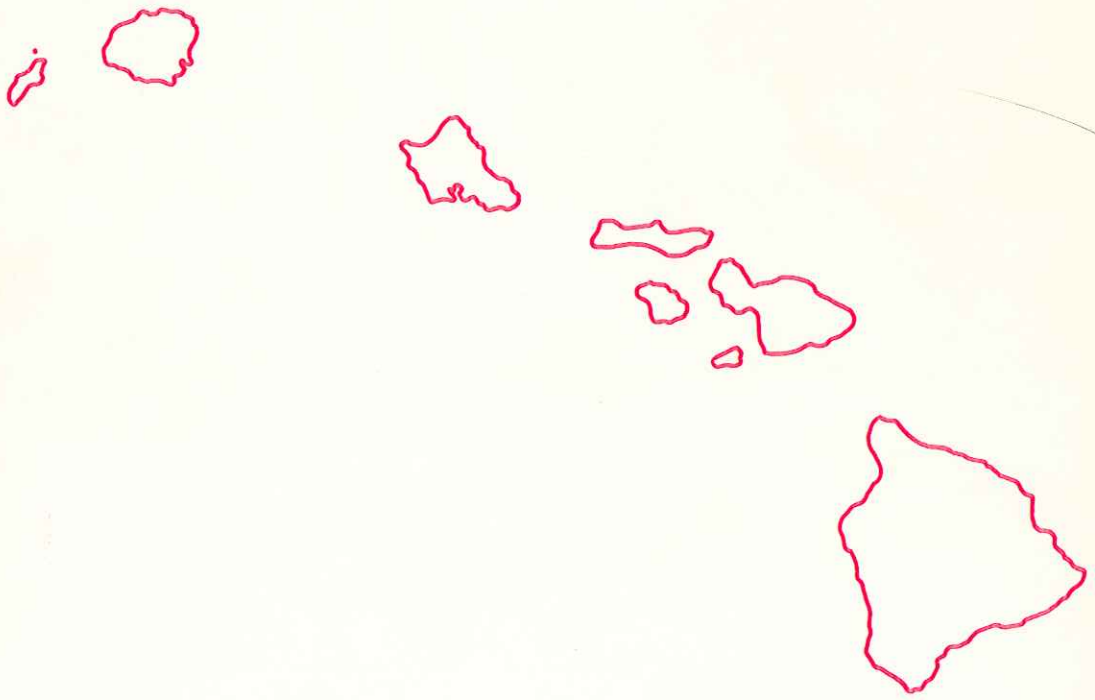
Water Resources Data Hawaii and other Pacific Areas Water Year 1982

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-82-1

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 1982

1981

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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NOVEMBER

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

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1982

JANUARY

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
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31						

FEBRUARY

S	M	T	W	T	F	S
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28						

MARCH

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28	29	30	31			

APRIL

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MAY

S	M	T	W	T	F	S
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30	31					

JUNE

S	M	T	W	T	F	S
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JULY

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25	26	27	28	29	30	31

AUGUST

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29	30	31				

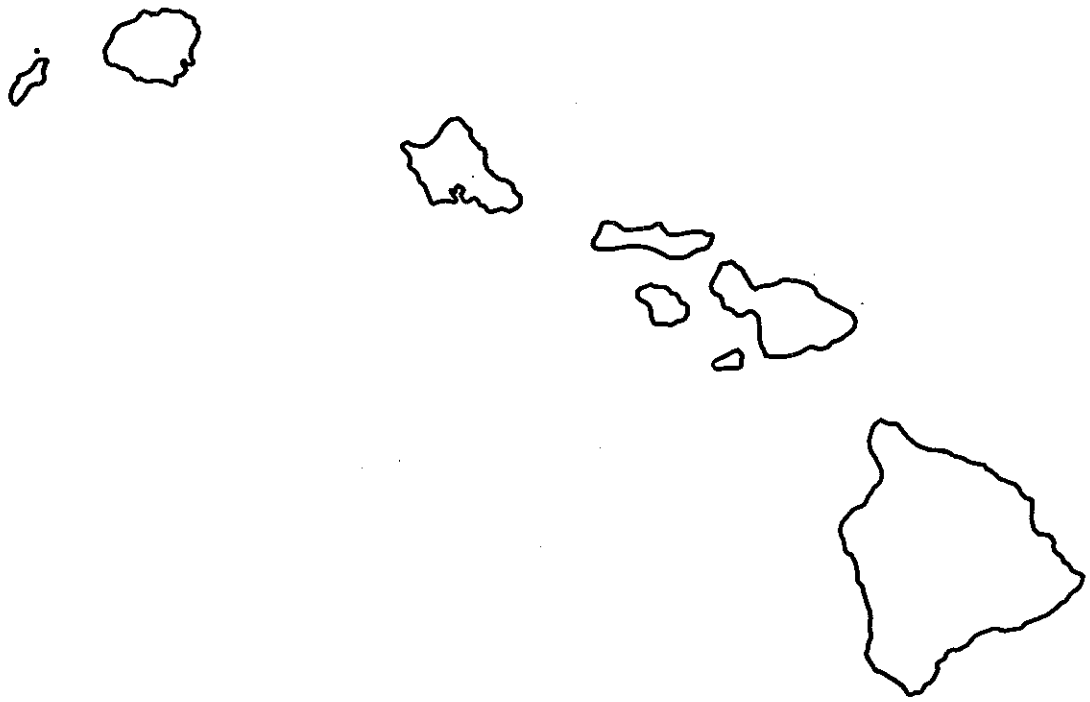
SEPTEMBER

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 1982

Volume 1. Hawaii

by Salwyn S. Chinn, Grace A. Tateishi, and Johnson J.S. Yee



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-82-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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and other Pacific Areas write to
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P. O. Box 50166
Honolulu, Hawaii 96850

1983

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 2 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:

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George Gohara
Eugene S. Capellas
Rose M. Maruoka
David K. Uyematsu
Richard H. Nakahara
Noriaki Kojiri
Isao Yamashiro
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Leonora L. K. Onaga

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 Benjamin L. Jones, succeeded by Stanley F. Kapustka, District Chief, Hawaii.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-82/073	2.	3. Recipient's Accession No.
4. Title and Subtitle: Water Resources Data for Hawaii and other Pacific Areas, Water Year 1982. Volume 1, Hawaii			5. Report Date: July 1983 6.
7. Author(s): Salwyn S. Chinn, Grace A. Tateishi, and Johnson J.S. Yee			8. Performing Organization Rept. No. USGS-WDR-HI-82-01
9. Performing Organization Name and Address: U.S. Geological Survey, Water Resources Division 300 Ala Moana Blvd, Room 6110 Honolulu, Hawaii 96850			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address: U.S. Geological Survey, Water Resources Division 300 Ala Moana Blvd, Room 6110 Honolulu, Hawaii 96850			13. Type of Report & Period Covered: Annual - Oct. 1, 1981 to Sept. 30, 1982 14.

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 1982 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 106 gaging stations; water quality for 11 gaging stations, 95 partial-record flow stations, and 152 wells; and water levels for 21 observation wells. Also included are 108 crest-stage partial-record stations and 15 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

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

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
No restriction on distribution. This report may be purchased from: National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	253
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

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

Letters after station name designate type of data:
(d) discharge, (c) chemical, (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

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HAWAII			
ISLAND OF KAUAI			
(2-0044-10)	220018159444701	(ct)	220
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(2-0044-15)	220016159442701	(ct)	220
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(2-0120-02)	220134159205401	(ct)	220
(2-0145-10)	220148159453501	(ct)	220
(2-0320-01)	220354159205601	(w)	210
(2-0320-03)	220354159205602	(ct)	230
(2-0345-04)	220341159453901	(ct)	220
(2-0545-01)	220530159450401	(ct)	221
(2-0818-01)	220827159185401	(ct)	221
(2-0818-02)	220826159185401	(ct)	221
(2-1020-03)	221038159203801	(ct)	221
(2-1125-01)	221141159252501	(ct)	221
(2-1125-02)	221141159252502	(ct)	221
(2-1229-03)	221201159293401	(ct)	221
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(3-3956-04) 213902157561601 (ct) 226
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(3-4258-04) 214233157583501 (ct) 226
ISLAND OF MOLOKAI
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SMPL P-C 210928157024801 (ct) 226
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1982

Volume 1

INTRODUCTION

Water resources data for the 1982 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 106 gaging stations; water quality for 11 gaging stations, 95 partial-record flow stations, and 152 wells; and water levels for 21 observation wells. Also included are 108 crest-stage partial-record stations and 15 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge (or stage) of streams, and contents (or stage) of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." Through water year 1960 these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 1200 South Bads Street, Arlington, VA 22202.

Beginning with the 1961 water year (fiscal year for Hawaii) and continuing through water year 1974, streamflow data have been released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records beginning with the 1964 water year, and ground-water data since the 1971 water year have been similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water-quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report HI-82-1." For archiving and general distribution, the reports for water years 1971-74 are also identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

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

COOPERATION

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

Hawaii Department of Land and Natural Resources, Division of Water and Land Development, R. T. Chuck, manager-chief engineer.
Hawaii Department of Health, C. G. Clark, 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, M. J. Chun, 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 1982 water year was above normal at all four index stations in the State of Hawaii. The mean runoff in relation to the median of yearly mean discharges for the period 1951-80 for the index stations ranged between 120 and 225 percent. Monthly mean flow at all index stations was in the excessive range (upper 25 percent of record) during August and September. Excessive flow at the index stations on Kauai, Oahu, and Maui occurred randomly throughout the year but mostly during the first 9 months of the calendar year.

At Kauai, streamflow was excessive for January, March, April, July, August, and September. Annual mean discharge was excessive and was 165 percent of the annual median. Streamflow at Kalihi Stream near Honolulu, Oahu, was excessive for 6 months and deficient (lower 25 percent of record) for the month of October. Yearly mean discharge was 176 percent of the annual median. Monthly mean flow at Honopou Stream near Huelo, Maui, was in the normal range for 5 months and excessive for the other 7 months. Annual mean discharge was 225 percent of the annual median. Monthly mean flow at the index station, Waiakea Stream near Mountain View, Hawaii, was in the normal range for 7 months, excessive for 4 months, and deficient for November. Annual mean discharge was 120 percent of the annual median.

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

On Oct. 28, 1981, heavy showers caused flooding of lower Waiawa Stream on Oahu. Property damage was estimated at over $700,000 by the State Department of Civil Defense. The peak stage of 22.46 ft and the discharge of 26,000 ft^3/s at station 16216000, Waiawa Stream near Pearl City, were the highest since the station was established in June 1952.

The chemical quality of surface waters statewide showed little change from previous years. Specific conductance values generally decreased from the 1981 water year. The average values determined at 102 gaging stations ranged from 15 to 529 µmhos/cm (micromhos per centimeter). By comparison, the range for the previous year was 18 to 1,000 µmhos/cm. Specific conductance values of streams listed by islands are:

Island	Number of Streams	Specific Conductance (µmho/cm) Minimum	Maximum
Kauai	27	31	132
Oahu	26	44	529
Molokai	8	75	137
Maui	19	15	75
Hawaii	22	22	50

Dissolved-solids concentrations at the six NASQAN (National Stream Quality Accounting Network) stations decreased during the 1982 water year from the previous year. This may be in part due to sampling at higher-than-normal flow conditions. Samples were collectd bimonthly, 6 per year, in 1982. The average dissolved-solids concentrations ranged from 33 to 188 mg/L (milligrams per liter) during 1982 compared to 43 to 304 mg/L during 1981. Waikele Stream at Waipahu, Oahu, had the highest concentration values of the NASQAN stations monitored in the State of Hawaii.

Dissolved-oxygen concentrations were near saturation, between 92 to 116 percent, at all NASQAN stations.

Concentrations of trace metals were less than the minimum contaminant levels established by EPA (Environmental Protection Agency).

Fecal coliform densities decreased at three of the NASQAN stations and also at the benchmark station on the island of Hawaii. Kalihi Stream at Kalihi, Oahu, had the highest fecal coliform densities. The geometric-mean values for fecal coliform at selectd stations were:

NASQAN Station	Fecal Coliform (colonies per 100 milliliters) 1981	1982
Waimea River at Waimea, Kauai	637	274
Waikele Stream at Waipahu, Oahu	16,900	3,810
Kalihi Stream at Kalihi, Oahu	7,330	19,200
Halawa Stream near Halawa, Molokai	100	342
Kahakuloa Stream at Kahakuloa, Maui	52	105
Wailuku River at Hilo, Hawaii	139	116
Benchmark Station		
Honolii Stream near Papaikou, Hawaii	36	62

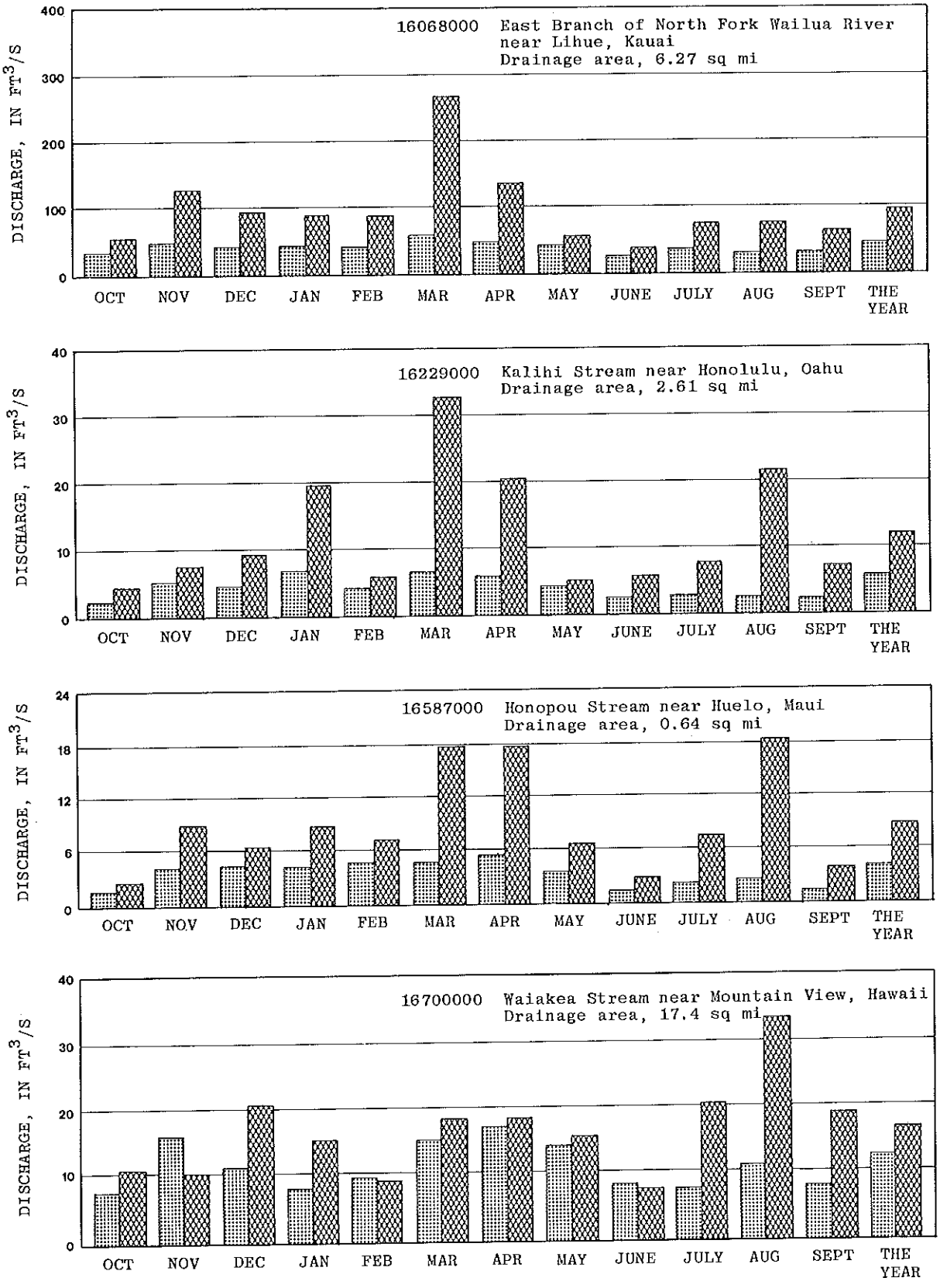

FIGURE 1. DISCHARGE DURING 1982 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1951-80 FOR FOUR REPRESENTATIVE GAGING STATIONS.

Ground-water levels at two index well sites on Oahu showed that while remaining in the normal range, the water level rose steadily from December 1981 to September 1982. Two index well sites on Maui showed normal ground-water levels for the year.

Analyses of water samples taken at more than 152 basal water-table wells generally did not show significant changes in chloride concentration.

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

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

Fecal coliform bacteria are bacteria that are present in the intestine or feces of 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 medium (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 bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C + 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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 "DISCHARGE (CFS)."

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

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

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

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

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

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

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

Microgram per gram (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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Turbidity of a sample is the reduction of transparency due to the presence of particulate matter. In this report it is expressed 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 this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000 which appears just to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "200000." In this report, the records are listed in downstream order by islands. Locations of the stations are shown in figures 2, 4, 6, 8, and 10.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

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

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

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

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

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

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

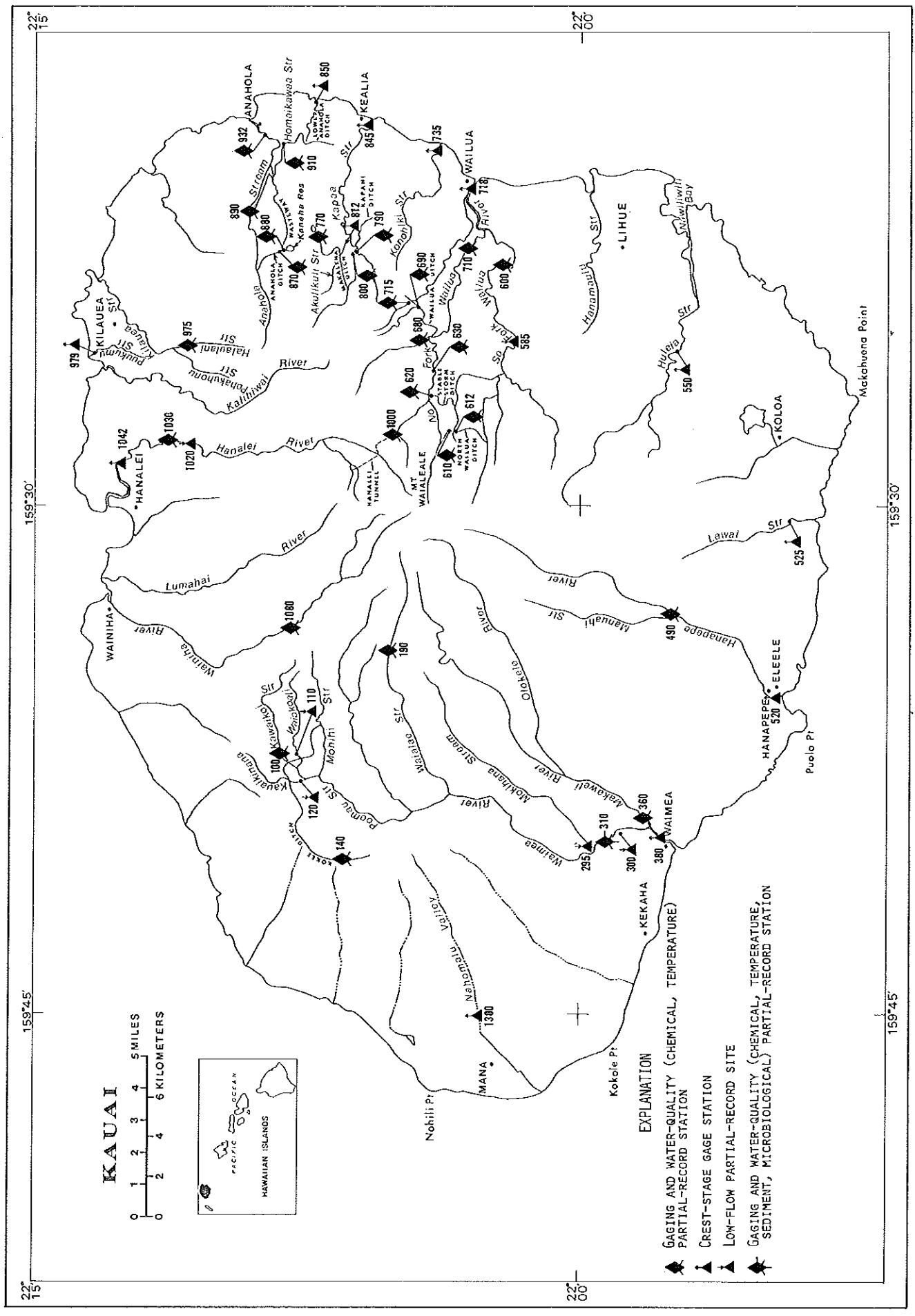

FIGURE 2.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON KAUAI.

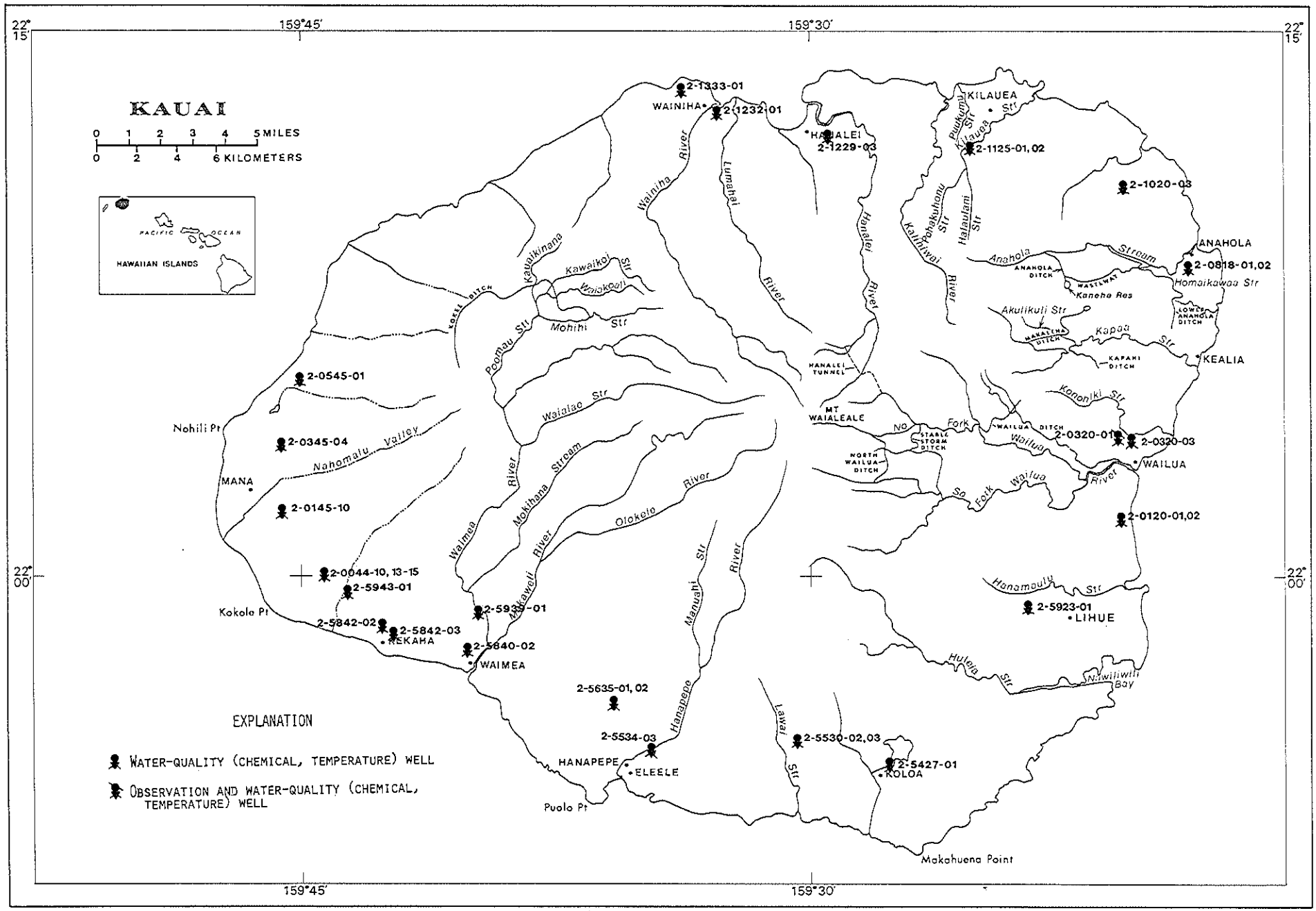

FIGURE 3.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON KAUAI.

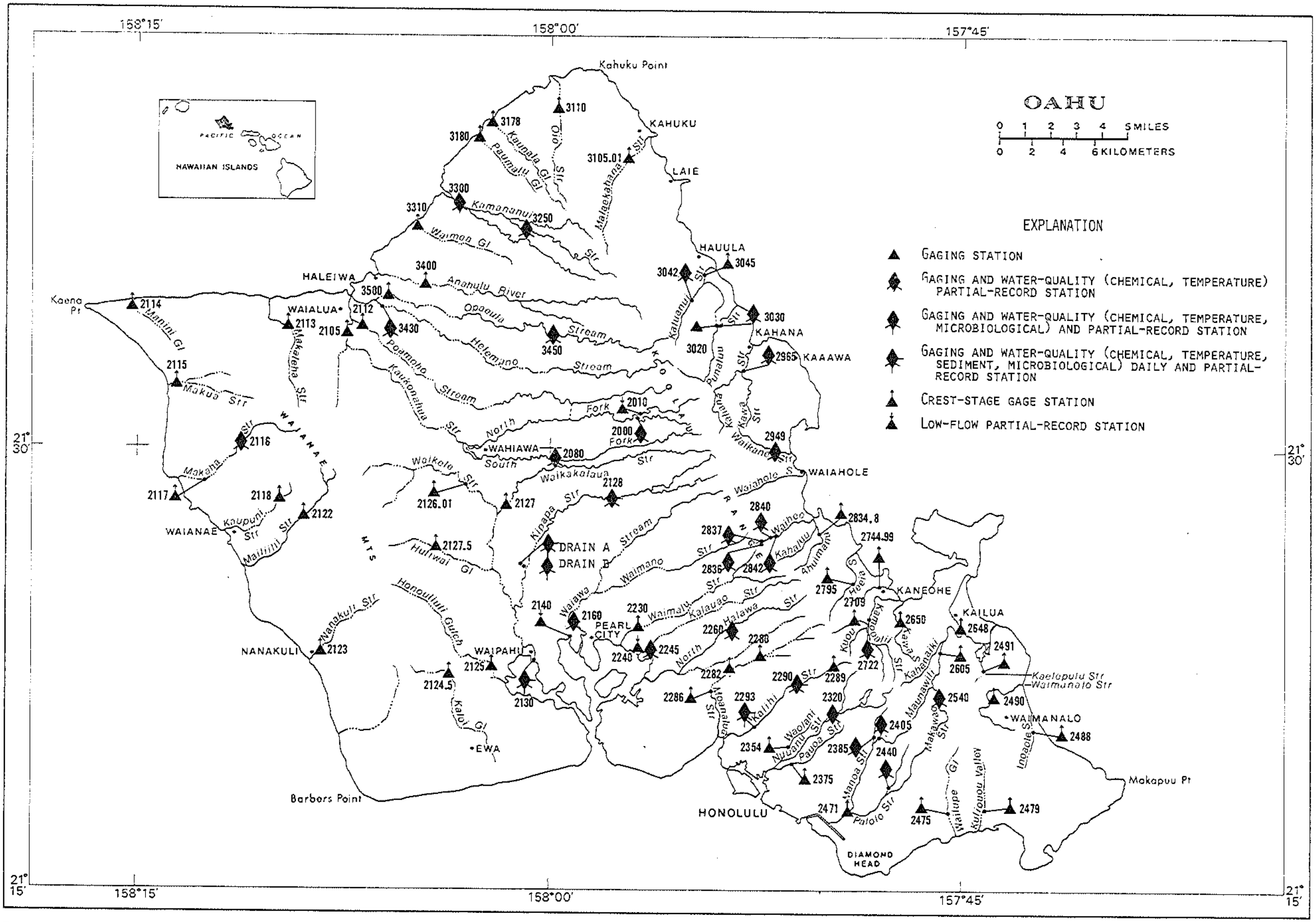

Figure 4.--Locations of gaging, water-quality, and partial-record stations on Oahu.

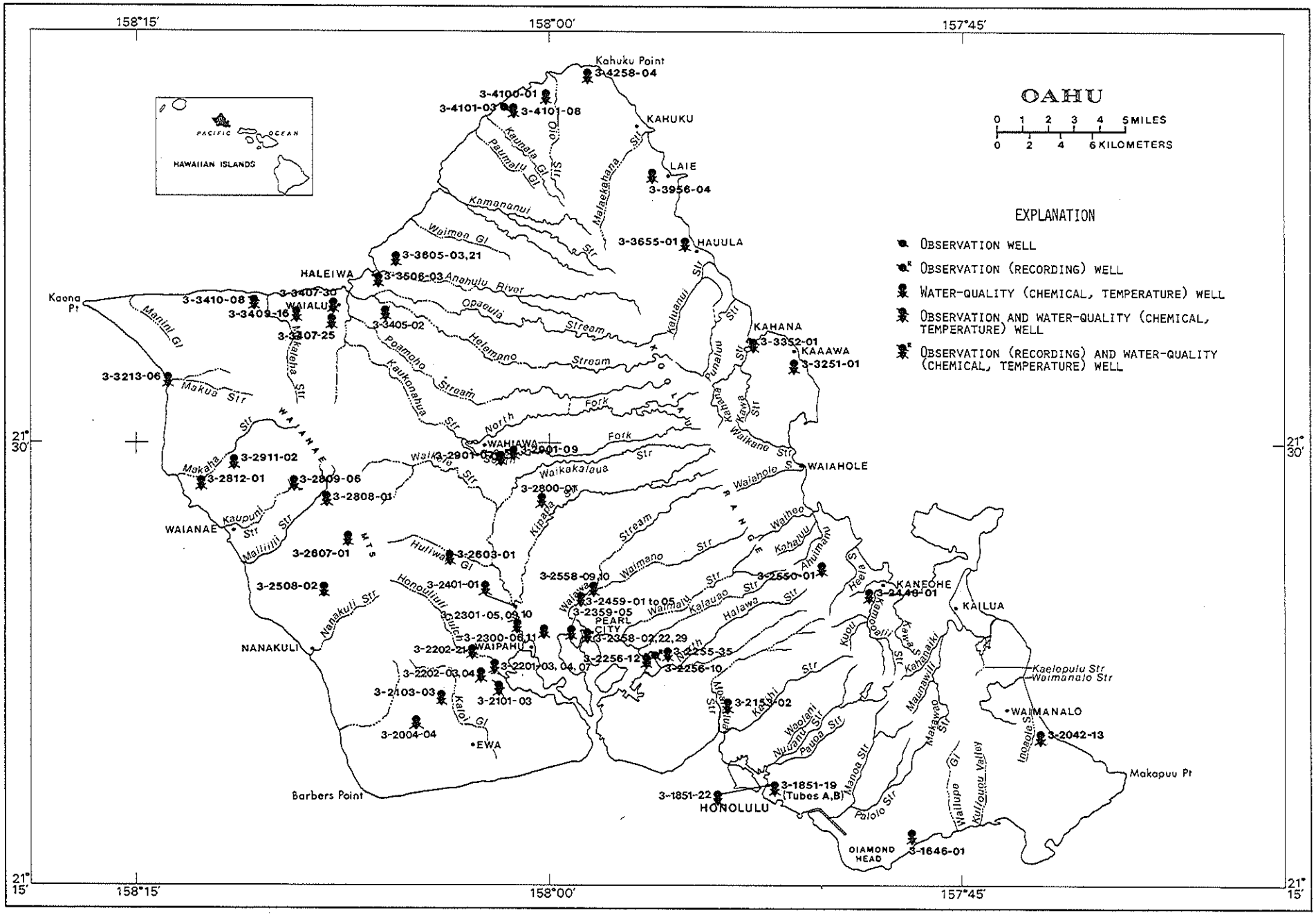

FIGURE 5.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON OAHU.

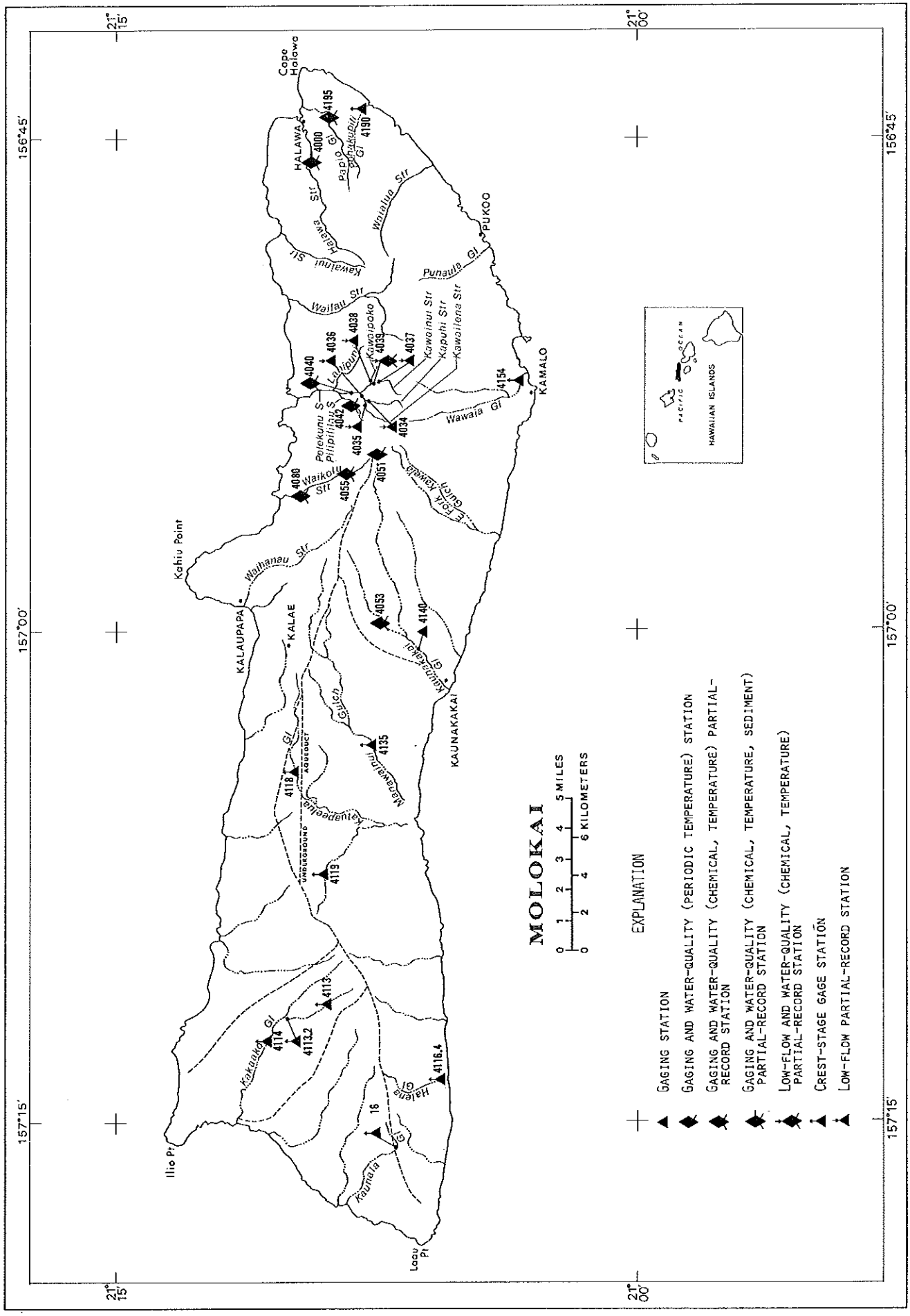

FIGURE 6.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MOLOKAI.

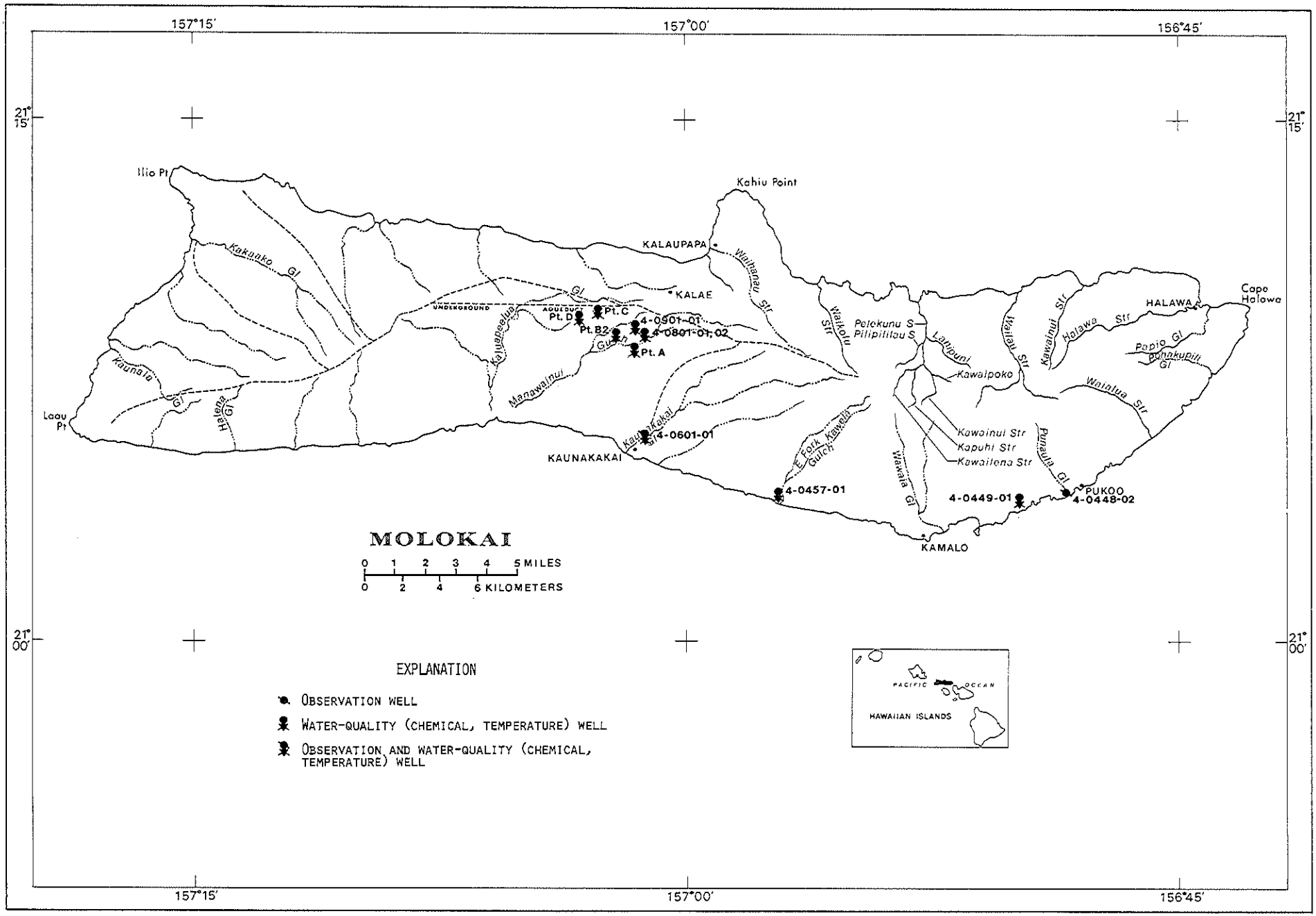

FIGURE 7.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MOLOKAI.

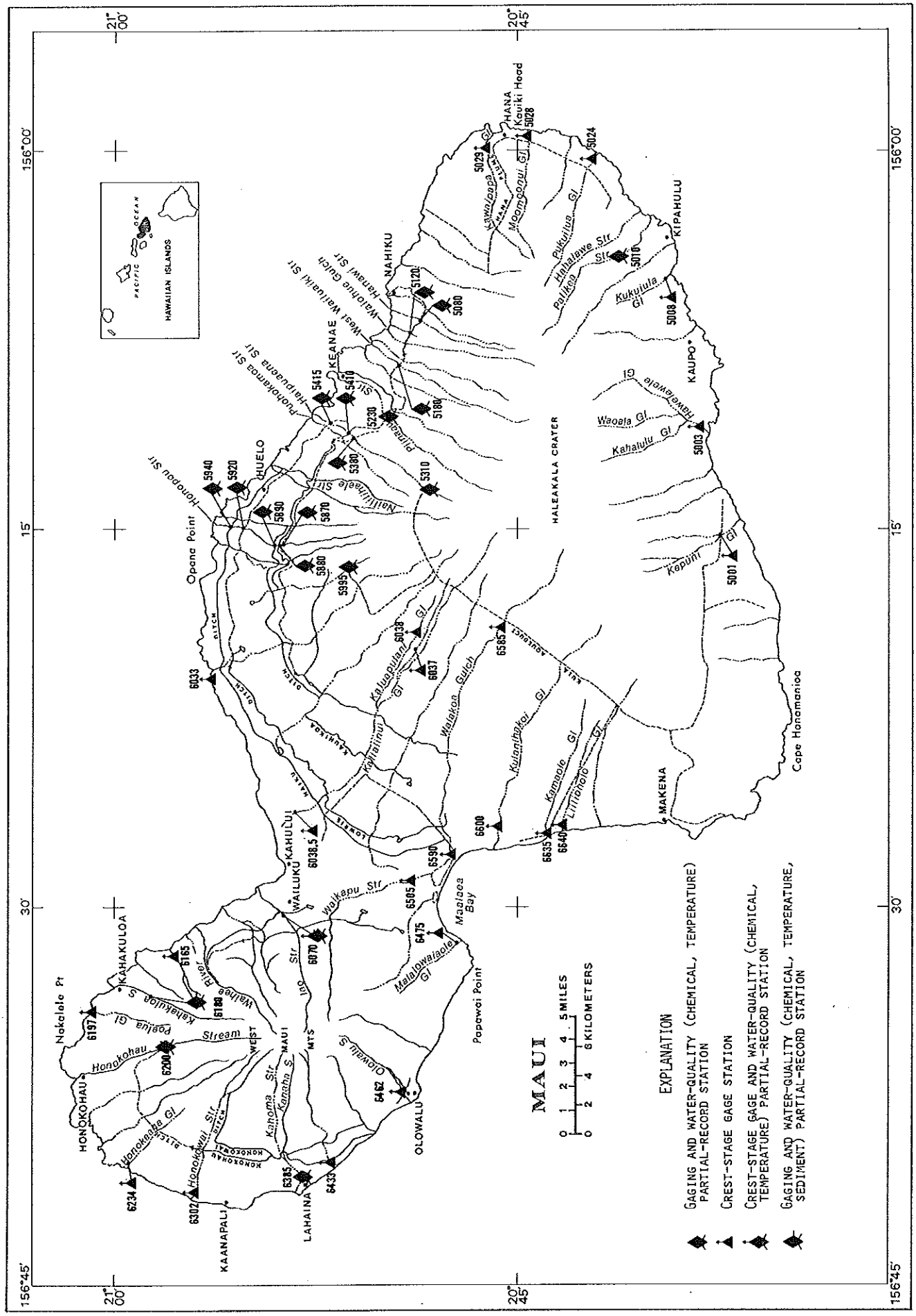

FIGURE 8.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MAUI.

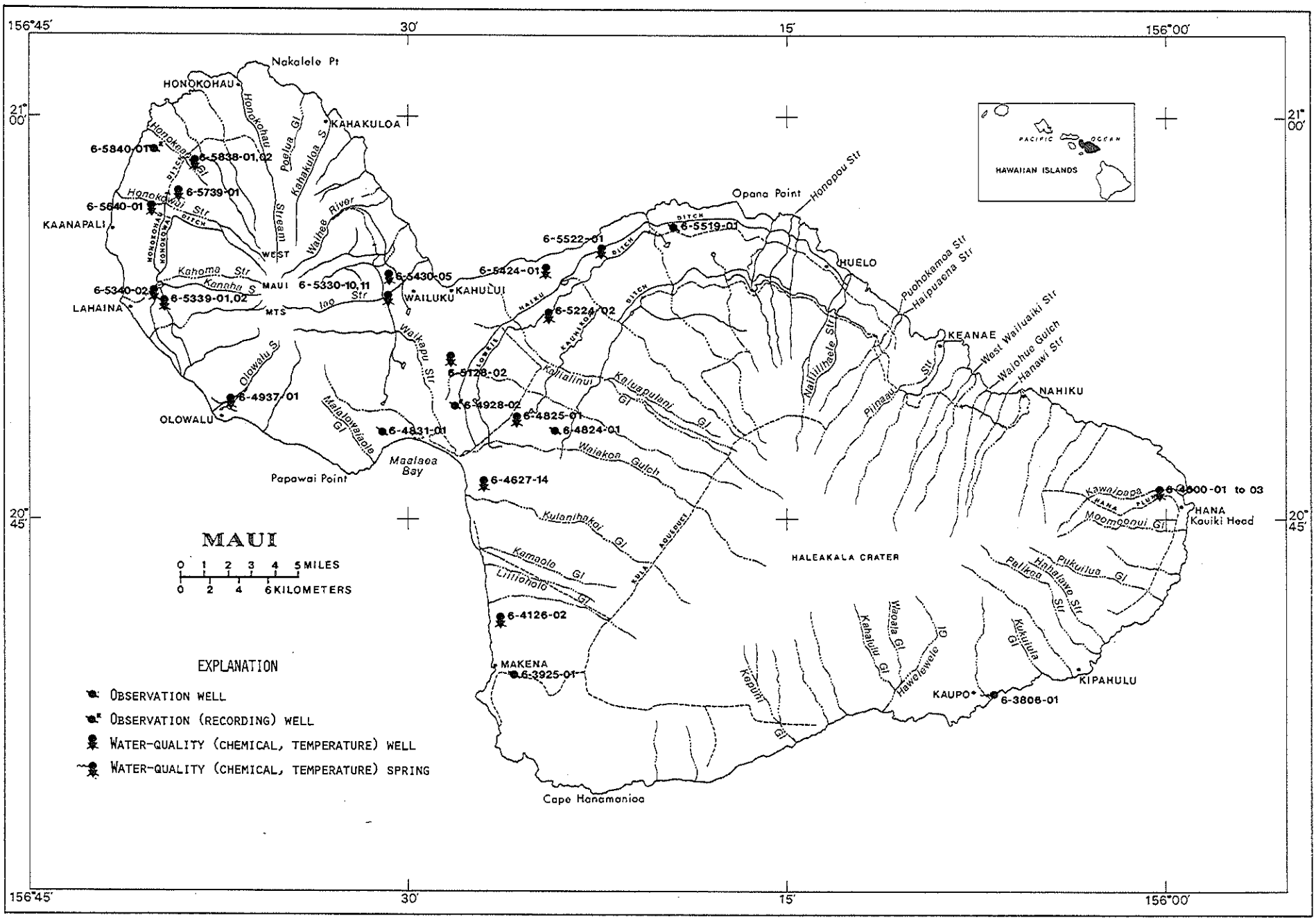

FIGURE 9.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MAUI.

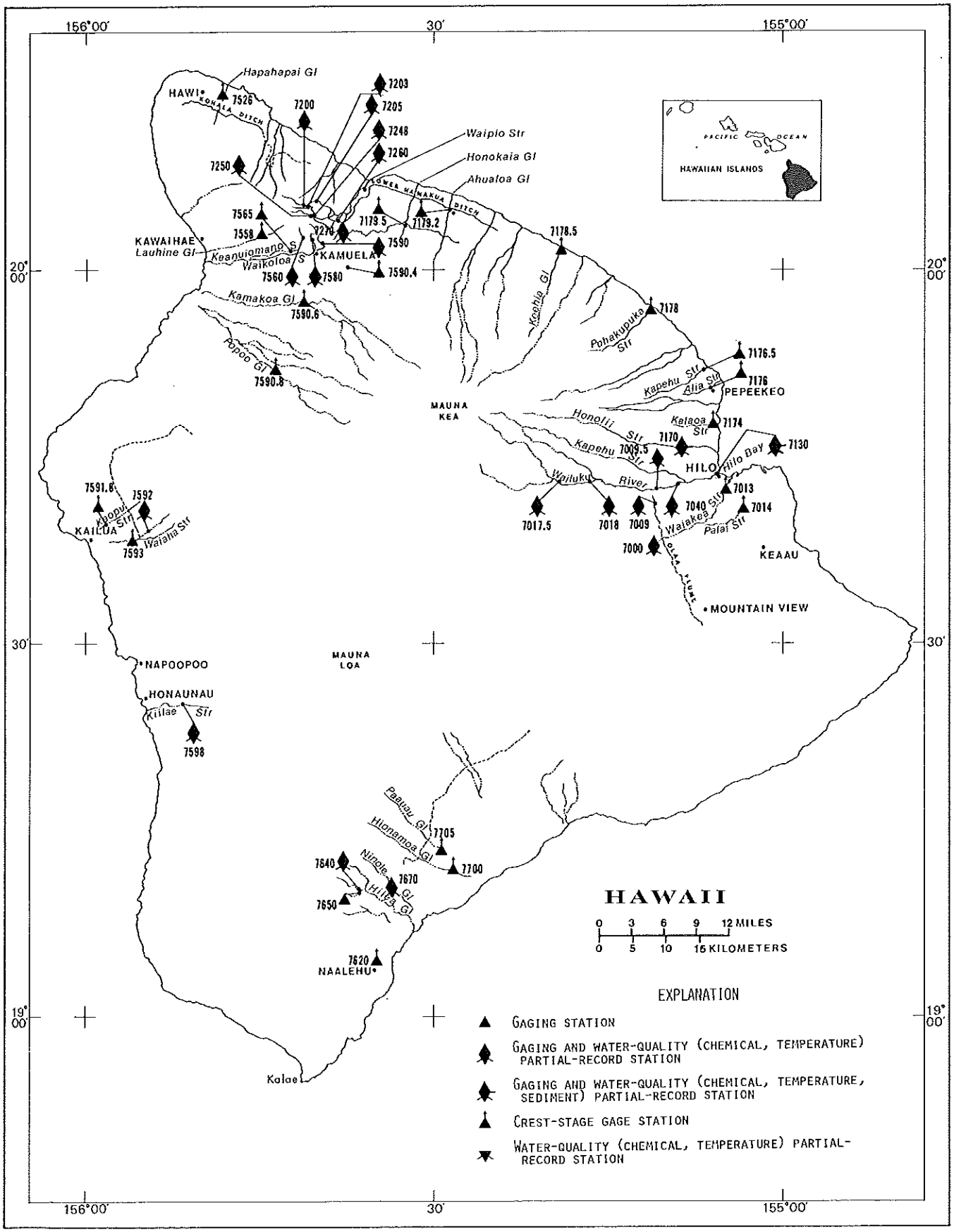

FIGURE 10.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON HAWAII.

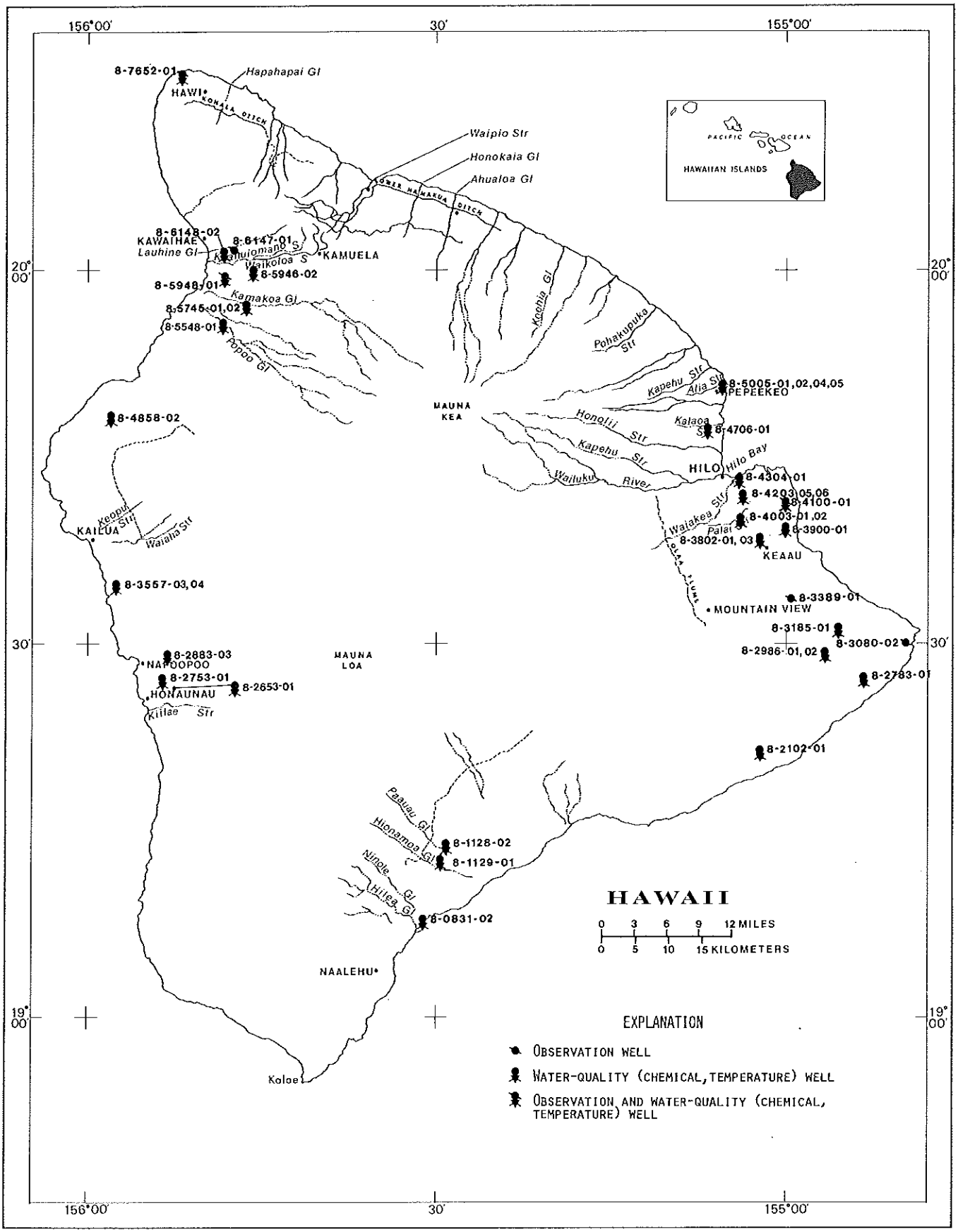

FIGURE 11.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON HAWAII.

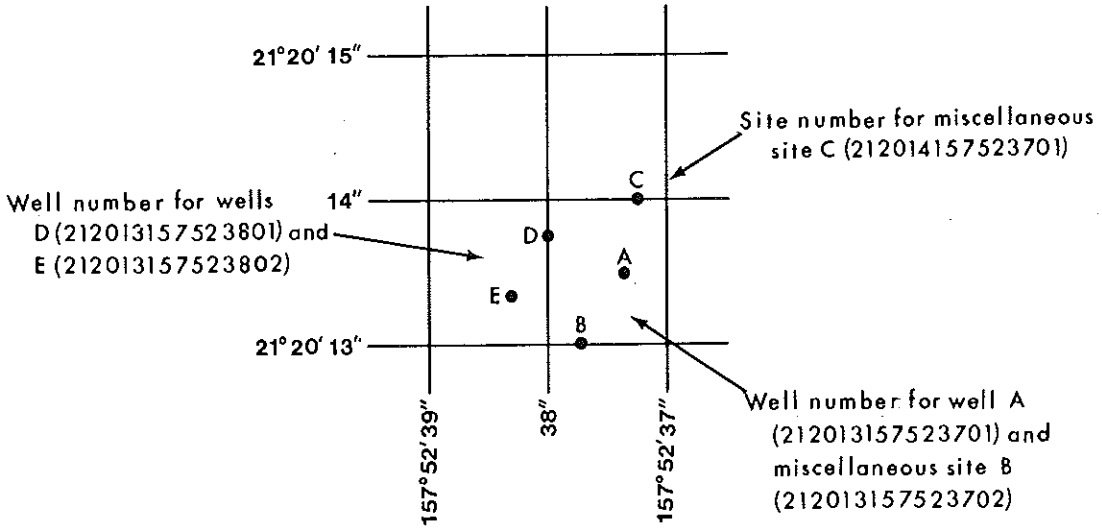

Figure 12. Sketch showing system for numbering wells and miscellaneous sites

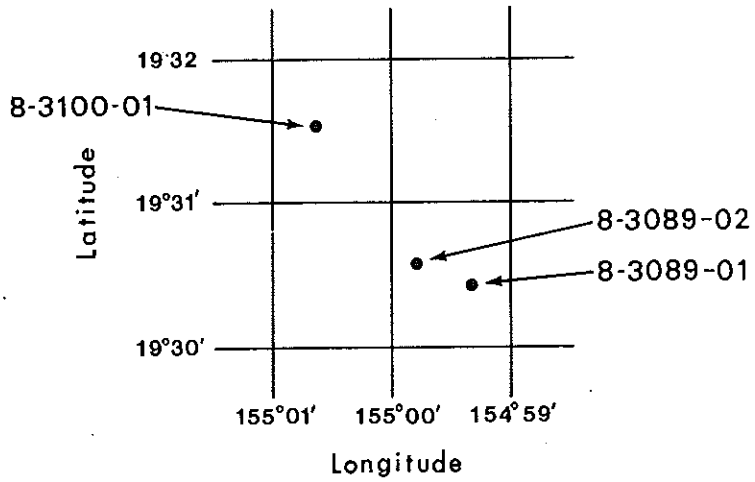

Figure 13. Sketch showing local well numbering system

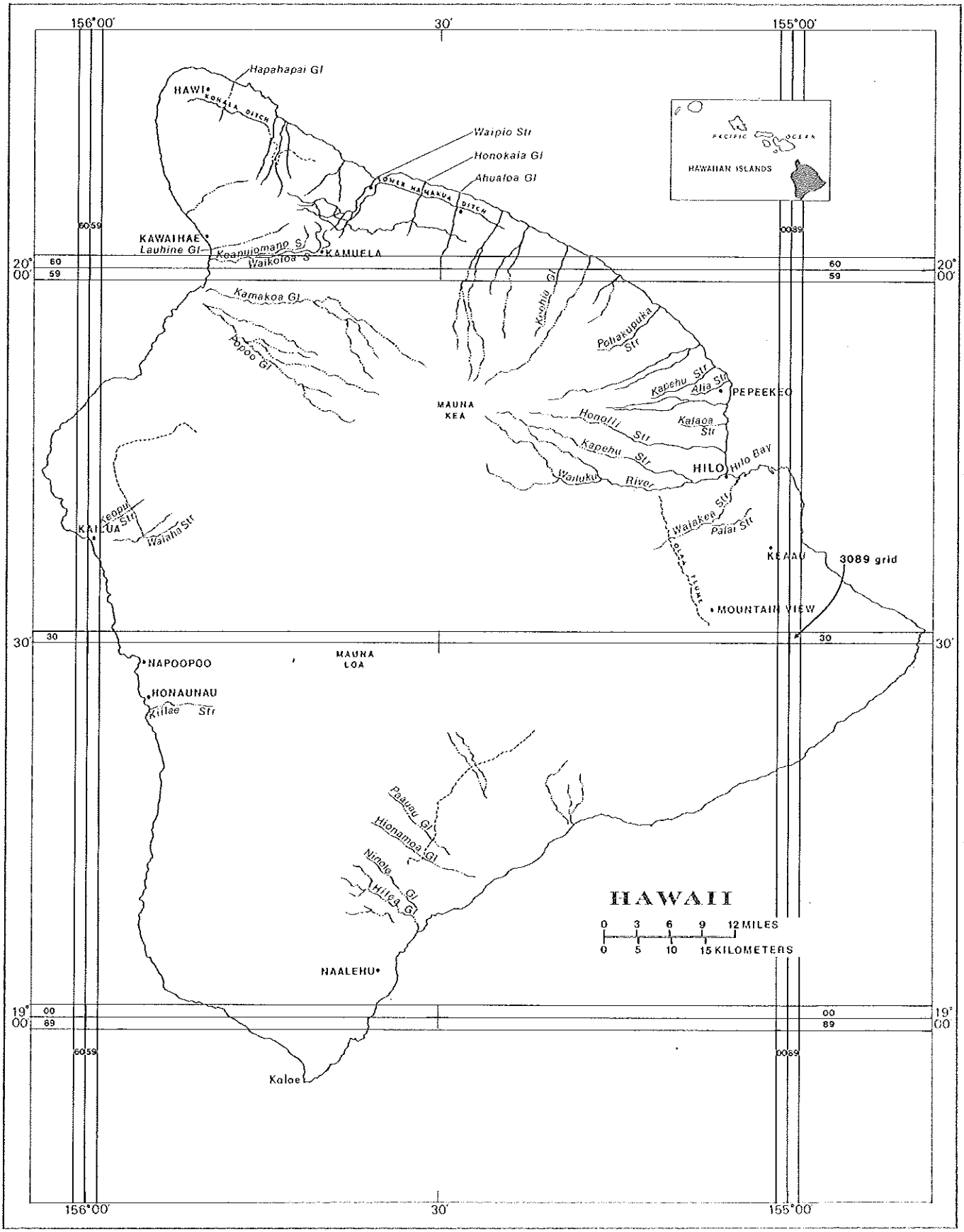

FIGURE 14.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

SPECIAL NETWORKS AND PROGRAMS

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

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

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

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

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

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

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

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

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

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

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

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

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

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

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

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE", it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

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

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

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

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

Accuracy of field data and computed results

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

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

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

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

Records of discharge collected by agencies other than the Geological Survey

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

Other data available

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

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

Publications

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

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

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

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

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

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

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

Water analysis

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

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

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis.

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 diel temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

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

Sediment

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

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

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

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

Publications

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

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

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

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

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

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

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

Publications

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

Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.
1935	777	1942	949	1949	1161	1956-60	1770
1936	817	1943	991	1950	1170	1961-65	1855
1937	840	1944	1021	1951	1196	1966-70	2010
1938	845	1945	1028	1952	1226	1971-74	2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments,* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.

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

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

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

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

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

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

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

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

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

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi² (10.23 km²).

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

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

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

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

AVERAGE DISCHARGE.--65 years (water years, 1912, 1914, 1920-82), 34.6 ft³/s (0.980 m³/s), 25,070 acre-ft/yr (30.9 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,100 ft³/s (59.5 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	1930	*6580	186	*12.47	3.800	Mar. 23	0130	6220	176	12.22	3.725
Jan. 6	2100	3180	90.1	9.42	2.871	Mar. 31	0600	2430	68.8	8.53	2.600
Jan. 21	0700	2800	79.3	8.98	2.737						

Minimum discharge, 4.0 ft³/s (0.113 m³/s) Oct. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	1120	43	14	21	37	159	23	11	50	133	16
2	4.6	1200	94	14	54	30	165	19	7.9	107	304	24
3	7.6	744	51	12	24	39	91	17	7.0	82	27	12
4	6.6	66	23	12	18	30	45	16	6.6	42	18	9.0
5	5.3	42	17	12	40	25	34	15	6.4	35	15	7.9
6	6.2	38	17	528	93	25	29	14	6.0	47	14	7.4
7	11	29	200	129	102	35	74	20	5.8	94	13	6.8
8	7.0	22	34	32	319	37	65	16	5.6	32	12	6.4
9	5.3	19	20	23	168	80	94	13	5.4	58	12	6.2
10	4.6	16	16	21	230	38	33	12	5.4	25	51	12
11	4.3	14	27	31	133	24	25	20	7.2	17	27	62
12	4.2	13	21	49	60	32	22	15	9.2	18	94	27
13	57	14	14	23	52	27	35	12	6.4	157	14	12
14	13	23	12	17	32	87	32	11	5.8	45	10	9.2
15	6.8	56	12	15	27	33	24	10	5.3	42	9.5	11
16	5.3	24	11	22	22	20	19	9.8	5.1	78	30	7.4
17	30	16	9.8	18	20	16	47	10	5.0	89	21	6.4
18	30	23	9.2	20	19	384	28	11	6.4	129	16	6.6
19	16	14	16	57	17	202	17	10	55	37	12	6.8
20	8.4	11	60	370	79	143	95	9.2	43	25	9.5	5.8
21	5.8	9.5	153	622	102	66	232	13	26	28	21	5.3
22	5.1	8.7	139	56	32	161	95	9.8	11	32	29	5.0
23	4.8	525	24	38	27	556	78	8.7	17	26	54	5.1
24	7.9	122	336	161	77	91	109	7.9	8.4	24	19	5.3
25	7.6	58	374	163	617	42	73	8.4	52	17	48	5.6
26	64	46	68	53	311	32	35	7.9	13	13	91	9.2
27	250	107	35	98	338	131	31	7.6	8.1	24	15	6.8
28	304	58	27	46	55	89	106	7.4	21	20	11	5.3
29	25	24	22	35	---	52	32	12	60	23	9.5	4.8
30	20	37	18	35	---	36	30	19	51	16	18	5.1
31	20	---	16	26	---	545	---	14	---	12	28	---
TOTAL	952.0	4499.2	1919.0	2752	3089	3145	1954	398.7	483.0	1444	1185.5	319.4
MEAN	30.7	150	61.9	88.8	110	101	65.1	12.9	16.1	46.6	38.2	10.6
MAX	304	1200	374	622	617	556	232	23	60	157	304	62
MIN	4.2	8.7	9.2	12	17	16	17	7.4	5.0	12	9.5	4.8
AC-FT	1890	8920	3810	5460	6130	6240	3880	791	958	2860	2350	634

CAL YR 1981 TOTAL 16934.1 MEAN 46.4 MAX 1200 MIN 4.2 AC-FT 33590
WTR YR 1982 TOTAL 22140.8 MEAN 60.7 MAX 1200 MIN 4.2 AC-FT 43920

16014000 KOKEE DITCH NEAR WAIMEA

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

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

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

REMARKS.--Records good. Ditch diverts at altitude 3,400 ft (1,040 m) from Mohihi Stream and all streams west which are tributary to Waimea River, for irrigation in vicinity of Kekaha. Records do not include waste water diverted at times at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--56 years, 24.7 ft^3/s (0.700 m^3/s), 17,900 acre-ft/yr (22.1 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 87 ft^3/s (2.46 m^3/s) Dec.22; no flow Jan. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	48	55	39	31	46	12	41	22	39	40	26
2	6.0	57	69	36	65	58	13	35	19	80	65	32
3	11	56	66	34	42	52	11	37	17	74	44	23
4	11	59	41	32	31	48	9.5	38	16	58	29	17
5	8.2	70	31	38	25	37	16	36	16	44	24	15
6	7.8	62	28	84	11	30	18	35	15	53	21	14
7	14	54	52	56	14	41	29	45	14	74	20	13
8	11	44	52	62	41	46	16	35	14	46	20	13
9	7.3	37	33	36	45	56	17	32	14	63	18	12
10	6.2	33	30	42	23	45	9.0	30	13	38	54	14
11	5.5	29	39	46	20	37	1.8	36	15	25	35	60
12	5.1	26	38	62	19	55	27	33	19	23	59	39
13	40	24	28	49	20	40	43	28	14	55	26	22
14	22	33	25	62	13	43	45	26	14	62	19	16
15	10	45	22	36	5.6	19	38	25	13	44	17	18
16	7.8	40	21	12	9.0	20	38	25	12	68	26	14
17	13	28	20	16	20	38	55	25	12	78	39	12
18	41	33	19	20	20	44	32	27	13	77	26	12
19	20	27	23	28	30	18	37	25	25	54	22	12
20	12	21	35	28	58	16	56	23	46	35	17	11
21	8.2	19	60	7.0	70	15	56	25	46	32	25	10
22	6.8	17	87	.00	45	22	39	23	20	42	41	9.8
23	6.2	61	52	.00	37	20	47	21	24	28	45	9.8
24	10	71	61	7.3	48	14	47	20	16	32	32	10
25	11	63	23	31	54	6.8	38	20	51	23	32	10
26	58	60	11	39	42	7.8	53	19	23	18	77	14
27	66	64	7.7	2.6	34	17	56	19	16	23	31	12
28	67	64	31	4.9	27	20	68	18	25	27	22	10
29	44	38	60	27	---	18	49	22	38	26	19	9.2
30	30	47	49	36	---	10	52	28	67	21	23	9.2
31	32	---	43	34	---	15	---	24	---	17	38	---
TOTAL	603.9	1330	1211.7	1006.80	899.6	954.6	1028.3	876	669	1379	1006	499.0
MEAN	19.5	44.3	39.1	32.5	32.1	30.8	34.3	28.3	22.3	44.5	32.5	16.6
MAX	67	71	87	84	70	58	68	45	67	80	77	60
MIN	5.1	17	7.7	.00	5.6	6.8	1.8	18	12	17	17	9.2
AC-FT	1200	2640	2400	2000	1780	1890	2040	1740	1330	2740	2000	990

CAL YR 1981 TOTAL 11554.40 MEAN 31.7 MAX 88 MIN 5.1 AC-FT 22920
WTR YR 1982 TOTAL 11463.90 MEAN 31.4 MAX 87 MIN .00 AC-FT 22740

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

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

DRAINAGE AREA.--1.79 mi² (4.64 km²).

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--41 years (water years 1921-31, 1953-82), 22.5 ft³/s (0.637 m³/s), 16,300 acre-ft/yr (20.1 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0700	2460	69.7	6.17	1.881	Jan. 20	2300	1400	39.6	4.67	1.423
Nov. 1	2100	2650	75.0	6.41	1.954	Mar. 23	0230	*2850	80.7	*6.66	2.030
Nov. 23	0430	2260	64.0	5.92	1.804	Mar. 27	0400	1580	44.7	4.95	1.509
Dec. 24	1400	1400	39.6	4.66	1.420						

Minimum discharge, 2.3 ft³/s (0.065 m³/s) June 15, 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	490	33	5.8	7.2	12	127	7.2	4.0	16	112	12
2	28	527	32	5.5	55	12	88	6.0	4.0	40	208	93
3	47	300	21	5.0	11	14	42	5.5	3.7	34	13	15
4	51	32	12	4.5	8.0	11	18	5.2	3.4	27	10	8.8
5	15	14	8.8	8.7	9.2	8.0	14	5.0	3.0	26	9.2	7.2
6	8.8	11	7.2	294	18	6.8	14	5.8	2.7	23	8.0	5.8
7	16	8.8	55	65	20	7.2	145	38	2.5	114	8.0	5.2
8	8.4	6.8	17	13	104	8.4	33	16	2.4	29	7.6	4.5
9	6.0	5.8	9.2	8.8	122	14	26	8.8	2.4	29	5.8	4.5
10	5.0	5.0	8.0	17	108	14	15	6.4	2.4	15	22	5.0
11	4.0	4.5	8.8	38	99	30	11	14	2.4	10	24	89
12	3.5	4.2	8.8	32	64	90	9.2	18	2.4	9.6	67	55
13	12	4.0	6.4	13	41	27	9.6	9.2	2.6	101	10	33
14	8.4	3.8	5.5	9.2	18	166	11	7.2	2.6	31	6.8	44
15	4.8	4.2	4.8	8.0	14	33	8.4	5.5	2.3	14	9.6	45
16	3.8	5.0	4.2	7.2	11	14	7.2	5.2	2.3	35	77	10
17	3.8	5.8	4.0	45	9.2	11	38	5.0	17	169	40	7.6
18	5.2	8.8	3.8	72	8.8	78	12	7.6	13	105	25	7.2
19	4.5	7.6	4.5	130	8.4	45	7.6	7.2	7.2	19	9.6	6.0
20	3.8	4.8	83	316	15	48	10	5.5	5.2	12	7.6	5.2
21	3.4	4.0	146	447	74	142	40	8.0	7.2	9.6	9.6	4.8
22	3.2	3.4	174	29	17	572	32	5.8	4.5	10	12	4.5
23	3.4	489	34	16	12	603	19	5.5	3.5	8.0	31	4.2
24	8.7	92	398	21	14	69	27	14	3.0	6.4	19	4.2
25	8.8	53	267	57	219	22	28	9.2	4.2	5.8	144	13
26	31	46	44	16	89	17	12	5.5	4.2	5.0	184	30
27	118	164	17	23	37	342	9.2	4.8	3.4	4.8	16	15
28	378	45	12	17	18	153	26	4.2	4.5	4.8	11	16
29	24	29	9.6	11	---	122	12	4.0	13	6.0	10	9.2
30	13	42	8.0	9.6	---	123	9.2	4.0	43	7.2	11	7.2
31	11	---	6.8	8.4	---	458	---	4.5	---	8.0	13	---
TOTAL	849.2	2420.5	1453.4	1752.7	1230.8	3272.4	860.4	257.8	178.0	934.2	1140.8	571.1
MEAN	27.4	80.7	46.9	56.5	44.0	106	28.7	8.32	5.93	30.1	36.8	19.0
MAX	378	527	398	447	219	603	145	38	43	169	208	93
MIN	3.2	3.4	3.8	4.5	7.2	6.8	7.2	4.0	2.3	4.8	5.8	4.2
AC-FT	1680	4800	2880	3480	2440	6490	1710	511	353	1850	2260	1130

CAL YR 1981 TOTAL 8870.2 MEAN 24.3 MAX 527 MIN 1.8 AC-FT 17590
WTR YR 1982 TOTAL 14921.3 MEAN 40.9 MAX 603 MIN 2.3 AC-FT 29600

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

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT											
07...	1015	25	28	6.3	16.0	6	5.0	.9	.8	2.9	51
JAN											
22...	1015	29	21	6.3	12.0	7	.00	2.2	.4	2.6	43
APR											
15...	1030	8.6	24	5.6	14.5	4	.00	.7	.5	3.3	61
JUN											
11...	1010	2.4	32	5.7	17.0	7	.00	1.2	1.0	4.5	56

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
07...	.6	.3	1.0	<5.0	6.0	.1	3.6	20	.03	.11	.030
JAN											
22...	.4	.2	8.0	5.0	4.5	.1	3.6	24	.03	<.09	.010
APR											
15...	.8	.4	4.0	7.0	5.5	<.1	5.0	25	.03	<.10	<.010
JUN											
11...	.8	.5	9.0	<5.0	6.4	<.1	7.1	--	--	<.10	.120

DATE	TIME	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	DATE	TIME	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
OCT				APR			
07...	1015	410	8	15...	1030	250	5
JAN				JUN			
22 ..	1015	180	7	11...	1010	220	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 (2.1 km) upstream from Makaweli River and 1.9 mi (3.1 km) north of Waimea Post Office.

DRAINAGE AREA.--57.8 mi² (149.7 km²).

