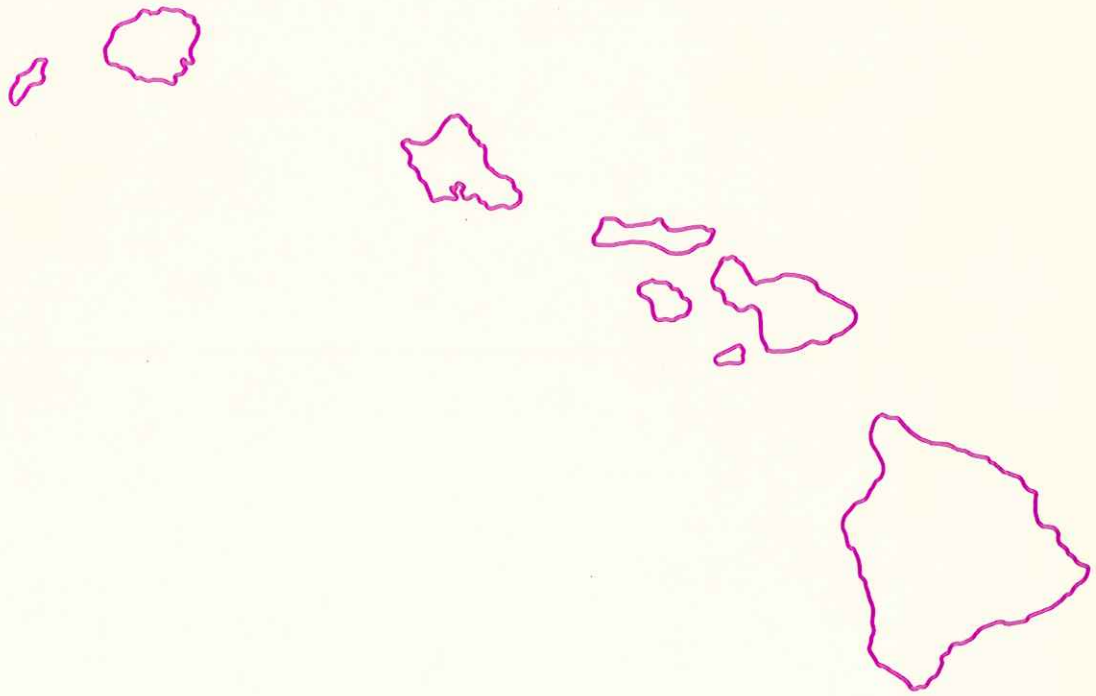
Water Resources Data Hawaii and other Pacific Areas Water Year 1989

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-89-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

CALENDAR FOR WATER YEAR 1989

1988

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
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NOVEMBER

S	M	T	W	T	F	S
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DECEMBER

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1989

JANUARY

S	M	T	W	T	F	S
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FEBRUARY

S	M	T	W	T	F	S
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JUNE

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JULY

S	M	T	W	T	F	S
						1
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23	24	25	26	27	28	29
30	31					

AUGUST

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

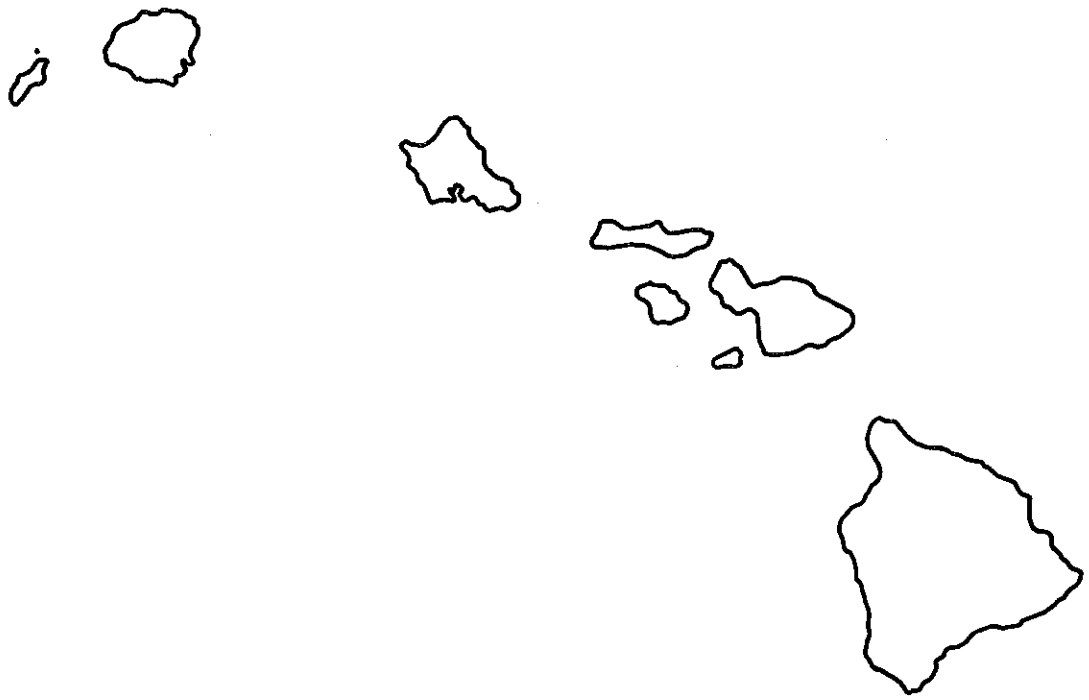
SEPTEMBER

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

Water Resources Data
Hawaii and other Pacific Areas
Water Year 1989

Volume 1. Hawaii

by R.H.Nakahara, M.G.H.S. Lum, I.Y. Yamashiro,G.A. Tateishi, and V.E. Kunishige



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-89-1
Prepared in cooperation with the State of Hawaii Department
of Land and Natural Resources, Division of Water and
Land Development and with other agencies

U.S DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

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and other Pacific Areas write to
District Chief, Water Resources Division
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1990

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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15. Supplementary Notes

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

16. Abstract (Limit: 200 words)

Water resources data for the 1989 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 82 gaging stations; water quality for 14 gaging stations, 65 partial-record flow stations, and 138 wells; and water levels for 35 observations wells. Also included are 107 crest-stage partial record stations, 25 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.

17. Document Analysis a. Descriptors

*Hawaii, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses.

b. Identifiers/Open-Ended Terms

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

			Page
HAWAII			
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	220
(2-0044-13)	220018159444702	(otw)	221
(2-0044-14)	220019159444801	(w)	222
(2-0044-15)	220016159442701	(ctw)	223
(2-0120-01)	220136159205501	(ct)	282
(2-0120-02)	220134159205401	(w)	224
(2-0145-10)	220148159453501	(ct)	282
(2-0145-11)	220148159453502	(w)	224
(2-0320-01)	220354159205601	(otw)	225
(2-0320-03)	220354159205602	(ctw)	226
(2-0345-04)	220341159453901	(ctw)	227
(2-0545-01)	220530159450401	(ct)	282
(2-0818-01)	220827159185401	(ctw)	228
(2-0818-02)	220826159185401	(ct)	282
(2-1020-03)	221038159203801	(otw)	229
(2-1125-01)	221141159252501	(ct)	230
(2-1125-02)	221141159252502	(ctw)	231
(2-1126-01)	221150159264501	(ctw)	232
(2-1126-02)	221151159265001	(ct)	282
(2-1229-03)	221201159293401	(ct)	282
(2-1232-01)	221247159324801	(ctw)	233
(2-1333-01)	221318159335901	(otw)	234
(2-5426-03)	215434159263301	(w)	235
(2-5427-01)	215454159274201	(otw)	238
(2-5427-02)	215455159274201	(ct)	282
(2-5526-01)	215536159263501	(ctw)	237
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(2-5534-03)	215522159342601	(ctw)	238
(2-5634-01)	215607159344301	(w)	239
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(2-5840-01)	215803159401201	(ctw)	240
(2-5842-02)	215854159424601	(ct)	283
(2-5842-03)	215843159422901	(ctw)	241
(2-5843-01)	215857159430101	(w)	242
(2-5921-01)	215958159214301	(w)	243
(2-5923-01)	215901159235301	(ct)	244
(2-5923-07)	215901159235201	(ctw)	245
(2-5939-01)	215906159395601	(ctw)	246
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(3-1646-01)	211646157465201	(ct)	284
(3-1851-19A)	211832157515501	(ct)	284
(3-1851-19B)	211832157515502	(ct)	284
(3-1859-05)	211907157594701	(w)	248
(3-2042-13)	212038157422501	(ct)	284
(3-2101-03)	212154158015201	(w)	248
(3-2103-03)	212133158035501	(ct)	284
(3-2153-02)	212106157533701	(ct)	284
(3-2153-05)	212123157535501	(w)	249
(3-2255-35)	212259157554201	(ct)	284
(3-2258-10)	212238157561101	(w)	249
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(3-2558-10)	212506157582301	(ct)	285
(3-2600-04)	212659158004102	(w)	250
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(3-2800-01)	212803158000701	(ct)	285
(3-2809-06)	212828158092001	(ct)	285
(3-2812-01)	212859158124301	(ct)	285
(3-2901-07)	212927158014801	(ctw)	251
(3-2901-09)	212945158014301	(ct)	285
(3-2911-02)	212939158112301	(ct)	285
(3-3213-06)	213224158135901	(ct)	285

			Page
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ISLAND OF OAHU--Continued			
(3-3251-01)	213243157510001	(ct)	285
(3-3352-01)	213327157524401	(ctw)	252
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(3-3407-25)	213411158074501	(ct)	285
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(3-3605-03)	213638158053701	(ct)	285
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(3-4258-04)	214233157583501	(ct)	285
ISLAND OF MOLOKAI			
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(4-0601-01)	210605157012001	(ctw)	257
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(6-3925-01)	203912156255901	(w)	260
(8-3926-03)	203947156261201	(ct)	287
(6-4600-01)	204601156001501	(ct)	287
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(6-4627-14)	204635156270101	(ct)	287
(6-4824-01)	204827156242201	(w)	261
(6-4825-01)	204845156255001	(ct)	287
(6-4831-01)	204818156310301	(w)	282
(6-4928-02)	204909156281401	(w)	263
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(8-5021-01)	205014156212701	(ct)	287
(6-5128-02)	205102156282501	(ct)	287
(6-5130-01)	205140156304501	(w)	264
(6-5130-02)	205154156303801	(w)	265
(6-5224-02)	205243156243201	(ct)	287
(6-5330-09)	205329156305502	(ct)	287
(6-5330-10)	205329156305501	(ct)	287
(6-5330-11)	205330156305401	(ct)	287
(6-5339-01)	205322156394501	(ct)	287
(6-5339-02)	205320156394501	(ct)	287
(6-5340-01)	205343156401101	(ct)	288
(6-5419-01)	205412156193801	(w)	266
(6-5424-01)	205416156244301	(ct)	288
(6-5430-03)	205419156304401	(w)	267
(6-5430-05)	205405156305401	(ctw)	268
(6-5431-01)	205437156310501	(w)	269
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1989

Volume 1

INTRODUCTION

Water resources data for the 1989 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 82 gaging stations; water quality for 14 gaging stations, 65 partial-record flow stations, and 138 wells; and water levels for 35 observation wells. Also included are 107 crest-stage partial-record stations, 25 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, 1980 (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-89-1." 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 1989 year was excessive (upper 25 percent of record) at the index stations on the islands of Kauai, Oahu, Maui, and Hawaii. The monthly mean flow for all index stations was in the normal range for the months October to December and excessive for the month of July.

At East Branch of North Fork Wailua River near Lihue, Kauai, streamflow was excessive for the months of January to March, July, and August. Its annual mean discharge was 49 percent greater than the 1951-80 annual median. Streamflow at Kalihi Stream near Honolulu, Oahu was excessive for the months of February, April, and July. The yearly mean was 51 percent greater than the 1951-80 annual median. Monthly mean discharge at Honopou Stream near Huelo, Maui was excessive for the months of the months of January, February, April to July, and September and the yearly mean was 24 percent greater than the 1951-80 annual median. Monthly mean flows at Waiakea Stream near Mountain View, Hawaii was excessive for the months of January, and May to July and the annual mean was 18 percent greater than the 1951-80 annual mean.

Monthly and yesrly 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 1989 year from the previous year. Samples collected every other month showed dissolved-solids concentrations ranged from 22 to 374 mg/L (milligrams per liter) during 1989. Waikele Stream at Waipahu, Oahu, had the highest concentration values.

Average dissolved-oxygen concentrations ranged from 86 to 99 percent saturation. Waikele Stream was lowest at 86 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:

	Fecal Coliform (colonies per 100 milliliters)	
NASQAN Station	1988	1989
Waimea River at Waimea, Kauai	860	830
Waikele Stream at Waipahu, Oahu	4,400	6,500
Kalihi Stream at Kalihi, Oahu	8,800	5,900
Halawa Stream near Halawa, Molokai	224	259
Kahakuloa Stream at Kahakuloa, Maui	19	6
Wailuku River at Hilo, Hawaii	155	144
Benchmark Station		
Honolii Stream near Papaikou, Hawaii	78	122

Analyses of water samples taken at more than 138 basal water-table wells generally did not show significant changes in chloride concentration.

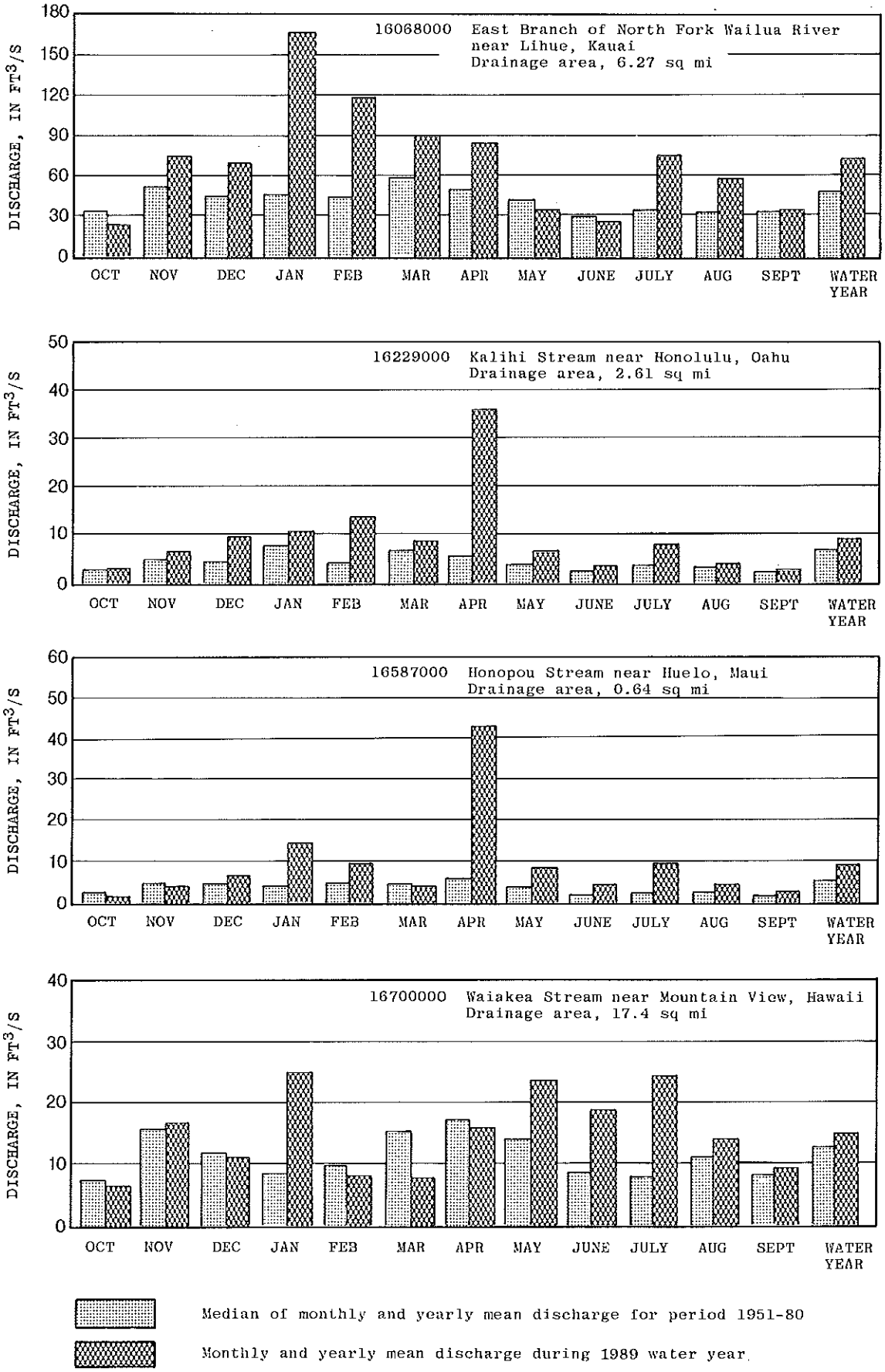

Figure 1.--Discharge during 1989 water year compared with median discharge for period 1951-80 for four representative gaging stations.

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 diseases, 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 withing 24 hours when incubated at 35°C ± 0.5°C on M-Endosgar (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 ± 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 ± 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/m^3 (grams per cubic meter), and periphyton and benthic organisms in g/m^2 (grams per square meter).

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

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

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

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 of liters (L).

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

Chlorophyll refers to the green pigments of plants. 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 increassd quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressaed 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 (µg/g) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

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

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 insolution after the part of a respresentative 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 comparibility 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 different digestion procedures are likely to produce different analytical results.

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

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 indention, each indention representing one rank.

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in thia report. In assigning station numbers, no distinction is made between partial-record etations and continuous-record gaging stations; therefore, the station number for a partial-record station inidcated 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 numbera are not consecutive. The complete 8-digit number for each sstation, such as 16200000 which appears just to the left of the atation name includea 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 syatem of the U.S. Geologicsl Survey ia 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 ia 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 numbera "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. Thsse two-digit numbera 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 poasible to have a same 6-digit number for wells on different islands, another digit distinguishing each of the ialands, 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.

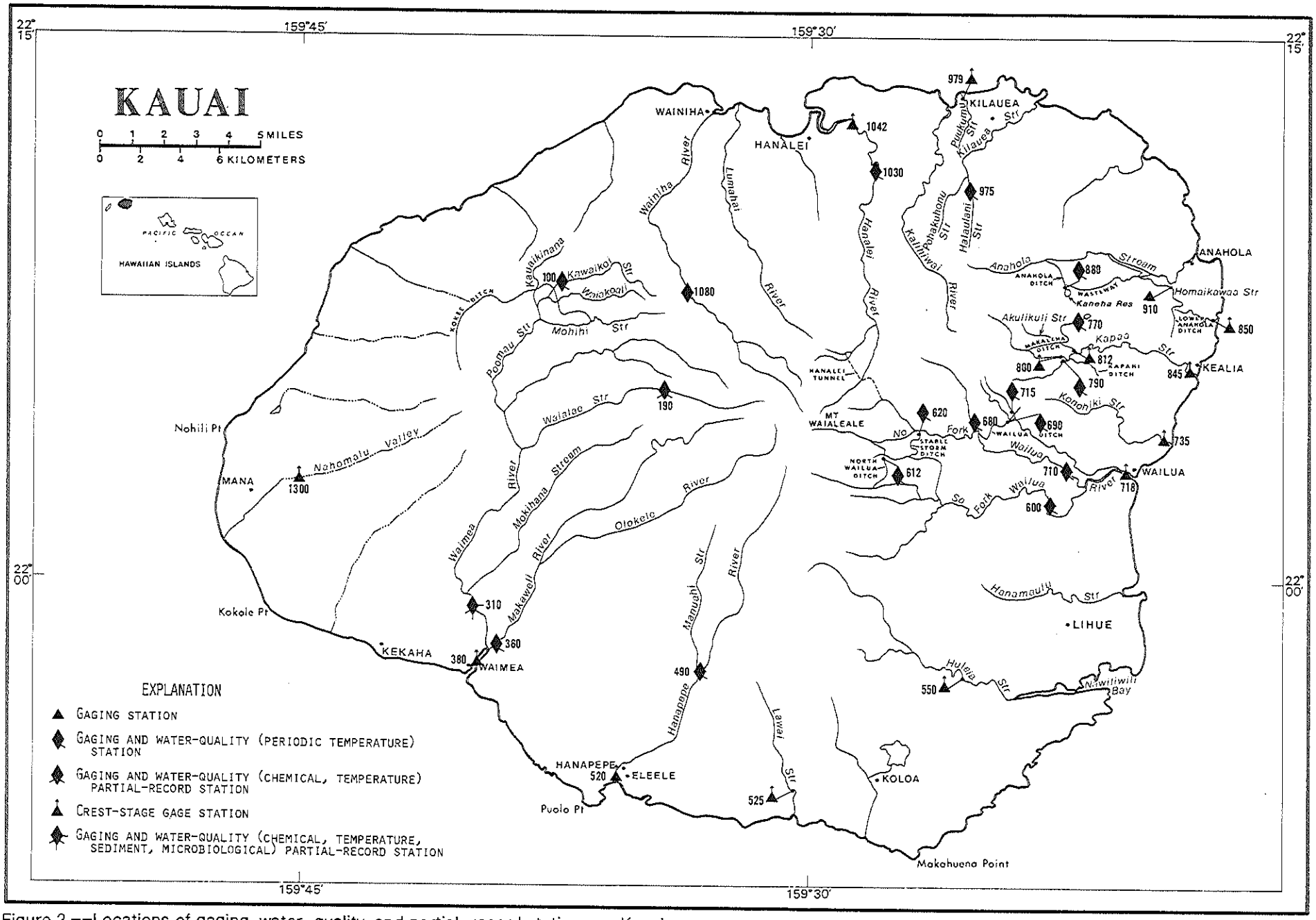

Figure 2.--Locations of gaging, water-quality, and partial-record stations on Kauai.

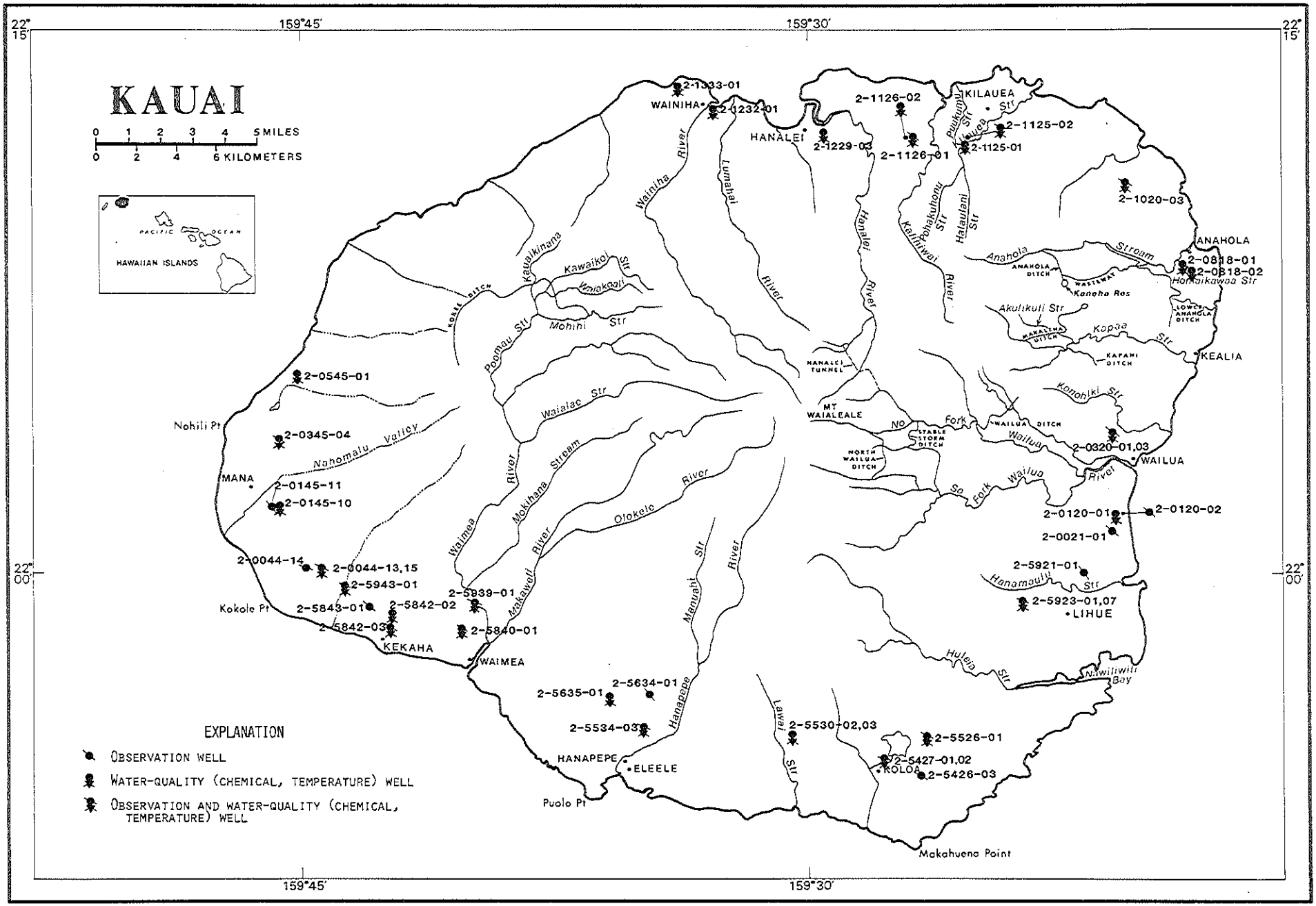

Figure 3.--Locations of observation wells and ground-water quality sampling sites on Kauai.

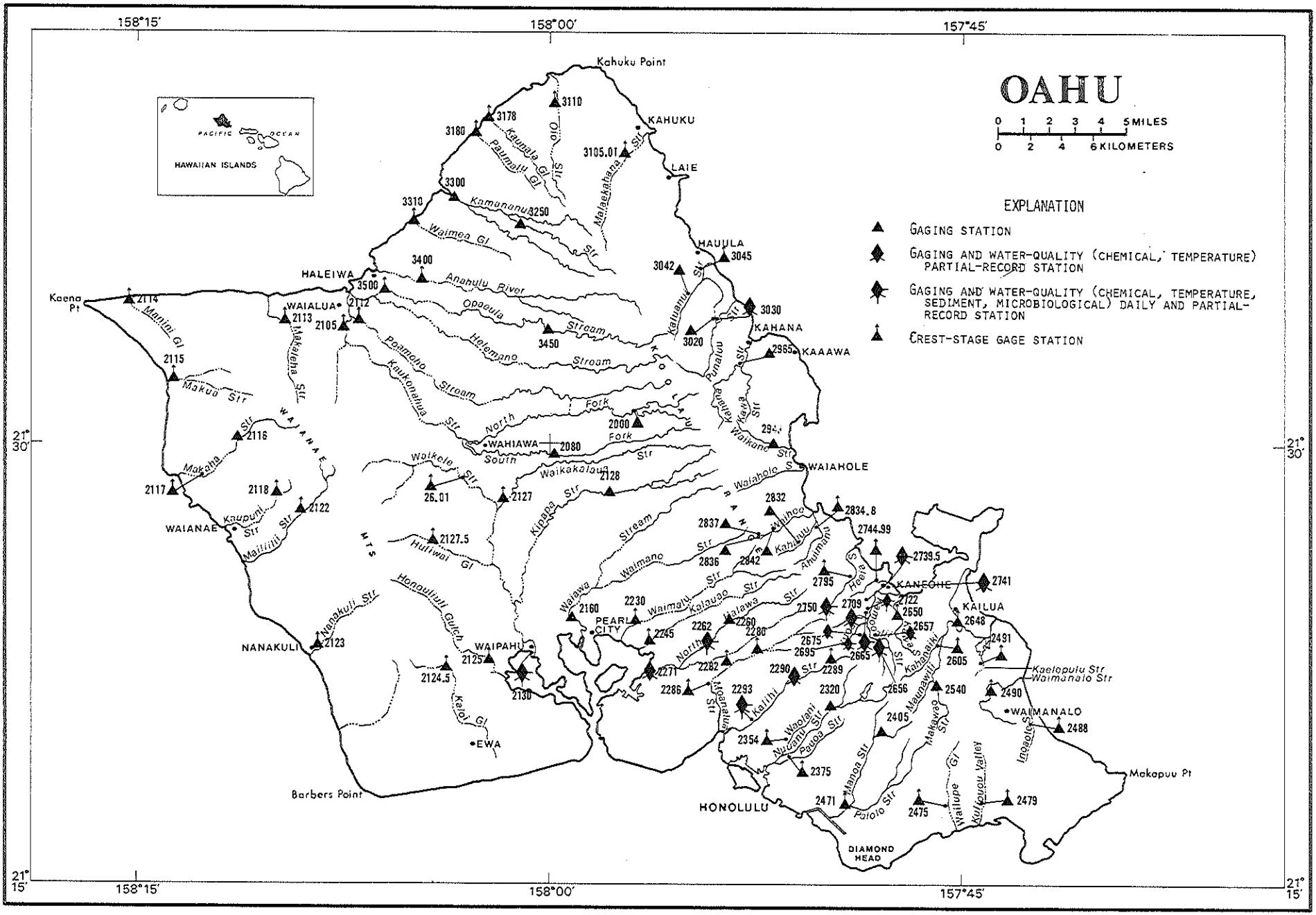

Figure 4.--Locations of gaging, water-quality, and partial-record stations on Oahu.

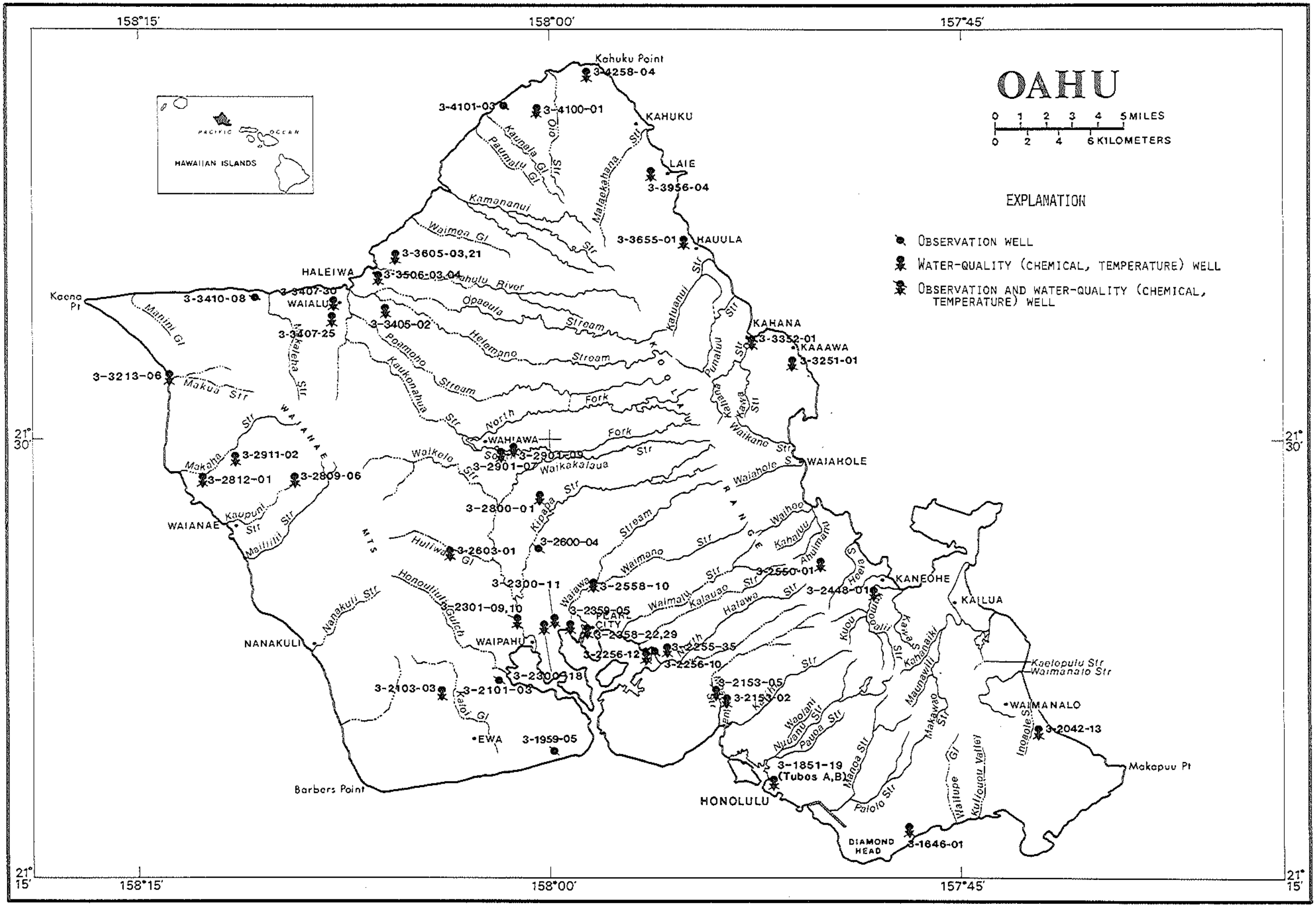

Figure 5.--Locations of observation wells and ground-water quality sampling sites on Oahu.

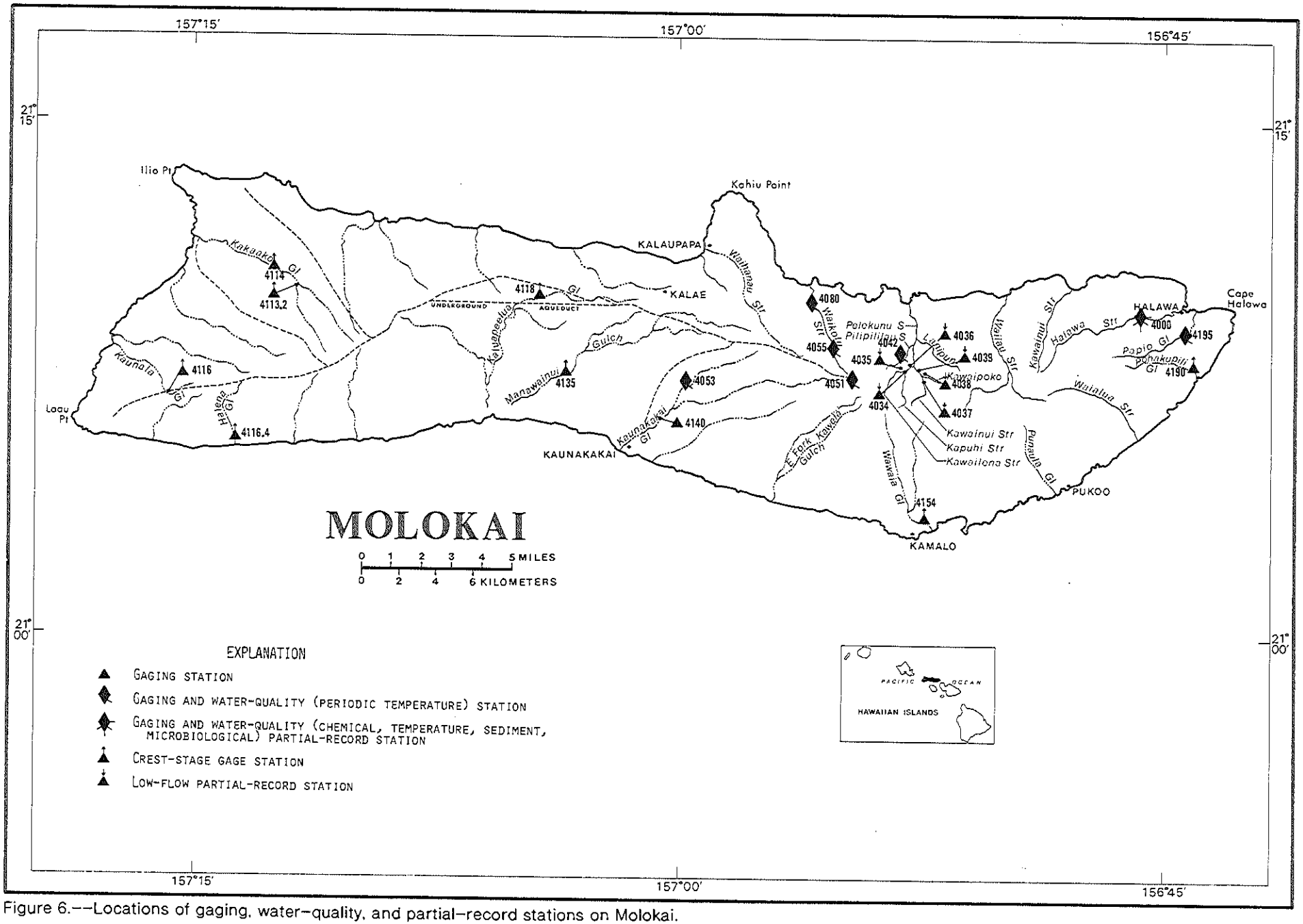

Figure 6.--Locations of gaging, water-quality, and partial-record stations on Molokai.

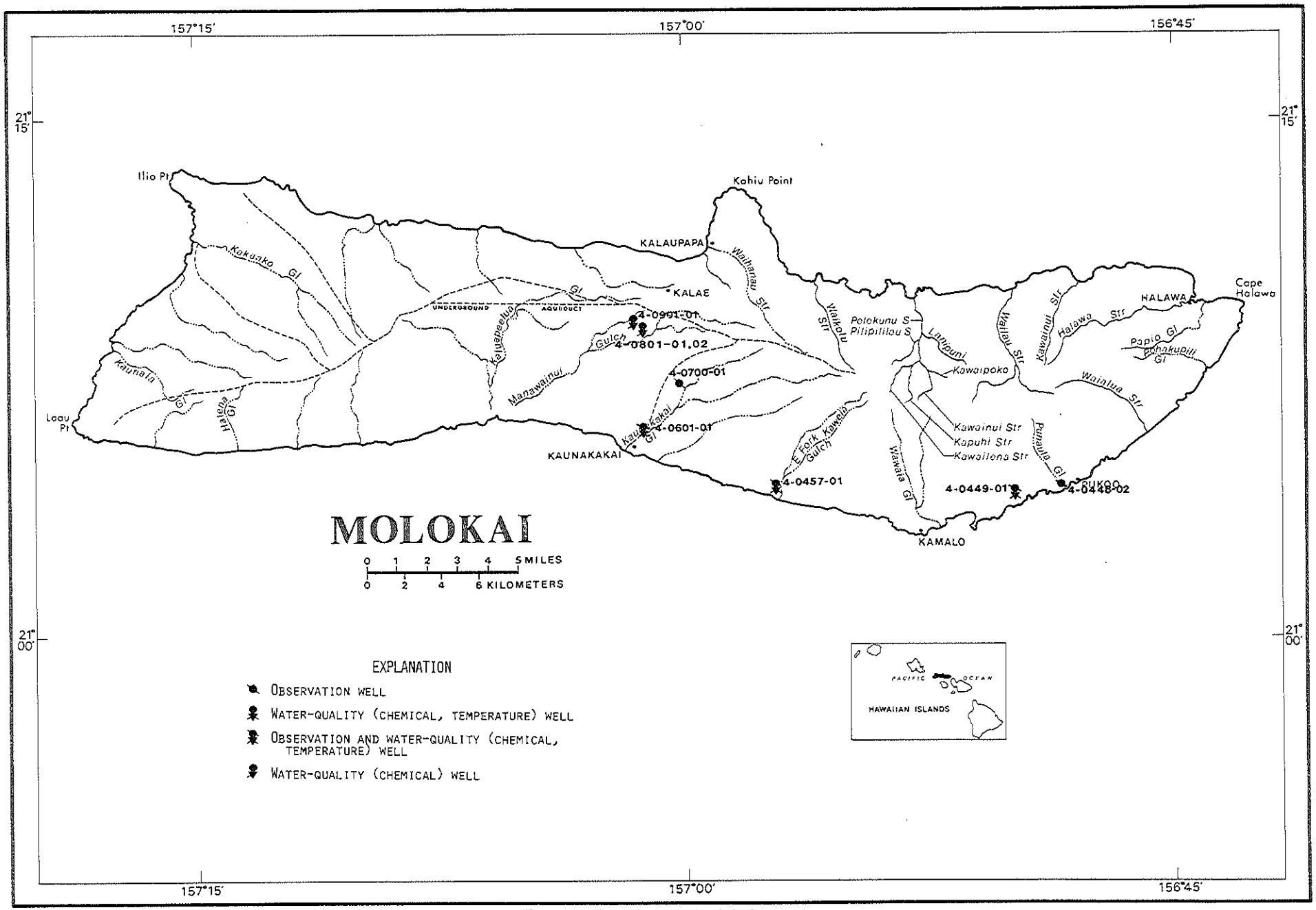

Figure 7.--Locations of observation wells and ground-water quality sampling sites on Molokai.

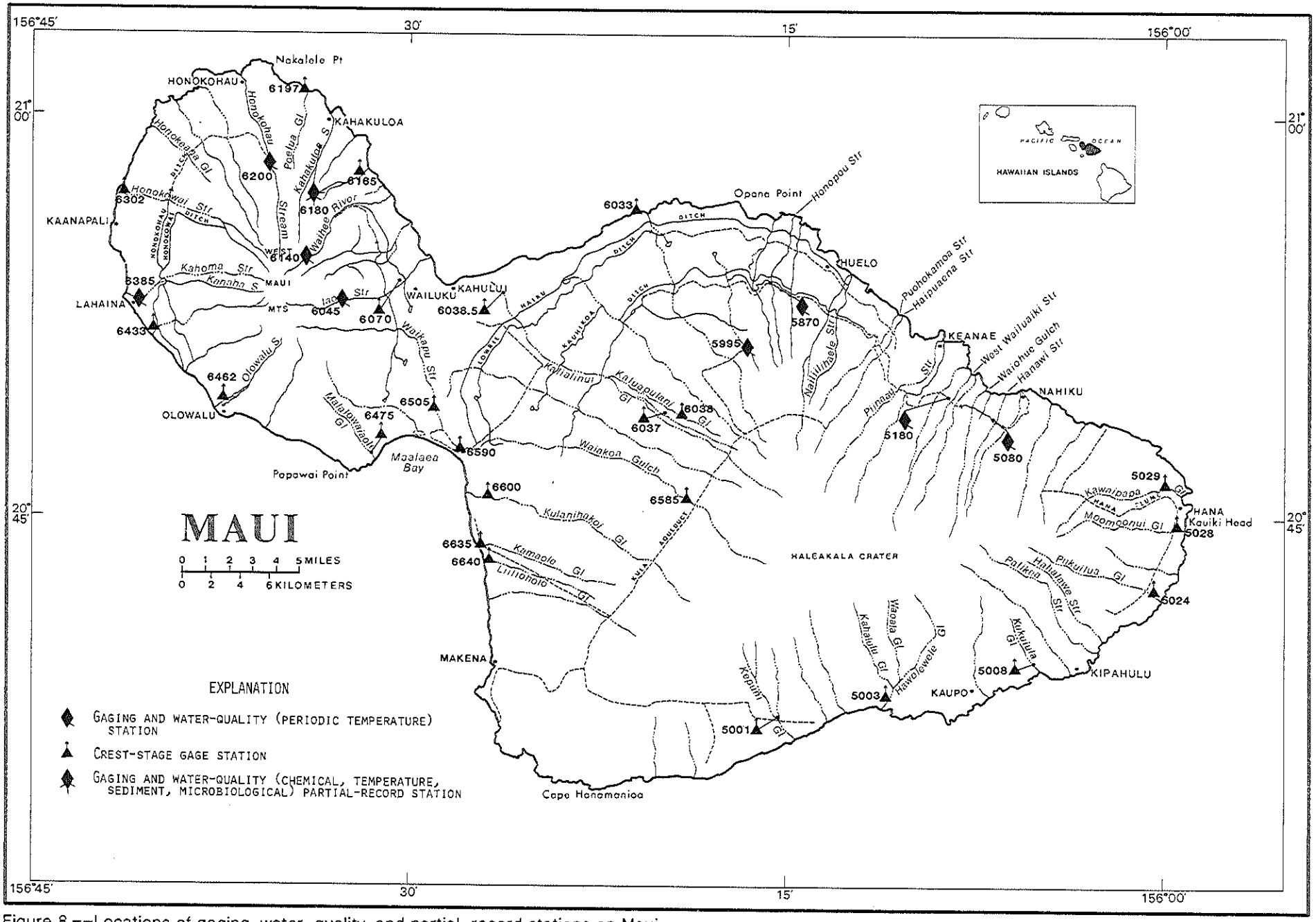

Figure 8.--Locations of gaging, water-quality, and partial-record stations on Maui.

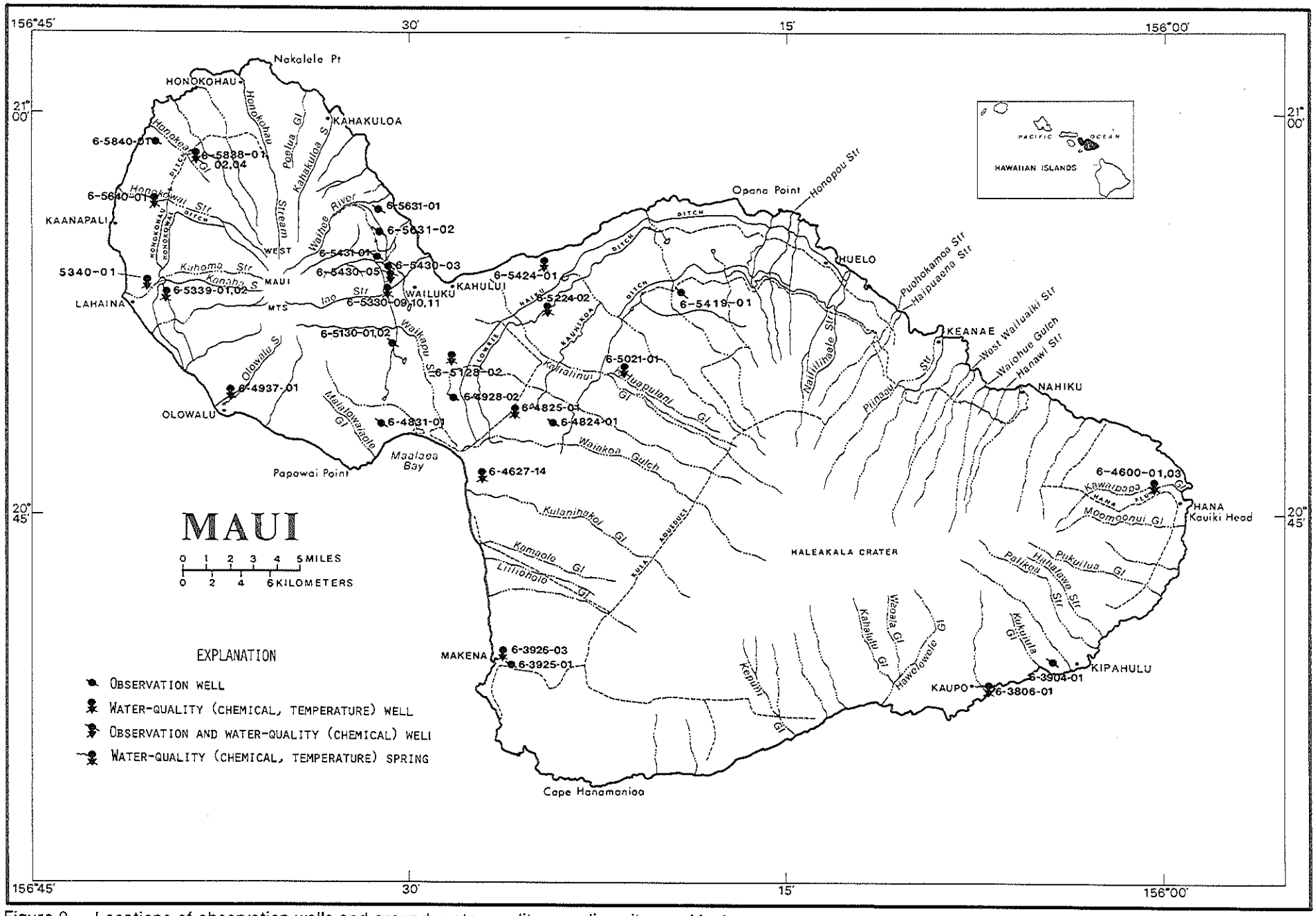

Figure 9.--Locations of observation wells and ground-water quality sampling sites on Maui.

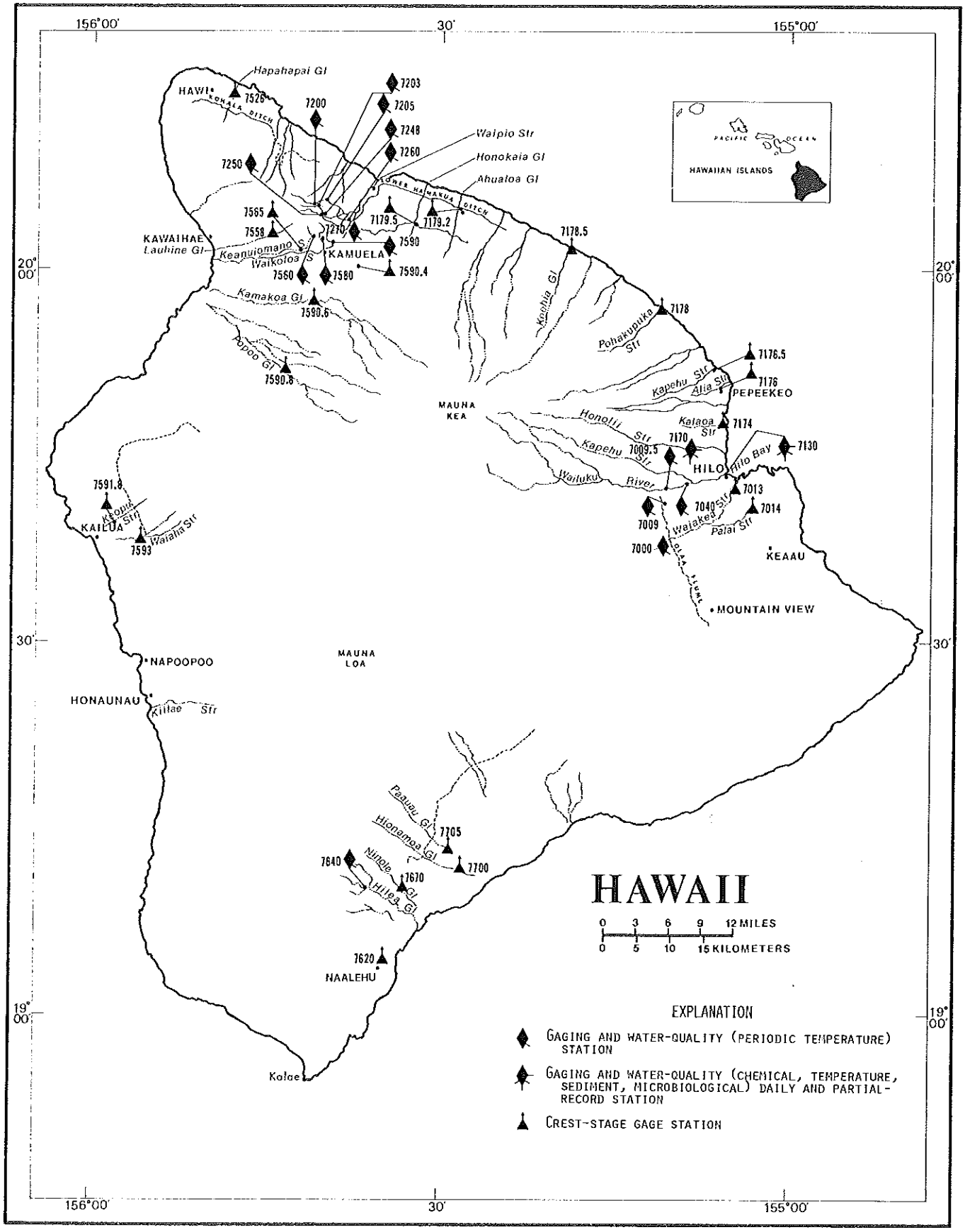

Figure 10.--Locations of gaging, water-quality, and partial-record stations on Hawaii.

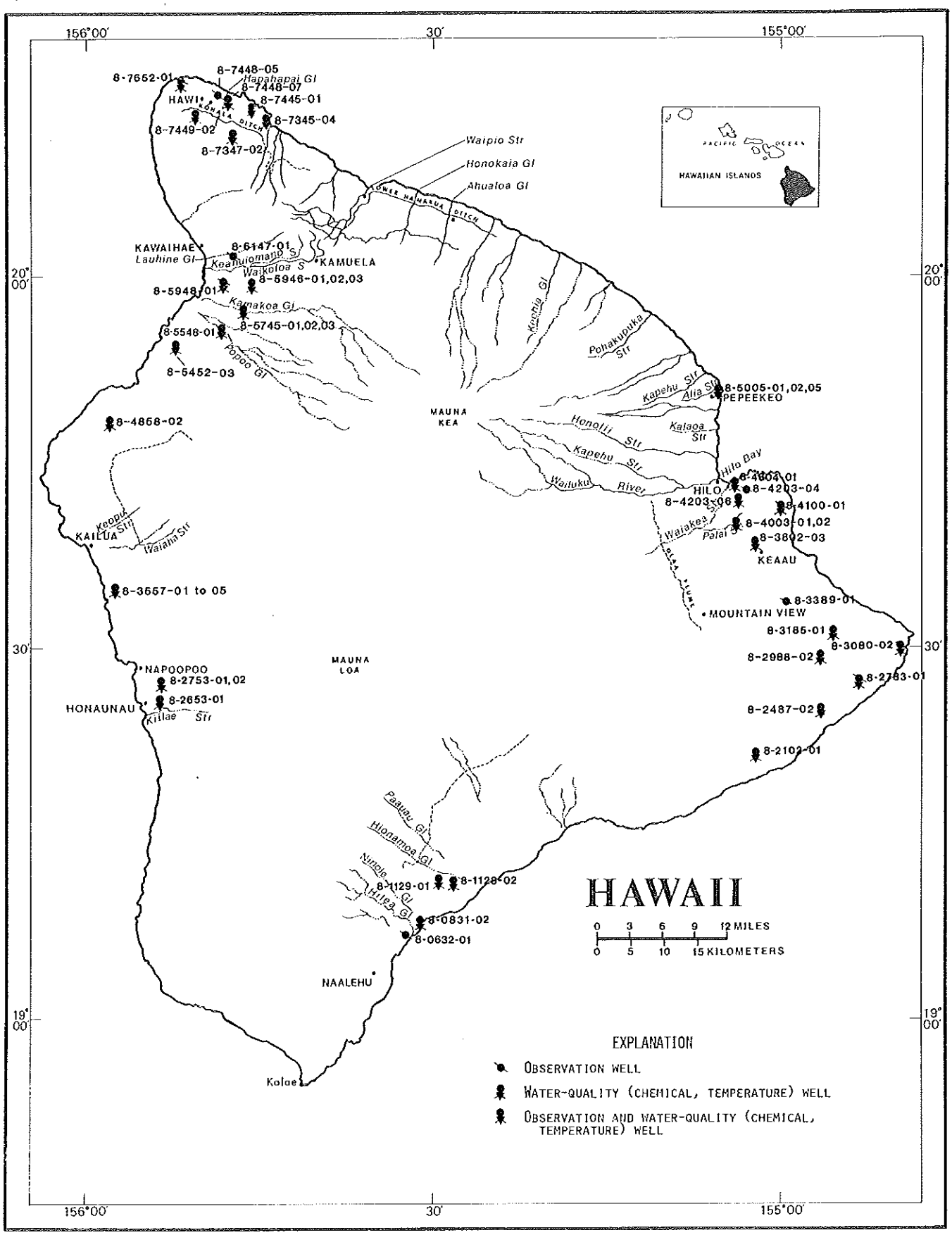

Figure 11.--Locations of observation wells and ground-water quality sampling sites on Hawaii.

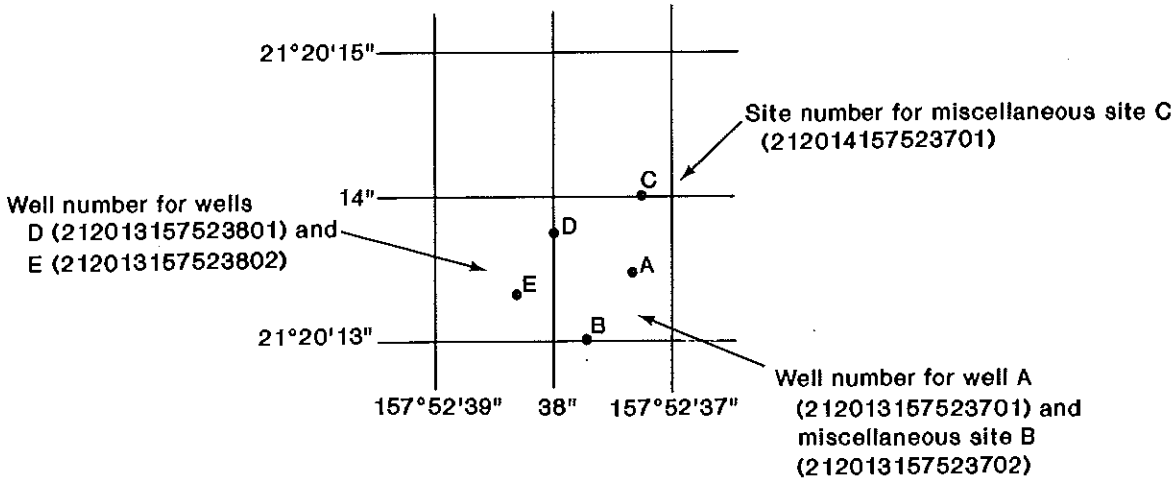

Figure 12.--Sketch showing system for numbering wells and miscellaneous sites.

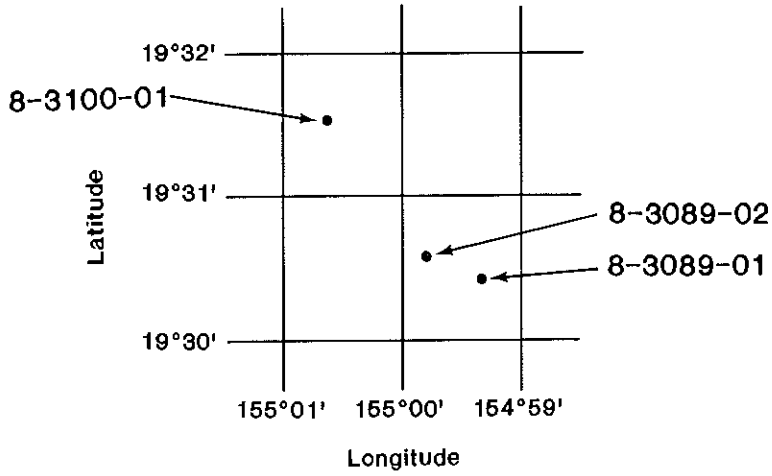

Figure 13.--Sketch showing local well numbering system.

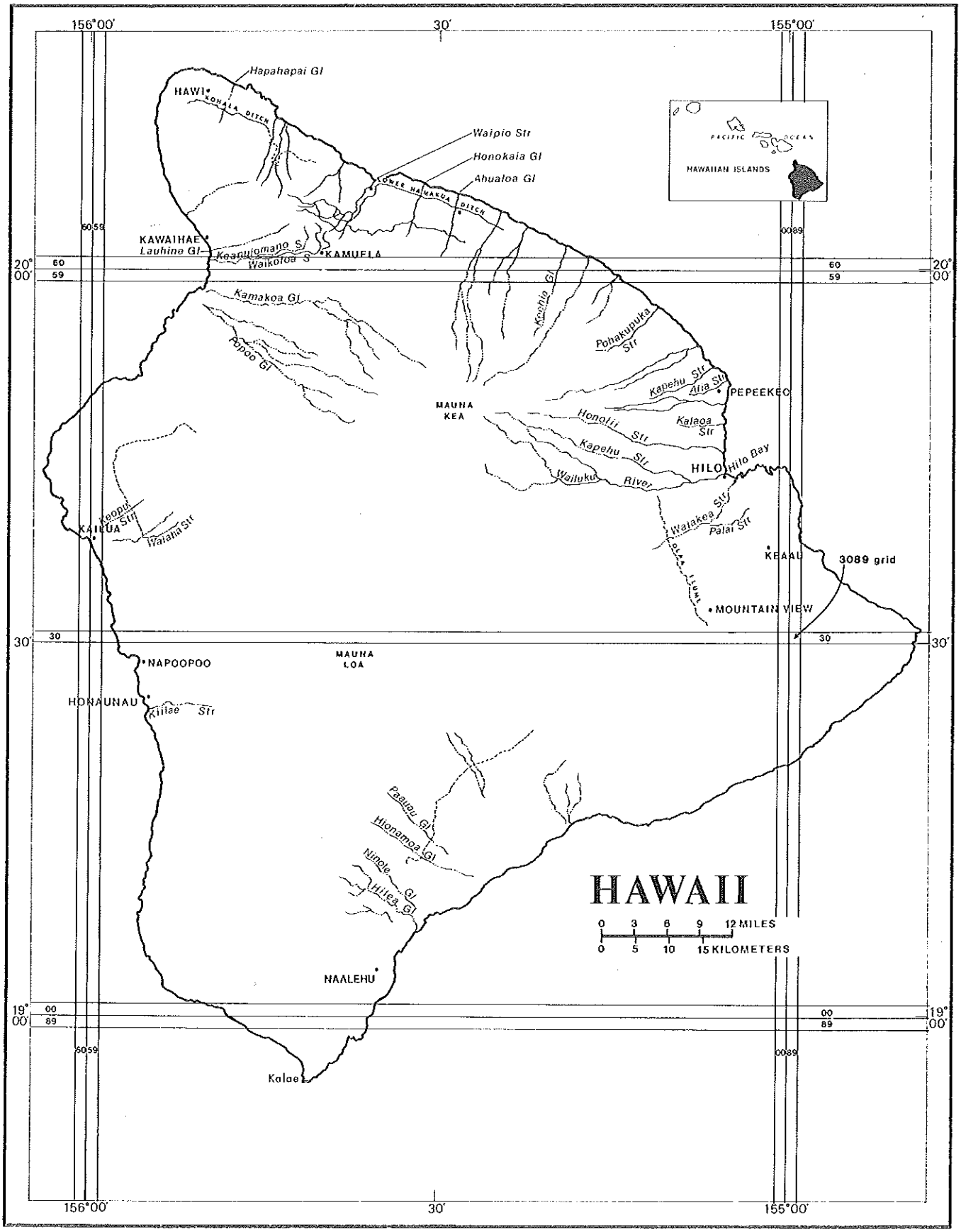

Figure 14.--Map of Hawaii showing system for numbering local well numbers.

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 natual 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 computed 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.

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

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

Surface water aamples for analyses usually are collected at or near gaging stations. The water-quality records are given immediately following the diacharge 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 atstements 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 dsta 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 st 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.

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic network of observation walls 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 longitiude 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 reportd 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.

Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.
1935	777	1942	949	1949	1161	1956-60	1770
1936	817	1943	991	1950	1170	1961-65	1855
1937	840	1944	1021	1951	1196	1966-70	2010
1938	845	1945	1028	1952	1226	1971-74	2162
1939	886	1946	1078	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

ACCESS TO WATSTORE DATA

The National WATer Data STOrage and REtrievsl Syatem (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 releaaing the data to the public. The system is operated and maintained on the central computer facilitiea 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 atatistical analyses. A minimal fee, plus the actual computer cost incurred in producing a deeirad product, is charged to the requester. Informstion 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).

Gsneral 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. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

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

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

2-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.

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

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

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

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

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

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

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

3-A9. *Measurement of time of travel in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

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.

3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.

3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

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.

3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathbun, N. Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

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

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

3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction*, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics*, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

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

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

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

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

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

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

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

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

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

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M. 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.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

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

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

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

6-A1. *A modular three-dimensional finite-difference ground-water flow model*, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

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

7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels*, by R. W. Schaffrannek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

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

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

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

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--72 years (water years 1912, 1914, 1920-89), 34.8 ft^3/s (25,210 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s, Jan. 13, 1967, gage height, 15.33 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurements at gage heights 12.12 ft and 13.43 ft; minimum, 1.14 ft^3/s, Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 2,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	0800	4,520	10.42	Feb. 23	1400	5,580	11.48
Nov. 6	0900	4,940	10.84	Mar. 2	1300	2,800	8.62
Jan. 11	1000	2,880	8.73	July 23	1100	*5,910	*11.81

Minimum discharge, 3.6 ft^3/s, June 28, 29.

DISCHARGE, IN 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	6.6	8.1	7.5	24	12	180	24	18	7.1	6.9	39	11
2	5.7	12	7.7	17	233	472	25	14	6.7	4.9	128	32
3	5.2	8.7	7.2	13	39	524	17	18	7.7	6.1	61	18
4	4.7	640	6.5	26	25	99	535	14	6.5	99	34	16
5	4.4	61	7.6	27	33	54	60	11	42	52	22	10
6	4.5	841	79	53	35	40	164	10	30	143	17	7.5
7	6.8	84	15	43	21	61	91	9.7	11	74	16	6.8
8	5.9	28	9.2	82	16	36	393	9.2	7.4	15	14	6.8
9	6.1	23	7.6	46	14	26	129	8.6	6.5	9.1	12	6.2
10	13	25	6.9	219	71	24	45	8.3	6.9	11	13	30
11	13	18	6.5	808	44	21	29	10	6.2	32	14	14
12	6.7	14	6.4	105	21	20	53	8.5	5.6	12	11	7.9
13	5.6	13	6.4	620	15	18	63	7.9	5.2	61	9.6	6.4
14	6.9	11	6.8	170	13	16	71	10	5.0	102	8.7	5.8
15	19	10	10	52	12	14	26	14	4.9	45	8.2	5.3
16	48	9.0	365	35	12	14	20	11	5.0	85	7.7	5.6
17	18	8.4	178	32	11	13	17	8.4	8.2	20	7.5	6.9
18	8.4	8.2	150	27	10	15	15	7.3	6.5	14	7.8	6.4
19	6.0	9.9	58	22	126	17	16	7.1	5.1	27	11	5.5
20	5.0	42	24	19	703	14	34	8.5	4.6	134	12	5.4
21	4.5	55	19	17	595	14	18	8.1	4.5	214	56	5.0
22	4.2	37	76	17	347	12	79	60	4.6	243	21	4.9
23	4.0	22	35	15	1650	10	22	49	4.5	1250	12	13
24	4.1	17	24	14	214	9.9	40	21	4.1	61	8.5	43
25	4.4	18	18	13	82	11	21	14	4.0	33	7.4	22
26	5.8	14	14	12	54	16	14	9.0	3.9	27	7.6	8.4
27	7.4	14	14	11	47	12	92	8.0	3.7	24	7.3	6.0
28	8.8	10	12	18	79	10	63	7.3	3.6	21	6.5	5.2
29	17	8.6	31	109	---	8.5	22	6.5	5.8	44	7.2	4.7
30	41	8.1	55	17	---	8.1	23	13	19	29	6.6	4.4
31	20	---	88	13	---	14	---	8.6	---	36	6.1	---
TOTAL	320.7	2058.2	1351.3	2694	4534	1803.5	2221	418.0	245.8	2935.0	599.7	330.1
MEAN	10.3	68.6	43.6	86.9	162	58.2	74.0	13.5	8.19	94.7	19.3	11.0
MAX	48	841	365	808	1650	524	535	60	42	1250	128	43
MIN	4.0	8.1	6.4	11	10	8.1	14	6.5	3.6	4.9	6.1	4.4
AC-FT	636	4080	2680	5340	8990	3580	4410	829	488	5820	1190	655

CAL YR 1988	TOTAL	13333.8	MEAN	36.4	MAX	1030	MIN	3.8	AC-FT	26450
WTR YR 1989	TOTAL	19511.3	MEAN	53.5	MAX	1650	MIN	3.6	AC-FT	38700

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 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1920 to July 1932, June 1952 to current year. Prior to July 1954, published as Waialae River at altitude 3,700 ft 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.--48 years (water years 1921-31, 1953-89), 22.1 ft^3/s (16,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s, Jan. 16, 1921, gage height, 8.44 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 ft^3/s, May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0430	2,300	5.97	Feb. 23	1030	*2,960	*6.79
Dec. 20	0100	2,120	5.73	July 23	0730	2,740	6.52

Minimum discharge, 1.9 ft^3/s, June 28.

DISCHARGE, IN 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	3.8	3.8	5.5	82	7.0	80	4.3	5.0	4.3	2.2	27	3.9
2	3.3	3.1	5.0	35	197	471	8.5	4.5	4.1	2.2	55	37
3	3.1	2.7	4.5	20	22	383	6.6	4.7	3.9	2.3	27	13
4	2.9	123	4.0	20	12	73	52	4.1	3.7	11	43	7.5
5	2.7	116	5.2	21	12	e35	19	3.7	12	40	15	5.5
6	6.5	437	88	53	19	e25	40	3.5	22	60	12	4.4
7	14	42	13	84	9.5	e30	22	3.4	6.8	22	12	4.6
8	5.0	12	7.2	179	7.4	e22	43	3.2	4.3	6.6	10	5.5
9	3.5	11	5.5	55	8.7	e17	28	3.1	3.5	4.0	7.7	4.9
10	8.4	14	4.8	219	114	e15	11	3.1	3.3	3.8	7.9	7.0
11	8.4	12	4.2	e770	22	e13	7.5	3.0	3.1	8.8	6.4	6.1
12	3.9	8.0	15	e138	12	e11	8.0	4.1	2.9	6.1	7.1	4.1
13	6.1	7.2	19	e550	8.5	e9.6	7.8	5.3	2.7	18	6.9	3.3
14	20	7.2	9.2	222	7.1	e8.6	19	12	2.6	19	5.5	3.1
15	15	5.2	20	35	6.1	e8.0	8.5	215	2.5	15	5.4	2.9
16	14	4.2	e120	e34	5.6	e8.0	5.2	95	2.5	69	6.8	3.3
17	13	3.8	e80	e88	5.2	e7.0	4.2	12	2.6	16	6.5	12
18	5.5	25	e100	23	5.2	e9.0	3.7	6.8	2.4	8.8	5.7	5.5
19	3.9	65	82	15	36	e12	3.7	5.8	2.5	5.3	12	5.2
20	3.3	27	27	12	277	e8.0	5.0	7.1	2.3	162	11	6.6
21	3.0	53	20	10	350	e8.0	8.6	5.3	2.4	225	105	5.3
22	2.9	32	e80	8.7	421	e6.0	69	41	2.3	201	16	4.0
23	2.8	26	34	8.5	1010	e5.0	22	43	2.2	711	8.5	6.2
24	2.6	22	40	8.0	172	e4.0	165	43	2.2	38	5.9	22
25	2.5	20	16	6.7	e45	11	19	20	2.2	17	4.7	7.0
26	2.6	29	21	5.8	e30	14	8.4	9.4	2.1	16	4.4	4.6
27	2.5	28	15	5.4	e20	5.8	20	31	2.0	28	3.9	3.5
28	2.8	10	13	73	e25	4.1	17	8.7	1.9	15	3.6	3.1
29	3.5	8.0	162	31	---	3.4	8.9	5.5	2.3	31	3.5	2.9
30	7.8	6.8	82	9.4	---	3.2	6.3	5.7	2.5	20	3.4	2.8
31	6.8	---	186	6.9	---	3.2	---	5.1	---	14	3.4	---
TOTAL	186.1	1164.0	1288.1	2828.4	2866.3	1312.9	651.2	622.1	116.1	1798.1	452.2	206.8
MEAN	6.00	38.8	41.6	91.2	102	42.4	21.7	20.1	3.87	58.0	14.6	6.89
MAX	20	437	186	770	1010	471	165	215	22	711	105	37
MIN	2.5	2.7	4.0	5.4	5.2	3.2	3.7	3.0	1.9	2.2	3.4	2.8
AC-FT	369	2310	2550	5610	5690	2600	1290	1230	230	3570	897	410

CAL YR 1988	TOTAL	5836.8	MEAN	15.9	MAX	437	MIN	2.0	AC-FT	11580
WTR YR 1989	TOTAL	13492.3	MEAN	37.0	MAX	1010	MIN	1.9	AC-FT	26760

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 1988 TO SEPTEMBER 1989

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)	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
NOV												
07...	1055	37	25	6.20	18.0	5	5	0.81	0.68	2.7	53	0.5
JAN												
17...	1010	130	24	6.90	14.5	4	4	0.63	0.59	2.6	56	0.6
MAR												
24...	1100	3.5	28	6.60	17.0	5	5	0.74	0.76	3.5	59	0.7
JUN												
13...	1005	2.7	36	6.80	17.0	6	6	1.0	0.94	4.0	55	0.7
AUG												
15...	1030	5.4	28	6.30	16.5	5	5	0.76	0.71	3.5	59	0.7

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											
07...	0.30	2.0	16	4.6	<0.10	2.5	29	0.04	<0.100	410	17
JAN											
17...	0.30	2.0	9.1	5.6	0.10	1.3	22	0.03	<0.100	220	13
MAR											
24...	0.30	2.0	9.4	6.0	0.10	5.8	29	0.04	0.130	320	2
JUN											
13...	0.50	3.0	<1.0	6.4	<0.10	6.9	--	--	<0.100	260	5
AUG											
15...	0.30	3.0	<1.0	6.2	<0.10	5.5	--	--	<0.100	330	3

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

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

LOCATION.--Lat 21°59'02", long 159°39'47", Hydrologic Unit 20070000, on right bank 1.3 mi upstream from Makaweli River and 1.9 mi north of Waimea Post Office.
DRAINAGE AREA.--57.8 mi^2.

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 maan 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.--48 years (water years 1911-17, 1945-68, 1970-72, 1976-89), 128 ft^3/s (92,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft^3/s, Feb. 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft^3/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 ft^3/s, from rating curve extended above 2,200 ft^3/s on basis of slope-area measurement at gage height 19.05 ft.
EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 8,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 8	0830	20,580	16.23	Feb. 23	1530	20,820	16.94
Jan. 11	1200	8,920	12.46	Mar. 2	1630	11,730	13.69
Jan. 13	2000	9,320	12.66	July 23	1200	*21,460	*17.13

Minimum discharge, 3.8 ft^3/s, Oct. 5.

DISCHARGE, IN 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	5.0	9.9	11	350	26	1540	28	17	11	8.5	159	15
2	5.0	6.3	10	231	1290	4640	32	14	27	7.7	278	24
3	4.9	5.8	9.7	98	397	4620	73	13	23	7.5	318	124
4	4.5	1850	9.2	79	143	1790	907	12	12	26	176	25
5	4.7	446	11	92	98	904	386	11	11	248	150	19
6	5.4	5760	422	114	109	626	433	10	102	334	e170	16
7	7.7	592	81	358	68	546	269	11	32	175	e90	16
8	8.9	220	27	576	47	468	807	10	12	35	e50	16
9	9.9	130	16	238	38	382	519	10	9.1	12	e35	16
10	21	128	11	714	681	313	166	11	8.5	6.6	e25	15
11	11	114	17	4020	393	269	80	10	7.2	9.1	e22	24
12	7.4	84	e100	1190	161	238	54	10	7.0	18	e50	17
13	5.8	78	e80	3980	86	214	82	11	6.6	12	e30	15
14	7.0	78	e64	2410	52	186	155	12	6.8	143	e22	15
15	26	64	100	592	39	156	75	295	7.1	85	18	14
16	28	55	600	400	31	140	26	514	7.3	339	17	14
17	23	13	945	480	25	55	17	56	7.7	50	18	15
18	12	31	1380	292	22	72	14	17	7.9	24	17	22
19	8.8	116	853	202	98	111	13	11	7.2	12	16	16
20	6.2	83	311	160	1470	87	15	10	7.2	351	28	18
21	6.0	152	222	134	2090	79	17	11	7.4	706	254	18
22	7.0	108	559	120	2450	54	210	9.3	8.3	1840	112	15
23	9.4	81	445	106	8480	41	103	141	7.4	6600	31	15
24	6.5	45	309	92	2420	35	489	98	7.8	736	19	51
25	6.0	82	206	51	1000	35	194	85	7.8	280	16	31
26	5.2	40	154	20	681	73	49	29	8.0	180	15	20
27	5.8	72	182	16	579	44	119	40	7.8	260	15	15
28	5.9	21	117	76	554	32	168	28	8.1	180	15	14
29	6.1	13	348	364	---	30	60	11	9.0	135	16	14
30	7.8	12	387	64	---	29	24	9.6	9.0	210	15	14
31	17	---	588	33	---	28	---	10	---	92	14	---
TOTAL	292.9	10488.0	8374.9	17652	23526	17839	5584	1536.9	400.2	13124.4	2209	659
MEAN	9.45	350	270	569	840	575	185	49.6	13.3	423	71.3	22.0
MAX	28	5780	1380	4020	8480	4640	907	514	102	6600	318	124
MIN	4.5	5.8	9.2	16	22	28	13	9.3	8.8	7.5	14	14
AC-FT	581	20800	16610	35010	46680	35380	11040	3050	794	26030	4380	1310

CAL YR 1988	TOTAL	39783.2	MEAN	109	MAX	5760	MIN	4.4	AC-FT	78910
WTR YR 1989	TOTAL	101666.3	MEAN	279	MAX	8480	MIN	4.5	AC-FT	201700

e Estimated

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 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
11...	1030	765	13	125	7.90	23.0	64	8.3	96	1400
DEC										
12...	1045	764	45	110	7.80	21.0	5.1	8.6	96	970
JAN										
11...	0950	--	3300	--	--	23.0	--	--	--	--
FEB										
01...	1000	764	49	100	7.30	19.5	3.0	8.7	95	460
APR										
26...	1100	764	43	77	6.90	20.0	110	9.1	100	3900
JUN										
14...	1030	764	6.2	165	7.90	24.0	0.60	7.8	93	220
AUG										
14...	1130	764	24	110	6.90	24.5	1.5	5.0	60	610

DATE	TIME	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
11...	1030	1700	55	5	8.4	8.3	7.4	22	0.4	0.90	61
DEC											
12...	1045	790	43	0	6.0	6.9	6.8	25	0.4	0.90	53
FEB											
01...	1000	2500	36	3	4.8	5.8	6.9	29	0.5	0.60	40
APR											
26...	1100	11000	26	2	3.3	4.4	5.6	31	0.5	0.60	30
JUN											
14...	1030	240	61	0	8.1	10	9.6	25	0.5	0.70	77
AUG											
14...	1130	280	38	0	5.1	6.2	6.8	27	0.5	0.60	48

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
11...	0	49	50	4.1	9.6	0.10	21	85	90
DEC									
12...	0	44	44	4.0	9.8	<0.10	23	82	85
FEB									
01...	0	33	33	4.6	10	0.10	18	66	72
APR									
26...	0	25	25	1.3	7.9	0.10	16	55	55
JUN									
14...	0	63	63	2.0	13	0.10	24	94	105
AUG									
14...	0	39	40	<1.0	8.8	0.10	19	81	--

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

16031000 WAIMEA RIVER NR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
11...	0.12	<0.100	0.030	0.060	0.37	0.40	0.040	0.020	0.010
DEC									
12...	0.11	0.240	<0.010	0.020	--	<0.20	0.060	0.020	0.010
FEB									
01...	0.09	0.220	0.020	0.040	0.18	0.20	0.020	0.010	0.010
APR									
26...	0.08	0.180	0.060	0.030	0.34	0.40	0.080	0.010	<0.010
JUN									
14...	0.13	<0.100	<0.010	<0.010	--	<0.20	0.010	<0.010	<0.010
AUG									
14...	--	--	0.010	--	0.29	0.30	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)
OCT											
11...	1030	120	<1	3	<0.5	<1	2	<3	2	37	<5
FEB											
01...	1000	90	<1	2	<0.5	<1	1	<3	3	210	<5
APR											
26...	1100	100	<1	<2	<0.5	<1	2	<3	1	130	<5
AUG											
14...	1130	30	<1	<2	<0.5	<1	<1	<3	2	58	<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										
11...	<4	13	<0.1	<10	<1	<1	1.0	41	<6	23
FEB										
01...	<4	9	<0.1	<10	3	<1	<1.0	32	<6	8
APR										
26...	<4	7	<0.1	<10	4	<1	1.0	21	<6	<3
AUG										
14...	<4	7	<0.1	<10	1	<1	<1.0	33	<6	11

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				
11...	1030	68	2.4	97
DEC				
12...	1045	84	10	42
FEB				
01...	1000	7	0.93	100
APR				
26...	1100	106	12	99
JUN				
14...	1030	16	0.27	100
AUG				
14...	1130	2	0.13	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 mi^2.

