4
7	.01	.00	.00	.00	41	44	1.8	30	4.1	.00	19	3.3
8	.00	.00	.00	.00	6.9	78	1.3	53	16	.00	3.2	2.3
9	5.8	.00	15	30	3.2	19	1.2	2.5	11	.00	.00	3.6
10	1.1	.00	5.4	7.6	2.4	4.7	.92	1.3	4.2	.00	.00	24
11	.00	.00	.00	5.2	1.9	6.3	.70	5.0	3.5	3.2	.00	4.7
12	.00	.00	.00	39	1.7	13	.45	.02	3.1	21	.00	6.2
13	.00	.00	.00	5.0	.82	11	.00	.00	3.6	.88	5.3	4.5
14	.00	.00	.00	2.6	.00	4.2	.00	.00	3.3	.00	.00	5.8
15	.00	.00	.00	2.5	.00	4.9	.00	.00	4.2	.00	9.2	5.6
16	.00	.00	.00	3.3	.00	17	.00	.00	41	.00	16	22
17	.00	.00	.00	19	.00	5.1	.00	.00	36	1.7	9.9	41
18	.00	.00	.00	57	.00	3.2	.00	.00	22	25	3.7	13
19	.00	.00	.00	16	.00	2.6	7.6	4.0	10	14	2.9	21
20	.00	.00	.00	36	.00	2.2	26	50	28	5.0	3.6	5.1
21	3.8	.00	.00	2.8	.00	1.9	11	61	18	.26	2.8	3.7
22	.00	.00	.00	.02	.00	1.7	46	16	21	.00	2.3	3.7
23	7.3	.00	.00	1.7	.00	1.5	4.1	1.0	21	.00	3.9	2.9
24	1.9	.00	.00	2.7	6.2	1.4	4.4	22	49	10	14	4.5
25	3.8	.00	.00	2.0	21	.29	2.8	31	37	30	13	2.9
26	5.1	.00	.00	1.7	52	.00	.54	13	13	7.6	7.9	2.3
27	2.9	.00	.00	1.4	6.6	.00	.00	46	30	12	13	3.0
28	1.8	.00	.00	1.8	11	.00	.00	29	15	19	.66	16
29	.66	.00	.00	.25	---	4.4	.00	8.0	44	23	.00	32
30	.01	.00	.00	46	---	4.6	.00	24	7.1	2.0	.00	18
31	.00	---	.00	48	---	14	---	9.1	---	1.7	.00	---
TOTAL	59.08	0.00	20.40	332.67	267.72	566.99	154.31	455.82	482.8	251.85	131.36	279.10
MEAN	1.91	.000	.66	10.7	9.56	18.3	5.14	14.7	16.1	8.12	4.24	9.30
MAX	15	.00	15	57	52	92	46	61	49	43	19	41
MIN	.00	.00	.00	.00	.00	.00	.00	.00	3.1	.00	.00	.00
AC-FT	117	.00	40	660	531	1120	306	904	958	500	261	554

CAL YR 1989 TOTAL 3042.49 MEAN 8.34 MAX 214 MIN .00 AC-FT 6030
WTR YR 1990 TOTAL 3002.10 MEAN 8.22 MAX 92 MIN .00 AC-FT 5950

HAWAII, ISLAND OF HAWAII

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 upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi².

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft, from topographic map.

REMARKS.--Records good. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--43 years, 9.13 ft³/s (6,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft³/s, Nov. 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft³/s on basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.59 ft³/s, Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	2300	*172	*3.26				

Minimum discharge, 0.75 ft³/s, Dec. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	2.1	1.7	1.1	13	83	9.4	2.4	12	20	12	4.0
2	2.9	1.9	1.9	1.2	8.8	43	6.0	2.5	16	50	13	3.7
3	2.9	1.9	1.6	2.0	13	49	22	8.1	12	28	13	17
4	2.9	2.0	1.4	3.5	6.4	40	9.9	15	9.5	11	12	17
5	18	1.9	1.5	3.0	6.5	29	5.2	27	6.3	9.2	7.6	17
6	16	1.8	1.3	1.6	8.5	27	3.8	23	6.0	6.6	7.5	12
7	4.9	1.8	1.2	1.2	22	34	3.0	40	6.0	5.4	23	6.1
8	3.2	1.8	1.1	1.0	5.3	62	2.6	48	17	7.6	11	5.1
9	2.7	1.8	15	42	3.2	12	2.5	11	13	7.4	6.9	8.9
10	2.3	1.7	7.4	12	2.6	6.7	2.4	8.9	7.2	5.8	5.3	26
11	2.1	1.8	2.4	10	2.5	11	2.3	8.7	6.7	7.8	4.7	8.4
12	2.0	1.9	1.7	25	2.1	16	2.2	4.8	6.5	26	5.1	9.7
13	1.9	1.6	1.6	4.6	1.9	12	2.2	4.0	7.1	9.2	11	8.0
14	1.8	1.5	1.7	2.7	1.8	5.1	2.1	4.3	5.9	5.7	8.6	7.4
15	1.9	1.4	1.4	3.6	1.7	12	2.7	6.4	5.8	4.7	16	9.5
16	1.8	1.9	1.2	4.3	1.6	22	3.8	4.1	18	7.9	23	21
17	1.8	9.3	1.2	28	1.7	7.1	3.8	3.7	16	15	14	30
18	1.7	5.8	1.1	58	2.0	4.8	4.0	4.4	15	23	6.6	11
19	2.2	3.0	1.0	13	1.6	3.6	20	7.1	8.9	25	5.8	12
20	5.9	3.7	.95	23	1.7	3.1	22	45	25	19	7.6	8.5
21	7.7	3.4	1.0	7.3	1.5	2.8	16	86	15	10	6.2	7.6
22	4.7	2.6	1.0	3.8	1.6	2.6	40	27	21	7.3	5.3	7.8
23	13	2.5	1.2	4.8	1.5	2.5	8.2	12	21	7.4	9.2	6.7
24	9.4	3.1	1.0	3.1	9.6	2.5	5.2	21	45	15	14	11
25	9.6	2.5	.88	2.4	17	2.6	3.6	27	32	35	14	5.8
26	8.1	2.2	.87	2.2	33	2.2	2.9	22	19	20	21	4.8
27	4.2	1.9	.88	2.0	11	2.1	2.6	47	36	21	25	6.2
28	3.3	1.6	.84	2.8	19	2.3	2.5	30	17	27	13	17
29	2.7	1.5	.80	3.3	---	11	2.6	16	35	34	6.9	30
30	2.4	1.6	1.3	36	---	11	2.3	35	14	15	5.1	21
31	2.2	---	1.1	30	---	17	---	12	---	13	4.4	---
TOTAL	149.5	73.5	59.22	338.5	202.1	541.0	217.8	613.4	474.9	499.0	337.8	360.2
MEAN	4.82	2.45	1.91	10.9	7.22	17.5	7.26	19.8	15.8	16.1	10.9	12.0
MAX	18	9.3	15	58	33	83	40	86	45	50	25	30
MIN	1.7	1.4	.80	1.0	1.5	2.1	2.1	2.4	5.8	4.7	4.4	3.7
AC-FT	297	146	117	671	401	1070	432	1220	942	990	670	714

CAL YR 1989 TOTAL 3966.42 MEAN 10.9 MAX 180 MIN .80 AC-FT 7870
WTR YR 1990 TOTAL 3866.92 MEAN 10.6 MAX 86 MIN .80 AC-FT 7670

HAWAII, ISLAND OF HAWAII

165

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi².

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 above mean sea level (Hawaii County Department of Water Supply bench mark).

REMARKS.--Records good. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--34 years, 1.65 ft³/s (1,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft³/s, Nov. 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft³/s on basis of slope-conveyance study; maximum gage height, 4.65 ft Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 17	2130	*79	*2.58	No other peak greater than base discharge.			

Minimum discharge, 0.07 ft³/s, Dec. 25-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	.36	.15	.09	1.7	24	1.5	.52	2.0	3.5	1.8	.98
2	.36	.34	.15	.09	1.2	11	.97	.52	3.9	16	1.7	.94
3	.36	.32	.13	.09	1.7	13	3.0	1.3	2.6	5.8	1.7	4.0
4	.38	.31	.12	.13	.81	9.4	1.2	2.1	1.7	2.1	1.7	2.4
5	6.6	.33	.12	.18	.78	5.3	.82	4.3	1.3	1.7	1.4	2.2
6	2.4	.32	.10	.11	.96	4.6	.68	4.4	1.2	1.3	1.5	1.7
7	.89	.29	.10	.09	3.8	11	.58	13	1.1	1.2	3.7	1.1
8	.59	.28	.09	.12	.75	14	.52	11	3.0	1.4	2.0	1.0
9	.46	.27	2.2	8.9	.48	2.0	.48	1.7	2.0	1.2	1.4	1.8
10	.39	.25	.83	1.7	.37	1.1	.45	1.4	1.3	1.0	1.2	4.0
11	.37	.24	.23	2.4	.31	1.3	.43	1.1	1.2	1.2	1.1	1.3
12	.34	.24	.17	5.6	.27	3.2	.41	.79	1.2	3.2	1.3	1.4
13	.33	.22	.17	.70	.24	1.7	.43	.69	1.1	1.3	2.0	1.2
14	.31	.22	.15	.36	.22	.82	.42	.71	1.1	1.0	1.5	1.3
15	.38	.22	.13	.65	.21	1.7	.61	.87	1.1	.97	2.5	1.7
16	.33	.29	.11	.60	.19	3.3	.66	.65	2.8	1.7	4.6	2.6
17	.31	.88	.10	11	.18	.94	.58	.61	2.0	2.0	2.1	5.0
18	.31	.59	.09	13	.18	.68	.64	.62	2.2	3.6	1.3	1.5
19	.61	.32	.09	2.5	.17	.55	4.3	.84	1.4	3.7	1.4	1.3
20	1.3	.32	.09	5.0	.18	.47	3.5	8.2	5.3	2.8	1.5	1.2
21	1.1	.30	.10	1.2	.16	.43	4.3	26	2.3	1.6	1.1	1.3
22	1.1	.26	.09	.67	.15	.39	7.5	6.5	4.7	1.3	1.0	1.2
23	1.8	.25	.08	.74	.14	.36	1.3	1.9	4.7	1.3	1.4	1.3
24	1.4	.28	.08	.43	1.0	.34	.92	3.2	8.3	2.6	2.0	1.8
25	1.3	.24	.08	.33	1.6	.33	.71	5.7	5.4	7.8	2.3	1.0
26	1.0	.20	.07	.28	5.5	.35	.62	6.3	3.2	5.1	3.8	.91
27	.60	.19	.07	.24	1.4	.38	.55	13	6.7	4.5	4.3	.96
28	.48	.18	.07	.32	3.7	.47	.50	6.8	3.0	6.6	2.2	2.6
29	.43	.17	.07	.35	---	2.2	.49	3.3	7.3	6.5	1.3	4.9
30	.40	.15	.09	9.0	---	1.4	.48	9.1	2.8	2.7	1.1	4.2
31	.41	---	.09	5.4	---	2.8	---	2.3	---	2.1	1.0	---
TOTAL	27.40	8.83	6.21	72.27	28.35	119.51	39.55	139.42	87.9	98.77	58.9	58.79
MEAN	.88	.29	.20	2.33	1.01	3.86	1.32	4.50	2.93	3.19	1.90	1.96
MAX	6.6	.88	2.2	13	5.5	24	7.5	26	8.3	16	4.6	5.0
MIN	.31	.15	.07	.09	.14	.33	.41	.52	1.1	.97	1.0	.91
AC-FT	54	18	12	143	56	237	78	277	174	196	117	117

CAL YR 1989 TOTAL 868.02 MEAN 2.38 MAX 54 MIN .07 AC-FT 1720
WTR YR 1990 TOTAL 745.90 MEAN 2.04 MAX 26 MIN .07 AC-FT 1480

HAWAII, ISLAND OF HAWAII

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi upstream from mouth, 6.6 mi northwest of Honuapo, and 6.7 mi west of Punaluu.

DRAINAGE AREA.--9.17 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 2,940 ft, from topographic map.

REMARKS.--Records fair except for estimated discharge, which are poor. No diversion upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--24 years, 7.05 ft³/s (5,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s, Mar. 18, 1980, gage height, 8.00 ft, from rating curve extended above 75 ft³/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 19	1600	*1,600	*6.93	No other peak greater than base discharge.			

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	.32	.00	e.50	e10	45	.00	.00	.00	.03	.01	.53
2	7.5	.25	.00	e.30	e30	3.0	.00	.00	.00	.01	.01	3.1
3	19	.18	.00	e.10	e45	.70	.00	.00	.00	.01	.01	.74
4	4.7	.33	.00	e.05	e5.0	.41	.00	.00	.00	.01	.01	.28
5	3.0	.42	.00	e.03	e.50	.24	.00	.00	.00	.01	.01	44
6	4.2	.49	.00	e.01	e.30	2.7	.00	.00	.00	.01	.01	55
7	.89	.32	.00	e.00	e10	2.4	.00	.00	.00	.01	.01	6.6
8	.59	.25	.00	e.00	e1.0	.42	.00	.00	.00	.01	.01	1.2
9	1.6	1.5	.00	e.00	e.50	.20	.00	.00	.00	.01	.78	1.8
10	26	.96	.00	e.00	e.30	.35	.00	.00	.00	.01	6.2	39
11	1.7	.21	.00	e.00	e.10	3.0	.00	.00	.00	.01	2.5	5.4
12	.66	.16	.00	e.00	e.05	1.3	.00	.00	.00	.01	1.9	.85
13	.47	.14	.00	e.00	e.00	.38	.00	.00	.00	.57	1.5	.69
14	.39	.03	.00	e.00	e.00	.19	.00	.85	.00	1.2	.25	.70
15	5.4	.00	e.00	e.00	e.00	.09	.00	.64	.00	.78	.13	.50
16	.87	.00	e.00	e.00	e.00	.04	.00	7.7	.00	.37	.04	.22
17	.60	.00	e.00	e.00	e.00	.01	.00	1.0	21	.06	.55	.12
18	.56	.00	e.00	e.50	e.00	.00	.00	27	1.1	.20	.41	.05
19	.49	.00	e.00	e300	e.00	.00	.00	1.6	.03	2.6	.66	2.0
20	.44	.00	e.00	e15	e.00	.00	.00	.59	.01	2.2	27	109
21	.47	.00	e.00	e5.0	e.00	.00	.00	1.1	.01	1.7	29	6.5
22	.37	.00	e.00	e3.0	e.00	.00	.00	.64	.03	1.2	5.0	2.6
23	.81	.00	e.00	e1.0	.00	.00	.00	.43	.14	.89	1.0	1.4
24	4.2	.00	e.00	e.50	.80	.00	.00	.35	6.7	.33	.57	.76
25	9.7	.00	e.00	e.20	1.1	.00	.53	.43	1.8	.13	.48	.99
26	1.7	.00	e.00	e.15	7.7	.00	6.5	.47	.89	.04	.20	1.5
27	1.1	.00	e.00	e.10	.63	.00	1.0	.54	3.9	.01	.09	1.0
28	33	.00	e.00	e.05	6.9	.00	.15	.37	1.1	.01	.03	.71
29	3.6	.00	e.00	e.05	---	.00	.12	.09	.29	.06	.01	.91
30	.71	.00	e.00	e.10	---	.00	.02	.03	.10	.06	.01	45
31	.44	---	e.00	e5.0	---	.00	---	.00	---	.04	.01	---
TOTAL	155.16	5.56	0.00	331.64	119.88	60.43	8.32	43.83	37.10	12.59	78.40	333.15
MEAN	5.01	.19	.000	10.7	4.28	1.95	.28	1.41	1.24	.41	2.53	11.1
MAX	33	1.5	.00	300	45	45	6.5	27	21	2.6	29	109
MIN	.37	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.05
AC-FT	308	11	.00	658	238	120	17	87	74	25	156	661

CAL YR 1989 TOTAL 1928.53 MEAN 5.28 MAX 246 MIN .00 AC-FT 3830
WTR YR 1990 TOTAL 1186.06 MEAN 3.25 MAX 300 MIN .00 AC-FT 2350

e Estimated

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 flood-flow analyses, depending on the type of data collected.

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.

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 1990						
Station No.	Station name	Location	Drainage area mi ²	Period of record	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Molokai						
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft upstream from Kawaiiena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.51	1968-90	11-08-89 05-01-90 07-19-90	0.78 1.22 1.26
16403500	Kawaiiena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft upstream from mouth, 2.2 mi south of former village of Pelekunu, and 5.5 mi north of Kamalo.	.65	1968-90	11-08-89 05-01-90 07-19-90	1.49 1.98 1.75
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft downstream from Kawaiiena Stream, 2.1 mi south of former village of Pelekunu, and 5.6 mi north of Kamalo.	1.20	1968-70#, 1974-90	11-08-89 05-01-90 07-19-90	2.58 3.33 2.77
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft upstream from Kawaipoko Stream, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.79	1968-90	11-08-89 05-01-90 07-19-89	2.06 1.96 2.62
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft upstream from mouth, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.26	1968-90	11-08-89 05-01-90 07-19-90	0.39 0.47 1.12
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", on right bank 900 ft upstream from confluence with Kapuhi Stream, 2.1 mi south of former village of Pelekunu, and 5.7 mi north of Kamalo.	1.17	1968-79#, 1980-90	11-08-89 05-01-90 07-19-90	2.61 2.67 4.74

Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND 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 1990

Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Kauai							
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-90b	01-21-90	6.91	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	26.6	1950-90b	01-21-90	5.26	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72 [†] , 1973-90	01-21-90	7.20	2,870
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.6	1912-15 [†] , 1962-67, 1968-70 [†] , 1971-90	01-21-90	15.30	9,450
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-90b	01-21-90	5.74	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-90	01-21-90	8.04	260
16080000	Kapaa Stream at Kapahi ditch intake, near Kapaa	Lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 3.8 mi northwest of Kapaa, and 4.3 mi northwest of Wailua.	3.86	1936-85 [†] , 1986-90	01-23-90	3.38	2,600
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	.40	1964-90	01-23-90	5.84	395
16084500	Kapaa Stream at old highway crossing, near Kealia	Lat 22°06'28", long 159°19'52", at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-90	01-23-90	12.45	7,320
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi southeast of Anahola School, and 1.6 mi north of Kealia.	.85	1964-90	01-23-90	2.70	250
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	.91	1964-68, 1971-90	11-04-89	6.10	220
16104200	Hanalei River at Highway 56 bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-90b	11-04-89	10.98	-

[†] Operated as a continuous-record gaging station.

b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued

Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Kauai--Continued							
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71 [‡] , 1972-90	01-21-90	5.47	511
Hawaii, Island of Oahu							
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-90	03-06-90	19.87	2,270
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	10.9	1967-90	10-03-89	15.25	e1,240
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of sugar mill at Waialua.	4.15	1958-63, 1964-65 [‡] , 1966-90	01-16-90	5.47	448
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft upstream from Highway 99, 1.7 mi west of Camp Erdman, and 2.0 mi east of Kaena Point.	1.08	1974-90	01-16-90	13.48	e350
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank 20 ft upstream from old concrete highway ford, 140 ft downstream from Farrington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-90	01-16-90	9.27	e580
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-90	01-16-90	10.83	1,110
16211800	Kaupuni Stream at altitude 372 ft, near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72 [‡] , 1973-90	01-16-90	5.44	e380
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery near Waianae.	1.51	1958-90	01-16-90	3.55	e320
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi upstream from Highway 90 and 0.6 mi northeast of Nanakuli Post Office.	3.98	1968-90	10-03-89	22.60	350
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of Ewa Post Office.	1.70	1968-90	10-03-89	5.13	341
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-90	10-03-89	2.45	365
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-90	01-16-90	6.37	334

[‡] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Oahu--Continued							
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	7.49	1958-90	09-20-90	6.56	812
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	.84	1974-90	10-03-89	10.61	e75
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi northwest of Aiea High School.	5.97	1952-70 [‡] , 1973-90	10-03-89	3.03	1,440
16224500	Kalauao Stream at Moanalua Road, at Aiea	Lat 21°23'07", long 157°56'22", on left bank at downstream side of Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	2.59	1957-82 [‡] , 1984-90	10-03-89	5.77	1,710
16228000	Moanalua Stream near Honolulu	Lat 21°22'53", long 157°52'22", on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78 [‡] , 1979-90	10-03-89	6.09	792
16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1969-90	10-03-89	4.48	906
16228600	Moanalua Stream at Tripler Hospital	Lat 21°21'52", long 157°54'05", on right bank 0.5 mi west of Tripler Hospital and 1.6 mi northeast of Aliamanu School.	4.44	1971-90	10-03-89	14.84	950
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	.60	1967-71 [‡] , 1972-90	03-01-90	2.80	240
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.28	1958-90	10-03-89	1.62	628
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-90	10-03-89	.56	285
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 downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.	9.35	1968-90	10-03-89	86.43	2,090
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi upstream from Kalaniana'ole Highway in Aina Haina.	2.35	1958-90	03-01-90	1.72	496
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft downstream of single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-90	03-01-90	-	e250
16248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft upstream from culvert on Hihimanu Street and 0.8 mi northwest of Waimanalo Post Office.	1.21	1958-90	03-01-90	4.87	280
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft upstream from Highway 72 and 2.3 mi northwest of Waimanalo Post Office.	2.16	1967-70 [‡] , 1971-90	03-01-90	2.58	900

[‡] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Oahu--Continued							
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft upstream from Kalaniana'ole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-90	03-01-90	2.13	51
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 west of Maunawili School, and 1.6 mi southwest of Kailua Post Office.	5.34	1958-67, 1968-71 ^a , 1972-90	03-01-90	-	e810
16264800	Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi northwest of Kailua Post Office.	11.0	1957-60, 1963-64, 1967-90b		2.37	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-90	01-16-90	5.93	440
16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft upstream from bridge on Kamehameha Highway in Kaneohe.	.62	1959-90	03-01-90	3.74	e610
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft downstream from culvert on Kahekili Highway, 0.7 mi west of Kaneohe Post Office, and 0.8 mi southwest of Heeia.	1.80	1965-66, 1968-90	10-03-89	1.33	944
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-90	10-03-89	-	e890
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-90	03-06-90	2.10	e450
16310501	Malaekahana Stream at altitude 30 ft, near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-90	03-01-90	3.98	e100
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi southwest of junction of plantation road and Highway 83 and 2.7 mi west of Kahuku Hospital.	2.13	1958-90	03-01-90	-	e60
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 northeast of Waimea.	1.98	1973-90	10-03-89	3.19	e55
16318000	Paumalu Gulch at Sunset	Lat 21°40'19", long 158°02'28", 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi northeast of Waimea.	2.59	1968-90	03-01-90	3.29	e75

^a Operated as a continuous-record gaging station.
^b Gage height only.
^e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Oahu--Continued							
16331000	Waimea Gulch near Kawaihoa Camp	Lat 21°37'29", long 158°04'58", at culvert on Ashley Road, 0.1 mi up-stream from Highway 83, and 1.1 mi north of Kawaihoa Camp.	2.23	1968-90	03-01-90	3.19	138
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Haleiwa.	13.5	1958-90	01-16-90	6.24	2,040
16350000	Opaepala Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-90	01-16-90	12.98	1,390
Hawaii, Island of Molokai							
16411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-90	02-25-90	-	e<2
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72 [‡] , 1973-90	02-25-90	-	e<50
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	.28	1964-90	02-25-90	0.93	11
16411640	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-90	02-25-90	2.31	248
16411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-90	-	-	<1
16413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-90	01-17-90	-	e250
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-90	01-17-90	-	e210
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	.48	1964-90	02-25-90	6.64	179
Hawaii, Island of Maui							
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72 [‡] , 1973-90	10-06-89	5.88	415
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo.	11.3	1967-90	12-09-89	6.83	1,300
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo.	.76	1963-68 [‡] , 1969-90	10-01-89	6.53	586

[‡] Operated as a continuous-record gaging station.