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--41 years (water years, 1911-17, 1945-68, 1970-72, 1976-82), 130 ft³/s (3.682 m³/s), 94,180 acre-ft/yr (116 hm³/yr).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 19, 1974, which destroyed the station reached a stage of 19.05 ft (5.806 m), from floodmarks, discharge, 29,100 ft³/s (824 m³/s), from rating curve extended above 2,200 ft³/s (62.3 m³/s) on basis of slope-area measurement at gage height 19.05 ft (5.806 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,700 ft³/s (246 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2130	17300	490	14.52	4.426	Mar. 23	0400	17800	504	14.72	4.487
Dec. 25	1230	14510	411	13.28	4.048	Mar. 31	0800	10410	295	11.41	3.478
Jan. 7	0030	*22080	625	*16.43	5.008						

Minimum discharge, 1.1 ft³/s (0.031 m³/s) Oct. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	3040	67	64	154	166	2500	52	12	59	100	37
2	2.3	4680	50	56	311	128	1450	47	11	146	1000	135
3	49	3450	40	50	160	114	890	42	9.7	76	78	62
4	32	280	32	41	121	109	364	32	9.2	90	30	24
5	32	99	16	88	124	90	255	28	9.2	70	21	14
6	4.2	51	12	4040	192	78	266	29	8.7	48	13	12
7	2.9	35	13	1960	328	58	1910	103	8.5	294	9.7	11
8	8.2	20	12	240	1200	62	594	56	8.5	100	9.4	10
9	2.7	16	11	134	2500	78	432	48	8.0	71	8.7	9.2
10	2.6	13	10	166	1700	140	238	29	7.6	64	30	8.7
11	2.4	12	12	208	2300	100	160	23	8.0	28	68	111
12	2.4	18	11	283	682	241	132	49	11	16	175	142
13	2.6	11	10	160	546	116	112	36	8.2	150	42	62
14	17	11	10	110	322	450	114	22	8.7	195	13	51
15	4.3	10	10	93	241	227	99	18	8.7	64	9.2	103
16	2.8	17	9.8	80	192	121	89	18	12	59	150	30
17	2.7	12	9.6	134	166	98	140	18	8.2	441	120	14
18	3.0	12	9.6	189	152	626	116	24	40	392	90	12
19	3.6	17	11	700	134	626	81	24	52	98	80	10
20	2.8	12	50	2000	140	428	94	18	65	40	70	9.4
21	2.2	9.9	500	3000	387	534	339	16	43	24	200	8.0
22	2.0	9.2	3000	1600	212	1980	272	18	24	21	140	8.0
23	2.3	950	1000	500	128	5420	102	17	14	19	300	7.8
24	2.4	446	4000	1000	128	950	200	14	11	12	120	7.8
25	3.6	77	1000	1000	2200	283	202	30	10	9.7	500	7.8
26	14	142	500	500	1610	178	94	19	16	8.9	200	34
27	325	49	300	1000	840	1710	70	16	10	8.5	98	50
28	1560	45	160	500	280	1140	124	13	8.7	8.2	52	22
29	89	65	110	300	---	1060	84	12	9.9	8.5	33	24
30	16	54	90	300	---	546	58	12	86	10	29	12
31	5.8	---	74	200	---	4700	---	12	---	12	41	---
TOTAL	2204.2	13663.1	11140.0	20696	17450	22557	11581	895	546.8	2642.8	3830.0	1048.7
MEAN	71.1	455	359	668	623	728	386	28.9	18.2	85.3	124	35.0
MAX	1560	4680	4000	4040	2500	5420	2500	103	86	441	1000	142
MIN	2.0	9.2	9.6	41	121	58	58	12	7.6	8.2	8.7	7.8
AC-FT	4370	27100	22100	41050	34610	44740	22970	1780	1080	5240	7600	2080

CAL YR 1981 TOTAL 42963.2 MEAN 118 MAX 4680 MIN 1.6 AC-FT 85220
WTR YR 1982 TOTAL 108254.6 MEAN 297 MAX 5420 MIN 2.0 AC-FT 214700

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
NOV											
02...	1400	6350	28	6.6	19.0	48	9.8	105	930	2600	7
JAN											
04...	1145	44	102	7.4	18.5	5.0	9.1	97	350	3600	37
FEB											
01...	1115	153	85	7.3	16.0	3.3	9.4	95	K90	900	28
APR											
05...	1130	263	85	6.5	19.0	3.5	9.2	99	140	1500	28
JUN											
07...	1200	8.6	167	7.1	24.0	.80	9.0	107	80	350	66
AUG											
02...	1415	767	30	5.9	24.0	18	9.1	108	1300	7400	9

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV											
02...	5.0	1.2	1.0	2.8	44	.5	.4	2.0	5.0	6.0	.0
JAN											
04...	1.0	5.2	5.8	6.4	27	.5	.6	36	6.0	10	.1
FEB											
01...	1.0	3.9	4.4	6.3	32	.5	.5	27	<5.0	11	.1
APR											
05...	.00	3.9	4.5	6.3	32	.5	.4	30	5.0	9.7	<.1
JUN											
07...	2.0	8.3	11	9.8	24	.5	.7	64	<5.0	13	.2
AUG											
02...	.00	1.3	1.3	2.7	40	.4	.3	9.0	11	4.0	<.1

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
NOV										
02...	4.0	25	21	.03	.23	.130	.91	.310	.040	<.020
JAN										
04...	19	--	75	.10	.22	<.070	.31	.020	.030	.020
FEB										
01...	18	58	--	.08	.21	<.070	.33	.020	.020	.030
APR										
05...	19	63	67	.09	.19	<.060	.33	<.010	<.010	.030
JUN										
07...	23	117	--	.16	<.10	<.060	.50	.070	.050	<.010
AUG										
02...	6.7	36	33	.05	<.10	.090	1.80	.090	.030	.030

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
NOV										
02...	1400	1	0	1	100	90	6	<1	1	140
FEB										
01...	1115	1	0	2	<100	--	5	2	<1	10
APR										
05...	1130	1	0	1	<100	--	7	<1	<3	<10
AUG										
02...	1415	1	--	<1	200	200	6	<1	<1	20

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.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	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, SUSPENDED RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
NOV 02...	<10	42	<3	60	56	4	46000	46000	190	3
FEB 01...	<10	2	<3	11	10	1	280	210	74	20
APR 05...	<10	<1	<1	22	20	2	370	260	110	3
AUG 02...	<10	2	<1	17	10	7	3700	3300	360	8

DATE	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY SUSPENDED RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)
NOV 02...	--	<1	770	750	17	.7	.6	.1	290
FEB 01...	--	<1	10	2	8	<.1	--	<.1	9
APR 05...	1	2	10	4	6	.6	.4	.2	1
AUG 02...	5	3	120	110	13	<.1	--	<.1	6

DATE	NICKEL, SUSPENDED RECOVERABLE (UG/L AS NI)	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)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, SUSPENDED RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
NOV 02...	290	1	<1	<1	<1	<1	90	80	15
FEB 01...	--	<1	<1	<1	<1	<1	20	--	<3
APR 05...	0	1	<1	<1	<1	<1	30	--	<12
AUG 02...	--	<1	<1	<1	<1	<1	290	270	18

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 02...	1400	6350	854	14600	--
JAN 04...	1145	44	6	.71	100
FEB 01...	1115	153	3	1.2	100
APR 05...	1130	263	5	3.6	100
JUN 07...	1200	8.6	2	.05	100
AUG 02...	1415	767	99	205	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 (1.1 km) upstream from mouth and 1.9 mi (3.1 km) northeast of Waimea.

DRAINAGE AREA.--26.0 mi² (67.3 km²).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records fair except those below 108 ft³/s (3.059 m³/s), which are poor. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi (14.5 km) above station for irrigation in vicinity of Makaweli. A 5 ft³/s (0.14 m³/s) capacity ditch diverts water from above the station for irrigation of taro in the vicinity of the station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--39 years, 88.8 ft³/s (2.515 m³/s), 64,340 acre-ft/yr (79.3 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,700 ft³/s (135 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2300	7200	204	8.28	2.524	Mar. 23	0300	*10210	289	*9.98	3.042
Dec. 24	1600	8390	238	8.90	2.713	Mar. 29	0200	8520	241	8.98	2.737
Jan. 21	0730	9320	264	9.48	2.900	Mar. 31	0700	5590	158	7.03	2.143

Minimum discharge, 8.5 ft³/s (0.241 m³/s) Oct. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	1470	162	44	81	66	1130	45	29	72	387	131
2	91	1690	154	43	189	96	754	45	42	108	899	408
3	165	1220	105	41	85	58	416	45	31	100	82	95
4	306	198	52	41	77	44	249	44	30	79	62	58
5	62	100	36	68	76	31	200	45	30	118	51	32
6	28	50	33	866	76	28	257	45	29	92	38	30
7	40	30	83	469	79	28	1140	213	29	455	41	30
8	22	25	50	95	230	29	415	249	30	150	32	29
9	24	22	28	58	594	31	286	91	30	145	27	29
10	16	20	23	152	499	40	180	65	30	52	96	36
11	12	19	25	102	683	398	155	82	30	39	137	202
12	12	18	27	88	458	754	160	99	30	45	135	162
13	17	17	23	52	308	344	219	45	30	218	36	133
14	17	17	23	45	195	1220	200	36	29	122	25	190
15	12	17	23	44	139	311	150	33	29	82	50	121
16	10	17	24	44	120	119	310	30	25	118	238	54
17	10	19	24	158	106	85	479	44	33	694	210	38
18	10	68	24	249	74	158	192	171	41	615	136	42
19	10	23	25	702	72	153	165	68	30	94	41	32
20	9.5	16	348	1110	193	136	163	61	43	41	33	27
21	9.0	14	409	3140	732	612	110	70	34	50	99	27
22	9.0	14	1100	521	169	2000	89	45	26	37	72	27
23	9.0	1280	276	200	97	3910	53	52	24	27	123	28
24	61	504	2080	145	84	593	64	129	24	24	190	27
25	22	202	1350	247	288	235	72	63	25	23	766	67
26	16	222	300	130	244	218	52	39	23	22	708	90
27	136	457	123	131	121	1660	51	46	23	22	106	73
28	1030	202	74	126	78	927	94	37	46	31	71	127
29	116	133	54	92	---	914	56	32	39	23	63	46
30	42	164	48	84	---	851	56	36	160	54	53	50
31	33	---	45	82	---	2830	---	28	---	31	56	---
TOTAL	2384.5	8248	7151	9369	6147	18879	7917	2133	1054	3783	5063	2441
MEAN	76.9	275	231	302	220	609	264	68.8	35.1	122	163	81.4
MAX	1030	1690	2080	3140	732	3910	1140	249	160	694	899	408
MIN	9.0	14	23	41	72	28	51	28	23	22	25	27
AC-FT	4730	16360	14180	18580	12190	37450	15700	4230	2090	7500	10040	4840

CAL YR 1981 TOTAL 31066.5 MEAN 85.1 MAX 2080 MIN 8.5 AC-FT 61620
WTR YR 1982 TOTAL 74569.5 MEAN 204 MAX 3910 MIN 9.0 AC-FT 147900

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

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

DRAINAGE AREA.--18.5 mi² (47.9 km²).

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

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

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

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

AVERAGE DISCHARGE.--58 years (water years, 1918-20, 1928-82), 86.8 ft³/s (2.458 m³/s), 62,890 acre-ft/yr (77.5 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2300	4190	119	6.43	1.960	Mar. 23	0400	5680	161	7.36	2.243
Dec. 21	2400	3710	105	6.13	1.868	Mar. 27	1000	*7600	215	*8.24	2.512
Dec. 24	1500	5340	151	7.15	2.179	Mar. 31	1100	6460	183	7.78	2.371
Mar. 12	0530	4040	114	6.34	1.932	Apr. 7	0100	5800	164	7.44	2.268

Minimum dicharge, 15 ft³/s (0.42 m³/s) Oct. 1, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	530	283	24	70	28	1680	29	23	128	371	329
2	72	696	144	25	117	74	875	29	24	108	642	422
3	136	875	70	23	71	27	350	30	25	92	89	99
4	338	150	40	21	67	24	168	28	26	76	80	58
5	71	55	30	32	51	23	115	29	26	96	64	49
6	26	33	27	415	26	21	130	29	26	104	45	40
7	47	27	58	200	26	20	1060	256	26	696	43	37
8	24	24	71	44	58	20	298	318	26	223	32	34
9	21	21	67	31	208	19	170	67	26	261	32	32
10	18	20	65	34	283	21	91	42	26	98	69	43
11	17	19	80	66	440	322	70	85	26	92	144	148
12	17	18	75	51	117	926	76	132	26	98	158	253
13	24	18	65	28	80	405	212	50	28	512	40	218
14	17	18	64	26	46	1130	107	42	27	202	33	250
15	17	18	61	25	34	435	58	33	25	109	45	142
16	17	20	59	25	31	124	326	32	33	168	689	56
17	17	24	58	107	27	70	624	124	32	1000	438	40
18	18	56	36	212	27	126	182	238	30	564	153	46
19	18	20	18	594	27	80	85	59	26	144	66	32
20	18	17	277	672	277	52	78	42	72	84	45	30
21	18	16	495	1460	903	362	55	59	33	88	138	29
22	18	16	648	200	170	1170	46	34	27	54	85	29
23	19	918	159	85	155	2650	40	35	26	49	210	31
24	85	395	1390	54	72	475	42	99	24	44	204	28
25	17	172	576	76	44	134	49	54	27	39	755	48
26	16	157	161	92	136	96	34	42	24	36	640	71
27	205	286	69	100	78	1640	32	38	24	35	119	62
28	798	148	46	102	37	726	70	30	49	34	74	117
29	79	138	34	80	---	666	34	27	42	35	62	40
30	28	159	30	75	---	1120	34	28	210	61	86	38
31	24	---	26	72	---	3000	---	25	---	39	79	---
TOTAL	2268	5064	5282	5051	3678	15986	7191	2165	1065	5369	5730	2851
MEAN	73.2	169	170	163	131	516	240	69.8	35.5	173	185	95.0
MAX	798	918	1390	1460	903	3000	1680	318	210	1000	755	422
MIN	16	16	18	21	26	19	32	25	23	34	32	28
AC-FT	4500	10040	10480	10020	7300	31710	14260	4290	2110	10650	11370	5650

CAL YR 1981 TOTAL 26011 MEAN 71.3 MAX 1390 MIN 15 AC-FT 51590
WTR YR 1982 TOTAL 61700 MEAN 169 MAX 3000 MIN 16 AC-FT 122400

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--22.4 mi² (58.0 km²).

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

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

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

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

AVERAGE DISCHARGE.--65 years (water years, 1913-18, 1920, 1922-24, 1926-56, 1959-82), 118 ft³/s (3.342 m³/s), 85,490 acre-ft/yr (105 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,800 ft³/s (164 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0800	10840	307	16.11	4.907	Feb. 22	0100	6230	176	14.68	4.474
Nov. 1	2400	17020	482	17.37	5.294	Mar. 23	0500	9280	263	15.67	4.776
Nov. 18	0600	5820	165	14.51	4.423	Mar. 29	0530	8090	229	15.32	4.670
Dec. 22	0030	6830	193	14.93	4.551	Mar. 31	1200	12000	340	16.40	4.999
Dec. 24	1530	7750	219	15.22	4.639	Apr. 2	1730	14100	399	16.84	5.133
Jan. 21	0900	6690	189	14.87	4.532	Aug. 17	1700	*20510	581	*17.93	5.465

Minimum discharge, 5.4 ft³/s (0.153 m³/s) Oct. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	2170	302	94	62	149	2410	65	34	144	227	766
2	18	1940	200	82	97	762	3250	66	38	157	669	714
3	122	1200	136	78	51	245	1020	95	32	64	186	241
4	236	440	105	72	40	142	570	58	24	62	141	164
5	58	204	92	69	39	120	428	47	24	135	134	128
6	13	192	83	434	39	105	376	45	21	154	91	108
7	39	128	85	388	35	97	1000	567	18	792	86	93
8	17	98	70	106	31	84	681	420	16	286	74	86
9	20	74	58	87	112	79	654	150	14	377	60	83
10	9.0	64	38	82	230	86	362	97	13	174	97	78
11	7.0	57	48	105	579	707	272	135	15	128	229	267
12	6.6	52	57	119	182	1040	275	172	27	171	199	388
13	10	49	38	85	112	1130	485	100	21	502	76	330
14	13	45	36	74	75	1310	292	100	63	273	61	613
15	6.8	40	36	65	62	856	136	87	25	140	93	458
16	6.3	56	30	66	53	487	404	70	35	209	586	164
17	6.3	53	27	118	48	345	569	331	198	781	1490	118
18	6.6	652	25	160	43	524	371	585	95	716	546	126
19	6.3	105	27	660	42	384	210	144	83	240	200	94
20	5.9	57	299	1260	308	260	251	103	100	157	113	83
21	5.5	43	425	2470	1010	396	177	114	74	206	269	74
22	5.5	39	1450	587	734	760	142	72	49	124	192	62
23	5.5	816	368	322	365	2660	102	69	72	182	371	40
24	112	381	1980	206	196	811	112	188	59	199	322	38
25	13	220	852	208	217	390	121	135	49	120	688	98
26	6.6	240	384	145	276	295	91	127	12	78	558	88
27	103	276	192	111	213	2270	79	105	11	68	172	103
28	1670	160	163	94	133	1000	121	77	34	63	115	233
29	404	177	126	71	---	1710	89	50	14	68	103	76
30	123	210	115	63	---	2040	78	43	273	123	129	75
31	93	---	112	57	---	4480	---	43	---	106	158	---
TOTAL	3154.2	10238	7959	8538	5384	25724	15128	4460	1543	6999	8435	5989
MEAN	102	341	257	275	192	830	504	144	51.4	226	272	200
MAX	1670	2170	1980	2470	1010	4480	3250	585	273	792	1490	766
MIN	5.5	39	25	57	31	79	78	43	11	62	60	38
AC-FT	6260	20310	15790	16940	10680	51020	30010	8850	3060	13880	16730	11880

CAL YR 1981 TOTAL 37369.4 MEAN 102 MAX 2170 MIN 3.4 AC-FT 74120
WTR YR 1982 TOTAL 103551.2 MEAN 284 MAX 4480 MIN 5.5 AC-FT 205400

HAWAII, ISLAND OF KAUAI

16061000 NORTH WAILUA DITCH NEAR LIHUE

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

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

REVISED RECORDS.--WSP 770: 1933.

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

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

AVERAGE DISCHARGE.--50 years, 18.8 ft^3/s (0.532 m^3/s), 13,620 acre-ft/yr (16.8 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 44 ft^3/s (1.25 m^3/s) Feb. 21; minimum daily, no flow Apr. 15, 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	27	23	20	20	15	28	20	24	28	22	15
2	23	27	22	20	22	18	20	22	25	25	23	15
3	24	22	21	20	20	7.3	9.8	21	24	26	20	11
4	25	6.9	20	20	19	8.3	5.2	21	24	26	20	16
5	22	15	20	24	20	14	5.2	21	24	26	20	16
6	21	24	20	30	20	15	5.4	22	24	28	18	16
7	22	23	22	24	20	10	6.7	23	23	26	19	18
8	21	21	20	22	24	17	2.3	24	23	20	18	24
9	21	17	20	21	24	20	1.9	20	23	20	18	25
10	20	20	21	23	27	20	.14	19	24	19	20	28
11	20	20	23	23	27	27	.03	21	27	19	21	33
12	20	20	23	22	28	29	.67	20	24	18	20	30
13	22	20	22	22	24	25	2.5	20	27	22	18	30
14	20	19	22	23	21	29	.06	20	25	20	18	31
15	20	20	21	22	21	23	.00	18	25	20	18	28
16	19	22	21	22	20	20	3.7	18	28	21	22	26
17	20	20	21	27	20	17	4.7	27	29	24	22	25
18	20	24	21	26	21	22	.00	32	25	23	21	26
19	19	21	23	31	25	20	.00	26	26	20	18	25
20	18	21	29	36	34	20	.46	25	27	19	18	24
21	18	20	28	35	44	23	7.5	25	24	20	20	24
22	18	21	28	26	5.3	28	18	25	24	20	20	24
23	20	27	28	23	.27	32	18	26	23	20	22	25
24	23	22	32	25	4.4	23	19	30	24	20	22	24
25	20	24	29	27	24	19	18	26	25	18	25	26
26	21	23	24	23	22	19	17	25	23	18	18	27
27	23	24	23	24	17	30	15	26	24	18	7.2	27
28	28	22	22	22	8.0	22	16	24	25	18	6.6	17
29	22	23	21	21	---	15	19	24	25	18	7.2	12
30	21	23	21	20	---	20	23	21	30	20	6.9	22
31	20	---	20	20	---	29	---	21	---	18	7.8	---
TOTAL	652	638.9	711	744	581.97	636.6	267.26	713	748	658	556.7	690
MEAN	21.0	21.3	22.9	24.0	20.8	20.5	8.91	23.0	24.9	21.2	18.0	23.0
MAX	28	27	32	36	44	32	28	32	30	28	25	33
MIN	18	6.9	20	20	.27	7.3	.00	18	23	18	6.6	11
AC-FT	1290	1270	1410	1480	1150	1260	530	1410	1480	1310	1100	1370

CAL YR 1981 TOTAL 7284.10 MEAN 20.0 MAX 32 MIN 1.2 AC-FT 14450
WTR YR 1982 TOTAL 7597.43 MEAN 20.8 MAX 44 MIN .00 AC-FT 15070

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

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

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

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

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

AVERAGE DISCHARGE.--17 years, 23.4 ft^3/s (0.663 m^3/s), 16,950 acre-ft/yr (20.9 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 38 ft^3/s (1.08 m^3/s) Mar. 23; minimum daily, 10 ft^3/s (0.28 m^3/s) Apr. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	32	24	20	20	21	33	20	20	23	23	24
2	25	33	23	20	22	28	32	22	20	22	29	23
3	27	32	21	19	20	19	23	21	20	21	22	16
4	27	22	20	19	20	16	17	20	20	21	21	15
5	23	21	20	21	20	20	16	20	20	22	21	14
6	22	23	20	32	20	19	18	20	20	23	19	14
7	23	22	20	24	19	16	23	25	20	29	19	14
8	22	21	19	21	21	20	17	26	20	23	18	15
9	22	16	19	20	22	21	19	21	20	24	18	16
10	21	20	19	22	26	21	12	20	20	20	21	16
11	20	19	20	22	25	30	10	22	21	19	23	21
12	20	19	21	21	25	33	12	22	21	19	21	21
13	21	20	20	21	22	29	19	20	22	25	19	22
14	20	19	20	21	21	34	15	21	22	22	18	25
15	20	20	19	20	20	27	11	20	21	21	20	20
16	19	23	19	20	20	23	26	19	23	23	26	17
17	20	21	19	23	20	21	28	23	25	28	26	16
18	20	27	19	23	20	26	21	28	22	29	21	17
19	19	21	20	29	21	23	16	22	22	21	16	16
20	19	20	28	32	28	22	17	21	24	20	15	15
21	18	20	27	33	35	26	19	22	21	22	18	15
22	19	20	27	24	20	31	22	21	20	20	17	15
23	20	33	26	22	18	38	21	21	19	23	21	15
24	24	25	33	23	16	28	21	25	19	25	22	15
25	20	24	28	24	28	33	21	22	19	21	28	18
26	21	24	23	22	26	22	20	21	19	19	23	17
27	24	25	22	22	24	35	20	21	19	18	14	18
28	33	22	21	22	18	28	22	20	20	18	13	20
29	24	24	21	21	---	29	19	20	20	18	13	13
30	23	24	20	20	---	31	21	19	28	22	13	16
31	21	---	20	20	---	36	---	19	---	19	14	---
TOTAL	679	692	678	703	617	806	591	664	627	680	612	519
MEAN	21.9	23.1	21.9	22.7	22.0	26.0	19.7	21.4	20.9	21.9	19.7	17.3
MAX	33	33	33	33	35	38	33	28	28	29	29	25
MIN	18	16	19	19	16	16	10	19	19	18	13	13
AC-FT	1350	1370	1340	1390	1220	1600	1170	1320	1240	1350	1210	1030

CAL YR 1981 TOTAL 7873.69 MEAN 21.6 MAX 33 MIN .69 AC-FT 15620
WTR YR 1982 TOTAL 7868.00 MEAN 21.6 MAX 38 MIN 10 AC-FT 15610

16062000 STABLE STORM DITCH NEAR LIHUE

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

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

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

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

AVERAGE DISCHARGE.--45 years (water years 1938-82), 10.5 ft^3/s (0.297 m^3/s), 7,610 acre-ft/yr (9.38 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 44 ft^3/s (1.25 m^3/s) Oct. 4; minimum daily, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	2.2	.02	.01	.00	.12	.28	.20	.78	.28	.38	.19
2	34	.20	.02	.00	.00	.12	.46	2.4	.64	.28	.38	.12
3	40	.24	.02	.00	.60	.12	.20	.38	.64	.28	.38	.12
4	44	.05	.02	.00	.92	.12	.20	.20	.64	.28	.38	.12
5	34	.02	.02	.01	.92	.12	.12	.12	.64	.38	.38	.12
6	29	.02	.02	.05	.92	.12	.12	.38	.64	.38	.38	.12
7	34	.02	.05	.05	.92	.12	.22	2.0	.64	.38	.38	.12
8	29	.02	.02	.05	.92	.02	.20	2.6	.64	.38	.38	.12
9	28	.02	.01	.05	.92	.03	.20	.64	.64	.38	.38	.12
10	24	.02	.00	.05	.92	.05	.12	.28	.64	.38	.38	.12
11	23	.00	.00	.03	.78	.12	.12	.64	.64	.38	.38	.12
12	22	.00	.00	.02	.64	1.1	.05	4.7	.64	.38	.38	.05
13	30	.00	.00	.01	.50	.20	.05	13	.64	.38	.38	.05
14	22	.00	.00	.00	.38	.20	.05	23	.64	.38	.38	.24
15	21	.00	.00	.00	.38	.20	.05	17	.64	.38	.38	.05
16	21	.01	.00	.00	.28	.12	.05	15	.64	.38	.50	.05
17	24	.02	.00	.02	.28	.12	.12	4.9	.76	.38	.90	.02
18	24	.43	.00	.02	.28	.12	.12	.12	.28	.38	.20	.02
19	21	.02	.00	.05	.28	.12	.12	.12	.38	.38	.20	.02
20	20	.02	.05	.20	.28	.12	.12	.12	.38	.38	.20	.02
21	20	.02	.16	.20	1.1	.12	.12	.05	.28	.38	.20	.02
22	20	.02	.05	.12	.15	.05	.12	.05	.28	.38	.20	.02
23	25	.17	.05	.12	.12	.87	.12	.05	.28	.41	.20	.02
24	36	.05	.20	.05	.12	.12	.12	24	.28	.38	.20	.02
25	25	.05	.05	.05	.12	.12	.10	28	.28	.38	.28	.05
26	28	.05	.05	.05	.12	.12	.10	26	.28	.38	.28	.05
27	33	.05	.05	.05	.12	.98	.08	26	.28	.38	.12	.05
28	27	.02	.05	.02	.12	.30	.08	9.4	.28	.38	.12	.12
29	.64	.02	.05	.00	---	1.7	.88	1.1	.28	.38	.12	.12
30	.64	.02	.02	.00	---	.41	1.1	.92	.28	.38	.12	.12
31	.50	---	.02	.00	---	.50	---	.92	---	.38	.12	---
TOTAL	766.78	3.78	1.00	1.28	13.09	8.65	5.79	204.29	14.98	11.41	9.66	2.50
MEAN	24.7	.13	.032	.041	.47	.28	.19	6.59	.50	.37	.31	.083
MAX	44	2.2	.20	.20	1.1	1.7	1.1	28	.78	.41	.90	.24
MIN	.50	.00	.00	.00	.00	.02	.05	.05	.28	.28	.12	.02
AC-FT	1520	7.5	2.0	2.5	26	17	11	405	30	23	19	5.0

CAL YR 1981	TOTAL	5173.24	MEAN 14.2	MAX 49	MIN .00	AC-FT	10260	
WTR YR 1982	TOTAL	1043.21	MEAN 2.86	MAX 44	MIN .00	AC-FT	2070	

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

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

DRAINAGE AREA.--5.29 mi² (13.70 km²).

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

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

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

REMARKS.--Records good. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see sta 16061000 and 160620000) divert water above station for power development and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1916-18, 1920-82), 74.2 ft³/s (2.101 m³/s), 53,760 acre-ft/yr (66.3 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,800 ft³/s (79.4 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0630	4070	115	8.53	2.600	Mar. 23	0530	3510	99.4	8.07	2.460
Nov. 1	1900	5130	145	9.29	2.832	bMar. 29	a0300	*7210	204	*10.77	3.283
Nov. 18	0400	4580	130	8.90	2.713	Apr. 2	1630	4230	120	8.65	2.637
Nov. 23	0200	3570	101	8.13	2.478	Apr. 6	0100	4900	139	9.13	2.783
Dec. 21	2330	3900	110	8.40	2.560	May 7	0400	4510	128	8.85	2.697
Dec. 24	1100	3340	94.6	7.92	2.414	May. 17	1830	3180	90.1	7.76	2.365
Feb. 21	2300	4480	127	8.83	2.691	Aug. 7	1600	5500	156	9.56	2.914
Mar. 12	2330	4000	113	8.48	2.585	Sept. 1	1430	2900	82.1	7.48	2.280

Minimum discharge, 16 ft³/s (0.453 m³/s) Oct. 20.

a About.
b Probably.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	900	108	52	42	122	1100	45	37	91	234	402
2	63	920	102	51	51	286	950	72	32	67	389	297
3	102	654	76	47	37	112	387	56	31	54	87	137
4	139	195	62	45	36	77	216	45	30	62	97	81
5	53	119	54	78	38	59	184	43	28	79	83	66
6	38	97	49	398	39	55	192	44	27	114	59	59
7	57	68	97	125	36	54	509	283	26	405	61	48
8	38	59	49	68	50	53	204	330	24	119	46	39
9	36	58	44	57	59	69	246	101	24	121	43	33
10	26	51	39	68	181	66	132	72	27	60	92	40
11	22	47	47	76	167	521	110	104	46	55	173	144
12	21	45	46	64	116	920	150	98	24	50	92	115
13	42	45	36	51	59	950	219	57	45	245	48	213
14	22	44	39	46	46	1000	132	47	32	78	51	585
15	19	52	33	45	43	600	99	34	24	88	71	151
16	18	87	32	45	40	200	364	32	79	131	337	81
17	26	55	30	90	38	150	511	254	217	374	417	59
18	24	372	29	100	36	290	214	374	77	368	253	54
19	19	77	46	274	42	144	136	94	135	95	101	43
20	17	58	297	658	222	112	224	80	138	69	76	36
21	17	53	393	832	842	221	212	75	50	136	140	33
22	17	49	385	135	259	562	133	57	38	94	111	30
23	36	603	182	86	187	1190	98	68	30	226	201	36
24	87	180	785	100	103	600	104	148	24	163	214	28
25	29	159	366	159	271	170	91	45	38	74	600	60
26	37	125	123	67	269	130	68	34	23	51	326	64
27	92	183	95	68	223	1100	59	40	24	49	123	57
28	676	92	81	59	103	850	84	38	50	44	108	203
29	207	138	68	51	---	1000	55	50	62	47	103	64
30	136	116	62	47	---	1000	47	49	242	121	101	60
31	92	---	57	44	---	1700	---	45	---	53	112	---
TOTAL	2245	5701	3912	4086	3635	14363	7230	2914	1684	3783	4949	3318
MEAN	72.4	190	126	132	130	463	241	94.0	56.1	122	160	111
MAX	676	920	785	832	842	1700	1100	374	242	405	600	585
MIN	17	44	29	44	36	53	47	32	23	44	43	28
AC-FT	4450	11310	7760	8100	7210	28490	14340	5780	3340	7500	9820	6580

CAL YR 1981 TOTAL 25486.99 MEAN 69.8 MAX 920 MIN .55 AC-FT 50550
WTR YR 1982 TOTAL 57820.00 MEAN 158 MAX 1700 MIN 17 AC-FT 114700

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--6.27 mi² (16.24 km²).

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

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

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

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

AVERAGE DISCHARGE.--67 years (water years, 1913-14, 1916-17, 1920-82), 48.7 ft³/s (1.379 m³/s), 35,280 acre-ft/yr (43.5 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 29	1200	4090	116	7.67	2.338	Mar. 12	2330	2250	63.7	6.18	1.884
Nov. 1	1700	3540	100	7.35	2.240	Mar. 27	2100	*4830	137	*8.32	2.536
Nov. 18	0400	2960	83.8	6.83	2.082	Mar. 31	0900	3170	89.8	7.02	2.140
Dec. 21	2330	2290	64.9	6.22	1.896	Apr. 7	0100	2660	75.3	6.55	1.996
Jan. 21	0800	2820	79.9	6.70	2.042	Aug. 17	1630	2290	64.9	6.22	1.896
Feb. 23	1600	2360	66.8	6.28	1.914	Sept.14	1730	2030	57.5	5.98	1.823

Minimum discharge, 18 ft³/s (0.51 m³/s) Oct. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	603	79	45	37	94	552	40	32	59	72	129
2	28	608	76	44	36	225	494	41	30	64	84	98
3	38	473	61	40	34	100	282	40	30	44	52	61
4	55	147	54	39	33	75	165	36	29	46	46	51
5	30	94	50	45	33	62	119	36	28	59	49	46
6	26	87	47	124	33	58	115	40	27	82	41	43
7	46	65	67	78	33	53	314	199	26	172	41	40
8	29	57	46	48	32	51	103	110	26	89	37	38
9	26	52	42	43	33	62	140	60	25	76	35	35
10	24	47	40	43	70	65	81	49	24	57	40	36
11	22	44	44	44	79	152	69	56	25	49	76	85
12	21	41	40	44	42	448	65	49	24	47	67	72
13	35	40	37	38	35	305	104	41	25	150	40	62
14	23	39	37	37	32	339	72	40	25	76	36	327
15	21	39	36	36	32	200	57	37	24	71	41	112
16	20	41	35	38	30	203	107	35	54	83	96	62
17	21	42	33	49	29	104	149	85	48	185	230	53
18	20	299	32	46	28	261	96	133	35	200	183	50
19	20	60	37	138	30	162	70	55	95	86	75	44
20	19	48	109	379	86	134	116	47	41	68	57	40
21	18	44	290	627	255	143	142	47	34	93	68	37
22	18	41	343	119	168	130	84	40	30	79	74	35
23	23	217	82	80	230	621	70	40	29	60	78	35
24	55	112	440	75	104	259	74	58	26	61	75	33
25	25	85	230	93	273	125	68	44	30	50	187	35
26	26	81	99	57	267	98	54	45	26	44	104	36
27	44	106	78	52	161	1040	50	44	26	42	68	38
28	385	65	66	48	90	426	57	35	39	40	58	41
29	393	69	59	44	---	624	47	36	37	42	58	32
30	98	76	52	42	---	717	44	37	87	48	58	38
31	71	---	48	39	---	1030	---	33	---	40	60	---
TOTAL	1702	3822	2789	2674	2345	8366	3960	1688	1037	2362	2286	1844
MEAN	54.9	127	90.0	86.3	83.8	270	132	54.5	34.6	76.2	73.7	61.5
MAX	393	608	440	627	273	1040	552	199	95	200	230	327
MIN	18	39	32	36	28	51	44	33	24	40	35	32
AC-FT	3380	7580	5530	5300	4650	16590	7850	3350	2060	4690	4530	3660

CAL YR 1981 TOTAL 17600 MEAN 48.2 MAX 608 MIN 13 AC-FT 34910
WTR YR 1982 TOTAL 34875 MEAN 95.5 MAX 1040 MIN 18 AC-FT 69170

16069000 WAILUA DITCH NEAR KAPAA

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

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

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

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

AVERAGE DISCHARGE.--45 years (water years 1938-82), 15.3 ft^3/s (0.433 m^3/s), 11,080 acre-ft/yr (13.7 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft^3/s (0.96 m^3/s) Oct. 1; no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	14	30	.00	11	16	12	16	25	18	14	16
2	30	6.1	18	.00	10	17	3.9	16	25	11	14	16
3	27	.18	.21	.00	15	18	.00	22	26	.27	14	11
4	28	.09	.04	.00	24	18	.00	26	16	.27	14	.08
5	28	3.5	.00	.00	23	18	.00	26	.27	.24	14	.03
6	28	9.1	.00	.00	18	18	.00	26	11	8.2	14	.10
7	28	9.1	.00	.00	19	18	.00	18	20	14	14	7.2
8	28	9.1	.00	.00	26	18	.00	.27	17	14	14	13
9	28	8.9	3.8	.00	22	18	.00	.27	17	14	14	13
10	27	21	8.9	.00	5.3	18	.00	4.8	18	15	14	9.4
11	27	29	9.1	.00	4.9	7.3	.00	15	18	15	14	.15
12	27	29	9.3	7.8	14	.24	.00	16	18	15	15	.15
13	27	30	9.3	21	21	.24	.00	18	18	15	15	8.7
14	27	30	9.5	21	20	.24	.00	30	18	15	15	14
15	27	30	9.5	12	19	.27	.00	30	18	15	15	14
16	27	30	9.5	.15	18	.24	.00	29	18	7.8	19	14
17	27	30	9.7	.12	20	.24	.00	23	18	.27	25	14
18	27	30	9.5	.08	22	.24	.00	7.2	17	.24	26	14
19	27	30	9.3	.10	23	.21	3.7	9.0	17	9.6	26	14
20	27	30	9.5	.12	23	.18	11	26	16	14	22	14
21	27	30	3.8	.18	24	.18	11	26	16	15	16	14
22	27	30	.08	.15	22	.18	11	26	16	15	16	14
23	27	19	.00	.10	20	.18	12	26	16	15	16	14
24	27	.00	.00	.02	14	.15	13	26	16	15	15	14
25	27	.01	.00	.00	10	.12	13	26	17	15	15	20
26	27	.00	.00	.00	17	.10	14	26	17	15	15	24
27	27	.00	.00	.00	17	.10	14	26	17	15	15	24
28	20	.00	.00	4.9	16	.12	15	25	17	15	15	24
29	.03	.00	.00	12	---	.18	15	25	17	15	15	24
30	7.7	20	.00	12	---	.21	15	25	17	15	16	23
31	13	---	.00	12	---	5.5	---	25	---	14	16	---
TOTAL	785.73	478.08	159.03	103.72	498.2	193.42	163.60	640.54	517.27	365.89	502	387.81
MEAN	25.3	15.9	5.13	3.35	17.8	6.24	5.45	20.7	17.2	11.8	16.2	12.9
MAX	34	30	30	21	26	18	15	30	26	18	26	24
MIN	.03	.00	.00	.00	4.9	.10	.00	.27	.27	.24	14	.03
AC-FT	1560	948	315	206	988	384	325	1270	1030	726	996	769

CAL YR 1981 TOTAL 8474.68 MEAN 23.2 MAX 41 MIN .00 AC-FT 16810
WTR YR 1982 TOTAL 4795.29 MEAN 13.1 MAX 34 MIN .00 AC-FT 9510

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

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

DRAINAGE AREA.--17.9 mi² (46.4 km²).

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

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

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

REMARKS.--Records good. Wailua and Aahoaka ditches (see stas 16069000 and 16070000) divert above station for irrigation of sugarcane in vicinities of Kapaa and Wailua, respectively. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--30 years, 130 ft³/s (3.682 m³/s), 94,180 acre-ft/yr (116 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,100 ft³/s (116 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 29	1230	4950	140	7.60	2.316	Mar. 13	0030	4890	138	7.56	2.304
Nov. 1	1730	6610	187	8.48	2.585	Mar. 23	0700	4350	123	7.20	2.195
Nov. 18	0530	6170	175	8.26	2.518	Mar. 29	0530	*9700	275	*9.88	3.011
Dec. 22	0030	5130	145	7.72	2.353	Mar. 31	1000	5850	166	8.10	2.469
Dec. 24	1500	4380	124	7.22	2.201	Apr. 2	1700	4770	135	7.48	2.280
Jan. 21	0830	4920	139	7.58	2.310	Apr. 7	0100	5350	152	7.85	2.393
Feb. 21	2300	4110	116	7.04	2.146	Aug. 17	1700	4800	136	7.50	2.286

Minimum discharge, 14 ft³/s (0.40 m³/s) Oct. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	1650	210	115	102	192	2050	76	47	137	235	386
2	53	1720	201	109	102	565	1800	89	35	165	444	372
3	117	1300	175	102	65	245	893	75	28	127	150	192
4	190	467	139	96	25	182	508	70	37	123	133	150
5	80	275	127	128	23	145	359	68	69	180	125	133
6	51	235	115	478	23	127	314	69	66	178	94	117
7	90	175	185	253	55	121	928	443	24	530	93	100
8	57	148	115	113	71	109	395	405	22	222	82	75
9	51	135	104	94	78	129	488	165	24	200	72	63
10	39	99	84	100	226	129	275	127	25	129	99	69
11	32	72	83	128	376	600	240	132	51	104	220	210
12	27	66	83	121	185	1180	260	117	39	111	162	190
13	53	68	70	93	121	1000	375	84	44	368	86	220
14	27	70	72	86	94	1150	286	70	46	220	76	844
15	20	73	72	100	89	625	225	61	34	195	104	296
16	18	99	73	115	60	503	425	53	101	220	350	148
17	17	98	70	159	25	318	524	238	177	521	521	121
18	30	669	66	181	23	600	318	416	124	580	467	111
19	19	155	77	501	35	408	215	129	257	210	185	92
20	16	102	397	1170	254	318	330	100	177	145	137	83
21	15	89	568	1820	965	404	335	103	104	215	198	76
22	14	80	1050	458	507	660	202	77	69	175	182	66
23	28	759	313	248	560	1830	155	79	63	230	257	66
24	115	386	1300	225	286	636	170	164	51	200	248	57
25	38	283	760	331	550	318	158	75	66	131	590	84
26	43	251	346	220	634	251	117	72	50	96	431	84
27	115	344	263	190	458	2030	105	62	46	90	180	76
28	991	205	215	143	240	991	127	54	84	83	150	175
29	795	233	158	125	---	1700	100	59	75	96	141	83
30	318	232	137	115	---	2110	89	68	275	155	139	80
31	210	---	123	107	---	3050	---	57	---	111	148	---
TOTAL	3688	10538	7751	8224	6232	22626	12766	3857	2310	6247	6499	4819
MEAN	119	351	250	265	223	730	426	124	77.0	202	210	161
MAX	991	1720	1300	1820	765	3050	2050	443	275	580	590	844
MIN	14	66	66	86	23	109	89	53	22	83	72	57
AC-FT	7320	20900	15370	16310	12360	44880	25320	7650	4580	12390	12890	9560

CAL YR 1981 TOTAL 41173.1 MEAN 113 MAX 1720 MIN 5.3 AC-FT 81670
WTR YR 1982 TOTAL 95557.0 MEAN 262 MAX 3050 MIN 14 AC-FT 189500

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

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

DRAINAGE AREA.--0.65 mi² (1.68 km²).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--22 years, 2.73 ft³/s (0.077 m³/s), 1,980 acre-ft/yr (2.44 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 70 ft³/s (1.98 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 29	1400	112	3.17	2.68	0.817	Mar. 12	2100	130	3.68	2.83	0.863
Nov. 1	1900	128	3.62	2.82	.860	Mar. 23	0530	86	2.44	2.46	.750
Dec. 21	2400	114	3.23	2.70	.823	Mar. 27	2100	*354	10.0	*4.12	1.256
Dec. 24	1600	82	2.32	2.42	.738	Mar. 31	0830	246	6.97	3.58	1.091
Jan. 21	0830	175	4.96	3.18	.969	Apr. 7	0100	200	5.66	3.34	1.018
Feb. 23	1600	282	7.99	3.76	1.146	Aug. 18	0400	130	3.68	2.83	.863

Minimum discharge, 1.0 ft³/s (0.028 m³/s) Oct. 15-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	21	3.9	4.3	4.3	6.4	40	4.6	2.4	2.2	3.1	5.1
2	1.2	22	4.3	4.1	4.1	7.7	29	4.4	2.4	2.7	3.2	4.3
3	1.2	19	4.1	3.8	4.1	6.4	23	4.4	2.4	2.1	3.2	3.8
4	1.4	8.9	3.8	3.6	3.8	5.7	16	4.3	2.3	2.0	2.9	3.6
5	1.3	6.4	3.6	3.6	3.6	5.3	15	4.1	2.2	2.0	2.9	3.4
6	1.2	6.1	3.4	4.1	3.6	5.3	15	4.1	2.1	2.3	2.8	3.4
7	1.4	4.8	3.4	3.9	3.4	5.0	32	12	2.1	5.1	2.7	3.4
8	1.3	4.4	3.2	3.4	3.2	4.8	17	3.8	1.9	3.6	2.7	3.2
9	1.2	4.1	3.1	3.1	3.2	5.0	16	3.4	1.9	2.9	2.5	3.1
10	1.1	3.8	2.9	3.1	4.3	4.8	12	3.4	1.8	2.7	2.4	2.9
11	1.1	3.6	2.9	3.1	5.5	4.4	11	3.2	1.8	2.5	3.4	4.6
12	1.1	3.4	2.8	3.2	3.6	18	9.2	3.1	1.7	2.4	3.1	4.1
13	1.2	3.2	2.7	2.9	3.2	13	8.6	3.1	1.7	4.2	2.7	3.4
14	1.1	3.1	2.7	2.8	3.1	16	8.0	3.1	1.7	3.6	2.5	7.1
15	1.1	2.9	2.5	2.8	2.8	13	7.1	2.9	1.7	2.9	2.8	4.3
16	1.0	2.9	2.4	2.9	2.8	13	7.4	2.9	1.7	3.2	3.7	3.6
17	1.0	2.9	2.4	3.4	2.8	8.9	8.0	3.8	2.0	4.8	4.1	3.4
18	1.0	8.1	2.3	3.6	2.7	11	6.8	7.6	1.6	5.3	24	3.2
19	1.0	3.6	2.3	11	2.7	9.2	6.4	3.4	2.9	4.3	6.1	3.1
20	1.0	3.1	3.9	18	3.6	8.6	8.1	3.1	2.1	3.9	4.8	2.9
21	1.0	2.9	13	44	8.4	8.0	7.7	2.9	1.9	3.6	5.0	2.9
22	1.0	2.9	25	13	4.1	6.6	6.6	2.9	1.9	3.4	4.3	2.9
23	1.0	7.1	5.7	8.9	25	21	6.1	2.8	1.9	3.2	4.6	2.8
24	1.2	5.9	20	7.4	8.9	13	5.9	3.2	1.7	3.1	4.4	2.7
25	1.1	4.6	14	6.6	10	9.5	5.7	2.9	1.7	3.1	4.6	2.7
26	1.1	4.4	8.3	5.9	10	8.3	5.5	2.8	1.7	2.9	4.1	2.7
27	1.2	4.8	6.6	5.5	8.3	43	5.3	2.9	1.7	2.9	3.8	2.7
28	7.5	4.3	5.9	5.3	6.6	24	5.3	2.7	1.8	2.9	3.8	2.5
29	13	4.1	5.3	5.0	---	36	4.8	2.7	1.8	3.1	3.6	2.5
30	4.3	4.1	4.8	4.6	---	45	4.6	2.7	2.5	3.1	3.6	2.7
31	3.6	---	4.4	4.4	---	69	---	2.7	---	2.9	3.9	---
TOTAL	59.2	182.4	175.6	201.3	151.7	454.9	353.1	115.9	59.0	98.9	131.3	103.0
MEAN	1.91	6.08	5.66	6.49	5.42	14.7	11.8	3.74	1.97	3.19	4.24	3.43
MAX	13	22	25	44	25	69	40	12	2.9	5.3	24	7.1
MIN	1.0	2.9	2.3	2.8	2.7	4.4	4.6	2.7	1.6	2.0	2.4	2.5
AC-FT	117	362	348	399	301	902	700	230	117	196	260	204

CAL YR 1981 TOTAL 892.82 MEAN 2.45 MAX 25 MIN .60 AC-FT 1770
WTR YR 1982 TOTAL 2086.30 MEAN 5.72 MAX 69 MIN 1.0 AC-FT 4140

HAWAII, ISLAND OF KAUAI

16077000 MAKALEHA DITCH NEAR KEALIA

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

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

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

REMARKS.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane in vicinity of Kealia. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years (water years 1938-82), 6.73 ft^3/s (0.191 m^3/s), 4,880 acre-ft/yr (6.02 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) June 30; minimum daily, 0.28 ft^3/s (0.008 m^3/s) Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	6.2	1.7	.58	5.2	2.2	6.8	12	12	28	1.4	1.1
2	13	9.0	1.8	.52	8.3	2.5	4.9	15	12	12	1.2	.93
3	14	8.8	7.0	.47	8.7	2.5	4.0	16	12	1.1	1.1	.87
4	5.0	3.6	9.7	.42	8.6	1.8	2.3	12	12	.93	.87	.87
5	9.0	4.9	8.6	.52	9.3	1.5	1.4	12	12	.81	.93	.87
6	11	12	8.3	.69	11	1.2	1.2	13	12	.93	7.5	.87
7	17	3.5	11	.87	12	1.1	6.4	17	11	1.8	12	.93
8	13	3.2	7.8	.69	9.3	1.1	4.0	11	11	1.4	13	.87
9	13	2.8	7.9	.58	9.0	9.9	3.9	9.3	11	1.1	13	.81
10	9.8	2.6	9.0	.47	11	14	2.1	7.9	11	.93	16	.81
11	8.9	2.5	14	.52	8.0	7.7	1.3	7.6	4.9	.87	20	1.0
12	8.0	2.3	13	3.1	.74	3.4	.99	4.9	.69	.81	9.2	1.1
13	18	2.3	11	3.1	.58	5.5	.74	.63	.63	1.4	.93	7.4
14	11	2.1	13	.74	.47	5.7	.58	.58	7.0	1.5	.87	22
15	5.4	2.1	10	.74	.42	4.6	.52	.52	12	1.1	.87	19
16	4.3	1.9	9.3	.69	5.5	2.7	.47	.52	14	1.1	.87	10
17	9.0	5.0	8.9	.74	8.6	1.9	.58	.47	6.8	2.0	13	1.5
18	10	19	8.7	.74	8.6	2.4	.52	.52	.52	2.2	19	1.5
19	9.0	15	16	3.0	9.7	3.5	.47	.42	.58	1.7	3.2	1.3
20	8.0	11	24	10	20	2.8	.69	.38	.58	1.2	2.1	1.2
21	7.9	11	12	16	20	2.0	1.4	2.1	.49	1.1	1.9	1.1
22	7.9	11	12	4.7	18	1.4	1.1	6.4	.47	.87	1.7	6.5
23	9.2	17	2.7	1.8	18	4.0	.81	6.1	7.4	.81	1.7	12
24	17	3.5	7.5	.99	15	2.4	.74	8.3	12	.74	1.7	11
25	13	2.7	8.2	.74	5.3	1.4	.63	7.3	13	.69	1.4	14
26	14	2.5	3.6	.52	6.2	.99	.58	7.3	1.2	.69	1.2	17
27	16	2.3	1.8	.42	4.6	3.1	.52	7.5	1.1	.81	1.2	18
28	17	2.1	1.3	.38	2.9	4.1	.52	10	1.1	.81	1.1	19
29	2.9	1.6	.99	.33	---	7.2	.47	12	12	.87	1.1	5.5
30	1.9	1.5	.81	.33	---	10	7.7	10	31	.93	1.1	.74
31	1.8	---	.63	.28	---	16	---	8.2	---	.87	1.1	---
TOTAL	317.0	175.0	252.23	55.67	245.01	130.59	58.33	226.94	243.46	72.07	152.24	179.77
MEAN	10.2	5.83	8.14	1.80	8.75	4.21	1.94	7.32	8.12	2.32	4.91	5.99
MAX	18	19	24	16	20	16	7.7	17	31	28	20	22
MIN	1.8	1.5	.63	.28	.42	.99	.47	.38	.47	.69	.87	.74
AC-FT	629	347	500	110	486	259	116	450	483	143	302	357

CAL YR 1981 TOTAL 3231.85 MEAN 8.85 MAX 25 MIN .52 AC-FT 6410
WTR YR 1982 TOTAL 2108.31 MEAN 5.78 MAX 31 MIN .28 AC-FT 4180

16079000 KAPAHI DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--64 years (water years 1918-20, 1922-82), 6.28 ft^3/s (0.178 m^3/s), 4,550 acre-ft/yr (5.61 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s (0.670 m^3/s) Apr. 27; minimum daily, 0.03 ft^3/s (0.001 m^3/s) Jan. 23-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.51	1.2	11	.25	9.5	.19	.58	9.0	2.5	12	.37	15
2	.51	.99	6.4	.19	6.2	.65	.65	11	6.4	8.6	.25	16
3	.51	1.2	.31	.19	5.1	.25	.45	12	6.2	.25	5.5	8.6
4	.60	.45	.25	.10	5.4	.14	.25	8.4	3.6	.37	8.2	5.8
5	.45	.45	.19	.14	5.7	.14	.25	9.4	.72	2.1	8.2	.19
6	.45	.45	.19	.25	6.9	.14	.51	13	.84	8.6	7.6	.19
7	.45	.38	.25	.38	8.6	.14	.87	8.3	.38	9.4	8.3	.19
8	.45	.38	.19	.25	5.7	.14	.54	.19	4.0	8.4	.19	4.5
9	.45	.38	4.0	.25	5.6	.25	.45	.10	5.4	8.2	1.8	9.0
10	.45	6.9	5.4	.25	6.6	.25	.14	8.2	5.6	8.0	10	6.2
11	1.1	13	9.3	10	5.3	.19	.14	18	12	8.0	7.8	.44
12	3.3	13	7.0	15	4.7	1.2	.14	23	11	8.0	.31	.38
13	12	12	5.4	6.1	10	.56	.31	23	3.0	9.4	.14	5.1
14	4.9	.45	7.4	.25	.19	1.3	.14	21	5.7	3.4	.14	15
15	7.2	.45	5.7	.19	.19	.31	.14	11	5.6	.45	.19	12
16	7.2	.38	5.0	.19	3.7	.65	.31	.38	8.3	.51	6.5	11
17	3.3	3.1	4.9	.19	4.6	.10	.38	.50	13	.89	9.6	10
18	3.5	8.8	4.7	.19	4.4	.82	.14	.40	12	5.5	11	.14
19	3.2	5.7	9.0	1.1	1.6	.66	5.3	18	4.0	.51	9.4	.10
20	3.2	1.8	17	2.6	.61	.38	5.9	6.7	.47	.51	9.2	11
21	3.0	1.9	4.1	1.8	.67	.38	.75	.31	11	.58	6.8	16
22	3.0	.38	1.1	.06	.28	.25	.25	.31	17	.51	.31	11
23	3.3	.90	.14	.03	.49	1.4	.25	.25	8.6	4.6	.19	6.1
24	11	.38	1.2	.03	.23	.60	.25	.31	6.6	6.8	.31	5.7
25	6.6	.31	.74	.03	1.0	.25	.38	.25	5.9	.52	5.4	5.7
26	7.0	1.9	.25	.03	.99	.25	19	.25	5.7	5.1	7.0	7.4
27	8.1	.45	.19	.06	.45	1.2	24	.31	5.7	16	12	8.8
28	8.0	1.9	.19	.10	.14	.55	19	1.9	10	8.3	11	9.2
29	.73	.38	.19	.14	---	.69	.66	.25	12	.19	5.6	11
30	.45	7.7	.19	.19	---	1.4	6.1	2.9	13	.19	5.7	15
31	.45	---	.26	3.1	---	1.4	---	.51	---	.14	5.7	---
TOTAL	105.36	87.66	112.13	43.63	104.84	16.83	88.23	209.12	206.21	146.02	164.70	226.73
MEAN	3.40	2.92	3.62	1.41	3.74	.54	2.94	6.75	6.87	4.71	5.31	7.56
MAX	12	13	17	15	10	1.4	24	23	17	16	12	16
MIN	.45	.31	.14	.03	.14	.10	.14	.10	.38	.14	.14	.10
AC-FT	209	174	222	87	208	33	175	415	409	290	327	450

CAL YR 1981 TOTAL 1947.81 MEAN 5.34 MAX 25 MIN .14 AC-FT 3860
WTR YR 1982 TOTAL 1511.46 MEAN 4.14 MAX 24 MIN .03 AC-FT 3000

16080000 KAPAA STREAM AT KAPAHI DITCH INTAKE, NEAR KAPAA

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

DRAINAGE AREA.--3.86 mi² (10.00 km²).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see sta 16079000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--46 years, 20.6 ft³/s (0.583 m³/s), 14,920 acre-ft/yr (18.4 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	1700	2190	62.0	3.14	0.957
Dec. 21	2300	2240	63.4	3.17	.966
Jan. 21	0700	2410	68.2	3.27	.997
Feb. 23	1500	2050	58.1	3.06	.933
Mar. 12	2100	2490	70.5	3.32	1.012
Mar. 27	2200	*4920	139	*4.40	1.341
Mar. 30	2200	2900	82.1	3.55	1.082

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	344	31	19	.34	47	222	.00	7.3	22	68	40
2	4.8	314	31	19	.00	139	251	.00	.00	28	62	28
3	15	249	20	19	.50	60	138	.50	.00	32	26	16
4	41	48	13	18	.00	32	57	.00	3.0	34	25	14
5	11	26	12	24	.00	24	48	.00	5.4	37	29	19
6	5.4	40	11	56	.10	24	105	.97	5.4	60	10	16
7	16	24	26	40	.37	24	227	190	6.5	115	6.7	19
8	5.8	20	12	20	.00	24	77	51	1.9	46	13	12
9	5.4	18	5.0	19	.00	35	132	29	.00	36	8.7	7.0
10	4.4	7.2	.00	18	26	24	42	13	.00	24	.32	12
11	3.1	.08	1.3	7.9	34	40	34	10	.09	22	32	39
12	.00	.00	.00	1.4	14	297	36	3.5	6.3	21	40	41
13	9.1	5.7	.00	8.1	5.7	136	77	.00	19	120	24	22
14	.00	17	.00	16	15	265	40	1.2	5.9	44	22	78
15	.00	23	.00	16	15	82	34	10	.00	43	26	12
16	.00	30	.00	19	4.7	106	75	21	7.9	57	52	6.4
17	.00	23	.00	33	.00	44	86	56	7.4	135	62	10
18	.00	109	.00	29	.00	143	45	87	19	125	177	21
19	.00	6.7	9.4	125	5.7	110	31	13	39	40	28	17
20	.00	8.5	79	205	81	77	86	19	28	36	19	6.2
21	.00	7.0	272	414	135	61	103	26	13	44	46	.00
22	.00	7.7	203	54	49	48	45	19	5.7	40	51	.00
23	.00	133	40	34	122	319	36	19	7.1	25	48	.00
24	12	52	343	34	63	99	44	34	2.0	60	68	.00
25	.00	36	159	34	171	42	36	24	20	30	55	.00
26	.00	38	45	22	149	35	6.4	24	15	19	32	.00
27	5.4	47	34	21	76	642	.00	21	20	20	16	.11
28	169	22	30	20	36	192	12	13	24	27	13	.00
29	112	30	24	20	---	282	24	18	14	34	19	.00
30	33	28	21	20	---	498	9.7	14	54	41	20	12
31	36	---	20	15	---	588	---	15	---	32	24	---
TOTAL	493.20	1713.88	1441.70	1400.4	1003.41	4539	2159.10	732.17	336.89	1449	1122.72	467.71
MEAN	15.9	57.1	46.5	45.2	35.8	146	72.0	23.6	11.2	46.7	36.2	15.6
MAX	169	344	343	414	171	642	251	190	54	135	177	78
MIN	.00	.00	.00	1.4	.00	24	.00	.00	.00	19	.32	.00
AC-FT	978	3400	2860	2780	1990	9000	4280	1450	668	2870	2230	928

CAL YR 1981 TOTAL 6632.03 MEAN 18.2 MAX 344 MIN .00 AC-FT 13150
WTR YR 1982 TOTAL 16859.18 MEAN 46.2 MAX 642 MIN .00 AC-FT 33440

16087000 ANAHOLA DITCH WASTEWAY NEAR KEALIA

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

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

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

REMARKS.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 mi (3 km) below gaging station 16089000 on Anahola Stream. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--46 years, 4.39 ft^3/s (0.124 m^3/s), 3,180 acre-ft/yr (3.92 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s (0.74 m^3/s) Mar. 27; minimum daily, 0.04 ft^3/s (0.001 m^3/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.13	.08	5.4	3.6	3.5	12	.13	.08	1.4	.58	4.8
2	.08	13	.13	6.6	2.3	6.1	14	.13	.08	.93	.42	12
3	.13	18	.04	6.0	.42	12	11	.08	.08	4.8	1.7	6.8
4	.13	11	.04	4.6	.42	9.3	8.6	.04	.08	6.6	2.8	6.3
5	.04	8.9	.04	7.5	.30	8.0	7.4	.08	.20	7.4	2.8	4.9
6	.04	9.6	.04	9.5	.30	7.4	7.8	.13	.20	7.4	1.8	4.6
7	.13	5.9	.08	10	.30	7.4	14	10	.20	9.3	.58	5.4
8	.04	.93	.72	6.3	.13	7.1	7.7	14	.20	7.4	.58	4.6
9	.13	.76	2.8	5.4	.13	8.3	8.8	9.3	.20	7.1	.58	4.6
10	.08	.76	2.0	4.9	.20	8.6	6.6	8.0	.20	6.0	.42	4.6
11	.08	.58	1.6	3.4	.13	12	6.3	5.6	.20	5.7	.38	12
12	.08	.76	.20	.58	.08	16	6.0	.76	.20	5.7	.08	9.3
13	.20	.76	.20	.42	.08	16	10	.58	.30	8.6	.13	6.6
14	.08	.58	.13	.42	.04	21	13	.42	.13	7.1	.13	12
15	.08	.42	.04	.30	.04	16	11	.30	.13	6.6	.20	8.8
16	.08	.42	.04	.30	.04	14	18	.30	.98	7.4	3.4	6.0
17	.08	.20	.08	.42	.04	11	23	1.0	.87	8.9	16	4.9
18	.08	.13	.08	.30	.04	17	15	1.3	.08	8.7	22	3.1
19	.13	.08	.20	4.5	.08	19	6.5	.13	.67	6.3	11	.76
20	.08	.04	.06	17	.30	16	.30	.08	.58	6.0	8.3	.58
21	.13	.04	6.4	25	7.8	16	.20	.08	.58	6.3	14	.58
22	.13	.04	15	9.3	11	13	.13	.04	.20	6.6	15	.58
23	.30	.04	11	7.7	9.9	23	.13	.08	.08	5.7	15	.58
24	.13	.04	19	7.1	11	17	.13	.58	.13	6.0	17	.58
25	.04	.04	17	6.8	13	13	.13	.13	.76	5.1	21	.42
26	.04	.08	10	5.4	13	12	.08	.20	.08	4.9	16	.30
27	.08	.08	8.9	4.9	11	26	.08	.13	.13	2.3	10	.13
28	.08	.13	8.6	4.9	8.3	13	.08	.04	.58	.76	6.7	.20
29	.04	.20	7.4	4.6	---	12	.08	.08	.76	.58	1.1	.13
30	.04	.20	6.6	5.1	---	18	.08	.08	2.0	.58	.93	.13
31	.08	---	6.0	4.1	---	18	---	.08	---	.58	.58	---
TOTAL	2.94	73.84	124.50	178.74	93.97	416.7	208.12	53.88	10.96	168.73	191.19	126.27
MEAN	.095	2.46	4.02	5.77	3.36	13.4	6.94	1.74	.37	5.44	6.17	4.21
MAX	.30	18	19	25	13	26	23	14	2.0	9.3	22	12
MIN	.04	.04	.04	.30	.04	3.5	.08	.04	.08	.58	.08	.13
AC-FT	5.8	146	247	355	186	827	413	107	22	335	379	250

CAL YR 1981 TOTAL 499.13 MEAN 1.37 MAX 25 MIN .04 AC-FT 990
WTR YR 1982 TOTAL 1649.84 MEAN 4.52 MAX 26 MIN .04 AC-FT 3270

HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--58 years (water years, 1923-25, 1928-82), 4.18 ft^3/s (0.118 m^3/s), 3,030 acre-ft/yr (3.74 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 23 ft^3/s (0.65 m^3/s) Oct. 28, Dec. 20; minimum daily 0.01 ft^3/s (0.0003 m^3/s) Apr. 11, 12, 15, Aug. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	20	9.0	1.2	.70	7.7	.40	5.1	3.8	9.6	6.2	8.1
2	4.5	6.9	7.0	1.9	1.5	7.4	.24	6.2	3.5	8.7	5.4	4.3
3	9.4	.50	5.0	1.4	3.6	1.7	.20	9.4	3.3	2.9	1.6	1.4
4	8.4	.38	4.0	.97	3.5	.64	.13	5.0	3.2	1.3	.38	1.2
5	5.0	.33	3.0	2.0	3.4	.57	.13	5.7	3.0	1.6	.38	.79
6	4.8	.33	3.0	4.0	3.4	.50	.23	7.1	2.9	1.8	1.5	.72
7	9.5	3.1	3.6	3.8	3.3	.40	.25	17	2.6	2.6	2.6	.97
8	4.8	5.9	3.0	1.8	3.2	.40	.13	.20	2.6	1.4	2.4	.72
9	6.9	5.1	.75	1.4	3.1	.50	.13	.09	2.4	1.4	2.4	.64
10	3.6	4.6	2.0	1.2	5.0	.50	.09	.09	2.4	1.2	6.4	.72
11	3.0	4.3	3.5	3.6	3.5	.50	.01	3.8	2.6	1.0	12	5.1
12	2.9	4.1	4.0	9.3	3.3	.60	.01	6.6	2.6	.97	14	4.2
13	12	6.2	3.5	5.1	3.2	.60	.05	6.4	3.5	2.3	6.4	2.5
14	4.4	6.2	4.0	4.4	3.1	.90	.05	5.9	3.6	1.4	5.7	7.7
15	3.3	6.8	4.0	4.3	3.1	.50	.01	5.1	2.6	1.2	8.1	3.9
16	3.0	7.2	3.8	5.0	3.0	.30	.12	5.1	6.0	1.7	10	2.3
17	4.1	8.7	3.6	8.7	3.0	.30	.20	8.7	8.6	2.4	.08	1.6
18	3.6	14	3.6	6.2	3.0	.30	.08	10	5.3	2.3	.11	4.3
19	4.0	9.3	18	7.5	4.4	.10	3.9	6.4	7.8	1.2	.01	4.8
20	2.6	6.8	23	6.0	22	.05	18	5.5	8.2	1.0	.01	4.3
21	2.3	6.4	12	7.1	12	.05	17	5.7	7.7	1.2	.12	4.1
22	2.3	5.5	7.9	1.9	1.7	.05	11	4.6	6.1	1.2	.09	3.8
23	4.0	17	3.9	1.7	1.1	.26	11	4.8	5.3	.97	.17	5.0
24	15	12	11	1.5	1.6	.20	10	7.7	5.4	1.2	.18	4.1
25	5.7	10	7.9	1.4	2.7	.16	9.3	5.7	8.0	.88	.20	8.4
26	4.1	11	3.6	1.3	3.3	.16	7.0	6.8	5.1	.89	.13	10
27	10	13	3.0	1.2	2.3	.80	6.6	5.9	5.0	4.1	.13	7.2
28	23	9.0	2.8	1.1	1.6	.50	11	5.0	7.6	5.5	3.7	11
29	14	8.5	2.0	1.0	---	.40	7.4	4.6	7.9	5.7	6.8	5.5
30	8.2	9.0	1.6	.90	---	.60	6.1	4.8	11	6.1	7.4	9.3
31	11	---	1.4	.80	---	.70	---	4.6	---	5.5	12	---
TOTAL	203.3	222.14	168.45	99.67	108.60	28.34	120.76	179.58	149.6	81.20	116.59	128.66
MEAN	6.56	7.40	5.43	3.22	3.88	.91	4.03	5.79	4.99	2.62	3.76	4.29
MAX	23	20	23	9.3	22	7.7	18	17	11	9.6	14	11
MIN	2.3	.33	.75	.80	.70	.05	.01	.09	2.4	.88	.01	.64
AC-FT	403	441	334	198	215	56	240	356	297	161	231	255

CAL YR 1981 TOTAL 1943.26 MEAN 5.32 MAX 24 MIN .06 AC-FT 3850
WTR YR 1982 TOTAL 1606.89 MEAN 4.40 MAX 23 MIN .01 AC-FT 3190

16089000 ANAHOLA STREAM NEAR KEALIA

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

DRAINAGE AREA.--4.27 mi² (11.06 km²).

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

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

GAGE.--Water-stage recorder and combination concrete dam and orifice control. Datum of gage is 295.11 ft (89.95 m) above mean sea level (Highway Department bench mark). Prior to May 4, 1934, at site 0.1 mi (0.2 km) upstream at different datum.

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

AVERAGE DISCHARGE.--67 years (water years, 1914-17, 1920-82), 22.8 ft³/s (0.646 m³/s), 16,520 acre-ft/yr (20.4 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,200 ft³/s (62.3 m³/s) and maximum (*), from rating curve extended above 410 ft³/s (11.6 m³/s) on basis of slope-area measurement at gage height 10.6 ft (3.23 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	0200	2250	63.7	5.94	1.811	Apr. 7	0100	2270	64.3	5.97	1.820
Jan. 21	0930	2920	82.7	6.56	1.999	May 7	0230	*4700	133	*8.00	2.438
Mar. 27	0700	3330	94.3	6.94	2.115	July 17	2300	2290	64.9	5.99	1.826

Minimum discharge, 2.7 ft³/s (0.076 m³/s) Oct. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	183	18	16	8.5	47	196	13	13	42	60	20
2	6.6	217	16	20	8.2	58	270	12	12	36	81	38
3	11	189	14	16	8.2	76	150	17	12	16	28	14
4	10	45	12	14	7.9	23	90	12	12	15	27	12
5	8.2	23	12	23	9.5	16	60	12	12	40	24	11
6	7.1	23	11	44	11	14	30	12	12	37	30	10
7	10	16	14	74	14	12	225	300	11	100	29	18
8	6.1	14	11	20	8.9	12	64	70	11	37	18	12
9	6.8	12	10	18	7.9	17	89	37	11	33	16	10
10	4.4	11	11	16	14	15	60	26	11	16	17	9.9
11	3.4	10	14	16	33	57	50	26	11	15	27	50
12	3.2	10	12	24	9.9	152	45	19	12	12	42	28
13	13	12	10	16	10	125	50	15	12	95	14	12
14	6.1	15	12	14	9.9	216	40	15	14	32	12	90
15	4.5	21	12	12	9.2	87	30	12	12	23	12	25
16	3.7	18	9.5	11	9.2	68	40	12	78	41	25	12
17	3.5	40	9.2	19	9.2	37	60	25	45	146	66	10
18	4.5	131	8.4	18	8.9	120	45	35	10	152	138	10
19	3.4	29	59	74	9.9	137	35	20	21	35	29	9.5
20	3.0	17	97	314	146	83	40	15	19	30	18	8.7
21	2.8	15	131	497	204	94	38	14	18	49	33	8.7
22	2.9	14	396	67	59	41	27	14	10	54	37	8.4
23	2.9	155	53	31	27	252	20	14	8.9	28	43	8.4
24	85	53	379	23	52	100	20	17	9.2	47	48	8.2
25	12	21	258	20	106	37	24	15	23	23	51	10
26	10	32	59	17	118	30	20	18	8.7	18	55	9.2
27	19	39	32	14	52	658	15	14	8.4	30	18	8.4
28	132	76	28	13	28	128	15	13	21	25	16	9.2
29	69	16	20	10	---	152	15	13	24	31	16	8.2
30	19	21	18	9.5	---	319	15	13	68	36	14	9.5
31	31	---	16	9.0	---	439	---	13	---	19	18	---
TOTAL	511.2	1478	1762.1	1489.5	999.3	3622	1878	863	550.2	1313	1059	498.3
MEAN	16.5	49.3	56.8	48.0	35.7	117	62.6	27.8	18.3	42.4	34.2	16.6
MAX	132	217	396	497	204	658	270	300	78	152	138	90
MIN	2.8	10	8.4	9.0	7.9	12	15	12	8.4	12	12	8.2
AC-FT	1010	2930	3500	2950	1980	7180	3730	1710	1090	2600	2100	988

CAL YR 1981 TOTAL 9162.7 MEAN 25.1 MAX 396 MIN 2.8 AC-FT 18170
WTR YR 1982 TOTAL 16023.6 MEAN 43.9 MAX 658 MIN 2.8 AC-FT 31780

HAWAII, ISLAND OF KAUAI

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--45 years (water years 1938-82), 2.93 ft^3/s (0.083 m^3/s), 2,120 acre-ft/yr (2.61 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 8.7 ft^3/s (0.246 m^3/s) Nov. 1; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	8.7	.18	.01	.30	.26	.23	.06	.03	.03	.00	.00
2	.06	3.6	.00	.03	.23	.26	.28	.06	.03	.03	.00	.00
3	.06	.26	.00	.03	.19	.37	.23	.09	.03	.03	.00	.00
4	.12	.26	.00	.03	.19	.30	.23	.09	.06	.03	.00	.00
5	.03	.30	.00	.06	.26	.30	.19	.09	.06	.03	.00	.00
6	1.0	.30	.00	.06	.23	.30	.27	.06	.06	.00	.00	.00
7	2.0	.26	.00	.03	.26	.26	.59	.26	.06	.00	.00	.00
8	2.1	2.1	.00	.03	.16	.26	.27	.06	.03	.00	.00	.00
9	2.0	5.8	.10	.03	.23	.30	.19	.03	.03	.00	.00	.00
10	1.8	6.3	.00	.03	.35	.30	.19	.03	.03	.00	.00	.00
11	1.7	6.9	.30	.50	.30	.30	.12	.03	.03	.00	.00	.00
12	1.6	5.8	.00	.54	.23	.37	.16	.03	.06	.00	.00	.00
13	2.2	6.8	.00	.03	.19	.37	.06	.01	.03	.00	.00	.00
14	2.3	6.9	.00	.01	.19	.64	.03	.02	.03	.00	.00	.00
15	1.9	6.6	.00	.03	.19	.37	.03	.00	.03	.00	.00	.00
16	1.7	6.6	.03	.38	.19	.36	.06	.01	.08	.00	.00	.00
17	1.6	7.5	.00	1.1	.19	.30	.06	.01	.03	.00	.00	.00
18	1.6	7.8	.20	1.1	.28	.37	.06	.03	.03	.00	.00	.00
19	1.6	7.2	1.1	2.5	.30	.40	.06	.01	.03	.00	.00	.00
20	1.6	6.7	.64	3.2	.33	.40	.06	.01	.03	.00	.00	.00
21	1.6	4.2	.13	2.7	.34	.44	.03	.01	.03	.00	.00	.00
22	1.6	.16	.45	.76	.33	.30	.03	.01	.03	.00	.00	.00
23	1.7	.16	.00	.63	.33	.82	.09	.01	.03	.00	.00	.00
24	2.9	.13	1.2	.63	.33	.54	.09	.01	.03	.00	.00	.00
25	3.5	.03	.19	.67	.40	.43	.09	.01	.03	.00	.00	.00
26	3.0	.03	.03	.67	.37	.50	.09	.01	.03	.00	.00	.00
27	3.0	.03	.03	.63	.33	1.4	.06	.03	.03	.00	.00	.00
28	6.1	.03	.03	.50	.23	.28	.06	.03	.03	.00	.00	.00
29	6.5	.03	.03	.33	---	.19	.06	.03	.03	.00	.00	.00
30	4.9	.01	.03	.33	---	.70	.06	.03	.03	.00	.00	.00
31	7.0	---	.01	.33	---	.44	---	.03	---	.00	.00	---
TOTAL	68.83	101.49	4.68	17.91	7.45	12.83	4.03	1.20	1.10	.15	.00	.00
MEAN	2.22	3.38	.15	.58	.27	.41	.13	.039	.037	.005	.000	.000
MAX	7.0	8.7	1.2	3.2	.40	1.4	.59	.26	.08	.03	.00	.00
MIN	.03	.01	.00	.01	.16	.19	.03	.00	.03	.00	.00	.00
AC-FT	137	201	9.3	36	15	25	8.0	2.4	2.2	.3	.00	.00

CAL YR 1981 TOTAL 633.86 MEAN 1.74 MAX 8.7 MIN .00 AC-FT 1260
WTR YR 1982 TOTAL 219.67 MEAN .60 MAX 8.7 MIN .00 AC-FT 436

HAWAII, ISLAND OF KAUAI

16093200 ANAHOLA STREAM AT ANAHOLA

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

DRAINAGE AREA.--9.24 mi² (23.93 km²).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records fair. Anahola and Lower Anahola ditches (see sta 16088000 and 16091000) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively. Observations of specific conductance, pH, and water temperature are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years (water years 1966-82), 36.5 ft³/s (1.034 m³/s), 26,440 acre-ft/yr (32.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft³/s (379 m³/s) May 15, 1965, gage height, 15.84 ft (4.828 m), present site, from rating curve extended above 5,800 ft³/s (164 m³/s) on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft³/s (0.059 m³/s) Oct. 25, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,200 ft³/s (62.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	0100	3870	110	11.04	3.365	Mar. 30	2330	3150	89.2	10.44	3.182
Dec. 24	1600	2810	79.6	10.11	3.082	Apr. 7	0100	4010	114	11.16	3.402
Jan. 21	0800	4970	141	11.95	3.642	May 7	0230	*7160	203	*13.28	4.048
Mar. 27	0700	5700	161	12.46	3.798	July 18	0030	2380	67.4	9.58	2.920

Minimum discharge, 4.4 ft³/s (0.125 m³/s) Oct. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	348	30	31	28	69	354	30	22	55	60	28
2	7.8	344	30	37	27	117	472	29	21	68	94	53
3	11	280	26	38	27	154	278	35	21	42	49	30
4	12	96	24	26	26	71	163	32	20	43	41	26
5	9.0	57	23	43	30	53	124	30	20	68	36	25
6	7.0	52	22	72	28	48	118	30	20	61	42	24
7	9.5	37	26	113	32	44	412	491	19	131	39	38
8	6.4	24	24	38	24	42	171	87	18	60	34	29
9	7.4	19	25	28	23	50	172	51	18	52	20	30
10	6.0	18	26	26	41	49	105	43	18	37	29	27
11	5.4	15	30	27	58	93	86	43	18	34	44	77
12	5.1	15	27	38	25	175	75	33	18	32	64	57
13	17	16	22	25	22	229	82	30	18	100	27	33
14	8.2	24	26	23	20	316	68	30	19	54	26	88
15	6.0	30	26	22	19	168	56	28	18	41	29	58
16	5.4	26	20	23	19	117	72	28	50	55	44	28
17	5.4	57	20	28	19	79	123	47	94	84	96	26
18	5.7	160	20	26	18	164	76	58	36	195	204	24
19	5.4	36	89	145	21	221	55	30	38	54	50	20
20	5.7	21	138	683	170	145	68	26	38	43	35	18
21	4.8	20	345	972	277	163	64	26	37	50	52	18
22	4.8	19	688	166	121	93	48	26	29	61	56	18
23	4.8	180	92	102	64	415	39	26	27	41	60	18
24	96	66	753	80	94	178	38	32	24	53	67	17
25	15	33	420	70	145	94	41	28	42	38	77	18
26	9.2	47	120	57	189	80	39	33	26	35	59	19
27	16	49	77	49	115	1190	32	24	24	41	36	17
28	175	28	73	42	66	363	32	23	39	32	33	17
29	81	35	50	36	---	368	32	22	41	41	24	15
30	25	56	41	32	---	600	32	22	77	42	23	18
31	51	---	33	30	---	825	---	22	---	31	26	---
TOTAL	635.8	2208	3366	3128	1748	6773	3527	1495	910	1774	1584	914
MEAN	20.5	73.6	109	101	62.4	218	118	48.2	30.3	57.2	51.1	30.5
MAX	175	348	753	972	277	1190	472	491	94	195	204	88
MIN	4.8	15	20	22	18	42	32	22	18	31	23	15
AC-FT	1260	4380	6680	6200	3470	13430	7000	2970	1800	3520	3140	1810

CAL YR 1981 TOTAL 13744.2 MEAN 37.7 MAX 753 MIN 4.8 AC-FT 27260
WTR YR 1982 TOTAL 28062.8 MEAN 76.9 MAX 1190 MIN 4.8 AC-FT 55660

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

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

DRAINAGE AREA.--1.9 mi² (3.08 km²).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--24 years (water years, 1959-82), 11.7 ft³/s (0.331 m³/s), 8,480 acre-ft/yr (10.5 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 580 ft³/s (16.4 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 21	2330	638	18.1	4.76	1.451	Mar. 27	0730	1580	44.7	7.30	2.225
Dec. 25	0800	692	19.6	4.94	1.506	Mar. 30	0600	614	17.4	4.68	1.426
Jan. 21	0800	714	20.2	5.01	1.527	May 7	0200	*1680	47.6	*7.51	2.289

Minimum discharge, 5.9 ft³/s (0.17 m³/s) Feb. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	44	15	8.1	7.0	13	75	9.5	8.6	24	28	33
2	7.9	61	12	11	6.6	17	71	9.3	8.4	20	38	40
3	12	67	10	8.6	6.6	35	45	11	8.4	14	17	16
4	10	22	9.0	7.5	6.4	13	26	9.3	8.4	21	14	13
5	7.9	13	8.4	8.6	7.3	11	20	9.3	8.4	35	13	11
6	7.9	11	7.9	20	7.3	9.7	17	9.7	7.9	26	13	10
7	11	9.5	10	18	8.8	9.3	38	76	7.9	40	14	10
8	8.4	8.6	7.5	8.8	7.0	8.8	17	27	7.7	27	11	11
9	10	8.1	7.1	7.9	6.8	10	23	14	7.5	28	10	9.3
10	7.7	7.5	7.0	7.5	12	10	14	12	7.5	19	13	9.5
11	7.1	7.3	7.7	11	14	32	12	17	7.5	16	20	24
12	7.0	7.1	7.3	14	7.3	53	20	13	7.3	13	22	19
13	11	8.1	7.0	8.4	6.8	35	53	11	7.7	36	11	16
14	7.5	8.4	7.5	7.7	6.4	80	25	10	7.3	20	10	37
15	7.0	13	7.0	7.3	6.4	31	19	9.5	7.3	16	11	16
16	6.6	9.0	6.8	7.7	6.2	20	42	9.3	11	27	23	12
17	6.8	10	6.6	8.1	6.0	14	45	24	23	67	45	10
18	6.6	50	7.0	7.5	6.0	29	24	22	12	65	39	10
19	6.6	12	34	18	10	38	16	12	13	21	18	9.3
20	6.4	9.3	35	75	64	24	22	11	12	16	12	8.8
21	6.2	8.1	88	93	88	45	16	10	13	23	18	8.6
22	6.2	7.5	55	18	44	26	12	9.7	11	19	20	8.6
23	6.4	80	21	12	14	95	12	9.5	10	15	24	8.6
24	42	25	100	10	24	37	11	13	10	17	32	8.4
25	9.5	15	105	9.3	32	20	11	11	14	13	35	11
26	7.5	16	21	8.4	40	16	10	9.7	10	11	27	9.0
27	15	18	14	8.1	21	230	9.7	12	12	15	15	9.3
28	54	11	12	7.7	13	61	15	9.5	19	12	13	10
29	17	13	10	7.3	---	65	11	9.3	13	17	14	8.4
30	15	15	9.3	7.5	---	93	9.7	9.0	33	20	12	9.3
31	18	---	8.6	7.1	---	144	---	8.6	---	13	20	---
TOTAL	359.2	594.5	663.7	459.1	484.9	1324.8	741.4	437.2	333.8	726	612	416.1
MEAN	11.6	19.8	21.4	14.8	17.3	42.7	24.7	14.1	11.1	23.4	19.7	13.9
MAX	54	80	105	93	88	230	75	76	33	67	45	40
MIN	6.2	7.1	6.6	7.1	6.0	8.8	9.7	8.6	7.3	11	10	8.4
AC-FT	712	1180	1320	911	962	2630	1470	867	662	1440	1210	825

CAL YR 1981 TOTAL 4779.3 MEAN 13.1 MAX 105 MIN 5.3 AC-FT 9480
WTR YR 1982 TOTAL 7152.7 MEAN 19.6 MAX 230 MIN 6.0 AC-FT 14190

HAWAII, ISLAND OF KAUAI

16100000 HANALEI TUNNEL OUTLET NEAR LIHUE

LOCATION.--Lat 22°05'03", long 159°27'51", Hydrologic Unit 20070000, on left bank at outlet of Hanalei tunnel, 2.2 mi (3.5 km) downstream from intake on Kaapoko Stream, and 9.4 mi (15.1 km) northwest of Lihue.