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 ft^3/s capacity ditch diverts water from upstream of the station for irrigation of taro in the vicinity of the station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--46 years, 86.7 ft^3/s (62,810 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 4,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0500	11,770	11.82	Mar. 1	1400	8,080	10.18
Jan. 13	0200	9,130	10.68	July 23	0700	14,030	12.61
Feb. 23	1300	*15,800	*13.20				

Minimum discharge, 9.0 ft^3/s, Nov. 1-4.

DISCHARGE, IN 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	14	11	e29	e350	73	e1000	33	31	23	16	e120	16
2	12	9.6	e28	e200	493	e1500	42	25	65	14	e300	138
3	12	9.2	e27	e130	166	e1000	43	25	35	17	e290	47
4	12	236	e27	e140	108	e500	96	24	23	42	e350	32
5	11	344	e60	e80	108	e250	53	23	54	78	e130	24
6	40	2370	e130	e160	127	e190	52	22	76	132	e160	25
7	51	e400	e80	e400	86	e170	35	22	25	62	e80	34
8	15	e150	e66	e800	79	e90	40	25	20	21	e40	25
9	15	e90	57	e250	74	e60	39	22	28	17	e30	27
10	18	e60	54	e800	267	e50	34	21	21	15	29	25
11	18	e40	53	e3000	132	e44	28	20	18	37	25	21
12	12	e31	113	e1300	92	e40	41	23	17	19	58	18
13	25	e30	76	e2500	83	e37	29	31	17	30	32	28
14	22	e27	68	e1000	77	e35	52	40	16	67	31	32
15	37	e25	171	e450	53	e33	24	420	16	129	27	17
16	20	e23	193	e250	33	e32	21	360	16	171	38	23
17	24	e24	214	e350	30	e31	21	86	17	59	29	65
18	16	e70	458	e220	28	e70	20	26	16	39	21	30
19	13	e110	399	e140	89	e66	19	33	18	28	44	28
20	12	e110	198	e150	299	e50	23	26	16	402	31	35
21	11	e130	e100	98	699	e35	61	20	16	626	310	24
22	15	e90	e600	86	936	e30	217	57	18	628	108	21
23	18	e50	e250	108	e3500	e25	101	144	16	3120	30	21
24	12	e60	e300	71	e1000	e25	824	140	15	323	25	56
25	11	e200	e90	61	e400	e70	188	99	15	145	22	29
26	11	e110	e95	57	e300	e64	88	73	15	e100	22	21
27	10	e70	e60	56	e250	e50	59	205	16	e130	23	18
28	9.8	e40	e90	138	e200	e40	43	42	16	e110	20	18
29	10	e50	e600	160	---	34	42	27	16	e130	19	18
30	13	e40	e400	81	---	25	38	30	17	e100	19	17
31	12	---	e600	75	---	25	---	23	---	e80	19	---
TOTAL	531.8	5009.8	5686	13661	9782	5671	2406	2165	697	6887	2482	933
MEAN	17.2	167	183	441	349	183	80.2	69.8	23.2	222	80.1	31.1
MAX	51	2370	600	3000	3500	1500	824	420	76	3120	350	138
MIN	9.8	9.2	27	56	28	25	19	20	15	14	19	16
AC-FT	1050	9940	11280	27100	19400	11250	4770	4290	1380	13660	4920	1850

CAL YR 1988	TOTAL	24476.0	MEAN	66.9	MAX	2370	MIN	7.2	AC-FT	48550
WTR YR 1989	TOTAL	55911.6	MEAN	153	MAX	3500	MIN	9.2	AC-FT	110900

e Estimated

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57'28", 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 mi^2.

PERIOD OF RECORD.--July 1917 to January 1921, December 1926 to current year. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site 0.5 mi 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years 1918-20, 1928-89), 85.6 ft^3/s (82,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s, Apr. 15, 1963, gage height, 14.87 ft, from rating curve extended above 7,600 ft^3/s on basis of slope-area measurement of peak flow; minimum, 5.1 ft^3/s, May 21, 1954.
EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 8	0300	8,400	8.60	Mar. 1	1430	5,620	7.36
Jan. 13	0230	5,550	7.30	July 23	0600	*12,640	*10.01
Feb. 23	1130	8,000	8.44	Aug. 21	1030	4,750	6.90

Minimum discharge, 15 ft^3/s, Oct. 31, Nov. 1.

DISCHARGE, IN 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	18	15	21	324	39	898	22	18	21	17	119	32
2	18	18	20	155	418	1290	33	18	25	17	317	234
3	17	16	19	106	124	937	128	18	22	20	303	56
4	17	189	18	107	89	359	80	17	19	31	379	42
5	17	435	48	63	99	210	34	17	e35	42	130	25
6	40	1900	104	136	116	165	24	17	e50	87	159	54
7	47	304	25	334	80	163	20	17	e25	56	103	77
8	18	108	21	717	73	73	19	26	19	19	75	46
9	17	74	19	222	72	52	19	18	23	17	55	54
10	29	43	18	819	231	44	19	25	19	18	41	48
11	19	30	17	2720	118	38	19	23	17	28	28	27
12	17	24	219	1170	81	34	34	20	17	18	120	22
13	41	25	58	2410	71	32	37	27	17	24	54	79
14	43	21	190	976	67	31	40	51	17	63	47	37
15	30	20	86	330	65	28	17	446	17	190	28	20
16	24	19	48	206	63	28	17	267	17	173	51	22
17	27	19	40	305	61	27	17	77	18	47	25	57
18	21	71	161	175	78	65	17	32	17	25	34	33
19	19	90	190	122	203	62	17	42	19	19	53	39
20	18	87	61	127	460	45	18	28	16	597	28	47
21	18	103	39	65	1060	29	69	20	19	819	617	31
22	30	65	523	75	1440	25	229	e50	18	485	137	23
23	22	38	192	96	3090	23	101	e140	17	2240	55	23
24	18	44	268	67	946	23	988	e130	18	351	44	31
25	18	157	69	61	341	46	181	104	21	152	32	24
26	18	84	74	56	259	46	52	45	17	106	28	20
27	18	47	44	51	230	25	71	e150	19	143	26	21
28	18	28	66	105	196	21	33	45	17	113	24	20
29	19	39	537	82	---	20	21	27	20	137	24	20
30	24	27	324	44	---	19	19	e30	18	103	23	20
31	17	---	537	39	---	19	---	22	---	90	23	---
TOTAL	717	4138	4058	12285	10170	4877	2395	1967	614	6247	3182	1284
MEAN	23.1	138	131	398	363	157	79.8	63.5	20.5	202	103	42.8
MAX	47	1900	537	2720	3090	1290	988	446	50	2240	617	234
MIN	17	15	17	39	39	19	17	17	16	17	23	20
AC-FT	1420	8210	8050	24370	20170	9670	4750	3900	1220	12390	6310	2550

CAL YR 1988	TOTAL	26402	MEAN	72.1	MAX	1900	MIN	14	AC-FT	52370
WTR YR 1989	TOTAL	51934	MEAN	142	MAX	3090	MIN	15	AC-FT	103000

e Estimated

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--72 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-89), 116 ft^3/s (84,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s, Apr. 15, 1963, gage height, 22.90 ft, from rating curve extended above 13,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft^3/s, Aug. 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 5,800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0530	18,760	17.66	Apr. 24	0930	13,900	16.80
Jan. 11	1030	15,580	17.13	July 23	0730	*19,540	*17.79
Feb. 23	2130	15,820	17.17	Aug. 21	1100	12,340	16.48
Mar. 1	1530	9,280	15.67				

Minimum discharge, 6.9 ft^3/s, June 23.

DISCHARGE, IN 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	56	9.9	71	216	45	2280	16	100	73	10	171	87
2	49	9.0	62	178	374	2850	36	80	81	8.4	468	265
3	42	10	56	226	98	2510	42	77	69	8.0	565	129
4	35	195	51	202	60	1020	153	85	61	12	534	99
5	29	297	49	176	87	560	148	80	86	35	221	85
6	33	3320	175	176	112	398	117	76	132	93	278	188
7	95	555	52	406	83	695	102	75	67	101	212	245
8	39	141	20	517	93	347	100	127	56	26	198	165
9	40	101	14	234	75	245	117	102	73	30	173	177
10	32	91	10	615	235	135	71	139	63	24	171	144
11	42	74	20	6000	163	59	34	122	51	44	130	116
12	29	62	91	1520	115	48	54	72	48	23	269	99
13	54	60	115	2670	68	54	53	53	45	16	257	148
14	45	50	201	1240	22	75	152	98	31	56	205	173
15	61	36	126	542	19	101	38	358	12	387	156	72
16	46	34	183	384	16	128	23	380	12	532	171	51
17	25	42	183	416	15	126	21	173	16	155	131	117
18	20	294	244	324	25	133	15	103	12	72	126	63
19	18	239	299	223	210	157	12	107	13	43	132	56
20	8.4	163	177	231	884	160	19	84	11	487	114	76
21	9.6	183	128	168	1460	133	113	74	11	997	1370	58
22	9.4	142	260	147	1590	99	387	76	13	621	308	61
23	27	103	259	176	4060	92	199	198	7.8	2620	144	73
24	12	106	466	149	1530	92	3010	192	10	544	128	89
25	11	202	190	127	520	118	669	132	13	279	88	66
26	11	234	169	126	537	130	226	56	11	249	72	42
27	11	131	143	111	632	71	295	257	11	285	62	40
28	8.7	95	175	94	397	19	179	110	16	268	53	36
29	11	113	569	168	---	14	133	72	12	249	51	33
30	27	100	294	81	---	12	120	62	12	230	43	32
31	21	---	344	73	---	17	---	42	---	199	60	---
TOTAL	957.1	7191.9	5196	17916	13525	12878	6674	3762	1128.8	8703.4	7061	3085
MEAN	30.9	240	168	578	483	415	222	121	37.6	281	228	103
MAX	95	3320	569	6000	4060	2850	3010	380	132	2620	1370	265
MIN	8.4	9.0	10	73	15	12	12	42	7.8	8.0	43	32
AC-FT	1900	14270	10310	35540	26830	25540	13240	7460	2240	17260	14010	6120

CAL YR 1988	TOTAL	45035.7	MEAN	123	MAX	3320	MIN	5.0	AC-FT	89330
WTR YR 1989	TOTAL	88078.2	MEAN	241	MAX	6000	MIN	7.8	AC-FT	174700

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. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 23.2 ft^3/s (16,810 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft^3/s, Jan. 11; minimum daily, 4.3 ft^3/s, June 28.

DISCHARGE, IN 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	23	21	21	25	21	28	19	21	21	10	21	20
2	23	21	21	23	27	28	20	21	21	19	26	23
3	22	20	20	23	23	29	19	21	21	20	25	20
4	22	26	20	24	22	22	22	20	20	21	25	20
5	22	25	21	22	23	20	20	20	22	22	21	21
6	24	32	23	23	24	21	21	20	23	24	22	23
7	24	19	21	27	22	19	19	20	21	22	22	23
8	22	11	21	26	22	14	20	23	20	20	21	21
9	22	8.6	20	23	21	20	21	22	22	20	21	21
10	22	6.5	20	29	24	20	19	23	20	20	20	21
11	22	6.5	20	34	22	19	19	22	20	21	19	20
12	21	6.5	24	28	21	19	21	22	20	20	23	20
13	24	6.5	21	31	21	19	21	22	20	21	23	21
14	24	6.5	22	27	21	19	22	23	20	22	22	21
15	24	6.5	22	23	20	19	20	26	20	26	22	20
16	23	6.5	25	22	20	19	19	26	20	25	22	20
17	22	6.6	25	25	20	18	19	23	20	22	21	22
18	22	17	26	23	21	19	19	22	19	22	21	20
19	21	26	25	20	24	19	19	20	20	21	21	20
20	21	24	22	20	27	20	20	19	19	27	21	21
21	21	24	22	16	28	19	22	21	20	28	27	20
22	22	23	26	15	29	19	24	22	19	26	23	20
23	21	22	25	20	32	18	23	23	19	29	21	20
24	21	23	26	15	25	19	32	24	19	24	21	20
25	21	25	23	16	22	21	23	23	20	21	20	20
26	21	25	23	22	24	20	18	23	14	21	20	20
27	20	23	22	21	24	19	22	26	5.3	22	20	20
28	20	22	23	23	22	18	20	22	4.3	22	20	20
29	21	23	28	22	---	18	17	21	5.4	22	20	19
30	23	22	25	21	---	18	20	22	11	21	20	19
31	21	---	25	21	---	18	---	22	---	21	20	---
TOTAL	682	534.7	708	710	652	618	620	685	546.0	682	671	616
MEAN	22.0	17.8	22.8	22.9	23.3	19.9	20.7	22.1	18.2	22.0	21.6	20.5
MAX	24	32	28	34	32	29	32	26	23	29	27	23
MIN	20	6.5	20	15	20	14	17	19	4.3	10	19	19
AC-FT	1350	1060	1400	1410	1290	1230	1230	1360	1080	1350	1330	1220

CAL YR 1988	TOTAL	8435.7	MEAN	23.0	MAX	33	MIN	6.5	AC-FT	16730
WTR YR 1989	TOTAL	7724.7	MEAN	21.2	MAX	34	MIN	4.3	AC-FT	15320

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. Periodic determinations of temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--52 years (water years 1938-89), 10.6 ft^3/s (7,680 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 67 ft^3/s, Feb. 20; no flow for many days.

DISCHARGE, IN 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	.11	21	.00	.02	.00	1.5	.02	.00	.00	16	.00	.00
2	.11	21	.00	.01	.00	1.5	.02	.00	.00	5.7	.01	.00
3	.11	6.4	.00	.01	.00	.86	.02	.00	.00	7.7	.02	.00
4	.11	.81	.00	.02	.00	.05	.08	.00	.00	8.6	.02	.00
5	.11	.56	.00	.01	.00	.05	.00	.00	.00	14	.01	.00
6	.12	.98	.00	.01	.00	.04	.01	.00	.00	37	.00	.00
7	.08	.02	.00	.02	.00	.02	.01	.00	.00	24	.00	.00
8	.05	.01	.00	.04	.00	.02	.03	.00	.00	9.8	.00	.00
9	.05	.00	.00	.01	.00	.02	.02	.00	.00	8.0	.00	.00
10	.09	.00	.00	.13	.00	.01	.00	.00	.00	9.1	.01	.00
11	.09	.00	.00	.30	.00	.01	.00	.00	.00	12	.01	.00
12	.11	.00	.00	.06	.00	.01	.02	.00	.00	8.8	.01	.00
13	.11	.00	.00	.07	.00	.01	.03	.00	.00	11	.02	.01
14	.11	.00	.00	.05	.00	.01	.02	.00	.00	26	.02	.00
15	.11	.00	.00	.02	1.3	.01	.01	.00	.00	48	.02	.00
16	.11	.00	.03	.02	.22	.01	.01	.00	.00	49	.02	.00
17	.13	.00	.03	.02	7.3	.02	.02	.00	.00	14	.01	.00
18	.15	.00	.04	.02	19	.02	.02	.00	.00	.73	.01	.00
19	.14	.00	.02	.01	46	.02	.02	.00	.00	.57	.01	.00
20	15	.00	.02	.00	67	.02	.04	.00	.00	.77	.00	.00
21	22	.00	.02	.00	27	.02	.05	.00	.00	.52	.44	.00
22	26	.00	.06	.00	.40	.02	.08	.00	.00	.43	.02	.00
23	23	.00	.02	.00	2.9	.02	.06	.00	3.9	1.1	.02	.00
24	24	.00	.04	.00	.05	.02	1.9	.00	8.8	.03	.00	.00
25	21	.00	.02	.00	.02	.03	.02	.00	8.3	.02	.00	.00
26	24	.02	.02	.00	.02	.02	.01	.00	9.8	.01	.00	.00
27	21	.01	.02	.00	.02	.02	.01	.00	29	.00	.00	.00
28	22	.00	.01	.00	.22	.02	.00	.00	24	.00	.00	.00
29	23	.00	.05	.00	---	.02	.00	.00	23	.00	.00	.00
30	30	.00	.02	.00	---	.02	.00	.00	20	.00	.00	.00
31	23	---	.02	.00	---	.01	---	.00	---	.00	.00	---
TOTAL	276.00	50.81	.44	.85	171.45	4.43	2.53	.00	126.80	312.88	.68	.01
MEAN	8.90	1.69	.014	.027	6.12	.14	.084	.00	4.23	10.1	.022	.000
MAX	30	21	.06	.30	67	1.5	1.9	.00	29	49	.44	.01
MIN	.05	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
AC-FT	547	101	.9	1.7	340	8.8	5.0	.00	252	621	1.3	.02

CAL YR 1988	TOTAL	922.27	MEAN	2.52	MAX	42	MIN	.00	AC-FT	1830
WTR YR 1989	TOTAL	946.88	MEAN	2.59	MAX	67	MIN	.00	AC-FT	1880

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--74 years (water years 1913-14, 1916-17, 1920-89), 48.5 ft^3/s (35,140 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.-- Peak discharge greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0530	2,750	6.67	Feb. 23	1930	*5,000	*8.47
Nov. 26	1600	2,090	6.07	Mar. 1	1400	2,140	6.12
Jan. 13	0230	3,720	7.55	Apr. 24	0730	3,460	7.32

Minimum discharge, 14 ft^3/s, Nov. 3.

DISCHARGE, IN 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	29	17	39	56	27	564	24	42	106	16	54	29
2	26	17	36	48	52	523	39	38	47	16	186	68
3	24	15	33	64	29	348	38	36	32	22	146	36
4	21	96	30	77	26	168	202	33	28	21	133	29
5	20	76	32	68	29	107	55	32	39	23	73	32
6	25	596	63	57	33	93	50	30	34	60	75	75
7	28	111	30	112	25	117	36	29	27	41	58	54
8	21	51	29	122	24	69	70	30	25	22	53	37
9	26	41	26	69	23	62	77	28	32	19	62	37
10	19	37	24	212	28	52	44	26	25	20	55	38
11	18	30	23	1350	24	47	35	26	23	23	42	31
12	17	28	43	561	22	43	47	26	21	19	43	28
13	23	27	52	810	21	39	102	28	20	19	77	27
14	25	24	37	390	20	37	90	34	20	38	47	26
15	28	23	31	169	19	34	44	35	19	66	40	25
16	31	22	194	125	19	35	37	39	19	182	40	27
17	22	50	110	144	19	32	33	31	22	42	35	35
18	19	59	106	88	18	34	31	26	19	31	35	27
19	18	83	117	68	57	34	30	26	19	27	35	30
20	17	55	59	73	179	51	33	28	18	129	31	28
21	16	53	53	54	529	32	44	24	19	208	132	26
22	19	64	84	47	426	28	179	30	19	125	69	24
23	16	44	93	46	831	27	71	27	18	539	44	24
24	18	44	237	42	296	26	682	44	19	165	39	35
25	16	60	74	38	146	28	125	80	18	86	34	25
26	22	244	97	35	131	34	72	30	17	73	32	23
27	17	92	65	33	131	28	92	59	19	70	30	22
28	17	56	58	33	138	25	74	31	18	66	29	21
29	17	58	103	32	---	24	55	27	17	62	30	20
30	31	46	79	29	---	24	50	36	17	55	27	22
31	20	---	75	27	---	25	---	27	---	59	27	---
TOTAL	668	2219	2132	5079	3322	2790	2561	1018	776	2344	1813	961
MEAN	21.5	74.0	68.8	164	119	90.0	85.4	32.8	25.9	75.6	58.5	32.0
MAX	31	596	237	1350	831	564	682	60	106	539	186	75
MIN	16	15	23	27	18	24	24	24	17	16	27	20
AC-FT	1320	4400	4230	10070	6590	5530	5080	2020	1540	4650	3600	1910

CAL YR 1988	TOTAL	18063	MEAN	49.4	MAX	596	MIN	15	AC-FT	35870
WTR YR 1989	TOTAL	25663	MEAN	70.4	MAX	1350	MIN	15	AC-FT	50940

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--52 years (water yesrs 1938-89), 16.0 ft^3/s (11,590 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37 ft^3/s, Oct. 20; minimum daily, 2.8 ft^3/s, Nov. 21.

DISCHARGE, IN 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	23	25	21	9.2	6.3	7.4	13	13	12	24	17	15
2	22	25	21	9.0	6.6	7.7	13	13	12	24	17	18
3	22	25	21	9.0	6.7	7.4	13	13	12	23	17	16
4	22	25	21	9.0	6.9	7.2	12	13	12	23	17	17
5	21	24	21	9.0	7.2	6.7	12	13	12	22	17	17
6	21	26	22	9.0	7.3	6.3	12	13	12	22	17	17
7	21	26	22	8.7	7.4	6.3	11	13	12	22	17	17
8	20	25	22	8.5	7.6	6.1	10	13	12	22	17	17
9	20	24	22	8.6	7.8	6.1	9.7	13	12	22	17	17
10	20	22	22	8.4	7.5	6.0	8.9	13	12	22	17	17
11	20	21	22	9.8	6.9	5.7	8.2	13	12	22	17	16
12	20	20	22	9.8	6.2	5.5	7.7	12	12	22	17	16
13	21	18	23	9.5	5.6	5.2	8.0	12	12	22	17	15
14	22	17	24	9.1	5.6	5.0	8.6	12	12	22	17	15
15	23	15	24	8.7	5.9	5.6	9.0	12	12	22	16	15
16	24	7.2	24	8.8	6.1	8.9	9.3	13	12	24	16	15
17	24	4.3	24	8.4	6.3	8.5	9.5	13	12	25	16	15
18	24	3.6	24	8.4	6.4	7.9	9.7	13	12	25	16	15
19	23	3.3	24	8.2	6.6	7.2	9.9	13	12	25	16	15
20	37	3.1	24	8.1	7.0	6.6	10	13	12	23	16	15
21	29	2.8	24	8.0	7.4	7.2	10	12	12	17	16	15
22	25	5.7	24	7.9	7.6	7.6	11	12	22	17	16	15
23	25	14	24	7.7	8.0	6.6	11	12	29	17	16	15
24	25	15	24	7.4	7.8	9.6	11	12	28	17	16	15
25	25	16	24	7.4	7.5	10	12	13	27	17	15	15
26	25	17	24	7.2	7.4	11	12	13	26	17	15	15
27	25	19	14	6.9	7.2	12	12	12	26	17	15	19
28	25	20	8.2	6.8	7.0	11	13	12	25	17	15	24
29	25	20	8.1	6.7	---	11	13	12	25	17	14	23
30	25	21	9.5	6.5	---	12	13	12	25	17	15	24
31	25	---	9.5	6.4	---	13	---	12	---	17	15	---
TOTAL	729	510.0	643.3	255.9	193.6	246.5	322.5	390	485	645	502	498
MEAN	23.5	17.0	20.8	8.25	6.91	7.95	10.7	12.6	16.2	20.8	16.2	16.6
MAX	37	26	24	9.8	8.0	13	13	13	29	25	17	24
MIN	20	2.8	8.1	6.4	5.6	5.0	7.7	12	12	17	14	15
AC-FT	1450	1010	1280	506	384	489	640	774	962	1280	996	988

CAL YR 1988	TOTAL	7953.4	MEAN	21.7	MAX	37	MIN	2.8	AC-FT	15760
WTR YR 1989	TOTAL	5420.6	MEAN	14.9	MAX	37	MIN	2.8	AC-FT	10750

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--37 years, 124 ft^3/s (89,840 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0400	5,850	8.10	Mar. 1	1430	4,890	7.56
Nov. 26	1530	4,440	7.26	Apr. 24	0800	7,930	9.14
Jan. 11	1800	*9,100	*9.64	July 23	0700	4,400	7.23
Feb. 23	2000	8,580	9.43				

Minimum discharge, 9.0 ft^3/s, Oct. 28.

DISCHARGE, IN 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	64	12	75	e160	70	1390	53	101	165	17	122	39
2	55	11	66	e140	220	1530	83	89	99	15	384	149
3	51	11	59	e180	74	1240	103	81	73	18	347	73
4	47	210	54	e160	57	510	381	75	63	21	386	52
5	45	201	54	e140	73	317	149	69	77	26	196	53
6	64	1600	163	e140	81	253	131	66	92	78	208	127
7	86	361	58	e350	68	310	98	64	51	72	180	126
8	48	170	56	e500	70	198	129	104	45	25	168	92
9	53	139	48	e270	67	169	190	70	67	20	175	90
10	59	122	43	e600	114	153	108	72	51	17	182	80
11	47	106	40	e3500	122	141	92	64	43	15	126	65
12	31	96	114	e1000	117	131	110	60	41	12	147	57
13	33	92	119	e1500	81	121	193	69	40	10	202	101
14	39	88	121	999	46	112	192	82	36	26	148	74
15	47	84	81	446	55	102	80	179	37	152	113	49
16	64	83	353	337	49	99	66	254	36	399	115	54
17	41	114	240	421	51	97	60	104	41	69	88	93
18	35	225	333	299	37	103	57	69	35	54	83	55
19	34	226	265	255	113	108	55	88	34	37	85	56
20	28	153	153	243	395	109	60	87	32	376	73	62
21	16	149	117	162	1040	65	86	57	31	662	525	53
22	15	133	295	165	1090	48	352	70	33	442	196	45
23	18	98	255	187	2090	37	167	83	26	1370	110	42
24	14	95	477	173	932	36	1750	117	18	472	96	67
25	13	162	181	140	393	46	372	117	16	242	85	46
26	12	479	199	124	426	61	194	68	16	207	80	39
27	12	181	139	127	427	42	300	205	20	208	74	37
28	10	113	129	150	358	45	226	86	22	209	66	35
29	9.8	125	320	107	---	50	167	68	19	179	69	34
30	18	98	202	83	---	49	138	83	18	168	41	34
31	17	---	217	90	---	53	---	67	---	150	39	---
TOTAL	1125.8	5737	5026	13148	8716	7725	6142	2848	1377	5768	4909	1979
MEAN	36.3	191	162	424	311	249	205	91.9	45.9	186	158	66.0
MAX	86	1600	477	3500	2090	1530	1750	254	165	1370	525	149
MIN	9.8	11	40	83	37	36	53	57	16	10	39	34
AC-FT	2230	11380	9970	26080	17290	15320	12180	5650	2730	11440	9740	3930

CAL YR 1988	TOTAL	41829.8	MEAN	114	MAX	1600	MIN	9.8	AC-FT	82970
WTR YR 1989	TOTAL	64500.8	MEAN	177	MAX	3500	MIN	9.8	AC-FT	127900

e Estimated

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

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

DRAINAGE AREA.--0.65 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-atage 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. Periodic determinations of water temperature for the current year are published elsewhere in the report.

AVERAGE DISCHARGE.--29 years, 2.67 ft^3/s (1,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft^3/s, Jan. 31, 1975, gage height, 5.58 ft, from rating curve extended above 415 ft^3/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft^3/s, Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 70 ft^3/s and maximum (*):

Date	Time	Diacharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0500	234	3.52	Mar. 1	1430	107	2.64
Nov. 26	1500	124	2.78	Apr. 24	0930	109	2.66
Jan. 12	1330	*326	*3.98	July 23	1500	258	3.64
Feb. 23	1930	322	3.96				

Minimum discharge, 1.0 ft^3/s, Oct. 4, Jun. 27.

DISCHARGE, IN 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	1.1	1.1	3.2	4.2	3.2	31	2.5	3.9	3.4	1.3	3.0	2.5
2	1.1	1.1	3.1	4.1	3.6	27	2.6	3.7	2.6	1.3	6.0	2.8
3	1.1	1.1	2.9	4.0	3.1	20	2.6	3.6	2.0	1.4	6.8	2.4
4	1.2	3.7	2.8	4.0	2.9	13	4.8	3.4	1.9	1.3	5.5	2.2
5	1.2	3.7	3.0	3.8	2.9	10	3.1	3.2	1.9	1.3	4.5	2.2
6	1.1	35	3.6	3.7	2.8	8.8	2.7	3.2	1.9	1.5	4.7	2.5
7	1.3	7.7	2.8	5.0	2.7	8.4	2.6	3.1	1.8	1.4	4.0	2.4
8	1.2	4.4	2.7	4.7	2.6	7.1	2.8	3.0	1.8	1.3	3.8	2.3
9	1.9	3.8	2.8	4.0	2.6	8.5	2.9	2.9	1.8	1.3	8.7	2.2
10	1.2	3.2	2.6	8.4	2.6	5.9	2.6	2.8	1.8	1.3	4.8	2.1
11	1.2	2.8	2.5	80	2.5	5.5	2.5	2.7	1.7	1.3	4.2	2.0
12	1.2	2.6	3.2	53	2.4	5.1	2.7	2.6	1.7	1.2	4.0	2.0
13	1.2	2.5	6.5	51	2.4	4.7	3.1	2.6	1.7	1.2	4.7	1.9
14	1.2	2.3	4.1	30	2.4	4.4	2.9	2.8	1.6	1.2	4.0	1.9
15	1.2	2.5	3.4	19	2.5	4.2	2.8	2.4	1.6	1.8	3.7	1.9
16	1.2	2.5	6.5	14	2.4	4.2	2.4	2.3	1.6	3.4	3.5	1.9
17	1.2	2.9	7.0	12	2.3	3.9	2.4	2.2	1.6	1.8	3.4	2.0
18	1.1	2.9	7.8	9.8	2.3	3.9	2.3	2.2	1.5	1.4	3.3	1.9
19	1.1	3.2	9.1	8.5	2.7	3.7	2.3	2.2	1.5	1.3	3.1	1.9
20	1.1	2.9	6.3	7.7	5.0	3.4	2.3	2.1	1.5	2.5	3.0	1.9
21	1.1	3.0	5.6	6.8	20	3.2	2.3	2.0	1.6	5.9	4.0	1.8
22	1.4	3.1	6.4	6.1	18	3.2	6.0	2.0	1.5	3.5	3.4	1.8
23	1.2	2.8	6.1	5.7	46	3.1	3.1	2.0	1.5	39	3.1	1.7
24	1.1	2.8	12	5.6	21	3.0	16	2.2	1.4	10	2.9	1.8
25	1.1	2.8	6.3	5.0	11	3.0	5.4	2.0	1.5	6.0	2.9	1.7
26	1.2	12	6.2	4.7	8.5	3.7	4.5	1.9	1.3	4.9	2.8	1.7
27	1.1	5.0	5.8	4.4	9.2	2.9	9.0	2.1	1.5	4.2	2.7	1.6
28	1.1	4.0	5.4	4.4	9.7	2.8	5.2	1.9	1.3	3.8	2.7	1.6
29	1.2	3.8	5.7	4.0	---	2.7	4.5	1.9	1.4	3.5	2.6	1.6
30	1.2	3.5	5.1	3.6	---	2.6	4.2	2.0	1.3	3.3	2.6	1.6
31	1.2	---	4.5	3.4	---	2.6	---	1.9	---	3.2	2.5	---
TOTAL	37.0	134.7	154.8	384.6	199.3	213.5	114.9	78.6	51.2	117.8	120.9	59.8
MEAN	1.19	4.49	4.99	12.4	7.12	6.89	3.83	2.54	1.71	3.80	3.90	1.99
MAX	1.9	35	12	80	46	31	16	3.9	3.4	39	8.7	2.8
MIN	1.1	1.1	2.5	3.4	2.3	2.6	2.3	1.9	1.3	1.2	2.5	1.6
AC-FT	73	267	307	763	395	423	228	156	102	234	240	119

CAL YR 1988	TOTAL	1141.0	MEAN	3.12	MAX	35	MIN	1.0	AC-FT	2260
WTR YR 1989	TOTAL	1667.1	MEAN	4.57	MAX	80	MIN	1.1	AC-FT	3310

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.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane in vicinity of Kealia. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--52 years (water years 1938-89), 6.77 ft^3/s (4,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s, Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft^3/s, Dec. 16, Jan. 11; minimum daily, 0.17 ft^3/s, Aug. 19, 20.

DISCHARGE, IN 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	8.3	9.1	11	.94	.20	12	9.4	.98	14	8.8	.26	.27
2	7.7	9.4	9.9	.89	.24	9.0	10	.84	13	7.4	2.5	.29
3	7.6	9.0	9.2	.90	.23	4.9	10	.73	7.4	4.7	3.8	.27
4	7.3	6.4	8.7	.86	.22	3.0	9.5	.67	3.6	8.0	2.3	.26
5	7.1	1.9	8.9	.78	.23	1.6	1.8	.64	9.5	11	1.4	.26
6	8.2	13	12	.78	4.1	.92	1.3	.61	9.9	13	.80	.33
7	9.1	4.6	9.2	.88	9.6	.78	1.0	.62	3.4	11	.59	.29
8	8.0	2.0	8.8	.94	9.0	.64	.98	6.5	3.3	9.5	.45	.28
9	10	1.0	8.3	.93	8.7	.52	1.1	8.1	3.2	8.9	1.2	.29
10	8.7	.65	8.2	1.4	5.8	.41	1.0	4.8	2.9	9.9	.67	.26
11	8.0	.47	8.1	19	.89	.36	.91	4.4	2.9	9.6	.49	.24
12	7.8	.36	11	14	.77	.31	3.6	4.0	5.6	9.3	.39	.26
13	9.8	.30	13	9.8	2.9	.29	4.8	3.6	8.3	9.3	.34	.26
14	9.6	.25	11	5.4	7.5	.27	3.5	3.4	6.8	11	.28	.23
15	9.7	5.2	9.9	2.8	7.4	.26	3.3	3.2	5.9	13	.25	.23
16	11	8.4	19	1.6	7.3	.26	3.2	3.4	5.8	14	.23	.24
17	9.6	12	16	1.0	5.2	.27	3.0	3.2	7.7	12	.20	.25
18	8.7	12	15	.72	2.9	.27	2.8	2.8	8.2	12	.19	.48
19	8.0	12	13	.55	2.6	.30	2.5	2.8	8.8	11	.17	.43
20	7.1	12	3.5	.45	2.1	.30	2.4	2.7	8.2	8.7	.17	3.3
21	7.0	11	2.3	.39	6.1	.30	5.4	2.5	9.9	5.1	.32	9.5
22	9.2	12	1.7	.33	7.0	.36	10	2.5	8.2	3.6	.42	9.9
23	8.8	9.5	1.5	.30	11	.38	9.5	2.3	4.6	14	.36	11
24	8.7	10	1.6	.28	7.8	.38	8.9	2.5	3.5	5.8	.32	14
25	7.5	9.8	1.3	.26	2.8	.34	2.6	2.6	1.5	2.4	.32	12
28	10	12	1.3	.25	1.6	.28	1.7	2.4	4.0	1.2	.34	9.8
27	8.8	13	1.1	.23	2.1	4.9	4.6	2.3	6.0	.73	.32	9.3
28	9.2	12	1.0	.23	6.6	9.6	2.8	2.1	9.2	.54	.30	7.9
29	9.6	14	1.0	.23	---	8.9	1.8	6.2	8.8	.43	.29	4.4
30	10	12	.99	.23	---	8.9	1.3	9.4	9.4	.36	.28	3.9
31	9.3	---	.99	.21	---	8.9	---	8.9	---	.32	.27	---
TOTAL	269.4	235.33	228.48	67.54	122.88	79.88	124.69	101.69	203.5	236.58	20.22	100.42
MEAN	8.69	7.84	7.37	2.18	4.39	2.58	4.16	3.28	6.78	7.63	.65	3.35
MAX	11	14	19	19	11	12	10	9.4	14	14	3.8	14
MIN	7.0	.25	.99	.21	.20	.26	.91	.61	1.5	.32	.17	.23
AC-FT	534	467	453	134	244	158	247	202	404	469	40	199

CAL YR 1988	TOTAL	2238.39	MEAN	6.12	MAX	19	MIN	.25	AC-FT	4440
WTR YR 1989	TOTAL	1790.61	MEAN	4.91	MAX	19	MIN	.17	AC-FT	3550

16079000 KAPANI 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.--Records good. Ditch diverts from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--71 years (water years 1918-20, 1922-89), 6.18 ft^3/s (4,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s, Feb. 8, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s, Apr. 27, 28; minimum daily, 0.09 ft^3/s, Oct. 26.

DISCHARGE, IN 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	3.9	.29	3.9	1.3	13	6.7	.43	15	.81	3.9	4.7	17
2	1.9	.23	3.9	1.0	13	5.8	.38	13	5.2	6.2	12	17
3	1.9	.23	3.9	.81	11	5.1	10	9.6	8.2	13	12	18
4	2.5	.96	3.9	.68	9.4	4.6	12	8.2	8.3	12	11	16
5	3.6	2.8	6.9	.60	9.6	4.4	.69	7.5	10	9.5	7.9	16
6	5.4	3.4	13	.62	9.5	4.4	.45	1.0	12	17	7.6	18
7	6.8	2.5	8.3	.76	7.8	4.6	.36	13	14	14	4.7	18
8	4.2	3.3	6.9	.72	8.9	4.4	7.0	13	13	7.4	2.6	17
9	8.4	3.1	5.5	.60	6.5	4.4	9.6	9.7	15	5.8	1.3	18
10	5.0	2.9	5.2	1.4	7.1	4.3	9.3	13	14	9.1	1.0	18
11	4.2	11	4.9	5.3	7.8	4.2	9.1	13	13	9.7	.96	17
12	4.0	16	13	2.9	7.8	4.2	9.3	14	9.2	7.8	5.1	16
13	6.1	16	20	1.6	7.3	4.1	9.6	16	5.7	6.2	15	14
14	5.7	14	13	.84	6.4	3.5	9.2	21	7.1	15	18	10
15	5.3	8.6	8.8	.20	8.3	.18	8.7	18	7.6	21	21	5.5
16	4.3	5.6	12	.19	6.2	12	8.6	19	8.2	6.5	21	.81
17	3.3	17	11	.19	6.8	20	8.6	18	12	.51	19	.60
18	3.3	15	11	.19	7.4	19	8.6	15	6.1	.24	20	3.3
19	3.3	16	12	.17	7.8	20	8.6	17	5.8	6.2	20	3.5
20	3.3	15	11	.74	8.7	13	14	16	5.2	8.1	12	4.9
21	3.5	15	9.7	1.1	9.7	2.7	20	.48	7.8	.46	1.8	6.5
22	2.5	15	11	2.5	8.9	2.6	13	.36	8.4	.32	1.2	5.2
23	.34	14	12	4.9	10	1.9	16	.32	9.4	3.1	5.9	6.1
24	.29	14	12	4.7	5.7	1.3	20	2.3	13	.34	17	8.9
25	.17	14	11	8.3	5.2	1.2	16	11	14	.42	17	6.4
26	.09	16	11	12	5.2	1.3	17	7.8	11	.35	17	4.6
27	.23	16	11	11	5.5	.98	31	11	11	.33	16	4.3
28	.23	15	8.9	7.8	5.9	.90	31	8.3	5.3	.30	15	5.0
29	.23	13	4.5	7.8	---	.67	24	.83	4.8	.26	14	8.1
30	.28	4.0	4.4	11	---	.52	22	.46	5.4	.23	14	11
31	.29	---	2.9	13	---	.50	---	.45	---	1.9	16	---
TOTAL	94.55	289.91	276.5	104.91	222.4	163.45	354.51	313.30	270.51	187.16	351.76	314.71
MEAN	3.05	9.66	8.92	3.38	7.94	5.27	11.8	10.1	9.02	6.04	11.3	10.5
MAX	8.4	17	20	13	13	20	31	21	15	21	21	18
MIN	.09	.23	2.9	.17	5.2	.18	.36	.32	.81	.23	.96	.60
AC-FT	188	575	548	208	441	324	703	621	537	371	698	624

CAL YR 1988	TOTAL	2267.50	MEAN	6.20	MAX	24	MIN	.01	AC-FT	4500
WTR YR 1989	TOTAL	2943.67	MEAN	8.06	MAX	31	MIN	.09	AC-FT	5840

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, except for period of no gage-height record which is fair. 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). Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1923-25, 1928-89), 4.37 ft^3/s (3,170 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 56 ft^3/s, Feb. 23; minimum daily, 0.13 ft^3/s, Jan. 18, 28.

DISCHARGE, IN 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	2.9	e1.7	e3.5	.35	3.7	27	6.5	6.7	17	2.5	9.1	5.5
2	2.4	e1.7	e3.2	.29	7.7	17	6.3	5.8	9.8	2.2	11	9.4
3	2.2	e1.5	e3.0	.46	5.3	13	13	5.3	5.4	2.8	4.5	5.1
4	2.0	e5.0	e3.0	.50	5.5	8.3	28	4.7	4.5	8.0	4.6	3.7
5	1.9	e4.5	e3.5	.37	7.3	5.4	15	4.4	11	10	2.4	3.3
6	e2.2	e13	e6.8	.39	7.3	6.3	12	4.1	6.8	27	2.8	4.8
7	e2.9	e7.0	.84	.44	4.8	10	7.9	3.9	4.3	15	2.6	8.2
8	e2.1	e4.5	.72	.37	4.1	4.9	16	5.5	3.9	4.1	4.4	6.1
9	e2.5	e4.0	.63	.31	3.7	3.5	19	4.0	9.2	3.2	12	6.9
10	e2.0	e3.5	2.1	.57	4.8	2.9	4.0	3.4	4.7	4.5	7.4	7.1
11	e1.8	e3.0	2.8	1.7	4.1	5.0	4.6	3.2	3.7	5.6	6.5	4.9
12	e1.7	e2.8	10	.71	3.3	6.1	19	3.9	3.3	3.2	7.4	3.6
13	e2.3	e2.6	13	.58	3.1	5.4	15	3.4	3.1	5.3	11	4.8
14	e2.6	e2.4	5.7	.29	2.9	5.0	16	7.1	2.9	25	7.8	4.4
15	e2.8	e2.2	11	.20	2.8	4.6	7.9	9.4	2.9	27	6.6	3.2
16	e3.2	e2.1	18	.16	2.7	5.7	6.5	6.6	3.7	29	9.0	3.6
17	e2.2	e4.0	5.2	.16	2.6	4.6	5.6	5.0	8.2	14	6.1	7.5
18	e1.9	e6.0	4.9	.13	2.8	4.5	4.9	3.3	3.1	7.7	6.2	3.8
19	e1.8	e8.0	8.2	5.2	22	4.4	4.9	3.9	2.7	10	6.6	5.0
20	e1.7	e5.4	3.3	7.2	46	9.5	7.8	10	2.4	17	5.3	6.4
21	e1.6	e4.7	2.1	6.7	54	5.7	7.2	4.3	4.7	9.9	8.3	4.3
22	e1.9	e6.0	1.4	6.7	46	4.0	19	11	3.5	7.1	2.6	3.5
23	e1.8	e4.0	1.1	7.3	56	3.7	17	5.7	2.4	19	1.6	4.8
24	e1.8	e4.0	1.2	5.8	38	3.4	16	12	2.2	5.7	1.5	7.9
25	e1.6	e5.0	.64	5.1	22	4.3	8.0	14	3.7	3.8	2.4	6.0
26	e2.2	e8.0	.79	4.7	21	14	8.4	5.2	3.1	3.2	4.2	3.7
27	e1.7	e6.0	.47	4.5	30	12	16	14	5.9	2.8	3.7	3.2
28	e1.6	e5.0	.57	4.3	36	4.6	18	5.3	2.9	3.3	3.5	3.1
29	e1.7	e4.5	.75	4.7	---	4.1	9.7	5.1	3.6	7.6	3.3	2.9
30	e3.0	e4.0	.63	3.8	---	4.9	9.7	8.6	5.2	9.8	3.2	3.5
31	e2.0	---	.57	3.6	---	5.1	---	4.6	---	8.2	3.5	---
TOTAL	66.0	136.1	119.61	77.58	449.5	218.9	348.9	193.4	149.8	303.5	171.1	150.2
MEAN	2.13	4.54	3.86	2.50	16.1	7.06	11.6	6.24	4.99	9.79	5.52	5.01
MAX	3.2	13	18	7.3	56	27	28	14	17	29	12	9.4
MIN	1.6	1.5	.47	.13	2.6	2.9	4.0	3.2	2.2	2.2	1.5	2.9
AC-FT	131	270	237	154	892	434	692	384	297	602	339	298

CAL YR 1988	TOTAL	2083.41	MEAN	5.69	MAX	33	MIN	.47	AC-FT	4130
WTR YR 1989	TOTAL	2384.59	MEAN	6.53	MAX	56	MIN	.13	AC-FT	4730

e Estimated

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.--51 years (water years 1938-83, 1986-89), 2.62 ft^3/s (1,900 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily dischsrge, 0.26 ft^3/s, July 23; minimum daily discharge, no flow for most of the year.

DISCHARGE, IN 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	.00	.00	.00	.00	.00	.01	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.02	.00	.00	.00	.00	.26	.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	.00	.00	.00	.00	.02	.01	.00	.00	.00	.26	.00	.00
MEAN	.00	.00	.00	.00	.001	.000	.00	.00	.00	.008	.00	.00
MAX	.00	.00	.00	.00	.02	.01	.00	.00	.00	.26	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.04	.02	.00	.00	.00	.5	.00	.00

CAL YR 1988	TOTAL	.48	MEAN	.00	MAX	.43	MIN	.00	AC-FT	.9
WTR YR 1989	TOTAL	.29	MEAN	.00	MAX	.26	MIN	.00	AC-FT	.6

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--31 years (water years 1959-89), 11.9 ft^3/s (8,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft^3/s, July 23, 1989, gage height, 7.69 ft; minimum, 1.8 ft^3/s, Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0300	900	5.25	Apr. 24	0630	1,200	5.85
Jan. 12	1030	1,130	5.72	Jul. 16	0230	945	5.35
Feb. 23	1830	848	5.12	July 23	1500	*2,420	*7.69

Minimum discharge, 5.7 ft^3/s, Oct. 11, 12, July 1, 2.

DISCHARGE, IN 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	7.2	7.1	9.6	9.4	7.1	103	8.6	10	e15	5.8	15	7.8
2	6.8	7.7	9.0	9.1	15	69	9.7	9.6	e10	5.8	52	15
3	6.5	7.4	8.4	9.6	8.3	32	14	9.2	e9.4	5.8	43	8.5
4	6.3	70	7.9	18	11	20	73	9.0	e8.8	6.5	35	7.7
5	8.1	32	7.8	11	12	14	16	8.6	e15	7.7	17	7.4
6	6.3	135	10	19	13	18	12	8.4	e14	9.2	15	9.7
7	6.2	21	7.5	25	8.9	24	10	8.2	e9.4	12	13	10
8	6.0	11	7.1	25	8.0	12	9.6	e8.6	e9.0	6.7	11	12
9	7.2	9.5	6.9	15	7.7	12	33	7.8	e12	6.1	13	9.5
10	5.9	9.0	6.7	62	7.9	11	12	7.4	e8.0	6.3	9.6	8.9
11	5.8	8.0	6.7	224	7.5	9.6	10	e7.4	e7.4	6.9	9.0	7.9
12	5.9	7.5	10	133	7.1	9.2	19	e9.0	e7.0	6.2	9.0	7.5
13	7.0	7.2	13	91	6.9	8.8	14	e12	e6.8	6.3	22	7.3
14	6.2	6.8	7.9	45	6.8	8.6	12	e16	e6.6	19	10	7.1
15	21	6.8	24	23	6.7	8.2	10	e40	6.6	25	9.0	6.9
16	25	6.5	70	19	6.6	9.3	9.0	e45	6.8	81	9.4	7.1
17	9.4	7.8	26	18	6.5	8.4	8.8	e15	7.8	13	8.5	8.2
18	10	13	26	13	7.5	8.2	8.4	e12	6.6	9.7	8.5	7.0
19	8.6	22	68	11	29	8.4	8.4	e12	6.4	9.3	9.0	7.7
20	7.3	18	15	10	48	19	10	e14	6.2	55	8.4	9.0
21	6.9	12	11	9.5	104	10	11	e11	8.0	50	48	8.2
22	6.8	12	10	9.8	82	8.0	32	e20	6.4	45	20	7.3
23	6.9	9.3	13	9.6	135	7.8	27	e25	6.2	298	11	7.9
24	6.7	9.0	27	8.6	43	7.4	190	e35	6.0	41	9.6	8.7
25	6.5	15	10	8.3	22	8.2	24	e30	6.0	19	8.8	7.6
26	7.5	33	16	8.1	25	18	15	e15	6.1	15	8.7	7.0
27	6.6	29	10	7.8	25	13	18	e30	5.9	13	8.2	6.9
28	6.5	15	12	7.7	63	8.6	18	e13	5.9	16	7.8	6.7
29	6.9	19	17	7.8	---	8.4	12	e12	5.9	15	7.7	6.5
30	9.9	12	13	7.4	---	8.6	12	e14	6.3	12	7.5	6.4
31	7.6	---	11	7.2	---	6.4	---	e11	---	12	7.3	---
TOTAL	249.5	578.6	495.5	881.9	730.5	519.1	666.5	485.2	241.5	839.3	471.0	245.4
MEAN	8.05	19.3	16.0	28.4	26.1	16.7	22.2	15.7	8.05	27.1	15.2	8.18
MAX	25	135	70	224	135	103	190	45	15	298	52	15
MIN	5.8	6.5	6.7	7.2	6.5	7.4	8.4	7.4	5.9	5.8	7.3	6.4
AC-FT	495	1150	983	1750	1450	1030	1320	962	479	1660	934	487

CAL YR 1988	TOTAL	4998.3	MEAN	13.7	MAX	162	MIN	5.8	AC-FT	9910
WTR YR 1989	TOTAL	6404.0	MEAN	17.5	MAX	296	MIN	5.8	AC-FT	12700

e Estimated

16103000 HANALEI RIVER NEAR HANALEI

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 mi^2.

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. Periodic determinations of temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--26 years (water years 1964-89), 219 ft^3/s (158,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft^3/s, Apr. 19, 1974, gage height, 14.28 ft, from rating curve extended above 9,600 ft^3/s; minimum, 31 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0300	*20,840	*13.46	Apr. 24	0700	15,280	12.07
Jan. 13	0200	17,400	12.60	July 16	0330	19,440	13.11
Feb. 23	1930	20,480	13.37	July 23	0500	10,260	10.52

Minimum discharge, 86 ft^3/s, Oct. 12.

DISCHARGE, IN 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	116	100	150	302	132	1610	143	162	209	99	283	143
2	106	98	143	232	298	1980	185	150	167	97	896	261
3	100	92	135	240	157	1010	178	143	137	105	569	160
4	96	877	129	289	154	380	1340	135	129	137	551	142
5	94	569	131	231	191	252	281	130	217	158	262	137
6	113	3120	271	262	223	251	305	126	192	353	274	205
7	115	396	134	447	153	344	209	121	139	233	257	205
8	93	219	127	538	143	211	511	171	129	127	220	174
9	90	190	120	271	136	184	750	129	159	110	210	162
10	122	184	117	1190	206	169	262	123	129	116	202	183
11	94	161	115	4770	150	160	197	117	119	133	168	147
12	87	145	217	1960	133	154	257	131	114	113	207	133
13	116	146	150	3260	128	148	320	149	111	142	258	153
14	293	134	124	1130	123	146	271	217	108	427	185	139
15	347	127	168	389	108	140	178	539	108	494	162	122
16	296	124	1280	346	106	140	161	575	109	1850	173	141
17	156	182	424	607	105	137	153	230	120	243	151	191
18	126	267	419	278	108	137	146	160	106	187	156	145
19	110	469	369	226	378	136	153	158	105	190	169	148
20	102	279	213	270	1640	226	184	179	103	1070	146	158
21	97	248	181	195	3210	144	265	143	109	1060	1090	140
22	101	246	619	186	2030	127	740	261	104	808	318	130
23	100	203	405	202	4380	122	397	335	102	2470	193	145
24	101	195	680	168	1020	122	2660	465	101	593	169	191
25	92	281	234	158	429	149	324	402	103	277	155	151
26	126	611	334	152	436	138	208	203	100	251	152	128
27	95	246	208	148	380	142	486	356	114	289	141	121
28	102	191	224	150	605	121	342	176	102	261	135	119
29	111	202	471	160	---	117	204	159	105	280	139	115
30	176	171	327	139	---	121	187	177	114	236	129	112
31	121	---	378	134	---	136	---	150	---	238	130	---
TOTAL	3994	10453	8997	19030	17282	9354	11997	6672	3764	12947	8250	4601
MEAN	129	348	290	614	617	302	400	215	125	418	266	153
MAX	347	3120	1280	4770	4380	1980	2660	575	217	2470	1090	261
MIN	87	92	115	134	105	117	143	117	100	97	129	112
AC-FT	7920	20730	17850	37750	34240	18550	23800	13230	7470	25680	16360	9130

CAL YR 1988	TOTAL	83416	MEAN	228	MAX	3120	MIN	83	AC-FT	165500
WTR YR 1989	TOTAL	117321	MEAN	321	MAX	4770	MIN	87	AC-FT	232700

16108000 WAINIHA RIVER NEAR HANALEI

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

DRAINAGE AREA.--10.2 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--34 years (water years 1953-55, 1959-89), 141 ft^3/s (102,150 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft^3/s, Apr. 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 32 ft^3/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 ft^3/s, from unit-discharge study.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	0230	3,700	5.27	Mar. 1	1400	1,050	5.40
Jan. 13	0200	*10,350	*6.89	July 23	0600	*10,350	*6.89
Feb. 23	1200	5,870	5.94	Aug. 21	1100	3,620	5.24

Minimum, 55 ft^3/s, Oct. 22, 24, 25, 27, 28, Dec. 11.

DISCHARGE, IN 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	65	67	63	405	72	615	105	83	97	65	176	107
2	62	66	62	163	406	1360	112	76	87	63	441	306
3	60	58	59	145	121	1230	95	78	84	91	274	107
4	58	404	56	175	103	241	580	69	77	158	382	94
5	57	390	111	140	122	122	171	66	183	203	118	82
6	146	1240	215	222	154	130	371	65	160	364	174	103
7	104	198	73	366	89	202	242	63	86	183	120	120
8	65	93	64	517	80	107	558	116	77	92	92	78
9	61	99	59	221	85	91	296	68	121	73	78	92
10	92	110	57	873	271	83	130	67	78	95	72	106
11	65	92	57	2140	115	77	103	68	71	134	69	76
12	58	70	229	856	87	75	164	112	69	90	152	66
13	126	83	80	2300	77	72	188	131	68	159	96	106
14	92	68	72	825	73	75	202	165	67	288	108	77
15	93	81	86	198	70	71	107	798	67	312	82	65
16	119	57	628	188	68	69	88	620	70	732	114	92
17	89	77	380	443	67	70	79	132	90	176	75	144
18	67	254	396	149	86	79	75	87	67	106	88	103
19	61	229	237	102	329	80	102	118	81	115	122	102
20	58	208	133	125	1660	106	129	100	66	982	76	114
21	56	213	102	84	1830	77	181	77	73	1000	560	90
22	63	223	1000	79	1780	66	463	196	67	796	155	76
23	60	129	290	126	3070	64	317	198	64	1970	86	126
24	66	139	345	77	751	71	1040	272	63	338	76	129
25	57	213	109	72	244	159	165	186	70	130	70	87
26	80	232	274	69	239	84	95	108	65	159	73	70
27	58	103	118	68	158	73	280	362	80	251	67	65
28	76	77	132	137	134	69	198	97	65	180	64	65
29	91	105	526	102	---	68	108	84	82	192	70	63
30	140	74	343	71	---	76	99	113	89	133	67	62
31	82	---	465	68	---	82	---	94	---	146	76	---
TOTAL	2427	5432	6821	11506	12341	5844	6843	4869	2484	9776	4273	2973
MEAN	78.3	181	220	371	441	189	228	157	82.8	315	138	99.1
MAX	146	1240	1000	2300	3070	1360	1040	798	183	1970	560	306
MIN	56	57	56	68	67	64	75	63	63	63	64	62
AC-FT	4810	10770	13530	22820	24480	11590	13570	9660	4930	19390	8480	5900

CAL YR 1988	TOTAL	53519	MEAN	146	MAX	1850	MIN	56	AC-FT	106200
WTR YR 1989	TOTAL	75589	MEAN	207	MAX	3070	MIN	56	AC-FT	149900

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 mi^2.

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.--66 years (water years 1914-24, 1927-52, 1961-89), 16.5 ft^3/s (11,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s, Oct. 28, 1981, gage height, 13.2 ft, from rating curve extended above 68 ft^3/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft^3/s, Mar. 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 16	2100	1,300	6.24	Jan. 11	0200	1,590	6.82
Dec. 6	0200	1,480	6.59	Jan. 12	1800	*1,740	*7.07

Minimum discharge, 2.2 ft^3/s, Mar. 31, Apr. 1.

DISCHARGE, IN 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	6.1	e1.7	6.4	11	5.0	43	3.5	11	55	3.2	18	15
2	5.2	e1.6	6.0	58	50	76	e60	9.0	12	3.2	49	108
3	4.5	e1.5	5.1	25	7.9	23	16	7.9	9.9	3.1	21	8.7
4	4.1	e100	4.4	10	22	14	e50	7.2	9.6	3.1	42	8.3
5	3.8	e25	4.1	8.3	43	20	22	6.3	19	31	12	11
6	e4.5	e23	149	9.5	19	61	e20	6.1	10	61	18	41
7	e7.0	e9.0	9.7	21	9.7	29	e45	16	7.2	11	19	24
8	e12	e3.5	6.2	48	7.2	10	e150	e25	13	5.3	11	12
9	e4.0	e3.0	5.2	17	5.9	8.2	e130	e30	11	4.7	8.3	8.1
10	e3.0	e2.7	4.6	126	11	7.0	16	14	6.3	9.7	7.3	8.5
11	e2.9	e2.3	7.7	215	68	6.4	11	12	5.5	51	8.1	7.2
12	e2.9	e2.0	60	158	18	9.3	e33	9.3	5.1	8.6	43	5.7
13	e6.0	e15	6.8	255	7.1	5.7	29	11	4.7	23	110	6.2
14	e8.0	e6.0	5.1	32	6.0	5.5	32	e40	4.4	85	16	4.7
15	e3.5	e2.5	4.5	62	5.4	4.6	9.6	27	4.2	66	17	4.2
16	e2.7	e44	38	50	4.9	5.9	7.7	30	24	14	17	27
17	e2.4	10	13	22	4.5	4.4	6.7	17	26	12	12	23
18	e2.1	12	6.9	16	4.7	4.1	5.9	9.3	18	7.2	19	11
19	e2.0	5.8	24	14	11	3.9	7.2	49	6.1	32	42	21
20	e1.9	9.3	6.6	38	4.9	3.6	e64	11	5.7	165	26	20
21	e7.0	15	6.3	13	98	3.3	e45	8.4	11	144	59	8.2
22	e6.4	7.4	5.6	11	29	3.2	e30	31	5.3	128	24	7.1
23	e3.5	34	51	11	64	3.2	e20	12	4.2	21	15	5.6
24	e11	22	16	8.7	22	6.1	e17	21	17	20	13	6.1
25	e6.0	99	8.7	7.8	8.7	17	14	21	15	12	8.6	7.1
26	e3.0	41	24	7.3	7.2	7.4	11	17	4.7	25	7.4	4.5
27	e2.5	14	30	6.8	6.3	3.5	e70	21	4.7	28	6.7	3.9
28	e2.4	9.8	23	6.5	11	3.1	e50	8.4	3.9	16	7.8	5.6
29	e1.8	56	39	6.2	---	4.4	e48	8.4	3.6	45	6.0	19
30	e1.9	8.4	30	5.6	---	3.2	19	35	3.5	14	5.6	7.1
31	e2.2	---	15	5.2	---	2.5	---	85	---	13	5.3	---
TOTAL	136.3	586.5	621.9	1284.9	561.4	401.7	1044.6	616.3	329.6	1065.1	674.1	448.8
MEAN	4.40	19.6	20.1	41.4	20.1	13.0	34.8	19.9	11.0	34.4	21.7	15.0
MAX	12	100	149	255	98	76	150	85	55	165	110	108
MIN	1.6	1.5	4.1	5.2	4.5	2.5	3.5	6.1	3.5	3.1	5.3	3.9
AC-FT	270	1160	1230	2550	1110	797	2070	1220	654	2110	1340	890

CAL YR 1988	TOTAL	6463.1	MEAN	17.7	MAX	289	MIN	1.5	AC-FT	12820
WTR YR 1989	TOTAL	7771.2	MEAN	21.3	MAX	255	MIN	1.5	AC-FT	15410

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 mi^2.

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.--27 years (water years, 1961-62, 1965-89), 21.9 ft^3/s (15,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft^3/s, Apr. 15, 1983, gage height, 11.33 ft, from rating curve extended above 1,100 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
July 21	0600	*2,110	*6.77	No other peak greater than base discharge.			

Minimum discharge, 2.0 ft^3/s, Nov. 3.

DISCHARGE, IN 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	8.2	2.3	9.9	17	8.2	83	11	17	82	5.4	37	25
2	6.9	2.2	8.9	32	97	131	87	14	19	5.0	74	96
3	6.1	2.1	8.0	49	23	70	23	12	12	6.3	39	18
4	5.5	148	7.0	16	16	36	40	10	10	5.0	59	24
5	5.0	30	6.4	14	51	20	51	9.6	22	68	25	13
6	5.9	29	237	12	43	115	48	8.8	25	179	21	27
7	9.6	12	31	29	28	70	73	10	10	35	21	34
8	16	4.8	15	64	20	24	289	27	22	13	16	15
9	5.4	4.2	11	36	12	18	249	38	18	8.7	14	15
10	4.2	3.8	9.4	132	24	15	33	17	9.5	13	13	30
11	3.9	3.2	8.6	340	153	14	20	8.9	8.2	86	12	18
12	4.0	2.7	99	106	88	17	55	8.3	7.5	18	16	14
13	7.8	21	17	295	21	13	53	10	6.9	62	53	10
14	10	7.5	11	80	16	11	62	47	6.5	62	17	9.9
15	4.9	3.6	10	92	13	9.9	19	26	6.0	110	11	7.7
16	3.6	17	56	75	11	11	13	11	6.0	20	13	8.2
17	3.3	38	45	43	10	9.6	11	13	41	17	13	24
18	2.9	6.4	14	32	9.5	8.5	9.9	8.7	38	12	33	19
19	2.7	5.6	46	27	15	7.9	14	59	9.6	63	30	34
20	2.5	12	15	58	12	7.4	90	15	6.8	153	18	39
21	10	24	10	27	182	6.8	66	9.3	8.5	439	88	20
22	8.8	21	8.6	21	27	6.4	59	22	8.1	181	28	21
23	5.0	54	38	18	69	6.2	45	18	5.9	49	17	13
24	14	35	13	16	48	6.5	28	27	6.0	34	22	39
25	7.9	151	9.2	14	20	11	16	18	31	32	12	34
26	3.9	109	20	13	15	15	14	12	7.3	26	10	12
27	3.3	21	18	12	14	6.8	101	15	5.2	27	9.2	10
28	3.2	14	24	11	18	5.4	72	8.1	5.9	31	9.0	14
29	2.4	55	49	11	---	7.1	71	7.4	5.3	68	8.5	22
30	2.6	14	53	9.4	---	8.8	27	63	5.6	34	7.5	15
31	3.0	---	29	8.6	---	5.1	---	76	---	26	7.5	---
TOTAL	182.5	853.6	937.0	1710.0	1063.7	776.4	1747.9	646.1	454.8	1888.4	755.7	680.8
MEAN	5.89	28.5	30.2	55.2	38.0	25.0	58.3	20.8	15.2	60.9	24.4	22.7
MAX	16	151	237	340	182	131	289	76	82	439	88	96
MIN	2.4	2.1	6.4	8.6	8.2	5.1	9.9	7.4	5.2	5.0	7.5	7.7
AC-FT	362	1690	1860	3390	2110	1540	3470	1280	902	3750	1500	1350

CAL YR 1988	TOTAL	8911.3	MEAN	24.3	MAX	402	MIN	2.1	AC-FT	17680
WTR YR 1989	TOTAL	11696.9	MEAN	32.0	MAX	439	MIN	2.1	AC-FT	23200

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'18", 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 mi^2.

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 (Waienae Plantation bench mark).

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

AVERAGE DISCHARGE.--30 years, 1.96 ft^3/s (1,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft^3/s, Jan. 6, 1982, gage height, 7.40 ft, from floodmarks, from rating curve extended above 51 ft^3/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 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0100	220	3.48	Apr. 9	0530	*318	*3.87
Feb. 2	1530	235	3.54				

Minimum discharge, 0.03 ft^3/s, Sept. 28.

DISCHARGE, IN 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	1.4	.18	.11	.77	.51	13	.54	3.2	.91	.23	.21	.11
2	1.3	.12	.10	.82	26	18	.51	2.4	.72	.22	.24	.12
3	1.4	.11	.09	.68	8.9	14	2.9	2.1	.62	.22	.35	.10
4	1.4	4.0	.08	.59	4.2	9.1	37	1.9	.59	.21	.35	.11
5	.63	4.2	.13	.52	3.2	6.0	31	1.7	.59	.20	.30	.10
6	.11	2.4	26	.48	2.5	7.0	8.7	1.5	.54	.19	.28	.11
7	.64	.99	3.3	.43	1.9	5.3	9.3	1.5	.52	.20	.25	.13
8	1.2	.64	1.8	.41	1.7	4.0	84	1.3	.48	.20	.23	.13
9	1.2	.51	1.3	.42	1.8	3.3	117	1.3	.46	.19	.22	.12
10	1.2	.42	.89	1.3	7.3	2.8	26	1.2	.44	.18	.20	.11
11	1.2	.34	.68	7.5	20	2.4	13	1.2	.43	.18	.18	.10
12	1.2	.27	.87	2.5	8.8	2.1	12	1.1	.42	.17	.18	.10
13	1.2	.23	.86	8.0	5.0	1.8	11	1.0	.41	.17	.17	.10
14	.60	.20	.57	4.2	3.5	1.6	8.5	.96	.36	.17	.15	.09
15	.08	.21	.59	2.7	2.8	1.4	4.9	.98	.33	.17	.15	.08
16	.05	.23	43	2.0	2.4	1.3	4.0	.96	.34	.16	.14	.14
17	.27	.20	11	1.6	1.9	1.3	3.5	.90	.40	.15	.13	.08
18	.64	.18	7.1	1.3	1.7	1.2	3.0	.83	.37	.15	.13	.08
19	.99	.17	4.0	1.1	1.5	1.1	2.8	.83	.33	.15	.13	.08
20	1.2	.15	2.8	.93	1.4	.91	2.3	.81	.34	.22	.13	.07
21	.94	.15	2.1	.83	14	.83	2.2	.77	.35	1.9	.14	.07
22	.94	.16	1.7	.76	5.0	.76	2.1	.78	.34	1.0	.13	.07
23	7.4	.16	1.5	.72	3.9	.74	1.9	.73	.34	.77	.12	.06
24	1.7	.18	1.3	.68	3.5	.70	3.1	.70	.33	.51	.14	.06
25	1.3	.16	1.1	.62	2.5	.69	2.2	.88	.32	.41	.16	.08
26	.77	.16	.93	.57	2.0	.65	1.9	.63	.30	.36	.16	.06
27	.34	.18	.86	.55	1.8	.62	5.0	.63	.29	.29	.15	.06
28	.28	.16	.83	.56	18	.57	4.7	.62	.26	.26	.15	.05
29	.23	.12	.83	.72	---	.56	3.5	.58	.25	.25	.14	.05
30	.20	.11	.90	.66	---	.58	3.8	.61	.25	.23	.14	.07
31	.21	---	.97	.57	---	.58	---	.65	---	.21	.12	---
TOTAL	32.20	17.27	118.29	45.27	157.71	104.89	410.15	35.05	12.63	9.92	5.67	2.67
MEAN	1.04	.58	3.82	1.46	5.63	3.38	13.7	1.13	.42	.32	.18	.09
MAX	7.4	4.2	43	8.0	26	18	117	3.2	.91	1.9	.35	.14
MIN	.05	.11	.08	.41	.51	.56	.51	.58	.25	.15	.12	.05
AC-FT	64	34	235	90	313	208	814	70	25	20	11	5.3

CAL YR 1988	TOTAL	1021.34	MEAN	2.79	MAX	149	MIN	.05	AC-FT	2030
WTR YR 1989	TOTAL	951.72	MEAN	2.61	MAX	117	MIN	.05	AC-FT	1890

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 mi^2.

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

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

REMARKS.--Records good except for estimated daily discharges, which are 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.--32 years, 11.0 ft^3/s (7,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,680 ft^3/s, May 14, 1963, gage height, 12.29 ft, from rating curve extended above 300 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 25	2315	1,340	7.78	Feb. 2	1530	1,770	8.54
Dec. 6	0300	1,830	8.64	July 14	2245	1,000	7.06
Jan. 11	0300	1,050	7.18	July 21	0430	*3,010	*10.20

Minimum discharge, 0.32 ft^3/s, July 3,15.

DISCHARGE, IN 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	3.4	.47	4.4	8.6	3.0	60	2.4	6.7	52	.62	4.8	2.1
2	2.8	1.2	3.6	23	157	102	20	4.8	7.5	.46	18	42
3	2.0	1.7	3.2	28	26	68	23	4.0	4.4	.36	8.4	5.1
4	1.8	87	2.6	8.8	36	19	83	3.5	3.4	.42	19	2.9
5	1.5	18	2.3	13	36	e16	22	3.1	13	1.3	5.0	1.8
6	1.6	30	138	7.9	40	e90	41	2.8	4.3	31	4.0	1.6
7	3.1	8.8	16	16	15	e50	72	2.7	2.7	8.6	6.2	4.7
8	6.6	3.9	7.1	37	16	20	272	3.0	2.5	2.7	4.2	2.3
9	2.0	3.0	5.0	14	5.1	14	108	4.4	2.2	1.4	2.6	1.8
10	1.1	2.6	3.9	97	e50	13	19	4.2	1.8	1.2	2.3	1.5
11	1.9	2.6	3.4	236	215	9.9	9.9	2.8	1.6	6.5	2.0	1.4
12	1.3	2.6	63	73	e54	23	39	3.9	1.4	2.3	2.0	1.8
13	3.6	6.0	7.5	204	e26	8.8	30	2.8	1.3	9.0	6.5	1.4
14	2.7	3.9	4.7	43	e20	6.6	38	10	1.1	41	2.6	2.1
15	1.4	2.0	3.8	32	e16	6.1	8.6	12	1.0	37	1.9	.95
16	1.0	14	35	20	12	9.9	6.5	7.3	1.0	6.0	1.8	.82
17	.69	18	30	13	8.6	6.6	6.6	5.1	11	3.1	1.6	15
18	.50	7.4	7.7	9.5	9.9	5.4	6.1	2.8	4.8	2.4	2.2	2.0
19	.45	4.5	37	7.4	13	5.2	5.6	28	2.3	10	13	5.8
20	.40	3.5	8.5	37	15	5.0	10	5.2	1.3	111	3.6	4.4
21	28	12	5.2	22	e100	4.7	9.3	2.8	1.2	357	63	2.6
22	7.2	4.6	3.9	7.7	11	4.7	5.4	11	2.9	135	7.0	2.7
23	12	13	45	6.4	e54	4.5	23	4.5	1.7	29	3.5	1.5
24	17	13	11	5.2	21	4.5	14	13	1.2	13	3.2	1.4
25	6.9	99	5.9	4.6	8.3	25	5.4	4.2	3.8	7.7	2.4	3.0
26	2.9	57	19	4.2	6.1	15	12	2.9	1.8	6.5	1.8	1.8
27	1.8	10	6.4	4.1	5.0	3.6	52	5.7	.94	7.3	1.6	.97
28	1.1	6.2	8.6	3.7	4.5	1.9	26	2.7	.67	9.2	1.7	.79
29	.83	46	43	3.6	---	1.7	30	2.0	.62	14	1.7	2.1
30	.63	7.1	26	3.2	---	1.4	12	4.4	.65	12	1.2	3.5
31	.54	---	15	2.9	---	1.3	---	35	---	4.7	1.2	---
TOTAL	118.74	489.07	575.7	995.8	983.5	606.8	1011.8	207.3	136.08	871.76	200.0	121.83
MEAN	3.83	16.3	18.6	32.1	35.1	19.6	33.7	6.69	4.54	28.1	6.45	4.06
MAX	28	99	138	236	215	102	272	35	52	357	63	42
MIN	.40	.47	2.3	2.9	3.0	1.3	2.4	2.0	.62	.36	1.2	.79
AC-FT	236	970	1140	1980	1950	1200	2010	411	270	1730	397	242

CAL YR 1988	TOTAL	4480.90	MEAN	12.2	MAX	220	MIN	.40	AC-FT	8890
WTR YR 1989	TOTAL	6318.38	MEAN	17.3	MAX	357	MIN	.36	AC-FT	12530

e Estimated.

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 mi^2.

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.--36 years (water years 1953-59, 1961-89), 38.4 ft^3/s (27,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s, Nov. 28, 1954, gage height, 14.82 ft, site and datum then in use, from rating curve extended above 730 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	1700	2,710	6.21	Feb. 11	0700	2,610	6.11
Jan. 11	0500	1,710	5.20	July 21	0630	*2,750	*6.25
Feb. 2	1730	2,150	5.65				

Minimum discharge, 10 ft^3/s, Nov. 2.

DISCHARGE, IN 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	25	21	28	43	26	120	21	39	101	21	37	22
2	20	16	25	36	365	269	41	29	55	20	45	52
3	17	12	25	90	99	260	101	30	33	21	44	50
4	18	262	20	44	44	124	96	27	25	21	49	33
5	15	80	23	42	73	63	102	26	29	22	40	30
6	13	72	620	36	92	98	39	29	30	59	32	30
7	14	53	108	42	49	155	117	30	24	56	34	26
8	16	31	51	76	54	65	293	24	21	30	35	28
9	16	26	40	50	43	46	487	26	20	24	28	25
10	15	18	36	128	70	42	81	28	21	21	26	24
11	14	16	33	653	723	39	51	24	19	22	26	25
12	16	16	109	202	245	46	58	23	19	26	24	23
13	14	16	57	504	72	48	85	24	18	28	27	23
14	17	19	40	173	54	35	78	28	20	36	31	23
15	19	16	35	90	47	31	52	36	20	112	28	23
16	17	18	155	83	40	27	35	31	18	42	27	25
17	17	40	99	59	37	38	31	30	25	34	25	35
18	19	24	45	48	34	35	28	25	24	33	25	30
19	18	21	67	43	33	30	28	42	25	29	28	25
20	14	18	50	75	34	27	24	41	23	153	33	29
21	21	28	39	64	229	24	38	29	21	838	95	27
22	37	29	33	44	69	23	35	27	17	272	46	25
23	25	33	72	37	71	26	40	33	20	101	32	26
24	39	51	51	34	68	27	53	29	17	63	27	23
25	36	76	37	32	44	28	41	31	18	50	26	32
26	20	226	42	30	38	49	33	23	23	42	26	28
27	16	52	35	30	36	34	79	22	22	37	28	25
28	14	32	40	30	40	30	72	23	20	38	25	24
29	17	77	73	29	---	29	75	20	20	48	24	23
30	20	37	83	28	---	22	45	21	19	51	23	32
31	19	---	64	27	---	22	---	37	---	38	22	---
TOTAL	598	1434	2235	2902	2829	1912	2357	887	767	2388	1018	846
MEAN	19.3	47.8	72.1	93.6	101	61.7	78.6	28.6	25.6	77.0	32.8	28.2
MAX	39	262	620	653	723	269	487	42	101	838	95	52
MIN	13	12	20	27	26	22	21	20	17	20	22	22
AC-FT	1190	2840	4430	5760	5610	3790	4680	1760	1520	4740	2020	1680

CAL YR 1988	TOTAL	15337	MEAN	41.9	MAX	866	MIN	11	AC-FT	30420
WTR YR 1989	TOTAL	20173	MEAN	55.3	MAX	838	MIN	12	AC-FT	40010

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981.
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, 798 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, 1978; minimum daily mean, 1 mg/L, Mar. 20-22, 1989.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons, Apr. 19, 1974; minimum daily, 0.08 ton, Mar. 21, 22, 1989.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,380 mg/L, July 21; minimum daily mean, 1 mg/L, Mar. 20-22.
SEDIMENT DISCHARGE: Maximum daily, 7,590 tons, July 21; minimum daily, 0.08 ton, Mar. 21, 22.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
31...	1015	763	11	825	7.10	25.0	15	5.9	71	12000
DEC										
27...	0945	785	36	315	7.20	21.0	13	8.2	92	6200
FEB										
27...	1030	759	36	380	6.50	21.0	4.3	7.8	88	12000
MAY										
01...	0930	763	48	365	7.20	22.5	4.9	8.0	92	4100
JUN										
19...	1000	765	28	420	7.00	23.0	3.1	7.3	85	2100
AUG										
21...	1015	764	161	102	6.50	24.0	98	7.7	91	10000

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
31...	3600	110	45	17	16	76	60	3	3.1	77
DEC										
27...	4600	50	5	8.4	7.1	41	63	3	2.0	55
FEB										
27...	5300	66	16	11	9.3	48	60	3	2.1	61
MAY										
01...	2500	59	18	9.6	8.6	45	61	3	2.1	51
JUN										
19...	1700	67	10	11	9.6	55	63	3	2.5	69
AUG										
21...	48000	17	3	3.1	2.2	13	61	1	1.2	17

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
31...	0	63	63	27	130	0.10	63	374	378
DEC									
27...	0	46	45	15	51	0.10	38	202	194
FEB									
27...	0	54	50	19	66	0.10	46	297	238
MAY									
01...	0	43	42	16	69	0.10	37	208	217
JUN									
19...	0	55	56	18	73	0.10	49	263	258
AUG									
21...	0	15	14	5.0	16	<0.10	12	68	63

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
31...	0.51	1.60	0.120	0.080	0.48	0.60	0.190	0.190	0.160
DEC									
27...	0.27	0.940	0.040	0.030	0.26	0.30	0.120	0.110	0.110
FEB									
27...	0.40	1.20	0.070	0.050	--	<0.20	0.150	0.150	0.130
MAY									
01...	0.28	0.940	0.040	0.030	0.26	0.30	0.120	0.110	0.080
JUN									
19...	0.36	1.30	0.030	0.030	0.27	0.30	0.160	0.160	0.130
AUG									
21...	0.09	0.240	0.020	0.020	1.3	1.3	1.10	0.310	0.190

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT										
31...	<10	<1	10	<0.5	<1	<1	<3	1	16	<5
FEB										
27...	20	<1	6	<0.5	<1	1	<3	2	65	<5
MAY										
01...	50	<1	5	<0.5	<1	1	<3	5	120	<5
AUG										
21...	240	<1	<2	<0.5	<1	2	<3	4	350	1

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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										
31...	<4	120	<0.1	<10	3	2	<1.0	120	37	7
FEB										
27...	<4	73	<0.1	<10	3	1	1.0	77	24	4
MAY										
01...	<4	48	0.2	<10	2	1	<1.0	68	21	4
AUG										
21...	<4	10	0.3	<10	2	<1	<1.0	21	<6	10

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				
31...	1015	27	0.80	100
DEC				
27...	0945	13	1.3	100
FEB				
27...	1030	8	0.78	100
MAY				
01...	0930	11	1.4	100
JUN				
19...	1000	18	1.4	100
AUG				
21...	1015	202	88	99

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	25	69	4.5	21	25	1.4	28	25	1.9
2	20	28	1.5	16	22	.93	25	20	1.4
3	17	e38	1.8	12	21	.69	25	18	1.2
4	18	111	5.5	262	518	604	20	18	.98
5	15	86	3.8	80	89	22	23	17	1.1
6	13	22	.80	72	89	18	820	1100	2970
7	13	26	.92	53	51	7.7	108	72	22
8	16	36	1.6	31	37	3.1	51	e62	8.6
9	16	41	1.8	26	37	2.6	40	e58	6.3
10	15	52	2.1	18	33	1.6	36	e54	5.3
11	14	30	1.2	16	35	1.6	34	e51	4.6
12	16	21	.89	16	33	1.4	109	154	65
13	14	19	.72	16	24	1.0	58	e71	11
14	17	24	1.2	19	25	1.3	40	e48	5.1
15	20	23	1.2	16	26	1.1	35	e39	3.7
16	17	19	.85	16	27	1.2	155	224	118
17	17	17	.76	40	73	8.9	99	123	37
18	19	17	.87	24	56	3.7	45	e53	6.5
19	18	21	1.0	21	44	2.5	66	64	14
20	14	20	.73	18	28	1.4	50	35	5.1
21	21	38	4.7	28	50	4.2	39	17	1.7
22	37	86	8.9	29	25	2.0	33	12	1.1
23	25	55	3.8	33	19	1.8	72	91	32
24	39	42	4.4	51	24	3.5	51	42	6.1
25	36	36	3.6	76	66	23	36	16	1.6
26	20	29	1.6	226	558	475	42	20	2.5
27	16	26	1.1	52	216	34	35	16	1.5
28	14	25	.93	32	27	2.3	40	16	1.7
29	17	23	1.1	77	74	22	73	44	9.8
30	20	22	1.2	37	e28	2.9	83	45	10
31	19	32	1.6	---	---	---	64	24	4.1
TOTAL	598	---	68.67	1434	---	1256.82	2235	---	3360.68
		JANUARY			FEBRUARY			MARCH	
1	43	14	1.6	26	6	.40	120	418	346
2	36	9	.90	365	604	1610	269	878	891
3	90	79	21	99	131	48	260	458	501
4	44	16	2.0	44	25	3.3	124	420	207
5	42	15	1.8	73	60	13	63	49	8.3
6	35	12	1.2	92	67	21	98	73	23
7	43	14	1.6	49	18	2.5	155	139	72
8	76	34	8.1	54	18	2.8	65	22	4.1
9	50	18	2.4	43	24	3.7	46	9	1.1
10	128	e78	46	70	89	18	42	6	.67
11	653	e1070	2640	723	915	2760	39	3	.28
12	202	e278	212	245	279	306	46	2	.27
13	504	e870	1650	72	50	9.7	48	3	.35
14	173	e188	110	54	38	5.6	35	2	.19
15	90	e90	22	47	41	5.2	31	2	.13
16	83	e76	18	40	49	5.4	27	1	.09
17	59	e49	7.8	36	22	2.1	38	2	.21
18	49	e42	5.4	34	21	1.9	34	2	.19
19	43	e35	4.1	33	18	1.7	29	2	.13
20	75	e66	18	35	19	1.7	27	1	.07
21	64	e54	9.6	229	494	520	24	1	.06
22	44	e36	4.3	69	81	16	23	1	.06
23	37	13	1.3	71	45	9.0	25	8	.62
24	34	7	.62	68	39	7.2	27	10	.75
25	32	7	.62	44	25	3.0	28	11	.88
26	30	6	.46	38	19	2.0	49	28	4.0
27	30	6	.48	36	20	1.9	34	19	1.7
28	30	9	.76	40	24	2.7	30	17	1.4
29	29	16	1.3	---	---	---	28	16	1.3
30	28	16	1.3	---	---	---	22	11	.68
31	27	6	.43	---	---	---	22	12	.69
TOTAL	2903	---	4795.07	2829	---	5383.80	1908	---	2068.22

e Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	21	16	.88	39	18	2.0	101	261	78
2	41	57	8.4	29	15	1.2	55	114	20
3	101	424	325	30	15	1.2	33	38	3.4
4	96	772	153	27	13	.94	25	30	2.1
5	102	338	111	26	13	.93	29	29	2.4
6	39	71	8.0	29	13	1.0	30	28	2.2
7	117	134	45	30	11	.88	25	26	1.7
8	293	392	491	24	10	.66	21	25	1.5
9	487	650	1230	26	11	.78	20	24	1.3
10	81	69	16	28	11	.84	21	27	1.5
11	51	28	3.9	24	12	.77	19	27	1.4
12	58	36	7.8	23	11	.65	16	24	1.2
13	85	57	14	24	10	.66	18	22	1.1
14	78	34	7.7	28	14	1.1	20	25	1.4
15	52	30	4.4	36	17	1.6	20	25	1.4
16	35	21	2.0	31	13	1.1	18	21	1.0
17	31	16	1.3	30	18	1.4	25	25	1.7
18	28	12	.92	25	17	1.1	24	24	1.6
19	27	11	.78	42	27	3.6	25	22	1.5
20	24	9	.59	41	25	2.9	23	22	1.4
21	38	29	3.2	29	14	1.1	21	22	1.3
22	35	26	2.5	27	14	1.1	17	21	1.0
23	40	18	2.2	33	19	1.8	20	23	1.3
24	53	21	3.0	29	21	2.0	17	23	1.1
25	41	16	1.7	31	28	2.4	18	28	1.4
26	33	17	1.5	23	18	1.1	23	21	1.3
27	79	51	16	22	19	1.1	22	23	1.4
28	72	53	11	23	18	1.1	20	24	1.3
29	75	55	12	20	17	.96	20	24	1.3
30	45	27	3.4	21	17	.98	20	23	1.2
31	---	---	---	37	29	3.3	---	---	---
TOTAL	2358	---	2488.17	887	---	42.25	768	---	140.4
		JULY			AUGUST			SEPTEMBER	
1	21	20	1.1	35	19	1.8	22	6	.34
2	20	22	1.2	44	29	3.5	52	30	8.2
3	21	24	1.4	44	13	1.5	50	28	4.1
4	21	22	1.2	49	11	1.6	33	10	.88
5	22	20	1.2	40	10	1.0	30	7	.56
6	59	51	11	31	e8	.66	30	6	.52
7	56	45	7.3	34	8	.79	26	7	.52
8	30	21	1.7	34	11	1.0	28	9	.72
9	24	17	1.1	28	24	1.9	25	10	.68
10	21	13	.73	26	9	.63	24	8	.48
11	22	15	.94	26	35	2.3	25	7	.44
12	26	21	1.5	24	539	35	23	6	.40
13	28	21	1.7	26	18	1.2	23	8	.48
14	36	23	2.3	30	7	.54	22	10	.58
15	112	259	94	26	8	.61	23	12	.72
16	42	63	7.3	27	7	.54	25	19	1.3
17	34	36	3.3	25	8	.51	35	28	2.8
18	32	23	2.0	25	7	.50	30	19	1.6
19	29	20	1.6	28	8	.64	25	18	1.2
20	153	251	306	33	6	.55	29	27	2.2
21	835	2380	7590	95	84	31	27	23	1.7
22	271	426	384	46	25	3.2	25	32	2.2
23	101	261	85	32	13	1.1	26	33	2.3
24	63	e96	17	27	8	.61	23	24	1.5
25	49	32	4.5	26	8	.58	32	57	5.1
26	42	10	1.2	26	13	.92	28	15	1.2
27	37	9	.91	28	44	3.6	25	6	.39
28	38	9	.92	26	11	.76	24	7	.44
29	47	11	1.5	24	6	.40	23	7	.44
30	51	14	1.9	23	6	.35	32	7	.60
31	36	9	.92	22	8	.46	---	---	---
TOTAL	2381	---	8516.42	1012	---	99.77	845	---	44.61
YEAR	20158		28266.28						

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 mi^2.