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

e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Maui--Continued							
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi southwest of Puuiki, and 4.0 mi south of Hana.	0.48	1963-90	10-24-89	2.42	83
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 south of Hana.	.90	1963-90	01-19-90	10.17	565
16502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-90	10-24-89	7.49	4,480
16603300	Unnamed gulch at Maliko Bay	Lat 20°56'26", long 156°21'04", at Hana Highway, 0.5 mi west of Maliko Bay, and 1.3 mi north of Hamakuapoko.	.43	1963-90	01-15-90	1.94	15
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-90	12-09-89	-	e1
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi west of Olinda Prison Camp, and 2.3 mi southeast of Pukalani.	.45	1963-90	12-09-89	1.25	16
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital, and 2.5 mi southeast of Kahului Post Office.	17.9	1967-90	12-09-89	3.84	22
16607000	Iao Stream at Wailuku	Lat 20°53'38", long 156°30'27", 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951 [†] , 1952-90	10-08-89	5.31	3,840
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi east of Maluhia Camp, and 1.8 mi northwest of Waihee.	.12	1964-90	01-16-90	-	e50
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'58", long 156°34'58", at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse, and 2.2 mi northwest of Kahakuloa.	1.18	1965-90	01-16-90	13.05	592
16630200	Honokowai Stream at Honokowai	Lat 20°56'58", long 156°41'07", 0.5 mi southeast of Honokowai, and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-90	01-16-90	5.42	838
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960, 1962, 1964-90	10-09-89	3.56	265
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 northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72 [†] , 1973-90	10-08-89	3.65	368
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi north of McGregor Point, and 1.2 mi southwest of Maalaea.	.64	1964-90	10-08-89	3.96	22
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi northeast of Maalaea, and 2.5 mi northwest of Kihei.	6.97	1963-90	10-08-89	6.82	982

[†] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Maui--Continued							
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44'56", long 156°19'22", at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	0.98	1964-90	12-09-89	-	e1.0
16659000	Waiakoa Gulch at Kihei	Lat 20°47'14", long 156°27'41", 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-90	11-15-89	6.44	218
16660000	Kulanihakai Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70 [‡] , 1971-90	11-15-89	0.20	135
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft upstream from mouth, and 0.2 mi south of Kamaole.	4.28	1972-90	11-15-89	-	e7.0
16664000	Lililioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft upstream from mouth, and 0.8 mi south of Kamaole.	4.12	1972-90	11-15-89	-	e10
Hawaii, Island of Hawaii							
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi upstream from Kinooles Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1968-90	01-19-90	5.21	634
16701400	Palai Stream at Hilo	Lat 19°40'56", long 155°04'04", at Highway 11, 300 ft south of Palai Street intersection, and 3.5 mi southeast of Hilo Post Office.	5.08	1965-90	01-19-90	3.38	185
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi north of Papaikou, and 5.1 mi north of Hilo Post Office.	.24	1963-90	01-19-90	8.17	186
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	.58	1962-72 [‡] , 1973-90	01-19-90	4.13	392
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-90	01-19-90	8.61	844
16717800	Pohakupuka Stream near Papaaloa	Lat 19°57'20", long 155°11'20", on right bank 200 ft downstream from Highway 19, 2.8 mi northwest of Honohina, and 3.0 mi southwest of Papaaloa.	2.76	1963-80 [‡] , 1983-90	01-20-90	8.23	1,710
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	.62	1963-90	01-20-90	5.66	224
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-90	01-18-90	9.21	324
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert 4.8 mi southwest of Honokaa Hospital, and 5.5 mi southeast of Kukuihaele.	2.42	1963-90	01-18-90	4.10	159

[‡] Operated as a continuous-record gaging station.

e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1990--Continued							
Station no.	Station name	Location	Drainage area mi ²	Period of record	Annual maximum		
					Date	Gage height (ft)	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 east of Kapaau Post Office.	1.52	1963-90	01-18-90	4.73	54
16755800	Luahine Gulch near Waimea	Lat 20°03'11", long 155°44'35", on culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	.32	1963-90	01-18-90	1.87	27
16756500	Keanuio mano Stream near Kamuela	Lat 20°1'48", long 155°42'05", on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72 [‡] , 1973-90	09-17-90	4.56	338
16759040	Paia kuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	.27	1963-90	09-17-90	3.03	118
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.6	1963-90	10-06-89	5.03	434
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi north of Keamuku, and 5.2 mi west of Waikii.	33.1	1963-90	10-06-89	7.86	2,640
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi east of Kailua, and 2.3 mi northwest of Holualoa Post Office.	2.61	1962, 1965-90	09-30-90	10.07	641
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi northeast of Holualoa School, and 4.2 mi southeast of Honokohau School.	8.74	1961-71 [‡] , 1972-90	09-30-90	7.98	2,670
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 upstream from Highway 11 at Naalehu.	2.87	1963-90	01-19-90	7.84	1,350
16767000	Ninole Gulch near Punaluu	Lat 19°10'44", long 155°33'46", on right bank 300 ft downstream from forest-reserve boundary, 4.6 mi northwest of Punaluu, and 6.0 mi north of Honuapo.	15.5	1966-82 [‡] , 1983-90	01-19-90	5.73	1,170
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi southwest of Pahala, and 4.1 mi north of Punaluu.	9.41	1963-90	01-19-90	14.79	5,890
16770500	Paa uau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79 [‡] , 1980-90	01-19-90	7.89	1,620

[‡] Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1990						
Stream	Tributary to	Location	Drainage area mi ²	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Oahu						
Kahana (formerly 16295995)	Pacific Ocean	Lat 21°32'17", long 157°53'29", 1.8 mi upstream from main bridge on Kamahamaha Highway and 2.8 mi southwest of Kaaawa School.	3.20	1960-62, 1966, 1971-72, 1974-81, 1983-85 1988-89	11-03-89	19.6
					01-12-90	12.3
					06-04-90	16.9
					07-17-90	20.2
					09-13-90	20.4
Kawa (formerly 16297000)	Kahana Stream	Lat 21°32'35", long 157°53'51", 0.1 mi upstream from mouth and 1.0 mi south of Kahana.	2.10	1914-17 [†] , 1958 ^b , 1961-62, 1966, 1971-72, 1974-81, 1983-85 1988-89	11-03-89	3.34
					01-12-90	1.21
					03-20-90	6.48
					06-04-90	2.96
					07-17-90	2.16
					09-05-90	1.99
					09-13-90	1.67
Kaluanui	Pacific Ocean	Lat 21°34'51", long 157°54'59", 1.9 mi west of Punaluu Beach Park and 2.3 mi south of cemetery in Hauula.	.85	1988-89	11-03-89	.57
					02-06-90	3.52
					02-09-90	1.44
					05-10-90	.60
					07-17-90	1.16
	09-11-90	.70				
Kaluanui	Pacific Ocean	Lat 21°34'14", long 157°54'44", 1.5 mi west of Punaluu Beach Park and 1.6 mi south of cemetery in Hauula.	1.96	1988-89	11-03-89	.52
					01-29-90	3.01
					02-06-90	3.49
					02-09-90	1.52
					05-10-90	.58
					07-17-90	1.09
	09-11-90	.79				
Kaluanui (16304500)	Pacific Ocean	Lat 21°35'57", long 157°54'24", 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-89 ^f	11-03-89	.51
					02-09-90	1.61
					05-10-90	.58
					07-17-90	1.13
					09-11-90	.79
Makawao	Maunawili Stream	Lat 21°21'20", long 157°45'52", 1.8 mi southwest of Maunawili School and 2.2 mi southeast of Hawaii Loa College.	.84	1988-89	11-09-89	1.27
					01-08-90	1.24
					06-05-90	1.41
					07-13-90	1.09
					09-07-90	1.01
Ainoni	Maunawili Stream	Lat 21°21'26", long 157°45'55", 1.7 mi southwest of Maunawili School and 2.1 mi southeast of Hawaii Loa College.	.60	1988-89	11-09-89	.72
					01-08-90	.55
					06-05-90	1.73
					07-13-90	.68
					09-07-90	.64
Maunawili	Pacific Ocean	Lat 21°21'28", long 157°46'13", 1.9 mi southwest of Maunawili School and 1.9 mi southeast of Hawaii Loa College.	1.09	1988-89	11-07-89	3.13
					01-08-90	1.75
					06-05-90	1.09
					07-13-90	1.24
					09-07-90	.89
Maunawili	Pacific Ocean	Lat 21°21'51", long 157°46'05", 1.4 mi southwest of Maunawili School and 1.6 mi southeast of Hawaii Loa College.	1.19	1988-89	11-09-90	3.36
					01-08-90	1.96
					06-05-90	1.03
					07-13-90	1.36
					09-07-90	.41
Onao	Maunawili Stream	Lat 21°21'56", long 157°46'06", 1.3 mi southwest of Maunawili School and 1.5 mi southeast of Hawaii Loa College.	.94	1988-89	11-09-89	1.38
					01-08-90	.82
					06-05-90	1.24
					07-13-90	1.29
					09-07-90	.82
Maunawili (16260500)	Pacific Ocean	Lat 21°22'51", long 157°45'48", 0.6 mi west of Maunawili School, and 1.6 mi southwest of Kailua Post Office.	5.34	1958-67, 1968-71 [†] , 1972-89 ^f	11-09-89	8.11
					01-08-90	5.23
					06-05-90	6.19
					07-13-90	5.36
					09-07-90	4.49

[†] Also operates as a crest-stage partial record gaging station.

[‡] Operated as a continuous-record gaging station.

^b Gage height only.

Discharge measurements made at miscellaneous sites during water year 1990--Continued

Stream	Tributary to	Location	Drainage area mi ²	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Oahu--Continued						
Kahanaiki	Pacific Ocean	Lat 21°22'22", long 157°46'27", 1.4 mi southwest of Maunawili School and 0.9 mi southeast of Hawaii Loa College.	.36	1988-89	11-09-89	.57
					01-08-90	.46
					06-05-90	.60
					07-13-90	.46
					09-07-90	.31
Kahanaiki (formerly 16263000)	Pacific Ocean	Lat 21°22'20", long 157°46'25", 1.3 mi southwest of Maunawili School and 0.9 mi southeast of Hawaii Loa College.	.61	1912b, 1914-16 1988-89	11-09-89	.94
					01-08-90	.71
					06-05-90	.90
					07-13-90	.85
					09-07-90	.48
Kahanaiki (formerly 16264100)	Pacific Ocean	Lat 21°22'49", long 157°46'46", 0.9 mi west of Maunawili School and 1.0 mi east of Hawaii Loa College.	1.43	1960-63, 1965-66, 1971-81, 1983-85 1988-89	11-09-89	1.31
					01-08-90	1.05
					06-05-90	1.28
					07-13-90	1.16
					09-07-90	.64
Punaluu	Pacific Ocean	Lat 21°33'12", long 157°54'05", 1.4 mi west of Kahana and 2.1 mi southwest of Punaluu.	1.80	1988-89	11-08-89	15.9
					01-11-90	11.7
					05-16-90	20.1
					07-16-90	14.1
					09-06-90	11.8
Waiaohi	Punaluu Stream	Lat 21°33'15", long 157°54'06", 1.4 mi west of Kahana and 2.1 mi southwest of Punaluu.	.52	1988-89	11-08-89	5.14
					01-11-90	3.92
					05-16-90	4.66
					07-16-90	4.02
					09-16-90	3.66
Punaluu	Pacific Ocean	Lat 21°34'41", long 157°53'21", 1.4 mi north of Kahana and 0.3 mi south of Punaluu.	3.51	1988-89	11-08-89	21.7
					01-11-90	15.8
					05-16-90	22.4
					07-16-90	12.2
					09-16-90	14.7
Waiahole	Pacific Ocean	Lat 21°28'29", long 157°52'39", 1.7 mi southwest of Waiahole School and 2.8 mi northwest of Kahaluu.	.92	1988-89	11-07-89	3.91
					01-10-90	3.25
					05-09-90	3.54
					07-11-90	3.48
					09-10-90	3.31
Waiahole	Pacific Ocean	Lat 21°28'59", long 157°51'43", 0.6 mi southwest of Waiahole School and 2.2 mi northwest of Kahaluu.	1.65	1988-89	11-07-89	5.93
					01-10-90	4.75
					05-09-90	5.81
					07-11-90	5.52
					09-10-90	4.39
Waiahole	Pacific Ocean	Lat 21°29'05", long 157°50'57", 0.4 mi southwest of Waiahole School and 1.8 mi northwest of Kahaluu.	2.12	1988-89	11-07-89	10.1
					01-10-90	9.06
					05-09-90	11.3
					07-11-90	9.48
					09-10-90	7.61
Waiahole (formerly 16291000)	Pacific Ocean	Lat 21°28'35", long 157°52'30", on left bank, 1.5 mi southwest of Waiahole School and 2.7 mi northwest of Kahaluu.	1.05	1955-68 ^a , 1970, 1988-89	11-07-89	10.1
					01-10-90	9.06
					05-09-90	11.3
					07-11-90	9.48
					09-10-90	7.61
Waianu (formerly 16293100)	Waiahole Stream	Lat 21°28'59", long 157°51'47", 0.6 mi southwest of Waiahole School and 2.3 mi northwest of Kahaluu.	1.64	1961-66, 1988-89	11-07-89	3.58
					01-10-90	2.25
					05-09-90	3.59
					07-11-90	2.78
					09-10-90	2.10
Waikane	Pacific Ocean	Lat 21°30'21", long 157°52'42", 1.7 mi west of Waikane, and 2.0 mi northwest of Waiahole School.	.58	1988-89	11-07-89	.96
					01-09-90	.44
					05-11-90	1.03
					07-11-90	1.16
					09-10-90	1.06

^a Operated as a continuous-record gaging station.

^b Gage height only.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1990--Continued						
Stream	Tributary to	Location	Drainage area mi ²	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Oahu--Continued						
Waikane	Pacific Ocean	Lat 21°30'17", long 157°52'43", 1.7 mi west of Waikane, and 1.8 mi northwest of Waiahole School.	.67	1988-89	11-07-89	.60
					01-09-90	.30
					05-11-90	.67
					07-11-90	.58
					09-10-90	.46
Waikane	Pacific Ocean	Lat 21°30'07", long 157°52'12", 1.1 mi west of Waikane, and 1.4 mi northwest of Waiahole School.	1.57	1988-89	11-07-89	2.32
					01-09-90	1.47
					05-11-90	2.62
					07-11-90	2.64
					09-10-90	2.20
Waikaeke	Waikane Stream	Lat 21°30'02", long 157°52'14", 1.1 mi west of Waikane, and 1.4 mi northwest of Waiahole School.	.43	1988-89	11-07-89	.17
					01-09-90	.11
					05-11-90	.49
					07-11-90	.32
					09-10-90	.28
Waikane	Pacific Ocean	Lat 21°29'56", long 157°51'15", 0.1 mi west of Waikane, and 0.7 mi north of Waiahole School.	2.50	1988-89	11-07-89	3.60
					01-09-90	2.69
					05-11-90	4.52
					07-11-90	3.56
					09-10-90	3.06

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. A schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figures 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU

16227100 - HALAWA STREAM BELOW H1 (LAT 21°22'17" LONG 157°55'57")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	
NOV	13...	1025	E0.30	700	9.0	28.5	0.40	761	9.8	127	--
DEC	18...	1000	0.11	800	8.2	24.5	4.0	761	7.9	95	50000
JAN	23...	1025	5.6	322	9.1	22.5	10	757	10.6	123	--
FEB	14...	0940	--	531	9.0	24.5	1.5	765	11.1	132	K200
MAR	26...	0920	1.7	520	8.9	25.0	1.0	766	10.0	121	--
APR	24...	1000	0.48	810	8.9	30.0	1.0	763	8.2	109	--
JUN	14...	0900	0.46	750	8.9	26.0	0.60	765	9.7	119	--
JUL	26...	1400	0.88	340	9.7	31.0	2.5	762	8.6	116	600
AUG	13...	1425	0.06	610	9.6	31.0	1.0	763	8.1	109	--
SEP	19...	0900	0.22	640	9.1	27.0	3.4	765	10.8	135	1000

DATE	TIME	HARD-NESS TOTAL (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)	ALKA-LINITY LAB (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	
DEC	18...	1000	230	36	33	81	43	2	3.6	139	37	160
SEP	19...	0900	200	38	26	54	36	2	3.2	87	25	150

DATE	TIME	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	
DEC	18...	1000	0.10	34	547	469	0.74	11	<0.100	0.60	--	0.040
FEB	14...	0940	--	--	--	--	5	<0.100	<0.20	--	--	<0.010
JUL	26...	1400	--	--	--	--	7	0.100	0.50	0.60	--	0.020
SEP	19...	0900	0.10	26	360	375	0.49	15	<0.100	0.50	--	0.040

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

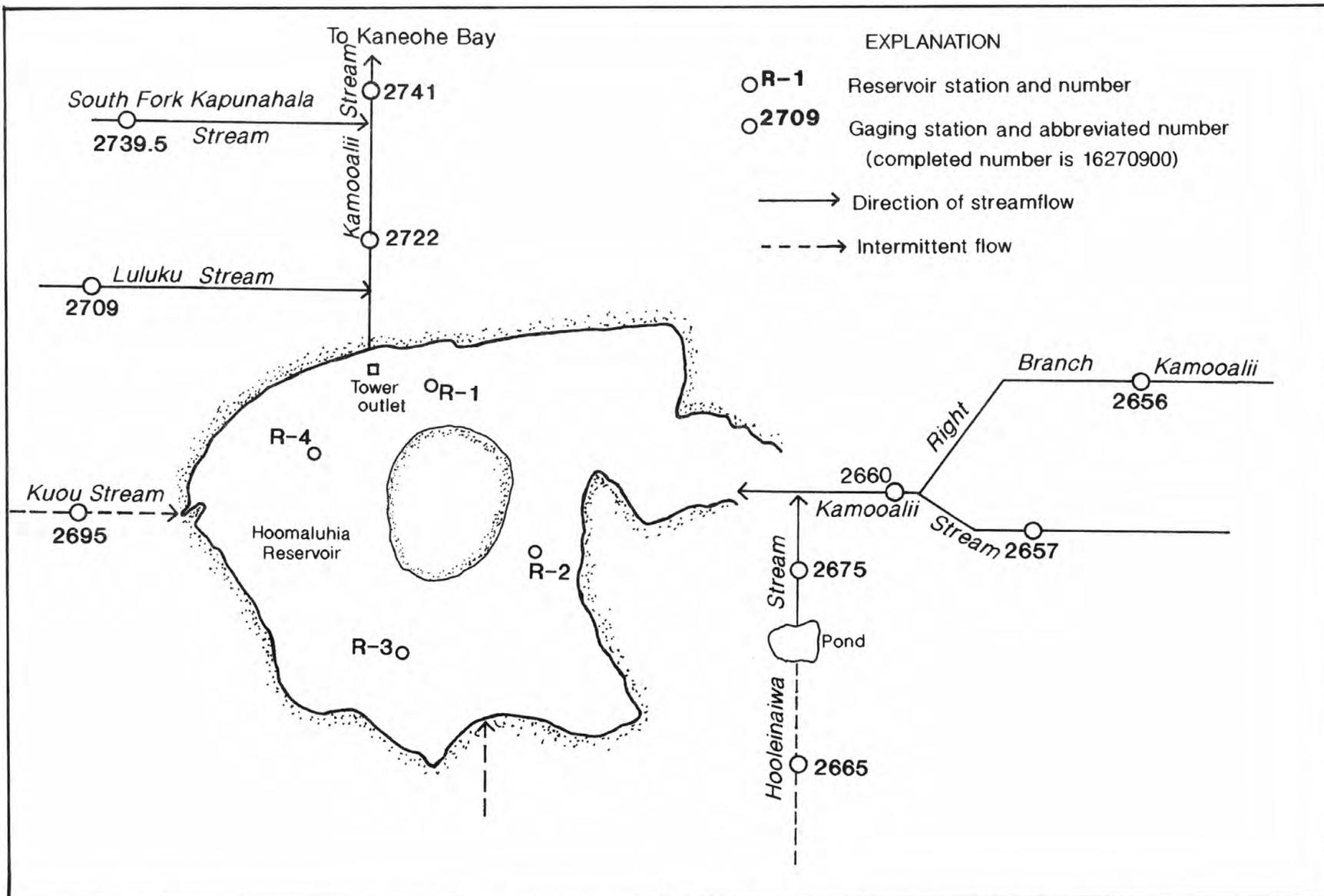


Figure 15.--Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	TIME	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	
DEC 18...	1000	90	<10	<1	<1	<100	26	<10	<0.5	2	<1.0	
SEP 19...	0900	230	10	2	1	<100	18	<10	<0.5	<1	<1.0	
DATE	TIME	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)
DEC 18...	10	9	1	<3	<3	10	8	260	38	10	<1	<10
SEP 19...	<1	<1	<1	<3	<3	8	4	500	11	3	1	<10
DATE	TIME	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)
DEC 18...	<4	40	17	<0.10	<0.10	0.1	3	<10	3	2	<1	<1
SEP 19...	<4	40	3	<0.10	<0.10	<0.1	5	<10	3	1	<1	<1
DATE	TIME	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV- ERABLE (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)
DEC 18...	<1	<1.0	410	<6	<6	30	15	35	<1	<0.010	<0.1	--
SEP 19...	<1	<1.0	320	<6	<6	50	22	5.4	1	<0.010	<0.1	0.01
DATE	TIME	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2, 4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	
DEC 18...		<0.010	<0.010	<0.010	<0.01	0.02	<0.010	<0.01	<0.01	<0.01	<0.010	
SEP 19...		<0.010	<0.010	<0.010	<0.01	0.04	<0.010	<0.01	0.02	<0.01	<0.010	

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/L)
			WATER WHOLE TOT.REC (UG/L)							
DEC 18...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
SEP 19...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
DATE	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR.	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2,4,5-T TOTAL (UG/L)
		POLY- CHLOR. TOTAL (UG/L)								
DEC 18...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 19...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16265700 - KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEHOE (LAT 21°23'12" LONG 157°47'56")

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT 03...	1700	5.0	--	--	--	3900	--	--
NOV 15...	1425	1.3	200	6.7	22.5	98	753	7.1
DEC 19...	1300	0.52	225	7.2	22.0	0.50	755	7.7
JAN 25...	1115	1.7	215	7.1	21.0	2.8	753	8.8
FEB 15...	0945	1.2	197	6.9	20.5	3.1	761	7.9
MAR 26...	1300	2.4	220	6.6	22.0	48	761	7.9
27...	0855	6.1	180	6.6	21.0	77	762	7.9
27...	1015	4.9	180	6.6	21.0	80	762	7.9
APR 26...	0930	1.7	220	6.4	21.0	3.0	759	7.7
JUN 13...	1240	0.87	215	7.4	23.0	0.60	761	8.1
JUL 25...	1105	0.49	203	6.5	22.5	1.0	758	7.6
AUG 13...	1230	0.53	220	7.5	23.5	0.60	761	7.1
SEP 19...	1000	0.36	220	8.0	23.5	10	758	7.0

DATE	TIME	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
NOV 15...	1425	83	--	--	--	--	--	--
DEC 19...	1300	89	210	<1	0.200	<0.20	--	0.040
JAN 25...	1115	100	--	--	--	--	--	--
FEB 15...	0945	88	100	5	0.100	<0.20	--	<0.010
MAR 26...	1300	91	--	--	--	--	--	--
27...	0855	89	--	--	--	--	--	--
27...	1015	89	--	--	--	--	--	--
APR 26...	0930	87	--	--	--	--	--	--
JUN 13...	1240	95	--	--	--	--	--	--
JUL 25...	1105	89	100	<1	0.100	0.20	0.30	<0.010
AUG 13...	1230	84	--	--	--	--	--	--
SEP 19...	1000	83	460	4	0.500	0.30	0.80	0.030

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16266000 - KAMOOALII STREAM NR KANEOHE (LAT 21°23'20" LONG 157°48'05")

DATE	TIME	BARO- METRIC PRES- SURE (MM OF HG)	SAM- PLING DEPTH (FEET)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)
JUN 08...	1530	761	1.00	0.500	<0.100

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

PHYTOPLANKTON ANALYSES

DATE	JUN 08, 90
TIME	1530
SAMPLING DEPTH (FEET)	1.00
TOTAL CELLS/ML	1900
	CELLS PER- /ML CENT
CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...HYDRODICTYACEAE	
....PEDIASTRUM	1200 63
....OOCYSTACEAE	
....ANKISTRODESMUS	23 1
....SELENASTRUM	23 1
....TETRAEDRON	250 13
..ZYGNEATALES	
..MESOTAENIACEAE	
....MESOTAENIUM	45 2
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..CENTRALES	
...COSCIDINODISCACEAE	
....CYCLOTELLA	23 1
..PENNALES	23 1
...CYMBELLACEAE	
....CYMBELLA	30 2
...NAVICULACEAE	
....NAVICULA	120 6
..NITZSCHIACEAE	
....NITZSCHIA	30 2
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROCOCCALES	
...CHROCOCCACEAE	90 5
...SYNECHOCOCCUS	23 1
EUGLENOPHYTA (EUGLENOIDS)	
.EUGLENOPHYCEAE	
..EUGLENALES	
...EUGLENACEAE	
....EUGLENA	23 1

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'06" LONG 157°48'16")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)
OCT 03...	1750	5.0	--	--	--	4700	--	--
NOV 14...	1310	0.28	127	7.1	22.0	2.5	754	8.4
DEC 19...	1135	0.17	122	7.5	21.5	1.7	755	7.7
JAN 24...	1230	0.77	130	6.8	22.0	1.5	750	7.6
FEB 15...	1010	0.45	121	7.0	22.0	1.0	762	8.1
MAR 27...	0900	1.8	170	7.2	21.0	17	761	7.9
APR 27...	1200	0.39	135	7.2	22.5	0.30	756	8.4
JUN 14...	1400	0.22	135	6.9	23.0	0.40	759	7.9
JUL 25...	1030	0.13	149	6.6	23.0	0.30	758	8.3
AUG 13...	1115	0.11	142	6.8	23.5	0.60	760	8.4
SEP 18...	1315	0.11	138	7.2	23.0	1.0	756	7.6

DATE	TIME	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 14...	1310	97	--	--	--	--	--	--
DEC 19...	1135	88	110	<1	<0.100	<0.20	--	<0.010
JAN 24...	1230	88	--	--	--	--	--	--
FEB 15...	1010	92	K20	<1	0.200	<0.20	--	<0.010
MAR 27...	0900	89	--	--	--	--	--	--
APR 27...	1200	98	--	--	--	--	--	--
JUN 14...	1400	93	--	--	--	--	--	--
JUL 25...	1030	97	42	<1	0.400	0.20	0.60	<0.010
AUG 13...	1115	99	--	--	--	--	--	--
SEP 18...	1315	89	84	3	0.200	0.20	0.40	0.020

< 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).