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

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

REMARKS.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa. Prior to Feb. 24, 1976 records do not include water by-passing at times above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--50 years, 27.2 ft^3/s (0.770 m^3/s), 19,710 acre-ft/yr (24.3 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 62 ft^3/s (1.76 m^3/s) Nov. 2; minimum daily, 2.4 ft^3/s (0.068 m^3/s) Mar. 7, July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	55	38	27	22	7.9	40	6.3	5.1	11	22	17
2	42	62	38	28	24	15	33	8.7	5.1	8.7	23	15
3	48	55	32	26	21	6.1	22	6.8	5.1	8.1	8.6	8.3
4	52	43	27	26	21	3.5	14	6.5	5.1	8.4	10	6.5
5	41	38	26	34	22	2.6	13	6.5	5.1	8.6	9.8	5.7
6	38	38	25	52	23	2.6	12	6.8	5.1	10	6.8	5.4
7	42	33	35	37	22	2.4	18	16	5.1	20	6.8	5.4
8	38	30	26	29	26	2.6	13	23	5.1	2.4	5.7	5.7
9	35	30	25	28	28	5.2	16	8.6	5.1	7.2	5.4	5.4
10	30	29	24	30	32	6.2	9.3	7.6	5.4	3.7	8.4	6.3
11	28	28	27	30	34	28	8.3	11	6.9	3.7	15	14
12	28	28	25	29	36	38	11	9.2	5.1	3.2	8.4	11
13	40	30	24	27	26	28	16	7.0	6.9	15	5.7	14
14	28	28	25	26	23	47	9.6	7.8	5.4	5.4	5.9	21
15	27	35	23	26	23	16	8.6	6.5	5.1	6.0	7.6	10
16	26	36	23	26	22	8.7	25	6.3	11	9.5	20	7.0
17	33	29	22	33	22	4.5	32	13	13	26	15	6.3
18	33	42	22	31	22	23	14	21	7.8	21	12	6.0
19	28	34	30	43	24	12	9.3	8.1	8.0	7.8	7.0	5.7
20	26	30	48	53	41	8.4	16	8.1	7.5	6.8	6.3	5.1
21	26	28	46	52	56	17	17	7.3	5.7	11	11	4.8
22	26	28	47	33	14	46	10	6.5	5.4	7.6	8.3	5.1
23	34	54	47	27	5.5	54	9.3	6.5	5.1	15	11	5.7
24	48	39	56	37	5.9	17	9.3	11	5.4	14	17	4.8
25	37	39	52	39	27	7.0	7.8	6.5	6.8	7.6	34	7.4
26	41	39	38	28	24	7.1	7.0	6.0	4.8	6.3	19	9.1
27	44	46	34	28	21	41	6.8	7.2	5.1	6.7	8.3	7.0
28	58	35	31	25	6.3	20	8.6	5.4	6.2	6.4	7.3	16
29	48	42	29	24	---	29	6.8	6.1	9.3	5.7	8.1	5.7
30	45	40	28	23	---	37	7.0	5.4	18	11	7.3	7.6
31	40	---	27	22	---	44	---	5.4	---	6.0	7.0	---
TOTAL	1144	1123	1000	979	673.7	586.8	429.7	268.1	199.8	289.5	347.7	254.0
MEAN	36.9	37.4	32.3	31.6	24.1	18.9	14.3	8.65	6.66	9.34	11.2	8.47
MAX	58	62	56	53	56	54	40	23	18	26	34	21
MIN	26	28	22	22	5.5	2.4	6.8	5.4	4.8	2.4	5.4	4.8
AC-FT	2270	2230	1980	1940	1340	1160	852	532	396	574	690	504

CAL YR 1981 TOTAL 10293.48 MEAN 28.2 MAX 64 MIN .34 AC-FT 20420
WTR YR 1982 TOTAL 7295.30 MEAN 20.0 MAX 62 MIN 2.4 AC-FT 14470

HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI

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

DRAINAGE AREA.--19.1 mi² (49.5 km²).

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

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 35.8 ft (10.91 m) above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, nonrecording gage at site 0.2 mi (0.3 km) upstream at different datum. Jan. 26 to Dec. 26, 1962, crest-stage gage at present site and datum.

REMARKS.--Records fair. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation. China ditch above station diverts for irrigation of taro in vicinity of Hanalei. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--19 years (water years 1964-82), 224 ft³/s (6.344 m³/s) 162,300 acre-ft/yr (200 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s (705 m³/s) Apr. 19, 1974, gage height, 14.28 ft (4.353 m), from rating curve extended above 9,600 ft³/s (272 m³/s); minimum, 31 ft³/s (0.88 m³/s) Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,200 ft³/s (261 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	1700	13170	373	11.49	3.502	Mar. 29	0400	*17880	506	*12.72	3.877
Dec. 21	2400	9240	262	10.02	3.054	Mar. 31	0930	10380	294	10.56	3.219
Feb. 21	2230	15280	433	12.07	3.679	Aug. 17	1600	14840	420	11.96	3.645

Minimum discharge, 49 ft³/s (1.39 m³/s) Oct. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	3480	334	106	110	295	2050	175	141	346	670	1220
2	140	2870	275	118	106	521	1510	171	137	365	926	866
3	217	2480	203	102	99	430	748	169	134	269	266	314
4	252	465	159	92	98	248	434	159	132	268	241	233
5	139	240	137	126	105	207	330	155	130	350	217	205
6	95	235	124	582	113	187	263	165	129	335	183	187
7	169	159	354	320	165	179	690	744	126	786	183	173
8	95	110	139	126	116	173	292	509	124	347	163	163
9	90	86	114	107	136	255	530	238	124	318	157	151
10	72	78	106	109	315	281	235	207	122	229	220	163
11	66	80	110	114	377	1170	205	303	132	199	307	441
12	61	86	107	132	189	1720	221	275	126	195	345	337
13	143	94	93	95	124	987	549	211	130	605	177	319
14	76	90	92	90	105	2070	284	197	129	307	159	744
15	63	150	88	85	98	740	221	183	122	287	195	317
16	58	123	84	116	95	418	508	175	278	469	698	205
17	70	120	80	158	90	260	802	290	281	1350	947	177
18	77	899	77	110	87	1170	350	542	173	1390	407	175
19	58	184	187	305	105	846	231	231	165	342	231	155
20	53	124	668	1660	791	522	501	207	191	248	193	145
21	50	112	1150	2310	2390	801	634	221	189	363	330	137
22	50	103	1250	329	879	2570	322	185	143	517	359	130
23	81	1510	451	211	561	3000	263	179	132	467	492	137
24	330	565	1860	304	482	880	272	300	134	346	709	132
25	84	349	1760	398	1180	398	240	197	225	238	1710	167
26	106	354	318	179	1450	332	205	183	242	195	767	207
27	371	532	217	179	1240	3490	191	173	231	215	306	201
28	2250	252	187	169	350	1270	307	159	193	193	278	266
29	513	291	147	141	---	2420	205	155	337	219	263	151
30	314	374	128	130	---	2270	189	163	529	260	278	177
31	202	---	116	117	---	3860	---	145	---	189	413	---
TOTAL	6411	16595	11115	9120	11953	33970	13782	7366	5381	12207	12790	8395
MEAN	207	553	359	294	427	1096	459	238	179	394	413	280
MAX	2250	3480	1860	2310	2390	3860	2050	744	529	1390	1710	1220
MIN	50	78	77	85	87	173	189	145	122	189	157	130
AC-FT	12720	32920	22050	18090	23710	67380	27340	14610	10670	24210	25370	16650

CAL YR 1981 TOTAL 79563 MEAN 218 MAX 3480 MIN 45 AC-FT 157800
WTR YR 1982 TOTAL 149085 MEAN 408 MAX 3860 MIN 50 AC-FT 295700

16108000 WAINIHA RIVER NEAR HANALEI

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

DRAINAGE AREA.--10.2 mi² (26.4 km²).

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

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

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

AVERAGE DISCHARGE.--27 years (water years, 1953-55, 1959-82), 141 ft³/s (3.993 m³/s), 102,200 acre-ft/yr (126 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s (796 m³/s) Apr. 19, 1974, gage height, 9.47 ft (2.886 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement at gage height 7.72 ft (2.353 m); minimum, 33.0 ft³/s (0.93 m³/s) Feb. 11, 12, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft (4.30 m), from floodmarks, discharge, about 40,000 ft³/s (1,130 m³/s), from unit-discharge study.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0630	3850	109	5.32	1.622	Mar. 13	2230	3780	107	5.29	1.612
Nov. 1	1900	10640	301	6.94	2.115	Mar. 23	0100	7700	218	6.38	1.945
Nov. 23	0200	4650	132	5.60	1.707	Mar. 27	0330	*16190	459	*7.77	2.368
Dec. 25	0400	3620	103	5.23	1.594	Mar. 29	0200	9860	279	6.81	2.076
Jan. 20	2300	3780	107	5.29	1.612						

Minimum discharge, 44 ft³/s (1.25 m³/s) Oct. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	1760	212	61	70	100	1080	93	76	259	698	251
2	171	2660	189	64	119	141	508	87	74	250	933	363
3	271	1320	144	62	70	122	265	87	73	242	151	133
4	370	166	94	58	65	87	158	82	72	218	154	98
5	89	101	81	106	70	78	126	81	72	227	135	88
6	86	111	76	675	101	83	110	91	71	231	108	83
7	173	80	423	214	105	100	287	195	70	776	121	78
8	78	70	119	90	227	113	158	332	69	239	94	79
9	72	66	92	75	260	181	239	108	69	250	96	78
10	54	62	77	75	332	154	116	103	68	136	189	112
11	49	63	104	105	347	617	97	198	84	117	296	340
12	45	65	87	100	219	792	138	184	73	122	294	224
13	138	75	70	84	129	650	237	109	78	558	101	212
14	63	71	72	65	89	1720	127	103	75	213	95	266
15	53	95	65	65	78	247	97	83	70	204	149	161
16	48	88	62	66	71	122	381	78	81	279	484	101
17	80	74	60	145	67	102	510	100	96	828	214	87
18	75	200	59	116	66	605	154	250	85	782	153	99
19	58	84	81	261	74	432	99	109	86	159	98	81
20	49	66	542	975	378	342	218	116	133	116	89	76
21	45	65	635	1350	864	633	449	120	108	170	193	74
22	46	66	587	137	181	2620	256	99	82	116	160	73
23	58	1470	239	94	105	2210	191	104	80	94	295	95
24	193	370	1030	538	174	403	242	187	78	100	406	82
25	68	294	1120	416	1300	162	194	107	147	89	1270	147
26	167	234	155	129	690	202	120	101	80	78	744	217
27	392	429	94	172	443	1800	112	96	83	94	145	157
28	1190	188	82	118	135	519	206	80	142	93	125	225
29	201	223	72	92	---	800	113	92	178	120	143	94
30	86	211	66	87	---	746	114	94	401	170	149	133
31	68	---	64	76	---	2060	---	86	---	100	157	---
TOTAL	4629	10827	6853	6671	6829	18943	7102	3755	2954	7430	8439	4307
MEAN	149	361	221	215	244	611	237	121	98.5	240	272	144
MAX	1190	2660	1120	1350	1300	2620	1080	332	401	828	1270	363
MIN	45	62	59	58	65	78	97	78	68	78	89	73
AC-FT	9180	21480	13590	13230	13550	37570	14090	7450	5860	14740	16740	8540

CAL YR 1981 TOTAL 52161 MEAN 143 MAX 2660 MIN 42 AC-FT 103500
WTR YR 1982 TOTAL 88739 MEAN 243 MAX 2660 MIN 45 AC-FT 176000

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

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

DRAINAGE AREA.--1.38 mi² (3.57 km²).

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

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

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

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

AVERAGE DISCHARGE.--59 years (water years, 1914-24, 1927-52, 1961-82), 16.6 ft³/s (0.470 m³/s), 12,030 acre-ft/yr (14.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft³/s (160 m³/s) Oct. 28, 1981, gage height, 13.2 ft (4.02 m), from rating curve extended above 68 ft³/s (1.93 m³/s) on basis of slope-area measurement at gage height, 12.46 ft (3.798 m); minimum, 0.12 ft³/s (0.003 m³/s) Mar. 2, 13, 1941.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0630	*5640	160	*13.20	4.023	July 17	0730	1420	40.2	6.47	1.972
Jan. 6	2200	2540	71.9	8.40	2.560	Aug. 1	1130	2120	60.0	7.70	2.347
Jan. 20	1630	1400	41.9	6.59	2.009	Aug. 16	0800	2240	63.4	7.90	2.408
Mar. 14	1500	2600	73.6	8.50	2.591	Sept. 1	1300	3080	87.2	9.12	2.780
Mar. 27	0630	1530	43.3	6.70	2.042						

Minimum discharge, 1.45 ft³/s (0.041 m³/s) Feb. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	51	24	3.8	3.6	3.8	110	11	6.1	40	149	179
2	51	33	12	8.9	3.5	3.6	170	14	5.5	9.6	44	38
3	6.5	38	9.9	7.1	3.2	2.6	47	11	5.1	15	18	15
4	13	7.9	6.7	3.6	3.0	2.3	24	8.4	5.3	73	15	12
5	12	6.1	5.9	3.1	3.1	2.0	19	12	4.9	17	14	11
6	4.6	11	5.5	172	3.0	1.8	16	7.4	11	35	11	11
7	4.7	28	9.6	59	3.3	1.9	50	43	5.5	76	9.9	8.7
8	3.5	5.9	5.1	5.9	3.0	1.7	22	48	4.1	18	15	10
9	3.1	4.7	6.3	4.9	2.6	1.6	51	13	3.8	51	10	7.9
10	2.8	4.2	4.1	4.1	2.5	0.0	15	8.7	7.8	12	51	9.0
11	2.6	4.2	3.9	3.6	9.6	108	12	30	4.9	12	72	13
12	2.4	3.9	3.6	4.4	5.3	150	19	75	3.8	16	25	22
13	2.7	3.3	3.3	3.3	2.5	34	56	11	11	12	10	14
14	5.4	3.2	9.5	3.0	2.1	265	38	16	4.2	9.0	28	44
15	2.5	4.4	3.8	2.7	1.9	204	15	13	3.5	17	171	27
16	2.3	12	3.0	2.7	1.8	16	184	30	70	89	319	9.0
17	5.5	63	2.5	2.6	1.6	28	73	41	18	137	28	8.2
18	6.7	6.3	2.4	2.5	1.6	12	33	14	6.3	38	18	7.4
19	2.7	7.4	56	22	1.5	7.9	21	41	11	13	13	6.1
20	2.1	3.9	64	99	112	7.9	18	13	6.3	11	13	5.5
21	1.9	3.5	47	92	19	81	45	11	5.3	26	23	5.1
22	2.0	3.2	13	15	4.7	195	24	8.2	3.8	59	23	5.1
23	13	129	25	6.1	3.3	332	14	16	3.8	15	15	6.1
24	14	15	14	11	2.7	45	13	63	3.3	9.6	74	4.7
25	4.7	12	57	48	2.6	18	13	64	23	7.9	81	17
26	9.1	7.7	31	7.2	2.4	14	13	17	5.4	7.9	41	33
27	9.6	23	8.7	11	11	179	15	11	48	12	30	23
28	601	10	6.7	5.9	4.9	16	86	9.0	62	21	65	21
29	17	11	5.5	5.7	---	119	17	7.7	9.4	39	29	12
30	7.7	55	4.7	5.9	---	155	19	12	44	16	15	7.2
31	11	---	4.2	5.9	---	290	---	6.7	---	7.9	12	---
TOTAL	836.1	570.8	457.9	631.9	221.3	2306.1	1252	686.1	406.1	921.9	1441.9	592.0
MEAN	27.0	19.0	14.8	20.4	7.90	74.4	41.7	22.1	13.5	29.7	46.5	19.7
MAX	601	129	64	172	112	332	184	75	70	137	319	179
MIN	1.9	3.2	2.4	2.5	1.5	1.6	12	6.7	3.3	7.9	9.9	4.7
AC-FT	1660	1130	908	1250	439	4570	2480	1360	805	1830	2860	1170

CAL YR 1981 TOTAL 4056.64 MEAN 13.3 MAX 601 MIN .34 AC-FT 9630
WTR YR 1982 TOTAL 10324.10 MEAN 28.3 MAX 601 MIN 1.5 AC-FT 20480

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

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

DRAINAGE AREA.--4.04 mi² (10.46 km²).

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

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

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

AVERAGE DISCHARGE.--(since termination of diversions to Schofield Barracks).--20 years (water years, 1961-62, 1965-82), 22.3 ft³/s (0.632 m³/s), 16,160 acre-ft/yr (19.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s (155 m³/s) Apr. 15, 1963, gage height, 11.33 ft (3.453 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft³/s (31.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0730	*5200	147	*11.00	3.353	Aug. 16	1100	1520	43.0	5.81	1.771
Jan. 7	0030	1910	54.1	6.46	1.969	Sept. 1	1430	2100	59.5	6.76	2.060
Mar. 15	0230	1660	47.0	6.05	1.844						

Minimum discharge, 0.96 ft³/s (0.027 m³/s) Oct. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	76	50	8.0	12	5.1	119	26	6.5	81	110	279
2	25	71	28	12	11	4.8	172	22	6.0	22	46	77
3	10	74	27	20	9.6	3.9	70	21	5.6	47	32	35
4	5.7	15	15	7.9	8.7	5.5	35	15	6.0	74	14	28
5	21	11	13	6.7	8.9	3.3	26	15	5.8	46	13	26
6	5.2	20	12	60	8.6	2.8	22	13	7.4	43	13	26
7	3.8	51	20	306	8.0	2.8	91	49	9.2	83	12	19
8	2.5	11	14	19	8.4	2.7	35	31	5.1	54	17	18
9	1.9	7.8	8.8	12	8.2	2.5	66	16	4.4	114	19	17
10	1.6	6.8	7.8	9.9	7.1	12	22	12	13	34	46	22
11	1.4	6.8	7.3	9.0	17	91	17	18	8.5	22	41	22
12	1.2	7.9	7.4	9.2	19	235	16	53	5.0	27	58	20
13	1.2	5.8	7.2	7.8	7.3	51	84	14	4.1	22	13	17
14	5.0	5.2	17	6.4	5.8	220	66	11	4.7	20	15	19
15	2.8	4.9	8.1	5.9	5.2	295	21	11	3.7	39	147	36
16	1.4	7.6	6.2	6.1	5.1	33	55	11	65	65	338	15
17	1.1	99	5.6	6.4	4.9	54	57	17	26	137	56	11
18	12	10	5.4	5.4	5.0	45	25	12	16	54	32	13
19	2.6	19	21	48	4.7	18	22	22	5.7	25	19	8.9
20	1.6	7.0	114	225	176	14	20	11	6.0	17	16	8.0
21	1.1	6.3	95	183	26	45	43	13	8.2	26	21	7.4
22	.98	6.1	41	75	8.5	96	52	11	4.9	77	65	7.1
23	7.1	228	35	25	6.1	345	18	8.5	3.4	40	26	9.2
24	19	66	17	25	5.3	87	16	26	4.0	14	38	11
25	5.1	34	114	105	5.1	29	16	56	12	12	92	32
26	14	21	91	26	4.7	20	20	41	13	11	87	38
27	19	29	23	48	7.6	144	26	12	45	11	26	14
28	770	15	15	32	11	24	147	9.1	155	39	111	11
29	42	16	12	21	---	73	54	7.7	16	36	48	7.0
30	15	124	10	18	---	189	66	16	43	22	32	8.0
31	19	---	9.0	14	---	260	---	9.5	---	11	23	---
TOTAL	1021.78	1062.2	856.8	1362.7	414.8	2413.4	1499	609.8	518.2	1325	1626	861.6
MEAN	33.0	35.4	27.6	44.0	14.8	77.9	50.0	19.7	17.3	42.7	52.5	28.7
MAX	770	228	114	306	176	345	172	56	155	137	338	279
MIN	.98	4.9	5.4	5.4	4.7	2.5	16	7.7	3.4	11	12	7.0
AC-FT	2030	2110	1700	2700	823	4790	2970	1210	1030	2630	3230	1710

CAL YR 1981 TOTAL 6377.65 MEAN 17.5 MAX 770 MIN .54 AC-FT 12650
WTR YR 1982 TOTAL 13571.28 MEAN 37.2 MAX 770 MIN .98 AC-FT 26920

HAWAII, ISLAND OF OAHU

16211600 MAKAHA STREAM NEAR MAKAHA

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

DRAINAGE AREA.--2.31 mi² (5.98 km²).

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records fair except those for periods of no gage-height record, which are poor. Wells and water-development tunnels in the vicinity and above the station may affect low-flow records. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 1.96 ft³/s (0.056 m³/s), 1,420 acre-ft/yr (1.75 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft³/s (41.1 m³/s) Jan. 6, 1982, gage height, 7.40 ft (2.256 m), from floodmarks, from rating curve extended above 51 ft³/s (1.44 m³/s) on basis of slope-area measurements at gage heights 6.50 ft (1.981 m), and 7.40 ft (2.256 m); no flow at times.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft³/s (5.66 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 6	2200	*1450	41.1	*7.40	2.256
Jan. 19	2130	250	7.08	3.60	1.097
Jan. 21	0330	398	11.3	4.16	1.268

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) Oct. 6-8, 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	1.6	1.1	1.8	3.4	6.4	4.7	2.4	.92	.90	5.5	.96
2	.05	2.3	.85	4.4	4.6	4.9	5.6	2.1	.92	.74	2.3	1.0
3	.06	3.0	.92	3.1	3.1	6.1	4.0	1.9	.85	1.5	1.4	.69
4	.05	1.3	.74	2.2	2.5	4.5	2.7	1.8	.92	1.2	1.1	.60
5	.05	.97	.63	1.9	7.2	3.3	2.2	1.7	1.2	1.0	1.0	2.0
6	.04	.90	.57	90	4.5	2.9	2.0	1.6	1.8	.80	.89	1.2
7	.03	1.1	1.2	100	4.2	2.9	12	3.1	1.1	.90	.82	.74
8	.04	.72	1.1	14	3.7	2.6	2.8	1.8	.84	.80	.75	.62
9	.04	.70	.69	5.0	3.5	2.2	3.0	1.5	.68	.74	.70	.57
10	.04	.69	.58	2.7	4.5	2.0	2.0	1.5	.65	.70	.71	.62
11	.04	.42	.54	2.4	6.9	1.9	1.7	1.4	.62	.68	.71	.71
12	.04	.32	.62	12	5.7	7.1	1.8	1.4	.60	.70	.69	.61
13	.03	.33	.59	5.7	3.6	4.1	1.9	1.3	.60	.76	.64	.56
14	.02	.33	.57	4.1	3.0	5.6	2.2	1.3	.60	.70	.60	.54
15	.02	2.6	.62	2.8	2.5	5.1	1.9	1.2	.60	1.4	1.6	.51
16	.02	1.8	.56	2.4	2.1	3.1	3.0	1.8	.60	.90	2.4	.47
17	.03	1.5	.41	2.3	1.9	5.1	5.3	1.8	.60	.80	1.3	.45
18	.03	1.2	.43	2.2	1.9	4.6	3.0	2.0	.57	.86	1.1	.45
19	.02	.74	1.5	30	4.3	3.4	1.6	1.4	3.7	.84	.84	.43
20	.01	.74	6.2	82	21	5.2	1.5	1.3	3.3	1.0	.69	.39
21	.01	.52	6.0	107	9.1	3.3	6.0	1.2	1.0	.95	.65	.35
22	.01	.46	3.0	41	5.9	2.7	2.5	1.2	.74	1.5	.60	.32
23	.02	2.7	2.0	17	4.5	5.0	5.0	1.2	.69	2.5	.60	.31
24	.05	2.3	1.8	49	4.4	2.6	3.6	1.2	.62	1.4	.60	.32
25	.12	1.1	7.8	60	6.7	2.2	3.1	1.2	2.0	1.0	2.6	.32
26	.14	.95	21	23	5.3	1.9	2.7	1.2	.80	1.2	2.2	.30
27	.40	1.2	5.4	11	27	1.9	2.6	1.2	.90	2.7	.99	.29
28	.72	.96	3.5	7.6	10	1.7	4.7	1.1	.70	2.5	.90	.29
29	.45	.77	2.7	6.4	---	1.6	3.5	1.1	.80	2.2	.77	.29
30	1.4	1.8	2.3	5.7	---	2.2	2.8	1.0	.76	1.8	.65	.29
31	2.0	---	2.0	4.1	---	7.1	---	.99	---	1.2	.62	---
TOTAL	6.03	36.02	77.92	702.8	167.0	115.2	101.4	46.89	30.68	36.87	36.92	17.20
MEAN	.19	1.20	2.51	22.7	5.96	3.72	3.38	1.51	1.02	1.19	1.19	.57
MAX	2.0	3.0	21	107	27	7.1	12	3.1	3.7	2.7	5.5	2.0
MIN	.01	.32	.41	1.8	1.9	1.6	1.5	.99	.57	.68	.60	.29
AC-FT	12	71	155	1390	331	228	201	93	61	73	73	34

CAL YR 1981 TOTAL 455.79 MEAN 1.25 MAX 33 MIN .01 AC-FT 904
WTR YR 1982 TOTAL 1374.93 MEAN 3.77 MAX 107 MIN .01 AC-FT 2730

NOTE.--No gage-height record Jan. 6-12, Apr. 10-23, June 21 to July 29.

16212800 KIPAPA STREAM NEAR WAHIAWA

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

DRAINAGE AREA.--4.29 mi² (11.11 km²).

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--25 years, 11.2 ft³/s (0.317 m³/s), 8,110 acre-ft/yr (10.0 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft³/s (26.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0700	*5660	160	*12.28	3.743	Mar. 23	0530	980	27.8	7.00	2.134
Nov. 1	1800	1830	51.8	8.64	2.633	Mar. 27	0900	1010	28.6	7.08	2.158
Dec. 25	1100	968	27.4	6.97	2.124	June 16	1400	1320	37.4	7.73	2.356
Jan. 6	2230	2090	59.2	9.05	2.758	July 16	2400	1240	35.1	7.59	2.313
Mar. 12	2400	1310	37.1	7.72	2.353	Aug. 16	0930	1760	49.8	8.51	2.594
Mar. 15	0100	2370	67.1	9.40	2.865	Sept. 1	1300	2910	82.4	10.08	3.072

Minimum discharge, 0.37 ft³/s (0.010 m³/s) Oct. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.76	120	12	2.8	3.5	7.2	73	6.4	2.5	35	80	191
2	7.4	75	20	13	3.3	5.1	76	15	2.2	13	29	34
3	4.1	59	12	9.7	2.8	4.5	38	9.0	2.0	7.0	9.0	10
4	2.4	11	5.4	3.3	2.5	3.3	18	4.9	2.2	30	6.8	7.0
5	8.1	6.8	4.0	2.5	2.8	1.6	12	4.5	2.1	20	5.9	6.4
6	2.1	17	3.5	111	3.2	1.3	11	3.8	7.8	14	5.4	7.4
7	.89	41	12	123	2.5	1.2	67	40	4.9	58	5.2	4.7
8	.64	6.4	4.9	12	2.6	1.0	17	18	2.1	12	5.9	4.7
9	.49	4.3	2.8	6.8	2.4	.77	50	5.9	1.6	41	8.5	4.9
10	.45	3.3	2.4	5.4	2.2	3.2	11	4.0	25	8.2	17	8.6
11	.45	3.0	2.1	4.3	24	45	7.9	3.5	5.4	5.7	18	11
12	.41	2.5	2.0	3.6	9.8	202	7.0	19	2.5	10	31	4.9
13	.49	2.2	1.8	3.0	3.3	42	12	4.7	3.4	5.7	4.7	4.7
14	3.2	2.0	3.0	2.5	2.2	185	24	4.7	3.6	5.9	3.5	7.4
15	1.2	1.7	2.4	2.4	1.7	286	8.2	12	1.5	12	55	4.9
16	.70	16	1.6	5.7	1.6	31	49	4.5	147	73	275	3.2
17	.54	124	1.4	3.3	1.5	85	74	10	11	94	42	2.6
18	13	6.8	1.3	3.0	1.3	42	21	26	5.4	22	17	3.6
19	1.7	4.5	39	33	1.2	13	15	14	9.1	8.2	8.2	2.4
20	1.0	3.3	103	89	101	13	14	5.2	3.6	5.4	5.9	1.8
21	.64	2.6	96	119	15	52	50	5.7	4.7	5.7	16	1.7
22	.59	2.4	21	40	7.2	46	45	5.2	2.8	31	36	1.5
23	3.5	90	31	11	4.3	260	11	4.0	1.8	12	7.4	2.8
24	22	23	11	14	2.6	73	10	13	1.7	6.8	24	3.2
25	3.9	9.0	80	99	2.6	19	12	15	16	3.5	106	3.2
26	6.5	6.8	47	15	2.2	13	9.4	9.4	7.6	3.2	74	11
27	9.6	15	12	12	12	98	7.9	4.0	20	6.3	14	5.4
28	810	5.9	7.4	6.8	7.1	14	38	3.2	40	18	23	3.5
29	350	4.7	5.2	5.4	---	50	11	2.8	8.2	9.9	11	2.1
30	180	52	4.0	6.8	---	164	12	6.9	40	13	10	2.0
31	100	---	3.3	4.0	---	208	---	4.7	---	4.0	5.4	---
TOTAL	1536.75	721.2	554.5	772.3	228.4	1970.17	811.4	289.0	387.7	593.5	959.8	361.6
MEAN	49.6	24.0	17.9	24.9	8.16	63.6	27.0	9.32	12.9	19.1	31.0	12.1
MAX	810	124	103	123	101	286	76	40	147	94	275	191
MIN	.41	1.7	1.3	2.4	1.2	.77	7.0	2.8	1.5	3.2	3.5	1.5
AC-FT	3050	1430	1100	1530	453	3910	1610	573	769	1180	1900	717

CAL YR 1981	TOTAL	5025.18	MEAN 13.8	MAX 810	MIN .22	AC-FT	9970
WTR YR 1982	TOTAL	9186.32	MEAN 25.2	MAX 810	MIN .41	AC-FT	18220

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1973 to June 1982.

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

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,600 mg/L Oct. 28, 1981; minimum daily mean, 0 mg/L on many days.
SEDIMENT DISCHARGE: Maximum daily 7,870 tons (7,140 tonnes) Oct. 28, 1981; minimum daily, 0 ton (0 tonne) on many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,600 mg/L Oct. 28; minimum daily mean, 2 mg/L on many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 7,870 tons (7,140 tonnes) Oct. 28; minimum daily, 0 ton (o tonne) on many days during the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
05...	1415	27	47	6.9	24.5
28...	0600	4460	--	--	--
NOV					
02...	1425	57	34	6.1	21.0
24...	1415	15	45	6.8	25.0
DEC					
21...	1245	23	44	6.6	20.0
25...	1230	230	--	--	--
JAN					
07...	0100	560	--	--	--
18...	1310	2.9	50	6.9	21.0
FEB					
05...	1225	2.6	75	6.5	20.0
MAR					
08...	1205	.96	59	6.8	21.0
APR					
16...	1350	114	47	6.7	21.0
MAY					
12...	1335	35	52	6.8	21.5
JUL					
28...	1330	18	44	6.4	25.5
SEP					
23...	1620	2.6	64	6.9	25.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM
OCT								
28...	0600	4460	4080	49100	23	37	46	61
DEC								
25...	1230	230	1060	658	27	39	--	70
JAN								
07...	0100	560	518	783	--	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM
OCT							
28...	74	78	84	90	96	96	100
DEC							
25...	--	87	94	98	100	--	--
JAN							
07...	--	83	89	95	100	--	--

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

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	.76	4	.00	120	270	87	12	60	1.9
2	7.4	8	.16	75	120	24	20	50	5.1
3	4.1	7	.08	59	73	16	12	40	1.3
4	2.4	5	.03	11	15	.45	5.4	20	.29
5	8.1	12	.43	6.8	12	.22	4.0	14	.15
6	2.1	10	.06	17	19	1.1	3.5	12	.11
7	.89	7	.02	41	46	5.7	12	28	2.0
8	.64	5	.00	6.4	25	.43	4.9	20	.26
9	.49	3	.00	4.3	8	.09	2.8	10	.08
10	.45	3	.00	3.3	8	.07	2.4	8	.05
11	.45	3	.00	3.0	7	.06	2.1	6	.03
12	.41	3	.00	2.5	6	.04	2.0	6	.03
13	.49	3	.00	2.2	5	.03	1.8	5	.02
14	3.2	7	.06	2.0	5	.03	3.0	7	.06
15	1.2	2	.00	1.7	4	.02	2.4	5	.03
16	.70	2	.00	16	26	3.6	1.6	4	.02
17	.54	2	.00	124	182	126	1.4	3	.01
18	13	62	3.4	6.8	10	.18	1.3	3	.01
19	1.7	20	.09	4.5	6	.07	39	39	23
20	1.0	10	.03	3.3	5	.04	103	99	53
21	.64	5	.00	2.6	4	.03	96	84	36
22	.59	4	.00	2.4	4	.03	21	30	1.7
23	3.5	10	.09	90	73	24	31	16	1.5
24	22	224	22	23	19	1.4	11	6	.18
25	3.9	50	.53	9.0	9	.22	80	318	186
26	6.5	70	1.2	6.8	8	.15	47	180	25
27	9.6	100	2.6	15	11	.47	12	55	1.8
28	810	3600	7870	5.9	7	.11	7.4	30	.60
29	350	1300	1230	4.7	7	.09	5.2	20	.28
30	180	500	243	52	97	17	4.0	15	.16
31	100	250	67	---	---	---	3.3	12	.11
TOTAL	1536.75	---	9440.78	721.2	---	308.63	554.5	---	340.78
		JANUARY			FEBRUARY			MARCH	
1	2.8	10	.08	3.5	3	.03	7.2	10	.19
2	13	22	1.2	3.3	3	.03	5.1	7	.10
3	9.7	17	.45	2.8	2	.02	4.5	6	.07
4	3.3	13	.12	2.5	2	.01	3.3	5	.04
5	2.5	11	.07	2.8	2	.02	1.6	4	.02
6	111	192	413	3.2	2	.02	1.3	3	.01
7	123	218	197	2.5	2	.01	1.2	3	.00
8	12	10	.32	2.6	2	.01	1.0	3	.00
9	6.8	9	.17	2.4	2	.01	.77	3	.00
10	5.4	8	.12	2.2	2	.01	3.2	6	.05
11	4.3	6	.07	24	108	9.3	45	141	65
12	3.6	5	.05	9.8	25	.66	202	400	445
13	3.0	4	.03	3.3	9	.08	42	20	2.3
14	2.5	4	.03	2.2	7	.04	185	352	597
15	2.4	3	.02	1.7	5	.02	286	350	876
16	5.7	15	.23	1.6	4	.02	31	37	17
17	3.3	12	.11	1.5	4	.02	85	289	110
18	3.0	10	.08	1.3	3	.01	42	109	21
19	33	73	17	1.2	2	.00	13	30	1.1
20	89	128	36	101	85	29	13	25	.88
21	119	95	38	15	16	.65	52	106	42
22	40	15	1.6	7.2	10	.19	46	62	12
23	11	7	.21	4.3	8	.09	260	300	310
24	14	20	.76	2.6	7	.05	73	100	20
25	99	115	57	2.6	7	.05	19	25	1.3
26	15	15	.61	2.2	7	.04	13	20	.70
27	12	10	.32	12	13	.83	98	140	37
28	6.8	5	.09	7.1	12	.23	14	20	.76
29	5.4	5	.07	---	---	---	50	70	9.5
30	6.8	6	.11	---	---	---	164	180	80
31	4.0	3	.03	---	---	---	208	230	129
TOTAL	772.3	---	764.95	228.4	---	41.45	1970.17	---	2778.02

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

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	73	90	18	6.4	4	.07	2.5	4	.03
2	76	90	18	15	10	.41	2.2	4	.02
3	38	45	4.6	9.0	7	.17	2.0	4	.02
4	18	20	.97	4.9	4	.05	2.2	3	.02
5	12	15	.49	4.5	4	.05	2.1	3	.02
6	11	15	.45	3.8	3	.03	7.8	14	.72
7	67	75	14	40	221	44	4.9	13	.17
8	17	15	.69	18	88	.90	2.1	12	.07
9	50	60	8.1	5.9	12	.19	1.6	12	.05
10	11	10	.30	4.0	10	.11	25	129	16
11	7.9	8	.17	3.5	10	.09	5.4	25	.36
12	7.0	6	.11	19	72	5.1	2.5	10	.07
13	12	10	.32	4.7	13	.16	3.4	8	.07
14	24	20	1.3	4.7	9	.11	3.6	8	.08
15	8.2	8	.18	12	27	1.4	1.5	4	.02
16	49	45	6.0	4.5	11	.13	147	268	307
17	74	106	40	10	17	.57	11	30	.89
18	21	15	.85	26	63	8.2	5.4	20	.29
19	15	10	.41	14	19	.79	9.1	23	.57
20	14	12	.45	5.2	10	.14	3.6	15	.15
21	50	53	18	5.7	10	.15	4.7	18	.23
22	45	47	12	5.2	8	.11	2.8	10	.08
23	11	8	.24	4.0	6	.06	1.8	9	.04
24	10	7	.19	13	13	.51	1.7	8	.04
25	12	9	.29	15	16	.83	16	30	1.3
26	9.4	7	.18	9.4	13	.33	7.6	25	.51
27	7.9	5	.11	4.0	6	.06	20	43	8.4
28	38	35	3.7	3.2	6	.05	40	50	7.0
29	11	13	.39	2.8	6	.05	8.2	20	.44
30	12	15	.49	6.9	8	.17	40	64	9.2
31	---	---	---	4.7	4	.05	---	---	---
TOTAL	811.4	---	150.98	289.0	---	65.04	387.7	---	353.86

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

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

DRAINAGE AREA.--45.7 mi² (118.4 km²).

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--29 years (water years, 1953-59, 1961-82), 39.4 ft³/s (1.116 m³/s), 28,550 acre-ft/yr (35.2 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0900	7300	207	9.69	2.954	Mar. 15	0445	2830	80.1	6.33	1.929
Dec. 25	1230	1430	40.5	4.89	1.490	Apr. 7	0630	2150	60.9	5.65	1.722
Jan. 7	0030	*12600	357	*12.53	3.819	Aug. 16	1100	2170	61.5	5.67	1.728
Jan. 20	1700	3020	85.5	6.50	1.981	Sept. 1	1500	2810	79.6	6.31	1.923

Minimum discharge, 3.1 ft³/s (0.088 m³/s) Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	147	53	35	49	34	211	52	20	67	122	419
2	8.3	200	43	50	47	39	188	50	18	67	92	120
3	15	131	51	61	44	34	149	60	24	42	38	48
4	13	42	27	39	44	32	91	41	20	75	29	39
5	11	23	23	35	45	27	63	29	23	69	24	46
6	14	19	28	403	51	26	51	29	33	47	33	50
7	8.2	75	24	1760	48	25	432	49	30	96	24	37
8	8.3	46	38	91	51	26	115	84	18	43	23	24
9	8.8	26	18	58	53	23	123	56	19	72	25	25
10	9.7	18	12	48	46	21	78	40	30	44	39	28
11	14	20	9.7	46	123	59	65	26	34	36	42	38
12	12	10	20	57	96	441	60	45	19	31	69	32
13	8.7	8.2	26	46	50	136	59	35	17	26	31	27
14	8.7	9.3	23	43	42	356	79	23	17	24	24	27
15	9.5	20	25	41	40	613	66	40	15	21	57	33
16	10	19	22	44	36	90	92	64	163	46	540	30
17	13	225	21	49	30	159	146	58	82	219	121	25
18	23	33	21	44	29	139	83	59	41	67	66	23
19	13	19	19	240	30	76	65	34	27	43	37	24
20	13	15	223	1040	165	58	45	28	24	30	37	24
21	12	17	214	774	72	118	64	23	18	24	34	24
22	11	25	102	336	48	125	144	28	24	45	63	23
23	13	121	70	115	36	469	55	37	23	61	43	19
24	24	90	52	90	34	193	49	40	19	32	37	21
25	26	32	254	240	36	73	59	36	17	22	208	22
26	13	39	302	97	31	54	48	39	40	22	197	29
27	16	46	71	85	31	210	38	28	26	25	53	31
28	1300	38	51	74	45	72	77	22	109	43	55	30
29	88	32	43	64	---	87	64	26	39	34	45	26
30	42	147	39	57	---	325	55	37	71	37	38	21
31	48	---	37	53	---	503	---	34	---	32	30	---
TOTAL	1823.0	1692.5	1961.7	6215	1452	4643	2914	1252	1060	1542	2276	1365
MEAN	58.8	56.4	63.3	200	51.9	150	97.1	40.4	35.3	49.7	73.4	45.5
MAX	1300	225	302	1760	165	613	432	84	163	219	540	419
MIN	8.2	8.2	9.7	35	29	21	38	22	15	21	23	19
AC-FT	3620	3360	3890	12330	2880	9210	5780	2480	2100	3060	4510	2710

CAL YR 1981 TOTAL 12330.0 MEAN 33.8 MAX 1300 MIN 3.8 AC-FT 24460
WTR YR 1982 TOTAL 28196.2 MEAN 77.2 MAX 1760 MIN 8.2 AC-FT 55930

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 TEMPERATURES: April 1973 to September 1981.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

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

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm Dec. 1, 1980; minimum, 30 micromhos/cm Apr. 19, 1974.
WATER TEMPERATURES: Maximum, 30.0°C May 6, 1973; minimum, 16.0°C Mar. 16, 1976.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L Feb. 7, 1976; minimum daily mean, 8 mg/L Jan. 26, Mar. 5, 1981.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons (29,800 tonnes) Apr. 19, 1974; minimum daily, 0.07 ton (0.06 tonne) Sept. 4, Oct. 1, 1975.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,310 mg/L Oct. 28; minimum daily mean, 10 mg/L on several days during the year.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons (29,800 tonnes) Jan. 7; minimum daily, 0.41 ton (0.37 tonne) June 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
DEC					
01...	0910	52	180	6.7	21.0
JAN					
27...	1125	96	280	6.5	21.0
FEB					
23...	0945	33	390	7.0	21.5
MAR					
09...	1050	19	470	6.9	22.0
APR					
27...	1015	37	400	6.8	22.5
JUN					
23...	1150	16	500	7.1	24.5
28...	1100	206	130	6.9	24.5
AUG					
04...	1015	25	380	6.8	24.0
24...	0945	27	395	6.8	24.0

DATE	TIME	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)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
DEC										
01...	0910	36	8.7	100	8600	17000	30	6.0	5.7	3.9
JAN										
27...	1125	15	9.1	102	3200	40000	54	17	10	7.1
FEB										
23...	0945	4.5	8.1	92	600	2200	66	12	12	8.8
APR										
27...	1015	1.6	8.6	99	2200	1100	71	18	13	9.3
JUN										
28...	1100	37	7.9	95	8900	93000	22	3.0	4.6	2.6
AUG										
24...	0945	5.2	7.5	--	9400	38000	64	14	11	8.9

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
DEC									
01...	20	57	1.6	2.0	24	5.0	33	.6	20
JAN									
27...	29	53	1.8	2.2	37	10	55	.1	24
FEB									
23...	51	61	2.8	3.0	54	20	69	.2	49
APR									
27...	47	58	2.5	2.8	53	17	75	.2	44
JUN									
28...	15	58	1.4	1.5	19	11	19	.1	12
AUG									
24...	51	62	2.8	2.8	50	20	76	.1	47

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
DEC 01...	114	105	.16	.88	.280	.64	.270	.220	.190
JAN 27...	155	160	.21	1.2	.320	.71	.180	.170	.190
FEB 23...	253	246	.34	2.6	.360	1.40	.680	.700	.650
APR 27...	253	240	.34	2.2	.360	1.40	.520	.510	.520
JUN 28...	76	77	.10	.31	.160	1.10	.240	.040	.070
AUG 24...	274	247	.37	2.0	.200	1.10	.750	.610	.610

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)
DEC 01...	0910	1	0	1	<100	13	43	<1	10	<10
FEB 23...	0945	2	--	<1	<100	11	<1	<1	10	<10
APR 27...	1015	<1	--	<1	<100	9	<1	<3	10	<10
AUG 24...	0945	<1	--	1	<100	12	<1	<1	<10	10

DATE	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
DEC 01...	2	<3	7	6	1	3100	3000	150	4
FEB 23...	3	<3	5	2	3	690	630	65	3
APR 27...	5	<1	6	4	2	410	350	64	3
AUG 24...	2	<1	7	0	7	630	460	170	1

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
DEC 01...	--	<1	190	80	110	.1	<.1	7	6
FEB 23...	--	<1	80	0	83	.1	<.1	5	--
APR 27...	--	<1	80	10	68	<.1	<.1	5	4
AUG 24...	0	1	90	0	96	<.1	<.1	6	--

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC									
01...	1	<1	--	<1	<1	<1	30	30	5
FEB									
23...	<1	1	0	1	1	<1	10	--	<3
APR									
27...	1	1	0	1	<1	<1	20	--	<12
AUG									
24...	<1	1	0	1	1	<1	10	0	10

DATE	TIME	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	PCN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-DANE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
DEC												
01...	0910	--	3	.0	--	.6	--	33	--	28	--	45
FEB												
23...	0945	.00	--	--	.00	--	.00	--	.00	--	.00	--
APR												
27...	1015	<.10	2	<1.0	<.01	<.1	<.10	34	<.01	22	<.01	36

DATE	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-ELDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ENDO-SULFAN, TOTAL (UG/L)	ENDO-SULFAN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
DEC												
01...	--	73	--	--	1.6	--	.0	--	.0	--	--	.6
FEB												
23...	.00	--	.10	.00	--	.00	--	.00	--	.00	.00	--
APR												
27...	<.01	52	.06	<.01	1.0	<.01	<.1	<.01	<.1	<.01	<.01	.4

DATE	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METH-OXY-CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
DEC											
01...	--	2.3	--	.1	--	--	.0	--	--	--	.0
FEB											
23...	.00	--	.01	--	.01	.00	--	.00	.00	.00	--
APR											
27...	<.01	.8	.01	.6	.01	<.01	<.1	<.01	<.01	<.01	<.1

DATE	NAPH-THA-LENES, POLY-CHLOR, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE IN BOTTOM MATERIL (UG/KG)	TOX-APHENE, TOTAL (UG/L)	TOXA-PHENE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC											
01...	--	--	--	.00	--	.0	--	--	--	--	--
FEB											
23...	.00	.00	.00	--	0	--	.00	.01	.00	.00	.00
APR											
27...	<.10	<.10	<.01	<1.00	<1	<10	<.01	<.01	<.01	<.01	<.01

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
28...	1000	7240	6050	118000	90
30...	0930	33	7390	658	98
DEC					
01...	0910	52	55	7.7	100
JAN					
06...	2245	4640	4610	57800	61
20...	1700	2400	4250	27500	86
27...	1125	96	11	2.9	100
FEB					
23...	0945	33	8	.71	100
MAR					
09...	1050	19	--	--	--
15...	0300	2100	2610	14800	89
APR					
27...	1015	37	5	.50	100
JUN					
16...	1630	450	1150	1400	94
23...	1150	16	--	--	--
28...	1100	206	195	108	100
JUL					
17...	0100	482	1250	1630	95
AUG					
04...	1015	25	--	--	--
24...	0945	27	12	.87	100
SEP					
01...	1600	1530	3170	13100	93

DATE	TIME	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM
OCT										
28...	1000	33	49	62	78	82	95	98	99	100
30...	0930	34	46	59	77	93	99	100	--	--
JAN										
06...	2245	20	27	38	51	59	83	95	99	100
20...	1700	30	39	--	62	--	95	99	100	--
MAR										
15...	0300	24	32	--	64	--	96	99	100	--
JUN										
16...	1630	31	44	--	75	--	98	100	--	--
JUL										
17...	0100	36	55	--	77	--	99	100	--	--
SEP										
01...	1600	27	38	55	74	90	97	99	100	--

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	8.8	70	1.7	147	392	530	53	200	29
2	8.3	60	1.3	200	565	307	43	175	20
3	15	65	2.6	131	400	141	51	90	12
4	13	40	1.4	42	180	20	27	75	5.5
5	11	45	1.3	23	70	4.3	23	70	4.3
6	14	55	2.1	19	60	3.1	28	45	3.4
7	8.2	50	1.1	75	200	40	24	35	2.3
8	8.3	45	1.0	46	70	8.7	38	125	13
9	8.8	50	1.2	26	65	4.6	18	65	3.2
10	9.7	50	1.3	18	55	2.7	12	45	1.5
11	14	40	1.5	20	50	2.7	9.7	45	1.2
12	12	40	1.3	10	40	1.1	20	60	3.2
13	8.7	70	1.6	8.2	35	.77	26	70	4.9
14	8.7	70	1.6	9.3	40	1.0	23	40	2.5
15	9.5	90	2.3	20	75	4.1	25	35	2.4
16	10	120	3.2	19	40	2.1	22	32	1.9
17	13	140	4.9	225	513	403	21	30	1.7
18	23	80	5.0	33	80	7.1	21	30	1.7
19	13	70	2.5	19	65	3.3	19	25	1.3
20	13	95	3.3	15	40	1.6	223	258	170
21	12	90	2.9	17	50	2.3	214	186	144
22	11	70	2.1	25	50	3.4	102	67	23
23	13	40	1.4	121	96	31	70	40	7.6
24	24	50	3.2	90	111	38	52	30	4.2
25	26	55	3.9	32	35	31	254	546	741
26	13	45	1.6	39	45	4.7	302	353	483
27	16	55	2.4	46	25	3.1	71	37	7.1
28	1300	2310	20100	38	20	2.1	51	22	3.0
29	88	150	36	32	20	1.7	43	17	2.0
30	42	130	15	147	159	98	39	16	1.7
31	48	140	18	---	---	---	37	15	1.5
TOTAL	1823.0	---	20228.7	1692.5	---	1703.47	1961.7	---	1703.1
		JANUARY			FEBRUARY			MARCH	
1	35	14	1.3	49	12	1.6	34	14	1.3
2	50	20	2.7	47	12	1.5	39	16	1.7
3	61	23	3.8	44	12	1.4	34	14	1.3
4	39	14	1.5	44	13	1.5	32	12	1.0
5	35	13	1.2	45	14	1.7	27	12	.87
6	403	647	7560	51	14	1.9	26	12	.84
7	1760	2160	32900	48	14	1.8	25	12	.81
8	91	95	23	51	15	2.1	26	14	.98
9	58	75	12	53	22	3.1	23	12	.75
10	48	60	7.8	46	20	2.5	21	12	.68
11	46	55	6.8	123	428	170	59	24	3.8
12	57	75	12	96	160	41	441	713	1070
13	46	55	6.8	50	34	4.6	136	90	33
14	43	40	4.6	42	23	2.6	356	812	2010
15	41	38	4.2	40	17	1.8	613	1010	3380
16	44	45	5.3	36	13	1.3	90	65	16
17	49	48	6.4	30	12	.97	159	223	110
18	44	35	4.2	29	12	.94	139	202	88
19	240	460	1320	30	12	.97	76	80	16
20	1040	1400	4800	165	152	103	58	30	4.7
21	774	552	1210	72	45	8.7	118	127	62
22	336	200	181	48	38	4.9	125	120	49
23	115	37	11	36	20	1.9	469	546	1000
24	90	30	7.3	34	17	1.6	193	112	75
25	240	206	201	36	18	1.7	73	38	7.5
26	97	36	9.4	31	12	1.0	54	30	4.4
27	85	30	6.9	31	14	1.2	210	295	289
28	74	20	4.0	45	16	1.9	72	75	15
29	64	17	2.9	---	---	---	87	45	11
30	57	14	2.2	---	---	---	325	272	274
31	53	14	2.0	---	---	---	503	358	610
TOTAL	6215	---	48321.3	1452	---	369.18	4643	---	9138.63

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

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	211	480	457	52	20	2.8	20	10	.54
2	188	275	164	50	12	1.6	18	10	.49
3	149	158	78	60	12	1.9	24	11	.71
4	91	38	9.3	41	15	1.7	20	10	.54
5	63	25	4.3	29	10	.78	23	10	.62
6	51	25	3.4	29	12	.94	33	12	1.1
7	432	1070	2790	49	32	7.2	30	12	.97
8	115	160	50	84	83	21	18	10	.49
9	123	70	23	56	28	4.2	19	10	.51
10	78	28	5.9	40	17	1.8	30	25	2.0
11	65	20	3.5	26	13	.91	34	20	1.8
12	60	18	2.9	45	22	2.7	19	12	.62
13	59	16	2.5	35	18	1.7	17	10	.46
14	79	30	6.4	23	12	.75	17	10	.46
15	66	25	4.5	40	16	1.7	15	10	.41
16	92	50	12	64	20	3.5	163	401	530
17	146	100	39	58	20	3.1	82	267	68
18	83	40	9.0	59	37	5.0	41	130	14
19	65	25	4.4	34	27	2.5	27	45	3.3
20	45	15	1.8	28	18	1.4	24	30	1.9
21	64	23	4.0	23	17	1.1	18	25	1.2
22	144	92	44	28	18	1.4	24	25	1.6
23	55	24	3.6	37	18	1.8	23	20	1.2
24	49	16	2.1	40	18	1.9	19	20	1.0
25	59	14	2.2	36	18	1.7	17	20	.92
26	48	12	1.6	39	22	2.3	40	26	2.8
27	38	10	1.0	28	15	1.1	26	20	1.4
28	77	25	5.2	22	12	.71	109	102	35
29	64	22	3.8	26	12	.84	39	32	3.4
30	55	24	3.6	37	12	1.2	71	38	7.3
31	---	---	---	34	12	1.1	---	---	---
TOTAL	2914	---	3742.0	1252	---	82.33	1060	---	684.74
		JULY			AUGUST			SEPTEMBER	
1	67	50	13	122	284	209	419	860	2760
2	67	46	8.3	92	90	22	120	220	71
3	42	30	3.4	38	30	3.1	48	25	3.2
4	75	38	7.7	29	25	2.0	39	23	2.4
5	69	30	5.6	24	20	1.3	46	20	2.5
6	47	20	2.5	33	18	1.6	50	18	2.4
7	96	110	33	24	12	.78	37	17	1.7
8	43	36	4.2	23	15	.93	24	16	1.0
9	72	49	11	25	17	1.1	25	16	1.1
10	44	25	3.0	39	19	2.0	28	17	1.3
11	36	17	1.7	42	20	2.3	38	20	2.1
12	31	15	1.3	69	43	9.5	32	15	1.3
13	26	14	.98	31	20	1.7	27	20	1.5
14	24	13	.84	24	15	.97	27	20	1.5
15	21	11	.62	57	87	49	33	18	1.6
16	46	32	4.0	540	865	2670	30	17	1.4
17	219	397	304	121	100	33	25	15	1.0
18	67	70	13	66	30	5.3	23	14	.87
19	43	30	3.5	37	22	2.2	24	14	.91
20	30	19	1.5	37	20	2.0	24	14	.91
21	24	15	.97	34	25	2.3	24	14	.91
22	45	40	4.9	63	32	5.4	23	14	.87
23	61	82	14	43	30	3.5	19	11	.56
24	32	39	3.4	37	20	2.0	21	13	.74
25	22	20	1.2	208	195	254	22	15	.89
26	22	20	1.2	197	188	132	29	16	1.3
27	25	20	1.4	53	30	4.3	31	16	1.3
28	43	20	2.3	55	23	3.4	30	16	1.3
29	34	18	1.7	45	20	2.4	26	15	1.1
30	37	20	2.0	38	18	1.8	21	10	.57
31	32	15	1.3	30	15	1.2	---	---	---
TOTAL	1542	---	497.51	2276	---	3432.08	1365	---	2869.23
YEAR	28196.2		92732.27						

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from lower bridge on Highway 90, 0.6 mi (1.0 km) northwest of Pearl City, and 2.0 mi (3.2 km) northeast of Waipahu.

DRAINAGE AREA.--26.4 mi² (68.4 km²).

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

REVISED RECORDS.--WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft (0.552 m) above mean sea level.

REMARKS.--Records good except those above 200 ft³/s (5.66 m³/s), which are poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--30 years, 34.7 ft³/s (0.983 m³/s), 25,140 acre-ft/yr (31.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft³/s (736 m³/s) Oct. 28, 1981, gage height, 22.46 ft (6.846 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurements at gage heights 17.1 ft (5.21 m) and 20.56 ft (6.267 m); minimum, 1.7 ft³/s (0.048 m³/s) Nov. 8, 9, 1973, Jan. 26, Sept. 25, 27, 1977, Mar. 25, Apr. 2-4, 1978, Apr. 22, Sept. 15, 20, 1981.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0800	*26000	736	*22.46	6.846	Mar. 27	0930	2790	79.0	9.93	3.027
Dec. 25	1200	2370	67.1	10.98	3.347	Mar. 31	1300	3800	108	11.05	3.368
Jan. 6	2330	4100	116	12.95	3.947	Apr. 17	1300	2780	78.7	9.41	2.869
Jan. 21	0430	2370	67.1	9.38	2.859	June 16	1400	4090	116	11.94	3.639
Mar. 12	1530	4650	132	11.88	3.621	Aug. 16	0900	11000	312	16.96	5.169
Mar. 15	0230	6380	181	13.40	4.084	Aug. 25	1800	4540	129	12.38	3.773
Mar. 23	0730	5240	148	12.44	3.792	Sept. 1	1330	7370	209	14.72	4.487

Minimum discharge, 2.0 ft³/s (0.057 m³/s) Dec. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	186	63	7.8	11	7.9	180	23	6.4	85	248	720
2	4.0	262	98	35	9.4	33	244	15	6.4	39	86	79
3	4.6	184	67	49	7.7	29	157	20	6.1	33	26	40
4	5.2	32	25	18	6.5	15	80	9.9	7.1	53	14	26
5	5.6	17	14	11	7.5	7.4	65	8.3	5.3	45	8.4	22
6	5.0	12	9.4	318	9.2	5.6	42	7.3	5.1	31	7.1	22
7	4.6	70	7.1	458	7.1	4.8	338	20	5.0	128	8.7	17
8	4.5	16	13	57	7.1	4.5	80	28	5.2	34	8.3	15
9	4.0	7.4	6.0	36	8.8	4.1	151	9.9	4.4	87	9.7	16
10	3.1	5.0	4.6	28	9.1	3.9	66	6.9	24	30	52	18
11	3.0	4.1	3.5	25	97	45	52	7.5	11	15	38	22
12	2.7	3.4	3.2	22	46	900	47	22	5.5	16	50	18
13	2.7	3.0	3.0	21	16	128	48	12	3.8	10	12	17
14	2.5	2.8	2.9	19	9.7	488	80	7.3	3.5	9.4	7.0	33
15	2.5	2.8	2.7	18	7.4	1060	45	8.9	3.3	9.1	341	25
16	2.6	12	3.0	18	6.1	61	128	9.5	303	132	1390	17
17	2.9	392	2.7	20	5.4	224	383	36	29	307	128	15
18	3.1	27	2.5	19	5.0	224	65	116	19	49	58	14
19	2.5	18	117	180	5.2	55	38	18	29	18	27	12
20	2.5	10	375	581	358	31	21	11	10	11	17	9.6
21	2.4	6.5	392	836	38	176	76	6.8	5.0	8.2	37	9.1
22	2.4	4.5	98	313	20	106	108	9.1	4.0	42	63	8.5
23	2.6	166	69	69	27	1060	24	5.9	3.8	41	28	8.3
24	2.4	106	27	57	15	224	17	17	4.5	29	72	7.6
25	2.4	26	380	277	8.3	59	28	44	17	8.0	816	6.9
26	2.6	17	244	70	8.7	34	24	19	21	5.3	211	6.0
27	7.7	27	58	58	6.5	362	14	8.8	23	4.6	56	6.0
28	3020	18	29	52	15	43	86	6.0	110	13	75	6.1
29	177	11	19	38	---	48	37	4.8	22	23	42	6.2
30	79	179	13	24	---	390	47	7.6	66	28	25	6.2
31	90	---	9.6	14	---	844	---	12	---	12	21	---
TOTAL	3460.7	1827.5	2161.2	3748.8	777.7	6677.2	2771	537.5	968.4	1355.6	3982.2	1228.5
MEAN	112	60.9	69.7	121	27.8	215	92.4	17.3	32.3	43.7	128	41.0
MAX	3020	392	392	836	358	1060	383	116	503	307	1390	720
MIN	2.4	2.8	2.5	7.8	5.0	3.9	14	4.8	3.3	4.6	7.0	6.0
AC-FT	6860	3620	4290	7440	1540	13240	5500	1070	1920	2690	7900	2440

CAL YR 1981 TOTAL 13489.8 MEAN 37.0 MAX 3020 MIN 2.4 AC-FT 26760
WTR YR 1982 TOTAL 29496.3 MEAN 80.8 MAX 3020 MIN 2.4 AC-FT 58510

16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA

LOCATION.--Lat 21°23'07", long 157°56'22", Hydrologic Unit 20060000, on left bank at downstream side of Moanalua Road bridge, 0.4 mi (0.6 km) northwest of Aiea Post Office, and 2.3 mi (3.7 km) southeast of Pearl City Post Office.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

PERIOD OF RECORD.--July 1957 to September 1982 (discontinued).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 11.71 ft (3.569 m) above mean sea level. Nov. 15, 1965, to June 16, 1966, at datum 0.04 ft (0.012 m) higher. Prior to Nov. 15, 1965, and June 17, 1966, to Sept. 30, 1970, at datum 1.04 ft (0.317 m) higher.

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

AVERAGE DISCHARGE.--25 years, 3.06 ft³/s (0.087 m³/s), 2,220 acre-ft/yr (2.74 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 245 ft³/s (6.94 m³/s) revised, and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0645	*2130	60.3	*6.23	1.899	Mar. 27	0830	266	7.53	3.56	1.085
Nov. 1	1930	375	10.6	3.83	1.167	June 16	1330	662	18.7	4.37	1.332
Dec. 25	1130	288	8.16	3.62	1.103	July 22	1330	500	14.2	4.08	1.244
Jan. 21	1530	352	9.97	3.78	1.152	Aug. 16	0930	965	27.3	4.85	1.478
Mar. 12	1515	288	8.16	3.62	1.103	Aug. 25	1700	752	21.3	4.52	1.378
Mar. 15	0130	848	24.0	4.68	1.426	Sept. 1	1145	1940	54.9	6.02	1.835
Mar. 23	0645	332	9.40	3.73	1.137						

No flow several days in December and September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	28	5.0	.16	.36	.14	31	3.9	.10	9.1	14	26
2	.08	24	8.3	16	.20	.94	25	2.7	.09	4.8	9.2	17
3	.08	14	6.8	11	.26	.11	16	2.3	.09	2.9	2.3	4.5
4	.05	4.1	2.7	3.4	.52	.11	5.8	.37	.13	6.5	.77	2.2
5	.08	1.7	.93	1.6	.51	.11	3.3	.15	.17	4.7	.25	1.2
6	.07	.50	.24	9.4	.68	.14	2.0	.09	1.1	2.8	.21	.59
7	.07	2.9	.62	54	.58	.25	11	.14	.71	10	.20	.29
8	.08	1.2	.36	6.3	.14	.33	7.9	.90	.06	3.0	.17	.15
9	.08	.15	.07	2.9	.13	.28	23	.12	.07	10	.17	.11
10	.05	.05	.02	2.0	.60	.16	4.0	.06	.05	4.3	1.2	.12
11	.05	.04	.00	1.5	2.5	2.8	1.9	.05	.07	1.4	.66	.09
12	.08	.04	.00	.91	3.6	68	1.0	.06	.12	3.1	2.4	.12
13	.05	.04	.00	.40	.69	16	.56	.07	.15	.77	.34	.15
14	.04	.07	.00	.16	.19	32	2.3	.10	.10	.27	.09	.10
15	.05	.05	.00	.27	.14	111	1.7	.05	.09	.08	26	.03
16	.05	.09	.00	.21	.19	6.8	8.5	.41	43	7.8	131	.02
17	.07	32	.00	.17	.20	6.4	20	.18	12	20	15	.02
18	.05	2.9	.00	.17	.10	8.1	5.6	9.7	5.2	5.5	5.7	.01
19	.04	.99	15	15	.14	5.2	3.0	1.1	.62	1.5	2.5	.00
20	.04	.24	32	76	25	2.3	1.6	.75	.35	.45	1.2	.00
21	.04	.26	39	150	4.2	15	14	.51	.11	.13	2.2	.00
22	.04	.02	9.9	36	1.0	11	18	.34	.11	31	12	.00
23	.08	15	5.5	7.8	6.2	76	4.0	.18	.13	11	3.8	.00
24	.04	12	2.9	8.3	2.1	25	2.9	.16	.21	6.8	11	.04
25	.06	2.9	34	41	.30	6.3	2.2	.17	2.5	1.3	139	.10
26	.08	1.2	31	7.7	.10	3.4	1.3	.12	1.8	.20	27	.11
27	.58	2.3	7.2	4.2	.34	34	.88	.12	2.9	.16	5.7	.35
28	94	1.4	3.4	2.9	1.6	5.3	10	.11	13	.16	7.9	1.9
29	10	.58	1.8	2.0	---	3.2	4.6	.10	2.9	1.8	4.0	.99
30	2.2	12	.89	1.6	---	48	4.6	.10	6.9	4.8	2.2	.05
31	4.1	---	.36	.86	---	74	---	.09	---	.99	1.6	---
TOTAL	112.47	160.72	207.99	463.91	52.57	562.37	237.64	25.20	94.83	157.31	429.76	56.24
MEAN	3.63	5.36	6.71	15.0	1.88	18.1	7.92	.81	3.16	5.07	13.9	1.87
MAX	94	32	39	150	25	111	31	9.7	43	31	139	26
MIN	.04	.02	.00	.16	.10	.11	.56	.05	.05	.08	.09	.00
AC-FT	223	319	413	920	104	1120	471	50	188	312	852	112

CAL YR 1981 TOTAL 1016.54 MEAN 2.79 MAX 217 MIN .00 AC-FT 2020
WTR YR 1982 TOTAL 2561.01 MEAN 7.02 MAX 150 MIN .00 AC-FT 5080

HAWAII, ISLAND OF OAHU

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi (4.3 km) upstream from confluence with South Halawa Stream and 2.7 mi (4.3 km) northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi² (8.94 km²).

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

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

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

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

AVERAGE DISCHARGE.--32 years (water years, 1930-32, 1954-82), 5.11 ft³/s (0.145 m³/s), 3,700 acre-ft/yr (4.56 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft³/s (188 m³/s) Feb. 28, 1932, gage height, 13.36 ft (4.103 m), from rating curve extended above 420 ft³/s (11.9 m³/s); maximum gage height, 13.46 ft (4.103 m) May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 570 ft³/s (16.1 m³/s) and maximum (*), from rating curve extended above 63 ft³/s (1.78 m³/s) on basis of slope-area measurements at gage heights 10.3 ft (3.140 m), 13.04 ft (3.975 m), and 13.46 ft (4.103 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0630	*1970	55.8	*11.94	3.639	Aug. 16	0900	1270	36.0	10.70	3.261
Nov. 1	1830	740	21.0	9.40	2.865	Aug. 25	1630	1090	30.9	10.33	3.149
Mar. 15	0230	952	27.0	9.98	3.042	Sept. 1	1130	1000	28.3	10.11	3.082

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	45	8.0	1.1	1.4	1.1	52	4.9	.80	23	24	100
2	.00	55	7.1	16	1.5	.80	59	5.9	.58	8.0	17	23
3	.00	36	6.6	12	1.3	1.4	33	4.1	.48	5.3	4.4	8.3
4	.00	9.3	3.2	4.9	1.1	1.1	14	2.6	.44	8.0	2.6	5.3
5	.00	3.9	1.9	2.7	1.1	.58	8.0	2.3	.40	7.6	1.6	3.6
6	.00	2.3	1.3	8.4	1.1	.32	5.8	1.9	2.1	8.4	1.4	2.8
7	.00	4.0	1.0	49	1.0	.17	11	4.1	1.1	24	1.2	2.2
8	.00	2.0	.75	9.5	.93	.10	23	3.4	.48	7.4	1.2	2.2
9	.00	1.1	.63	4.4	.80	.07	39	1.6	.34	18	1.6	2.0
10	.00	.80	.34	3.6	.93	4.4	10	1.4	.56	6.6	5.1	1.9
11	.00	.58	.21	3.6	6.3	15	5.6	1.3	.80	3.5	3.0	2.0
12	.00	.38	.14	2.0	3.6	86	4.1	1.7	.44	9.0	5.1	1.4
13	.00	.25	.10	1.4	1.4	30	4.8	1.3	.29	4.0	1.8	1.4
14	.00	.14	.08	1.1	1.0	45	6.0	1.1	.14	2.6	3.4	2.2
15	.00	.10	.05	.93	.80	146	3.9	1.5	.11	2.0	33	1.5
16	.00	3.4	.03	.88	.58	16	20	1.1	66	9.2	159	1.3
17	.00	44	.02	1.4	.38	11	42	3.3	21	29	39	1.0
18	.00	4.7	.02	1.4	.27	9.7	15	20	13	8.6	14	.93
19	.00	2.2	29	16	9.0	6.4	8.0	3.2	3.9	4.1	6.4	.80
20	.00	1.4	51	92	34	3.8	6.2	1.8	2.8	2.6	3.9	.63
21	.00	.93	64	150	7.6	31	33	1.8	2.5	1.9	7.2	.52
22	.00	.63	19	50	2.7	22	37	1.6	1.1	31	21	.48
23	.00	19	11	14	5.5	111	10	1.1	.75	19	17	.40
24	.95	15	5.3	15	2.2	49	6.6	.93	.52	5.4	30	.40
25	.01	4.4	37	52	1.1	15	4.7	3.2	12	2.2	164	.44
26	.02	2.6	43	15	.93	7.2	3.8	2.6	3.0	1.4	49	.40
27	.02	3.4	12	7.6	3.0	63	3.8	1.4	6.6	2.4	16	.52
28	204	2.4	5.4	5.1	2.3	13	18	.93	21	2.0	19	.32
29	16	1.5	3.2	4.7	---	16	7.4	.68	6.6	6.0	7.6	.25
30	4.2	18	2.0	3.9	---	95	7.0	3.4	13	7.7	5.6	.19
31	5.4	---	1.4	2.4	---	140	---	1.6	---	2.0	3.9	---
TOTAL	230.60	284.41	314.77	552.01	93.82	941.14	501.7	87.74	182.83	271.9	669.0	168.38
MEAN	7.44	9.48	10.2	17.8	3.35	30.4	16.7	2.83	6.09	8.77	21.6	5.61
MAX	204	55	64	150	34	146	59	20	66	31	164	100
MIN	.00	.10	.02	.88	.27	.07	3.8	.68	.11	1.4	1.2	.19
AC-FT	457	564	624	1090	186	1870	995	174	363	539	1330	334

CAL YR 1981 TOTAL 1650.09 MEAN 4.52 MAX 257 MIN .00 AC-FT 3270
WTR YR 1982 TOTAL 4298.30 MEAN 11.8 MAX 204 MIN .00 AC-FT 8530

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi (3.1 km) upstream from Kamanaiki Stream and 4.1 mi (6.6 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi² (6.76 km²).

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Records fair except for period of no gage-height record, which are poor.

AVERAGE DISCHARGE.--68 years (water years 1915-82), 6.79 ft³/s (0.192 m³/s), 4,920 acre-ft/yr (6.07 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft³/s (351 m³/s) Nov. 18, 1930, gage height, 13.81 ft (4.209 m), from rating curve extended above 280 ft³/s (7.93 m³/s) on basis of indirect measurements at gage heights 8.9 ft (2.71 m), 10.96 ft (3.341 m), and 11.27 ft (3.435 m); minimum, 0.09 ft³/s (0.003 m³/s) Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0800	1670	47.3	9.16	2.792	Mar. 15	0200	2110	59.8	9.69	2.954
Nov. 1	1800	960	27.2	7.96	2.426	Mar. 31	0830	714	20.2	7.36	2.243
Dec. 25	1100	790	22.4	7.55	2.301	Aug. 25	1700	*5120	145	*11.81	3.600
Jan. 21	1500	914	25.9	7.86	2.396	Sept. 1	1100	2500	70.8	10.11	3.082

Minimum discharge, 0.30 ft³/s (0.008 m³/s) several days in October.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	36	6.3	5.4	6.2	4.2	59	6.5	2.3	19	15	70
2	1.0	23	4.0	22	5.9	3.2	82	6.2	2.2	6.2	10	11
3	.57	12	3.2	12	5.4	3.4	40	5.6	2.0	7.9	4.2	7.4
4	.82	5.4	3.0	6.8	4.9	2.8	24	5.1	2.2	15	3.8	7.1
5	.73	4.0	2.4	5.6	4.9	2.6	18	5.1	1.9	5.9	3.6	6.8
6	.57	3.2	2.3	12	4.6	2.4	14	4.6	2.6	16	4.3	5.6
7	.50	3.4	2.4	36	4.0	2.4	17	5.6	2.3	16	3.6	5.4
8	.50	2.3	2.2	9.1	4.0	2.3	33	4.6	1.9	7.6	3.6	5.6
9	.43	2.0	1.9	7.4	3.7	2.3	32	4.2	1.8	15	3.6	4.9
10	.43	1.9	1.6	6.8	4.0	5.3	13	3.8	18	5.9	10	5.9
11	.36	1.9	1.6	5.9	7.5	17	10	4.0	3.4	4.9	5.0	4.6
12	.36	1.6	1.6	5.4	4.4	79	8.7	4.2	2.3	4.4	8.0	4.4
13	.65	1.5	1.5	5.1	3.6	23	8.7	3.4	2.8	4.0	3.6	4.2
14	.57	1.4	1.6	4.9	3.1	38	15	3.8	2.3	3.6	5.0	9.5
15	.43	1.8	1.6	4.2	3.0	163	8.9	3.6	2.0	3.8	30	4.4
16	.36	11	1.6	5.1	2.6	19	35	4.2	29	5.1	130	4.0
17	.36	41	1.6	5.4	2.6	16	36	6.0	19	16	40	3.6
18	.60	5.9	1.5	4.4	2.6	13	22	18	5.9	5.9	12	3.4
19	.54	4.6	6.7	14	5.4	9.1	13	5.4	7.3	3.8	8.0	3.2
20	.47	3.6	60	84	32	7.5	11	4.0	3.6	3.6	7.0	3.0
21	.36	3.0	22	148	7.4	18	20	4.0	3.2	3.5	13	3.6
22	.43	2.6	14	45	4.6	23	16	3.4	2.8	12	17	3.2
23	.70	7.1	14	20	4.0	160	9.1	3.2	2.4	4.0	12	3.0
24	.55	5.5	9.8	20	3.8	30	8.7	3.6	2.3	3.4	37	2.8
25	.60	3.8	50	53	3.6	11	8.0	5.6	11	3.3	180	2.6
26	1.3	3.2	20	16	3.4	12	6.8	3.2	4.2	3.1	45	3.4
27	2.0	3.8	10	11	6.6	50	7.4	2.8	6.8	3.2	15	2.8
28	101	3.0	9.1	9.1	4.0	13	18	2.4	13	6.4	13	2.3
29	5.6	3.0	8.0	8.3	---	11	7.1	2.4	4.9	5.1	8.3	2.2
30	2.8	7.5	7.1	7.5	---	86	8.7	4.0	6.5	7.9	7.7	2.2
31	3.6	---	6.2	6.8	---	174	---	2.4	---	4.2	6.8	---
TOTAL	130.01	210.0	278.8	606.2	151.8	1003.5	610.1	144.9	171.9	225.7	665.1	202.1
MEAN	4.19	7.00	8.99	19.6	5.42	32.4	20.3	4.67	5.73	7.28	21.5	6.74
MAX	101	41	60	148	32	174	82	18	29	19	180	70
MIN	.36	1.4	1.5	4.2	2.6	2.3	6.8	2.4	1.8	3.1	3.6	2.2
AC-FT	258	417	553	1200	301	1990	1210	287	341	448	1320	401

CAL YR 1981 TOTAL 1644.65 MEAN 4.51 MAX 258 MIN .36 AC-FT 3260
WTR YR 1982 TOTAL 4400.11 MEAN 12.1 MAX 180 MIN .36 AC-FT 8730

NOTE.--No gage-height record Aug. 1-26.