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 except for estimated days and those above 200 ft^3/s which are poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--37 years, 34.3 ft^3/s (24,850 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s, Oct. 28, 1981, gage height, 26.46 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft^3/s for several days in 1984 and 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 25	2400	4,790	11.51	Feb. 11	0830	6,580	13.06
Dec. 6	0330	9,230	14.83	Feb. 21	0500	4,760	11.49
Jan. 11	0430	5,060	11.78	Apr. 8	2400	4,560	11.30
Jan. 13	0130	3,500	10.25	Jul. 21	0500	*12,730	*16.62
Feb. 2	1700	11,530	16.10				

Minimum discharge, 1.7 ft^3/s, Oct. 9-16, Nov. 3.

DISCHARGE, IN 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	5.0	1.8	10	29	6.7	229	3.3	23	163	e2.1	e14	e5.6
2	2.9	1.8	6.9	135	1550	185	22	11	26	e2.0	e35	e34
3	2.1	1.8	5.4	83	115	408	78	7.4	19	e1.8	e24	e14
4	1.9	232	4.0	27	89	73	174	8.9	11	e1.9	38	e7.6
5	1.8	31	3.0	24	72	e33	69	6.8	33	e2.0	16	e4.9
6	1.8	35	1350	19	93	141	51	e6.4	18	26	9.9	e4.3
7	1.8	18	78	23	31	125	110	e6.2	e8.0	12	13	e10
8	1.8	4.8	27	98	32	37	894	e6.8	e5.6	4.2	e11	e8.2
9	1.8	2.9	17	37	15	e25	981	e8.8	e3.8	2.5	e7.0	e4.7
10	1.8	2.6	12	647	89	e17	59	e8.0	e2.9	2.5	e6.0	e4.0
11	1.8	2.8	13	1750	1730	e15	30	e7.2	e2.6	2.6	e5.4	e3.7
12	1.8	2.8	214	390	224	e30	84	e8.2	e2.4	5.1	e5.4	e4.8
13	1.7	2.7	34	1100	37	e22	67	e7.2	2.3	21	e14	e3.7
14	1.7	2.9	17	171	21	e15	59	19	2.3	20	e7.0	e5.6
15	1.7	2.9	11	65	15	e12	27	16	2.2	141	e5.1	e2.6
16	4.2	80	77	54	11	e16	16	7.8	2.2	16	e4.7	e2.2
17	2.1	112	151	45	7.9	e13	e10	12	11	7.7	e4.3	e24
18	2.1	15	29	27	6.1	e10	e7.8	6.6	5.2	5.0	e6.0	e5.0
19	2.2	9.1	40	18	6.4	e8.4	e5.2	25	4.0	4.1	18	e13
20	2.3	6.8	19	65	9.4	e7.6	e4.5	15	2.6	564	14	e9.6
21	2.4	21	12	34	850	e6.6	10	6.5	2.4	2720	106	e6.8
22	2.2	15	7.5	24	39	e5.5	11	6.7	2.3	486	18	e7.2
23	2.0	18	50	14	50	e4.7	27	13	2.3	91	e9.6	e4.0
24	1.9	43	23	11	54	e4.2	70	7.5	2.2	42	e8.5	e3.7
25	1.8	154	12	8.7	e26	4.2	27	7.9	2.3	29	e6.4	e7.4
26	1.8	390	23	7.0	e14	17	14	5.7	2.3	e18	e5.0	e4.5
27	1.8	28	13	6.5	e9.0	6.8	44	4.1	2.3	e21	e4.3	e2.6
28	1.9	14	24	8.3	e8.3	4.4	48	4.8	2.3	e26	e4.6	e2.1
29	1.8	126	111	7.9	---	3.7	53	3.9	2.4	e30	e4.6	e5.0
30	1.8	22	95	6.5	---	3.5	37	3.5	2.5	e25	e3.2	e7.4
31	1.8	---	62	6.5	---	3.3	---	93	---	e13	e3.2	---
TOTAL	65.5	1397.3	2550.8	4941.4	5210.8	1483.9	3092.8	371.5	350.4	4344.5	428.2	220.2
MEAN	2.11	46.6	82.3	159	186	47.9	103	12.0	11.7	140	13.8	7.34
MAX	5.0	390	1350	1750	1730	406	981	93	163	2720	106	34
MIN	1.7	1.8	3.0	6.5	6.1	3.3	3.3	3.5	2.2	1.8	3.2	2.1
AC-FT	130	2770	5060	9800	10340	2940	6130	737	695	8620	851	437

CAL YR 1988	TOTAL	13502.9	MEAN	36.9	MAX	1960	MIN	1.7	AC-FT	26780
WTR YR 1989	TOTAL	24458.3	MEAN	67.0	MAX	2720	MIN	1.7	AC-FT	48510

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 mi^2.

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

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

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

REMARKS.--Records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--39 years (water years 1930-32, 1954-89), 5.00 ft^3/s (3,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discherge, 6,650 ft^3/s, Feb. 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft^3/s; maximum gage height, 13.46 ft, May 14, 1963; no flow at times each yesr.

EXTREMES FOR CURRENT YEAR.--Peak diacharges greater than base discharge of 570 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0230	*884	*9.81	Apr. 8	2230	734	9.38

Minimum discharge, 0.01 ft^3/s for many days.

DISCHARGE, IN 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	1.1	.02	1.5	4.5	.30	23	.18	6.9	14	.01	2.0	.04
2	.48	.01	.95	12	64	35	3.6	3.9	3.4	.01	8.0	4.6
3	.21	.01	.59	19	19	44	3.5	2.7	1.5	.01	3.1	2.7
4	.13	16	.35	6.8	19	13	19	1.8	.98	.01	9.0	1.3
5	.08	1.7	.23	3.9	11	15	24	1.6	3.4	.01	2.6	.73
6	.05	5.0	101	2.2	11	36	45	1.6	1.5	14	1.6	.77
7	.03	1.2	16	2.7	7.1	39	63	1.3	.83	3.4	1.8	3.7
8	.03	.17	5.4	14	6.5	12	238	1.6	.66	.99	1.0	1.7
9	.01	.06	2.7	7.7	3.5	5.8	142	2.6	.44	.37	.64	.85
10	.01	.04	1.6	58	7.0	3.7	25	2.0	.31	.28	.48	.53
11	.01	.01	1.2	96	64	2.6	9.5	1.4	.26	2.0	.36	.35
12	5.5	.01	24	36	21	8.0	33	1.2	.21	.69	.30	.22
13	1.1	5.8	6.1	56	7.2	2.4	36	1.1	.14	4.8	.27	.11
14	2.3	1.3	2.9	21	3.8	1.6	34	1.4	.10	13	.32	.05
15	1.2	.26	1.9	11	2.4	1.3	12	1.4	.06	16	.29	.02
16	.09	32	37	6.9	1.7	1.6	6.0	.97	.10	3.2	.23	.01
17	.03	17	25	4.8	1.3	1.1	4.1	.92	2.7	2.2	.15	.01
18	.01	4.8	7.0	3.1	.96	1.3	3.0	.70	1.7	1.2	.11	.01
19	.01	1.7	4.0	2.2	.80	.85	2.4	4.5	.66	3.7	1.9	.01
20	.01	.80	2.1	12	.71	.65	2.3	2.2	.35	59	1.6	.01
21	13	.92	1.3	5.6	62	.52	2.1	1.1	.29	143	16	.01
22	4.4	.68	.96	3.0	12	.46	2.0	.96	1.2	41	4.1	.01
23	2.0	12	12	2.1	12	.49	3.0	.75	.60	18	1.8	.01
24	11	8.0	4.5	1.5	10	.45	13	1.4	.34	7.2	.94	.01
25	2.6	41	2.0	1.1	4.6	2.4	5.0	.98	.25	4.0	.58	.03
26	.55	48	3.4	.86	2.8	2.2	2.8	.60	.14	2.5	.43	.03
27	.13	8.1	2.0	.69	2.0	.65	50	1.1	.07	1.7	.32	.01
28	.05	3.8	5.7	.60	28	.37	36	.63	.04	3.6	.24	.01
29	.03	15	14	.55	---	.31	33	.44	.03	11	.12	.01
30	.02	2.6	22	.41	---	.23	15	.45	.01	4.7	.06	.01
31	.01	---	11	.32	---	.19	---	18	---	2.5	.04	---
TOTAL	46.16	227.99	320.38	396.53	383.67	256.37	867.48	68.20	36.27	362.08	60.38	17.86
MEAN	1.49	7.60	10.3	12.8	13.7	8.27	28.9	2.20	1.21	11.7	1.95	.60
MAX	13	48	101	96	64	44	238	18	14	143	16	4.6
MIN	.01	.01	.23	.32	.30	.19	.18	.44	.01	.01	.04	.01
AC-FT	92	452	635	787	761	509	1720	135	72	718	120	35

CAL YR 1988	TOTAL	2482.43	MEAN	6.78	MAX	221	MIN	.00	AC-FT	4920
WTR YR 1989	TOTAL	3043.37	MEAN	8.34	MAX	238	MIN	.01	AC-FT	6040

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 mi^2.

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.--6 Years, 5.45 ft^3/s (3,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0230	*868	*10.62	Apr. 8	1845	796	10.44

Minimum discharge, 0.01 ft^3/s, Oct. 31, Nov. 1-4, Sept. 27-30.

DISCHARGE, IN 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	1.4	.03	1.8	5.8	.19	25	.30	8.3	17	.05	2.8	.07
2	.71	.06	1.2	12	83	44	2.5	4.5	3.7	.05	11	8.3
3	.38	.02	.89	18	24	47	2.5	3.1	1.6	.04	4.0	2.6
4	.26	18	.61	6.5	23	15	21	2.2	.94	.05	12	1.6
5	.21	2.1	.41	3.8	16	17	24	1.7	3.0	.05	3.5	.72
6	.17	5.2	115	2.0	16	43	51	2.0	1.6	13	2.4	5.7
7	.17	1.8	18	2.4	9.1	45	76	1.6	.84	3.6	2.5	6.2
8	.16	.46	6.4	13	8.6	15	298	1.7	.63	1.3	1.7	1.8
9	.13	.23	3.0	8.1	4.7	7.7	188	2.7	.45	.53	1.1	.84
10	.10	.17	1.5	85	8.1	5.1	31	2.5	.38	.40	.82	.50
11	.08	.14	1.0	115	83	e4.0	11	1.6	.29	2.0	.62	.26
12	6.6	.10	24	41	28	e9.0	37	1.5	.22	.85	.50	.15
13	1.7	5.6	6.8	64	11	3.8	47	1.4	.16	4.8	.42	.08
14	1.8	1.8	3.0	23	5.2	2.7	37	1.7	.11	14	.46	.07
15	2.0	.57	1.8	12	3.3	2.2	13	1.6	.08	18	.43	.05
16	.38	36	32	7.6	2.2	2.9	5.9	1.0	.06	3.6	.34	.07
17	.22	17	27	5.3	1.7	1.9	3.9	.97	2.2	2.4	.28	.07
18	.13	4.6	7.7	3.2	1.4	1.2	2.9	.75	1.7	1.5	.25	.04
19	.10	2.0	4.2	2.1	1.2	.94	2.5	3.6	.76	3.3	4.7	.08
20	.09	1.0	2.1	13	1.1	.73	2.3	2.4	.39	74	2.0	.07
21	14	.94	1.3	6.5	69	.57	2.2	1.1	.29	181	41	.06
22	4.3	.94	.82	3.4	14	.50	2.3	.91	.89	60	e7.5	.08
23	3.0	12	11	2.1	15	.49	2.9	.74	.89	25	e3.3	.05
24	11	9.3	4.1	1.5	13	.47	14	1.1	.38	13	e2.0	.22
25	3.1	40	1.8	1.1	7.5	1.6	5.9	1.1	.27	6.9	e1.2	.10
26	.87	54	2.8	.76	4.5	2.3	3.3	.58	.16	4.1	e.64	.03
27	.34	9.8	2.1	.59	3.3	.72	70	.89	.09	2.4	e.39	.02
28	.16	4.3	5.6	.50	31	.42	47	.64	.08	4.3	e.22	.02
29	.08	17	14	.47	---	.36	38	.45	.11	14	.10	.02
30	.07	3.2	24	.35	---	.29	17	.44	.06	6.2	.07	.02
31	.03	---	13	.23	---	.24	---	15	---	3.4	.08	---
TOTAL	53.74	248.36	338.93	440.30	488.09	301.13	1059.40	69.77	39.11	463.82	108.32	29.89
MEAN	1.73	8.28	10.9	14.2	17.4	9.71	35.3	2.25	1.30	15.0	3.49	1.00
MAX	14	54	115	115	83	47	298	15	17	181	41	8.3
MIN	.03	.02	.41	.23	.19	.24	.30	.44	.06	.04	.07	.02
AC-FT	107	493	872	873	968	597	2100	138	78	920	215	59

CAL YR 1988	TOTAL	2744.24	MEAN	7.50	MAX	271	MIN	.00	AC-FT	5440
WTR YR 1989	TOTAL	3640.86	MEAN	9.97	MAX	298	MIN	.02	AC-FT	7220

e Estimated

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

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,230 mg/L (estimated), Apr. 8; 1 mg/l for several days.
SEDIMENT DISCHARGE: Maximum daily, 4,730 tons (estimated), Apr. 8; minimum daily, lesa than 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
04...	1140	751	10	59	7.20	22.0	310	8.4	98	--	--
DEC											
07...	1250	--	14	163	7.58	22.0	160	8.5	--	520	--
MAR											
22...	0830	761	0.54	220	7.10	21.5	1.9	8.5	97	--	--
APR											
25...	1220	760	5.5	160	8.00	21.5	5.1	8.7	99	110	43
JUN											
13...	1050	761	0.16	215	7.60	23.0	0.40	7.5	88	--	--
28...	1045	757	0.15	210	7.40	23.0	0.50	7.8	92	--	--
JUL											
21...	1045	760	138	77	7.64	22.0	290	8.3	95	940	--
AUG											
09...	1230	758	0.86	170	8.20	25.5	0.80	8.0	98	240	49
28...	0940	757	0.19	194	7.82	22.5	0.20	7.7	90	--	--
SEP											
25...	1130	758	0.05	207	7.60	23.5	0.40	6.7	79	--	--

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
25...	43	7.5	5.8	14	41	0.9	0.90	40	5.0	18
AUG										
09...	49	8.8	6.5	15	40	0.9	0.90	49	5.0	17

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
07...	--	--	--	--	--	212	0.100	0.50	0.60	0.130
APR										
25...	0.10	20	85	86	0.12	7	<0.100	<0.20	--	0.010
JUL										
21...	--	--	--	--	--	853	<0.100	1.9	--	0.060
AUG										
09...	<0.10	21	101	104	0.14	5	<0.100	<0.20	--	<0.010

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
25...	660	90	<1	<1	<100	<2	<10	<0.5	<1	<1
AUG										
09...	170	30	1	1	<100	<2	<10	<0.5	<1	2

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
25...	1	4	<1	<3	3	14	440	62	1	<1
AUG										
09...	1	<1	<1	<3	1	2	210	43	<1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
25...	<10	<4	20	10	<0.10	<0.1	3	<10	4
AUG									
09...	<10	<4	20	12	0.20	0.2	<1	<10	<1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
25...	2	<1	<1	<1	<1.0	41	<6	80	5
AUG									
09...	1	<1	<1	<1	<1.0	50	<6	<10	5

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
APR										
25...	1.0	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
09...	2.4	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
25...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
25...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	1.4	e5	.02	.03	e7	<.01	1.8	e31	.15
2	.71	e5	.01	.06	e6	<.01	1.2	e20	.07
3	.38	e4	<.01	.02	e6	<.01	.89	e13	.03
4	.26	e4	<.01	18	752	108	.61	e8	.01
5	.21	e4	<.01	2.1	e33	.22	.41	e5	.01
6	.17	e4	<.01	5.2	e24	.50	115	2100	1300
7	.17	e4	<.01	1.8	e17	.10	18	493	27
8	.16	e4	<.01	.46	e6	.01	6.4	349	6.1
9	.13	e3	<.01	.23	e6	<.01	3.0	e167	1.4
10	.10	e3	<.01	.17	e6	<.01	1.5	e89	.38
11	.08	e3	<.01	.14	e5	<.01	1.0	e48	.13
12	6.6	856	66	.10	e5	<.01	24	545	87
13	1.7	e262	2.4	5.6	155	6.4	6.8	50	1.0
14	1.8	e15	.48	1.8	e42	.25	3.0	e22	.18
15	2.0	e17	.15	.57	e11	.02	1.8	e18	.09
16	.38	e5	<.01	36	1010	606	32	493	170
17	.22	e4	<.01	17	316	34	27	88	19
18	.13	e4	<.01	4.6	23	.31	7.7	21	.43
19	.10	e4	<.01	2.0	e14	.07	4.2	42	.60
20	.09	e3	<.01	1.0	e12	.03	2.1	e16	.09
21	14	298	84	.94	e10	.02	1.3	e14	.05
22	4.3	e21	.99	.94	e8	.02	.82	e12	.03
23	3.0	e15	.16	12	386	66	11	92	5.5
24	11	133	17	9.3	141	4.1	4.1	e19	.23
25	3.1	e19	.16	40	1120	578	1.8	e13	.06
26	.87	e16	.04	54	1280	386	2.8	e16	.13
27	.34	e14	.01	9.8	83	2.5	2.1	e16	.16
28	.16	e12	<.01	4.3	55	.64	5.6	e43	.83
29	.08	e11	<.01	17	634	79	14	80	3.4
30	.07	e9	<.01	3.2	e48	.42	24	116	9.1
31	.03	e8	<.01	---	---	---	13	16	.55
TOTAL	53.74	---	171.60	248.36	---	1870.68	338.93	---	1633.71
		JANUARY			FEBRUARY			MARCH	
1	5.8	894	13	.19	e21	.01	25	e418	59
2	12	30	3.8	83	1410	843	44	e761	350
3	18	35	3.2	24	408	28	47	641	140
4	6.5	53	.99	23	708	89	15	35	1.6
5	3.8	e38	.40	16	592	28	17	398	61
6	2.0	e30	.16	16	186	9.4	43	833	190
7	2.4	e23	.16	9.1	37	1.1	45	369	69
8	13	51	2.5	8.6	20	.49	15	30	1.4
9	8.1	251	5.3	4.7	14	.17	7.7	11	.23
10	65	900	217	8.1	71	2.0	5.1	21	.32
11	115	624	226	83	838	323	e4.0	6	.06
12	41	162	19	28	e138	13	e9.0	e200	4.9
13	64	403	94	11	50	1.6	3.8	10	.10
14	23	109	7.9	5.2	16	.22	2.7	e8	.06
15	12	33	1.1	3.3	e14	.13	2.3	e7	.04
16	7.6	24	.50	2.2	e13	.08	2.9	e5	.04
17	5.3	66	.85	1.7	e12	.06	1.9	4	.02
18	3.2	109	.95	1.4	e11	.04	1.2	e5	.02
19	2.1	83	.47	1.2	e10	.03	.94	e5	.01
20	13	103	4.6	1.1	e9	.03	.73	e4	.01
21	6.5	23	.43	69	1280	589	.57	e4	.01
22	3.4	e15	.14	14	151	6.9	.50	e4	<.01
23	2.1	e17	.10	15	208	8.7	.49	e4	<.01
24	1.5	e18	.08	13	40	1.5	.47	e3	<.01
25	1.1	e20	.06	7.5	17	.34	1.6	e9	.16
26	.76	e23	.05	4.5	20	.25	2.3	e15	.13
27	.59	e25	.04	3.3	e13	.12	.72	e9	.02
28	.50	e24	.03	31	871	361	.42	e9	.01
29	.47	e23	.03	---	---	---	.36	9	.01
30	.35	e22	.02	---	---	---	.29	e8	.01
31	.23	e22	.01	---	---	---	.24	e9	.01
TOTAL	440.30	---	602.87	488.09	---	2307.17	301.23	---	878.20

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued
SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	.30	e9	.01	8.3	e22	.54	17	115	6.7
2	2.5	e20	.24	4.5	e10	.13	3.7	42	.45
3	2.5	e16	.22	3.1	e8	.06	1.6	e21	.10
4	21	645	141	2.2	e6	.03	.94	e11	.03
5	24	195	23	1.7	e13	.10	3.0	e11	.10
6	51	871	285	2.0	e11	.06	1.6	e5	.02
7	76	e1290	424	1.6	e9	.04	.84	e2	<.01
8	298	e4230	4730	1.7	e9	.05	.63	1	<.01
9	188	e1910	1600	2.7	e16	.14	.45	e1	<.01
10	31	e419	37	2.5	e11	.08	.36	e1	<.01
11	11	e167	5.3	1.8	e12	.05	.29	e1	<.01
12	37	306	48	1.5	e13	.05	.22	e1	<.01
13	47	418	94	1.4	e15	.05	.16	e1	<.01
14	37	426	67	1.7	e16	.07	.11	e1	<.01
15	13	14	.56	1.7	e18	.08	.08	e1	<.01
16	5.9	5	.08	1.0	20	.05	.06	e1	<.01
17	3.9	4	.04	.97	e17	.04	2.2	e10	.07
18	2.9	4	.03	.75	e14	.03	1.7	e8	.04
19	2.5	3	.02	3.5	e22	.32	.76	e6	.01
20	2.3	3	.02	2.4	22	.15	.39	e4	<.01
21	2.2	e3	.02	1.1	e11	.03	.29	e3	<.01
22	2.3	e3	.02	.91	e6	.02	.89	e5	.02
23	2.9	e11	.10	.74	e6	.01	.69	e9	.02
24	14	47	3.0	1.1	e6	.02	.38	e9	.01
25	5.9	4	.07	1.1	e5	.01	.27	e9	.01
26	3.3	1	.01	.58	e5	.01	.16	e8	<.01
27	70	1020	376	.89	e8	.01	.09	e8	<.01
28	47	e570	84	.64	e5	.01	.08	e8	<.01
29	38	e281	39	.45	e5	.01	.11	8	<.01
30	17	e101	4.7	.44	e5	.01	.06	e8	<.01
31	---	---	---	15	147	11	---	---	---
TOTAL	1059.40	---	7942.44	69.77	---	13.26	39.11	---	7.75
		JULY			AUGUST			SEPTEMBER	
1	.05	e8	<.01	2.8	7	.05	.07	e5	<.01
2	.05	e8	<.01	11	33	1.8	8.3	48	3.7
3	.04	e8	<.01	4.0	1	.01	2.6	e9	.07
4	.05	e8	<.01	12	33	1.9	1.6	e8	.03
5	.05	e8	<.01	3.5	5	.05	.72	e7	.01
6	13	e94	4.7	2.4	5	.03	5.7	31	2.4
7	3.6	160	1.3	2.5	e9	.07	8.2	24	.48
8	1.3	e21	.09	1.7	12	.05	1.8	e14	.07
9	.53	e10	.01	1.1	e11	.03	.84	e14	.03
10	.40	e9	.01	.82	e10	.02	.50	e13	.02
11	2.0	e13	.09	.82	e9	.02	.26	e13	.01
12	.85	e11	.03	.50	e9	.01	.15	e12	<.01
13	4.8	e31	.83	.42	e8	.01	.08	e12	<.01
14	14	95	11	.48	e7	.01	.07	e11	<.01
15	18	88	6.4	.43	e7	.01	.05	e11	<.01
16	3.6	259	2.8	.34	e6	.01	.07	e10	<.01
17	2.4	e24	.15	.28	e6	<.01	.07	e10	<.01
18	1.5	e11	.04	.25	e5	<.01	.04	e9	<.01
19	3.3	e19	.98	4.7	e27	.85	.08	e9	<.01
20	74	328	164	2.0	8	.05	.07	e9	<.01
21	181	1510	794	41	266	48	.06	e8	<.01
22	80	367	67	e7.5	16	.37	.08	e8	<.01
23	25	88	6.0	e3.3	12	.11	.05	e8	<.01
24	13	168	5.0	e2.0	e13	.08	.22	e7	<.01
25	6.9	929	17	e1.2	e15	.07	.10	7	<.01
26	4.1	888	12	e.64	e17	.07	.03	e6	<.01
27	2.4	10	.06	e.39	e20	.06	.02	e6	<.01
28	4.3	33	.45	e.22	e18	.02	.02	e5	<.01
29	14	43	1.7	.10	e11	<.01	.02	e5	<.01
30	6.2	18	.33	.07	e9	<.01	.02	e5	<.01
31	3.4	6	.06	.08	e7	<.01	---	---	---
TOTAL	483.82	---	1095.88	108.32	---	53.81	29.89	---	7.02
YEAR	3640.96		16581.33						

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

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 Kamanaiki Stream and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi^2.

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.--75 years (water years 1915-89), 8.85 ft^3/s (4,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s, Nov. 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft^3/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft^3/s, Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0200	1,020	8.09	Apr. 4	1730	810	7.60
Feb. 2	1700	1,030	8.10	Apr. 8	1830	*1,080	*8.20
Feb. 11	0830	714	7.38	July 20	2200	786	7.54

Minimum discharge, 0.91 ft^3/s, Oct. 22.

DISCHARGE, IN 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	2.5	1.7	4.1	4.2	3.5	15	2.5	12	18	1.7	3.8	1.9
2	2.1	1.5	3.9	3.9	65	23	6.3	9.8	5.5	1.7	11	3.6
3	2.1	1.6	3.4	4.9	8.5	20	9.8	8.2	4.8	1.6	5.7	2.4
4	1.8	13	3.1	6.5	9.2	7.6	34	7.4	4.0	1.7	7.9	3.4
5	1.5	5.3	2.8	3.5	16	11	20	6.9	4.7	4.0	4.7	2.3
6	1.7	4.6	79	3.2	9.8	40	31	8.4	3.7	2.9	4.2	3.1
7	1.7	2.9	9.8	3.8	7.1	23	69	6.0	3.3	2.0	4.5	6.2
8	1.7	2.3	6.2	5.8	5.6	9.4	278	5.9	3.3	1.7	3.5	3.0
9	1.5	2.0	5.2	7.4	5.4	7.3	160	6.0	3.1	1.6	3.1	3.0
10	1.8	1.8	4.5	37	15	6.4	34	5.8	2.9	1.9	2.9	2.2
11	1.6	2.1	4.2	51	70	7.3	22	5.6	2.8	2.5	2.8	1.9
12	2.2	1.5	22	25	11	11	57	4.9	2.5	1.8	2.7	1.8
13	1.5	3.8	5.8	47	7.1	6.1	35	4.9	2.4	5.2	2.7	1.8
14	1.5	1.9	4.8	15	8.2	5.5	25	5.7	2.3	9.1	2.4	1.7
15	1.3	1.6	9.4	12	5.7	6.1	15	5.6	2.3	8.4	2.4	1.7
16	3.9	13	28	9.4	5.4	5.1	12	5.1	2.8	2.8	2.3	2.2
17	1.9	4.3	15	7.4	4.8	5.4	9.9	4.5	2.8	2.4	2.3	2.0
18	1.4	7.2	7.1	6.4	4.4	4.6	8.6	4.1	2.4	2.1	2.4	1.7
19	1.3	6.2	5.6	6.0	4.6	3.9	7.9	7.6	2.1	3.5	4.9	2.2
20	1.3	3.2	4.8	28	4.0	3.9	7.2	4.5	2.3	42	3.9	2.6
21	1.6	4.7	4.3	7.5	51	4.0	6.6	3.9	2.7	66	23	1.9
22	13	3.9	3.8	5.7	8.0	3.3	6.8	4.5	2.9	19	4.5	1.8
23	5.0	9.2	18	5.1	6.9	3.3	15	4.6	2.5	10	3.9	1.8
24	13	6.3	7.3	4.8	6.7	3.2	46	4.0	2.1	6.6	3.0	2.0
25	4.5	20	5.3	4.3	5.3	3.4	9.8	3.9	2.0	6.1	2.7	1.6
26	2.8	27	5.3	3.9	4.6	3.0	7.8	4.0	1.9	5.7	2.4	1.5
27	2.2	7.0	5.2	3.8	4.4	2.8	62	4.9	2.2	4.8	2.3	1.4
28	1.9	7.4	4.8	4.8	14	2.6	29	4.5	1.7	4.6	2.4	2.6
29	1.8	8.2	6.2	3.9	---	2.5	36	4.2	2.0	6.1	2.1	1.5
30	1.9	4.9	9.1	3.3	---	2.5	16	4.0	1.9	4.3	2.1	1.5
31	2.4	---	5.6	3.3	---	2.5	---	33	---	3.9	2.0	---
TOTAL	86.2	180.1	303.2	335.8	369.2	254.7	1079.0	202.4	99.9	237.7	130.5	68.3
MEAN	2.78	6.00	9.78	10.8	13.2	8.22	36.0	6.53	3.33	7.87	4.21	2.28
MAX	13	27	79	51	70	40	278	33	18	66	23	6.2
MIN	1.3	1.5	2.8	3.2	3.5	2.5	2.5	3.9	1.7	1.6	2.0	1.4
AC-FT	171	357	601	666	732	505	2140	401	198	471	259	135

CAL YR 1988	TOTAL	2550.11	MEAN	6.97	MAX	160	MIN	.77	AC-FT	5060
WTR YR 1989	TOTAL	3347.0	MEAN	9.17	MAX	278	MIN	1.3	AC-FT	6640

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 1988 TO SEPTEMBER 1989

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)	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
DEC												
30...	1200	6.2	140	7.50	21.0	33	33	5.5	4.7	14	47	1
MAR												
30...	0825	2.6	150	6.80	20.5	34	34	5.2	5.0	14	47	1
JUN												
29...	0950	2.2	150	7.70	21.5	36	36	5.7	5.4	15	47	1
SEP												
25...	0935	1.5	155	7.80	21.5	37	37	5.9	5.3	14	45	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)
DEC											
30...	1.1	27	9.0	21	<0.10	14	86	0.12	<0.100	130	14
MAR											
30...	0.70	28	5.0	21	0.10	12	80	0.11	<0.100	180	13
JUN											
29...	0.80	29	5.0	21	0.10	13	84	0.11	<0.100	210	23
SEP											
25...	0.80	31	5.0	20	<0.10	13	83	0.11	<0.100	260	23

< 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 mi^2.

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.--27 years, 10.7 ft^3/s (7,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s, Apr. 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft^3/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0.16 ft^3/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 ft^3/s, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0230	1,080	4.17	Apr. 4	1730	1,030	4.08
Feb. 2	1700	*1,380	*4.65	Apr. 8	1830	1,250	4.45

Minimum discharge, 1.5 ft^3/s, Oct. 21.

DISCHARGE, IN 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	2.9	2.5	4.4	9.1	6.2	30	5.8	17	29	2.0	7.1	2.3
2	2.5	2.0	4.1	6.7	154	54	21	14	7.9	2.0	18	5.4
3	2.3	2.0	3.7	18	23	54	22	12	7.1	2.0	8.2	3.4
4	2.2	21	3.5	12	19	18	63	11	5.5	2.6	12	4.8
5	2.0	6.9	3.2	6.1	30	15	37	10	8.0	7.4	6.2	2.7
6	2.2	7.0	153	5.3	21	62	39	9.4	5.4	4.5	8.1	2.9
7	2.5	3.4	17	11	12	46	109	8.9	4.5	3.0	6.2	11
8	2.4	2.8	8.4	14	10	17	431	8.6	4.6	2.6	4.5	3.8
9	1.8	2.5	6.2	21	7.9	13	251	8.0	4.3	2.4	3.9	3.8
10	1.8	2.4	5.0	103	29	11	50	7.4	4.1	3.0	3.5	3.3
11	2.3	2.5	4.7	151	180	11	29	7.1	3.9	3.7	3.5	2.7
12	2.3	2.2	60	77	28	16	69	7.3	3.8	2.5	3.4	2.5
13	2.2	6.9	12	130	14	8.9	45	7.9	3.8	11	3.3	2.3
14	2.7	2.7	6.9	36	11	7.7	34	12	3.8	14	2.9	2.2
15	2.0	2.3	35	28	9.1	8.2	21	9.1	3.6	15	2.8	2.3
16	4.5	12	50	22	8.0	7.3	16	6.8	3.6	4.0	2.7	3.3
17	2.5	6.3	39	17	7.4	6.9	14	5.7	4.1	3.8	2.7	2.5
18	1.9	9.2	13	11	6.9	7.7	13	5.3	3.7	3.3	3.1	2.2
19	1.8	9.5	8.0	9.1	8.0	6.3	11	9.9	3.2	4.6	7.3	2.5
20	1.7	4.1	6.5	65	6.2	5.9	11	6.1	2.9	90	4.9	3.3
21	1.7	7.1	5.8	16	92	5.6	11	5.2	3.6	120	38	2.5
22	12	6.8	5.1	9.7	18	5.6	14	12	3.4	33	6.1	2.5
23	5.8	14	21	8.3	17	5.2	28	7.1	2.8	16	4.0	2.7
24	16	11	9.8	7.3	17	5.3	133	5.5	3.0	9.9	3.5	3.8
25	5.0	29	8.7	6.8	9.5	6.3	23	5.3	3.0	8.7	3.1	2.5
26	3.2	32	7.8	6.4	7.6	5.2	14	5.0	2.6	6.6	2.9	2.2
27	2.7	8.4	20	6.6	7.4	5.2	95	6.1	2.8	5.8	2.7	2.0
28	2.4	6.4	18	8.2	19	4.7	46	4.6	2.5	6.4	2.8	2.9
29	2.2	12	20	5.9	---	5.0	49	4.5	2.5	10	2.5	2.2
30	2.3	5.3	38	4.5	---	4.7	23	5.3	2.2	5.8	2.3	2.0
31	2.9	---	17	4.1	---	4.6	---	55	---	5.3	2.3	---
TOTAL	102.7	242.2	612.8	836.1	778.2	463.3	1727.8	299.1	145.4	410.9	184.5	94.5
MEAN	3.31	8.07	19.8	27.0	27.8	14.9	57.6	9.65	4.85	13.3	5.95	3.15
MAX	18	32	153	151	180	62	431	55	29	120	38	11
MIN	1.7	2.0	3.2	4.1	6.2	4.6	5.8	4.5	2.2	2.0	2.3	2.0
AC-FT	204	480	1220	1660	1540	919	3430	593	288	815	366	187

CAL YR 1988	TOTAL	4050.4	MEAN	11.1	MAX	336	MIN	1.4	AC-FT	8030
WTR YR 1989	TOTAL	5897.5	MEAN	16.2	MAX	431	MIN	1.7	AC-FT	11700

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 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
31...	1155	760	2.3	195	7.90	24.0	3.3	7.8	93	4400
FEB										
27...	1240	756	7.5	275	7.90	20.5	1.5	8.6	96	6100
MAY										
01...	1135	761	17	195	8.40	20.5	1.9	9.1	101	3000
AUG										
21...	1345	760	21	122	7.90	24.0	26	8.3	99	K11000

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
31...	7500	49	7	9.0	6.5	17	42	1	1.4	52
FEB										
27...	4700	66	8	12	8.7	24	44	1	1.1	70
MAY										
01...	6100	46	9	8.1	6.2	18	46	1	0.90	45
AUG										
21...	21000	32	1	6.4	3.6	12	44	0.9	1.3	37

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
31...	0	44	42	8.4	23	<0.10	16	116	108
FEB									
27...	0	56	58	13	32	0.10	18	141	144
MAY									
01...	0	38	37	8.0	26	0.10	15	100	105
AUG									
21...	0	30	30	5.0	15	<0.10	12	89	74

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
31...	0.16	0.160	0.020	0.010	0.28	0.30	0.050	0.050	0.030
FEB									
27...	0.19	0.190	<0.010	0.040	--	<0.20	0.040	0.020	<0.010
MAY									
01...	0.14	0.130	0.030	0.020	--	<0.20	0.030	0.030	0.010
AUG									
21...	0.12	<0.100	0.020	0.020	0.58	0.60	0.100	0.020	0.030

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT										
31...	20	<1	4	<0.5	<1	<1	<3	2	160	<5
FEB										
27...	20	<1	5	<0.5	<1	<1	<3	2	130	<5
MAY										
01...	40	<1	3	<0.5	<1	<1	<3	2	120	<5
AUG										
21...	150	<1	3	<0.5	<1	1	<3	4	280	1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
31...	<4	8	<0.1	<10	3	<1	<1.0	75	<6	4
FEB										
27...	<4	10	<0.1	<10	2	<1	<1.0	92	<6	4
MAY										
01...	<4	7	0.2	<10	4	<1	<1.0	58	<6	8
AUG										
21...	<4	7	0.3	<10	<1	<1	<1.0	50	<6	10

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
31...	1155	3	0.02	100
FEB				
27...	1240	3	0.06	100
MAY				
01...	1135	4	0.18	100
AUG				
21...	1345	38	2.2	87

< 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 wastoway, and 3.5 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi^2.

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.--73 years (water years 1915-16, 1918-20, 1922-89), 7.03 ft^3/s (5,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft^3/s, Jan. 16, 1921, gage height, 8.74 ft, from floodmarks, from rating curve extended above 420 ft^3/s by test of model of station site; minimum, 0.09 ft^3/s, Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0200	500	4.51	Apr. 8	1830	*622	*4.74
Feb. 2	1700	265	3.60	Apr. 24	0900	372	4.16
Feb. 11	0830	265	3.60	July 20	2230	578	4.66

Minimum discharge, 1.6 ft^3/s, Oct. 20-22.

DISCHARGE, IN 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	2.5	2.0	3.6	5.6	5.8	9.9	5.2	18	46	4.9	9.5	3.5
2	2.4	1.9	3.4	5.7	38	15	8.0	15	13	4.9	14	6.0
3	2.2	1.9	3.3	6.5	8.9	15	6.4	12	10	4.9	13	3.7
4	2.2	6.4	3.1	6.1	7.7	8.2	17	11	8.5	4.9	15	3.7
5	2.1	3.7	3.1	5.2	13	8.3	19	10	8.2	5.1	14	3.2
6	2.1	3.9	50	4.9	10	30	16	9.5	8.0	5.3	14	3.3
7	2.3	2.3	7.1	5.8	7.4	26	38	9.2	7.9	4.4	15	3.8
8	2.1	2.3	5.2	7.0	7.3	13	234	9.1	7.8	4.2	13	3.5
9	2.1	2.2	4.8	6.4	6.9	8.4	182	8.9	7.3	4.1	13	3.4
10	1.9	2.1	4.7	36	8.7	8.2	89	8.9	7.2	4.3	12	3.2
11	2.0	2.2	4.8	41	38	8.0	73	8.7	7.0	4.6	11	3.0
12	2.3	2.0	35	19	9.5	8.7	73	8.6	6.9	4.2	11	2.9
13	2.1	3.2	8.8	38	7.9	7.8	64	8.6	6.8	5.6	11	2.8
14	2.0	2.1	7.0	13	7.1	7.6	57	8.8	6.3	8.4	7.9	2.7
15	1.9	2.0	7.2	12	7.4	7.5	31	8.5	6.3	8.4	4.8	2.6
16	1.9	4.1	15	9.6	7.2	7.3	19	8.6	6.9	4.7	4.6	2.9
17	1.8	3.5	12	8.4	6.8	6.5	15	8.4	6.4	4.1	4.5	2.8
18	1.8	4.7	7.3	8.3	6.5	6.6	12	8.4	6.3	4.0	4.6	2.7
19	1.8	4.0	6.0	8.2	6.6	6.4	11	11	6.1	4.9	5.8	2.7
20	1.7	2.6	5.8	23	6.4	6.2	9.6	8.7	6.1	45	5.5	2.6
21	1.7	3.0	5.5	9.0	32	6.0	9.2	8.3	6.3	49	17	2.4
22	13	2.7	5.6	8.2	8.8	5.9	9.5	9.7	6.2	15	5.5	2.4
23	4.1	5.5	10	8.2	8.6	6.0	19	8.0	5.7	9.6	4.2	2.4
24	4.7	5.3	7.0	7.7	8.3	5.9	85	7.8	5.8	7.8	4.2	2.6
25	2.8	16	5.9	7.3	7.5	6.0	18	7.3	5.5	7.6	4.1	2.4
26	2.2	8.6	5.7	6.9	7.1	5.7	14	7.1	5.4	7.2	3.9	2.2
27	2.1	4.4	5.1	6.5	6.8	5.5	28	8.2	5.3	6.8	3.8	2.2
28	2.0	4.1	5.7	6.9	7.6	4.9	31	7.0	5.1	7.0	3.7	2.4
29	2.1	5.6	6.8	6.3	---	5.2	36	6.7	5.1	7.9	3.6	3.2
30	2.1	3.8	7.5	5.9	---	5.1	23	6.9	5.1	6.6	3.5	2.6
31	2.0	---	6.5	5.7	---	4.9	---	26	---	7.3	3.5	---
TOTAL	80.0	118.1	268.5	348.3	303.8	275.7	1251.9	302.9	244.5	272.7	260.2	89.8
MEAN	2.58	3.94	8.66	11.2	10.8	8.89	41.7	9.77	8.15	8.80	8.39	2.99
MAX	13	16	50	41	38	30	234	26	46	49	17	6.0
MIN	1.7	1.9	3.1	4.9	5.8	4.9	5.2	6.7	5.1	4.0	3.5	2.2
AC-FT	159	234	533	691	603	547	2480	601	485	541	516	178

CAL YR 1988	TOTAL	3765.4	MEAN	10.3	MAX	391	MIN	1.6	AC-FT	7470
WTR YR 1989	TOTAL	3816.4	MEAN	10.5	MAX	234	MIN	1.7	AC-FT	7570

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 mi^2.

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

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

GAGE.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft 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 fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream. Occasional amall diversions for irrigation upstream.

AVERAGE DISCHARGE.--71 years (water years 1914-20, 1926-89), 5.09 ft^3/s (3,690 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0200	*490	*3.74	Apr. 24	0815	402	3.52
Feb. 11	0815	327	3.29	June 1	0300	351	3.37
Mar. 2	2045	315	3.25	July 20	2130	374	3.44

Minimum diacharge, 2.8 ft^3/s, Oct. 20, 22.

DISCHARGE, IN 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	3.9	3.3	3.5	4.1	3.7	8.4	4.7	8.2	35	4.3	5.3	5.6
2	3.5	3.2	3.6	5.4	19	13	5.9	7.2	7.6	4.3	12	14
3	3.4	3.3	3.3	13	4.6	17	13	6.5	6.0	4.1	8.0	5.5
4	3.3	6.8	3.3	8.1	6.7	5.8	18	6.4	5.9	4.1	8.7	4.9
5	3.3	6.9	3.2	4.5	7.5	11	11	6.2	6.5	4.9	5.8	4.6
6	3.3	4.9	30	4.1	7.5	40	11	5.9	5.3	5.5	8.6	6.2
7	3.6	3.5	6.1	5.0	4.9	19	21	5.7	5.2	4.6	7.8	7.1
8	3.4	3.3	4.2	5.9	4.4	7.2	107	7.3	5.6	4.2	5.7	5.5
9	3.2	3.5	3.8	4.9	4.0	6.1	59	6.3	5.1	4.1	5.2	4.8
10	3.6	3.2	3.6	24	7.3	5.5	13	5.7	4.9	5.1	5.0	4.7
11	3.2	3.4	4.0	25	25	5.3	10	5.6	4.9	5.3	4.9	4.5
12	3.9	3.0	26	16	6.0	5.5	24	5.7	4.8	4.8	4.8	4.3
13	3.4	4.7	5.2	19	4.8	4.8	15	7.0	4.8	9.9	4.9	4.2
14	3.4	3.3	4.1	9.1	4.4	4.6	12	8.7	4.7	11	4.5	4.0
15	3.2	3.1	6.1	7.6	4.3	5.3	7.7	5.9	4.6	8.0	4.6	3.8
16	3.1	4.8	18	6.2	4.1	5.1	6.8	6.0	8.1	4.9	4.5	4.6
17	3.0	3.4	8.0	5.5	4.0	4.7	6.7	5.3	7.9	5.1	4.5	4.5
18	2.9	7.2	5.1	5.3	4.0	4.5	6.4	6.3	8.0	4.4	4.9	4.1
19	2.9	4.4	4.4	5.0	4.8	4.4	6.2	15	5.3	12	8.9	4.7
20	2.9	3.4	4.1	16	4.1	4.2	6.3	6.2	5.5	40	13	4.3
21	3.0	4.7	3.8	5.3	32	4.2	5.9	5.6	6.7	24	17	4.2
22	25	5.8	3.8	4.8	7.6	4.1	7.0	6.7	6.0	12	6.1	4.3
23	5.5	16	7.2	4.6	5.7	3.9	14	5.5	4.8	7.3	5.3	4.8
24	9.0	7.1	4.8	4.4	5.6	4.0	35	5.5	4.8	6.4	5.2	6.4
25	4.3	17	4.1	4.1	4.7	5.4	7.8	5.2	4.6	5.9	5.3	5.0
26	3.6	6.9	4.7	3.8	4.5	4.1	6.5	5.5	4.5	5.9	4.7	4.8
27	3.4	4.5	9.9	4.0	4.4	3.9	25	6.3	4.5	5.3	4.5	4.6
26	3.3	4.7	5.5	4.3	8.7	3.8	18	5.2	4.5	6.1	4.5	6.0
29	3.3	4.2	6.5	3.9	---	4.3	28	5.0	4.6	10	4.3	5.3
30	3.5	3.7	5.4	3.7	---	3.8	12	7.7	4.4	5.6	4.2	4.8
31	3.6	---	4.5	3.7	---	3.7	---	29	---	5.7	4.6	---
TOTAL	133.9	157.2	209.8	240.3	208.3	226.6	523.9	224.3	195.1	244.8	197.3	156.1
MEAN	4.32	5.24	6.77	7.75	7.44	7.31	17.5	7.24	6.50	7.90	6.36	5.20
MAX	25	17	30	25	32	40	107	29	35	40	17	14
MIN	2.9	3.0	3.2	3.7	3.7	3.7	4.7	5.0	4.4	4.1	4.2	3.8
AC-FT	266	312	416	477	413	449	1040	445	387	486	391	310

CAL YR 1988	TOTAL	2687.1	MEAN	7.34	MAX	72	MIN	2.9	AC-FT	5330
WTR YR 1989	TOTAL	2717.6	MEAN	7.45	MAX	107	MIN	2.9	AC-FT	5390

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 mi^2.

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 except for estimated daily discharges, which are poor. Maunawili ditch diverts 1.5 mi upstream for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--33 years (water years 1914-15, 1959-89), 5.19 ft^3/s (3,760 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s, Feb. 4, 1965, gage height, 12.41 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.43 ft^3/s, Sept. 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0430	515	5.40	Apr. 8	2200	836	6.34
Mar. 2	2000	738	6.08	June 1	1530	1,050	6.88
Apr. 4	1700	*1,730	*8.14				

Minimum discharge, 1.6 ft^3, Oct. 5.

DISCHARGE, IN 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	2.7	e2.8	3.8	4.8	e4.0	27	6.0	10	104	4.9	3.9	3.5
2	2.8	e2.7	3.8	5.0	e10	36	6.0	9.8	13	5.2	4.3	4.1
3	2.3	e2.4	3.5	4.7	e7.0	39	31	8.5	10	4.8	4.2	3.6
4	2.1	e3.1	3.2	4.6	e5.4	15	115	7.7	9.4	4.7	4.2	3.4
5	1.7	e4.7	2.9	5.0	e6.9	23	22	9.0	8.5	4.5	4.6	3.1
6	1.9	e4.0	36	4.8	e6.6	18	13	e8.2	7.9	4.8	4.8	2.8
7	2.0	e3.1	12	4.4	e5.9	15	34	e7.8	7.3	4.1	4.3	3.0
8	2.4	e2.5	6.9	4.2	e5.2	12	193	e8.0	6.9	4.1	3.4	2.8
9	2.4	e2.2	5.7	4.4	e4.9	12	157	e7.6	6.8	4.2	3.4	3.1
10	2.5	e2.4	5.3	7.1	e6.4	11	41	e7.2	6.7	4.6	3.0	3.2
11	2.0	e2.4	4.8	15	e12	11	29	e6.9	6.6	4.8	3.1	2.8
12	2.5	e2.5	9.0	9.5	e15	9.6	57	e6.8	6.5	4.1	3.6	2.6
13	e2.4	e4.1	5.4	11	e7.8	9.5	24	e7.5	6.4	4.7	4.0	2.6
14	e2.3	e4.5	4.7	7.2	e6.6	9.2	19	e8.0	6.1	4.5	3.4	2.7
15	e2.2	e3.6	4.5	6.4	e6.3	8.5	17	e7.3	6.4	4.8	2.8	2.5
16	e2.2	3.1	23	6.4	5.9	8.2	15	e7.1	7.1	4.5	2.7	2.4
17	e2.1	2.3	16	6.0	5.1	8.8	14	e6.7	7.0	5.1	2.5	2.3
18	e2.0	2.4	9.3	5.7	4.9	8.2	12	e7.8	6.6	4.9	3.4	2.2
19	e2.0	2.7	7.7	5.4	5.0	7.9	11	e9.5	5.9	4.9	3.8	3.1
20	e1.9	2.5	7.0	6.0	5.2	7.9	9.8	e7.5	5.6	15	4.1	2.6
21	e2.4	2.6	6.6	5.4	21	7.8	9.4	e7.3	5.5	13	4.7	2.6
22	e9.0	2.6	6.2	5.1	6.0	6.8	9.3	e7.5	4.9	5.9	3.8	2.5
23	e4.0	3.3	6.9	5.0	5.3	7.2	9.7	7.2	5.2	5.3	3.7	2.7
24	e6.0	3.7	5.5	4.9	4.8	6.6	8.5	7.3	5.5	4.7	3.8	2.9
25	e4.1	8.1	5.1	4.4	4.9	8.5	8.2	7.1	5.9	4.4	3.7	2.5
26	e3.2	5.6	5.6	4.0	5.8	6.4	8.1	6.3	5.1	4.3	3.5	2.1
27	e2.8	4.1	5.5	4.1	5.5	6.0	9.1	5.9	5.3	4.1	3.4	2.4
28	e2.6	4.5	5.0	e3.8	20	5.9	11	5.9	4.8	4.6	4.1	2.5
29	e2.5	4.3	5.6	e3.8	---	5.7	16	6.0	4.5	4.9	4.1	2.7
30	e2.6	3.9	5.0	e3.7	---	6.1	11	6.3	4.3	4.1	3.5	2.7
31	e2.8	---	4.8	e3.7	---	6.0	---	6.6	---	4.0	3.6	---
TOTAL	66.4	102.7	236.3	175.5	209.4	369.6	926.1	233.3	295.7	162.5	115.4	64.0
MEAN	2.79	3.42	7.62	5.66	7.48	11.9	30.9	7.53	9.86	5.24	3.72	2.80
MAX	9.0	8.1	36	15	21	39	193	10	104	15	4.8	4.1
MIN	1.7	2.2	2.9	3.7	4.0	5.7	6.0	5.9	4.3	4.0	2.5	2.1
AC-FT	171	204	469	348	415	733	1840	463	587	322	229	167

CAL YR 1988	TOTAL	2825.4	MEAN	7.72	MAX	140	MIN	1.7	AC-FT	5600
WTR YR 1989	TOTAL	2997.1	MEAN	8.21	MAX	193	MIN	1.7	AC-FT	5940

e Estimated

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 mi^2.

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

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

REMARKS.--Records fair except for daily discharges above 10 ft^3/s, which are poor.

AVERAGE DISCHARGE.--8 years (water years 1984-89) 1.57 ft^3/s (1,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft^3/s, Nov. 10, 1986, gage height, 11.65 ft from rating curve extended above 100 ft^3/s on basis of slope-conveyance computation; minimum, 0.03 ft^3/s for several days in November, December 1984 and January 1985.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0215	*697	*8.63	Apr. 4	1645	629	8.23
Feb. 2	1715	607	8.10				

Minimum discharge, 0.29 ft^3/s, for several days in October.

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	.41	.56	.96	1.1	.92	16	1.4	1.6	16	1.6	1.3	1.1
2	.40	.57	.95	1.2	41	15	1.6	1.6	1.8	1.6	1.6	1.1
3	.37	.85	.84	1.5	2.1	6.2	26	1.6	1.7	1.6	1.0	.95
4	.41	7.0	.90	1.6	2.1	1.2	43	1.8	1.8	1.6	.96	1.1
5	.47	3.8	.93	.81	1.7	2.2	4.0	2.0	1.8	1.7	.93	1.1
6	.48	1.1	52	.79	2.1	2.4	5.6	1.9	1.7	1.5	.95	1.0
7	.43	.56	1.1	.72	1.4	1.4	30	1.9	1.7	1.4	1.0	1.1
8	.41	.56	.90	.95	1.5	1.1	124	2.0	1.8	1.4	.99	1.0
9	.39	.58	.91	.76	1.9	1.2	47	1.9	1.8	1.5	.96	1.0
10	.45	.62	.93	3.5	8.2	1.2	2.8	1.9	1.7	1.5	1.0	1.0
11	.35	.63	.95	15	33	1.2	2.3	1.9	1.7	1.5	1.0	1.0
12	.56	.63	2.5	2.0	2.4	2.4	26	1.9	1.7	1.3	.95	.99
13	.39	1.3	.71	3.3	1.6	1.1	3.7	1.9	1.7	1.4	1.0	1.0
14	.41	.72	.69	.92	1.5	1.1	3.2	2.0	1.7	2.3	.99	1.1
15	.36	.72	.91	.87	1.5	1.2	1.8	2.0	1.7	1.4	.99	1.1
16	1.3	.72	12	.83	1.5	5.3	1.8	2.0	1.8	1.3	.97	1.1
17	.52	.85	2.4	.80	1.5	1.3	1.8	2.1	1.7	1.3	.96	1.2
18	.39	.86	1.4	.81	1.5	1.4	1.8	2.3	1.7	1.3	.96	1.1
19	.41	.88	.77	.82	1.5	1.2	1.8	2.7	1.7	1.4	.97	1.1
20	.42	.89	.78	.94	1.5	1.0	1.9	2.0	1.8	11	1.7	1.0
21	2.0	1.2	.82	.86	20	1.1	2.0	1.8	1.8	4.7	1.1	.96
22	1.4	.88	.87	.81	1.8	1.1	2.1	2.0	1.8	2.4	.88	.88
23	.69	1.2	1.8	.81	1.5	1.1	2.3	1.8	1.7	1.4	.94	.96
24	1.9	1.0	.90	.84	1.5	1.1	2.1	1.8	1.6	1.4	.92	.85
25	.52	6.5	.79	.80	1.4	1.3	2.1	1.8	1.6	1.5	1.1	.75
26	.51	4.3	.95	.79	1.3	1.2	1.8	1.9	1.5	1.4	.99	.61
27	.51	.74	.70	.83	1.4	1.2	3.3	1.9	1.5	1.4	.95	.92
28	.53	.74	.79	1.2	12	1.2	3.0	1.8	1.5	1.4	3.2	.83
29	.56	1.2	1.1	1.1	---	1.1	3.9	1.9	1.5	1.5	.96	.77
30	.62	.73	1.0	.82	---	1.2	1.8	1.9	1.6	1.4	.90	.87
31	.57	---	1.0	.81	---	1.2	---	2.1	---	1.3	1.0	---
TOTAL	19.14	42.89	94.25	48.89	151.32	77.9	355.9	59.7	65.1	59.4	34.12	29.54
MEAN	.62	1.43	3.04	1.58	5.40	2.51	11.9	1.93	2.17	1.92	1.10	.98
MAX	2.0	7.0	52	15	41	16	124	2.7	16	11	3.2	1.2
MIN	.35	.56	.69	.72	.92	1.0	1.4	1.6	1.5	1.3	.88	.61
AC-FT	38	85	187	97	300	155	706	118	129	118	68	59

CAL YR 1988 TOTAL 637.05 MEAN 1.74 MAX 52 MIN .35 AC-FT 1260
WTR YR 1989 TOTAL 1038.15 MEAN 2.84 MAX 124 MIN .35 AC-FT 2060

16265600 RB OF KAMOOALII STR NR 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 for several days in 1988.
SEDIMENT DISCHARGE: Maximum daily mean, 966 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton for many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 362 mg/L, Dec. 6; minimum daily mean, 4 mg/L for several days.
SEDIMENT DISCHARGE: Maximum daily mean, 271 tons, Dec. 6; minimum daily, less than 0.01 ton for several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
07...	1455	757	0.56	280	6.50	25.0	2.9	5.0	61	--	--
DEC											
07...	1015	758	1.1	280	6.70	23.0	5.5	4.7	55	3500	--
MAR											
22...	1350	761	1.1	215	6.50	25.5	2.4	6.4	78	--	--
APR											
26...	1110	762	2.7	260	6.70	23.5	2.1	7.3	86	260	83
JUN											
13...	1430	760	1.7	235	6.70	26.0	1.3	8.2	101	--	--
26...	1350	757	1.5	230	6.70	26.0	0.90	6.9	86	--	--
JUL											
21...	1015	759	2.5	210	6.40	24.0	22	--	--	4400	--
AUG											
09...	0900	8	1.1	213	6.46	24.0	1.6	5.8	0	K310	64
29...	1510	756	1.0	230	6.80	26.0	3.4	5.8	72	--	--
SEP											
26...	1455	756	0.76	235	6.90	25.0	1.0	5.6	68	--	--

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
26...	83	19	8.5	19	33	0.9	1.8	71	19	20
AUG										
09...	64	14	7.1	19	39	1	0.90	55	12	20

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

16265600 RB OF KAMOOALII STR NR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
07...	--	--	--	--	--	11	0.600	0.20	0.80	0.040
APR										
26...	0.10	16	142	146	0.19	<1	0.400	0.30	0.70	0.030
JUL										
21...	--	--	--	--	--	25	0.400	0.90	1.3	0.100
AUG										
09...	0.10	19	123	126	0.17	4	0.500	0.30	0.80	<0.010

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
26...	190	<10	<1	<1	<100	16	<10	<0.5	3	<1
AUG										
09...	140	<10	<1	<1	100	12	<10	<0.5	<1	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
26...	3	<1	1	<3	11	8	720	78	2	1
AUG										
09...	1	<1	1	<3	7	5	520	87	10	1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
26...	<10	<4	200	180	<0.10	<0.1	4	<10	20
AUG									
09...	<10	<4	200	190	0.30	0.1	<1	<10	9

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
26...	6	<1	<1	<1	<1.0	100	<6	160	160
AUG									
09...	5	<1	<1	<1	<1.0	75	<6	70	74

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

16265600 RB OF KAMOOALII STR NR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
APR										
26...	1.0	1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
09...	0.9	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
26...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
26...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

16265600 RIGHT BRANCH OF KAMOOALII STR NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.41	e4	<.01	.56	e15	.02	.96	e19	.05
2	.40	e4	<.01	.57	e15	.02	.95	e19	.05
3	.37	e4	<.01	.85	46	.12	.84	e19	.04
4	.41	e4	<.01	7.0	159	6.7	.90	e20	.05
5	.47	e4	<.01	3.8	47	3.2	.93	e20	.05
6	.48	e4	<.01	1.1	30	.12	52	362	271
7	.43	e4	<.01	.56	18	.03	1.1	e25	.07
8	.41	e4	<.01	.56	e18	.03	.90	e20	.05
9	.39	e4	<.01	.58	e18	.03	.91	e20	.05
10	.45	e5	.01	.62	e18	.03	.93	e20	.05
11	.35	e4	<.01	.63	e18	.03	.95	e20	.05
12	.56	e7	.02	.63	e18	.03	2.5	39	.74
13	.39	e4	<.01	1.3	63	.32	.71	e15	.03
14	.41	e4	<.01	.72	e18	.03	.69	e15	.03
15	.36	e4	<.01	.72	e18	.03	.91	e16	.04
16	1.3	29	.44	.72	e18	.03	12	118	5.4
17	.52	e11	.02	.85	e18	.04	2.4	e37	.42
18	.39	e10	.01	.86	e18	.04	1.4	e24	.14
19	.41	e10	.01	.88	e18	.04	.77	e15	.03
20	.42	e10	.01	.89	e18	.05	.78	e16	.03
21	2.0	62	1.1	1.2	e25	.09	.82	e17	.04
22	1.4	41	.49	.88	e19	.05	.87	e17	.04
23	.69	e18	.04	1.2	e26	.09	1.8	e33	.23
24	1.9	54	.58	1.0	e20	.06	.90	e16	.04
25	.52	e15	.02	6.5	96	5.4	.79	e15	.03
26	.51	e15	.02	4.3	93	2.4	.95	e16	.04
27	.51	e15	.02	.74	e18	.04	.70	e15	.03
28	.53	e15	.02	.74	e19	.04	.79	e16	.03
29	.56	e15	.02	1.2	32	.16	1.1	e18	.05
30	.62	e15	.02	.73	e18	.04	1.0	e18	.05
31	.57	e15	.02	---	---	---	1.0	e18	.05
TOTAL	19.14	---	2.87	42.89	---	19.31	84.25	---	279.00
		JANUARY			FEBRUARY			MARCH	
1	1.1	e18	.05	.92	e22	.06	16	e155	18
2	1.2	e18	.06	41	e228	97	15	146	31
3	1.5	33	.29	2.1	e42	.24	6.2	e80	2.3
4	1.6	e23	.19	2.1	e39	.23	1.2	e27	.09
5	.81	e14	.03	1.7	e35	.17	2.2	e41	.35
6	.79	e14	.03	2.1	e40	.25	2.4	e44	.33
7	.72	e14	.03	1.4	e30	.11	1.4	e31	.12
8	.95	e19	.05	1.5	e30	.12	1.1	e25	.08
9	.76	e15	.03	1.9	e32	.17	1.2	e25	.08
10	3.5	e50	.86	8.2	e96	5.9	1.2	e28	.08
11	15	e134	22	33	e228	84	1.2	e25	.08
12	2.0	e38	.47	2.4	e42	.28	2.4	e39	.44
13	3.3	e52	.75	1.6	e35	.15	1.1	e24	.07
14	.92	e20	.05	1.5	e35	.14	1.1	e24	.07
15	.87	e20	.05	1.5	e35	.14	1.2	e26	.09
18	.83	e20	.05	1.5	e35	.14	5.3	e61	4.9
17	.80	e20	.04	1.5	e35	.14	1.3	e28	.10
18	.81	e20	.04	1.5	e35	.14	1.4	e26	.09
19	.82	e20	.04	1.5	e35	.15	1.2	e26	.08
20	.94	e20	.05	1.5	e35	.14	1.0	e26	.07
21	.86	e20	.05	20	e168	31	1.1	e28	.08
22	.81	e20	.04	1.8	e36	.18	1.1	e26	.08
23	.81	e20	.04	1.5	e35	.14	1.1	e26	.08
24	.84	e20	.05	1.5	e35	.14	1.1	e26	.08
25	.80	e20	.04	1.4	e35	.13	1.3	e28	.11
26	.79	e20	.04	1.3	e35	.12	1.2	e26	.09
27	.83	e20	.05	1.4	e35	.13	1.2	e26	.08
28	1.2	e27	.10	12	e113	17	1.2	e26	.08
29	1.1	e24	.09	---	---	---	1.1	e26	.08
30	.82	e20	.04	---	---	---	1.2	e26	.08
31	.81	e20	.04	---	---	---	1.2	e26	.09
TOTAL	48.89	---	25.74	151.32	---	238.51	77.9	---	59.35

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

16265600 RIGHT BRANCH OF KAMOOALII STR NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	1.4	e28	.10	1.6	e24	.11	16	e73	6.4
2	1.6	e31	.15	1.6	e24	.10	1.8	e23	.11
3	26	164	28	1.6	e24	.11	1.7	e23	.11
4	43	276	158	1.8	e24	.11	1.8	e23	.11
5	4.0	e155	1.8	2.0	e25	.14	1.8	e23	.11
6	5.6	e178	3.1	1.9	e24	.12	1.7	e23	.11
7	30	e315	69	1.9	e24	.12	1.7	e23	.11
8	124	345	184	2.0	e24	.13	1.8	e23	.11
9	47	93	23	1.9	e24	.12	1.8	e24	.12
10	2.8	e27	.20	1.9	e24	.12	1.7	e23	.11
11	2.3	e24	.15	1.9	e24	.12	1.7	e23	.11
12	26	e92	15	1.9	e24	.12	1.7	e23	.11
13	3.7	e30	.39	1.9	e24	.13	1.7	e22	.10
14	3.2	e29	.38	2.0	e24	.13	1.7	e22	.10
15	1.8	e23	.11	2.0	e24	.13	1.7	e22	.10
16	1.8	e23	.11	2.0	e24	.13	1.8	e23	.11
17	1.8	e23	.11	2.1	e24	.14	1.7	e22	.10
18	1.8	e23	.11	2.3	e24	.15	1.7	e22	.10
19	1.8	e23	.11	2.7	e27	.21	1.7	e22	.10
20	1.9	e23	.12	2.0	e23	.12	1.8	e22	.11
21	2.0	e23	.12	1.8	e23	.11	1.8	e22	.11
22	2.1	e24	.14	2.0	e24	.14	1.8	e22	.11
23	2.3	e23	.14	1.8	e23	.11	1.7	e22	.10
24	2.1	e22	.12	1.8	e23	.11	1.6	e22	.10
25	2.1	e21	.12	1.8	e23	.11	1.6	e22	.09
26	1.8	e20	.10	1.9	e23	.11	1.5	e22	.09
27	3.3	e31	.39	1.9	e23	.12	1.5	e22	.09
28	3.0	e31	.30	1.8	e23	.11	1.5	e22	.09
29	3.9	e35	.49	1.9	e23	.12	1.5	e22	.09
30	1.8	e24	.12	1.9	e23	.12	1.6	e22	.09
31	---	---	---	2.1	e25	.15	---	---	---
TOTAL	355.9	---	485.96	59.7	---	3.87	65.1	---	9.40
		JULY			AUGUST			SEPTEMBER	
1	1.6	e22	.09	1.3	e46	.16	1.1	e24	.07
2	1.6	e22	.09	1.6	e44	.54	1.1	e31	.11
3	1.6	e22	.10	1.0	e28	.08	.95	e27	.07
4	1.6	e21	.09	.96	e25	.06	1.1	e29	.09
5	1.7	e21	.10	.93	e24	.06	1.1	e29	.08
6	1.5	e20	.08	.95	e23	.06	1.0	e32	.09
7	1.4	e20	.08	1.0	e28	.09	1.1	e31	.10
8	1.4	e20	.08	.99	e23	.06	1.0	e29	.08
9	1.5	e20	.08	.96	e22	.06	1.0	e28	.08
10	1.5	e20	.08	1.0	e22	.06	1.0	e27	.07
11	1.5	e22	.09	1.0	e22	.06	1.0	e27	.07
12	1.3	e21	.07	.95	e22	.05	.99	e27	.07
13	1.4	e21	.08	1.0	e21	.06	1.0	e27	.08
14	2.3	e26	.25	.99	e21	.06	1.1	e27	.08
15	1.4	e20	.08	.99	e21	.06	1.1	e27	.08
16	1.3	e18	.06	.97	e21	.05	1.1	e27	.08
17	1.3	e18	.06	.98	e20	.05	1.2	e27	.08
18	1.3	e18	.06	.96	e20	.05	1.1	e27	.08
19	1.4	e18	.07	.97	e31	.13	1.1	e32	.10
20	11	543	76	1.7	e77	1.3	1.0	e31	.09
21	4.7	e191	5.6	1.1	e27	.13	.96	e27	.07
22	2.4	e98	.87	.88	e18	.04	.88	e27	.06
23	1.4	e67	.25	.94	e19	.05	.98	e27	.07
24	1.4	e63	.24	.92	e20	.05	.85	e27	.06
25	1.5	e60	.24	1.1	e21	.06	.75	e27	.05
26	1.4	e56	.22	.99	e22	.06	.61	e27	.04
27	1.4	e53	.20	.95	e24	.06	.92	e27	.07
28	1.4	e52	.20	3.2	e77	2.9	.83	e32	.07
29	1.5	e55	.24	.96	e21	.05	.77	e28	.06
30	1.4	e48	.18	.90	e22	.05	.87	e26	.06
31	1.3	e47	.17	1.0	e23	.06	---	---	---
TOTAL	59.4	---	86.10	34.12	---	6.61	29.54	---	2.26
YEAR	1036.15		1220.90						

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE

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 mi^2.

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.--9 years (water years 1968-71, 1985-89), 1.35 ft^3/s (978 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft^3/s, Nov. 26, 1970 (gage height, 6.18 ft for datum and site then in use), from rating curve extended above 10 ft^3/s on basis of slope-area measurement at gage height 6.09 ft; minimum, 0.03 ft^3/s for many days 1984-85.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 182 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 7	0430	*260	*2.25	No other peak greater than base discharge.			

Minimum discharge, 0.03 ft^3/s, Oct. 14.