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM ABOVE CONFLUENCE WITH KAMOOALII STR, NR KANEOHE (LAT 21°23'18" LONG 157° 48'18")

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV							
14...	1100	1.1	160	7.0	24.0	240	756
DEC							
19...	1015	0.67	166	7.0	24.5	60	761
JAN							
24...	1345	1.9	140	7.8	22.0	23	750
FEB							
15...	1125	1.1	153	7.7	21.5	4.5	769
MAR							
27...	1015	3.2	155	7.4	21.5	36	763
APR							
27...	1000	0.99	160	7.6	23.0	8.5	758
JUN							
13...	1125	0.62	185	7.0	24.0	4.1	761
JUL							
24...	1040	0.71	180	7.0	25.5	4.2	759
AUG							
13...	1000	0.64	185	7.3	24.5	3.5	761
SEP							
18...	1120	0.78	162	7.2	24.5	15	759

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
NOV							
14...	8.3	100	--	--	--	--	--
DEC							
19...	7.9	95	490	72	<0.100	<0.20	0.020
JAN							
24...	7.8	91	--	--	--	--	--
FEB							
15...	8.3	94	K45	25	<0.100	<0.20	<0.010
MAR							
27...	8.3	94	--	--	--	--	--
APR							
27...	8.1	95	--	--	--	--	--
JUN							
13...	7.4	88	--	--	--	--	--
JUL							
24...	7.7	95	K120	<1	<0.100	<0.20	<0.010
AUG							
13...	7.5	90	--	--	--	--	--
SEP							
18...	7.4	89	1500	11	<0.100	<0.20	0.020

< 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).

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'30" LONG 157°48'44")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)
NOV								
16...	1350	0.08	280	--	22.0	16	756	5.8
DEC								
19...	1230	0.06	270	7.4	21.5	4.6	755	8.5
JAN								
24...	1350	0.38	231	7.9	21.5	6.5	749	6.6
FEB								
15...	0950	0.13	275	6.6	22.0	3.4	757	7.2
MAR								
26...	1345	0.18	270	7.0	21.5	3.2	760	7.4
APR								
26...	1215	0.06	260	7.0	22.5	2.7	758	7.0
JUN								
13...	1330	1.1	275	6.8	22.0	0.60	760	8.4
JUL								
25...	1310	E0.05	300	7.8	23.5	4.0	758	8.3
AUG								
13...	1400	0.01	260	7.1	23.5	1.9	758	6.8
SEP								
18...	1400	E0.02	300	8.7	23.5	1.8	757	6.1

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV							
16...	67	--	--	--	--	--	--
DEC							
19...	97	140	2	0.200	<0.20	--	0.010
JAN							
24...	76	--	--	--	--	--	--
FEB							
15...	83	K9	4	0.400	<0.20	--	<0.010
MAR							
26...	84	--	--	--	--	--	--
APR							
26...	81	--	--	--	--	--	--
JUN							
13...	96	--	--	--	--	--	--
JUL							
25...	98	K380	<1	0.200	<0.20	--	<0.010
AUG							
13...	81	--	--	--	--	--	--
SEP							
18...	72	520	<1	0.200	0.20	0.40	0.020

< 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).

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482601 HOOMALUHIA RES SEC 1-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB								
13...	1210	1.00	178	7.6	21.5	757	8.3	95
13...	1211	3.00	177	7.6	21.5	757	8.2	93
13...	1212	5.00	177	7.6	21.5	757	8.2	93
13...	1213	7.00	177	7.6	21.0	757	8.2	93
13...	1214	9.00	176	7.6	21.0	757	8.1	92
APR								
24...	1010	1.00	180	8.5	25.5	758	8.1	100
24...	1011	3.00	181	8.5	25.0	758	8.1	99
24...	1012	5.00	181	8.5	24.5	758	8.2	99
24...	1013	7.00	181	8.5	24.5	758	8.2	99
24...	1014	9.00	184	8.5	24.0	758	7.4	89
JUN								
07...	1055	1.00	190	7.6	25.0	761	7.2	88
07...	1056	3.00	191	7.5	25.0	761	7.3	88
07...	1057	5.00	192	7.5	25.0	761	7.2	87
07...	1058	7.00	193	7.5	25.0	761	6.9	84
07...	1059	9.00	191	7.5	24.5	761	5.9	71
JUL								
23...	1039	1.00	175	7.2	26.5	760	7.6	95
23...	1041	3.00	176	7.2	26.5	760	7.7	96
23...	1043	5.00	176	7.1	26.0	760	7.6	94
23...	1044	7.00	178	7.1	26.0	760	7.0	87
23...	1046	9.00	181	7.0	25.5	760	6.5	80

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482602 HOOMALUHIA RES SEC 1-2 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1040	1.00	157	7.1	24.0	758	6.2	74
16...	1041	3.00	156	7.1	24.0	758	6.2	74
16...	1042	5.00	156	7.1	23.5	758	6.3	75
16...	1043	7.00	156	7.1	23.5	758	6.4	76
16...	1044	9.00	159	7.0	23.5	758	6.2	73
FEB								
13...	1200	1.00	178	7.6	21.5	757	8.2	94
13...	1201	3.00	178	7.6	21.5	757	8.2	93
13...	1202	5.00	178	7.6	21.5	757	8.2	93
13...	1203	7.00	177	7.6	21.0	757	8.0	91
13...	1204	9.00	177	7.6	21.0	757	7.7	87
APR								
24...	1000	1.00	181	8.6	25.5	758	8.0	99
24...	1001	3.00	181	8.6	25.5	758	8.1	99
24...	1002	5.00	181	8.5	24.5	758	8.1	98
24...	1003	7.00	181	8.6	24.5	758	8.1	98
24...	1004	9.00	184	8.5	24.0	758	7.9	95
JUN								
07...	1045	1.00	190	7.5	25.5	761	7.5	92
07...	1046	3.00	191	7.5	25.5	761	7.3	89
07...	1047	5.00	191	7.5	25.0	761	7.4	90
07...	1048	7.00	191	7.5	25.0	761	6.8	82
07...	1049	9.00	191	7.5	24.5	761	5.9	71
JUL								
23...	1029	1.00	176	7.2	26.5	760	7.6	95
23...	1031	3.00	176	7.2	26.5	760	7.7	96
23...	1033	5.00	176	7.1	26.0	760	7.3	91
23...	1035	7.00	178	7.0	26.0	760	7.0	86
23...	1039	9.00	171	7.0	25.5	760	6.6	81

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	TRANS- PAR- ENCY (SECCHI DISK) (IN)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV										
16...	1015	1.00	156	6.9	24.0	2.7	41.5	758	6.1	73
16...	1016	2.00	157	6.9	24.0	--	41.5	758	6.0	72
16...	1017	3.00	156	6.9	24.0	--	41.5	758	6.0	72
16...	1018	5.00	156	6.9	24.0	--	41.5	758	6.1	73
16...	1019	7.00	158	6.9	24.0	5.0	41.5	758	6.4	76
16...	1020	9.00	164	6.9	23.5	--	41.5	758	6.1	72
16...	1021	10.0	161	6.9	24.0	--	41.5	758	6.1	73
16...	1022	11.0	165	6.9	23.5	--	41.5	758	6.2	73
16...	1023	12.0	163	6.9	23.5	170	41.5	758	6.2	73
16...	1024	13.0	166	6.9	23.0	--	41.5	758	6.2	73
16...	1055	1.00	157	7.0	24.0	--	41.5	758	6.1	73
16...	1056	3.00	157	7.1	24.0	--	41.5	758	6.1	73
16...	1057	5.00	156	7.1	23.5	--	41.5	758	6.3	75
16...	1058	7.00	155	7.1	24.0	--	41.5	758	6.4	76
16...	1059	8.60	156	7.1	24.0	--	41.5	758	6.4	76
FEB										
13...	1135	1.00	179	7.7	21.5	1.2	69.0	757	8.6	98
13...	1136	2.00	179	7.7	21.5	--	69.0	757	8.4	96
13...	1137	3.00	178	7.7	21.5	--	69.0	757	8.3	95
13...	1138	5.00	178	7.7	21.5	--	69.0	757	8.2	93
13...	1140	7.00	177	7.7	21.0	1.3	69.0	757	7.9	89
13...	1142	9.00	178	7.6	21.0	--	69.0	757	7.6	86
13...	1143	10.0	179	7.6	21.0	--	69.0	757	7.6	86
13...	1145	11.0	181	7.6	21.0	1.5	69.0	757	7.5	85
13...	1147	12.0	184	7.5	20.5	--	69.0	757	7.3	82
13...	1150	--	177	7.7	21.0	2.5	--	757	7.9	89
APR										
24...	0930	1.00	176	8.6	25.5	--	--	758	8.1	99
24...	0931	2.00	176	8.6	25.5	--	74.0	758	8.1	99
24...	0932	3.00	177	8.6	25.5	--	--	758	8.1	99
24...	0933	5.00	179	8.6	25.0	--	--	758	8.1	99
24...	0934	7.00	180	8.6	24.5	--	--	758	8.1	98
24...	0935	9.00	184	8.6	24.0	--	--	758	7.5	90
24...	0936	10.0	184	8.5	23.5	--	--	758	7.3	86
24...	0937	11.0	186	8.5	23.5	--	--	758	4.2	50
24...	0938	11.6	186	8.5	23.5	--	74.0	758	3.8	45
JUN										
07...	1015	1.00	190	7.1	25.5	1.4	66.5	761	7.7	94
07...	1015	2.00	190	7.1	25.5	--	--	761	7.8	95
07...	1016	2.00	190	7.1	25.5	--	66.5	761	7.8	95
07...	1017	3.00	190	7.1	25.0	--	--	761	7.7	94
07...	1018	5.00	191	7.1	25.0	--	--	761	7.5	91
07...	1019	7.00	193	7.2	25.0	1.2	66.5	761	7.0	85
07...	1020	9.00	190	7.1	24.5	--	--	761	5.8	70
07...	1021	10.0	190	7.0	24.5	--	--	761	5.9	71
07...	1022	11.0	189	7.0	24.5	--	--	761	6.2	74
07...	1023	12.0	190	7.0	24.0	2.1	66.5	761	5.4	64
JUL										
23...	0958	1.00	176	7.0	26.5	1.7	--	760	7.9	98
23...	1001	3.00	176	7.1	26.5	--	--	760	7.8	97
23...	1004	5.00	177	7.1	26.0	--	--	760	7.6	94
23...	1008	7.00	181	7.0	25.5	2.0	--	760	7.5	92
23...	1011	9.00	183	6.9	25.5	--	--	760	6.7	82
23...	1014	11.0	186	6.8	25.0	3.4	--	760	7.1	86
23...	1020	--	181	7.0	25.5	2.1	--	760	7.5	92

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS, TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	CALCIUM SED. BEDMAT PERCENT	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	MAGNESIUM, SEDI-MENT BEDMAT PERCENT	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM SEDI-MENT BEDMAT PERCENT
FEB											
13...	1135	K7	--	--	--	--	--	--	--	--	--
13...	1140	23	--	--	--	--	--	--	--	--	--
13...	1145	K10	--	--	--	--	--	--	--	--	--
13...	1150	--	52	8.5	--	7.5	--	16	39	1	--
JUN											
07...	1016	--	--	--	1.1	--	0.94	--	--	--	0.24
JUL											
23...	0958	K16	--	--	--	--	--	--	--	--	--
23...	1008	K17	--	--	--	--	--	--	--	--	--
23...	1014	43	--	--	--	--	--	--	--	--	--
23...	1020	--	53	8.9	--	7.5	--	15	38	0.9	--

DATE	POTASSIUM, DIS-SOLVED (MG/L AS K)	POTASSIUM, SEDI-MENT BEDMAT PERCENT	ALKALINITY, LAB (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)	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)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)
FEB											
13...	--	--	--	--	--	--	--	--	--	--	6
13...	--	--	--	--	--	--	--	--	--	--	5
13...	--	--	--	--	--	--	--	--	--	--	5
13...	1.0	--	<1.0	9.0	17	0.10	19	124	--	--	--
JUN											
07...	--	0.16	--	--	--	--	--	--	--	--	--
JUL											
23...	--	--	--	--	--	--	--	--	--	--	<1
23...	--	--	--	--	--	--	--	--	--	--	<1
23...	--	--	--	--	--	--	--	--	--	--	<1
23...	0.90	--	49	9.0	22	<0.10	18	111	111	0.15	--

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITROGEN, NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, IN BOT. MAT. (MG/KG AS P)	PHOSPHORUS, SEDI-MENT BEDMAT PERCENT	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DIS-SOLVED (UG/L AS AL)
FEB											
13...	0.400	--	--	<0.20	--	--	0.030	--	--	--	--
13...	0.400	--	--	0.40	--	0.80	0.010	--	--	--	--
13...	0.400	--	--	0.20	--	0.60	0.020	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	160	<30
JUN											
07...	--	<2.0	170	--	3500	--	--	1600	0.23	--	--
JUL											
23...	0.300	--	--	0.40	--	0.70	0.020	--	--	--	--
23...	0.400	--	--	0.30	--	0.70	0.010	--	--	--	--
23...	0.400	--	--	0.20	--	0.60	0.010	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	90	30

< 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).

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	ALUM- INUM SED. BEDMAT PERCENT	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	ARSENIC BOT MAT <63U DS LAB (UG/G)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA)	BARIUM, DIS- SOLVED (UG/L AS BA)	BARIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS BA)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	
FEB 13...	1150	--	<1	<1	--	--	<100	<100	--	<10	<10	
JUN 07...	1016	10	--	--	20	9	--	--	260	--	--	
JUL 23...	1020	--	<1	<1	--	--	<100	4	--	<10	<0.5	
DATE	TIME	BERYL- LIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COBALT, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)
FEB 13...	--	<4	<2.0	--	2	<1	--	<4	<2	--	--	8
JUN 07...	1	--	--	<2	--	--	610	--	--	--	60	--
JUL 23...	--	<1	1.0	--	<1	<1	--	1	<3	--	--	5
DATE	TIME	COPPER, DIS- SOLVED (UG/L AS CU)	COPPER, FM BOT- TOM MA- TERIAL (UG/G AS CU)	GOLD SEDI- MENT SUSP. (UG/G)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	IRON SEDI- MENT SUSP. PERCENT	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)	LITHIUM TOTAL RECOV- ERABLE (UG/L AS LI)	LITHIUM DIS- SOLVED (UG/L AS LI)
FEB 13...	4	--	--	350	<10	--	<4	<2	--	--	<10	<10
JUN 07...	--	170	<8	--	--	14	--	--	50	--	--	--
JUL 23...	2	--	--	210	9	--	1	<1	--	--	<10	<4
DATE	TIME	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G AS HG)	MOLYB- DENUM, TOTAL RECOV- ERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	MOLYB- DENUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)
FEB 13...	30	<10	--	0.10	0.1	--	1	<1	--	--	4	<2
JUN 07...	--	--	--	1800	--	--	0.22	--	--	<2.0	--	--
JUL 23...	30	<1	--	<0.10	<0.1	--	1	<10	--	--	2	1
DATE	TIME	NICKEL, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS NI)	SCAN- DIUM TOTAL BOT.MAT (UG/KG AS SC)	SELE- NIUM, TOTAL (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SELE- NIUM, TOTAL IN BOT- TOM MA- TERIAL (UG/G)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	SILVER, FM BOT- TOM MA- TERIAL (UG/G AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	STRON- TIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	TAN- TALUM BOT.MAT (UG/KG AS TA)
FEB 13...	--	--	--	<1	<1	--	<1	<2.0	--	60	--	--
JUN 07...	350	41	--	--	2	--	--	<2	--	140	<40	--
JUL 23...	--	--	--	<1	<1	--	<1	<1.0	--	58	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	THORIUM BOT.MAT (UG/KG AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN)	TIT- ANIUM SEDI- MENT BEDMAT PERCENT	VANA- DIUM, DIS- SOLVED (UG/L AS V)	VANA- DIUM, TOTAL IN BOT- TOM MA- (UG/G)	YTTER- BIUM BOT.MAT (UG/KG AS YB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)	ZINC, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS ZN)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB 13...	--	--	--	<1	--	--	20	<10	--	--	1.7
JUN 07...	6.0	<10	2.1	--	330	2.0	--	--	210	<100	--
JUL 23...	--	--	--	<6	--	--	<10	<3	--	--	1.5

DATE	CARBON ORG.SED BEDMAT PERCENT	CARBON INGRSED BEDMAT PERCENT	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)
FEB 13...	--	--	--	<0.010	<0.1	--	<0.010	<0.010	<0.010	<0.01	<0.01
JUN 07...	4.4	0.07	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	<1	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

DATE	TIME	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)
FEB 13...	1150	0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	--	<0.010	<0.010
JUL 23...	1020	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.0	<0.010	<0.010

DATE	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)
FEB 13...	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01
JUL 23...	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	2,4,5-T TOTAL (UG/L)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)
NOV							
16...	1016	--	--	--	--	3.30	0.200
FEB							
13...	1136	--	--	--	--	2.30	0.100
13...	1150	<0.01	<1	<0.01	<0.01	--	--
APR							
24...	0931	--	--	--	--	2.00	0.200
JUN							
07...	1016	--	--	--	--	2.50	0.200
JUL							
23...	1020	<0.01	<1	<0.01	<0.01	--	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

BENTHIC INVERTEBRATE ANALYSES

DATE	JUN 07, 90
TIME	1016
SAMPLING DEPTH (FEET)	2.00
TOTAL CELLS/ML	170
	CELLS PER- /ML CENT
ANNELIDA (SEGMENTED WORMS)	
.OLIGOCHAETA	
..PLESIOPORA	
...NAIDIDAE	
...NAIS	1 <1
...TUBIFICIDAE	
...BRANCHIURA	27 16
...LIMNODRILUS	56 33
MOLLUSCA (MOLLUSCS)	
.GASTROPODA	
..MESOGASTROPODA	
...THIARIDAE	
...MELANOIDES	81 48

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE TIME	NOV 16, 89 1016	NOV 16, 89 1021	FEB 13, 90 1136	FEB 13, 90 1143
SAMPLING DEPTH (FEET)	2.00	10.0	2.00	10.0
TOTAL CELLS/ML	21000	9100	19000	6100
	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT
BACILLARIOPHYTA (DIATOMS)				
.BACILLARIOPHYCEAE				
..ACHNANTHALES				
...ACHNANTHACEAE				
...ACHNANTHES	14 <1	--	34 <1	--
..FRAGILARIALES				
...FRAGILARIACEAE				
...SYNEDRA				
...S.RADIANS	41 <1	--	--	--
..RHIZOLENIALES				
...RHIZOLENIACEAE				
...RHIZOLENIA	--	--	34 <1	34 <1
CHLOROPHYTA (GREEN ALGAE)				
.CHLOROPHYCEAE				
..CHAETOPHORALES				
...APHANOCHAETACEAE				
...APHANOCHAETE	4300 20	3100 34	--	--
..CHLOROCOCCALES				
...CHLOROCOCCACEAE				
...CHLOROCOCCUM	1600 8	1300 14	650 3	--
..HYDRODICTYACEAE				
...PEDIASTRUM	--	--	--	270 4
...OOCYSTACEAE				
...CHLORELLA	1200 6	1100 12	--	--
...KIRCHNERIELLA	570 3	82 <1	--	130 2
...OOCYSTIS	82 <1	--	--	--
...SELENASTRUM	160 <1	--	--	--
..PALMELLACEAE				
...SPAEROCYSTIS	--	250 3	--	--
..TETRASPORALES				
...GLOEOCYSTACEAE				
...GLOEOCYSTIS	--	--	100 <1	34 <1
..ULOTRICHALES				
...CHAETOPHORACEAE				
...APHANOCHAETE	6500 31	740 8	1300 7	1800 30
..VOLVOCALES				
...PEDINOMONADACEAE				
...PEDINOMONAS	--	--	130 <1	170 3
..ZYGNEATALES				
...MESOTAENIAEAE				
...MESOTAENIUM	82 <1	--	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)				
.BACILLARIOPHYCEAE				
..CENTRALES				
...COSCINODISCAEAE				
...CYCLOTILLA	82 <1	82 <1	--	--
...PENNALES	--	--	--	34 <1
...NAVICULACEAE				
...NAVICULA	14 <1	--	34 <1	--
...NITZSCHIAEAE				
...NITZSCHIA	--	82 <1	--	34 <1
.CHRYSOPHYCEAE				
..CHROMULINALES				
...CHRYSOCOCCACEAE				
...KEPHYRION	--	--	34 <1	--
..OCHROMONADALES				
...DINOBRYACEAE				
...DINOBRYON	160 <1	82 <1	--	--
...OCHROMONADACEAE				
...OCHROMONAS	--	--	--	34 <1
...SYNURACEAE				
...MALLOMONAS	--	--	68 <1	130 2

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE TIME	NOV 16, 89 1016	NOV 16, 89 1021	FEB 13, 90 1136	FEB 13, 90 1143
SAMPLING DEPTH (FEET)	2.00	10.0	2.00	10.0
TOTAL CELLS/ML	21000	9100	19000	6100
	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT
CYANOPHYTA (BLUE-GREEN ALGAE)				
.CYANOPHYCEAE				
..CHROOCOCCALES	--	--	650 3	--
...CHROOCOCCACEAE	2100 10	82 <1	1100 6	960 16
...SYNECHOCOCCUS	3000 14	1600 18	15000 79	2200 36
...SYNECHOCYSTIS	410 2	82 <1	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)				
.CYANOPHYCEAE				
...OSCILLATORIALES				
...OSCILLATORIACEAE				
...OSCILLATORIA	160 <1	160 2	34 <1	--
EUGLENOPHYTA (EUGLENOIDS)				
.CRYPTOPHYCEAE				
..CRYPTOMONIDALES				
...CRYPTOCHRYSIDACEAE				
...CHROOMONAS	160 <1	--	--	--
...CRYPTOMONODACEAE				
...CRYPTOMONAS	410 2	82 <1	100 <1	330 5
EUGLENOPHYCEAE				
..EUGLENALES				
...EUGLENACEAE				
...EUGLENA	82 <1	--	34 <1	--
PYRRHOPHYTA (FIRE ALGAE)				
.DINOPHYCEAE				
..DINOCOCCALES	82 <1	--	--	--