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
26...	1100	1.6	160	7.6	21.5
NOV					
25...	1200	3.6	145	7.3	20.0
MAR					
25...	1135	14	140	6.8	19.0
APR					
26...	1520	7.4	140	7.0	20.0
MAY					
26...	1345	3.4	140	7.2	20.0
JUL					
28...	1145	5.1	100	7.1	22.5
AUG					
26...	1230	23	120	6.9	22.0

DATE	TIME	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
NOV									
25...	1200	35	5.0	9.9	4.9	15	47	1.1	1.1
MAR									
25...	1135	31	6.0	5.1	4.4	13	47	1.0	.9
MAY									
26...	1345	32	4.0	5.3	4.5	13	47	1.0	.6
AUG									
26 .	1230	28	2.0	4.9	3.8	12	47	1.0	1.2

DATE	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)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
NOV									
25...	30	5.0	28	.1	13	92	.12	.11	--
MAR									
25...	25	5.0	23	.1	12	79	.11	.12	.010
MAY									
26...	28	6.0	20	<.1	12	78	.11	<.10	.040
AUG									
26 .	26	7.0	18	<.1	12	75	.10	.14	--

DATE	TIME	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV			
25...	1200	97	8
MAR			
29...	1135	58	8
MAY			
26...	1345	170	12
AUG			
27...	1230	95	7

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

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

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi (0.6 km) northwest of Bishop Museum, and 2.4 mi (3.9 km) northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi² (13.42 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 70 ft (21 m), from topographic map. Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft (183 m) downstream at different datum.

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

AVERAGE DISCHARGE.--20 years, 11.4 ft³/s (0.323 m³/s), 8,260 acre-ft/yr (10.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s (201 m³/s) Apr. 19, 1974, gage height, 9.98 ft (3.042 m), from rating curve extended above 180 ft³/s (5.10 m³/s) on basis of slope-area measurement at gage height 9.98 ft (3.042 m); minimum, 0.16 ft³/s (0.005 m³/s) June 24, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft (2.44 m) from floodmarks, present site and datum, discharge, 6,350 ft³/s (180 m³/s), from slope-area measurement of peak flow.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0900	1920	54.4	5.38	1.640	Aug. 16	0900	1680	47.6	5.07	1.545
Jan. 21	1500	1640	46.4	5.02	1.530	Aug. 25	1700	*5580	158	*8.80	2.682
Mar. 15	0300	2160	61.2	5.67	1.728						

Minimum discharge, 0.63 ft³/s (0.018 m³/s) Oct. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	102	16	7.0	8.9	5.7	85	13	3.7	29	21	157
2	1.4	49	9.2	67	8.5	4.7	105	11	3.5	12	18	21
3	1.2	24	6.2	28	7.4	5.0	54	9.1	3.3	16	7.0	12
4	2.5	10	4.8	13	6.9	4.2	31	7.8	3.6	28	5.2	11
5	1.7	6.6	4.1	9.6	7.3	4.1	22	7.4	3.5	10	5.2	9.7
6	1.0	5.4	3.9	30	6.3	3.9	19	6.6	3.9	18	4.8	9.7
7	.90	5.0	5.4	88	5.8	3.8	26	8.5	3.6	30	4.1	9.7
8	.90	3.8	3.2	17	5.8	3.7	34	6.6	3.0	12	4.5	9.7
9	.80	3.4	3.0	12	5.3	3.6	47	5.9	2.9	25	5.6	9.1
10	.80	3.1	2.7	13	7.0	7.4	18	5.4	22	11	14	11
11	.90	3.1	2.5	9.7	16	20	14	5.7	4.9	8.0	7.0	9.7
12	.71	2.7	2.4	7.9	7.3	116	12	6.3	3.7	7.0	14	9.1
13	1.0	2.5	2.4	7.1	5.4	41	13	4.9	4.2	6.0	4.8	9.1
14	1.1	2.5	2.6	6.6	4.8	51	19	5.6	3.7	5.6	8.0	15
15	.80	2.5	2.2	6.9	4.5	256	12	5.1	3.0	5.6	43	9.1
16	.71	7.1	2.2	6.6	4.3	30	48	5.1	36	9.1	227	9.1
17	.71	56	2.2	8.9	4.0	38	45	9.7	36	31	66	9.1
18	1.0	9.1	2.5	6.3	4.0	50	27	29	9.1	11	21	9.1
19	.80	7.3	38	31	7.7	22	17	8.0	8.0	6.5	13	8.6
20	.80	5.4	132	250	41	14	14	5.6	4.1	5.6	10	8.6
21	.71	4.4	89	421	12	36	27	5.8	4.1	4.8	17	8.6
22	.80	4.7	28	100	7.9	41	30	4.8	3.3	20	28	8.6
23	1.2	22	18	32	7.6	224	14	4.6	3.3	9.7	15	8.6
24	1.0	15	13	27	6.1	56	13	6.0	3.0	5.6	51	8.6
25	1.1	8.3	118	115	5.4	25	11	10	12	4.8	352	9.1
26	4.5	5.9	75	29	5.5	18	10	5.2	4.5	4.5	57	9.1
27	12	11	23	20	7.8	76	10	4.3	8.0	4.8	23	9.7
28	212	6.6	15	16	5.8	21	48	3.9	24	7.0	25	9.7
29	13	6.9	12	13	---	16	19	3.7	7.5	5.6	15	9.7
30	5.3	23	9.4	11	---	131	25	6.0	9.7	10	12	9.7
31	5.9	---	8.1	9.9	---	194	---	3.9	---	4.8	10	---
TOTAL	278.64	418.3	656.0	1419.5	226.3	1522.1	869	224.5	245.1	368.0	1108.2	447.8
MEAN	8.99	13.9	21.2	45.8	8.08	49.1	29.0	7.24	8.17	11.9	35.7	14.9
MAX	212	102	132	421	41	256	105	29	36	31	352	157
MIN	.71	2.5	2.2	6.3	4.0	3.6	10	3.7	2.9	4.5	4.1	8.6
AC-FT	553	830	1300	2820	449	3020	1720	445	486	730	2200	888

CAL YR 1981 TOTAL 2895.84 MEAN 7.93 MAX 355 MIN .71 AC-FT 5740
WTR YR 1982 TOTAL 7783.44 MEAN 21.3 MAX 421 MIN .71 AC-FT 15440

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 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
DEC					
01...	1030	21	240	7.1	22.0
JAN					
21...	1125	118	210	7.5	22.0
27...	1305	19	230	7.1	21.5
FEB					
23...	1115	6.5	210	7.7	21.5
APR					
27...	1215	9.7	225	8.7	22.5
JUN					
23...	1600	3.2	220	8.5	28.5
28...	1320	17	140	7.7	25.0
AUG					
05...	1530	4.3	200	8.1	27.5
24...	1145	156	600	6.9	23.5

DATE	TIME	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)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
DEC										
01...	1030	18	8.9	100	24000	30000	58	8.0	13	6.3
JAN										
27...	1305	10	9.3	106	11000	12000	56	8.0	11	7.0
FEB										
23...	1115	1.4	9.6	109	51000	23000	56	4.0	11	7.0
APR										
27...	1215	1.4	10.0	116	5900	6100	48	6.0	8.8	6.2
JUN										
28...	1320	20	8.3	101	18000	47000	36	1.0	7.0	4.4
AUG										
24...	1145	230	8.1	--	35000	K110000	14	2.0	3.1	1.5

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
DEC									
01...	19	41	1.1	1.6	50	6.0	29	.1	15
JAN									
27...	21	44	1.2	1.0	48	7.0	32	.0	16
FEB									
23...	20	43	1.2	1.3	52	6.0	33	.1	14
APR									
27...	17	43	1.1	.8	42	5.0	29	<.1	13
JUN									
28...	14	45	1.0	1.4	35	10	16	<.1	12
AUG									
24...	6.0	46	.7	1.1	12	9.0	9.0	<.1	5.0

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
DEC									
01...	135	120	.18	.43	.170	.54	.100	.060	.070
JAN									
27...	124	124	.17	.37	.220	.54	.030	.030	.030
FEB									
23...	120	124	.16	.13	.080	.45	.040	.050	.030
APR									
27...	122	105	.17	<.10	.110	.52	.030	.030	<.010
JUN									
28...	84	86	.11	<.10	.100	1.10	.080	<.010	.040
AUG									
24...	53	42	.07	.13	.110	7.70	.650	.080	.040

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
DEC										
01...	1030	2	1	1	<100	10	<1	<1	<10	--
FEB										
23...	1115	<1	--	<1	<100	8	<1	<1	10	--
APR										
27...	1215	<1	--	<1	<100	7	<1	<3	10	--
AUG										
24...	1145	1	--	<1	<100	7	1	<1	10	0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
DEC									
01...	<10	1	<3	10	8	2	2500	2400	150
FEB									
23...	<10	2	<3	13	11	2	170	60	110
APR									
27...	<10	3	<1	9	7	2	210	110	99
AUG									
24...	10	16	<1	60	52	8	40000	40000	310

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
DEC									
01...	20	19	1	60	50	7	<.1	<.1	4
FEB									
23...	4	--	<1	20	10	9	.1	<.1	2
APR									
27...	3	2	1	10	7	3	.2	<.1	1
AUG									
24...	50	47	3	810	800	14	.2	<.1	62

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC									
01...	3	1	<1	<1	<1	<1	40	20	16
FEB									
23...	--	<1	<1	<1	1	<1	20	20	4
APR									
27...	--	<1	<1	<1	<1	<1	20	--	<12
AUG									
24...	--	<1	2	<1	<1	<1	120	110	14

DATE	TIME	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	PCN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-DANE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ODE, TOTAL (UG/L)	DDE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
DEC												
01...	1030	--	110	--	--	28	--	830	--	.0	--	<7.0
FEB												
23...	1115	.00	--	--	.00	--	.10	--	.00	--	.00	--
APR												
27...	1215	<.10	<1	<1.0	<.01	8.2	.10	410	<.01	<.1	<.01	3.7

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-ELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDO-SULFAN, TOTAL (UG/L)	ENDO-SULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)
DEC												
01...	--	13	--	--	87	--	.0	--	2.1	--	--	14
FEB												
23...	.00	--	.00	.03	--	.00	--	.00	--	.00	.00	--
APR												
27...	<.01	22	.01	.02	48	<.01	<.1	<.01	.4	<.01	<.01	11

DATE	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)
DEC											
01...	--	3.1	--	.0	--	--	.0	--	--	--	.0
FEB											
23...	.01	--	.00	--	.01	.00	--	.00	.00	.00	--
APR											
27...	.01	2.0	<.01	<.1	<.01	<.01	<.1	<.01	<.01	<.01	<.1

DATE	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIL (UG/KG)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC											
01...	--	--	--	.00	--	.0	--	--	--	--	--
FEB											
23...	.00	.00	.00	--	0	--	.00	.00	.00	.00	.00
APR											
27...	<.10	<.10	<.01	<1.00	<1	<10	<.01	<.01	<.01	<.01	<.01

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC					
01...	1030	21	38	2.2	100
JAN					
21...	1125	118	--	--	--
27...	1305	19	3	.15	100
FEB					
23...	1115	6.5	3	.05	100
APR					
27...	1215	9.7	2	.05	100
JUN					
23...	1600	3.2	--	--	--
28...	1320	17	20	.92	100
AUG					
05...	1530	4.3	--	--	--
24...	1145	156	932	393	95

< 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 (0.3 km) downstream from reservoir 2 wasteway, and 3.5 mi (5.6 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi² (8.68 km²).

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

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

GAGE.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft (192.545 m) above mean sea level. Prior to Sept. 7, 1915, nonrecording gage at same site at datum 0.03 ft (0.009 m) lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

REMARKS.--Records good. Low-flow regulation by reservoirs 2, 3, and 4, capacities, 21 acre-ft (25,900 m³), 34 acre-ft (41,900 m³), and 1,630 acre-ft (2.01 hm³), respectively. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years 1915-16, 1918-20, 1922-82), 14.9 ft³/s (0.422 m³/s), 5,190 acre-ft/yr (6.40 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft³/s (198 m³/s) Jan. 16, 1921, gage height, 8.74 ft (2.664 m), from floodmarks, from rating curve extended above 420 ft³/s (11.9 m³/s) by test of model of station site; minimum, 0.09 ft³/s (0.003 m³/s) Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 240 ft³/s (6.80 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0900	567	16.1	4.64	1.414	Mar. 15	0330	633	17.9	4.76	1.451
Nov. 1	1830	535	15.2	4.58	1.396	Mar. 23	0600	672	19.0	4.83	1.472
Dec. 25	1100	252	7.14	3.51	1.070	Mar. 30	0730	368	10.4	4.14	1.262
Jan. 7	0330	265	7.50	3.60	1.097	Aug. 16	1730	407	11.5	4.29	1.308
Jan. 20	2330	242	6.85	3.45	1.052	Aug. 25	1630	*2460	69.7	*6.52	1.987
Jan. 21	1500	307	8.69	3.86	1.177	Sept. 1	1130	704	19.9	4.89	1.490

Minimum discharge, 0.90 ft³/s (0.025 m³/s) Oct. 19-21, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	38	4.0	7.9	9.3	5.4	86	6.2	3.1	16	11	57
2	1.7	10	3.5	22	9.3	5.3	103	5.8	3.1	6.7	10	29
3	1.5	4.2	3.1	13	8.7	5.4	104	5.8	3.0	5.6	4.6	29
4	1.5	3.0	3.0	20	8.5	5.1	90	5.6	3.1	13	4.2	4.9
5	1.3	2.6	3.1	41	8.6	5.0	85	5.5	3.0	5.1	4.5	4.8
6	1.3	2.7	3.9	51	8.1	5.0	45	5.5	3.1	9.6	4.3	4.7
7	1.2	3.2	2.9	71	7.7	4.6	56	6.0	2.8	17	4.2	4.6
8	1.3	2.5	2.5	26	8.0	4.5	54	5.4	2.7	5.6	4.2	4.6
9	1.1	2.4	2.5	9.0	7.7	4.6	28	5.0	2.7	8.1	4.3	4.5
10	1.2	2.4	2.5	8.9	6.9	5.3	14	4.2	23	5.6	37	4.5
11	1.2	2.3	2.6	8.7	9.2	14	13	4.7	3.5	5.0	52	4.5
12	1.1	2.2	2.2	8.5	7.2	40	12	6.5	3.1	5.3	23	4.5
13	1.2	2.2	2.2	8.1	6.9	15	12	4.7	3.5	5.0	4.1	4.3
14	1.2	2.2	2.4	7.9	6.5	18	16	5.1	3.3	4.2	4.6	6.0
15	1.1	2.3	2.3	8.0	6.2	76	11	4.5	3.2	4.7	26	4.4
16	1.1	3.7	2.3	7.8	6.0	13	40	4.6	20	7.6	83	4.4
17	1.1	22	2.3	8.2	6.0	12	19	7.6	8.0	16	36	4.2
18	1.1	3.1	2.1	7.3	5.9	11	17	15	6.0	7.3	48	4.1
19	1.1	3.0	15	10	6.7	9.2	12	5.0	4.4	5.0	64	4.0
20	.95	2.8	51	60	17	8.9	11	4.6	4.0	4.7	57	3.8
21	.96	2.7	28	110	7.0	9.4	21	21	4.2	4.6	33	3.7
22	.99	2.8	9.4	45	6.2	19	19	48	4.3	10	9.2	3.7
23	1.0	5.7	7.8	25	6.4	139	12	29	4.5	6.1	6.5	3.9
24	1.0	5.1	7.3	24	6.0	44	11	4.9	4.5	4.7	18	3.2
25	1.1	3.2	28	46	5.8	25	10	6.2	7.9	4.5	189	3.4
26	1.4	3.2	20	36	5.7	20	33	4.1	5.6	4.5	66	3.4
27	1.6	3.6	9.9	52	7.7	44	70	3.6	5.4	4.7	80	3.5
28	62	3.2	8.8	28	6.1	23	75	3.5	11	6.1	65	3.5
29	4.8	3.1	8.4	11	---	20	61	3.4	6.3	5.2	28	3.0
30	3.7	6.0	8.2	10	---	94	39	3.9	10	6.4	13	3.1
31	3.7	---	7.9	9.6	---	134	---	3.3	---	4.6	12	---
TOTAL	107.00	155.4	259.1	800.9	211.3	838.7	1179	248.2	172.3	218.5	1005.7	226.2
MEAN	3.45	5.18	8.36	25.8	7.55	27.1	39.3	8.01	5.74	7.05	32.4	7.54
MAX	62	38	51	110	17	139	104	48	23	17	189	57
MIN	.95	2.2	2.1	7.3	5.7	4.5	10	3.3	2.7	4.2	4.1	3.0
AC-FT	212	308	514	1590	419	1660	2340	492	342	433	1990	449

CAL YR 1981 TOTAL 1728.90 MEAN 4.74 MAX 223 MIN .95 AC-FT 3430
WTR YR 1982 TOTAL 5422.30 MEAN 14.9 MAX 189 MIN .95 AC-FT 10760

16238500 WAIHI STREAM AT HONOLULU

LOCATION.--Lat 21°19'55", long 157°48'12", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from bridge on Waaloa Way, 700 ft (210 m) upstream from confluence with Waiakeakua Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.14 mi² (2.95 km²).

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

REVISED RECORDS.--WSP 1319: 1930-32(M), 1939(M). WSP 1569: Drainage area.

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

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

AVERAGE DISCHARGE.--64 years (water years, 1914-20, 1926-82), 3.63 ft³/s (0.103 m³/s), 2,630 acre-ft/yr (3.24 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s (92.0 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 60 ft³/s (1.70 m³/s); minimum, 0.07 ft³/s (0.002 m³/s) Jan. 17, 18, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 60 ft³/s (1.70 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0845	350	9.91	4.24	1.292	Aug. 16	1800	732	20.7	5.38	1.640
Nov. 1	1815	752	21.3	5.43	1.655	Aug. 25	1630	*880	24.9	*5.70	1.737
Jan. 21	1530	368	10.4	4.31	1.314	Sept. 1	1130	570	16.1	4.93	1.503
Mar. 23	0545	637	18.0	5.15	1.570						

Minimum discharge, 0.17 ft³/s (0.005 m³/s) Oct. 18, 20, 21, 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	17	4.0	2.1	2.2	1.8	28	4.2	1.2	23	9.4	32
2	1.7	8.9	2.8	15	2.2	1.3	30	4.4	1.2	4.9	8.3	4.3
3	.64	3.7	2.2	6.0	1.8	1.6	14	3.2	1.2	6.9	3.1	3.3
4	.81	2.2	1.8	3.3	1.8	1.1	8.3	2.8	1.2	7.2	2.5	2.9
5	.58	1.6	1.5	2.7	2.2	1.0	6.1	2.6	1.1	4.0	3.1	3.1
6	.47	1.4	4.2	11	1.6	.98	5.3	2.4	1.6	13	2.9	2.5
7	.44	4.0	1.8	18	1.4	1.0	6.9	2.4	1.1	10	3.3	2.3
8	.39	1.4	1.5	4.0	1.4	.94	9.0	2.5	1.1	4.5	3.3	2.8
9	.37	1.2	1.4	3.1	1.3	.83	13	2.0	.90	6.7	4.2	2.0
10	.31	1.0	1.1	2.9	1.6	1.1	4.2	1.8	18	3.2	10	3.3
11	.31	1.0	1.1	2.5	5.0	11	3.5	1.8	1.8	3.1	4.5	2.0
12	.32	.91	1.0	2.3	1.8	27	4.3	5.2	1.5	3.5	4.5	1.8
13	.45	.83	.93	2.0	1.4	10	6.6	1.8	3.5	2.6	2.3	1.8
14	.55	1.1	1.2	1.9	1.0	12	7.9	4.5	1.8	2.2	5.4	5.3
15	.34	1.3	.94	2.2	.94	31	3.8	1.9	1.4	3.9	30	1.8
16	.31	5.7	.82	2.3	.94	5.0	29	2.1	25	9.0	72	1.6
17	.27	13	.78	3.2	.78	4.9	12	6.5	3.6	13	23	1.5
18	.22	2.0	.78	1.9	.78	3.4	11	8.3	2.4	6.4	6.6	1.4
19	.22	2.5	14	6.5	3.1	2.7	5.1	2.4	2.5	3.0	4.5	1.3
20	.20	1.4	38	42	17	2.4	4.4	2.2	1.9	2.6	5.7	1.3
21	.21	1.2	19	61	3.6	2.9	16	2.3	1.8	2.5	6.6	1.2
22	.23	1.5	6.2	16	2.2	16	7.1	1.8	1.4	17	13	1.1
23	.34	11	4.3	6.4	4.5	83	3.8	1.9	1.4	4.4	6.2	1.2
24	.24	6.0	3.2	7.7	2.1	16	3.4	2.5	1.3	3.0	20	1.1
25	.20	3.5	20	16	1.7	6.9	3.1	6.3	4.9	2.6	66	1.1
26	1.3	2.3	13	4.6	1.7	5.4	3.0	2.1	1.6	2.5	13	1.3
27	1.2	2.8	4.9	3.7	3.7	18	5.0	1.7	5.4	2.5	7.1	1.2
28	29	2.0	3.5	3.6	1.8	4.8	24	1.6	12	4.0	8.6	1.2
29	2.9	2.2	2.9	3.3	---	4.4	7.9	1.4	3.4	4.9	4.7	1.4
30	1.8	9.2	2.6	2.8	---	42	12	2.8	9.8	6.0	4.1	1.2
31	2.4	---	2.3	2.4	---	48	---	1.4	---	2.5	3.6	---
TOTAL	49.29	113.84	163.75	262.4	71.54	368.45	297.7	90.8	117.00	184.6	361.5	90.3
MEAN	1.59	3.79	5.28	8.46	2.56	11.9	9.92	2.93	3.90	5.95	11.7	3.01
MAX	29	17	38	61	17	83	30	8.3	25	23	72	32
MIN	.20	.83	.78	1.9	.78	.83	3.0	1.4	.90	2.2	2.3	1.1
AC-FT	98	226	325	520	142	731	590	180	232	366	717	179

CAL YR 1981 TOTAL 988.32 MEAN 2.71 MAX 134 MIN .20 AC-FT 1960
WTR YR 1982 TOTAL 2171.17 MEAN 5.95 MAX 83 MIN .20 AC-FT 4310

16240500 WAIAKEAKUA STREAM AT HONOLULU

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

DRAINAGE AREA.--1.06 mi² (2.75 km²).

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

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

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

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

AVERAGE DISCHARGE.--64 years (water years 1914-20, 1926-82), 5.10 ft³/s (0.144 m³/s), 3,690 acre-ft/yr (4.55 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s (87.5 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s (1.64 m³/s). Current peak discharges are derived from rating curve extended above 1,760 ft³/s (49.8 m³/s) on the basis of slope-area measurement at gage height 5.28 ft (1.609 m); minimum, 0.6 ft³/s (0.017 m³/s) June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0830	367	10.4	3.42	1.042	Apr. 2	2100	395	11.2	3.50	1.067
Nov. 1	1800	582	16.5	3.92	1.195	Aug. 16	1730	520	14.7	3.80	1.158
Dec. 25	1000	370	10.5	3.43	1.045	Aug. 25	1600	*630	17.8	*4.00	1.219
Mar. 23	0530	505	14.3	3.77	1.149	Sept. 1	1100	339	9.60	3.33	1.015

Minimum discharge, 1.6 ft³/s (0.045 m³/s) Oct. 17-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	19	4.7	3.3	4.1	3.8	32	6.8	4.4	25	9.9	21
2	2.8	18	4.2	18	4.1	3.3	36	7.3	4.4	8.0	7.7	7.3
3	2.1	5.7	3.2	6.3	3.9	3.6	17	6.2	4.3	9.0	5.5	6.5
4	2.4	3.5	2.8	4.0	3.8	3.0	10	6.0	4.4	8.0	5.0	6.2
5	2.0	2.8	2.6	3.7	4.2	3.0	8.4	5.8	4.3	6.2	6.1	6.8
6	1.9	3.0	4.6	13	3.7	2.8	7.7	5.7	5.1	12	5.5	5.9
7	1.8	9.8	3.0	17	3.6	2.7	9.1	6.1	4.4	9.4	6.0	5.8
8	1.8	3.1	2.7	4.8	3.7	2.6	15	5.9	4.2	7.0	6.4	6.8
9	1.8	2.7	2.5	4.2	3.4	2.7	16	5.3	4.2	7.3	6.5	5.7
10	1.7	2.5	2.4	3.9	4.4	3.6	7.3	5.2	31	5.7	11	6.8
11	1.7	2.5	2.4	3.7	7.7	12	6.5	5.2	5.0	5.3	7.9	5.6
12	1.7	2.3	2.4	3.5	4.0	21	6.8	6.1	4.5	5.9	7.8	5.6
13	2.3	2.1	2.4	3.3	3.4	11	8.1	5.0	6.5	5.2	5.6	5.5
14	2.7	2.7	2.4	3.2	3.0	13	13	6.3	4.7	5.0	10	8.9
15	1.8	3.9	2.2	3.6	2.8	22	7.3	4.9	4.4	6.4	29	5.6
16	1.8	6.5	2.1	3.4	2.7	5.8	23	5.3	17	10	58	5.3
17	1.7	15	2.0	4.6	2.6	5.3	13	9.0	5.3	13	26	5.2
18	1.8	3.8	2.0	3.3	2.6	5.2	12	9.4	4.8	8.6	11	5.1
19	1.7	3.9	31	11	5.0	4.6	8.2	5.2	4.8	5.3	7.6	4.9
20	1.6	2.7	44	43	17	4.2	8.6	5.0	5.8	5.2	10	4.9
21	1.7	2.4	16	62	6.0	4.3	21	5.0	4.6	5.3	11	4.9
22	1.7	2.5	7.2	16	4.0	18	12	4.7	4.2	28	16	4.9
23	1.9	10	5.5	7.1	6.4	68	7.4	4.7	4.1	7.7	8.6	4.9
24	1.8	4.9	4.5	7.2	3.8	25	7.0	4.8	4.1	5.5	20	4.9
25	1.7	3.4	19	16	3.7	10	6.5	7.7	13	5.2	51	4.8
26	3.0	3.0	13	6.1	3.9	6.8	6.3	5.1	4.9	5.2	12	5.0
27	3.7	3.5	5.4	5.2	5.5	17	7.8	4.7	6.6	6.3	8.3	4.8
28	25	2.7	4.5	5.3	4.0	6.2	19	4.5	15	8.1	8.5	4.8
29	3.2	3.0	4.1	4.6	---	5.8	9.3	4.5	6.0	11	7.0	4.9
30	3.3	8.2	3.9	4.4	---	30	11	6.5	12	10	6.6	4.9
31	5.9	---	3.6	4.2	---	41	---	4.6	---	5.6	6.3	---
TOTAL	92.1	159.1	212.3	298.9	127.0	367.3	372.3	178.5	208.0	265.4	397.8	184.2
MEAN	2.97	5.30	6.85	9.64	4.54	11.8	12.4	5.76	6.93	8.56	12.8	6.14
MAX	25	19	44	62	17	68	36	9.4	31	28	58	21
MIN	1.6	2.1	2.0	3.2	2.6	2.6	6.3	4.5	4.1	5.0	5.0	4.8
AC-FT	183	316	421	593	252	729	738	354	413	526	789	365

CAL YR 1981 TOTAL 1538.2 MEAN 4.21 MAX 150 MIN 1.6 AC-FT 3050
WTR YR 1982 TOTAL 2862.9 MEAN 7.84 MAX 68 MIN 1.6 AC-FT 5680

16244000 PUKELE STREAM NEAR HONOLULU

LOCATION.--Lat 21°18'36", long 157°47'27", Hydrologic Unit 20060000, on right bank 200 ft (60 m) upstream from bridge on Palolo Avenue, 0.6 mi (1.0 km) upstream from confluence with Waiomao Stream, and 4.8 mi (7.7 km) east of Honolulu Post Office.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

PERIOD OF RECORD.--June 1926 to September 1982 (discontinued).

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

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

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

AVERAGE DISCHARGE.--56 years, 1.94 ft³/s (0.055 m³/s), 1,410 acre-ft/yr (1.74 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,600 ft³/s (73.6 m³/s) Apr. 11, 1930, gage height, 7.75 ft (2.362 m), from rating curve extended above 71 ft³/s (2.01 m³/s) by test of model of station site; minimum, 0.08 ft³/s (0.002 m³/s) Oct. 31, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	1830	*400	11.3	*4.52	1.378	Mar. 23	0630	149	4.22	3.36	1.024
Jan. 7	0330	206	5.83	3.73	1.137	Aug. 16	1830	270	7.65	4.00	1.219

Minimum discharge, 0.30 ft³/s (0.008 m³/s) Oct. 22-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	16	1.0	1.4	2.0	1.3	14	2.6	.92	7.3	1.4	5.2
2	.36	9.6	.90	9.8	1.9	1.2	18	2.1	.93	2.8	2.0	2.0
3	.36	3.1	.84	5.9	1.9	1.5	9.3	2.0	.93	1.9	.93	1.4
4	.36	1.2	.81	2.3	1.9	1.2	4.7	1.9	.94	2.2	.87	1.3
5	.36	.95	.81	1.6	1.8	1.1	3.4	1.8	.88	1.5	.89	1.2
6	.36	1.1	1.2	6.7	1.7	1.1	2.8	1.7	.90	3.7	.89	1.2
7	.36	4.6	.89	14	1.7	1.1	4.2	1.6	.84	4.1	.83	1.1
8	.36	1.2	.78	3.4	1.6	1.0	5.9	1.5	.83	1.6	.93	1.2
9	.36	1.1	.75	2.2	1.3	1.0	12	1.5	.83	1.7	1.6	1.1
10	.36	1.3	.72	1.9	1.5	.96	4.0	1.4	11	1.2	2.2	1.4
11	.36	1.7	.70	1.8	4.5	4.2	2.8	1.3	1.2	1.2	1.3	1.1
12	.36	1.8	.67	1.7	1.6	12	2.5	1.2	.75	1.2	3.2	1.0
13	.36	1.8	.63	1.7	1.3	7.1	2.6	1.2	.98	1.2	1.1	1.0
14	.36	1.7	.62	1.6	1.2	3.8	4.6	1.1	.86	1.1	1.9	2.7
15	.36	1.8	.59	1.6	1.2	10	2.6	1.1	.75	1.1	9.9	.94
16	.36	1.5	.56	1.5	1.2	2.5	11	1.0	3.0	1.9	24	.91
17	.33	4.3	.55	1.5	1.3	1.8	5.3	1.1	.93	4.9	13	.87
18	.36	.68	.53	1.4	1.7	1.7	4.4	2.7	.81	1.6	6.4	.84
19	.33	.64	13	6.7	2.5	1.5	3.0	1.0	.75	.97	2.8	.81
20	.33	.62	15	21	7.3	1.5	3.6	.98	.81	.93	3.0	.79
21	.33	.62	11	29	2.0	1.5	9.4	1.0	.81	.94	5.0	.75
22	.33	.62	4.1	13	1.2	5.1	9.4	.96	.81	5.2	6.6	.73
23	.30	4.1	2.4	5.5	2.7	23	3.4	.97	.81	1.9	3.0	.71
24	.30	3.4	1.5	4.0	1.5	8.6	2.5	.95	.81	.98	6.2	.68
25	.30	1.1	9.2	12	1.2	3.5	2.2	1.2	3.8	.93	11	.66
26	.30	.77	12	4.6	1.2	2.6	2.0	.95	.88	.93	4.4	.67
27	.36	.93	3.6	3.3	2.5	9.4	2.0	.93	.69	1.3	2.5	.67
28	4.2	.82	2.1	2.7	1.5	3.1	8.1	.93	4.6	2.3	2.5	.63
29	.47	.81	1.7	2.4	---	2.2	3.2	.94	1.1	1.6	1.7	.62
30	.39	2.3	1.6	2.2	---	10	4.6	1.2	3.6	3.2	1.5	.59
31	1.9	---	1.5	2.1	---	16	---	.93	---	1.0	1.3	---
TOTAL	16.29	72.16	92.25	170.5	54.9	142.56	167.5	41.74	47.75	64.38	124.84	34.77
MEAN	.53	2.41	2.98	5.50	1.96	4.60	5.58	1.35	1.59	2.08	4.03	1.16
MAX	4.2	16	15	29	7.3	23	18	2.7	11	7.3	24	5.2
MIN	.30	.62	.53	1.4	1.2	.96	2.0	.93	.69	.93	.83	.59
AC-FT	32	143	183	338	109	283	332	83	95	128	248	69

CAL YR 1981 TOTAL 466.35 MEAN 1.28 MAX 61 MIN .30 AC-FT 925
WTR YR 1982 TOTAL 1029.64 MEAN 2.82 MAX 29 MIN .30 AC-FT 2040

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft (198 m) upstream from mouth, 2.7 mi (4.3 km) southwest of Kailua, and 4.3 mi (6.9 km) southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi² (5.28 km²).

PERIOD OF RECORD.--November 1912 to June 1916, January 1958 to current ayear.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 80 ft (24 m), from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft (61 m) upstream at different datums.

REMARKS.--Records good. Maunawili ditch diverts 1.5 mi (2.4 km) above station for irrigation in vicinity of Waimanalo. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years (water years, 1914-15, 1959-82), 5.20 ft³/s (0.147 m³/s), 3,770 acre-ft/yr (4.65 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 390 ft³/s (11.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 20	2000	405	11.5	4.98	1.518	Apr. 2	2130	533	15.1	5.46	1.664
Dec. 25	1100	612	17.3	5.72	1.743	June 10	1100	405	11.5	4.98	1.518
Jan. 7	0330	408	11.6	4.99	1.521	June 16	1530	748	21.2	6.11	1.862
Jan. 20	2330	*936	26.5	*6.59	2.009	Aug. 16	0900	734	20.8	6.07	1.850
Mar. 17	1500	425	12.0	5.06	1.542	Aug. 25	1630	584	16.5	5.63	1.716

Minimum discharge, 1.4 ft³/s (0.040 m³/s) several days in October.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	18	5.0	9.7	12	18	17	6.7	4.1	8.0	5.3	21
2	1.5	14	4.5	25	10	8.7	70	6.6	4.0	6.1	4.9	8.0
3	1.5	5.6	3.8	17	9.5	23	23	6.5	3.8	5.8	4.8	6.6
4	1.4	4.3	3.7	11	9.1	9.5	16	6.3	4.2	5.6	4.8	5.9
5	1.4	3.3	3.5	10	9.7	8.3	14	6.2	4.2	5.1	4.8	6.0
6	1.5	2.9	3.7	40	8.6	7.9	13	6.1	5.1	6.7	4.6	6.5
7	1.4	4.3	3.1	53	8.7	7.7	25	6.0	4.2	4.9	4.6	12
8	1.7	2.9	3.1	17	9.2	7.4	49	6.0	4.0	4.8	4.2	6.9
9	2.3	2.7	3.8	15	8.5	7.2	26	5.8	15	4.9	4.6	5.6
10	2.4	2.6	3.9	14	13	7.1	15	5.7	100	4.8	4.4	6.1
11	2.7	2.4	4.0	13	33	21	14	5.6	11	4.4	4.7	5.3
12	2.2	2.4	3.7	12	12	62	14	5.5	7.5	4.3	5.6	5.2
13	1.5	2.3	2.6	11	10	24	12	5.4	6.8	4.2	4.4	5.1
14	1.5	2.9	2.5	10	9.5	23	14	5.3	6.3	4.1	4.6	5.0
15	1.5	2.9	2.4	9.7	8.4	23	11	5.3	5.7	4.1	6.7	4.9
16	1.4	5.8	2.4	9.8	7.6	14	11	5.1	47	4.3	54	4.7
17	1.4	30	2.3	11	7.7	28	10	5.7	17	4.5	12	4.7
18	1.5	8.4	2.3	8.8	8.3	15	9.6	6.7	10	5.1	6.9	4.6
19	1.5	6.4	79	32	11	13	9.2	5.2	8.3	4.1	6.2	4.5
20	1.5	5.4	70	127	15	12	9.2	5.1	8.0	4.7	6.0	4.5
21	1.4	4.9	70	180	10	11	18	5.0	7.1	4.3	6.0	4.3
22	1.5	4.6	35	54	8.5	10	12	4.9	6.6	19	13	4.3
23	1.5	5.1	23	31	12	22	9.2	4.8	6.9	32	6.0	4.4
24	1.5	5.5	18	26	8.7	12	8.6	4.7	5.5	8.1	9.8	4.2
25	1.5	4.9	44	26	9.0	11	8.2	4.8	8.6	6.7	37	4.2
26	1.8	4.4	51	19	9.4	9.6	7.8	4.6	5.9	6.1	6.9	4.2
27	1.9	4.3	25	17	9.8	10	7.6	4.4	5.5	5.5	5.9	4.2
28	3.9	4.3	20	16	8.4	9.0	7.5	4.4	5.4	8.1	5.5	4.1
29	2.4	4.3	17	15	---	8.7	7.1	4.3	5.1	5.7	5.3	4.0
30	3.6	5.4	14	14	---	14	7.0	4.5	6.2	6.0	5.2	3.8
31	6.2	---	11	13	---	32	---	4.1	---	4.9	5.3	---
TOTAL	60.5	177.2	537.3	867.0	296.6	489.1	475.0	167.3	339.0	206.6	264.0	174.8
MEAN	1.95	5.91	17.3	28.0	10.6	15.8	15.8	5.40	11.3	6.66	8.52	5.83
MAX	6.2	30	79	180	33	62	70	6.7	100	32	54	21
MIN	1.4	2.3	2.3	8.8	7.6	7.1	7.0	4.1	3.8	4.1	4.2	3.8
AC-FT	120	351	1070	1720	588	970	942	332	672	410	524	347

CAL YR 1981 TOTAL 2072.9 MEAN 5.68 MAX 260 MIN 1.4 AC-FT 4110
WTR YR 1982 TOTAL 4054.4 MEAN 11.1 MAX 180 MIN 1.4 AC-FT 8040

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Hydrologic Unit 20060000, on left bank 300 ft (91 m) downstream from Luluku Stream, 1.0 mi (1.6 km) southwest of Castle High School and 1.9 mi (3.1 km) northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi² (9.87 km²).

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good except those above 400 ft³/s (11.3 m³/s), which are poor. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--5 years, 12.9 ft³/s (0.365 m³/s), 9,350 acre-ft/yr (11.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft³/s (42.5 m³/s) Mar. 18, 1980, gage height, 5.50 ft (1.676 m), from rating curve extended above 200 ft³/s (5.66 m³/s); minimum, 0.60 ft³/s (0.017 m³/s) Mar. 27, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 916 ft³/s (25.9 m³/s) Aug. 16, gage height, 4.61 ft (1.405 m), from rating curve extended as explained above; minimum, 0.72 ft³/s (0.020 m³/s) Oct. 9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	16	7.2	16	25	20	38	19	14	19	18	69
2	5.6	15	6.2	28	25	18	87	21	14	17	16	24
3	5.3	9.1	6.0	24	25	18	55	20	14	17	15	18
4	5.3	7.3	5.8	17	24	17	34	19	15	17	14	17
5	5.3	6.8	5.7	17	25	16	31	19	15	17	14	16
6	5.3	6.9	5.7	28	24	16	30	19	19	19	14	16
7	5.0	7.1	6.0	77	22	16	34	22	19	19	13	16
8	17	6.8	5.6	23	22	15	48	19	15	17	13	16
9	.72	6.8	6.2	23	21	15	46	18	15	19	13	16
10	.72	6.6	6.0	31	21	18	30	18	150	17	13	16
11	.72	6.3	5.7	20	37	22	28	18	25	16	13	16
12	3.0	5.7	5.7	19	23	111	27	17	20	16	14	15
13	5.3	5.5	5.7	18	19	40	27	17	19	16	13	15
14	5.0	5.7	6.0	17	18	72	29	17	18	17	14	15
15	4.7	5.9	5.8	17	18	115	27	18	17	17	18	15
16	4.7	7.3	5.6	19	17	30	28	17	88	18	170	15
17	4.7	33	5.4	19	17	37	29	18	37	19	32	15
18	4.7	8.8	5.3	17	17	29	27	28	27	18	19	14
19	5.0	7.5	72	34	18	24	25	17	21	17	17	14
20	4.4	6.9	84	111	23	24	24	16	19	17	16	14
21	4.4	6.4	102	237	20	28	27	16	19	17	17	14
22	4.1	6.1	36	74	18	25	26	15	18	32	17	14
23	5.8	6.7	26	43	21	46	24	15	19	75	18	14
24	5.0	6.7	20	40	18	24	23	15	19	31	31	14
25	4.7	6.2	54	56	17	23	22	16	22	19	86	14
26	5.5	6.2	46	34	17	22	21	15	19	19	25	14
27	5.5	6.2	23	32	20	35	21	15	18	14	17	13
28	33	5.8	21	30	18	23	21	14	19	15	17	13
29	10	5.7	19	28	---	22	22	14	18	15	16	13
30	7.1	7.1	18	27	---	51	18	16	18	16	15	13
31	7.6	---	17	26	---	91	---	14	---	15	15	---
TOTAL	190.76	244.1	643.6	1202	590	1063	929	542	770	617	743	508
MEAN	6.15	8.14	20.8	38.8	21.1	34.3	31.0	17.5	25.7	19.9	24.0	16.9
MAX	33	33	102	237	37	115	87	28	150	75	170	69
MIN	.72	5.5	5.3	16	17	15	18	14	14	14	13	13
AC-FT	378	484	1280	2380	1170	2110	1840	1080	1530	1220	1470	1010

CAL YR 1981 TOTAL 3548.76 MEAN 9.72 MAX 198 MIN .72 AC-FT 7040
WTR YR 1982 TOTAL 8042.46 MEAN 22.0 MAX 237 MIN .72 AC-FT 15950

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: November 1976 to current year.

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

REMARKS.--In addition to the sediment sampler record, observations of specific conductance, pH, and water temperature were collected during the year.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L Mar. 18, 1980; minimum daily mean, 2 mg/L Oct. 9-11, 1981.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons (1,250 tonnes) Mar. 18, 1980; minimum daily, 0 ton (0 tonne) Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 710 mg/L Aug. 16; minimum daily mean, 2 mg/L Oct. 9-11.
SEDIMENT DISCHARGE: Maximum daily, 1,070 tons (971 tonnes) Aug. 16; minimum daily, 0 ton (0 tonne) Oct. 9-11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
26...	1235	6.1	210	7.3	25.0
DEC					
16...	1500	5.8	200	7.7	24.0
MAR					
15...	0430	314	--	--	--
MAY					
17...	1400	17	220	7.7	22.0
AUG					
16...	0900	685	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
MAR							
15...	0430	314	1920	1630	24	30	--
AUG							
16...	0900	685	6350	11700	34	44	70

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM
MAR							
15...	63	--	76	80	87	94	100
AUG							
16...	75	88	91	94	97	100	--

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	5.6	5	.08	16	10	.43	7.2	12	.23
2	5.6	5	.08	15	10	.41	6.2	10	.17
3	5.3	5	.07	9.1	9	.22	6.0	8	.13
4	5.3	5	.07	7.3	5	.10	5.8	8	.13
5	5.3	5	.07	6.8	5	.09	5.7	8	.12
6	5.3	5	.07	6.9	6	.11	5.7	8	.12
7	5.0	3	.04	7.1	5	.10	6.0	8	.13
8	17	40	1.8	6.8	4	.07	5.6	6	.09
9	.72	2	.00	6.8	4	.07	6.2	8	.13
10	.72	2	.00	6.6	10	.18	6.0	8	.13
11	.72	2	.00	6.3	8	.14	5.7	8	.12
12	3.0	3	.02	5.7	6	.09	5.7	8	.12
13	5.3	5	.07	5.5	5	.07	5.7	8	.12
14	5.0	5	.07	5.7	6	.09	6.0	8	.13
15	4.7	4	.05	5.9	8	.13	5.8	6	.09
16	4.7	4	.05	7.3	10	.20	5.6	4	.06
17	4.7	4	.05	33	20	1.8	5.4	4	.06
18	4.7	4	.05	8.8	10	.24	5.3	4	.06
19	5.0	6	.08	7.5	8	.16	72	17	5.1
20	4.4	6	.07	6.9	6	.11	84	25	9.4
21	4.4	5	.06	6.4	6	.10	102	25	8.6
22	4.1	4	.04	6.1	6	.10	36	17	1.7
23	5.8	10	.16	6.7	4	.07	26	10	.70
24	5.0	8	.11	6.7	4	.07	20	8	.43
25	4.7	5	.06	6.2	6	.10	54	28	8.1
26	5.5	6	.09	6.2	6	.10	46	13	1.6
27	5.5	6	.09	6.2	6	.10	23	6	.37
28	33	27	3.4	5.8	4	.06	21	5	.28
29	10	12	.32	5.7	4	.06	19	4	.21
30	7.1	8	.15	7.1	15	.29	18	4	.19
31	7.6	9	.18	---	---	---	17	3	.14
TOTAL	190.76	---	7.45	244.1	---	5.86	643.6	---	38.96
		JANUARY			FEBRUARY			MARCH	
1	16	3	.13	25	12	.81	20	10	.54
2	28	6	.45	25	12	.81	18	10	.49
3	24	5	.32	25	12	.81	18	10	.49
4	17	4	.18	24	12	.78	17	10	.46
5	17	4	.18	25	12	.81	16	10	.43
6	28	9	2.4	24	12	.78	16	10	.43
7	77	21	5.5	22	10	.59	16	10	.43
8	23	12	.75	22	10	.59	15	8	.32
9	23	12	.75	21	10	.57	15	8	.32
10	31	25	2.1	21	10	.57	18	10	.49
11	20	20	1.1	37	15	1.5	22	15	.89
12	19	20	1.0	23	8	.50	111	65	37
13	18	20	.97	19	7	.36	40	25	2.7
14	17	15	.69	18	5	.24	72	119	65
15	17	15	.69	18	5	.24	115	674	537
16	19	10	.51	17	3	.14	30	20	1.6
17	19	10	.51	17	3	.14	37	25	2.5
18	17	8	.37	17	3	.14	29	20	1.6
19	34	18	2.5	18	4	.19	24	15	.97
20	111	55	26	23	6	.37	24	15	.97
21	237	156	123	20	5	.27	28	20	1.5
22	74	40	8.0	18	4	.19	25	15	1.0
23	43	25	2.9	21	6	.34	46	30	3.7
24	40	25	2.7	18	4	.19	24	15	.97
25	56	30	4.5	17	4	.18	23	15	.93
26	34	20	1.8	17	4	.18	22	10	.59
27	32	20	1.7	20	6	.32	35	25	2.4
28	30	20	1.6	18	6	.29	23	15	.93
29	28	18	1.4	---	---	---	22	15	.89
30	27	15	1.1	---	---	---	51	40	5.5
31	26	12	.84	---	---	---	91	60	15
TOTAL	1202	---	196.64	590	---	12.90	1063	---	688.04

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

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	38	30	3.1	19	12	.62	14	10	.38
2	87	50	12	21	15	.85	14	10	.38
3	55	40	5.9	20	12	.65	14	10	.38
4	34	25	2.3	19	12	.62	15	12	.49
5	31	20	1.7	19	12	.62	15	12	.49
6	30	20	1.6	19	12	.62	19	15	.77
7	34	25	2.3	22	15	.89	19	15	.77
8	48	59	14	19	12	.62	15	10	.41
9	46	37	5.8	18	10	.49	15	10	.41
10	30	20	1.6	18	10	.49	150	234	178
11	28	15	1.1	18	10	.49	25	80	5.4
12	27	10	.73	17	10	.46	20	50	2.7
13	27	10	.73	17	10	.46	19	50	2.6
14	29	10	.78	17	10	.46	18	30	1.5
15	27	10	.73	18	10	.49	17	30	1.4
16	28	12	.91	17	10	.46	88	426	284
17	29	18	1.4	18	10	.49	37	75	7.5
18	27	10	.73	28	35	2.6	27	60	4.4
19	25	10	.68	17	12	.55	21	50	2.8
20	24	8	.52	16	10	.43	19	40	2.1
21	27	12	.87	16	10	.43	19	40	2.1
22	26	12	.84	15	8	.32	18	30	1.5
23	24	10	.65	15	8	.32	19	35	1.8
24	23	10	.62	15	8	.32	19	35	1.8
25	22	10	.59	16	12	.52	22	40	2.4
26	21	10	.57	15	10	.41	19	30	1.5
27	21	10	.57	15	10	.41	18	25	1.2
28	21	10	.57	14	10	.38	19	30	1.5
29	22	49	11	14	10	.38	18	20	.97
30	18	10	.49	16	12	.52	18	20	.97
31	---	---	---	14	10	.38	---	---	---
TOTAL	929	---	75.38	542	---	17.75	770	---	512.62
		JULY			AUGUST			SEPTEMBER	
1	19	15	.77	18	10	.49	69	623	309
2	17	8	.37	16	8	.35	24	40	2.6
3	17	8	.37	15	8	.32	18	20	.97
4	17	8	.37	14	8	.30	17	15	.69
5	17	8	.37	14	8	.30	16	10	.43
6	19	10	.51	14	8	.30	16	10	.43
7	19	10	.51	13	6	.21	16	10	.43
8	17	8	.37	13	6	.21	16	10	.43
9	19	10	.51	13	6	.21	16	10	.43
10	17	8	.37	13	6	.21	16	10	.43
11	16	6	.26	13	6	.21	16	10	.43
12	16	6	.26	14	8	.30	15	8	.32
13	16	6	.26	13	6	.21	15	8	.32
14	17	8	.37	14	8	.30	15	8	.32
15	17	8	.37	18	12	.58	15	8	.32
16	18	10	.49	170	710	1070	15	8	.32
17	19	10	.51	32	45	3.9	15	8	.32
18	18	10	.49	19	20	1.0	14	7	.26
19	17	8	.37	17	15	.69	14	7	.26
20	17	8	.37	16	15	.65	14	7	.26
21	17	8	.37	17	15	.69	14	7	.26
22	32	12	1.0	17	15	.69	14	7	.26
23	75	20	4.1	18	15	.73	14	7	.26
24	31	12	1.0	31	40	3.3	14	7	.26
25	19	10	.51	86	212	169	14	7	.26
26	19	162	50	25	60	4.1	14	7	.26
27	14	120	4.5	17	20	.92	13	7	.25
28	15	8	.32	17	20	.92	13	7	.25
29	15	8	.32	16	15	.65	13	7	.25
30	16	8	.35	15	15	.61	13	7	.25
31	15	8	.32	15	15	.61	---	---	---
TOTAL	617	---	71.06	743	---	1258.96	508	---	321.53
YEAR	8042.46		3207.15						

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'47", long 157°52'12", Hydrologic Unit 20060000, on left bank 0.2 mi (0.3 km) upstream from confluence with North Fork, 3.0 mi (4.8 km) southwest of Waiahole School, and 4.0 mi (6.4 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi² (0.08 km²).

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft (187.678 m) above mean sea level (levels by Honolulu Board of Water Supply).

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

AVERAGE DISCHARGE.--20 years, 1.63 ft³/s (0.046 m³/s), 1,180 acre-ft/yr (1.45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft³/s (12.2 m³/s) Oct. 28, 1981, gage height, 4.68 ft (1.426 m), from rating curve extended above 4.8 ft³/s (0.14 m³/s); no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 47 ft³/s (1.33 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0700	*430	12.2	*4.68	1.426	July 16	2200	80	2.27	2.57	0.783
Mar. 14	2300	341	9.66	4.28	1.305	Aug. 16	0930	85	2.41	2.62	.799
Mar. 27	0700	63	1.78	2.36	.719	Sept. 1	1630	84	2.38	2.61	.796

Minimum discharge, 0.22 ft³/s (0.006 m³/s) Feb. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.60	1.0	.70	.24	.56	.26	.60	.28	.37	.56	1.3	4.4
2	.60	1.3	.80	.42	.56	.33	2.0	.34	.33	.42	.70	.42
3	.60	.91	.75	.26	.56	.37	.47	.28	.33	.47	.56	.33
4	.60	.65	.65	.24	.56	.42	.33	.28	.33	.51	.47	.33
5	.60	.60	.65	.26	.56	.42	.30	.28	.37	.51	.30	.33
6	.60	.60	.65	.93	.56	.42	.30	.28	.51	.61	.26	.33
7	.65	.60	.65	1.1	.56	.42	.69	.53	.37	.68	.26	.33
8	.65	.56	.65	.28	.56	.37	2.2	.30	.37	.51	.26	.42
9	.65	.51	.65	.26	.56	.30	.68	.28	.37	.85	.28	.47
10	.65	.47	.65	.26	.68	.42	.30	.28	.37	.51	.42	.47
11	.65	.51	.65	.26	.91	1.6	.28	.28	.37	.51	.42	.47
12	.65	.51	.65	.26	.75	6.8	.28	.28	.37	.51	.42	.47
13	.65	.56	.65	.26	.70	.60	.28	.28	.42	.51	.33	.47
14	.65	.60	.65	.26	.65	13	.30	.28	.42	.51	.33	.51
15	.65	.65	.65	.26	.65	3.7	.30	.30	.37	.51	1.3	.47
16	.65	1.4	.65	.26	.65	.33	.71	.30	3.9	1.9	5.5	.47
17	.70	2.0	.65	.26	.65	.30	1.1	.70	.66	1.1	.82	.47
18	.70	.70	.70	.28	.65	.59	.47	.45	.37	.56	.42	.47
19	.70	.70	2.5	.76	.99	.30	.33	.30	.47	.51	.33	.47
20	.70	.70	2.0	1.5	2.2	.30	.33	.30	.37	.51	.30	.47
21	.70	.65	2.2	2.0	.75	1.1	1.1	.30	.37	.51	.42	.47
22	.70	.65	.98	.75	.56	.54	.33	.30	.37	1.6	.33	.47
23	.80	.91	.98	.65	.30	2.0	.30	.33	.37	1.2	.30	.47
24	.75	.75	.85	.81	.24	.55	.28	.38	.37	.60	.76	.47
25	.70	.70	1.3	.95	.24	.30	.28	.48	.59	.51	1.7	.47
26	.70	.70	.98	.60	.22	.30	.28	.37	.42	.47	.55	.47
27	.75	.65	.75	.56	.41	2.4	.30	.33	.47	.47	.30	.47
28	7.9	.65	.60	.56	.24	.33	.33	.33	.42	.51	.30	.47
29	.91	.65	.28	.56	---	.51	.30	.33	.42	.82	.30	.47
30	.80	.75	.26	.56	---	2.5	.30	.37	.88	.60	.30	.47
31	.80	---	.24	.56	---	4.0	---	.37	---	.51	.30	---
TOTAL	28.41	22.59	25.97	17.17	17.48	45.78	16.05	10.49	16.12	20.56	20.54	17.27
MEAN	.92	.75	.84	.55	.62	1.48	.54	.34	.54	.66	.66	.58
MAX	7.9	2.0	2.5	2.0	2.2	13	2.2	.70	3.9	1.9	5.5	4.4
MIN	.60	.47	.24	.24	.22	.26	.28	.28	.33	.42	.26	.33
AC-FT	56	45	52	34	35	91	32	21	32	41	41	34

CAL YR 1981 TOTAL 255.26 MEAN .70 MAX 7.9 MIN .24 AC-FT 506
WTR YR 1982 TOTAL 258.41 MEAN .71 MAX 13 MIN .22 AC-FT 513

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

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

DRAINAGE AREA.--0.03 mi² (0.08 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 639.00 ft (194.767 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 1.71 ft³/s (0.048 m³/s), 1,240 acre-ft/yr (1.53 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 45 ft³/s (1.27 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0630	*189	5.35	*2.72	0.829	Aug. 16	0930	57	1.61	1.87	0.570
Mar. 14	2300	110	3.12	2.30	.701	Sept. 1	1700	51	1.44	1.80	.549
July 16	2200	54	1.53	1.83	.558						

Minimum discharge, 0.30 ft³/s (0.008 m³/s) Jan. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.91	1.4	.86	.30	.86	.42	.96	.66	.86	1.1	1.8	3.6
2	.91	1.6	.98	.60	.86	.66	1.8	.71	.81	1.0	1.2	.96
3	.91	1.2	.91	.39	.86	.76	.86	.71	.81	1.0	1.1	.86
4	.91	.86	.86	.33	.86	.76	.66	.71	.86	1.1	1.0	.81
5	.91	.86	.86	.42	.86	.76	.62	.71	.86	1.0	.71	.81
6	.91	.86	.86	1.3	.86	.76	.62	.71	.91	1.0	.66	.81
7	.91	.93	.86	1.7	.86	.76	.93	.96	.91	1.3	.62	.86
8	.91	.86	.86	.54	.86	.76	1.7	.76	.91	1.1	.62	1.0
9	.91	.86	.86	.54	.86	.66	1.1	.76	.91	1.3	.66	1.0
10	.91	.86	.86	.54	.93	.71	.54	.76	.86	1.1	.86	1.0
11	.96	.86	.86	.54	1.1	1.4	.54	.76	.86	1.1	.95	1.0
12	.96	.86	.86	.54	.91	4.6	.54	.76	.86	1.1	.91	1.0
13	.96	.81	.86	.50	.86	.96	.54	.76	.86	1.1	.86	1.1
14	1.0	.81	.86	.50	.86	4.2	.54	.76	.86	1.1	.86	1.1
15	1.0	.86	.86	.50	.86	3.2	.54	.76	.86	1.1	1.7	1.1
16	1.0	1.8	.86	.50	.86	.71	.96	.76	2.8	2.3	5.3	1.1
17	1.0	2.7	.91	.50	.86	.66	1.3	1.0	1.1	1.5	1.3	1.1
18	1.0	.96	.91	.58	.86	.92	.76	.98	.91	1.1	.96	1.1
19	1.0	.91	2.9	1.1	1.5	.62	.62	.76	.91	1.1	.86	1.1
20	1.0	.91	2.2	2.2	2.7	.62	.62	.76	.91	1.1	.86	1.1
21	1.0	.86	2.8	2.9	1.0	1.1	1.2	.76	.91	1.1	.99	1.1
22	1.0	.86	1.1	1.2	.86	.80	.66	.81	.91	1.6	.91	1.1
23	1.1	1.2	1.3	.91	.54	1.8	.62	.81	.96	1.6	.86	1.1
24	1.1	.91	1.0	1.1	.39	.93	.62	.86	.96	1.1	1.3	1.1
25	1.1	.86	1.6	1.4	.36	.71	.62	1.0	1.1	1.1	2.0	1.1
26	1.0	.86	1.4	.91	.36	.71	.62	.86	1.0	1.1	1.1	1.1
27	1.0	.86	.91	.86	.48	1.7	.66	.86	1.1	1.1	.81	1.1
28	5.7	.86	.86	.86	.36	.71	.66	.86	1.1	1.1	.86	1.1
29	1.1	.86	.54	.86	---	.82	.66	.86	1.0	1.3	.81	1.1
30	.96	.91	.39	.86	---	2.1	.66	.86	1.4	1.2	.81	1.1
31	.96	---	.33	.86	---	2.9	---	.86	---	1.1	.81	---
TOTAL	35.00	30.81	33.08	26.84	24.39	39.18	23.73	24.91	30.07	37.0	35.05	33.51
MEAN	1.13	1.03	1.07	.87	.87	1.26	.79	.80	1.00	1.19	1.13	1.12
MAX	5.7	2.7	2.9	2.9	2.7	4.6	1.8	1.0	2.8	2.3	5.3	3.6
MIN	.91	.81	.33	.30	.36	.42	.54	.66	.81	1.0	.62	.81
AC-FT	69	61	66	53	48	78	47	49	60	73	70	66

CAL YR 1981 TOTAL 379.37 MEAN 1.04 MAX 5.7 MIN .33 AC-FT 752
WTR YR 1982 TOTAL 373.57 MEAN 1.02 MAX 5.7 MIN .30 AC-FT 741

16284000 WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°27'01", long 157°51'38", Hydrologic Unit 20060000, on left bank 120 ft (37 m) downstream from forest-reserve boundary, 3.5 mi (5.6 km) northwest of Heeia, and 4.0 mi (6.4 km) northwest of Kaneohe Post Office.

DRAINAGE AREA.--0.93 mi² (2.41 km²).

PERIOD OF RECORD.--December 1935 to September 1982 (discontinued).

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

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

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

AVERAGE DISCHARGE.--46 years (water years 1937-82), 7.73 ft³/s (0.219 m³/s), 5,600 acre-ft/yr (6.90 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,110 ft³/s (145 m³/s) Feb. 4, 1965, gage height, 8.72 ft (2.658 m), from floodmarks, from rating curve extended above 77 ft³/s (2.18 m³/s) on basis of slope-area measurements at gage heights 6.06 ft (1.847 m) and 8.72 ft (2.658 m); no flow July 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0645	a770	21.8	Unknown		Mar. 30	1445	a190	5.38	Unknown	
Dec. 21	1645	a170	4.81	Unknown		Apr. 2	2045	a245	6.94	Unknown	
Dec. 25	0945	a200	5.66	Unknown		June 16	1445	a210	5.95	Unknown	
Jan. 6	2145	a215	6.09	Unknown		July 16	2215	a350	9.91	Unknown	
Jan. 20	0145	a160	4.53	Unknown		July 22	1215	a215	6.09	Unknown	
Mar. 12	1315	a375	10.6	Unknown		Aug. 16	0845	a580	16.4	Unknown	
Mar. 14	2245	*a1160	32.9	Unknown		Aug. 25	1645	a150	4.25	Unknown	
Mar. 23	0545	a170	4.81	Unknown		Sept. 1	1445	a610	17.3	Unknown	
Mar. 27	0745	a425	12.0	Unknown							

Minimum discharge, 1.0 ft³/s (0.028 m³/s) Jan. 1, 2.

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DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	4.1	1.4	1.1	2.2	3.0	9.2	3.7	3.5	5.2	9.0	42
2	1.5	11	1.8	2.3	2.2	3.0	23	4.3	3.5	4.8	6.0	7.0
3	1.5	9.0	1.6	1.5	2.2	3.2	12	3.7	3.5	4.8	5.3	5.5
4	1.5	2.4	1.4	1.2	2.1	3.2	7.0	3.7	3.5	4.8	5.0	4.9
5	1.5	1.9	1.4	1.2	2.2	3.0	5.8	3.7	3.5	4.5	4.3	4.9
6	1.5	1.7	1.4	9.0	2.2	3.0	5.3	3.7	4.3	4.5	3.7	4.9
7	1.5	1.8	1.4	25	2.2	3.0	8.0	8.0	4.1	5.6	3.7	4.8
8	1.5	1.6	1.3	2.5	2.2	3.0	24	4.8	3.5	4.5	3.7	4.9
9	1.5	1.4	1.3	1.7	2.2	2.8	14	4.3	3.5	5.0	3.7	4.9
10	1.5	1.4	1.3	1.6	2.6	3.1	6.1	3.7	3.7	4.8	4.5	4.9
11	1.5	1.4	1.3	1.5	3.6	11	5.3	3.7	2.9	4.5	4.8	4.9
12	1.5	1.4	1.3	1.5	3.1	70	4.8	3.7	2.9	4.3	4.3	4.9
13	1.5	1.4	1.3	1.4	2.7	12	4.5	3.7	3.5	4.3	4.3	4.9
14	1.5	1.4	1.3	1.4	2.6	65	4.5	3.7	2.9	4.3	4.3	4.9
15	1.6	1.4	1.3	1.4	2.5	62	4.3	4.3	2.9	4.3	11	4.9
16	1.6	7.4	1.3	1.4	2.4	9.0	5.8	4.8	35	15	45	4.9
17	1.6	23	1.3	1.4	2.4	6.4	8.0	6.4	11	10	11	4.9
18	1.4	3.6	1.3	1.4	2.4	7.0	5.3	8.0	6.4	5.5	7.0	4.8
19	1.4	2.5	21	5.6	5.0	5.0	4.5	4.5	5.5	5.0	5.8	4.8
20	1.4	2.0	20	27	25	4.3	4.3	4.3	5.0	4.8	5.3	4.8
21	1.4	1.8	31	49	5.0	7.0	9.0	4.3	4.8	4.5	5.2	4.8
22	1.4	1.6	8.5	14	4.5	5.5	5.3	3.7	4.5	12	5.1	4.8
23	1.7	2.5	6.7	6.2	3.3	17	4.5	3.7	4.5	15	4.8	4.8
24	1.4	1.9	3.8	7.0	2.8	7.0	4.3	4.3	4.8	6.4	6.5	4.8
25	1.4	1.6	14	11	2.6	5.0	3.7	4.8	5.5	5.5	14	4.5
26	1.4	1.6	11	5.3	2.4	4.5	3.7	3.7	4.8	5.3	8.0	4.5
27	1.5	1.5	4.0	3.0	3.4	14	4.3	3.7	4.8	4.8	5.5	4.5
28	47	1.4	2.9	2.7	3.0	5.0	4.3	3.5	4.8	4.8	5.3	4.5
29	4.2	1.4	1.8	2.6	---	5.6	3.7	3.5	4.8	5.8	5.0	4.5
30	2.2	1.5	1.4	2.5	---	25	3.7	3.7	8.0	5.5	5.0	4.5
31	2.0	---	1.2	2.2	---	42	---	3.5	---	5.0	4.8	---
TOTAL	95.6	98.6	152.0	196.6	101.0	419.6	212.2	133.1	165.9	185.1	220.9	183.6
MEAN	3.08	3.29	4.90	6.34	3.61	13.5	7.07	4.29	5.53	5.97	7.13	6.12
MAX	47	23	31	49	25	70	24	8.0	35	15	45	42
MIN	1.4	1.4	1.2	1.1	2.1	2.8	3.7	3.5	2.9	4.3	3.7	4.5
AC-FT	190	196	301	390	200	832	421	264	329	367	438	364

CAL YR 1981 TOTAL 1003.2 MEAN 2.75 MAX 47 MIN 1.0 AC-FT 1990
WTR YR 1982 TOTAL 2164.2 MEAN 5.93 MAX 70 MIN 1.1 AC-FT 4290

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Hydrologic Unit 20060000, on right bank 0.2 mi (0.3 km) downstream from forest-reserve boundary, 1.0 mi (1.6 km) south of Kahaluu School, and 1.6 mi (2.6 km) west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi² (2.51 km²).

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 170 ft (52 m), from topographic map.

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

AVERAGE DISCHARGE.--8 years, 5.73 ft³/s (0.162 m³/s), 4,150 acre-ft/yr (5.12 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft³/s (33.4 m³/s) Mar. 14, 1982, gage height, 7.52 ft (2.292 m) from rating curve extended above 100 ft³/s (2.83 m³/s); minimum, 1.1 ft³/s (0.031 m³/s) Apr. 7, 1977.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0700	788	22.3	6.62	2.018	Mar. 30	1500	206	5.83	4.65	1.417
Dec. 21	1700	183	5.18	4.53	1.381	Apr. 2	2100	267	7.56	4.94	1.506
Dec. 25	1000	214	6.06	4.69	1.430	June 16	1500	230	6.51	4.77	1.454
Jan. 6	2200	230	6.51	4.77	1.454	July 16	2230	370	10.5	5.36	1.634
Jan. 20	0200	176	4.98	4.49	1.369	July 22	1230	226	6.40	4.75	1.448
Mar. 12	1330	390	11.0	5.44	1.658	Aug. 16	0900	599	17.0	6.13	1.868
Mar. 14	2300	*1180	33.4	*7.52	2.292	Aug. 25	1700	164	4.64	4.42	1.347
Mar. 23	0600	191	5.41	4.57	1.393	Sept. 1	1500	631	17.9	6.22	1.896
Mar. 27	0800	445	12.6	5.64	1.719						

Minimum discharge, 4.0 ft³/s (0.113 m³/s) several days in December.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	8.4	4.2	4.2	6.4	6.0	15	7.1	6.9	8.2	12	53
2	4.2	15	4.8	5.9	6.4	6.0	27	7.3	6.9	7.8	9.0	10
3	4.2	10	4.6	4.9	6.4	6.2	14	7.1	6.9	7.8	8.3	8.5
4	4.2	6.6	4.2	4.4	6.4	6.2	10	7.1	6.9	7.8	8.0	8.0
5	4.4	5.6	4.1	4.2	6.6	6.0	8.8	7.1	6.9	7.5	7.3	8.0
6	4.2	5.2	4.1	15	6.4	6.0	8.3	7.1	7.3	7.5	7.1	8.0
7	4.2	5.4	4.1	30	6.2	6.0	12	11	7.1	8.8	7.1	7.8
8	4.2	4.9	4.1	7.1	6.2	6.0	28	7.8	6.9	7.5	7.1	8.0
9	4.2	4.7	4.1	5.6	6.2	5.8	18	7.3	6.9	8.5	7.1	8.0
10	4.2	4.6	4.0	5.2	6.7	6.1	9.1	7.1	7.1	7.8	7.5	8.0
11	4.2	4.6	4.0	4.7	7.7	16	8.3	7.1	6.6	7.5	7.8	8.0
12	4.2	4.6	4.0	4.7	6.9	77	7.8	7.1	6.6	7.3	7.7	8.0
13	4.2	4.6	4.0	4.4	6.2	17	7.5	7.1	6.9	7.3	7.3	8.0
14	4.2	4.6	4.0	4.4	6.2	73	7.5	7.1	6.6	7.3	7.3	8.0
15	4.2	4.6	4.0	4.4	6.0	70	7.3	7.3	6.6	7.3	15	8.0
16	4.2	10	4.0	4.4	6.0	12	8.8	7.8	42	19	55	8.0
17	4.4	32	4.0	4.4	6.0	9.4	11	9.4	14	13	16	8.0
18	4.2	6.9	4.0	4.4	6.0	11	8.3	11	9.4	8.5	10	7.8
19	4.2	5.4	28	8.7	9.1	8.0	7.5	7.5	8.5	8.0	8.8	7.8
20	4.2	4.9	26	31	30	7.3	7.3	7.3	8.0	7.8	8.3	7.8
21	4.2	4.6	41	54	8.8	11	13	7.3	7.8	7.5	8.2	7.8
22	4.2	4.4	14	18	7.1	8.5	8.3	7.1	7.5	16	8.1	7.8
23	4.9	5.4	11	9.4	6.3	21	7.5	7.1	7.5	20	7.8	7.8
24	4.4	4.9	8.0	11	5.8	11	7.3	7.3	7.8	9.4	9.5	7.8
25	4.4	4.6	18	15	5.6	8.0	7.1	7.8	8.5	8.5	19	7.5
26	4.4	4.4	15	8.3	5.4	7.5	7.1	7.1	7.8	8.3	11	7.5
27	4.4	4.4	8.0	7.5	6.4	19	7.3	7.1	7.8	7.8	8.5	7.5
28	53	4.2	6.6	7.1	6.0	8.0	7.3	6.9	7.8	7.8	8.3	7.5
29	9.1	4.2	5.4	6.9	---	8.6	7.1	6.9	7.8	8.8	8.0	7.5
30	6.4	4.4	4.7	6.6	---	30	7.1	7.1	11	8.5	8.0	7.5
31	5.4	---	4.4	6.4	---	50	---	6.9	---	8.0	7.8	---
TOTAL	189.2	198.1	264.4	312.2	205.4	543.6	310.6	233.3	266.3	282.8	327.9	282.9
MEAN	6.10	6.60	8.53	10.1	7.34	17.5	10.4	7.53	8.88	9.12	10.6	9.43
MAX	53	32	41	54	30	77	28	11	42	20	55	53
MIN	4.2	4.2	4.0	4.2	5.4	5.8	7.1	6.9	6.6	7.3	7.1	7.5
AC-FT	375	393	524	619	407	1080	616	463	528	561	650	561

CAL YR 1981 TOTAL 2181.6 MEAN 5.98 MAX 54 MIN 3.0 AC-FT 4330
WTR YR 1982 TOTAL 3416.7 MEAN 9.36 MAX 77 MIN 4.0 AC-FT 6780

16294900 WAIKANE STREAM AT ALTITUDE 75 FT (23 M), AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank 0.3 mi (0.5 km) downstream from Waikeekee Stream, 0.7 mi (1.1 km) west of Waikane, and 1.2 mi (1.9 km) northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi² (5.75 km²).

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (23 m), from topographic map.

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

AVERAGE DISCHARGE.--22 years (water years 1961-82), 8.68 ft³/s (0.246 m³/s), 6,290 acre-ft/yr (7.76 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft³/s (249 m³/s) Feb. 4, 1965, gage height, 10.76 ft (3.280 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of slope-area measurements at gage heights 4.88 ft (1.487 m), 9.46 ft (2.883 m), and 10.76 ft (3.280 m); minimum, 0.76 ft³/s (0.022 m³/s) Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0830	4130	117	9.13	2.783	June 10	0830	754	21.4	4.96	1.512
Jan. 6	2200	2870	81.3	7.96	2.426	July 22	1300	1310	37.1	6.01	1.832
Jan. 8	0030	2420	68.5	7.49	2.283	Aug. 16	1030	1060	30.0	5.60	1.707
Mar. 12	1100	935	26.5	5.35	1.631	Sept. 1	1300	3910	111	8.95	2.728
Mar. 14	2300	*5010	142	*9.76	2.975						

Minimum discharge, 1.8 ft³/s (0.051 m³/s) Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	56	4.4	9.4	6.7	31	23	6.7	4.4	13	18	96
2	2.2	49	6.0	12	6.5	11	50	9.8	4.2	9.6	12	15
3	2.1	31	5.1	10	6.4	16	21	7.4	4.2	8.4	9.0	9.7
4	2.0	14	4.7	8.4	6.1	10	15	6.6	5.2	14	8.2	8.0
5	2.6	9.3	4.5	7.5	6.0	8.9	12	7.2	4.7	11	7.9	8.3
6	2.1	9.7	4.4	35	5.9	8.2	10	6.4	11	10	7.6	9.2
7	2.1	12	4.2	45	5.8	7.8	18	18	6.2	16	7.5	7.5
8	2.0	7.8	4.0	13	5.7	7.5	50	8.7	4.8	8.8	7.4	9.0
9	2.0	6.6	3.8	10	5.6	7.0	27	6.8	7.1	11	7.7	6.9
10	2.0	5.9	3.6	8.2	7.0	7.7	15	6.3	63	7.7	7.0	6.8
11	2.0	5.4	3.5	7.0	15	75	10	6.0	12	7.2	14	7.1
12	2.0	5.0	3.4	6.0	8.7	188	9.5	6.0	7.1	7.2	14	6.5
13	2.0	4.8	3.3	5.1	6.2	50	9.0	5.4	6.4	6.8	6.8	6.0
14	2.1	4.7	3.2	4.8	5.5	330	17	5.2	5.7	6.4	6.5	6.0
15	2.0	5.6	3.1	4.7	5.2	436	12	5.4	5.1	7.8	23	5.9
16	1.9	13	3.0	4.6	5.0	52	18	5.4	37	34	90	5.6
17	1.9	69	2.9	4.4	4.8	33	13	5.5	22	46	21	5.4
18	2.1	11	2.8	5.0	4.8	23	11	5.2	9.5	16	12	5.1
19	2.1	9.0	70	17	21	14	9.0	5.2	14	10	9.2	4.9
20	2.0	8.0	60	60	125	10	8.0	5.0	9.8	9.3	8.2	4.8
21	2.1	7.0	80	150	21	17	20	5.0	11	8.4	12	4.6
22	2.1	6.5	40	50	12	11	14	4.7	7.5	91	13	4.6
23	2.3	8.0	32	15	10	43	11	4.7	7.1	55	8.2	4.7
24	2.4	7.0	19	18	9.2	20	10	5.0	6.7	21	10	4.4
25	2.2	6.0	47	30	8.5	12	9.2	5.8	34	13	14	4.4
26	2.6	5.4	42	12	7.9	10	8.3	5.5	12	11	12	4.8
27	2.5	5.0	22	10	21	40	8.4	5.0	18	12	7.9	4.4
28	186	4.7	17	9.0	11	12	11	4.4	16	15	7.7	4.2
29	14	4.6	14	8.0	---	14	7.8	4.4	13	21	6.9	4.2
30	9.5	4.5	12	7.5	---	42	7.2	5.2	24	14	6.5	4.1
31	17	---	10	7.0	---	100	---	4.4	---	10	6.2	---
TOTAL	284.0	395.5	534.9	593.6	363.5	1647.1	464.4	192.3	392.7	531.6	401.4	278.1
MEAN	9.16	13.2	17.3	19.1	13.0	53.1	15.5	6.20	13.1	17.1	12.9	9.27
MAX	186	69	80	150	125	436	50	18	63	91	90	96
MIN	1.9	4.5	2.8	4.4	4.8	7.0	7.2	4.4	4.2	6.4	6.2	4.1
AC-FT	563	784	1060	1180	721	3270	921	381	779	1050	796	552

CAL YR 1981 TOTAL 2961.8 MEAN 8.11 MAX 186 MIN 1.8 AC-FT 5870
WTR YR 1982 TOTAL 6079.1 MEAN 16.7 MAX 436 MIN 1.9 AC-FT 12060

NOTE.--No gage-height record Nov. 19 to Dec. 23, Jan. 6 to Feb. 12.

16296500 KAHANA STREAM AT ALTITUDE 30 FT (9.1 M), NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft (183 m) upstream from Kawa Stream, 1.1 mi (1.8 km) southwest of Kahana, and 2.2 mi (3.5 km) southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi² (9.69 km²).