DISCHARGE, IN 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	.53	1.0	.94	1.0	.98	2.7	1.1	1.4	3.2	.77	1.0	.92
2	.47	.95	.93	1.0	6.6	3.6	1.2	1.3	1.0	.76	1.1	.90
3	.47	.95	.86	1.3	2.0	3.9	2.5	1.2	.93	.76	1.0	.86
4	.38	2.7	.86	1.3	1.7	2.0	5.3	1.2	.89	.76	1.1	.84
5	.33	1.8	.86	1.4	1.5	2.6	2.7	1.2	.90	.85	1.0	.86
6	.30	1.8	8.7	1.5	1.4	2.4	3.6	1.1	.86	.82	.99	.86
7	.28	1.5	1.7	1.7	1.4	2.1	8.5	1.1	.88	.79	.98	.88
8	.22	1.2	1.3	1.7	1.3	1.9	27	1.1	.86	.77	1.0	.85
9	.20	1.2	1.2	1.7	1.7	1.9	11	1.1	.84	.78	.99	.84
10	.20	1.0	1.2	2.5	2.5	1.7	2.8	1.1	.84	.79	.97	.84
11	.12	1.1	1.2	3.8	5.1	1.7	2.2	1.0	.64	.80	.96	.84
12	.12	.97	1.7	2.2	1.9	1.9	6.1	.99	.62	.79	.95	.86
13	.10	1.0	1.2	2.4	1.6	1.6	2.9	.99	.80	.83	.96	.84
14	.03	.97	1.2	2.1	1.5	1.6	2.4	.98	.80	.88	.95	.87
15	.05	.96	1.2	2.1	1.4	2.2	2.1	.92	.79	.90	.96	.85
16	.17	.99	3.1	2.0	1.4	1.8	2.1	.92	.84	.85	.95	.83
17	.28	.95	1.9	2.0	1.4	1.6	2.1	.91	.78	.85	.95	.82
18	.33	.96	1.5	2.0	1.4	1.6	2.1	.92	.75	.84	.96	.84
19	.44	.92	1.3	1.9	1.3	1.5	1.9	1.1	.76	.87	1.1	.86
20	.47	.95	1.3	1.9	1.3	1.5	1.8	.91	.78	3.0	1.4	.85
21	1.1	.97	1.2	1.8	4.6	1.7	1.6	.93	.79	5.5	1.6	.85
22	.93	.94	1.2	1.9	1.8	1.5	1.5	.88	.78	1.9	1.0	.83
23	.95	1.1	1.4	1.9	1.7	1.6	1.5	.88	.81	1.3	1.0	.84
24	1.4	.94	1.2	1.9	1.5	1.3	1.4	.86	.78	1.2	.96	.81
25	1.2	1.7	1.2	1.7	1.5	1.5	1.3	.84	.78	1.1	.96	.82
26	1.1	4.6	1.2	1.6	1.4	1.3	1.3	.84	.80	1.0	.93	.95
27	1.0	1.1	1.1	1.0	1.4	1.2	3.7	.83	.80	.96	.93	.81
28	1.0	1.0	1.1	1.1	3.3	1.2	2.4	.82	.77	.97	1.1	.95
29	1.0	2.1	1.1	1.2	---	1.2	2.2	.83	.76	1.0	.93	.85
30	.95	1.1	1.4	1.1	---	1.2	1.8	.83	.77	.96	.93	.90
31	1.0	---	1.2	1.1	---	1.1	---	1.1	---	.98	.92	---
TOTAL	17.12	39.42	47.45	53.8	56.58	56.6	110.1	31.08	26.98	35.33	31.53	25.72
MEAN	.55	1.31	1.53	1.74	2.02	1.83	3.67	1.00	.90	1.14	1.02	.86
MAX	1.4	4.6	8.7	3.8	6.6	3.9	27	1.4	3.2	5.5	1.6	.95
MIN	.03	.92	.86	1.0	.98	1.1	1.1	.82	.75	.76	.92	.81

CAL YR 1988	TOTAL	435.55	MEAN	1.19	MAX	9.8	MIN	.03
WTR YR 1989	TOTAL	531.71	MEAN	1.46	MAX	27	MIN	.03

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 for many days each yesr.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum dsily mean, 443 mg/L, Dec. 6; minimum daily mean, 3 mg/L, Oct. 11-15.
SEDIMENT DISCHARGE: Maximum daily, 51 tons, Apr. 8; minimum daily, less than 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	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)	OXYGEN, DIS-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											
04...	1230	760	6.1	130	6.90	22.0	140	8.9	102	--	--
DEC											
06...	1000	755	2.7	165	7.10	21.5	3.3	8.2	94	590	--
MAR											
22...	1200	761	1.9	180	7.00	22.0	0.50	9.1	104	--	--
APR											
26...	1000	757	1.3	177	7.30	21.5	0.40	9.2	105	690	61
JUN											
14...	1220	761	0.80	175	7.20	22.5	0.40	8.7	101	--	--
27...	1220	759	0.74	170	7.60	22.0	0.30	9.1	105	--	--
JUL											
20...	1125	756	1.0	156	7.49	21.5	0.30	8.2	94	9000	--
AUG											
08...	1115	8	1.0	155	7.67	22.0	0.40	8.8	0	520	48
28...	1045	760	0.99	170	7.60	21.0	0.30	8.1	91	--	--
SEP											
26...	1315	758	0.88	170	7.00	21.5	0.20	7.6	87	--	--

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)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
APR										
26...	61	12	7.5	14	33	0.8	1.2	55	5.0	18
AUG										
08...	48	9.6	5.7	13	37	0.8	0.90	49	3.0	15

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)	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-PHOROUS TOTAL (MG/L AS P)
DEC										
06...	--	--	--	--	--	<1	0.400	<0.20	--	0.030
APR										
26...	0.10	27	110	118	0.15	2	0.600	<0.20	--	0.020
JUL										
20...	--	--	--	--	--	<1	0.200	0.40	0.60	0.030
AUG										
08...	<0.10	29	105	106	0.14	6	0.100	<0.20	--	0.020

< 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 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
26...	80	10	1	1	<100	<2	<10	<0.5	<1	<1
AUG										
08...	40	<10	<1	<1	<100	<2	<10	<0.5	<1	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
26...	2	<1	<1	<3	3	1	100	19	1	1
AUG										
08...	1	<1	<1	<3	1	2	40	21	1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
26...	<10	<4	<10	8	0.10	0.2	2	<10	6
AUG									
08...	<10	<4	10	5	<0.10	<0.1	<1	<10	1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
26...	1	<1	<1	<1	<1.0	70	<6	<10	5
AUG									
08...	<1	<1	<1	<1	<1.0	55	6	<10	6

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
APR										
26...	4.0	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
08...	0.5	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

< 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 1988 TO SEPTEMBER 1989

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
26...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
26...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

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

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.53	e4	.01	1.0	e4	.01	.94	e6	.02
2	.47	e4	.01	.95	e4	.01	.93	e8	.02
3	.47	e4	.01	.95	e4	.01	.86	e6	.01
4	.38	e4	<.01	2.7	219	4.1	.86	e4	.01
5	.33	e4	<.01	1.8	e30	.15	.86	e4	.01
6	.30	e4	<.01	1.8	e15	.07	8.7	443	31
7	.28	e4	<.01	1.5	e10	.04	1.7	e20	.09
8	.22	e4	<.01	1.2	e8	.03	1.3	e10	.04
9	.20	e4	<.01	1.2	e6	.02	1.2	9	.03
10	.20	e4	<.01	1.0	e6	.02	1.2	9	.03
11	.12	e3	<.01	1.1	e4	.01	1.2	8	.02
12	.12	e3	<.01	.97	e4	.01	1.7	17	.08
13	.10	e3	<.01	1.0	e6	.02	1.2	15	.05
14	.03	e3	<.01	.97	e4	.01	1.2	12	.04
15	.05	e3	.01	.96	e4	.01	1.2	e9	.03
16	.17	e4	.01	.99	e5	.01	3.1	56	.92
17	.28	e4	<.01	.95	e4	.01	1.9	e38	.20
18	.33	e4	<.01	.96	e4	.01	1.5	e20	.08
19	.44	e4	<.01	.92	e4	.01	1.3	e12	.04
20	.47	e4	.01	.95	e4	.01	1.3	e8	.03
21	1.1	129	1.5	.97	e5	.01	1.2	e6	.02
22	.93	e20	.05	.94	e4	.01	1.2	4	.01
23	.95	e10	.03	1.1	e15	.04	1.4	e10	.04
24	1.4	121	1.1	.94	e6	.02	1.2	e6	.02
25	1.2	e8	.03	1.7	315	5.4	1.2	e6	.02
26	1.1	e6	.02	4.6	165	4.5	1.2	e6	.02
27	1.0	e4	.01	1.1	e7	.02	1.1	e6	.02
28	1.0	e4	.01	1.0	e4	.01	1.1	e6	.02
29	1.0	e4	.01	2.1	58	.97	1.1	e6	.02
30	.95	e4	.01	1.1	e8	.02	1.4	e8	.03
31	1.0	e4	.01	---	---	---	1.2	e6	.02
TOTAL	17.12	---	2.98	39.42	---	15.57	47.45	---	32.89
		JANUARY			FEBRUARY			MARCH	
1	1.0	e4	.01	.98	e4	.01	2.7	48	.82
2	1.0	e4	.01	6.6	226	19	3.6	64	3.2
3	1.3	e7	.03	2.0	e18	.10	3.9	53	1.8
4	1.3	e7	.03	1.7	e15	.07	2.0	e7	.03
5	1.4	e4	.02	1.5	e10	.04	2.6	e12	.08
6	1.5	e4	.02	1.4	e9	.03	2.4	e10	.06
7	1.7	e6	.02	1.4	e8	.03	2.1	e9	.05
8	1.7	e8	.04	1.3	e8	.02	1.9	e8	.04
9	1.7	e6	.03	1.7	e6	.03	1.9	e7	.04
10	2.5	e50	.32	2.5	e20	.14	1.7	e6	.03
11	3.8	116	1.7	5.1	118	3.6	1.7	e6	.03
12	2.2	32	.20	1.9	e10	.05	1.9	e8	.04
13	2.4	36	.23	1.6	e8	.03	1.6	e5	.02
14	2.1	e15	.09	1.5	e7	.03	1.6	e5	.02
15	2.1	e12	.07	1.4	e6	.02	2.2	9	.08
16	2.0	e10	.05	1.4	e6	.02	1.8	e7	.03
17	2.0	e8	.04	1.4	e5	.02	1.6	e6	.03
18	2.0	e6	.03	1.4	e5	.02	1.6	e5	.02
19	1.9	e6	.03	1.3	e5	.02	1.5	e4	.02
20	1.9	e8	.04	1.3	e4	.01	1.5	e4	.02
21	1.8	e6	.03	4.6	109	3.6	1.7	e6	.03
22	1.9	e5	.02	1.8	e9	.04	1.5	e5	.02
23	1.9	e5	.02	1.7	e5	.02	1.6	e5	.02
24	1.9	e4	.02	1.5	e4	.02	1.3	e5	.02
25	1.7	e4	.02	1.5	e4	.02	1.5	e6	.02
26	1.6	e4	.02	1.4	e4	.02	1.3	e5	.02
27	1.0	e4	.01	1.4	e4	.02	1.2	e4	.01
28	1.1	e10	.03	3.3	92	2.5	1.2	e4	.01
29	1.2	e8	.02	---	---	---	1.2	e4	.01
30	1.1	e6	.02	---	---	---	1.2	e4	.01
31	1.1	e5	.01	---	---	---	1.1	e4	.01
TOTAL	53.8	---	3.23	56.58	---	29.53	56.6	---	6.64

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

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

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	1.1	e6	.02	1.4	e6	.02	3.2	140	2.2
2	1.2	e8	.03	1.3	e5	.02	1.0	e7	.02
3	2.5	39	.58	1.2	e4	.01	.93	e4	.01
4	5.3	118	4.5	1.2	e4	.01	.89	e4	.01
5	2.7	30	.30	1.2	e5	.02	.90	e4	.01
6	3.6	49	1.1	1.1	e4	.01	.86	e4	.01
7	8.5	106	9.5	1.1	e4	.01	.86	e4	.01
8	27	386	51	1.1	e4	.01	.86	e4	.01
9	11	81	4.5	1.1	e5	.01	.84	e4	.01
10	2.8	8	.06	1.1	e5	.01	.84	e4	.01
11	2.2	7	.04	1.0	e4	.01	.84	e4	.01
12	6.1	78	2.8	.99	e4	.01	.82	e4	.01
13	2.9	25	.22	.99	e5	.01	.80	e4	.01
14	2.4	e15	.09	.98	e5	.01	.80	e4	.01
15	2.1	e12	.07	.92	e4	.01	.79	e4	.01
16	2.1	e10	.06	.92	e5	.01	.84	e5	.01
17	2.1	e9	.05	.91	e4	.01	.78	e4	.01
18	2.1	e8	.04	.92	e4	.01	.75	e4	.01
19	1.9	e7	.04	1.1	e6	.02	.76	e4	.01
20	1.8	e6	.03	.91	e4	.01	.78	e4	.01
21	1.6	e5	.02	.93	e4	.01	.79	e4	.01
22	1.5	e5	.02	.88	e4	.01	.78	e4	.01
23	1.5	e8	.02	.88	e4	.01	.81	e4	.01
24	1.4	e4	.02	.86	e4	.01	.78	e4	.01
25	1.3	e4	.01	.84	e4	.01	.78	e4	.01
26	1.3	e5	.02	.84	e4	.01	.80	e4	.01
27	3.7	43	.87	.83	e4	.01	.80	e4	.01
28	2.4	e12	.07	.82	e4	.01	.77	e4	.01
29	2.2	e10	.06	.83	e4	.01	.76	e4	.01
30	1.8	e8	.04	.83	e4	.01	.77	e4	.01
31	---	---	---	1.1	e10	.03	---	---	---
TOTAL	110.1	---	76.18	31.08	---	0.37	26.98	---	2.50
		JULY			AUGUST			SEPTEMBER	
1	.77	e4	.01	1.0	e5	.01	.92	6	.01
2	.76	e4	.01	1.1	e6	.02	.90	6	.01
3	.76	e4	.01	1.0	e5	.01	.86	6	.01
4	.76	e4	.01	1.1	e6	.02	.84	6	.01
5	.85	e6	.01	1.0	e4	.01	.86	5	.01
6	.82	e4	.01	.99	e4	.01	.86	5	.01
7	.79	e4	.01	.98	e5	.01	.88	6	.01
8	.77	e4	.01	1.0	5	.01	.85	5	.01
9	.78	e4	.01	.99	4	.01	.84	5	.01
10	.79	e4	.01	.97	4	.01	.84	5	.01
11	.80	e6	.01	.96	4	.01	.84	5	.01
12	.79	e4	.01	.95	4	.01	.86	5	.01
13	.83	e5	.01	.96	4	.01	.84	5	.01
14	.88	e7	.02	.95	4	.01	.87	5	.01
15	.90	e5	.01	.96	4	.01	.85	5	.01
16	.85	e4	.01	.95	4	.01	.83	4	.01
17	.85	e4	.01	.95	4	.01	.82	4	.01
18	.84	e4	.01	.96	4	.01	.84	4	.01
19	.87	e5	.01	1.1	10	.03	.86	4	.01
20	3.0	187	6.2	1.4	31	.70	.85	4	.01
21	5.5	60	1.8	1.6	23	.23	.85	4	.01
22	1.9	e11	.08	1.0	6	.02	.83	4	.01
23	1.3	e9	.03	1.0	6	.02	.84	4	.01
24	1.2	e8	.03	.96	4	.01	.81	4	.01
25	1.1	e7	.02	.96	4	.01	.82	4	.01
26	1.0	e6	.02	.93	4	.01	.95	4	.01
27	.96	e6	.01	.93	4	.01	.81	4	.01
28	.97	e6	.02	1.1	8	.03	.95	6	.02
29	1.0	e6	.02	.93	6	.02	.85	4	.01
30	.96	e4	.01	.93	6	.02	.90	5	.01
31	.98	e4	.01	.92	6	.01	---	---	---
TOTAL	35.33	---	8.43	31.53	---	1.32	25.72	---	0.31
YEAR	532.16		180.55						

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 mi^2.

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.--12 years, 11.5 ft^3/s (8,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft^3/s, Dec. 31, 1987, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.25 ft^3/s, several days in October 1984.

EXTREMES FOR CURRENT YEAR.--Peak dischargea greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 8	2215	*994	*4.74	No other peak greater than base discharge.			

Minimum discharge, 1.2 ft^3/s, Oct. 12, 13.

DISCHARGE, IN 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	7.7	6.9	9.1	10	10	41	12	22	51	10	10	8.8
2	7.1	6.6	9.4	10	92	39	13	20	18	10	12	9.5
3	7.0	6.7	8.4	11	21	42	44	20	15	10	11	8.9
4	6.6	25	8.1	14	14	18	100	19	14	10	11	9.3
5	6.6	13	7.9	11	13	19	30	20	14	11	10	8.6
6	6.8	14	121	10	14	21	29	18	13	11	9.9	8.7
7	6.8	9.2	17	11	12	19	87	18	13	10	10	9.6
8	6.5	8.1	13	11	12	16	293	18	13	9.8	9.9	8.8
9	6.2	7.8	11	11	12	16	210	18	13	9.7	9.6	8.8
10	6.9	7.4	11	17	22	15	44	17	13	10	11	8.3
11	7.4	7.3	11	42	85	15	33	17	13	11	9.7	8.1
12	12	7.0	16	24	19	18	93	16	12	9.5	9.5	8.1
13	2.5	9.1	11	23	14	15	44	17	12	9.7	9.4	8.1
14	6.5	7.4	11	15	13	14	33	17	12	10	9.1	7.8
15	6.4	7.0	11	14	13	16	28	16	12	12	8.4	7.7
16	8.0	7.4	30	13	12	19	27	16	12	9.8	8.9	7.8
17	7.8	7.7	22	13	12	15	26	15	12	9.9	8.8	7.8
18	6.6	7.3	15	12	12	15	25	15	12	9.3	8.7	7.8
19	8.3	7.2	13	12	12	14	24	18	12	9.5	10	8.5
20	6.2	7.3	12	12	12	13	23	15	12	27	11	8.6
21	10	8.9	11	12	59	13	23	15	12	47	15	7.8
22	10	7.5	11	11	16	13	22	15	12	18	9.8	7.7
23	12	8.6	14	11	14	13	23	15	11	14	9.4	7.8
24	14	7.8	12	11	13	12	21	14	11	12	9.1	7.7
25	9.9	12	11	11	13	14	21	14	11	12	9.0	7.4
26	8.1	42	11	11	12	13	21	14	11	11	8.7	7.5
27	7.6	11	11	10	12	12	39	14	11	11	8.6	7.2
28	7.1	9.2	11	12	34	12	31	13	11	11	14	8.3
29	7.0	15	11	12	---	12	30	13	11	12	10	7.6
30	7.0	9.6	11	10	---	11	24	13	10	11	9.0	8.2
31	6.9	---	11	10	---	11	---	16	---	11	8.9	---
TOTAL	237.5	311.0	492.9	417	599	536	1473	508	409	389.2	309.4	246.8
MEAN	7.66	10.4	15.9	13.5	21.4	17.3	49.1	16.4	13.6	12.6	9.98	8.23
MAX	14	42	121	42	92	42	293	22	51	47	15	9.6
MIN	2.5	6.6	7.9	10	10	11	12	13	10	9.3	8.4	7.2
AC-FT	471	617	978	827	1190	1060	2920	1010	811	772	614	490

CAL YR 1988	TOTAL	5474.2	MEAN	15.0	MAX	723	MIN	2.5	AC-FT	10860
WTR YR 1989	TOTAL	5928.8	MEAN	16.2	MAX	293	MIN	2.5	AC-FT	11760

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 for several days in 1988.
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, 317 mg/L, Apr. 4; minimum daily mean, 3 mg/L, Dec. 14-15.
SEDIMENT DISCHARGE: Maximum daily, 353 tons, Apr. 8; minimum daily, 0.07 ton, Oct. 4.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
04...	1510	760	32	180	7.00	24.0	24	8.2	98	--	--
DEC											
06...	1400	754	49	135	7.00	22.5	110	6.4	75	22000	--
MAR											
22...	1405	762	13	185	7.80	25.5	1.7	8.6	105	--	--
APR											
26...	0930	757	21	195	7.90	23.0	1.7	8.5	100	K43	56
JUN											
14...	1400	762	12	185	8.00	26.5	1.1	7.8	97	--	--
27...	1430	762	11	190	8.00	26.5	0.70	8.0	100	--	--
JUL											
20...	1210	759	11	181	7.83	25.5	1.2	8.4	104	290	--
AUG											
08...	0940	760	10	176	7.86	26.5	1.2	8.2	103	150	54
29...	1120	760	9.6	200	7.60	27.0	1.5	7.8	98	--	--
SEP											
25...	1100	760	8.3	210	7.30	26.0	1.4	8.4	104	--	--

DATE	HARDNESS NONCARB DISSOLVED FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
26...	56	9.2	7.9	14	35	0.8	1.1	50	7.0	18
AUG										
08...	54	9.0	7.6	15	37	0.9	0.90	50	7.0	17

< 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).

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
06...	--	--	--	--	--	100	0.300	0.80	1.1	0.220
APR										
26...	0.10	20	93	107	0.13	<1	0.300	0.30	0.60	0.020
JUL										
20...	--	--	--	--	--	9	0.300	<0.20	--	0.010
AUG										
08...	<0.10	20	108	107	0.15	18	0.200	0.20	0.40	0.020

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
26...	100	<10	<1	<1	<100	6	<10	<0.5	<1	<1
AUG										
08...	90	<10	1	1	<100	4	<10	<0.5	<1	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
26...	2	<1	1	<3	5	1	340	41	1	<1
AUG										
08...	<1	<1	<1	<3	2	2	180	17	1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
26...	<10	<4	60	11	<0.10	<0.1	5	<10	6
AUG									
08...	<10	<4	40	7	<0.10	<0.1	<1	<10	1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
26...	1	<1	<1	<1	<1.0	69	<6	10	<3
AUG									
08...	1	<1	<1	<1	<1.0	70	<6	<10	<3

< 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 1988 TO SEPTEMBER 1989

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
APR										
26...	1.0	1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
08...	1.6	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
26...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
26...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<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 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	7.7	5	.10	6.9	13	.24	9.1	4	.10
2	7.1	4	.09	6.6	13	.24	9.4	5	.12
3	7.0	4	.08	6.7	9	.16	6.4	8	.18
4	6.6	4	.07	25	87	7.8	8.1	8	.18
5	6.6	6	.11	13	e22	.76	7.9	9	.18
6	6.6	9	.16	14	e21	.81	121	247	133
7	6.8	8	.14	9.2	e14	.35	17	27	1.3
8	6.5	7	.12	8.1	e13	.28	13	7	.23
9	6.2	7	.12	7.8	e12	.26	11	6	.19
10	6.9	13	.26	7.4	e12	.24	11	6	.18
11	7.4	22	.44	7.3	e12	.23	11	6	.17
12	12	48	1.4	7.0	e11	.22	16	7	.28
13	2.5	36	.27	9.1	e14	.35	11	5	.16
14	6.5	77	1.4	7.4	e12	.24	11	3	.09
15	6.4	194	3.3	7.0	e11	.22	11	3	.09
16	8.0	151	3.0	7.4	e12	.24	30	32	4.0
17	7.8	55	1.2	7.7	e12	.26	22	20	1.4
18	6.6	52	.92	7.3	e12	.23	15	17	.88
19	6.3	52	.86	7.2	e12	.23	13	e18	.64
20	6.2	25	.42	7.3	e12	.23	12	e17	.56
21	10	30	1.0	8.9	e14	.34	11	e16	.52
22	10	35	1.0	7.6	e12	.25	11	e17	.50
23	12	26	.80	8.6	e14	.32	14	e21	.81
24	14	29	1.1	7.8	e12	.26	12	e18	.58
25	9.9	17	.46	12	e19	1.2	11	e17	.50
26	8.1	5	.10	42	133	36	11	e17	.50
27	7.6	4	.08	11	14	.44	11	e16	.46
28	7.1	5	.10	9.2	6	.17	11	e17	.46
29	7.0	7	.13	15	9	.56	11	e18	.52
30	7.0	7	.13	9.6	4	.12	11	e18	.52
31	6.9	9	.16	---	---	---	11	e16	.47
TOTAL	237.5	---	19.54	311.1	---	53.25	492.9	---	149.77
		JANUARY			FEBRUARY			MARCH	
1	10	e15	.42	10	e16	.44	41	27	3.3
2	10	e16	.44	92	e187	46	39	35	4.0
3	11	e18	.54	21	e32	1.8	42	14	1.8
4	14	e21	.78	14	e20	.80	18	e24	1.2
5	11	e16	.47	13	e19	.67	19	e28	1.4
6	10	e16	.44	14	e19	.73	21	e30	1.7
7	11	e16	.47	12	e18	.59	19	e27	1.4
8	11	e17	.52	12	e16	.53	16	e23	.99
9	11	e16	.46	12	e18	.53	16	e22	.94
10	17	e26	1.2	22	e33	1.9	15	e21	.87
11	42	e67	7.6	85	e145	33	15	e21	.87
12	24	e34	2.2	19	e26	1.3	18	e26	1.3
13	23	e31	1.9	14	19	.77	15	e20	.82
14	15	e21	.91	13	14	.50	14	e21	.78
15	14	e20	.80	13	25	.84	16	e22	.95
16	13	e19	.71	12	17	.57	19	e26	1.3
17	13	e19	.65	12	10	.32	15	e20	.83
18	12	e17	.61	12	11	.35	15	e20	.82
19	12	e18	.58	12	9	.30	14	e19	.72
20	12	e17	.61	12	8	.25	13	e20	.69
21	12	e17	.54	59	59	17	13	e19	.67
22	11	e16	.49	16	30	1.3	13	e18	.64
23	11	e17	.50	14	19	.73	13	e18	.64
24	11	e18	.52	13	10	.37	12	e18	.62
25	11	e17	.50	13	21	.70	14	e19	.72
26	11	e16	.49	12	17	.55	13	e19	.67
27	10	e16	.44	12	15	.49	12	e18	.60
28	12	e17	.55	34	23	3.5	12	e18	.57
29	12	e19	.61	---	---	---	12	e17	.55
30	10	e16	.42	---	---	---	11	e16	.52
31	10	e15	.41	---	---	---	11	e17	.52
TOTAL	417	---	27.78	599	---	116.83	536	---	33.40

e Estimated

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	12	e18	.57	22	27	1.6	51	47	7.4
2	13	e18	.64	20	28	1.5	18	39	2.0
3	44	e83	9.8	20	27	1.4	15	12	.49
4	100	317	151	19	22	1.1	14	7	.28
5	30	79	6.8	20	23	1.2	14	8	.31
6	29	51	3.9	18	26	1.3	13	14	.52
7	87	191	49	18	42	2.0	13	15	.54
8	293	305	353	18	68	3.2	13	18	.64
9	210	99	81	18	35	1.7	13	10	.36
10	44	46	5.4	17	31	1.5	13	9	.31
11	33	30	2.6	17	35	1.6	13	13	.45
12	93	62	22	16	24	1.1	12	7	.23
13	44	38	4.6	17	29	1.3	12	7	.23
14	33	31	2.8	17	44	1.9	12	16	.54
15	28	27	2.1	16	61	2.6	12	16	.52
16	27	21	1.6	16	91	3.9	12	11	.37
17	28	23	1.6	15	35	1.5	12	14	.48
18	25	21	1.4	15	35	1.4	12	20	.63
19	24	11	.72	18	26	1.2	12	13	.40
20	23	11	.67	15	25	1.0	12	15	.49
21	23	11	.69	15	31	1.2	12	15	.49
22	22	13	.80	15	34	1.4	12	10	.32
23	23	11	.71	15	25	.97	11	12	.37
24	21	10	.60	14	19	.74	11	12	.35
25	21	11	.60	14	20	.75	11	54	1.6
26	21	9	.54	14	28	1.1	11	107	3.1
27	39	69	11	14	24	.89	11	22	.63
28	31	30	2.6	13	20	.73	11	13	.38
29	30	31	2.6	13	20	.70	11	17	.49
30	24	26	1.7	13	22	.78	10	19	.52
31	---	---	---	16	23	1.0	---	---	---
TOTAL	1473	---	723.04	508	---	44.26	409	---	25.44
		JULY			AUGUST			SEPTEMBER	
1	10	18	.48	10	12	.34	8.8	20	.47
2	10	16	.45	12	12	.41	9.5	20	.52
3	10	16	.44	11	8	.23	8.9	15	.37
4	10	18	.50	11	11	.33	9.3	48	1.2
5	11	16	.47	10	11	.31	8.6	78	1.8
6	11	15	.44	9.9	7	.18	8.7	8	.20
7	10	32	.88	10	24	.67	9.6	9	.22
8	9.8	46	1.2	9.9	35	.94	8.8	9	.22
9	9.7	15	.39	9.6	11	.30	8.8	63	1.5
10	10	10	.27	11	15	.44	8.3	179	4.0
11	11	8	.24	9.7	14	.37	8.1	39	.86
12	9.5	13	.32	9.5	6	.17	8.1	62	1.3
13	9.7	22	.57	9.4	24	.60	8.1	100	2.2
14	10	21	.58	9.1	14	.33	7.8	227	4.7
15	12	19	.62	8.4	11	.25	7.7	85	1.8
16	9.8	18	.48	8.9	12	.30	7.8	32	.67
17	9.9	17	.45	8.8	7	.17	7.8	23	.48
18	9.3	16	.40	8.7	7	.17	7.8	32	.68
19	9.5	15	.38	10	10	.27	8.5	30	.69
20	27	80	15	11	14	.44	8.6	30	.70
21	47	61	11	15	37	1.6	7.8	59	1.2
22	18	14	.68	9.8	34	.89	7.7	44	.90
23	14	13	.46	9.4	40	1.0	7.8	53	1.1
24	12	13	.43	9.1	34	.83	7.7	51	1.1
25	12	9	.30	9.0	42	1.0	7.4	18	.36
26	11	18	.54	8.7	57	1.3	7.5	19	.39
27	11	15	.45	8.6	30	.70	7.2	39	.76
28	11	6	.19	14	120	6.1	8.3	27	.59
29	12	5	.17	10	65	2.0	7.6	27	.55
30	11	7	.20	9.0	18	.43	8.2	40	.89
31	11	8	.23	8.9	26	.62	---	---	---
TOTAL	389.2	---	39.21	309.4	---	23.69	246.8	---	32.42
YEAR	5928.9		1286.69						

e Estimated

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 mi^2.

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 fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--41 years (water years 1944-77, 1984-89), 2.20 ft^3/s (1,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft^3/s May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft^3/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft^3/s July 20, 1957, Sept. 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 340 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0200	610	3.40	Apr. 8	2230	630	3.42
Mar. 2	2030	*640	*3.43				

Minimum discharge, 1.6 ft^3/s, for many days.

DISCHARGE, IN 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	2.2	2.0	2.6	2.1	1.9	7.1	2.3	3.8	6.3	2.0	2.4	1.8
2	2.0	1.9	2.4	2.1	23	23	2.3	3.1	3.3	2.0	2.3	2.1
3	1.9	1.9	2.3	2.6	4.5	16	2.7	2.8	2.9	2.0	2.2	1.9
4	1.8	5.6	2.1	2.3	3.8	6.0	12	2.8	2.8	2.0	2.3	1.8
5	1.8	2.9	2.1	2.1	3.2	7.3	9.7	2.7	2.6	2.1	2.2	1.8
6	1.7	2.6	36	2.0	2.8	6.7	16	2.6	2.5	2.1	2.1	1.8
7	1.7	2.5	5.9	2.0	2.7	5.1	25	2.6	2.4	2.0	2.1	1.8
8	1.7	2.2	3.7	2.1	2.5	4.1	143	2.6	2.4	2.0	2.1	1.7
9	1.7	2.1	3.0	2.1	2.4	3.5	57	2.5	2.3	1.9	2.1	1.7
10	1.8	2.0	2.8	5.7	2.6	3.2	11	2.5	2.2	1.9	2.1	1.7
11	1.7	1.9	2.6	13	18	3.0	6.3	2.5	2.2	1.9	2.0	1.7
12	2.8	1.9	4.2	5.6	4.2	3.2	15	2.5	2.2	2.0	2.0	1.7
13	2.2	2.4	2.8	6.4	3.0	2.9	12	2.5	2.1	2.0	2.0	1.7
14	2.4	2.3	2.5	3.9	2.6	2.8	5.7	2.4	2.1	2.0	2.0	1.7
15	2.1	2.0	2.4	3.0	2.5	2.7	4.7	2.4	2.1	2.1	2.0	1.7
16	2.0	4.0	12	2.7	2.4	2.7	4.0	2.3	2.1	2.0	2.0	1.7
17	1.9	2.9	5.8	2.5	2.3	2.8	3.5	2.2	2.1	1.9	2.0	1.7
18	1.8	2.2	3.5	2.4	2.2	2.5	3.3	2.2	2.0	1.9	2.0	1.6
19	1.7	2.0	2.9	2.3	2.2	2.5	3.1	2.3	2.0	2.0	2.1	1.6
20	2.3	1.9	2.7	2.4	2.2	2.5	3.0	2.2	2.0	11	2.8	1.6
21	6.8	1.9	2.5	2.2	15	2.5	2.9	2.2	2.0	23	2.6	1.6
22	6.3	1.9	2.5	2.1	3.3	2.4	2.8	2.2	2.0	6.6	2.1	1.6
23	4.3	2.3	3.4	2.1	2.8	2.4	2.8	2.2	2.0	3.5	2.0	1.6
24	6.5	2.3	2.7	2.1	2.5	2.4	2.8	2.2	2.0	2.6	2.0	1.6
25	3.8	4.1	2.5	2.0	2.3	2.5	2.6	2.1	2.0	2.6	1.9	1.6
26	2.8	17	2.3	2.0	2.2	2.4	2.6	2.1	2.0	2.5	1.9	1.6
27	2.5	3.5	2.2	2.1	2.2	2.4	12	2.1	1.9	2.3	1.9	1.6
28	2.3	2.7	2.2	2.0	11	2.3	7.6	2.1	1.9	2.2	1.9	1.6
29	2.2	7.2	2.4	2.0	---	2.4	7.1	2.1	1.9	2.3	1.9	1.6
30	2.0	3.0	2.3	1.9	---	2.3	4.6	2.1	1.9	2.2	1.8	1.6
31	2.0	---	2.2	1.9	---	2.4	---	3.0	---	2.2	1.8	---
TOTAL	80.7	95.1	131.5	91.7	132.3	135.8	389.4	75.9	70.2	100.8	64.6	50.8
MEAN	2.60	3.17	4.24	2.96	4.72	4.38	13.0	2.45	2.34	3.25	2.08	1.69
MAX	6.8	17	36	13	23	23	143	3.8	6.3	23	2.8	2.1
MIN	1.7	1.9	2.1	1.9	1.9	2.3	2.3	2.1	1.9	1.9	1.8	1.6
AC-FT	160	189	261	182	262	269	772	151	139	200	128	101

CAL YR 1988	TOTAL	1141.1	MEAN	3.12	MAX	98	MIN	1.6	AC-FT	2260
WTR YR 1989	TOTAL	1418.8	MEAN	3.89	MAX	143	MIN	1.6	AC-FT	2810

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

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L, Apr. 8; minimum daily mean, 1 mg/L, Mar. 13, 14, 17, Aug. 26.
SEDIMENT DISCHARGE: Maximum daily, 1,800 tons, Apr. 8; minimum daily, less than 0.01 tons, Mar. 13, 14, 17, Aug. 26.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
10...	1520	756	2.0	185	7.60	21.0	1.7	8.5	96	--	--
DEC											
06...	1155	--	12	149	7.20	21.5	37	8.2	--	240	--
MAR											
22...	1115	761	2.5	134	7.50	20.5	0.60	8.6	96	--	--
APR											
25...	0940	760	2.6	147	7.60	20.0	0.70	8.8	97	K34	47
JUN											
14...	1000	758	2.1	145	7.80	20.5	0.90	8.9	99	--	--
26...	1030	755	1.9	140	7.90	21.0	0.70	8.5	96	--	--
JUL											
20...	1040	755	2.1	150	7.80	21.5	1.0	8.3	95	400	--
AUG											
08...	1000	752	2.0	153	7.48	21.0	0.80	8.3	94	140	46
28...	1600	754	1.8	146	7.60	21.5	5.1	8.3	95	--	--
SEP											
25...	1045	760	1.6	150	7.80	20.5	0.50	8.7	97	--	--

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
25...	47	8.8	6.0	12	35	0.8	1.0	46	3.0	14
AUG										
08...	46	8.8	5.9	12	36	0.8	0.80	47	3.0	14

< 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).

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
06...	--	--	--	--	--	43	0.200	0.20	0.40	0.050
APR										
25...	0.10	26	88	99	0.12	<1	<0.100	<0.20	--	0.020
JUL										
20...	--	--	--	--	--	1	<0.100	<0.20	--	0.020
AUG										
08...	<0.10	27	99	100	0.13	8	<0.100	<0.20	--	0.010

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
25...	50	10	<1	<1	<100	<2	<10	<0.5	8	<1
AUG										
08...	70	20	<1	<1	<100	2	<10	<0.5	<1	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
25...	<1	<1	<1	<3	2	2	210	73	4	1
AUG										
08...	1	<1	<1	<3	2	2	230	100	<1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
25...	<10	<4	10	19	0.20	0.2	3	<10	3
AUG									
08...	<10	<4	20	17	0.30	0.4	<1	<10	1

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
25...	1	<1	<1	<1	<1.0	52	<6	<10	4
AUG									
08...	1	<1	<1	<1	<1.0	52	<6	10	8

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
APR										
25...	0.3	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
08...	1.2	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
25...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
25...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	--	--	--	--
AUG										
08...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< 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 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	2.2	2	.01	2.0	4	.02	2.6	7	.05
2	2.0	2	.01	1.9	5	.02	2.4	5	.03
3	1.9	2	.01	1.9	6	.03	2.3	12	.07
4	1.8	2	.01	5.6	e45	1.4	2.1	25	.15
5	1.8	2	.01	2.9	e14	.11	2.1	11	.06
6	1.7	3	.01	2.6	e13	.09	36	599	93
7	1.7	3	.01	2.5	e12	.08	5.9	33	.58
8	1.7	4	.02	2.2	e11	.07	3.7	11	.11
9	1.7	6	.03	2.1	e11	.06	3.0	11	.09
10	1.8	6	.03	2.0	e10	.05	2.8	10	.08
11	1.7	6	.03	1.9	e9	.05	2.6	9	.06
12	2.8	12	.28	1.9	e8	.04	4.2	e21	.32
13	2.2	5	.03	2.4	e9	.06	2.8	9	.07
14	2.4	7	.07	2.3	e9	.05	2.5	9	.06
15	2.1	3	.02	2.0	e8	.05	2.4	10	.06
16	2.0	3	.02	4.0	e43	1.6	12	e111	9.5
17	1.9	3	.02	2.9	52	.42	5.8	35	.62
18	1.8	3	.01	2.2	e12	.07	3.5	18	.17
19	1.7	3	.01	2.0	e8	.05	2.9	12	.09
20	2.3	5	.07	1.9	e8	.04	2.7	11	.08
21	6.8	e50	5.0	1.9	e9	.05	2.5	11	.08
22	6.3	e46	1.8	1.9	e9	.05	2.5	13	.08
23	4.3	11	.13	2.3	e11	.08	3.4	20	.32
24	6.5	32	1.3	2.3	e9	.06	2.7	14	.10
25	3.8	11	.12	4.1	e37	1.2	2.5	23	.15
26	2.8	5	.04	17	e242	68	2.3	25	.16
27	2.5	5	.03	3.5	e12	.12	2.2	24	.15
28	2.3	5	.03	2.7	e9	.06	2.2	16	.10
29	2.2	5	.03	7.2	e47	3.3	2.4	13	.09
30	2.0	4	.02	3.0	e10	.06	2.3	4	.03
31	2.0	4	.02	---	---	---	2.2	4	.02
TOTAL	80.7	---	9.23	95.1	---	77.36	131.5	---	106.53
		JANUARY			FEBRUARY			MARCH	
1	2.1	5	.03	1.9	16	.08	7.1	54	2.4
2	2.1	5	.03	23	792	144	23	284	126
3	2.6	4	.03	4.5	30	.36	16	239	35
4	2.3	21	.13	3.8	23	.29	6.0	32	.50
5	2.1	26	.15	3.2	11	.09	7.3	e68	3.5
6	2.0	15	.09	2.8	12	.08	6.7	e41	.82
7	2.0	12	.07	2.7	11	.08	5.1	10	.13
8	2.1	11	.06	2.5	21	.14	4.1	15	.15
9	2.1	42	.23	2.4	18	.11	3.5	30	.26
10	5.7	e46	1.2	2.6	22	.15	3.2	8	.07
11	13	e122	5.3	18	264	60	3.0	18	.13
12	5.6	32	.68	4.2	17	.20	3.2	11	.09
13	6.4	e42	.88	3.0	7	.06	2.9	1	.01
14	3.9	16	.17	2.6	5	.03	2.8	1	.01
15	3.0	9	.08	2.5	9	.06	2.7	2	.02
16	2.7	6	.04	2.4	13	.08	2.7	2	.01
17	2.5	4	.03	2.3	4	.03	2.6	1	.01
18	2.4	4	.03	2.2	3	.02	2.5	5	.03
19	2.3	4	.02	2.2	6	.04	2.5	19	.12
20	2.4	4	.03	2.2	6	.04	2.5	8	.05
21	2.2	3	.02	15	202	39	2.5	7	.04
22	2.1	3	.02	3.3	12	.11	2.4	2	.01
23	2.1	4	.02	2.8	12	.09	2.4	4	.02
24	2.1	4	.02	2.5	9	.06	2.4	4	.03
25	2.0	2	.01	2.3	e3	.02	2.5	9	.06
26	2.0	2	.01	2.2	2	.01	2.4	9	.06
27	2.1	3	.02	2.2	7	.04	2.4	5	.03
28	2.0	3	.02	11	302	39	2.3	5	.03
29	2.0	2	.01	---	---	---	2.4	5	.03
30	1.9	4	.02	---	---	---	2.3	6	.04
31	1.9	6	.03	---	---	---	2.4	7	.05
TOTAL	91.7	---	9.46	132.3	---	284.27	135.8	---	169.71

e Estimeted

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	2.3	7	.04	3.8	11	.12	6.3	246	20
2	2.3	8	.05	3.1	11	.09	3.3	44	.39
3	2.7	15	1.4	2.8	9	.07	2.9	19	.15
4	12	662	106	2.8	10	.07	2.8	15	.11
5	9.7	158	6.0	2.7	12	.08	2.6	16	.11
6	16	291	35	2.6	13	.09	2.5	15	.10
7	25	621	210	2.6	10	.07	2.4	12	.08
8	143	e2130	1800	2.6	8	.06	2.4	11	.08
9	57	e789	225	2.5	12	.08	2.3	10	.08
10	11	52	1.7	2.5	14	.09	2.2	12	.07
11	6.3	30	.51	2.5	13	.09	2.2	11	.07
12	15	e170	11	2.5	13	.08	2.2	12	.07
13	12	91	4.7	2.5	12	.08	2.1	18	.10
14	5.7	23	.36	2.4	16	.10	2.1	14	.08
15	4.7	24	.30	2.4	18	.11	2.1	10	.06
16	4.0	18	.20	2.3	12	.08	2.1	13	.07
17	3.5	17	.16	2.2	12	.07	2.1	12	.07
18	3.3	17	.15	2.2	14	.09	2.0	10	.06
19	3.1	24	.20	2.3	12	.07	2.0	23	.13
20	3.0	12	.10	2.2	12	.07	2.0	28	.16
21	2.9	11	.09	2.2	14	.08	2.0	13	.07
22	2.8	32	.25	2.2	13	.08	2.0	24	.13
23	2.8	34	.26	2.2	86	.39	2.0	19	.11
24	2.8	34	.25	2.2	e235	1.5	2.0	13	.07
25	2.6	31	.22	2.1	18	.11	2.0	11	.06
26	2.6	14	.10	2.1	15	.09	2.0	11	.06
27	12	e98	8.9	2.1	13	.07	1.9	10	.05
28	7.6	e50	1.6	2.1	13	.07	1.9	13	.07
29	7.1	e40	.99	2.1	13	.07	1.9	12	.06
30	4.6	15	.18	2.1	14	.08	1.9	11	.06
31	---	---	---	3.0	e17	.14	---	---	---
TOTAL	389.4	---	2415.71	75.9	---	4.34	70.2	---	22.76
		JULY			AUGUST			SEPTEMBER	
1	2.0	17	.09	2.4	5	.03	1.8	e6	.03
2	2.0	18	.10	2.3	4	.02	2.1	e6	.08
3	2.0	13	.07	2.2	3	.02	1.9	e6	.03
4	2.0	11	.06	2.3	3	.02	1.8	e6	.03
5	2.1	11	.06	2.2	6	.04	1.8	e6	.03
6	2.1	11	.06	2.1	6	.03	1.8	e6	.03
7	2.0	13	.08	2.1	4	.02	1.8	e6	.03
8	2.0	17	.10	2.1	3	.02	1.7	e6	.03
9	1.9	15	.08	2.1	4	.02	1.7	e6	.03
10	1.9	13	.08	2.1	3	.02	1.7	e6	.03
11	1.9	14	.08	2.0	5	.03	1.7	e6	.03
12	2.0	15	.08	2.0	4	.02	1.7	e8	.03
13	2.0	13	.07	2.0	4	.02	1.7	e6	.03
14	2.0	16	.09	2.0	5	.03	1.7	e6	.03
15	2.1	20	.14	2.0	5	.03	1.7	e6	.03
16	2.0	11	.07	2.0	6	.03	1.7	e6	.03
17	1.9	11	.07	2.0	5	.03	1.7	e6	.03
18	1.9	9	.05	2.0	4	.02	1.6	e6	.03
19	2.0	6	.03	2.1	2	.01	1.6	e6	.03
20	11	847	108	2.8	e8	.58	1.6	e6	.03
21	23	1130	182	2.6	9	.54	1.8	e6	.03
22	6.6	124	3.8	2.1	4	.02	1.6	e6	.03
23	3.5	21	.21	2.0	3	.02	1.6	e6	.03
24	2.6	16	.12	2.0	3	.02	1.6	e6	.03
25	2.6	20	.14	1.9	3	.02	1.6	e6	.03
26	2.5	31	.21	1.9	1	.01	1.6	6	.03
27	2.3	7	.04	1.9	3	.02	1.6	e6	.03
28	2.2	5	.03	1.9	6	.03	1.6	e6	.02
29	2.3	6	.04	1.9	6	.03	1.6	e5	.02
30	2.2	4	.02	1.8	6	.03	1.6	e5	.02
31	2.2	5	.03	1.8	e6	.03	---	---	---
TOTAL	100.8	---	296.10	64.6	---	1.81	50.8	---	0.92
YEAR	1417.6		3401.00						

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 mi^2.

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.

AVERAGE DISCHARGE.--6 years, 2.82 ft^3/s (2,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 486 ft^3/s, Dec. 31, 1987, gage height, 5.28 ft; minimum, 0.58 ft^3/s several days in September, October, November 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discherge of 180 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	About 0200	e205	Unknown	Apr. 8	About 2200	*332	4.51
Feb. 2	About 1600	250	4.10	July 21	0300	224	3.93
Feb. 21	About 0530	e200	Unknown				

Minimum discharge, 2.3 ft^3/s, several days in October.

DISCHARGE, IN 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	3.1	3.3	e4.3	e4.0	4.0	e15	4.4	7.7	13	3.8	4.2	3.6
2	2.8	3.2	e4.2	e5.7	e30	e10	4.6	6.3	6.3	3.8	4.6	3.7
3	2.7	3.3	e4.1	e4.5	e6.5	e14	4.4	5.8	5.4	3.7	4.3	3.5
4	2.7	11	e3.8	e4.3	e8.0	e7.0	e13	5.3	4.9	3.7	4.4	3.5
5	2.8	5.4	e3.7	e4.2	e5.8	e9.0	e10	5.1	5.0	3.7	4.0	3.5
6	2.9	5.0	e25	e4.1	e5.0	e7.5	e15	4.9	4.7	3.8	3.9	4.0
7	3.0	4.1	e8.0	e4.0	e4.6	e6.4	e20	4.8	4.7	3.8	4.0	3.8
8	2.9	3.6	e4.5	e4.2	e4.3	e5.7	e18	4.7	4.9	3.7	3.9	3.6
9	2.8	3.0	e4.3	e4.0	e4.2	e5.3	e28	6.2	4.7	3.6	3.8	3.5
10	3.0	3.3	e4.1	e10	e4.5	e5.1	e15	4.9	4.6	3.8	3.8	3.5
11	2.9	3.2	e4.0	e21	e17	e4.8	e8.0	4.8	4.5	3.8	3.7	3.5
12	5.6	3.2	e7.2	e8.6	e7.0	e5.6	e25	4.8	4.5	3.7	3.7	3.6
13	3.5	3.2	e5.0	e11	e5.5	e5.1	e16	4.9	4.5	8.3	3.6	3.6
14	3.5	3.2	e4.5	e8.0	e4.8	e4.8	e10	4.9	4.4	14	3.7	3.5
15	3.1	3.1	e4.2	e5.2	e4.5	e5.0	7.8	4.8	4.4	5.3	3.7	3.4
16	3.1	8.7	e10	e4.5	e4.4	e4.9	6.5	4.9	4.5	3.7	3.7	3.5
17	3.0	3.8	e7.0	e4.2	e4.3	e4.7	5.7	4.8	4.2	3.8	3.7	3.5
18	2.9	3.4	e5.0	e4.0	e4.2	e4.6	4.9	4.8	4.1	3.8	3.8	3.5
19	2.8	3.4	e5.8	e3.9	e4.1	e4.5	5.4	5.3	4.3	3.9	4.3	3.7
20	3.0	3.2	e4.1	e4.0	e4.0	e4.5	5.2	4.8	4.3	15	6.1	3.6
21	20	3.2	e4.0	e3.8	e25	e4.4	5.1	4.6	4.3	28	6.7	3.5
22	5.2	3.1	e3.9	e3.6	e8.0	e4.4	5.2	4.8	4.3	11	4.2	3.6
23	4.5	3.3	e5.2	e3.5	e6.0	e4.5	5.2	4.7	4.2	6.1	4.2	3.5
24	8.9	3.1	e4.6	e3.5	e5.0	e4.4	5.3	4.8	4.1	4.9	3.9	3.4
25	5.3	e6.0	e4.5	e4.0	e4.5	e4.6	4.9	4.7	4.0	4.5	3.8	3.5
26	4.3	e8.0	e4.4	e3.6	e4.2	e4.5	4.8	4.7	4.0	4.3	3.6	3.4
27	3.9	e5.8	e4.3	e3.4	e4.0	e4.4	15	4.6	4.0	4.3	3.6	3.4
28	3.6	e4.5	e4.2	3.9	e18	e4.4	18	4.5	3.9	4.3	3.7	3.4
29	3.5	e6.0	e4.7	3.9	---	e4.3	18	4.5	4.0	4.3	3.6	5.5
30	3.4	e4.4	e4.4	3.9	---	e4.3	11	4.8	4.0	4.1	3.6	3.7
31	3.3	---	e4.2	3.9	---	4.2	---	14	---	4.1	3.5	---
TOTAL	128.0	131.0	171.2	164.4	211.4	181.9	317.4	165.0	142.7	182.6	125.3	108.5
MEAN	4.13	4.37	5.52	5.30	7.55	5.87	10.6	5.32	4.76	5.89	4.04	3.62
MAX	20	11	25	21	30	15	28	14	13	28	6.7	5.5
MIN	2.7	3.0	3.7	3.4	4.0	4.2	4.4	4.5	3.9	3.6	3.5	3.4
AC-FT	254	260	340	326	419	361	630	327	283	362	249	215

CAL YR 1988	TOTAL	1720.8	MEAN	4.70	MAX	66	MIN	2.4	AC-FT	3410
WTR YR 1989	TOTAL	2029.4	MEAN	5.56	MAX	30	MIN	2.7	AC-FT	4030

e Estimated

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 mi^2.

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.--27 years, 1.41 ft^3/s (1,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s, Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft^3/s; no flow, July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 8	0100	*113	*2.91	Apr. 8	2200	54	2.24

Minimum discharge, 0.20 ft^3/s for many days.

DISCHARGE, IN 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	.48	e.28	.27	e.29	.20	e1.6	.24	.20	.44	.28	.31	e.29
2	.46	.28	.27	e1.4	3.7	e.68	.35	.21	.25	.25	.32	e.29
3	.46	.28	.27	e.48	.29	e1.4	.45	.24	.27	.27	.32	e.29
4	.46	1.4	.27	e.32	.58	e.45	1.1	.24	.24	.27	.37	e.29
5	.46	.55	.27	e.29	.41	e.58	.30	.20	.27	.26	.31	e.29
6	.46	.35	4.2	e.29	.29	e.35	.87	.20	.25	.29	.31	e.29
7	.46	.30	.31	e.29	.27	e.29	.86	.20	.24	.29	.31	e.29
8	.46	.29	.28	e.40	.27	e.24	6.9	.20	.24	.27	.31	e.27
9	.44	.28	.27	e1.6	.25	.24	2.8	.22	.27	.27	.31	e.28
10	.43	.29	.27	e1.5	.41	.24	.30	.24	.27	.28	e.29	e.28
11	.43	.29	.27	e1.7	2.0	.26	.27	.24	.27	.29	e.29	e.29
12	.51	.29	1.0	e.70	.31	.39	1.8	.24	.27	.26	e.29	e.28
13	.44	.29	.29	e.80	.26	.24	.79	.24	.27	.27	e.29	e.28
14	.45	.29	.27	e.40	.24	.24	.27	.24	.26	.37	e.29	e.28
15	.42	.29	.27	e.30	.24	.27	.27	.25	.26	.52	e.29	e.28
16	.42	2.0	e1.3	e.27	.24	.24	.27	.27	.27	.28	e.29	e.28
17	.42	.33	e.55	e.25	.24	.24	.25	.27	.27	.29	e.29	e.29
18	.39	.29	e.35	e.25	.24	.24	.24	.24	.26	.26	e.29	e.28
19	.31	.29	e.52	e.25	.24	.24	.24	.30	.27	.22	e.33	e.28
20	.31	.29	e.38	e.24	.24	.24	.24	.27	.26	2.1	e.67	e.28
21	.32	.29	e.34	e.24	3.7	.24	.27	.27	.25	4.1	e.53	e.29
22	.31	.29	e.33	e.24	.27	.24	.27	.27	.27	1.2	e.31	e.28
23	.35	.30	e.45	e.24	.27	.24	.27	.27	.27	.37	e.31	e.28
24	.39	.29	e.32	e.24	.25	.24	.25	.27	.27	.33	e.29	e.28
25	.31	.64	e.32	e.42	.24	.31	.24	.27	.27	.33	e.29	e.28
26	.31	.84	e.31	.22	e.24	.25	.23	.28	.27	.33	e.29	e.28
27	e.31	.29	e.30	.22	e.24	.24	.33	.31	.27	.33	e.29	e.29
28	e.31	.29	e.30	.22	e.70	.24	.53	.31	.27	.32	e.29	e.28
29	e.31	.56	e.52	.21	---	.24	.55	.31	.27	.40	e.29	e.28
30	e.31	.28	e.33	.20	---	.24	.26	.31	.27	.33	e.29	e.28
31	e.31	---	e.29	.20	---	.24	---	1.3	---	.31	e.29	---
TOTAL	12.19	13.02	15.69	14.67	16.83	11.39	22.01	8.88	8.08	15.96	9.95	8.50
MEAN	.39	.43	.51	.47	.60	.37	.73	.29	.27	.51	.32	.28
MAX	.51	2.0	4.2	1.7	3.7	1.6	6.9	1.3	.44	4.1	.67	.29
MIN	.31	.28	.27	.20	.20	.24	.23	.20	.24	.22	.29	.27
AC-FT	24	26	31	29	33	23	44	18	16	32	20	17

CAL YR 1988	TOTAL	213.21	MEAN	.58	MAX	4.2	MIN	.27	AC-FT	423
WTR YR 1989	TOTAL	157.17	MEAN	.43	MAX	6.9	MIN	.20	AC-FT	312

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 mi^2.

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 poor. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--27 years, 1.57 ft^3/s (1,140 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0100	*97	*2.21	July 21	0515	50	1.79
Dec. 16	2100	53	1.82				

Minimum discharge, 0.49 ft^3/s, for many days.

DISCHARGE, IN 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	1.2	.87	.69	.60	e.80	e1.7	.49	.73	.92	.73	.82	.82
2	1.2	.87	.69	1.6	e3.5	e1.0	.64	.69	.73	.73	e.82	.82
3	1.2	.87	.69	.78	e.62	e1.3	.73	.69	.69	.73	e.81	.78
4	1.2	2.6	.89	.60	e.96	e.78	1.2	.69	.69	.73	e.81	.78
5	1.1	.98	.69	.60	e.72	e.90	.73	.69	.73	.73	e1.0	.78
6	1.1	.87	2.8	.60	e.61	e.66	1.1	.89	.89	.78	e.82	.78
7	1.1	.78	.73	.60	e.56	e.57	1.1	.69	.89	.78	e.82	.78
8	1.1	.73	.69	.69	e.52	e.52	5.3	.89	.69	.78	e.82	.78
9	1.1	.73	.69	1.8	e.60	.49	2.8	.69	.69	.78	e.82	.78
10	1.1	.73	.64	1.6	e1.0	.49	.78	.69	.69	.78	e.82	.78
11	1.1	.73	.64	1.8	e1.9	.49	.73	.69	.69	.78	.82	.78
12	1.3	.73	1.1	1.0	e.60	.56	1.7	.69	.69	.78	.82	.78
13	1.2	.73	.64	1.1	e.54	.49	1.2	.69	.69	.78	.82	.78
14	1.1	.73	.64	.64	e.52	.49	.73	.69	.69	.82	.82	.78
15	1.1	.73	.84	.64	e.51	.52	.69	.69	.69	1.2	.82	.78
16	1.1	1.7	1.5	.64	e.52	.49	.69	.64	.73	.78	.82	.78
17	1.1	.78	.78	.60	e.52	.49	.69	.64	.89	.78	.82	.78
16	1.0	.73	.69	.60	e.52	.49	.69	.64	.69	.78	.82	.78
19	.92	.73	.82	.60	e.52	.49	.69	.89	.69	.78	.82	.78
20	.92	.69	.69	e.60	e.70	.49	.69	.64	.69	1.9	1.2	.78
21	.92	.73	.64	e.58	e2.6	.49	.69	.64	.73	4.2	1.0	.78
22	.92	.69	.64	e.57	e.60	.49	.69	.64	.73	1.6	.82	.78
23	1.0	.73	.78	e.57	e.54	.49	.69	.64	.73	.87	.82	.78
24	.98	.69	.64	e.58	e.52	.49	.89	.64	.73	.87	.82	.78
25	.87	.92	.64	e.70	e.52	.56	.69	.64	.73	.87	.82	.78
26	.87	.98	.64	e.52	e.52	.49	.69	.64	.73	.87	.82	.78
27	.87	.73	.60	e.50	e.51	.49	.82	.64	.73	.87	.82	.78
28	.87	.73	.80	e.50	e1.0	.49	1.0	.84	.73	.92	.82	.78
29	.87	.82	.82	e.49	---	.49	1.0	.64	.73	1.1	.82	.78
30	.87	.73	.64	e.49	---	.49	.76	.64	.73	.82	.82	.78
31	.87	---	.60	e.49	---	.49	---	1.5	---	.82	.82	---
TOTAL	32.15	26.06	24.38	23.68	23.55	18.85	31.11	21.54	21.45	30.74	28.14	23.48
MEAN	1.04	.87	.79	.76	.84	.61	1.04	.69	.71	.99	.84	.78
MAX	1.3	2.6	2.8	1.8	3.5	1.7	5.3	1.5	.92	4.2	1.2	.82
MIN	.87	.69	.60	.49	.51	.49	.49	.64	.89	.73	.81	.78
AC-FT	64	52	48	47	47	37	62	43	43	81	52	47

CAL YR 1988	TOTAL	406.61	MEAN	1.12	MAX	4.5	MIN	.60	AC-FT	810
WTR YR 1989	TOTAL	303.13	MEAN	.83	MAX	5.3	MIN	.49	AC-FT	601

e Estimated

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 mi^2.

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.--15 years, 6.16 ft^3/s (4,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/s, Mar. 14, 1982, gage height, 7.52 ft, from rating curve extended above 100 ft^3/s; minimum, 1.1 ft^3/s, Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	0500	187	4.55	Mar. 1	1500	249	4.86
Dec. 6	0200	483	5.77	Apr. 4	1430	228	4.76
Feb. 2	1600	522	5.90	Apr. 8	2200	*846	*6.76
Feb. 21	0530	403	5.49	July 21	0300	359	5.32

Minimum discharge, 5.3 ft^3/s, Oct. 19, 20, 21, Nov. 2.

DISCHARGE, IN 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	6.4	5.4	6.4	6.3	6.4	22	6.4	8.0	16	7.4	7.4	6.8
2	6.3	5.5	6.4	8.7	49	15	7.5	7.5	8.7	7.4	7.5	6.8
3	6.3	5.5	6.3	7.4	9.3	22	7.6	7.4	8.1	7.4	7.4	6.8
4	6.3	16	6.0	6.4	10	9.2	22	7.4	7.8	7.3	7.5	6.8
5	6.2	8.0	5.9	6.4	7.8	13	8.6	7.4	8.0	7.2	7.4	6.8
6	6.1	7.2	43	6.4	7.1	9.6	15	7.4	7.7	7.4	7.4	6.8
7	6.1	6.9	8.7	8.4	6.6	8.7	18	7.3	7.6	7.4	7.4	6.8
8	6.1	6.6	7.4	6.6	6.4	7.5	101	7.4	7.8	7.4	7.3	6.8
9	6.1	6.4	6.5	6.4	6.3	7.1	61	7.4	7.7	7.3	7.2	6.7
10	5.9	6.2	6.3	18	7.6	6.9	13	7.3	7.9	7.3	7.2	6.8
11	5.9	6.1	6.1	33	26	6.9	9.4	7.3	7.9	7.4	7.2	6.7
12	6.0	6.1	12	14	8.8	7.6	29	7.3	7.8	7.4	7.2	6.6
13	5.8	6.1	6.5	17	7.1	6.9	20	7.4	7.9	7.6	7.1	6.6
14	5.9	6.1	6.3	10	6.7	6.7	9.3	7.4	7.9	7.8	7.0	6.6
15	5.8	6.0	6.3	8.4	6.5	6.9	8.3	7.4	7.9	9.1	6.9	6.6
16	5.8	16	16	8.1	6.3	6.7	7.8	7.4	7.8	7.6	6.9	6.6
17	5.8	7.3	10	7.7	6.3	6.6	7.6	7.4	7.6	7.5	6.9	6.6
18	5.6	6.4	7.1	7.4	6.3	6.6	7.4	7.4	7.6	7.4	6.9	6.6
19	5.4	6.4	8.9	7.1	6.2	6.5	7.4	7.9	7.6	7.5	6.9	6.6
20	5.4	6.1	7.2	7.0	6.2	6.4	7.2	7.5	7.6	25	9.9	6.7
21	5.5	6.1	6.8	7.0	47	6.4	7.2	7.4	7.7	51	9.9	6.6
22	5.4	6.1	6.6	7.0	7.5	6.4	7.2	7.4	7.9	19	7.2	6.6
23	6.1	6.1	8.5	7.0	7.0	6.5	7.2	7.4	7.7	9.6	7.2	6.6
24	6.2	6.1	7.0	8.3	6.7	6.4	7.3	7.4	7.6	8.3	7.1	6.6
25	5.7	9.5	6.8	7.1	6.4	6.8	7.1	7.5	7.6	7.7	7.0	6.6
26	5.6	13	6.6	6.9	6.4	6.6	7.2	7.5	7.6	7.4	7.0	6.7
27	5.6	6.0	6.5	6.8	6.3	6.5	7.7	7.4	7.6	7.4	6.9	6.9
28	5.6	7.3	6.3	6.8	26	6.4	9.3	7.4	7.5	7.4	6.8	6.8
29	5.6	10	7.1	6.7	---	6.4	11	7.4	7.4	7.8	6.8	6.7
30	5.5	7.0	6.6	6.4	---	6.4	9.1	7.5	7.4	7.5	6.8	6.8
31	5.4	---	6.4	6.4	---	6.4	---	19	---	7.4	6.8	---
TOTAL	181.4	225.5	264.5	275.1	316.2	260.0	453.8	242.2	240.9	308.3	226.1	200.8
MEAN	5.85	7.52	8.53	8.87	11.3	8.39	15.1	7.81	6.03	9.95	7.29	6.69
MAX	6.4	16	43	33	49	22	101	19	16	51	9.9	6.9
MIN	5.4	5.4	5.9	6.3	6.2	6.4	6.4	7.3	7.4	7.2	6.8	6.6
AC-FT	360	447	525	546	627	516	900	480	478	612	448	398

CAL YR 1988	TOTAL	2772.1	MEAN	7.57	MAX	77	MIN	5.4	AC-FT	5500
WTR YR 1989	TOTAL	3194.8	MEAN	8.75	MAX	101	MIN	5.4	AC-FT	6340

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 Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-atage 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.--29 years (water years 1961-89), 8.71 ft^3/s (6,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, Feb. 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 21	1330	782	5.03	Apr. 4	1600	1,210	5.85
Nov. 26	0800	702	4.83	Apr. 8	1830	*1,700	*6.60
Feb. 2	1500	1,220	5.86				

Minimum discharge, 2.6 ft^3/s, Sept. 26, 27.

DISCHARGE, IN 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	4.9	4.9	5.2	e4.8	4.3	105	5.3	e8.0	40	3.8	5.4	3.8
2	4.3	5.0	5.1	e16	70	83	6.5	e7.0	7.7	3.6	7.7	7.0
3	4.0	4.5	5.0	e10	11	61	13	e6.4	5.8	3.6	6.1	3.7
4	3.8	47	4.8	e6.0	10	28	105	e6.0	5.2	3.5	7.9	3.3
5	3.7	15	e4.4	e5.4	14	38	27	e5.5	5.3	4.8	5.6	3.2
6	3.9	42	e35	e6.4	12	56	60	e5.3	4.9	7.3	5.1	4.0
7	3.9	11	e9.0	e8.0	11	44	72	e6.0	4.7	e4.5	7.9	4.4
8	3.8	8.2	e7.4	e9.0	8.5	23	e200	e6.8	4.6	e3.7	5.3	3.5
9	3.4	7.0	e6.2	e5.2	7.3	18	e68	9.8	4.6	e3.5	4.9	3.2
10	3.7	6.4	e5.6	e20	11	15	e20	8.7	4.6	e3.5	4.5	3.2
11	3.5	5.9	e6.0	e58	68	14	e35	6.6	4.5	e5.0	4.6	3.1
12	3.5	5.5	e20	e20	20	14	e80	6.3	4.4	e3.5	4.8	3.1
13	3.3	5.9	e6.2	e56	12	11	e20	6.0	4.3	e4.5	4.5	4.1
14	9.5	5.2	e5.4	e13	11	9.8	e15	8.5	4.2	e20	4.3	3.1
15	5.4	5.1	e5.0	e11	9.6	9.2	e7.6	5.8	4.1	e16	4.1	3.0
16	4.1	5.5	e23	e12	8.7	8.6	e6.8	8.0	5.7	e7.4	4.0	3.2
17	3.7	5.5	e10	e8.0	8.0	8.0	e8.4	5.4	5.5	e5.4	4.0	4.1
18	3.4	5.2	e7.6	e7.0	7.4	7.5	e6.3	5.3	4.7	e4.6	4.1	3.1
19	3.4	5.1	e9.0	e6.2	7.6	7.0	e6.2	21	4.3	e4.0	4.3	3.5
20	3.3	4.7	e6.8	e12	6.8	6.7	e7.0	6.7	4.1	e60	11	3.1
21	86	5.0	e6.0	e8.0	71	6.4	e7.7	5.6	4.5	e70	13	3.0
22	11	4.5	e5.8	e6.0	18	6.1	e6.0	5.3	4.9	e20	5.0	3.0
23	27	4.7	e27	e6.3	16	8.0	e12	5.2	4.5	e14	4.3	2.8
24	13	5.3	e8.0	e5.6	10	6.1	e8.0	8.4	4.1	e10	4.0	3.2
25	9.0	20	e6.8	e5.2	8.6	7.2	e8.0	5.3	4.3	e8.8	3.8	3.0
26	6.9	49	e7.0	e4.8	8.0	6.9	e5.3	5.5	4.0	7.4	3.8	2.8
27	6.1	8.1	e8.0	e4.7	7.7	5.7	e20	5.2	3.9	8.8	3.6	2.7
28	5.6	8.3	e5.8	e5.0	52	5.3	e22	4.8	3.8	6.3	3.6	3.0
29	5.2	8.7	e6.8	e5.4	---	5.3	e17	5.1	3.7	6.2	3.6	10
30	5.2	5.6	e5.8	e6.0	---	4.8	e12	6.0	3.9	5.9	3.4	4.4
31	5.0	---	e5.4	e4.5	---	4.8	---	9.4	---	5.5	3.3	---
TOTAL	282.3	319.8	276.7	353.5	509.5	631.4	883.1	208.7	174.6	333.1	161.3	110.6
MEAN	8.46	10.7	8.93	11.4	18.2	20.4	29.4	8.73	5.82	10.7	5.20	3.69
MAX	86	49	35	58	71	105	200	21	40	70	13	10
MIN	3.3	4.5	4.4	4.5	4.3	4.8	5.3	4.8	3.7	3.5	3.3	2.7
AC-FT	520	634	549	701	1010	1250	1750	414	348	661	320	219

CAL YR 1988	TOTAL	4432.8	MEAN	12.1	MAX	451	MIN	2.5	AC-FT	8790
WTR YR 1989	TOTAL	4224.6	MEAN	11.6	MAX	200	MIN	2.7	AC-FT	8380

e Estimated

16298500 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 mi^2.

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 except for period of no gage-height record, which is poor. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--30 years (water years 1960-89), 37.1 ft^3/s (26,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft^3/s, Apr. 15, 1963, gage height, 8.10 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 10 ft^3/s, Sept. 17, 18, 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak dischargea greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	1430	2,160	5.41	Apr. 4	1600	*3,700	*6.84
Nov. 28	0900	2,600	5.86	Apr. 8	2230	1,660	4.88
Dec. 8	0200	2,550	5.81	June 1	1400	1,840	5.06
Jan. 13	0030	1,890	5.11	June 21	0330	1,730	4.93

Minimum diacharge, 19 ft^3/s, many days.

DISCHARGE, IN 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	30	20	35	28	e27	e60	24	49	183	22	32	25
2	28	19	33	90	e200	e80	36	45	50	21	56	113
3	27	19	31	59	e60	e235	59	41	37	21	36	32
4	25	211	29	33	e40	e70	259	38	34	20	61	25
5	27	50	27	30	e60	e52	99	38	35	25	32	28
6	27	222	288	33	e45	e120	129	34	32	60	31	60
7	26	51	53	29	e35	e110	153	42	31	29	52	69
8	25	38	38	50	e30	e80	557	67	30	22	39	31
9	25	31	35	30	e29	e46	439	108	29	21	31	28
10	23	28	32	82	e29	44	110	43	28	21	29	28
11	23	26	33	280	e240	59	65	40	27	30	28	28
12	23	28	99	79	e68	82	389	35	26	21	39	26
13	23	34	33	281	e45	41	123	34	25	26	185	27
14	23	25	31	66	e38	36	100	37	25	106	43	24
15	22	23	29	52	e35	34	57	35	26	80	35	23
16	21	77	145	46	e33	35	49	46	34	38	33	28
17	22	53	84	41	e32	33	44	35	51	29	32	39
18	21	38	44	38	e45	31	41	32	35	26	31	24
19	20	32	53	35	e70	29	40	99	38	62	37	28
20	20	30	36	61	e60	27	45	38	23	254	29	25
21	120	37	33	41	e130	26	51	33	30	319	91	24
22	28	28	32	33	e298	25	36	35	26	188	40	23
23	44	39	188	34	e100	25	76	32	27	63	33	22
24	37	36	44	31	e148	25	60	49	25	49	30	24
25	26	79	36	29	e90	60	38	33	32	41	29	23
26	24	173	39	28	e45	35	35	35	28	40	27	22
27	22	47	33	27	e68	25	119	35	24	41	24	21
28	22	36	32	e27	e56	24	133	30	25	33	29	23
29	22	121	38	e26	---	24	104	33	25	45	27	67
30	21	40	33	e30	---	23	89	53	22	32	24	42
31	20	---	31	e27	---	23	---	178	---	31	23	---
TOTAL	867	1687	1887	1776	2156	1599	3559	1478	1059	1816	1268	1002
MEAN	28.0	56.2	54.4	57.3	77.0	51.6	119	47.7	35.3	58.8	40.9	33.4
MAX	120	222	288	281	298	235	557	178	183	319	185	113
MIN	20	19	27	26	27	23	24	30	22	20	23	21
AC-FT	1720	3350	3350	3520	4280	3170	7060	2930	2100	3600	2520	1990

CAL YR 1988	TOTAL	16949	MEAN	46.3	MAX	634	MIN	18	AC-FT	33620
WTR YR 1989	TOTAL	19954	MEAN	54.7	MAX	557	MIN	19	AC-FT	39580

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 fair. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--36 years, 7.27 ft^3/s (5,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft^3/s on several days; minimum daily, 0.27 ft^3/s, Mar. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	5.5	17	5.8	14	4.3	5.1	19	18	12	15	9.5
2	10	7.0	13	10	12	.62	9.0	17	18	10	9.5	10
3	7.1	16	16	13	12	9.4	14	19	15	5.1	6.5	10
4	9.2	8.8	18	13	9.9	.30	16	18	18	5.0	4.6	11
5	11	8.1	11	9.1	7.5	.31	19	16	10	7.0	8.8	7.9
6	5.4	7.1	9.8	12	3.5	.33	19	18	17	16	18	8.4
7	12	15	13	6.7	3.2	.27	19	19	13	10	17	7.2
8	11	9.6	12	9.2	2.9	10	19	12	7.6	10	17	16
9	9.4	6.1	9.6	14	2.6	19	18	15	4.0	10	15	10
10	7.3	11	7.2	12	2.4	16	18	15	4.0	8.0	12	6.4
11	12	15	6.1	13	.70	10	18	14	12	8.0	10	5.4
12	15	12	6.2	15	13	14	18	15	8.0	10	15	4.4
13	11	10	11	15	18	14	19	14	7.0	4.0	14	4.1
14	8.5	9.2	6.7	15	18	9.7	12	14	9.0	5.0	16	11
15	11	6.5	5.0	11	17	16	14	10	7.0	4.0	13	14
16	15	10	8.0	15	14	10	15	13	4.0	10	14	9.6
17	12	13	8.5	18	11	13	10	18	5.9	5.4	15	7.9
18	9.4	10	7.9	14	7.4	12	8.3	13	7.0	4.0	11	8.2
19	12	13	8.0	10	5.9	11	10	9.7	9.0	4.0	10	8.1
20	16	13	13	10	11	10	12	18	8.7	4.0	11	4.7
21	13	8.5	12	16	11	10	9.9	14	4.0	9.0	11	10
22	17	4.9	13	12	12	5.1	13	9.0	4.0	12	17	12
23	16	4.5	15	7.4	6.8	5.1	12	16	10	11	14	8.2
24	13	12	15	5.6	17	8.0	13	9.7	7.0	17	11	5.8
25	13	11	12	13	12	7.0	18	8.0	10	11	8.9	4.2
26	17	7.2	12	13	9.5	11	14	15	12	7.7	13	11
27	15	13	18	9.0	7.5	11	15	9.1	10	11	15	14
28	13	16	14	6.8	5.0	10	18	8.3	10	5.5	11	11
29	8.9	5.7	8.8	5.2	---	7.0	18	9.5	6.1	11	8.7	11
30	6.8	8.7	4.8	15	---	10	18	10	7.0	11	7.3	10
31	6.1	---	9.9	16	---	9.3	---	10	---	14	5.8	---
TOTAL	351.6	295.4	339.5	361.8	266.80	273.73	441.3	423.3	282.3	269.7	374.7	267.0
MEAN	11.3	9.85	11.0	11.7	9.52	8.83	14.7	13.7	9.41	8.70	12.1	8.90
MAX	17	16	18	18	18	19	19	19	18	17	18	16
MIN	5.4	4.5	4.8	5.2	.70	.27	5.1	8.0	4.0	4.0	4.8	4.1
AC-FT	697	588	673	718	529	543	875	840	560	535	743	530

CAL YR 1988	TOTAL	4607.3	MEAN	12.6	MAX	25	MIN	3.9	AC-FT	9140
WTR YR 1989	TOTAL	3846.93	MEAN	10.8	MAX	19	MIN	.27	AC-FT	7830

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 mi^2.

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.--36 years, 17.9 ft^3/s (12,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft^3/s, July 17, 1974, gage height, 7.60 ft, from rating curve extended above 170 ft^3/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.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 6	1430	1,470	4.26	Apr. 12	0900	1,180	3.83
Dec. 23	0630	980	3.50	June 1	1300	1,720	4.60
Apr. 4	1630	*2,790	*5.76	July 21	0400	1,050	3.62
Apr. 8	1730	1,190	3.85				

Minimum discharge, 0.65 ft^3/s, Nov. 2.

DISCHARGE, IN 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	14	10	7.3	16	6.8	e33	14	23	94	6.3	11	11
2	8.7	9.3	11	16	44	e45	14	19	17	7.7	19	17
3	13	1.4	7.4	19	12	e70	23	14	16	13	19	10
4	10	108	5.2	12	15	e35	144	13	12	11	25	8.6
5	8.7	31	11	14	29	e31	45	14	18	13	17	11
6	13	104	e129	11	26	e62	72	13	11	16	9.0	14
7	7.2	20	e18	15	23	e54	76	13	14	11	19	19
8	6.8	16	e15	22	21	28	322	18	19	9.3	12	5.9
9	7.7	16	e15	9.2	20	16	242	19	21	8.9	12	9.4
10	9.7	9.6	e17	33	24	16	48	14	19	10	13	12
11	5.8	4.1	e20	108	83	21	35	15	10	13	15	12
12	3.2	6.8	e34	49	22	30	184	12	14	8.8	11	13
13	5.9	11	e17	66	10	16	54	14	14	16	33	15
14	7.7	8.7	15	23	8.7	20	43	13	11	31	9.7	9.0
15	5.6	11	16	27	8.7	14	31	20	13	22	12	6.4
16	2.7	32	71	22	9.7	18	28	19	18	12	10	11
17	4.8	18	29	13	12	12	28	10	23	14	9.3	16
18	8.4	16	22	15	15	12	28	14	13	16	13	12
19	4.5	9.5	29	16	e36	11	24	34	11	17	14	15
20	1.8	7.3	12	41	e28	11	23	11	11	90	13	15
21	24	14	12	12	e58	9.7	28	13	19	136	42	9.4
22	2.4	14	10	14	e117	15	19	21	16	52	9.2	8.0
23	3.8	16	116	19	e47	15	34	12	9.7	28	10	11
24	5.5	8.0	16	18	e41	12	80	26	13	17	11	14
25	5.2	27	17	12	e22	24	16	17	12	19	12	15
26	2.0	90	19	11	e17	12	19	9.6	9.0	21	8.8	8.8
27	3.2	14	9.2	14	e29	9.4	45	17	10	17	6.7	5.5
28	4.1	12	12	15	e27	10	60	17	9.9	21	10	9.0
29	7.3	37	20	16	---	13	47	16	14	18	11	12
30	9.7	15	20	8.0	---	9.8	49	22	12	16	12	9.8
31	10	---	14	5.9	---	10	---	55	---	12	13	---
TOTAL	224.4	694.7	768.1	692.1	811.9	694.9	1855	547.6	503.6	703.0	441.5	344.8
MEAN	7.24	23.2	24.8	22.3	29.0	22.4	61.8	17.7	16.8	22.7	14.2	11.5
MAX	24	108	129	108	117	70	322	55	94	136	42	19
MIN	1.8	1.4	5.2	5.9	6.8	9.4	14	9.6	9.0	8.3	6.7	5.5
AC-FT	445	1380	1520	1370	1610	1380	3680	1090	999	1390	876	684

CAL YR 1988	TOTAL	6376.4	MEAN	17.4	MAX	382	MIN	1.4	AC-FT	12650
WTR YR 1989	TOTAL	8281.6	MEAN	22.7	MAX	322	MIN	1.4	AC-FT	16430

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 mi^2.

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.--22 years, 4.39 ft^3/s (3,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/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 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 21	1230	986	9.62	Apr. 4	1545	*1,930	*11.26
Jan. 11	0730	504	8.44				

Minimum discharge, 0.03 ft^3/s, Dec. 5.

DISCHARGE, IN 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	1.1	.59	.16	1.1	.37	42	4.2	3.9	18	.15	1.9	1.3
2	.82	.87	.21	2.3	30	48	6.2	2.5	2.2	.11	6.4	9.5
3	.87	.50	.12	9.6	3.0	17	24	1.9	1.3	.10	2.5	1.2
4	.58	53	.06	1.6	4.9	7.7	91	1.5	1.5	.10	6.1	.97
5	.50	12	.04	1.2	15	28	16	1.3	6.7	2.3	1.4	.60
6	.55	19	58	1.5	8.6	22	33	1.1	1.8	8.2	3.1	.56
7	.71	1.4	3.6	3.7	2.1	18	38	1.0	.96	2.3	12	4.0
8	.85	.51	1.6	8.6	1.3	3.8	106	1.9	.81	.49	2.3	1.5
9	1.2	.33	1.1	1.6	.99	2.8	54	7.0	1.3	.26	1.5	.78
10	.45	.29	.91	14	7.6	2.3	6.8	3.1	.69	1.1	1.0	1.4
11	.70	.22	2.2	58	22	3.1	4.0	2.5	.52	4.6	.92	.62
12	1.3	.15	12	9.1	4.7	18	53	1.7	.42	1.1	2.4	.54
13	1.1	.82	5.2	33	1.4	2.0	14	1.6	.39	3.5	1.5	.52
14	.92	.54	1.8	4.7	1.0	1.8	7.9	3.4	.31	18	.90	.34
15	.53	.13	.88	7.9	.84	3.4	3.0	6.3	.28	9.1	.79	.25
16	.67	1.4	56	4.9	.70	4.6	2.4	2.0	10	2.6	1.1	2.9
17	.44	3.8	6.5	2.7	.59	1.5	2.0	1.6	7.3	2.8	1.0	3.6
18	.24	1.7	4.2	1.9	1.2	1.1	1.6	1.1	1.4	1.3	2.2	.48
19	.19	.36	4.3	1.6	6.9	.93	1.4	15	.85	8.3	7.3	2.8
20	.15	.25	2.0	5.6	5.8	.81	1.7	1.5	.54	35	3.5	1.2
21	33	.62	2.3	2.0	62	.69	2.7	1.0	2.6	37	26	2.8
22	3.4	.38	1.7	1.3	8.9	.59	2.6	4.8	.95	20	3.7	1.5
23	1.1	1.4	26	1.2	18	.58	7.3	2.0	.53	4.1	2.4	.58
24	6.7	.53	3.2	1.0	3.7	1.5	6.4	9.0	.38	3.3	1.8	1.7
25	1.6	21	1.6	.87	1.9	12	1.8	1.8	.40	3.3	1.2	2.2
26	1.2	11	4.2	.88	4.5	4.1	1.2	1.8	.29	2.4	1.0	.58
27	.78	.48	1.3	.75	2.6	1.0	13	3.0	.23	3.5	.84	.44
28	.47	.38	1.6	.62	43	.67	30	1.2	.19	1.8	1.5	1.6
29	.94	1.2	7.5	.80	---	.67	25	.95	.16	2.5	.78	3.9
30	1.3	.28	3.7	.57	---	.72	17	5.6	.17	2.1	.58	1.3
31	1.0	---	1.7	.42	---	.55	---	9.9	---	1.2	.57	---
TOTAL	65.14	135.13	215.48	185.01	263.59	251.91	579.0	102.95	63.17	182.61	100.18	51.66
MEAN	2.10	4.50	6.95	5.97	9.41	8.13	19.3	3.32	2.11	5.89	3.23	1.72
MAX	33	53	58	58	62	48	108	15	18	37	26	9.5
MIN	.15	.13	.04	.42	.37	.55	1.2	.95	.16	.10	.57	.25
AC-FT	129	268	427	367	523	500	1150	204	125	362	199	102

CAL YR 1988	TOTAL	2014.18	MEAN	5.50	MAX	182	MIN	.04	AC-FT	4000
WTR YR 1989	TOTAL	2195.83	MEAN	6.02	MAX	108	MIN	.04	AC-FT	4360

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 mi^2.

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.--26 years, 10.6 ft^3/s (7,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft^3/s, Jan. 30, 1975, gage height, 10.06 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurement at gage height 10.08 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 9	0100	*1,120	*7.62	July 21	0400	985	7.35

Minimum discharge, 0.32 ft^3/s, Nov. 3, 4.