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE TIME	APR 24, 90 0931	APR 24, 90 0936	JUN 07, 90 1015	JUN 07, 90 1021
SAMPLING DEPTH (FEET)	2.00	10.0	2.00	10.0
TOTAL CELLS/ML	24000	15000	13000	3900
	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT
BACILLARIOPHYTA (DIATOMS)				
.BACILLARIOPHYCEAE				
..ACHNANTHALES				
...ACHNANTHACEAE				
	25 <1	56 <1	--	16 <1
..FRAGILARIALES				
...FRAGILARIACEAE				
...ASTERIONELLA				
	13 <1	--	--	--
...FRAGILARIA				
...F.DIBOLOS				
	--	110 <1	--	--
...SYNEDRA				
	52 <1	--	--	16 <1
...S.DELICATISSIMA				
.RHIZOLENIALES				
...RHIZOLENIA				
	320 1	23 <1	470 4	79 2
CHLOROPHYTA (GREEN ALGAE)				
.CHLOROPHYCEAE				
..CHAETOPHORALES				
...APHANOCHAETACEAE				
	770 3	1100 7	880 7	--
...APHANOCHAETE				
..CHLOROCOCCALES				
...CHLOROCOCCACEAE				
	960 4	810 5	1000 8	360 9
...CHLOROCOCCUM				
...OOCYSTACEAE				
...ANKISTRODESMUS				
	--	68 <1	--	--
...CHLORELLA				
	290 1	410 3	610 5	360 9
...SELENASTRUM				
	96 <1	--	68 <1	40 1
...TETRAEDRON				
	480 2	68 <1	340 3	240 6
...SCENEDESMACEAE				
...COELASTRUM				
	--	--	--	320 8
...TETRASTRUM				
	--	--	--	240 6
.TETRASPORALES				
...GLOEOCYSTACEAE				
	96 <1	--	--	--
...GLOEOCYSTIS				
.ULOTRICHIALES				
...CHAETOPHORACEAE				
	3100 13	610 4	810 6	--
...APHANOCHAETE				
.ZYGNEMATALES				
...MESOTAENIACEAE				
	190 <1	--	1500 12	200 5
...MESOTAENIUM				
CHRYSOPHYTA (YELLOW-GREEN ALGAE)				
.BACILLARIOPHYCEAE				
..CENTRALES				
...COSCINODISCACEAE				
	160 <1	68 <1	68 <1	40 1
...CYCLOTILLA				
	--	45 <1	--	--
...MELOSIRA				
..PENNALES				
...NAVICULACEAE				
	6 <1	56 <1	--	16 <1
...NAVICULA				
...NITZSCHIA				
	--	--	--	32 <1
...NITZSCHIA				
	190 <1	130 <1	--	--
.CHRYSOPHYCEAE				
...CHROMULINALES				
...CHRYSOCCACEAE				
	--	--	68 <1	--
...CHRYSOCCUS				
...OCHROMONADACEAE				
	--	--	--	79 2
...OCHROMONAS				
...OCHROMONADALES				
...SYNURACEAE				
	190 <1	470 3	68 <1	40 1
...MALLOMONAS				

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE TIME	APR 24, 90 0931	APR 24, 90 0936	JUN 07, 90 1015	JUN 07, 90 1021
SAMPLING DEPTH (FEET)	2.00	10.0	2.00	10.0
TOTAL CELLS/ML	24000	15000	13000	3900
	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT	CELLS PER- /ML CENT
CYANOPHYTA (BLUE-GREEN ALGAE)				
.CYANOPHYCEAE				
..CHROCOCCALES				
...CHROCOCCACEAE	960 4	540 4	950 7	79 2
...DACTYLOCOCCOPSIS	13000 54	8000 53	3400 26	990 25
...SYNECHOCOCCUS	2900 12	2400 16	2200 17	360 9
EUGLENOPHYTA (EUGLENOIDS)				
.CRYPTOPHYCEAE				
..CRYPTOMONIDALES				
...CRYPTOCHRYSIDACEAE				
...CHROOMONAS	96 <1	68 <1	68 <1	79 2
...CRYPTOMONODACEAE				
...CRYPTOMONAS	96 <1	68 <1	130 1	280 7
.EUGLENOPHYCEAE				
..EUGLENALES				
...EUGLENACEAE				
...EUGLENA	96 <1	--	--	--
ROTIFERA (ROTIFERS)				
.MONOGONONTA				
..COLLOTHECACEAE				
...COLLOTHECIDAE	--	110 <1	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212331157482501 HOOMALUHIA RES SEC 2-1 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1545	1.00	154	7.2	24.0	758	6.7	80
16...	1546	2.00	154	7.1	24.0	758	6.7	80
16...	1547	3.00	154	7.1	24.0	758	6.7	80
16...	1548	5.00	156	7.1	24.0	758	6.7	80
16...	1549	7.00	157	7.1	24.0	758	6.6	79
16...	1550	8.00	157	7.1	24.0	758	6.5	78
FEB								
13...	1405	1.00	177	7.6	21.5	757	8.2	94
13...	1406	3.00	177	7.6	21.5	757	8.2	94
13...	1407	5.00	177	7.6	21.5	757	8.2	94
13...	1408	7.00	175	7.6	21.5	757	8.1	92
13...	1409	8.00	174	7.6	21.5	757	8.0	91
APR								
24...	1400	1.00	177	9.0	25.5	758	7.8	96
24...	1401	3.00	178	9.0	25.5	758	7.7	94
24...	1402	5.00	180	9.0	25.0	758	7.7	93
24...	1403	7.00	182	8.9	24.5	758	7.5	90
24...	1404	9.00	184	8.9	24.0	758	6.5	77
JUN								
08...	1450	1.00	190	7.7	27.0	761	8.1	102
08...	1451	3.00	190	7.7	26.5	761	8.2	102
08...	1452	5.00	190	7.7	26.5	761	8.2	102
08...	1453	7.00	190	7.7	26.5	761	8.0	99
08...	1454	8.00	190	7.6	25.5	761	7.2	88
JUL								
23...	1528	1.00	174	7.4	27.5	760	7.8	99
23...	1529	3.00	174	7.4	27.5	760	7.8	99
23...	1531	5.00	175	7.4	27.0	760	7.9	100
23...	1533	7.00	176	7.3	26.5	760	7.6	95
23...	1535	9.00	179	7.3	26.0	760	7.4	92

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (IN)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)		
NOV											
16...	1515	1.00	154	7.2	24.0	38.0	758	6.6	79		
16...	1516	2.00	154	7.1	24.0	38.0	758	6.6	79		
16...	1517	3.00	153	7.1	24.0	38.0	758	6.6	79		
16...	1519	7.00	154	7.1	24.0	38.0	758	6.5	78		
16...	1520	8.00	154	7.1	24.0	38.0	758	6.4	77		
16...	1521	9.00	150	7.1	23.5	38.0	758	6.0	71		
16...	1522	10.0	163	7.1	23.0	38.0	758	6.2	73		
16...	1523	11.0	164	7.1	23.0	38.0	758	6.2	73		
FEB											
13...	1345	1.00	176	7.9	21.5	61.5	757	8.3	95		
13...	1346	2.00	176	7.9	21.5	61.5	757	8.3	95		
13...	1347	3.00	177	7.8	21.5	61.5	757	8.3	95		
13...	1348	5.00	176	7.7	21.5	61.5	757	8.2	94		
13...	1349	7.00	175	7.7	21.5	61.5	757	8.1	92		
13...	1350	9.00	174	7.7	21.0	61.5	757	7.9	90		
13...	1351	11.0	182	7.6	21.0	61.5	757	7.3	82		
13...	1352	12.0	185	7.5	20.5	61.5	757	7.2	81		
APR											
24...	1340	1.00	177	9.0	25.5	67.5	758	8.0	98		
24...	1341	2.00	178	9.0	25.5	67.5	758	8.0	98		
24...	1342	3.00	179	8.9	25.0	67.5	758	7.9	96		
24...	1343	5.00	180	8.9	24.5	67.5	758	7.9	96		
24...	1344	7.00	183	8.9	24.5	67.5	758	7.5	91		
24...	1345	9.00	183	8.9	23.5	67.5	758	6.7	80		
24...	1346	11.0	186	8.8	23.5	67.5	758	6.3	74		
24...	1347	12.5	187	8.7	23.0	67.5	758	6.3	74		
JUN											
08...	1429	1.00	190	7.6	26.5	--	761	8.2	102		
08...	1430	2.00	190	7.6	26.5	66.5	761	8.2	102		
08...	1431	3.00	190	7.7	26.5	--	761	8.2	102		
08...	1432	5.00	190	7.7	26.5	--	761	8.2	102		
08...	1433	7.00	190	7.7	26.0	--	761	8.1	100		
08...	1434	8.00	190	7.4	25.0	--	761	7.4	90		
08...	1435	9.00	190	7.6	25.0	--	761	6.9	84		
08...	1436	10.0	189	7.5	24.5	--	761	6.9	83		
JUL											
23...	1513	1.00	176	7.5	27.5	--	760	7.8	99		
23...	1514	3.00	175	7.5	27.5	--	760	7.8	99		
23...	1516	5.00	174	7.5	27.0	--	760	7.8	98		
23...	1517	7.00	177	7.4	27.0	--	760	7.7	97		
23...	1519	9.00	179	7.3	26.0	--	760	7.5	92		
23...	1521	11.0	185	7.2	25.0	--	760	7.2	87		
DATE	TIME	CALCIUM SED. BEDMAT PERCENT	MAGNES- IUM SEDI- MENT BEDMAT PERCENT	SODIUM SEDI- MENT BEDMAT PERCENT	POTAS- SIUM SEDI- MENT BEDMAT PERCENT	NITRO- GEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITRO- GEN, NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITRO- GEN, NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	PHOS- PHORUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOS- PHORUS SEDI- MENT BEDMAT PERCENT	ALUM- INUM SED. BEDMAT PERCENT
JUN											
08...	1430	1.0	0.88	0.23	0.15	<2.0	110	3700	1700	0.22	10
DATE	TIME	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	BERIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS BA)	BERYL- LIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COBALT, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CO)	COPPER, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CU)	GOLD SEDI- MENT SUSP. (UG/G)	IRON SEDI- MENT SUSP. PERCENT	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)
JUN											
08...	20	11	260	1	<2	570	60	170	<8	15	60

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE--Continued

DATE	MANGANESE, RECOV. FM BOT-TOM MATERIAL (UG/G)	MERCURY RECOV. FM BOT-TOM MATERIAL (UG/G)	MOLYBDENUM, RECOV. FM BOT-TOM MATERIAL (UG/G)	NICKEL, RECOV. FM BOT-TOM MATERIAL (UG/G)	SCANDIUM (UG/KG)	SELENIUM, RECOV. FM BOT-TOM MATERIAL (UG/G)	SILVER, RECOV. FM BOT-TOM MATERIAL (UG/G)	STRONTIUM, RECOV. FM BOT-TOM MATERIAL (UG/G)	TANTALUM (UG/KG)	THORIUM (UG/KG)	TIN RECOV. FROM BOT. MATERIAL (UG/KG)
JUN 08...	1500	0.02	<2.0	330	41	2	<2	130	<40	6.0	<10
DATE	TIME	TITANIUM SEDI-MENT BEDMAT PERCENT	VANADIUM, TOTAL IN BOT-TOM MATERIAL (UG/G)	YTTERBIUM (UG/KG)	ZINC, RECOV. FM BOT-TOM MATERIAL (UG/G)	URANIUM NATURAL TOTAL IN BOTTOM MATERIAL (UG/G)	CARBON ORG. SED BEDMAT PERCENT	CARBON INRG SED BEDMAT PERCENT	CHLOR-A PHYTO-PLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANKTON CHROMO FLUOROM (UG/L)	
NOV 16...	1516	--	--	--	--	--	--	--	4.10	0.200	
FEB 13...	1346	--	--	--	--	--	--	--	3.00	0.200	
APR 24...	1341	--	--	--	--	--	--	--	3.20	0.300	
JUN 08...	1430	2.0	340	2.0	210	<100	4.5	0.06	2.70	0.500	

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

BENTHIC INVERTEBRATE ANALYSES

DATE	JUN 08, 90
TIME	1430
SAMPLING DEPTH (FEET)	2.00
TOTAL CELLS/ML	67
	CELLS PER- /ML CENT
ANNELIDA (SEGMENTED WORMS)	
.OLIGOCHAETA	
..PLESIOPORA	
...NAIDIDAE	
....DERO	1 2
...TUBIFICIDAE	
....BRANCHIURA	4 7
...LIMNODRILUS	28 42
ARTHROPODA (ARTHROPODS)	
.INSECTA	
..DIPTERA	
...CHIRONOMIDAE	
....CHIRONOMUS	2 4
MOLLUSCA (MOLLUSCS)	
.BIVALVIA	
..NUCULOIDEA	
...SPHAERIIDAE	
....PISIDIUM	1 2
GASTROPODA	
..MESOGASTROPODA	
...THIARIDAE	
....MELANOIDES	31 46

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212331157482503 HOOMALUHIA RES SEC 2-3 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1500	1.00	156	7.2	24.0	758	6.5	78
16...	1501	3.00	156	7.2	24.0	758	6.5	78
16...	1502	5.00	156	7.2	24.0	758	6.5	78
16...	1503	7.00	156	7.2	24.0	758	6.4	77
16...	1504	8.00	154	7.1	24.0	758	6.3	75
16...	1505	9.00	157	7.2	24.0	758	6.0	72
FEB								
13...	1335	1.00	177	7.9	21.5	757	8.9	102
13...	1336	3.00	177	7.8	21.5	757	8.7	99
13...	1337	5.00	176	7.8	21.5	757	8.5	97
13...	1338	7.00	176	7.8	21.5	757	8.4	96
13...	1339	9.00	174	7.7	21.0	757	8.2	93
APR								
24...	1330	1.00	177	9.0	25.5	758	7.9	97
24...	1331	3.00	177	9.0	25.5	758	7.9	97
24...	1332	5.00	180	9.0	25.0	758	7.6	93
24...	1333	7.00	185	8.9	24.5	758	6.9	84
24...	1334	9.00	186	8.8	23.5	758	6.9	82
JUN								
08...	1018	7.00	190	7.6	26.0	761	7.5	93
08...	1019	9.00	189	7.5	25.0	761	7.1	86
08...	1415	1.00	190	7.5	27.0	761	8.1	102
08...	1416	3.00	190	7.6	26.5	761	8.1	101
08...	1417	5.00	189	7.6	26.5	761	8.1	101
JUL								
23...	1504	1.00	175	7.6	27.5	760	7.9	100
23...	1506	3.00	174	7.5	27.5	760	7.8	99
23...	1507	5.00	175	7.5	27.5	760	7.9	100
23...	1508	7.00	176	7.5	26.5	760	7.8	97
23...	1510	9.00	179	7.4	26.0	760	7.4	92

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212329157483101 HOOMALUHIA RES SEC 3-1 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAM- FLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1345	1.00	156	7.2	24.0	758	6.4	77
16...	1346	3.00	156	7.2	24.5	758	6.1	73
16...	1347	5.00	157	7.2	24.5	758	6.1	73
16...	1348	7.00	158	7.1	24.5	758	5.9	71
16...	1349	9.00	158	7.1	24.0	758	6.0	72
FEB								
13...	1100	1.00	175	7.7	21.5	757	8.4	96
13...	1101	3.00	175	7.7	21.5	757	8.4	96
13...	1102	5.00	175	7.7	21.5	757	8.3	95
13...	1103	7.00	175	7.6	21.5	757	8.3	95
13...	1104	9.00	175	7.7	21.5	757	8.2	93
APR								
24...	1200	1.00	177	8.9	25.5	758	7.2	89
24...	1201	3.00	179	8.9	25.5	758	7.2	88
24...	1202	5.00	179	8.9	25.0	758	7.0	85
24...	1203	7.00	180	8.8	24.5	758	6.6	80
24...	1204	9.00	182	8.8	24.0	758	5.5	66
24...	1205	9.50	183	8.8	23.5	758	5.0	59
JUN								
08...	1232	5.00	189	7.6	26.5	761	8.1	101
08...	1233	7.00	189	7.6	26.5	761	8.1	101
08...	1234	9.00	189	7.6	26.0	761	7.7	95
08...	1330	1.00	190	7.6	27.0	761	8.1	102
08...	1331	3.00	189	7.6	27.0	761	8.1	102
JUL								
23...	1149	1.00	171	7.6	27.0	760	7.7	97
23...	1150	3.00	172	7.6	27.0	760	7.7	97
23...	1152	5.00	173	7.5	26.5	760	7.7	96
23...	1153	7.00	173	7.5	26.5	760	7.6	95
23...	1155	9.00	173	7.4	26.5	760	7.4	93

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	TRANS- PAR- ENCY (SECCHI DISK) (IN)	BARO- METRIC PRES- SURE OF (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)
NOV										
16...	1400	1.00	156	7.1	24.5	31	40.5	758	6.0	72
16...	1401	2.00	156	7.1	24.5	--	40.5	758	6.0	72
16...	1402	3.00	156	7.1	24.5	--	40.5	758	6.0	72
16...	1403	5.00	157	7.1	24.0	--	40.5	758	5.9	71
16...	1404	6.00	157	7.0	24.0	3.2	40.5	758	5.8	70
16...	1405	7.00	157	7.1	24.0	--	40.5	758	5.8	70
16...	1406	9.00	157	7.1	24.0	--	40.5	758	5.7	68
16...	1407	10.00	157	7.0	24.0	5.0	40.5	758	5.7	68
FEB										
13...	1110	1.00	176	7.7	21.5	0.60	62.0	757	8.5	97
13...	1112	2.00	176	7.7	21.5	--	62.0	757	8.5	97
13...	1114	3.00	176	7.7	21.5	--	62.0	757	8.4	96
13...	1115	6.00	176	7.7	21.5	1.5	62.0	757	8.4	96
13...	1116	5.00	176	7.7	21.5	--	62.0	757	8.4	96
13...	1117	7.00	176	7.6	21.5	--	62.0	757	8.4	95
13...	1119	9.00	175	7.6	21.5	--	62.0	757	8.3	94
13...	1120	11.00	175	7.6	21.5	--	62.0	757	8.3	94
13...	1121	10.00	175	7.6	21.5	2.7	62.0	757	8.3	94
APR										
24...	1145	1.00	178	8.9	25.5	--	69.5	758	7.8	96
24...	1146	2.00	178	8.9	25.5	--	69.5	758	7.7	95
24...	1147	3.00	180	8.8	25.5	--	69.5	758	7.7	95
24...	1148	5.00	180	8.9	25.0	--	69.5	758	7.7	94
24...	1149	7.00	180	8.8	24.5	--	69.5	758	7.2	87
24...	1150	9.00	182	8.8	24.0	--	69.5	758	6.8	82
24...	1151	10.00	183	8.8	24.0	--	69.5	758	6.4	76
JUN										
08...	1300	1.00	190	7.4	26.5	0.50	72.5	761	8.2	102
08...	1301	2.00	190	7.5	26.5	--	72.5	761	8.2	102
08...	1302	3.00	190	7.5	26.5	--	--	761	8.1	101
08...	1303	6.00	190	7.5	26.5	1.0	72.5	761	8.2	102
08...	1304	7.00	190	7.5	26.0	--	--	761	8.2	102
08...	1305	9.00	190	7.4	26.0	--	--	761	8.1	100
08...	1306	10.00	190	7.3	25.0	2.4	72.5	761	4.1	50
JUL										
23...	--	3.00	174	7.4	26.5	--	--	760	7.6	95
23...	1157	1.00	174	7.5	26.5	1.2	--	760	7.7	97
23...	1200	5.00	174	7.3	26.5	--	--	760	7.7	96
23...	1202	7.00	174	7.3	26.5	--	--	760	7.5	94
23...	1203	10.00	174	7.2	26.5	4.5	--	760	7.4	92
30...	1201	6.00	174	7.3	26.5	1.2	--	760	7.6	95

DATE	TIME	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	CALCIUM SED. BEDMAT PERCENT	MAGNES- IUM SEDI- MENT BEDMAT PERCENT	SODIUM SEDI- MENT BEDMAT PERCENT	POTAS- SIUM SEDI- MENT BEDMAT PERCENT	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITRO- GEN, NH4 TOTAL IN BOT. MAT. (MG/KG AS N)
FEB										
13...	1110	K2	--	--	--	--	4	0.400	--	--
13...	1115	K5	--	--	--	--	9	0.400	--	--
13...	1121	K2	--	--	--	--	18	0.400	--	--
JUN										
08...	1301	--	0.81	0.77	0.19	0.13	--	--	<2.0	99
JUL										
23...	1157	K2	--	--	--	--	<1	0.300	--	--
23...	1203	K10	--	--	--	--	2	0.300	--	--
30...	1201	K9	--	--	--	--	<1	0.300	--	--

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE--Continued

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	NITRO- GEN, TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/KG AS P)	PHOS- PHORUS SEDI- MENT BEDMAT PERCENT	ALUM- INUM SED. BEDMAT PERCENT	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	ARSENIC BOT MAT <63U DS LAB (UG/G)	IRON SEDI- MENT SUSP. PERCENT
FEB										
13...	<0.20	--	--	0.020	--	--	--	--	--	--
13...	<0.20	--	--	0.010	--	--	--	--	--	--
13...	0.30	--	0.70	0.010	--	--	--	--	--	--
JUN										
08...	--	3200	--	--	1900	0.24	11	40	20	14
JUL										
23...	0.30	--	0.60	<0.010	--	--	--	--	--	--
23...	0.20	--	0.50	0.010	--	--	--	--	--	--
30...	0.30	--	0.60	<0.010	--	--	--	--	--	--

DATE	TIME	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G AS HG)	SELE- NIUM, TOTAL IN BOT- TOM MA- TERIAL (UG/G)	SILVER, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS AG)	TIT- ANIUM SEDI- MENT BEDMAT PERCENT	CARBON ORG. SED BEDMAT PERCENT	CARBON INRGSED BEDMAT PERCENT	CHLOR-A PHYTO- PLANK- TON CHRCMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)
NOV										
16...	1401	--	--	--	--	--	--	--	4.60	0.200
FEB										
13...	1112	--	--	--	--	--	--	--	3.10	<0.100
APR										
24...	1146	--	--	--	--	--	--	--	2.70	0.300
JUN										
08...	1301	2100	0.16	2	<2	2.1	3.7	0.02	2.30	0.200

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

BENTHIC INVERTEBRATE ANALYSES

DATE	JUN 08, 90
TIME	1301
SAMPLING DEPTH (FEET)	2.00
TOTAL CELLS/ML	190
	CELLS PER- /ML CENT
ANNELIDA (SEGMENTED WORMS)	
.OLIGOCHAETA	
..PLESIOPORA	
...NAIDIDAE	
....DERO	2 1
...TUBIFICIDAE	
....AULODRILUS	4 2
....BRANCHIURA	17 9
....LIMNODRILUS	150 79
MOLLUSCA (MOLLUSCS)	
.GASTROPODA	
..MESOGASTROPODA	
...THIARIDAE	
....MELANOIDES	21 11

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212329157483103 HOOMALUHIA RES SEC 3-3 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAM- FLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1430	1.00	157	7.1	24.0	758	6.0	72
16...	1431	3.00	157	7.0	24.0	758	6.0	72
16...	1432	5.00	157	7.0	24.0	758	5.7	68
16...	1433	7.00	158	7.0	24.0	758	5.6	67
16...	1434	9.00	157	7.0	24.0	758	5.6	67
16...	1435	11.0	157	7.0	24.0	758	5.5	66
16...	1436	12.0	157	7.0	24.0	758	5.2	62
FEB								
13...	1125	1.00	176	7.7	21.5	757	8.6	98
13...	1126	3.00	176	7.7	21.5	757	8.5	97
13...	1127	5.00	176	7.7	21.0	757	8.4	95
13...	1128	7.00	175	7.7	21.0	757	8.3	94
13...	1129	9.00	175	7.7	21.0	757	8.2	93
13...	1130	11.0	175	7.7	21.0	757	8.2	93
13...	1131	12.0	176	7.6	21.0	757	8.0	90
APR								
24...	1130	1.00	178	8.9	25.5	758	7.8	96
24...	1131	3.00	179	8.9	25.5	758	7.7	94
24...	1132	5.00	180	8.9	25.0	758	7.8	95
24...	1133	7.00	179	8.9	24.5	758	7.4	89
24...	1134	9.00	182	8.8	24.0	758	6.7	80
24...	1135	11.0	183	8.7	23.5	758	6.2	74
24...	1136	12.0	184	8.7	23.5	758	6.1	72
JUN								
08...	1225	1.00	189	7.1	26.5	761	8.3	104
08...	1226	3.00	189	7.2	26.5	761	8.3	103
08...	1227	5.00	189	7.3	26.0	761	8.3	103
08...	1228	7.00	189	7.3	26.0	761	8.2	101
08...	1229	9.00	189	7.3	26.0	761	8.1	100
08...	1230	10.0	190	7.2	25.0	761	4.4	54
08...	1231	11.0	190	7.3	24.5	761	4.1	49
08...	1232	12.0	190	7.1	24.5	761	3.8	46
JUL								
23...	1205	1.00	174	7.5	27.0	760	7.6	95
23...	1206	3.00	174	7.4	27.0	760	7.6	95
23...	1207	5.00	174	7.3	26.5	760	7.6	95
23...	1208	7.00	174	7.2	26.5	760	7.7	96
23...	1209	9.00	174	7.2	26.5	760	7.6	95
23...	1210	11.0	184	7.1	25.5	760	4.2	51