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

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

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

REMARKS.--Records fair to poor. Approximately 9 ft³/s (0.25 m³/s) is diverted by Waiahaole Water Co. at 800-ft (244-m) elevation, 2.3 mi (3.7 km) above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--23 years (water years 1960-82), 36.9 ft³/s (1.05 m³/s), 26,730 acre-ft/yr (33.0 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0930	*4880	138	*7.72	2.353	Mar. 30	1430	2380	67.4	5.64	1.719
Dec. 25	1030	1800	51.0	5.01	1.527	Apr. 2	0030	1920	54.4	5.14	1.567
Jan. 6	2230	3260	92.0	6.46	1.969	June 16	1600	3290	93.2	6.50	1.981
Mar. 11	2400	1610	45.6	4.80	1.463	July 17	0330	1680	47.6	4.88	1.487
Mar. 15	0100	3630	103	6.78	2.067	July 22	1330	2880	81.6	6.13	1.868
Mar. 23	0630	1950	55.2	5.18	1.579	Aug. 16	1030	2370	67.1	5.63	1.716
Mar. 27	0830	2420	68.5	5.68	1.731	Sept. 1	1330	3160	89.5	6.38	1.945

Minimum discharge, 14 ft³/s (0.40 m³/s) Oct. 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	135	31	31	26	54	450	32	29	47	112	233
2	18	99	27	39	26	35	394	45	28	31	59	70
3	16	72	25	33	25	31	132	35	27	30	37	39
4	17	34	23	28	24	26	84	36	29	74	34	35
5	21	29	22	27	25	25	64	38	29	40	35	36
6	16	35	22	234	23	24	54	33	40	35	32	35
7	16	41	22	262	23	23	123	201	30	94	32	31
8	16	26	20	45	22	22	107	104	27	35	32	37
9	16	24	20	55	22	22	104	41	28	48	30	30
10	15	22	20	52	21	25	52	37	234	29	42	30
11	15	22	20	32	40	181	45	36	45	28	115	30
12	15	21	19	30	25	449	44	99	34	28	61	33
13	15	20	19	29	22	129	64	37	38	26	31	32
14	15	20	21	27	21	683	92	37	32	29	33	92
15	15	21	19	27	20	583	64	66	30	38	182	48
16	15	84	18	34	20	83	217	57	270	160	344	31
17	15	303	18	28	20	67	121	84	48	235	79	29
18	17	33	18	25	20	44	115	40	34	74	47	29
19	15	28	235	68	35	36	64	48	42	38	39	28
20	14	25	292	170	360	33	52	36	34	35	41	27
21	14	23	279	192	47	229	84	34	33	52	29	26
22	14	22	94	96	32	178	51	32	27	238	31	26
23	15	121	111	54	27	488	42	36	27	92	27	27
24	21	36	109	70	26	140	40	48	27	44	99	25
25	16	26	205	125	25	56	38	68	45	37	132	27
26	16	25	135	36	24	44	37	38	29	35	107	34
27	16	31	62	33	39	283	37	33	74	36	45	30
28	688	24	55	30	27	71	54	32	54	49	52	33
29	68	23	42	30	---	238	35	31	33	84	38	27
30	30	54	36	29	---	527	34	32	99	51	34	25
31	38	---	33	27	---	637	---	29	---	34	33	---
TOTAL	1254	1479	2072	1998	1067	5466	2894	1555	1556	1906	2044	1235
MEAN	40.5	49.3	66.8	64.5	38.1	176	96.5	50.2	51.9	61.5	65.9	41.2
MAX	688	303	292	262	360	683	450	201	270	238	344	233
MIN	14	20	18	25	20	22	34	29	27	26	27	25
AC-FT	2490	2930	4110	3960	2120	10840	5740	3080	3090	3780	4050	2450

CAL YR 1981 TOTAL 13727 MEAN 37.6 MAX 688 MIN 13 AC-FT 27230
WTR YR 1982 TOTAL 24526 MEAN 67.2 MAX 688 MIN 14 AC-FT 48650

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft (244 m) downstream from intake, 1.5 mi (2.4 km) west of Kahana, and 1.7 mi (2.7 km) southwest of Punaluu.

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

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

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

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

AVERAGE DISCHARGE.--29 years, 7.59 ft^3/s (0.215 m^3/s), 5,500 acre-ft/yr (6.78 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s (1.53 m^3/s) Oct. 31, 1964; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft^3/s (0.37 m^3/s) Jan. 24; minimum daily, 0.01 ft^3/s (<0.001 m^3/s) Oct. 29-31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	1.7	9.0	9.2	4.7	6.6	.13	.73	4.1	1.2	1.8	4.7
2	.89	.53	1.0	6.8	2.4	5.8	.11	.78	3.6	1.0	1.2	.19
3	2.5	.04	1.0	4.6	5.6	5.5	.09	.78	2.9	3.8	3.5	5.1
4	2.1	.04	1.5	3.6	8.7	4.7	.07	.78	2.4	6.6	4.6	7.1
5	4.4	.04	1.5	2.7	5.9	4.6	.05	3.4	2.0	4.7	4.2	6.7
6	6.2	.04	1.5	2.3	4.1	5.4	.03	4.2	1.6	3.9	5.1	3.0
7	7.2	.04	1.5	.73	3.3	5.9	.02	.98	1.1	1.7	4.5	3.4
8	5.5	.04	1.5	.65	2.6	5.6	.24	.14	2.7	1.4	3.4	3.9
9	4.8	.04	1.5	1.0	2.4	5.2	.15	2.0	3.9	1.4	2.8	2.6
10	4.6	.04	4.0	1.8	1.9	4.8	3.0	4.0	1.4	6.3	2.0	2.1
11	4.2	.04	5.0	1.8	1.4	4.5	6.5	3.0	.28	8.0	1.7	2.0
12	2.9	.04	5.0	1.5	1.0	.12	5.9	2.0	.26	5.6	1.1	1.9
13	2.2	.04	4.0	1.4	.92	.10	5.2	3.1	.23	4.0	2.5	1.8
14	1.6	.04	3.0	2.4	2.6	.40	4.2	4.2	.21	3.6	4.2	1.2
15	1.5	1.0	3.0	3.9	3.7	.17	3.2	2.4	2.9	3.0	3.4	3.6
16	1.6	2.0	3.0	6.0	3.2	.03	3.2	1.4	1.6	2.1	.79	4.0
17	1.6	2.0	5.0	5.9	2.2	.03	4.8	1.1	.28	5.8	5.0	3.2
18	2.7	.50	6.0	4.7	1.8	.03	6.0	.78	.23	9.6	6.5	2.9
19	3.2	.30	6.0	4.3	1.6	.04	4.8	.73	.26	8.5	5.1	2.6
20	2.9	.30	6.0	1.5	.43	.09	3.9	3.3	.26	6.9	4.6	2.4
21	2.6	.30	6.0	.21	.31	.17	3.1	3.9	.26	5.9	5.0	3.0
22	2.4	.40	4.3	.19	.26	.02	1.6	2.9	4.0	3.1	4.1	3.6
23	2.3	2.0	4.0	7.0	.21	.14	1.4	2.2	9.2	5.9	3.5	2.6
24	1.3	1.0	.26	13	.17	.05	1.3	1.6	8.0	8.0	1.3	2.4
25	.82	1.0	.21	8.9	.17	.05	1.2	1.2	6.3	9.2	.61	4.0
26	.78	1.0	.19	6.9	4.8	.07	1.2	.97	4.6	8.0	.43	2.2
27	2.9	1.0	.17	6.2	6.9	.44	1.2	3.6	4.0	5.6	6.5	6.0
28	6.1	1.5	.17	5.9	6.8	.19	1.1	4.1	2.6	3.9	7.3	5.9
29	.01	1.5	.15	6.0	---	.19	.92	3.2	2.4	3.1	7.8	4.5
30	.01	2.0	.15	5.6	---	.17	.82	2.4	1.6	2.0	6.0	3.8
31	.01	---	5.6	5.3	---	.15	---	3.7	---	1.8	6.6	---
TOTAL	82.39	20.51	91.20	131.98	80.07	61.25	65.43	69.57	75.17	145.6	117.13	102.39
MEAN	2.66	.68	2.94	4.26	2.86	1.98	2.18	2.24	2.51	4.70	3.78	3.41
MAX	7.2	2.0	9.0	13	8.7	6.6	6.5	4.2	9.2	9.6	7.8	7.1
MIN	.01	.04	.15	.19	.17	.02	.02	.14	.21	1.0	.43	.19
AC-FT	163	41	181	262	159	121	130	138	149	289	232	203

CAL YR 1981 TOTAL 279.15 MEAN .76 MAX 16 MIN .00 AC-FT 554
WTR YR 1982 TOTAL 1042.69 MEAN 2.86 MAX 13 MIN .01 AC-FT 2070

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi (2.2 km) west of Kahana, and 1.8 mi (2.9 km) southwest of Punaluu.

DRAINAGE AREA.--2.78 mi² (7.20 km²).

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

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

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

REMARKS.--Records poor. Records do not include flow of Punaluu ditch (see sta 16302000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--29 years, 17.9 ft³/s (0.507 m³/s), 12,970 acre-ft/yr (16.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft³/s (161 m³/s) July 17, 1974, gage height, 7.60 ft (2.316 m), from rating curve extended above 170 ft³/s (4.81 m³/s) on basis of slope-area measurements at gage heights 5.77 ft (1.759 m) and 7.60 ft (2.316 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft³/s (26.3 m³/s) and maximum (*), from rating curve extended above 30 ft³/s (0.85 m³/s) as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0730	2860	81.0	5.82	1.774	Mar. 30	1430	980	27.8	3.50	1.067
Nov. 1	1700	1120	31.7	3.73	1.137	Apr. 2	2100	1070	30.3	3.65	1.113
Dec. 25	0930	1450	41.1	4.23	1.289	Apr. 7	0500	1050	29.7	3.62	1.103
Jan. 6	2200	2340	66.3	5.34	1.628	May 7	1800	1270	36.0	3.97	1.210
Jan. 20	1700	1880	53.2	4.80	1.463	July 17	0200	1050	29.7	3.62	1.103
Mar. 15	0100	2070	58.6	5.04	1.536	July 22	1200	1080	30.6	3.67	1.119
Mar. 21	1930	1180	33.4	3.83	1.167	Aug. 16	0800	2040	57.8	5.00	1.524
Mar. 27	0830	*2940	83.3	*5.88	1.792						

Minimum discharge, 3.7 ft³/s (0.10 m³/s) Oct. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	72	19	15	15	18	91	26	24	35	61	103
2	8.2	58	18	20	16	15	135	29	24	30	32	45
3	6.3	43	16	19	13	15	64	27	24	28	26	30
4	6.8	20	16	17	15	14	48	26	26	39	24	27
5	6.3	19	16	17	14	14	41	27	26	32	24	38
6	5.3	20	15	200	14	13	38	23	33	31	23	30
7	4.7	20	15	102	14	13	68	149	29	52	22	27
8	4.4	16	15	36	14	13	77	48	26	31	22	30
9	4.7	16	15	39	14	13	59	35	24	35	22	27
10	5.0	15	12	35	16	13	35	34	76	28	26	27
11	5.3	15	9.1	25	26	43	34	33	36	24	44	26
12	6.3	15	10	24	17	174	34	47	31	25	27	27
13	6.8	15	11	23	15	52	31	32	30	28	23	32
14	6.8	14	13	20	13	259	42	31	28	27	23	41
15	7.2	18	13	18	12	207	31	36	26	31	83	26
16	6.8	41	13	17	13	43	72	32	114	90	144	24
17	12	98	12	16	13	36	56	47	45	111	38	24
18	7.7	20	10	16	13	31	41	31	36	30	28	24
19	6.3	13	80	32	38	28	34	30	36	24	25	23
20	6.3	13	111	103	72	26	34	28	34	23	27	23
21	6.8	13	104	97	35	154	55	27	33	23	28	23
22	6.8	15	56	41	23	63	35	27	28	70	31	22
23	7.2	39	58	23	20	162	32	30	24	66	25	22
24	17	22	49	25	19	62	30	32	24	27	58	22
25	9.1	19	87	29	18	38	30	37	36	23	65	23
26	9.6	18	57	18	14	34	30	32	28	22	48	28
27	10	18	37	16	15	169	28	26	36	25	30	23
28	299	16	33	16	14	74	31	25	41	27	30	28
29	29	17	29	16	---	124	28	25	32	37	29	21
30	18	38	26	15	---	177	27	28	53	29	28	21
31	20	---	19	15	---	169	---	25	---	26	27	---
TOTAL	563.9	776	994.1	1105	535	2266	1391	1085	1063	1129	1143	887
MEAN	18.2	25.9	32.1	35.6	19.1	73.1	46.4	35.0	35.4	36.4	36.9	29.6
MAX	299	98	111	200	72	259	135	149	114	111	144	103
MIN	4.4	13	9.1	15	12	13	27	23	24	22	22	21
AC-FT	1120	1540	1970	2190	1060	4490	2760	2150	2110	2240	2270	1760

CAL YR 1981 TOTAL 7830.0 MEAN 21.5 MAX 299 MIN 4.4 AC-FT 15530
WTR YR 1982 TOTAL 12938.0 MEAN 35.4 MAX 299 MIN 4.4 AC-FT 25660

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank 0.8 mi (1.3 km) downstream from Sacred Falls, 1.6 mi (2.6 km) west of Punaluu Beach Park, and 1.7 mi (2.7 km) south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi² (2.87 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 110 ft (34 m), from topographic map.

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

AVERAGE DISCHARGE.--15 years, 4.30 ft³/s (0.122 m³/s), 3,120 acre-ft/yr (3.85 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft³/s (67.7 m³/s) Jan. 6, 1982, gage height, 11.9 ft (3.63 m), from rating curve extended above 14 ft³/s (0.40 m³/s) on basis of slope-area measurements at gage heights 8.85 ft (2.697 m) and 10.0 ft (3.05 m); maximum gage height, 10.84 ft (3.304 m) July 17, 1974; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0730	1610	45.6	10.78	3.286	Mar. 27	0845	1340	37.9	10.33	3.149
Jan. 6	2200	*2390	67.7	*11.90	3.627	July 16	1945	558	15.8	8.61	2.624
Mar. 14	2245	672	19.0	8.93	2.722	July 23	1645	534	15.1	8.54	2.603
Mar. 23	0415	788	22.3	9.22	2.810						

Minimum discharge, 0.16 ft³/s (0.005 m³/s) Oct. 10, 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	28	2.7	1.1	.70	9.3	23	1.2	.55	6.5	22	22
2	1.3	22	1.8	5.7	.60	2.1	47	7.1	.48	2.4	8.9	8.3
3	.82	15	1.8	2.2	.50	3.5	14	2.0	.40	2.2	2.9	2.2
4	1.9	2.5	1.3	1.0	5.6	2.0	5.6	1.1	3.1	9.1	2.9	1.7
5	1.1	1.7	.98	.82	1.5	.97	3.7	2.6	4.4	3.4	3.4	9.1
6	.40	4.9	1.0	159	1.1	.78	2.8	1.2	20	5.6	2.4	2.5
7	.36	5.7	4.5	45	.74	1.2	14	48	2.6	19	2.5	3.2
8	.26	1.4	.98	6.0	.60	1.2	34	9.5	1.1	6.4	3.2	7.6
9	.21	1.0	.69	16	.48	.67	18	2.3	.78	9.5	2.8	1.8
10	.17	.86	.59	8.0	.42	3.0	2.8	2.1	23	2.8	7.0	2.9
11	.17	1.2	.54	5.2	7.0	25	2.0	3.2	13	2.1	22	3.7
12	.33	.93	.49	3.5	2.3	105	3.7	8.0	1.5	2.5	9.4	4.3
13	2.1	.68	.45	2.2	1.4	14	5.0	1.6	5.2	8.5	2.4	2.6
14	2.0	2.2	1.2	1.5	.90	98	9.8	2.1	1.3	2.7	3.3	5.3
15	.43	13	.79	1.1	.50	130	3.7	5.7	.82	9.9	15	2.8
16	.31	45	.45	.90	.40	20	24	2.8	16	47	50	1.5
17	2.1	46	.34	.80	.33	25	20	3.7	5.5	42	10	1.2
18	2.6	2.8	.28	.70	.28	10	13	2.0	2.0	8.6	5.0	1.1
19	.70	2.4	87	18	36	2.1	4.8	2.2	2.8	3.3	3.0	1.0
20	.34	1.5	44	32	61	2.0	4.8	1.1	1.7	4.4	3.2	.90
21	.21	1.3	49	51	11	150	14	1.0	2.1	2.7	3.4	.83
22	.25	1.0	17	6.0	3.9	37	4.5	.88	.93	27	3.9	.78
23	.73	17	19	3.5	2.0	100	4.7	1.5	2.1	79	3.0	1.0
24	6.0	2.8	8.6	7.0	3.2	3.7	2.4	3.2	.84	6.9	19	.80
25	.83	1.8	28	35	3.8	3.3	2.7	6.0	25	3.2	22	2.0
26	1.6	2.4	17	4.0	1.7	2.8	2.3	2.2	2.3	4.0	9.1	4.0
27	1.8	1.6	5.6	2.6	9.5	77	1.4	.94	12	12	2.9	2.8
28	113	1.3	5.2	1.9	2.8	15	4.9	.73	9.5	5.7	5.2	2.4
29	6.5	1.3	2.2	1.5	---	44	1.6	.64	5.2	16	3.0	1.5
30	4.3	15	1.6	1.1	---	57	1.5	4.9	14	6.7	2.4	.90
31	5.9	---	1.3	.80	---	54	---	.78	---	2.4	1.9	---
TOTAL	160.92	244.27	306.38	425.12	160.25	999.62	295.7	132.27	180.22	363.5	257.1	102.71
MEAN	5.19	8.14	9.88	13.7	5.72	32.2	9.86	4.27	6.01	11.7	8.29	3.42
MAX	113	46	87	159	61	150	47	48	25	79	50	22
MIN	.17	.68	.28	.70	.28	.67	1.4	.64	.40	2.1	1.9	.78
AC-FT	319	485	608	843	318	1980	587	262	357	721	510	204

CAL YR 1981 TOTAL 1688.67 MEAN 4.63 MAX 113 MIN .00 AC-FT 3350
WTR YR 1982 TOTAL 3628.06 MEAN 9.94 MAX 159 MIN .17 AC-FT 7200

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on right bank 75 ft (23 m) upstream from Pupukea Military Road and 3.5 mi (5.6 km) southeast of Maunawai.

DRAINAGE AREA.--3.13 mi² (8.11 km²).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961, 1963, June 1963 to September 1982 (discontinued).

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 590 ft (180 m), from topographic map.

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

AVERAGE DISCHARGE.--19 years, 11.0 ft³/s (0.312 m³/s), 7,970 acre-ft/yr (9.83 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s (96.0 m³/s) Jan. 30, 1975, gage height, 10.06 ft (3.066 m), from rating curve extended above 42 ft³/s (1.19 m³/s) on basis of slope-area measurement at gage height 10.06 ft (3.066 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 950 ft³/s (26.9 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0830	1820	51.5	8.55	2.606	Mar. 12	0130	1420	40.2	8.07	2.460
Jan. 6	2300	*2790	79.0	*9.54	2.908	Mar. 21	2030	1020	28.9	7.43	2.265

Minimum discharge, 0.51 ft³/s (0.014) Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	33	11	6.4	9.0	5.8	50	10	2.8	19	37	34
2	5.0	74	9.2	7.4	20	4.2	80	11	2.6	15	24	30
3	3.2	93	7.2	17	12	6.4	60	8.8	2.6	7.0	12	10
4	1.6	28	5.8	7.0	8.0	6.7	28	7.0	2.9	27	12	7.4
5	3.2	17	4.9	5.6	11	3.4	25	7.0	8.3	10	12	8.1
6	2.2	12	4.5	200	18	2.9	23	7.2	23	10	9.8	8.8
7	1.2	31	4.7	210	9.0	4.5	34	36	9.5	46	8.5	7.4
8	1.0	12	6.3	40	7.6	3.2	20	20	3.8	15	9.0	6.9
9	.86	7.8	3.8	25	7.0	2.7	45	8.5	2.8	21	8.5	8.3
10	.81	6.3	3.4	20	6.0	5.8	22	6.7	5.9	12	23	6.0
11	.81	5.4	3.2	15	10	7.3	18	5.4	20	7.4	21	7.2
12	.81	5.0	3.1	12	16	198	15	14	4.1	7.6	34	7.4
13	.86	4.4	3.0	10	7.0	31	17	7.0	3.2	11	9.8	8.0
14	2.0	4.5	3.8	9.0	4.0	135	20	6.7	4.1	11	7.8	7.9
15	1.7	15	3.7	8.6	3.4	97	18	7.0	2.2	14	19	5.4
16	1.1	86	2.9	8.0	3.1	24	38	15	68	49	95	4.8
17	.96	120	2.6	7.5	2.9	19	42	18	19	103	18	4.4
18	.86	26	2.4	7.0	2.8	16	23	7.6	12	24	12	4.1
19	1.0	23	40	38	2.7	12	18	5.9	5.4	16	10	3.1
20	1.0	9.5	140	180	90	16	14	5.4	3.9	15	9.2	2.8
21	.91	7.2	110	100	25	89	34	5.4	3.0	12	15	2.6
22	.91	5.9	70	60	15	48	27	4.5	2.4	28	17	2.4
23	1.1	35	40	35	9.0	192	14	4.9	3.6	21	19	2.8
24	5.6	19	15	38	8.0	110	12	7.2	2.9	15	47	2.6
25	3.8	10	50	140	10	30	12	12	21	8.1	23	3.2
26	2.0	9.8	56	78	15	20	12	9.6	10	8.3	41	11
27	9.9	9.5	25	14	11	220	11	4.5	11	16	13	8.9
28	277	8.3	14	12	8.0	28	24	3.8	41	30	13	5.5
29	22	6.5	11	11	---	35	13	3.1	6.7	24	12	2.6
30	8.3	25	8.5	10	---	160	12	5.0	17	16	11	2.4
31	12	---	7.0	9.5	---	190	---	4.2	---	8.8	8.8	---
TOTAL	376.49	749.1	672.0	1341.0	350.5	1722.9	781	278.4	324.7	627.2	611.4	226.0
MEAN	12.1	25.0	21.7	43.3	12.5	55.6	26.0	8.98	10.8	20.2	19.7	7.53
MAX	277	120	140	210	90	220	80	36	68	103	95	34
MIN	.81	4.4	2.4	5.6	2.7	2.7	11	3.1	2.2	7.0	7.8	2.4
AC-FT	747	1490	1330	2660	695	3420	1550	552	644	1240	1210	448

CAL YR 1981 TOTAL 3480.23 MEAN 9.53 MAX 277 MIN .10 AC-FT 6900
WTR YR 1982 TOTAL 8060.69 MEAN 22.1 MAX 277 MIN .81 AC-FT 15990

16330000 KAMANANUI STREAM AT MAUNAWAI

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

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

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

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

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

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

AVERAGE DISCHARGE.--24 years, 18.0 ft³/s (0.510 m³/s), 13,040 acre-ft/yr (16.1 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0800	4410	125	8.74	2.664	Mar. 15	0030	2340	66.3	6.74	2.054
Jan. 6	2330	*5960	169	*9.84	2.999	Mar. 21	2200	1690	47.9	5.98	1.823
Jan. 20	0030	1610	45.6	5.88	1.792	Mar. 27	0900	3400	96.3	7.84	2.390
Jan. 25	0230	2220	62.9	6.61	2.015	July 16	2200	1460	41.3	5.68	1.731
Mar. 12	0230	2730	77.3	7.17	2.185	Aug. 16	1200	2460	69.7	6.88	2.097

Minimum discharge, 0.08 ft³/s (0.002 m³/s) Oct. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	36	17	9.1	16	11	163	15	3.6	31	96	118
2	4.4	168	12	10	27	9.4	220	14	3.1	28	47	65
3	2.9	202	8.6	22	19	8.9	190	14	3.0	12	19	19
4	1.9	28	6.5	9.2	13	13	69	11	3.1	46	16	12
5	1.8	20	5.0	6.7	18	7.0	50	9.9	9.1	18	14	12
6	2.4	10	4.3	659	24	5.6	41	10	38	15	12	13
7	1.1	21	4.1	666	13	7.0	87	85	17	125	9.9	11
8	.72	11	5.3	62	12	6.3	37	42	6.0	29	9.5	9.0
9	.50	6.0	3.5	33	12	5.1	114	15	3.9	45	9.3	13
10	.35	4.6	3.1	29	9.2	7.2	33	10	3.9	26	30	7.7
11	.23	3.8	2.9	22	15	11	26	9.7	28	14	23	9.7
12	.14	3.3	2.7	19	21	747	24	15	8.0	13	71	11
13	.09	2.9	2.6	16	10	104	25	12	4.4	17	13	12
14	.20	2.9	2.9	13	6.9	432	37	8.2	5.6	20	8.9	12
15	1.3	4.3	3.2	11	5.7	405	28	8.5	3.5	21	18	9.3
16	.75	201	2.7	9.7	5.2	58	72	11	193	135	363	7.5
17	.43	299	2.3	9.4	4.9	37	92	32	33	379	34	5.6
18	.31	33	2.0	8.4	4.8	33	35	11	35	45	18	5.5
19	.20	25	111	59	4.7	24	28	7.9	9.5	25	14	4.8
20	.17	14	327	531	296	25	25	6.7	7.7	21	12	4.4
21	.33	9.7	240	337	43	198	79	6.3	5.3	18	18	4.3
22	.19	7.4	105	156	22	163	74	5.7	4.3	55	20	4.5
23	.20	64	51	45	13	504	24	5.3	4.3	47	24	4.8
24	1.5	28	25	52	12	161	20	7.2	5.3	35	103	4.6
25	8.6	13	142	375	18	50	17	11	35	14	31	4.9
26	2.8	13	153	49	20	34	17	12	19	13	94	12
27	11	11	38	35	17	626	15	5.9	11	25	19	11
28	886	10	22	28	16	80	45	4.6	120	64	17	9.7
29	31	7.5	17	25	---	110	25	3.9	16	47	15	4.8
30	11	40	13	22	---	435	18	4.6	29	33	13	3.8
31	11	---	11	18	---	493	---	6.2	---	17	10	---
TOTAL	984.13	1299.4	1345.7	3346.5	698.4	4810.5	1730	420.6	667.6	1433	1201.6	425.9
MEAN	31.7	43.3	43.4	108	24.9	155	57.7	13.6	22.3	46.2	38.8	14.2
MAX	886	299	327	666	296	747	220	85	193	379	363	118
MIN	.09	2.9	2.0	6.7	4.7	5.1	15	3.9	3.0	12	8.9	3.8
AC-FT	1950	2580	2670	6640	1390	9540	3430	834	1320	2840	2380	845

CAL YR 1981 TOTAL 6457.70 MEAN 17.7 MAX 886 MIN .02 AC-FT 12810
WTR YR 1982 TOTAL 18363.33 MEAN 50.3 MAX 886 MIN .09 AC-FT 36420

16343000 HELEMANO STREAM AT HALEIWA

LOCATION.--Lat 21°34'40", long 158°06'12", Hydrologic Unit 20060000, on left bank at upstream side of private road bridge, 0.3 mi (0.5 km) east of Weed Circle, and 1.1 mi (1.8 km) southeast of Waialua School at Haleiwa.

DRAINAGE AREA.--14.2 mi² (36.8 km²).

PERIOD OF RECORD.--November 1967 to September 1982 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1.57 ft (0.479 m) above mean sea level.

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

AVERAGE DISCHARGE.--14 years (1968-82), 11.6 ft³/s (0.329 m³/s), 8,400 acre-ft/yr (10.4 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0900	*11000	312	*17.71	5.398	Mar. 27	1100	3580	101	12.10	3.688
Jan. 6	1830	8990	255	16.43	5.008	Mar. 30	1030	2660	75.3	11.08	3.377
Mar. 14	1800	3680	104	12.20	3.719	Aug. 16	1230	3810	108	12.33	3.758
Mar. 21	2400	1480	41.9	9.05	2.774						

Minimum discharge, 0.01 ft³/s (0.0003 m³/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR.	MAY	JUN	JUL	AUG	SEP
1	.01	3.0	24	3.6	3.9	.95	90	3.7	.06	4.5	18	130
2	.01	86	7.2	3.0	4.3	.55	44	2.2	.08	2.3	34	67
3	.01	44	4.5	3.9	5.3	.38	49	1.3	.08	1.8	5.5	19
4	.01	11	3.1	3.7	3.9	.32	14	.76	.14	6.5	1.5	13
5	.01	3.6	1.8	3.0	4.2	.32	10	.78	.29	8.8	.35	12
6	.01	4.8	.95	316	4.8	.32	8.2	1.6	.11	2.2	.03	14
7	.01	3.5	.95	1170	3.9	.35	47	76	.05	13	.01	9.9
8	.01	7.2	1.7	31	3.4	.35	16	59	.02	5.3	.01	4.8
9	.01	3.7	2.0	15	3.3	.42	39	5.1	.03	2.2	.19	1.6
10	.01	3.4	1.0	10	3.3	.50	18	2.3	.01	1.4	.06	.88
11	.01	1.2	.70	6.8	5.0	.60	8.0	1.7	.01	1.1	.01	.50
12	.01	.60	.55	5.3	7.7	131	5.7	1.0	.01	.35	.01	.29
13	.01	.82	.50	4.5	3.9	36	4.2	4.9	.01	.06	1.8	.23
14	.02	.60	.46	3.6	2.3	445	9.1	1.6	.01	.05	.29	.20
15	.02	.70	.46	2.5	1.5	287	13	.50	.05	.03	.03	5.4
16	.02	.60	.46	1.7	1.0	16	38	.08	52	.05	475	2.0
17	.01	31	.46	1.6	1.6	7.3	47	1.1	15	120	36	.65
18	.02	10	.46	2.0	.76	3.7	29	2.0	19	12	10	.29
19	.02	2.8	.55	9.3	.46	2.4	9.5	1.9	5.2	4.2	5.2	.20
20	.02	1.1	40	206	9.7	1.5	7.8	.42	1.0	2.2	4.1	.14
21	.02	4.1	53	225	12	58	5.0	.03	.19	1.0	.88	.08
22	.02	4.8	48	89	3.6	188	81	.01	.01	.50	.42	.06
23	.02	18	33	19	2.0	300	12	.01	.01	.17	.29	.29
24	.02	34	11	11	1.4	56	6.4	.02	.01	.11	8.3	.65
25	.02	9.2	78	72	.95	12	4.3	.01	.13	.46	141	.29
26	.03	5.9	81	16	2.2	4.5	3.7	.03	.01	.32	90	.17
27	.08	3.3	22	9.5	.76	403	4.5	.14	.01	1.0	14	.08
28	1130	2.0	9.5	7.2	.38	37	9.3	.17	18	.20	7.0	.06
29	48	1.3	6.6	5.7	---	167	17	.11	5.7	.06	6.2	.23
30	8.3	43	5.5	4.8	---	694	5.9	14	1.8	.02	4.2	.29
31	3.0	---	4.3	4.2	---	244	---	.08	---	.01	2.3	---
TOTAL	1189.77	345.22	443.70	2265.9	97.51	3098.46	655.6	168.69	119.03	191.89	866.68	284.28
MEAN	38.4	11.5	14.3	73.1	3.48	100	21.9	5.44	3.97	6.19	28.0	9.48
MAX	1130	86	81	1170	12	694	90	76	52	120	475	130
MIN	.01	.60	.46	1.6	.38	.32	3.7	.01	.01	.01	.01	.06
AC-FT	2360	685	880	4490	193	6150	1300	335	236	381	1720	564

CAL YR 1981 TOTAL 3052.06 MEAN 8.36 MAX 1130 MIN .00 AC-FT 6050
WTR YR 1982 TOTAL 9726.73 MEAN 26.6 MAX 1170 MIN .01 AC-FT 19290

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 20060000, on left bank 4.3 mi (6.9 km) northeast of Leilehua High School in Wahiawa and 8.1 mi (13.0 km) east of Waialua School.

DRAINAGE AREA.--2.98 mi² (7.72 km²).

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

REVISED RECORDS.--WSP 1937: 1960.

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

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

AVERAGE DISCHARGE.--23 years, 14.0 ft³/s (0.396 m³/s), 10,140 acre-ft/yr (12.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft³/s (157 m³/s) July 17, 1974, gage height, 11.94 ft (3.639 m), from rating curve extended above 110 ft³/s (3.12 m³/s) on basis of slope-area measurements at gage heights 6.74 ft (2.054 m) and 10.12 ft (3.085 m); minimum, no flow Jan. 24, 25, 1977, Feb. 18, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0730	3000	142	11.35	3.459	Mar. 27	0930	3090	87.5	9.11	2.777
Jan. 6	2330	*5020	142	*11.37	3.466	Mar. 29	1830	1580	44.7	7.04	2.146
Mar. 14	1700	2500	70.8	8.35	2.545	Aug. 16	1030	2340	66.3	8.13	2.478
Mar. 21	2200	2030	57.5	7.68	2.341						

Minimum discharge, 0.57 ft³/s (0.016 m³/s) Oct. 11-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	83	14	3.9	4.3	7.6	64	9.0	3.5	22	78	118
2	5.1	65	9.3	4.8	4.5	5.7	82	7.1	3.0	14	40	27
3	6.1	67	9.3	15	5.7	5.1	64	13	2.6	8.4	15	9.6
4	5.7	12	5.7	4.4	3.6	8.1	21	6.8	3.0	39	8.1	6.8
5	7.1	6.6	4.4	3.2	5.2	4.1	14	8.7	4.8	17	11	17
6	3.2	13	3.8	371	12	3.0	12	8.4	23	9.6	7.6	20
7	1.6	43	13	300	6.1	4.7	50	106	13	64	6.6	5.9
8	1.2	7.9	9.0	15	6.6	4.4	14	35	4.1	12	8.4	9.6
9	.88	4.7	3.7	8.1	3.9	3.9	103	10	3.0	23	8.7	9.9
10	.74	3.8	3.0	7.9	3.3	7.3	14	6.8	2.8	16	28	6.6
11	.61	3.5	2.6	5.9	33	17	9.3	7.1	9.9	6.8	25	9.6
12	.57	3.5	2.4	5.7	19	270	9.0	26	5.2	7.6	52	9.3
13	.61	3.2	2.2	6.4	4.9	44	20	9.0	2.8	13	8.1	6.8
14	7.1	2.7	2.2	3.9	3.3	335	49	7.6	6.4	15	9.6	22
15	3.6	4.5	4.4	3.4	2.7	228	15	10	2.9	23	53	9.6
16	1.9	25	2.8	3.1	2.3	18	74	10	89	93	273	8.1
17	1.4	118	2.1	3.4	2.2	17	65	14	31	164	18	4.7
18	14	9.6	1.8	4.1	2.1	9.9	22	9.6	19	28	13	5.1
19	3.7	6.8	33	23	1.9	9.0	16	6.1	5.2	12	8.7	4.2
20	2.4	5.2	144	121	146	11	13	7.3	4.9	9.0	7.3	3.6
21	1.6	3.7	95	155	24	249	73	4.9	4.1	10	12	3.3
22	1.0	3.2	40	49	15	81	67	4.9	4.1	41	18	3.1
23	.83	73	78	11	5.9	257	17	4.4	2.9	33	14	3.1
24	3.8	34	18	29	6.8	74	13	5.9	3.8	23	56	3.5
25	7.3	7.9	95	102	7.1	17	10	18	22	7.6	78	3.4
26	4.7	11	73	12	7.3	12	18	9.3	17	6.4	48	18
27	5.9	7.1	14	9.3	19	359	9.0	4.9	16	9.9	12	11
28	782	5.7	8.1	7.9	19	37	45	3.9	88	25	21	13
29	53	4.7	6.4	7.3	---	201	15	3.6	12	20	12	5.1
30	7.6	66	4.9	12	---	313	11	13	43	23	9.0	5.2
31	15	---	4.3	5.7	---	178	---	6.6	---	8.4	6.6	---
TOTAL	951.34	704.3	706.4	1313.4	376.7	2790.8	1008.3	396.9	452.0	803.7	959.7	382.1
MEAN	30.7	23.5	22.8	42.4	13.5	90.0	33.6	12.8	15.1	25.9	31.0	12.7
MAX	782	118	144	371	146	359	103	106	89	164	273	118
MIN	.57	2.7	1.8	3.1	1.9	3.0	9.0	3.6	2.6	6.4	6.6	3.1
AC-FT	1890	1400	1400	2610	747	5540	2000	787	897	1590	1900	758

CAL YR 1981 TOTAL 5249.28 MEAN 14.4 MAX 782 MIN .07 AC-FT 10410
WTR YR 1982 TOTAL 10845.64 MEAN 29.7 MAX 782 MIN .57 AC-FT 21510

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

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

DRAINAGE AREA.--4.62 mi² (11.97 km²).

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--58 years (water years, 1918-31, 1939-82), 29.4 ft³/s (0.833 m³/s), 21,300 acre-ft/yr (26.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s (762 m³/s) Feb. 4, 1965, gage height, 19.91 ft (6.069 m), from floodmarks, from rating curve extended above 105 ft³/s (2.97 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s (0.022 m³/s) about Nov. 23, 1962.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 18	0230	2190	62.0	8.70	2.652
Jan. 21	0630	*2440	69.1	9.05	2.758
Mar. 17	2000	2020	57.2	8.46	2.579

Minimum discharge, 3.5 ft³/s (0.099 m³/s) Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	183	25	15	12	12	423	28	5.5	56	157	100
2	80	77	48	10	20	11	266	48	5.0	27	30	34
3	9.2	117	26	22	12	197	83	17	4.7	88	20	12
4	14	31	14	9.9	9.0	73	43	13	4.5	25	16	9.3
5	30	15	10	8.5	27	12	26	11	4.6	38	31	8.4
6	7.9	64	16	9.1	25	10	25	9.8	18	28	18	19
7	5.2	75	40	211	21	25	50	9.4	11	40	17	9.8
8	21	24	14	42	26	24	218	14	5.2	19	20	63
9	6.1	25	8.5	39	11	20	185	9.4	16	67	23	20
10	5.3	15	7.5	62	36	79	29	8.2	150	18	12	19
11	31	17	6.7	27	211	105	19	7.4	17	13	13	10
12	5.9	9.3	7.0	15	19	314	68	17	7.8	16	33	15
13	5.5	7.5	14	12	11	134	38	7.8	34	9.9	11	9.5
14	57	6.6	35	12	8.7	165	56	7.2	8.7	14	75	20
15	8.6	28	9.5	25	8.0	90	52	6.7	6.3	16	33	20
16	9.2	230	6.4	23	7.4	83	187	11	71	44	21	8.3
17	5.1	143	5.5	24	6.7	341	46	54	28	54	14	8.2
18	9.0	19	5.0	152	6.2	161	35	16	38	51	27	9.8
19	8.6	23	305	21	5.9	45	19	16	108	14	11	6.0
20	5.3	12	108	16	45	24	30	7.6	18	9.7	10	5.4
21	7.1	9.4	131	649	12	21	74	13	12	31	16	5.0
22	4.4	47	28	301	14	50	130	9.8	8.1	291	22	4.7
23	5.1	175	34	39	9.3	206	65	25	6.7	42	16	8.4
24	13	40	21	115	127	58	18	46	6.0	14	51	6.1
25	16	19	215	121	12	19	54	58	24	10	121	5.8
26	35	28	97	8.7	8.1	34	27	39	76	8.7	24	5.9
27	66	88	33	8.5	85	78	20	9.6	94	8.5	24	5.5
28	30	22	59	12	19	93	99	7.5	202	12	67	7.7
29	20	13	22	39	---	38	43	6.5	119	39	18	10
30	28	153	14	44	---	119	60	13	61	44	12	8.9
31	63	---	26	12	---	547	---	7.1	---	12	8.9	---
TOTAL	634.5	1715.8	1391.1	2104.7	814.3	3188	2488	553.0	1170.1	1159.8	971.9	474.7
MEAN	20.5	57.2	44.9	67.9	29.1	103	82.9	17.8	39.0	37.4	31.4	15.8
MAX	80	230	305	649	211	547	423	58	202	291	157	100
MIN	4.4	6.6	5.0	8.5	5.9	10	18	6.5	4.5	8.5	8.9	4.7
AC-FT	1260	3400	2760	4170	1620	6320	4930	1100	2320	2300	1930	942

CAL YR 1981 TOTAL 9511.7 MEAN 26.1 MAX 718 MIN 2.2 AC-FT 18870
WTR YR 1982 TOTAL 16665.9 MEAN 45.7 MAX 649 MIN 4.4 AC-FT 33060

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT											
19...	1300	12	45	6.6	20.5	6.6	9.5	107	290	480	7
DEC											
07...	1245	10	55	6.6	18.0	3.4	9.6	102	63	1200	9
JAN											
25...	1515	76	36	6.7	17.5	42	9.7	102	1100	1500	5
MAR											
15...	1315	57	41	6.5	20.0	10	9.4	104	360	860	5
JUN											
28...	1315	57	31	6.0	22.0	14	9.1	105	1000	1600	5
AUG											
23...	1345	20	44	6.4	22.0	11	9.2	106	220	3300	7

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
OCT											
19...	1.0	1.1	1.0	5.6	62	1.0	.6	6.0	<5.0	12	.1
DEC											
07...	.00	1.8	1.2	7.3	61	1.1	.7	9.0	<5.0	14	<.1
JAN											
25...	.00	.7	.8	5.3	67	1.0	.5	8.0	<5.0	8.2	.1
MAR											
15...	.00	.8	.8	4.8	63	.9	.7	11	5.0	8.6	<.1
JUN											
28...	.00	1.1	.6	3.6	57	.7	.5	8.0	<5.0	6.4	<.1
AUG											
23...	3.0	1.1	1.0	5.7	62	1.0	.5	4.0	--	9.2	<.1

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
OCT										
19...	7.6	39	--	.05	<.09	.060	.40	.020	<.010	<.020
DEC										
07...	7.4	37	--	.05	--	--	.21	.010	--	--
JAN										
25...	2.3	21	28	.03	<.09	<.070	.52	.040	.020	.010
MAR										
15...	3.9	--	32	.04	<.10	<.060	.46	.030	.010	<.010
JUN										
28...	2.4	25	30	.03	<.10	<.070	1.00	.070	.040	.030
AUG										
23...	5.8	45	--	.06	<.10	.060	1.10	.060	.070	.020

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
OCT 19...	1300	1	1	0	<100	3	0	<1	0	0
JAN 25...	1515	1	--	<1	<100	<100	1	<1	10	--
MAR 15...	1315	1	--	<1	<100	4	1	<1	<10	--
AUG 23...	1345	2	--	<1	<100	5	<1	<1	<10	--

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT 19...	0	0	<3	7	1	6	470	330	140	5
JAN 25...	<10	1	<1	5	1	4	1300	910	390	<1
MAR 15...	<10	1	<1	18	16	2	510	240	270	6
AUG 23...	10	<1	<1	5	2	3	820	490	330	<1

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT 19...	4	1	20	20	5	.0	.0	.0	0	0
JAN 25...	--	1	10	--	<10	.1	--	<.1	2	0
MAR 15...	--	<1	10	8	2	<.1	--	<.1	9	8
AUG 23...	--	1	10	6	4	<.1	--	<.1	<1	--

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 19...	0	0	0	0	0	0	0	180	180	5
JAN 25...	2	<1	--	<1	<1	--	<1	<10	--	10
MAR 15...	1	1	--	<1	<1	--	<1	20	--	<3
AUG 23...	<1	<1	--	<1	<1	--	<1	40	40	3

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 19...	1300	12	5	.16	100
DEC 07...	1245	10	4	.11	100
JAN 25...	1515	76	15	3.1	100
MAR 15...	1315	57	6	.92	100
JUN 28...	1315	57	11	1.7	100
AUG 23...	1345	20	8	.43	100

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

16404000 PELEKUNU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'11", long 156°52'43", Hydrologic Unit 20050000, on left bank 0.4 mi (0.6 km) upstream from Pilipililau Stream, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

PERIOD OF RECORD.--December 1919 to January 1929, September 1937 to November 1947, June 1948 to August 1957, August 1971 to March 1982 (discontinued). Occasional low-flow measurements and annual maximum, water years 1968-71.

REVISED RECORDS.--WSP 1569: 1940(M). WDR-HI-1981-1: 1972-80.

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

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,850 ft³/s (194 m³/s) Jan. 7, 1982, gage height, 7.20 ft (2.195 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurement at gage height, 7.20 ft (2.195 m); minimum, 2.2 ft³/s (0.062 m³/s) Sept. 29, Oct. 3, 4, 6, 12-18, 1974.

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

EXTREMES FOR PERIOD OCTOBER 1981 TO MARCH 1982.--Peak discharges above base of 700 ft³/s (19.8 m³/s), and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 27	1300	808	22.9	3.64	1.109	Jan. 25	0700	3240	91.8	5.60	1.707
Nov. 1	2000	1330	37.7	4.23	1.289	Feb. 5	1930	1460	41.3	4.36	1.329
Nov. 30	0400	866	24.5	3.72	1.134	Feb. 11	1030	946	26.8	3.82	1.164
Dec. 21	0100	1170	33.1	4.07	1.241	Feb. 24	0800	1060	30.0	3.95	1.204
Jan. 7	0530	*6850	194	*7.2	2.195	Mar. 14	1500	808	22.9	3.64	1.109
Jan. 22	0100	2840	80.4	5.37	1.637	Apr. 1	1730	3050	86.4	5.50	1.676

Minimum discharge, 3.8 ft³/s (0.108 m³/s) Oct. 10-13, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1981 TO MARCH 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	102	36	13	25	24						
2	11	69	42	30	25	19						
3	5.8	29	35	27	20	63						
4	8.1	18	24	14	18	44						
5	6.0	14	19	12	53	24						
6	5.2	18	16	16	28	20						
7	4.6	16	114	300	23	20						
8	4.8	12	54	49	24	23						
9	4.0	10	27	33	23	23						
10	4.0	9.7	20	25	29	24						
11	4.0	9.7	16	22	195	43						
12	3.8	8.1	14	20	46	88						
13	3.8	7.4	13	18	28	61						
14	8.7	7.4	12	16	22	112						
15	5.2	9.4	10	14	18	81						
16	4.0	14	9.7	13	16	37						
17	3.8	23	8.9	13	15	28						
18	19	10	8.9	27	13	36						
19	10	10	26	14	14	24						
20	6.7	8.9	33	21	15	20						
21	6.7	8.1	215	462	13	16						
22	5.4	12	43	369	11	21						
23	5.2	110	30	59	12	63						
24	4.8	61	23	76	61	31						
25	4.8	30	153	552	19	22						
26	18	26	77	108	16	20						
27	63	64	38	118	87	25						
28	24	29	26	85	44	19						
29	15	22	20	50	---	24						
30	10	111	16	49	---	46						
31	10	---	14	30	---	133						
TOTAL	295.2	878.7	1193.5	2655	913	1234						
MEAN	9.52	29.3	38.5	85.6	32.6	39.8						
MAX	63	111	215	552	195	133						
MIN	3.8	7.4	8.9	12	11	16						
AC-FT	586	1740	2370	5270	1810	2450						

CAL YR 1981 TOTAL 6175.1 MEAN 16.9 MAX 456 MIN 3.8 AC-FT 12250

16404200 PILIPILILAU STREAM NEAR PELEKUNU

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

DRAINAGE AREA.--0.49 mi² (1.27 km²).

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

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

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

AVERAGE DISCHARGE.--14 years, 1.54 ft³/s (0.044 m³/s), 1,120 acre-ft/yr (1.38 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft³/s (23.6 m³/s) Jan. 25, 1982, gage height, 4.25 ft (1.295 m), from rating curve extended above 6.2 ft³/s (0.18 m³/s) on basis of slope-area measurement at gage height, 4.25 ft (1.295 m); minimum, 0.50 ft³/s (0.014 m³/s) Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2000	137	3.88	3.10	0.945	Feb. 5	1900	109	3.09	2.98	0.908
Jan. 7	0530	550	15.6	3.95	1.204	Feb. 24	1000	137	3.88	3.10	.945
Jan. 21	0600	181	5.13	3.25	.991	Feb. 27	1000	137	3.88	3.10	.945
Jan. 25	0500	*835	23.6	*4.25	1.295	Mar. 14	1800	162	4.59	3.19	.972

Minimum discharge, 0.76 ft³/s (0.022 m³/s) Oct. 7-13, 16-18, 23-25.

REVISIONS.--The peak discharges and annual maximum (*) for water years 1968-81 have been revised, superseding figures published in WSP 2137 and 1971-81 annual reports.

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1968	Aug. 4, 1968	0830	5.4	0.15	1.85	0.564
1969	Nov. 28, 1968	2400	*240	6.80	*3.41	1.039
	Jan. 8, 1969	--	175	4.96	a3.23	.984
1970	Jan. 3, 1970	1730	*148	4.19	*3.14	.957
1971	Nov. 17, 1970	1830	224	6.34	3.37	1.027
	Nov. 20, 1970	1730	103	2.92	2.95	.899
	Nov. 25, 1970	1830	*320	9.06	*3.58	1.091
	Jan. 5, 1971	1000	105	2.97	2.96	.902
	Jan. 15, 1971	2100	227	6.43	3.38	1.030
	Feb. 1, 1971	0930	148	7.05	3.14	.957
1972	Feb. 4, 1972	2100	*107	3.03	*2.97	.905
1973	Dec. 8, 1972	1830	*120	3.40	*3.03	.924
1974	Dec. 8, 1973	0330	*428	12.1	*3.78	1.152
	Jan. 6, 1974	2300	350	9.91	3.64	1.109
	Mar. 2, 1974	0130	157	4.45	3.17	.966
1975	Nov. 21, 1974	--	*34	0.96	*2.45	0.747
1976	Feb. 6, 1976	--	*94	2.66	*2.91	.887
1977	May 14, 1977	0400	*109	3.09	*2.98	.908
1978	Mar. 1, 1978	1430	*127	3.60	*3.06	.933
1979	Nov. 13, 1978	1430	518	14.7	3.91	1.192
	Jan. 11, 1979	1700	518	14.7	3.91	1.192
	Jan. 13, 1979	1900	125	3.54	3.05	.930
	Feb. 10, 1979	0830	*558	15.8	*3.96	1.207
	Feb. 21, 1979	0300	113	3.20	3.00	.914
1980	Jan. 8, 1980	2100	*503	14.2	*3.89	1.186
1981	Apr. 29, 1981	2230	*113	3.20	*3.00	.914

16404200 PILIPILILAU STREAM NEAR PELEKUNU--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	5.8	2.0	2.2	3.7	3.1	8.1	3.0	1.7	1.9	3.7	3.0
2	.89	4.9	2.3	2.4	3.8	2.9	5.8	3.0	1.7	2.5	2.0	1.6
3	.84	1.7	2.3	2.8	3.1	9.5	3.8	2.8	1.7	2.6	1.5	1.3
4	.89	1.1	1.8	2.0	2.9	5.3	3.2	2.6	1.7	1.7	1.4	1.2
5	.84	.99	1.6	2.0	5.8	3.4	3.0	2.6	1.7	1.6	1.3	1.2
6	.80	1.3	1.4	2.0	3.8	3.2	3.0	2.5	1.7	1.6	1.3	1.2
7	.80	1.2	6.8	13	3.5	3.0	2.9	2.5	1.6	1.6	1.3	1.2
8	.76	.99	3.1	3.5	3.2	3.4	7.8	2.4	1.6	1.5	1.3	1.4
9	.76	.94	2.0	2.9	3.5	3.4	5.9	2.4	1.6	1.6	1.4	1.2
10	.76	.89	1.9	2.4	3.5	3.4	3.7	2.3	1.6	1.4	1.8	1.4
11	.80	.89	1.6	2.4	10	4.0	3.2	2.3	1.5	1.3	1.3	1.2
12	.76	.84	1.6	2.2	4.0	6.5	3.2	2.2	1.6	1.3	1.4	1.2
13	.76	.84	1.6	2.0	3.4	4.8	3.2	2.2	1.6	1.3	1.2	1.1
14	.89	.84	1.6	1.9	3.2	9.9	3.0	2.2	1.5	1.3	1.7	1.0
15	.80	.94	1.5	1.8	3.0	5.2	2.8	2.1	1.5	1.4	1.8	1.0
16	.76	.99	1.4	1.7	3.0	3.8	3.5	2.1	1.5	1.5	1.4	1.0
17	.76	1.0	1.3	2.2	2.9	3.5	3.0	2.2	1.6	1.4	1.3	1.0
18	1.9	.89	1.3	2.6	2.8	4.8	2.6	2.1	1.5	1.3	1.3	1.0
19	1.1	.84	2.1	1.9	2.9	3.7	2.5	2.0	1.5	1.3	1.2	.99
20	1.0	.84	2.0	2.1	2.8	3.1	2.6	2.0	1.4	1.2	1.2	.99
21	.85	.80	12	25	2.6	3.0	3.7	2.0	1.4	1.3	1.2	.99
22	.78	1.0	2.9	11	2.5	3.0	10	2.0	1.4	3.2	1.2	1.0
23	.76	4.8	2.6	4.6	2.8	4.1	4.7	2.0	1.4	2.0	1.2	1.0
24	.76	3.9	2.4	9.9	6.5	3.2	3.2	2.0	1.4	1.5	1.3	1.0
25	.76	1.7	9.4	60	2.0	2.8	5.8	2.0	1.6	1.4	1.8	1.0
26	1.4	1.5	4.5	8.0	1.8	2.6	3.8	1.9	1.6	1.3	1.4	1.0
27	2.7	3.3	3.0	7.5	11	2.8	3.2	1.8	1.6	1.3	1.5	.99
28	1.2	1.6	2.6	5.8	4.1	2.5	4.8	1.8	3.1	1.3	2.1	.99
29	.94	1.3	2.5	5.6	---	2.6	4.0	1.8	1.9	1.3	1.5	.99
30	.84	5.2	2.4	5.5	---	3.5	3.7	2.0	1.7	1.2	1.3	.99
31	.89	---	2.3	4.0	---	7.6	---	1.8	---	1.3	1.2	---
TOTAL	29.55	53.82	87.8	202.9	108.1	127.6	123.7	68.6	48.9	48.4	46.5	35.13
MEAN	.95	1.79	2.83	6.55	3.86	4.12	4.12	2.21	1.63	1.56	1.50	1.17
MAX	2.7	5.8	12	60	11	9.9	10	3.0	3.1	3.2	3.7	3.0
MIN	.76	.80	1.3	1.7	1.8	2.5	2.5	1.8	1.4	1.2	1.2	.99
AC-FT	59	107	174	402	214	253	245	136	97	96	92	70

CAL YR 1981 TOTAL 593.72 MEAN 1.63 MAX 31 MIN .76 AC-FT 1180
WTR YR 1982 TOTAL 981.00 MEAN 2.69 MAX 60 MIN .76 AC-FT 1950

16405100 MOLOKAI TUNNEL AT EAST PORTAL

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

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

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

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

AVERAGE DISCHARGE.--16 years, 3.20 ft³/s (0.091 m³/s), 2,320 acre-ft/yr (2.86 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 30 ft³/s (0.85 m³/s) Apr. 29, 1981; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft³/s (0.54 m³/s) Nov. 23, Aug. 1; minimum daily, 0.09 ft³/s (0.003 m³/s) Apr. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	5.9	5.2	3.5	3.1	3.2	10	1.9	5.5	11	19	7.5
2	2.5	10	9.9	8.0	3.2	2.5	7.8	1.9	5.4	17	12	4.7
3	2.1	5.6	11	16	3.1	7.0	.12	1.6	5.3	15	5.5	2.7
4	3.1	2.7	4.6	5.2	2.5	6.8	.12	.75	4.5	7.1	3.2	2.3
5	2.2	1.9	2.5	3.8	4.6	2.5	.12	.22	3.8	5.7	3.3	2.2
6	1.6	5.8	2.6	3.8	5.2	2.0	.11	.42	3.8	4.1	2.9	2.2
7	1.3	8.8	7.8	13	5.3	2.9	.09	.29	3.8	6.1	2.6	2.0
8	1.2	3.3	6.6	7.2	3.3	8.1	3.4	.29	3.8	5.5	3.1	4.7
9	1.2	2.1	.95	4.5	3.6	13	5.8	.29	4.0	9.3	6.0	2.9
10	1.2	1.9	.54	3.3	5.6	12	1.6	.29	5.5	4.8	11	7.8
11	1.1	2.4	.35	3.0	10	11	.64	1.0	6.4	3.0	6.1	3.6
12	1.1	1.8	.28	2.8	4.5	15	.75	.73	5.1	5.4	6.8	3.7
13	1.1	1.5	.25	2.3	2.0	12	4.4	.22	5.1	3.1	4.1	2.5
14	3.0	1.4	.41	1.6	1.6	8.4	5.2	.22	4.1	3.2	4.9	2.3
15	2.3	2.0	1.1	1.8	1.5	11	1.1	.22	2.9	7.2	7.9	2.1
16	1.6	5.0	1.6	2.0	1.4	4.7	5.5	.19	2.0	9.4	3.8	2.0
17	1.3	10	1.4	5.3	1.3	3.6	3.8	.21	3.2	8.6	.65	1.9
18	12	2.5	1.4	6.9	1.2	8.3	1.4	1.2	5.0	4.7	1.3	1.9
19	5.9	2.3	9.7	3.8	1.4	7.2	.67	1.1	5.1	3.4	2.6	1.8
20	2.5	1.8	12	4.5	6.3	3.6	1.0	3.2	4.2	2.5	2.3	1.7
21	2.1	1.5	14	10	2.7	3.1	2.8	3.2	2.6	2.5	2.7	1.7
22	1.6	2.2	7.1	9.5	2.4	3.1	4.1	3.2	1.9	12	2.6	1.7
23	1.4	19	5.5	5.8	4.3	15	3.8	3.2	1.9	10	2.9	1.7
24	1.3	16	3.9	6.7	14	9.2	1.9	3.1	1.9	4.1	4.1	1.7
25	1.4	7.1	14	10	4.8	4.4	5.7	3.6	2.0	5.0	11	1.8
26	14	7.0	15	7.0	3.6	3.4	2.3	4.5	3.4	4.7	8.0	2.0
27	18	15	7.2	9.5	12	7.3	1.1	3.7	7.7	4.7	6.3	2.3
28	7.8	6.1	5.1	12	9.5	4.7	5.0	5.4	15	4.7	14	1.9
29	2.9	2.9	3.7	6.7	---	5.7	3.2	5.3	13	4.2	6.5	1.8
30	1.9	12	3.7	12	---	13	3.0	13	9.2	4.7	4.4	1.7
31	2.1	---	3.6	4.8	---	9.8	---	6.6	---	5.2	2.9	---
TOTAL	104.0	167.5	162.98	196.3	124.0	223.5	86.52	71.04	147.1	197.9	174.45	80.8
MEAN	3.35	5.58	5.26	6.33	4.43	7.21	2.88	2.29	4.90	6.38	5.63	2.69
MAX	18	19	15	16	14	15	10	13	15	17	19	7.8
MIN	1.1	1.4	.25	1.6	1.2	2.0	.09	.19	1.9	2.5	.65	1.7
AC-FT	206	332	323	389	246	443	172	141	292	393	346	160

CAL YR 1981 TOTAL 1303.03 MEAN 3.57 MAX 30 MIN .05 AC-FT 2580
WTR YR 1982 TOTAL 1736.09 MEAN 4.76 MAX 19 MIN .09 AC-FT 3440

16405300 MOLOKAI TUNNEL AT WEST PORTAL

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

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (295.7 m), from tunnel plans.

REMARKS.--Records excellent except for the period of no gage-height record, Oct. 22 to Dec. 7, which are 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 (221.9 m) in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 5.59 ft³/s (0.158 m³/s), 4,050 acre-ft/yr (4.99 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft³/s (0.62 m³/s) Nov. 23; minimum daily, 3.0 ft³/s (0.085 m³/s) Dec. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	8.4	7.7	4.8	6.5	6.8	13	5.5	9.1	14	21	11
2	5.0	12	12	7.2	6.0	5.8	14	5.5	9.1	20	15	8.5
3	5.0	8.1	14	18	6.5	9.4	3.7	5.2	8.8	18	9.1	6.5
4	5.8	5.2	7.1	6.5	5.8	11	3.7	4.8	8.0	11	7.2	6.0
5	5.0	4.4	5.0	5.0	6.8	5.8	3.7	3.7	7.2	9.4	7.0	6.0
6	4.5	8.3	5.1	4.8	8.5	5.3	3.7	3.7	7.2	8.0	6.5	6.0
7	4.3	11	10	17	8.7	6.0	3.7	3.7	7.2	9.7	6.2	5.8
8	4.1	5.8	9.4	9.7	6.5	10	5.9	3.7	7.2	9.4	6.8	8.4
9	3.9	4.6	3.9	7.0	6.3	16	9.7	3.7	7.5	12	9.4	6.2
10	3.9	4.4	3.5	5.8	9.2	16	5.2	3.7	9.1	8.8	14	11
11	3.9	4.9	3.1	5.5	12	14	4.3	4.1	9.7	6.8	9.7	7.5
12	3.9	4.3	3.1	5.3	8.3	17	4.1	4.1	8.5	8.5	11	7.0
13	3.9	4.0	3.0	4.8	5.0	15	6.6	3.7	8.5	6.8	7.8	6.2
14	5.4	3.9	3.1	4.1	4.8	11	9.5	3.7	7.5	6.8	8.9	5.8
15	5.5	4.5	3.8	4.3	4.8	14	5.0	3.7	7.0	10	11	5.8
16	4.5	7.5	4.5	4.5	4.5	8.0	8.0	3.7	6.0	13	7.6	5.5
17	4.3	12	4.3	7.8	4.5	6.8	7.5	3.7	6.8	12	4.3	5.5
18	13	5.0	4.1	9.4	4.5	10	5.3	4.3	8.5	8.2	4.8	5.2
19	8.8	4.8	11	6.3	4.5	11	4.3	4.3	8.8	7.2	6.2	5.2
20	5.5	4.3	15	7.0	9.1	7.0	4.1	7.0	7.8	6.0	5.8	5.2
21	4.8	4.0	17	13	6.0	6.3	5.8	7.0	6.8	6.2	6.2	5.2
22	4.1	4.7	9.4	12	5.4	6.3	8.3	7.0	5.8	15	6.0	5.2
23	3.9	22	7.8	8.3	6.6	16	8.6	7.0	5.8	14	6.2	5.0
24	3.9	18	5.8	9.2	16	13	6.4	7.0	5.8	7.8	7.5	5.0
25	3.9	9.6	15	13	8.0	7.8	9.5	7.2	6.0	8.8	13	5.2
26	16	9.5	16	9.5	6.8	6.8	6.6	8.2	7.2	8.5	13	5.2
27	20	18	8.0	12	14	10	3.9	7.5	9.6	8.5	9.4	6.2
28	10	8.6	5.8	15	13	8.3	8.0	9.1	19	8.5	18	5.5
29	5.4	5.4	4.8	9.2	---	8.5	6.2	9.1	16	8.0	11	5.2
30	4.4	14	4.8	16	---	16	6.8	16	13	8.5	8.2	5.2
31	4.6	---	4.8	8.3	---	13	---	10	---	9.2	7.0	---
TOTAL	185.1	241.2	231.9	270.3	208.6	317.9	195.1	180.6	254.5	308.6	284.8	187.2
MEAN	5.97	8.04	7.48	8.72	7.45	10.3	6.50	5.83	8.48	9.95	9.19	6.24
MAX	20	22	17	18	16	17	14	16	19	20	21	11
MIN	3.9	3.9	3.0	4.1	4.5	5.3	3.7	3.7	5.8	6.0	4.3	5.0
AC-FT	367	478	460	536	414	631	387	358	505	612	565	371

CAL YR 1981 TOTAL 2251.3 MEAN 6.17 MAX 31 MIN 3.0 AC-FT 4470
WTR YR 1982 TOTAL 2865.8 MEAN 7.85 MAX 22 MIN 3.0 AC-FT 5680

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT (274 M), NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi (2.9 km) southwest of Haupu Bay, 2.3 mi (3.7 km) upstream from mouth, and 5.2 mi (8.4 km) southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi² (5.15 km²).

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

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

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

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

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--21 years (water years, 1961, 1963-82), 7.50 ft³/s (0.212 m³/s), 5,430 acre-ft/yr (6.70 hm³/yr). The figure published in the 1981 report was in error; the correct figure is 20 years, 7.32 ft³/s (0.207 m³/s), 5,300 acre-ft/yr (6.53 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft³/s (101 m³/s) Jan. 25, 1982, gage height, 6.64 ft (2.024 m), from rating curve extended above 43 ft³/s (1.22 m³/s) on basis of slope-area measurement at gage height 5.24 ft (1.597 m); minimum, 0.02 ft³/s (0.001 m³/s) Oct. 26, 27, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft (4.151 m), from flood-marks, former site and datum, discharge, 6,220 ft³/s (176 m³/s), by slope-area measurement.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2000	2190	62.0	5.62	1.713	Jan. 21	0530	1280	36.2	4.67	1.423
Nov. 30	0500	1010	28.6	4.31	1.314	Jan. 25	0300	*3570	101	*6.64	2.024
Dec. 7	1530	595	16.9	3.65	1.113	Feb. 27	0930	704	19.9	3.84	1.170
Dec. 21	0100	2140	60.6	5.57	1.698	Mar. 31	1130	930	26.3	4.20	1.280
Jan. 7	0500	2920	82.7	6.19	1.887	Apr. 22	0100	668	18.9	3.78	1.152

Minimum discharge, 0.99 ft³/s (0.028 m³/s) Oct. 24.

REVISIONS.--Revised peak discharges and annual maximum (*) for water years 1962-81 have been revised, superseding figures published in WSP 1937, 2137 and the 1971-81 annual reports.

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1962	Oct. 15, 1961	0730	770	21.8	3.95	1.204	1969	Oct. 2, 1968	a0200	698	19.8	3.83	1.167
	Oct. 17, 1961	0900	824	23.3	4.04	1.231		Nov. 28, 1968	2300	*2190	62.0	*5.62	1.713
1963	Jan. 16, 1963	1830	560	15.9	3.58	1.091		Dec. 3, 1968	1300	881	24.9	4.13	1.259
	Jan. 22, 1963	0900	484	13.7	3.42	1.042		Dec. 4, 1968	0600	794	22.5	3.99	1.216
	Mar. 1, 1963	0800	610	17.3	3.68	1.122		Jan. 3, 1969	0600	909	25.7	4.17	1.271
	Mar. 26, 1963	1200	812	23.0	4.02	1.225		Jan. 9, 1969	a0030	758	21.5	3.93	1.198
	Mar. 28, 1963	0430	498	14.1	3.45	1.052	1970	Jan. 3, 1970	a1700	*1060	30.0	*4.38	1.335
	May 14, 1963	1830	*842	23.8	*4.07	1.241		Apr. 2, 1970	1000	842	23.8	4.07	1.241
	Sept. 17, 1963	0700	585	16.6	3.63	1.106	1971	Nov. 17, 1970	1800	1030	29.2	4.34	1.323
1964	Nov. 9, 1963	1630	*550	15.6	*3.56	1.085		Nov. 20, 1970	1730	1050	29.7	4.37	1.332
1965	Oct. 6, 1964	0430	386	10.9	3.19	.972		Nov. 25, 1970	1630	*2060	58.3	*5.50	1.676
	Nov. 5, 1964	a1900	370	10.5	3.15	.960		Jan. 15, 1971	2130	1110	31.4	4.46	1.359
	Dec. 20, 1964	a0600	2670	75.6	6.00	1.829		Feb. 1, 1971	0900	842	23.8	4.07	1.241
	Feb. 4, 1965	0930	1350	38.2	4.76	1.451	1972	Feb. 4, 1972	1930	*1210	34.3	*4.59	1.399
	Mar. 23, 1965	a0400	2710	76.7	6.03	1.838							
	Apr. 13, 1965	a2000	*2830	80.1	*6.12	1.865	1973	Dec. 8, 1972	1730	895	25.3	4.15	1.265
1966	Oct. 12, 1965	2100	502	14.2	3.46	1.055		Feb. 20, 1973	1900	*1030	29.2	*4.34	1.323
	Oct. 29, 1965	1430	444	12.6	3.33	1.015	1974	Dec. 8, 1973	0300	*1850	52.4	*5.30	1.615
	Nov. 12, 1965	0600	462	13.1	3.37	1.027		Jan. 6, 1974	2230	1190	33.7	4.56	1.390
	Nov. 14, 1965	1430	540	15.3	3.54	1.079		Mar. 1, 1974	2330	776	22.0	3.96	1.207
	Dec. 1, 1965	2000	*1130	32.0	*4.48	1.366							
	Dec. 6, 1965	1630	605	17.1	3.67	1.119	1975	Nov. 21, 1974	0930	*502	14.2	*3.46	1.055
	Jan. 24, 1966	2030	626	17.7	3.71	1.131							
	Mar. 2, 1966	1500	511	14.5	3.48	1.061	1976	Jan. 31, 1976	1800	*615	17.4	*3.69	1.125
1967	Oct. 15, 1966	1030	484	13.7	3.42	1.042	1977	Nov. 16, 1976	0600	*1070	30.3	*4.40	1.341
	Nov. 4, 1966	1630	*2710	76.7	*6.03	1.838							
	Dec. 28, 1966	2230	638	18.1	3.73	1.137	1978	Mar. 1, 1978	1400	*764	21.6	*3.94	1.201
	Jan. 12, 1967	0100	710	20.1	3.85	1.173							
	Jan. 25, 1967	0600	470	13.3	3.39	1.033	1979	Nov. 12, 1978	1200	1680	47.6	5.13	1.564
	Feb. 27, 1967	0800	484	13.7	3.42	1.042		Dec. 6, 1978	1200	1040	29.5	4.36	1.329
	Mar. 7, 1967	0800	550	15.6	3.56	1.085		Jan. 11, 1979	1700	*2360	66.8	*5.76	1.756
	Mar. 17, 1967	1530	692	19.6	3.82	1.164		Feb. 11, 1979	1530	2100	59.5	5.54	1.689
	Mar. 22, 1967	1900	860	24.4	4.10	1.250							
1968	Dec. 10, 1967	1400	1230	34.8	4.61	1.405	1980	Dec. 25, 1979	0400	1070	30.3	4.40	1.341
	Jan. 16, 1968	1530	*2800	79.3	*6.10	1.859		Jan. 8, 1980	2100	*2850	80.7	*6.14	1.871
	Jan. 20, 1968	0800	1650	46.7	5.10	1.554							
	Feb. 21, 1968	1030	909	25.7	4.17	1.271	1981	Dec. 22, 1980	1330	1130	32.0	4.48	1.366
	Apr. 19, 1968	1530	662	18.7	3.77	1.149		Apr. 30, 1981	2400	*1790	50.7	*5.24	1.597

a About.

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT (274 M), NEAR KALAUPAPA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	131	2.5	2.9	2.3	3.4	29	8.2	2.1	6.9	40	8.6
2	1.4	64	11	9.3	4.2	2.3	18	5.8	2.1	19	9.0	1.5
3	1.2	6.7	15	18	3.1	61	8.6	5.1	2.1	13	1.7	1.3
4	1.6	2.0	2.3	3.6	2.3	25	5.8	4.8	2.1	1.7	1.3	1.3
5	1.3	1.6	1.6	3.3	31	3.6	4.5	4.5	2.1	1.5	1.3	1.5
6	1.2	8.0	1.6	3.5	7.8	2.8	4.2	4.5	2.1	1.5	1.3	1.5
7	1.1	6.3	99	134	6.2	4.2	4.2	4.5	2.1	1.7	1.3	1.7
8	1.1	2.3	11	12	4.5	5.1	41	4.5	2.1	1.6	1.3	1.9
9	1.1	1.8	3.1	5.3	6.9	5.1	42	4.5	2.1	2.6	3.4	1.5
10	1.1	1.7	2.6	3.8	9.5	5.5	5.5	4.5	1.7	1.5	7.3	5.1
11	1.1	1.9	2.3	4.5	66	7.8	4.2	4.5	1.7	1.5	1.9	1.3
12	1.1	1.7	2.2	5.4	7.3	37	4.5	4.5	1.9	1.7	3.1	1.3
13	1.1	1.6	2.2	4.6	3.6	14	8.6	4.5	2.1	1.5	1.5	1.5
14	1.4	1.6	2.3	4.4	3.4	31	7.8	4.5	2.1	1.5	5.5	1.5
15	1.2	2.0	1.6	3.9	3.1	12	4.5	4.5	2.1	2.1	3.9	1.5
16	1.1	3.6	1.2	3.5	3.1	2.3	12	4.5	2.1	3.6	3.4	1.5
17	1.1	7.8	1.2	7.1	2.8	1.9	9.0	4.5	2.1	2.8	3.6	1.3
18	5.2	2.0	1.2	18	2.6	20	5.5	5.1	2.1	1.5	2.3	1.3
19	1.9	1.9	14	5.1	3.1	3.9	4.2	4.8	2.1	1.5	1.5	1.3
20	1.2	1.7	13	6.3	5.8	1.9	4.2	4.5	2.1	1.5	1.5	1.5
21	1.2	1.6	176	279	4.2	1.7	27	5.1	2.3	1.5	1.5	1.5
22	1.1	2.9	6.0	87	2.3	1.7	112	5.5	1.9	15	1.5	1.5
23	1.1	68	3.8	3.2	5.8	14	27	4.8	1.9	3.1	1.7	1.3
24	1.0	42	2.8	114	31	3.6	8.2	5.1	1.9	1.3	1.3	1.3
25	1.1	4.1	108	430	1.9	1.9	41	5.1	1.9	1.3	6.6	1.3
26	9.2	4.4	18	15	1.5	1.5	14	6.6	2.1	1.3	4.2	1.3
27	17	45	4.6	27	81	3.1	7.8	3.9	5.8	1.3	2.3	1.5
28	2.6	3.5	3.5	9.0	11	1.9	26	2.1	36	1.3	12	1.5
29	1.4	2.2	3.6	11	---	2.3	19	2.1	5.8	1.3	2.6	1.5
30	1.2	64	2.9	19	---	8.6	17	7.4	3.6	1.3	1.5	1.3
31	1.3	---	2.9	1.9	---	78	---	2.3	---	1.7	1.5	---
TOTAL	66.9	488.9	523.0	1254.6	317.3	368.1	526.3	146.8	104.2	100.5	132.8	53.9
MEAN	2.16	16.3	16.9	40.5	11.3	11.9	17.5	4.74	3.47	3.24	4.28	1.80
MAX	17	131	176	430	81	78	112	8.2	36	19	40	8.6
MIN	1.0	1.6	1.2	1.9	1.5	1.5	4.2	2.1	1.7	1.3	1.3	1.3
AC-FT	133	970	1040	2490	629	730	1040	291	207	199	263	107

CAL YR 1981 TOTAL 2630.8 MEAN 7.21 MAX 462 MIN 1.0 AC-FT 5220
WTR YR 1982 TOTAL 4083.3 MEAN 11.2 MAX 430 MIN 1.0 AC-FT 8100

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi (1.1 km) upstream from mouth and 4.4 mi (7.1 km) southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi² (9.53 km²).

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

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

REMARKS.--Records fair. Diversion above station for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began)--22 years (water years 1961-82), 15.5 ft³/s (0.439 m³/s), 11,230 acre-ft/yr (13.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,740 ft³/s (248 m³/s) Mar. 31, 1982, gage height, 7.63 ft (2.326 m), from rating curve extended above 59 ft³/s (1.67 m³/s) on basis of slope-area measurement at gage height 6.68 ft (2.036 m); minimum, 2.0 ft³/s (0.057 m³/s) Nov. 1, 2, 1925, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2000	2460	69.7	5.51	1.679	Jan. 25	0400	5200	147	6.68	2.036
Nov. 30	0500	1210	34.3	4.64	1.414	Feb. 27	0900	1030	29.2	4.47	1.362
Dec. 21	0500	1830	51.8	5.12	1.561	Mar. 31	1130	*8740	248	*7.63	2.326
Jan. 7	0530	2820	79.9	5.70	1.737	Apr. 22	0130	2240	63.4	5.39	1.643
Jan. 21	0630	2130	60.3	5.32	1.622	June 28	0500	716	20.3	4.12	1.256

Minimum discharge, 5.6 ft³/s (0.16 m³/s) several days in October and January.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	91	8.9	8.5	11	14	103	23	11	20	80	20
2	6.2	50	13	9.4	14	12	38	19	10	53	20	11
3	6.0	13	15	13	13	99	19	18	9.8	34	11	10
4	6.4	8.2	8.8	6.5	11	43	14	18	10	14	11	10
5	6.0	7.5	7.9	6.3	42	15	12	17	11	13	11	10
6	5.6	13	7.9	6.5	20	14	12	17	11	13	11	10
7	5.6	12	47	92	18	15	12	17	11	12	11	10
8	5.8	8.3	17	9.3	14	16	76	17	11	12	11	13
9	5.8	7.6	11	6.6	18	20	109	17	11	13	13	11
10	5.8	7.4	10	6.1	22	20	16	16	10	12	21	14
11	5.6	7.2	9.7	6.1	111	20	14	16	9.4	12	12	10
12	5.8	7.0	9.4	6.3	21	54	14	16	9.0	12	12	10
13	5.8	6.9	9.5	6.0	14	29	23	16	9.0	11	11	10
14	7.2	6.8	9.6	5.9	13	50	21	16	10	11	14	9.8
15	6.2	8.1	8.9	5.7	12	25	14	16	11	12	14	9.8
16	5.6	9.7	8.2	5.6	12	13	24	16	12	14	13	9.8
17	5.6	13	8.1	6.9	11	13	19	16	11	13	13	9.8
18	10	7.8	7.9	11	11	31	15	16	9.4	11	12	9.8
19	9.2	7.6	23	6.1	12	17	13	16	9.0	11	10	9.8
20	6.7	7.0	23	6.2	27	12	13	13	9.8	11	10	9.8
21	6.7	6.8	172	266	16	11	47	13	11	11	10	9.8
22	6.4	8.2	12	114	12	12	370	13	12	41	10	9.8
23	6.2	48	10	10	17	34	54	13	11	17	10	9.8
24	6.2	34	9.1	93	51	16	21	13	11	12	11	9.8
25	6.1	10	79	554	13	12	122	13	12	11	16	9.8
26	20	9.1	19	35	12	11	34	14	12	10	15	9.8
27	26	32	11	49	131	13	22	13	19	10	13	9.4
28	11	9.2	9.5	25	24	12	88	10	129	10	28	9.4
29	7.7	8.0	9.2	19	---	12	51	9.8	21	10	13	9.4
30	7.1	48	8.8	32	---	21	41	25	16	9.8	11	9.8
31	7.0	---	8.7	12	---	336	---	11	---	10	11	---
TOTAL	236.9	512.4	612.1	1439.0	703	1022	1431	483.8	459.4	465.8	469	314.4
MEAN	7.64	17.1	19.7	46.4	25.1	33.0	47.7	15.6	15.3	15.0	15.1	10.5
MAX	26	91	172	554	131	336	370	25	129	53	80	20
MIN	5.6	6.8	7.9	5.6	11	11	12	9.8	9.0	9.8	10	9.4
AC-FT	470	1020	1210	2850	1390	2030	2840	960	911	924	930	624

CAL YR 1981 TOTAL 4881.5 MEAN 13.4 MAX 345 MIN 5.6 AC-FT 9680
WTR YR 1982 TOTAL 8148.8 MEAN 22.3 MAX 554 MIN 5.6 AC-FT 16160

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi (1.0 km) upstream from Molokai Ranch pipeline crossing, 1.3 mi (2.1 km) northeast of Kaunakakai Post Office, and 1.7 mi (2.7 km) upstream from mouth.