DISCHARGE, IN 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	4.4	.50	3.3	5.5	3.7	51	14	18	16	1.1	6.7	2.7
2	3.7	.47	3.0	5.0	41	102	18	13	6.2	1.1	21	21
3	3.2	.38	3.0	12	16	45	20	11	4.0	1.1	11	7.1
4	2.7	40	2.3	5.3	5.8	28	91	9.5	3.2	1.1	18	3.4
5	2.3	42	2.2	5.1	11	17	37	8.6	14	1.2	7.4	2.4
6	2.5	31	103	4.4	22	52	50	7.7	9.9	6.8	6.8	2.2
7	2.4	7.3	17	5.2	8.3	51	97	7.2	2.9	8.2	15	4.3
8	4.0	3.3	7.2	16	5.3	23	352	6.7	2.3	1.8	7.9	3.4
9	2.5	2.3	5.3	6.4	4.8	17	321	6.1	2.1	1.2	5.1	2.1
10	1.8	1.9	4.3	26	14	15	53	6.1	1.8	1.1	4.1	1.7
11	1.7	1.8	3.9	219	18	13	34	5.7	1.7	7.2	3.8	1.7
12	1.8	1.6	26	42	15	18	87	6.8	1.6	2.5	3.8	1.6
13	3.8	2.8	7.2	150	5.9	15	46	8.5	1.5	6.2	4.2	1.5
14	3.8	2.3	5.3	37	4.5	10	40	9.4	1.5	12	4.2	1.4
15	2.7	1.6	3.9	23	4.0	8.6	25	13	1.4	25	5.0	1.3
16	2.0	3.6	52	20	3.6	9.8	20	6.7	2.4	5.0	3.5	1.7
17	1.6	14	27	14	3.3	9.5	17	5.6	24	2.3	3.0	8.1
18	1.4	9.2	13	11	3.1	7.2	15	4.6	6.8	1.9	8.6	2.2
19	1.2	4.2	16	9.9	3.5	8.4	14	13	2.8	6.4	18	1.5
20	1.1	3.3	8.9	11	4.9	5.6	18	8.2	1.8	82	7.3	1.5
21	9.5	6.6	6.7	9.2	153	5.0	17	3.8	1.7	173	35	2.5
22	4.1	4.5	5.7	7.8	21	4.7	13	5.3	2.3	66	13	1.7
23	1.3	5.8	65	7.1	38	4.5	22	7.1	1.6	22	6.0	1.7
24	5.6	15	13	6.7	26	5.7	21	9.1	1.5	14	4.5	1.6
25	2.6	44	6.0	6.1	14	12	11	5.0	1.9	10	3.7	4.6
26	1.4	84	15	5.7	11	14	9.8	3.5	1.6	8.6	3.4	1.7
27	.84	8.9	7.0	5.3	9.4	5.1	19	4.4	1.3	7.9	3.0	1.1
28	.66	5.1	8.1	5.0	15	4.1	44	3.5	1.2	6.0	3.5	1.4
29	.61	11	18	4.9	---	4.2	55	3.0	1.2	15	3.3	2.6
30	.57	5.2	10	4.5	---	3.8	30	12	1.2	9.4	2.6	1.3
31	.53	---	7.2	4.1	---	3.5	---	14	---	7.1	2.6	---
TOTAL	78.31	343.45	477.5	694.2	485.1	570.7	1608.8	242.1	123.2	516.2	245.0	93.0
MEAN	2.53	11.4	15.4	22.4	17.3	18.4	53.6	7.81	4.11	16.7	7.90	3.10
MAX	9.5	64	103	219	153	102	352	18	24	173	35	21
MIN	.53	.38	2.2	4.1	3.1	3.5	9.8	3.0	1.2	1.1	2.6	1.1
AC-FT	155	681	947	1380	962	1130	3190	480	244	1020	486	184

CAL YR 1988	TOTAL	5493.66	MEAN	15.0	MAX	568	MIN	.38	AC-FT	10900
WTR YR 1989	TOTAL	5477.56	MEAN	15.0	MAX	352	MIN	.38	AC-FT	10860

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 Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, 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 good. Small diversion upstream.

AVERAGE DISCHARGE.--31 years, 18.5 ft^3/s (13,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft^3/s, Mar. 18, 1980, gage height, 11.46 ft, from rating curve extended above 150 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0330	2,230	6.62	Mar. 2	0200	2,160	6.54
Jan. 11	0900	2,570	7.00	Apr. 4	1830	2,530	6.96
Jan. 13	0230	1,570	5.82	Apr. 9	0130	3,260	7.72
Feb. 21	0600	2,860	7.32	July 21	0530	*4,230	*8.62

Minimum discharge, 0.46 ft^3/s, Nov. 3.

DISCHARGE, IN 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	4.8	.66	8.1	12	7.6	111	20	e50	31	1.7	9.5	3.2
2	3.7	.60	4.9	9.9	146	386	28	e30	16	1.4	24	17
3	3.1	.53	4.8	19	53	131	51	e22	6.4	1.4	19	11
4	2.6	81	3.8	12	15	87	320	e18	4.7	1.2	27	4.8
5	2.3	95	4.0	8.8	27	58	138	e15	10	1.2	13	3.4
6	2.3	94	525	7.6	63	125	104	e13	21	3.1	9.4	3.1
7	2.2	12	73	7.8	20	121	302	e12	6.7	12	16	3.3
8	3.2	4.9	21	26	14	43	1320	e11	4.4	3.8	13	4.8
9	3.3	3.2	14	14	14	31	1350	e10	3.9	2.0	8.6	3.2
10	2.1	2.4	13	44	25	25	189	e10	3.3	1.5	6.5	2.7
11	1.6	2.0	12	910	55	22	85	e9.0	2.9	5.3	5.6	2.5
12	1.4	1.7	49	179	34	35	206	e12	2.7	4.6	5.7	2.4
13	2.2	2.0	17	647	15	22	98	e10	2.5	5.8	5.8	2.2
14	3.2	2.6	9.9	165	14	17	74	e15	2.3	12	5.9	2.1
15	3.0	2.0	7.0	70	8.7	15	44	e20	2.2	41	6.3	2.3
16	2.7	1.5	152	57	7.7	16	e30	e9.0	2.3	9.6	5.5	2.2
17	3.6	16	108	34	6.7	15	e23	e7.0	30	5.2	4.6	5.7
18	2.0	8.1	29	26	6.0	12	e19	5.6	11	3.4	7.5	4.1
19	1.5	5.3	52	22	6.6	10	e18	12	5.3	3.3	22	2.5
20	1.3	3.4	25	26	8.4	9.2	e19	11	3.3	201	12	2.2
21	5.3	4.5	16	20	610	8.1	e21	5.5	2.9	920	53	2.5
22	7.7	6.1	13	16	49	7.3	e18	5.5	3.4	213	19	2.3
23	2.7	3.4	196	14	105	8.7	e35	9.6	2.9	55	8.9	2.2
24	5.3	14	35	13	57	7.5	e35	11	2.5	24	5.8	2.1
25	4.3	62	19	13	27	15	e18	8.2	2.5	16	5.0	3.3
26	2.8	233	30	11	21	28	e16	5.0	3.2	13	4.2	2.9
27	1.7	24	16	9.9	18	9.6	e30	4.7	2.2	12	3.7	2.1
28	1.1	11	16	9.0	93	8.1	e150	4.7	1.8	12	3.6	2.0
29	.94	17	37	8.7	---	5.6	e175	3.6	1.7	22	3.8	2.5
30	.89	11	24	8.3	---	5.1	e100	11	1.7	15	3.2	2.1
31	.75	---	16	7.9	---	4.6	---	18	---	11	3.2	---
TOTAL	85.38	724.89	1548.5	2427.9	1526.7	1394.8	5036	388.4	198.7	1633.5	340.3	108.5
MEAN	2.75	24.2	50.0	78.3	54.5	45.0	168	12.5	6.56	52.7	11.0	3.62
MAX	7.7	233	525	910	610	386	1350	50	31	920	53	17
MIN	.75	.53	3.8	7.6	6.0	4.6	16	3.6	1.7	1.2	3.2	2.0
AC-FT	169	1440	3070	4820	3030	2770	9990	770	390	3240	675	215

CAL YR 1988	TOTAL	11692.54	MEAN	31.9	MAX	1940	MIN	.53	AC-FT	23190
WTR YR 1989	TOTAL	15411.57	MEAN	42.2	MAX	1350	MIN	.53	AC-FT	30570

e Estimated

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 Waialua School.

DRAINAGE AREA.--2.98 mi^2.

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.--30 years, 14.0 ft^3/s (10,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	0830	1,400	6.73	Apr. 9	0130	1,920	7.53
Feb. 21	0430	1,450	6.81	July 21	0500	*2,400	*8.21
Apr. 4	1800	1,300	6.57				

Minimum discharge, 0.39 ft^3/s, Oct. 21.

DISCHARGE, IN 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	3.4	1.9	4.4	6.7	2.9	80	4.3	15	60	1.4	5.3	2.4
2	2.5	1.6	3.5	5.5	77	120	22	8.8	13	1.3	16	31
3	2.0	1.4	3.9	20	19	57	49	7.0	5.5	1.1	15	10
4	1.7	143	2.9	6.4	8.9	28	153	6.0	4.5	.99	17	4.4
5	1.4	23	2.4	6.0	27	15	78	5.5	13	4.6	6.8	3.6
6	1.5	44	173	4.4	39	97	98	5.0	9.7	22	6.8	2.4
7	1.5	13	20	5.9	10	67	149	4.6	4.7	14	12	12
8	1.9	3.8	6.1	46	5.6	16	603	6.0	3.8	4.3	8.8	5.9
9	2.0	2.6	4.3	9.9	4.9	9.4	392	14	3.6	2.2	4.6	3.3
10	2.1	2.0	3.5	30	19	7.6	31	8.2	3.8	1.7	3.8	4.3
11	1.5	2.0	3.1	306	49	6.3	16	6.7	3.0	13	3.3	4.7
12	1.1	2.1	42	57	29	14	148	6.4	2.6	5.4	4.5	3.0
13	.86	6.7	9.5	177	6.7	8.6	42	4.7	2.4	12	9.1	2.4
14	1.9	5.5	5.2	32	4.7	6.2	75	19	2.2	34	6.3	1.9
15	1.7	2.9	3.5	32	4.0	5.4	17	33	2.0	70	3.6	1.6
16	1.4	1.7	56	29	3.6	12	10	9.0	1.9	10	3.7	1.5
17	.90	18	49	14	3.2	7.2	8.4	6.7	30	5.7	3.5	10
18	.69	7.4	13	9.4	2.9	4.4	7.2	4.8	9.5	6.0	3.6	4.1
19	.55	5.0	22	7.5	5.8	3.8	6.5	37	4.9	13	13	5.8
20	.47	4.1	10	57	7.0	3.4	8.5	8.8	3.3	161	7.9	8.4
21	.43	8.2	6.4	15	205	3.0	15	4.6	2.8	364	80	3.8
22	6.3	6.0	8.5	7.3	14	2.8	17	12	5.7	66	11	5.7
23	2.3	12	113	6.0	58	2.6	22	14	4.6	20	5.9	4.3
24	4.0	21	19	5.7	24	2.6	49	30	2.4	11	5.0	2.6
25	8.4	82	8.0	4.9	8.0	10	11	7.7	2.1	9.0	4.4	7.2
26	2.9	126	9.7	4.5	6.0	12	6.3	5.5	1.9	7.8	3.2	3.6
27	2.1	11	6.2	4.3	5.7	4.7	50	8.6	1.6	11	2.8	2.0
28	1.8	5.6	9.7	4.0	29	2.8	82	5.5	1.5	7.7	2.7	1.8
29	1.1	30	18	4.0	---	2.4	62	3.8	1.4	8.9	2.8	3.6
30	.78	9.3	23	3.8	---	2.2	40	16	1.5	13	2.4	9.0
31	3.3	---	9.7	3.2	---	2.2	---	18	---	6.4	2.1	---
TOTAL	64.48	602.8	668.5	924.4	678.9	615.6	2272.2	341.9	208.9	908.49	276.9	166.3
MEAN	2.08	20.1	21.6	29.8	24.2	19.9	75.7	11.0	6.96	29.3	8.93	5.54
MAX	8.4	143	173	306	205	120	603	37	60	364	80	31
MIN	.43	1.4	2.4	3.2	2.9	2.2	4.3	3.8	1.4	.99	2.1	1.5
AC-FT	128	1200	1330	1830	1350	1220	4510	678	414	1800	549	330

CAL YR 1988	TOTAL	6084.76	MEAN	16.6	MAX	540	MIN	.43	AC-FT	12070
WTR YR 1989	TOTAL	7729.37	MEAN	21.2	MAX	603	MIN	.43	AC-FT	15330

16400000 HALAWA STREAM NEAR HALAWA
(National atream-quality accounting network atation)

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 mi^2.

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-atage 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.--65 years (water years 1918-31, 1939-89), 29.6 ft^3/a (21,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of alope-area measurement of peak flow; minimum, 0.76 ft^3/s, about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gege height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1300	2,220	8.74	Mar. 3	1000	*2,370	*8.96
Dec. 16	0800	2,060	8.52	Apr. 9	0030	1,960	8.37
Mar. 1	0300	1,920	8.32				

Minimum discharge, 3.0 ft^3/s, Oct. 12.

DISCHARGE, IN 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	6.1	5.6	11	13	5.4	214	15	41	65	8.9	24	59
2	4.9	5.2	9.1	12	61	42	95	19	13	6.8	88	179
3	4.3	4.7	8.2	18	116	545	221	20	12	7.2	13	16
4	3.9	299	7.2	14	128	154	289	12	11	12	23	20
5	3.6	40	6.8	9.1	20	168	424	11	34	90	9.5	18
6	4.0	27	281	18	52	175	333	9.6	12	116	18	29
7	10	12	81	41	17	146	425	8.3	12	13	18	28
8	9.2	9.6	72	62	9.9	54	757	12	31	8.5	11	21
9	4.3	56	14	39	8.4	23	465	65	11	6.7	7.0	7.6
10	4.2	25	10	157	35	17	66	28	7.4	32	6.0	6.7
11	3.5	18	41	123	142	28	32	26	6.7	28	5.7	5.9
12	51	8.9	76	77	21	37	29	11	7.6	8.7	10	25
13	9.4	73	47	107	10	13	126	44	7.3	77	25	32
14	152	31	12	55	8.3	11	314	17	5.7	75	10	6.8
15	13	12	9.2	45	7.4	10	32	13	5.4	24	16	5.4
16	21	84	415	27	6.8	11	20	28	67	14	7.0	46
17	80	61	61	61	6.5	9.2	15	29	66	17	12	63
18	16	25	78	21	6.5	8.2	13	9.9	50	8.2	21	8.5
19	9.1	23	19	15	6.1	7.8	11	59	9.2	121	27	23
20	280	18	14	53	5.8	7.2	24	13	11	67	97	13
21	147	17	12	21	29	6.9	16	9.2	45	44	45	11
22	26	39	11	14	34	6.5	18	87	18	130	16	9.1
23	108	125	20	11	43	6.3	19	23	33	25	20	15
24	32	25	42	9.2	38	8.7	12	31	16	18	17	68
25	16	32	31	7.8	8.2	20	8.9	19	8.9	18	8.2	28
26	9.2	18	60	7.6	6.4	12	24	11	7.4	17	7.0	8.2
27	8.3	14	16	6.9	5.9	8.5	132	12	5.7	26	7.2	6.6
28	35	22	19	6.2	62	5.9	246	7.7	6.7	23	9.2	49
29	9.7	33	50	15	---	6.1	418	7.3	22	20	6.9	64
30	6.6	32	72	7.8	---	6.5	120	71	15	12	6.7	9.7
31	6.3	---	32	5.8	---	6.1	---	140	---	8.6	10	---
TOTAL	1091.6	1195.0	1637.5	1079.4	899.6	1773.9	4719.9	892.0	622.0	1082.6	601.4	879.5
MEAN	35.2	39.8	52.8	34.8	32.1	57.2	157	28.8	20.7	34.9	19.4	29.3
MAX	280	299	415	157	142	545	757	140	67	130	97	179
MIN	3.5	4.7	6.8	5.8	5.4	5.9	8.9	7.3	5.4	6.7	5.7	5.4
AC-FT	2170	2370	3250	2140	1780	3520	9360	1770	1230	2150	1190	1740

CAL YR 1988	TOTAL	13103.8	MEAN	35.8	MAX	724	MIN	3.2	AC-FT	25990
WTR YR 1989	TOTAL	16474.4	MEAN	45.1	MAX	757	MIN	3.5	AC-FT	32680

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water yeara 1959-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV										
08...	1130	754	9.4	50	7.50	21.5	6.8	8.4	96	490
DEC										
06...	0920	758	188	39	6.30	19.0	53	9.0	98	25000
07...	1250	--	45	--	--	20.5	--	--	--	--
JAN										
24...	1200	756	9.8	60	6.90	18.0	2.8	9.3	99	81
MAR										
15...	1055	--	10	--	--	19.5	--	--	--	--
APR										
18...	1230	760	13	59	6.90	17.5	1.0	9.0	94	34
JUN										
06...	1230	759	14	49	6.90	21.0	10	8.6	97	270
JUL										
11...	0850	--	21	--	--	19.0	--	--	--	--
AUG										
29...	1130	758	6.3	54	7.10	23. 0	1.5	8.4	99	33

DATE	TIME	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
NOV											
08...	1130	1200	10	4	2.1	1.2	6.4	56	0.9	0.60	7
DEC											
06...	0920	14000	6	4	1.1	0.71	6.4	68	1	0.70	2
JAN											
24...	1200	660	8	3	1.1	1.3	7.5	64	1	0.80	6
APR											
18...	1230	220	9	4	1.2	1.4	7.8	84	1	0.60	6
JUN											
06...	1230	630	8	2	1.1	1.2	6.7	64	1	0.50	7
AUG											
29...	1130	630	8	2	1.1	1.2	7.1	64	1	0.70	7

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
NOV									
08...	0	6.0	6	7.6	9.9	0.40	7.4	39	40
DEC									
06...	0	3.0	2	9.0	8.4	<0.10	3.7	34	31
JAN									
24...	0	6.0	5	5.3	12	0.10	7.7	35	39
APR									
18...	0	6.0	5	2.0	12	0.10	8.8	31	37
JUN									
06...	0	6.0	6	2.0	9.8	0.10	5.9	30	31
AUG									
29...	0	7.0	6	2.0	9.8	<0.10	8.5	29	34

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
NOV									
08...	0.05	<0.100	0.030	0.040	0.17	0.20	0.030	0.030	0.020
DEC									
06...	0.05	0.100	0.020	0.040	1.3	1.3	0.170	0.020	<0.010
JAN									
24...	0.05	<0.100	0.030	<0.010	--	<0.20	0.020	0.010	0.010
APR									
18...	0.04	<0.100	0.040	0.050	0.16	0.20	0.020	0.020	0.020
JUN									
06...	0.04	<0.100	0.020	0.050	0.58	0.60	0.030	0.020	<0.010
AUG									
29...	0.04	<0.100	<0.010	0.010	--	0.20	0.020	0.020	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)
NOV											
08...	1130	110	<1	5	<0.5	1	<1	<3	<1	210	<5
JAN											
24...	1200	50	<1	4	<0.5	<1	<1	<3	<1	80	<5
APR											
18...	1230	40	<1	4	<0.5	<1	<1	<3	<1	47	<5
AUG											
29...	1130	50	<1	4	<0.5	<1	<1	<3	<1	97	<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)
NOV										
08...	<4	7	0.3	<10	1	<1	<1.0	14	<6	15
JAN										
24...	<4	3	0.3	<10	<1	<1	1.0	17	<6	6
APR										
18...	<4	3	0.2	<10	4	<1	<1.0	16	<6	<3
AUG										
29...	<4	3	0.1	<10	1	<1	<1.0	17	<6	6

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV				
08...	1130	5	0.13	100
DEC				
06...	0920	87	44	68
JAN				
24...	1200	4	0.11	100
APR				
18...	1230	1	0.04	100
JUN				
06...	1230	10	0.38	100
AUG				
29...	1130	3	0.05	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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 1.61 ft^3/s (1,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s, Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft^3/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	2000	181	3.25	Apr. 4	2300	386	3.71
Feb. 11	1530	248	3.43	Apr. 8	2130	*526	*3.92
Mar. 3	0830	404	3.74				

Minimum discharge, 0.72 ft^3/s, Oct. 4-5, 27, 30-31.

DISCHARGE, IN 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	.76	.76	.84	1.5	1.3	2.0	2.2	3.7	2.0	1.4	1.3	1.2
2	.76	.76	.84	1.3	2.2	2.0	2.6	3.2	1.8	1.4	1.5	1.3
3	.76	.72	.84	1.3	3.9	27	2.3	3.1	1.8	1.4	1.2	1.2
4	.76	6.2	.80	1.3	8.2	7.2	17	3.0	2.0	1.3	1.2	1.2
5	.76	1.4	.80	1.2	2.6	4.4	23	2.9	2.0	1.5	1.2	1.0
6	.80	2.3	15	1.8	2.2	7.1	5.8	2.8	1.9	2.2	1.2	1.0
7	.89	.94	4.9	2.4	1.8	4.8	11	2.6	1.8	1.4	1.1	1.0
8	.80	.84	1.6	3.4	1.6	3.5	152	2.6	1.8	1.3	1.1	.99
9	.80	1.0	1.2	2.2	1.7	3.1	36	2.6	1.7	1.3	1.1	.99
10	.80	.84	1.0	3.6	2.6	2.9	8.7	2.5	1.6	1.3	1.0	.99
11	.80	.84	1.0	5.7	6.2	2.6	6.5	2.5	1.6	1.3	1.0	.94
12	.89	.80	1.0	3.0	2.1	2.5	5.8	2.4	1.6	1.3	1.0	.99
13	.80	1.8	.94	5.1	1.4	2.3	8.6	2.5	1.6	2.2	1.0	.94
14	.80	1.0	.84	3.4	1.2	2.1	8.5	2.4	1.6	2.0	1.0	.94
15	.76	.89	.84	2.9	1.1	2.1	5.6	2.3	1.6	1.5	1.1	.94
16	.76	.84	13	2.3	1.0	2.2	5.0	2.3	1.6	1.3	1.0	.99
17	1.2	.84	3.8	2.0	.99	2.1	4.8	2.2	1.7	1.2	1.1	.99
18	.80	.80	3.2	1.9	.94	2.2	4.6	2.1	1.6	1.2	1.0	.94
19	.80	.80	1.8	1.8	.89	2.2	4.5	2.2	1.6	1.5	1.1	.94
20	1.0	.84	1.4	1.7	.89	2.1	4.1	2.1	1.6	1.7	3.5	.94
21	.84	.84	1.3	1.6	.94	2.1	4.1	2.0	1.6	1.6	3.1	.94
22	.81	1.2	1.1	1.6	.94	2.1	4.0	2.4	1.6	2.6	1.5	.94
23	.80	1.6	1.1	1.5	1.4	2.1	3.8	2.1	1.5	1.7	1.3	.99
24	.76	1.2	1.1	1.4	1.3	2.2	3.7	2.0	1.5	1.4	1.2	1.3
25	.76	1.6	1.0	1.4	.94	2.2	3.5	2.0	1.4	1.3	1.2	.99
26	.76	1.2	1.1	1.4	.94	2.2	3.5	2.0	1.4	1.3	1.1	.94
27	.72	.99	.99	1.4	.89	2.2	4.5	1.9	1.4	1.3	1.1	.94
28	.76	.94	1.0	1.4	1.4	2.2	6.7	1.8	1.5	1.3	1.1	.99
29	.78	.89	2.1	1.6	---	2.2	7.8	1.8	1.6	1.3	1.0	.94
30	.72	.84	3.8	1.4	---	2.2	4.3	2.0	1.5	1.2	1.0	.94
31	.72	---	2.1	1.3	---	2.3	---	2.2	---	1.2	1.0	---
TOTAL	24.91	36.51	72.33	65.8	53.56	110.4	364.3	74.2	49.5	45.9	39.3	30.33
MEAN	.80	1.22	2.33	2.12	1.91	3.56	12.1	2.39	1.65	1.48	1.27	1.01
MAX	1.2	6.2	15	5.7	8.2	27	152	3.7	2.0	2.6	3.5	1.3
MIN	.72	.72	.80	1.2	.89	2.0	2.2	1.8	1.4	1.2	1.0	.94
AC-FT	49	72	143	131	106	219	723	147	98	91	78	60

CAL YR 1988	TOTAL	664.96	MEAN	1.82	MAX	16	MIN	.72	AC-FT	1320
WTR YR 1989	TOTAL	967.04	MEAN	2.65	MAX	152	MIN	.72	AC-FT	1920

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 4.19 ft^3/s (3,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 32 ft^3/s, Mar. 3; minimum daily, 1.1 ft^3/s, Jan. 12.

DISCHARGE, IN 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	4.2	4.0	2.2	3.6	4.3	16	12	e6.5	e10	4.7	3.2	2.6
2	4.0	4.0	2.0	2.4	9.5	21	21	e5.3	e8.0	3.0	12	9.7
3	2.3	3.9	2.0	3.2	25	32	12	e4.8	e5.7	3.2	5.3	4.6
4	2.3	e19	2.0	3.3	23	20	17	e4.0	e6.4	3.4	5.4	9.6
5	2.3	e12	4.2	2.8	9.6	12	e25	e3.7	e12	6.6	4.3	3.1
6	2.3	e14	26	8.4	10	28	e15	e3.2	e8.5	21	4.3	2.6
7	2.5	e2.8	17	18	8.2	17	e25	e3.4	e6.4	5.8	4.1	2.7
8	2.9	e2.3	4.9	23	5.8	6.8	e20	e3.0	5.7	3.9	3.8	2.8
9	2.5	e4.4	3.3	8.1	5.9	4.1	e4.1	e4.2	5.6	3.4	3.6	2.4
10	2.4	e4.2	2.9	7.0	18	3.3	e3.2	e4.2	5.3	4.1	3.6	2.4
11	2.2	3.6	2.8	7.8	22	2.8	e3.3	e4.8	5.1	9.1	3.6	2.4
12	1.5	2.5	5.1	1.1	11	2.6	e2.8	e4.8	5.0	3.8	3.6	2.2
13	1.7	17	2.6	20	4.1	2.6	e2.5	e6.5	3.2	22	3.5	2.0
14	1.5	7.8	2.5	17	3.1	3.0	e10	e6.4	2.5	20	3.5	2.0
15	1.4	6.1	2.1	15	2.8	2.9	e11	e8.0	2.5	8.4	3.7	2.1
16	1.4	5.8	30	5.8	2.7	2.8	e8.0	e6.5	2.8	4.7	4.0	2.1
17	5.2	5.0	15	6.7	2.6	2.8	e7.0	e6.4	6.3	3.8	3.7	3.5
18	5.9	4.7	15	5.8	2.6	2.8	4.9	e6.3	8.3	3.8	5.2	2.3
19	4.5	4.7	4.3	5.0	2.5	2.8	4.5	e6.4	3.6	13	6.1	2.1
20	4.3	4.7	3.3	7.4	2.4	2.5	4.2	e7.3	3.6	15	22	2.0
21	4.3	9.8	2.8	5.7	2.7	3.1	4.1	e5.5	3.9	10	21	2.0
22	4.9	16	2.7	4.8	3.6	4.0	4.8	e6.4	3.7	19	5.1	2.0
23	9.2	19	2.6	4.6	14	4.0	6.8	e7.3	3.4	7.2	3.0	3.1
24	5.4	11	3.6	4.4	15	4.0	6.2	e5.7	3.3	4.9	2.5	14
25	4.4	11	3.9	4.3	4.0	4.1	e5.1	e5.1	3.2	3.4	2.2	6.4
26	5.9	5.7	6.8	4.3	2.4	4.1	e5.1	e5.7	3.0	2.9	2.2	2.8
27	4.8	3.7	3.4	4.1	3.8	4.0	e16	e6.5	2.3	2.7	2.0	2.2
28	4.8	3.2	2.2	4.0	6.1	4.0	e24	e5.7	2.5	5.9	2.5	2.0
29	4.8	2.2	16	5.0	---	4.0	e25	e5.6	3.1	7.5	1.9	1.9
30	4.8	2.2	28	4.6	---	4.0	e13	e5.5	4.4	4.8	1.9	1.8
31	4.5	---	12	4.4	---	5.2	---	e12	---	2.9	2.1	---
TOTAL	115.1	216.3	233.2	221.6	226.7	234.3	322.6	176.7	149.3	233.9	154.9	103.4
MEAN	3.71	7.21	7.52	7.15	8.10	7.56	10.8	5.70	4.98	7.55	5.00	3.45
MAX	9.2	19	30	23	25	32	25	12	12	22	22	14
MIN	1.4	2.2	2.0	1.1	2.4	2.5	2.5	3.0	2.3	2.7	1.9	1.8
AC-FT	228	429	463	440	450	465	640	350	296	464	307	205

CAL YR 1988	TOTAL	2202.2	MEAN	6.02	MAX	35	MIN	1.2	AC-FT	4370
WTR YR 1989	TOTAL	2388.0	MEAN	6.54	MAX	32	MIN	1.1	AC-FT	4740

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 walla 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 6.69 ft^3/s (4,850 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, Apr. 8, 9, 1986, Jan. 2, 26, 1988, and Mar. 3, 1989; minimum daily, 1.8 ft^3/s, Oct. 15, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 39 ft^3/s, Mar. 3; minimum daily, 4.0 ft^3/s, Jan. 12.

DISCHARGE, IN 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	7.2	6.6	4.3	6.9	6.6	21	15	11	14	9.3	6.4	5.8
2	7.2	6.6	4.3	5.4	9.6	23	23	9.6	12	7.2	15	13
3	5.6	6.6	4.3	5.8	32	39	16	8.6	10	7.1	9.3	8.0
4	5.4	22	4.3	6.2	26	28	20	8.0	11	7.5	9.1	14
5	5.3	15	5.6	5.6	14	15	28	7.7	16	10	8.2	6.9
6	5.3	17	29	9.8	12	35	18	6.3	13	26	7.9	6.1
7	5.4	5.8	21	20	11	25	28	7.4	11	10	8.0	6.4
8	6.0	4.9	7.4	29	8.9	11	22	7.2	10	8.2	7.5	6.8
9	5.5	7.4	5.9	10	7.6	6.9	8.0	8.4	10	7.5	7.4	6.1
10	5.4	7.6	5.5	9.8	22	5.8	6.2	8.4	9.6	7.5	7.2	6.1
11	5.3	6.1	5.5	11	25	5.4	6.9	8.6	9.3	13	7.1	6.1
12	4.5	5.2	7.5	4.0	16	5.2	5.4	8.6	9.3	7.7	7.0	5.8
13	4.7	20	5.4	21	7.2	4.9	5.1	11	7.7	25	6.9	5.8
14	4.7	11	4.7	22	5.7	5.4	14	11	6.6	25	6.7	5.6
15	4.5	8.3	4.5	19	5.5	5.7	15	12	6.4	14	6.8	5.8
16	4.5	7.4	32	9.3	5.3	5.6	12	11	6.6	8.6	7.3	5.6
17	7.2	7.2	20	9.6	5.2	5.5	11	11	9.3	7.4	6.8	6.9
18	8.9	6.9	19	8.9	5.1	5.5	9.8	11	13	7.7	8.6	5.8
19	7.4	6.9	7.2	8.0	5.1	5.5	9.3	11	7.4	15	9.4	5.6
20	7.2	6.6	6.0	10	5.1	5.5	8.6	12	7.6	20	25	5.4
21	6.9	11	5.5	8.8	5.2	5.8	8.3	10	7.8	18	27	5.4
22	7.4	19	5.3	7.4	6.1	7.2	10	11	7.8	23	9.5	5.2
23	12	21	5.3	7.2	15	7.2	11	12	7.5	12	6.6	5.8
24	8.6	15	6.0	6.9	21	8.9	10	10	7.2	8.9	6.1	17
25	7.4	12	6.4	6.9	6.9	7.4	9.0	9.3	7.2	7.2	5.8	10
26	8.6	8.5	9.5	6.6	5.2	7.4	9.0	10	7.2	6.4	5.6	6.1
27	7.8	5.7	6.5	6.6	6.1	7.2	19	11	6.4	6.1	5.4	5.4
28	7.8	5.3	4.9	6.6	7.6	7.2	27	10	6.5	8.6	5.7	5.2
29	7.8	4.3	18	7.4	---	7.2	28	10	8.9	12	5.4	5.2
30	7.5	4.3	33	7.2	---	7.2	18	10	8.1	8.6	5.4	5.2
31	7.5	---	16	6.9	---	7.9	---	16	---	6.4	5.4	---
TOTAL	208.5	291.2	319.8	309.4	308.0	342.5	428.4	309.1	272.4	358.9	265.5	207.9
MEAN	6.68	9.71	10.3	9.98	11.0	11.0	14.3	9.97	9.08	11.6	8.56	6.93
MAX	12	22	33	29	32	39	28	16	16	26	27	17
MIN	4.5	4.3	4.3	4.0	5.1	4.9	5.1	6.3	6.4	6.1	5.4	5.2
AC-FT	410	578	634	614	611	679	850	613	540	712	527	412

CAL YR 1988	TOTAL	3560.7	MEAN	9.73	MAX	39	MIN	4.3	AC-FT	7060
WTR YR 1989	TOTAL	3819.6	MEAN	9.92	MAX	39	MIN	4.0	AC-FT	7180

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 mi^2.

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. 18, 1980, water divertsd upstream at times, either into or from Molokai tunnel. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--28 years (water years 1961, 1963-89), 6.84 ft^3/s (4,960 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/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, 1981, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1230	858	4.18	Feb. 11	1430	1,090	4.51
Dec. 6	2030	2,410	5.81	Mar. 3	0830	1,310	4.78
Dec. 16	0730	714	3.94	Apr. 4	2230	*2,890	*6.18
Feb. 4	1230	905	4.25				

Minimum discharge, 0.10 ft^3/s, Jan. 28, Feb. 13.

DISCHARGE, IN 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	.45	.43	.55	1.0	.39	8.6	4.5	7.6	3.0	1.8	1.6	1.3
2	.45	.43	.59	1.1	8.0	8.6	8.8	3.0	1.4	1.6	5.0	3.1
3	.43	.47	.65	1.1	20	162	2.5	2.7	1.1	1.6	1.6	1.6
4	.67	37	.65	1.0	72	22	157	2.5	1.3	1.6	1.6	3.3
5	.75	1.6	.72	.90	1.3	10	206	2.5	3.0	2.6	1.6	1.3
6	.75	9.2	150	2.6	1.7	36	45	3.4	2.3	13	1.5	1.2
7	.80	.62	18	6.9	.90	13	120	2.5	1.4	2.0	1.5	1.3
8	.96	.66	.80	14	.25	2.0	847	2.4	1.4	1.6	1.4	1.3
9	1.0	1.6	.75	7.3	.40	1.6	156	2.4	1.4	1.6	1.4	1.2
10	1.1	1.1	.75	27	8.8	.99	16	2.2	1.4	1.9	1.4	1.2
11	1.1	.87	.75	40	48	1.1	7.6	2.2	1.4	3.7	1.4	1.2
12	1.1	.78	1.1	4.4	.94	1.1	12	2.2	1.5	1.6	1.4	1.2
13	1.1	6.3	.75	19	.13	1.1	99	3.4	1.6	14	1.4	1.2
14	1.1	1.8	.83	4.2	.31	1.1	64	3.1	1.6	8.0	1.4	1.2
15	1.1	.76	.79	3.6	.63	1.1	5.6	2.2	1.6	3.4	1.4	1.2
16	1.1	.75	107	1.1	.45	1.1	3.4	1.8	1.7	2.2	1.3	1.2
17	1.3	.75	6.0	1.1	.47	1.1	3.0	1.6	2.3	1.6	1.4	1.2
18	1.1	.75	5.8	.98	.55	1.1	3.0	1.4	3.3	1.6	1.4	1.2
19	.90	.79	.92	.99	.79	1.1	2.8	1.9	1.6	5.1	1.7	1.2
20	.90	.84	.90	1.6	.61	1.1	2.8	1.7	1.6	5.7	37	1.2
21	.90	1.2	.92	.93	.68	.93	2.6	1.2	1.6	4.0	18	1.2
22	.95	4.4	.90	.90	.66	.61	2.8	4.2	1.6	11	2.0	1.2
23	2.7	7.3	.90	.78	5.5	.52	3.7	2.9	1.6	2.7	1.4	1.2
24	.84	1.6	.99	.51	4.2	.40	3.3	2.3	1.6	1.9	1.4	4.8
25	.76	1.9	1.1	.35	.70	.41	2.5	2.2	1.6	1.6	1.4	2.1
26	.38	.89	1.7	.27	.70	.38	4.6	2.0	1.6	1.6	1.2	1.2
27	.30	.55	.90	.17	.67	.33	29	2.0	1.6	1.6	1.2	1.2
28	.25	.55	.90	.16	1.3	.37	66	2.0	1.6	2.5	1.2	1.2
29	.25	.60	7.2	.20	---	.57	51	2.0	1.6	3.1	1.2	1.2
30	.18	.58	21	.65	---	.66	13	1.8	1.8	2.1	1.2	1.2
31	.26	---	3.0	.29	---	1.1	---	4.7	---	1.6	1.2	---
TOTAL	25.93	86.87	337.81	145.08	181.03	282.07	1944.5	80.0	52.1	109.9	99.8	45.3
MEAN	.84	2.90	10.9	4.68	6.47	9.10	64.8	2.58	1.74	3.55	3.22	1.51
MAX	2.7	37	150	40	72	162	847	7.6	3.3	14	37	4.8
MIN	.18	.43	.55	.16	.13	.33	2.5	1.2	1.1	1.6	1.2	1.2
AC-FT	51	172	670	288	359	559	3860	159	103	218	198	90

CAL YR 1988	TOTAL	1946.28	MEAN	5.32	MAX	152	MIN	.18	AC-FT	3860
WTR YR 1989	TOTAL	3390.39	MEAN	9.29	MAX	847	MIN	.13	AC-FT	6720

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--29 years (water years 1961-89), 16.8 ft^3/s (12,170. acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft^3/s, Apr. 8, 1989, gage height, 8.50 ft, from rating curve extended above 26 ft^3/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft^3/s, Nov. 1, 2, 1926, June 5, 1926.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1300	1,600	4.96	Feb. 11	1530	2,740	5.66
Dec. 6	2030	4,700	6.50	Mar. 3	0900	3,150	5.86
Dec. 16	0730	2,720	5.65	Apr. 4	2230	6,770	7.16
Feb. 4	1330	1,580	4.94	Apr. 8	2130	*13,210	*8.50

Minimum discharge, 5.1 ft^3/s, Nov. 2-3.

DISCHARGE, IN 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	7.0	5.4	6.5	8.2	6.5	30	20	38	22	17	15	13
2	6.9	5.3	6.5	8.0	18	22	26	29	20	17	19	14
3	6.8	5.2	6.6	8.2	56	379	19	27	20	17	14	13
4	6.6	75	6.5	7.9	175	81	384	27	20	16	14	15
5	6.5	9.7	6.5	7.6	13	46	498	26	21	18	14	12
6	6.6	24	371	8.9	9.7	245	106	27	19	41	13	12
7	6.6	7.5	64	13	8.6	95	304	26	19	18	13	12
8	6.3	7.1	9.9	30	8.0	21	3810	26	18	16	13	12
9	6.3	8.4	8.8	15	8.3	16	441	25	18	16	13	12
10	6.2	8.2	8.4	54	24	14	49	25	18	17	13	12
11	6.2	7.4	8.2	94	127	13	32	24	18	19	13	12
12	6.6	7.4	8.3	13	14	13	35	24	17	16	12	12
13	6.3	16	8.0	38	10	13	294	25	17	41	12	12
14	6.4	9.5	8.0	14	9.8	12	247	24	18	32	12	12
15	6.2	7.6	8.1	12	9.5	12	34	24	18	20	12	12
16	6.5	7.2	335	9.1	9.2	12	27	23	19	17	12	12
17	7.1	6.9	28	8.5	9.2	12	25	23	21	16	12	12
18	6.4	6.8	19	7.8	8.9	12	25	23	22	16	12	12
19	5.9	6.6	10	7.6	8.8	12	24	23	18	23	12	12
20	12	6.5	9.4	7.6	8.8	12	24	23	18	21	88	11
21	8.3	6.5	8.9	7.5	46	12	24	22	18	18	81	11
22	7.2	11	8.6	7.0	21	11	24	25	18	28	17	12
23	8.3	17	8.4	6.8	17	11	24	24	17	17	14	12
24	6.5	9.8	8.3	6.8	19	11	24	23	17	15	14	16
25	6.1	7.9	8.3	6.8	10	11	23	23	17	15	13	13
26	5.9	7.6	8.9	6.8	10	11	26	22	17	15	13	11
27	5.8	6.9	8.0	6.8	10	11	72	21	17	15	13	11
28	5.7	6.8	8.0	6.8	15	11	197	21	17	16	13	11
29	5.5	6.6	15	7.4	---	11	171	20	18	16	13	11
30	5.4	6.5	41	6.8	---	10	56	21	18	15	13	11
31	5.4	---	12	6.6	---	11	---	26	---	14	13	---
TOTAL	205.5	324.3	1072.1	448.5	690.3	1193	7065	760	555	598	555	365
MEAN	6.63	10.8	34.6	14.5	24.7	38.5	236	24.5	18.5	19.3	17.9	12.2
MAX	12	75	371	94	175	379	3810	38	22	41	88	16
MIN	5.4	5.2	6.5	6.6	6.5	10	19	20	17	14	12	11
AC-FT	408	643	2130	890	1370	2370	14010	1510	1100	1190	1100	724

CAL YR 1988	TOTAL	9007.6	MEAN	24.6	MAX	632	MIN	5.2	AC-FT	17870
WTR YR 1989	TOTAL	13831.7	MEAN	37.9	MAX	3810	MIN	5.2	AC-FT	27440

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 mi^2.

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 augmentad by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--39 years (water years 1951-89), 1.83 ft^3/s (1,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s, Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	2130	1,030	6.40	Mar. 3	1030	870	6.08
Dec. 16	1100	342	4.82	Mar. 4	0200	308	4.71
Feb. 4	1600	554	5.36	Apr. 4	2230	*1,590	*7.36
Feb. 11	1800	308	4.71	Apr. 8	1630	1,550	7.30

Minimum discharge, no flow for many days.

DISCHARGE, IN 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	.00	.00	.00	.03	.00	.00	.00	4.1	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
3	.00	.00	.00	.00	.28	163	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	86	73	69	.00	.00	.00	.00	.00
5	.00	.02	.00	.00	15	7.2	206	.00	.00	.00	.00	.00
6	.00	3.8	76	.00	.25	21	15	.00	.00	.00	.00	.00
7	.00	.00	85	.00	.23	13	91	.00	.00	.00	.00	.00
8	.00	.00	.57	6.1	.07	1.5	643	.00	.00	.00	.00	.00
9	.00	.00	.00	.42	.00	.04	224	.00	.00	.00	.00	.00
10	.00	.00	.00	2.8	7.5	.00	28	.00	.00	.00	.00	.00
11	.00	.00	.00	39	44	.00	9.4	.00	.00	.00	.00	.00
12	.00	.00	.00	1.4	18	.00	3.8	.00	.00	.00	.00	.00
13	.00	.00	.00	.46	.91	.00	12	.00	.00	.00	.00	.00
14	.00	.00	.00	6.4	.01	.00	44	.00	.00	.00	.00	.00
15	.00	.00	.00	.62	.00	.00	7.9	.00	.00	.00	.00	.00
16	.00	.00	80	.51	.00	.00	2.2	.00	.00	.00	.00	.00
17	.00	.00	32	.00	.00	.00	.40	.00	.00	.00	.00	.00
18	.00	.00	6.1	.00	.00	.00	.01	.00	.00	.00	.00	.00
19	.00	.00	1.2	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	27	.00	.00	.00	.00	.00
30	.00	.00	1.4	.00	---	.00	4.4	.00	.00	.00	.00	.00
31	.00	---	7.7	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	3.82	289.97	57.74	172.25	278.74	1387.11	4.11	.00	.00	.00	.00
MEAN	.00	.13	9.35	1.86	6.15	8.99	46.2	.13	.00	.00	.00	.00
MAX	.00	3.8	85	39	86	163	643	4.1	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	7.6	575	115	342	553	2750	8.2	.00	.00	.00	.00

CAL YR 1988	TOTAL	754.69	MEAN	2.06	MAX	133	MIN	.00	AC-FT	1500
WTR YR 1989	TOTAL	2193.74	MEAN	6.01	MAX	643	MIN	.00	AC-FT	4350

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 mi^2.

PERIOD OF RECORD.--July 1983 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years, 0.857 ft^3/s (621 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	2130	216	4.06	Apr. 9	0330	254	4.28
Mar. 3	1000	*536	*5.52				

Minimum discharge, 0.05 ft^3/s, Oct. 6.

DISCHARGE, IN 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	.16	.14	.29	.59	.39	9.8	.79	4.1	2.9	.89	.88	.64
2	.12	.14	.26	.55	1.1	1.7	3.1	3.1	1.8	.89	2.1	2.9
3	.10	.14	.26	.51	3.7	53	6.1	2.9	1.8	.94	.94	.89
4	.10	22	.23	.51	2.6	20	23	2.6	1.6	.94	.84	.64
5	.08	5.1	.20	.47	1.2	10	25	2.6	1.6	1.6	.79	.64
6	.10	1.3	13	.47	.69	8.4	24	2.5	1.4	3.8	.74	.69
7	.12	.89	8.1	.47	.59	6.5	41	2.3	1.4	1.2	.74	.64
8	.14	.47	1.2	.98	.55	3.0	30	2.2	1.6	1.0	.69	.64
9	.12	.64	.64	.47	.51	2.5	40	2.5	1.4	.89	.69	.59
10	.10	.61	.51	2.1	.59	2.2	12	2.5	1.3	1.2	.64	.55
11	.10	.39	.63	3.2	6.3	2.3	7.8	2.3	1.2	1.1	.59	.51
12	.42	.29	2.2	.94	1.8	2.2	6.3	2.1	1.2	.89	.64	.64
13	.32	.70	.55	2.9	.74	1.4	5.4	2.1	1.2	1.5	.59	.64
14	.20	.55	.47	.94	.64	1.3	8.0	2.1	1.2	1.6	.59	.51
15	.20	.32	.43	.79	.59	1.2	4.3	1.9	1.2	1.1	.64	.43
16	.20	.39	25	.84	.47	1.2	3.8	1.9	1.3	.89	.59	.88
17	.85	.76	5.3	.88	.39	1.2	3.3	1.9	1.5	.89	.59	1.9
18	.39	.39	3.5	.64	.35	1.2	3.1	1.8	1.8	.84	.59	.59
19	.20	.35	1.5	.55	.35	1.1	3.0	2.1	1.2	1.9	.64	.51
20	4.8	.32	1.2	.55	.32	1.1	2.8	1.8	1.2	2.1	1.2	.51
21	15	.29	.94	.55	.49	1.1	2.7	1.8	1.4	1.2	1.7	.47
22	1.0	.32	.79	.47	.93	1.0	2.6	2.4	1.2	3.8	.79	.47
23	1.3	1.9	.69	.43	.59	1.0	2.6	2.1	1.1	1.4	.64	.51
24	.55	.80	.79	.47	.69	1.1	2.5	1.8	1.1	1.0	.59	1.3
25	.32	.43	.64	.43	.55	1.2	2.4	1.7	1.1	.89	.55	.79
26	.26	.39	1.3	.43	.43	.94	2.5	1.6	1.0	.84	.55	.51
27	.23	.29	.79	.39	.51	2.3	2.6	1.8	.94	.79	.55	.43
28	.23	.26	.64	.35	1.5	.94	8.5	1.5	1.0	.79	.55	.43
29	.23	.26	.64	.47	---	.84	25	1.5	1.0	.84	.55	1.1
30	.20	.35	.74	.39	---	.79	5.9	1.7	.94	.74	.55	.55
31	.18	---	.94	.39	---	.74	---	7.7	---	.69	.55	---
TOTAL	28.32	41.18	74.37	23.92	29.56	143.05	310.09	72.7	40.38	38.94	23.28	22.50
MEAN	.91	1.37	2.40	.77	1.06	4.61	10.3	2.35	1.35	1.26	.75	.75
MAX	15	22	25	3.2	6.3	53	41	7.7	2.9	3.8	2.1	2.9
MIN	.08	.14	.20	.35	.32	.74	.79	1.5	.94	.69	.55	.43
AC-FT	56	82	148	47	59	284	615	144	80	77	46	45

CAL YR 1988	TOTAL	476.01	MEAN	1.30	MAX	51	MIN	.08	AC-FT	944
WTR YR 1989	TOTAL	848.29	MEAN	2.32	MAX	53	MIN	.08	AC-FT	1680

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 mi^2.

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

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

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--67 years (water years 1923-89), 23.7 ft^3/s (17,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1600	3,000	8.71	Mar. 3	1130	2,080	7.12
Nov. 5	1830	1,920	6.85	Apr. 5	0800	2,160	7.32
Dec. 6	0930	1,780	6.56	Apr. 7	1630	2,680	8.20
Jan. 11	1600	*3,200	*9.00	Apr. 13	2030	1,820	6.65
Feb. 4	2300	1,800	6.60	July 22	0730	1,840	6.69

Minimum discharge, 2.5 ft^3/s, Oct. 10-11.

DISCHARGE, IN 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	4.4	3.4	3.8	89	7.8	7.1	135	34	20	9.4	24	42
2	3.8	3.4	3.6	16	7.1	242	233	16	11	7.0	44	62
3	3.5	4.1	3.5	11	14	927	47	13	14	13	12	39
4	3.1	364	3.4	19	433	357	19	12	25	23	11	26
5	2.9	148	3.3	38	64	124	504	12	63	150	9.7	9.8
6	2.9	16	212	128	87	198	146	11	90	251	14	6.9
7	4.8	5.2	56	176	13	161	723	12	25	17	11	9.7
8	3.2	4.3	5.4	197	6.5	42	185	10	28	25	8.6	7.2
9	2.7	46	4.1	196	7.1	12	159	24	10	6.5	8.0	6.0
10	2.8	27	3.9	467	6.4	6.9	25	13	9.0	19	7.4	18
11	2.6	23	10	395	23	7.1	13	15	9.1	36	7.2	9.2
12	25	5.1	6.4	120	12	9.8	61	10	14	19	6.7	7.2
13	3.6	73	9.7	295	5.7	5.8	500	49	9.6	151	6.4	5.5
14	3.0	81	5.4	223	5.1	5.5	563	87	13	103	6.3	4.9
15	2.7	8.2	4.3	229	4.8	5.6	51	176	10	27	6.1	4.8
16	2.8	4.7	56	96	4.4	8.0	19	38	16	13	5.7	4.7
17	11	8.0	17	72	4.3	7.1	12	19	47	13	5.6	12
18	6.6	5.6	21	34	4.1	6.1	11	12	18	10	6.5	9.7
19	5.8	15	8.3	24	4.1	5.6	45	14	10	131	22	17
20	4.9	6.7	7.0	42	3.8	5.3	189	19	10	77	420	7.8
21	5.1	56	57	20	3.8	5.1	56	11	8.9	30	46	10
22	3.2	63	10	24	4.5	5.0	59	239	7.5	258	11	7.0
23	3.0	90	6.3	18	90	4.9	336	177	6.8	31	10	7.3
24	20	30	16	17	101	4.8	62	162	7.0	17	14	7.0
25	4.9	29	24	17	48	4.7	26	54	6.6	15	7.6	6.8
26	8.8	11	73	14	6.9	4.4	23	22	6.1	13	6.3	5.5
27	5.1	6.5	41	12	5.0	4.3	89	12	5.6	10	5.7	5.0
28	8.3	5.4	88	11	4.4	4.2	149	9.9	5.4	58	5.3	4.6
29	6.3	4.6	250	9.9	---	4.4	340	27	6.0	75	4.9	4.5
30	4.0	4.1	305	9.8	---	5.6	61	128	7.8	22	4.8	4.2
31	3.8	---	201	8.6	---	92	---	47	---	11	4.8	---
TOTAL	174.4	1153.3	1517.4	3029.3	982.8	2284.3	4841	1484.9	539.4	1642.9	762.8	371.3
MEAN	5.63	38.4	48.9	97.7	35.1	73.7	161	47.9	18.0	53.0	24.6	12.4
MAX	25	364	305	467	433	927	723	239	90	258	420	62
MIN	2.6	3.4	3.3	8.6	3.8	4.2	11	9.9	5.4	7.0	4.8	4.2
AC-FT	346	2290	3010	6010	1950	4530	9600	2950	1070	3260	1510	736

CAL YR 1988	TOTAL	10159.3	MEAN	27.6	MAX	781	MIN	2.0	AC-FT	20150
WTR YR 1989	TOTAL	18783.8	MEAN	51.5	MAX	927	MIN	2.6	AC-FT	37260

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 mi^2.

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 aupply and irrigation of sugarcane in central Maui. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--69 years (water years 1915, 1917, 1923-89), 35.5 ft^3/s (25,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1600	3,610	9.66	Apr. 5	0800	3,640	9.69
Dec. 6	0900	2,370	8.30	Apr. 7	1430	*4,200	*10.20
Jan. 11	1800	3,020	9.05	Apr. 13	2030	3,390	9.44
Feb. 4	1230	3,430	9.48	July 6	0100	2,190	8.08
Mar. 3	0030	2,110	7.98	July 22	0800	2,730	8.73
Apr. 2	0700	2,110	7.98	Aug. 20	1000	2,420	8.36

Minimum discharge, 3.8 ft^3/s, Oct. 11-12.

DISCHARGE, IN 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	8.0	6.3	7.2	62	7.2	10	134	39	36	13	27	47
2	6.7	6.2	6.8	24	6.7	226	252	21	17	8.9	42	59
3	5.8	6.7	6.4	20	26	490	79	17	15	18	14	38
4	5.2	392	6.0	31	839	188	26	17	27	29	12	29
5	4.8	71	5.7	41	95	182	627	16	59	176	11	14
6	5.1	16	170	121	37	219	223	14	100	356	15	10
7	8.5	10	41	133	20	183	1160	14	27	25	11	12
8	5.3	8.9	13	174	14	50	358	11	27	26	8.9	9.4
9	4.3	38	9.4	192	12	21	249	18	14	13	8.0	9.2
10	3.9	25	8.4	398	10	17	33	13	12	21	7.4	26
11	3.8	21	14	349	18	15	20	15	12	32	7.1	13
12	31	11	11	107	16	16	56	10	18	20	6.5	10
13	7.5	54	18	189	10	11	734	30	12	138	6.1	8.9
14	8.4	74	11	198	9.4	9.5	856	68	14	98	6.0	7.3
15	6.7	16	8.2	218	8.6	9.0	58	106	12	31	5.7	7.1
16	14	12	80	84	7.6	8.7	27	25	19	18	5.4	6.5
17	19	15	32	50	6.9	7.9	18	18	45	18	5.7	15
18	12	12	47	28	6.8	7.0	16	13	21	15	7.3	12
19	10	24	17	23	6.9	6.5	51	14	12	132	20	23
20	11	15	13	22	6.0	6.1	220	20	12	54	555	10
21	8.1	54	27	16	5.8	5.9	53	13	10	20	45	13
22	7.8	66	13	18	7.4	5.5	54	205	8.7	229	15	9.6
23	10	79	10	13	43	5.1	332	175	8.1	36	12	9.3
24	45	37	17	11	70	5.0	35	109	8.0	22	15	9.3
25	13	21	27	17	54	5.0	23	46	7.5	19	8.9	9.0
26	15	14	60	13	13	4.6	23	25	6.6	16	7.5	7.1
27	10	12	26	9.9	10	4.4	92	16	6.0	12	6.9	6.3
28	13	10	60	9.0	9.8	4.2	171	13	5.9	54	6.6	5.9
29	9.7	9.2	193	8.7	---	5.2	582	34	7.9	72	6.3	7.0
30	7.9	8.0	215	8.5	---	7.4	67	134	11	26	6.3	5.6
31	7.0	---	203	7.7	---	89	---	55	---	15	6.5	---
TOTAL	327.5	1144.3	1376.1	2595.8	1376.1	1824.0	6629	1324	590.7	1762.9	917.1	448.5
MEAN	10.6	38.1	44.4	83.7	49.1	58.8	221	42.7	19.7	56.9	29.6	14.9
MAX	45	392	215	398	839	490	1160	205	100	356	555	59
MIN	3.8	6.2	5.7	7.7	5.8	4.2	16	10	5.9	8.9	5.4	5.6
AC-FT	650	2270	2730	5150	2730	3620	13150	2630	1170	3500	1820	890

CAL YR 1988	TOTAL	12083.7	MEAN	33.0	MAX	1110	MIN	2.2	AC-FT	23970
WTR YR 1989	TOTAL	20316.0	MEAN	55.7	MAX	1160	MIN	3.8	AC-FT	40300

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 mi^2.

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

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--78 years (water years 1912-89), 4.75 ft^3/s (3,440 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of model of station site; minimum, 0.02 ft^3/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 4	1300	1,370	4.37	Apr. 20	0730	280	3.09
Apr. 7	1300	1,400	4.40	May 22	0430	883	3.87
Apr. 9	0400	*2,390	*5.31				

Minimum discharge, 0.42 ft^3/s, Oct. 8-11, Nov. 3-4.

DISCHARGE, IN 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	.60	.51	2.0	11	2.5	2.0	4.4	13	5.8	2.5	6.3	7.8
2	.59	.51	1.9	7.8	2.5	1.6	11	10	4.6	1.9	13	9.2
3	.51	.49	1.8	7.3	15	1.5	2.0	6.8	5.1	2.1	4.6	4.8
4	.51	6.4	1.6	6.2	151	7.4	1.6	7.4	4.5	4.6	7.4	3.7
5	.51	6.1	1.6	6.0	15	6.4	53	6.3	7.5	19	4.7	2.6
6	.52	1.1	8.0	8.9	9.3	14	34	5.5	5.0	26	6.3	2.4
7	.55	.86	4.0	13	6.5	18	305	4.8	4.1	4.2	4.2	2.6
8	.47	.84	2.0	21	5.4	5.7	99	4.2	5.9	4.2	3.5	2.2
9	.42	2.1	1.8	23	4.6	4.2	254	4.0	3.4	3.1	3.2	2.0
10	.42	1.8	1.7	52	4.2	3.7	22	3.6	3.2	6.2	3.0	2.5
11	.89	2.6	3.1	47	5.5	3.3	14	3.4	3.0	6.2	2.9	3.2
12	2.6	1.1	2.7	26	4.2	3.5	11	3.0	4.8	3.8	2.6	3.8
13	.66	9.0	3.1	32	3.4	2.9	34	4.0	3.0	20	2.5	1.9
14	.62	7.5	1.8	33	3.0	2.6	85	11	3.0	13	2.4	1.7
15	.51	2.2	1.6	38	2.8	2.5	17	16	3.0	6.7	2.2	1.7
16	.54	1.9	29	21	2.6	2.3	12	4.1	7.3	5.1	2.1	1.7
17	1.8	2.7	4.9	14	2.4	2.1	9.4	3.4	13	5.4	2.1	1.8
18	.73	2.1	3.5	11	2.2	1.9	8.0	2.9	5.7	4.6	2.0	1.5
19	.60	2.5	3.1	13	2.1	1.9	7.3	3.2	3.7	32	2.8	2.6
20	.58	1.8	2.8	11	1.9	1.8	63	4.3	3.8	9.9	35	1.5
21	.96	3.0	3.2	8.0	1.9	1.6	14	3.9	3.3	6.5	7.9	1.9
22	.59	4.3	2.5	6.6	1.9	1.5	14	55	3.0	31	3.7	1.6
23	.51	8.6	2.4	5.6	3.8	1.5	44	8.5	2.8	8.7	3.4	1.5
24	.55	5.8	4.2	4.9	4.2	1.4	14	11	2.7	6.9	3.0	1.4
25	.52	3.5	6.1	4.4	3.3	1.4	10	7.0	2.5	5.9	2.7	1.4
26	.85	3.1	8.8	4.0	1.8	1.3	8.6	5.4	2.3	5.2	2.5	1.2
27	.63	2.8	4.6	3.6	1.6	1.2	16	4.6	2.1	4.5	2.3	1.2
28	1.3	2.6	7.9	3.3	2.4	1.1	39	4.2	2.0	9.2	2.1	1.1
29	.73	2.5	26	3.9	---	1.2	75	4.8	2.1	19	2.0	1.1
30	.57	2.1	26	3.0	---	1.3	21	24	2.2	5.8	2.0	1.0
31	.51	---	19	2.7	---	2.0	---	8.6	---	4.4	2.0	---
TOTAL	22.35	92.41	192.5	452.2	267.0	104.8	1302.3	259.9	124.4	287.6	146.4	74.6
MEAN	.72	3.08	6.21	14.6	9.54	3.38	43.4	8.38	4.15	9.28	4.72	2.49
MAX	2.6	9.0	29	52	151	18	305	55	13	32	35	9.2
MIN	.42	.49	1.6	2.7	1.6	1.1	1.6	2.9	2.0	1.9	2.0	1.0
AC-FT	44	183	382	897	530	208	2580	516	247	570	290	148

CAL YR 1988	TOTAL	1688.39	MEAN	4.61	MAX	89	MIN	.42	AC-FT	3350
WTR YR 1989	TOTAL	3326.46	MEAN	9.11	MAX	305	MIN	.42	AC-FT	6600

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 ia 2,340 ft, from topographic map.

REMARKS.--Records good. No estimated daily discharges. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao, and Pukalani areas. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 3.19 ft^3/s (2,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s, Mar. 31, 1982, Apr. 12, 1988; minimum daily, 0.11 ft^3/s, Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15 ft^3/s on Apr. 7; minimum daily, 0.14 ft^3/s on Oct. 11.

DISCHARGE, IN 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	.47	.27	1.2	7.7	3.6	4.5	8.0	8.1	7.0	3.1	5.2	4.6
2	.32	.23	1.1	6.5	3.4	4.1	8.2	7.3	5.8	2.5	6.0	6.8
3	.27	.20	1.0	6.2	7.2	4.8	6.2	6.8	5.4	2.6	5.2	5.8
4	.23	4.0	.86	6.0	9.3	7.3	5.2	6.6	5.9	3.4	4.8	6.2
5	.20	8.0	.79	6.5	6.2	6.5	6.3	6.2	7.8	8.0	4.4	4.6
6	.20	3.2	6.4	9.6	5.4	7.9	7.0	5.8	8.4	11	4.9	4.8
7	.23	1.8	7.9	10	5.1	7.0	15	5.7	6.2	6.1	4.2	5.4
8	.23	1.3	3.8	10	4.8	6.0	12	5.4	5.7	4.8	3.8	4.1
9	.20	2.0	2.4	11	4.6	5.4	12	5.2	5.1	4.2	3.6	3.6
10	.17	3.2	1.8	12	4.5	5.2	8.8	4.9	4.8	4.1	3.2	3.8
11	.14	2.6	2.0	11	4.7	4.9	7.9	4.8	4.6	6.2	3.3	3.3
12	2.2	1.8	1.8	9.4	4.9	4.8	7.2	4.4	4.6	4.6	3.4	3.4
13	1.2	3.6	1.4	9.8	4.6	4.6	9.2	4.5	4.5	8.7	3.2	3.6
14	.52	7.7	1.2	10	4.5	4.4	12	4.6	4.5	8.4	3.0	2.9
15	.32	3.7	1.1	10	4.4	4.2	9.2	5.5	4.2	6.5	2.9	2.6
16	.27	3.1	6.6	9.6	4.2	3.9	8.1	4.5	4.2	5.2	2.8	2.5
17	1.8	3.2	7.7	8.6	3.9	3.7	7.3	4.1	4.5	4.8	2.6	3.3
18	.94	2.5	5.8	7.9	3.8	3.4	6.8	3.9	4.6	4.5	2.6	2.5
19	.79	3.6	3.8	7.5	3.7	3.3	6.3	3.9	4.1	8.4	2.9	3.2
20	1.1	2.5	2.8	7.2	3.4	3.2	7.7	3.9	3.9	7.9	10	2.9
21	.65	6.2	3.0	8.8	3.2	3.0	7.3	3.6	3.7	5.8	7.7	2.6
22	.42	6.3	2.4	6.6	3.1	2.9	7.0	6.2	3.4	10	5.7	2.5
23	.32	8.2	2.0	6.2	3.6	2.6	10	9.0	3.2	7.7	4.8	2.2
24	2.8	7.5	2.4	5.7	5.2	2.5	7.9	7.3	3.1	6.5	4.4	2.0
25	2.7	4.9	2.2	5.4	5.4	2.4	7.2	6.2	3.0	6.0	4.2	2.0
26	1.1	3.1	6.5	5.1	4.5	2.3	6.6	5.5	2.8	5.5	4.1	1.6
27	.79	2.4	3.8	4.8	3.8	2.0	6.8	5.1	2.8	5.1	3.8	1.6
28	.58	2.0	4.0	4.5	3.7	2.0	7.7	4.9	2.5	5.6	3.7	1.4
29	.47	1.8	5.9	4.5	---	2.0	11	5.1	2.5	7.9	3.4	1.4
30	.37	1.4	11	4.2	---	1.8	8.8	6.8	2.9	6.3	3.3	1.4
31	.32	---	10	3.8	---	4.2	---	7.3	---	5.4	3.2	---
TOTAL	22.12	102.30	114.85	233.9	128.7	126.8	250.7	173.1	135.7	186.8	130.1	98.6
MEAN	.71	3.41	3.70	7.55	4.60	4.09	8.36	5.58	4.52	6.03	4.20	3.29
MAX	2.7	8.2	11	12	9.3	7.9	15	9.0	8.4	11	10	6.8
MIN	.14	.20	.79	3.8	3.1	1.8	5.2	3.6	2.5	2.5	2.6	1.4
AC-FT	44	203	227	464	255	252	497	343	269	371	258	196

CAL YR 1988	TOTAL	1163.02	MEAN	3.18	MAX	12	MIN	.13	AC-FT	2310
WTR YR 1989	TOTAL	1703.47	MEAN	4.67	MAX	15	MIN	.14	AC-FT	3380

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--8 years (1984-89), 68.0 ft^3/s (49,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft^3/s, Jan. 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft^3/s for several days in October and November 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1330	*4,590	*7.73	Apr. 8	2300	4,280	7.49
Dec. 7	0300	1,550	4.66	Apr. 13	2400	1,680	4.83
Mar. 4	0330	1,090	3.97	May 31	1600	1,620	4.75

Minimum discharge, 17 ft^3/s, Oct. 1-11, 22-23.

DISCHARGE, IN 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	18	20	30	41	23	36	61	148	185	48	85	103
2	18	19	28	36	68	59	113	104	93	42	144	140
3	17	19	27	30	122	149	34	82	67	42	67	63
4	17	313	26	53	266	315	28	71	61	87	63	54
5	17	115	26	61	116	195	161	73	62	203	53	87
6	17	72	342	54	74	430	92	61	74	335	67	77
7	19	45	363	48	62	411	301	60	76	104	46	78
8	18	39	101	57	46	206	555	62	68	72	40	50
9	17	52	60	50	49	104	763	78	46	54	38	48
10	17	39	45	120	198	76	192	79	42	82	34	66
11	18	36	49	89	133	61	40	82	40	62	46	42
12	67	30	36	51	84	53	91	54	60	57	36	41
13	22	86	29	71	61	45	398	55	41	243	31	36
14	22	78	26	136	48	40	711	60	55	166	34	33
15	21	49	26	150	39	49	220	111	41	89	34	31
16	20	48	153	83	34	38	130	111	145	70	31	48
17	21	46	70	50	30	31	93	75	246	55	61	39
18	20	41	45	44	28	29	76	54	189	51	44	33
19	19	41	36	80	27	28	73	71	82	251	70	44
20	18	57	30	46	26	27	304	95	79	125	345	31
21	19	65	27	81	25	26	171	66	55	74	144	33
22	18	99	26	51	24	25	199	104	46	192	74	45
23	48	83	26	36	35	24	398	124	41	150	65	36
24	72	49	47	31	39	24	188	78	40	92	53	37
25	30	36	105	31	42	24	122	122	39	68	42	30
26	26	31	179	28	25	24	95	79	57	61	39	29
27	23	34	58	26	23	23	148	65	38	49	36	26
28	26	33	41	25	44	23	252	60	38	85	33	29
29	34	34	131	40	---	22	633	80	36	133	31	28
30	23	47	104	27	---	26	256	171	48	59	33	26
31	22	---	60	24	---	58	---	411	---	48	42	---
TOTAL	764	1756	2352	1750	1791	2681	6898	2946	2190	3249	1961	1463
MEAN	24.6	58.5	75.9	56.5	64.0	86.5	230	95.0	73.0	105	63.3	48.8
MAX	72	313	363	150	266	430	763	411	246	335	345	140
MIN	17	19	26	24	23	22	28	54	36	42	31	26
AC-FT	1520	3480	4670	3470	3550	5320	13680	5840	4340	6440	3890	2900

CAL YR 1988	TOTAL	24477	MEAN	66.9	MAX	740	MIN	17	AC-FT	48550
WTR YR 1989	TOTAL	29801	MEAN	81.6	MAX	763	MIN	17	AC-FT	59110

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--5 years, 89.5 ft^3/s (64,840 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 9,660 ft^3/s, Jan. 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 22 ft^3/s, Jan. 18-22, 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1400	*9,130	*8.54	Apr. 5	0300	3,430	5.14
Dec. 6	0530	4,500	5.62	Apr. 9	0200	5,100	5.86
Jan. 4	1130	2,730	4.79	Apr. 29	0300	2,440	4.63
Mar. 7	0100	2,070	4.38	July 22	0900	2,670	4.76
Apr. 2	0700	3,590	5.22				

Minimum discharge, 38 ft^3/s, Dec. 4, 5, 6.

DISCHARGE, IN 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	48	44	42	44	43	45	69	94	128	75	85	e170
2	48	46	40	74	70	129	238	80	71	68	171	e230
3	47	48	39	51	91	183	58	76	70	69	83	e110
4	47	508	38	59	368	278	61	74	69	117	76	e94
5	46	68	38	52	61	135	505	92	77	299	e70	e150
6	46	57	542	54	56	506	326	78	81	579	e84	e130
7	50	44	144	53	50	514	560	80	83	71	e70	e135
8	46	46	46	61	47	79	1060	91	73	77	e64	e86
9	44	58	43	65	48	54	643	106	62	62	e60	e82
10	44	44	43	195	91	52	83	91	61	95	e56	e110
11	55	44	51	115	85	59	71	96	62	74	e78	e74
12	130	40	44	57	50	56	75	71	102	68	e62	e68
13	50	121	42	84	46	48	579	71	64	301	e53	e64
14	78	72	42	124	44	48	674	71	74	110	e56	e56
15	47	46	43	119	46	67	87	96	65	71	e56	e54
16	47	125	192	58	43	52	73	93	259	69	e52	e82
17	48	46	52	48	42	48	69	71	330	66	e105	e70
18	47	42	46	47	42	48	68	73	165	62	e76	e56
19	47	61	44	56	43	47	91	86	73	377	e120	e76
20	46	52	43	48	42	47	388	133	80	126	e540	e54
21	49	59	43	54	42	46	89	100	77	84	e240	e56
22	48	93	42	47	43	46	96	156	66	293	e130	e78
23	110	72	44	44	46	44	265	118	62	113	e110	e62
24	91	58	77	44	58	44	97	76	64	73	e94	e64
25	52	61	167	46	57	47	83	74	66	71	e76	e52
26	53	47	340	44	43	44	87	76	82	71	e66	e49
27	49	47	47	44	42	44	230	77	61	64	e62	e46
28	64	113	44	43	49	44	429	70	65	96	e56	e50
29	57	60	198	46	---	46	982	79	61	154	e53	e48
30	47	58	87	44	---	46	156	244	70	68	e57	e45
31	46	---	56	43	---	62	---	318	---	64	e72	---
TOTAL	1727	2280	2759	1963	1788	3008	8292	3109	2723	3987	3033	2501
MEAN	55.7	76.0	89.0	63.3	63.9	97.0	276	100	90.8	129	97.8	83.4
MAX	130	508	542	195	368	514	1060	318	330	579	540	230
MIN	44	40	38	43	42	44	58	70	61	62	52	45
AC-FT	3430	4520	5470	3890	3550	5970	16450	6170	5400	7910	6020	4960

CAL YR 1988	TOTAL	34371	MEAN	93.9	MAX	1160	MIN	38	AC-FT	68170
WTR YR 1989	TOTAL	37170	MEAN	102	MAX	1060	MIN	38	AC-FT	73730

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 mi^2.

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.--WSF 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.--40 years (1940-42, 1948-70, 1976-89), 17.8 ft^3/s (12,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, Jan. 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft^3/s, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1330	3,730	9.48	Apr. 9	0300	3,730	9.48
Dec. 6	0630	820	5.90	Apr. 29	0730	880	6.02
Apr. 5	0300	*4,040	*9.76	July 22	0830	730	5.72

Minimum discharge, 5.0 ft^3/s, Feb. 28.

DISCHARGE, IN 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	4.4	4.8	6.4	7.3	4.1	6.6	13	35	35	19	11	48
2	4.3	4.4	6.3	17	6.9	9.5	53	20	16	14	54	99
3	4.1	4.5	6.3	9.9	71	34	24	17	19	18	19	15
4	4.1	191	5.6	9.4	152	99	29	15	14	20	16	17
5	4.0	24	5.4	6.4	20	76	431	22	18	86	12	16
6	4.0	8.6	123	9.5	14	150	218	16	15	165	19	19
7	4.2	5.9	60	8.2	8.8	198	435	16	13	18	15	18
8	4.2	6.2	9.6	12	7.4	39	523	19	14	18	11	11
9	4.0	10	7.5	30	6.7	12	398	28	12	13	9.8	9.8
10	4.1	9.2	6.8	81	31	9.8	37	18	12	23	9.6	17
11	3.9	6.0	10	59	22	21	22	21	12	15	9.4	10
12	45	4.9	8.2	14	11	24	20	14	35	14	9.4	25
13	6.6	29	5.3	21	7.0	9.2	137	13	17	100	9.0	12
14	15	19	4.5	31	6.3	7.7	219	13	15	35	9.5	9.6
15	6.6	8.2	4.3	46	6.2	9.1	32	12	14	17	9.4	8.7
16	4.7	74	121	17	5.8	11	20	13	104	14	9.0	18
17	8.7	17	19	8.4	5.7	6.9	17	12	116	13	14	18
18	6.0	10	8.7	7.1	5.6	6.5	15	12	51	12	12	8.8
19	5.5	14	6.5	6.4	5.8	6.2	15	21	16	118	28	19
20	6.0	9.4	5.5	6.4	5.5	6.1	99	36	15	44	92	9.6
21	7.7	19	5.1	5.8	5.5	6.1	22	16	16	16	24	9.1
22	13	22	4.9	5.4	7.8	5.9	25	74	13	102	13	9.4
23	32	12	4.6	5.1	6.0	5.8	46	35	12	22	13	13
24	19	15	12	5.0	8.7	5.8	17	17	12	18	13	23
25	8.5	36	43	4.9	9.4	6.9	16	14	12	13	9.9	10
26	6.0	8.9	82	4.9	5.8	7.0	19	13	14	14	9.3	8.9
27	5.1	7.0	8.7	4.6	5.2	5.7	76	12	11	12	9.2	8.5
28	9.6	17	6.1	4.4	6.0	5.6	133	12	12	18	8.9	11
29	8.8	11	50	5.0	---	5.8	423	13	11	47	8.7	11
30	5.0	11	31	4.5	---	5.6	89	70	11	15	12	8.7
31	4.6	---	17	4.3	---	10	---	73	---	12	12	---
TOTAL	268.7	619.0	694.3	460.9	457.2	811.8	3623	722	687	1065	511.1	521.1
MEAN	8.67	20.6	22.4	14.9	16.3	26.2	121	23.3	22.9	34.4	16.5	17.4
MAX	45	191	123	81	152	198	523	74	116	165	92	99
MIN	3.9	4.4	4.3	4.3	4.1	5.6	13	12	11	12	8.7	8.5
AC-FT	533	1230	1380	914	907	1610	7190	1430	1360	2110	1010	1030

CAL YR 1988	TOTAL	8592.2	MEAN	23.5	MAX	452	MIN	3.9	AC-FT	17040
WTR YR 1989	TOTAL	10441.1	MEAN	28.6	MAX	523	MIN	3.9	AC-FT	20710

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
03...	1140	752	5.5	97	7.90	21.0	1.3	9.1	104	<1
NOV										
15...	1310	--	7.8	--	--	21.0	--	--	--	--
DEC										
12...	1145	751	8.0	77	7.40	20.5	1.5	8.4	95	<1
FEB										
06...	1135	751	16	65	7.40	18.5	1.9	9.1	99	K1
MAR										
20...	1240	--	6.3	--	--	21.5	--	--	--	--
APR										
25...	1230	754	20	69	7.30	20.5	0.40	8.6	97	30
JUN										
19...	1230	756	15	70	7.40	21.5	0.40	8.1	93	55
AUG										
08...	1130	754	11	84	7.80	20.5	0.50	8.6	97	32
SEP										
20...	1130	--	9.5	--	--	20.5	--	--	--	--

DATE	TIME	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
03...	1140	810	27	0	5.1	3.5	8.8	40	0.7	1.0	33
DEC											
12...	1145	630	20	3	4.3	2.2	7.2	43	0.7	0.90	20
FEB											
06...	1135	1000	15	0	2.7	2.0	6.7	48	0.8	0.80	18
APR											
25...	1230	400	17	0	3.0	2.2	7.2	47	0.8	0.80	21
JUN											
19...	1230	320	18	0	3.4	2.2	6.8	44	0.7	0.80	23
AUG											
08...	1130	740	22	0	4.3	2.8	7.8	42	0.7	0.90	32

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
03...	0	28	27	2.8	11	0.10	23	78	72
DEC									
12...	0	19	17	3.9	9.0	<0.10	16	64	53
FEB									
06...	0	16	15	3.4	8.7	0.10	14	46	47
APR									
25...	0	18	17	1.0	8.8	0.10	16	47	50
JUN									
19...	0	19	19	2.0	8.5	<0.10	16	57	52
AUG									
08...	0	23	27	2.0	9.8	<0.10	19	53	62

< 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 1988 TO SEPTEMBER 1989

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
03...	0.11	0.150	0.010	0.030	0.19	0.20	0.030	0.030	0.020
DEC									
12...	0.09	<0.100	0.010	0.030	--	<0.20	0.030	0.030	0.010
FEB									
06...	0.06	<0.100	0.020	<0.010	0.26	0.30	0.020	0.010	0.010
APR									
25...	0.06	<0.100	<0.010	0.010	--	0.30	0.010	0.010	0.020
JUN									
19...	0.08	0.120	<0.010	0.020	--	0.30	0.020	0.030	0.030
AUG									
08...	0.07	<0.100	<0.010	<0.010	--	<0.20	0.020	0.020	0.020

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											
03...	1140	20	<1	3	<0.5	<1	<1	<3	1	5	<5
FEB											
06...	1135	50	<1	3	<0.5	<1	<1	<3	1	49	<5
APR											
25...	1230	30	<1	3	<0.5	<1	10	<3	1	17	<5
AUG											
08...	1130	20	<1	3	<0.5	<1	<1	<3	2	6	<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										
03...	<4	<1	0.3	<10	<1	<1	<1.0	33	<6	5
FEB										
06...	<4	<1	<0.1	<10	<1	<1	<1.0	19	<6	9
APR										
25...	<4	<1	0.3	<10	2	<1	<1.0	21	<6	4
AUG										
08...	<4	<1	0.2	<10	<1	<1	<1.0	28	<6	5

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				
03...	1140	2	0.03	100
DEC				
12...	1145	4	0.09	100
FEB				
06...	1135	12	0.52	100
APR				
25...	1230	2	0.11	100
JUN				
19...	1230	2	0.08	100
AUG				
08...	1130	2	0.06	100

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

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 156°35'22", Hydrologic Unit 20020000, on right bank 1,000 ft upstream from intake of Honokohau ditch and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to November 4, 1988 (station destroyed by flood)). Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P).

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 870 ft, from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good till the control got demolished by a huge boulder. No diversion upstream. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau ditch. Periodic determinations of water temperature for the current year are publiahed elsewhere in this report.

AVERAGE DISCHARGE.--72 years (water years 1914-19, 1923-88) 39.6 ft^3/s (28,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s revised, Jan. 28, 1988, gage height, 8.38 ft, from rating curve extended above 3,200 ft^3/a, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft^3/s, May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during the period of Oct. 1 to Nov. 4, 1988, 6,790 ft^3/s, Nov. 4, gage height 8.24 ft; minimum, 14 ft^3/s, Oct. 22-23, Nov. 1-2.

DISCHARGE, IN 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	16	14										
2	15	15										
3	15	20										
4	15	171										
5	15	---										
6	15	---										
7	20	---										
8	16	---										
9	15	---										
10	15	---										
11	16	---										
12	82	---										
13	18	---										
14	16	---										
15	15	---										
16	15	---										
17	16	---										
18	15	---										
19	15	---										
20	15	---										
21	15	---										
22	15	---										
23	22	---										
24	40	---										
25	19	---										
26	17	---										
27	15	---										
28	21	---										
29	21	---										
30	15	---										
31	15	---										
TOTAL	595	---										
MEAN	19.2	---										
MAX	82	---										
MIN	15	---										
AC-FT	1180	---										

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 mi^2.

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

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years (water years 1964-89), 3.48 ft^3/s (2,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft^3/s, July 11, 1965, gage height, 11.03 ft, from rating curve extended above 332 ft^3/s on basis of slope-area measurements at gage heighta 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 ft^3/s, by slope-area measurement, 0.6 mi upstream from station.

EXTREMES FOR CURRENT YEAR.--Peak dischargea greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1330	865	7.65	Apr. 23	1700	825	7.57
Apr. 8	2300	790	7.50	May 31	1600	*1,040	*7.99

Minimum discharge, no flow for many days.