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157483001 HOOMALUHIA RES SEC 4-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1130	1.00	158	7.2	24.0	758	5.7	68
16...	1131	3.00	159	7.1	24.0	758	5.3	63
16...	1132	5.00	159	7.1	24.0	758	5.0	60
16...	1133	7.00	159	7.1	24.0	758	4.9	58
16...	1134	8.00	159	7.1	23.5	758	4.9	58
FEB								
13...	1035	1.00	177	7.6	21.5	757	8.7	99
13...	1036	3.00	177	7.6	21.0	757	8.5	96
13...	1037	5.00	177	7.6	21.0	757	8.4	95
13...	1038	7.00	177	7.6	21.0	757	8.4	95
13...	1039	8.00	176	7.6	21.0	757	8.5	96
13...	1040	8.50	176	7.6	21.0	757	8.5	96
APR								
24...	1055	1.00	177	8.8	25.5	758	8.0	98
24...	1056	3.00	179	8.8	25.0	758	8.0	98
24...	1057	5.00	180	8.8	25.0	758	8.0	97
24...	1058	7.00	180	8.8	24.5	758	7.8	94
24...	1059	8.50	183	8.7	24.0	758	7.7	92
JUN								
07...	1540	1.00	191	8.0	26.5	761	8.3	103
07...	1541	3.00	191	8.0	26.5	761	8.2	102
07...	1542	5.00	194	7.9	26.0	761	8.0	99
07...	1543	7.00	193	7.9	25.5	761	7.8	96
07...	1544	8.00	192	7.9	25.0	761	7.3	89
JUL								
23...	1451	1.00	174	7.3	27.5	760	7.7	98
23...	1453	3.00	175	7.3	27.0	760	8.0	101
23...	1454	5.00	175	7.3	27.0	760	7.9	99
23...	1456	7.00	175	7.2	26.5	760	7.7	96
23...	1459	8.00	175	7.2	26.5	760	7.7	96

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (IN)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV									
16...	1145	1.00	158	7.1	24.0	--	758	5.5	66
16...	1146	2.00	158	7.1	24.0	41.0	758	5.5	66
16...	1147	3.00	158	7.1	24.0	--	758	5.5	66
16...	1148	5.00	158	7.0	24.0	--	758	5.4	64
16...	1149	7.00	159	7.0	23.5	--	758	5.1	61
16...	1150	9.00	159	7.0	23.5	--	758	5.0	59
16...	1151	10.00	160	7.0	23.5	--	758	5.6	66
FEB									
13...	1015	1.00	177	7.7	21.0	63.0	757	8.5	96
13...	1016	2.00	177	7.7	21.0	63.0	757	8.5	96
13...	1017	3.00	177	7.6	21.0	63.0	757	8.5	96
13...	1018	5.00	177	7.6	21.0	63.0	757	8.5	96
13...	1019	7.00	177	7.6	21.0	63.0	757	8.5	96
13...	1020	9.00	177	7.6	21.0	63.0	757	7.7	87
13...	1021	10.00	177	7.6	21.0	63.0	757	7.6	86
APR									
24...	1040	1.00	176	8.9	25.5	--	758	7.7	94
24...	1041	2.00	177	8.8	25.5	71.5	758	7.8	96
24...	1042	3.00	177	8.9	25.0	71.5	758	7.9	97
24...	1043	5.00	179	8.8	25.0	71.5	758	7.9	96
24...	1044	7.00	181	8.8	24.5	71.5	758	7.9	95
24...	1045	8.00	182	8.8	24.0	71.5	758	7.1	85
24...	1046	9.00	184	8.7	24.0	71.5	758	7.2	86
24...	1047	10.00	184	8.7	24.0	71.5	758	6.8	81
JUN									
07...	1524	1.00	190	7.9	26.0	--	761	8.4	104
07...	1525	2.00	190	7.9	26.0	66.0	761	8.4	104
07...	1526	3.00	190	7.9	26.0	--	761	8.3	103
07...	1527	5.00	191	7.9	26.0	--	761	8.1	100
07...	1528	7.00	192	7.9	25.5	--	761	7.9	97
07...	1529	9.00	192	7.9	25.0	--	761	6.7	81
07...	1530	10.00	191	7.7	24.5	--	761	5.7	69
JUL									
23...	1440	1.00	175	7.3	27.5	--	760	7.8	99
23...	1441	3.00	175	7.3	27.5	--	760	7.9	100
23...	1443	5.00	175	7.3	26.5	--	760	8.0	100
23...	1445	7.00	175	7.2	27.0	--	760	7.9	99
23...	1446	9.00	178	7.2	26.0	--	760	7.1	88
23...	1448	10.00	180	7.1	26.0	--	760	6.0	74

DATE	TIME	CALCIUM SED. BEDMAT PERCENT	MAGNES- IUM SEDI- MENT BEDMAT PERCENT	SODIUM SEDI- MENT BEDMAT PERCENT	POTAS- SIUM SEDI- MENT BEDMAT PERCENT	NITRO- GEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITRO- GEN, NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITRO- GEN, NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	PHOS- PHORUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOS- PHORUS SEDI- MENT BEDMAT PERCENT	ALUM- INUM SED. BEDMAT PERCENT
JUN 07...	1525	1.2	1.0	0.27	0.12	<2.0	150	4000	1600	0.21	10

DATE	TIME	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	BERYL- LIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS BA)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COBALT, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CO)	COPPER, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CU)	GOLD SEDI- MENT SUSP. (UG/G)	IRON SEDI- MENT SUSP. PERCENT	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)	
JUN 07...	50	29	250	1	<2	460	60	190	<8	13	100

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE--Continued

DATE	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G) AS HG)	MOLYB- DENUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	NICKEL, RECOV. FM BOT- TOM MA- TERIAL (UG/G) AS NI)	SCAN- DIUM BOT.MAT (UG/KG) AS SC)	SELE- NIUM, TOTAL FM BOT- TOM MA- TERIAL (UG/G)	SILVER, RECOV. FM BOT- TOM MA- TERIAL (UG/G) AS AG)	STRON- TIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	TAN- TALUM BOT.MAT (UG/KG) AS TA)	THORIUM BOT.MAT (UG/KG) AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG) AS SN)
JUN 07...	1600	0.20	<2.0	250	38	2	<2	130	<40	<4.0	<10
DATE	TIME	TIT- ANIUM SEDI- MENT BEDMAT PERCENT	VANA- DIUM, TOTAL FM BOT- TOM MA- TERIAL (UG/G)	YTTER- BIUM BOT.MAT (UG/KG) AS YB)	ZINC, RECOV. FM BOT- TOM MA- TERIAL (UG/G) AS ZN)	URANIUM NATURAL TOTAL FM BOT- TOM MA- TERIAL (UG/G)	CARBON ORG.SED BEDMAT PERCENT	CARBON INRGSSED BEDMAT PERCENT	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	
NOV 16...	1146	--	--	--	--	--	--	--	2.30	0.100	
FEB 13...	1016	--	--	--	--	--	--	--	2.70	0.200	
APR 24...	1041	--	--	--	--	--	--	--	2.80	0.300	
JUN 07...	1525	2.0	370	3.0	200	<100	4.9	0.03	3.30	0.300	

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE, OAHU, HI

BENTHIC INVERTEBRATE ANALYSES

DATE	JUN 07, 90
TIME	1525
SAMPLING DEPTH (FEET)	2.00
TOTAL CELLS/ML	100
	CELLS PER- /ML CENT
ANNELIDA (SEGMENTED WORMS)	
.OLIGOCHAETA	
..PLESIOPODA	
...TUBIFICIDAE	
....BRANCHIURA	26 26
....LIMNODRILLUS	38 38
MOLLUSCA (MOLLUSCS)	
.BIVALVIA	
..NUCULOIDEA	
...SPHAERIIDAE	
....PISIDIUM	1 2
.GASTROPODA	
..MESOGASTROPODA	
...THIARIDAE	
....MELANOIDES	36 36

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212335157483003 HOOMALUHIA RES SEC 4-3 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV								
16...	1210	1.00	157	7.0	24.0	758	5.7	68
16...	1211	3.00	157	7.0	24.0	758	5.7	68
16...	1212	5.00	157	7.0	24.0	758	5.7	68
16...	1213	7.00	157	7.0	24.0	758	5.7	68
16...	1214	9.00	159	7.0	24.0	758	5.0	60
16...	1215	11.0	159	7.0	23.5	758	5.0	59
16...	1216	12.0	161	7.0	23.5	758	5.6	66
FEB								
13...	1005	1.00	176	7.6	21.0	757	8.5	96
13...	1006	3.00	176	7.6	21.0	757	8.4	95
13...	1007	5.00	176	7.6	21.0	757	8.4	95
13...	1008	7.00	176	7.6	21.0	757	8.4	95
13...	1009	9.00	176	7.6	21.0	757	8.3	94
13...	1010	11.0	176	7.6	21.0	757	8.3	94
13...	1011	12.0	176	7.6	21.0	757	8.2	93
APR								
24...	1030	1.00	176	8.8	25.5	758	7.5	92
24...	1031	3.00	176	8.8	25.5	758	7.5	92
24...	1032	5.00	179	8.8	25.0	758	7.4	90
24...	1033	7.00	181	8.8	24.5	758	7.3	88
24...	1034	9.00	183	8.8	24.0	758	6.4	76
24...	1035	11.0	185	8.7	23.5	758	6.3	75
24...	1036	12.0	185	8.7	23.5	758	6.0	71
JUN								
07...	1515	1.00	190	8.0	26.5	761	8.3	103
07...	1516	3.00	190	8.0	26.0	761	8.4	104
07...	1517	5.00	191	7.9	26.0	761	8.1	100
07...	1518	7.00	193	7.9	25.5	761	7.5	92
07...	1519	9.00	194	7.8	25.0	761	7.5	91
07...	1520	11.0	192	7.8	24.5	761	5.8	70
07...	1521	12.0	191	7.7	24.5	761	5.6	67
JUL								
23...	1426	1.00	173	7.2	27.5	760	8.1	103
23...	1430	3.00	174	7.3	27.5	760	8.0	101
23...	1432	5.00	174	7.3	27.0	760	8.1	102
23...	1433	7.00	174	7.3	27.0	760	7.9	99
23...	1434	9.00	178	7.2	26.5	760	7.3	91
23...	1436	11.0	181	7.1	25.0	760	6.0	73
23...	1438	12.0	180	7.0	25.0	760	6.0	73

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEHOE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	TRANS- PAR- ENCY (SECCHI DISK) (IN)
JUN											
07...	1109	1.00	189	7.6	25.5	761	7.2	88	--	--	--
07...	1110	2.00	190	7.5	25.5	761	7.5	92	3.00	0.300	66.0
07...	1111	3.00	191	7.5	25.0	761	7.0	85	--	--	--
07...	1112	5.00	191	7.5	25.0	761	6.7	81	--	--	--
07...	1113	7.00	193	7.5	25.0	761	6.3	76	--	--	--
07...	1114	9.00	192	7.5	25.0	761	6.0	73	--	--	--
07...	1116	11.0	191	7.4	24.0	761	5.0	60	--	--	--
07...	1117	13.0	190	7.4	24.0	761	4.1	49	--	--	--
07...	1118	15.0	190	7.3	24.0	761	4.1	49	--	--	--
07...	1119	17.0	190	7.3	24.0	761	4.2	50	--	--	--
07...	1200	1.00	189	7.6	25.5	761	7.2	88	--	--	--
07...	1201	1.00	189	7.6	25.5	761	7.2	88	--	--	--

DATE	LENGTH OF EXPO- SURE (DAYS)	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)	BIOMASS CHLORO- PHYLL RATIO PERI- PHYTON (UNITS)
JUN						
07...	44	0.790	0.550	0.400	0.300	600

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEHOE--Continued

PERIPHYTON ANALYSES

DATE TIME	JUN 07, 90 1200	JUN 07, 90 1201
SAMPLING DEPTH (FEET)	1.00	1.00
TOTAL CELLS/ML	2000	2000
	CELLS PER- /ML CENT	CELLS PER- /ML CENT
BACILLARIOPHYTA (DIATOMS)		
.BACILLARIOPHYCEAE		
..ACHNANTHALES		
...ACHNANTHACEAE		
....ACHNANTHES	320 16	490 25
..FRAGILARIALES		
...FRAGILARIACEAE		
....SYNEDRA	11 <1	14 <1
CHLOROPHYTA (GREEN ALGAE)		
.CHLOROPHYCEAE		
..CHLOROCOCCALES		
...CHARACIACEAE		
....CHARACIUM	17 <1	--
...CHLOROCOCCACEAE		
....CHLOROCOCCUM	8 <1	29 1
...OOCYSTACEAE		
....CHLORELLA	8 <1	12 <1
....TETRAEDRON	--	6 <1
..ULOTRICHALES		
...CHAETOPHORACEAE		
....STIGEOCLONIUM	1100 55	590 30
..ZYGNEMATALES		
...MESOTAENIACEAE		
....MESOTAENIUM	25 1	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)		
.BACILLARIOPHYCEAE		
..CENTRALES		
...COSCINODISCACEAE		
....CYCLOTELLA	17 <1	18 <1
..PENNALES		
...CYMBELLACEAE		
....CYMBELLA	--	10 <1
...DIATOMACEAE		
....DIATOMA	11 <1	9 <1
...NAVICULACEAE		
....NAVICULA	--	5 <1
CYANOPHYTA (BLUE-GREEN ALGAE)		
.CYANOPHYCEAE		
..CHROCOCCALES		
...CHROCOCCACEAE	130 7	35 2
....SYNECHOCOCCUS	25 1	24 1
..OSCILLATORIALES	--	18 <1
...OSCILLATORIACEAE		
....LYNGBYA	100 5	690 35
....OSCILLATORIA	180 9	76 4

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE	JUN 07, 90
TIME	1110
SAMPLING DEPTH (FEET)	2.00
TOTAL CELLS/ML	10000
	CELLS PER- /ML CENT
BACILLARIOPHYTA (DIATOMS)	
.BACILLARIOPHYCEAE	
..ACHNANTHALES	
...ACHNANTHACEAE	
....ACHNANTHES	25 <1
..FRAGILARIALES	
...FRAGILARIACEAE	
....FRAGILARIA	16 <1
....SYNEDRA	8 <1
..NAVICULALES	
...NAVICULACEAE	
....NAVICULA	
....N.ATOMUS	8 <1
CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHAETOPHORALES	
...APHANOCHAETACEAE	
....APHANOCHAETE	1400 14
..CHLOROCOCCALES	
...CHLOROCOCCACEAE	
....CHLOROCOCCUM	590 6
....SCHROEDERIA	270 3
...OOCYSTACEAE	
...CHLORELLA	770 8
...SELENASTRUM	45 <1
...TETRAEDRON	680 7
..TETRASPORALES	
...GLOEOCYSTACEAE	
....GLOEOCYSTIS	90 <1
..ULOTRICHALES	
...CHAETOPHORACEAE	
....APHANOCHAETE	540 5
..ZYGNEMATALES	
...MESOTAENIACEAE	
....MESOTAENIUM	500 5
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..CENTRALES	
...RHI ZOSOLENIACEAE	
....RHIZOLENIA	180 2
..PENNALES	
...NAVICULACEAE	
....NAVICULA	25 <1
...NITZSCHIACEAE	
....NITZSCHIA	8 <1
..CHRYSOPHYCEAE	
..CHROMULINALES	
...CHROMULINACEAE	
....CHROMULINA	45 <1
..OCHROMONADALES	
...SYNURACEAE	
....MALLOMONAS	90 <1
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROCOCCALES	
...CHROCOCCACEAE	270 3
....DACTYLOCOCCOPSIS	2400 24
....SYNECHOCOCCUS	1200 12
EUGLENOPHYTA (EUGLENOIDS)	
.CRYPTOPHYCEAE	
..CRYPTOMONIDALES	
...CRYPTOCHRYSIDACEAE	
....CHROOMONAS	45 <1
...CRYPTOMONODACEAE	
....CRYPTOMONAS	450 5
..EUGLENOPHYCEAE	
...EUGLENALES	
...EUGLENACEAE	
....EUGLENA	45 <1

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY (LAT 21°24'54" LONG 157°48'03")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV 16...	1055	15	191	--	23.0	2.1	762	10.0	117	--
DEC 19...	1015	11	195	8.8	22.0	1.5	761	10.0	115	1200
JAN 25...	1400	19	185	7.8	23.0	4.5	757	8.7	102	--
FEB 15...	1420	14	200	7.6	25.5	1.8	765	6.3	77	1000
MAR 27...	1200	42	182	8.6	25.0	7.6	767	8.8	106	--
APR 26...	1000	18	190	7.9	25.0	1.9	763	9.0	109	--
JUN 14...	1400	12	200	8.5	31.0	3.5	765	8.7	117	--
JUL 24...	1000	9.8	190	8.2	26.0	3.2	765	6.4	79	2800
AUG 13...	1000	11	180	8.5	26.5	10	765	9.4	117	--
SEP 19...	1245	14	200	7.6	26.5	3.8	761	9.2	115	11

DATE	TIME	HARD-NESS TOTAL (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)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC 19...	1015	59	11	7.6	16	37	0.9	0.90	55	8.0	20
SEP 19...	1245	54	10	7.1	16	38	0.9	1.2	56	7.5	22

DATE	TIME	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 19...	1015	<0.10	22	115	119	0.16	13	0.300	0.60	0.90	0.030
FEB 15...	1420	--	--	--	--	--	10	0.300	<0.20	--	0.010
JUL 24...	1000	--	--	--	--	--	4	0.200	0.30	0.50	0.020
SEP 19...	1245	<0.10	22	111	120	0.15	8	0.300	0.30	0.60	0.040

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
DEC 19...	1015	90	<10	<1	<1	<100	3	<10	<0.5	<1	<1.0
SEP 19...	1245	380	40	<1	1	<100	3	<10	<0.5	<1	<1.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEHOE STREAM BELOW KAM HWY--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM, TOTAL RECOVERABLE (UG/L AS LI)
DEC 19...	<1	<1	1	<3	2	1	440	100	2	<1	<10
SEP 19...	<1	<1	<1	<3	3	1	980	110	1	<1	<10

DATE	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, TOTAL RECOVERABLE (UG/L AS HG)	MERCURY, DIS-SOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELENIUM, TOTAL RECOVERABLE (UG/L AS SE)	SELENIUM, DIS-SOLVED (UG/L AS SE)
DEC 19...	<4	50	19	<0.10	<0.1	<1	<10	2	<1	<1	<1
SEP 19...	<4	100	11	<0.10	<0.1	1	<10	1	<1	<1	<1

DATE	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRONTIUM, DIS-SOLVED (UG/L AS SR)	VANADIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	OIL AND GREASE, TOTAL RECOVERABLE (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORODIRIFOS, TOTAL RECOVERABLE (UG/L)
DEC 19...	<1	<1.0	74	<6	10	3	1.3	<1	<0.010	0.1	--
SEP 19...	<1	<1.0	73	<6	10	<3	2.7	<1	<0.010	<0.1	<0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN, TOTAL (UG/L)	DI-SYSTON, TOTAL (UG/L)	2,4-DP, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)
DEC 19...	<0.010	<0.010	<0.010	<0.01	<0.01	0.030	<0.01	<0.01	<0.01	<0.010
SEP 19...	<0.010	<0.010	<0.010	<0.01	0.01	0.020	<0.01	<0.01	0.02	<0.010

DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
DEC 19...	<0.010	<0.01	--	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
SEP 19...	<0.010	<0.01	<0.0	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE, TOTAL (UG/L)	PHORATE, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRI-THION, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)
DEC 19...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 19...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

GROUND-WATER RECORDS

217

HAWAII, ISLAND OF KAUAI--Continued

220018159444702. Local number 2-0044-13

LOCATION.--Lat 22°00'18", long 159°44'47", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 206 ft; casing diameter 12 in, cased to 165 ft.

DATUM.--Elevation of land surface datum is 8 ft. Measuring point: Top of standpipe 10.61 ft above mean sea level. From July 27, 1977 to Sept. 10, 1981, before standpipe was extended, measuring point elevation at top of standpipe was at 9.11 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements July 1977 to current year.

WATER QUALITY: Occasional measurements October 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 10.19 ft above mean sea level on Nov. 9, 1983. Lowest measured 8.33 ft above mean sea level on Mar. 29, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	8.97	FEB 5	9.66	APR 2	9.48	MAY 7	9.42	JUN 25	9.09	AUG 20	8.93
DEC 11	9.27										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
18...	1430	530	22.0	69	08...	0950	510	22.0	84
DEC					JUN				
13...	1400	510	22.0	98	26...	1300	520	22.0	90
FEB					AUG				
07...	1400	510	21.5	88	22...	1400	525	22.0	92
APR									
03...	1500	510	21.5	84					

HAWAII, ISLAND OF KAUAI--Continued

220019159444801. Local number 2-0044-14.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 12 in., cased to 164 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Top of standpipe, 11.49 ft above mean sea level. Prior to June 1979 nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements, 1937 to 1962 (measured by Kekaha Sugar Co.). Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, Dec. 20, 1937; lowest measured, 7.52 ft above mean sea level, Aug. 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.86	8.97	8.90	9.00	9.70	9.58	9.60	9.47	9.07	8.94	9.07	8.93
10	8.81	8.94	9.17	8.90	9.74	9.66	9.67	9.54	9.00	8.89	9.12	8.97
15	8.87	9.29	9.38	9.03	9.72	9.32	9.61	9.51	9.02	9.27	9.08	8.92
20	9.30	9.43	9.46	9.54	9.74	9.59	9.21	9.24	9.02	9.05	9.06	8.98
25	9.41	9.49	9.46	9.69	9.63	9.60	9.19	9.09	9.22	9.12	8.99	8.99
EQM	9.40	9.02	9.05	9.75	9.53	9.56	9.17	9.09	8.98	9.19	8.96	8.97
WTR YEAR	1990	MAX	9.94	JAN. 26	MIN	8.66	OCT. 14					

GROUND-WATER RECORDS

219

HAWAII, ISLAND OF KAUAI--Continued

220016159442701. Local number, 2-0044-15.

LOCATION.--Lat 22°00'16", long 159°44'27", Hydrologic Unit 20070000, 2.5 mi Northwest from Kekaha School and, 1.8 mi Northeast of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 63.1 ft, 12 ft concrete casing, cased to 63.1 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point is the south top of concrete ring at 57.84 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements 1973 to current year.

WATER QUALITY: Occasional measurements 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 11.73 ft above mean sea level on Jan. 24, 1978. Lowest water level measured 4.16 ft above mean sea level on May 10, 1977.

REMARKS.--Water used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	5.14	FEB 5	9.07	APR 2	9.01	MAY 7	8.79	JUL 2	6.06	AUG 20	5.64
DEC 11	8.26										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
16...	0945	5,000	23.0	1200	08...	0930	1,000	22.0	200
DEC					JUN				
11...	0915	1,880	22.0	270	25...	0850	1,990	22.0	530
FEB					AUG				
05...	0900	850	22.0	170	20...	0910	2,350	22.5	560
APR									
02...	0900	790	22.0	160					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, .3 mi southwest of Wailua County Golf Course and 1.6 mi south southwest of Wailua River Mouth. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 312 ft, casing diameter 6 in., cased to 60 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point is the top of 10 in. plastic pipe, 11.36 ft above mean sea level. Prior to June 24, 1980 measuring point was the top of 6 in. steel casing, 11.93 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements 1973 to 1980, 1987 to current year.