DRAINAGE AREA.--6.57 mi² (17.02 km²).

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

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

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

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

AVERAGE DISCHARGE.--32 years (water years 1951-82), 1.64 ft³/s (0.046 m³/s), 1,190 acre-ft/yr (1.47 hm³/yr).

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

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2200	293	8.30	4.66	1.420	Jan. 21	0800	564	16.0	5.41	1.649
Dec. 21	0500	845	23.9	6.03	1.838	Jan. 25	0500	*1830	51.8	*7.72	2.353
Jan. 7	0600	805	22.8	5.95	1.814	Mar. 31	1400	444	12.6	5.11	1.558

No flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	29	.00	.00	.08	.21	1.9	.00	.00	.00	.03	.00
2	.00	32	.00	.00	.00	.00	.79	.00	.00	.00	.10	.00
3	.00	.67	.00	16	.00	8.7	.18	.00	.00	.00	.00	.00
4	.00	.00	.00	.64	.00	12	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	9.0	.18	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	7.8	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	73	78	.26	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	38	6.8	.01	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.69	1.1	.00	.00	8.8	.00	.00	.00	.00	.00
10	.00	.00	.00	.01	1.2	.00	.34	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	40	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	7.8	5.8	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.42	9.7	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	3.3	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.03	.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	137	141	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	3.3	136	.00	.00	46	.00	.00	.00	.00	.00
23	.00	.00	.09	11	.00	.00	7.4	.00	.00	.00	.00	.00
24	.00	15	.00	20	4.6	.00	.38	.00	.00	.00	.00	.00
25	.00	.66	66	431	.24	.00	2.0	.00	.00	.00	.00	.00
26	.00	.00	20	40	.00	.00	3.3	.00	.00	.00	.00	.00
27	.00	9.2	5.2	11	40	.00	.02	.00	.00	.00	.00	.00
28	.00	.89	.36	5.3	9.4	.00	.02	.00	.00	.00	.00	.00
29	.00	.00	.00	1.2	---	.00	.12	.00	.00	.00	.00	.00
30	.00	30	.00	20	---	.00	.19	.00	.00	.00	.00	.00
31	.00	---	.00	.88	---	37	---	.00	---	.00	.00	---
TOTAL	.00	117.42	343.64	919.93	120.81	77.15	71.44	.00	.00	.00	.13	.00
MEAN	.000	3.91	11.1	29.7	4.31	2.49	2.38	.000	.000	.000	.004	.000
MAX	.00	32	137	431	40	37	46	.00	.00	.00	.10	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	233	682	1820	240	153	142	.00	.00	.00	.3	.00

CAL YR 1981 TOTAL 970.79 MEAN 2.66 MAX 231 MIN .00 AC-FT 1930
WTR YR 1982 TOTAL 1650.52 MEAN 4.52 MAX 431 MIN .00 AC-FT 3270

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft (61 m) downstream from wooden bridge on Highway 45 and 0.8 mi (1.3 km) south of Halawa.

DRAINAGE AREA.--0.94 mi² (2.43 km²).

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 640 ft (195 m), from topographic map.

REMARKS.--Records fair except those for period of no gage-height record, Mar. 30 to May 2, which are poor. Diversion above station for domestic use at Puu O Hoku Ranch. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years, 0.827 ft³/s (0.023 m³/s), 599 acre-ft/yr (739,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s (77.0 m³/s) Apr. 13, 1965, gage height, 11.25 ft (3.429 m), from rating curve extended above 37 ft³/s (1.05 m³/s) on basis of slope-area measurements at gage heights 4.60 ft (1.402 m), 7.15 ft (2.179 m), and 11.25 ft (3.429 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 210 ft³/s (5.95 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 4	1930	284	8.04	4.46	1.359
Jan. 21	0630	310	8.78	4.60	1.402
Mar. 17	2100	*475	13.5	*5.30	1.615

No flow Oct. 1-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	2.6	.56	.56	1.1	.68	32	2.0	.83	1.3	6.4	1.4
2	.00	2.5	.36	.48	1.0	.60	9.9	2.5	.83	.98	1.6	.78
3	.00	2.3	.33	.52	.98	3.8	6.0	1.6	.83	2.3	.93	.56
4	.00	16	.27	.40	.88	2.8	4.0	1.6	.83	1.0	.78	.48
5	.00	3.3	.18	.33	1.3	.83	2.6	1.6	.88	1.3	.73	.48
6	.00	.56	.16	.30	1.4	.68	1.8	1.5	.88	.98	.78	.64
7	.00	1.5	.17	8.8	1.4	.64	3.0	1.5	.93	.88	.68	.48
8	.00	.52	.21	1.9	1.3	.60	16	1.4	.83	.83	.64	1.6
9	.00	.33	.14	1.2	.93	.56	12	1.4	.93	1.0	.60	.73
10	.00	.24	.12	4.7	2.0	.73	3.0	1.4	5.7	.98	.60	.60
11	.00	.18	.12	1.3	11	2.4	1.3	1.3	1.2	.73	.56	.56
12	.00	.12	.12	.83	1.6	12	4.0	1.3	.98	.68	.68	.48
13	.00	.08	.34	.60	1.0	8.8	2.9	1.3	1.3	.64	.60	.44
14	.00	.04	.67	.56	.88	9.2	3.4	1.3	.98	.60	1.1	.44
15	.00	.04	.21	.60	.78	5.2	3.2	1.2	.83	.64	1.1	.40
16	.00	4.8	.12	.52	.73	1.6	13	1.2	.83	.78	.64	.40
17	.00	8.2	.08	.60	.68	36	3.9	1.6	.78	1.2	.60	.40
18	.00	.60	.04	1.4	.64	15	3.5	1.3	.73	.93	.78	.40
19	.00	.33	7.2	1.2	.64	5.3	1.9	1.2	1.2	.73	.68	.36
20	.00	.24	6.8	.64	.83	2.7	3.0	1.2	.88	.60	.56	.36
21	.00	.16	6.7	44	.73	2.1	4.6	1.1	.78	.60	.60	.33
22	.00	.29	1.0	30	.60	1.9	7.0	1.0	.68	5.5	.60	.33
23	.00	2.3	.60	5.0	.64	3.1	3.9	1.0	.64	2.7	.56	.33
24	.00	.70	.48	3.7	5.4	1.9	2.7	1.3	.60	.88	.60	.33
25	.00	.27	14	4.3	1.0	1.4	4.0	1.2	.73	.78	2.1	.33
26	.00	.18	6.6	2.1	.83	1.4	2.6	1.7	1.3	.64	1.1	.33
27	.00	.88	1.7	3.0	1.8	1.7	1.8	1.0	1.1	.60	.64	.30
28	.00	.33	1.9	1.6	1.0	1.3	5.0	.98	9.2	.60	.88	.30
29	.00	.18	1.2	1.4	---	1.2	3.0	.93	2.8	1.1	.68	.30
30	.00	3.2	.83	1.3	---	4.0	4.1	.93	1.8	1.3	.52	.30
31	.00	---	.64	1.1	---	41	---	.88	---	.73	.48	---
TOTAL	.00	52.97	53.85	124.94	43.07	171.12	169.1	41.42	42.81	34.51	29.80	15.17
MEAN	.000	1.77	1.74	4.03	1.54	5.52	5.64	1.34	1.43	1.11	.96	.51
MAX	.00	16	14	44	11	41	32	2.5	9.2	5.5	6.4	1.6
MIN	.00	.04	.04	.30	.60	.56	1.3	.88	.60	.60	.48	.30
AC-FT	.00	105	107	248	85	339	335	82	85	68	59	30

CAL YR 1981 TOTAL 171.63 MEAN .47 MAX 18 MIN .00 AC-FT 340
WTR YR 1982 TOTAL 778.76 MEAN 2.13 MAX 44 MIN .00 AC-FT 1540

16501000 PALIKEA STREAM BELOW DIVERSION DAM, NEAR KIPAHULU

LOCATION.--Lat 20°41'03", long 156°04'10", Hydrologic Unit 20020000, on left bank 50 ft (15 m) downstream from old diversion dam, 2 mi (3 km) northwest of Kipahulu, and 2.1 mi (3.4 km) upstream from mouth.

DRAINAGE AREA.--6.29 mi² (16.29 km²).

PERIOD OF RECORD.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to current year. Published as Oheo Stream at elevation 1,550 ft (472 m) near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

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

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

REMARKS.--Records fair except those above 2,000 ft³/s (57 m³/s) which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--47 years, (water years, 1928, 1933-34, 1937, 1940-82), 58.1 ft³/s (1.645 m³/s), 42,090 acre-ft/yr (51.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft³/s (456 m³/s) Jan. 23, 1965, gage height, 18.3 ft (5.58 m), from floodmarks, from rating curve extended above 3,300 ft³/s (93.5 m³/s) on basis of computations of peak flow over dam at gage heights 12.68 ft (3.865 m) and 17.5 ft (5.33 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,700 ft³/s (105 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 7	0830	4540	129	9.59	2.923	Mar. 23	0200	6300	178	10.00	3.048
Jan. 27	0030	3960	112	9.49	2.893	Mar. 28	0600	8600	244	12.10	3.688
Mar. 14	1800	4060	115	9.51	2.899	Mar. 31	1330	*9460	268	*12.96	3.950

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) several days in January, March and June.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	122	44	302	24	1.5	.07	754	20	.09	44	717	216
2	203	106	101	1.9	1.1	.03	345	24	.05	132	185	124
3	22	229	125	1.4	.72	.03	39	4.1	.03	63	26	11
4	329	312	29	.91	.56	.02	19	24	.05	194	56	2.5
5	112	40	5.2	.64	.48	.02	8.0	2.6	3.4	32	14	1.4
6	8.6	4.9	1.8	.29	.48	.01	5.6	8.2	.12	25	48	.91
7	7.2	54	53	577	.29	.01	4.2	41	.09	104	4.2	.81
8	1.5	6.0	36	54	.24	.01	19	74	.03	19	2.2	6.0
9	1.4	2.5	7.1	11	109	.02	119	22	.02	128	56	5.7
10	1.1	1.2	1.7	142	92	105	25	38	.02	41	396	84
11	.48	.91	.35	74	572	119	8.0	75	.02	15	41	2.4
12	.24	.41	.19	7.6	13	595	3.8	109	.02	72	41	15
13	.15	.15	.12	2.3	1.9	278	170	12	3.1	5.5	22	13
14	.07	.12	.07	1.4	1.0	1030	40	21	.41	35	517	39
15	.03	.03	.03	3.1	.64	278	16	1.8	.09	38	386	46
16	.02	.03	.03	44	.48	425	275	85	.09	192	23	9.5
17	.02	19	.03	14	.35	683	21	188	.33	173	4.8	27
18	.02	.81	.03	845	.29	404	46	125	1.4	38	1.8	4.5
19	.01	2.7	.03	76	.24	35	7.9	89	.41	7.0	1.0	.81
20	.01	.19	.03	9.4	.19	6.7	2.2	12	.35	1.5	.81	.41
21	.01	.07	6.8	506	.15	213	140	12	.12	14	14	.24
22	.01	24	59	189	.15	713	26	30	.03	301	19	.12
23	.02	874	245	9.5	49	1160	2.6	87	.02	9.9	143	1.9
24	.02	564	173	2.3	.64	57	37	89	.01	2.0	263	.81
25	.02	119	774	831	.35	13	47	14	.01	1.2	442	23
26	.03	52	81	926	.24	42	20	22	.02	.72	169	102
27	113	493	18	1240	.15	694	11	1.6	.15	.41	156	144
28	299	126	7.3	137	.12	2040	181	.72	182	.19	370	50
29	68	57	1.4	13	---	1040	140	.41	48	.67	95	39
30	5.1	440	.72	43	---	1280	116	1.4	103	38	66	22
31	14	---	13	4.1	---	2220	---	.35	---	.41	132	---
TOTAL	1308.06	3573.02	2041.93	5790.84	847.26	13430.92	2648.3	1234.18	343.48	1727.50	4411.81	993.01
MEAN	42.2	119	65.9	187	30.3	433	88.3	39.8	11.4	55.7	142	33.1
MAX	329	874	774	1240	572	2220	754	188	182	301	717	216
MIN	.01	.03	.03	.29	.12	.01	2.2	.35	.01	.19	.81	.12
AC-FT	2590	7090	4050	11490	1680	26640	5250	2450	681	3430	8750	1970

CAL YR 1981 TOTAL 13282.21 MEAN 36.4 MAX 874 MIN .00 AC-FT 26350
WTR YR 1982 TOTAL 38350.31 MEAN 105 MAX 2220 MIN .01 AC-FT 76070

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft (61 m) upstream from Koolau ditch intake and trail, 1.9 mi (3.1 km) southwest of Nahiku, and 4.5 mi (7.2 km) southeast of Keanae.

DRAINAGE AREA.--3.49 mi² (9.04 km²).

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

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

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

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

AVERAGE DISCHARGE.--60 years (water years 1923-82), 23.2 ft³/s (0.657 m³/s), 16,810 acre-ft/yr (20.7 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft³/s (48.1 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 28	0700	1780	50.4	6.55	1.996	Mar. 23	0200	3080	87.2	8.85	2.697
Nov. 1	2300	1940	54.9	6.90	2.103	Mar. 28	0530	2210	62.6	7.42	2.262
Jan. 26	2230	2280	64.6	7.54	2.298	Mar. 31	1600	*4450	126	*10.61	3.234
Mar. 14	2000	2680	75.9	8.24	2.512	Aug. 1	0900	1970	55.8	6.96	2.121

Minimum discharge, 2.4 ft³/s (0.068 m³/s) Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	97	112	4.7	8.6	17	112	26	7.0	24	572	37
2	29	126	84	4.4	6.7	17	114	14	6.0	139	35	18
3	4.9	31	91	4.3	6.2	84	37	11	5.5	58	17	12
4	17	38	30	4.1	6.4	38	21	9.4	5.1	73	20	9.9
5	37	11	14	3.9	6.8	11	15	8.6	4.8	46	12	9.0
6	5.9	35	18	3.8	6.9	7.2	14	8.2	4.4	21	14	9.1
7	4.6	85	177	25	7.0	6.1	13	8.0	4.3	19	9.3	8.6
8	3.7	17	73	5.9	6.8	7.8	17	7.9	4.1	15	8.2	19
9	3.2	12	27	13	6.9	38	85	7.8	6.0	51	52	16
10	3.0	7.7	16	5.2	6.9	162	18	9.8	4.2	29	221	50
11	2.9	6.8	12	4.7	223	34	13	30	3.8	13	28	11
12	2.9	5.8	11	4.4	11	275	13	28	3.7	26	39	11
13	5.0	5.4	10	3.9	6.8	149	107	9.9	3.9	25	18	8.9
14	3.5	4.8	9.5	3.7	6.2	352	46	9.1	3.6	47	84	11
15	3.2	5.0	9.0	3.5	5.8	63	42	7.6	3.4	50	57	12
16	3.0	30	8.5	3.5	5.4	13	159	6.9	3.3	60	15	10
17	2.8	12	8.0	3.6	5.1	41	26	6.6	3.2	21	11	17
18	3.2	6.7	7.6	63	4.8	67	31	7.1	3.2	32	8.9	9.4
19	3.3	5.8	7.4	16	4.6	19	14	11	3.1	17	7.9	8.1
20	3.0	5.3	7.3	4.1	4.6	8.0	14	8.9	3.1	10	7.3	7.0
21	2.8	5.0	7.4	227	4.3	55	116	9.8	3.0	16	6.9	6.5
22	2.7	64	7.4	131	4.1	270	144	20	2.9	198	7.8	6.1
23	2.8	309	7.8	14	3.9	541	18	14	2.9	18	83	9.1
24	2.9	385	6.3	73	3.8	72	114	20	2.8	11	41	7.0
25	8.1	67	178	717	3.7	24	64	14	2.9	9.5	47	23
26	6.3	33	24	762	3.6	18	32	27	16	8.5	28	19
27	190	235	7.9	586	97	69	22	10	26	7.9	64	12
28	234	66	6.7	109	43	531	120	21	136	7.4	107	7.3
29	189	17	5.9	19	---	114	122	8.8	35	7.9	47	7.2
30	14	144	5.4	201	---	412	88	45	21	7.9	36	11
31	14	---	5.0	15	---	1170	---	9.6	---	10	96	---
TOTAL	811.3	1872.3	994.1	3038.7	509.9	4685.1	1751	435.0	334.2	1078.1	1800.3	402.2
MEAN	26.2	62.4	32.1	98.0	18.2	151	58.4	14.0	11.1	34.8	58.1	13.4
MAX	234	385	178	762	223	1170	159	45	136	198	572	50
MIN	2.7	4.8	5.0	3.5	3.6	6.1	13	6.6	2.8	7.4	6.9	6.1
AC-FT	1610	3710	1970	6030	1010	9290	3470	863	663	2140	3570	798

CAL YR 1981 TOTAL 6161.4 MEAN 16.9 MAX 599 MIN 1.6 AC-FT 12220
WTR YR 1982 TOTAL 17712.2 MEAN 48.5 MAX 1170 MIN 2.7 AC-FT 35130

16512000 KOOLAU DITCH AT NAHIKU WEIR, NEAR NAHIKU

LOCATION.--Lat 20°48'56", long 156°07'15", Hydrologic Unit 20020000, on right bank between Kapaula and Waiohue Gulches, 1.8 mi (2.9 km) southwest of Nahiku, and 3.8 mi (6.1 km) southeast of Keanae.

PERIOD OF RECORD.--February 1919 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft (392.930 m) above mean sea level. Prior to Apr. 28, 1922, nonrecording gage at same site and datum.

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

AVERAGE DISCHARGE.--63 years, 34.2 ft^3/s (0.969 m^3/s), 24,780 acre-ft/yr (30.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 104 ft^3/s (2.95 m^3/s) Mar. 17, 1980; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 93 ft^3/s (2.63 m^3/s) Apr. 28; minimum daily, 13.0 ft^3/s (0.37 m^3/s) Oct. 21-24 and June 23-25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	47	82	23	39	49	48	80	37	55	85	80
2	57	71	83	22	39	60	56	62	32	84	76	72
3	25	64	81	21	35	68	42	51	29	80	64	54
4	47	66	67	20	32	82	32	46	27	84	65	46
5	67	56	41	19	31	50	25	42	25	81	51	42
6	33	54	44	18	29	37	25	38	23	74	55	39
7	26	85	58	49	28	32	28	35	22	73	42	38
8	22	68	86	27	27	34	50	34	21	59	38	55
9	19	56	67	52	26	74	89	33	36	78	59	51
10	18	43	62	26	26	88	55	38	25	75	85	70
11	16	39	50	23	71	81	45	75	21	56	74	46
12	16	33	45	22	37	84	21	73	20	68	79	47
13	23	30	41	20	27	86	28	47	20	50	67	40
14	18	27	39	19	25	76	26	44	18	77	80	48
15	16	26	37	18	23	75	19	36	17	77	82	53
16	15	64	35	18	22	50	36	33	17	81	66	46
17	14	49	33	19	22	56	24	31	16	70	50	55
18	15	33	32	57	21	73	23	33	16	75	44	43
19	16	30	31	45	20	52	36	45	15	64	39	38
20	14	27	31	22	20	34	58	36	15	49	35	34
21	13	25	32	60	19	41	85	39	14	63	33	32
22	13	41	33	82	18	86	92	58	14	77	33	30
23	13	87	36	52	17	72	68	61	13	60	76	35
24	13	88	30	57	17	65	86	67	13	52	78	31
25	31	83	58	86	16	56	89	59	13	45	75	56
26	28	69	64	86	16	49	80	70	44	40	71	59
27	76	86	38	77	49	57	70	48	64	37	80	48
28	91	77	33	56	78	66	93	75	89	33	84	35
29	89	46	29	39	---	65	92	45	69	35	79	34
30	61	84	27	68	---	54	92	76	56	35	76	42
31	56	---	25	42	---	36	---	46	---	37	84	---
TOTAL	979	1654	1450	1245	830	1888	1613	1556	841	1924	2005	1399
MEAN	31.6	55.1	46.8	40.2	29.6	60.9	53.8	50.2	28.0	62.1	64.7	46.6
MAX	91	88	86	86	78	88	93	80	89	84	85	80
MIN	13	25	25	18	16	32	19	31	13	33	33	30
AC-FT	1940	3280	2880	2470	1650	3740	3200	3090	1670	3820	3980	2770

CAL YR 1981 TOTAL 8662.9 MEAN 23.7 MAX 91 MIN 6.0 AC-FT 17180
WTR YR 1982 TOTAL 17384.0 MEAN 47.6 MAX 93 MIN 13 AC-FT 34480

HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft (152 m) upstream from Koolau ditch crossing and trail bridge and 2.8 mi (4.5 km) south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi² (9.48 km²).

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

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

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

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

AVERAGE DISCHARGE.--62 years (water years 1915, 1917, 1923-82), 35.5 ft³/s (1.005 m³/s), 25,720 acre-ft/yr (31.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s (280 m³/s) Jan. 14, 1923, gage height, 13.5 ft (4.11 m), from floodmarks, from rating curve extended above 650 ft³/s (18.4 m³/s); minimum, 0.5 ft³/s (0.014 m³/s) July 26, 1922.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2330	2770	78.4	8.78	2.676
Jan. 27	0300	4320	122	10.31	3.142
Jan. 30	0230	2140	60.6	8.01	2.441
Mar. 14	2030	2300	65.1	8.21	2.502
Mar. 23	0230	3220	91.2	9.27	2.825
Mar. 31	1600	*6680	189	*12.07	3.679
Apr. 21	0300	1870	53	7.64	2.329
Aug. 1	0930	3240	91.8	9.29	2.832

Minimum discharge, 3.4 ft³/s (0.096 m³/s) Oct. 17, 18, Jan. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	172	120	4.7	18	29	129	38	14	35	699	46
2	55	159	117	4.4	14	33	122	23	11	190	41	26
3	9.6	27	137	4.5	12	125	47	17	9.1	81	22	16
4	23	26	53	4.4	10	66	31	14	8.5	90	22	13
5	56	15	26	3.9	9.3	21	22	12	7.8	61	14	11
6	10	59	31	3.6	8.4	13	18	11	6.9	34	16	10
7	7.7	106	245	47	7.6	11	16	9.8	8.2	29	11	9.8
8	5.7	31	115	11	7.0	16	19	8.9	7.8	22	9.6	27
9	4.8	21	39	27	7.1	68	88	8.9	8.2	72	56	26
10	4.2	15	23	11	10	174	23	14	13	40	237	77
11	4.0	12	17	8.8	171	49	16	33	10	22	34	16
12	4.4	10	14	8.8	20	338	16	31	6.6	36	44	14
13	14	8.9	12	6.3	10	207	109	11	6.3	36	23	10
14	7.4	7.7	11	5.2	8.0	245	57	10	5.2	68	80	12
15	5.4	10	9.4	4.7	7.0	81	58	8.3	4.7	67	68	14
16	4.4	66	8.4	4.4	6.3	23	223	7.6	4.5	70	26	11
17	3.7	25	7.7	4.5	5.9	30	36	7.2	4.5	31	16	26
18	6.0	12	6.8	45	5.4	50	29	7.6	12	44	13	10
19	9.5	9.3	6.9	20	5.3	22	22	13	5.7	26	11	8.9
20	5.0	8.0	8.9	7.1	5.2	14	19	11	5.1	16	9.8	7.8
21	4.4	7.0	6.7	252	5.0	27	148	13	4.2	27	8.7	7.0
22	5.1	91	6.2	173	4.4	250	177	25	3.8	166	12	6.4
23	8.0	373	5.7	27	6.2	656	29	19	3.7	26	118	13
24	7.4	541	5.0	92	5.5	93	138	26	3.8	16	47	8.3
25	26	95	101	1080	4.3	36	76	17	6.9	13	42	39
26	33	45	31	1030	3.9	25	46	40	54	11	38	24
27	262	239	10	980	172	21	33	15	46	9.1	72	14
28	176	86	8.1	147	78	288	127	26	209	8.3	116	9.1
29	230	27	6.5	34	---	55	131	12	64	8.7	55	9.1
30	27	151	5.6	256	---	319	100	64	38	8.3	41	15
31	30	---	5.1	28	---	1470	---	16	---	32	91	---
TOTAL	1056.9	2454.9	1199.0	4335.3	626.8	4855	2105	569.3	592.5	1395.4	2093.1	536.4
MEAN	34.1	81.8	38.7	140	22.4	157	70.2	18.4	19.8	45.0	67.5	17.9
MAX	262	541	245	1080	172	1470	223	64	209	190	699	77
MIN	3.7	7.0	5.0	3.6	3.9	11	16	7.2	3.7	8.3	8.7	6.4
AC-FT	2100	4870	2380	8600	1240	9630	4180	1130	1180	2770	4150	1060

CAL YR 1981 TOTAL 8769.9 MEAN 24.0 MAX 842 MIN 1.0 AC-FT 17400
WTR YR 1982 TOTAL 21819.6 MEAN 59.8 MAX 1470 MIN 3.6 AC-FT 43280

16538000 SPRECKELS DITCH AT HAIPUAENA WEIR, NEAR HUELO

LOCATION.--Lat 20°51'15", long 156°11'25", Hydrologic Unit 20020000, on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 mi (4.3 km) west of Keanae, and 4.5 mi (7.2 km) southeast of Huelo.

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

REVISED RECORDS.--WSP 770: 1932-33.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft (448.349 m) above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft (30 m) upstream at different datum.

REMARKS.--Records good. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 ft^3/s (0.17 m^3/s) was diverted above station to East Maui Irrigation Co. powerplant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since termination of powerplant diversion).--21 years (water years 1962-82), 29.5 ft^3/s (0.835 m^3/s), 21,370 acre-ft/yr (26.3 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 150 ft^3/s (4.25 m^3/s) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 115 ft^3/s (3.26 m^3/s) Apr. 16, July 2; minimum daily, 5.7 ft^3/s (0.161 m^3/s) June 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	34	84	8.1	27	37	27	72	27	59	103	90
2	71	63	87	7.8	21	49	24	52	20	115	56	59
3	19	37	85	8.5	17	50	23	34	16	99	38	35
4	50	37	71	8.3	15	53	32	26	15	111	49	26
5	56	25	39	7.1	15	36	35	22	14	99	32	22
6	19	44	50	6.6	15	22	28	19	12	78	36	19
7	17	74	51	50	12	19	23	17	12	79	22	18
8	12	64	74	23	11	30	42	16	11	53	19	51
9	10	46	51	64	18	58	100	17	11	103	61	53
10	9.4	29	33	22	49	60	36	42	18	83	103	76
11	9.0	24	22	13	64	56	25	88	12	50	59	27
12	11	20	18	11	46	59	42	69	8.5	73	83	26
13	38	17	16	9.6	19	56	110	32	10	49	47	18
14	25	15	14	8.7	14	49	84	28	8.1	91	86	39
15	15	16	13	8.2	12	51	58	21	7.3	90	87	42
16	10	67	12	7.6	11	42	115	17	6.9	102	60	30
17	9.0	46	11	8.1	9.8	38	65	15	6.6	61	34	59
18	16	26	10	40	9.0	50	61	17	8.2	89	44	30
19	30	18	12	19	11	32	45	38	34	55	31	22
20	11	15	22	9.5	10	30	45	23	11	33	25	17
21	9.0	14	10	56	9.0	31	86	27	6.6	60	22	15
22	12	52	9.5	80	7.0	52	105	55	6.0	100	38	13
23	25	91	8.7	36	6.6	48	48	59	5.7	48	100	31
24	16	92	8.4	49	6.4	44	83	69	6.1	32	81	18
25	32	85	35	78	6.1	43	99	49	20	24	58	62
26	43	61	39	61	5.8	40	79	67	83	20	65	45
27	91	88	18	46	31	34	67	35	89	17	91	31
28	90	78	14	37	54	42	114	63	104	15	102	19
29	90	42	11	33	---	40	112	27	61	18	78	20
30	39	87	9.4	44	---	57	107	94	75	18	69	34
31	41	---	8.6	39	---	49	---	32	---	38	100	---
TOTAL	962.4	1407	946.6	899.1	531.7	1357	1920	1242	725.0	1962	1879	1047
MEAN	31.0	46.9	30.5	29.0	19.0	43.8	64.0	40.1	24.2	63.3	60.6	34.9
MAX	91	92	87	80	64	60	115	94	104	115	103	90
MIN	9.0	14	8.4	6.6	5.8	19	23	15	5.7	15	19	13
AC-FT	1910	2790	1880	1780	1050	2690	3810	2460	1440	3890	3730	2080

CAL YR 1981 TOTAL 7055.5 MEAN 19.3 MAX 94 MIN 1.2 AC-FT 13990
WTR YR 1982 TOTAL 14878.8 MEAN 40.8 MAX 115 MIN 5.7 AC-FT 29510

16541000 KOOLAU DITCH AT HAIPUAENA, NEAR HUELO

LOCATION.--Lat 20°51'17", long 156°11'19", Hydrologic Unit 20020000, on right bank at Haipuaena Stream, 1,000 ft (305 m) upstream from intake at Puohokamoa Stream, 3.3 mi (5.3 km) southeast of Kailua, and 4.5 mi (7.2 km) southeast of Huelo.

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

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (378 m), from topographic map. Prior to Mar. 21, 1933, at datum 1.94 ft (0.591 m) lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft (0.076 m) lower, than present datum.

REMARKS.--Records excellent. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--50 years 116 ft^3/s (3.285 m^3/s), 84,040 acre-ft/yr (104 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 300 ft^3/s (8.50 m^3/s) July 1, 17, 1963; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 282 ft^3/s (7.99 m^3/s) Nov. 24; minimum daily, 28 ft^3/s (0.79 m^3/s) Apr. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	154	255	60	138	138	107	216	118	179	281	243
2	198	244	261	56	124	206	77	192	101	274	220	201
3	83	202	253	55	105	219	32	156	88	254	193	159
4	140	199	220	52	94	251	28	134	81	273	196	136
5	200	166	185	49	89	167	48	120	76	253	153	120
6	99	190	185	47	83	111	85	110	69	227	166	110
7	81	273	204	146	77	94	100	100	70	218	122	104
8	65	217	248	86	73	111	130	95	66	193	109	175
9	57	195	211	177	73	220	258	94	93	253	189	172
10	51	143	191	95	95	270	129	128	91	228	273	231
11	48	124	151	72	206	213	57	225	77	191	215	146
12	48	106	129	72	100	248	71	204	61	220	236	143
13	104	95	116	60	88	256	261	129	63	171	193	110
14	71	84	107	56	72	225	209	124	55	237	248	144
15	57	85	98	51	65	226	152	97	51	240	247	164
16	50	231	91	51	61	174	276	87	49	253	209	134
17	45	182	85	52	58	169	190	83	47	212	157	177
18	61	113	80	148	55	212	175	88	59	236	145	121
19	70	94	81	133	55	166	139	144	56	201	119	105
20	48	83	90	69	54	117	171	104	47	151	103	92
21	45	75	82	172	54	120	243	121	42	191	94	85
22	49	152	82	239	48	272	178	175	40	254	109	78
23	57	273	84	180	50	271	79	188	39	200	257	109
24	54	282	70	196	48	217	232	196	39	162	240	89
25	122	251	143	277	44	192	246	174	54	131	216	184
26	153	215	199	281	41	180	157	209	209	114	219	187
27	261	275	101	276	124	171	196	139	222	101	255	143
28	264	246	86	198	208	245	276	202	278	92	273	98
29	268	193	75	129	---	197	272	134	240	100	234	97
30	200	262	68	246	---	260	264	234	217	97	226	139
31	181	---	64	169	---	271	---	149	---	127	269	---
TOTAL	3311	5404	4295	3950	2382	6189	4838	4551	2798	6033	6166	4196
MEAN	107	180	139	127	85.1	200	161	147	93.3	195	199	140
MAX	268	282	261	281	208	272	276	234	278	274	281	243
MIN	45	75	64	47	41	94	28	83	39	92	94	78
AC-FT	6570	10720	8520	7830	4720	12280	9600	9030	5550	11970	12230	8320

CAL YR 1981 TOTAL 28545 MEAN 78.2 MAX 282 MIN 15 AC-FT 56620
WTR YR 1982 TOTAL 54113 MEAN 148 MAX 282 MIN 28 AC-FT 107300

16541500 MANUEL LUIS DITCH AT PUOHOKAMOA GULCH, NEAR HUELO

LOCATION.--Lat 20°51'48", long 156°10'49", Hydrologic Unit 20020000, on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 mi (3.5 km) west of Keanae, and 4.4 mi (7.1 km) southeast of Huelo.

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

REVISED RECORDS.--WSP 1719: 1918-30.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (280 m), from topographic map.

REMARKS.--Records good. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1919-24, 1926-82), 8.33 ft^3/s (0.236 m^3/s), 6,040 acre-ft/yr (7.45 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 142 ft^3/s (4.02 m^3/s) Jan. 3, 1927; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 134 ft^3/s (3.79 m^3/s) Mar. 31; minimum daily, 0.18 ft^3/s (0.005 m^3/s) June 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.73	17	35	.62	3.1	20	107	10	1.4	3.3	123	21
2	27	37	40	.53	2.3	37	85	5.9	1.2	64	18	5.6
3	1.4	5.5	26	.56	1.7	58	39	3.7	1.1	13	5.4	3.5
4	1.5	4.3	6.2	.49	1.4	66	16	2.8	.96	44	4.4	2.7
5	7.4	3.0	3.3	.45	1.3	5.0	3.5	2.3	.86	25	3.2	2.2
6	1.1	32	3.3	.38	1.2	2.9	2.5	1.9	.75	10	3.2	1.8
7	1.0	81	43	6.1	.96	2.2	2.0	1.6	.75	7.7	2.3	1.6
8	.79	8.4	29	1.0	.85	2.4	8.0	1.4	.71	4.6	2.1	14
9	.68	5.7	2.2	8.0	1.3	34	52	1.2	.67	34	20	2.7
10	.61	3.5	1.8	2.1	6.7	100	6.0	1.2	.71	7.3	82	20
11	.53	2.6	1.5	1.4	75	27	3.7	11	.54	4.0	3.0	1.5
12	.65	2.1	1.3	1.2	4.4	78	5.3	11	.45	4.4	5.5	1.8
13	1.3	1.7	1.1	1.0	1.5	86	93	1.1	.61	3.9	2.2	1.4
14	.82	1.4	1.0	.96	1.3	42	25	1.0	.48	7.4	44	7.8
15	.62	1.6	.93	.88	1.1	45	25	.83	.39	5.9	45	3.3
16	.49	40	.81	.80	.99	8.7	94	.71	.33	20	8.0	1.5
17	.45	13	.71	.88	.85	16	10	.70	.30	3.9	4.3	18
18	.98	2.2	.62	2.2	.75	30	7.8	.73	.26	7.2	4.3	1.2
19	1.4	1.8	.69	1.2	.67	6.4	7.4	1.4	2.9	3.7	2.3	1.1
20	.60	1.5	1.0	.73	.66	5.8	5.6	.70	.43	2.4	1.9	.94
21	.53	1.4	.56	22	.58	16	37	.64	.26	3.0	1.6	.86
22	.50	19	.55	9.9	.51	125	55	.74	.24	56	1.6	.75
23	.57	85	.55	3.1	.45	131	6.5	12	.19	7.6	38	5.8
24	.50	115	.47	46	.43	69	22	8.3	.19	5.0	18	.93
25	.73	14	24	115	.37	19	8.8	1.4	.18	3.4	8.6	1.2
26	3.8	4.3	5.3	127	.33	6.2	4.1	14	15	2.7	16	1.2
27	74	68	1.1	128	59	3.8	3.5	1.2	12	2.2	46	.88
28	79	27	.95	46	60	96	78	5.0	76	1.6	67	.72
29	85	3.9	.82	13	---	21	59	1.7	26	2.0	13	.76
30	8.1	53	.72	72	---	102	43	30	12	1.6	6.2	.72
31	7.7	---	.65	5.8	---	134	---	1.8	---	3.9	56	---
TOTAL	310.48	655.9	235.13	619.28	229.70	1395.4	914.7	137.95	157.86	364.7	656.1	127.46
MEAN	10.0	21.9	7.58	20.0	8.20	45.0	30.5	4.45	5.26	11.8	21.2	4.25
MAX	85	115	43	128	75	134	107	30	76	64	123	21
MIN	.45	1.4	.47	.38	.33	2.2	2.0	.64	.18	1.6	1.6	.72
AC-FT	616	1300	466	1230	456	2770	1810	274	313	723	1300	253

CAL YR 1981 TOTAL 2050.06 MEAN 5.62 MAX 121 MIN .06 AC-FT 4070
WTR YR 1982 TOTAL 5804.66 MEAN 15.9 MAX 134 MIN .18 AC-FT 11510

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft (23 m) upstream from Wailoa ditch intake, 2.2 mi (3.5 km) southwest of Huelo, and 2.5 mi (4.0 km) west of Kailua.

DRAINAGE AREA.--0.64 mi² (1.66 km²).

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

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft (368 m) above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

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

AVERAGE DISCHARGE.--71 years (water years 1912-82), 4.72 ft³/s (0.134 m³/s), 3,420 acre-ft/yr (4.22 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft³/s (162 m³/s) Nov. 18, 1930, gage height, 7.28 ft (2.219 m), from rating curve extended above 110 ft³/s (3.12 m³/s) by test of model of station site; minimum, 0.02 ft³/s (0.001 m³/s) several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 270 ft³/s (7.65 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 14	2000	296	8.38	3.12	0.951
Apr. 1	2300	1,000	28.3	4.00	1.219
Aug. 1	1130	*2,600	73.6	*5.48	1.670

Minimum discharge, 0.64 ft³/s (0.018 m³/s) Oct. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	13	22	1.6	8.0	3.6	64	15	3.2	3.9	284	11
2	4.0	13	22	1.5	7.6	3.3	32	12	3.0	6.7	20	7.6
3	1.5	5.8	15	1.6	6.2	13	16	9.5	2.8	7.0	12	6.7
4	1.6	4.7	12	1.5	5.4	10	12	8.3	2.8	17	9.5	5.8
5	1.3	4.1	10	1.3	4.9	5.4	9.5	7.3	2.7	13	7.3	5.1
6	1.1	4.3	9.0	1.2	4.3	4.5	8.0	6.2	2.5	10	7.1	4.7
7	.96	15	11	5.2	3.9	3.9	6.9	5.6	2.4	9.8	5.8	4.1
8	.84	5.8	9.9	2.7	3.5	3.9	9.2	5.1	2.3	7.8	4.9	6.7
9	.84	5.4	7.6	6.5	17	3.5	14	4.5	2.1	12	8.7	4.5
10	.84	4.7	6.5	2.8	7.6	10	6.9	4.9	2.1	10	29	5.5
11	.84	4.1	5.8	2.3	51	5.6	5.8	16	2.0	8.0	9.5	3.7
12	.96	3.9	5.1	2.1	11	25	6.5	9.4	1.9	9.0	9.0	3.5
13	1.2	3.5	4.5	2.0	7.6	20	37	6.0	1.9	6.9	6.9	3.0
14	1.3	3.2	3.9	1.9	6.2	35	15	5.1	1.7	6.7	16	3.2
15	1.1	3.2	3.5	1.9	5.4	17	12	4.5	1.6	6.9	14	3.7
16	.96	9.5	3.2	1.9	4.7	11	30	3.9	1.5	10	8.8	3.2
17	.84	7.1	3.0	1.9	4.3	9.0	13	3.7	1.5	7.1	7.3	3.2
18	1.1	3.9	2.8	5.2	3.7	10	11	3.5	1.3	8.8	6.7	2.7
19	1.1	3.3	2.8	2.4	3.3	7.6	9.6	3.7	1.3	6.9	5.8	2.4
20	.84	3.2	2.7	2.0	3.5	6.9	8.8	3.2	1.2	8.0	5.4	2.4
21	.74	3.0	2.4	4.8	3.0	15	24	3.2	1.2	5.6	4.7	2.1
22	.74	5.3	2.3	5.0	2.7	37	45	4.0	1.1	11	4.5	2.1
23	.74	22	2.1	2.7	2.5	72	12	10	.96	5.8	5.6	3.6
24	.64	17	2.0	6.7	2.4	20	9.8	6.1	.96	5.1	6.0	2.3
25	.84	11	5.1	83	2.3	14	9.8	3.9	1.1	4.7	6.4	2.5
26	1.3	8.8	3.2	20	2.1	11	8.8	3.7	2.4	4.3	6.2	2.4
27	9.2	20	2.1	40	8.6	8.8	9.1	3.3	3.9	3.9	11	2.1
28	18	13	2.0	18	6.6	14	40	4.1	19	3.3	13	2.0
29	12	10	1.7	13	---	8.0	22	3.0	5.8	3.3	7.8	1.8
30	4.9	27	1.7	16	---	44	22	6.5	7.1	3.2	7.6	1.8
31	4.1	---	1.6	9.5	---	99	---	3.5	---	3.2	11	---
TOTAL	77.52	257.8	188.5	268.2	199.3	551.0	529.7	188.7	85.32	228.9	561.5	115.4
MEAN	2.50	8.59	6.08	8.65	7.12	17.8	17.7	6.09	2.84	7.38	18.1	3.85
MAX	18	27	22	83	51	99	64	16	19	17	284	11
MIN	.64	3.0	1.6	1.2	2.1	3.3	5.8	3.0	.96	3.2	4.5	1.8
AC-FT	154	511	374	532	395	1090	1050	374	169	454	1110	229

CAL YR 1981 TOTAL 971.34 MEAN 2.66 MAX 65 MIN .24 AC-FT 1930
WTR YR 1982 TOTAL 3251.84 MEAN 8.91 MAX 284 MIN .64 AC-FT 6450

16588000 WAILOA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'19", Hydrologic Unit 20020000, on right bank 100 ft (30 m) downstream from intake at Honopou Stream, 0.5 mi (0.8 km) west of Lupi, and 2.2 mi (3.5 km) southwest of Huelo.

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft (368.2 m) above mean sea level (by vertical angles).

REMARKS.--Records good. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft (366 m). Water is used for domestic supply, power, and irrigation in Central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--59 years (water years 1924-82), 171 ft^3/s (4.843 m^3/s), 123,900 acre-ft/yr (153 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 328 ft^3/s (9.29 m^3/s) Nov. 24, 1981; no flow Jan. 24-27, 1923.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 328 ft^3/s (9.29 m^3/s) Nov. 24; minimum daily, 63 ft^3/s (1.78 m^3/s) June 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	252	319	100	203	220	196	242	235	220	280	296
2	259	313	319	95	211	256	190	241	202	310	257	295
3	166	294	318	96	197	284	180	279	173	307	264	288
4	205	278	284	91	175	304	175	277	160	316	275	271
5	255	245	241	83	163	262	206	246	145	311	264	237
6	168	248	240	79	167	206	213	216	131	305	278	210
7	146	313	288	219	140	181	211	194	127	295	224	196
8	117	298	317	186	131	207	212	183	121	297	202	273
9	101	293	308	215	154	265	209	179	139	306	281	256
10	92	254	299	190	182	269	203	223	149	306	320	289
11	87	228	259	147	175	264	185	292	128	298	307	256
12	88	198	228	138	178	180	219	295	103	303	305	249
13	171	175	200	114	170	149	304	257	112	293	296	196
14	143	153	183	104	157	149	307	246	95	300	308	227
15	119	152	168	98	139	147	282	193	87	300	307	269
16	93	295	155	95	129	146	314	172	84	307	301	251
17	82	287	146	98	121	146	266	160	79	300	285	250
18	109	227	135	176	113	147	240	167	89	303	272	234
19	150	184	133	185	112	155	237	261	124	298	244	198
20	92	161	184	123	114	161	239	186	91	290	214	169
21	81	144	132	164	107	161	241	222	72	290	197	154
22	89	241	132	205	92	187	242	283	68	305	237	138
23	124	322	128	201	90	213	225	260	65	296	302	222
24	106	328	113	201	90	212	211	287	63	284	300	162
25	168	297	180	204	80	216	207	282	82	239	295	259
26	193	266	248	200	76	215	238	290	253	210	296	273
27	297	312	180	199	138	212	249	259	247	188	307	232
28	315	319	157	198	207	217	250	291	295	169	291	168
29	312	311	128	194	---	235	290	243	268	189	268	169
30	292	320	115	198	---	218	271	226	297	189	296	233
31	270	---	106	197	---	192	---	255	---	200	308	---
TOTAL	5049	7708	6343	4793	4011	6376	7012	7407	4284	8524	8581	6920
MEAN	163	257	205	155	143	206	234	239	143	275	277	231
MAX	315	328	319	219	211	304	314	295	297	316	320	296
MIN	81	144	106	79	76	146	175	160	63	169	197	138
AC-FT	10010	15290	12580	9510	7960	12650	13910	14690	8500	16910	17020	13730

CAL YR 1981 TOTAL 44338 MEAN 121 MAX 328 MIN 24 AC-FT 87940
WTR YR 1982 TOTAL 77008 MEAN 211 MAX 328 MIN 63 AC-FT 152700

16589000 NEW HAMAKUA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'28", long 156°15'22", Hydrologic Unit 20020000, on right bank 15 ft (4.6 m) upstream from tunnel portal, 600 ft (183 m) downstream from Honopou Stream crossing, and 2.1 mi (3.4 km) southwest of Huelo.

PERIOD OF RECORD.--January 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,170 ft (356.6 m) above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft (91 m) upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years, 36.1 ft^3/s (1.022 m^3/s), 26,150 acre-ft/yr (32.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 182 ft^3/s (5.15 m^3/s) Nov. 2, 1967; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 160 ft^3/s (4.53 m^3/s) Nov. 23 and 24; minimum daily, 0.02 ft^3/s (0.001 m^3/s) several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	41	158	1.1	.02	21	59	57	10	113	147	151
2	122	154	152	1.1	.03	81	58	57	2.4	153	132	144
3	14	90	140	1.1	.03	91	48	58	2.1	152	116	70
4	64	60	76	1.0	.03	115	29	23	2.0	156	126	15
5	113	29	.06	.93	.03	66	18	7.7	1.8	155	63	6.0
6	10	55	.05	.85	.02	17	15	6.2	1.7	153	83	5.1
7	1.2	157	60	58	.02	9.4	16	5.1	1.6	153	26	4.5
8	.94	147	34	10	.02	6.5	23	4.5	1.5	137	16	78
9	.78	126	.04	7.9	.06	111	58	3.9	1.4	151	85	63
10	.70	29	31	7.0	.02	121	49	44	1.3	154	154	141
11	.62	9.8	16	3.2	.12	120	11	95	1.2	138	147	21
12	.61	5.6	4.3	2.4	.02	49	31	91	1.1	149	147	15
13	53	4.8	3.4	2.1	.02	.05	59	26	1.2	75	127	3.6
14	15	4.2	3.2	2.6	.02	.08	58	25	1.0	151	137	40
15	1.2	3.8	2.7	1.8	.02	.02	45	7.5	1.0	151	152	67
16	.78	127	2.3	1.8	.02	.02	60	4.3	.90	154	149	19
17	.65	104	2.1	1.7	2.6	.02	59	2.2	.79	150	80	62
18	.61	13	1.9	1.1	2.9	.02	59	2.1	.76	147	52	24
19	8.9	4.5	1.9	.24	2.5	28	57	47	8.7	142	19	2.6
20	.66	4.0	9.8	2.8	2.6	59	56	6.2	1.5	43	5.5	2.3
21	.56	3.4	1.7	5.3	2.5	59	57	17	.75	80	4.7	2.1
22	.54	56	1.6	4.2	2.0	60	58	89	.67	151	11	1.9
23	5.3	160	1.5	.08	1.9	60	57	130	.62	130	126	10
24	.72	160	1.4	.07	1.8	60	57	134	.56	61	143	3.2
25	34	98	27	.13	1.6	59	57	65	3.6	23	131	77
26	59	28	76	.03	1.5	59	57	117	124	12	132	52
27	149	29	2.3	.03	61	58	57	18	136	4.4	145	38
28	159	131	1.9	.02	46	59	58	125	155	3.8	152	2.0
29	157	132	1.5	.03	---	58	57	29	144	4.5	147	2.0
30	116	156	1.4	.02	---	59	57	64	147	4.2	139	14
31	67	---	1.2	.02	---	60	---	38	---	16	150	---
TOTAL	1179.77	2122.1	816.25	118.65	129.40	1546.11	1439	1398.7	756.15	3266.9	3244.2	1136.3
MEAN	38.1	70.7	26.3	3.83	4.62	49.9	48.0	45.1	25.2	105	105	37.9
MAX	159	160	158	58	61	121	60	134	155	156	154	151
MIN	.54	3.4	.04	.02	.02	.02	11	2.1	.56	3.8	4.7	1.9
AC-FT	2340	4210	1620	235	257	3070	2850	2770	1500	6480	6430	2250

CAL YR 1981 TOTAL 8083.08 MEAN 22.1 MAX 160 MIN .04 AC-FT 16030
WTR YR 1982 TOTAL 17153.53 MEAN 47.0 MAX 160 MIN .02 AC-FT 34020

16592000 LOWRIE DITCH AT HONOPOU GULCH, NEAR HUELO

LOCATION.--Lat 20°54'57", long 156°15'08", Hydrologic Unit 20020000, on left bank 0.2 mi (0.3 km) downstream from siphon across Honopou Stream, 1.6 mi (2.6 km) west of Huelo, and 2.7 mi (4.3 km) northwest of Kailua.

PERIOD OF RECORD.--January 1910 to March 1927, February 1930 to current year. Published as "at Opana weir, near Huelo" 1910-27.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft (182.27 m) above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 mi (2.4 km) downstream at different datum.

REMARKS.--Records good. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional stream westward to Maliko Gulch for irrigation in central Maui. Ditch flow regulated at times. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--68 years (water years 1911-26, 1931-82), 36.8 ft^3/s (1.042 m^3/s), 26,660 acre-ft/yr (32.9 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 116 ft^3/s (3.29 m^3/s) Oct. 31, 1921; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 108 ft^3/s (3.06 m^3/s) Oct. 28; minimum daily, 0.83 ft^3/s (0.024 m^3/s) Feb. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	63	71	13	1.0	15	8.7	1.8	24	40	90	81
2	62	88	51	13	1.2	61	6.7	1.7	25	84	80	80
3	20	69	4.1	14	.94	58	4.2	1.6	27	81	78	64
4	15	53	3.9	12	.91	80	3.3	1.6	21	82	79	46
5	48	40	3.4	12	.92	38	2.7	11	13	82	66	42
6	14	45	2.9	12	.86	6.2	2.3	17	11	81	60	36
7	14	102	20	64	.83	6.8	2.0	15	12	81	44	33
8	13	87	3.5	15	5.5	20	1.9	14	25	63	38	64
9	14	82	3.3	3.7	7.5	62	1.7	13	25	71	56	51
10	13	58	9.9	2.3	2.0	81	1.4	17	22	81	88	83
11	13	42	22	2.1	6.4	79	1.3	40	10	58	69	36
12	12	38	24	1.9	2.2	35	1.4	31	9.6	72	70	33
13	16	33	21	5.8	1.7	3.8	1.4	15	11	37	50	34
14	17	26	27	18	1.4	3.0	1.6	23	9.5	77	64	46
15	16	27	28	11	1.2	2.4	1.3	20	8.9	79	82	58
16	15	81	28	4.1	7.0	1.9	2.3	18	8.6	81	80	35
17	15	88	27	4.0	14	1.9	1.5	18	8.1	73	59	48
18	14	44	30	2.9	11	2.1	1.3	17	7.9	72	54	34
19	12	38	30	1.7	9.8	1.7	1.2	19	8.7	67	42	20
20	7.4	35	27	1.4	9.6	1.8	1.4	19	8.4	38	36	18
21	6.5	35	21	2.1	8.7	2.3	1.6	17	8.3	39	32	27
22	6.3	43	17	2.1	12	2.2	1.7	32	7.9	92	34	29
23	6.9	106	14	1.4	30	3.5	1.2	80	7.1	83	75	43
24	6.2	88	13	1.3	29	2.5	1.1	65	6.1	60	90	27
25	8.6	43	31	3.6	33	2.2	1.1	25	5.9	43	80	29
26	13	3.5	68	1.5	23	2.0	1.1	68	52	36	87	20
27	89	3.7	20	1.3	43	1.8	1.1	19	54	32	83	24
28	108	60	17	1.3	52	5.7	2.2	67	99	31	81	27
29	89	67	14	1.3	---	2.6	1.6	22	67	35	80	30
30	84	81	15	1.3	---	4.8	2.5	95	84	33	79	28
31	70	---	14	1.1	---	18	---	54	---	24	82	---
TOTAL	850.9	1669.2	681.0	232.2	316.66	608.2	64.8	857.7	687.0	1908	2088	1226
MEAN	27.4	55.6	22.0	7.49	11.3	19.6	2.16	27.7	22.9	61.5	67.4	40.9
MAX	108	106	71	64	52	81	8.7	95	99	92	90	83
MIN	6.2	3.5	2.9	1.1	.83	1.7	1.1	1.6	5.9	24	32	18
AC-FT	1690	3310	1350	461	628	1210	129	1700	1360	3780	4140	2430

CAL YR 1981 TOTAL 7097.00 MEAN 19.4 MAX 108 MIN 1.6 AC-FT 14080
WTR YR 1982 TOTAL 11189.66 MEAN 30.7 MAX 108 MIN .83 AC-FT 22190

16594000 HAIKU DITCH AT HONOPOU GULCH, NEAR KAILUA

LOCATION.--Lat 20°55'07", long 156°14'58", Hydrologic Unit 20020000, on right bank on west side of Honopou Gulch, 160 ft (49 m) below new Government Road, 2.5 mi (4.0 km) northwest of Kailua, and 5.0 mi (8.0) east of Haiku.

PERIOD OF RECORD.--January 1910 to December 1928, February 1930 to current year. Published as "at Peahi Weir, near Huelo" prior to July 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft (128.485 m) above mean sea level. Prior to Oct. 7, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 mi (4.7 km) downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mi (1.4 km) downstream at different datum.

REMARKS.--Records good. Ditch diverts from all streams between Naiiiiihaele Stream and Maliko Gulch for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--67 years (water years 1911, 1914, 1916-28, 1931-82), 24.6 ft^3/s (0.697 m^3/s), 17,820 acre-ft/yr (22.0 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 209 ft^3/s (5.92 m^3/s) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 110 ft^3/s (3.12 m^3/s) Apr. 27; minimum daily, 0.06 ft^3/s (0.002 m^3/s) Feb. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.66	16	81	2.3	.08	52	.96	82	2.4	9.4	42	82
2	48	78	30	2.3	.50	55	.34	81	2.2	96	75	73
3	3.4	10	16	2.5	.06	47	.23	76	2.1	84	67	14
4	2.4	8.1	11	2.3	.06	89	25	69	2.0	74	45	8.4
5	17	6.4	1.0	2.2	.08	31	85	49	1.8	70	22	6.5
6	2.5	21	.80	2.1	.11	21	70	30	2.0	75	15	6.0
7	2.1	98	63	2.6	4.9	15	67	26	2.4	97	11	5.5
8	1.8	71	16	.42	20	3.4	66	23	1.8	43	10	39
9	.72	20	55	.71	8.3	14	101	20	1.8	71	22	23
10	.58	9.7	64	.34	.19	91	64	21	1.8	88	97	50
11	.59	8.2	16	.28	1.3	69	24	70	1.6	17	59	6.0
12	.68	6.4	7.1	.26	.15	34	53	72	1.5	45	54	5.3
13	1.2	5.1	6.5	.25	.14	.47	96	14	1.6	6.0	17	4.5
14	1.0	4.5	5.3	.25	.14	.62	47	4.2	1.5	67	50	17
15	.86	3.6	4.0	.25	.13	.28	32	3.4	1.4	51	73	15
16	.82	47	3.7	.25	.10	.25	36	3.2	1.5	71	60	4.6
17	.59	54	3.1	.25	19	.30	34	3.2	1.4	42	26	30
18	.58	6.0	2.7	17	16	.21	34	3.0	1.4	46	12	8.0
19	.85	5.1	3.0	28	15	.19	36	2.8	1.4	31	11	4.0
20	.61	4.6	3.3	22	15	.24	63	2.7	1.3	4.9	8.3	3.7
21	.58	4.1	2.8	1.4	14	.28	86	2.6	1.2	4.3	6.9	3.4
22	.58	5.4	2.6	.68	9.9	.24	65	2.8	1.1	80	7.0	3.3
23	.58	99	2.5	.57	3.8	.31	49	50	1.1	45	68	3.9
24	.62	86	2.3	.53	3.5	.24	52	36	1.2	6.4	88	2.8
25	.96	62	14	.77	3.2	.22	54	3.4	1.2	4.3	44	2.6
26	1.3	43	31	.18	2.9	.22	51	40	14	3.9	69	2.4
27	51	44	3.2	.16	33	.22	110	2.6	43	3.6	63	2.2
28	102	94	.42	.15	91	1.4	96	37	91	3.3	93	2.1
29	98	26	4.2	.13	---	48	83	2.6	48	3.6	83	2.3
30	41	82	2.9	.10	---	16	84	80	76	3.4	62	2.2
31	27	---	2.4	.09	---	2.7	---	24	---	2.9	76	---
TOTAL	410.56	1028.2	460.82	91.32	262.54	593.79	1664.53	936.5	312.7	1249.0	1436.2	432.7
MEAN	13.2	34.3	14.9	2.95	9.38	19.2	55.5	30.2	10.4	40.3	46.3	14.4
MAX	102	99	81	28	91	91	110	82	91	97	97	82
MIN	.58	3.6	.42	.09	.06	.19	.23	2.6	1.1	2.9	6.9	2.1
AC-FT	814	2040	914	181	521	1180	3300	1860	620	2480	2850	858

CAL YR 1981 TOTAL 3213.52 MEAN 8.80 MAX 105 MIN .19 AC-FT 6370
WTR YR 1982 TOTAL 8878.86 MEAN 24.3 MAX 110 MIN .06 AC-FT 17610

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi (0.5 km) north of Kailiili, and 2.7 mi (4.3 km) east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (713 m), from topographic map.

REMARKS.--Records good except for periods of backwater, which are poor. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 3.12 ft^3/s (0.088 m^3/s), 2,260 acre-ft/yr (2.79 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s (0.51 m^3/s) Mar. 31, 1982; minimum daily, 0.11 ft^3/s (0.003 m^3/s) Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s (0.51 m^3/s) Mar. 31; minimum daily, 0.36 ft^3/s (0.010 m^3/s) Oct. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.53	2.9	11	2.5	5.7	7.0	10	8.4	3.5	5.5	12	.86
2	5.1	9.9	11	2.3	4.8	5.3	8.8	7.5	3.2	11	6.9	.86
3	2.0	5.2	11	2.4	4.1	6.3	7.3	6.6	3.0	8.7	5.7	.80
4	1.1	3.0	10	2.2	3.1	12	6.5	6.0	2.8	9.9	5.1	.79
5	1.5	2.3	8.9	2.0	2.8	7.8	6.0	5.6	2.5	7.9	4.8	.80
6	1.0	4.0	8.5	1.8	2.9	5.6	5.7	5.2	2.3	6.3	4.6	.81
7	.71	7.8	10	7.1	2.2	5.0	5.4	5.0	2.2	5.4	4.3	.84
8	.56	4.3	11	6.7	2.0	5.1	5.5	4.7	2.0	4.8	4.0	.86
9	.49	3.1	9.6	7.8	4.1	8.0	7.2	4.5	1.9	7.5	4.8	.90
10	.42	2.5	8.8	6.5	8.8	11	5.8	4.5	1.8	6.5	11	1.4
11	.39	2.2	8.1	4.2	16	9.8	5.1	4.6	1.8	5.2	6.9	.79
12	.38	1.9	7.5	3.4	13	13	4.8	4.6	1.7	5.9	6.2	.79
13	.51	2.1	6.9	2.8	9.4	15	5.5	4.1	1.7	5.6	5.6	.79
14	.60	2.1	6.3	2.5	8.2	13	5.5	3.9	1.6	8.5	7.0	2.2
15	.54	2.0	5.8	2.4	7.1	14	5.1	3.7	1.5	7.7	7.0	3.4
16	.42	4.3	5.4	2.3	6.3	12	11	3.5	1.4	8.7	6.5	2.2
17	.36	6.6	4.9	2.5	5.8	12	7.2	3.4	1.3	7.5	5.5	1.5
18	.37	3.5	4.5	4.3	5.4	13	6.5	3.3	1.3	7.0	5.1	1.5
19	.77	2.8	4.2	3.5	5.0	11	5.8	3.3	1.2	6.5	2.4	1.4
20	.70	2.4	4.1	2.6	4.7	10	5.4	3.2	1.2	5.8	1.1	1.4
21	.49	2.1	3.8	6.2	4.3	9.8	6.5	3.1	1.1	5.4	1.1	1.3
22	.53	3.3	3.4	9.9	4.0	14	10	3.5	1.1	8.7	1.0	1.3
23	.50	13	3.2	6.3	3.7	17	7.0	3.1	1.0	7.4	1.2	1.3
24	.42	14	3.0	6.3	3.5	15	7.7	4.2	.99	5.9	1.1	1.3
25	.49	11	4.9	17	3.5	13	9.4	3.6	1.1	5.3	1.1	1.3
26	1.4	9.1	7.4	5.8	3.5	12	8.4	4.6	3.3	4.6	1.3	1.3
27	7.3	12	4.3	13	6.5	12	7.3	3.4	3.2	4.2	.92	1.2
28	9.5	11	4.2	9.6	12	12	9.4	3.1	10	3.9	1.1	1.2
29	9.4	8.9	3.3	7.5	---	12	10	2.7	6.7	3.7	.94	1.1
30	4.6	10	3.0	11	---	14	10	5.6	7.5	3.5	.87	1.5
31	2.5	---	2.7	7.2	---	18	---	4.1	---	3.8	.87	---
TOTAL	55.58	169.3	200.7	171.6	162.4	344.7	215.8	136.6	75.89	198.3	128.00	37.69
MEAN	1.79	5.64	6.47	5.54	5.80	11.1	7.19	4.41	2.53	6.40	4.13	1.26
MAX	9.5	14	11	17	16	18	11	8.4	10	11	12	3.4
MIN	.36	1.9	2.7	1.8	2.0	5.0	4.8	2.7	.99	3.5	.87	.79
AC-FT	110	336	398	340	322	684	428	271	151	393	254	75

CAL YR 1981 TOTAL 812.36 MEAN 2.23 MAX 14 MIN .20 AC-FT 1610
WTR YR 1982 TOTAL 1896.56 MEAN 5.20 MAX 18 MIN .36 AC-FT 3760

16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi (0.8 km) downstream from Kapuna Stream, 1.3 mi (2.1 km) south of Kahakuloa, 2.0 mi (3.2 km) west of Puu Makawana, and 4.3 mi (6.9 km) southeast of Honokohau.

DRAINAGE AREA.--3.47 mi² (8.99 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi (1.6 km) upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (101 m), from topographic map.

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

AVERAGE DISCHARGE.--33 years (1940-42, 1948-70, 1976-82), 17.3 ft³/s (0.490 m³/s) 12,530 acre-ft/yr (15.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft³/s (108 m³/s) Nov. 25, 1970, gage height, 10.57 ft (3.222 m), from floodmarks, from rating curve extended above 510 ft³/s (14.4 m³/s), on basis of slope-area measurements at gage heights 6.70 ft (2.042 m), 8.48 ft (2.585 m), and 10.57 ft (3.222 m); minimum, 3.0 ft³/s (0.085 m³/s) Feb. 9-11, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	2130	1360	38.5	6.35	1.935	Jan. 25	1530	1530	43.3	6.56	1.999
Nov. 16	2230	788	22.3	5.64	1.719	Mar. 12	2330	598	16.9	5.33	1.625
Nov. 22	2400	712	20.2	5.52	1.682	Mar. 21	0430	1200	34.0	6.15	1.875
Dec. 19	2400	823	23.3	5.69	1.734	Mar. 31	1300	*3340	94.6	*9.49	2.893
Dec. 25	1700	682	19.3	5.47	1.667	July 22	1700	945	26.8	5.85	1.783
Jan. 21	0730	1230	34.8	6.19	1.887	Aug. 1	1030	1860	52.7	6.95	2.110

Minimum discharge, 4.4 ft³/s (0.12 m³/s) Oct. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	64	18	6.6	9.1	16	299	19	21	24	197	21
2	59	67	50	6.4	10	39	72	30	13	18	19	29
3	8.1	16	19	7.2	9.0	71	31	14	9.9	19	13	12
4	9.2	9.8	13	6.7	7.8	35	24	13	9.7	40	13	11
5	14	8.2	8.9	6.0	8.2	10	17	12	9.2	30	12	11
6	6.0	26	9.1	5.9	9.9	8.7	15	11	9.2	22	14	11
7	5.3	90	37	27	7.4	8.4	14	11	8.9	23	11	11
8	4.9	17	14	14	7.4	12	40	11	8.7	13	10	55
9	4.7	22	8.2	50	14	28	99	10	12	21	21	13
10	4.5	12	7.5	20	14	166	18	10	10	20	56	20
11	4.9	12	6.9	9.0	65	24	14	22	10	12	13	11
12	7.9	8.3	6.6	8.0	11	155	35	22	8.7	13	19	10
13	29	7.7	8.3	7.5	7.9	89	123	10	24	11	14	9.9
14	32	7.1	13	7.4	7.3	17	67	11	9.9	14	85	14
15	9.3	7.5	8.5	7.6	7.0	23	65	9.9	14	20	72	27
16	7.8	160	6.4	9.7	6.8	13	134	9.7	71	21	53	17
17	6.2	48	6.0	9.4	6.6	55	26	12	25	14	21	19
18	8.3	11	5.8	8.3	6.4	47	22	12	14	26	10	11
19	14	8.7	125	7.1	6.4	17	18	10	10	11	13	9.0
20	6.2	7.7	64	6.4	11	11	19	9.4	9.2	10	17	8.7
21	5.4	7.1	16	144	12	56	48	9.7	8.4	11	12	8.4
22	5.0	27	11	75	7.5	51	115	10	8.4	169	22	8.2
23	6.9	99	8.7	11	6.6	227	22	22	8.3	20	27	8.8
24	16	23	8.6	52	6.7	30	16	33	8.6	12	24	8.2
25	20	9.6	99	383	6.3	16	27	17	9.2	11	19	11
26	21	9.1	21	35	6.1	12	22	27	72	9.9	17	9.2
27	42	21	11	58	93	12	19	10	35	9.4	26	8.1
28	79	10	14	22	55	37	116	13	129	9.0	52	8.2
29	52	7.9	8.8	18	---	14	23	10	80	19	14	12
30	16	56	7.5	39	---	213	38	32	71	25	12	13
31	107	---	7.0	11	---	367	---	13	---	11	46	---
TOTAL	619.3	879.7	647.8	1078.1	425.4	1880.1	1595	465.7	737.3	688.3	962	425.7
MEAN	20.0	29.3	20.9	34.8	15.2	60.6	53.2	15.0	24.6	22.2	31.0	14.2
MAX	107	160	125	383	93	367	299	33	129	169	197	55
MIN	4.5	7.1	5.8	5.9	6.1	8.4	14	9.4	8.3	9.0	10	8.1
AC-FT	1230	1740	1280	2140	844	3730	3160	924	1460	1370	1910	844

CAL YR 1981 TOTAL 5324.7 MEAN 14.6 MAX 412 MIN 4.0 AC-FT 10560
WTR YR 1982 TOTAL 10404.4 MEAN 28.5 MAX 383 MIN 4.5 AC-FT 20640

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT											
13...	1200	26	42	6.3	21.5	7.2	8.6	--	850	2000	12
DEC											
01...	1145	13	64	7.3	19.0	2.3	9.8	107	110	310	15
JAN											
18...	1230	7.7	67	7.2	19.5	2.5	9.2	100	49	1400	17
MAR											
08...	1230	10	72	6.9	18.0	.50	9.8	104	31	1700	18
JUN											
21...	1300	8.5	83	6.7	21.5	1.4	9.0	102	30	630	21
AUG											
16...	1200	18	57	6.9	21.0	2.6	9.1	103	310	5300	14

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
OCT											
13...	3.0	1.6	2.0	5.0	46	.6	.5	9.0	<5.0	8.0	.0
DEC											
01...	1.0	2.9	2.0	7.3	49	.8	.9	14	5.0	13	.0
JAN											
18...	.00	3.3	2.1	7.0	46	.8	.9	19	5.0	11	.1
MAR											
08...	.00	3.4	2.3	7.4	46	.8	.8	21	<5.0	9.2	.0
JUN											
21...	.00	4.0	2.7	9.4	48	.9	.9	25	<5.0	10	<.1
AUG											
16...	.00	3.1	1.6	6.0	46	.7	.7	16	<5.0	7.9	<.1

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
OCT										
13...	6.6	--	--	--	.23	.200	.50	.040	.020	.060
DEC										
01...	12	45	52	.06	.19	.090	.31	.030	.020	.030
JAN										
18...	15	44	57	.06	.16	.340	.52	<.010	.010	.030
MAR										
08...	18	55	--	.07	<.10	<.060	.18	.010	<.010	.020
JUN										
21...	21	58	--	.08	.12	<.060	1.70	.030	.040	.020
AUG										
16...	13	44	--	.06	.12	.070	.60	.030	.010	.010

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

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
OCT 13...	1200	1	1	0	100	90	14	1	<1	0	0
JAN 18...	1230	1	--	<1	<100	--	<100	<1	<1	<10	--
MAR 08...	1230	1	--	<1	<100	--	<100	<1	<1	10	--
AUG 16...	1200	1	--	<1	<100	--	4	<1	<1	<10	--

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT 13...	0	4	--	<3	9	3	6	410	--	<10	6
JAN 18...	<10	1	--	<1	6	4	2	90	0	100	1
MAR 08...	<10	12	11	1	6	0	6	90	50	40	4
AUG 16...	<10	<1	--	<1	3	0	4	140	50	94	5

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT 13...	5	1	10	10	0	.1	.1	.0	14	14
JAN 18...	--	<1	10	--	<10	<.1	--	<.1	3	--
MAR 08...	--	<1	10	0	10	<.1	--	.1	7	--
AUG 16...	--	<1	<10	--	2	<.1	--	.1	8	4

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 13...	0	0	0	0	1	1	0	30	10	20
JAN 18...	<1	<1	--	<1	1	--	<1	10	--	<10
MAR 08...	<1	<1	--	<1	<1	--	<1	10	0	10
AUG 16...	4	<1	--	<1	<1	--	<1	10	0	11

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

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
13...	1200	26	5	.35	100
DEC					
01...	1145	13	4	.14	100
JAN					
18...	1230	7.7	2	.04	100
MAR					
08...	1230	10	2	.05	100
JUN					
21...	1300	8.5	1	.02	100
AUG					
16...	1200	18	5	.24	100

HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 156°38'22", Hydrologic Unit 20020000, on right bank 1,000 ft (305 m) upstream from intake of Honokohau ditch and 4.1 mi (6.6 km) southeast of Honokohau.

DRAINAGE AREA.--4.11 mi² (10.64 km²).

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

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

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 870 ft (265 m), from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good. No diversion above station. All medium and low flow, together with the inflow from two development tunnels below station, is diverted into Honokohau ditch. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1914-19, 1923-82), 39.6 ft³/s (1.121 m³/s), 28,690 acre-ft/yr (35.4 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft³/s (31.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 23	0530	1270	36.0	5.32	1.622	Mar. 31	1300	*5030	142	*7.63	2.326
Jan. 21	0800	1520	43.0	5.58	1.701	July 22	1230	1270	36.0	5.32	1.622
Jan. 25	0830	1420	40.2	5.48	1.670	Aug. 1	1030	4100	116	7.22	2.201
Mar. 23	0400	1370	38.8	5.43	1.655						

Minimum discharge, 12 ft³/s (0.34 m³/s) Oct. 11, 12, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	79	53	16	22	54	123	53	32	88	553	64
2	105	76	92	16	26	65	66	61	30	82	66	78
3	16	36	49	23	22	71	39	37	30	72	38	33
4	38	19	28	16	20	39	42	35	29	178	49	31
5	27	15	19	16	27	22	32	34	29	87	45	31
6	15	35	21	16	22	21	30	33	28	74	41	30
7	15	74	120	62	20	24	30	33	28	86	38	30
8	13	21	37	28	22	36	48	38	27	41	32	67
9	13	27	19	36	32	54	102	35	27	103	102	40
10	13	23	18	26	35	189	33	48	37	61	242	57
11	12	25	17	17	107	36	34	139	33	37	38	31
12	13	17	16	17	23	177	79	76	27	44	64	35
13	35	17	17	16	20	95	172	41	38	29	40	62
14	57	15	23	16	19	26	65	45	28	41	131	39
15	17	15	17	16	19	33	98	33	44	47	205	54
16	14	110	16	17	19	23	354	32	80	95	109	42
17	13	44	15	17	18	53	106	38	36	45	43	44
18	15	17	15	17	18	36	98	53	29	70	33	32
19	28	16	117	17	18	24	43	50	27	31	30	28
20	14	15	63	16	40	22	48	35	26	27	59	28
21	13	15	32	219	23	75	99	36	26	31	39	27
22	12	124	22	109	19	237	153	41	25	323	63	27
23	15	297	18	20	19	514	49	80	25	61	101	38
24	15	80	17	39	19	67	49	119	25	32	157	29
25	32	27	125	595	18	35	85	50	28	27	143	44
26	45	22	40	211	18	63	57	59	114	26	67	29
27	48	67	21	296	123	37	61	32	133	25	126	43
28	97	32	19	94	59	29	272	36	383	25	154	31
29	52	17	17	37	---	26	119	31	136	105	43	49
30	19	103	16	83	---	288	111	120	132	77	36	45
31	91	---	16	24	---	612	---	34	---	44	116	---
TOTAL	934	1480	1115	2148	847	3053	2697	1587	1692	2114	3003	1218
MEAN	30.1	49.3	36.0	69.3	30.3	98.5	89.9	51.2	56.4	68.2	96.9	40.6
MAX	105	297	125	595	123	612	354	139	383	323	553	78
MIN	12	15	15	16	18	21	30	31	25	25	30	27
AC-FT	1850	2940	2210	4260	1680	6060	5350	3150	3360	4190	5960	2420

CAL YR 1981 TOTAL 10774 MEAN 29.5 MAX 401 MIN 11 AC-FT 21370
WTR YR 1982 TOTAL 21888 MEAN 60.0 MAX 612 MIN 12 AC-FT 43410

16638500 KAHOMA STREAM AT LAHAINA

LOCATION.--Lat 20°53'10", long 156°40'36", Hydrologic Unit 20020000, on right bank 0.2 mi (0.3 km) west of Kelawea, 0.6 mi (1.0 km) northeast of Lahaina, 0.6 mi (1.0 km) downstream from Kanaha Stream, and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE AREA.--5.22 mi² (13.52 km²).

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

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

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

REMARKS.--Records poor. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years (water years 1964-02), 3.65 ft³/s (0.103 m³/s), 2,640 acre-ft/yr (3.26 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft³/s (70.5 m³/s) July 11, 1965, gage height, 11.03 ft (3.362 m), from rating curve extended above 332 ft³/s (9.40 m³/s) on basis of slope-area measurements at gage heights 7.39 ft (2.252 m), 7.58 ft (2.310 m), 8.07 ft (2.460 m) 9.12 ft (2.780 m), and 11.03 ft (3.362 m); no flow many days each year.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 2	0030	704	19.9	7.39	2.252	Mar. 21	2300	1270	36.0	8.40	2.560
Nov. 22	2400	758	21.5	7.48	2.280	Apr. 16	1800	782	22.1	7.52	2.292
Jan. 21	0800	914	25.9	7.74	2.359	Aug. 1	1230	*1530	43.3	*8.96	2.731
Jan. 25	2030	890	25.2	7.70	2.347	Aug. 10	0500	878	24.9	7.68	2.341

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	6.3	.00	.00	.00	6.4	.00	.00	5.0	262	1.3
2	.00	21	13	.00	.00	.00	.03	.00	.00	12	4.7	.00
3	.00	.00	19	.00	.00	.00	.00	.00	.00	.78	.48	.00
4	.00	.00	1.6	.00	.00	.00	.00	.00	.00	7.5	5.1	.00
5	.00	.00	.00	.00	.15	.00	.00	.00	.00	.05	.11	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00
7	.00	.00	12	7.3	.00	.00	.00	.00	.00	.20	.00	.00
8	.00	.00	3.2	.00	.00	.00	.65	.00	.00	.77	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	17	.02	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	225	3.7
11	.00	.00	.00	.00	.07	.00	.00	.07	.00	.00	.16	.00
12	.00	.00	.00	.00	.00	.16	.00	.00	.00	7.3	.00	.00
13	.00	.00	.00	.00	.00	3.6	3.6	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	2.2	.00	.00	.00	1.6	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.00
16	.00	.00	.00	.00	.00	.00	168	.00	.00	3.5	.21	.00
17	.00	.00	.00	.00	.00	.00	6.0	.00	.00	.08	.00	.00
18	.00	.00	.00	.00	.00	.05	.02	.00	.00	.00	.00	.00
19	.00	.00	.00	.11	.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	77	.00	71	.63	.00	.00	.00	.00	.00
22	.00	8.4	.00	55	.00	245	.00	.00	.00	.15	.00	.00
23	.00	116	.00	2.0	.00	147	.00	.00	.00	.00	.00	.00
24	.00	105	.00	.00	.00	15	.00	.00	.00	.00	.49	.00
25	.00	1.2	30	228	.00	1.3	.97	.00	.00	.00	28	.00
26	.00	.00	.63	62	.00	.68	1.4	.00	.00	.00	20	.00
27	.00	23	.00	245	.00	.55	.00	.00	8.3	.00	11	.00
28	.00	6.1	.00	33	.00	.55	12	.00	40	.00	32	.00
29	.00	.00	.00	.51	---	.40	21	.00	.00	.00	7.3	.00
30	.00	13	.00	.07	---	15	10	.00	.00	.00	.55	.00
31	.00	---	.00	.00	---	27	---	.00	---	5.6	.00	---
TOTAL	.00	293.70	85.73	709.99	.22	527.29	232.90	.07	48.30	60.01	600.17	5.00
MEAN	.000	9.79	2.77	22.9	.008	17.0	7.76	.002	1.61	1.94	19.4	.17
MAX	.00	116	30	245	.15	245	168	.07	40	17	262	3.7
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	583	170	1410	.4	1050	462	.1	96	119	1190	9.9

CAL YR 1981 TOTAL 692.97 MEAN 1.90 MAX 116 MIN .00 AC-FT 1370
WTR YR 1982 TOTAL 2563.38 MEAN 7.02 MAX 262 MIN .00 AC-FT 5080

HAWAII, ISLAND OF HAWAII

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft (61 m) upstream from Olaa Flume Road, 7.3 mi (11.7 km) northwest of Mountain View, and 8.0 mi (12.9 km) southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi² (45.1 km²).