DISCHARGE, IN 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	.00	.00	.00	.00	.00	.00	16	.00	14	3.7	3.6	2.2
2	.00	.00	.00	.00	.00	.00	72	.00	.38	.00	46	10
3	.00	.00	.00	.00	2.7	3.8	.37	.00	.00	.00	.93	1.2
4	.00	58	.00	.00	42	56	.00	.00	.00	.00	13	.50
5	.00	4.0	.00	.00	.00	.55	22	.00	5.8	19	.56	.00
6	.00	.00	132	75	.00	58	.00	.00	45	87	1.3	.00
7	.00	.53	59	20	.00	8.7	16	.00	.83	.41	.00	.00
8	.00	.00	.00	43	.00	.05	162	.00	6.0	.00	.00	.00
9	.00	1.2	.00	5.0	.00	.00	80	.00	.10	.00	.00	.00
10	.00	.00	.00	83	1.6	.00	4.0	.00	.00	13	.00	.00
11	.00	.00	.00	55	6.9	.00	.86	.00	.00	35	.00	.00
12	.00	.00	.00	.00	.10	.00	.51	.00	.00	.00	.00	.00
13	.00	37	.00	30	.00	.00	21	1.1	.00	99	.00	.00
14	.00	8.5	.00	68	.00	.00	59	27	.00	36	.00	.00
15	.00	.00	.00	140	.00	.00	1.7	21	.00	10	.00	.00
16	.00	.00	13	36	.00	.00	.39	5.4	.00	1.6	.00	.00
17	.00	.00	.12	.17	.00	.00	.00	1.8	1.5	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	5.5	.00	.00	.00
19	.00	.00	.00	9.6	.00	.00	.00	9.6	.00	52	1.7	.00
20	.00	.08	.00	1.1	.00	.00	4.2	2.3	.32	11	155	.00
21	.00	.62	.00	.69	.00	.00	26	.00	.00	.00	48	.00
22	.00	24	.00	.00	.00	.00	69	2.4	.00	58	.50	.00
23	.00	58	.00	.00	12	.00	260	34	.00	3.1	.00	.00
24	.15	.29	.00	.00	17	.00	16	31	.00	7.2	.00	.00
25	.00	.00	.00	.00	3.4	.00	.51	18	.00	.00	.00	.00
26	.00	.00	19	.00	.00	.00	.00	3.8	.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	8.6	.00	.00
29	.00	.00	86	.00	---	.00	53	.00	.00	44	.00	.00
30	.00	.00	67	.00	---	.00	2.4	1.8	.00	2.4	.00	.00
31	.00	---	2.4	.00	---	.00	---	117	---	.00	.00	---
TOTAL	.15	192.22	378.52	566.56	85.70	127.10	886.94	276.20	79.43	491.01	270.59	13.90
MEAN	.005	6.41	12.2	18.3	3.06	4.10	29.6	8.91	2.65	15.8	8.73	.46
MAX	.15	58	132	140	42	58	260	117	45	99	155	10
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.3	381	751	1120	170	252	1760	548	158	974	537	28

CAL YR 1988	TOTAL	807.65	MEAN	2.21	MAX	132	MIN	.00	AC-FT	1600
WTR YR 1989	TOTAL	3368.32	MEAN	9.23	MAX	260	MIN	.00	AC-FT	6680

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--59 years, 11.7 ft^3/s (8,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft^3/s, Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
July 6	0630	100	3.45	No other peak greater than base discharge.			

Minimum, 1.3 ft^3/s, Oct. 15.

DISCHARGE, IN 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	3.3	10	17	41	11	13	5.6	28	28	8.8	29	9.1
2	3.0	9.6	16	32	9.9	12	5.0	28	27	8.7	26	12
3	3.0	8.8	14	32	10	12	11	28	27	8.7	24	11
4	2.7	16	13	e30	8.8	11	11	27	26	8.7	21	11
5	2.5	16	12	e26	8.2	9.8	11	27	26	9.2	19	12
6	2.3	16	11	e24	10	9.6	9.7	25	23	28	18	11
7	2.1	15	9.9	e22	8.1	14	9.8	22	23	20	17	10
8	2.0	15	9.3	e26	7.6	11	9.8	20	22	19	15	10
9	1.9	15	8.3	e25	7.2	11	9.7	20	22	18	14	9.8
10	1.7	16	7.6	e35	6.9	10	9.4	19	22	18	13	9.0
11	1.7	19	7.5	e28	6.6	9.7	8.9	19	22	18	12	8.5
12	1.7	17	6.6	e25	6.4	9.3	8.4	19	21	16	11	8.2
13	1.4	17	6.1	e26	5.8	8.5	8.1	24	22	22	9.9	7.7
14	1.4	19	5.7	e30	5.5	7.7	15	e22	21	28	9.4	7.2
15	5.7	17	5.1	e30	5.2	7.1	14	e22	20	27	9.0	7.0
16	2.1	17	4.8	e28	4.9	6.7	13	e20	20	27	8.7	7.6
17	9.7	16	4.6	e26	4.6	6.4	12	e20	19	27	8.1	9.6
18	6.7	16	4.8	e25	4.4	6.2	12	e18	18	27	7.3	8.8
19	9.9	14	4.7	e24	4.2	6.0	11	e18	16	e30	7.8	9.2
20	8.3	13	4.2	e24	4.0	5.6	13	e20	16	e35	15	9.0
21	11	13	4.3	e22	3.9	5.3	14	e18	15	e32	16	9.0
22	11	17	4.0	e26	3.7	5.1	21	e16	14	e33	14	8.9
23	11	20	3.7	28	9.4	4.8	27	e25	14	e30	13	8.7
24	11	20	4.0	24	12	4.7	27	e20	13	e28	13	8.2
25	10	21	4.6	21	14	4.4	27	e30	11	e30	12	7.9
26	9.6	22	21	19	12	4.1	27	e24	11	e35	11	7.5
27	8.8	22	15	17	12	4.0	26	e24	9.9	e40	11	7.5
28	13	21	16	16	13	3.9	30	e22	9.4	35	9.9	7.3
29	12	19	22	15	---	3.8	36	e26	8.9	33	9.2	7.2
30	12	18	29	13	---	3.6	28	e35	8.8	30	8.4	7.0
31	11	---	36	13	---	4.7	---	28	---	28	7.8	---
TOTAL	193.5	485.4	331.8	771	219.3	235.0	470.4	714	556.0	756.1	419.5	266.9
MEAN	6.24	16.5	10.7	24.9	7.83	7.58	15.7	23.0	18.5	24.4	13.5	8.90
MAX	13	22	36	41	14	14	36	35	28	40	29	12
MIN	1.4	8.8	3.7	13	3.7	3.6	5.0	16	8.8	8.7	7.3	7.0
AC-FT	384	983	658	1530	435	466	933	1420	1100	1500	832	529

CAL YR 1988	TOTAL	3520.7	MEAN	9.62	MAX	44	MIN	1.4	AC-FT	6980
WTR YR 1989	TOTAL	5428.9	MEAN	14.9	MAX	41	MIN	1.4	AC-FT	10770

e Estimated

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 southwast 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, divarts by 16-in. pipeline 50 ft upstream for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 6.72 ft^3/s (4,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s, Jan. 8, 1975; minimum daily, 0.02 ft^3/s, Mar. 24, 26-30, Apr. 1, 1983, Sept. 19, 1984, and for many days in 1985.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft^3/s, Jan. 12, May 15, 26; minimum daily, 0.05 ft^3/s, Dec. 16-18.

DISCHARGE, IN 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	.36	1.2	2.5	7.2	6.5	4.7	.15	8.3	9.1	.92	8.3	.76
2	.20	.60	2.4	6.1	5.2	3.8	.20	7.2	8.8	.68	7.2	1.3
3	.28	.36	2.5	5.1	4.0	2.4	2.2	7.6	7.2	.52	6.5	4.7
4	.20	.28	2.4	6.0	4.0	2.0	7.4	8.1	6.5	1.1	5.4	4.5
5	.20	3.9	2.1	7.9	3.8	1.5	5.8	5.6	7.4	4.4	4.6	5.4
6	.20	5.1	.90	8.3	3.8	2.0	7.0	4.7	9.7	6.5	4.1	4.4
7	.20	5.2	.07	7.4	4.7	4.4	5.6	3.8	12	7.2	5.4	2.6
8	.20	4.4	.60	8.3	6.1	5.6	5.2	3.6	11	6.3	6.0	.92
9	.20	2.8	.60	9.7	8.3	5.4	4.4	4.7	9.4	5.4	5.1	.44
10	.20	2.4	.20	10	7.4	4.7	3.5	6.1	7.6	5.8	3.8	.28
11	.20	3.2	.10	12	4.7	3.6	3.6	6.1	6.7	5.1	3.2	.20
12	.20	3.6	.44	13	4.2	3.2	3.5	7.9	6.0	4.2	2.6	.07
13	.28	3.1	.36	11	3.2	2.6	2.6	9.4	7.4	5.2	2.0	.15
14	.28	2.8	.10	11	3.6	2.0	.68	12	7.2	9.4	2.4	.20
15	.28	3.0	.07	11	3.8	1.8	.84	13	7.0	10	2.7	.20
16	.20	3.4	.05	10	3.2	1.7	.68	12	7.4	8.6	2.4	.10
17	.20	2.8	.05	9.4	3.1	1.6	.28	12	6.1	8.3	1.9	.84
18	.28	1.8	.05	8.3	2.0	1.9	.92	11	5.2	7.6	1.5	4.0
19	.36	1.5	.07	10	1.3	1.0	1.2	12	5.8	7.2	1.2	3.8
20	.36	.92	.07	12	1.4	1.5	.52	10	5.4	10	1.6	3.5
21	.44	1.3	.28	11	1.2	1.7	2.6	9.7	4.4	12	6.5	2.8
22	.44	3.0	1.1	12	.84	1.2	5.8	9.4	3.8	11	8.3	1.6
23	.44	4.1	1.4	12	.60	.84	8.6	9.7	3.5	12	7.6	.52
24	.44	4.6	1.1	11	4.8	.44	8.3	9.4	3.2	12	5.6	1.2
25	.44	4.1	1.4	11	9.1	.15	7.6	11	3.1	9.7	4.6	1.9
26	.44	3.8	5.4	11	8.8	.15	8.3	13	1.8	10	3.1	.84
27	.44	3.5	5.4	9.4	8.6	.15	7.4	11	.84	11	2.0	.10
28	.44	3.0	4.4	8.3	7.0	.15	5.2	9.1	1.0	9.4	1.5	.10
29	.44	2.5	5.2	7.4	---	.15	6.5	9.1	1.3	8.6	1.3	.07
30	.44	2.8	7.0	8.6	---	.15	8.6	12	1.3	9.1	.92	.07
31	1.4	---	7.4	8.3	---	.15	---	9.7	---	9.4	1.0	---
TOTAL	10.68	85.06	55.71	293.7	125.24	62.63	125.17	278.2	177.14	228.62	120.32	47.56
MEAN	.34	2.84	1.80	9.47	4.47	2.02	4.17	8.97	5.90	7.37	3.88	1.59
MAX	1.4	5.2	7.4	13	9.1	5.6	8.6	13	12	12	8.3	5.4
MIN	.20	.28	.05	5.1	.60	.15	.15	3.6	.84	.52	.92	.07
AC-FT	21	169	111	583	248	124	248	552	351	453	239	94

CAL YR 1988	TOTAL	772.59	MEAN	2.11	MAX	13	MIN	.03	AC-FT	1530
WTR YR 1989	TOTAL	1610.03	MEAN	4.41	MAX	13	MIN	.05	AC-FT	3190

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--8 years, 4.84 ft^3/s (3,510 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 23 ft^3/s, Apr. 10, 1986; minimum daily, 0.03 ft^3/s, Mar. 23, 24, 31, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15 ft^3/s, Jan. 15; minimum daily, 1.5 ft^3/s, Oct. 18.

DISCHARGE, IN 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	3.9	4.9	10	5.3	5.2	4.4	6.7	6.6	4.1	6.1	4.9
2	3.9	3.8	4.6	7.9	5.2	5.1	4.9	6.1	6.3	4.1	5.9	5.6
3	3.9	3.7	4.5	7.9	5.4	4.9	7.1	5.7	6.3	4.5	5.7	4.7
4	3.9	6.1	4.4	6.8	5.6	4.9	4.9	5.4	6.5	5.8	5.5	5.0
5	3.9	5.8	4.3	6.4	5.2	5.3	5.9	5.2	8.4	6.0	5.4	4.6
6	3.9	5.6	4.1	5.9	5.9	5.9	4.9	5.2	8.4	9.0	6.0	4.5
7	3.8	5.1	4.0	8.3	5.2	7.4	4.8	4.8	9.7	5.9	5.4	4.3
8	3.6	5.3	3.9	8.6	5.2	5.3	4.8	6.0	7.9	6.1	5.3	4.4
9	3.4	5.6	3.9	8.2	5.4	5.1	4.5	6.0	7.0	5.4	5.2	4.5
10	3.2	5.7	3.9	13	5.5	5.0	4.3	6.1	6.6	5.2	5.2	4.2
11	3.1	8.1	5.2	9.1	5.4	4.9	4.2	6.0	6.2	5.3	5.1	4.0
12	3.2	5.9	4.1	8.3	5.3	4.9	4.1	5.6	9.2	5.1	5.1	4.0
13	2.8	5.6	4.0	13	5.0	4.8	4.0	11	6.6	9.2	5.4	4.2
14	3.2	7.0	3.9	14	4.9	4.6	5.5	8.0	6.6	8.6	5.5	4.0
15	2.4	5.7	3.8	15	4.9	4.5	5.1	11	7.4	7.2	5.1	4.0
16	1.8	5.4	3.7	12	4.8	4.5	4.2	9.5	6.4	6.2	5.5	4.3
17	1.6	5.2	3.4	9.7	4.8	4.4	4.0	7.9	6.3	5.7	5.1	5.4
18	1.5	5.1	3.5	7.4	4.8	4.4	3.9	7.4	6.4	5.4	4.9	4.6
19	2.3	4.9	3.9	6.6	4.6	4.5	3.9	7.1	5.8	8.8	4.9	4.7
20	2.6	5.0	3.7	6.2	4.6	4.5	5.3	8.2	5.7	11	7.2	4.5
21	3.1	5.1	4.0	6.9	4.5	4.0	5.8	6.7	5.6	7.5	8.3	4.3
22	3.1	7.1	4.0	6.8	4.4	3.7	6.6	6.8	5.5	12	6.0	4.1
23	2.7	7.5	3.9	6.5	6.3	3.6	7.7	8.5	5.5	8.6	5.6	4.0
24	2.6	7.0	4.0	6.2	7.9	3.6	6.6	7.8	5.3	8.1	5.4	4.0
25	2.9	6.6	4.7	5.9	7.7	3.5	5.7	11	5.3	8.0	5.2	3.9
26	2.8	6.3	9.8	5.6	6.0	3.5	5.3	8.1	5.3	7.1	5.1	4.0
27	3.5	5.9	5.8	5.5	5.8	3.5	5.4	7.2	4.6	6.4	5.0	4.4
28	6.3	5.6	6.9	5.6	5.6	3.5	7.3	6.6	4.2	6.1	4.9	4.4
29	4.5	5.2	8.2	5.5	---	3.5	10	11	4.3	7.8	4.8	4.3
30	4.3	5.5	11	5.5	---	3.4	11	8.8	4.4	7.8	4.8	3.9
31	3.9	---	11	5.4	---	3.4	---	7.4	---	6.8	4.2	---
TOTAL	101.7	170.3	155.0	249.7	151.2	139.3	166.1	228.8	190.3	214.8	168.8	131.7
MEAN	3.28	5.68	5.00	8.05	5.40	4.49	5.54	7.38	6.34	6.93	5.45	4.39
MAX	6.3	8.1	11	15	7.9	7.4	11	11	9.7	12	8.3	5.6
MIN	1.5	3.7	3.4	5.4	4.4	3.4	3.9	4.8	4.2	4.1	4.2	3.9
AC-FT	202	338	307	495	300	276	329	454	377	426	335	261

CAL YR 1988	TOTAL	1640.9	MEAN	4.48	MAX	12	MIN	1.5	AC-FT	3250
WTR YR 1989	TOTAL	2067.7	MEAN	5.66	MAX	15	MIN	1.5	AC-FT	4100

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 mi^2, of which 81 mi^2 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 ft^3/s upstream for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River upstream 1938-63. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years (water years 1929-39, 1942-47, 1949-89), 281 ft^3/s (203,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, revised, Aug. 11, 1940, gage height, 28.6 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s; minimum, 0.15 ft^3/s, Jan. 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base dischsrge of 8,700 ft^3/s and maximum (*), from rating curve extended ss explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	1830	8,750	15.00	July 22	1630	*17,700	*18.00
July 6	0630	11,700	16.00				

Minimum discharge, 21 ft^3/s, Oct. 10, 11.

DISCHARGE, IN 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	73	55	133	1600	135	138	179	598	421	57	334	99
2	61	47	102	952	119	114	219	348	323	53	287	340
3	48	46	102	899	143	95	445	254	281	67	231	166
4	40	e1100	81	616	174	101	221	201	242	346	195	225
5	38	e900	67	433	136	172	333	177	626	700	167	146
6	45	401	62	313	508	156	290	168	e2300	e3000	261	111
7	36	212	55	951	415	518	202	143	e1600	446	194	91
8	31	182	45	e2000	284	208	204	223	747	378	150	81
9	28	225	38	e1800	185	143	140	345	410	248	125	79
10	24	253	35	e7000	153	115	110	286	305	194	115	65
11	21	e1700	98	e1950	168	96	90	328	244	205	110	57
12	39	350	51	920	152	95	79	297	609	163	100	232
13	49	243	37	e5000	130	79	66	e3400	370	e1900	102	295
14	e95	623	36	e4500	168	65	131	e2300	276	e2200	125	87
15	106	298	30	e4600	95	56	171	e1700	399	787	99	72
16	46	206	31	e2700	78	57	98	987	272	434	103	93
17	35	179	31	1190	67	127	77	1050	230	303	89	327
18	30	335	32	825	61	153	63	657	227	234	73	237
19	27	155	48	564	56	81	62	457	172	e964	70	165
20	38	156	109	557	52	69	242	601	142	e3800	292	161
21	97	196	67	646	45	67	291	471	133	e1400	809	115
22	102	471	149	888	42	46	788	411	116	e8500	305	91
23	54	e1750	52	533	221	39	e1800	1040	105	e1700	202	76
24	53	657	55	446	1060	35	551	670	87	892	153	81
25	49	530	127	336	922	33	329	e3500	75	790	119	53
26	33	373	e2000	273	376	36	239	e1500	84	589	99	55
27	40	288	383	229	238	39	211	568	82	412	84	64
28	e400	236	390	283	177	27	366	385	64	327	74	64
29	117	183	982	233	---	25	827	e1900	90	838	65	102
30	104	184	e3100	184	---	24	e2800	934	76	837	61	62
31	66	---	e3400	157	---	24	---	602	---	492	56	---
TOTAL	2025	12514	11926	43578	6360	3033	11624	26501	11108	33256	5249	3872
MEAN	65.3	417	385	1406	227	97.8	387	855	370	1073	169	129
MAX	400	1750	3400	7000	1060	518	2800	3500	2300	8500	809	340
MIN	21	46	30	157	42	24	62	143	64	53	56	53
AC-FT	4020	24820	23660	86440	12620	6020	23060	52560	22030	65960	10410	7680

CAL YR 1988	TOTAL	65515	MEAN	179	MAX	3400	MIN	15	AC-FT	129900
WTR YR 1989	TOTAL	171046	MEAN	469	MAX	8500	MIN	21	AC-FT	339300

e Estimsted

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 mi^2, of which 81 mi^2 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.--Recorda good except for estimated daily discharges, which are fair. Hilo Electric Light Co. diverts upstream for Hydro-plant use.

AVERAGE DISCHARGE.--10 years (water years 1978, 1979, 1981-87, 1989), 416 ft^3/s (301,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,800 ft^3/s, Dec. 13, 1987, gage height, 38.66 ft, from floodmarks and from rating curve extended above 6,840 ft^3/s on basis of slope-area measurements at gage heights 23.30 ft, 34.57 ft, and 38.66 ft; minimum, 4.6 ft^3/s, July 17, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,500 ft^3/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)
Dec. 26	0130	11,800	13.66	May 13	1430	10,600	13.10
Dec. 31	0300	14,700	15.00	May 25	1700	18,200	16.53
Jan. 10	1900	20,100	17.34	July 6	0700	21,700	18.05
Jan. 13	2030	20,000	17.32	July 13	2230	11,000	13.32
Apr. 29	2030	10,600	13.12	July 22	1700	*29,700	*21.40

Minimum discharge, 22 ft^3/s, Feb. 22.

DISCHARGE, IN 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	e85	79	275	1870	186	171	320	1140	825	58	620	148
2	e70	64	220	700	157	128	384	700	652	46	572	643
3	e55	57	214	1190	239	99	766	522	580	45	432	318
4	e50	1390	175	950	292	77	354	394	480	676	358	411
5	e45	1060	144	750	190	301	483	340	1060	1200	286	255
6	e55	661	123	560	722	224	528	322	2920	3670	492	182
7	e45	355	104	1920	663	938	325	255	1970	790	349	117
8	e40	275	88	2450	490	370	355	463	1270	735	240	105
9	e35	345	69	2280	242	230	214	740	725	460	190	103
10	e30	456	60	9570	190	177	157	580	572	370	171	71
11	e25	2060	183	2330	216	139	116	603	452	391	162	69
12	43	812	94	1320	190	133	103	540	1210	298	136	152
13	78	418	61	6670	120	103	83	4300	750	2390	128	541
14	111	881	50	5630	237	76	407	2960	540	2800	179	92
15	e150	522	42	5720	87	55	468	2310	840	1340	130	68
18	e80	355	32	3430	57	57	222	1740	552	805	128	119
17	40	344	35	1670	47	89	155	1690	470	576	108	603
18	30	807	32	1220	38	293	112	1100	463	442	76	400
19	24	286	45	975	32	88	108	800	340	2100	71	250
20	32	295	186	950	27	68	490	1060	270	4860	677	260
21	42	334	117	1050	25	81	608	850	250	1840	1610	153
22	216	541	286	1430	23	34	1290	750	210	10700	812	103
23	98	2070	81	800	324	27	2420	1740	180	2170	376	76
24	64	1040	78	760	1480	29	1000	1310	138	1360	275	52
25	76	900	171	588	1440	26	660	4360	105	1290	208	39
26	38	710	2680	470	580	28	470	1890	108	1030	162	42
27	99	548	840	379	346	50	448	1000	122	740	130	81
28	536	452	581	463	230	30	938	710	71	588	105	55
29	228	349	1600	381	---	28	2850	2420	118	1430	81	150
30	182	364	3900	275	---	24	3640	1880	105	1400	73	57
31	108	---	4350	224	---	26	---	1160	---	900	65	---
TOTAL	2808	18630	16714	58975	8870	4197	20474	40629	18348	47500	9200	5695
MEAN	90.6	621	539	1902	317	135	682	1311	612	1532	297	190
MAX	536	2070	4350	9570	1480	938	3640	4360	2920	10700	1610	643
MIN	24	57	32	224	23	24	83	255	71	45	65	39
AC-FT	5570	36950	33150	117000	17590	8320	40610	80590	36390	94220	18250	11300

WTR YR 1989 TOTAL 252040 MEAN 691 MAX 10700 MIN 23 AC-FT 499900

e Estimated

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
25...	0900	758	77	59	6.70	19.0	2.0	9.1	99	310
27...	1345	--	27	--	--	18.0	--	--	--	--
DEC										
13...	0815	755	63	65	6.60	19.0	1.4	8.0	98	36
16...	1115	--	30	--	--	17.0	--	--	--	--
FEB										
22...	0930	--	21	--	--	17.0	--	--	--	--
MAR										
23...	1445	--	27	--	--	17.5	--	--	--	--
28...	0815	755	30	70	8.80	19.0	0.40	9.0	98	58
APR										
25...	0645	755	705	39	6.50	19.0	12	9.0	98	150
JUN										
13...	0815	755	785	32	6.30	18.5	1.7	9.4	101	720
JUL										
03...	0945	--	38	--	--	19.0	--	--	--	--
AUG										
14...	0845	755	180	58	8.80	19.0	0.70	9.1	99	120
SEP										
25...	1205	--	38	--	--	19.0	--	--	--	--

DATE	TIME	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
25...	0900	810	22	3	4.2	2.7	3.1	23	0.3	1.0	23
DEC											
13...	0815	410	24	3	4.7	3.0	3.8	25	0.3	0.80	26
MAR											
28...	0815	780	24	0	4.6	3.0	3.9	26	0.3	0.60	33
APR											
25...	0645	700	13	0	2.6	1.7	2.7	30	0.3	0.40	23
JUN											
13...	0815	1100	10	0	2.1	1.2	2.1	30	0.3	0.30	12
AUG											
14...	0845	250	20	0	4.4	2.3	3.0	24	0.3	0.40	36

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
25...	0	20	19	3.7	4.3	0.10	11	49	43
DEC									
13...	0	23	22	2.8	4.6	0.10	15	56	49
MAR									
28...	0	23	25	3.7	4.2	0.10	14	42	51
APR									
25...	0	12	19	1.8	3.2	0.10	8.9	28	33
JUN									
13...	0	10	10	2.0	2.7	<0.10	7.5	27	24
AUG									
14...	0	30	30	2.0	3.6	<0.10	14	56	48

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
25...	0.07	0.330	0.020	0.030	0.18	0.20	0.020	0.010	<0.010
DEC									
13...	0.08	0.230	0.080	0.070	--	<0.20	0.020	<0.010	<0.010
MAR									
28...	0.06	0.160	<0.010	0.060	--	<0.20	<0.010	<0.010	<0.010
APR									
25...	0.04	0.110	0.010	0.060	0.19	0.20	<0.010	<0.010	<0.010
JUN									
13...	0.04	0.100	0.020	0.020	0.58	0.60	<0.010	<0.010	<0.010
AUG									
14...	0.08	0.120	0.020	0.030	0.68	0.70	<0.010	<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											
13...	0815	20	<1	<2	<0.5	<1	<1	<3	2	18	<5
MAR											
28...	0815	20	<1	<2	<0.5	<1	<1	<3	2	42	<5
JUN											
13...	0815	60	<1	<2	<0.5	<1	<1	<3	2	120	<1
AUG											
14...	0845	20	<1	<2	<0.5	<1	2	<3	2	42	<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										
13...	<4	2	<0.1	<10	2	<1	<1.0	32	<6	<3
MAR										
28...	<4	1	<0.1	<10	<1	2	<1.0	29	<6	<3
JUN										
13...	<4	2	<0.1	<10	<1	<1	<1.0	15	<6	3
AUG										
14...	<4	1	<0.1	<10	1	<1	<1.0	30	<6	<3

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				
25...	0900	4	0.83	100
DEC				
13...	0815	5	0.85	100
MAR				
28...	0815	3	0.24	100
APR				
25...	0645	2	3.8	100
JUN				
13...	0815	6	13	100
AUG				
14...	0845	4	1.9	100

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

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 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. 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 ft^3/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--23 years, 128 ft^3/s (92,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 31	0400	5,490	12.99	July 6	0630	9,820	16.16
Jan. 10	2000	5,320	12.80	July 22	1330	*11,100	*16.80
May 25	1700	5,280	12.76				

Minimum discharge, 10 ft^3/s, Oct. 20-22.

DISCHARGE, IN 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	28	21	51	769	30	33	154	122	159	29	101	119
2	22	19	40	164	27	28	184	78	110	29	106	273
3	19	21	38	274	76	25	187	63	114	48	87	105
4	17	609	31	128	78	61	69	53	73	288	80	184
5	16	269	27	113	59	97	161	51	724	382	67	103
6	28	118	24	69	223	115	105	69	1040	1160	138	67
7	18	51	22	729	282	309	92	53	617	104	84	57
8	16	45	20	886	90	90	101	204	249	133	61	57
9	14	73	19	959	49	54	58	251	94	71	52	57
10	13	161	18	2210	38	42	49	147	77	65	54	47
11	12	644	35	329	51	36	42	148	65	91	60	44
12	14	79	22	120	52	41	39	101	270	81	53	107
13	22	52	17	1870	33	34	36	1300	110	997	49	148
14	28	244	17	1930	57	29	160	1240	74	724	64	59
15	34	68	16	1830	30	24	181	655	233	245	56	53
16	16	61	14	552	24	40	74	337	88	115	58	94
17	14	129	13	188	21	111	52	290	76	83	57	207
18	12	154	14	121	19	84	50	179	82	64	44	122
19	11	52	25	96	19	43	71	117	56	1150	64	101
20	11	62	51	99	19	90	325	252	46	1290	371	106
21	10	112	134	254	17	41	231	138	49	252	713	66
22	32	390	86	274	17	26	513	178	41	2520	134	52
23	21	590	33	105	219	22	852	526	38	288	82	45
24	21	221	37	108	714	20	162	470	31	178	68	40
25	17	183	196	74	632	19	85	1170	28	232	57	37
26	14	115	1000	55	92	29	59	368	33	179	50	54
27	14	114	74	45	53	25	71	119	32	105	45	80
28	133	81	186	169	41	17	321	84	26	99	42	67
29	63	57	477	51	---	15	1160	824	67	621	38	91
30	42	88	1450	38	---	16	952	382	43	398	42	51
31	24	---	2410	33	---	29	---	176	---	166	38	---
TOTAL	756	4863	6597	14642	3062	1645	6596	10145	4745	12187	3015	2693
MEAN	24.4	162	213	472	109	53.1	220	327	158	393	97.3	89.8
MAX	133	644	2410	2210	714	309	1160	1300	1040	2520	713	273
MIN	10	19	13	33	17	15	36	51	26	29	38	37
AC-FT	1500	9650	13090	29040	6070	3260	13080	20120	9410	24170	5980	5340

CAL YR 1988	TOTAL	34899	MEAN	95.4	MAX	2410	MIN	10	AC-FT	69220
WTR YR 1989	TOTAL	70946	MEAN	194	MAX	2520	MIN	10	AC-FT	140700

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
05...	1435	--	15	--	--	19.0	--	--	--	--
25...	0745	724	16	62	6.80	18.0	9.4	8.8	98	K470
NOV										
29...	1155	--	54	--	--	18.0	--	--	--	--
DEC										
13...	0900	724	17	62	6.70	18.0	0.80	8.8	98	48
MAR										
23...	0925	--	22	--	--	18.0	--	--	--	--
28...	0700	724	18	65	6.70	17.5	1.2	9.2	101	140
APR										
25...	0815	724	90	27	6.00	17.0	20	9.0	98	53
JUN										
13...	0645	724	124	24	6.60	17.0	1.7	9.0	98	410
23...	1435	--	37	--	--	18.0	--	--	--	--
AUG										
14...	0645	724	65	51	6.80	17.5	1.1	9.0	99	47
SEP										
11...	1035	--	45	--	--	18.0	--	--	--	--

DATE	TIME	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
25...	0745	1900	24	0	4.8	2.9	3.0	21	0.3	0.40	29
DEC											
13...	0900	330	26	0	5.3	3.0	3.1	21	0.3	0.40	31
MAR											
28...	0700	220	27	0	5.5	3.1	3.3	21	0.3	0.40	34
APR											
25...	0815	210	10	0	1.9	1.2	1.9	29	0.3	0.20	16
JUN											
13...	0645	320	8	0	1.6	0.91	1.7	32	0.3	0.10	13
AUG											
14...	0645	K50	19	1	4.0	2.3	2.8	24	0.3	0.20	23

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
25...	0	25	24	4.3	2.9	0.10	13	48	46
DEC									
13...	0	27	26	2.5	3.0	0.10	15	50	48
MAR									
28...	0	23	28	3.6	2.9	<0.10	15	--	51
APR									
25...	0	9.0	13	1.6	2.3	<0.10	6.1	26	23
JUN									
13...	0	7.0	11	1.0	2.1	<0.10	5.2	22	19
AUG									
14...	0	20	19	1.0	3.0	<0.10	12	58	37

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
25...	0.06	<0.100	0.040	0.060	0.26	0.30	0.020	0.010	<0.010
DEC									
13...	0.07	0.100	0.050	0.070	--	<0.20	0.010	0.010	0.010
MAR									
28...	0.07	<0.100	<0.010	0.030	--	0.20	0.020	0.010	0.010
APR									
25...	0.03	<0.100	<0.010	0.030	--	<0.20	<0.010	<0.010	0.010
JUN									
13...	0.03	<0.100	0.030	0.060	0.27	0.30	<0.010	<0.010	<0.010
AUG									
14...	0.08	<0.100	<0.010	0.070	--	1.4	<0.010	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)
OCT											
25...	0745	60	<1	<2	<0.5	<1	<1	<3	1	160	<5
MAR											
28...	0700	30	<1	<2	<0.5	1	<1	<3	5	73	<5
JUN											
13...	0645	110	<1	<2	<0.5	<1	1	<3	6	210	1
AUG											
14...	0645	40	<1	<2	<0.5	<1	1	<3	4	130	<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										
25...	<4	2	0.2	<10	2	<1	<1.0	32	<6	8
MAR										
28...	<4	2	<0.1	<10	1	<1	1.0	37	<6	<3
JUN										
13...	<4	3	<0.1	<10	<1	<1	<1.0	11	<6	7
AUG										
14...	<4	1	0.1	<10	1	<1	<1.0	27	<6	5

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 SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)
DEC									
13...	0900	<0.4	<0.4	0.7	0.8	0.6	0.8	0.03	<0.01
APR									
25...	0815	<0.4	<0.4	0.5	<0.4	0.5	<0.4	<0.02	<0.01

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
25...	0745	5	0.22	100
DEC				
13...	0900	1	0.05	100
MAR				
28...	0700	2	0.10	100
APR				
25...	0815	2	0.49	100
JUN				
13...	0645	2	0.67	100
AUG				
14...	0645	2	0.35	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 mi^2.

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. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years, 14.9 ft^3/s (10,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s, Nov. 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0900	1,320	7.39	May 29	2200	505	5.25
Apr. 7	1900	*1,720	*8.12	June 5	2300	691	5.87
Apr. 28	1730	670	5.80				

Minimum discharge, 0.29 ft^3/s, Mar. 22, 24.

DISCHARGE, IN 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	2.0	4.1	4.1	8.8	1.4	.94	11	4.6	18	3.1	8.3	25
2	1.7	4.4	2.7	4.5	1.3	.72	13	1.5	3.6	2.3	23	25
3	1.5	3.2	2.1	20	145	.60	5.8	.91	1.9	4.3	11	7.1
4	1.5	13	1.8	9.5	50	44	1.5	1.0	10	29	9.7	12
5	7.1	15	1.6	8.4	17	12	52	.84	79	25	13	5.8
6	7.8	3.1	1.5	4.6	5.5	33	28	.54	77	42	12	6.8
7	3.1	2.4	1.9	7.8	2.7	45	254	.37	22	7.6	5.0	6.9
8	2.4	35	1.5	68	1.9	13	98	9.7	9.9	6.7	2.7	5.5
9	2.1	9.3	1.4	30	1.8	2.7	12	19	3.7	5.3	2.0	6.9
10	1.8	34	3.9	79	29	2.6	4.3	11	1.8	22	1.7	16
11	2.2	41	43	15	42	1.6	1.8	6.3	1.5	43	1.5	14
12	4.1	12	12	4.5	18	1.2	1.1	7.6	36	43	2.1	5.0
13	3.5	39	3.5	17	3.2	.88	.75	79	6.9	148	2.1	2.6
14	2.8	29	2.7	116	1.9	.62	139	34	27	104	6.8	2.9
15	2.1	10	2.1	94	1.4	5.3	35	14	43	26	6.4	2.5
16	1.8	5.0	11	27	1.2	9.5	12	18	20	13	5.8	2.0
17	1.7	3.1	21	11	1.1	1.5	3.3	12	22	8.8	3.2	4.6
18	1.5	3.2	3.7	10	1.0	.92	3.4	8.9	14	21	2.9	3.5
19	1.4	4.1	2.4	19	1.1	.60	3.2	21	1.7	154	14	4.7
20	1.4	3.9	2.1	12	1.2	.48	7.1	46	9.2	22	161	2.5
21	1.3	46	2.1	5.0	.97	.38	17	12	5.0	8.7	14	2.0
22	1.2	80	2.2	11	1.4	.32	36	10	3.6	47	9.8	1.7
23	1.3	46	1.9	3.7	15	.39	35	27	3.0	12	8.0	1.8
24	1.8	30	16	2.7	64	.33	6.9	26	2.2	8.0	4.7	1.4
25	1.4	7.5	58	2.2	32	1.5	1.7	88	1.9	30	2.5	3.2
26	1.3	3.7	49	2.0	3.7	.86	1.0	28	1.8	20	1.8	5.8
27	1.4	11	5.7	1.9	1.7	.80	1.4	6.2	1.5	9.9	1.5	18
28	10	5.0	4.5	1.7	1.2	1.4	162	8.5	1.3	33	1.3	5.0
29	6.7	8.0	7.2	1.6	---	8.5	120	47	21	46	1.2	5.9
30	4.4	15	21	1.6	---	7.6	43	46	7.8	28	1.6	2.4
31	3.6	---	23	1.5	---	30	---	38	---	8.9	1.5	---
TOTAL	87.9	526.0	316.6	601.0	447.67	229.24	1110.25	632.96	457.3	981.6	342.1	208.3
MEAN	2.84	17.5	10.2	19.4	16.0	7.39	37.0	20.4	15.2	31.7	11.0	6.94
MAX	10	80	58	116	145	45	254	88	79	154	161	25
MIN	1.2	2.4	1.4	1.5	.97	.32	.75	.37	1.3	2.3	1.2	1.4
AC-FT	174	1040	628	1190	888	455	2200	1260	907	1950	679	413

CAL YR 1988	TOTAL	4686.8	MEAN	12.8	MAX	110	MIN	1.1	AC-FT	9300
WTR YR 1989	TOTAL	5940.92	MEAN	16.3	MAX	254	MIN	.32	AC-FT	11780

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 Hamakua ditch intake and 4.4 mi north of Kamuela.

DRAINAGE AREA.--0.45 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 4.26 ft^3/s (3,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft^3/s, Nov. 18, 1979, gage height, 8.32 ft, from rating curve extended above 33 ft^3/s on basis of slope-area measurement at gage height 8.32 ft; minimum, 0.01 ft^3/s, Mar. 10-15, 1983.

EXTREMES FOR CURRENT YEAR.--Paak discharges greater than base discharge of 100 ft^3/a and maximum (*):

Data	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0900	444	4.97	May 29	2200	169	3.39
Apr. 7	2000	*787	*6.29	June 5	2300	186	3.51
Apr. 14	0400	119	2.88	Aug. 20	0400	116	2.85
Apr. 28	1700	234	3.83				

Minimum discharge, 0.10 ft^3/s, Oct. 23, 25-27.

DISCHARGE, IN 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	.24	.53	.73	1.7	.18	.22	3.0	2.0	4.3	.85	2.4	6.4
2	.19	.60	.39	.73	.18	.19	4.4	.61	1.8	.58	4.8	5.0
3	.17	.42	.30	4.1	37	.18	2.1	.40	.98	1.4	3.3	2.0
4	.16	1.6	.23	2.0	10	12	.47	.45	2.9	6.2	3.0	2.5
5	1.9	2.5	.20	2.8	5.7	4.0	14	.48	23	5.0	4.2	1.5
6	1.5	.43	.19	.71	1.8	11	7.6	.37	27	9.1	3.4	2.7
7	.40	.28	.32	.87	.78	14	67	.30	9.3	2.0	2.3	2.5
8	.26	9.8	.22	12	.38	4.6	23	5.4	3.9	2.0	2.3	1.9
9	.20	2.2	.20	4.1	.58	1.1	5.1	6.4	2.6	1.7	2.0	2.4
10	.17	8.2	.46	14	8.7	1.3	2.0	4.8	1.4	5.3	1.3	4.0
11	.25	9.8	8.0	2.3	11	.62	.66	2.7	1.2	9.1	.97	3.7
12	1.1	2.7	2.1	.54	4.6	.43	.40	2.9	15	9.5	1.0	1.7
13	.62	5.8	.45	3.7	.86	.33	.37	24	3.4	37	.70	.67
14	.41	5.3	.29	29	.40	.27	47	8.9	11	24	2.6	.99
15	.24	2.1	.21	19	.31	3.0	10	3.7	17	5.3	2.7	.76
16	.19	1.0	1.7	4.2	.24	3.5	3.8	7.4	8.0	2.8	2.2	.56
17	.16	.46	3.1	2.3	.22	.54	1.4	4.7	8.5	2.3	1.4	1.6
18	.15	.53	.46	2.0	.23	.29	1.7	4.0	6.0	6.0	1.0	1.5
19	.14	1.3	.28	4.7	.26	.22	1.7	6.7	1.3	39	4.6	2.3
20	.14	.89	.23	2.3	.30	.20	2.8	14	5.4	4.4	44	1.2
21	.12	11	.^3	1.1	.24	.18	6.3	4.3	2.9	2.8	4.2	.84
22	.12	19	.23	2.9	.38	.18	11	4.8	1.4	11	3.1	.66
23	.12	11	.19	.74	2.7	.21	8.2	9.9	.76	2.9	2.4	.55
24	.13	5.5	2.6	.59	18	.18	2.3	7.6	.54	1.9	1.4	.50
25	.12	1.4	13	.34	9.5	.42	.59	25	.51	6.6	.64	1.1
26	.10	.57	9.9	.30	1.2	.24	.35	7.4	.49	4.8	.45	1.7
27	.19	2.7	.88	.27	.43	.25	.58	2.6	.45	2.9	.37	4.3
28	3.3	1.2	1.1	.24	.27	.57	56	3.8	.40	9.3	.33	2.3
29	1.9	1.9	1.9	.22	---	2.9	38	16	6.0	10	.31	2.7
30	.89	4.7	3.6	.20	---	2.3	13	13	2.5	6.5	.39	.86
31	.56	---	3.1	.20	---	8.0	---	14	---	2.7	.36	---
TOTAL	16.14	115.41	56.79	120.15	116.44	73.42	334.82	208.61	169.93	234.93	104.12	61.39
MEAN	.52	3.85	1.83	3.88	4.16	2.37	11.2	6.73	5.66	7.58	3.36	2.05
MAX	3.3	19	13	29	37	14	67	25	27	39	44	6.4
MIN	.10	.28	.19	.20	.18	.18	.35	.30	.40	.58	.31	.50
AC-FT	32	229	113	238	231	146	664	414	337	466	207	122

CAL YR 1988	TOTAL	1137.25	MEAN	3.11	MAX	29	MIN	.10	AC-FT	2260
WTR YR 1989	TOTAL	1612.15	MEAN	4.42	MAX	67	MIN	.10	AC-FT	3200

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 Kawaiki 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 Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years, 7.25 ft^3/s (5,250 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s, Nov. 2, 1967; no flow Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft^3/s, Apr. 14, July 13, 14, 19; minimum daily, 0.56 ft^3/s Oct. 22.

DISCHARGE, IN 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	1.5	6.4	5.6	12	.72	e1.5	15	14	16	4.8	6.9	13
2	1.1	7.4	2.7	4.9	.67	e1.0	16	6.6	13	3.5	16	17
3	.89	4.8	1.9	16	12	e1.0	13	3.5	9.0	6.1	10	11
4	.78	5.4	1.4	12	12	e16	3.8	4.1	9.3	18	12	13
5	4.9	15	1.2	12	9.6	e12	11	3.6	17	17	10	8.6
6	11	5.0	.94	5.8	2.7	e15	18	2.6	17	19	13	6.7
7	3.6	2.9	1.6	9.8	2.6	e18	19	2.1	16	11	7.0	9.8
8	1.6	18	1.2	15	2.3	e10	14	14	14	11	3.4	8.2
9	1.4	15	.89	17	2.5	e3.5	11	16	12	8.4	2.4	9.4
10	.94	15	2.6	18	14	e3.5	4.9	16	7.7	17	1.8	17
11	2.0	18	17	14	18	e2.5	6.4	15	7.1	18	1.4	15
12	6.9	16	12	5.2	16	e2.5	4.7	15	16	18	2.6	7.4
13	4.8	18	3.1	9.8	7.4	e1.5	2.7	17	13	20	2.7	2.9
14	3.0	18	1.9	19	2.9	e1.5	20	17	16	20	9.5	3.8
15	1.6	15	1.3	18	e2.5	e6.0	19	16	17	17	8.8	2.9
16	1.2	10	4.0	17	e2.5	e10	17	16	16	15	8.4	2.1
17	.89	5.2	14	14	e2.0	e3.5	15	15	16	13	4.7	6.9
18	.84	4.8	3.5	14	e2.0	2.3	15	15	15	12	4.0	5.0
19	.67	7.2	1.7	12	e1.5	1.5	15	14	8.0	20	9.5	7.4
20	.62	5.8	1.4	13	e1.5	1.4	16	17	10	17	18	3.1
21	.62	17	1.6	6.6	e1.5	1.1	18	16	12	13	14	2.4
22	.56	18	1.7	13	e2.0	1.0	18	16	8.8	19	13	1.9
23	.67	18	1.2	3.4	e12	1.2	18	17	5.0	14	9.6	1.6
24	1.0	18	12	2.3	e18	.94	16	16	3.5	11	6.6	1.4
25	.67	12	18	1.8	e15	3.8	9.9	18	3.2	18	3.2	4.2
26	.62	4.4	17	1.4	e4.5	1.9	3.5	17	2.9	17	2.3	6.4
27	1.3	14	7.7	1.3	e2.5	2.2	4.6	15	2.4	13	1.7	16
28	14	8.6	6.0	.94	e2.0	4.1	19	15	2.1	13	1.4	7.7
29	12	7.8	12	.89	---	15	18	17	14	18	1.2	9.1
30	7.8	15	15	.89	---	15	17	17	12	17	1.4	2.7
31	5.8	---	16	.78	---	17	---	16	---	11	1.4	---
TOTAL	95.27	345.7	188.13	291.80	172.89	177.44	398.5	419.5	331.0	449.8	207.9	223.6
MEAN	3.07	11.5	6.07	9.41	6.17	5.72	13.3	13.5	11.0	14.5	6.71	7.45
MAX	14	18	18	19	18	18	20	18	17	20	18	17
MIN	.56	2.9	.89	.78	.67	.94	2.7	2.1	2.1	3.5	1.2	1.4
AC-FT	189	686	373	578	343	352	790	832	657	892	412	444

CAL YR 1988	TOTAL	3066.94	MEAN	8.38	MAX	19	MIN	.56	AC-FT	6080
WTR YR 1989	TOTAL	3301.33	MEAN	9.04	MAX	20	MIN	.56	AC-FT	6550

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 4.88 ft^3/s (3,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Aug. 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s, Apr. 28; no flow for many days.

DISCHARGE, IN 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	.29	.76	2.8	4.1	.01	.36	5.3	10	9.8	4.0	6.1	5.7
2	.11	.91	1.3	2.2	.00	.19	5.7	5.5	7.6	3.4	11	8.7
3	.02	.55	.71	4.9	7.8	.08	4.6	3.5	5.4	3.5	7.4	6.4
4	.00	.50	.38	4.5	5.4	3.1	1.7	3.5	4.6	9.3	8.5	6.9
5	.54	3.4	.23	4.4	4.9	5.2	7.4	3.0	11	9.9	7.3	5.2
6	2.5	1.2	.13	2.4	1.8	6.2	7.4	2.2	14	12	9.2	4.5
7	.87	.34	.46	3.0	1.5	8.2	13	1.7	12	7.4	5.6	6.0
8	.34	4.4	.19	5.1	1.2	6.4	7.7	6.9	9.4	6.7	3.6	4.5
9	.16	3.7	.04	6.0	.57	3.6	3.0	8.7	7.6	5.6	3.3	5.2
10	.03	4.3	.22	7.0	4.8	3.4	1.8	8.2	5.2	9.3	2.6	8.1
11	.02	5.7	4.8	5.5	7.2	2.0	1.4	7.2	4.4	11	2.1	8.0
12	1.0	4.6	3.8	2.5	6.5	1.4	1.2	7.1	11	11	2.3	4.9
13	.88	4.9	1.4	3.2	3.2	.73	.78	12	7.6	17	2.3	2.6
14	.41	5.3	.69	9.0	1.5	.37	12	10	11	16	5.1	2.4
15	.14	4.4	.29	8.5	.90	2.1	6.0	8.7	13	13	5.1	2.1
16	.02	3.3	.76	6.7	.48	4.6	4.5	9.4	11	10	5.6	1.4
17	.00	1.9	4.1	5.5	.32	1.6	3.4	9.0	11	8.9	4.0	3.3
18	.00	1.4	1.5	5.5	.30	.68	3.1	8.6	9.6	9.0	2.9	2.7
19	.00	2.9	.49	5.2	.32	.30	3.0	7.3	5.4	18	5.0	4.2
20	.00	2.0	.30	5.2	.41	.19	3.0	11	6.4	13	17	2.6
21	.00	6.0	.20	3.1	.21	.11	4.0	8.9	6.9	9.8	9.9	1.7
22	.00	7.8	.29	4.9	.49	.03	5.1	9.0	4.7	14	8.8	1.2
23	.00	7.3	.12	2.2	1.5	.09	4.4	11	3.7	10	6.8	.87
24	.00	6.8	2.2	1.1	7.5	.02	4.2	8.9	2.5	8.3	5.5	.63
25	.00	4.9	5.4	.63	6.9	.64	3.6	13	2.0	11	3.3	1.4
26	.00	2.7	6.0	.39	3.8	.29	3.3	11	1.8	11	3.1	3.1
27	.00	5.0	2.9	.32	1.4	.18	3.2	8.6	1.3	9.3	2.6	6.8
28	1.8	3.6	2.5	.20	.67	.70	21	8.4	1.0	8.8	1.4	4.1
29	2.2	3.4	4.1	.12	---	3.5	18	10	7.6	12	.79	4.7
30	1.3	5.7	4.5	.09	---	4.3	16	12	7.4	12	.96	1.9
31	.72	---	5.1	.04	---	5.7	---	12	---	8.8	.93	---
TOTAL	13.35	109.66	57.90	113.49	71.58	66.26	178.78	256.3	215.7	313.0	160.08	121.80
MEAN	.43	3.66	1.87	3.66	2.56	2.14	5.96	8.27	7.19	10.1	5.16	4.06
MAX	2.5	7.8	6.0	9.0	7.8	8.2	21	13	14	18	17	8.7
MIN	.00	.34	.04	.04	.00	.02	.78	1.7	1.0	3.4	.79	.63
AC-FT	26	218	115	225	142	131	355	508	428	621	318	242

CAL YR 1988	TOTAL	1125.25	MEAN	3.07	MAX	11	MIN	.00	AC-FT	2230
WTR YR 1989	TOTAL	1677.90	MEAN	4.60	MAX	21	MIN	.00	AC-FT	3330

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 mi^2.

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 except for estimated daily discharges, which are fair. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years, 6.96 ft^3/s (5,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft^3/s, Apr. 7, 1989, gage height, 10.28 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 120 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0800	752	7.28	Apr. 28	1830	666	7.12
Apr. 7	2000	*2,400	*10.28	Aug. 20	0430	163	4.80

Minimum, 0.68 ft^3/s, Oct. 23, 26, 27.

DISCHARGE, IN 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	1.4	1.9	2.8	3.0	.95	1.4	7.4	8.1	11	2.5	5.4	8.6
2	1.2	1.9	2.1	2.4	.90	1.2	9.3	4.6	7.1	2.0	6.2	7.6
3	1.0	1.8	1.7	7.6	50	1.1	6.0	4.0	4.3	2.4	5.6	3.7
4	1.0	2.2	1.4	4.4	26	19	2.6	5.2	4.5	8.6	4.5	3.6
5	3.5	6.0	1.2	5.8	11	8.5	26	5.1	31	9.8	7.6	2.9
6	3.8	2.3	1.2	2.9	6.0	e20	14	4.7	44	19	4.4	5.6
7	2.1	1.6	1.2	2.6	3.5	e10	172	4.4	16	4.7	3.2	5.2
8	1.4	15	1.2	16	2.1	e7.0	52	12	8.9	3.6	2.4	3.3
9	1.2	4.0	1.0	6.0	1.6	e5.0	12	15	5.4	3.4	2.1	3.7
10	.96	14	1.0	17	15	e3.2	5.8	11	3.6	7.9	1.8	6.7
11	.97	16	12	4.5	20	2.6	2.6	7.8	3.2	14	1.6	7.1
12	2.0	4.6	5.3	2.7	12	2.1	2.0	7.3	29	15	2.4	4.0
13	2.4	7.2	2.6	5.0	3.2	1.8	1.7	36	7.9	53	2.3	2.4
14	1.7	8.2	1.9	39	2.4	1.5	76	19	23	41	5.6	2.3
15	1.3	4.3	1.5	29	2.1	5.7	22	11	34	11	7.2	2.2
16	1.1	3.0	2.1	7.1	1.6	7.3	9.4	16	17	5.0	5.2	1.9
17	.95	2.2	6.9	4.3	1.4	2.6	5.7	12	20	4.1	3.5	2.5
18	.67	2.5	2.4	3.9	1.4	1.9	6.5	9.8	13	12	2.6	2.7
19	.80	3.6	1.6	9.3	1.5	1.5	6.5	12	3.6	50	6.1	4.0
20	.76	2.6	1.4	4.6	1.6	1.3	7.3	27	11	6.9	59	2.5
21	.72	18	1.2	3.5	1.4	1.2	13	11	5.7	6.2	10	2.1
22	.71	28	1.2	4.5	1.4	1.0	23	10	2.9	20	7.6	1.9
23	.71	15	1.0	2.6	2.4	1.1	18	22	2.3	4.6	4.8	1.7
24	.73	7.6	2.6	2.0	30	1.0	5.3	12	2.0	5.4	4.2	1.5
25	.71	3.5	19	1.6	15	1.2	3.8	41	1.8	10	2.5	1.5
26	.68	2.5	19	1.4	3.5	1.2	4.9	18	1.7	6.3	2.1	2.0
27	.86	4.4	3.4	1.4	2.4	1.0	3.8	8.1	1.6	3.5	1.8	5.1
28	5.1	3.2	2.9	1.2	1.7	1.3	130	10	1.4	17	1.5	3.9
29	4.4	3.6	4.0	1.1	---	3.6	87	19	11	22	1.4	4.7
30	3.0	8.1	5.3	1.1	---	4.8	31	27	5.9	7.6	1.4	2.4
31	2.2	---	4.3	1.0	---	13	---	24	---	4.3	1.3	---
TOTAL	50.23	198.8	116.4	198.5	222.05	135.1	766.6	434.1	333.8	382.8	177.3	109.3
MEAN	1.62	6.63	3.75	6.40	7.93	4.36	25.6	14.0	11.1	12.3	5.72	3.64
MAX	5.1	28	19	39	50	20	172	41	44	53	59	8.6
MIN	.68	1.6	1.0	1.0	.90	1.0	1.7	4.0	1.4	2.0	1.3	1.5
AC-FT	100	394	231	394	440	268	1520	861	662	759	352	217

CAL YR 1988	TOTAL	2131.20	MEAN	5.82	MAX	48	MIN	.68	AC-FT	4230
WTR YR 1989	TOTAL	3124.98	MEAN	8.56	MAX	172	MIN	.68	AC-FT	6200

e Estimated

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 11.9 ft^3/s (8,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 56 ft^3/s, Apr. 14, 1989; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 58 ft^3/s, Apr. 14; minimum daily, 0.45 ft^3/s, Oct. 21.

DISCHARGE, IN 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	2.2	2.3	22	e5.0	e1.0	e2.5	34	29	15	25	7.0	17
2	1.5	1.4	12	e4.5	e1.0	e2.0	34	16	6.5	19	25	23
3	1.1	13	2.9	e10	e35	e1.5	34	16	15	11	11	7.8
4	1.0	6.2	2.0	e6.5	e20	e20	16	21	30	37	22	6.4
5	10	2.6	1.7	e8.0	e15	e10	31	14	44	39	24	4.2
6	13	12	1.2	e5.0	e9.0	e25	47	4.3	49	42	26	4.7
7	2.5	29	1.4	e4.5	e5.0	e15	45	3.4	46	33	11	4.8
8	1.2	20	1.2	e20	e3.5	e9.0	41	37	41	32	1.9	2.1
9	.99	35	1.0	e9.0	e2.5	e7.0	34	20	37	30	1.5	4.1
10	1.6	31	1.2	e20	e18	e6.0	26	19	32	37	1.3	9.5
11	3.2	25	32	e7.0	e25	26	26	24	30	39	1.2	18
12	2.4	30	e7.5	e3.5	e15	22	21	21	52	34	6.8	13
13	1.8	29	e3.0	e7.0	e5.0	18	13	36	41	48	3.9	3.9
14	1.1	24	e3.0	e30	e3.5	7.4	58	33	47	49	2.9	3.7
15	.90	14	e4.5	e20	e3.0	23	48	26	54	42	7.2	3.5
16	.80	e6.0	e6.0	e10	e2.5	37	38	28	49	37	4.4	2.6
17	.60	e5.0	e3.5	e6.0	e2.5	25	30	33	49	35	2.6	4.4
18	.59	8.8	e2.5	e5.0	e2.0	17	22	30	44	35	4.1	3.2
19	.55	23	e2.0	e12	e2.0	3.4	16	15	33	52	8.6	2.3
20	.50	11	e2.0	e6.0	e2.5	1.6	11	38	32	37	49	2.6
21	.45	35	e1.5	e5.0	e2.0	1.4	30	32	23	28	31	2.5
22	10	40	e1.5	e6.0	e2.0	1.2	46	28	13	41	19	2.3
23	.90	39	e3.5	e4.0	e3.0	1.2	43	41	15	30	3.5	2.6
24	.63	35	e5.0	e3.5	e25	1.1	35	21	20	19	8.3	3.9
25	.54	26	e25	e3.0	e18	1.6	25	45	12	28	6.0	2.9
26	9.3	18	e20	e2.5	e5.0	1.4	9.6	37	9.0	30	3.1	2.0
27	13	26	e5.0	e2.5	e4.0	1.2	15	26	4.1	18	2.9	2.1
28	8.1	22	e4.5	e2.0	e3.0	1.6	56	29	3.1	13	2.8	2.7
29	3.7	23	e7.5	e2.0	---	13	47	36	24	34	2.5	2.8
30	2.5	34	e8.0	e1.5	---	17	46	40	26	34	1.9	3.1
31	2.2	---	e6.0	e1.5	---	31	---	37	---	21	3.2	---
TOTAL	98.85	626.1	202.1	232.5	235.0	350.1	977.6	835.7	895.7	1009	305.6	167.7
MEAN	3.19	20.9	6.52	7.50	8.39	11.3	32.6	27.0	29.9	32.5	9.86	5.59
MAX	13	40	32	30	35	37	58	45	54	52	49	23
MIN	.45	1.4	1.0	1.5	1.0	1.1	9.6	3.4	3.1	11	1.2	2.0
AC-FT	196	1240	401	461	466	694	1940	1660	1780	2000	606	333

CAL YR 1988	TOTAL	5744.69	MEAN	15.7	MAX	54	MIN	.25	AC-FT	11390
WTR YR 1989	TOTAL	5935.95	MEAN	16.3	MAX	58	MIN	.45	AC-FT	11770

e Estimated

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 racorder and concrete control. Elevation of gage is 2,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts into Waimea Reservoir for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--12 years, 2.52 ft^3/s (1,830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s, Apr. 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.6 ft^3/s, Apr. 28; no flow for many days.

DISCHARGE, IN 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	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.97	.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	.08	.00	.03	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.42	.00	.02	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.22	.01	.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	.02	.00	.00	.00	.09	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00
14	.00	.00	.00	.00	.00	.00	.17	.00	.08	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.18	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.01	.02	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.03	.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	.05	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.11	.00
21	.00	.32	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
22	.00	.08	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.01	.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	.03	.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	1.6	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.66	.02	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.08	.01	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.05	---	.00	.00	---
TOTAL	.00	.40	.00	.00	.99	.00	3.23	.16	.55	.20	.11	.00
MEAN	.00	.013	.00	.00	.035	.00	.11	.005	.018	.006	.004	.00
MAX	.00	.32	.00	.00	.97	.00	1.6	.05	.18	.09	.11	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.8	.00	.00	2.0	.00	6.4	.3	1.1	.4	.2	.00

CAL YR 1988	TOTAL	565.13	MEAN	1.54	MAX	34	MIN	.00	AC-FT	1120
WTR YR 1989	TOTAL	5.64	MEAN	.01	MAX	1.6	MIN	.00	AC-FT	11

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 mi^2.

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by atadia 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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--33 years, 8.41 ft^3/s (6,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft^3/s, Aug. 7, 1958, gage height, 10.76 ft, site and datum then in use, from rating curve extended above 70 ft^3/s by test of model of station site; no flow at times in 1968, 1971-88.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0930	684	5.03	Apr. 28	1900	960	5.34
Apr. 7	2300	*2,800	*6.50				

Minimum discharge, no flow for many days.

DISCHARGE, IN 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	.00	.00	.20	.00	.00	.00	10	10	18	.00	.57	4.6
2	.00	.00	.00	.00	.00	.00	6.7	1.2	2.5	.00	8.4	6.3
3	.00	.00	.00	.00	76	.00	7.5	.17	.21	.00	2.6	.66
4	.00	.00	.00	.00	20	37	.03	.11	.30	5.7	3.6	.59
5	.00	.00	.00	.27	7.9	17	33	.07	30	11	2.1	.07
6	.00	.00	.00	.00	2.1	13	23	.05	77	21	5.9	.00
7	.00	.00	.00	.00	.01	40	214	.05	21	3.2	1.6	.00
8	.00	3.5	.00	16	.00	11	85	4.1	17	.12	.03	.01
9	.00	.01	.00	2.1	.00	2.1	25	13	6.6	.01	.00	.00
10	.00	8.0	.00	22	21	1.0	9.0	7.3	4.0	5.9	.00	.01
11	.00	20	4.0	4.4	39	.74	1.7	1.4	3.0	24	.00	.02
12	.00	.04	3.0	.00	25	.34	.10	.17	37	16	.00	.04
13	.00	.00	.00	.42	1.5	.08	.06	43	15	75	.00	.03
14	.00	3.2	.00	46	.02	.03	82	24	31	61	.00	.02
15	.00	.05	.00	44	.01	.63	35	11	59	21	.00	.02
16	.00	.00	.19	13	.01	5.2	14	8.2	32	4.5	.00	.00
17	.00	.00	2.1	1.1	.01	.75	.85	13	34	1.1	.00	.02
18	.00	.00	.00	.11	.00	.02	.36	2.8	24	3.7	.00	.01
19	.00	.00	.00	.28	.00	.00	2.0	8.6	5.1	86	.00	.00
20	.00	.00	.00	.88	.00	.00	1.7	35	8.1	22	104	.00
21	.00	15	.00	.00	.00	.00	13	8.9	7.3	5.8	13	.00
22	.00	24	.00	.00	.00	.00	32	3.8	.12	26	8.0	.00
23	.00	24	.00	.00	.00	.00	35	23	.03	5.2	3.7	.00
24	.00	6.5	.00	.00	30	.00	13	7.6	.01	.46	2.8	.00
25	.00	.07	5.9	.00	18	.00	2.6	59	.00	11	1.6	.00
26	.00	.00	23	.00	2.2	.00	.79	27	.00	8.8	.84	.00
27	.00	.00	.00	.00	.18	.00	.25	3.4	.00	2.5	.42	.00
28	.00	.00	.00	.00	.01	.00	133	2.5	.00	12	.12	.00
29	.00	.00	.00	.00	---	.00	111	11	3.0	33	.05	.00
30	.00	4.5	.00	.00	---	.00	52	35	.86	23	.00	.00
31	.00	---	.00	.00	---	8.4	---	21	---	6.3	.00	---
TOTAL	.00	108.87	38.39	150.56	242.95	137.29	943.64	385.42	436.13	495.29	159.33	12.40
MEAN	.00	3.63	1.24	4.86	8.68	4.43	31.5	12.4	14.5	16.0	5.14	.41
MAX	.00	24	23	46	76	40	214	59	77	86	104	6.3
MIN	.00	.00	.00	.00	.00	.00	.03	.05	.00	.00	.00	.00
AC-FT	.00	216	76	299	482	272	1870	764	865	982	316	25

CAL YR 1988	TOTAL	1470.73	MEAN	4.02	MAX	66	MIN	.00	AC-FT	2920
WTR YR 1989	TOTAL	3110.27	MEAN	8.52	MAX	214	MIN	.00	AC-FT	6170

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--42 years, 9.10 ft^3/s (6,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s, Nov. 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.59 ft^3/s, Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0930	613	4.43	Apr. 28	1930	1,140	5.13
Apr. 7	2030	*1,970	*5.86	Aug. 20	0430	251	3.57
Apr. 14	0400	196	3.37				

Minimum discharge, 1.4 ft^3/s, Feb. 1, 2.

DISCHARGE, IN 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	3.9	3.0	5.0	3.1	1.5	2.2	8.8	14	19	4.7	7.2	6.2
2	3.8	3.0	3.6	2.3	1.6	2.2	13	7.8	9.9	3.8	12	8.7
3	3.4	2.7	3.3	4.4	81	1.8	9.1	6.0	6.8	3.8	8.2	5.8
4	3.2	3.2	2.8	3.7	14	27	3.4	5.9	7.7	7.7	8.4	4.4
5	6.3	6.3	2.5	4.8	8.5	13	28	5.2	28	12	11	4.0
6	7.6	3.5	2.5	2.8	5.9	15	21	4.4	60	22	11	5.6
7	4.5	2.9	2.8	2.5	3.3	40	180	3.9	25	8.7	6.1	7.8
8	3.6	11	2.6	7.1	2.8	17	59	25	16	6.7	4.7	4.7
9	3.4	5.4	2.4	5.1	2.5	5.4	19	21	9.7	6.0	4.4	4.7
10	3.5	12	2.7	15	15	4.2	9.5	13	8.1	8.0	4.0	5.6
11	3.6	19	14	6.5	24	3.7	5.1	9.4	6.9	8.5	3.7	6.9
12	3.9	6.5	7.8	3.1	22	3.0	3.8	7.4	44	16	4.3	5.6
13	3.9	4.9	3.9	4.4	4.8	2.5	3.2	43	19	64	4.4	4.0
14	3.6	6.6	3.5	39	3.0	2.3	110	22	31	46	4.5	3.9
15	3.6	4.9	3.0	26	2.8	6.7	37	13	64	18	7.0	3.8
16	3.3	4.0	5.0	10	2.6	9.1	18	23	32	9.8	7.2	3.6
17	3.0	3.2	11	5.1	2.4	3.6	10	20	34	8.0	4.6	3.8
18	3.0	3.3	4.1	5.1	2.4	3.0	7.9	14	21	12	4.1	3.5
19	3.2	5.9	2.6	4.7	2.6	2.5	7.7	9.1	9.7	73	5.4	4.5
20	3.1	3.5	2.0	5.0	2.5	2.2	7.1	34	15	20	100	3.6
21	3.1	18	1.8	3.6	2.0	2.3	15	18	12	11	14	3.2
22	3.3	29	1.7	4.6	2.0	2.2	27	14	7.1	31	11	3.3
23	3.0	20	1.7	3.1	2.2	2.2	24	32	5.5	13	7.0	3.1
24	2.7	8.8	2.0	2.5	24	2.1	11	12	4.8	8.4	5.9	3.0
25	2.8	5.1	15	2.1	14	2.3	5.3	58	4.5	14	4.8	3.1
26	2.8	3.9	20	1.9	4.6	2.4	4.0	29	4.1	14	4.1	3.3
27	3.0	4.6	3.5	1.8	2.9	2.1	4.1	12	3.7	9.5	3.7	4.8
28	9.9	3.9	2.5	1.7	2.3	2.2	172	14	3.5	10	3.4	4.4
29	6.9	5.2	2.8	1.7	---	4.8	105	24	11	20	3.4	5.3
30	4.4	12	3.2	1.7	---	5.7	54	33	7.5	18	3.5	3.6
31	3.4	---	3.7	1.6	---	10	---	31	---	12	3.3	---
TOTAL	122.7	225.3	145.0	186.0	259.2	204.7	982.0	578.1	530.5	519.6	286.3	137.8
MEAN	3.96	7.51	4.68	6.00	9.26	6.60	32.7	18.6	17.7	16.8	9.24	4.59
MAX	9.9	29	20	39	81	40	180	58	64	73	100	8.7
MIN	2.7	2.7	1.7	1.6	1.5	1.8	3.2	3.9	3.5	3.8	3.3	3.0
AC-FT	243	447	288	369	514	406	1950	1150	1050	1030	568	273

CAL YR 1988	TOTAL	3356.9	MEAN	9.17	MAX	73	MIN	1.7	AC-FT	6660
WTR YR 1989	TOTAL	4177.2	MEAN	11.4	MAX	180	MIN	1.5	AC-FT	8290

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 mi^2.

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. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--33 years, 1.63 ft^3/s (1,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s, Nov. 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 3	0830	510	4.02	Apr. 14	0230	101	2.74
Apr. 5	1200	208	3.25	Apr. 29	1830	312	3.58
Apr. 7	1930	*580	*4.16	Aug. 20	0430	116	2.83

Minimum discharge, 0.16 ft^3/s, Feb. 1-3.

DISCHARGE, IN 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	.39	.21	.52	.31	.17	.30	.73	2.9	2.9	.84	1.4	.89
2	.32	.20	.36	.26	.16	.27	3.6	1.3	1.4	.78	2.2	1.4
3	.29	.19	.30	.34	49	.25	1.1	.89	1.0	.79	1.6	.78
4	.28	.30	.26	.38	2.3	5.2	.43	.86	2.7	1.3	1.4	.68
5	1.1	.75	.23	.34	.97	2.1	14	.74	4.7	1.6	2.5	.73
6	.73	.26	.22	.26	.78	4.1	4.2	.63	12	3.6	1.6	.69
7	.38	.21	.27	.21	.44	7.8	54	.55	5.4	1.3	1.2	.74
8	.32	1.3	.21	.80	.34	3.0	18	4.5	2.6	1.1	1.1	.72
9	.28	.49	.19	.50	.40	.91	4.1	2.9	1.4	1.1	.97	.70
10	.25	1.8	.22	1.2	1.8	.77	1.5	1.6	1.2	1.5	.92	.64
11	.27	2.4	2.2	.65	3.1	.51	.86	1.1	1.1	1.6	.88	.61
12	.29	.69	.82	.32	6.0	.43	.64	.94	12	4.2	.93	.64
13	.29	.52	.37	.42	.83	.39	1.6	12	3.4	21	.86	.56
14	.27	.80	.35	7.9	.50	.34	36	2.9	7.2	9.9	.82	.60
15	.26	.52	.26	5.0	.39	1.0	8.6	1.5	16	3.0	1.1	.53
16	.25	.38	.88	1.6	.35	1.0	3.0	7.4	7.5	1.7	1.0	.51
17	.25	.28	1.6	.78	.39	.43	1.5	4.1	7.8	1.3	.83	.51
18	.24	.41	.62	.78	.47	.36	1.1	2.3	3.6	3.0	.77	.53
19	.22	.67	.36	.53	.37	.32	.97	1.4	1.6	21	1.1	.60
20	.22	.31	.30	.46	.36	.30	.89	7.6	3.0	3.8	30	.42
21	.24	3.0	.26	.37	.27	.28	2.8	2.8	1.8	1.8	2.8	.40
22	.22	6.8	.23	.38	.28	.29	5.0	1.8	1.3	6.9	1.6	.40
23	.21	3.3	.21	.31	.27	.27	3.4	6.5	1.1	2.2	1.1	.37
24	.20	1.4	.32	.27	4.8	.25	1.4	1.6	.98	1.5	.88	.37
25	.20	.72	3.2	.25	2.0	.28	.80	14	.94	2.3	.79	.37
26	.19	.47	2.8	.23	.66	.23	.73	4.5	.88	2.1	.74	.38
27	.23	.80	.52	.21	.41	.23	.78	1.8	.84	1.5	.69	.47
28	.74	.42	.36	.20	.34	.30	47	1.9	.80	1.7	.64	.44
29	.37	.72	.35	.19	---	.66	43	5.2	2.1	3.4	.61	.61
30	.28	1.4	.41	.21	---	.53	12	5.1	1.0	2.6	.61	.40
31	.23	---	.37	.18	---	.69	---	6.4	---	1.8	.58	---
TOTAL	10.01	31.72	19.57	25.84	78.15	33.79	273.73	109.71	110.24	112.21	64.22	17.69
MEAN	.32	1.06	.63	.83	2.79	1.09	9.12	3.54	3.67	3.62	2.07	.59
MAX	1.1	6.8	3.2	7.9	49	7.8	54	14	16	21	30	1.4
MIN	.19	.19	.19	.18	.16	.23	.43	.55	.80	.78	.58	.37
AC-FT	20	63	39	51	155	67	543	218	219	223	127	35

CAL YR 1988	TOTAL	556.75	MEAN	1.52	MAX	22	MIN	.19	AC-FT	1100
WTR YR 1989	TOTAL	886.88	MEAN	2.43	MAX	54	MIN	.16	AC-FT	1760

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 mi^2.

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. No diversion upstream. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 7.21 ft^3/s (5,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft^3/s, Mar. 18, 1980, gage height, 8.00 ft, from rating curve extended above 75 ft^3/s; no flow at times each year.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 15	1830	940	5.80	July 20	0130	900	5.72
Feb. 4	1730	602	4.98	July 22	1500	810	5.50
May 29	1230	*945	*5.81				

Minimum discharge, no flow for msny days.

DISCHARGE, IN 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	.00	.00	11	1.3	.14	.08	.15	1.1	2.6	.40	.77	18
2	.00	3.6	1.6	.16	.10	29	1.6	.17	1.5	.27	.69	9.6
3	.00	.15	.31	.41	35	40	.24	.13	.82	.21	.76	.87
4	15	142	.17	.41	31	.49	.12	.13	.70	.24	.69	.35
5	.53	10	.05	.22	8.2	1.6	.10	.13	24	1.8	1.9	.67
6	.00	.40	.03	.05	24	.28	.10	.13	8.3	.30	18	.75
7	.00	.04	.02	.12	2.1	.19	.10	.13	34	.20	3.9	.71
8	.00	.00	.00	.05	.52	.18	.25	6.4	5.1	.18	.73	21
9	.00	.00	.00	.05	.32	.17	4.1	6.0	.71	.18	.67	3.5
10	.00	.00	.00	70	.19	.17	.85	3.0	.50	.17	.68	1.0
11	.00	.02	.11	14	1.3	.17	.24	38	.36	.17	.65	.46
12	.16	.00	1.5	3.7	1.9	.17	.16	2.9	9.2	.17	.64	.36
13	.00	.00	15	38	.19	12	.13	.22	1.9	.17	.64	.54
14	.00	.00	.61	49	26	1.1	.19	20	.49	.66	.60	.35
15	.03	64	.14	8.0	2.8	23	.11	8.8	.35	.34	.65	.23
16	.00	2.6	.04	3.9	.36	2.7	.11	36	.31	.18	.64	5.2
17	.00	.11	.03	27	.16	.19	.11	3.3	.30	.18	.46	4.1
18	.00	.02	.16	45	.13	.17	.10	.17	.30	.18	.32	1.1
19	.00	.29	.08	3.3	.13	.17	.10	.14	.25	91	.25	.50
20	.00	.10	.02	.79	.11	22	.10	38	.23	246	.44	3.2
21	.00	.00	.01	13	.10	1.4	3.4	3.7	.24	4.9	32	1.9
22	.00	.01	.01	4.5	.10	.16	.22	3.6	.23	126	4.5	.75
23	.66	5.5	.01	4.9	.09	.15	.12	1.1	.20	17	7.8	.34
24	1.1	1.2	.01	2.9	.09	.14	14	.30	12	5.8	2.5	.31
25	11	.41	.01	11	.09	.14	1.9	.15	1.8	21	.83	.48
26	.60	.21	.37	2.5	.09	.37	.14	.15	2.2	4.9	.53	.46
27	.00	1.4	15	.68	.08	.19	1.1	.14	3.8	1.1	.93	.58
28	.00	.75	4.5	.59	.08	.15	.30	.14	.88	5.1	.58	3.0
29	.00	.28	.97	.48	---	.15	.13	108	2.8	11	.30	3.2
30	.00	9.8	3.0	.41	---	.15	30	8.9	.87	3.5	.30	.47
31	.00	---	15	.36	---	.15	---	6.1	---	2.5	.21	---
TOTAL	29.08	242.89	69.76	306.78	135.37	136.98	60.27	297.13	116.94	545.80	84.56	83.98
MEAN	.94	8.10	2.25	9.90	4.83	4.42	2.01	9.58	3.90	17.6	2.73	2.80
MAX	15	142	15	70	35	40	30	108	34	246	32	21
MIN	.00	.00	.00	.05	.08	.08	.10	.13	.20	.17	.21	.23
AC-FT	58	482	138	608	269	272	120	589	232	1080	168	167

CAL YR 1988	TOTAL	821.16	MEAN	2.24	MAX	142	MIN	.00	AC-FT	1630
WTR YR 1989	TOTAL	2109.54	MEAN	5.78	MAX	246	MIN	.00	AC-FT	4180

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 analyaes, 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 psrtial-record stations during water year 1989

Station No.	Station name	Location	Drainage area mi^2	Period of record	Measurements: Date	Measurements: 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 Kawailena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.51	1968-89	11-03-88 01-26-89 04-20-89 08-31-89	0.64 1.93 3.01 1.26
16403500	Kawailena 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	1968-89	11-03-88 01-26-89 04-20-89 08-31-89	1.40 2.77 4.58 1.80
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft downstream from Kawailena Stream, 2.1 mi aouth of former village of Pelekunu, and 5.6 mi north of Kamalo.	1.20	1968-70≠, 1974-89	11-03-88 01-26-89 04-20-89 08-31-89	1.76 5.25 8.37 3.46
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	1968-89	11-03-88 01-26-89 04-20-89 08-31-89	1.15 3.41 5.61 2.48
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 Kamslo.	.26	1968-89	11-03-89 01-26-89 04-20-89 08-31-89	.25 .86 1.26 .52
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≠, 1980-89	11-03-88 01-26-89 04-20-89 08-31-89	1.41 5.24 8.24 3.88

≠ Operated as a continuous-record gaging station.