WATER QUALITY: Occasional measurements 1982 to 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 11.79 ft above mean sea level, Feb. 21, 1974. Lowest measured 8.08 ft above mean sea level Oct. 12, 1978.

REMARKS.--Well affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	10.76	FEB 1	10.88	MAR 21	11.23	MAY 7	10.58	JUN 28	11.22	AUG 23	10.86
DEC 7	10.76										

220148159453502. Local number, 2-0145-11.

LOCATION.--Lat 22°01'48", long 159°43'35", Hydrologic Unit 20070000, 1.0 mi Southeast from Mana Camp and 3.3 mi north of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 31.5 ft, probably obstructed; casing diameter 12 in, cased depth unknown.

DATUM.--Elevation of land-surface datum is 29 ft. Measuring point is the top of steel pipe 29.23 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 23.83 ft above mean sea level on Jan 23, 1989; Lowest water level measured 17.52 ft above mean sea level on Sept. 6, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	23.08	FEB 5	22.73	APR 2	22.82	MAY 7	22.98	JUN 25	23.13	AUG 20	23.39

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220354159205602. Local number, 2-0320-03.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 302 ft; casing diameter 14 in, cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top edge of steel pump base at breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements, Aug. 1976 to current year.

Water quality: Occasional measurements, 1972, 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level on Nov. 19, 1982. Lowest water level measured, 0.35 ft below mean sea level on Sept. 22, 1979.

REMARKS.--Water is used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	8.88	FEB 2	7.70	MAR 30	8.29	MAY 4	10.03	JUL 23	7.80
DEC 8	9.88							AUG 24	7.89

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
27...	0840	375	840.0	42	04...	0900	400	24.0	44
DEC					JUL				
08...	0920	395	25.0	44	23...	0810	375	24.5	45
FEB					AUG				
02...	0900	350	23.0	44	24...	0830	380	27.0	46
MAR									
30...	0900	375	23.5	42					

GROUND-WATER RECORDS

223

HAWAII, ISLAND OF KAUAI--Continued

220341159453901. Local number, 2-0345-04.

LOCATION.--Lat 22°03'41", long 159°43'39", Hydrologic Unit 20070000, 1.7 mi north northeast from Mana Camp and 1.7 mi east southeast from Nohili Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 66 ft, concrete casing, diameter 12 ft, cased to 66 ft.

DATUM.--Elevation of land-surface datum 57 ft. Measuring point is the top of concrete ring (south side) at 60.80 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft above mean sea level on Jan. 31, 1974. Lowest water level measured, 1.42 ft below mean sea level on Jan. 22, 1985.

REMARKS.--Water is used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	3.23	FEB 5	5.36	APR 2	4.34	MAY 7	4.70	JUN 25	3.03	AUG 20	2.45
DEC 11	3.75										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 16...	1020	875	22.0	160	MAY 08...	0900	800	22.0	160
DEC 11...	1000	660	21.5	120	JUN 25...	0915	1,290	22.0	320
FEB 05...	0940	595	22.0	100	AUG 20...	0950	1,840	22.0	240
APR 02...	0940	710	22.0	140					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220827159185401. Local number, 2-0818-01.

LOCATION.--Lat 22°08'27", long 159°18'54", Hydrologic Unit 20070000, 1.3 mi southwest from Kahala Point and .2 mi south from Anahola School. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table; depth 433 ft; casing diameter 10 in, cased to 295 ft.

DATUM.--Elevation of land-surface datum 270 ft. Measuring point is the top of hole on pump base at 272.80 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1973 to current year.

Water quality: Occasional measurements 1972-89.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 13.14 ft above mean sea level on Feb. 17, 1983.

Lowest water level measured 0.34 ft below mean sea level on Aug. 16, 1978.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	12.93	DEC 8	13.02	FEB 2	12.96	MAR 30	12.37	MAY 4	12.41

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit, 2.6 mi south of Kulikoa Point and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 700 ft.

DATUM.--Elevation of land-surface datum 358 ft. Measuring point is the top of airvent pipe after removing 2 in. elbow on the southwest side of base, elevation 359.04 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level on Mar. 30, 1990.
Lowest water level measured, 42.69 ft above mean sea level on Oct. 4, 1973.

REMARKS.--Water is used for public supply and truck farming irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL								
OCT 25	141.38	DEC 18	140.79	MAR 30	144.56	MAY 23	141.97	JUL 3	144.15	SEP 4	143.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 25...	1700	203	24.0	15	MAY 18...	1030	205	22.5	18
DEC 18...	1630	205	22.0	18	JUN 29...	1030	205	22.0	21
FEB 20...	1550	205	21.5	21	AUG 24...	1330	205	22.0	20
MAR 30...	1415	205	23.0	20					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

221141159252501. Local number, 2-1125-01.

LOCATION.--Lat 22°11'41", long 159°25'25", Hydrologic Unit 20070000, 2.3 mi south of Kapukaamoi Point and 1.4 mi west northwest of Puu Ka Ele Reservoir. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 790 ft; casing diameter 12 in, cased to 390 ft.

DATUM.--Elevation of land-surface datum is 390 ft. Measuring point is the top of hole on pump base after removing nipple and elbow, 391.37 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1973 to 1988.

Water quality: Occasional measurements 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.37 ft above mean sea level on Jan 9, 1980.

Lowest water level measured, 8.77 ft above mean sea level on Mar 11, 1986.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
FEB 02...	1130	175	24.0	17

HAWAII, ISLAND OF KAUAI--Continued

221141159252502. Local number, 2-1125-02

LOCATION.--LAT 22°11'41", long 159°25'25", Hydrologic unit 20070000, 2.3 mi south of Kapukaamoi Point and 1.4 mi west northwest of Puu Ka Ele Reservoir. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 840 ft; casing diameter 12 in, cased to 510 ft.

DATUM.--Elevation of land-surface datum is 388 ft. Measuring point is the top of hole south side of pump base after removing nipple and elbow, 390.38 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1976 to 1983, 1988-1989.

Water quality: Occasional measurements 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.40 ft above mean sea level on Jan. 9, 1980.

Lowest water level measured, 8.63 ft above mean sea level on Mar. 2, 1977.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 27...	1100	155	26.0	13	MAY 04...	1045	150	24.0	13
DEC 08...	1100	155	26.0	12	JUN 29...	0905	155	24.0	16
MAR 30...	1045	152	22.0	13	AUG 24...	1000	170	24.5	15

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

221150159264501. Local number, 2-1126-01.

LOCATION.--Lat 22°11'50", long 159°26'45", Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 763 ft; casing diameter 14 in, cased to 435 ft.

DATUM.--Elevation of land-surface datum 348 ft. Measuring point is the top of pump opening .40 ft above 1 in. hole on southside of pump base, 349.31 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level on June 3, 1974.

Lowest water level measured, 9.24 ft below mean sea level on Aug. 10, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	5.63	DEC 19	5.74	FEB 16	6.34	APR 4	6.86	JUL 17	5.86	AUG 17	5.22

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 25...	0840	195	24.5	21	MAY 18...	0910	200	22.5	17
FEB 13...	0720	200	22.0	24	AUG 20...	0730	208	23.0	22

HAWAII, ISLAND OF KAUAI--Continued

221247159324801. Local number, 2-1232-01.

LOCATION.--Lat 22°12'47", long 159°32'48", Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point and 1.5 mi southeast of Haena Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 188 ft; casing diameter 6 in, cased to 140 ft.

DATUM.--Elevation of land-surface datum is 65 ft. Measuring point is the top of 1 in. pipe .06 ft above flange, 66.56 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level on June 3, 1974.
Lowest water level measured, 10.04 ft below mean sea level on June 9, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	8.24	DEC 8	8.00	MAY 4	9.70	JUL 23	7.42	AUG 24	7.31

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 27...	1140	140	25.0	20	MAY 04...	1300	130	25.5	20
DEC 08...	1210	140	24.0	19	JUL 23...	1130	135	26.0	21
FEB 02...	1245	135	22.5	20	AUG 24...	1150	140	27.5	20
MAR 30...	1220	130	24.0	19					

HAWAII, ISLAND OF KAUAI--Continued

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, .6 mi south southwest of Haena Point and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 159 ft; casing diameter 8 in, cased to 104 ft.

DATUM.--Elevation of land-surface datum 83 ft. Measuring point is the top of unthreaded hole after removing 1 in pipe, .22 ft above hole on pump base, 82.45 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level on Dec. 8, 1989.
Lowest water level measured 4.37 ft below mean sea level on Jan. 13, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL		
DEC 8	11.35	FEB 2	8.28	MAR 30	5.79	MAY 4	9.35	JUL 23	9.96	AUG 31	9.95

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
27...	1230	215	22.0	20	04...	1210	195	23.0	18
DEC					JUL				
08...	1230	175	22.0	19	23...	1050	160	25.5	20
FEB					AUG				
02...	1330	205	22.0	22	24...	1130	160	25.0	20
MAR									
30...	1200	205	21.5	20					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 22°54'54", long 159°27'42", Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 456 ft; casing diameter 12 in, cased to 263 ft.

DATUM.--Elevation of land surface datum is 245 ft. Measuring point is the top of 1/2 in. pipe on pump base 246.07 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level on July 15, 1974. Lowest water level measured, 22.07 ft above mean sea level on Mar. 3, 1983.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 29	34.66	MAY 3	34.97	JUL 17	31.97	AUG 23	32.89

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
FEB 01...	0800	225	23.0	23	MAY 03...	0800	225	22.5	24
MAR 29...	0845	230	22.5	24	JUN 28...	0800	235	23.0	26

HAWAII, ISLAND OF KAUAI--Continued

215536159263501. Local number, 2-5526-01.

LOCATION.--Lat 21°55'36", long 159°26'35", Hydrologic Unit 20070000, 3.7 mi north of Makahuena Point and 2.5 mi southeast of Knudsen Gap. Owner: McBryde Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 1010 ft; casing diameter 20 in, cased to 400 ft.

DATUM.--Elevation of land-surface is 355 ft. Measuring point is the top of 1 in. hole on top of pipe flange, southeast side, 355.28 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1977 to current year.

Water quality: Occasional measurements 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.07 ft above mean sea level on Jun. 28, 1990.
Lowest water level measured, 22.67 ft below mean sea level on July 27, 1978.

REMARKS.--Water used for sugar cane irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	100.60	DEC 7	102.21	FEB 1	103.62	MAR 29	105.05	MAY 3	106.09	JUN 28	108.07

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
AUG 23..	0840	225	23.0	22

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

215522159342601. Local number, 2-5534-03.

LOCATION.--Lat 21°55'22", long 159°34'26", Hydrologic Unit 20070000, 1.9 mi north from Weli Point and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 108 ft; casing diameter 9 in, cased to 108 ft.

DATUM.--Elevation of land surface datum 78 ft. Measuring point is the top of pump base east side, 78.97 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level on Feb. 1, 1990.
Lowest water level measured, 9.19 ft above mean sea level on Oct. 13, 1978.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	17.60	FEB 1	22.91	MAR 29	19.49	MAY 3	18.49	JUN 28	17.59	AUG 23	15.87
DEC 7	18.84										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 04...	1020	255	27.5	26	MAY 03...	1330	265	26.0	29
DEC 07...	1000	255	26.0	26	JUN 28...	0930	270	26.0	32
FEB 01...	1000	265	24.0	30	AUG 23...	0930	275	27.0	32
MAR 29...	1000	265	25.0	30					

GROUND-WATER RECORDS

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HAWAII, ISLAND OF KAUAI--Continued

215607159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56'07", long 159°34'43", Hydrologic Unit 20070000, 2.7 mi north of Weli Point and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 508 ft, casing diameter 8 in., cased to 507 ft.

DATUM.--Elevation of land-surface datum is 439 ft. Measuring point: Top of casing 440.62 ft above mean sea level.

PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.51 ft above mean sea level Feb. 20, 1990; lowest 15.87 ft above mean sea level Nov. 1, 1989

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.11	17.20	e17.10	e17.18	e17.40	17.38	17.35	17.15	16.93	16.78	16.84	16.69
10	17.12	17.19	e17.10	e17.20	e17.40	17.38	17.40	17.10	16.92	16.81	16.81	16.73
15	17.22	e17.14	e17.10	e17.25	e17.42	17.41	17.41	17.02	16.88	16.86	e16.75	16.66
20	17.16	e17.14	e17.10	e17.30	e17.45	17.42	17.30	16.97	16.89	16.90	e16.75	16.73
25	17.19	e17.15	17.07	e17.34	17.44	17.41	17.31	16.93	16.90	16.97	e16.73	16.77
EOM	17.21	e17.15	e17.15	e17.40	17.40	17.35	17.26	16.91	16.81	16.84	16.72	16.73
WTR YEAR	1990	MAX	17.51	FEB. 20	MIN	16.62	SEP. 4,	13-15				

215803159401201. Local number, 2-5840-01.

LOCATION.--Lat 21°58'03", long 159°40'12", Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal-table well; depth 190 ft; casing diameter 8 in, cased to 167 ft.

DATUM.--Elevation of land surface is 167 ft. Measuring point is the top of 1/2 in. hole above pump base, 168.08 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1973 to current year.

Water quality: Occasional measurements 1972-89.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level on Jan. 26, 1989. Lowest water level measured, 5.26 ft above mean sea level on July 24, 1985.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	9.04	FEB 1	9.26	MAR 29	7.04	MAY 3	7.96	JUL 19	6.58	SEP 4	7.00
DEC 7	8.82										

e Estimated

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

215843159422901. Local number, 2-5842-03.

LOCATION.--Lat 21°58'43", long 159°42'28", Hydrologic Unit 20070000, 1.0 mi north of Oomano Point and 3.5 mi east of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 27 ft; diameter 15 ft; uncased.

DATUM.--Elevation of land surface is 46 ft. Measuring point is the top of H-Beam on east side of pump base, 22.96 ft above mean sea level. Obtained nearby elevation from Kekaha Sugar Co. Levels run to measuring point on June 15, 1972.

PERIOD OF RECORD.--

Water level: Recording station 1973-79. Occasional measurements 1979 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.45 ft above mean sea level on Jan 16, 1974.

Lowest water level measured, 2.58 ft below mean sea level on July 11, 1977.

REMARKS.--Water used for irrigation and for cleaning sugar cane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL
FEB 5	6.18

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
16...	1400	1,100	24.5	170	08...	1100	930	24.5	180
DEC					JUN				
11...	1340	1,050	24.0	220	25...	1310	1,100	24.5	260
FEB					AUG				
05...	1320	675	24.0	120	20...	1250	975	24.5	210
APR									
02...	1330	1,050	24.0	220					

HAWAII, ISLAND OF KAUAI--Continued

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59'58", long 159°21'43", Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 540 ft, casing diameter 14 in., cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point: Top of tee flange, elevation 303.77 ft, above mean sea level.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.69 ft Nov. 26, 1985. Lowest measured, 13.39 ft Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	e14.94	e14.97	e14.87	14.63	14.48	14.56	14.79	14.94	14.92	14.89	14.76	14.75
10	e14.95	e14.97	e14.82	14.57	14.60	14.60	14.85	14.94	14.87	14.88	14.82	14.76
15	e15.00	e14.95	e14.78	14.58	14.43	14.61	14.88	14.92	14.81	14.87	14.82	14.69
20	e14.95	e14.92	14.71	14.63	14.52	14.68	14.88	14.94	14.81	14.83	14.84	14.74
25	e14.97	e14.91	14.67	14.52	14.56	14.72	14.93	14.95	14.85	14.82	14.79	14.72
EOM	e15.00	e14.90	14.64	14.48	14.48	14.78	14.90	14.97	14.85	14.76	14.81	14.70
WTR YEAR 1990		MAX	15.03	MAY 07	MIN	14.40	Feb 16					

e Estimated.

GROUND-WATER RECORDS

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HAWAII, ISLAND OF KAUAI--Continued

215901159235301. Local number, 2-5923-01.

LOCATION.--Lat 21°59'01", long 159°23'53", Hydrologic Unit 20070000, 4.2 mi northwest of Ninini Point and 3.4 mi West from Lihue Airport terminal. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 920 ft; casing diameter 14 in, cased to 341 ft.

DATUM.--Elevation of land surface is 371 ft. Measuring point is the top of 1 in. hole northside of pump base after removing elbowed pipe. Elevation of measuring point is at 372.42 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1974 to 1988.

Water quality: Occasional measurements 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 50.42 ft above mean sea level on Sept. 12, 1983. Lowest water level measured, 29.24 ft above mean sea level on Mar. 15, 1978.

REMARKS.--Water used for public supply.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					APR				
06...	0805	258	25.5	18	04...	0820	265	23.5	18
DEC					JUN				
08...	0815	255	22.0	18	29...	0730	260	25.5	20
FEB					AUG				
02...	0820	200	21.5	22	24...	0745	215	24.5	24
MAR									
30...	0820	200	21.0	17					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

215901159235201. Local number, 2-5923-07.

LOCATION.--Lat 21°59'01", long 159°23'52", Hydrologic Unit 20070000, 4.2 mi northwest of Ninini Point and 3.4 mi west from Lihue Airport terminal. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water-table well; depth 200 ft, casing diameter 12 in, cased to 200 ft.

DATUM.--Elevation of land surface is 364 ft. Measuring point is the top of pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1985 to current year.

Water quality: Occasional measurements 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 226.86 ft above mean sea level on Dec. 08, 1989.

Lowest water level measured, 216.50 ft above mean sea level on Aug. 31, 1990.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	225.92	FEB 2	225.53	MAR 30	224.36	MAY 4	224.72	JUL 23	219.00	AUG 31	216.50
DEC 8	226.86										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
06...	0800	210	23.5	20	04...	0800	200	21.5	20
DEC					JUN				
08...	0800	200	20.5	20	29...	0710	215	23.0	20
FEB					AUG				
02...	0800	195	21.0	21	24...	0730	205	25.0	22
MAR									
30...	0800	200	20.0	17					

GROUND-WATER RECORDS

241

HAWAII, ISLAND OF KAUAI--Continued

215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59'06", long 159°39'56", Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea
Recreational Pier State Park and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 40 ft, 6.5 ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point is the top west side of concrete base 41.61 ft
above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIODS OF RECORD.--Highest water level measured, 10.43 ft above mean sea level on Jan. 14, 1988.
Lowest water level measured 6.05 ft below mean sea level on Sept. 8, 1980.

REMARKS.--Water is used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	9.00	DEC 7	9.12	FEB 1	9.25	MAR 29	9.32	MAY 3	9.01	SEP 4	8.96

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
04...	1205	580	26.0	110	03...	1130	580	23.5	110
DEC					JUN				
07...	1130	660	23.5	140	28...	1130	710	24.0	160
FEB					AUG				
01...	1130	550	24.0	100	23...	1100	795	24.0	180
MAR									
29...	1215	575	23.5	110					

GROUND-WATER RECORDS

HAWAII, ISLAND OF KAUAI--Continued

215937159434201. Local number, 2-5943-01.

LOCATION.--Lat 21°59'37", long 159°43'42", Hydrologic Unit 20070000, 2.2 mi northeast of Kokole Point andd 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well. Well is a 45 degree inclined Maui type shaft from 59 ft to 16 ft elevation and a vertical pump 10 ft in diameter and 15 ft deep with a lateral tunnel extending into the hillside at the bottom of the shaft.

DATUM.--Elevation of land surface is 60 ft. Measuring point is the top of 2 in galvanized pipe plug on the pump platform, 16.19 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.62 ft above mean sea level on Oct. 16, 1989. Lowest water level measured, .07 ft above mean sea level on Sept 17, 1979.

REMARKS.--Water used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	10.62	FEB 5	9.85	APR 2	9.28	MAY 7	9.18	JUL 2	8.77	AUG 20	8.74
DEC 11	9.15										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 16...	0900	860	24.5	150	MAY 08...	1000	880	24.5	120
DEC 11...	0830	825	24.0	160	JUN 25...	0830	860	24.0	160
FEB 05...	0840	810	24.0	160	AUG 20...	0840	1,020	24.0	160
APR 02...	0840	800	24.0	140					

GROUND-WATER RECORDS

243

HAWAII, ISLAND OF OAHU

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19'06", long 157°59'46", Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: Hawaii Institute of Geophysics.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-in. PVC casing, 6.40 ft above mean sea level.

REMARKS.--Geophysical log and water-quality records are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, December 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.38 ft above mean sea level, Jan. 17, 1969; lowest, 2.81 ft below mean sea level, Aug. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	2.62	3.00	2.91	3.22	3.48	3.46	2.90	2.43	1.87	1.55	1.15	.90
10	2.93	3.24	3.01	3.01	3.44	3.32	2.96	2.39	1.77	1.46	1.14	.86
15	3.20	3.06	2.87	3.13	3.26	3.18	2.89	2.25	1.69	1.40	1.06	.78
20	3.28	3.12	2.91	3.50	3.23	3.14	2.68	2.19	1.67	1.32	1.09	.83
25	3.32	2.99	3.10	3.62	3.27	3.02	2.62	2.07	1.66	1.25	.88	.67
EOM	3.08	2.88	3.11	3.66	3.41	2.91	2.48	2.01	1.56	1.22	.83	.68
WTR YEAR 1990		MAX 3.86	JAN 25		MIN 0.53	SEPT 29						

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of Ewa Hospital. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well was modified in January 1958 and May 1982.

DATUM.--Elevation of land-surface datum is 15 ft. Measuring point: Top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1978-81, are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.2 ft, above mean sea level (below petcock then in use), Sept. 2, and Oct. 19, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	20.29	DEC 20	19.03	MAR 5	20.54	JUN 19	16.77	SEP 12	15.17
DEC 11	19.47	FEB 8	20.45	APR 9	19.36	AUG 9	15.97	SEP 24	15.37

HAWAII, ISLAND OF OAHU--Continued

212123157535501. Local number, 3-2153-05.

LOCATION.--Lat 21°21'23", long 157°53'55", Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 6-in. PVC casing, cased to 24 ft, perforated from 24 to 1,246 ft. Well was modified and deepened August 1980.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in. PVC casing, 37.90 ft, revised, above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, March 1981 to current year.

WATER QUALITY: 1985 to December 1986.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level Jan. 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	20.06	e20.55	e20.55	20.45	20.74	20.74	20.31	19.76	19.28	19.05	18.62	18.32
10	e20.20	e20.60	e20.50	20.40	20.56	20.72	20.33	19.72	19.25	19.00	18.48	18.44
15	e20.40	e20.60	20.45	20.50	20.62	20.59	20.21	19.60	19.02	18.86	18.46	18.30
20	e20.50	e20.65	20.38	20.63	20.65	20.56	20.05	19.58	19.22	18.68	18.44	18.44
25	e20.60	e20.65	20.55	20.72	20.64	20.42	19.95	19.49	19.25	18.67	18.28	18.49
EOM	e20.60	e20.55	20.44	20.79	20.67	20.34	19.87	19.34	19.10	18.66	18.27	18.51
WTR YEAR 1990		MAX 20.90	JAN 27, 29		MIN 18.11	SEP 4						

212238157561101. Local number, 3-2256-10.

LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 173 ft, casing diameter 12 in., cased to 143 ft.

DATUM.--Elevation of land-surface datum is 10 ft. Measuring point: Top of 10-inch stilling pipe for water-level recorder, 26.15 ft above mean sea level.

REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.

PERIOD OF RECORD.-- Occasional measurements, January 1928 to February 1931, September 1934 to August 1966. Water-level recorder, September 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, Jan. 16, 1928; lowest, 12.97 ft above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.28	17.93	17.82	18.00	18.28	18.21	17.59	17.08	16.45	16.16	15.66	15.38
10	17.61	17.99	17.92	17.86	18.25	18.18	17.65	17.98	16.37	16.05	15.56	15.38
15	17.87	17.95	17.73	17.86	18.09	17.99	17.64	16.82	16.22	15.96	15.46	15.33
20	17.90	18.05	17.75	18.13	18.08	17.94	17.36	16.86	16.30	15.82	15.45	15.32
25	18.04	17.98	17.89	18.22	18.07	17.87	17.24	16.68	16.26	15.74	15.36	15.33
EOM	18.03	17.84	17.90	18.29	18.10	17.72	17.16	16.62	16.19	15.73	15.26	15.37
WTR YEAR 1990		MAX 18.35	FEB 4		MIN 15.19	AUG 29,30						

e Estimated

GROUND-WATER RECORDS

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HAWAII, ISLAND OF OAHU--Continued

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23'40", long 158°00'19", Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1,400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal-water table well, depth 1,090 ft, casing diameter 12 in., cased to 38 ft. Well was deepened May 1980 and modified February 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of casing, 27.73 ft above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, November 1982 to July 1983, March 1984 to November 30, 1987. Occasional measurements, October 1987 to current year.