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

REVISED RECORDS.--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft (589 m) above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft (0.070 m) lower.

REMARKS.--Records good. No diversion above station. Large part of flow comes from 3 tunnels. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--52 years, 11.9 ft³/s (0.337 m³/s), 8,620 acre-ft/yr (10.6 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft³/s (2.83 m³/s) and maximum (*), from rating curve extended above 160 ft³/s (4.53 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0500	106	3.00	3.48	1.061	July 16	a2230	151	4.28	3.67	1.119
Mar. 23	1830	110	3.12	3.50	1.067	Aug. 1	1430	*530	15.0	*4.40	1.341

Minimum discharge, 0.56 ft³/s (0.016 m³/s) Mar. 8-10.

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DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	8.1	32	21	28	1.6	37	19	9.9	7.8	65	48
2	20	6.9	41	18	25	1.3	37	22	9.4	18	50	44
3	18	9.3	40	16	21	1.2	35	20	9.2	17	47	42
4	18	9.6	38	14	18	1.1	32	18	8.7	17	42	34
5	17	8.5	33	13	16	.95	28	17	8.2	16	35	29
6	16	7.5	29	12	15	.80	27	16	8.2	20	29	28
7	16	7.5	28	11	13	.70	24	16	7.5	22	27	25
8	15	8.2	26	9.6	12	.65	21	17	9.6	18	24	21
9	14	8.1	23	8.7	11	.75	18	17	8.9	18	21	18
10	13	7.5	20	7.9	9.8	1.4	16	17	8.5	18	41	19
11	12	6.9	18	7.1	9.0	1.4	15	18	8.3	16	44	17
12	12	6.5	16	6.4	8.1	1.7	13	18	7.1	16	48	16
13	11	6.3	15	5.8	7.2	22	12	17	6.9	17	43	15
14	10	6.0	14	5.3	6.3	16	11	16	6.4	17	33	17
15	10	5.7	13	5.0	5.7	16	10	16	6.3	17	28	17
16	9.4	5.3	12	4.6	5.2	18	11	15	6.0	30	28	16
17	8.8	5.1	11	4.3	4.7	26	15	16	6.4	45	26	15
18	8.1	4.7	9.9	4.2	4.3	27	14	16	7.3	25	23	14
19	7.5	4.4	9.2	3.9	4.0	26	14	16	7.5	25	20	13
20	6.9	4.2	8.4	3.8	3.7	25	14	16	7.2	22	18	13
21	6.3	4.0	7.8	8.1	3.6	24	14	15	7.2	22	17	12
22	5.8	3.9	7.0	12	3.2	27	13	15	7.3	20	17	11
23	5.6	4.7	6.5	8.9	2.9	39	13	14	7.5	25	24	11
24	5.5	24	6.4	7.5	2.8	46	12	14	7.0	24	28	10
25	5.3	19	35	13	2.4	45	11	13	7.3	23	30	10
26	5.0	17	25	42	2.2	41	12	13	7.1	23	32	11
27	4.5	22	28	54	2.0	36	11	12	6.9	22	33	12
28	6.8	26	30	46	1.7	33	14	12	7.2	19	37	12
29	8.2	26	29	40	---	30	17	11	7.1	18	40	12
30	9.9	30	28	34	---	29	19	11	6.9	16	44	12
31	9.2	---	26	29	---	36	---	11	---	21	49	---
TOTAL	333.8	312.9	665.2	476.1	247.8	575.55	540	484	229.0	634.8	1043	574
MEAN	10.8	10.4	21.5	15.4	8.85	18.6	18.0	15.6	7.63	20.5	33.6	19.1
MAX	20	30	41	54	28	46	37	22	9.9	45	65	48
MIN	4.5	3.9	6.4	3.8	1.7	.65	10	11	6.0	7.8	17	10
AC-FT	662	621	1320	944	492	1140	1070	960	454	1260	2070	1140

CAL YR 1981 TOTAL 2301.44 MEAN 6.31 MAX 41 MIN .00 AC-FT 4560
WTR YR 1982 TOTAL 6116.15 MEAN 16.8 MAX 65 MIN .65 AC-FT 12130

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft (18 m) downstream from tunnel entrance, 3.3 mi (5.3 km) northwest of Kaumana School, and 6.5 mi (10.5 km) southwest of Hilo Post Office.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,970 ft (600 m), from topographic map.

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

AVERAGE DISCHARGE.--8 years, 9.19 ft^3/s (0.260 m^3/s), 6,660 acre-ft/yr (8.21 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s (0.51 m^3/s) Dec. 26, Sept. 12; minimum daily, 0.86 ft^3/s (0.024 m^3/s) Mar. 5-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	1.3	14	13	7.9	1.0	14	14	2.5	.94	9.9	18
2	9.3	1.3	16	12	7.0	1.0	14	14	1.9	2.9	13	18
3	10	1.4	15	11	6.0	1.0	13	14	1.5	9.5	13	16
4	9.5	9.1	14	10	5.8	.94	12	12	1.5	10	11	15
5	8.9	8.3	12	9.5	4.6	.86	10	10	1.4	10	8.9	14
6	8.1	5.8	11	9.0	4.8	.86	9.9	8.5	1.4	11	8.3	13
7	7.5	4.4	10	8.0	4.6	.86	9.1	7.2	1.6	11	7.7	12
8	6.8	5.6	9.7	7.0	4.0	.86	8.5	7.2	1.5	9.7	7.0	11
9	5.9	6.6	9.7	6.5	3.5	.94	7.7	10	1.4	8.7	6.4	9.7
10	5.0	5.3	8.9	6.0	3.0	.94	6.8	13	1.6	8.5	9.7	9.7
11	4.2	4.0	8.1	5.0	2.5	.94	6.0	13	2.4	8.9	15	12
12	3.9	3.0	7.2	4.5	1.8	1.0	5.3	14	2.0	7.7	14	11
13	4.5	2.2	6.4	4.0	1.3	7.7	4.8	13	1.3	7.0	12	10
14	4.4	1.5	5.6	3.5	1.0	13	4.7	12	1.1	6.8	9.7	8.1
15	3.5	1.3	5.0	3.0	.94	12	4.5	11	1.1	7.2	8.7	10
16	2.7	1.3	4.5	3.0	.94	9.9	4.6	9.5	1.0	7.5	8.3	12
17	2.1	1.2	3.9	2.5	.94	11	7.2	8.3	1.5	8.3	7.9	12
18	1.5	1.2	3.4	2.0	.94	14	8.7	11	5.9	7.5	7.7	12
19	1.3	1.3	2.5	1.5	.94	14	8.9	10	5.9	5.9	7.5	10
20	1.3	1.2	1.9	1.5	.94	12	8.5	9.5	5.2	4.5	7.7	7.2
21	1.3	1.2	1.6	1.4	1.0	11	7.7	8.7	5.8	4.2	7.7	5.4
22	1.3	1.2	1.3	7.7	1.0	12	7.5	8.7	5.6	4.3	7.5	3.6
23	1.3	1.3	1.3	8.9	1.0	12	6.6	7.9	4.5	4.4	7.7	3.5
24	1.3	5.8	1.5	7.3	1.0	14	5.8	7.7	3.9	4.0	8.7	3.4
25	1.3	12	9.7	7.7	1.0	16	5.0	5.4	3.2	3.9	8.7	2.3
26	1.3	11	18	13	1.0	14	4.5	4.7	2.3	3.9	10	3.7
27	1.3	10	17	16	1.0	12	4.5	4.5	1.4	5.3	13	4.7
28	1.3	11	16	16	.94	11	6.4	4.2	.94	7.0	15	5.0
29	2.5	12	15	12	---	11	12	3.7	1.1	6.4	16	4.8
30	2.8	12	14	9.7	---	12	14	3.0	1.1	6.2	16	4.7
31	1.8	---	14	8.7	---	13	---	2.9	---	6.2	17	---
TOTAL	127.6	144.8	278.2	230.9	71.38	242.80	242.2	282.6	73.54	209.34	320.7	281.8
MEAN	4.12	4.83	8.97	7.45	2.55	7.83	8.07	9.12	2.45	6.75	10.3	9.39
MAX	10	12	18	16	7.9	16	14	14	5.9	11	17	18
MIN	1.3	1.2	1.3	1.4	.94	.86	4.5	2.9	.94	.94	6.4	2.3
AC-FT	253	287	552	458	142	482	480	561	146	415	636	559

CAL YR 1981 TOTAL 1198.28 MEAN 3.28 MAX 18 MIN .42 AC-FT 2380
WTR YR 1982 TOTAL 2505.86 MEAN 6.87 MAX 18 MIN .86 AC-FT 4970

HAWAII, ISLAND OF HAWAII

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

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

PERIOD OF RECORD.--February 1981 to current year.

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s (0.51 m^3/s) Jan. 26, 1982; minimum daily, 0.05 ft^3/s (0.001 m^3/s) July 28, 29, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s (0.51 m^3/s) Jan. 26; minimum daily, 2.3 ft^3/s (0.06 m^3/s) Mar. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	4.2	9.7	5.9	6.3	3.1	11	7.0	4.7	4.6	16	8.2
2	7.3	4.0	11	5.7	6.1	3.3	8.1	8.4	4.6	8.5	15	11
3	5.9	6.6	8.3	5.5	5.8	3.0	7.4	6.9	4.8	7.5	14	10
4	6.2	5.3	7.4	5.3	5.4	2.9	7.4	6.0	4.4	8.0	13	9.5
5	5.7	5.1	6.9	5.2	5.2	2.8	7.0	5.3	4.3	7.6	12	9.0
6	5.6	5.0	6.4	5.0	5.0	2.7	6.6	5.1	4.4	6.7	10	8.5
7	5.6	6.0	6.5	4.9	4.9	2.5	6.4	5.4	4.3	6.3	11	8.0
8	5.3	6.2	7.1	4.7	4.7	2.3	6.2	6.3	4.7	6.4	14	7.5
9	5.2	5.4	6.2	4.6	4.6	2.3	6.0	7.0	4.5	7.3	11	7.0
10	5.0	5.0	5.8	4.5	4.5	3.7	5.8	7.2	4.5	9.2	9.0	7.5
11	5.1	4.8	5.5	4.5	4.4	3.9	5.7	6.6	4.3	6.7	7.2	7.0
12	5.2	4.6	5.3	4.4	4.3	4.5	5.5	6.4	4.1	7.2	7.0	7.0
13	5.2	4.7	5.2	4.3	4.2	13	5.5	5.5	4.3	6.6	6.5	6.5
14	4.9	4.4	5.0	4.3	4.1	7.6	5.8	5.7	4.5	8.7	6.1	6.0
15	4.8	4.3	4.9	4.2	4.1	7.3	5.4	5.3	4.2	8.0	6.1	5.5
16	4.5	4.1	4.8	4.1	4.0	9.3	6.8	5.1	4.0	14	6.1	5.5
17	4.3	4.0	4.6	4.1	4.0	10	8.4	6.3	7.9	14	6.1	5.0
18	4.2	4.0	4.5	5.0	3.9	7.9	7.2	5.8	8.0	11	6.0	5.0
19	4.1	3.8	4.4	4.4	3.7	7.0	6.3	6.1	6.0	8.8	5.8	4.5
20	4.0	3.5	4.4	4.2	3.6	6.6	6.2	5.5	5.5	7.2	6.8	4.5
21	3.9	3.4	4.3	7.5	3.5	6.7	6.9	5.7	5.3	8.7	6.0	4.0
22	3.9	3.3	4.5	7.2	3.4	7.2	6.0	5.5	5.2	9.0	6.1	4.0
23	3.7	4.4	4.6	5.7	3.4	14	5.8	5.3	5.0	7.3	8.5	4.0
24	3.7	12	4.9	5.6	3.3	9.5	5.6	5.2	4.7	6.8	8.5	3.5
25	3.6	7.0	20	7.5	3.2	9.1	5.5	5.0	4.6	6.5	9.0	3.5
26	3.4	6.2	13	18	3.1	7.4	6.4	5.0	4.4	6.5	8.0	3.5
27	3.3	7.7	8.9	17	3.1	7.2	5.7	5.0	4.3	6.5	8.0	3.0
28	6.0	7.6	7.1	11	3.0	9.1	7.9	4.9	4.9	6.0	8.5	3.0
29	5.8	6.4	6.6	7.5	---	7.9	9.1	4.6	4.7	6.0	9.2	3.0
30	5.3	11	6.4	6.9	---	9.8	8.0	4.8	4.5	5.5	9.8	3.0
31	4.7	---	6.2	6.5	---	12	---	4.6	---	6.5	8.6	---
TOTAL	151.7	164.0	210.4	195.1	118.8	205.6	201.6	178.5	145.6	239.6	278.8	177.2
MEAN	4.89	5.47	6.79	6.29	4.24	6.63	6.72	5.76	4.85	7.73	8.99	5.91
MAX	7.3	12	20	18	6.3	14	11	8.4	8.0	14	16	11
MIN	3.3	3.3	4.3	4.1	3.0	2.3	5.4	4.6	4.0	4.6	6.8	3.0
AC-FT	301	325	417	387	236	408	400	354	289	475	553	351

WTR YR 1982 TOTAL 2266.9 MEAN 6.21 MAX 20 MIN 2.3 AC-FT 4500

16701750 WAILUKU RIVER NEAR HUMUULA

LOCATION.--Lat 19°42'55", long 155°18'36", Hydrologic Unit 20010000, on right bank 300 ft (91 m) upstream from trail terminus, 10 mi (16 km) east of Humuula, and 14 mi (22 km) west of Hilo.

DRAINAGE AREA.--34.8 mi² (90.1 km²).

PERIOD OF RECORD.--February 1965 to September 1982 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (1,295 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record and those above 40 ft³/s (1.13 m³/s), which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 3.18 ft³/s (0.090 m³/s), 2,300 acre-ft/yr (2.84 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,430 ft³/s (267 m³/s) Aug. 10, 1982, gage height, 12.36 ft (3.767 m), from rating curve extended above 10 ft³/s (0.51 m³/s) on basis of slope-area measurement at gage height 11.87 ft (3.618 m); no flow at times in 1965, 1969-81.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	1430	820	23.2	6.40	1.951	July 16	2330	815	23.1	6.29	1.917
Mar. 23	2230	399	11.3	5.43	1.655	Aug. 10	a1600	*9430	267	*12.36	3.767
Mar. 31	1830	650	18.4	6.06	1.847						

Minimum discharge, 0.06 ft³/s (0.002 m³/s) Mar. 8.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.24	.16	11	.65	.55	.40	17	.35	.20	.12	37	8.0
2	.35	.18	8.6	.45	.45	.50	7.0	.30	.20	.65	4.1	5.0
3	.30	.30	3.4	.35	.35	.40	3.9	.28	.22	.65	1.9	2.0
4	.26	6.4	2.5	.28	.30	.30	2.7	.26	.22	1.1	1.4	1.5
5	.24	1.1	1.8	.26	.28	.20	2.0	.24	.18	.75	1.1	1.0
6	.22	.24	1.3	.24	.26	.20	1.4	.22	.20	.75	.80	.80
7	.22	.20	1.0	.24	.26	.15	1.0	.22	.18	.50	.65	.50
8	.20	.20	.75	.24	.24	.10	.75	.24	.18	.40	.50	.45
9	.22	.18	.55	.22	.24	.15	.60	.24	.20	.55	1.5	.40
10	.20	.16	.40	.22	.22	.50	.55	.24	.22	.94	350	2.0
11	.18	.14	.35	.20	.26	.75	.50	.26	.18	.94	25	.50
12	.18	.14	.30	.10	.45	.80	.45	.35	.14	.65	5.0	.45
13	.20	.14	.28	.16	.45	20	.40	.26	.14	.60	4.0	.40
14	.18	.12	.26	.14	.35	5.0	.40	.24	.12	1.0	3.5	2.5
15	.16	.12	.24	.14	.30	6.0	.35	.22	.12	.75	2.0	3.0
16	.16	.14	.24	.12	.30	10	.50	.35	.12	29	1.0	.50
17	.16	.14	.22	.12	.26	20	1.0	.35	.28	115	6.0	.45
18	.14	.14	.22	.14	.24	15	.65	.45	.24	8.1	3.0	.35
19	.14	.10	.20	.10	.24	3.9	.45	.50	.18	3.4	.50	.30
20	.14	.10	.20	.16	.22	4.2	.45	.30	.14	2.6	.50	.25
21	.12	.10	.20	20	.20	3.0	.40	.30	.12	3.3	.55	.25
22	.12	.10	.18	3.7	.18	2.3	.30	.30	.10	6.2	.75	.20
23	.10	.24	.18	1.2	.20	36	.28	.28	.10	4.1	5.0	.20
24	.10	8.0	.20	.70	.20	31	.26	.26	.10	4.2	10	.15
25	.10	1.8	242	.55	.25	5.3	.26	.24	.10	1.6	12	.40
26	.10	.60	28	2.3	.20	3.2	.26	.26	.10	1.3	12	1.0
27	.09	1.5	4.7	4.5	.15	2.4	.24	.24	.12	1.0	4.0	.80
28	.14	3.5	2.7	1.7	.10	2.0	.40	.24	.16	.75	6.0	.50
29	.14	1.5	1.9	1.0	---	2.2	.45	.22	.16	.60	4.5	.40
30	.14	19	1.3	.87	---	3.5	.40	.22	.12	.50	4.0	.30
31	.14	---	.94	.70	---	68	---	.22	---	.65	10	---
TOTAL	5.38	46.74	316.11	41.83	7.70	247.45	45.30	8.65	4.84	189.65	518.25	34.55
MEAN	.17	1.56	10.2	1.35	.28	7.98	1.51	.28	.16	6.12	16.7	1.15
MAX	.35	19	242	20	.55	68	17	.50	.28	115	350	8.0
MIN	.09	.10	.18	.10	.10	.10	.24	.22	.10	.12	.50	.15
AC-FT	11	93	627	83	15	491	90	17	9.6	376	1030	69

CAL YR 1981 TOTAL 847.11 MEAN 2.32 MAX 446 MIN .00 AC-FT 1680
WTR YR 1982 TOTAL 1466.45 MEAN 4.02 MAX 350 MIN .09 AC-FT 2910

NOTE.--No gage-height record Feb. 24 to Mar. 19, Aug. 9 to Sept. 30.

HAWAII, ISLAND OF HAWAII

16701800 WAILUKU RIVER NEAR KAUMANA

LOCATION.--Lat 19°43'15", long 155°16'08", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Waipahoehoe Gulch and 8.4 mi (13.5 km) west of Kaumana.

DRAINAGE AREA.--43.4 mi² (112.4 km²).

PERIOD OF RECORD.--October 1966 to September 1982 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (1,073 m), from topographic map.

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

AVERAGE DISCHARGE.--16 years, 30.4 ft³/s (0.861 m³/s), 22,020 acre-ft/yr (27.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,800 ft³/s (3.91 m³/s) Nov. 17, 1979, gage height, 16.30 ft (4.968 m), from rating curve extended above 2,200 ft³/s (62.3 m³/s); no flow at times in 1970, 1978, 1980, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*), from rating curve extended above 2,200 ft³/s (62.3 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 30	1830	1750	49.6	6.61	2.015
Dec. 25	1330	4370	124	9.56	2.914
Mar. 23	2330	2210	62.6	7.26	2.213
Mar. 31	1800	4080	116	9.28	2.828
July 16	2300	4410	125	9.60	2.926
Aug. 10	1530	*13400	379	*16.00	4.877

Minimum discharge, 0.44 ft³/s (0.12 m³/s) Mar. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	1.1	180	7.4	8.8	.83	214	7.6	2.8	1.8	424	161
2	12	1.6	187	6.3	7.2	1.2	76	6.4	2.8	19	73	76
3	8.6	32	53	5.2	6.1	.86	36	6.1	4.2	16	25	33
4	7.6	76	28	4.4	5.2	.71	26	5.2	3.7	30	16	22
5	7.0	17	20	3.7	4.7	.68	18	4.6	2.9	21	12	16
6	5.8	5.9	14	3.1	4.4	.56	13	4.0	3.7	16	10	13
7	6.1	6.1	12	2.8	3.5	.47	10	3.9	2.9	11	8.4	11
8	5.1	5.8	11	2.6	2.9	.44	8.6	5.1	3.1	8.6	7.2	9.2
9	4.9	4.6	8.6	2.6	2.6	.50	7.2	5.4	3.7	13	9.6	7.4
10	3.9	3.5	7.0	2.7	2.3	2.5	6.1	5.1	4.9	31	2200	20
11	3.7	2.9	5.9	2.2	1.9	4.0	5.4	6.1	4.4	18	168	9.0
12	3.9	2.6	5.2	1.6	1.6	4.0	5.1	8.8	2.9	14	56	8.0
13	4.4	2.3	4.6	1.5	1.5	224	4.7	5.8	3.1	13	28	7.0
14	2.9	1.8	3.9	1.4	1.4	41	4.9	5.2	2.7	30	23	22
15	2.7	1.7	3.4	1.3	1.3	58	3.9	4.6	2.2	17	15	42
16	2.4	1.6	2.9	1.2	1.4	100	11	4.2	1.9	641	12	10
17	1.9	1.6	2.6	1.2	1.2	243	22	8.2	15	676	64	8.4
18	1.8	1.7	2.3	1.5	1.0	134	11	9.4	7.4	55	30	8.0
19	1.6	1.4	1.8	1.3	1.0	31	7.8	11	4.7	32	10	6.8
20	1.5	1.2	1.7	1.4	.89	23	6.4	7.4	3.7	22	10	5.9
21	1.4	1.1	1.6	140	.83	45	6.8	7.2	3.1	49	11	5.4
22	1.3	1.0	1.8	60	.80	27	5.4	7.4	2.6	78	16	4.4
23	1.2	6.7	1.9	14	.95	389	4.7	6.4	2.2	75	63	4.4
24	1.1	242	2.9	10	.89	269	4.0	5.4	1.8	33	150	3.5
25	1.1	36	1570	14	1.0	47	3.5	4.7	1.8	16	160	6.4
26	.98	13	271	137	.80	26	4.2	5.6	1.6	12	168	16
27	.92	79	47	166	.71	20	3.9	4.9	1.5	10	54	13
28	1.3	138	24	41	.68	22	8.2	4.6	2.3	8.6	92	10
29	1.3	27	15	20	---	32	9.0	3.7	2.2	8.6	66	7.8
30	1.1	305	12	14	---	107	8.0	3.5	1.8	6.4	64	6.6
31	1.2	---	9.2	11	---	564	---	3.2	---	36	167	---
TOTAL	108.90	1021.2	2511.3	682.4	67.55	2418.75	554.8	180.7	103.6	2018.0	4212.2	573.2
MEAN	3.51	34.0	81.0	22.0	2.41	78.0	18.5	5.83	3.45	65.1	136	19.1
MAX	12	305	1570	166	8.8	564	214	11	15	676	2200	161
MIN	.92	1.0	1.6	1.2	.68	.44	3.5	3.2	1.5	1.8	7.2	3.5
AC-FT	216	2030	4980	1350	134	4800	1100	358	205	4000	8350	1140

CAL YR 1981 TOTAL 6225.37 MEAN 17.1 MAX 1660 MIN .00 AC-FT 12350
WTR YR 1982 TOTAL 14452.60 MEAN 39.6 MAX 2200 MIN .44 AC-FT 28670

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) downstream from Hookelekele Stream, 0.9 mi (1.4 km) west of Piihonua, and 4.1 mi (6.6 km) west of Hilo Post Office. Prior to Nov. 16, 1977, at opposite site on left bank.

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

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

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

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

REMARKS.--Records fair except those for periods of no gage-height, which are poor. Hawaii County Board of Water Supply diverts about 6 ft³/s (0.17 m³/s) above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--51 years (water years, 1929-39, 1942-47, 1949-82), 286 ft³/s (8.100 m³/s), 207,200 acre-ft/yr (255 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,700 ft³/s (246 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	a1500	17200	487	17.85	5.441	July 16	a2200	*40500	1150	*23.12	7.047
Jan. 26	a2100	18600	527	18.26	5.566	Aug. 1	a1500	15700	445	17.32	5.279
Mar. 31	a1900	20600	583	18.83	5.739	Aug. 10	a1700	14900	422	17.07	5.203

Minimum discharge, 4.2 ft³/s (0.119 m³/s) Mar. 8.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	54	1000	100	200	30	1500	350	68	54	5000	1560
2	392	41	1500	90	150	15	950	325	69	908	1000	1080
3	273	459	900	80	100	10	700	300	79	731	850	671
4	221	468	700	70	90	8.0	450	200	95	1060	600	458
5	217	253	400	60	80	5.0	311	150	64	743	450	339
6	147	104	300	45	70	5.4	234	125	99	641	300	269
7	157	142	200	40	65	4.7	189	100	70	396	200	221
8	114	196	450	35	50	4.3	156	202	67	290	150	191
9	102	155	250	30	35	4.9	126	323	79	361	200	155
10	79	104	150	30	30	25	104	334	111	927	6000	468
11	71	78	125	25	30	90	87	338	94	613	1100	221
12	83	65	100	25	25	69	76	455	65	453	900	189
13	98	60	80	24	20	1920	68	264	67	426	700	164
14	66	47	70	21	25	868	64	229	69	962	500	417
15	60	40	60	19	20	875	61	171	55	551	400	739
16	50	35	50	18	25	965	59	140	46	3590	300	314
17	41	31	40	18	20	1680	750	244	737	4190	327	233
18	35	30	30	62	18	1210	500	303	540	1070	412	207
19	31	28	25	55	16	506	250	383	339	823	265	177
20	28	24	20	26	15	371	150	241	213	508	237	148
21	25	21	20	786	15	439	200	240	148	700	329	128
22	24	20	30	777	12	536	150	230	111	750	317	106
23	21	100	35	282	10	2800	100	193	86	600	1330	135
24	20	1500	90	221	10	1590	80	144	71	500	1610	107
25	20	900	9000	338	12	868	75	117	61	400	1520	150
26	19	400	2000	4500	12	525	90	118	53	250	1490	450
27	15	950	900	3000	20	450	80	116	46	200	924	350
28	124	1000	500	1000	25	700	300	101	63	175	1390	325
29	235	700	300	800	---	800	600	83	77	150	1040	250
30	85	1100	200	400	---	850	450	79	59	125	1080	225
31	79	---	150	300	---	3000	---	75	---	250	1840	---
TOTAL	3137	9105	19675	13277	1200	21224.3	8910	6673	3801	23397	32761	10447
MEAN	101	304	635	428	42.9	685	297	215	127	755	1057	348
MAX	392	1500	9000	4500	200	3000	1500	455	737	4190	6000	1560
MIN	15	20	20	18	10	4.3	59	75	46	54	150	106
AC-FT	6220	18060	39030	26330	2380	42100	17670	13240	7540	46410	64980	20720

CAL YR 1981 TOTAL 55025.10 MEAN 151 MAX 9000 MIN .24 AC-FT 109100
WTR YR 1982 TOTAL 153607.30 MEAN 421 MAX 9000 MIN 4.3 AC-FT 304700

NOTE.--No gage-height record Nov. 23 to Jan. 12, Jan. 26 to Mar. 5.

HAWAII, ISLAND OF HAWAII

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

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft (152 m) upstream from Wailuku bridge and 0.2 mi (0.3 km) west of Hilo Post Office.

DRAINAGE AREA.--256 mi² (663 km²), of which 81 mi² (210 km²) probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 to September 1979, June 1980 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 80 ft (24 m), from topographic map.

REMARKS.--Records good. Hilo Electric Light Co. diverts above station for Hydro-plant use.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,500 ft³/s (269 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 30	2100	15800	447	15.50	4.724
Dec. 25	1500	33100	937	22.85	6.965
Jan. 26	2130	34200	968	23.30	7.102
Mar. 23	2100	13900	394	14.65	4.465
Mar. 31	1930	38800	1100	24.85	7.574
July 16	2230	*55800	1580	*30.98	9.443
Aug. 1	1530	37700	1070	24.48	7.462
Aug. 10	1700	35600	1010	23.75	7.239

Minimum discharge, 18 ft³/s (0.51 m³/s) Mar. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	364	91	2590	255	400	61	2890	760	75	40	8020	2460
2	684	59	3050	202	304	43	1560	750	91	1450	2200	1760
3	522	741	1460	150	235	28	1010	556	91	1160	1280	1130
4	435	878	1010	112	180	24	815	435	157	1640	850	835
5	435	470	710	83	144	20	640	325	71	1160	620	640
6	280	210	540	63	116	26	488	268	160	1050	488	522
7	310	331	435	68	88	43	400	220	86	680	385	435
8	206	480	790	64	66	26	364	394	69	540	310	355
9	173	391	540	42	49	20	268	640	95	620	435	280
10	126	260	400	34	42	28	220	640	153	1560	9510	755
11	99	190	304	32	37	167	186	676	128	1000	2280	385
12	120	157	235	33	30	75	158	900	61	800	1560	325
13	158	143	194	28	26	3340	150	533	61	750	1020	255
14	85	95	150	24	32	1430	190	470	71	1490	850	479
15	73	73	116	22	28	1500	120	340	42	950	680	1180
16	51	59	88	26	30	1750	310	275	28	6000	533	505
17	35	46	68	26	25	3340	1190	438	1060	6830	467	376
18	31	38	55	110	24	2260	825	600	936	1580	700	349
19	30	30	49	93	22	975	446	725	548	1220	470	295
20	26	29	37	34	22	760	340	498	325	875	361	238
21	32	29	32	1280	21	770	442	470	226	1090	505	198
22	25	25	61	1420	22	977	268	460	150	1430	418	148
23	31	191	68	512	19	5230	200	370	104	1100	2240	226
24	23	3400	230	400	20	2880	162	275	74	900	2800	166
25	25	1490	12700	699	24	1440	144	218	53	620	2360	372
26	23	750	4700	7550	23	950	210	210	52	470	2280	950
27	20	1550	1280	5890	31	715	194	206	43	379	1460	800
28	239	2370	840	2040	57	1180	597	167	61	295	2200	775
29	534	1050	580	1080	---	1290	1020	128	99	242	1600	522
30	171	2920	428	745	---	1730	950	112	61	216	1680	463
31	180	---	331	533	---	5500	---	108	---	476	2930	---
TOTAL	5546	18546	34071	23650	2117	38578	16757	13167	5231	38613	63492	18179
MEAN	179	618	1099	763	75.6	1244	559	425	174	1246	1726	606
MAX	684	3400	12700	7550	400	5500	2890	900	1060	6830	9510	2460
MIN	20	25	32	22	19	20	120	108	28	40	310	148
AC-FT	11000	36790	67580	46910	4200	76520	33240	26120	10380	76590	106100	36060

CAL YR 1981 TOTAL 95749.5 MEAN 262 MAX 12700 MIN 4.6 AC-FT 189900
WTR YR 1982 TOTAL 267947.0 MEAN 734 MAX 12700 MIN 19 AC-FT 531500

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

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

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

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

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 292 mg/L Sept. 21, 1980; minimum daily mean, 0 mg/L on several days in June, July 1981 and Feb. 21-24, 1982.
SEDIMENT DISCHARGE: Maximum daily, 14,100 tons (12,800 tonnes) Feb. 20, 1979; minimum daily, 0 ton (0 tonne) on several days in June, July 1981, and Feb. 21-24, 1982.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 260 mg/L Dec. 25; minimum daily mean, 0 mg/L Feb. 21-24.
SEDIMENT DISCHARGE: Maximum daily, 11,000 tons (9,980 tonnes) Dec. 25, minimum daily, 0 ton (0 tonne) Feb. 21-24.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
NOV											
17...	1030	46	62	7.4	22.0	1.7	8.8	100	55	--	26
JAN											
28...	0945	2370	28	7.0	18.0	3.5	9.4	--	K110	830	8
MAR											
02...	0945	32	--	7.0	20.5	.30	9.0	100	400	1600	28
APR											
26...	0945	232	59	7.8	21.0	.70	9.0	101	88	1500	21
JUN											
28...	1000	35	65	7.3	21.0	1.0	8.9	100	220	3000	23
AUG											
17...	1015	442	43	7.2	21.0	.80	8.9	100	52	560	15

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV											
17...	9.0	5.1	3.2	4.1	25	.4	.6	17	<5.0	5.6	<.1
JAN											
28...	.00	1.6	1.0	2.1	34	.3	.6	10	<5.0	3.5	.0
MAR											
02...	.00	5.7	3.3	4.4	25	.4	.9	30	5.0	5.4	.0
APR											
26...	.00	4.3	2.6	3.5	25	.3	.7	21	<5.0	4.8	<.1
JUN											
28...	.00	4.6	2.7	4.0	27	.4	.6	26	<5.0	4.7	<.1
AUG											
17...	.00	3.2	1.8	2.8	28	.3	.4	19	<5.0	3.6	<.1

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
NOV										
17...	16	51	--	.07	.34	.170	.25	.010	<.010	.040
JAN										
28...	6.7	22	--	.03	.13	.260	1.50	<.010	.010	<.010
MAR										
02...	15	53	58	.07	.23	<.060	.38	<.010	<.010	<.010
APR										
26...	13	38	--	.05	.16	.060	.34	.010	.010	<.010
JUN										
28...	15	44	53	.06	.19	.150	.70	.110	.040	.030
AUG										
17...	12	23	--	.03	.17	.180	1.00	.020	.020	.010

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.

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
NOV 17...	1030	<1	<1	<100	--	5	--	1	<1	<10
MAR 02...	0945	1	--	<100	--	5	<1	<1	<1	10
APR 26...	0945	1	<1	<100	--	<6	--	1	<3	<10
AUG 17...	1015	<1	<1	100	100	5	--	<1	<1	<10

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
NOV 17...	<10	<1	<3	5	2	3	150	110	43	1
MAR 02...	--	2	<3	4	--	<10	260	220	40	2
APR 26 ..	<10	1	<1	3	2	1	90	60	31	<1
AUG 17...	<10	<1	<1	1	0	3	120	80	45	<1

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
NOV 17...	0	1	--	10	4	6	<.1	<.1	--	3
MAR 02...	--	<10	<4	10	6	4	<.1	--	<10	1
APR 26 ..	--	<1	--	<10	--	<3	<.1	<.1	--	<1
AUG 17...	--	2	--	<10	--	2	<.1	<.1	--	2

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 17...	<1	<1	<1	<1	<1	--	--	10	7	3
MAR 02...	--	<1	--	<1	--	35	<6.0	10	4	6
APR 26...	<1	<1	<1	<1	<1	--	--	10	--	<12
AUG 17...	<1	<1	<1	<1	<1	--	--	10	--	<10

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV					
17...	1030	46	5	.62	100
JAN					
28...	0945	2370	5	32	100
MAR					
02...	0945	32	2	.17	100
APR					
26...	0945	232	2	1.3	100
JUN					
28...	1000	35	3	.28	100
AUG					
17...	1015	442	3	3.6	100

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

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	364	3	2.9	91	5	1.2	2590	41	354
2	684	5	9.2	59	4	.64	3050	15	124
3	522	3	4.2	741	35	146	1460	3	12
4	435	4	4.7	878	64	240	1010	2	5.5
5	435	4	4.7	470	45	57	710	2	3.8
6	280	3	2.3	210	30	17	540	2	2.9
7	310	2	1.7	331	25	22	435	2	2.3
8	206	2	1.1	480	12	16	790	5	11
9	173	2	.93	391	7	7.4	540	2	2.9
10	126	2	.68	260	5	3.5	400	2	2.2
11	99	2	.53	190	5	2.6	304	2	1.6
12	120	2	.65	157	5	2.1	235	1	.63
13	158	2	.85	143	4	1.5	194	1	.52
14	85	2	.46	95	4	1.0	150	1	.41
15	73	1	.20	73	3	.59	116	1	.31
16	51	1	.14	59	3	.48	88	1	.24
17	35	1	.09	46	3	.37	68	1	.18
18	31	1	.08	38	2	.21	55	1	.15
19	30	1	.08	30	2	.16	49	1	.13
20	26	1	.07	29	1	.08	37	1	.10
21	32	1	.09	29	1	.08	32	1	.09
22	25	1	.07	25	1	.07	61	2	.33
23	31	1	.08	191	6	3.1	68	2	.37
24	23	1	.06	3400	56	640	230	3	1.9
25	25	1	.07	1490	6	24	12700	260	11000
26	23	1	.06	750	3	6.1	4700	76	1950
27	20	1	.05	1550	10	42	1280	5	17
28	239	15	9.7	2370	9	58	840	3	6.8
29	534	106	290	1050	4	11	580	3	4.7
30	171	8	3.7	2920	68	1720	428	2	2.3
31	180	8	3.9	---	---	---	331	2	1.8
TOTAL	5546	---	343.34	18546	---	3024.18	34071	---	13510.16

16713000 WAILUKU RIVER AT HILO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	255	2	1.4	400	1	1.1	61	2	.33
2	202	2	1.1	304	1	.82	43	4	.46
3	150	2	.81	235	1	.63	28	4	.30
4	112	1	.30	180	1	.49	24	3	.19
5	83	1	.22	144	1	.39	20	3	.16
6	63	1	.17	116	1	.31	26	3	.21
7	68	1	.18	88	1	.24	43	2	.23
8	64	1	.17	66	1	.18	26	2	.14
9	42	1	.11	49	2	.26	20	1	.05
10	34	1	.09	42	2	.23	28	4	.30
11	32	1	.09	37	2	.20	167	10	4.5
12	33	1	.09	30	2	.16	75	4	.81
13	28	1	.08	26	2	.14	3340	148	1670
14	24	1	.06	32	2	.17	1430	20	77
15	22	1	.06	28	2	.15	1500	25	101
16	26	1	.07	30	2	.16	1750	30	142
17	26	1	.07	25	2	.14	3340	31	346
18	110	3	.89	24	2	.13	2260	37	357
19	93	2	.50	22	1	.06	975	3	7.9
20	34	2	.18	22	1	.06	760	4	8.2
21	1280	20	69	21	0	.00	770	7	15
22	1420	25	96	22	0	.00	977	6	16
23	512	6	8.3	19	0	.00	5230	132	2230
24	400	3	3.2	20	0	.00	2880	8	62
25	699	26	120	24	1	.06	1440	5	19
26	7550	131	3950	23	1	.06	950	3	7.7
27	5890	67	1780	31	3	.25	715	2	3.9
28	2040	8	44	57	2	.31	1180	8	25
29	1080	3	8.7	---	---	---	1290	3	10
30	745	2	4.0	---	---	---	1730	8	37
31	533	2	2.9	---	---	---	5500	110	4160
TOTAL	23650	---	6092.74	2117	---	6.70	38578	---	9302.38
		APRIL			MAY			JUNE	
1	2890	25	222	760	3	6.2	75	2	.41
2	1560	7	29	750	3	6.1	91	3	.74
3	1010	3	8.2	556	3	4.5	91	2	.49
4	815	2	4.4	435	2	2.3	157	2	.85
5	640	1	1.7	325	3	2.6	71	2	.38
6	488	1	1.3	268	3	2.2	160	4	1.7
7	400	1	1.1	220	3	1.8	86	2	.46
8	364	1	.98	394	3	3.2	69	2	.37
9	268	1	.72	640	3	5.2	95	2	.51
10	220	1	.59	640	3	5.2	153	3	1.2
11	186	1	.50	676	3	5.5	128	3	1.0
12	158	1	.43	900	5	12	61	3	.49
13	150	1	.41	533	5	7.2	61	3	.49
14	190	1	.51	470	4	5.1	71	3	.58
15	120	1	.32	340	3	2.8	42	2	.23
16	310	3	2.5	275	2	1.5	28	2	.15
17	1190	5	16	438	3	3.5	1060	68	585
18	825	4	8.9	600	3	4.9	936	88	210
19	446	2	2.4	725	4	7.8	548	6	8.9
20	340	2	1.8	498	4	5.4	325	5	4.4
21	442	2	2.4	470	3	3.8	226	3	1.8
22	268	1	.72	460	3	3.7	150	2	.81
23	200	1	.54	370	3	3.0	104	2	.56
24	162	1	.44	275	3	2.2	74	2	.40
25	144	1	.39	218	2	1.2	53	1	.14
26	210	2	1.1	210	3	1.7	52	1	.14
27	194	2	1.0	206	3	1.7	43	1	.12
28	597	3	4.8	167	2	.90	61	1	.16
29	1020	5	14	128	2	.69	99	1	.27
30	950	3	7.7	112	2	.60	61	1	.16
31	---	---	---	108	2	.58	---	---	---
TOTAL	16757	---	336.85	13167	---	115.07	5231	---	822.91

16713000 WAILUKU RIVER AT HILO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	40	1	.11	8020	216	5140	2460	4	27
2	1450	8	31	2200	12	71	1760	3	14
3	1160	7	22	1280	5	17	1130	2	6.1
4	1640	5	22	850	4	9.2	835	2	4.5
5	1160	3	9.4	620	4	6.7	640	1	1.7
6	1050	3	8.5	488	3	4.0	522	1	1.4
7	680	2	3.7	385	3	3.1	435	1	1.2
8	540	2	2.9	310	2	1.7	355	1	.96
9	620	2	3.3	435	3	3.5	280	1	.76
10	1560	5	21	9510	99	2720	755	5	10
11	1000	3	8.1	2280	25	154	385	4	4.2
12	800	2	4.3	1560	8	34	325	3	2.6
13	750	2	4.1	1020	7	19	255	3	2.1
14	1490	6	24	850	5	11	479	3	3.9
15	950	5	13	680	3	5.5	1180	5	16
16	6000	121	5480	533	2	2.9	505	4	5.5
17	6830	129	3950	467	2	2.5	376	2	2.0
18	1580	8	34	700	6	11	349	2	1.9
19	1220	5	16	470	5	6.3	295	2	1.6
20	875	2	4.7	361	3	2.9	238	2	1.3
21	1090	2	5.9	505	3	4.1	198	2	1.1
22	1430	4	15	418	3	3.4	148	1	.40
23	1100	4	12	2240	41	331	226	1	.61
24	900	3	7.3	2800	98	984	166	1	.45
25	620	3	5.0	2360	20	127	372	3	3.0
26	470	3	3.8	2280	25	154	950	5	13
27	379	3	3.1	1460	8	32	800	3	6.5
28	295	2	1.6	2200	5	30	775	3	6.3
29	242	2	1.3	1600	5	22	522	2	2.8
30	216	2	1.2	1680	3	14	463	2	2.5
31	476	20	26	2930	5	40	---	---	---
TOTAL	38613	---	9744.31	53492	---	9966.8	18179	---	145.38
YEAR	267947		53410.82						

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi (1.1 km) downstream from Pohakupaa Stream, 4.1 mi (6.6 km) west of Papaikou, and 4.8 mi (7.7 km) northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi² (30.0 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Altitude of gage is 1,540 ft (469 m), from topographic map. Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911, to Mar. 24, 1913, water-stage recorder, at site 0.5 mi (0.8 km) upstream at different datum.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft³/s (0.091 m³/s) above station for fluming cane and domestic use.

AVERAGE DISCHARGE.--16 years, 130 ft³/s (3.682 m³/s), 94,180 acre-ft/yr (116 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft³/s (640 m³/s) May 23, 1978, gage height, 20.00 ft (6.096 m), from floodmarks and from rating curve extended above 4,610 ft³/s (131 m³/s) on basis of slope-area measurement at gage height 20.00 ft (6.096 m); minimum, 0.8 ft³/s (0.023 m³/s) Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,400 ft³/s (125 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	1500	8400	238	15.45	4.709	Aug. 1	1500	7220	204	14.72	4.487
Jan. 26	2100	9660	274	16.08	4.901	Aug. 10	1530	5020	142	12.47	3.801
Mar. 31	1900	6100	173	13.60	4.145	Aug. 23	2300	5320	151	12.80	3.901
July 16	2200	*14400	408	*17.98	5.408						

Minimum discharge, 8.2 ft³/s (0.23 m³/s) Mar. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	26	614	30	43	11	478	137	34	46	2370	407
2	196	22	661	26	36	20	165	160	34	763	306	288
3	92	294	215	22	31	13	88	93	48	310	137	125
4	105	312	126	21	28	11	88	76	61	456	78	85
5	94	111	79	19	26	9.3	72	60	56	270	62	70
6	66	49	62	18	25	8.7	55	56	64	193	56	62
7	74	102	81	17	23	8.4	49	58	46	99	51	59
8	49	141	311	17	22	8.3	41	114	53	82	45	63
9	46	96	130	16	20	13	35	179	49	137	110	53
10	37	59	80	16	19	112	32	167	65	567	2710	227
11	33	46	59	14	18	98	29	175	54	160	347	74
12	40	39	49	14	16	80	29	222	37	152	228	61
13	51	37	44	13	13	1520	41	88	43	153	105	52
14	33	28	38	12	13	371	58	88	43	707	91	171
15	29	24	33	12	14	306	43	65	31	256	76	209
16	24	22	28	12	14	732	215	57	26	2630	62	75
17	20	21	25	12	12	864	348	164	303	1700	60	65
18	17	19	23	69	11	405	140	139	106	150	86	69
19	15	18	20	43	9.1	90	67	183	67	151	69	65
20	14	16	19	19	9.8	61	57	96	47	89	59	55
21	13	14	18	697	9.4	81	140	98	37	205	85	50
22	14	14	47	464	9.1	244	59	106	30	266	190	45
23	13	92	70	105	9.1	1930	44	80	25	145	1180	70
24	12	1600	147	89	9.2	526	41	65	23	112	560	56
25	15	378	4470	540	9.4	245	55	53	21	70	475	172
26	15	122	596	3270	9.3	98	85	56	19	55	642	342
27	12	519	94	1590	9.0	83	75	52	18	48	389	165
28	139	836	61	424	9.4	309	292	50	37	43	564	158
29	168	153	48	103	---	315	402	44	47	35	267	98
30	47	598	39	70	---	536	247	47	43	34	458	86
31	41	---	33	53	---	1340	---	47	---	341	1090	---
TOTAL	1587	5808	8320	7827	476.8	10448.7	3570	3075	1567	10425	13008	3577
MEAN	51.2	194	268	252	17.0	337	119	99.2	52.2	336	420	119
MAX	196	1600	4470	3270	43	1930	478	222	303	2630	2710	407
MIN	12	14	18	12	9.0	8.3	29	44	18	34	45	45
AC-FT	3150	11520	16500	15520	946	20720	7080	6100	3110	20680	25800	7090

CAL YR 1981 TOTAL 29770.5 MEAN 81.6 MAX 4470 MIN 4.2 AC-FT 59050
WTR YR 1982 TOTAL 69689.5 MEAN 191 MAX 4470 MIN 8.3 AC-FT 138200

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)
OCT											
26...	1015	15	61	7.3	18.5	9.0	102	14	840	23	3.0
NOV											
17...	0915	20	58	7.3	19.0	8.8	100	20	--	22	6.0
DEC											
09...	0900	139	24	6.6	15.5	9.4	101	240	250	7	.00
JAN											
28...	0900	579	14	6.8	17.0	9.2	100	89	490	4	.00
MAR											
02...	0900	21	65	6.9	18.5	8.8	99	130	2300	25	.00
APR											
07...	0815	48	39	7.1	17.0	9.2	100	25	130	15	.00
26...	0900	79	31	7.5	17.5	9.0	100	320	1900	10	.00
JUN											
21...	0900	38	44	7.4	18.0	9.0	100	130	1600	17	.00
28...	0900	21	65	7.2	18.0	9.0	100	K20	1600	29	.00
JUL											
27...	1000	48	42	7.0	19.0	8.8	100	76	140	17	.00
AUG											
17...	0900	49	45	7.3	18.0	9.0	100	29	97	18	7.0
SEP											
01...	0900	285	16	6.6	17.5	9.1	100	89	500	6	.00

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
OCT											
26...	4.6	2.7	3.1	23	.3	.5	20	5.0	3.6	.1	15
NOV											
17...	4.7	2.6	2.8	20	.3	1.9	16	<5.0	3.2	<.1	15
DEC											
09...	1.2	.9	2.0	39	.4	.2	9.0	<5.0	3.6	<.1	3.9
JAN											
28...	.6	.5	1.1	39	.3	.2	9.0	5.0	2.1	.0	2.0
MAR											
02...	5.3	2.9	3.3	22	.3	.3	30	<5.0	3.4	.0	16
APR											
07...	3.0	1.8	2.4	25	.3	.3	17	5.0	2.7	.1	10
26...	2.0	1.3	2.0	29	.3	.3	12	6.0	3.0	<.1	6.6
JUN											
21...	3.4	2.0	4.5	36	.5	.3	20	<5.0	2.3	<.1	10
28...	6.1	3.3	3.4	20	.3	.5	32	6.0	3.0	<.1	17
JUL											
27...	3.2	2.1	2.3	23	.3	.3	22	<5.0	2.6	<.1	11
AUG											
17...	3.8	2.0	2.4	23	.3	.2	11	<5.0	3.0	<.1	11
SEP											
01...	1.1	.7	1.1	29	.2	.2	6.0	<5.0	1.9	<.1	3.3

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.

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT 26...	49	47	.07	<.09	<.09	<.060	--	.27	--	.050	.060
NOV 17...	43	--	.06	.13	.13	.080	--	.30	--	.010	.040
DEC 09...	29	23	.04	<.10	.08	.070	--	.43	--	.020	.030
JAN 28...	10	17	.01	<.09	<.09	<.060	.080	.53	.53	.010	.010
MAR 02...	48	54	.07	<.10	<.10	<.060	<.060	.22	.22	<.010	<.010
APR 07...	39	36	.05	<.10	<.10	<.060	.120	.21	--	<.010	<.010
26...	35	28	.05	<.10	<.10	<.060	<.060	.49	.32	.010	.010
JUN 21...	39	--	.05	<.10	<.10	<.060	.110	2.30	2.2	.030	.060
28...	46	59	.06	<.10	<.10	<.070	.070	.80	1.0	.370	.060
JUL 27...	37	--	.05	<.10	.10	<.060	<.060	1.70	.60	.050	.030
AUG 17...	36	--	.05	<.10	<.10	.070	.080	.80	.80	.040	.020
SEP 01...	13	17	.02	<.10	<.10	.200	.090	1.40	.80	.060	.010

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)
NOV 17...	0915	<1	--	<100	--	5	<1	1	<1	<10	<1	<3
JUN 28...	0900	<1	<1	200	200	5	<1	<1	<1	<10	<1	<3

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUB-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUB-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
NOV 17...	7	<10	240	150	90	1	<10	4	10	4	6	<.1
JUN 28...	2	<10	260	140	120	1	<10	<4	10	7	3	<.1

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 17...	<.1	<10	<1	<1	<1	<1	32	<6.0	10	--	<3
JUN 28...	<.1	<10	<1	<1	1	<1	39	<6.0	20	10	6

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 DIS-SOLVED, EXTRAC-TION (UG/L)
NOV 17...	0915	<1.0	<.4	.9	<.4	.9	<.4	.04	.04

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)
OCT 26...	1015	1.6	--	--	--
NOV 17...	0915	--	5.1	<.1	<.01
DEC 09...	0900	4.4	--	--	--
JAN 28...	0900	4.2	--	--	--
MAR 02...	0900	1.5	--	--	--
APR 07...	0815	2.5	--	--	--
APR 26...	0900	4.3	--	--	--
JUN 21...	0900	4.4	--	--	--
28...	0900	--	2.5	<.1	<.01
JUL 27...	1000	2.8	--	--	--
AUG 17...	0900	3.0	--	--	--
SEP 01...	0900	6.2	--	--	--

DATE	TIME	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	PCN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-DANE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
NOV 17...	0915	.00	0	.0	.00	.0	.00	.0	.00	.0	.00	.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)
NOV 17...	.00	.0	.00	.00	.0	.00	.0	.00	.0	.00	.00	.0

DATE	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)
NOV 17...	.00	.0	.00	.0	.00	.00	.0	.00	.00	.00	.0

DATE	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (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)
NOV 17...	.00	.00	.00	.00	0	.0	.00	.00	.00	.00	.00

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 26...	1015	15	3	.12	100
NOV 17...	0915	20	2	.11	100
DEC 09...	0900	139	3	1.1	100
JAN 28...	0900	579	2	3.1	100
MAR 02...	0900	21	2	.11	100
APR 07...	0815	48	1	.13	100
APR 26...	0900	79	4	.85	100
JUN 21...	0900	38	3	.31	100
28...	0900	21	1	.06	100
JUL 27...	1000	48	1	.13	100
AUG 17...	0900	49	3	.40	100
SEP 01...	0900	285	3	2.3	100

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft (76 m) upstream from Upper Hamakua ditch intake and 4.5 mi (7.2 km) north of Kamuela.

DRAINAGE AREA.--1.58 mi² (4.09 km²).

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,060 ft (1,237 m), from topographic map.

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

AVERAGE DISCHARGE.--18 years, 20.8 ft³/s (0.589 m³/s), 10,650 acre-ft/yr (13.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft³/s (89.5 m³/s) Nov. 18, 1979, gage height, 10.03 ft (3.057 m), from rating curve extended above 53 ft³/s (1.50 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft (3.057 m); minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1979, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 440 ft³/s (12.5 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 24	0900	610	17.3	5.60	1.707	Jan. 27	0400	619	17.5	5.63	1.716
Jan. 9	0100	1330	37.7	7.40	2.256	Feb. 11	2000	*1610	45.6	*7.92	2.414

Minimum discharge, 0.16 ft³/s (0.004 m³/s) Feb. 24, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	1.5	53	.50	2.7	14	3.3	38	2.6	36	72	22
2	36	2.3	53	.37	2.1	20	1.9	30	1.8	140	24	21
3	6.0	3.1	64	2.4	1.8	7.9	2.0	5.6	1.5	49	25	12
4	3.1	4.0	52	2.4	1.5	24	7.8	2.8	1.2	85	34	3.9
5	2.7	1.7	30	1.3	5.3	7.7	4.8	3.4	.98	63	13	2.4
6	1.6	1.1	23	.79	25	2.6	2.2	2.0	.76	34	5.9	2.6
7	1.3	45	77	.56	21	10	2.1	1.6	.57	14	13	8.3
8	.89	46	85	.44	5.3	26	1.8	5.5	.42	26	8.7	31
9	.68	21	30	73	37	28	3.6	24	.73	38	36	12
10	.52	4.7	20	5.2	49	37	4.4	40	2.0	94	118	62
11	.39	14	6.6	2.2	300	26	2.3	66	1.7	20	50	5.6
12	.33	42	3.1	1.6	28	61	2.0	29	.99	27	72	2.9
13	.38	30	4.4	1.3	4.2	153	13	23	7.5	29	37	7.8
14	.57	4.0	6.7	1.1	2.1	18	13	26	2.6	101	8.1	15
15	2.7	1.9	3.3	.89	1.6	17	3.1	6.4	2.6	79	3.4	40
16	1.2	1.3	2.0	.79	1.2	3.6	57	3.2	4.0	37	3.5	27
17	.66	.97	1.5	.63	.86	5.9	27	2.0	3.9	26	2.8	6.6
18	.39	.81	1.2	.58	.69	16	15	12	4.1	56	15	6.1
19	.41	.74	.89	1.0	.52	3.1	9.0	37	1.9	32	6.5	8.6
20	.38	.62	.70	.64	.38	2.0	9.2	11	1.3	6.5	3.4	3.0
21	.30	.50	.53	26	.32	1.6	9.8	24	.92	44	4.4	2.1
22	1.0	8.1	.41	27	.26	17	35	24	.60	16	35	1.8
23	.75	19	.34	14	.21	112	9.3	6.1	.40	5.5	60	25
24	1.7	325	.29	5.6	.33	57	24	2.9	.30	2.6	44	6.3
25	28	46	13	102	.56	45	31	12	.29	2.1	16	27
26	5.7	20	24	233	.24	16	62	21	14	1.8	53	11
27	2.4	40	3.0	191	.17	3.9	50	3.9	55	1.4	54	4.3
28	24	87	1.8	95	1.0	2.1	93	7.4	70	1.1	61	5.1
29	16	13	1.3	12	---	1.7	129	4.9	32	1.7	24	14
30	3.0	6.3	.93	50	---	4.2	83	19	30	2.4	26	5.6
31	1.8	---	.71	6.8	---	16	---	7.8	---	76	56	---
TOTAL	147.45	791.64	563.70	860.09	493.34	759.3	710.6	501.5	246.66	1147.1	984.7	402.0
MEAN	4.76	26.4	18.2	27.7	17.6	24.5	23.7	16.2	8.22	37.0	31.8	13.4
MAX	36	325	85	233	300	153	129	66	70	140	118	62
MIN	.30	.50	.29	.37	.17	1.6	1.8	1.6	.29	1.1	2.8	1.8
AC-FT	292	1570	1120	1710	979	1510	1410	995	489	2280	1950	797

CAL YR 1981 TOTAL 3205.34 MEAN 8.78 MAX 325 MIN .08 AC-FT 6360
WTR YR 1982 TOTAL 7608.08 MEAN 20.8 MAX 325 MIN .17 AC-FT 15090

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155°40'59", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Upper Hamakua ditch intake and 4.4 mi (7.1 km) north of Kamuela.

DRAINAGE AREA.--0.45 mi² (1.17 km²).

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

REVISED RECORDS.--WDR HI-80-1: 1969-79(P).

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (1,247 m), from topographic map.

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

AVERAGE DISCHARGE.--14 years, 4.31 ft³/s (0.122 m³/s), 3,120 acre-ft/yr (3.85 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft³/s (41.6 m³/s) Nov. 18, 1979, gage height, 8.32 ft (2.536 m), from rating curve extended above 33 ft³/s (0.94 m³/s) on basis of slope-area measurement at gage height 8.32 ft (2.536 m); minimum, 0.03 ft³/s (0.001 m³/s Nov. 12-15, 1968.

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

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 24	0830	147	4.16	3.17	0.966	Jan. 27	0330	160	4.53	3.30	1.006
Dec. 7	2200	112	3.17	2.80	.853	Feb. 11	2030	430	12.2	4.90	1.494
Jan. 9	0030	*618	17.5	*5.67	1.728	Aug. 1	0100	108	3.06	2.76	.841

Minimum discharge, 0.21 ft³/s (0.006 m³/s) Oct. 11, 12, Jan. 17, 18, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	.61	12	.48	.76	4.9	1.8	9.7	1.3	9.7	16	5.3
2	8.2	1.2	10	.42	.68	5.2	1.2	8.1	.95	33	6.4	5.5
3	1.6	1.8	15	1.2	.61	3.5	1.5	2.4	.85	13	6.9	3.7
4	1.3	1.6	10	1.3	.48	6.2	4.5	1.8	.76	18	8.5	1.8
5	.95	.68	6.4	.76	1.6	2.6	2.9	2.1	.68	16	3.7	1.5
6	.54	.50	6.1	.54	4.7	1.2	1.6	.76	.61	8.1	2.4	1.8
7	.48	14	25	.48	3.7	3.8	1.6	.76	.61	3.7	4.3	4.7
8	.36	12	20	25	1.6	7.2	1.3	2.9	.54	7.2	3.1	7.5
9	.28	4.9	8.5	23	7.5	7.2	1.9	7.8	.85	11	10	4.1
10	.28	2.0	5.3	2.1	8.7	9.6	2.5	11	1.3	23	24	14
11	.24	4.4	2.5	1.0	83	6.4	1.8	17	1.0	4.7	11	2.2
12	.21	12	1.6	.68	5.5	11	1.6	6.7	.76	7.2	20	1.5
13	.32	7.0	2.5	.48	1.3	40	5.0	5.8	3.3	7.8	9.1	2.6
14	.48	1.2	3.3	.68	.85	5.0	4.6	6.4	1.6	25	2.4	4.3
15	1.6	.81	2.1	.32	.76	4.3	2.1	2.2	1.6	19	1.5	11
16	.61	.62	1.3	.28	.68	1.5	15	1.2	2.4	9.1	1.0	7.2
17	.48	.52	1.0	.21	.61	1.9	6.7	.95	2.4	7.2	1.6	3.1
18	.36	.48	.85	.21	.61	4.1	4.5	4.5	2.4	15	6.7	2.9
19	.36	.41	.85	.32	.61	1.3	3.3	9.1	1.5	7.8	2.9	3.7
20	.32	.39	.85	.21	.56	.85	3.5	2.7	.85	2.2	2.1	1.5
21	.28	.39	.76	6.9	.56	.76	3.7	6.7	.61	14	2.4	1.2
22	.61	3.8	.76	5.5	.56	8.6	8.5	5.0	.54	3.5	12	1.2
23	.42	5.9	.68	2.7	.48	32	2.9	2.1	.48	1.6	16	7.5
24	.48	78	.61	1.8	.48	14	6.3	1.3	.32	1.2	11	2.5
25	6.4	9.7	6.6	28	.48	10	7.8	4.7	.32	1.0	5.5	5.8
26	2.0	3.5	4.7	56	.42	3.9	16	4.7	7.8	.85	14	3.1
27	.99	5.8	1.6	50	.42	1.6	11	1.9	16	.76	13	1.9
28	8.3	16	1.0	22	.68	1.2	23	3.3	15	.68	14	2.5
29	4.0	2.4	.76	2.9	---	.95	33	2.4	8.1	1.2	5.5	5.0
30	1.0	1.8	.61	8.8	---	1.8	22	5.8	6.9	1.3	6.7	2.7
31	.79	---	.54	1.8	---	4.1	---	2.4	---	22	13	---
TOTAL	45.74	194.41	153.77	246.07	128.89	206.66	203.0	144.17	82.33	295.79	256.7	123.2
MEAN	1.48	6.48	4.96	7.94	4.60	6.67	6.77	4.65	2.74	9.54	8.28	4.11
MAX	8.3	78	25	56	83	40	33	17	16	33	24	14
MIN	.21	.39	.54	.21	.42	.76	1.2	.76	.32	.68	1.0	1.2
AC-FT	91	386	305	488	256	410	403	286	163	587	509	244

CAL YR 1981 TOTAL 878.04 MEAN 2.41 MAX 78 MIN .07 AC-FT 1740
WTR YR 1982 TOTAL 2080.73 MEAN 5.70 MAX 83 MIN .21 AC-FT 4130

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft (244 m) downstream from Kawaiki Stream intake and 4.4 mi (7.1 km) north of Kamuela.

PERIOD OF RECORD.--January 1964 to September 1979. October 1980 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (1,225 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 7.66 ft³/s (0.217 m³/s), 5,550 acre-ft/yr (6.84 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft³/s (1.39 m³/s) Nov. 2, 1967; minimum daily, no flow Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft³/s (0.57 m³/s) Jan. 26; minimum daily, 0.42 ft³/s (0.012 m³/s) June 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	2.3	7.7	.89	3.9	7.3	4.8	17	3.2	12	14	7.0
2	14	3.9	7.8	.78	3.0	13	2.9	17	2.3	15	10	6.5
3	8.2	5.4	8.2	1.9	2.4	6.2	3.1	8.9	1.5	14	10	6.0
4	4.8	6.5	7.8	3.4	1.7	14	12	4.4	1.3	14	12	4.0
5	4.1	2.3	7.4	1.9	6.0	11	8.4	4.4	1.0	14	8.0	3.0
6	2.3	1.4	7.2	1.2	14	4.1	3.5	2.6	.84	14	6.0	3.0
7	1.7	15	8.9	.94	13	11	3.1	1.8	.72	11	7.0	6.0
8	1.2	16	9.0	.89	7.8	14	2.6	6.5	.67	13	6.0	10
9	.89	14	7.4	6.2	13	14	5.6	17	1.0	14	10	8.0
10	.84	8.2	6.8	2.4	14	14	6.6	17	2.6	14	15	15
11	.67	14	5.8	2.3	16	14	3.5	17	1.9	13	12	5.0
12	.62	16	3.9	2.3	7.0	15	2.9	16	1.0	13	14	3.5
13	.72	15	4.8	1.6	1.4	15	10	11	8.9	13	12	6.0
14	1.0	5.9	5.9	1.3	.78	12	14	17	3.2	15	7.0	8.0
15	4.7	2.9	4.1	1.0	.67	12	4.7	8.9	3.9	14	4.3	12
16	1.7	1.9	2.9	.89	.62	5.4	16	4.4	4.6	10	4.1	10
17	.84	1.4	2.1	.78	1.4	4.6	17	2.9	3.8	8.0	3.8	7.0
18	.67	1.3	1.6	.78	1.2	12	15	6.5	3.8	12	9.6	6.5
19	.62	1.1	1.3	1.0	1.0	4.8	9.3	17	1.3	8.0	5.0	8.0
20	.56	1.0	1.1	.78	.89	3.1	12	12	1.2	5.0	4.0	4.0
21	.45	.89	.94	7.6	.84	2.1	13	16	.89	12	4.5	3.0
22	1.0	5.2	.89	17	.72	6.5	17	16	.72	6.0	10	2.5
23	.89	14	.78	13	.67	14	12	8.2	.56	5.0	15	12
24	1.8	16	.72	7.8	.67	13	12	3.8	.42	3.0	12	5.0
25	14	8.9	1.9	18	.94	12	16	5.7	.42	2.5	8.0	12
26	9.2	7.4	6.6	20	.62	11	17	15	7.9	2.0	12	7.0
27	3.8	7.2	3.9	18	.56	5.9	17	5.2	14	2.0	12	5.0
28	5.7	8.9	2.7	17	1.3	3.5	18	11	14	1.5	15	6.0
29	13	6.4	1.9	14	---	2.7	18	7.0	14	1.5	9.0	8.0
30	4.4	5.2	1.4	15	---	5.0	18	11	13	3.0	9.0	6.0
31	2.9	---	1.2	9.5	---	14	---	10	---	15	12	---
TOTAL	111.67	215.59	134.63	190.13	116.08	296.2	315.0	318.2	114.64	299.5	292.3	205.0
MEAN	3.60	7.19	4.34	6.13	4.15	9.55	10.5	10.3	3.82	9.66	9.43	6.83
MAX	14	16	9.0	20	16	15	18	17	14	15	15	15
MIN	.45	.89	.72	.78	.56	2.1	2.6	1.8	.42	1.5	3.8	2.5
AC-FT	221	428	267	377	230	588	625	631	227	594	580	407

CAL YR 1981 TOTAL 1617.09 MEAN 4.43 MAX 20 MIN .02 AC-FT 3210
WTR YR 1982 TOTAL 2608.94 MEAN 7.15 MAX 20 MIN .42 AC-FT 5170

NOTE.--No gage-height record July 16 to Aug. 14, Aug. 19 to Sept. 30.

HAWAII, ISLAND OF HAWAII

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi (0.2 km) upstream from Alakahi Stream and 3.6 mi (5.8 km) north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,890 ft (1,186 m), from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 5.28 ft^3/s (0.150 m^3/s), 3,830 acre-ft/yr (4.72 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s (1.16 m^3/s) Aug. 18, 1972; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s (0.74 m^3/s) Jan. 26; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	.81	7.0	.20	3.9	4.4	4.4	16	3.2	15	19	16
2	9.2	1.8	7.1	.09	2.6	8.7	2.3	15	2.0	25	16	15
3	5.9	3.2	7.2	1.1	2.0	5.2	2.3	8.3	1.4	20	17	5.8
4	3.2	3.7	6.8	1.7	1.5	9.9	7.6	4.5	1.0	21	18	5.1
5	2.9	1.1	6.1	.75	3.2	7.4	6.1	4.7	.71	21	13	3.5
6	1.2	.39	5.9	.28	9.4	3.0	2.7	3.0	.48	19	7.3	3.2
7	.87	9.6	9.1	.13	9.8	7.5	2.0	2.0	.32	14	13	7.6
8	.45	11	11	1.9	6.1	9.4	1.6	4.9	.25	17	10	16
9	.26	9.1	7.2	5.3	8.1	10	2.9	12	.69	18	14	12
10	.15	4.9	6.3	1.4	12	11	4.5	13	2.5	22	22	18
11	.05	8.3	4.8	.80	21	11	2.3	15	2.0	17	19	6.9
12	.00	11	3.1	1.1	10	11	1.7	13	1.0	17	23	3.9
13	.00	10	3.9	.65	2.5	19	5.8	10	6.2	17	19	5.4
14	.10	4.3	4.7	.35	1.5	10	9.0	13	3.3	23	10	12
15	2.6	1.8	3.2	.18	1.2	9.9	3.7	7.9	2.7	23	4.8	18
16	.71	1.0	2.0	.08	1.1	5.0	11	4.4	4.4	20	4.1	17
17	.18	.58	1.4	.01	1.0	3.9	12	2.6	3.4	19	3.8	8.1
18	.03	.38	.95	.01	.82	8.9	11	5.3	3.8	22	12	7.8
19	.01	.32	.66	.10	.63	4.0	7.0	13	1.6	19	8.6	9.6
20	.00	.23	.48	.01	.47	2.4	8.5	9.7	1.1	8.7	5.1	3.9
21	.00	.16	.34	3.1	.33	1.5	8.6	12	.76	20	5.7	2.6
22	.05	2.4	.25	10	.23	5.9	10	12	.57	15	15	2.0
23	.03	7.9	.18	8.4	.15	15	8.4	6.8	.44	6.6	19	13
24	.00	22	.11	4.5	.10	13	9.2	3.6	.28	3.6	19	6.9
25	8.1	7.8	1.7	14	.25	11	12	5.1	.24	2.9	14	12
26	5.5	6.0	4.7	26	.05	9.5	14	11	8.9	2.1	20	11
27	2.3	5.5	2.3	25	.02	5.6	13	4.7	19	1.5	19	5.0
28	4.3	8.0	1.5	17	.37	3.1	17	8.2	19	1.1	20	5.6
29	8.3	5.1	.92	12	---	2.1	20	6.0	17	1.8	18	12
30	3.0	3.8	.56	13	---	2.9	19	8.6	17	2.6	18	6.1
31	1.4	---	.36	8.6	---	9.8	---	7.7	---	13	17	---
TOTAL	63.39	152.17	111.81	157.74	100.32	241.0	239.6	263.0	125.24	447.9	443.4	271.0
MEAN	2.04	5.07	3.61	5.09	3.58	7.77	7.99	8.48	4.17	14.4	14.3	9.03
MAX	9.2	22	11	26	21	19	20	16	19	25	23	18
MIN	.00	.16	.11	.01	.02	1.5	1.6	2.0	.24	1.1	3.8	2.0
AC-FT	126	302	222	313	199	478	475	522	248	888	879	538

CAL YR 1981 TOTAL 942.77 MEAN 2.58 MAX 22 MIN .00 AC-FT 1870
WTR YR 1982 TOTAL 2616.57 MEAN 7.17 MAX 26 MIN .00 AC-FT 5190

HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft (8 m) upstream from upper Hamakua ditch intake and 3.5 mi (5.6 km) north of Kamuela.

DRAINAGE AREA.--0.87 mi² (2.25 km²).

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,900 ft (1,189 m), from topograhic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi (0.6 km) above station for ranch use in Kamuela area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years, 6.14 ft³/s (0.174 m³/s), 4,980 acre-ft/yr (6.14 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft³/s (61.4 m³/s) Nov. 18, 1979, gage height, 9.90 ft (3.018 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft (3.018 m); minimum, 0.03 ft³/s (0.001 m³/s) on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 120 ft³/s (3.40 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 24	0830	223	6.32	5.22	1.591	Jan. 27	0030	466	13.2	6.42	1.957
Dec. 7	2130	157	4.45	4.75	1.448	Feb. 11	2030	*1300	36.8	*8.45	2.576
Jan. 9	0130	1010	28.6	7.90	2.408						

Minimum discharge, 0.15 ft³/s (0.004 m³/s) Oct. 20, 21, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	19	21	.64	3.0	6.4	3.0	21	2.8	16	31	10
2	13	8.4	19	.53	2.0	9.2	2.1	14	2.1	56	9.4	11
3	3.5	8.7	20	.56	1.6	5.5	2.0	4.5	1.6	20	11	8.3
4	2.5	26	15	1.3	1.4	10	6.3	3.1	1.4	32	13	4.9
5	2.4	7.2	10	.89	3.7	4.4	4.7	3.5	1.2	30	7.4	3.1
6	1.3	3.3	9.6	.61	9.2	2.5	2.7	2.6	1.1	16	4.5	3.0
7	.95	22	31	.48	9.6	5.4	1.9	2.1	1.0	7.3	6.7	6.3
8	.65	23	38	.38	6.0	11	1.7	3.7	.91	10	5.3	14
9	.47	8.2	15	56	11	12	2.2	17	.94	16	16	7.4
10	.31	3.7	8.7	6.1	22	19	3.1	29	1.6	45	39	24
11	.24	6.5	4.6	3.2	150	12	2.1	35	1.3	9.3	22	6.0
12	.22	18	2.7	1.5	35	22	1.7	9.8	1.0	12	44	3.9
13	.21	14	2.9	1.0	10	73	5.0	15	3.2	12	19	4.0
14	.22	3.0	4.2	.80	5.0	9.4	8.7	11	2.7	40	7.4	9.0
15	1.6	2.0	2.8	.60	3.5	11	3.4	4.8	2.8	38	5.6	20
16	.86	1.4	1.9	.50	2.5	3.2	24	3.2	4.0	16	3.6	16
17	.47	.90	1.4	.40	1.5	3.0	14	2.5	3.2	14	2.8	7.5
18	.23	.75	1.1	.36	1.1	9.0	8.8	11	3.6	30	13	7.4
19	.18	.65	.95	.50	.92	2.9	6.3	18	2.1	17	5.7	8.1
20	.18	.46	.81	.43	.82	2.0	6.8	6.1	1.5	4.6	4.1	5.6
21	.17	.43	.69	12	.72	1.6	6.3	11	1.1	25	4.0	4.8
22	.29	4.3	.59	11	.64	19	13	8.2	.95	7.5	19	3.2
23	.21	6.2	.53	6.9	.56	53	5.2	4.0	.86	3.6	28	14
24	.21	108	.44	3.5	.54	34	15	2.8	.66	2.9	22	7.0
25	9.6	19	5.6	42	.51	22	20	8.0	.70	2.8	9.0	11
26	3.9	8.4	12	124	.49	8.4	29	9.2	15	2.4	24	7.8
27	2.0	8.7	2.7	131	.44	3.5	31	3.8	34	2.1	22	6.0
28	13	26	1.8	48	.84	2.5	46	5.9	31	1.8	23	6.1
29	5.9	7.2	1.3	7.9	---	2.0	61	4.3	16	2.2	12	9.3
30	2.5	3.3	1.0	19	---	2.1	45	9.3	15	2.4	10	6.8
31	1.6	---	.82	6.0	---	7.4	---	5.3	---	35	24	---
TOTAL	70.77	368.69	238.13	488.08	284.58	388.4	382.0	288.7	155.32	528.9	467.5	255.5
MEAN	2.28	12.3	7.68	15.7	10.2	12.5	12.7	9.31	5.18	17.1	15.1	8.52
MAX	13	108	38	131	150	73	61	35	34	56	44	24
MIN	.17	.43	.44	.36	.44	1.6	1.7	2.1	.66	1.8	2.8	3.0
AC-FT	140	731	472	968	564	770	758	573	308	1050	927	507

CAL YR 1981 TOTAL 1439.59 MEAN 3.94 MAX 108 MIN .07 AC-FT 2860
WTR YR 1982 TOTAL 3916.57 MEAN 10.7 MAX 150 MIN .17 AC-FT 7770

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Hydrologic Unit 20010000, on left bank 120 ft (37 m) upstream from diversion intake leading to Waimea Reservoir and 3.7 mi (6.0 km) northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,020 ft (920 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--8 years, 9.82 ft^3/s (0.278 m^3/s), 7,110 acre-ft/yr (8.77 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s (1.36 m^3/s) Apr. 6, 1977, and Jan. 13, 1979; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 45 ft^3/s (1.27 m^3/s) Nov. 24; minimum daily, 0.23 ft^3/s (0.06 m^3/s) Oct. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	2.2	19	1.2	6.6	17	8.9	33	8.0	28	30	16
2	29	7.4	23	.97	5.6	24	5.4	29	5.6	40	25	17
3	18	8.7	22	1.1	3.8	15	6.7	15	4.2	35	28	14
4	7.6	6.9	18	2.9	3.2	33	20	9.6	3.4	38	30	15
5	7.2	2.8	16	1.6	5.5	17	15	11	2.8	38	25	12
6	2.8	2.3	16	1.0	14	7.8	6.7	7.7	2.4	30	15	10
7	1.9	28	24	.72	13	18	4.7	5.8	2.0	25	12	18
8	1.2	30	35	.87	8.0	27	4.0	9.9	1.8	28	10	17
9	.91	21	21	18	11	31	10	33	1.7	30	7.0	25
10	.63	10	15	4.4	18	27	11	33	1.9	35	21	30
11	.52	14	11	2.8	41	27	6.2	32	3.0	28	8.7	15
12	.42	18	7.5	2.9	20	30	3.9	27	2.3	28	23	12
13	.38	20	8.4	1.9	8.6	45	14	22	8.9	28	9.5	14
14	.57	11	11	1.4	5.6	25	22	27	7.0	40	4.7	20
15	4.2	5.4	8.1	1.1	4.0	25	8.7	17	7.4	40	3.7	30
16	1.6	3.3	5.2	.83	3.2	11	25	9.8	12	35	4.1	25
17	.73	2.2	3.7	.67	2.7	7.7	25	6.8	11	30	4.5	18
18	.49	1.7	2.8	.58	2.6	21	24	13	10	40	17	17
19	.38	1.4	2.2	.71	2.2	8.6	21	29	5.1	30	13	20
20	.30	1.2	1.8	.60	1.9	5.6	19	20	3.3	20	15	10
21	.23	1.1	1.5	12	1.7	3.9	16	24	2.4	38	13	8.0
22	.37	5.9	1.3	26	1.4	12	24	25	1.8	28	25	7.5
23	.30	15	1.2	18	1.2	38	16	14	1.5	15	30	22
24	6.5	45	1.0	9.5	1.1	33	17	8.0	1.2	10	31	15
25	26	18	5.6	34	1.1	29	25	11	1.0	9.5	26	20
26	12	7.0	18	44	.86	21	33	25	18	9.0	26	20
27	4.8	5.7	7.0	36	.74	11	27	13	35	5.0	21	12
28	13	16	4.3	28	5.9	6.7	38	22	35	4.5	22	13
29	19	5.6	2.8	12	---	5.2	40	15	30	6.0	16	20
30	7.1	6.0	2.0	20	---	6.2	40	21	30	8.0	12	14
31	3.8	---	1.5	8.3	---	22	---	18	---	22	23	---
TOTAL	177.43	322.8	316.9	294.05	194.50	610.7	537.2	586.6	259.7	801.0	551.2	506.5
MEAN	5.72	10.8	10.2	9.49	6.95	19.7	17.9	18.9	8.66	25.8	17.8	16.9
MAX	29	45	35	44	41	45	40	33	35	40	31	30
MIN	.23	1.1	1.0	.58	.74	3.9	3.9	5.8	1.0	4.5	3.7	7.5
AC-FT	352	640	629	583	386	1210	1070	1160	515	1590	1090	1000

CAL YR 1981 TOTAL 1687.93 MEAN 4.62 MAX 45 MIN .00 AC-FT 3350
WTR YR 1982 TOTAL 5158.58 MEAN 14.1 MAX 45 MIN .23 AC-FT 10230

NOTE.--No gage-height record June 25 to Aug. 6, Sept. 4-30.