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 1989

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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	1944-89b	07-23-89	6.06	-
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	1950-89b	07-23-89	5.83	-
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≠ 1973-89	02-23-89	6.76	2,610
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≠, 1971-89	01-13-89	17.23	12,340
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	1962-89b	11-06-88	7.34	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 m upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-89	01-13-89	12.62	1,450
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≠, 1986-89	07-23-89	4.34	4,740
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	1964-89	07-23-89	7.18	500
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	1962-89	07-23-89	15.55	12,585
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	1964-89	02-23-89	4.52	665
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, 1971-89	02-23-89	7.26	330
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	1963-89b	02-23-89	11.16	-

≠ Operated as a continuous-record gaging station.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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, 1984-71≠, 1972-89	01-13-89	5.23	439
		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 southeaat of Waialua High School, and 1.3 ml southwest of Weed Circle.	38.7	1963, 1968-89	07-21-89	21.49	e2,800
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	1967-89	12-06-88	15.67	e1,250
16211300	Mokaleha 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≠ 1966-89	12-06-88	5.50	460
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	1974-89	12-06-88	13.78	e390
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'48", 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	1958-89	04-09-89	8.63	e350
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi upstream from Ferrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-89	04-09-89	8.98	422
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≠, 1973-89	04-09-89	5.23	300
16212200	Maliiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualuslei Naval Reservation and 3.4 mi east of cemetery near Waianae.	1.51	1958-89	04-09-89	3.11	e250
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi upstream from Highway 90 and 0.6 mi northeaat of Nanakuli Post Office.	3.98	1968-89	12-06-88	23.32	e450
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	1968-89	12-06-88	5.12	340
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	1956-89	12-06-88	3.86	884
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, 1960-89	12-06-88	5.75	270

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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	1958-89	07-21-78	7.89	1,100
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	1974-89	12-06-88	10.51	e70
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≠, 1973-89	07-21-89	3.75	2,400
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≠, 1984-89	07-21-89	5.84	e1,600
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≠, 1979-89	04-08-89	6.46	885
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	1969-89	12-06-88	5.04	1,340
18228600	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	1971-89	04-08-89	13.92	e1,460
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≠, 1972-89	04-08-89	3.58	492
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	1958-89	04-08-89	2.25	480
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	1958-89	12-06-88	.67	348
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	1968-89	12-06-88	88.01	3,610
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi upstream from Kalanianaole Highway in Aina Haina.	2.35	1958-89	04-08-89	1.97	574
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, 1970-89	04-08-89	-	e500
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	1958-89	04-04-89	5.95	620
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≠, 1971-89	04-04-89	4.94	e1,800

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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 Kalanianaole Highway, 1.6 mi northwast of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-89	04-04-89	4.79	225
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 aouthweat of Kailua Post Office.	5.34	1958-67, 1968-71≠, 1972-89	04-04-89	-	e3,200
16284800	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, 1967-89b	04-04-89	2.36	-
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, 1977-89	04-04-89	7.44	902
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	1959-89	04-07-89	3.00	e480
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, 1968-89	03-02-89	5.21	e1,200
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road snd 0.8 mi south of Kahaluu.	2.31	1963-89	04-08-89	-	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	1958-89	04-04-89	6.25	e2,400
16310501	Malaekahsna 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	1958-89	04-04-89	5.84	220
16311000	Olo Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi southwest of junction of plantation road and Highway 83 snd 2.7 mi west of Kahuku Hospital.	2.13	1958-89	04-04-89	-	e130
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	1973-89	04-04-89	4.66	e110
16318000	Paumalu Gulch at Sunaet	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	1966-89	04-04-89	6.44	e350

≠ Operated as a continuous-record gsging station.
b Gage height only.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi²	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58", at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-89	07-21-89	6.05	436
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	1958-89	07-21-89	7.28	2,700
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.8 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-89	07-21-89	13.74	1,840
		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	1964-89	02-11-89	4.75	658
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≠, 1973-89	02-11-89	8.47	2,860
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	1964-89	11-06-89 02-11-89	1.75 1.75	59 59
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	1965-89	02-11-89	7.03	2,340
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	1964-89	03-03-89	-	<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	1965-89	04-04-89	-	3,620
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	1964-89	03-03-89	1.64	571
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	1964-89	03-03-89	6.90	241
		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≠, 1973-89	11-04-88	8.96	1,180
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	1967-89	11-04-88	10.30	4,410
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≠, 1969-89	12-06-88	5.43	394

≠ Operated as a continuous-record gaging station.
< Actual value is known to be less than the value shown.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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	1963-89	04-07-89	2.86	113
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.	.80	1963-89	04-07-89	13.62	1,190
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	1965-89	04-07-89	7.70	4,940
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	1963-89	04-09-89	5.13	103
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi south of Pukslani.	1.17	1967-89	03-04-89	5.04	194
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	1963-89	04-09-89	2.60	67
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	1967-89	04-09-89	6.25	640
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≠, 1952-89	11-04-88	5.62	4,420
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	1984-89	04-09-89	-	e10
16819700	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	1965-89	04-09-89	12.59	523
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, 1965-89	11-04-88	4.51	523
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, 1964-89	11-04-88	4.46	536
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≠, 1973-89	11-04-88	4.68	848
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	1964-89	04-08-89	5.70	81
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	1963-89	11-04-89	8.69	1,170

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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	1964-89	12-06-88	6.53	285
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	1963-89	12-08-88	8.77	1,080
16660000	Kulanihakoi 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 southeaat of Kihei.	14.4	1963-70≠, 1971-89	12-06-88	4.04	1,670
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	1972-89	12-06-88	-	e50
16664000	Liilioholo 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	1972-89	12-06-88	12.03	379
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi upstream from Kinoole Street bridge and 1.3 mi aouth-east of Hilo Post Office.	35.8	1968-89	07-22-89	5.13	606
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	1965-89	07-22-89	3.26	161
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	1963-89	07-22-89	7.56	171
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≠, 1973-89	07-22-89	4.43	515
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi south-east of Honomu, 2.2 mi north of Pepsekeo, and 9.4 mi north of Hilo.	1.09	1983-89	07-22-89	8.31	793
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≠, 1983-89	04-07-89	8.93	2,120
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	1963-89	04-07-89	8.60	450
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 up-stream from mouth.	2.27	1963-89	04-07-89	10.36	536
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert 4.8 mi southwest of Hono-kaa Hospital, and 5.5 mi southesst of Kukuihaele.	2.42	1963-89	04-07-89	7.24	377

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1989-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (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	1963-89	04-07-89	10.63	390
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	1963-89	04-07-89	5.33	277
16756500	Keanuiomano Stream near Kamuela	Lat 201'48", 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≠, 1973-89	04-07-89	8.22	2,600
16759040	Paiakuli 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	1963-89	04-07-89	5.17	241
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	1963-89	04-07-89	4.18	211
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	1963-89	11-09-88	5.91	1,400
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, 1965-89	06-01-89	4.80	104
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≠, 1972-89	06-01-89	4.77	548
16762000	Alapai Gulch at Naalehu	Lat 19°04'00", long 155°35'19", at debris catchmant outlet of Naalehu Watershed Protection Project and 0.2 mi upstream from Highway 11 at Naalehu.	2.87	1963-89	07-20-89	6.91	1,120
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≠, 1983-89	07-20-89	5.47	930
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	1963-89	07-20-89	14.67	5,770
16770500	Paauau 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≠, 1980-89	07-20-89	9.92	2,490

≠ Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1988

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Oahu				
Makawao	Maunawili Stream	Lat 221'20", long 157°45'52", 1.8 mi southwest of Maunawili School and 2.2 mi southeast of Hawaii Loa College.	0.84	--	09-26-88	0.92
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	--	09-26-88	1.51
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	--	09-26-88	1.01
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	--	09-26-88	1.46
Omao	Maunawili Stream	Lat 21°21'56", long 157°46'06", 1.3 mi southwest of Maunawili School and 1.5 mi southeaat of Hawaii Loa College.	.94	--	09-26-88	1.11
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	--	09-26-88	.39
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	09-26-88	.66
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	09-26-88	.84
Waiahole	Pacific Ocean	Lat 21°28'29", long 157°52'39", 1.7 mi southwest of Waiahole School and 2.8 mi northwast of Kahaluu.	.92	--	09-30-88	4.40
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	--	09-30-88	6.43
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	--	09-30-88	13.7
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≠ 1970	09-30-88	6.85
Waianu (formerly 16293100)	Waiahole Stream	Lat 21°28'59", long 157°51'47", 0.6 mi southwast of Waiahole School and 2.3 mi northwest of Kahaluu.	1.64	1961-66	09-30-88	4.96
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	--	09-30-88	1.83
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	--	09-30-88	1.48
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	--	09-30-88	3.82

≠ Operated as a continuous-record gaging station.
b Gage height only.

Discharge measurements made at miscellaneous sites during water year 1988

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued				
Waikeekee	Waikane Stream	Lat 21°30'02", long 157°52'14", 1.1 mi west of Waikane, and 1.4 mi northwest of Waiahole School.	0.43	--	09-30-88	0.75
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	--	09-30-88	5.98

Discharge measurements made at miscellaneous sites during water year 1989

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements Date	Measurements 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 Kamehameha Highway and 2.8 mi southwest of Kaaawa School.	3.20	1960-62, 1968, 1971-72, 1974-81, 1983-85 1988	10-04-88 05-04-89 08-14-89 09-12-89	19.7 30.3 32.9 19.0
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≠ 1958b, 1961-82 1966, 1971-72, 1974-81, 1983-85 1988	05-04-89 08-14-89 09-12-89	7.76 2.18 2.55
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	10-03-88 05-04-89 08-14-89 09-13-89	.69 1.40 .72 .57
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	10-03-88 05-04-89 08-14-89 09-13-89	.68 1.45 .84 .61
Makawao	Maunawili Stream	Lat 221'20", long 157°45'52", 1.8 mi southwest of Maunawili School and 2.2 mi southeast of Hawaii Loa College.	.84	1988	05-22-89 08-15-89 09-21-89	2.45 .93 .90
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	05-22-89 08-15-89 09-21-89	2.09 1.24 1.27
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	05-22-89 08-15-89 09-21-89	2.90 1.94 1.22
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	04-22-89 08-15-89 09-21-89	3.63 2.12 1.07
Omao	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	05-22-89 08-15-89 09-21-89	2.42 1.67 1.18
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	05-22-89 08-15-89 09-21-89	1.11 .58 .44
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	05-22-89 08-15-89 09-21-89	1.70 1.00 .71
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	05-22-89 08-15-89 09-21-89	2.97 1.39 .98
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	10-03-88 05-05-89 08-16-89 09-14-89	15.9 22.7 17.2 14.1
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	10-03-88 05-05-89 08-16-89 09-14-89	4.21 6.64 5.83 5.06

≠ Operated as a continuous-record gaging station.
b Gage height only.

Discharge measurements made at miscellaneous sites during water year 1989

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued				
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	10-03-88	21.0
					05-05-89	25.3
					08-16-89	15.6
					09-14-89	20.8
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	05-08-89	4.82
					07-31-89	4.66
					09-11-89	4.01
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	05-08-89	8.79
					07-31-89	6.60
					09-11-89	5.29
Waishole	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	05-08-89	17.0
					07-31-89	12.8
					09-11-89	10.1
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≠ 1970, 1988	05-08-89	8.45
					07-31-89	7.21
					09-11-89	5.85
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	05-08-89	5.47
					07-31-89	4.51
					09-11-89	2.19
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	05-08-89	1.86
					07-31-89	1.59
					09-11-89	.72
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	05-08-89	1.32
					07-31-89	1.11
					09-11-89	4.66
Waikane	Pacific Ocean	Lat 21°30'07", long 157°52'12", 1.1 mi west of Waikane, and 1.4 mi northwest of Wsiahole School.	1.57	1988	05-08-89	4.58
					07-31-89	3.68
					09-11-89	2.14
Waikeekee	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	05-08-89	.91
					07-31-89	.71
					09-11-89	.31
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	05-08-89	7.06
					07-31-89	5.75
					09-11-89	3.27

≠ Operated as a continuous-record gaging station.

Water-quality partial-record stations are particular sites where chemical-quality, biological, and or sediment data are collected systematically over a period of years for use in hydrologic analyses. A schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figurea 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU

16227100 - HALAWA STR BELOW H1 (LAT 21°22'17" LONG 157°55'57")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
09...	0930	764	0.20	750	8.80	26.0	3.1	9.6	118	--	--
DEC											
07...	1145	--	32	220	7.90	23.0	41	8.7	--	960	--
MAR											
22...	1100	767	1.2	750	9.10	29.5	0.60	11.9	156	--	--
APR											
25...	1030	763	13	220	9.30	22.5	13	10.8	125	940	55
JUN											
13...	0915	766	E0.30	950	8.90	28.0	0.40	10.2	130	--	--
26...	0930	762	E0.30	975	9.00	29.0	1.3	11.4	149	--	--
JUL											
24...	0920	764	E440	90	7.90	22.0	160	8.4	96	1500	--
AUG											
09...	0930	764	1.7	925	7.55	33.0	1.4	7.4	103	K4100	270
28...	1210	762	0.50	860	6.97	28.5	2.2	9.2	119	--	--
SEP											
25...	1015	762	0.16	738	9.10	29.0	0.50	12.1	158	--	--

DATE	HARDNESS NONCARB DISSOLV LAB AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
25...	55	9.8	7.5	21	45	1	1.1	47	8.0	29
AUG										
09...	270	50	36	60	32	2	4.4	113	36	190

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
07...	--	--	--	--	--	35	0.300	0.30	0.60	0.050
APR										
25...	0.10	21	142	126	0.19	8	<0.100	0.30	--	0.030
JUL										
24...	--	--	--	--	--	405	0.100	0.40	0.50	0.040
AUG										
09...	0.10	26	512	471	0.70	13	<0.100	0.40	--	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).

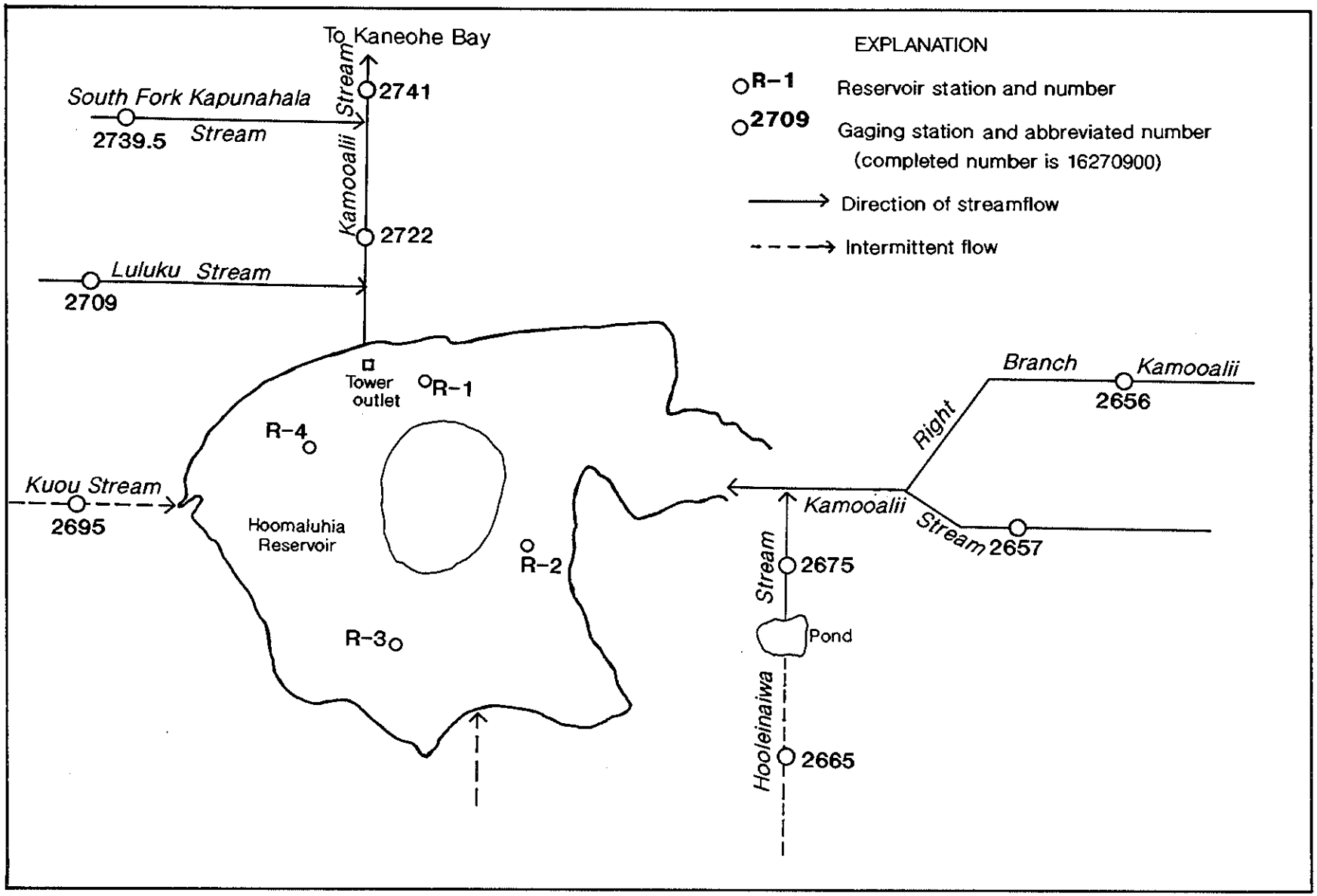

Figure 15.—Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STR BELOW H1--Continued

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
25...	1100	120	<1	<1	<100	2	<10	<0.5	1	<1
AUG										
09...	130	<10	<1	<1	<100	18	<10	<0.5	<1	<1

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
25...	3	1	<1	<3	5	3	770	470	1	1
AUG										
09...	3	<1	<1	<3	4	5	160	8	6	1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
25...	<10	<4	10	7	<0.10	<0.1	2	<10	8
AUG									
09...	<10	<4	20	5	0.40	<0.1	2	<10	2

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
25...	1	<1	<1	<1	<1.0	67	<6	40	<3
AUG									
09...	1	<1	<1	<1	<1.0	380	<6	30	10

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
APR										
25...	1.9	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	0.03	<0.010
AUG										
09...	3.6	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	0.01	<0.010

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STR BELOW H1--Continued

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
25...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.010	<0.010	<0.01	<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)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
25...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16265700 - KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEOHE (LAT 21°23'12" LONG 157°47'56")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)
NOV								
08...	1330	758	0.82	212	6.50	22.5	2.0	7.0
DEC								
06...	1025	754	1.4	200	6.70	21.5	5.9	7.4
MAR								
22...	0955	757	2.8	210	6.60	21.5	0.50	8.3
APR								
27...	1300	757	4.7	205	6.90	21.0	0.80	8.1
JUN								
14...	1100	760	3.0	200	7.00	22.0	0.50	8.1
27...	1100	759	2.3	205	6.90	22.0	0.40	8.2
JUL								
21...	1210	759	3.0	187	7.00	22.5	59	--
AUG								
10...	1030	759	1.9	202	6.96	22.5	98	6.4
29...	0940	758	1.5	235	6.90	22.0	82	7.4
SEP								
25...	1500	757	1.3	205	7.90	23.0	1.0	7.7

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
NOV							
08...	81	--	--	--	--	--	--
DEC							
06...	85	270	4	0.200	0.20	0.40	0.040
MAR							
22...	95	--	--	--	--	--	--
APR							
27...	92	2000	4	0.300	0.40	0.70	0.020
JUN							
14...	93	--	--	--	--	--	--
27...	94	--	--	--	--	--	--
JUL							
21...	--	9200	5	0.200	<0.20	--	0.160
AUG							
10...	74	400	156	0.200	0.20	0.40	0.210
29...	85	--	--	--	--	--	--
SEP							
25...	90	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)
JUL										
19...	1515	760	1.00	--	--	24.5	--	--	0.800	<0.100
SEP										
13...	1315	759	0.80	192	7.35	24.0	7.9	94	0.500	<0.100

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16266000 - KAMOOALII STREAM NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE	SEP 13, 89	
TIME	1315	
SAMPLING DEPTH (FEET)	0.80	
TOTAL CELLS/ML	950	
	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)		
.BACILLARIOPHYCEAE		
..ACHNANTHALES		
...ACHNANTHACEAE		
....ACHNANTHES	150	16
..NAVICULALES		
...NAVICULACEAE		
....NAVICULA	15	2
CHLOROPHYTA (GREEN ALGAE)		
.CHLOROPHYCEAE		
..CHLOROCOCCALES		
...CHLOROCOCCACEAE		
....CHLOROCOCCUM	90	9
...OOCYSTACEAE		
....ANKISTRODESMUS	11	1
....SELENASTRUM	56	6
....TETRAEDRON	33	3
..VOLVOCALES		
...CHLAMYDOMONADACEAE		
....CHLAMYDOMONAS	34	4
..ZYGNEMATALES		
...DESMIDIACEAE		
....COSMARIUM	11	1
...MESOTAENIACEAE		
....MESOTAENIUM	22	2
CHRYSOPHYTA (YELLOW-GREEN ALGAE)		
.BACILLARIOPHYCEAE		
..PENNALES		
...ACHNANTHACEAE		
....ACHNANTHES	9	1
....COCCONEIS	5	<1
...CYMBELLACEAE		
....AMPHORA	5	<1
...NAVICULACEAE		
....FRUSTULIA	14	1
....NAVICULA	10	1
...NITZSCHIACEAE		
....NITZSCHIA	14	1
.CHRYSOPHYCEAE		
..CHROMULINALES		
...OCHROMONADACEAE		
....OCHROMONAS	56	6
CYANOPHYTA (BLUE-GREEN ALGAE)		
.CYANOPHYCEAE		
..CHROOCOCCALES		
...CHROOCOCCACEAE		
....SYNECHOCOCCUS	130	14
....SYNECHOCYSTIS	34	4
..OSCILLATORIALES		
...OSCILLATORIACEAE		
....LYNGBYA	45	5
....OSCILLATORIA	190	20
EUGLENOPHYTA (EUGLENOIDS)		
.EUGLENOPHYCEAE		
..EUGLENALES		
...EUGLENACEAE		
....EUGLENA	11	1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'06" LONG 157°48'16")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)
NOV							
08...	1420	758	0.36	122	6.60	22.5	1.3
DEC							
06...	1225	752	1.2	120	6.70	22.0	2.4
MAR							
22...	1105	761	0.91	115	6.50	22.5	0.30
APR							
27...	1300	757	1.7	99	6.80	21.5	0.30
JUN							
14...	1200	759	0.63	110	6.10	22.5	0.30
27...	1100	759	0.53	110	7.20	22.0	0.50
JUL							
21...	1310	760	2.8	118	6.94	23.5	32
AUG							
10...	1030	758	0.42	115	7.20	22.5	1.8
29...	1330	759	1.1	152	7.30	24.5	0.70
SEP							
26...	1200	758	0.27	118	7.00	23.0	0.40

DATE	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
NOV							
08...	7.8	91	--	--	--	--	--
DEC							
06...	--	--	K130	2	<0.100	<0.20	0.010
MAR							
22...	8.6	100	--	--	--	--	--
APR							
27...	9.3	107	260	<1	<0.100	<0.20	<0.010
JUN							
14...	8.2	95	--	--	--	--	--
27...	8.2	94	--	--	--	--	--
JUL							
21...	8.1	96	1100	37	<0.100	<0.20	0.030
AUG							
10...	8.5	99	100	10	<0.100	<0.20	<0.010
29...	8.1	98	--	--	--	--	--
SEP							
26...	8.3	97	--	--	--	--	--

< 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 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM AB CONFLUENCE WITH KAMOOALII STR, NR KANEOHE (LAT 21°23'18" LONG 157° 48'18")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)
NOV							
09...	1330	765	1.0	170	7.20	24.0	3.9
DEC							
07...	1245	758	2.3	130	7.10	22.5	5.0
MAR							
22...	1225	762	1.6	150	6.30	23.5	2.5
APR							
27...	1000	758	3.5	115	6.80	21.5	12
JUN							
14...	1245	761	1.1	150	7.30	24.5	8.5
27...	1000	761	1.1	150	7.40	23.5	3.2
JUL							
21...	1430	758	0.75	105	6.80	22.5	5.8
AUG							
10...	1200	757	8.5	155	7.12	25.0	26
29...	1530	756	0.42	115	7.30	23.5	0.50
SEP							
26...	1040	760	0.84	168	7.47	23.5	2.9

DATE	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
NOV							
09...	7.1	84	--	--	--	--	--
DEC							
07...	8.0	93	570	7	<0.100	<0.20	0.020
MAR							
22...	8.0	94	--	--	--	--	--
APR							
27...	7.0	80	3300	12	<0.100	0.50	0.030
JUN							
14...	8.0	96	--	--	--	--	--
27...	8.2	97	--	--	--	--	--
JUL							
21...	7.9	92	K94	13	<0.100	0.60	0.010
AUG							
10...	8.0	98	540	29	<0.100	0.30	0.040
29...	8.2	97	--	--	--	--	--
SEP							
26...	8.4	99	--	--	--	--	--

< 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 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'30" LONG 157°48'44")

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	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)	OXYGEN, DIS-SOLVED (MG/L)
NOV								
12...	1030	759	0.20	320	6.90	22.5	5.5	5.5
DEC								
07...	1135	758	0.50	320	7.00	22.5	2.3	7.9
MAR								
22...	1420	759	0.16	280	7.00	22.0	1.9	8.4
APR								
26...	1310	756	0.49	225	6.90	21.5	43	7.5
JUN								
13...	1210	760	0.22	260	7.00	22.5	3.5	6.9
27...	1200	760	0.17	250	7.00	22.5	4.0	8.3
JUL								
21...	1320	757	1.0	225	6.90	22.5	7.9	7.2
AUG								
10...	0925	756	0.17	256	6.98	23.0	5.0	6.5
29...	1100	756	0.16	250	7.02	23.0	3.0	6.3
SEP								
26...	1100	758	0.07	261	6.96	22.5	4.3	5.7

DATE	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-PHOROUS TOTAL (MG/L AS P)
NOV							
12...	64	--	--	--	--	--	--
DEC							
07...	92	210	<1	1.10	0.50	1.6	0.010
MAR							
22...	97	--	--	--	--	--	--
APR							
26...	86	390	5	0.500	0.40	0.90	0.010
JUN							
13...	80	--	--	--	--	--	--
27...	96	--	--	--	--	--	--
JUL							
21...	84	540	4	0.700	0.70	1.4	0.020
AUG							
10...	76	110	11	0.100	0.50	0.60	0.010
29...	74	--	--	--	--	--	--
SEP							
26...	67	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY								
31...	0950	760	1.00	185	7.35	25.5	7.7	94
31...	0951	760	3.00	185	7.41	25.5	7.5	92
31...	0952	760	5.00	190	7.29	24.5	5.3	64
31...	0953	760	7.00	191	7.21	24.5	4.5	54
31...	0954	760	9.00	194	7.14	24.0	2.9	35
JUN								
22...	1045	759	1.00	182	7.52	26.5	7.4	93
22...	1046	759	3.00	182	7.54	26.5	7.3	91
22...	1047	759	5.00	183	7.44	26.0	6.8	84
22...	1048	759	7.00	185	7.30	25.0	6.1	74
22...	1049	759	9.00	188	7.13	24.5	3.8	46
JUL								
18...	1105	--	1.00	183	7.43	26.0	6.7	--
18...	1106	760	3.00	183	7.43	25.5	6.6	81
18...	1107	760	5.00	183	7.44	25.5	6.6	81
18...	1108	760	7.00	183	7.39	25.5	6.4	78
18...	1109	760	9.00	184	7.30	25.0	5.4	68
SEP								
13...	1025	759	1.00	184	7.61	27.0	7.9	99
13...	1026	759	3.00	184	7.66	27.0	8.2	103
13...	1027	759	5.00	184	7.64	26.5	7.8	98
13...	1028	759	7.00	185	7.59	26.5	6.5	81
13...	1029	759	8.00	186	7.41	26.0	5.2	64

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	TRANSPARENCY (SECCHI DISK) (IN)
MAY									
31...	1000	760	1.00	185	7.54	25.5	7.8	96	--
31...	1001	760	3.00	185	7.56	25.5	7.9	97	--
31...	1002	760	5.00	189	7.40	25.0	6.3	76	--
31...	1003	760	7.00	189	7.30	24.0	6.3	75	--
31...	1004	760	9.00	189	7.29	24.5	5.9	71	--
31...	1005	--	--	--	--	--	--	--	63.0
JUN									
22...	1035	759	1.00	182	7.56	26.5	7.4	93	--
22...	1036	759	3.00	182	7.56	26.5	7.4	93	--
22...	1037	759	5.00	183	7.45	26.0	6.7	83	--
22...	1038	759	7.00	186	7.33	25.5	5.9	72	--
22...	1039	759	9.00	186	7.24	24.5	5.7	69	--
JUL									
18...	1059	760	1.00	183	7.44	26.0	6.8	84	--
18...	1100	760	3.00	183	7.43	26.0	6.8	84	--
18...	1101	760	5.00	183	7.40	25.5	6.5	80	--
18...	1102	760	7.00	182	7.36	25.5	6.2	76	--
18...	1103	760	9.00	184	7.25	25.0	5.2	63	--
SEP									
13...	1015	759	1.00	184	7.43	27.0	8.0	101	--
13...	1016	759	3.00	184	7.53	27.0	7.8	98	--
13...	1017	759	5.00	184	7.56	26.5	7.7	97	--
13...	1018	759	7.00	185	7.51	26.5	6.4	80	--
13...	1019	759	9.00	186	7.43	26.0	6.7	83	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	RESERVOIR DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	TRANSPARENCY (SECCHI DISK) (IN)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
MAY												
31...	1000	760	--	13.1	189	7.38	25.0	2.1	--	5.8	70	--
31...	0940	760	1.00	13.1	185	7.54	25.5	1.0	--	7.7	94	39
31...	1010	760	1.00	--	185	7.54	25.5	--	--	7.7	94	--
31...	1001	760	2.00	--	185	7.50	25.5	--	83.0	7.7	94	--
31...	1011	760	3.00	--	185	7.58	25.5	--	--	7.7	94	--
31...	1012	760	5.00	--	187	7.53	25.5	--	--	6.8	83	--
31...	0945	760	7.00	13.1	189	7.38	25.0	1.8	--	5.8	70	78
31...	1013	760	7.00	--	189	7.38	25.0	--	--	5.8	70	--
31...	1014	760	9.00	--	190	7.28	24.5	--	--	5.0	60	--
31...	1005	760	10.0	--	185	7.50	25.5	--	63.0	--	--	--
31...	1015	760	11.0	--	190	7.24	24.0	--	--	5.4	64	--
31...	0950	760	12.0	13.1	191	7.21	24.0	3.2	--	5.1	61	280
31...	1016	760	12.0	--	191	7.21	24.0	--	--	5.1	61	--
JUN												
22...	1015	759	1.00	--	182	7.53	26.5	0.90	--	7.3	92	--
22...	1025	759	2.00	--	182	7.53	26.5	--	83.0	7.3	91	--
22...	1016	759	3.00	--	182	7.53	26.5	--	--	7.3	91	--
22...	1017	759	5.00	--	184	7.37	26.0	--	--	6.2	77	--
22...	1018	759	7.00	--	185	7.27	25.5	2.3	--	5.8	71	--
22...	1019	759	9.00	--	187	7.21	24.5	--	--	5.7	69	--
22...	1026	759	10.0	--	187	7.14	24.0	--	83.0	5.3	63	--
22...	1020	759	11.0	--	187	7.14	24.0	2.8	--	5.3	63	--
JUL												
18...	1040	760	--	--	183	7.36	25.5	2.2	--	5.6	68	--
18...	1030	760	1.00	--	183	7.44	26.0	1.4	--	7.0	87	60
18...	1025	760	2.00	--	183	7.44	26.0	--	53.0	7.0	87	--
18...	1031	760	3.00	--	183	7.44	26.0	--	--	7.0	87	--
18...	1032	760	5.00	--	183	7.44	26.0	--	--	6.9	85	--
18...	1033	760	7.00	--	183	7.36	25.5	1.7	--	5.6	68	47
18...	1034	760	9.00	--	184	7.26	25.0	--	--	5.4	66	--
18...	1026	760	10.0	--	185	7.11	24.5	--	53.0	5.0	60	--
18...	1035	760	11.0	--	185	7.23	24.5	4.0	--	5.0	60	110
18...	1036	760	12.0	--	185	7.20	24.5	--	--	4.9	59	--
SEP												
13...	0945	759	1.00	--	184	7.62	26.5	0.60	--	7.6	95	--
13...	0946	759	2.00	--	184	7.63	26.5	--	88.0	7.6	95	--
13...	0947	759	3.00	--	184	7.63	26.5	--	--	7.6	95	--
13...	0948	759	5.00	--	184	7.61	26.5	--	--	7.3	91	--
13...	0949	759	7.00	--	186	7.54	26.5	1.2	--	6.4	80	--
13...	0950	759	9.00	--	188	7.46	26.0	--	--	6.1	75	--
13...	0951	759	10.0	--	188	7.41	25.5	--	--	6.2	76	--
13...	0952	759	11.0	--	189	7.37	25.0	--	--	4.9	60	--
13...	0953	759	12.0	--	189	7.28	24.5	18	--	4.6	56	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV LAB AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	CALCIUM SED. BEDMAT PERCENT	MAGNESIUM, DISSOLVED (MG/L AS MG)	MAGNESIUM SEDIMENT BEDMAT PERCENT	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	SODIUM SEDIMENT BEDMAT PERCENT	POTASSIUM, DISSOLVED (MG/L AS K)
MAY												
31...	1000	61	61	9.8	--	8.8	--	16	36	0.9	--	1.0
JUL												
18...	1040	57	57	8.6	--	8.5	--	17	39	1	--	1.0
18...	1025	--	--	--	1.5	--	1.1	--	--	--	0.29	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482803 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	POTASSIUM SEDIMENT BEDMAT PERCENT	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
MAY												
31...	1000	--	55	7.0	19	<0.10	20	105	115	0.14	--	--
31...	0940	--	--	--	--	--	--	--	--	--	<1	0.400
31...	0945	--	--	--	--	--	--	--	--	--	<1	0.500
31...	0950	--	--	--	--	--	--	--	--	--	5	0.500
JUL												
18...	1040	--	54	7.0	18	0.10	21	127	114	0.17	--	--
18...	1030	--	--	--	--	--	--	--	--	--	<1	0.400
18...	1025	0.16	--	--	--	--	--	--	--	--	--	--
18...	1033	--	--	--	--	--	--	--	--	--	2	0.400
18...	1035	--	--	--	--	--	--	--	--	--	6	0.400

DATE	TIME	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)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOSPHOROUS SEDIMENT BEDMAT PERCENT	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)
MAY												
31...	1000	--	--	--	--	--	--	--	--	--	110	<10
31...	0940	--	--	0.20	--	0.60	2.7	<0.010	--	--	--	--
31...	0945	--	--	0.20	--	0.70	3.1	0.010	--	--	--	--
31...	0950	--	--	<0.20	--	--	--	0.010	--	--	--	--
JUL												
18...	1040	--	--	--	--	--	--	--	--	--	120	10
18...	1030	--	--	1.0	--	1.4	6.2	0.040	--	--	--	--
18...	1025	<10	170	--	3300	--	--	--	1200	0.25	--	--
18...	1033	--	--	0.80	--	1.2	5.3	0.020	--	--	--	--
18...	1035	--	--	1.1	--	1.5	6.6	0.020	--	--	--	--

DATE	TIME	ALUMINUM, RECOV. FM BOTTOM MATERIAL (UG/G)	ALUMINUM SED. BEDMAT PERCENT	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G)
MAY												
31...	1000	--	--	<1	<1	--	<100	6	--	<10	<0.5	--
JUL												
18...	1040	--	--	1	1	--	<100	7	--	<10	<0.5	--
18...	1025	100000	10	--	--	10	--	--	310	--	--	2

DATE	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COBALT, RECOV. FM BOTTOM MATERIAL (UG/G AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)
MAY											
31...	<1	<1	--	2	<1	--	1	<3	--	3	3
JUL											
18...	<1	2	--	2	<1	--	1	<3	--	2	2
18...	--	--	<2	--	--	610	--	--	80	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	GOLD IN BOTTOM MATERIAL (UG/KG AS AU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	IRON, RECOV. FM BOTTOM MATERIAL (UG/G AS FE)	IRON SEDIMENT BEDMAT PERCENT	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)
MAY											
31...	--	--	250	17	--	--	2	1	--	<10	<4
JUL											
18...	--	--	330	17	--	--	1	<1	--	<10	<4
18...	170	<8000	--	--	140000	14	--	--	60	--	--

DATE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI)
MAY											
31...	130	37	--	0.20	0.2	3	<10	--	3	1	--
JUL											
18...	120	37	--	0.20	0.2	<1	<10	--	<1	1	--
18...	--	--	2100	--	--	--	--	2.0	--	--	340

DATE	SCANDIUM BOT.MAT (UG/KG AS SC)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	SILVER, RECOV. FM BOTTOM MATERIAL (UG/G AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	STRONTIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	TANTALUM BOT.MAT (UG/KG AS TA)	THORIUM BOT.MAT (UG/KG AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN)
MAY											
31...	--	<1	<1	<1	<1.0	--	81	--	--	--	--
JUL											
18...	--	<1	<1	<1	<1.0	--	80	--	--	--	--
18...	41000	--	--	--	--	<2	--	170	<40000	8000	<10000

DATE	TITANIUM, TOTAL IN BOTTOM MATERIAL (UG/G)	TITANIUM SEDIMENT BEDMAT PERCENT	VANADIUM, DISSOLVED (UG/L AS V)	VANADIUM, TOTAL IN BOTTOM MATERIAL (UG/G)	YTTERBIUM BOT.MAT (UG/KG AS TA)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (GM/KG AS C)
MAY											
31...	--	--	<8	--	--	10	5	--	--	1.6	--
JUL											
18...	--	--	<6	--	--	<10	<3	--	--	1.7	--
18...	22000	2.2	--	340	3000	--	--	240	<100	--	5.0

DATE	CARBON ORG.SED BEDMAT PERCENT	CARBON INRGSED BEDMAT PERCENT	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
MAY											
31...	--	--	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
JUL											
18...	--	--	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
18...	4.9	0.14	--	--	--	--	--	--	--	--	--

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WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)
MAY												
31...	1000	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
JUL												
18...	1040	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	TIME	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)
MAY												
31...	1000	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01	--	--
31...	1001	--	--	--	--	--	--	--	--	--	4.20	0.200
JUN												
22...	1025	--	--	--	--	--	--	--	--	--	1.70	0.200
JUL												
18...	1040	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01	--	--
18...	1025	--	--	--	--	--	--	--	--	--	4.40	0.200
SEP												
13...	0946	--	--	--	--	--	--	--	--	--	4.30	0.400

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

BENTHIC INVERTEBRATE ANALYSES

DATE	JUL 18, 89	
TIME	1025	
SAMPLING DEPTH (FEET)	2.00	
TOTAL CELLS/ML	7800	
	CELLS /ML	PER-CENT
ANNELIDA (SEGMENTED WORMS)		
.OLIGOCHAETA		
..PLESIOPORA		
...NAIDIDAE		
....DERO	5	<1
...TUBIFICIDAE		
....BRANCHIURA	56	<1
....LIMNODRILUS	100	1
MOLLUSCA (MOLLUSCS)		
.GASTROPODA		
..MESOGASTROPODA		
...THIARIDAE		
....MELANOIDES	33	<1

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE	MAY 31, 89		MAY 31, 89		JUN 22, 89		JUN 22, 89	
TIME	1001		1005		1025		1026	
SAMPLING DEPTH (FEET)	2.00		10.0		2.00		10.0	
TOTAL CELLS/ML	8200		9200		20000		21000	
	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)								
.BACILLARIOPHYCEAE								
..ACHNANTHALES								
...ACHNANTHACEAE								
....ACHNANTHES	100	1	14	<1	--		--	
..BACILLARIALES								
...NITZSCHIACEAE								
....NITZSCHIA	26	<1	3	<1	--		--	
..NAVICULALES								
...NAVICULACEAE								
....NAVICULA	26	<1	--		--		--	
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHLOROCOCCACEAE								
....CHLOROCOCCUM	96	1	210	2	3900	20	6500	31
...HYDRODICTYACEAE								
....PEDIASTRUM	190	2	--		--		--	
...OOCYSTACEAE								
....ANKISTRODESMUS	96	1	--		420	2	--	
....SELENASTRUM	--		--		84	<1	--	
....TETRAEDRON	--		--		170	<1	--	
..TETRASPORALES								
...COCCOMYXACEAE								
....ELAKATOTHRIX	150	2	680	7	1900	10	1500	7
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	48	<1	130	1	84	<1	170	<1
..ZYGNEMATALES								
...DESMIDIACEAE								
....STAURASTRUM	96	1	42	<1	--		--	
CHRYSOPHYTA (YELLOW-GREEN ALGAE)								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	160	2	--		--		--	
....STEPHANODISCUS	320	4	130	1	84	<1	170	<1
...RHIZOSOLENIACEAE								
....RHIZOSOLENIA	--		--		510	3	170	<1
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	26	<1	3	<1	--		--	
...CYMBELLACEAE								
....CYMBELLA	--		3	<1	--		--	
...FRAGILARIACEAE	--		--		250	1	--	
....FRAGILARIA	26	<1	3	<1	--		--	
...GOMPHONEMATACEAE								
....GOMPHONEMA	26	<1	3	<1	--		--	
...NAVICULACEAE								
....NAVICULA	53	<1	3	<1	--		--	
...NITZSCHIACEAE								
....NITZSCHIA	--		12	<1	--		--	
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE	1600	20	800	9	4500	23	4800	23
....DACTYLOCOCCOPSIS	3600	44	5300	58	680	3	680	3
....SYNECHOCOCCUS	920	11	1600	17	4300	22	3200	15
....SYNECHOCYSTIS	--		--		2400	12	2000	10
..OSCILLATORIALES								
...OSCILLATORIACEAE								
....OSCILLATORIA	190	2	170	2	--		1200	6

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE	MAY 31, 89		MAY 31, 89		JUN 22, 89		JUN 22, 89	
TIME	1001		1005		1025		1026	
SAMPLING DEPTH (FEET)	2.00		10.0		2.00		10.0	
TOTAL CELLS/ML	8200		9200		20000		21000	
	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
EUGLENOPHYTA (EUGLENOIDS)								
.CRYPTOPHYCEAE								
..CRYPTOMONIDALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	340	4	130	1	680	3	170	<1
...CRYPTOMONODACEAE								
....CRYPTOMONAS	48	<1	--		250	1	170	<1
EUGLENOPHYTA (EUGLENOIDS)								
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	48	<1	--		--		--	

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

PHYTOPLANKTON ANALYSES

DATE	JUL 18, 89		JUL 18, 89		SEP 13, 89		SEP 13, 89	
TIME	1025		1026		0946		0951	
SAMPLING DEPTH (FEET)	2.00		10.0		2.00		10.0	
TOTAL CELLS/ML	7800		8500		31000		56000	
	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)								
.BACILLARIOPHYCEAE								
..ACHNANTHALES								
...ACHNANTHACEAE								
....ACHNANTHES	--		12	<1	--		120	<1
..BACILLARIALES								
...NITZSCHIACEAE								
....NITZSCHIA	--		50	<1	--		--	
..EUPODISCALES								
...COSCINODISCACEAE								
....CYCLOTELLA	--		20	<1	--		--	
..FRAGILARIALES								
...FRAGILARIACEAE								
....ASTERIONELLA	--		12	<1	--		--	
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHLOROCOCCACEAE								
....CHLOROCOCCUM	880	11	740	9	880	3	2700	5
...HYDRODICTYACEAE								
....PEDIASTRUM	--		430	5	--		--	
...OOCYSTACEAE								
....ANKISTRODESMUS	--		--		--		180	<1
....KIRCHNERIELLA	--		--		24000	77	38000	68
....SELENASTRUM	130	2	61	<1	68	<1	180	<1
....TETRAEDRON	--		--		1000	3	--	
..TETRASPORALES								
...COCCOMYXACEAE								
....ELAKATOTHRIX	340	4	180	2	880	3	1500	3
..ULOTRICHALES								
...CHAETOPHORACEAE								
....APHANOCHAETE	--		--		950	3	--	
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	88	<1	61	<1	130	<1	360	<1
...PHACOTACEAE								
....PHACOTUS	--		--		--		180	<1
..ZYGNEMATALES								
...MESOTAENIACEAE								
....MESOTAENIUM	470	6	180	2	68	<1	--	
CHRYSOPHYTA (YELLOW-GREEN ALGAE)								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....STEPHANODISCUS	--		20	<1	--		--	
...RHIZOSOLENIACEAE								
....RHIZOSOLENIA	68	<1	20	<1	130	<1	360	<1
..PENNALES								
...FRAGILARIACEAE	130	2	250	3	--		--	
...NAVICULACEAE								
....NAVICULA	--		37	<1	--		--	
...NITZSCHIACEAE								
....NITZSCHIA	--		12	<1	--		60	<1
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE	1100	14	1400	16	410	1	2900	5
....DACTYLOCOCCOPSIS	1300	17	1800	21	410	1	360	<1
....SYNECHOCOCCUS	2900	37	2200	26	1200	4	4400	8
....SYNECHOCYSTIS	--		--		540	2	3400	6
EUGLENOPHYTA (EUGLENOIDS)								
.CRYPTOPHYCEAE								
..CRYPTOMONIDALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	--		61	<1	200	<1	730	1
...CRYPTOMONODACEAE								
....CRYPTOMONAS	130	2	120	1	68	<1	180	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY								
31...	1515	760	1.00	185	7.86	25.5	8.2	101
31...	1516	760	3.00	185	7.86	25.5	8.1	100
31...	1517	760	5.00	185	7.84	25.5	8.1	100
31...	1520	760	6.00	185	7.78	25.5	7.8	96
31...	1518	760	7.00	185	7.81	25.5	7.0	86
31...	1519	760	9.00	187	7.36	24.5	4.3	52
JUN								
22...	1520	759	1.00	181	7.73	27.5	7.8	100
22...	1521	759	3.00	181	7.69	27.5	7.6	96
22...	1522	759	5.00	180	7.56	26.5	6.8	85
22...	1525	759	6.00	185	7.24	25.5	3.8	47
22...	1523	759	7.00	185	7.22	25.5	3.5	43
22...	1524	759	8.00	186	7.15	25.0	3.4	41
JUL								
19...	1058	760	1.00	182	7.45	26.0	6.1	75
19...	1100	760	3.00	182	7.47	25.5	6.2	76
19...	1101	760	5.00	183	7.45	25.5	6.1	75
19...	1102	760	7.00	183	7.42	25.5	5.6	69
19...	1103	760	9.00	187	7.14	24.5	3.3	40
SEP								
13...	1230	759	1.00	182	7.60	27.5	8.2	104
13...	1231	759	3.00	182	7.67	27.5	7.9	100
13...	1232	759	5.00	181	7.66	27.0	7.3	92
13...	1233	759	7.00	181	7.62	27.0	7.0	88
13...	1234	759	8.00	185	7.50	26.5	3.8	47
13...	1235	759	8.90	186	7.36	25.5	3.5	43

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE (LAT 21°23"31" LONG 157°48'25")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (IN)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY									
31...	1530	760	1.00	186	7.80	26.0	--	8.2	101
31...	1525	760	2.00	186	7.80	26.0	75.0	8.2	101
31...	1531	760	3.00	186	7.82	26.0	--	8.2	101
31...	1532	760	5.00	186	7.81	26.0	--	8.0	99
31...	1533	760	7.00	188	7.77	25.5	--	7.5	92
31...	1534	760	9.00	189	7.47	24.5	--	5.2	63
31...	1535	760	11.0	190	7.38	24.0	--	5.5	66
31...	1536	760	12.0	191	7.29	23.5	--	5.2	62
JUN									
22...	1505	759	1.00	182	7.81	27.5	--	7.8	100
22...	1515	759	2.00	181	7.75	27.5	80.0	7.8	99
22...	1506	759	3.00	181	7.75	27.5	--	7.8	99
22...	1507	759	5.00	183	7.49	26.0	--	6.8	85
22...	1508	759	7.00	186	7.23	25.0	--	4.1	50
22...	1511	759	8.00	186	7.19	25.0	--	4.3	52
22...	1509	759	9.00	187	7.18	25.0	--	5.0	61
22...	1510	759	11.0	187	7.15	24.0	--	5.5	66
JUL									
19...	1051	760	--	182	7.45	25.5	79.0	6.3	78
19...	1052	760	1.00	182	7.43	25.5	--	6.2	76
19...	1053	760	3.00	182	7.45	25.5	--	6.3	78
19...	1054	760	5.00	182	7.46	25.5	--	5.7	70
19...	1055	760	7.00	183	7.36	25.5	--	5.5	67
19...	1056	760	9.00	185	7.28	25.0	--	4.8	58
19...	1057	760	11.0	187	7.15	24.5	--	3.9	47
SEP									
13...	1240	759	1.00	182	7.61	27.5	--	7.9	101
13...	1241	759	2.00	182	7.62	27.5	74.0	7.8	99
13...	1242	759	3.00	182	7.63	27.5	--	7.8	99
13...	1243	759	5.00	183	7.65	27.0	--	7.9	100
13...	1244	759	6.00	183	7.65	27.0	--	6.8	86
13...	1245	759	7.00	181	7.59	26.5	--	5.0	63
13...	1246	759	8.00	186	7.42	25.5	--	4.1	51
13...	1247	759	9.00	186	7.37	25.5	--	5.9	73
13...	1248	759	10.0	187	7.33	25.0	--	4.8	58
13...	1249	759	11.0	188	7.30	25.0	--	4.1	50

DATE	TIME	CALCIUM SED. BEDMAT PERCENT	MAGNESIUM SEDIMENT BEDMAT PERCENT	SODIUM SEDIMENT BEDMAT PERCENT	POTASSIUM SEDIMENT BEDMAT PERCENT	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	PHOSPHOROUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOSPHOROUS SEDIMENT BEDMAT PERCENT
JUL										
19...	1051	1.1	1.0	0.26	0.15	18	190	3700	1600	0.25

DATE	ALUMINUM SED. BEDMAT PERCENT	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COBALT, RECOV. FM BOTTOM MATERIAL (UG/G AS CO)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	GOLD IN BOTTOM MATERIAL(UG/KG AS AU)	IRON SEDIMENT BEDMAT PERCENT
JUL										
19...	10	20	310	2	<2	580	80	180	<8000	14

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE--Continued

DATE	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI)	SCANDIUM BOT.MAT (UG/KG AS SC)	SILVER, RECOV. FM BOTTOM MATERIAL (UG/G AS AG)	STRONTIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	TANTALUM BOT.MAT (UG/KG AS TA)	THORIUM BOT.MAT (UG/KG AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN)
JUL										
19...	70	170 0	<2.0	330	41000	<2	140	<40000	7000	<10000

DATE	TIME	TITAWIUM SEDIMENT BEDMAT PERCENT	VANADIUM, TOTAL IN BOTTOM MATERIAL (UG/G)	YTTERBIUM BOT.MAT (UG/KG AS TA)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (GM/KG AS C)	CARBON ORG.SED BEDMAT PERCENT	CARBON INRGSED BEDMAT PERCENT	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
MAY											
31...	1525	--	--	--	--	--	--	--	--	4.80	0.800
JUN											
22...	1515	--	--	--	--	--	--	--	--	2.90	0.400
JUL											
19...	1051	2.2	350	4000	220	<100	5.1	5.0	0.10	3.70	0.200
SEP											
13...	1241	--	--	--	--	--	--	--	--	4.50	0.400

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

BENTHIC INVERTEBRATE ANALYSES

DATE	JUL 19, 89	
TIME	1051	
TOTAL COUNT	130	
	COUNT	PERCENT
ANNELIDA (SEGMENTED WORMS)		
.OLIGOCHAETA		
..PLESIOPORA		
...HAIDIDAE		
....DERO	2	2
...TUBIFICIDAE		
....BRANCHIURA	42	32
....LIMNODRILUS	59	45
MOLLUSCA (MOLLUSCS)		
.GASTROPODA		
..MESOGASTROPODA		
...THIARIDAE		
....MELANOIDES	26	20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BARO-METRIC PRES-SURE (MM OF HG)	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
MAY								
31...	1540	760	1.00	186	7.56	26.0	8.0	99
31...	1541	760	3.00	186	7.66	26.0	8.1	100
31...	1542	760	5.00	186	7.69	26.0	7.9	97
31...	1543	760	7.00	185	7.64	25.5	6.9	85
31...	1544	760	9.00	189	7.46	25.0	5.4	65
JUN								
22...	1455	759	1.00	181	7.69	27.5	7.8	100
22...	1456	759	3.00	181	7.64	27.5	7.7	98
22...	1457	759	5.00	183	7.53	26.5	6.7	83
22...	1500	759	6.00	183	7.38	25.5	5.4	66
22...	1458	759	7.00	187	7.30	25.5	3.5	43
22...	1459	759	9.00	187	7.16	24.5	4.0	48
JUL								
19...	1046	760	1.00	182	7.44	25.5	6.4	79
19...	1047	760	3.00	182	7.46	25.5	6.2	76
19...	1048	760	5.00	182	7.46	25.5	6.2	76
19...	1049	760	7.00	182	7.45	25.5	5.9	72
19...	1050	760	9.00	185	7.22	24.5	4.6	55
SEP								
13...	1255	759	1.00	182	7.56	27.5	8.4	107
13...	1256	759	3.00	182	7.63	27.5	8.0	101
13...	1257	759	5.00	183	7.61	27.0	7.4	93
13...	1258	759	6.00	183	7.54	26.5	5.9	74
13...	1259	759	7.00	185	7.47	26.5	5.6	70
13...	1300	759	8.00	186	7.41	26.0	4.9	61
13...	1301	759	8.80	187	7.34	25.5	5.4	66

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY								
31...	1255	760	1.00	185	7.74	26.0	7.9	98
31...	1256	760	3.00	185	7.73	26.0	7.9	97
31...	1257	760	5.00	185	7.70	26.0	7.8	96
31...	1258	760	7.00	185	7.68	26.0	7.9	97
31...	1300	760	8.00	185	7.53	26.0	7.7	95
31...	1259	760	9.00	193	7.29	24.5	1.4	17
JUN								
22...	1415	759	1.00	182	7.45	27.5	7.6	97
22...	1416	759	3.00	181	7.55	27.5	7.1	90
22...	1417	759	5.00	183	7.32	26.0	5.2	65
22...	1420	759	6.00	185	7.08	25.5	4.5	55
22...	1418	759	7.00	188	7.08	25.5	2.6	32
22...	1419	759	9.00	189	7.00	24.5	1.4	17
JUL								
18...	1145	760	1.00	182	7.63	26.5	7.2	90
18...	1146	760	3.00	182	7.64	26.5	7.2	90
18...	1147	760	5.00	182	7.82	26.5	7.2	90
18...	1148	760	7.00	182	7.61	26.0	7.1	88
18...	1149	780	9.00	182	7.60	26.0	7.1	88
SEP								
13...	1130	759	1.00	181	7.49	27.0	7.9	100
13...	1131	759	3.00	182	7.59	27.0	7.7	97
13...	1132	759	5.00	182	7.60	27.0	7.0	88
13...	1133	759	7.00	184	7.56	26.5	5.3	66
13...	1134	759	8.00	187	7.38	26.0	2.6	32
13...	1135	759	9.00	187	7.27	26.0	2.3	28

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (IN)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY									
31...	1225	760	1.00	186	7.60	26.0	--	8.0	99
31...	1245	760	1.00	186	7.60	26.0	--	8.0	99
31...	1240	760	2.00	186	7.60	26.0	79.0	8.1	100
31...	1246	760	3.00	186	7.67	26.0	--	8.1	100
31...	1247	760	5.00	186	7.66	25.5	--	8.1	100
31...	1230	760	6.00	186	7.66	25.5	--	8.1	100
31...	1248	760	7.00	185	7.64	25.5	--	8.1	100
31...	1249	760	9.00	190	7.41	25.0	--	4.9	60
31...	1235	760	10.0	190	7.41	25.0	--	4.9	60
31...	1250	760	11.0	194	7.17	24.0	--	3.5	42
JUN									
22...	1345	759	1.00	181	7.64	28.0	--	7.6	97
22...	1355	759	2.00	181	7.68	27.5	82.0	7.5	95
22...	1346	759	3.00	181	7.68	27.5	--	7.5	95
22...	1347	759	5.00	180	7.49	26.5	--	6.0	75
22...	1348	759	6.00	185	7.26	26.0	--	4.5	56
22...	1349	759	7.00	185	7.26	26.0	--	4.5	56
22...	1352	759	8.00	186	7.13	25.0	--	2.5	30
22...	1351	759	9.00	188	7.11	25.0	--	2.0	24
22...	1350	759	10.0	189	7.00	24.5	--	1.4	17
JUL									
18...	1130	760	--	182	7.60	26.5	61.0	7.2	90
18...	1131	760	1.00	182	7.60	26.5	--	7.2	90
18...	1132	760	3.00	182	7.61	26.5	--	7.2	90
18...	1133	760	5.00	182	7.61	26.0	--	7.1	88
18...	1134	760	6.00	182	7.61	26.0	--	7.1	88
18...	1135	760	7.00	182	7.59	26.0	--	7.1	88
18...	1136	760	9.00	182	7.58	26.0	--	7.1	88
18...	1137	760	10.0	182	7.58	26.0	--	7.1	88
SEP									
13...	1140	759	1.00	183	7.57	27.0	--	7.7	97
13...	1141	759	2.00	183	7.58	27.0	75.0	7.7	97
13...	1142	759	3.00	183	7.60	27.0	--	7.7	97
13...	1143	759	5.00	183	7.61	27.0	--	7.6	96
13...	1144	759	6.00	183	7.58	26.5	--	7.2	90
13...	1145	759	7.00	185	7.55	26.5	--	6.3	79
13...	1146	759	8.00	186	7.60	26.5	--	4.4	55
13...	1147	759	9.00	187	7.45	26.0	--	3.2	40
13...	1148	759	10.0	188	7.24	25.5	--	2.0	25

DATE	TIME	CALCIUM SED. BEDMAT PERCENT	MAGNESIUM SEDIMENT BEDMAT PERCENT	SODIUM SEDIMENT BEDMAT PERCENT	POTASSIUM SEDIMENT BEDMAT PERCENT	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	PHOSPHOROUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOSPHOROUS SEDIMENT BEDMAT PERCENT
JUL										
18...	1130	0.83	0.77	0.17	0.12	<10	160	2500	1200	0.24

DATE	ALUMINUM SED. BEDMAT PERCENT	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COBALT, RECOV. FM BOTTOM MATERIAL (UG/G AS CO)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	GOLD IN BOTTOM MATERIAL(UG/KG AS AU)	IRON SEDIMENT BEDMAT PERCENT
JUL										
18...	11	20	340	2	<2	570	90	180	<8000	14

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE (LAT 21°23'29" LONG 157°48'31")--Continued

DATE	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI)	SCANDIUM BOT.MAT (UG/KG AS SC)	SILVER, RECOV. FM BOTTOM MATERIAL (UG/G AS AG)	STRONTIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	TANTALUM BOT.MAT (UG/KG AS TA)	THORIUM BOT.MAT (UG/KG AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN)
JUL										
18...	60	2200	<2.0	30	41000	2	120	<40000	7000	<10000

DATE	TIME	TITANIUM SEDIMENT BEDMAT PERCENT	VANADIUM, TOTAL IN BOTTOM MATERIAL (UG/G)	YTTERBIUM BOT.MAT (UG/KG AS TA)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (GM/KG AS C)	CARBON ORG.SED BEDMAT PERCENT	CARBON INRGSED BEDMAT PERCENT	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
MAY											
31...	1240	--	--	--	--	--	--	--	--	4.60	0.600
JUN											
22...	1355	--	--	--	--	--	--	--	--	2.60	0.200
JUL											
18...	1130	2.2	410	4000	230	<100	3.4	3.4	0.04	4.10	0.200
SEP											
13...	1141	--	--	--	--	--	--	--	--	4.70	0.500

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

BENTHIC INVERTEBRATE ANALYSES

DATE	JUL 18, 89	
TIME	1130	
TOTAL COUNT	160	
	COUNT	PERCENT
ANNELIDA (SEGMENTED WORMS)		
.OLIGOCHAETA		
..PLESIOPORA		
...TUBIFICIDAE		
....AULODRILUS	1	<1
....BRANCHIURA	34	21
....LIMNODRILUS	96	60
MOLLUSCA (MOLLUSCS)		
.GASTROPODA		
..MESOGASTROPODA		
...T. IARIDAE		
....MELANOIDES	24	15

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BARO-METRIC PRES-SURE (MM OF HG)	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
MAY								
31...	1230	760	1.00	185	7.74	26.0	8.1	100
31...	1231	760	3.00	185	7.72	26.0	8.0	99
31...	1232	760	5.00	185	7.69	25.5	7.9	97
31...	1233	760	7.00	185	7.66	25.5	7.7	95
31...	1234	760	9.00	184	7.49	25.0	4.8	58
31...	1235	760	11.0	190	7.28	24.0	3.9	47
31...	1236	760	12.0	195	7.15	24.0	1.1	13
JUN								
22...	1335	759	1.00	180	7.79	27.5	8.1	103
22...	1336	759	3.00	181	7.73	27.5	7.9	100
22...	1337	759	5.00	181	7.59	26.5	6.5	81
22...	1338	759	7.00	186	7.40	25.5	4.4	54
22...	1339	759	9.00	186	7.22	25.0	2.9	35
22...	1340	759	11.0	187	7.16	24.5	2.4	29
JUL								
18...	1121	760	1.00	182	7.58	26.5	7.2	90
18...	1122	760	3.00	182	7.61	26.0	7.1	88
18...	1123	760	5.00	182	7.60	26.0	7.1	88
18...	1124	760	7.00	182	7.58	26.0	7.1	88
18...	1125	760	9.00	182	7.55	25.5	7.0	86
18...	1126	760	11.0	182	7.47	25.5	6.4	79
18...	1127	760	12.0	184	7.41	25.5	5.8	71
SEP								
13...	1155	759	1.00	183	7.34	27.5	8.7	110
13...	1156	759	3.00	183	7.54	27.0	8.2	104
13...	1157	759	5.00	183	7.61	27.0	7.9	100
13...	1158	759	6.00	183	7.61	27.0	7.6	96
13...	1159	759	7.00	184	7.58	26.5	6.0	75
13...	1200	759	8.00	186	7.48	26.5	4.2	52
13...	1201	759	9.00	187	7.35	26.0	3.5	43
13...	1202	759	10.0	188	7.24	25.5	3.1	38
13...	1203	759	11.0	189	7.19	25.5	2.3	28
13...	1204	759	11.8	189	7.11	25.5	1.9	23

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY								
31...	1415	760	1.00	186	7.67	26.0	8.0	99
31...	1416	760	3.00	186	7.69	26.0	8.0	99
31...	1417	760	5.00	187	7.67	25.5	7.7	95
31...	1418	760	7.00	189	7.52	25.5	6.4	78
31...	1419	760	9.00	190	7.34	24.5	4.5	54
JUN								
22...	1140	759	1.00	180	7.70	27.0	7.9	100
22...	1141	759	3.00	181	7.58	26.5	7.4	93
22...	1142	759	5.00	183	7.42	26.0	6.4	79
22...	1143	759	7.00	184	7.36	25.5	5.4	66
22...	1145	759	8.00	186	7.24	25.0	2.7	33
22...	1144	759	9.00	188	7.17	25.0	2.4	29
JUL								
19...	1036	760	1.00	183	7.44	25.5	6.3	77
19...	1037	760	3.00	183	7.44	25.5	6.2	76
19...	1038	760	5.00	183	7.44	25.5	6.1	75
19...	1039	760	7.00	183	7.44	25.5	6.1	75
19...	1040	760	8.00	184	7.43	25.5	5.9	72
SEP								
13...	1105	759	1.00	183	7.71	27.0	8.4	106
13...	1106	759	3.00	183	7.72	27.0	8.1	102
13...	1107	759	5.00	183	7.69	27.0	8.0	101
13...	1108	759	6.00	184	7.55	26.5	6.6	83
13...	1109	759	7.00	186	7.59	26.5	4.2	53
13...	1110	759	8.00	188	7.47	26.0	3.7	46

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (IN)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY									
31...	1406	760	1.00	185	7.66	26.0	--	7.9	97
31...	1405	760	2.00	186	7.70	26.0	71.0	7.8	96
31...	1407	760	3.00	186	7.70	26.0	--	7.8	96
31...	1408	760	5.00	186	7.69	26.0	--	7.8	96
31...	1409	760	7.00	188	7.50	25.0	--	6.2	76
31...	1410	760	9.00	190	7.34	24.5	--	5.5	66
31...	1411	760	10.5	191	7.22	24.0	--	4.3	51
JUN									
22...	1155	759	1.00	182	7.63	27.0	--	7.5	94
22...	1205	759	2.00	182	7.63	26.5	86.0	7.3	92
22...	1156	759	3:00	182	7.63	26.5	--	7.3	92
22...	1157	759	5.00	183	7.42	26.0	--	6.5	81
22...	1158	759	7.00	185	7.28	25.5	--	5.4	66
22...	1201	759	8.00	185	7.11	25.0	--	4.3	52
22...	1159	759	9.00	187	7.12	24.5	--	3.1	38
22...	1200	759	11.0	187	7.10	24.5	--	4.1	49
JUL									
19...	1028	760	--	183	7.44	25.5	75.0	6.4	79
19...	1029	760	1.00	183	7.42	25.5	--	6.9	85
19...	1030	760	3.00	183	7.44	25.5	--	6.4	79
19...	1031	760	5.00	183	7.43	25.5	--	6.1	75
19...	1032	760	7.00	183	7.44	25.5	--	6.1	75
19...	1033	760	9.00	185	7.33	25.5	--	3.9	48
19...	1034	760	10.0	185	7.15	25.0	--	3.9	47
SEP									
13...	1055	759	1.00	183	7.66	27.0	--	8.0	101
13...	1056	759	2.00	183	7.67	27.0	76.0	7.9	100
13...	1057	759	3.00	183	7.68	27.0	--	7.9	100
13...	1058	759	5.00	183	7.69	27.0	--	7.7	97
13...	1059	759	7.00	185	7.61	26.5	--	5.7	71
13...	1100	759	9.00	187	7.50	26.0	--	4.4	54
13...	1101	759	10.0	188	7.37	25.5	--	3.4	42

DATE	TIME	CALCIUM SED. BEDMAT PERCENT	MAGNESIUM SEDIMENT BEDMAT PERCENT	SODIUM SEDIMENT BEDMAT PERCENT	POTASSIUM SEDIMENT BEDMAT PERCENT	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N)	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	PHOSPHOROUS TOTAL IN BOT. MAT. (MG/KG AS P)	PHOSPHOROUS SEDIMENT BEDMAT PERCENT
JUL										
19...	1028	1.4	1.1	0.27	0.13	<10	250	3800	1600	0.22

DATE	ALUMINUM SED. BEDMAT PERCENT	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COBALT, RECOV. FM BOTTOM MATERIAL (UG/G AS CO)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	GOLD IN BOTTOM MATERIAL(UG/KG AS AU)	IRON SEDIMENT BEDMAT PERCENT
JUL										
19...	10	40	280	2	<2	470	70	200	<8000	13

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE (LAT 21°23'35" LONG 157°48'30")--Continued

DATE	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G)	MOLYBDENUM, RECOV. FM BOTTOM MATERIAL (UG/G)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI)	SCANDIUM BOT.MAT (UG/KG AS SC)	SILVER, RECOV. FM BOTTOM MATERIAL (UG/G AS AG)	STRONTIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	TANTALUM BOT.MAT (UG/KG AS TA)	THORIUM BOT.MAT (UG/KG AS TH)	TIN RECOV. FROM BOT.MAL (UG/KG AS SN)
JUL										
19...	100	1700	<2.0	260	40000	<2	150	<40000	6000	10000

DATE	TIME	TITANIUM SEDIMENT BEDMAT PERCENT	VANADIUM, TOTAL IN BOTTOM MATERIAL (UG/G)	YTTERBIUM BOT.MAT (UG/KG AS TA)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)	URANIUM NATURAL TOTAL IN BOTTOM MATERIL (UG/G)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (GM/KG AS C)	CARBON ORG.SED BEDMAT PERCENT	CARBON INRGSED BEDMAT PERCENT	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
MAY											
31...	1405	--	--	--	--	--	--	--	--	4.40	0.300
JUN											
22...	1205	--	--	--	--	--	--	--	--	2.40	0.200
JUL											
19...	1028	2.1	380	3000	220	<100	6.0	5.9	0.10	3.90	0.100
SEP											
13...	1056	--	--	--	--	--	--	--	--	3.90	0.500

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

BENTHIC INVERTEBRATE ANALYSES

DATE	JUL 19, 89	
TIME	1028	
TOTAL COUNT	120	
	COUNT	PERCENT
ANNELIDA (SEGMENTED WORMS)		
.OLIGOCHAETA		
..PLESIOPORA		
...TUBIFICIDAE		
....BRANCHIURA	47	39
....LIMNODRILUS	10	8
MOLLUSCA (MOLLUSCS)		
.GASTROPODA		
..MESOGASTROPODA		
...THIARIDAE		
....MELANOIDES	66	55

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
MAY								
31...	1355	760	1.00	185	7.80	26.0	8.0	99
31...	1356	760	3.00	185	7.78	26.0	8.0	99
31...	1357	760	5.00	186	7.76	25.5	7.9	97
31...	1358	760	7.00	188	7.55	25.0	6.2	75
31...	1359	760	9.00	191	7.32	24.5	4.2	51
31...	1400	760	11.0	192	7.22	24.0	4.4	53
31...	1401	760	12.0	194	7.15	24.0	2.9	35
JUN								
22...	1210	759	1.00	181	7.55	27.0	7.5	94
22...	1211	759	3.00	182	7.58	26.5	7.6	95
22...	1212	759	5.00	183	7.50	26.5	6.7	83
22...	1213	759	7.00	185	7.33	25.5	5.5	68
22...	1214	759	9.00	186	7.22	25.0	5.0	61
22...	1215	759	11.0	187	7.14	24.5	3.8	46
22...	1216	759	12.0	187	7.08	24.5	3.7	44
JUL								
19...	1016	760	1.00	184	7.45	25.5	6.7	82
19...	1020	760	3.00	183	7.44	25.5	6.4	78
19...	1023	760	5.00	183	7.44	25.5	6.4	79
19...	1024	760	7.00	184	7.43	25.5	5.8	71
19...	1025	760	9.00	185	7.36	25.5	5.1	62
19...	1026	760	11.0	185	7.14	25.0	4.4	53
19...	1027	760	12.0	186	7.12	25.0	4.4	53
SEP								
13...	1045	759	1.00	183	7.74	27.0	8.0	101
13...	1046	759	3.00	183	7.72	27.0	7.9	100
13...	1047	759	5.00	183	7.72	27.0	7.7	97
13...	1048	759	7.00	184	7.63	26.5	6.5	81
13...	1049	759	9.00	186	7.51	26.0	4.6	57
13...	1050	759	11.0	187	7.43	25.5	4.6	56
13...	1051	759	12.0	188	7.33	25.0	2.9	35
13...	1052	759	13.0	189	7.28	25.0	2.4	29

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)	TRANSPARENCY (SECCHI DISK) (IN)
MAY											
31...	1435	--	5.00	189	7.38	24.5	6.9	--	--	--	--
JUL											
18...	1115	--	--	189	7.40	26.0	7.2	--	--	--	--
18...	1116	--	--	189	7.40	26.0	7.2	--	--	--	--
19...	1030	760	2.00	--	--	26.0	7.2	--	2.60	0.200	68.0
19...	1110	760	3.00	--	--	26.0	7.2	--	--	--	--
19...	1111	760	4.00	--	--	25.5	7.2	--	--	--	--
19...	1112	760	5.00	--	--	25.5	6.9	--	--	--	--
SEP											
13...	1341	759	1.00	183	7.78	27.5	8.5	108	--	--	--
13...	1340	759	2.00	183	7.80	27.5	8.3	105	3.70	0.400	69.0
13...	1342	759	3.00	183	7.82	27.0	8.1	103	--	--	--
13...	1343	759	5.00	184	7.77	27.0	7.6	96	--	--	--
13...	1344	759	7.00	185	7.68	26.5	6.7	84	--	--	--
13...	1345	759	9.00	186	7.56	26.0	5.7	71	--	--	--
13...	1346	759	11.0	188	7.46	25.5	4.2	52	--	--	--
13...	1347	759	13.0	189	7.36	25.0	2.7	33	--	--	--
13...	1348	759	15.0	190	7.26	25.0	2.3	28	--	--	--
13...	1349	759	17.0	190	7.21	25.0	2.0	24	--	--	--

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

PERIPHYTON ANALYSES

DATE	LENGTH OF EXPOSURE (DAYS)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2)	CHLOR-B PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2)	BIOMASS CHLOROPHYLL RATIO PERIPHYTON (UNITS)
JUL						
19...	26	0.660	0.420	0.100	0.100	2400

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")--Continued

PERIPHYTON ANALYSES

DATE	JUL 18, 89		JUL 18, 89	
TIME	1115		1116	
TOTAL CELLS/ML	480		870	
	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)				
.BACILLARIOPHYCEAE				
..ACHNANTHALES				
...ACHNANTHACEAE				
....ACHNANTHES	150	31	230	26
..EUPODISCALES				
...COSCINODISCACEAE				
....MELOSIRA				
.....M.GRANULATA V.PROCERA	15	3	--	
CHLOROPHYTA (GREEN ALGAE)				
.CHLOROPHYCEAE				
..CHLOROCOCCALES				
...CHARACIACEAE				
....CHARACIUM	5	1	15	2
...CHLOROCOCCACEAE				
....CHLOROCOCCUM	8	2	9	1
...OOCYSTACEAE				
....SELENASTRUM	2	<1	1	<1
....TETRAEDRON	1	<1	--	
..TETRASPORALES				
...COCCOMYXACEAE				
....ELAKATOTHRIX	--		5	<1
..ULOTRICHALES				
...CHAETOPHORACEAE				
....STIGEOCLONIUM	120	25	220	25
CHRYSOPHYTA (YELLOW-GREEN ALGAE)				
.BACILLARIOPHYCEAE				
..CENTRALES				
...COSCINODISCACEAE				
....CYCLOTELLA	6	1	--	
....MELOSIRA	--		3	<1
..PENNALES				
...CYMBELLACEAE				
....CYMBELLA	--		4	<1
...GOMPHONEMATACEAE				
....GOMPHONEMA	3	<1	--	
...NAVICULACEAE				
....NAVICULA	--		4	<1
...NITZSCHIACEAE				
....NITZSCHIA	1	<1	--	
CYANOPHYTA (BLUE-GREEN ALGAE)				
.CYANOPHYCEAE				
..CHROOCOCCALES	20	4	27	3
...CHROOCOCCACEAE				
....SYNECHOCOCCUS	37	8	16	2
..OSCILLATORIALES				
...OSCILLATORIACEAE				
....LYNGBYA	6	1	240	28
....OSCILLATORIA	97	20	93	11
EUGLENOPHYTA (EUGLENOIDS)				
.CRYPTOPHYCEAE				
..CRYPTOMONIDALES				
...CRYPTOCHRYSIDACEAE				
....CHROOMONAS	1	<1	--	

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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")--Continued

PHYTOPLANKTON ANALYSES

DATE	SEP 13, 89	
TIME	1340	
SAMPLING DEPTH (FEET)	2.00	
TOTAL CELLS/ML	62000	
	CELLS /ML	PER-CENT
BACILLARIOPHYTA (DIATOMS)		
.BACILLARIOPHYCEAE		
..ACHNANTHALES		
...ACHNANTHACEAE		
....ACHNANTHES	140	<1
CHLOROPHYTA (GREEN ALGAE)		
.CHLOROPHYCEAE		
..CHLOROCOCCALES		
...CHLOROCOCCACEAE		
....CHLOROCOCCUM	2300	4
...OOCYSTACEAE		
....KIRCHNERIELLA	41000	66
....SELENASTRUM	330	<1
....TETRAEDRON	330	<1
..TETRASPORALES		
...COCCOMYXACEAE		
....ELAKATOTHRIX	1500	2
..VOLVOCALES		
...CHLAMYDOMONADACEAE		
....CHLAMYDOMONAS	650	1
....CHLOROMONAS	160	<1
CHRYSOPHYTA (YELLOW-GREEN ALGAE)		
.BACILLARIOPHYCEAE		
..PENNALES		
...FRAGILARIACEAE		
....FRAGILARIA	23	<1
CYANOPHYTA (BLUE-GREEN ALGAE)		
.CYANOPHYCEAE		
..CHROOCOCCALES		
...CHROOCOCCACEAE	4200	7
....DACTYLOCOCCOPSIS	820	1
....SYNECHOCOCCUS	8000	13
....SYNECHOCYSTIS	2100	3
EUGLENOPHYTA (EUGLENOIDS)		
.CRYPTOPHYCEAE		
..CRYPTOMONIDALES		
...CRYPTOCHRYSIDACEAE		
....CHROOMONAS	820	1
...CRYPTOMONODACEAE		
....CRYPTOMONAS	330	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE (LAT 21°24'21" LONG 157°48'31")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
04...	1445	750	4.9	195	7.10	22.5	41	7.9	93	--	--
DEC											
07...	1420	--	2.8	195	7.40	23.5	9.3	8.1	--	2200	--
MAR											
22...	1250	761	2.4	170	7.70	23.5	3.4	8.3	98	--	--
APR											
25...	1200	762	3.2	179	7.70	22.5	2.0	8.5	98	1000	54
JUN											
13...	1400	764	2.3	185	7.90	24.0	2.6	7.9	94	--	--
26...	1230	760	2.1	190	7.90	23.0	2.1	8.3	97	--	--
JUL											
20...	1300	759	2.5	190	8.00	22.5	1.9	8.1	94	6400	--
AUG											
08...	1300	760	2.3	190	7.63	22.5	2.2	8.1	94	1200	57
29...	1200	759	2.5	188	7.95	23.0	1.7	8.0	94	--	--
SEP											
25...	1345	759	2.0	192	7.62	23.0	2.0	8.4	98	--	--

DATE	HARDNESS NONCARB DISSOLV LAB AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
25...	54	11	6.4	17	40	1	1.3	54	5.0	18
AUG										
08...	57	12	6.5	17	39	1	1.0	60	4.0	18

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
07...	--	--	--	--	--	12	0.200	0.20	0.40	0.030
APR										
25...	0.10	26	104	117	0.14	9	<0.100	<0.20	--	0.030
JUL										
20...	--	--	--	--	--	4	<0.100	0.30	--	0.030
AUG										
08...	0.10	31	120	126	0.16	14	<0.100	<0.20	--	0.020

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
25...	270	<10	1	1	<100	3	<10	<0.5	3	<1
AUG										
08...	170	<10	1	1	<100	2	<10	<0.5	<1	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
25...	2	<1	1	<3	13	1	770	42	2	2
AUG										
08...	2	<1	<1	<3	2	3	600	140	<1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
25...	<10	<4	50	42	0.10	0.2	3	<10	29
AUG									
08...	<10	<4	80	55	0.30	0.3	<1	<10	2

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
25...	<1	<1	<1	<1	<1.0	63	<6	<10	100
AUG									
08...	2	<1	<1	<1	<1.0	66	7	<10	<3

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
APR										
25...	1.2	1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
08...	1.3	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
APR										
25...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE--Continued

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
25...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
08...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STR BELOW KAM HWY (LAT 21°24'54" LONG 157°48'03")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
09...	1120	765	13	120	8.80	26.0	6.5	9.5	117	--	--
DEC											
07...	1435	762	25	200	7.80	27.0	25	7.9	99	3900	--
MAR											
22...	1505	759	21	200	8.70	29.0	2.6	9.3	122	--	--
APR											
27...	1110	762	44	195	8.20	23.0	5.0	9.1	106	5400	57
JUN											
14...	0920	765	16	200	8.70	24.5	1.5	9.7	116	--	--
27...	0900	764	16	200	8.60	25.5	2.3	8.9	109	--	--
JUL											
20...	1000	762	19	186	8.60	25.0	2.1	8.8	107	8600	--
AUG											
09...	1300	759	17	184	9.01	30.5	4.8	8.9	119	870	56
28...	0920	761	15	189	8.68	25.5	2.2	8.2	100	--	--
SEP											
26...	0945	762	12	188	8.66	25.0	2.6	9.2	111	--	--

DATE	HARDNESS NONCARB DISSOLV LAB AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR										
27...	57	10	7.7	15	36	0.9	1.3	52	7.0	18
AUG										
09...	56	10	7.4	16	38	0.9	1.0	54	7.0	18

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC										
07...	--	--	--	--	--	15	0.600	0.40	1.0	0.070
APR										
27...	0.10	20	101	111	0.14	3	0.400	0.40	0.80	0.040
JUL										
20...	--	--	--	--	--	14	0.300	0.60	0.90	0.020
AUG										
09...	0.10	23	115	115	0.16	14	0.300	0.50	0.80	0.020

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
APR										
27...	490	30	<1	<1	<100	4	<10	<0.5	<1	<1
AUG										
09...	290	20	1	2	<100	2	<10	<0.5	<1	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STR BELOW KAM HWY --Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
APR										
27...	3	<1	1	<3	8	3	1100	80	2	1
AUG										
09...	2	2	<1	<3	3	4	810	110	1	<1

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
APR									
27...	<10	<4	80	35	0.20	<0.1	4	<10	4
AUG									
09...	<10	<4	70	16	0.30	0.3	<1	<10	2

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
APR									
27...	1	<1	<1	<1	<1.0	73	<6	<10	7
AUG									
09...	1	<1	<1	<1	<1.0	71	<6	<10	6

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
APR										
27...	2.0	2	<0.1	<0.010	0.1	<0.010	<0.010	<0.010	0.01	0.020
AUG										
09...	2.1	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	0.020

DATE	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
APR										
27...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.010	<0.010	<0.01	<0.010	0.010	<0.010	<0.01	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STR BELOW KAM HWY --Continued

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
APR										
27...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG										
09...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF KAUAI

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22°08'09" LONG 159°37'22")							
OCT 1988				MAY 1989			
04...	1000	5.0	18.0	09...	1020	8.2	15.5
NOV				JUN			
30...	0945	7.9	16.0	20...	1000	4.7	20.0
FEB 1989				AUG			
03...	0915	39	15.0	18...	0910	7.6	18.0
MAR							
14...	1030	18	15.5				
16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21°58'31" LONG 159°38'55")							
OCT 1988				MAY 1989			
03...	1310	13	25.0	02...	1305	26	21.0
JAN 1989				JUN			
24...	1055	75	18.5	22...	1220	16	24.0
FEB				AUG			
17...	1305	30	19.5	09...	1355	27	24.0
MAR							
28...	0910	43	20.0				
16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE,KAUAI,HI (LAT 21°57'29" LONG 159°33'13")							
OCT 1988				MAY 1989			
03...	1030	18	22.0	02...	1025	17	19.5
NOV				JUN			
04...	1040	320	18.5	22...	0950	18	22.0
JAN 1989				AUG			
09...	1010	210	19.0	09...	1025	44	22.0
MAR							
07...	1105	180	19.0				
16060000 - SF WAILUA RIVER NR LIHUE,KAUAI, HI (LAT 22°02'24" LONG 159°22'58")							
OCT 1988				APR 1989			
14...	0930	31	24.5	28...	1105	170	20.0
DEC				JUN			
15...	0915	110	19.0	23...	0920	7.8	24.5
JAN 1989				AUG			
30...	1220	83	18.5	30...	1215	44	25.0
MAR							
10...	1000	180	18.5				
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE,KAUAI,HI (LAT 22°03'34" LONG 159°28'00")							
OCT 1988				APR 1989			
07...	1050	22	20.5	28...	1335	19	19.0
DEC				JUN			
07...	0935	21	19.0	16...	0930	20	19.0
FEB 1989				AUG			
13...	1020	20	18.5	11...	0950	9.9	19.0
MAR							
10...	1200	19	18.0				
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22°04'09" LONG 159°26'46")							
OCT 1988							
07...	0915	0.19	23.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF KAUAI--Continued