WATER QUALITY: 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985-86.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 22.40 ft above mean sea level, Jan. 4, 1983; lowest 14.01 ft above mean sea level, Sept. 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	19.98	MAR 5	20.77	APR 9	20.05	JUN 20	18.01	AUG 14	17.06	SEP 12	16.47
FEB 20	20.40										

212659158004102. Local number, 3-2600-04.

LOCATION.--Lat 21°26'59", long 158°00'41", Hydrologic Unit 20060000, 30 ft south of Waiahole ditch, and 1.1 mi. east southeast of Kipapa School in Mililani. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 815 ft, casing diameter 16 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum is 665 ft. Measuring point: Top of 16-inch casing, 666.62 ft. revised, above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, October 1983 to September 10, 1987. Occasional measurements, October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.69 ft above mean sea level, Mar. 5, 1990; lowest 16.74 ft above mean sea level, Sept.14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 5	24.69	JUL 5	22.70	SEP 12	20.65

GROUND-WATER RECORDS

HAWAII, ISLAND OF OAHU-Continued

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, across the main gate of Wheeler AFB, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point: Top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--Water-level recorder is located on the pump chamber floor at the bottom of shaft. Water from this well is used for public supply.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, November 1938 to current year.

WATER QUALITY: 1966-72, 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft above mean sea level, May 12, 1969; lowest, 269.52 ft above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	280.68	280.63	280.47	279.94	279.78	279.60	279.36	279.74	279.50	279.78	279.84	279.98
10	280.67	280.69	280.41	279.93	279.49	279.58	279.68	279.56	279.42	279.18	279.89	279.46
15	280.68	280.73	280.39	280.02	279.69	279.70	279.63	279.87	279.40	279.46	279.40	279.39
20	280.68	280.66	280.31	279.96	279.75	279.70	279.78	279.94	279.83	279.58	279.47	279.33
25	280.67	280.59	280.20	280.01	279.70	279.65	279.85	279.82	279.95	279.89	279.59	278.97
EOM	280.67	280.54	279.98	279.84	279.70	279.66	279.79	279.94	279.94	279.54	279.04	279.22

* Taken from operator's log book at Schofield shaft. Operators read staff gauge twice a day at about 0800 hours and 1640 hours. No record on these days, recorder malfunctioned.
Note: well being pumped throughout the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
DEC					JUL				
27...	0950	168	22.0	--	02...	1045	172	22.0	18
MAY					AUG				
04...	1105	175	21.5	18	31...	1220	175	22.0	18

GROUND-WATER RECORDS

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HAWAII, ISLAND OF OAHU--Continued

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 southwest of Kamehameha Highway, Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 441 ft, casing diameter 10 in., cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, April 1935 to current year.

WATER QUALITY: 1935 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Mar. 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 8	15.47	APR 2	16.69	AUG 23	15.28

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
FEB					AUG				
08...	1410	270	23.5	35	23...	0750	260	22.5	33
APR									
02...	0950	280	22.0	32					

GROUND-WATER RECORDS

HAWAII, ISLAND OF OAHU--Continued

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 447 ft, casing diameter 1 inch, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 12-inch stilling well, 20.53 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, January 1963 to February 1972. Occasional measurements, January 1929 to December 1962, March 1972 to current year.

WATER QUALITY: 1929 to 1985, 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 19.98 ft above mean sea level, Jan. 5, 1969; lowest 16.08 ft above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	16.11	JUN 28	18.79	AUG 27	19.22

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 23...	1045	710	22.0	--	AUG 27...	1120	700	22.0	--
JUN 28...	1100	740	22.0	--					

GROUND-WATER RECORDS

249

HAWAII, ISLAND OF OAHU--Continued

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of UH agriculture experiment Station in Waialeale, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, casing diameter 8 in., cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point: Top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 23	16.48	APR 2	14.31	AUG 9	14.64

GROUND-WATER RECORDS

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 22 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point: Top of 2 x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

REMARKS.-- Water-quality records for 1970-1973 are available in files of district office.

PERIOD OF RECORD.-- Water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	4.49	DEC 7	4.33	JAN 22	5.27	MAR 19	4.66	APR 23	4.22	JUL 16	4.22

HAWAII, ISLAND OF MOLOKAI--Continued

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point: Top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, 1938-39, 1941-63, November 1972 to current year.

WATER QUALITY: 1948, 1952-56, 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, Jan. 19, 1950; lowest measured, 2.09 ft above mean sea level, Sept. 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.62	DEC 7	3.47	JAN 22	3.70	MAR 19	3.68	APR 23	3.36	JUL 16	3.36

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)
OCT 26...	1240	300	21.0	MAR 19...	1100	300	21.0
DEC 07...	1525	300	21.0	APR 23...	1530	300	20.5
JAN 22...	1350	300	20.5	JUL 16...	1420	320	21.0

GROUND-WATER RECORDS

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point: Top of steel plate, 37.37 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.

WATER QUALITY: 1948, 1954-56, 1960, 1962, 1971, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.66 ft above mean sea level, Dec. 5, 1950; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	2.02	DEC 8	1.96	JAN 22	2.15	MAR 19	1.99	APR 26	1.84	JUL 16	1.92

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)
OCT 27...	0750	290	23.0	MAR 19...	1230	240	23.5
DEC 08...	0900	330	22.5	APR 26...	1150	290	23.5
JAN 22...	1530	270	22.5	JUL 16...	1535	270	23.0

GROUND-WATER RECORDS

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HAWAII, ISLAND OF MOLOKAI--Continued

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalaniana'ole Colony. Owner: Molokai Ranch.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, casing diameter 12 in., cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point: Top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, May 1954 to current year.

WATER QUALITY: 1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, Jan. 20, 1969; lowest measured, 1.60 ft above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	2.85	DEC 8	2.80	JAN 26	2.96	MAR 19	2.73	APR 26	2.63	JUL 19	2.70

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE-CIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
OCT 27...	0840	340	24.5	26	MAR 19...	1440	160	23.5	10
DEC 08...	0930	340	24.0	32	APR 26...	1315	270	24.0	18
JAN 26...	0925	180	23.0	13	JUL 19...	1650	300	24.0	23

GROUND-WATER RECORDS

HAWAII, ISLAND OF MOLOKAI--Continued

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", long 157°00'05", Hydrologic Unit 20050000, 2.3 mi northeast of Kaunakakai, and 2.4 mi north of Kamiloloa. Owner: Kaluakoi Corporation.

AQUIFER.--East Molokai Volcanic Series.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,080 ft, casing diameter 20 in., cased to 956 ft, perforated from 956 to 1056 ft.

DATUM.--Measuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 975.25 ft below land-surface datum, Apr. 27, 1988; lowest measured, 976.23 ft below land-surface datum, Sept. 10, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	975.35	JAN 26	975.44	APR 26	975.39	JUL 20	975.51

GROUND-WATER RECORDS

255

HAWAII, ISLAND OF MAUI

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39'08", long 156°04'12", Hydrologic Unit 20020000, 1,300 ft northwest of Kakanoni Point, and 0.7 mi west of Kipahulu School. Owner: Cordelia May.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 in.

DATUM.--Elevation of land-surface datum is 133 ft. Measuring point: Top of 1-in. pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, Jun. 29, 1988; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	2.07	JAN 9	1.89	APR 5	1.38	MAY 17	1.39	JUN 20	1.27	AUG 15	1.96
NOV 21	2.36	FEB 21	1.46								

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, casing diameter 8 in., cased to 343 ft. perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 352 ft. Measuring point: Top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, Aug. 24, 1964; lowest measured, 0.43 ft below mean sea level, April 16, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL						
OCT 23	-0.13	JAN 17	-0.07	APR 16	-0.43	JUL 18	-0.20

GROUND-WATER RECORDS

HAWAII, ISLAND OF MAUI--Continued

205405156305401. Local number, 6-5430-05.

LOCATION.--Lat 20°45'59", long 156°30'56", Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, casing diameter 10 in., cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-in. casing, 380.84 ft. revised, above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, August 1983 to May 1986. Water-level recorder, June 1986 to current year.

WATER QUALITY: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, Dec. 14, 1989; lowest measured, 13.04 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.45	17.93	18.01	17.84	17.62	17.30	e16.68	e15.92	15.19	14.46	14.02	14.05
10	17.70	17.85	18.02	17.74	17.43	e17.10	e16.63	e15.77	15.07	14.32	14.00	14.09
15	17.87	17.95	18.06	17.68	17.33	e16.95	e16.50	e15.65	14.89	14.21	13.95	14.07
20	17.85	18.08	17.93	17.84	17.20	e16.90	16.35	e15.27	14.81	14.10	13.91	14.11
25	17.95	17.90	18.01	17.95	17.16	e16.90	e16.15	e15.18	14.76	14.14	13.84	14.10
EOM	17.98	17.94	17.83	17.78	17.26	e16.75	e16.06	15.23	14.61	14.01	13.95	14.24

WTR YEAR 1990 MAX 18.20 DEC 14 MIN 13.78 AUG 24-25

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
MAR					JUN				
07...	j1045	200	219	12	06...	j1220	750	5010	1500
07...	j1105	400	462	120	06...	j1300	800	41700	16000
07...	j1135	500	473	130	06...	j1340	825	47200	18000
07...	j1200	600	676	160	06...	j1415	850	49500	19000
07...	j1230	675	1830	510	06...	j1450	900	51100	19000
07...	j1305	750	4410	1300	06...	j1515	1000	52400	20000
07...	j1335	800	39800	14000	SEP				
07...	j1400	825	45900	17000	26...	j1000	200	200	13
07...	j1425	850	48800	18000	26...	j1020	400	514	130
07...	j1455	900	50200	19000	26...	j1045	500	548	140
07...	j1525	1000	51700	19000	26...	j1115	600	710	200
JUN					26...	j1140	675	1900	540
06...	j1000	200	203	12	26...	j1215	750	5490	1600
06...	j1025	400	511	140	26...	j1245	800	41900	16000
06...	j1050	500	500	140	26...	j1310	825	48100	18000
06...	j1115	600	204	14	26...	j1340	850	50300	18000
06...	j1145	675	1010	280	26...	j1445	900	51000	19000
					26...	j1510	1000	52000	20000

e Estimated

j Collected by non-USGS agency.

HAWAII, ISLAND OF MAUI--Continued

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56'51", long 156°31'32", Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, casing diameter 16 in., cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point: Top of 16-in. casing, 284.78 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, April 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.05 ft above mean sea level, Oct. 22, 1989 and Nov. 2, 10-11, 1989; lowest measured, 10.00 ft above mean sea level, Aug. 5, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.86	11.97	11.86	11.61	11.44	11.21	11.12	10.88	e10.57	10.32	10.06	e10.12
10	11.86	11.99	11.85	11.55	11.37	11.30	11.13	10.84	e10.54	10.26	10.13	e10.14
15	11.96	11.98	11.82	11.55	11.27	11.25	11.06	10.78	e10.48	10.23	10.12	e10.16
20	11.98	11.95	11.76	11.61	11.20	11.23	11.00	10.68	10.47	10.20	10.10	e10.10
25	11.99	11.91	11.72	11.61	11.19	11.17	11.01	e10.63	10.41	10.15	10.03	10.11
ECM	11.98	11.86	11.66	11.55	11.16	11.13	10.94	e10.58	10.37	10.11	e10.08	10.10
WTR YEAR 1990	MAX 12.05		OCT 22, NOV 2, 10-11		MIN 10.00		AUG 5					

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 east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, casing diameter 8 in., cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point: Top of 9-in. casing, 257.34 ft above mean sea level.

REMARKS.--Water-quality records for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water-level recorder, August 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, Sept. 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.19	3.18	3.17	3.01	2.88	2.93	2.86	2.82	2.95	2.89	2.91	3.07
10	3.17	3.24	3.17	2.95	2.84	3.00	2.96	2.85	2.94	2.88	3.12	3.17
15	3.26	3.26	3.12	2.99	2.81	2.92	2.88	2.80	2.95	2.98	3.09	3.11
20	3.18	3.21	3.09	3.19	2.79	2.92	2.84	2.86	3.01	2.99	3.08	3.18
25	3.21	3.19	3.05	3.19	2.85	2.87	2.99	2.84	2.90	2.93	3.06	3.20
EOM	3.20	3.15	2.99	3.03	2.87	2.82	2.91	2.88	2.88	2.96	3.06	3.19
WTR YEAR 1990	MAX 3.39		OCT 16-18, NOV 14,15		MIN 2.60		FEB 7					

e Estimated

GROUND-WATER RECORDS

263

HAWAII, ISLAND OF HAWAII

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14 in., cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 1-in. hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.39 ft above mean sea level, Oct. 19, 1978; lowest measured, 0.21 ft below mean sea level, June 19, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	1.07	FEB 14	1.19	MAR 12	0.74	MAY 2	1.12	JUL 11	0.46	AUG 23	0.93

GROUND-WATER RECORDS

HAWAII, ISLAND OF HAWAII--Continued

192728154530101. Local number, 8-2783-01.

LOCATION.--Lat 19°27'28", long 154°53'01", Hydrologic Unit 20010000, 0.8 mi southeast of Pawai crater in Keahialaka, and 1.9 mi north of Opihikao road junction, south Pahoā. Owner: State of Hawaii.

AQUIFER.--Hilina Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 319 ft, casing diameter 8 in., cased to 279 ft, perforated from 279 to 319 ft.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point: Top of casing, 273.00 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1972 to current year.

WATER QUALITY: 1962, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.90 ft above mean sea level, Jan. 29, 1990; lowest measured, 0.97 ft above mean sea level, July 26, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL						
DEC 11	2.80	JAN 29	2.90	MAR 13	2.56	MAY 10	1.83	JUL 9	1.90	AUG 24	2.69

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
DEC					JUL				
11...	1040	15,000	55.0	5500	09...	1000	17,200	--	5700
MAR					AUG				
13...	1010	8,300	55.0	2200	24...	1030	17,800	--	5800
MAY									
10...	1250	14,800	--	4800					

HAWAII, ISLAND OF HAWAII--Continued

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi 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, depth 46 ft, casing diameter 66 in., with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-in. hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1972 to current year.

WATER QUALITY: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.77 ft above mean sea level, Mar. 2, 1989; lowest measured, 1.18 ft above mean sea level, June 3, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

	DATE	WATER LEVEL		DATE	WATER LEVEL
	JUL 9	3.87		AUG 24	4.04

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
DEC					MAR				
11...	0950	1,200	25.0	200	13...	1105	970	25.0	120
JAN					MAY				
29...	1150	930	25.0	110	10...	1155	1,160	25.5	150

GROUND-WATER RECORDS

HAWAII, ISLAND OF HAWAII--Continued

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoia airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8 in., cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.37 ft above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft above mean sea level, Apr. 25, 1978, Mar. 10, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL						
DEC 11	18.86	MAR 13	21.01	MAR 28	20.80	MAY 11	19.18	JUL 9	17.50	AUG 24	18.05
JAN 30	19.64										

194222155035101. Local number, 8-4203-04.

LOCATION.--Lat 19°42'22", long 155°03'51", Hydrologic Unit 20010000, 0.5 mi east of Hawaii Technical School, and 1.0 mi south of Hilo airport terminal. Owner: Hawaii Electric Light Company.

AQUIFER.--Kahuku Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 201 ft, casing diameter 16 in., cased to 63 ft.

DATUM.--Elevation of land-surface datum is 47 ft. Measuring point: Top of 3-in. nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.67 ft above mean sea level, Mar. 11, 1979; lowest measured, 5.80 ft above mean sea level, Mar. 12, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL								
DEC 11	6.72	JAN 30	7.46	MAR 12	7.86	MAY 17	6.42	JUL 10	6.27	SEP 7	6.97

HAWAII, ISLAND OF HAWAII--Continued

195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 268 ft, casing diameter 10 in., cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, April 1970, March 1973 to current year.

WATER QUALITY: 1970, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.50 ft above mean sea level, Sept. 26, 1984; lowest measured, 1.40 ft, above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL		
OCT 4	4.28	DEC 14	4.24	JAN 31	4.18	APR 5	4.14	MAY 18	3.90	JUL 12	3.93

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					MAY				
04...	1250	1,650	26.5	440	18...	1310	1,820	27.0	430
DEC					JUL				
14...	0925	1,900	25.5	480	12...	1000	1,800	26.0	460
JAN					SEP				
31...	1320	1,880	26.0	440	05...	1040	1,800	26.0	500
APR									
05...	1310	1,880	27.0	480					

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 west of Upolu Point Airfield, 3.1 mi northwest of Hawi, and 1.9 mi west of Hoesa Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-in. steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1973 to current year.

WATER QUALITY: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, Sept. 21, 1988; lowest measured, 1.45 ft above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	2.75	FEB 9	2.24	MAR 21	2.20	MAY 18	2.10	JUL 13	2.40	AUG 31	2.12
DEC 19	2.50										

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 17...	1130	2,150	21.0	560	MAY 18...	1035	2,400	21.5	580
FEB 09...	1205	2,250	21.0	580	JUL 13...	0840	2,150	21.5	590
MAR 21...	1015	2,200	21.5	570	AUG 31...	0905	2,200	21.5	600

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI								
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	10-04-89	1300	800	25.5	150
				12-07-89	1430	790	26.0	140
				02-01-90	1410	800	26.0	150
				03-21-90	1240	800	25.5	140
				05-07-90	1410	800	25.5	140
				06-28-90	1410	660	26.0	120
				08-23-90	1310	800	26.0	150
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	10-16-89	1130	1480	22.0	350
				06-25-90	1100	910	21.5	190
				08-20-90	1100	1050	22.0	190
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-16-89	1050	790	25.0	140
				12-11-89	1030	810	23.0	150
				02-05-90	1015	805	23.5	160
				04-02-90	1015	805	23.5	160
				05-07-90	0945	805	24.0	160
				06-25-90	0950	805	24.5	160
				08-20-90	1030	800	23.5	160
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	10-27-89	1030	220	27.0	20
				12-08-89	1030	230	24.0	20
				02-02-90	1030	300	24.0	24
				03-30-90	1010	260	23.5	20
				05-04-90	1015	325	24.0	22
				07-23-90	0940	380	24.0	26
				08-24-90	0920	230	24.0	21
221151159265001	2-1126-02 KALIHIWAI	22 11 51 N	159 26 50 W	12-19-89	0830	205	22.0	22
				04-04-90	0800	205	22.0	20
				07-17-90	0830	200	23.0	22
221201159293401	2-1229-03 W73 HANAIE	22 12 01 N	159 29 34 W	10-27-89	1330	230	23.5	26
				12-08-89	1140	230	23.5	27
				02-02-90	1200	230	23.0	29
				03-30-90	1120	230	23.0	26
				05-04-90	1130	230	23.0	28
				06-29-90	0950	230	23.0	28
				08-24-90	1245	230	24.5	28
215455159274201	2-5427-02 W16B KOLOA	21 54 55 N	159 27 42 W	10-04-89	0750	227	23.0	25
				12-07-89	0815	230	22.5	25
				09-04-90	0750	280	23.0	27
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-04-89	0930	245	23.0	26
				12-07-89	1300	250	23.0	26
				02-20-90	1330	250	22.5	29
				03-27-90	1030	245	23.0	26
				05-03-90	1420	222	23.0	26
				06-28-90	1315	250	23.0	28
				08-20-90	1410	250	23.0	29
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	10-04-89	0930	220	27.5	23
				12-07-89	1310	225	23.0	24
				02-01-90	1300	222	22.5	26
				03-27-90	1040	222	23.0	24
				05-03-90	1425	225	23.5	24
				06-28-90	1325	225	23.5	26
				08-20-90	1420	210	24.0	24
215635159355001	2-5635-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-05-89	0810	620	23.5	96
				12-18-89	0900	650	23.0	130
				02-20-90	0930	645	23.0	120
				03-27-90	0910	650	23.0	120
				05-03-90	1300	640	23.5	120
				06-28-90	1200	630	24.0	120
				08-23-90	1200	670	23.0	120

GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION	NUMBER	LOCAL IDENT- I- FIER	LAT- I- TUDE	LONG- I- TUDE	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
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HAWAII, ISLAND OF KAUAI--Continued

215854159424601	2-5842-02	S11 KEKAHA	21 58 54 N	159 42 46 W	10-16-89	1330	650	24.5	95
					12-11-89	1300	650	24.0	95
					02-05-90	1250	640	24.5	100
					04-02-90	1305	640	24.0	96
					05-08-90	1030	650	24.5	95
					06-25-90	1250	650	24.5	100
					08-20-90	1215	650	24.5	100

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION	NUMBER	LOCAL IDENT- I- FIER	LAT- I- TUDE	LONG- I- TUDE	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU									
211646157465201	3-1646-01	W1-B WAIAL	21 16 46 N	157 46 52 W	11-01-89	1040	740	21.0	--
					04-05-90	0850	700	21.5	--
					06-18-90	1000	735	21.5	--
					08-15-90	1315	830	21.0	--
					09-25-90	1420	840	21.0	--
211832157515501	3-1851-19	W102 TUBEA	21 18 32 N	157 51 55 W	11-01-89	1130	34000	23.5	12000
					12-13-89	0940	34000	23.5	12000
					02-07-90	1200	34000	23.5	12000
					04-05-90	1140	34000	23.5	11000
					06-19-90	1510	32000	23.5	11000
					08-15-90	1425	a32200	--	12000
					09-25-90	0845	30000	24.0	--
211832157515502	3-1851-19	W102 TUBEB	21 18 32 N	157 51 55 W	11-01-89	1140	8600	23.5	--
					12-13-89	0915	8700	23.0	--
					02-07-90	1205	9000	23.5	--
					04-05-90	1145	9200	23.5	--
					06-19-90	1510	9400	23.5	--
					08-15-90	1415	9550	23.5	--
					09-25-90	0840	9600	24.0	--
212133158035501	3-2103-03	S14 MAKAKI	21 21 33 N	158 03 55 W	12-11-89	1310	1150	23.0	210
					02-08-90	0840	1100	23.0	220
					04-10-90	1315	1170	23.0	240
					06-19-90	1245	1150	23.0	220
					08-15-90	0845	1130	23.5	230
					09-24-90	1110	1100	23.5	240
212106157533701	3-2153-02	W153 MOANA	21 21 06 N	157 53 37 W	12-13-89	1110	455	21.5	76
					02-21-90	1500	450	21.5	64
					04-05-90	1420	460	21.5	86
					06-18-90	1250	450	21.5	86
					08-14-90	1505	458	21.5	86
					09-25-90	1010	440	22.0	84
212259157554201	3-2255-35	W189-3A	21 22 59 N	157 55 42 W	12-13-89	1300	1120	21.5	--
					08-15-90	1150	1040	21.5	--
					09-25-90	1335	1110	21.5	--
212238157561102	3-2256-12	W187-C	21 22 39 N	157 56 09 W	12-13-89	1000	810	23.0	200
					02-21-90	0900	810	22.5	200
					04-06-90	1455	830	23.0	220
					06-19-90	1350	820	24.0	220
					08-15-90	1020	810	25.0	210
					09-25-90	1220	780	25.0	210
212343158001001	3-2300-11	W238 WAIPH	21 23 43 N	158 00 10 W	12-11-89	1425	950	22.0	--
					02-20-90	1500	900	22.0	--
					04-09-90	1500	900	22.0	--
					06-20-90	1030	900	22.0	--
					08-14-90	1350	920	22.0	--
					09-24-90	1400	900	22.0	--
212358158010901	3-2301-09,10	W247-IJ	21 23 58 N	158 01 09 W	12-11-89	1400	745	22.0	--
					02-20-90	1440	750	22.0	--
					04-09-90	1430	730	22.0	--
					06-20-90	1110	720	22.0	--
					08-14-90	1200	695	22.0	--
					09-24-90	1240	610	22.0	--
212342157584301	3-2358-22	W204-4	21 23 42 N	157 58 43 W	12-14-89	1215	1670	20.5	--
					02-09-90	1435	1900	20.5	--
					04-10-90	1445	1770	20.5	--
					06-20-90	0950	1500	20.5	--
					08-14-90	1320	1390	20.5	--
					09-24-90	1345	1300	20.5	--