16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22°04'19" LONG 159°25'05")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				APR 1989			
28...	1000	17	21.0	27...	1015	120	20.0
NOV				MAY			
29...	0920	56	22.0	30...	0900	40	22.0
DEC				JUN			
29...	0810	110	18.5	29...	1130	17	23.0
JAN 1989				JUL			
30...	1005	30	19.0	31...	0920	65	22.0
FEB				AUG			
28...	1000	92	19.5	30...	0915	27	22.0
MAR				SEP			
30...	0950	23	21.0	29...	0930	20	22.0

16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22°04'34" LONG 159°24'04")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
13...	1200	21	26.5	03...	1245	12	22.0
DEC				JUN			
07...	1150	22	22.0	16...	1240	11	26.0
FEB 1989				AUG			
13...	1615	5.7	25.0	17...	1310	15	26.5
MAR							
20...	1125	6.4	24.5				

16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22°03'08" LONG 159°22'22")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
13...	0920	54	23.5	03...	0855	79	19.0
DEC				JUN			
15...	1130	78	20.0	23...	1050	27	24.5
JAN 1989				AUG			
13...	1035	1200	19.0	17...	0915	90	23.0
MAR							
06...	1050	240	20.0				

16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22°04'44" LONG 159°23'55")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
13...	1240	1.1	24.0	03...	1135	3.5	19.5
DEC				JUN			
15...	1210	3.4	21.0	16...	1340	1.6	23.0
FEB 1989				AUG			
13...	1425	2.0	20.0	17...	1120	3.5	22.5
MAR							
20...	1140	3.4	21.0				

16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22°07'06" LONG 159°22'04")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				APR 1989			
06...	1000	7.2	20.5	25...	1145	2.4	20.5
DEC				JUN			
06...	1050	12	20.0	15...	0950	5.5	19.5
FEB 1989				AUG			
02...	0955	0.19	18.5	10...	0905	0.67	22.0
MAR							
15...	1155	0.24	20.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22°06'09" LONG 159°22'28")							
OCT 1988				APR 1989			
06...	0835	3.4	21.5	25...	1010	16	20.0
DEC				JUN			
06...	1155	15	20.5	15...	1415	7.3	22.5
FEB 1989				AUG			
02...	1335	16	20.0	10...	1450	0.98	23.0
MAR							
15...	0855	0.29	20.0				
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA,KAUAI,HI (LAT 22°08'10" LONG 159°22'28")							
OCT 1988				APR 1989			
06...	1155	1.9	22.5	25...	1430	12	20.5
DEC				JUN			
06...	0910	14	19.5	15...	1245	2.8	21.5
FEB 1989				AUG			
02...	0845	5.5	17.5	10...	1130	7.8	22.0
MAR							
15...	1305	4.4	20.0				
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA,KAUAI,HI (LAT 22°10'54" LONG 159°25'17")							
OCT 1988				MAY 1989			
05...	1150	5.9	23.5	01...	1330	10	20.0
DEC				JUN			
09...	1425	6.8	21.0	26...	1245	5.9	23.5
JAN 1989				AUG			
31...	1320	7.2	18.5	08...	1140	11	22.0
MAR							
08...	1110	13	19.5				
16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22°11'31" LONG 159°27'57")							
OCT 1988				MAY 1989			
05...	0955	89	23.0	01...	1045	170	19.0
DEC				JUN			
09...	1055	120	22.0	26...	1020	100	22.0
JAN 1989				AUG			
31...	1005	140	17.5	08...	0825	230	21.0
MAR							
09...	1115	180	19.0				
16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22°08'20" LONG 159°33'38")							
NOV 1988				MAY 1989			
02...	1140	64	20.0	31...	1100	78	18.0
JAN 1989				AUG			
19...	1140	96	17.5	07...	1105	92	19.0
MAR							
22...	1210	65	19.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF MOLOKAI

16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21°08'08" LONG 156°53'09")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				JUL 1989			
03...	0835	0.77	19.0	13...	0820	3.5	20.5
JAN 1989				AUG			
26...	0840	1.4	19.5	31...	0930	1.1	20.5
APR							
20...	0825	4.3	18.0				

16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21°08'38" LONG 156°55'16")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				APR 1989			
09...	1740	3.5	19.0	19...	1015	4.5	16.5
10...	1615	3.4	19.5	JUN			
DEC				07...	1615	6.2	19.0
08...	0940	3.5	18.0	JUL			
JAN 1989				12...	0930	3.7	18.5
25...	1045	4.1	18.0	AUG			
MAR				30...	1045	2.0	19.0
14...	0920	2.3	16.5				

16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21°07'27" LONG 156°59'50")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				APR 1989			
10...	1810	6.3	19.0	21...	0850	8.7	18.0
DEC				JUN			
07...	0805	27	18.0	08...	0745	9.7	18.5
JAN 1989				JUL			
25...	1630	7.0	18.0	14...	0915	29	19.0
MAR				AUG			
14...	1530	4.9	17.5	30...	1645	5.3	18.5

16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLOKAI,HI (LAT 21°08'43" LONG 156°55'18")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				APR 1989			
09...	1430	0.76	20.0	19...	1400	2.8	18.5
DEC				JUN			
08...	1230	0.74	19.0	07...	1540	1.4	20.5
JAN 1989				JUL			
25...	1215	0.34	19.0	12...	0950	1.6	19.0
MAR				AUG			
14...	1225	0.91	20.0	30...	1310	1.2	20.0

16408000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA,MOLOKAI (LAT 21°09'45" LONG 156°55'54")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				JUN 1989			
09...	1045	7.5	21.0	07...	1200	19	20.5
DEC				JUL			
08...	1130	9.7	21.5	12...	1315	15	19.0
JAN 1989				AUG			
25...	1135	6.4	19.0	30...	1345	12	21.5
MAR							
14...	1130	12	22.0				

16419500 - PAPIO GULCH AT HALAWA, MOLOKAI, HI (LAT 21°08'55" LONG 156°44'16")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				APR 1989			
08...	1355	0.45	22.5	17...	1305	3.4	19.5
DEC				JUN			
05...	1230	0.21	21.5	05...	1305	1.6	22.0
JAN 1989				JUL			
23...	1205	0.45	19.5	11...	1320	1.1	21.0
MAR				AUG			
13...	1230	1.4	20.0	28...	1150	0.62	22.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF MAUI

16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20°48'37" LONG 156°07'00")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAR 1989			
04...	1605	3.1	20.5	28...	1725	4.3	20.0
NOV				MAY			
22...	1540	170	19.0	09...	1320	29	19.0
JAN 1989				JUN			
04...	1445	9.8	18.0	27...	1335	5.5	20.0
FEB				AUG			
14...	1435	5.4	17.5	16...	0900	5.8	20.0

16518000 - WEST WAILUAIKI STREAM NEAR KEAHAE, MAUI, HI (LAT 20°49'16" LONG 156°08'37")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAR 1989			
04...	1220	5.3	20.5	28...	1045	4.2	19.5
NOV				MAY			
22...	0950	32	19.0	09...	1110	25	19.0
JAN 1989				JUN			
04...	1150	17	18.5	27...	1015	8.2	21.5
FEB				AUG			
14...	0950	9.1	18.0	16...	1350	5.7	23.0

16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20°53'20" LONG 156°15'20")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				JUN 1989			
29...	1045	2.4	20.5	29...	1030	2.5	20.0
JAN 1989				JUL			
19...	1140	9.2	18.0	28...	1050	6.1	21.0
FEB				AUG			
27...	1120	1.6	18.5	25...	1100	2.8	19.5
MAR				SEP			
30...	1030	1.2	20.0	28...	1030	1.1	21.0
APR							
27...	1110	10	20.0				

16599500 - OPAHA TUNNEL NR KAILIILI, MAUI, HI (LAT 20°51'04" LONG 156°16'17")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				APR 1989			
11...	1145	0.14	19.0	24...	1110	7.7	16.0
NOV				MAY			
21...	1040	6.8	18.0	17...	1105	3.5	18.0
JAN 1989				JUL			
12...	1240	9.2	17.0	07...	1130	6.3	18.5
FEB				AUG			
28...	1110	3.4	18.5	14...	1220	2.9	19.0

16604500 - IAO STREAM AT KEPANIWAI PARK NR WAILUKU, MAUI (LAT 20°53'08" LONG 156°32'32")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				MAY 1989			
02...	1215	18	21.0	11...	1105	120	19.0
JAN 1989				JUN			
13...	1205	45	19.0	15...	1000	37	19.0
FEB				AUG			
17...	1110	33	20.0	01...	1100	82	20.0
APR							
04...	1145	28	20.0				

PERIODIC DETERMINATION OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
16614000 - WAIHEE RIVER AT DAM NR WAIHEE,MAUI,HI (LAT 20°56'21" LONG 156°32'59")							
OCT 1988				APR 1989			
06...	1125	44	20.5	03...	1350	89	19.0
NOV				MAY			
17...	1240	44	20.0	12...	1130	74	19.5
JAN 1989				JUN			
11...	1210	59	19.5	26...	1150	62	19.5
FEB				AUG			
16...	1215	41	19.0	07...	1320	64	21.0
16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20°57'48" LONG 156°35'22")							
OCT 1988				JUN 1989			
07...	1235	18	20.5	13...	1100	28	19.0
MAR 1989				AUG			
22...	1220	13	19.0	10...	1100	25	19.5
MAY							
18...	1200	28	19.0				
16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20°53'10" LONG 156°40'36")							
NOV 1988				APR 1989			
07...	1140	2.1	23.0	05...	1145	35	21.0
JAN 1989				MAY			
09...	1100	1.3	19.5	15...	1000	13	23.5

PERIODIC DETERMINATION OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

16700000 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19°38'30" LONG 155°10'28")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				JUN 1989			
29...	1545	11	17.0	29...	1300	8.8	17.0
DEC				AUG			
29...	1200	19	17.0	11...	1005	12	17.0
FEB 1989				30...	0940	8.6	17.0
27...	1325	13	17.0	SEP			
MAR				29...	0805	7.2	17.0
28...	1345	3.8	17.0				

16700900 - OLAA FLUME SPRING NR KAUMANA, HAWAII, HI (LAT 19°41'59" LONG 155°11'13")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
05...	1025	0.14	17.0	08...	0930	3.4	17.0
NOV				JUN			
05...	0905	4.0	16.0	08...	1015	11	17.0
JAN 1989				JUL			
04...	0905	7.5	17.0	10...	1040	7.0	17.0
FEB				AUG			
21...	0945	1.4	16.0	07...	1035	6.0	17.0

16700950 - LYMAN SPRINGS NO. 2 NEAR PIIHONUA,HAWAII,HI (LAT 19°42'02" LONG 155°10'36")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
15...	1300	2.3	17.0	09...	0925	5.5	17.0
DEC				JUN			
01...	0930	4.8	17.0	27...	0850	4.2	17.0
JAN 1989				AUG			
30...	0830	5.4	17.0	31...	1015	4.2	17.0
MAR							
21...	0855	3.7	16.0				

16704000 - WAILUKU RIVER AT PIIHONUA,HAWAII,HI (LAT 19°42'56" LONG 155°09'12")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				APR 1989			
05...	0915	34	18.0	13...	1140	72	18.0
DEC				AUG			
06...	1105	71	18.0	18...	1335	76	19.0
FEB 1989				SEP			
21...	0855	44	17.0	08...	1305	84	19.0
MAR							
24...	0840	36	17.0				

16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII, HI (LAT 20°05'18" LONG 155°40'58")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
04...	1145	1.4	14.0	20...	1105	27	15.0
NOV				JUN			
03...	1050	3.2	14.0	22...	1035	1.7	15.0
DEC				AUG			
10...	1155	1.4	14.0	29...	1055	1.2	15.0
MAR 1989							
17...	1050	1.6	14.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII--Continued

16720300 - KAWAIKI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20°05'13" LONG 155°40'59")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
04...	1045	0.18	15.0	20...	0955	7.1	14.0
NOV				JUN			
03...	1020	0.47	14.0	22...	0945	1.6	15.0
DEC				AUG			
10...	1130	0.18	14.0	29...	0950	0.29	15.0
MAR 1989							
17...	0930	0.54	15.0				

16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA,HI (LAT 20°05'15" LONG 155°40'42")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAR 1989			
04...	0940	0.74	15.0	17...	0845	4.0	14.0
NOV				JUN			
03...	0945	5.1	14.0	22...	0845	8.1	15.0
DEC				AUG			
10...	1045	0.64	14.0	29...	0855	1.4	15.0

16724800 - UPPER HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA, HI (LAT 20°04'31" LONG 155°40'26")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
NOV 1988				JUN 1989			
03...	1140	0.58	14.0	21...	0840	7.4	15.0
DEC				JUL			
19...	1015	0.52	14.0	18...	0925	7.6	13.0
MAR 1989				AUG			
10...	1000	3.9	14.0	28...	0935	1.0	15.0
MAY							
19...	0845	5.4	13.0				

16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20°04'27" LONG 155°40'25")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
04...	1155	1.0	15.0	19...	0800	6.2	13.0
NOV				JUN			
03...	1150	1.7	14.0	21...	0915	5.5	14.0
DEC				JUL			
19...	1030	1.6	14.0	18...	0855	4.0	13.0
MAR 1989				AUG			
10...	0925	3.1	14.0	28...	0900	1.4	15.0

16726000 - UPPER HAMAKUA DITCH AB WAIMEA RES DIV NR KAMUELA,HI (LAT 20°03'31" LONG 155°37'40")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
07...	0850	4.3	14.5	19...	1405	5.7	15.0
NOV				JUN			
17...	1230	5.2	15.0	21...	1450	20	15.0
DEC				AUG			
10...	1430	0.91	14.0	28...	1440	2.7	15.0

16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20°02'38" LONG 155°41'10")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
MAR 1989				JUL 1989			
10...	1115	1.4	14.0	18...	1045	0.44	14.0
JUN							
21...	1015	7.0	15.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII--Continued

16758000 - WAIKOLOA STR AT MARINE DAM NR KAMUELA,HAWAII,HI (LAT 20°02'48" LONG 155°39'58")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
04...	0945	3.1	14.0	19...	1045	6.7	14.0
NOV				JUN			
17...	1025	3.0	14.0	21...	1125	11	15.0
DEC				JUL			
19...	1330	2.5	13.0	18...	1135	7.0	14.0
MAR 1989				AUG			
17...	1225	3.5	14.0	28...	1145	3.4	15.0

16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20°02'28" LONG 155°39'05")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
OCT 1988				MAY 1989			
07...	1005	0.38	15.0	19...	1315	1.0	15.0
NOV				JUN			
17...	1130	0.26	13.0	21...	1350	1.6	15.0
DEC				JUL			
20...	1215	0.29	13.0	18...	1350	1.1	15.0
MAR 1989				AUG			
30...	0845	0.64	14.0	28...	1345	0.62	15.0

16764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19°10'27" LONG 155°35'58")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)
DEC 1988				AUG 1989			
29...	1140	0.36	17.0	17...	1045	0.38	17.0
MAY 1989							
30...	1000	3.1	16.5				

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00'57", long 159°21'04", Hydrologic Unit 20070000, 1.0 mi south southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table, depth 276 ft, casing diameter 8 in., cased to 196 ft.

DATUM.--Elevation of land surface datum is 166 ft. Measuring point: Top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.71 ft above mean sea level, Nov. 19, 1982; lowest measured, 13.39 ft above mean sea level, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	14.43	JAN 26	14.16	MAR 9	13.93	MAY 5	14.19	JUN 23	13.91	AUG 22	13.45
DEC 1	14.11										

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, Nov. 9, 1983; lowest measured, 8.33 ft above mean sea level, Mar. 29, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.15	JAN 23	9.43	MAR 13	9.63	MAY 8	9.51	JUN 19	8.71	AUG 21	9.38
DEC 5	9.35										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
18...	0830	530	22.0	100
DEC				
13...	1040	570	23.5	96
JAN				
24...	1145	520	25.0	92
MAR				
14...	1435	510	22.5	86
MAY				
10...	1340	510	22.5	84
JUN				
20...	1330	530	22.0	96
AUG				
23...	1030	515	22.5	91

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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.80	9.17	9.35	9.49	9.57	9.76	e9.85	e9.70	8.84	8.68	9.45	8.96
10	8.82	9.36	9.40	9.43	9.66	9.82	e9.90	9.54	8.82	8.74	9.00	8.91
15	8.90	9.43	9.04	9.54	9.64	9.50	e9.90	9.25	8.80	9.14	8.89	8.90
20	8.94	9.43	9.35	9.59	9.67	9.78	e9.90	9.20	8.78	8.87	9.35	8.86
25	8.83	9.47	9.45	9.20	9.73	e9.80	e9.85	8.98	8.75	9.31	9.42	8.86
EOM	8.79	9.45	9.45	9.50	9.82	e9.85	e9.80	8.93	8.73	9.37	9.02	8.87

WTR YEAR 1989 MAX 10.03 MAR 2, 3 MIN 8.48 JUL 3

e Estimated

HAWAII, ISLAND OF KAUAI--Continued

220016159442701. Local number, 2-0044-15.

LOCATION.--Lat 22°00'16", long 159°44'27", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.5 mi northwest from Kekaha School. 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: 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, Jan. 24, 1978; lowest measured, 4.16 ft above mean sea level, May 10, 1977.

REMARKS.--Water used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	5.06	JAN 23	8.66	MAR 13	9.28	MAY 8	9.17	JUN 19	5.09	AUG 21	8.59
DEC 5	8.34										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
17...	0900	2900	23.5	850
DEC				
05...	0940	1500	23.0	380
JAN				
23...	0930	1200	23.0	200
MAR				
13...	0910	580	22.0	98
MAY				
10...	1315	1100	23.0	260
JUN				
19...	0900	2450	23.0	700
AUG				
21...	1050	1310	24.0	350

HAWAII, ISLAND OF KAUAI--Continued

220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, 0.3 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: 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 6	9.94	FEB 15	11.15	MAR 17	11.38	MAY 5	11.36	JUN 23	10.66	AUG 31	10.41

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 artesien 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: 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, Jan. 23, 1989; lowest measured, 17.52 ft above mean sea level, Sept. 6, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	23.65	JAN 23	23.83	MAR 13	23.46	MAY 8	22.49	AUG 21	22.63

HAWAII, ISLAND OF KAUAI--Continued

220354159205601. Local number, 2-0320-01

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, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 240 ft, casing diameter 8 in., cased to 193 ft.

DATUM.--Elevation of land-surface datum is 155 ft. Measuring point: Top edge of steel pump base at breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, February 1960, June 1973 to current year.
WATER QUALITY: 1960, 1966, 1972-80, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft below mean sea level, May 27, 1977.

REMARKS.--Water used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	6.90	JAN 27	10.56	MAR 17	11.24	MAY 5	11.40	JUN 9	10.11	AUG 25	7.93
DEC 2	10.34										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
07...	0905	380	24.0	45

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: Top edge of steel pump base at breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, August 1976 to current year.
WATER QUALITY: Occasional measurements, 1972, 1976-1987, 1989.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, Nov. 19, 1982; lowest measured, 0.35 ft below mean sea level, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	7.96	JAN 27	11.52	MAR 17	11.54	MAY 5	11.67	JUN 9	10.40	AUG 25	8.23
DEC 2	11.28										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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					MAY				
02...	0925	400	24.0	44	05...	0930	400	25.0	45
JAN					JUN				
27...	0925	380	24.0	--	09...	0915	385	24.0	48
MAR					AUG				
17...	0930	380	24.5	45	25...	0915	400	26.5	49

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: Top of concrete ring (south side) at 60.80 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current.
WATER QUALITY: Occasional measurements, 1972 to current.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft above mean sea level, Jan. 31, 1974; lowest measured, 1.42 ft below mean sea level, Jan. 22, 1985.

REMARKS.--Water is used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	2.96	JAN 23	4.26	MAR 13	6.11	MAY 8	4.34	JUN 19	2.63	AUG 21	2.35
DEC 5	4.01										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
17...	1010	1400	23.5	360
DEC				
05...	1030	850	23.0	190
JAN				
23...	1030	1180	23.5	200
MAR				
13...	0945	575	23.0	100
MAY				
10...	1400	1100	23.5	280
JUN				
19...	0950	1140	22.5	260
AUG				
21...	1000	1410	23.0	310

HAWAII, ISLAND OF KAUAI--Continued

220827159185401. Local number, 2-0818-01.

LOCATION.--Lat 22°08'27", long 159°18'54", Hydrologic Unit 20070000, 0.2 mi south from Anahola School, and 1.3 mi southwest from Kahala Point. 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: 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 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level messured, 13.14 ft above mean sea level, Feb. 17, 1983; lowest water level measured, 0.34 ft below mean sea level, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.62	DEC 2	10.62	JAN 27	10.80	MAY 5	12.51	JUN 9	12.38	AUG 25	12.61

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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					JAN				
02...	1020	230	24.0	19	27...	1020	295	24.0	26

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit 20070000, 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: 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 meaaurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 133.59 ft above mean sea level, July 27, 1988; lowest water level measured, 42.69 ft above mean sea level, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	135.82	JAN 27	136.16	MAR 8	133.51	MAY 16	135.48	JUN 9	139.48	SEP 6	140.52
DEC 20	135.98										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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				
19...	0530	250	24.5	23	05...	1400	204	22.0	21
DEC					JUN				
23...	0900	200	23.0	20	09...	1420	260	25.0	20
JAN					AUG				
27...	1045	210	23.5	19	22...	0700	205	22.0	20
MAR									
08...	0845	200	21.5	20					

HAWAII, ISLAND OF KAUAI--Continued

221141159252501. Local number, 2-1125-01.

LOCATION.--Lat 22°11'41", long 159°25'25", Hydrologic Unit 20070000, 1.4 mi west northwest of Puu Ka Ele reservoir, and 2.3 mi south of Kapukaamoi Point. 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: 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, Jan. 9, 1980; lowest water level measured, 8.77 ft above mean sea level, Mar. 11, 1986.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
JAN				
27...	1125	160	24.0	14
MAR				
17...	1100	170	24.0	16
MAY				
05...	1100	170	24.0	15
JUN				
09...	1050	170	24.5	16

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 to current year.
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 LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	10.38	DEC 2	8.38	JAN 27	8.64	MAR 17	10.35

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
07...	1110	160	24.5	14
DEC				
02...	1110	145	25.0	14
AUG				
25...	1045	152	24.5	15

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: Top of pump opening 0.40 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, June 3, 1974; lowest water level measured, 9.24 ft below mean sea level, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	7.89	DEC 20	6.11	MAR 22	5.71	MAY 10	6.81	JUN 26	6.61	AUG 22	5.56

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC				
20...	0915	180	23.5	19
MAR				
22...	0900	195	23.5	22
JUN				
23...	0830	185	24.0	19

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: Top of 1-in. pipe 0.06 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, June 3, 1974; lowest water level measured, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	10.16	JAN 27	10.12	MAR 17	16.48	MAY 5	11.14	JUN 9	9.69	AUG 25	10.20
DEC 2	8.90										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 07...	1210	135	24.0	20
DEC 02...	1210	140	24.0	20
JAN 27...	1220	155	24.0	22
MAR 17...	1225	125	24.0	22
MAY 05...	1220	130	24.5	21
JUN 09...	1200	160	25.0	20
AUG 25...	1130	138	26.0	25

HAWAII, ISLAND OF KAUAI--Continued

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, 0.6 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: Top of unthreaded hole after removing 1-in. pipe, 0.22 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, 9.24 ft above mean sea level, Nov. 16, 1982; lowest water level measured, 4.37 ft below mean sea level, Jan. 13, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	3.77	JAN 27	5.43	MAR 17	7.68	MAY 5	7.98	JUN 9	7.14	AUG 25	7.25
DEC 2	5.19										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					MAY				
07...	1300	200	24.0	20	05...	1240	215	22.0	22
DEC					JUN				
02...	1300	190	24.0	21	09...	1230	260	23.5	21
JAN					AUG				
27...	1300	220	23.5	21	25...	1240	215	22.5	22
MAR									
17...	1255	215	24.0	22					

215434159263301. Local number, 2-5426-03.

LOCATION.--Lat 21°54'34", long 159°26'33", Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 318 ft, casing diameter 12 in., cased to 176 ft.

DATUM.--Elevation of land-surface datum is 221 ft. Measuring point: Top of 1-in. hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, Jan. 10, 1974; lowest water level measured, 5.05 ft above mean sea level, Mar. 10, 1975.

REMARKS.--Water used for irrigation and washing of sugarcane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	25.62	JAN 23	26.87	APR 3	26.26	MAY 15	25.92	JUN 28	26.16	SEP 5	26.32
DEC 12	26.67										

HAWAII, ISLAND OF KAUAI--Continued

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 21°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: 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, July 15, 1974; lowest water level measured, 22.07 ft above mean sea level, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	27.97	DEC 1	34.92	JAN 26	35.09

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
06...	0815	230	23.0	25	03...	0800	230	24.0	23
JAN									
26...	0840	220	23.0	26					

215536159263501. Local number, 2-5526-01.

LOCATION.--Lat 21°55'36", long 159°26'35", Hydrologic Unit 20070000, 2.5 mi southeast of Knudsen Gap, and 3.7 mi north of Makahuena Point. Owner: McBryde Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,010 ft, casing diameter 20 in., cased to 400 ft.

DATUM.--Elevation of land-surface is 355 ft. Measuring point: 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, 99.26 ft above mean sea level, Aug. 24, 1989; lowest water level measured, 22.67 ft below mean sea level, July 27, 1978.

REMARKS.--Water used for sugarcane irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	45.73	JAN 26	46.23	MAR 16	65.32	MAY 4	95.20	JUN 8	96.89	AUG 24	99.26
DEC 1	46.03										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 17...	0855	240	23.5	22
DEC 12...	0805	230	23.5	22
JAN 23...	0750	220	23.5	22
APR 03...	0800	230	24.0	--
MAY 15...	0900	227	24.0	22

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: 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, 20.39 ft above mean sea level, Nov. 9, 1983; lowest water level measured, 9.19 ft above mean sea level, Oct. 13, 1978.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	14.39	JAN 26	14.37	MAR 16	18.89	MAY 4	18.04	JUN 8	18.27	AUG 24	17.92
DEC 1	14.22										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					MAY				
06...	0945	430	24.0	70	04...	1240	280	26.0	32
DEC					JUN				
01...	1000	260	24.0	30	08...	0900	275	27.0	31
JAN					AUG				
26...	1000	262	24.0	30	24...	0915	260	27.0	30
MAR									
16...	1030	295	25.0	34					

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 Well 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, 17.20 ft above mean sea level, Sep.29, 1989; lowest, 15.78 ft above mean sea level, Oct. 2, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.10	15.92	16.30	16.43	16.74	18.74	18.83	18.98	e16.90	e16.75	e17.00	16.99
10	16.06	16.05	18.27	18.47	18.78	18.79	16.85	e16.96	e16.88	e16.77	e16.95	17.07
15	18.05	16.15	16.33	16.55	16.70	16.83	16.85	e16.97	e16.85	e16.80	e16.88	17.07
20	15.96	16.17	16.35	16.63	16.65	16.79	16.88	e16.95	16.83	e16.80	e16.88	17.10
25	15.94	16.22	16.39	16.66	16.67	16.83	16.92	e16.94	16.77	e16.85	16.87	17.12
ECM	15.91	16.20	16.42	18.75	16.73	18.78	18.98	e18.93	16.76	e16.95	16.86	17.14

WTR YEAR 1989 MAX 17.20 SEP 29 MIN 15.87 NOV 1

e Estimated

HAWAII, ISLAND OF KAUAI--Continued

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: 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 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level, Jan. 26, 1989; lowest water level measured, 5.26 ft above mean sea level, July 24, 1985.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	8.50	JAN 26	13.10	MAR 16	9.12	MAY 4	8.88	JUN 8	8.78	AUG 24	8.68
DEC 1	13.03										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT				MAY			
06...	1145	600	24.0	04...	1045	620	27.0
DEC				JUN			
01...	1245	590	24.0	08...	1130	770	24.5
JAN				AUG			
26...	1245	750	24.0	24...	1230	920	25.5
MAR							
16...	1115	655	24.0				

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. Measuring point established June 1972.

PERIOD OF RECORD.--
WATER LEVEL: Recording station 1973-79. Occasional measurements 1979-1986, 1989.
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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 16	5.83	MAR 13	5.96

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
17...	1210	1180	24.5	220
DEC				
13...	1035	1500	24.5	450
FEB				
16...	1145	650	24.0	110
MAR				
13...	1330	625	24.5	110
MAY				
09...	1415	900	24.5	190
JUN				
19...	1330	985	24.0	220
AUG				
21...	1420	1210	24.5	300

HAWAII, ISLAND OF KAUAI--Continued

215857159430101. Local number, 2-5843-01.

LOCATION.--Lat 21°58'57", long 159°43'01", Hydrologic Unit 20070000, 1.4 mi north northwest of Oomano Point, and 2.7 mi east northeast from Kokole Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 53 ft, casing diameter 15 ft, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point: Top west side of concrete shaft 57.70 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972, 1985 to current year.
WATER QUALITY: One measurement in 1972.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.44 ft above mean sea level, Mar. 13, 1989; lowest water level measured, 8.32 ft below mean sea level, Dec. 16, 1985 and June 19, 1986.

REMARKS.--Well used as a standby for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	8.80	JAN 23	8.72	MAR 13	9.44	MAY 8	8.93	JUN 19	8.61	AUG 21	8.64
DEC 5	8.57										

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 measured, 17.69 ft above mean sea level, Nov. 26, 1985; lowest measured, 13.39 ft above mean sea level, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.07	14.96	14.92	14.72	14.67	14.83	15.74	16.11	16.00	15.65	15.41	15.10
10	15.03	14.93	14.85	14.76	14.80	15.06	15.85	16.14	15.95	15.58	15.40	15.03
15	15.07	14.97	14.83	e14.71	14.76	15.23	15.91	16.17	15.90	15.53	15.34	14.98
20	15.01	14.92	14.78	e14.73	14.79	15.31	15.99	16.11	15.88	15.51	15.25	14.93
25	14.99	14.95	14.79	e14.70	14.85	15.51	16.06	16.03	15.80	15.47	15.2	14.88
EOM	14.98	14.87	14.74	14.65	14.91	15.64	16.08	16.08	15.72	15.43	15.3	14.89

WTR YEAR 1989 MAX 16.21 MAY 15 MIN 14.66 JAN 8, 13

e Estimated

HAWAII, ISLAND OF KAUAI--Continued

215901159235301. Local number, 2-5923-01.

LOCATION.--Lat 21°59'01", long 159°23'53", Hydrologic Unit 20070000, 3.4 mi west from Lihue Airport terminal, and 4.2 mi northwest of Ninini Point. 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: Top of 1-in. hole northside of pump base after removing elbow. Elevation of measuring point is at 372.42 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional meaaurements, 1974 to 1988.
WATER QUALITY: Occasional measurementa, 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 50.42 ft above mean sea level, Sept. 12, 1983; lowest water level measured, 29.24 ft above mean sea level, Mar. 15, 1978.

REMARKS.--Water used for public supply.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT				
07...	0745	270	23.5	17
DEC				
02...	0745	270	25.5	17
JAN				
27...	0745	282	25.0	18
MAR				
17...	0815	282	25.5	18
MAY				
05...	0810	180	22.0	21
JUN				
09...	0815	190	23.5	20
AUG				
25...	0815	208	24.5	24

HAWAII, ISLAND OF KAUAI--Continued

215901159235201. Local number, 2-5923-07.

LOCATION.--Lat 21°59'01", long 159°23'52", Hydrologic Unit 20070000, 3.4 mi west of Lihue Airport terminal, and 4.2 mi northwest of Ninini Point. 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: 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, 225.48 ft above mean sea level, Jan. 9, 1989; lowest water level measured, 217.26 ft above mean sea level, July 8, 1988.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	217.90	JAN 27	219.24	MAR 17	218.91	MAY 5	220.08	JUN 9	225.48	AUG 25	225.16
DEC 2	219.01										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					MAY				
07...	0730	195	23.5	20	05...	0750	195	21.5	21
DEC					JUN				
02...	0755	185	23.5	20	09...	0750	195	24.0	20
JAN					AUG				
27...	0730	218	21.0	20	25...	080D	190	23.5	22
MAR									
17...	0745	205	19.5	22					

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: 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 PERIOD OF RECORD.--Highest water level measured, 10.43 ft above mean sea level, Jan. 14, 1988; lowest water level measured 6.05 ft below mean sea level, Sept. 8, 1980.

REMARKS.--Water is used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 26	9.02	MAR 16	9.20	MAY 4	8.97	JUN 8	8.86	AUG 24	8.94

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					MAY				
06...	1220	430	24.5	75	04...	1110	480	24.5	83
DEC					JUN				
01...	1220	450	24.5	79	08...	1205	560	24.5	110
JAN					AUG				
26...	1220	410	24.0	56	24...	1130	505	25.0	96
MAR									
16...	1150	460	24.0	73					

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, and 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Seriee, 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 sump 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: 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 yesr.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.27 ft above mean sea level, Jan. 8, 1974; lowest water level measured, 0.07 ft above mean sea level, Sept 17, 1979.

REMARKS.--Water used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.51	JAN 23	9.70	MAR 13	9.86	MAY 8	9.41	AUG 21	8.80

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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				
17...	0840	1180	24.0	230	10...	1300	830	25.0	160
DEC					JUN				
05...	1000	1000	24.5	210	19...	0830	880	24.5	170
JAN					AUG				
23...	0910	1180	24.0	200	21...	1130	930	26.5	190
MAR									
14...	1415	830	24.0	160					

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 racorder, 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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	0.75	0.94	1.41	2.23	2.45	3.25	2.92	e2.9	e2.7	2.42	2.47	2.22
10	.72	1.27	1.73	2.12	2.60	3.37	3.29	e2.8	2.57	2.41	2.34	2.13
15	.78	1.22	1.92	2.38	2.83	3.10	3.04	e2.8	2.49	2.35	2.31	2.04
20	.71	1.12	2.05	2.27	2.95	3.16	3.03	e2.8	2.43	2.46	2.29	2.02
25	.71	1.40	2.18	2.24	3.00	3.27	e2.9	e2.7	2.53	2.69	2.19	2.02
EOM	.69	1.32	2.25	2.19	3.06	2.97	e3.0	e2.6	2.42	2.53	2.12	1.97

WTR YEAR 1989 MAX 3.55 MAR 7,10 MIN 0.50 OCT 23,24

e Estimated

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 aea 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	16.52	FEB 21	19.77	APR 5	18.59	JUN 7	18.08	JUL 26	18.19	SEP 9	16.88

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 1988.

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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	18.44	18.49	18.88	19.58	19.91	20.81	20.63	20.51	20.29	20.03	20.19	19.94
10	18.40	18.84	18.95	19.67	20.08	20.90	20.72	20.42	20.17	20.05	20.09	19.91
15	18.36	18.69	19.26	19.81	20.16	20.84	20.74	20.39	20.07	20.02	20.09	19.81
20	18.38	18.74	19.43	19.71	20.24	20.88	20.60	20.41	20.06	19.99	19.99	19.81
25	18.41	18.82	19.51	19.81	20.34	20.63	20.56	20.24	20.05	20.15	19.95	19.83
EOM	18.37	18.88	19.57	19.83	20.48	20.50	20.59	20.23	20.05	20.14	19.91	19.82

WTR YEAR 1989 MAX 21.07 MAR 13 MIN 18.25 OCT 12,13

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 1986 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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.84	15.72	16.14	16.98	17.26	18.11	18.03	18.06	17.84	17.60	17.62	17.30
10	15.68	15.91	18.37	16.98	17.35	18.25	18.22	18.03	17.76	17.50	17.47	17.28
15	15.69	15.98	16.58	17.15	17.54	18.16	18.17	18.02	17.59	17.46	17.38	17.13
20	15.66	16.01	16.69	17.10	17.69	18.19	18.11	17.90	17.56	17.42	17.44	17.17
25	15.60	16.14	16.86	17.13	17.90	18.17	18.10	17.77	17.64	17.60	17.29	17.17
EOM	15.82	18.08	16.98	17.09	17.91	18.00	18.16	17.84	17.52	17.62	17.18	17.06

WTR YEAR 1989 MAX 18.33 MAR 11 MIN 15.52 NOV 3

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	17.68	FEB 21	20.19	MAR 29	20.39	JUN 7	19.57	JUL 26	19.31	SEP 27	18.33

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 basel water-table well, depth 815 ft, casing diameter 16 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum ia 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, 24.49 ft above mean sea level, Apr. 5, 1989; loweat 16.74 ft above mean sea level, Sept.14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 16	23.97	APR 5	24.49	JUN 19	24.11	SEP 28	23.06

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-aurface 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 1988 TO SEPTEMBER 1989
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	276.07	275.71	275.75	*275.51	*275.77	275.96	277.12	278.16	*279.13	279.73	280.38	280.73
10	275.68	275.76	275.57	*275.51	*275.80	276.41	277.27	278.30	*279.23	279.25	280.01	280.72
15	275.85	275.78	275.63	*275.46	*275.84	276.49	277.43	278.66	*278.77	279.92	280.03	280.43
20	275.87	275.70	275.66	*275.57	275.76	276.59	277.55	278.82	279.55	280.22	280.49	279.99
25	276.02	275.76	275.55	*275.96	276.02	276.75	277.70	278.94	279.70	280.03	280.15	279.05
EOM	275.79	275.59	275.62	*275.68	276.22	276.76	278.01	279.04	279.02	280.10	280.19	280.63

* 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 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
13...	1315	170	21.5	18
FEB				
20...	1150	168	22.0	19
MAR				
05...	1200	160	22.5	19
JUN				
16...	1430	155	22.5	20

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 19	16.51	APR 28	18.33	AUG 23	16.43

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC					AUG				
19...	1405	270	22.5	35	23...	1400	270	22.5	35
APR									
28...	1225	270	22.5	36					

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34'48", 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.

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 28	18.68	JUN 19	18.83

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB 28...	1000	780	21.5	--	JUN 19...	1435	750	22.0	--

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 Waialee, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	14.70	MAY 16	14.46	AUG 23	15.04

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	4.49	JAN 23	4.67	APR 17	5.45	JUN 5	4.41	JUL 11	4.41	AUG 28	4.43
DEC 5	4.41	MAR 13	5.23								

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 aea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measursments, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	3.45	JAN 23	3.72	APR 17	3.84	JUN 5	3.60	JUL 11	3.55	AUG 28	3.71
DEC 5	3.19	MAR 13	3.88								

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
NOV				APR			
10...	1050	320	20.5	17...	1410	320	20.5
DEC				JUN			
05...	1350	320	20.5	05...	1405	320	21.0
JAN				JUL			
23...	1350	310	20.5	11...	1425	320	21.0
MAR				AUG			
13...	1355	330	20.5	28...	1335	310	22.0

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 measursd, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	2.18	JAN 23	2.05	MAR 13	2.18	JUN 1	1.96	JUL 11	1.96	AUG 28	2.10
DEC 5	2.05										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
NOV 11...	0715	330	22.5	APR 17...	1500	290	23.0
DEC 05...	1505	390	23.5	JUN 01...	1515	300	23.0
JAN 23...	1530	400	22.5	JUL 11...	1530	290	23.5
MAR 13...	1515	340	23.0	AUG 28...	1445	270	23.0

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 Kalanianaole 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	2.99	JAN 27	2.85	APR 21	2.86	JUN 8	2.78	JUL 4	2.71	SEP 1	2.87
DEC 6	2.90	MAR 16	2.97								

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV 11...	0730	330	24.0	31
DEC 06...	1510	350	24.0	32
JAN 27...	0825	320	24.0	22
MAR 16...	0740	320	23.5	44
APR 21...	1030	210	23.5	21
JUN 08...	1600	330	23.5	26
JUL 04...	1115	340	24.0	26
SEP 01...	0820	330	24.0	28

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	975.35	JAN 25	975.38	APR 21	975.28	JUL 14	975.38

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 diamster 4 in.

DATUM.--Elevation of land-surfaca 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 sbove mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	1.80	FEB 15	1.63	MAR 29	1.30	MAY 10	1.29	JUN 28	1.91	AUG 15	1.78
JAN 5	1.58										

HAWAII, ISLAND OF MAUI--Continued

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.6 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, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	0.11	MAR 2	0.12	MAY 22	-0.28	AUG 23	0.17

HAWAII, ISLAND OF MAUI--Continued

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa gulch, and 4 mi east of Kihei. owner: state of Hawaii.

AQUIFER.--Kula volcanic series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 647 ft, casing diameter 12 in., cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point: Top of 3-in. pipe attached to the steel casing cover, 594.75 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971, May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	4.05	JAN 18	4.51	MAY 2	4.71	MAY 23	4.62	JUL 25	4.48	AUG 24	4.45
DEC 14	4.68	MAR 8	4.66								

HAWAII, ISLAND OF MAUI--Continued

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapoolani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, casing diameter 8 in., cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point: Top of 8-in. casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974. Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, Nov. 30, 1983; lowest measured, 4.74 ft above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	5.32	JAN 10	5.44	APR 28	5.48	MAY 16	5.45	JUL 17	5.16	AUG 17	5.32
NOV 30	5.44										

HAWAII, ISLAND OF MAUI--Continued

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft vertical shaft, depth 53 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: Top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, Jan. 12, 1980; lowest measured, 3.05 ft above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	3.66	JAN 30	4.28	APR 28	4.35	MAY 22	4.31	JUL 19	4.05	AUG 25	4.18
DEC 1	4.06	MAR 2	4.30								

HAWAII, ISLAND OF MAUI--Continued

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51'40", long 156°30'45", Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 757 ft, casing diameter 8 in., cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point: Top of 6-in. pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, Oct. 13, 1982; lowest measured, 11.36 ft above mean sea level, Jan. 27, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	15.29	JAN 18	15.31	MAY 2	19.10	MAY 23	18.89	JUL 25	17.93	AUG 24	17.35
DEC 14	15.37	MAR 8	15.37								

HAWAII, ISLAND OF MAUI--Continued

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51'54", long 156°30'38", Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, casing diameter 20 in., cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point: Top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, Jul. 15, 1987; lowest measured, 13.48 ft above mean sea level, Apr. 8, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	13.80	JAN 18	13.88	MAY 2	13.93	MAY 23	13.84	JUL 25	13.83	AUG 24	13.87
DEC 14	13.98	MAR 8	13.94								

HAWAII, ISLAND OF MAUI--Continued

205412156193801. Local number, 6-5419-01.

LOCATION.--Lat 20°54'12", long 156°19'38", Hydrologic Unit 20020000, 0.9 mi south of Haiku Cannery, and 2 mi north west of Kaupakulua between the Haiku-Kokomo road and Maliko Gulch. Owner: State of Hawaii

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 in., cased to 829 ft, perforated from 829 to 859 ft.

DATUM.--Elevation of land-surface datum is 828 ft. Measuring point: Top of 6-in. pipe coupling, 828.44 ft above mean sea level.

REMARKS.--Water level readings are affected by oil floating on top of the water.

PERIOD OF RECORD.--Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.60 ft above mean sea level, May 2, 1989; lowest measured, 4.36 ft above mean sea level, July 9, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	4.81	JAN 18	5.05	MAY 2	5.69	MAY 23	5.60	JUL 25	5.33	AUG 24	5.32
DEC 14	5.13	MAR 8	5.30								

HAWAII, ISLAND OF MAUI--Continued

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled baasl water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point: Top of 1-in. galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, Dec. 31, 1982; lowest measured, 14.67 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	17.76	JAN 17	19.25	MAR 3	19.38	MAY 4	18.23	JUL 18	18.30	AUG 11	18.43
DEC 1	18.22										

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 1966. Water-level recorder, June 1986 to current year.
WATER QUALITY: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.18 ft above mean sea level, Sept. 30, 1989; lowest measured, 13.04 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.89	16.12	15.95	16.10	16.16	16.05	15.65	16.45	16.54	16.98	16.68	16.92
10	15.90	16.21	16.17	16.06	16.17	16.11	15.86	16.49	16.63	17.00	16.74	16.97
15	15.90	16.10	16.20	16.04	16.21	16.01	16.00	16.43	16.85	16.66	16.73	16.97
20	15.96	16.01	16.35	16.05	16.08	15.83	16.10	16.30	16.91	16.87	16.71	17.04
25	16.00	16.05	16.28	15.99	15.95	15.69	16.19	16.38	16.94	16.84	16.81	16.99
EOM	16.04	15.96	16.13	16.06	15.94	15.52	16.35	18.44	16.90	16.76	16.88	17.14

WTR YEAR 1989 MAX 17.18 SEP 30 MIN 15.42 APR 1

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE LAB (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV				
02...	j0950	200	122	12
02...	j1005	400	495	140
02...	j1030	500	491	140
02...	j1105	600	819	180
02...	j1125	675	1690	480
02...	j1150	750	4020	1200
02...	j1215	800	37100	14000
02...	j1255	825	43600	16000
02...	j1305	1000	49000	19000
02...	j1400	850	45900	17000
02...	j1445	900	47600	18000
MAR				
01...	j0920	200	223	14
01...	j0950	400	493	140
01...	j1015	500	507	140
01...	j1115	600	591	150
01...	j1140	675	1680	460
01...	j1210	750	4070	1200
01...	j1245	800	39000	14000
01...	j1310	825	44700	16000
01...	j1350	850	46600	17000
01...	j1410	900	48900	18000
01...	j1435	1000	49500	19000
JUN				
01...	j0905	200	220	13
01...	j0920	400	546	130
01...	j0937	500	495	140
01...	j1005	600	671	160
01...	j1040	875	1800	500
01...	j1120	750	4380	1300
01...	j1200	800	40100	15000
01...	j1240	825	46100	17000
01...	j1325	850	48600	18000
01...	j1415	900	50300	19000
01...	j1500	1000	51600	19000
SEP				
13...	j0930	200	220	13
13...	j0955	400	618	150
13...	j1005	500	553	140
13...	j1030	600	731	190
13...	j1100	675	1880	530
13...	j1130	750	4620	1400
13...	j1155	800	41000	15000
13...	j1220	825	46900	17000
13...	j1300	850	48600	18000
13...	j1335	900	50700	19000
13...	j1410	1000	52100	20000

j Collected by non-USGS agency.

HAWAII, ISLAND OF MAUI--Continued

205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54'37", long 156°31'05", Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point: Top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, Jan. 2, 1983; lowest measured, 12.63 ft above mean sea level, Oct. 14, 15, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.47	15.87	15.75	15.97	16.05	15.94	15.40	16.04	15.94	16.36	16.14	16.40
10	15.53	16.01	16.05	15.95	16.06	15.98	15.67	16.04	16.04	16.37	16.20	16.46
15	15.54	15.88	16.09	15.93	16.14	15.83	15.72	15.90	16.27	15.96	16.15	16.40
20	15.65	15.79	16.27	15.94	15.95	15.62	15.76	15.71	16.30	16.08	16.15	16.50
25	15.70	15.84	16.20	15.85	15.77	15.43	15.80	15.77	16.33	16.33	16.25	e16.53
EOM	15.75	15.76	16.01	15.91	15.79	15.21	15.98	15.85	16.25	16.25	16.35	16.74

WTR YEAR 1989 MAX 18.78 SEP 30 MIN 15.08 APR 1

e Estimated

HAWAII, ISLAND OF MAUI--Continued

205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point: Top of 1.5-in. PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, Dec. 6, 1982; lowest measured, 14.51 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	17.19	JAN 17	16.94	MAY 1	17.71	MAY 23	17.92	JUL 18	18.22	AUG 11	18.25
DEC 1	17.01	MAR 2	16.83								

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, 11.96 ft above mean sea level, Sept. 12, 1989. lowest measured, 10.44 ft above mean sea level, Apr. 1, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.96	10.91	10.77	10.66	10.59	10.56	10.51	11.31	11.56	11.79	11.75	11.90
10	10.95	10.88	10.75	10.66	10.62	10.61	10.62	11.38	11.60	11.79	11.77	11.90
15	10.96	10.85	10.78	10.62	10.56	10.62	10.86	11.28	11.63	11.76	11.77	11.91
20	10.92	10.80	10.78	10.61	10.52	10.64	10.98	11.27	11.70	11.73	11.82	11.87
25	10.93	10.79	10.75	10.60	10.54	10.61	11.08	11.42	11.77	11.70	11.86	11.82
EOM	10.89	10.72	10.74	10.62	10.58	10.51	11.20	11.51	11.80	11.71	11.86	11.84

WTR YEAR 1989 MAX 11.96 SEP 12 MIN 10.44 APR 1

HAWAII, ISLAND OF MAUI--Continued

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi 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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.23	3.33	3.24	3.03	3.17	3.26	3.17	3.16	3.23	3.12	3.20	3.36
10	3.27	3.23	3.22	3.03	3.18	3.27	3.24	3.12	3.18	3.11	3.20	3.34
15	3.29	3.19	3.25	3.13	3.09	3.18	3.04	3.18	3.23	3.11	3.19	3.32
20	3.24	3.18	3.19	3.17	3.04	3.24	3.11	3.16	3.20	3.16	3.27	3.24
25	3.28	3.20	3.14	3.19	3.07	3.20	3.10	3.08	3.28	3.14	3.30	3.25
EOM	3.20	3.12	3.13	3.22	3.22	3.01	3.15	3.16	3.25	3.14	3.26	3.25

WTR YEAR 1989 MAX 3.49 SEP 12 MIN 2.79 JAN 9

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, 0.50 ft below mean sea level, July 27, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	2.08	MAR 3	1.27	APR 26	0.57	JUN 19	0.21	AUG 7	1.35	SEP 21	1.89
JAN 9	1.42										

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 Pahoa. 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, 2.87 ft above mean sea level, Sept. 17, 1985, and Nov. 5, 1988; lowest measured, 0.97 ft above mean sea level, July 26, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	2.80	JAN 6	2.36	APR 19	1.80	JUN 14	2.09	JUL 5	1.85	AUG 16	2.28
NOV 7	2.56	MAR 2	2.81								

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV					APR				
07...	1005	11000	55.0	3500	19...	1040	8000	53.0	2500
JAN					JUN				
06...	1135	7200	55.0	2200	14...	1050	8200	53.0	2600
MAR					AUG				
02...	1005	8600	54.0	2300	16...	1340	14800	52.0	5100

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 Pahoa. 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-aurfece 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 end at times, water level affected by pumping.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measuremants, 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 6	4.29	MAR 2	4.77

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					JUN				
31...	1020	1170	25.5	220	14...	1230	950	25.0	120
APR					AUG				
19...	1140	1020	25.0	140	17...	1010	980	25.0	160

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoa 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 leval.

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; lowast 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	17.23	JAN 11	19.29	MAR 2	20.89	APR 19	20.33	JUN 15	20.91	AUG 17	20.96

194134155005801. Local number, 8-4100-01.

LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi southeast of Hilo Post Office, and 5.0 mi northeast of Keaau. Owner: Hawaiian Paradise Park Corporation.

AQUIFER.--Kau Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 55 ft, casing diameter 10 in., cased to 39 ft, perforated from 39 to 55 ft.

DATUM.--Elevation of land-surface datum is 45 ft. Measuring point: Top of casing, 46.84 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, November 1971 to current year.
WATER QUALITY: 1971, 1973-1986, 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.99 ft above mean sea level, Oct. 10, 1986; lowest measured, 2.24 ft above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	5.18	JAN 26	5.54

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV				
21...	1145	950	19.0	260
JAN				
26...	1030	830	19.5	--

HAWAII, ISLAND OF HAWAII--Continued

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	7.26	MAR 10	7.85	APR 27	7.55	JUN 15	8.38	AUG 17	7.94	SEP 25	7.37
JAN 26	8.71										

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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 30	4.20	MAR 21	4.04	AUG 9	4.23

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV					JUN				
03...	1015	1700	26.0	490	16...	1030	1800	25.5	490
JAN					AUG				
30...	0940	1820	25.5	480	09...	1015	1800	26.0	490
MAR									
21...	1110	1780	26.0	480					

HAWAII, ISLAND OF HAWAII--Continued

200132155471001. Local number, 8-6147-01.

LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,008 ft, casing diameter 8 in., cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point: Top of pipe coupling on casing cover 982.8 ft, revised, above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1963, June 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987, lowest measured, 4.82 ft above mean sea level, Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	5.86	JAN 12	5.56	MAR 6	6.04	MAY 4	5.42	JUN 23	5.57	AUG 9	5.65

201430155484101. Local number, 8-7448-05.

LOCATION.--Lat 20°14'30", long 155°48'41", Hydrologic Unit 20010000, 1200 ft southwset of Union Camp and 2000 ft north of Highway 27, at the head of Ohanaula Gulch. Owner: Kohsla Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 510 ft, casing diameter 16 in., cased to 420 ft, casing diameter 16 in., cased to 420 ft, perforated from 420 to 460 ft, open end from 460 to 510 ft.

DATUM.--Elevation of land-surface datum is 421 ft. Measuring point: Top of 1/2 in. hole in pump base, 422.18 ft above mean sea level.

REMARKS.--Occasional water level measurements and water-quality records for 1973-74 are available in the District office files. Kohala Suger Company was in operation during this period.

PERIOD OF RECORD.--Occasionel measurements, November 1973, 1974, 1975, 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.92 ft above mean sea level, October 12,1988, loweat measured, 1.61 ft below mean aea level, May 2, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	6.92	JAN 19	6.42	MAR 8	6.74

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 Hoea 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 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	2.74	JAN 19	2.55	MAR 8	2.45	MAY 10	1.90	JUN 23	2.05	AUG 23	3.02
NOV 3	2.73										

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV 03...	0830	2000	21.5	590
JAN 19...	0855	2300	21.0	600
MAR 08...	0920	2100	21.0	570
MAY 10...	1150	2150	22.0	570
JUN 23...	1225	1950	22.0	590
AUG 23...	1230	2100	21.0	610

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 KAUAI					
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	10-07-88	0835	680	26.0	140
				12-01-88	1355	700	28.0	150
				01-26-89	1355	810	28.0	140
				03-17-89	0900	775	26.0	140
				05-05-89	0855	780	25.0	140
				06-23-89	1300	790	27.0	140
				08-22-89	1300	790	27.0	150
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	12-05-88	1015	825	22.0	190
				02-21-89	1020	800	22.0	160
				03-13-89	1100	875	23.0	180
				05-08-89	1045	1180	21.5	280
				06-19-89	1115	1280	22.5	320
				08-24-89	1015	1100	22.0	260
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-17-88	1110	780	26.0	150
				12-05-88	1100	750	24.5	150
				01-23-89	1100	600	24.0	98
				05-08-89	0950	845	24.5	160
				06-19-89	1015	900	26.5	140
				09-15-89	0915	800	24.0	160
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	10-07-88	1000	230	25.5	20
				03-17-89	1035	260	24.5	20
				05-05-89	1030	220	24.0	20
				06-09-89	1030	220	24.0	20
				08-25-89	1015	265	24.5	22
221151159265001	2-1126-02 KALINIWAI	22 11 51 N	159 26 50 W	10-19-88	0825	150	24.0	15
				02-16-89	0820	195	24.0	21
				05-10-89	0830	195	23.0	22
				08-22-89	0830	200	23.0	23
221201159293401	2-1229-03 W73 HANALE	22 12 01 N	159 29 34 W	10-07-88	1330	230	24.0	27
				12-02-88	1330	220	24.0	28
				01-27-89	1330	280	24.0	28
				03-17-89	1430	230	24.0	28
				05-05-89	1150	227	23.0	28
				06-09-89	1130	290	23.0	28
				08-25-89	1330	230	26.0	28
215455159274201	2-5427-02 W16B KOLOA	21 54 55 N	159 27 42 W	05-04-89	0800	225	24.0	26
				06-08-89	0800	227	23.0	26
				08-24-89	0745	223	23.0	25
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-06-88	0925	260	23.5	29
				02-16-89	0750	255	22.5	30
				03-16-89	1000	250	23.0	30
				05-04-89	1325	243	23.5	28
				06-08-89	1420	250	23.0	28
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	10-06-88	0935	230	23.5	24
				12-01-88	0925	220	24.0	25
				01-26-89	0935	220	23.5	24
				03-16-89	1000	225	23.0	26
				05-04-89	1330	222	24.0	26
				06-08-89	1420	220	24.0	26
				08-23-89	1230	250	27.0	28
215635159355001	2-5835-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-06-88	1110	680	24.0	140
				12-01-88	1105	700	24.0	140
				02-16-89	1245	700	23.0	140
				03-16-89	1330	715	23.0	150
				05-08-89	1430	700	23.0	140
				06-08-89	1100	680	24.0	140
				08-23-89	0830	650	23.5	130

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 KAUAI--Continued								
215854159424801	2-5842-02 S11 KEKAHA	21 58 54 N	159 42 46 W	10-17-88	1145	530	24.0	100
				12-05-88	1215	675	24.5	110
				01-23-89	1215	600	24.0	95
				03-13-89	1300	645	25.0	100
				05-09-89	1430	645	24.5	98
				06-19-89	1250	625	24.5	100
				08-21-89	1400	650	24.5	100

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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						
211848157465201	3-1646-01 W1-B WAIAL	21 18 48 N	157 46 52 W	11-30-88	1025	710	21.0	--
				03-30-89	1100	710	21.0	--
				05-23-89	1100	850	21.5	--
				07-11-89	1120	810	21.5	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	12-02-88	1410	32000	23.5	12000
				02-18-89	1015	31000	23.5	12000
				04-04-89	0915	32000	23.0	12000
				05-23-89	1500	34000	23.5	12000
				07-11-89	1250	34000	23.5	12000
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	12-02-88	1400	8000	23.0	--
				02-16-89	1020	8000	23.0	--
				04-04-89	0920	8100	23.5	--
				05-23-89	1510	8500	23.0	--
				07-11-89	1300	8200	23.5	--
212038157422501	3-2042-13 W420-1A WA	21 20 02 N	157 42 06 W	12-20-88	1050	9500	25.0	3200
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	04-12-89	0805	1150	23.0	240
				06-07-89	0815	1100	23.0	240
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	10-11-88	1050	440	21.5	86
				12-02-88	1325	440	21.5	86
				02-14-89	1530	450	22.0	85
				04-13-89	1200	460	21.5	86
				05-19-89	1450	460	21.5	87
				07-11-89	0945	460	22.0	88
				09-27-89	1420	460	22.0	87
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	12-02-88	1300	1120	21.5	--
				04-14-89	1430	1100	21.5	--
				06-08-89	1315	1100	21.5	--
212238157561102	3-2256-12 W187-C	21 22 39 N	157 56 09 W	11-30-88	1450	750	24.5	210
				02-06-89	1340	770	23.0	200
				04-14-89	0930	800	23.0	210
				05-19-89	1415	800	24.5	210
				07-06-89	1330	775	25.5	200
				09-27-89	1315	765	25.5	200
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	12-02-88	1030	950	22.0	--
				02-21-89	1245	910	22.0	--
				03-29-89	0955	910	22.0	--
				06-07-89	1225	960	22.0	--
				07-26-89	1230	950	22.0	--
212358158010901	3-2301-09,10 W247-IJ	21 23 58 N	158 01 09 W	12-02-88	0935	600	21.5	--
				02-21-89	1225	700	22.0	--
				03-29-89	0925	725	22.0	--
				06-07-89	1200	700	22.0	--
				07-26-89	1200	700	22.0	--
212342157584301	3-2358-22 W204-4	21 23 42 N	157 58 43 W	11-30-88	1325	1300	20.0	--
				02-16-89	1315	1830	20.5	--
				04-13-89	1025	1720	20.5	--
				06-07-89	1300	1800	20.0	--
				07-12-89	1350	1500	20.5	--
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	11-30-88	1330	2900	20.0	--
				02-16-89	1320	4900	20.5	--
				04-13-89	1030	5200	20.5	--
				06-07-89	1310	4800	20.0	--
				07-12-89	1355	4400	20.5	--
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	11-30-88	1345	2650	22.0	--
				02-16-89	1330	3050	22.0	--
				04-14-89	1355	3250	22.0	--
				06-07-89	1315	3200	22.0	--
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	08-24-89	1305	190	20.5	19

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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--Continued						
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	11-23-88	1430	140	23.0	18
				08-24-89	1410	150	23.0	18
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	11-30-88	1310	300	21.0	--
				02-14-89	1430	300	21.0	--
				04-13-89	1120	320	21.0	--
				05-23-89	1400	315	21.0	--
				07-12-89	1220	305	21.0	--
				09-27-89	1030	300	21.0	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	12-02-88	1000	355	22.0	49
				04-13-89	1000	360	22.0	50
				06-07-89	1000	360	22.0	50
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	06-19-89	1000	145	22.0	17
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	02-23-89	1100	340	22.5	--
				06-08-89	1000	340	22.5	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	02-23-89	1135	465	24.5	--
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	11-29-88	1415	195	22.5	21
				06-20-89	1215	190	21.5	21
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	11-22-88	1400	260	21.0	26
				01-27-89	1410	260	21.0	26
				07-26-89	1500	260	21.5	25
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	11-22-88	1025	800	23.0	200
				02-23-89	1240	850	23.0	210
				06-08-89	1305	850	23.0	210
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	04-28-89	1305	890	22.5	190
				08-23-89	1430	890	22.5	200
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	01-26-89	1450	525	22.5	--
				03-23-89	1010	500	22.5	--
				06-20-89	1530	480	22.0	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	02-28-89	1140	1900	23.5	--
				06-19-89	1420	1900	23.0	--
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	11-29-88	1240	6450	24.0	--
				02-28-89	1215	5200	24.5	1400
				06-19-89	1555	6250	25.0	1700
213512158061601	3-3506-03 TO 04 W329 A-B W	21 35 12 N	158 06 16 W	06-20-89	1305	510	22.0	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	11-29-88	0930	1300	21.0	--
				03-24-89	0915	1700	22.5	--
				06-19-89	1345	1750	21.5	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	11-29-88	1010	1450	21.0	--
				03-24-89	0930	1580	22.5	--
				06-19-89	1350	1400	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	12-19-88	1340	250	21.0	35
				05-16-89	1300	250	21.5	36
				08-23-89	1300	250	21.5	--
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	12-19-88	1230	525	21.5	--
				08-23-89	1300	250	21.5	36
214157158000101	3-4100-01 W338	21 41 57 N	158 00 01 W	08-23-69	1130	a297	21.0	50
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	12-19-88	1005	1950	22.5	550

a Laboratory conductance.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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	03-10-89	j1500	a347	--	74
				04-19-89	j1455	a354	--	78
				06-07-89	j1450	a363	--	81
				07-07-89	j1500	a362	--	80
				08-25-89	j1455	a358	--	80
210857156010701	4-0801-02	21 08 57 N	157 01 07 W	11-04-88	j0815	340	--	71
				12-06-88	j1443	340	--	72
				01-25-89	j1000	a331	--	69
210903157013001	4-0901-01 W17	21 09 03 N	157 01 30 W	01-25-89	j0840	a271	--	52
				03-15-89	j0820	a267	--	50
				04-20-89	j0900	a272	--	52
				06-07-89	j0830	a272	--	52
				08-31-89	j1400	a274	--	52

a Laboratory conductance.
j Collected by non - USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 MAUI					
203835156065001	6-3806-01 PUNAHOU SP	20 38 35 N	156 06 50 W	03-29-89	1350	750	21.0	200
				05-10-89	1250	870	20.0	240
				08-15-89	0930	940	19.0	250
203947156261201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	12-01-88	1100	3100	19.5	970
				03-02-89	1230	2800	--	780
				05-22-89	1000	3000	19.0	600
				08-23-89	1300	2500	--	690
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-05-88	0740	380	21.5	56
				11-23-88	0815	400	21.5	62
				01-05-89	0730	400	21.5	57
				03-29-89	0745	390	21.5	52
				05-10-89	0830	370	21.5	46
				06-28-89	0740	350	22.0	43
				08-15-89	1545	360	22.5	51
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-05-88	0720	220	19.5	48
				01-05-89	0705	170	19.5	35
				02-15-89	0720	146	19.5	20
				03-29-89	0650	140	20.0	20
				05-10-89	0800	130	20.5	12
				06-28-89	0725	122	20.0	13
				08-16-89	0725	114	20.0	14
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	12-01-88	1240	1800	23.0	350
				03-02-89	1445	1800	23.5	360
				05-22-89	1250	1800	23.0	350
				08-25-89	1400	1750	23.5	360
204845156255001	6-4825-01 S15	20 48 45 N	156 25 50 W	10-13-88	1045	1550	23.5	--
				07-25-89	1300	1300	23.5	--
				08-24-89	1200	1320	--	--
204931156371201	6-4937-01 S10	20 49 31 N	156 37 12 W	10-04-88	1540	1550	24.5	380
				08-17-89	1300	870	24.5	160
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	10-28-88	j0700	2100	--	570
				06-11-89	j0630	2000	--	590
				08-18-89	1320	2050	21.5	590
205102156282501	6-5128-02 S16	20 51 02 N	156 28 25 W	10-13-88	1015	1460	23.5	--
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	10-13-88	1320	1440	23.5	300
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 54 W	10-07-88	1410	760	22.0	--
				04-07-89	1110	700	22.0	--
				05-24-89	1115	710	22.0	--
205329156305501	6-5330-10 W15B	20 53 29 N	156 30 55 W	07-19-89	1515	390	22.0	--
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	10-07-88	1415	620	22.5	--
				01-13-89	1400	620	22.5	--
				03-03-89	1355	620	22.5	--
				04-07-89	1115	620	22.0	--
				05-24-89	1125	600	22.5	--
				07-19-89	1520	710	23.0	--
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	10-05-88	1045	900	21.0	--
				01-10-89	1020	760	21.5	--
				08-11-89	0930	750	22.0	140
205320156394501	6-5339-02 W292	20 53 20 N	156 39 45 W	10-05-88	1040	900	21.0	--
				04-28-89	1510	750	21.5	--
				05-15-89	1145	710	21.5	--
				07-03-89	1015	700	22.0	--

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 MAUI--Continued						
205343156401101	6-5340-01 S5	20 53 43 N	156 40 11 W	10-05-88	1115	1650	23.0	--
				02-21-89	1135	1060	21.5	--
				08-11-89	1140	860	21.5	--
205416156244301	6-5424-01 S24	20 54 16 N	156 24 43 W	08-24-89	1415	2000	23.5	--
205651156401001	6-5640-01 S36	20 56 51 N	156 40 10 W	11-28-88	1220	550	21.0	--
				02-21-89	1010	460	20.0	--
				08-17-89	1040	440	21.5	--
205837156384601	6-5838-01 NAPILI A	20 58 37 N	156 38 46 W	10-05-88	1315	670	20.5	160
				11-28-88	1350	670	21.5	160
				01-09-89	1335	660	21.0	160
				02-21-89	1405	670	21.0	160
				04-26-89	1055	660	21.0	160
				05-15-89	1300	670	21.5	160
				07-03-89	1215	650	21.5	150
				08-11-89	1330	670	20.5	160
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	07-03-89	1235	300	20.5	65
205848156383601	6-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-05-88	1350	570	20.0	140
				01-09-89	1350	570	20.5	140
				04-26-89	1135	600	21.5	150
				08-11-89	1400	490	20.5	120

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 HAWAII						
190832155310901	8-0831-02 NINOLE A	19 08 32 N	155 31 09 W	11-01-88	0950	700	18.5	200
				01-09-89	1010	760	18.0	180
				03-03-89	1100	780	18.5	190
				04-26-89	1145	790	18.5	200
				06-19-89	1030	760	18.5	190
				08-07-89	1205	720	18.5	200
				09-21-89	1020	720	18.5	200
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	01-09-89	0925	111	19.0	13
				04-26-89	1030	116	19.0	14
				06-19-89	0940	120	19.0	14
				08-07-89	1045	118	19.0	14
				09-21-89	0925	113	19.0	13
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	01-09-89	0950	83	18.0	4.0
				06-19-89	1005	86	18.0	4.5
				08-07-89	1145	84	18.0	4.0
192108155021201	8-2102-01 W9-10	19 21 08 N	155 02 12 W	01-04-89	1025	810	25.5	--
				03-01-89	0940	870	25.0	--
				09-13-89	1020	820	25.5	--
192457154571801	8-2487-02 KEAUOHANA2	19 24 57 N	154 57 18 W	06-14-89	0940	600	25.0	140
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	11-01-88	1210	305	19.5	61
				01-18-89	1605	325	19.5	62
				03-07-89	1440	305	19.5	62
				05-03-89	1415	310	19.5	58
				06-28-89	1040	330	19.5	68
				08-07-89	1355	330	19.5	68
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	11-01-88	1245	510	19.5	160
				05-03-89	1510	730	19.5	180
				08-07-89	1435	630	19.5	150
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	05-03-89	1500	925	19.5	230
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	11-07-88	1055	110	23.0	6.5
				01-06-89	0955	112	23.0	6.0
				03-02-89	0840	111	23.0	7.0
				04-19-89	0900	113	23.0	6.5
				08-16-89	1245	113	23.0	7.0
193113154555801	8-3185-01 W9-11 HAWN SHORE	19 31 13 N	154 55 58 W	11-14-88	1105	118	21.0	16
				01-06-89	1500	115	21.0	15
				03-02-89	1345	110	21.0	15
				04-19-89	1400	112	21.0	14
				06-14-89	1340	115	21.0	14
				08-17-89	1055	112	21.0	14
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	11-01-88	1355	280	20.0	51
				06-28-89	0845	190	20.0	26
				08-08-89	1235	360	20.0	74
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	05-04-89	0835	465	20.0	100
				06-28-89	0915	590	20.0	130
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	11-01-88	1350	250	20.0	42
				01-18-89	1415	225	20.0	31
				06-28-89	0855	180	20.0	20
				08-08-89	1245	300	20.0	54
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	11-01-88	1330	390	20.0	86
				01-18-89	1440	410	20.0	--
				03-07-89	1255	390	20.5	81
				06-28-89	0910	400	20.5	83
				08-08-89	1225	410	20.5	89

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 HAWAII--Continued						
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	11-01-88	1415	840	20.0	240
				01-18-89	1315	820	20.0	200
				03-07-89	1115	700	20.0	180
				05-04-89	0855	870	20.0	210
				06-28-89	0825	820	20.0	200
				08-08-89	1300	740	20.0	190
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	11-07-88	1155	76	19.0	4.5
				01-06-89	0920	74	19.0	4.0
				03-01-89	1345	77	19.0	4.5
				04-20-89	1450	77	19.0	5.0
				06-14-89	1445	79	19.0	4.5
				08-17-89	1150	79	19.0	4.0
				09-25-89	0935	77	19.0	4.5
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	11-07-88	1335	76	20.0	5.0
				01-11-89	1505	75	20.0	5.0
				03-10-89	0920	77	20.0	5.5
				06-15-89	1040	81	20.5	6.0
				08-17-89	1325	81	20.5	4.5
				09-25-89	0955	79	20.5	5.4
194040155035201	8-4003-02 PANAEWA 2	19 40 40 N	155 03 52 W	11-07-88	1330	75	20.0	4.5
				04-20-89	1425	79	20.0	5.5
				09-25-89	1000	79	20.0	--
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	11-07-88	1415	106	23.5	15
				01-26-89	1350	108	22.0	14
				08-17-89	1400	92	24.0	8.5
				09-25-89	1300	92	24.0	8.5
194337155041801	8-4304-01 WAIAKEA DUG WELL	19 43 37 N	155 04 18 W	01-07-89	1435	13800	22.5	4100
				01-26-89	1410	45000	21.0	16000
				03-10-89	1010	44000	20.0	16000
				04-27-89	0830	43000	20.0	15000
				06-15-89	1300	17800	22.0	5600
				08-17-89	1420	10200	22.5	2900
				09-25-89	1400	42000	21.0	15000
194818155582301	8-4858-02 KONA VILLAGE	19 48 18 N	155 58 23 W	11-02-88	1050	2400	20.5	470
				01-17-89	1530	2350	20.5	480
				03-06-89	1350	2300	20.5	460
				05-04-89	1005	2300	20.5	470
				06-27-89	0945	2400	20.5	480
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	11-14-88	1330	172	20.5	13
				01-24-89	1205	168	22.5	16
				06-15-89	1415	190	22.5	15
				08-18-89	0925	185	22.0	15
				09-25-89	1505	188	22.0	13
195043155053801	8-5005-02 MAKAI	19 50 43 N	155 05 38 W	11-14-88	1315	210	22.0	21
				01-24-89	1150	200	22.5	16
				03-10-89	1100	205	22.5	18
				04-27-89	0955	175	23.0	17
				06-15-89	1355	180	22.5	17
				08-18-89	0905	180	22.5	18
				09-25-89	1445	180	23.0	16
195051155051501	8-5005-05 SALT WTR 3	19 50 51 N	155 05 15 W	11-14-88	1345	17000	18.0	5200
				01-24-89	1135	16000	18.5	5200
				03-10-89	1050	16000	18.5	5200
				06-15-89	1345	14100	18.5	4600
				08-18-89	0940	14000	18.0	4800
				09-25-89	1435	14200	18.5	4700
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	11-09-88	1020	2300	28.5	580
				01-17-89	1235	2350	28.5	580
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	11-09-88	1125	270	26.5	26
				01-17-89	1345	290	27.0	26
				03-14-89	0945	280	27.0	24

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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 HAWAII--Continued								
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	11-09-88	1110	275	26.5	26
				01-17-89	1330	295	26.5	28
				03-14-89	1000	280	26.5	27
				05-09-89	1040	290	26.5	27
				06-29-89	0930	285	26.0	27
				08-24-89	1130	285	26.0	29
195728155455401	8-5745-03 WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	05-09-89	1105	285	26.5	26
				06-29-89	0945	275	26.5	26
				08-24-89	1115	280	26.5	--
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	11-09-88	1340	460	26.0	86
				06-23-89	1015	485	26.0	86
				08-23-89	1045	490	26.5	93
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	11-09-88	1320	350	26.0	52
				01-12-89	1215	350	28.0	54
				03-14-89	1140	370	26.0	55
				05-09-89	1315	380	26.0	54
				06-23-89	1000	380	26.0	58
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	08-23-89	1100	470	26.0	88

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

201307155452001 - 8-7345-04 MAKAPALA

DATE	TIME	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV LAB 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
JUL 07...	1530	900	175	7.00	21.5	56	56	11	6.9	19	42	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	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)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)
JUL 07...	1.3	20	59	6.0	0.10	37	138	0.19	0.180	130	<1	100

DATE	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (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)	LITHIUM TOTAL RECOV-ERABLE (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)
JUL 07...	<10	<1	2	1	4	180	55	2	<10	<10	<1	<0.10

DATE	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALA-CHLOR TOTAL RECOVER (UG/L)	ALDRIN, TOTAL (UG/L)	AME-TRYNE TOTAL	ATRA-ZINE, TOTAL (UG/L)	BENZENE TOTAL (UG/L)	BROMO-FORM TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)
JUL 07...	<1	6	<1	1	<10	<0.10	<0.010	<0.10	<0.10	<0.20	<0.20	<0.20

DATE	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	CYAN-AZINE TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
JUL 07...	<0.20	<0.20	<0.1	<0.20	<0.20	<0.20	<0.20	<0.10	<0.010	<0.010	<0.010	<0.01

DATE	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
JUL 07...	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.010

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII--Continued

201307155452001 - 8-7345-04 MAKAPALA--Continued

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)	ETHYL-BENZENE TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)
JUL 07...	<0.01	<0.01	<0.010	<0.010	<0.01	<0.20	<0.010	<0.010	<0.010	<0.01	<0.01	<0.20

DATE	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-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)	PER-THANE TOTAL (UG/L)
JUL 07...	<0.20	<0.20	<0.01	<0.01	<0.1	<0.1	<0.01	<0.10	<0.01	<0.1	<0.1

DATE	PROME-TONE TOTAL (UG/L)	PROME-TRYNE TOTAL (UG/L)	PRO-PAZINE TOTAL (UG/L)	SILVEX, 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)	TOTAL TRI-THION (UG/L)
JUL 07...	<0.1	<0.1	<0.10	<0.01	<0.10	<0.1	<0.2	<0.20	<0.20	0.30	<0.01

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-FLUORO-METHANE TOTAL (UG/L)	TRI-FLURA-LIN TOTAL RECOVER (UG/L)	2,4,5-T TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
JUL 07...	<1	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.10	<0.01	<0.20	0.2

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

201352155470601 - 8-7347-02 W2-1

DATE	TIME	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV LAB 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
AUG 15...	1510	1000	165	8.00	22.0	45	45	8.1	6.0	18	45	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	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)
AUG 15...	1.7	21	39	5.0	0.10	41	128	0.17	0.940	27	1

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

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)
APR					
05...	0700	--	200	24.0	16
05...	0920	92.00	260	23.0	40
06...	0800	160	275	23.0	40
06...	0830	180	295	23.0	40
14...	1000	200	380	23.0	35
14...	1100	220	400	24.0	65
14...	1200	230	340	24.0	41
14...	1430	250	250	23.5	43
14...	1500	260	385	23.5	62
17...	0950	275	405	23.5	68
20...	0840	300	675	24.0	160
20...	1030	320	675	23.5	160
20...	1150	330	420	24.0	78
26...	1420	347	640	24.0	150
26...	1530	380	660	24.0	160
27...	0910	370	750	23.0	180
27...	1000	380	820	23.0	210
JUL					
14...	0900	400	1350	22.0	370
14...	1000	420	4500	22.0	1400
14...	1200	440	15800	22.0	5400
14...	1240	445	17200	22.0	6000
14...	1310	450	19500	22.0	6800
14...	1340	455	20000	22.0	7200
14...	1410	460	26000	22.0	9100

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

201428155480201 - 8-7448-07 HONOPUEO

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)	HARDNESS NONCARB DISSOLV LAB AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
AUG 31...	1300	185	245	7.80	24.5	0.10	58	58	10	7.9	27

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
AUG 31...	49	2	2.2	36	53	10	0.10	44	174	0.24	1.20

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	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, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
AUG 31...	10	<1	<100	<10	<1	1	1	4	50	41	4

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (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 (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)
AUG 31...	<10	<10	6	0.10	<1	<1	<1	<1	<10	<0.10	<0.010

DATE	AMETRYNE TOTAL	ATRAZINE, TOTAL (UG/L)	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROEIHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)
AUG 31...	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.1	<0.20	<0.20	<0.20

DATE	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	CYANAZINE TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,2-DICHLOROBENZENE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)	1,4-DICHLOROBENZENE TOTAL (UG/L)
AUG 31...	<0.20	<0.10	<0.010	<0.010	<0.010	<0.01	<0.01	<0.2	<0.20	<0.20	<0.20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII--Continued

201428155480201 - 8-7448-07 HONOPUEO--Continued

DATE	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE 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)
AUG 31...	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.010	<0.01	<0.01	<0.01

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)
AUG 31...	<0.010	<0.010	<0.01	<0.20	<0.010	<0.010	<0.010	<0.01	<0.01	<0.20	<0.20

DATE	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-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)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (UG/L)
AUG 31...	<0.20	<0.01	<0.01	<0.1	<0.1	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01

DATE	PROME-TONE TOTAL (UG/L)	PROME-TRYNE TOTAL (UG/L)	PRO-PAZINE TOTAL (UG/L)	SILVEX, 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)	TOTAL TRI-THION (UG/L)
AUG 31...	<0.1	<0.1	<0.10	<0.01	<0.10	<0.1	<0.2	<0.20	<0.20	<0.20	<0.01

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-FLUORO-METHANE TOTAL (UG/L)	TRI-FLURA-LIN TOTAL RECOVER (UG/L)	2,4,5-T TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
AUG 31...	<1	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.10	<0.01	<0.20	<0.2

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

HAWAII, ISLAND OF HAWAII

201428155494201 - 8-7449-02 HAWI

DATE	TIME	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV LAB 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
AUG												
04...	0800	475	190	7.70	22.0	44	44	7.8	5.9	21	50	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	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)
AUG											
04...	1.9	21	50	7.0	<0.10	51	148	0.20	0.450	6	<1

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

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October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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