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GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	
HAWAII, ISLAND OF OAHU--Continued									
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	12-14-89	1220	4900	20.5	--	
				02-09-90	1440	5500	20.5	--	
				04-10-90	1440	4900	20.5	--	
				06-20-90	0935	3500	20.5	--	
				08-14-90	1310	3600	20.5	--	
				09-24-90	1340	3200	20.5	--	
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	12-14-89	1230	3200	22.0	--	
				02-09-90	1500	3400	22.0	--	
				04-10-90	1455	3350	22.0	--	
				06-20-90	1000	3050	22.0	--	
				08-14-90	1300	2700	22.0	--	
				09-24-90	1320	2400	22.0	--	
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	07-19-90	1330	190	21.0	19	
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	04-02-90	1520	150	23.0	18	
				07-19-90	1305	140	23.5	17	
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	12-14-89	1145	315	21.0	--	
				02-09-90	1420	315	21.0	--	
				04-09-90	1120	315	21.0	--	
				06-18-90	1410	295	21.0	--	
				08-14-90	1410	295	21.0	--	
				09-24-90	1450	280	21.0	--	
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	12-11-89	1000	355	21.0	35	
				02-08-90	1015	360	21.5	48	
				04-10-90	0925	350	22.0	48	
				08-14-90	1115	345	22.0	55	
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	07-03-90	1130	155	21.5	17	
				08-31-90	1455	160	21.5	17	
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	10-25-89	1135	320	23.0	--	
				07-05-90	1150	380	22.5	--	
				08-15-90	0940	370	22.5	--	
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	10-25-89	1155	515	25.0	--	
				06-25-90	1420	680	25.5	--	
				08-15-90	1430	750	25.5	--	
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	10-23-89	1445	210	29.0	21	
				05-04-90	1340	200	21.5	21	
				07-03-90	0840	200	21.5	22	
				08-31-90	1405	200	21.5	20	
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	10-03-89	1140	260	21.0	24	
				02-28-90	1625	260	21.5	--	
				04-25-90	1325	265	21.0	26	
				08-15-90	1030	270	21.0	25	
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	10-25-89	1225	900	23.0	160	
				12-07-89	1300	920	23.0	--	
				12-07-89	1330	920	23.0	--	
				07-05-90	1300	920	23.0	200	
				08-28-90	1330	925	23.0	210	
				08-23-90	0710	820	22.5	180	
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	04-02-90	0900	850	22.5	170	
				08-23-90	0710	820	22.5	180	
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	10-23-89	1400	510	22.5	--	
				07-03-90	1055	450	22.0	--	
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	10-23-89	1200	2100	23.5	--	
				06-28-90	1230	1550	24.0	--	
				08-31-90	1030	1570	23.0	--	

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SEE-CIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	10-23-89	1210	6400	25.0	1200
				06-28-90	0950	5000	25.0	1200
				08-27-90	0930	8600	24.5	2800
213512158061601	3-3506-03 TO 04 W329 A-B W	21 35 12 N	158 06 16 W	08-16-90	0900	540	22.5	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	10-18-89	1100	1900	21.5	--
				07-03-90	0920	1700	21.0	--
				08-27-90	1430	1750	21.5	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	10-18-89	1110	1550	21.5	--
				08-27-90	1410	1500	21.0	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	01-23-90	1530	250	21.5	--
				04-02-90	1035	260	21.5	35
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	01-23-90	1500	530	21.5	--
				04-02-90	1050	550	21.5	--
				08-09-90	1515	540	21.5	--
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	04-02-90	1155	1850	23.0	480

GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION	NUMBER	LOCAL IDENT- I- FIER	LAT- I- TUDE	LONG- I- TUDE	DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MOLOKAI									
210856157011201	4-0801-01	W16	21 08 56 N	157 01 12 W	10-18-89	j1750	a345	--	76
					11-30-89	j1725	a342	--	71
					01-24-90	j0525	a332	--	76
					03-29-90	j1515	a337	--	74
					07-13-90	j1457	a360	--	80
210857156010701	4-0801-02		21 08 57 N	157 01 07 W	11-04-89	j0815	340	--	71
					12-06-89	j1443	340	--	72
					01-25-90	j1000	340	--	69
210903157013001	4-0901-01	W17	21 09 03 N	157 01 30 W	10-23-89	j0900	a213	--	39
					01-24-90	j0820	a248	--	47
					03-22-90	j0835	a304	--	61
					04-25-90	j1600	a298	--	60
					07-18-90	j --	a244	--	46

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GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI								
203835156065001	6-3806-01 PUNAHOU SPRINGS	20 38 35 N	156 06 50 W	11-21-89	1000	640	19.0	150
				01-09-90	1145	850	--	220
				02-21-90	1615	810	19.0	200
				04-05-90	1035	725	21.5	190
				06-20-90	0920	650	20.5	180
203947156261201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	10-04-89	1025	2600	19.5	620
				01-17-90	1115	2400	18.5	570
				04-16-90	1220	2800	20.0	700
				07-17-90	1215	2600	18.5	800
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-03-89	1440	300	--	--
				01-10-90	0740	320	--	62
				02-20-90	1440	320	--	62
				04-04-90	1510	270	--	47
				05-17-90	1345	280	--	52
				06-20-90	1330	310	--	62
				08-15-90	1400	390	--	76
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-04-89	0745	150	20.0	23
				11-22-89	0630	120	19.0	15
				01-10-90	0800	210	19.0	42
				02-20-90	1535	160	19.5	24
				04-04-90	1610	120	20.5	14
				05-17-90	1405	170	20.0	26
				06-21-90	0720	220	20.5	48
				08-15-90	1420	300	20.0	67
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	10-04-89	1235	1500	23.0	270
				01-17-90	1330	1700	23.0	310
				04-16-90	1415	1700	24.0	330
204845156255001	6-4825-01 S15	20 48 45 N	156 25 50 W	10-31-89	1050	1340	23.5	--
				11-28-89	1130	1360	27.0	--
				08-22-90	1225	1200	23.5	240
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	03-21-90	j1300	a2100	--	580
				04-10-90	j1330	a2100	--	570
				05-30-90	j0700	a2070	--	600
				08-22-90	1130	1800	22.0	560
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	04-20-90	1330	1260	23.0	220
				08-22-90	1110	1280	23.5	300
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 54 W	01-18-90	1410	1300	22.0	--
				04-13-90	1325	1350	22.5	350
205329156305501	6-5330-10 W15B	20 53 29 N	156 30 55 W	10-06-89	1230	450	22.5	--
				11-27-89	1340	490	23.0	--
				04-13-90	1320	440	22.5	--
				05-29-90	1050	410	22.5	--
				07-17-90	1350	440	21.5	--
				08-20-90	0905	380	22.5	--
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	10-06-89	1235	740	23.0	--
				11-27-89	1340	730	22.5	--
				01-18-90	1415	750	22.0	--
				04-13-90	1330	650	23.0	--
				05-29-90	1055	730	23.0	--
				07-17-90	1350	810	22.0	--
				08-20-90	0910	700	23.0	--
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	11-16-89	1020	670	21.0	--
205320156394501	6-5339-02 W292	20 53 20 N	156 39 45 W	10-03-89	1020	760	21.0	--
				11-16-89	1025	740	21.5	--
				05-24-90	0935	600	22.5	94

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GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued								
205343156401101	6-5340-01 S5	20 53 43 N	156 40 11 W	06-29-90	1020	950	22.0	--
205511156222101	6-5522-01 S31	20 55 11 N	156 22 21 W	08-22-90	0920	1000	--	240
205651156401001	6-5640-01 S36	20 56 51 N	156 40 10 W	06-29-90	1045	580	21.5	--
205837156384601	6-5838-01 NAPILI A	20 58 37 N	156 38 46 W	02-15-90	1325	600	21.5	130
				04-11-90	1140	600	21.0	130
				05-24-90	1215	625	21.0	140
				06-29-90	1205	600	21.0	130
				08-21-90	1220	610	20.5	160
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	10-23-89	1215	320	20.0	66
				11-16-89	1150	340	20.0	64
				01-12-90	1420	340	20.0	74
				04-11-90	1200	240	20.0	48
				05-24-90	1230	300	20.0	65
				08-21-90	1240	320	19.5	66
205848156383601	6-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-23-89	1230	540	20.5	120
				11-16-89	1200	540	20.0	110
				02-15-90	1355	570	20.5	140
				05-24-90	1245	590	20.5	140
				08-21-90	1300	590	19.5	160

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII								
190347155354301	8-0335-01 NAALEHU W1	19 03 47 N	155 35 43 W	05-02-90	1210	148	19.0	11
				07-11-90	1200	150	19.0	11
190832155310901	8-0831-02 NINOLE A	19 08 32 N	155 31 09 W	02-13-90	1015	800	18.5	190
				03-12-90	1020	780	18.0	190
				05-02-90	1055	760	18.5	190
				07-11-90	1025	650	18.5	190
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	02-13-90	0925	126	19.0	14
				03-12-90	0925	126	19.0	13
				05-02-90	1005	130	19.0	14
				07-11-90	0955	140	19.0	16
				08-23-90	0945	140	19.0	16
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	12-12-89	0945	93	18.0	5.0
				02-13-90	0955	92	18.0	4.0
				08-23-90	1010	95	18.0	4.5
191219155291601	8-1229-01 PAHALA	19 12 25 N	155 29 22 W	05-02-90	0945	97	17.5	5.0
				07-11-90	0930	98	17.5	5.0
				08-23-90	0925	97	17.5	45
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	10-05-89	1435	325	19.5	60
				12-12-89	1255	350	19.5	70
				02-01-90	1450	345	19.5	68
				03-15-90	1530	330	19.5	66
				06-27-90	1355	295	19.5	55
				08-30-90	0840	310	19.5	62
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	10-05-89	1355	570	19.5	150
				12-12-89	1350	760	19.5	180
				02-01-90	1415	700	19.5	160
				03-15-90	1455	620	19.5	140
				05-02-90	1355	770	19.5	180
				08-30-90	0910	625	19.5	150
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	12-12-89	1335	1090	19.0	260
				05-02-90	1345	1100	19.0	250
				08-30-90	0855	1050	19.0	270
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	12-07-89	1410	125	23.0	7.0
				03-13-90	0900	128	23.0	7.0
				05-10-90	1055	128	23.0	7.0
				07-09-90	0830	128	23.0	7.0
				08-24-90	1305	128	23.5	7.0
193113154555801	8-3185-01 W9-11 HAWN SHORE	19 31 13 N	154 55 58 W	12-11-89	1150	115	21.0	14
				07-09-90	1415	125	21.5	16
				08-24-90	1345	125	21.5	13
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	12-13-89	1220	170	20.0	20
				02-01-90	1315	290	20.0	50
				03-15-90	1325	250	20.0	39
				05-03-90	1130	195	20.0	23
				06-27-90	1010	250	20.0	40
				08-30-90	1020	450	20.0	99
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	10-06-89	0955	600	20.0	120
				12-13-89	1150	670	20.0	150
				02-01-90	1305	700	20.0	160
				03-15-90	1345	680	20.0	150
				05-03-90	1120	630	20.0	150
				06-27-90	1045	580	20.0	130
				08-30-90	1030	490	20.0	110
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	12-13-89	1205	155	20.0	14
				02-01-90	1325	240	20.0	36
				03-15-90	1320	205	20.5	27
				08-30-90	1005	355	20.0	72

GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	10-06-89	0945	400	20.5	80
				12-13-89	1135	450	20.5	94
				02-01-90	1255	460	20.5	94
				03-15-90	1405	450	20.5	92
				05-03-90	1110	440	20.5	94
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	10-06-89	1045	770	20.0	210
				12-12-89	1455	1160	20.0	280
				02-01-90	1140	890	20.0	210
				03-15-90	1300	890	20.0	200
				05-02-90	1435	970	20.0	200
				06-15-90	1430	1200	--	280
				06-15-90	1435	1500	--	400
				06-15-90	1440	1100	--	290
				06-15-90	1445	650	--	160
				06-15-90	1450	1100	--	280
				06-15-90	1455	1050	--	200
				06-15-90	1500	1400	--	500
				06-27-90	1155	1090	20.0	280
08-30-90	0950	1000	20.0	250				
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	12-11-89	1455	83	19.0	5.0
				01-30-90	1000	84	19.0	5.0
				03-13-90	1340	85	19.0	5.0
				05-10-90	1450	83	19.5	4.0
				07-10-90	1440	82	19.0	5.0
				08-24-90	1500	82	19.0	4.0
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	12-11-89	1515	85	20.5	6.0
				01-30-90	1020	83	20.5	4.0
				03-13-90	1520	84	20.5	5.0
				05-23-90	1310	85	21.0	5.0
				07-10-90	1410	85	20.5	5.0
				09-07-90	1150	85	20.5	4.0
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	12-11-89	1555	102	24.5	11
				01-30-90	1100	98	24.0	10
				03-12-90	1450	98	24.0	10
				05-17-90	1520	102	24.5	11
				07-10-90	1350	98	23.0	10
				09-07-90	1125	115	24.5	11
194337155041801	8-4304-01 WAIAKEA DUG WELL	19 43 37 N	155 04 18 W	12-21-89	1100	40000	21.0	12000
				01-30-90	1120	40000	20.5	16000
				03-12-90	1510	14000	20.5	3900
				05-17-90	1435	45000	21.0	14000
				07-10-90	1305	45000	21.0	16000
				09-07-90	1020	34000	21.0	11000
194818155582301	8-4858-02 KONA VILLAGE	19 48 18 N	155 58 23 W	10-05-89	1215	2400	21.0	470
				12-13-89	1425	2300	20.5	480
				12-19-89	1225	2200	21.0	550
				01-31-90	1430	2400	20.5	480
				03-14-90	1105	2400	20.5	510
				05-03-90	1315	2400	20.5	420
				06-28-90	1025	2550	20.5	480
				08-30-90	1400	2350	20.5	490
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	12-21-89	0845	205	21.5	14
				01-30-90	1345	190	22.0	14
				03-27-90	1355	205	22.5	16
				05-11-90	0915	210	21.0	13
				07-10-90	0915	195	21.0	13
				09-07-90	0820	190	20.5	13
195043155053801	8-5005-02 MAKAI	19 50 43 N	155 05 38 W	12-21-89	0830	230	22.5	19
				01-30-90	1330	195	23.0	17
				03-27-90	1340	205	22.5	17
				05-11-90	0855	210	22.5	18
				07-10-90	0905	220	22.5	18
				09-07-90	0835	210	22.5	18

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
195051155051501	8-5005-05 SALT WTR 3	19 50 51 N	155 05 15 W	12-21-89	0905	14000	18.0	4900
				01-30-90	1400	14000	18.5	4600
				03-27-90	1415	14500	18.5	4100
				05-17-90	1405	10200	18.5	2400
				07-10-90	0850	14200	18.5	4400
				09-07-90	0845	15800	18.5	5000
195459155522501	8-5452-03 RESORT IRRIGATIO	19 54 59 N	155 52 25 W	03-16-90	0935	2800	24.0	720
195546155462001	8-5546-01 WAIKOLOA WATER W	19 55 46 N	155 46 20 W	02-02-90	0950	500	29.0	74
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	10-05-89	0945	2000	28.5	540
				02-02-90	0820	2300	28.0	580
				03-16-90	1000	2300	28.5	580
				07-12-90	1040	2300	28.5	580
				09-05-90	1325	2300	28.5	610
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	10-05-89	1025	280	26.5	28
				05-04-90	0910	295	26.5	28
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	12-19-89	0945	300	26.0	28
				07-12-90	1150	300	26.5	29
				09-06-90	1035	295	26.5	28
195728155455401	8-5745-03 WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	12-19-89	1000	290	26.5	26
				02-02-90	0910	285	27.0	26
				03-16-90	1100	285	26.5	26
				05-04-90	0925	280	27.0	25
				07-12-90	1200	280	27.0	26
				09-06-90	1050	280	27.0	23
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	10-04-89	1145	475	26.5	68
				04-05-90	1145	520	26.5	96
				05-18-90	1225	520	26.5	96
				09-05-90	1120	495	26.5	96
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	01-10-90	1000	355	25.5	50
				02-27-90	1240	370	26.0	50
				04-05-90	1200	375	26.0	56
				05-18-90	1215	350	26.0	49
				07-12-90	0900	375	26.0	56
				09-05-90	1105	380	26.0	57
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	10-04-89	1130	465	26.0	80
				07-12-90	0925	500	26.0	90
				09-05-90	1130	515	26.0	98

GROUND-WATER RECORDS

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WATER LEVEL DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	WATER LEVEL (FT AB MSL)
HAWAII, ISLAND OF HAWAII						
201308155451901	8-7345-03 MAKAPALA	20 13 08 N	155 45 19 W	04-25-90	1305	10.80
				07-13-90	1140	10.40
				08-31-90	1105	10.18
201307155452001	8-7345-04 MAKAPALA	20 13 07 N	155 45 20 W	04-25-90	1320	10.75
				07-13-90	1200	10.41
				08-31-90	1120	10.26
201347155470501	8-7347-03 TEST WELL-E HALAULA, KOHALA	20 13 47 N	155 47 05 W	07-16-90	1025	10.14
				09-10-90	1030	14.03
201429155480201	8-7448-06 HONOPUEO OBV. WELL	20 14 29 N	155 48 02 W	05-22-90	1250	8.21
				07-16-90	0925	8.05
201428155480201	8-7448-07 HONOPUEO	20 14 28 N	155 48 02 W	07-16-90	0910	8.07
				09-10-90	1150	8.07
201428155494001	8-7449-03 TEST WELL-H HAWI, KOHALA	20 14 28 N	155 49 40 W	05-22-90	1420	6.03
				07-13-90	0955	6.90
				09-10-90	1325	7.26
201441155510701	8-7451-02 TEST WELL-J PRODUCTION, KOHALA	20 14 41 N	155 51 07 W	06-07-90	1200	5.33
				07-13-90	0920	5.31
				09-10-90	1300	5.88
201517155493701	8-7549-03 WAIPIELE	20 15 17 N	155 49 37 W	05-22-90	1335	2.47
				07-16-90	0820	2.45

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF KAUAI

220631159224301 - 2-0622-02 MAKALEHA WELL 2

DATE	TIME	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE LAB (US/CM)	TEMPERATURE WATER (DEG C)	HARDNESS TOTAL (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)	SODIUM PERCENT	
NOV 28...	1600	1680	1000	123	23.5	34	6.0	4.6	10	38	
DATE	RATIO	SODIUM ADSORPTION (MG/L AS K)	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (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)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)
NOV 28...	0.7	1.4	42	2.0	11	0.10	36	96	0.13	70	
DATE	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM, TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	
NOV 28...	<1	<100	<10	<1	3	1	1	50	15	2	
DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL RECOVERABLE (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)		
NOV 28...	<10	<10	<1	<1.0	<1	<1	<1	<1	<10		

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF HAWAII

201319155472301 - 8-7347-05 TEST WELL-B HALAULA MAUKA, KOHALA

DATE	TIME	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	HARDNESS TOTAL (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)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
OCT												
20...	1400	900	180	7.9	22.0	0.10	47	7.9	6.5	16	42	1
20...	1405	700	180	--	22.0	--	--	--	--	--	--	--

DATE	TIME	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (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)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)
OCT													
20...	1.5	43	7.0	19	0.10	44	133	0.18	1.20	<10	<1	<100	
20...	--	--	--	20	--	--	--	--	--	--	--	--	

DATE	TIME	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DIS-SOLVED (UG/L AS MN)
OCT												
20...	1400	10	<1	1	1	2	40	16	1	<10	<10	<1

DATE	TIME	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL RECOVERABLE (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ALACHLOR TOTAL RECOVER (UG/L)	ALDRIN, TOTAL (UG/L)	AME-TRYNE TOTAL (UG/L)	ATRAZINE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)
OCT													
20...		<0.10	<1	1	<1	<1	<10	<0.10	<0.010	<0.10	<0.10	<0.20	<0.20

DATE	TIME	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLORODANE, TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYL VINYL ETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	CYANAZINE TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
OCT													
20...		<0.20	<0.20	<0.20	<0.1	<0.20	<0.20	<0.20	<0.20	<0.10	<0.010	<0.010	<0.010

DATE	TIME	DEF AZINON, TOTAL (UG/L)	DIETHANOLAMINE, TOTAL (UG/L)	1,2-DIBROMOETHANE, TOTAL (UG/L)	1,2-DICHLOROBENZENE, TOTAL (UG/L)	1,3-DICHLOROBENZENE, TOTAL (UG/L)	1,4-DICHLOROBENZENE, TOTAL (UG/L)	DI-BROMOMETHANE, TOTAL (UG/L)	DI-CHLOROFLUOROMETHANE, TOTAL (UG/L)	1,1-DICHLOROETHANE, TOTAL (UG/L)	1,2-DICHLOROETHANE, TOTAL (UG/L)	1,1-DICHLOROETHYLENE, TOTAL (UG/L)	1,2-DICHLOROPROPANE, TOTAL (UG/L)
OCT													
20...		<0.01	<0.01	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

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

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF HAWAII--Continued

201319155472301 - 8-7347-05 TEST WELL-B HALAULA MAUKA, KOHALA--Continued

DATE	1,3-DI- CHLORO- PROPENE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHYL- BENZENE TOTAL (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)
OCT 20...	<0.20	<0.010	<0.01	<0.010	<0.010	<0.01	<0.20	<0.010	<0.010	<0.010	<0.01	<0.01
DATE	METHYL- BROMIDE TOTAL (UG/L)	METHYL- CHLO- RIDE TOTAL (UG/L)	METHYL- CHLO- RIDE TOTAL (UG/L)	METHYL- PARA- THION, TOTAL (UG/L)	METHYL THION, TOTAL (UG/L)	METOLA- CHLOR WATER WHOLE TOT.REC (UG/L)	METRI- BUZIN WATER WHOLE TOT.REC (UG/L)	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	
OCT 20...	<0.20	<0.20	<0.20	<0.01	<0.01	<0.1	<0.1	<0.01	<0.10	<0.01	<0.1	
DATE	PER- THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	PROME- TONE TOTAL (UG/L)	PROME- TRYNE TOTAL (UG/L)	PRO- PAZINE TOTAL (UG/L)	SIMA- ZINE TOTAL (UG/L)	SIME- TRYNE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA- CHLORO- ETHANE TOTAL (UG/L)	TETRA- CHLORO- ETHYL- ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	
OCT 20...	<0.1	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.2	<0.20	<0.20	<0.20	
DATE	TOX- APHENE, TOTAL (UG/L)	1,2- TRANSDI CHLORO- ETHENE TOTAL (UG/L)	TRANS- 1,3-DI- CHLORO- PROPENE TOTAL (UG/L)	TRI- CHLORO- ETHYL- ENE TOTAL (UG/L)	1,1,1- TRI- CHLORO- ETHANE TOTAL (UG/L)	1,1,2- TRI- CHLORO- ETHANE TOTAL (UG/L)	TRI- CHLORO- FLURO- METHANE TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	TRI- FLURA- LIN TOTAL RECOVER (UG/L)	VINYL CHLO- RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)	
OCT 20...	<1	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.01	<0.10	<0.20	<0.2	

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

GROUND-WATER RECORDS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF HAWAII--Continued

201406155454401 - 8-7445-01 KAPAMAIA

DATE	TIME	SAMPLE DEPTH DIS- TANCE BELOW MSL FEET	SPE- CIFIC CON- DUCT- ANCE (US/CM)	TEMPER- ATURE WATER (DEG C)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT					
14...	1700	325	610	22.0	160
14...	1720	360	670	22.0	180
14...	1745	380	800	22.0	230
14...	1800	410	1670	22.0	520
14...	1810	440	a22000	22.5	7500

a Laboratory conductance

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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).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1 2.54×10^{-2}	millimeters (mm) 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 4.047×10^{-1} 4.047×10^{-3}	square meters (m ²) square hectometers (hm ²) 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 3.785×10^0 3.785×10^{-3}	liters (L) cubic decimeters (dm ³) cubic meters (m ³)
million gallons	3.785×10^3 3.785×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1 2.832×10^{-2}	cubic decimeters (dm ³) cubic meters (m ³)
cfs-days	2.447×10^3 2.447×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3 1.233×10^{-3} 1.233×10^{-6}	cubic meters (m ³) cubic hectometers (hm ³) cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1 2.832×10^1 2.832×10^{-2}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2} 6.309×10^{-2} 6.309×10^{-5}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1 4.381×10^{-2}	cubic decimeters per second (dm ³ /s) 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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