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft (7.6 m) downstream from pipe railed bridge and 4.0 mi (6.4 km) northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,890 ft (881 m), from topographic map. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

REMARKS.--Records good. Ditch diverts above into 60 mg Waimea Reservoir for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--5 years, 1.84 ft^3/s (0.052 m^3/s), 1,320 acre-ft/yr (1.63 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Nov. 11, 12, 19, 1980; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14 ft^3/s (0.40 m^3/s) Jan. 26; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	6.6	.08	4.7	2.6	4.6	4.7	2.4	5.3	1.7	.70
2	2.4	1.8	7.7	.05	3.5	3.5	3.8	4.4	2.0	5.8	1.7	1.2
3	.18	5.6	8.0	.04	2.5	4.8	4.2	4.4	.75	5.6	1.7	.30
4	.06	4.0	7.7	.01	2.0	5.2	4.6	4.2	.27	5.8	1.7	.01
5	1.6	.40	7.7	.00	5.4	4.8	4.6	4.1	.03	5.8	1.7	.00
6	.55	.12	7.7	.00	10	4.7	4.2	3.8	.01	5.8	3.4	.08
7	.06	8.6	8.3	.00	7.5	4.8	3.6	2.2	.00	5.6	4.4	.40
8	.00	9.8	7.3	2.1	5.3	5.0	2.1	2.6	.00	5.6	5.3	2.0
9	.00	8.9	7.1	4.6	10	5.0	2.8	3.6	.00	2.1	2.6	.03
10	.00	6.4	6.9	1.2	11	5.0	4.3	3.6	.00	.30	4.8	6.2
11	.00	7.7	6.6	.12	4.2	5.0	3.5	3.6	.00	.30	4.1	5.3
12	.00	8.3	5.3	.80	3.4	5.0	1.4	3.6	.00	.30	4.2	4.2
13	.00	8.0	5.2	.10	5.2	5.2	2.8	3.6	.15	.30	4.1	3.4
14	.00	7.1	6.0	.05	4.2	4.8	4.7	3.6	.02	.30	2.1	5.0
15	.00	3.4	5.3	.10	2.8	4.8	4.7	3.5	.40	.30	.80	6.6
16	.00	1.6	2.9	.04	.60	4.8	4.7	3.4	2.0	.30	.65	6.6
17	.00	.50	.55	.03	.45	4.8	4.7	3.0	2.0	.30	.88	5.6
18	.00	.00	.06	.02	.45	4.8	4.7	3.2	1.9	.30	3.5	4.6
19	.00	.00	.05	.01	.24	4.8	4.6	3.6	1.8	.30	3.4	4.6
20	.00	.00	.00	.01	.27	4.0	4.6	3.5	.70	.30	3.4	2.5
21	.00	.00	.00	8.0	.06	2.2	4.6	3.5	.06	.27	3.5	1.4
22	.00	1.7	.00	12	.01	2.3	4.7	3.5	.01	1.3	3.6	.70
23	.00	5.4	.00	10	.00	5.2	4.6	3.4	.00	1.0	3.8	4.1
24	.39	10	.00	9.2	.00	5.0	4.6	3.4	.00	.05	3.6	3.2
25	7.8	8.6	2.2	12	.00	4.8	4.6	3.4	.00	.02	3.6	2.4
26	3.0	4.1	6.2	14	.00	4.8	4.6	3.5	1.2	.34	3.6	1.9
27	.02	2.4	4.0	13	.00	4.7	4.6	2.9	1.9	.00	3.8	.55
28	2.8	6.6	2.5	12	3.4	4.6	4.7	2.4	1.9	.00	2.8	.12
29	7.1	2.2	1.4	11	---	3.6	4.7	2.4	2.0	.00	.30	1.4
30	.40	2.6	.55	10	---	3.6	4.7	2.5	4.5	.00	.05	.96
31	.00	---	.18	6.4	---	4.6	---	2.4	---	.85	4.1	---
TOTAL	26.36	125.82	123.99	126.96	87.18	138.8	125.6	105.5	26.00	54.53	88.88	76.05
MEAN	.85	4.19	4.00	4.10	3.11	4.48	4.19	3.40	.87	1.76	2.87	2.54
MAX	7.8	10	8.3	14	11	5.2	4.7	4.7	4.5	5.8	5.3	6.6
MIN	.00	.00	.00	.00	.00	2.2	1.4	2.2	.00	.00	.05	.00
AC-FT	52	250	246	252	173	275	249	209	52	108	176	151

CAL YR 1981 TOTAL 508.86 MEAN 1.39 MAX 26 MIN .00 AC-FT 1010
WTR YR 1982 TOTAL 1105.67 MEAN 3.03 MAX 14 MIN .00 AC-FT 2190

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi (1.0 km) upstream from Oolamakapehu Gulch and 1.7 mi (2.7 km) northwest of Kamuela.

DRAINAGE AREA.--2.51 mi² (6.50 km²).

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft (997.6 m) above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1967, at site 0.5 mi (0.8 km) upstream at different datums.

REMARKS.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft (1,295 m). Hawaii Division of Water and Land Development diverts by pipeline 0.3 mi (0.5 km) above station at altitude 3,400 ft (1,036 m) for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years, 8.79 ft³/s (0.249 m³/s), 6,370 acre-ft/yr (7.85 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft³/s (110 m³/s) Aug. 7, 1958, gage height, 10.76 ft (3.280 m), site and datum then in use, from rating curve extended above 70 ft³/s (1.98 m³/s), by test of model of station site; no flow at times in 1968, 1971-81.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 46 ft³/s (1.30 m³/s) on basis of computation of flow over dam at gage height 6.20 ft (1.890 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 27	0030	400	11.3	4.58	1.396
Feb. 11	2000	*1040	29.4	*5.42	1.652

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	18	.07	3.5	.49	3.2	39	2.8	23	54	17
2	5.8	.00	37	.03	3.4	5.7	2.2	28	2.0	89	15	13
3	.08	.00	36	.01	2.4	1.4	1.9	7.1	1.6	40	16	9.3
4	.00	.00	32	.10	1.9	5.5	4.8	3.9	1.3	56	19	4.4
5	.00	.00	20	.01	4.2	2.7	3.8	3.4	1.1	45	10	3.2
6	.00	.00	16	.00	24	1.2	2.1	2.6	.97	29	4.8	2.5
7	.00	6.1	41	.00	25	3.9	1.9	2.0	.82	12	6.0	2.4
8	.00	17	72	.00	6.9	7.9	1.7	2.2	.71	17	5.5	12
9	.00	9.3	30	36	33	13	1.8	13	.37	26	15	5.1
10	.00	1.2	18	2.6	43	19	2.1	29	.00	64	64	35
11	.00	1.5	6.1	2.4	241	25	1.3	45	.00	19	39	5.6
12	.00	7.7	3.7	2.8	35	34	1.1	29	.00	15	58	3.2
13	.00	22	3.2	1.5	7.5	111	3.4	9.5	.00	19	33	2.6
14	.00	3.7	3.3	1.1	4.0	19	7.9	18	.00	62	8.0	4.4
15	.00	1.8	2.7	.47	2.8	23	2.8	5.5	.00	53	4.5	23
16	.00	1.0	1.9	.00	2.3	4.7	21	3.7	.00	30	3.2	23
17	.00	.67	1.5	.00	1.9	3.0	24	2.6	.58	18	3.7	6.1
18	.00	.54	1.3	.00	1.6	11	11	3.7	1.8	42	10	4.6
19	.00	.42	1.1	.00	1.4	3.2	5.6	20	1.1	29	7.5	4.8
20	.00	.35	.92	.00	1.2	2.3	5.9	8.9	.71	6.9	3.6	3.3
21	.00	.29	.82	17	1.1	1.7	5.7	9.5	.58	31	3.2	2.5
22	.00	.02	.76	24	.96	6.4	11	18	.50	15	11	2.1
23	.00	.00	.70	19	.14	61	5.8	5.7	.44	5.8	38	11
24	.00	153	.52	3.5	.01	51	7.2	3.1	.40	3.5	37	4.6
25	.00	37	3.3	44	.02	37	19	3.1	.39	2.9	13	8.3
26	.00	13	25	123	.01	18	48	11	8.7	2.4	33	6.3
27	.00	10	2.6	135	.00	4.6	28	3.8	40	2.0	36	3.3
28	1.2	48	1.3	72	.00	3.0	62	4.1	39	1.6	40	2.8
29	2.2	11	.79	13	---	2.5	84	3.4	19	2.1	22	4.3
30	.00	3.2	.44	25	---	2.5	65	6.9	20	1.8	9.8	3.6
31	.00	---	.21	6.8	---	6.4	---	5.2	---	44	40	---
TOTAL	9.28	348.79	382.16	529.39	448.24	491.09	445.2	349.9	144.87	807.0	662.8	233.3
MEAN	.30	11.6	12.3	17.1	16.0	15.8	14.8	11.3	4.83	26.0	21.4	7.78
MAX	5.8	153	72	135	241	111	84	45	40	89	64	35
MIN	.00	.00	.21	.00	.00	.49	1.1	2.0	.00	1.6	3.2	2.1
AC-FT	18	692	758	1050	889	974	883	694	287	1600	1310	463

CAL YR 1981 TOTAL 1050.78 MEAN 2.88 MAX 153 MIN .00 AC-FT 2080
WTR YR 1982 TOTAL 4852.02 MEAN 13.3 MAX 241 MIN .00 AC-FT 9620

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Hydrologic Unit 20010000, on right bank 160 ft (49 m) upstream from Marine Dam, 0.4 mi (0.6 km) east of Puu Ohu, and 1.6 mi (2.6 km) north of Kamuela.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,460 ft (1,055 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height, which are poor. Diversion above station for livestock and domestic use. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--35 years, 8.92 ft³/s (0.253 m³/s), 6,460 acre-ft/yr (7.97 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft³/s (96.6 m³/s) Nov. 18, 1979, gage height, 6.84 ft (2.085 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of computations of flow over dam at gage heights 5.46 ft (1.664 m) and 5.96 ft (1.817 m); minimum, 0.59 ft³/s (0.017 m³/s) Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 180 ft³/s (5.10 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 24	0930	226	6.40	3.48	1.061	Jan. 26	1930	400	11.3	4.00	1.219
Dec. 7	2130	215	6.09	3.44	1.049	Feb. 11	1700	*584	16.5	*4.38	1.335
Jan. 9	0130	284	8.04	3.68	1.122						

Minimum discharge, 1.5 ft³/s (0.042 m³/s) Oct. 21, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	2.4	17	2.9	5.6	9.2	6.9	47	6.9	10	35	14
2	9.2	4.7	18	2.8	5.1	15	4.9	29	5.8	50	10	13
3	5.0	6.3	16	2.8	4.4	6.5	4.8	11	5.1	15	12	14
4	3.5	3.8	12	2.9	4.0	21	9.5	8.4	4.4	30	15	7.8
5	3.2	2.6	9.0	2.7	6.0	9.3	10	7.8	3.8	15	8.5	6.4
6	2.6	2.3	9.9	2.6	15	5.3	5.8	5.8	3.8	15	7.0	5.3
7	2.4	27	22	2.7	14	11	4.8	4.8	3.6	8.0	8.5	6.0
8	2.1	28	67	2.6	6.3	17	4.5	6.9	3.5	10	7.5	14
9	2.0	16	19	36	11	22	6.1	24	3.5	15	20	9.2
10	1.9	5.8	11	5.6	26	17	8.3	28	2.7	35	35	18
11	1.8	6.6	7.2	4.5	163	18	5.1	30	2.6	10	18	8.4
12	1.8	15	5.1	4.5	26	19	4.2	17	2.5	8.0	56	6.2
13	1.7	23	5.3	3.4	8.1	100	6.0	15	3.3	15	21	5.8
14	1.9	5.6	6.0	3.1	5.4	15	15	16	3.1	35	9.5	10
15	3.1	3.7	5.1	2.9	4.4	19	6.6	9.5	3.4	25	30	25
16	2.3	3.1	4.0	2.8	3.9	7.5	12	6.9	4.7	12	25	22
17	1.9	2.9	3.5	2.7	3.6	5.4	26	5.8	5.8	9.0	10	9.2
18	1.8	2.7	3.3	2.9	3.4	9.8	15	9.8	5.8	25	7.0	8.4
19	1.7	2.5	3.1	3.5	3.2	5.8	12	19	3.6	20	7.5	9.2
20	1.7	2.4	3.0	3.0	3.0	4.5	13	11	3.0	6.5	7.5	6.4
21	1.6	2.4	2.9	16	3.0	4.0	9.5	13	2.8	12	6.9	5.1
22	1.8	3.4	2.8	15	2.9	9.2	14	14	2.6	7.0	17	4.6
23	1.7	7.0	2.8	11	2.8	57	11	8.1	2.4	5.5	27	14
24	1.7	129	2.7	5.0	2.9	48	9.3	6.0	2.4	5.0	28	7.8
25	8.6	20	7.6	48	2.8	27	24	8.1	2.4	4.5	15	8.6
26	6.2	8.9	18	150	2.7	16	34	14	7.5	4.0	24	7.2
27	3.1	7.3	5.0	119	2.8	7.8	18	8.1	30	3.5	22	5.5
28	14	22	3.8	60	3.8	5.7	54	12	12	3.5	23	5.3
29	11	8.1	3.4	14	---	5.2	76	9.8	6.0	3.0	10	7.3
30	4.2	4.7	3.1	18	---	5.5	74	13	8.0	3.0	9.2	5.6
31	2.9	---	3.0	8.5	---	11	---	10	---	25	23	---
TOTAL	111.2	379.2	301.6	561.4	345.1	533.7	504.3	428.8	157.0	444.5	555.1	289.3
MEAN	3.59	12.6	9.73	18.1	12.3	17.2	16.8	13.8	5.23	14.3	17.9	9.64
MAX	14	129	67	150	163	100	76	47	30	50	56	25
MIN	1.6	2.3	2.7	2.6	2.7	4.0	4.2	4.8	2.4	3.0	6.9	4.6
AC-FT	221	752	598	1110	685	1060	1000	851	311	882	1100	574

CAL YR 1981 TOTAL 1827.76 MEAN 5.01 MAX 129 MIN .88 AC-FT 3630
WTR YR 1982 TOTAL 4611.20 MEAN 12.6 MAX 163 MIN 1.6 AC-FT 9150

NOTE.--No gage-height record June 26 to Aug. 10.

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft (244 m) downstream from small tributary and 1.8 mi (2.9 km) northeast of Kamuela.

DRAINAGE AREA.--0.47 mi² (1.22 km²).

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since Feb. 27, 1963. Datum of gage is 3,117.42 (950.190 m) above mean sea level (Hawaii County Board of Water Supply bench mark).

REMARKS.--Records good. Diversion above station for livestock and domestic use. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years, 1.59 ft³/s (0.045 m³/s), 1,150 acre-ft/yr (1.42 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft³/s (23.3 m³/s) Nov. 18, 1979, gage height, 4.56 ft (1.390 m), from rating curve extended above 11 ft³/s (0.31 m³/s) on basis of slope-conveyance study; maximum gage height, 4.65 ft (1.417 m) Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 78 ft³/s (2.21 m³/s) and maximum (*), from rating curve extended above 54 ft³/s (1.53 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 24	0930	101	2.86	2.74	0.835	Jan. 26	1900	120	3.40	2.85	0.869
Dec. 7	2200	106	3.00	2.77	.844	Feb. 11	1700	*262	7.42	*3.44	1.048
Jan. 9	0130	106	3.00	2.77	.844						

Minimum discharge, 0.03 ft³/s (0.001 m³/s) Oct. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.24	.11	3.1	.14	.63	1.6	.61	8.8	.63	3.3	12	2.0
2	1.5	.10	3.1	.13	.51	1.8	.45	4.6	.53	19	1.4	1.9
3	.32	.18	3.4	.13	.40	1.2	.45	1.5	.46	6.4	2.0	1.5
4	.19	.15	2.0	.13	.34	4.2	1.0	.99	.42	7.4	2.1	.97
5	.16	.10	1.0	.11	.61	1.0	.77	.95	.39	10	1.7	.84
6	.10	.09	1.3	.10	1.6	.52	.46	.71	.37	4.9	1.1	.75
7	.08	2.2	13	.10	1.2	.88	.43	.59	.35	2.2	1.2	.88
8	.08	3.7	16	.10	.48	2.1	.39	.79	.34	2.1	.93	2.8
9	.08	1.7	3.6	6.7	.96	3.4	.83	4.5	.33	1.8	1.9	.91
10	.07	.55	1.6	.36	4.1	2.9	.82	5.5	.29	11	10	4.0
11	.07	.59	.82	.26	50	2.5	.45	4.5	.28	2.4	3.3	.94
12	.07	2.7	.55	.24	5.5	6.0	.37	2.5	.28	1.3	15	.74
13	.06	4.6	.54	.17	1.2	33	1.2	3.0	.35	2.0	3.6	.68
14	.07	.62	.52	.15	.59	3.1	1.5	2.1	.33	11	1.4	1.5
15	.09	.31	.39	.14	.44	2.9	.62	.94	.40	10	.96	3.8
16	.07	.22	.30	.12	.36	.87	4.6	.75	.58	4.2	.80	4.6
17	.06	.17	.27	.12	.32	.64	2.2	.65	.77	2.7	.76	1.3
18	.05	.15	.22	.15	.28	1.1	1.7	1.7	.55	10	3.9	.95
19	.05	.12	.20	.16	.25	.55	2.2	3.6	.31	5.0	1.5	.86
20	.05	.11	.18	.12	.25	.43	1.3	1.2	.26	1.5	1.1	.71
21	.04	.14	.17	2.2	.23	.38	.81	2.3	.24	5.8	.96	.63
22	.05	.62	.16	3.4	.21	.87	2.7	2.2	.23	2.1	2.6	.57
23	.04	.87	.15	1.9	.20	17	1.2	.91	.21	1.0	4.4	1.5
24	.14	45	.14	.44	.28	9.0	1.4	.70	.20	.85	4.7	.73
25	1.8	5.4	2.5	15	.22	4.8	2.7	.72	.21	.78	2.5	.81
26	.64	1.3	2.5	41	.19	1.9	7.2	1.2	3.5	.68	4.3	.70
27	.16	.87	.38	30	.18	.82	3.9	.70	6.9	.59	3.6	.52
28	4.8	3.6	.25	17	.58	.61	15	1.0	7.8	.53	4.1	.48
29	1.5	.87	.20	2.5	---	.58	24	.79	4.7	.91	2.2	.61
30	.31	.45	.17	4.2	---	.61	23	1.8	3.6	.75	1.3	.52
31	.17	---	.15	1.0	---	1.5	---	1.2	---	11	3.5	---
TOTAL	13.11	77.59	58.86	128.27	72.11	108.76	104.26	63.39	35.81	143.19	100.81	39.70
MEAN	.42	2.59	1.90	4.14	2.58	3.51	3.48	2.04	1.19	4.62	3.25	1.32
MAX	4.8	45	16	41	50	33	24	8.8	7.8	19	15	4.6
MIN	.04	.09	.14	.10	.18	.38	.37	.59	.20	.53	.76	.48
AC-FT	26	154	117	254	143	216	207	126	71	284	200	79

CAL YR 1981 TOTAL 238.94 MEAN .65 MAX 45 MIN .00 AC-FT 474
WTR YR 1982 TOTAL 945.86 MEAN 2.59 MAX 50 MIN .04 AC-FT 1880

16759200 RIGHT BRANCH WAIAHA STREAM NEAR HOLUALOA

LOCATION.--Lat 19°38'41", long 155°54'55", Hydrologic Unit 20010000, on right bank 1,000 ft (305 m) upstream from reservoir, 1.0 mi (1.6 km) northeast of Holualoa Makai Camp, and 2.9 mi (4.7 km) northeast of Holualoa School.

DRAINAGE AREA.--1.89 mi² (4.90 km²).

PERIOD OF RECORD.--April 1960 to current year.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (1,000 m), from topographic map.

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

AVERAGE DISCHARGE.--22 years, 0.324 ft³/s (0.009 m³/s), 235 acre-ft/yr (290,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft³/s (46.2 m³/s) Oct. 3, 1968, gage height, 5.78 ft (1.762 m), from rating curve extended above 9.1 ft³/s (0.26 m³/s) on basis of slope-area measurements at gage heights 4.07 ft (1.241 m) and 5.78 ft (1.762 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 115 ft³/s (3.26 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Feb. 11	0530	*1090	30.9	*5.46	1.664
Aug. 22	1800	162	4.6	3.97	1.210

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.05	.02	.06	.21	.48	.33
2	.00	.00	.00	.00	.00	.00	.06	.01	.03	.48	.36	.17
3	.00	.00	.00	.00	.00	.00	.02	.01	.02	.68	.91	.16
4	.00	.00	.00	.00	.00	.00	.01	.01	.01	.45	.77	.21
5	.00	.00	.00	.00	.00	.00	.01	.01	.01	.36	.27	.85
6	.00	.00	.00	.00	.21	.00	.01	.00	.02	.16	.10	.27
7	.00	.00	.00	.00	.03	.00	.60	.00	.06	.09	.07	.10
8	.00	.00	.00	.00	1.7	.00	.16	.00	1.3	.10	.05	.06
9	.00	.02	.00	.00	5.6	.00	.35	.01	.55	.10	.03	.04
10	.00	.05	.00	.00	.82	.00	.11	.01	.12	.11	.02	.06
11	.00	.04	.00	.00	127	.00	.04	.01	.07	.10	.02	.33
12	.00	.01	.00	.00	2.0	.00	.03	.00	.04	.16	.02	1.1
13	.00	.01	.00	.00	.23	.01	.01	.06	.06	.17	.01	.45
14	.00	.00	.00	.02	.09	.00	.01	.04	.51	.10	.04	.19
15	.00	.00	.00	.02	.04	.03	.01	.11	.27	.06	.02	.42
16	.00	.00	.00	.06	.02	.01	.00	.14	.10	.04	.02	.21
17	.00	.00	.00	.16	.01	2.0	.10	.09	.16	.02	.02	.05
18	.00	.00	.00	.16	.01	2.4	.11	.11	.12	.03	.02	1.2
19	.00	.00	.00	.09	.00	.17	.08	.08	4.9	.05	.01	.48
20	.00	.00	.00	.05	.00	.05	.03	.05	1.7	.02	.01	.16
21	.00	.00	.00	5.8	.00	.01	.02	.02	.63	.02	.01	.08
22	.00	.00	.00	2.5	.00	.09	.01	.01	.36	.10	7.4	.05
23	.00	.00	.00	.82	.00	.08	.00	.33	.25	.04	1.7	3.7
24	.00	.00	.00	.23	.00	2.6	.00	.36	.23	.02	5.1	.51
25	2.5	.00	.64	.09	.00	.82	.00	.21	1.2	.02	.77	.17
26	.23	.00	1.2	.05	.00	.30	.00	.30	.63	.05	.23	.09
27	.05	.00	.06	.02	.00	.12	.00	.21	.45	.17	.45	.05
28	.01	.00	.03	.02	.00	.06	.00	.08	9.7	.19	.51	.04
29	.00	.00	.01	.01	---	.02	.01	.08	1.3	.07	.93	.02
30	.00	.00	.00	.01	---	.02	.02	.14	.30	.04	5.2	.03
31	.00	---	.00	.00	---	.02	---	.08	---	.02	.51	---
TOTAL	2.79	.13	1.94	10.11	137.76	8.81	1.86	2.59	25.16	4.23	26.06	11.58
MEAN	.090	.004	.063	.33	4.92	.28	.062	.084	.84	.14	.84	.39
MAX	2.5	.05	1.2	5.8	127	2.6	.60	.36	9.7	.68	7.4	3.7
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.01	.02
AC-FT	5.5	.3	3.8	20	273	17	3.7	5.1	50	8.4	52	23

CAL YR 1981 TOTAL 23.69 MEAN .065 MAX 12 MIN .00 AC-FT 47
WTR YR 1982 TOTAL 233.02 MEAN .64 MAX 127 MIN .00 AC-FT 462

16759800 KIILAE STREAM NEAR HONAUNAU

LOCATION.--Lat 19°24'52", long 155°50'56", Hydrologic Unit 20010000, on right bank 2.4 mi (3.9 km) northeast of Kealia and 3.0 mi (4.8 km) southeast of Honaunau Post Office.

DRAINAGE AREA.--0.67 mi² (1.74 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 2,898 ft (883.3 m) above mean sea level (by stadia traverse).

REMARKS.--Records good except those for periods of no gage-height record, which are fair. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 0.209 ft³/s (0.006 m³/s), 151 acre-ft/yr (186,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft³/s (2.95 m³/s) Jan. 13, 1959, gage height, 2.32 ft (0.707 m), from rating curve extended above 5.7 ft³/s (0.161 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 25 ft³/s (0.71 m³/s) and maximum (*), from rating curve extended above 17 ft³/s (0.48 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 24	a1900	*31	0.88	*1.64	0.500	Aug. 17	2000	27	0.76	1.60	0.488
July 19	1730	27	.76	1.60	.488	Aug. 23	1330	26	.74	1.59	.484

No flow for many days.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	.00	.02	.00	.00	.00	.93	.06	.07	.31	.00	.50
2	.14	.00	.00	.00	.03	.00	.14	.03	.00	1.5	.07	.30
3	.08	.02	.00	.00	.79	.00	.03	.02	.01	.24	.92	.15
4	.07	.06	.00	.00	.11	.00	.46	.03	.01	.40	.40	.10
5	.03	.06	.00	.00	.14	.00	.18	.02	.02	1.5	.10	1.5
6	.01	.09	.00	.00	.22	.00	.10	.01	.52	.18	.02	.30
7	.00	.06	.00	.00	.00	.00	.04	.00	1.1	.09	.00	.15
8	.00	.04	.00	.00	.00	.00	.05	.02	.18	1.6	.07	.05
9	.00	.04	.00	.00	.41	.00	.34	.07	.03	.56	.04	.00
10	.00	.04	.00	.00	.07	.00	1.0	.12	.04	.28	.00	.00
11	.00	.01	.00	.01	2.1	.00	.02	.03	.02	.61	1.6	.40
12	.00	.00	.00	.03	.40	.00	.00	.11	.01	1.3	.56	2.0
13	.00	.00	.00	.04	.03	.89	.00	.31	.00	.85	.15	.50
14	.02	.00	.00	.05	.01	.05	.00	.07	.38	.20	.51	.25
15	.64	.00	.00	.02	.00	.18	.00	.07	.40	.16	.12	.50
16	.06	.00	.00	.10	.00	.00	.00	.05	.04	.10	.12	.30
17	.00	.00	.00	.20	.00	1.5	.01	.01	2.7	.01	2.8	.10
18	.00	.00	.00	.10	.00	.50	1.4	3.0	.18	.00	1.3	2.0
19	.02	.00	.00	.05	.00	.10	.55	.99	1.5	2.8	.18	.30
20	.00	.00	.00	.09	.00	.05	.20	.13	.40	.20	.10	.10
21	.00	.00	.00	3.9	.00	.00	2.2	.03	.40	.40	.10	.05
22	.00	.00	.00	1.5	.00	.00	.85	.02	.16	.61	.18	.00
23	.00	.00	.00	.18	.00	.00	.09	.02	.05	.13	2.4	2.5
24	.00	.00	.00	.06	.00	4.5	.08	.02	.03	.08	.92	.75
25	.61	.00	.25	.40	.00	1.5	.06	.40	.47	.04	.56	.25
26	.22	.00	1.0	.06	.00	.30	.20	.81	.72	.07	.18	.10
27	.02	.00	.10	.03	.00	.15	.08	.32	2.1	.15	.61	.05
28	.01	.00	.05	.00	.00	.10	.30	.89	2.5	.26	2.9	.00
29	.00	.00	.02	.00	---	.05	.24	.16	.85	.12	3.5	.00
30	.00	.00	.00	.69	---	.01	.11	1.2	.72	.02	1.5	.00
31	.00	---	.00	.08	---	.11	---	.46	---	.02	1.0	---
TOTAL	2.29	.42	1.44	7.59	4.31	9.99	9.66	9.48	15.61	14.79	22.91	13.20
MEAN	.074	.014	.046	.24	.15	.32	.32	.31	.52	.48	.74	.44
MAX	.64	.09	1.0	3.9	2.1	4.5	2.2	3.0	2.7	2.8	3.5	2.5
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	4.5	.8	2.9	15	8.5	20	19	19	31	29	45	26

CAL YR 1981 TOTAL 31.33 MEAN .086 MAX 3.9 MIN .00 AC-FT 62
WTR YR 1982 TOTAL 111.69 MEAN .31 MAX 4.5 MIN .00 AC-FT 222

NOTE.--No gage-height record Dec. 15 to Jan. 19, Aug. 30 to Sept. 30.

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.6 mi (10.6 km) northwest of Honuapo, and 6.7 mi (10.8 km) west of Punaluu.

DRAINAGE AREA.--9.17 mi² (23.75 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (896 m), from topographic map.

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

AVERAGE DISCHARGE.--16 years, 8.90 ft³/s (0.252 m³/s), 6,450 acre-ft/yr (7.95 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s (68.0 m³/s) Mar. 18, 1980, gage height, 8.00 ft (2.438 m), from rating curve extended above 75 ft³/s (2.12 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft³/s (17.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	2330	*1720	48.7	*7.10	2.164
Jan. 21	0930	1300	36.8	6.48	1.975
Mar. 1	1230	810	22.9	5.50	1.676
Apr. 19	1530	935	26.5	5.79	1.765
July 21	2300	882	25.0	5.68	1.731

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	.43	.00	2.0	.35	45	2.2	1.1	1.3	49	51	7.0
2	7.8	.36	.00	1.5	.30	1.3	.80	.80	.60	43	14	5.9
3	1.4	16	.00	1.0	.30	1.0	.60	.60	1.6	28	7.0	6.0
4	39	1.5	.00	1.0	.25	.80	.70	1.0	.66	85	7.6	1.5
5	3.5	.68	.00	.95	.50	.60	3.9	.86	.60	50	2.6	.83
6	24	.79	.00	.85	.55	.70	1.9	.65	.41	32	1.2	.62
7	5.1	2.4	.00	.75	.50	.90	2.0	1.7	1.1	9.8	.85	.59
8	6.1	26	.00	.65	.45	1.2	1.0	16	18	2.5	.76	1.3
9	1.6	6.9	.00	.60	.40	1.8	.50	11	1.8	51	.71	.67
10	1.1	1.8	.00	.65	.35	6.3	.40	4.4	.74	91	44	2.4
11	1.1	.56	.00	.60	55	3.2	.60	25	.59	7.2	1.9	.57
12	.84	.41	.00	.50	4.3	1.9	.80	13	.32	17	.73	4.7
13	2.9	.33	.00	.40	1.4	66	9.9	3.8	.90	4.2	.47	3.4
14	2.8	.23	.00	.70	1.3	3.3	1.8	12	12	.88	1.7	76
15	1.3	.21	.00	1.4	1.3	8.1	1.9	1.7	1.5	.79	.53	9.3
16	2.0	.22	.00	.64	1.0	16	21	2.1	18	45	.42	3.5
17	1.6	.16	.00	3.1	1.0	76	2.1	7.0	21	33	.52	51
18	.68	.13	.00	4.9	.95	16	23	26	2.4	1.6	.42	7.1
19	.52	.08	.00	1.3	.90	.90	34	25	1.9	4.5	.38	9.6
20	.46	.07	.00	26	.90	.70	68	1.4	9.4	7.3	24	7.0
21	.42	.00	.00	412	.85	1.2	2.2	.60	4.5	136	4.9	3.7
22	.36	.00	.31	89	.80	50	1.0	.71	5.5	77	11	14
23	.34	.00	1.6	1.5	.75	17	.70	1.2	1.9	2.1	31	9.1
24	.41	.00	17	.78	.70	1.8	.50	.58	1.1	2.3	55	16
25	1.7	.00	705	.68	.65	.80	.80	.42	.54	4.0	53	1.8
26	32	.00	107	.65	.60	1.0	11	.80	1.4	1.6	2.1	15
27	1.3	.00	3.5	.48	.55	.90	1.8	19	36	1.1	28	16
28	1.1	.00	3.0	.42	.50	.80	1.1	4.7	40	.98	21	7.3
29	3.0	.00	2.5	.40	---	9.3	2.5	.76	36	2.6	46	23
30	.92	.00	2.5	.40	---	2.8	1.1	41	16	1.2	17	2.8
31	.53	---	2.0	.35	---	3.1	---	3.3	---	.97	17	---
TOTAL	162.88	59.26	844.41	556.15	77.40	340.40	199.80	228.18	237.76	792.62	446.79	307.68
MEAN	5.25	1.98	27.2	17.9	2.76	11.0	6.66	7.36	7.93	25.6	14.4	10.3
MAX	39	26	705	412	55	76	68	41	40	136	55	76
MIN	.34	.00	.00	.35	.25	.60	.40	.42	.32	.79	.38	.57
AC-FT	323	118	1670	1100	154	675	396	453	472	1570	886	610

CAL YR 1981 TOTAL 2051.70 MEAN 5.62 MAX 705 MIN .00 AC-FT 4070
WTR YR 1982 TOTAL 4253.33 MEAN 11.7 MAX 705 MIN .00 AC-FT 8440

16765000 HILEA GULCH TRIBUTARY NO. 2 NEAR HONUAPO

LOCATION.--Lat 19°10'17", long 155°36'05", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.3 mi (10.1 km) northwest of Honuapo, and 6.6 mi (10.6 km) west of Punaluu.

DRAINAGE AREA.--1.86 mi² (4.82 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 2,880 ft (878 m), from topographic map.

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

AVERAGE DISCHARGE.--16 years, 3.00 ft³/s (0.085 m³/s), 2,170 acre-ft/yr (2.68 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 915 ft³/s (25.9 m³/s) Mar. 18, 1980, gage height, 8.75 ft (2.667 m), from rating curve extended above 41 ft³/s (1.16 m³/s); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 41 ft³/s (1.16 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	2330	*825	23.4	*8.45	2.576	Apr. 19	1430	356	10.1	6.23	1.899
Jan. 21	1000	644	18.2	7.77	2.368	July 21	a2200	319	9.03	a6.00	1.829
Mar. 1	1100	359	10.2	6.25	1.905						

No flow for many days.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	.00	.00	.00	.00	15	.00	.00	.00	15	14	.72
2	.76	.00	.00	.00	.00	.00	.00	.00	.00	10	1.8	.28
3	.00	3.2	.00	.00	.00	.00	.00	.00	.00	5.0	.53	.40
4	7.7	.00	.00	.00	.00	.00	.00	.00	.00	30	.62	.00
5	.02	.00	.00	.00	.00	.00	.00	.00	.00	20	.01	.00
6	1.6	.00	.00	.00	.00	.00	.00	.00	.00	5.0	.00	.00
7	.10	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00
8	.00	4.2	.00	.00	.00	.00	.00	1.5	.20	.00	.00	.00
9	.00	.32	.00	.00	.00	.00	.00	.53	.00	15	.00	.00
10	.00	.02	.00	.00	.00	.55	.00	.00	.00	35	15	.10
11	.00	.00	.00	.00	22	.00	.00	5.0	.00	.05	.01	.00
12	.00	.00	.00	.00	.64	.44	.00	.50	.00	.50	.00	.28
13	.00	.00	.00	.00	.00	20	.24	.00	.00	.00	.00	.01
14	.00	.00	.00	.00	.00	.23	.00	.50	.10	.00	.00	29
15	.00	.00	.00	.00	.00	.17	.00	.00	.00	.00	.00	1.1
16	.00	.00	.00	.00	.00	3.3	4.7	.00	.20	10	.00	.10
17	.00	.00	.00	.04	.00	24	.01	.00	.50	5.0	.00	14
18	.00	.00	.00	.17	.00	1.7	4.4	5.0	.00	.00	.00	.36
19	.00	.00	.00	.01	.00	.00	22	4.5	.00	.00	.00	.72
20	.00	.00	.00	7.4	.00	.00	22	.00	.00	.00	3.3	.45
21	.00	.00	.00	250	.00	.00	.01	.00	.00	75	.06	.14
22	.00	.00	.00	39	.00	15	.00	.00	.00	15	1.0	1.4
23	.00	.00	1.7	.00	.00	4.5	.00	.00	.00	.10	16	.73
24	.00	.00	2.4	.00	.00	.00	.00	.00	.00	.00	26	2.5
25	.00	.00	392	.00	.00	.00	.00	.00	.00	.00	24	.04
26	10	.00	45	.00	.00	.00	1.2	.00	.00	.00	.02	6.4
27	.00	.00	.01	.00	.00	.00	.00	.07	5.0	.00	10	7.3
28	.00	.00	.00	.00	.00	.00	.00	.00	10	.00	9.1	.44
29	.00	.00	.00	.00	---	.38	.06	.00	5.0	.01	21	2.7
30	.00	.00	.00	.00	---	.00	.00	.65	.50	.00	4.2	.07
31	.00	---	.00	.00	---	.00	---	.00	---	.00	5.8	---
TOTAL	22.58	7.74	441.11	296.62	22.64	85.27	54.62	18.25	21.50	241.16	152.48	69.24
MEAN	.73	.26	14.2	9.57	.81	2.75	1.82	.59	.72	7.78	4.92	2.31
MAX	10	4.2	392	250	22	24	22	5.0	10	75	26	29
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	45	15	875	588	45	169	108	36	43	478	302	137

CAL YR 1981 TOTAL 693.07 MEAN 1.90 MAX 392 MIN .00 AC-FT 1370
WTR YR 1982 TOTAL 1433.18 MEAN 3.93 MAX 392 MIN .00 AC-FT 2840

NOTE.--No gage-height record June 10 to July 29.

16767000 NINOLE GULCH NEAR PUNALUU

LOCATION.--Lat 19°10'44", long 155°33'46", Hydrologic Unit 20010000, on right bank 300 ft (91 m) downstream from forest-reserve boundary, 4.6 mi (7.4 km) northwest of Punaluu, and 6.0 mi (9.6 km) north of Honuapo.

DRAINAGE AREA.--15.5 mi² (40.1 km²).

PERIOD OF RECORD.--March 1966 to September 1982. Discontinued as a continuous-record station; converted to a crest-stage partial-record station.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (634 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record and those above 60 cfs, which are fair. No diversion above station. Observation of specific conductance, pH, and water temperature made during the year is published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 3.64 ft³/s (0.103 m³/s), 2,640 acre-ft/yr (3.26 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,610 ft³/s (73.9 m³/s) June 1, 1979, gage height, 6.74 ft (2.054 m), from rating curve extended above 30 ft³/s (0.85 m³/s); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*), from rating curve extended above 30 ft³/s (0.85 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	2330	*1420	40.2	*5.95	1.814
Jan. 21	1100	1050	29.7	5.60	1.707

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.16	.00	.00	.00	7.5	11	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	6.0	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.0	.00	.00
4	5.6	.00	.00	.00	.00	.00	.00	.00	.00	15	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	6.0	.00	.00
6	2.4	.11	.00	.00	.00	.00	.00	.00	.00	3.0	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	1.0	1.0	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.50	.00	6.0	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	20	18	.00
11	.00	.00	.00	.00	.70	.00	.00	2.5	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.50	.00	.50	.00	.00
13	.00	.00	.00	.00	.00	4.1	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.45	.50	.00	.00	10
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.75	.00	1.0	5.0	.00	.00
17	.00	.00	.00	.00	.00	10	.00	.00	1.5	3.0	.00	6.0
18	.00	.00	.00	.00	.00	.94	.80	3.5	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	5.0	1.0	.00	.00	.00	.00
20	.00	.00	.00	2.0	.00	.00	10	.00	.00	.00	.79	.00
21	.00	.00	.00	127	.00	.00	.00	.00	.00	35	.00	.00
22	.00	.00	.00	16	.00	7.1	.00	.00	.00	15	.33	.39
23	.00	.00	.00	.00	.00	2.3	.00	.00	.00	.00	12	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	31	.02
25	.00	.00	131	.00	.00	.00	.00	.00	.00	.00	28	.00
26	2.4	.00	42	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	1.5	4.0	.00	.63	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	4.5	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	3.0	.00	30	.58
30	.00	.00	.00	.00	---	.00	.00	5.5	.50	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	10.40	.11	173.00	145.00	.70	24.60	16.55	16.45	16.00	125.00	131.75	16.99
MEAN	.34	.004	5.58	4.68	.025	.79	.55	.53	.53	4.03	4.25	.57
MAX	5.6	.11	131	127	.70	10	10	5.5	4.5	35	31	10
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	21	.2	343	288	1.4	49	33	33	32	248	261	34

CAL YR 1981 TOTAL 365.98 MEAN 1.00 MAX 141 MIN .00 AC-FT 726
WTR YR 1982 TOTAL 676.55 MEAN 1.85 MAX 131 MIN .00 AC-FT 1340

NOTE.--No gage-height record Mar. 31 to July 29.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of base flow or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1982

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Kauai				
16011000	Waiakoali Stream near Waimea	Lat 22°07'42", long 159°37'27", 0.3 mi (0.5 km) upstream from mouth and 12 mi (19 km) northeast of Waimea.	1.58 (4.09)	1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-70, 1972-82	6- 3-82 7-21-82 9- 9-82	3.16 3.75 2.41
16012000	Kauaikinana Stream near Waimea	Lat 22°08'12", long 159°37'58", 0.6 mi (1.0 km) upstream from mouth and 12 mi (19 km) northeast of Waimea.	.84 (2.18)	1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-82	6- 3-82 7-21-82 9- 9-82	1.95 1.81 .89
16029500	Mokihana Stream near Waimea	Lat 21°59'38", long 159°40'07", 500 ft (152 m) upstream from mouth and 2.5 mi (4.0 km) north of Waimea.	4.83 (12.51)	1962, 1964-82	6- 7-82 8-13-82 8-23-82	2.14 .95 2.45
16030000	Peekauai ditch near Waimea	Lat 21°58'43",long 159°39'37", on right bank, 0.8 mi (1.3 km) upstream from Makaweli River, 1.6 mi (2.6 km) north of Waimea highway bridge and 1.6 mi (2.6 km) north of Waimea Post Office.	-	1911-19, 1979-82	1- 4-82 4- 5-82 6- 7-82 8- 2-82	1.76 1.78 2.66 2.15
16058500	South Fork Wailua River near rock Quarry	Lat 22°01'44", long 159°25'03", 7.5 mi (12.1 km) upstream from mouth and 4.6 mi (7.4 km) northwest of Lihue.	20.2 (52.3)	1974-82	10- 1-81 8-31-82	3.94 103
16102000	China ditch near Hanalei	Lat 22°11'10", long 159°28'00", on left bank just below intake and 3.0 mi (4.8 km) southeast of Hanalei.	-	1913-19≠, 1977-82	1-13-82 5-24-82 8- 9-82	9.47 4.18 2.58
		Hawaii, Island of Oahu				
16201000	Right Branch of North Fork Kaukonahua Stream near Wahiawa	Lat 21°31'11", long 157°56'53", 200 ft (61 m) above confluence with Left Branch and 4.5 mi (7.2 km) east of Leilehua High School in Wahiawa.	1.17 (3.03)	1913-53≠, 1960-62, 1966, 1968-82	10-15-81 1- 5-82 3- 4-82 6- 2-82 9-21-82	1.55 2.98 1.69 5.10 4.45
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi (1.1 km) west of Pearl City and 1.5 mi (2.4 km) east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970-82	5-24-82	16.6
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft (91 m) downstream from Highway 90 and 0.8 mi (1.3 km) west of Aiea Post Office Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970-82	5-24-82	18.0

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft (305 m), near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft (152 m) upstream from Kawailena Stream, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.51 (1.32)	1968-82	2-10-82 4-13-82 6- 8-82 7-29-82	5.21 3.97 1.05 1.53
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft (244 m) upstream from mouth, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.5 mi (8.8 km) north of Kamalo.	.65 (1.68)	1968-82	2-10-82 4-13-82 6- 8-82 7-29-82	5.46 5.61 1.96 1.99
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft (122 m) downstream from Kawailena Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.6 mi (9.0 km) north of Kamalo.	1.20 (3.11)	1968-70≠, 1974-82	2-10-82 4-13-82 6- 8-82 7-29-82	9.39 10.2 3.37 3.30
16403700	Kawainui Stream at altitude 1,000 ft (305 m), near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft (122 m) upstream from Kawaipoko Stream, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.79 (2.05)	1968-82	1-19-82 4-14-82 6- 9-82 7-30-82	4.50 7.73 1.61 3.62
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft (91 m) upstream from mouth, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.26 (.67)	1968-82	1-19-82 4-14-82 6- 9-82 7-30-82	1.11 3.62 .32 .93
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", on right bank 900 ft (274 m) upstream from confluence with Kapuhi Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.7 mi (9.2 km) north of Kamalo.	1.17 (3.03)	1969-79≠, 1980-82	1-19-82 4-14-82 6- 9-82 7-30-82	8.60 11.3 2.67 4.90

≠ 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 1982

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Kauai					
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft (46 m) upstream from highway bridge at Waimea and 0.2 mi (0.3 km) upstream from mouth.	86.5 (224.0)	1944-82b	1- 6-82	6.62	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft (122 m) upstream from bridge on Highway 50 and 0.5 mi (0.8 km) upstream from mouth.	26.6 (68.9)	1950-82b	11- 1-81	3.41	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi (1.4 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Koloa.	6.62 (17.15)	1962-63, 1964-72≠, 1973-82	4- 2-82	4.51	1,260
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi (6.0 km) southwest of Lihue, and 4.5 mi (7.2 km) upstream from mouth.	17.6 (45.6)	1912-15≠, 1962-67, 1968-70≠, 1971-82	12-24-81	11.89	4,570
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft (183 m) upstream from highway bridge, 850 ft (259 m) upstream from mouth,and 2.5 mi (4.0 km) southwest of Kapaa.	52.6 (136.2)	1962-82b	11- 1-81	7.11	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi (2.9 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Kapaa High School.	3.38 (8.75)	1964-67, 1970-82	1-21-82	10.50	570
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft (244 m) upstream from mouth and 3.5 mi (5.6 km) northwest of Kapaa armory.	.40 (1.04)	1964-82	5- 7-82	6.50	580
16084500	Kapaa Stream at old highway crossing, near Kealia	Lat 22°06'28", long 159°19'52", at abutment of old highway bridge, 100 ft (30 m) upstream from road crossing, 1.4 mi (2.2 km) northwest of Kealia and 2.1 mi (3.4 km) upstream from mouth.	14.0 (36.3)	1962-82	5- 7-82	15.26	12,000
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi (2.6 km) southeast of Anahola School and 1.6 mi (2.6 km) north of Kealia.	.85 (2.20)	1964-82	3-27-82	7.76	624
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi (1.3 km) northwest of Kilauea School and 0.9 mi (1.4 km) upstream from mouth.	.91 (2.36)	1964-68, 1971-82	3-27-82	12.45	963

≠ Operated as a continuous-record gaging station.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Kauai--Continued					
16104200	Hanalei River at Highway 56 Bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi (2.6 km) northeast of Hanalei and 2.4 mi (3.9 km) upstream from mouth.	21.0 (54.4)	1963-82b	3-29-82	11.10	-
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi (1.8 km) northeast of Mana and 5.3 mi (8.5 km) northwest of Kekaha School.	3.81 (9.87)	1962-63, 1964-71≠, 1972-82	1-21-82	5.04	497
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi (0.3 km) upstream from Highway 99, 0.4 mi (0.6 km) southeast of Waialua High School and 1.3 mi (2.1 km) southwest of Weed Circle.	38.7 (100.2)	1963, 1968-82	1- 6-82	23.69	5,970
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi (0.3 km) upstream from Highway 83 and 1.1 mi (1.8 km) east of Waialua High School.	10.9 (28.2)	1967-82	1- 6-82	23.00	a5,500
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi (1.6 km) southwest of Dillingham Ranch and 1.9 mi (3.1 km) southwest of sugar mill at Waialua.	4.15 (10.75)	1958-63, 1964-65≠, 1966-82	1- 6-82	6.84	1,040
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft (55 m) upstream from Highway 99, 1.7 mi (2.7 km) west of Camp Brdman and 2.0 mi (3.2 km) east of Kaena Point.	1.08 (2.80)	1974-82	1- 6-82	13.85	685
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank, 20 ft (6 m) upstream from old concrete highway ford, 140 ft (43 m) downstream from Farrington Highway box culvert, 0.1 mi (0.2 km) north of Makua cemetery, and 4.5 mi (7.2 km) southeast of Kaena Point lighthouse.	4.28 (11.09)	1958-82	1- 6-82	7.48	a1,200
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi (1.4 km) upstream from Farrington Highway and 1.1 mi (1.8 km) north of junction of Farrington Highway and Makaha Valley Road.	5.25 (13.60)	1966-82	1- 6-82	15.81	3,930
16211800	Kaupuni Stream at altitude 372 ft (144 m), near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi (4.2 km) northeast of Waianae cemetery and 2.8 mi (4.5 km) northeast of junction of Waianae Valley Road and Farrington Highway.	3.58 (9.27)	1961-72≠, 1973-82	1- 6-82	7.82	3,640
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi (5.5 km) east of cemetery near Waianae.	1.51 (3.91)	1958-82	1- 6-82	7.20	2,460
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi (1.1 km) upstream from Highway 90 and 0.6 mi (1.0 km) northeast of Nanakuli Post Office.	3.98 (10.31)	1968-82	1- 6-82	25.80	2,470

≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi^2 (km^2)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi (2.9 km) west of Honouliuli and 2.8 mi (4.5 km) northwest of Ewa Post Office.	1.70 (4.40)	1968-82	1- 6-82	4.10	209
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi (2.9 km) west of Waipahu Post Office.	11.0 (28.5)	1956-82	1- 6-82	10.28	3,500
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi (0.5 km) west of east-west runway at Wheeler Field, and 1.9 mi (3.1 km) southwest of Wahiawa Post Office.	6.35 (16.45)	1958, 1960-82	1- 6-82	22.50	1,850
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi (0.3 km) downstream from Kamehameha Highway and 2.4 mi (3.9 km) south of Wahiawa Post Office.	7.49 (19.40)	1958-82	10-28-81	14.13	2,780
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft (61 m) upstream from Highway 75 and 1.2 mi (1.9 km) south of Kunia Camp.	.84 (2.18)	1974-82	1 -6-82	-	a500
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft (400 m) upstream from bridge on Moanalua Road, and 1.2 mi (1.9 km) northwest of Aiea High School.	5.97 (15.46)	1952-70≠, 1973-82	10-28-81	5.65	5,700
16228000	Moanalua Stream near Honolulu	Lat 21°22'53", long 157°52'22", on left bank 1.8 mi (2.9 km) northeast of Tripler Hospital and 5.0 mi (8.0 km) north of Honolulu Post Office.	2.73 (7.07)	1927-78≠, 1979-82	5- 7-81 8-16-82	4.77 9.66	482 2,030
**16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi (1.8 km) northeast of Tripler Hospital and 2.9 mi (4.7 km) east of Aiea sugar refinery.	3.34 (8.65)	1969-82	8-16-82	7.16	3,010
16228600	Moanalua Stream at Tripler Hospital	Lat 21°21'52", long 157°54'05", on right bank 0.5 mi (0.8 km) west of Tripler Hospital and 1.6 mi (2.6 km) northeast of Aliamanu School.	4.44 (11.50)	1971-82	8-16-82	-	a3,500
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft (244 m) downstream from Likelike Highway, and 2.8 mi (4.5 km) southwest of Castle High School in Kaneohe.	.60 (1.55)	1967-71≠, 1972-82	8-25-82	5.00	1,250
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi (2.9 km) northeast of Honolulu Post Office.	1.28 (3.32)	1958-82	1- 6-82	2.73	672
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi (1.8 km) northeast of Honolulu Post Office.	1.43 (3.70)	1958-82	1- 6-82	.76	401
16247100	Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kaimuki High School, 0.3 mi (0.5 km) downstream from confluence of Manoa and Palolo Streams and 0.6 mi (1.0 km) upstream from point of discharge into Ala Wai Canal.	9.35 (24.22)	1968-82	8-16-82	9.10	4,940

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi (1.6 km) upstream from Kalanianaole Highway in Aina Haina.	2.35 (6.09)	1958-82	1- 6-82	2.23	666
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft (91 m) downstream of single-lane wooden bridge and 0.6 mi (1.0 km) upstream from Highway 72.	1.18 (3.06)	1958-59, 1970-82	1- 6-82	31.86	1,290
16248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft (9 m) upstream from culvert on Hihimanu Street and 0.8 mi (1.3 km) northwest of Waimanalo Post Office.	1.21 (3.13)	1958-82	1-20-82	-	a400
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft (12 m) upstream from Highway 72 and 2.3 mi (3.7 km) northwest of Waimanalo Post Office.	2.16 (5.59)	1967-70≠, 1971-82	1-20-82	5.16	a900
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft (9 m) upstream from Kalanianaole Highway, 1.6 mi (2.6 km) northwest of Waimanalo School and 2.4 mi (3.9 km) south of Kailua Post Office.	.16 (.41)	1963-82	1- 6-82	3.26	119
16260500	Maunawili Stream at Highway 61, near Kailua	Lat 21°22'51", long 157°45'48", on right bank at downstream side of bridge on Highway 61, 0.6 mi (1.0 km) west of Maunawili School and 1.6 mi (2.6 km) southwest of Kailua Post Office.	5.34 (13.83)	1958-67, 1968-71≠, 1972-82	1-20-82	9.85	2,060
16264800	Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi (1.9 km) northwest of Kailua Post Office.	11.0 (28.5)	1957-60, 1963-64, 1967-82b	10-28-81	2.32	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft (15 m) upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi (0.3 km) northeast of Castle High School, and 0.6 mi (1.0 km) upstream from mouth.	1.19 (3.08)	1965, 1968-74, 1977-82	3-14-82	7.03	779
16270900	Luluku Stream at altitude 220 ft (67 m), near Kaneohe	Lat 21°23'42", long 157°48'46", on left bank 0.5 mi (0.8 km) upstream from mouth, 1.4 mi (2.2 km) southwest of Castle High School, and 1.9 mi (3.1 km) south of Kaneohe Post Office.	.44 (1.14)	1967-71≠, 1972-75, 1977-82	1-20-82	5.84	548
16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft (11 m) upstream from bridge on Kamehameha Highway in Kaneohe.	.62 (1.61)	1959-82	8-16-82	4.88	a900
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft (18 m) downstream from culvert on Kahekili Highway, 0.7 mi (1.1 km) west of Kaneohe Post Office and 0.8 mi (1.3 km) southwest of Heeia.	1.80 (4.66)	1965-66, 1968-82	3-27-82	7.71	3,420
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi (1.3 km) south of Kahaluu.	2.31 (5.98)	1963-82	3-27-82	-	a3,500
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi (1.9 km) southeast of cemetery in Hauula and 1.4 mi (2.2 km) northeast of Sacred Falls.	2.12 (5.49)	1958-82	1- 6-82	6.95	4,920

≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16310501	Malaekahana Stream at altitude 30 ft (9 m), near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi (1.8 km) southwest of junction of plantation road and Highway 83, and 1.2 mi (1.9 km) south of Kahuku Hospital.	4.05 (10.49)	1958-82	3-21-82	11.35	3,950
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi (1.0 km) southwest of junction of Plantation Road and Highway 83 and 2.7 mi (4.3 km) west of Kahuku Hospital.	2.13 (5.52)	1958-82	1- 6-82	4.0	a150
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi (4.7 km) northeast of Waimea.	1.98 (5.13)	1973-82	1- 6-82	4.09	a250
16318000	Paumalu Gulch at Sunset Beach	Lat 21°40'19", long 158°02'28", 0.4 mi (0.6 km) upstream from Highway 83 at Sunset Beach and 2.2 mi (3.5 km) northeast of Waimea.	2.59 (6.71)	1968-82	1- 6-82	5.15	a200
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58",at culvert on Ashley Road, 0.1 mi (0.2 km) upstream from Highway 83 and 1.1 mi (1.8 km) north of Kawailoa Camp.	2.23 (5.78)	1968-82	1- 6-82	4.58	274
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi (2.7 km) southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi (4.0 km) east of Waialua School at Haleiwa.	13.5 (35.0)	1958-82	1- 6-82	12.07	7,480
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi (1.0 km) upstream from Kamehameha Highway and 2.1 mi (3.4 km) northeast of Waialua.	5.96 (15.44)	1956-82	1- 6-82	17.39	5,500
		Hawaii, Island of Molokai					
16411300	Kakaako Gulch at Highway 46, near Mauna Loa	Lat 21°08'49", long 157°11'36", at Highway 46, 1.6 mi (2.6 km) northeast of Mauna Loa, and 1.8 mi (2.9 km) upstream from Kamakahi Gulch.	.55 (1.42)	1964-82	1-21-82	1.26	13
16411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi (0.2 km) upstream from Kamakahi Gulch, 1.7 mi (2.7 km) downstream from Highway 46, and 2.5 mi (4.0 km) northeast of Mauna Loa.	1.40 (3.63)	1964-82	1-21-82	1.85	138
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi (2.0 km) downstream from Kamakahi Gulch and 3.0 mi (4.8 km) north of Mauna Loa School.	5.34 (13.83)	1963-72≠, 1973-82	1-21-82	4.66	720
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi (5.2 km) east of Laau Point lighthouse, and 3.3 mi (5.3 km) southwest of Mauna Loa.	.28 (.73)	1964-82	1-21-82	1.55	28

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Molokai--Continued					
16411640	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi (4.3 km) southwest of Mauna Loa and 5.5 mi (8.8 km) east of Laau Point.	2.07 (5.36)	1965-82	1-21-82	6.56	2,100
16411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi (0.6 km) south of Hoolehua and 2.1 mi (3.4 km) west of Kualapuu.	1.46 (3.78)	1964-82	3-31-82	-	-
16411900	Kaluapeelua Gulch tributary near Molokai Airport	Lat 21°08'57", long 157°07'12", 1.7 mi (2.7 km) southwest of Molokai Airport and 5.1 mi (8.2 km) west of Kualapuu.	1.56 (4.04)	1964-82	3-31-82	-	a350
16413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi (0.8 km) south of Holomua School and 2.3 mi (3.7 km) southwest of Kualapuu.	10.4 (26.9)	1965-82	3-31-82	10.86	2,600
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi (0.5 km) upstream from mouth, and 0.5 mi (0.8 km) northeast of Kamalo.	2.12 (5.49)	1964-82	1-21-82	1.63	564
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi (0.8 km) upstream from mouth and 1.9 mi (3.1 km) south of Halawa.	.48 (1.24)	1964-82	1-21-82	6.97	260
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft (37 m) upstream from bridge on Highway 31, 400 ft (122 m) upstream from Kamole Gulch, 1.1 mi (1.8 km) east of Kahikinui House, and 8.5 mi (13.7 km) west of Kaupo.	1.19 (4.95)	1963-72≠, 1973-82	1- 7-82	5.98	435
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft (213 m) upstream from Piilani Highway 31 and 3.9 mi (6.3 km) west of Kaupo.	11.3 (29.3)	1967-82	1- 7-82	12.05	7,080
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi (2.1 km) west of Kipahulu and 3.2 mi (5.2 km) east of Kaupo.	.76 (1.97)	1963-68≠, 1969-82	3-31-82	13.76	5,950
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi (0.6 km) southwest of Puuiki, and 4.0 mi (6.4 km) south of Hana.	.48 (1.24)	1963-82	3-31-82	7.87	607
16502800	Moomoonui Gulch at Hana	Lat 20°44'37", long 155°59'18", at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi (1.6 km) south of Hana.	.90 (2.33)	1963-82	3-31-82	14.06	1,540
16502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft (305 m) upstream from Highway 36 and 0.3 mi (0.5 km) northwest of Hana Hospital.	5.83 (15.10)	1965-82	8- 1-82	11.03	16,880
16603300	Unnamed gulch at Maliko Bay	Lat 20°56'26", long 156°21'04", at Hana Highway, 0.5 mi (0.8 km) west of Maliko Bay, and 1.3 mi (2.1 km) north of Hamakuapoko.	.43 (1.11)	1963-82	3-14-82	1.72	10

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi (2.3 km) south of Pukalani.	1.17 (3.03)	1967-82	2-11-82	6.65	340
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi (2.4 km) west of Olinda Prison Camp, and 2.3 mi (3.7 km) southeast of Pukalani.	.45 (1.17)	1963-82	11- 1-81	4.30	143
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft (183 m) upstream from Hansen Road, 0.5 mi (0.8 km) northeast of Puunene Hospital, and 2.5 mi (4.0 km) southeast of Kahului Post Office.	17.9 (46.4)	1967-82	2-11-82	6.48	732
**16607000	Iao Stream at Wailuku	Lat 20°53'38", long 156°30'27", 560 ft (171 m) upstream from Market Street bridge at Wailuku and 1.9 mi (3.1 km) upstream from mouth.	8.24 (21.4)	1951≠, 1952-82	1-21-82	5.04	3,380
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi (1.0 km) east of Maluhia Camp and 1.8 mi (2.9 km) northwest of Waihee.	.12 (.31)	1964-82	3-31-82	7.68	101
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'58", long 156°34'58", at Highway 30 (bypass), 1.3 mi (2.1 km) southeast of Nakalele Point lighthouse, and 2.2 mi (3.5 km) northwest of Kahakuloa.	1.18 (3.06)	1965-82	4- 1-82	12.01	487
16623400	Honokeana Gulch near Honokahua	Lat 20°59'39", long 156°40'13", at Honoapiilani Highway, 1.1 mi (1.8 km) southwest of Honokahua and 1.1 mi (1.8 km) south of Hawea Point.	.59 (1.53)	1964-82	3-21-82	4.06	88
16630200	Honokowai Stream at Honokowai	Lat 20°56'58", long 156°41'07", 0.5 mi (0.8 km) southeast of Honokowai and 1.1 mi (1.8 km) northwest of Puukolii.	5.59 (14.48)	1962-63, 1965-82	8- 1-82	11.0	4,520
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi (1.1 km) upstream from Honoapiilani Highway (bypass) and 1.3 mi (2.1 km) southeast of Lahaina lighthouse.	4.12 (10.67)	1960, 1962, 1964-82	8-10-82	4.43	526
16646200	Olowalu Stream at Olowalu	Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mi (1.0 km) northeast of Olowalu, and 5.5 mi (8.8 km) southeast of Lahaina.	4.08 (10.57)	1962-72≠, 1973-82	8- 1-82	4.20	600
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft (61 m) upstream from mouth, 0.2 mi (0.3 km) north of McGregor Point, and 1.2 mi (1.9 km) southwest of Maalaea.	.64 (1.66)	1964-82	1- 7-82	4.06	24
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi (4.0 km) northeast of Maalaea, and 2.5 mi (4.0 km) northwest of Kihei.	6.97 (18.05)	1963-82	1- 7-82	6.56	949

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44'56", long 156°19'22", at Upper Kula Road, 1.0 mi (1.6 km) southeast of Waiakoa and 1.0 mi (1.6 km) northeast of junction of Lower and Upper Kula Roads.	.98 (2.54)	1964-82	2-11-82	-	a60
16659000	Waiakoa Gulch at Kihei	Lat 20°47'14", long 156°27'41", 0.3 mi (0.5 km) northeast of Kihei and 0.4 mi (0.6 km) upstream from mouth.	10.1 (26.2)	1963-82	2-11-82	9.03	1,220
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi (0.8 km) northeast of Lihue Cemetery, 0.8 mi (1.3 km) upstream from mouth and 1.3 mi (2.1 km) southeast of Kihei.	14.4 (37.3)	1963-70≠, 1971-82	3-17-82	2.93	1,160
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft (107 m) upstream from mouth, and 0.2 mi (0.3 km) south of Kamaole.	4.28 (11.09)	1972-82	3-17-82	9.01	291
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft (91 m) upstream from mouth, and 0.8 mi (1.3 km) south of Kamaole.	4.12 (10.67)	1972-82	2-11-82	13.73	526
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi (0.5 km) upstream from Kinoole Street bridge and 1.3 mi (2.1 km) southeast of Hilo Post Office.	35.8 (92.7)	1968-82	7-16-82	4.34	378
16701400	Palai Stream at Hilo	Lat 19°40'56", long 155°04'04", at Highway 11, 300 ft (91 m) south of Palai Street intersection and 3.5 mi (5.6 km) southeast of Hilo Post Office.	5.08 (13.16)	1965-82	7-16-82	6.52	723
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi (1.6 km) north of Papaikou and 5.1 mi (8.2 km) north of Hilo Post Office.	.24 (.62)	1963-82	12-25-81	7.16	161
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft (3.0 m) downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi (3.2 km) south of Honomu, and 8.0 mi (12.9 km) north of Hilo.	.58 (1.50)	1962-72≠, 1973-82	12-25-81	4.68	640
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi (1.6 km) southeast of Honomu, 2.2 mi (3.5 km) north of Pepeekeo, and 9.4 mi (15.1 km) north of Hilo.	1.09 (2.82)	1963-82	12-25-81	8.07	754
16717800	Pohakupuka Stream near Papaaloa	Lat 19°57'20", long 155°11'20", on right bank 200 ft (61 m) downstream from Highway 19, 2.8 mi (4.5 km) northwest of Honohina, and 3.0 mi (4.8 km) southwest of Papaaloa.	2.76 (7.15)	1963-80≠, 1982	12-25-81	8.65	1,960
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi (2.7 km) west of Ookala, and 4.1 mi (6.6 km) southeast of Paauilo.	.62 (1.61)	1963-82	12-25-81	8.00	398

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1982--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Hawaii--Continued					
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi (1.8 km) northwest of Honokaa Hospital, and 1.5 mi (2.4 km) upstream from mouth.	2.27 (5.88)	1963-82	-	-	No flow
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert, 4.8 mi (7.7 km) southwest of Honokaa Hospital, and 5.5 mi (8.8 km) southeast of Kukuihaele.	2.42 (6.27)	1963-82	-	-	No flow
16752600	Hapahapai Gulch at Kapaau	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft (91 m) east of Kapaau Post Office.	1.52 (3.94)	1963-82	2-11-82	5.50	77
16755800	Luahine Gulch near Waimea	Lat 20°03'11", long 155°44'35", at culvert 5.1 mi (8.2 km) northwest of Waimea and 5.7 mi (9.2 km) east of Kawaihae.	.32 (.83)	1963-82	2-11-82	4.09	185
16756500	Keanuiomano Stream near Kamuela	Lat 20°01'48", long 155°42'05", on left bank 150 ft (46 m) upstream from Highway 25 at Waiaka and 2.0 mi (3.2 km) west of Kamuela.	4.30 (11.14)	1964-72≠, 1973-82	2-11-82	7.45	1,980
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi (3.4 km) west of Puukapu Reservoir, and 2.6 mi (4.2 km) northeast of Waimea.	.27 (.70)	1963-82	2-11-82	4.19	214
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi (2.2 km) north of Saddle Road Junction and 4.5 mi (7.2 km) south of Waimea.	50.6 (131.1)	1963-82	1- 9-82	3.63	113
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi (3.2 km) north of Keamuku and 5.2 mi (8.4 km) west of Waikii.	33.1 (85.7)	1963-82	1- 9-82	4.71	824
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi (3.1 km) east of Kailua, and 2.3 mi (3.7 km) northwest of Holualoa Post Office.	2.61 (6.76)	1962, 1965-82	2-11-82	11.10	a800
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi (2.9 km) northeast of Holualoa School, and 4.2 mi (6.8 km) southeast of Honokohau School.	8.74 (22.64)	1961-82	2-11-82	9.06	3,550
16762000	Alapai Gulch at Naalehu	Lat 19°04'00", long 155°35'19", at debris catchment outlet of Naalehu Watershed Protection Project and 0.2 mi (0.3 km) upstream from Highway 11 at Naalehu.	2.87 (7.43)	1963-82	12-25-81	8.00	1,420
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi (1.0 km) southwest of Pahala, and 4.1 mi (6.6 km) north of Punaluu.	9.41 (24.37)	1963-82	12-25-81	16.82	8,400
16770500	Paauau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft (30 m) downstream from bridge on Wood Valley Road and 0.7 mi (1.1 km) north of Pahala.	1.74 (4.51)	1962-79≠, 1980-82	12-25-81	10.12	3,250

≠ Operated as a continuous-record gaging station.
a Estimated.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi^2 (km^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Kauai				
16061000 North Wailua ditch near Lihue		Lat 22°03'56", long 159°28'14", on left bank 300 ft (91 m) downstream from intake, 7.9 mi (12.7 km) west of Wailua House Lots, and 8.8 mi (14.2 km) northwest of Lihue.		1932-81	9-21-82	23.5
North Fork Wailua River near Lihue	Pacific Ocean	Lat 22°03'57", long 159°28'12", 300 ft (90 m) below diversion dam at altitude 1,100 ft (335 m) and 8.8 mi (14.2 km) northwest of Lihue.			9-21-82	.77
Unnamed tributary	North Fork Wailua River	Lat 22°04'13", long 159°26'52", 170 ft (52 m) from Hanalei tunnel outlet to North Fork Wailua River, 7.8 mi (12.6 km) northwest of Lihue, and 7.9 mi (12.7 km) west of Kapaa.			9-21-82	19.4
Right Branch of unnamed tributary	North Fork Wailua River	Lat 22°04'12", long 159°26'53", 100 ft (30 m) above confluence with Hanalei tunnel water.			9-21-82	4.34
North Fork Wailua River	Pacific Ocean	Lat 22°04'10", long 159°26'49", 30 ft (9 m) above diversion dam at altitude 710 ft (216 m), 7.8 mi (12.6 km) northwest of Lihue, and 7.9 mi (12.7 km) west of Kapaa.			9-21-82	25.2
16062000 Stable storm ditch		Lat 22°04'09", long 159°26'46", on left bank 100 ft (30 m) downstream from intake, 7.8 mi (12.6 km) northwest of Lihue, and 7.9 mi (12.7 km) west of Kapaa.		1937-81	9-21-82	.02
North Fork Wailua River	Pacific Ocean	Lat 22°04'01", long 159°26'08", 1,200 ft (370 m) downstream from station 16063000 and 7.3 mi (12 km) northwest of Lihue.			9-21-82	31.4
Unnamed tributary	North Fork Wailua River	Lat 22°04'00", long 159°26'07", 1,400 ft (430 m) downstream from station 16063000 and 7.3 mi (12 km) northwest of Lihue.			9-21-82	.12
16068000 East Branch of North Fork Wailua River	North Fork Wailua River	Lat 22°04'19", long 159°25'05", on right bank 1,200 ft (366 m) upstream from mouth and 7.2 mi (11.6 km) northwest of Lihue.	6.27 (16.24)	1912-81	9-21-82	36.9
Diversion	Wailua Reservoir	Lat 22°04'07", long 159°24'57", 250 ft (76 m) downstream from North Fork Wailua River at altitude 500 ft (150 m), 6.5 mi (10 km) southwest of Kapaa, and 6.7 mi (11 km) northwest of Lihue.			9-21-82	15.4
Diversion	North Fork Wailua River	Lat 22°04'07", long 159°24'58", 200 ft (60 m) below concrete dam on North Fork Wailua River at altitude 480 ft (146 m), 6.5 mi (10 km) southwest of Kapaa, and 6.7 mi (11 km) northwest of Lihue.			9-21-82	9.21
North Fork Wailua River	Pacific Ocean	Lat 22°04'06", long 159°24'58", 200 ft (60 m) downstream of concrete dam at altitude 480 ft (146 m), 6.5 mi (10 km) southwest of Kapaa, and 6.7 mi (11 km) northwest of Lihue.			9-21-82	43.8
North Fork Wailua River	Pacific Ocean	Lat 22°03'36", long 159°24'48", 150 ft (46 m) upstream from tributary at altitude 480 ft (134 m), and 6.5 mi (10.5 km) southwest of Kapaa.			9-21-82	51.3
Unnamed tributary	North Fork Wailua	Lat 22°03'35", long 159°24'46", 25 ft (8 m) upstream from confluence with North Fork Wailua River at altitude 440 ft (134 m) and 6.5 mi (10.5 km) southwest of Kapaa.			9-21-82	1.95

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi^2 (km^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Kauai--Continued				
Spillway A of Wailua Reservoir	North Fork Wailua	Lat 22°03'57", long 159°24'09", 50 ft (15 m) below Highway 58, 5.7 mi (9.2 km) southwest of Kapaa, and 6.1 mi (9.8 km) northwest of Lihue.			9-21-82	7.97
Spillway B of Wailua Reservoir		Lat 22°03'53", long 159°23'54", 0.3 mi (0.5 km) below Highway 58, 5.4 mi (8.7 km) southwest of Kapaa, and 6.0 mi (9.7 km) northwest of Lihue.			9-21-82	.23
16071000 North Fork Wailua River	Pacific Ocean	Lat 22°03'08", long 159°22'22", on right bank, 1.1 mi (1.8 km) upstream from confluence with South Fork, 3.7 mi (6.0 km) southwest of Kapaa, and 5.0 mi (8.0 km) north of Lihue.	17.9 (46.4)	1952-81	9-21-82	82.1
		Hawaii, Island of Oahu				
Makaha Stream near Makaha	Pacific Ocean	Lat 21°30'46", long 158°10'24", 1.6 mi (2.6 km) northeast of Kaneaki Heiau and 4.1 mi (6.6 km) northeast of junction of Farrington Highway and Makaha Valley Road.		1981	12-14-81 12-16-81 12-17-81 12-22-81 12-23-81	.27 .26 .25 2.25 1.51
Makaha Stream near Makaha	Pacific Ocean	Lat 21°30'20", long 158°10'56", 0.9 mi (1.4 km) northeast of Kaneaki Heiau and 3.4 mi (5.5 km) northeast of junction of Farrington Highway and Makaha Valley Road.		1981	12-11-81 12-16-81 12-17-81 12-22-81 12-23-81	.33 .59 .29 2.26 1.86
Makaha Stream	Pacific Ocean	Lat 21°30'30", long 158°10'52", 1.1 mi (1.8 km) northeast of Kaneaki Heiau and 3.6 mi (5.8 km) northeast of junction of Farrington Highway and Makaha Valley Road.			12-11-81 12-14-81 12-16-81 12-17-81 12-22-81 12-23-81	.33 .30 .29 .28 2.28 1.66
Waiakeakua Stream	Manoa Stream	Lat 21°19'59", long 157°47'56", 2,100 ft (640 m) upstream from confluence of Waihi and Waiakeakua Streams, 1.2 mi (1.9 km) north of Manoa School, and 4.5 mi (7.2 km) northeast of Honolulu Post Office.			9-21-82	2.44
Luaalaea Stream	Waiakeakua Stream	Lat 21°20'03", long 157°48'05", 1,700 ft (520 m) upstream from confluence of Waihi and Waiakeakua Streams, 1.2 mi (1.9 km) north of Manoa School, and 4.4 mi (7.1 km) northeast of Honolulu Post Office.			9-21-82	2.43
Aihualama Stream	Waihi Stream	Lat 21°20'11", long 157°48'14", 2,500 ft (760 m) upstream from confluence of Waihi and Waiakeakua Streams, 1.2 mi (1.9 km) north of Manoa School, and 4.3 mi (6.9 km) northeast of Honolulu Post Office.			9-21-82 9-22-82	.29 .22
Waihi Stream	Manoa Stream	Lat 21°20'05", long 157°48'10", 1,700 ft (520 m) upstream from confluence of Waihi and Waiakeakua Streams, 1.2 mi (1.9 km) north of Manoa School, and 4.3 mi (6.9 km) northeast of Honolulu Post Office.			9-22-82	.74
16238500 Waihi Stream	Manoa Stream	Lat 21°19'55", long 157°48'12", on left bank 100 ft (30 m) upstream from bridge on Waaloa Way, 700 ft (210 m) upstream from confluence with Waiakeakua Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.	1.14 (2.95)	1913-21, 1925-81	9-21-82 9-22-82	1.20 1.11

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
16240500 Waiakeakua Stream	Manoa Stream	Lat 21°19'53", long 157°48'12", on right bank 5 ft (2 m) downstream from bridge on Waaloa Way, 500 ft (152 m) upstream from confluence with Waihi Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.	1.06 (2.75)	1913-21, 1925-81	9-21-82 9-22-82	4.91 4.78
Manoa Stream	Ala Wai Canal	Lat 21°19'47", long 157°48'13", 200 ft (60 m) downstream from confluence of Waihi and Waiakeakua Streams, 0.8 mi (1.3 km) north of Manoa School, and 4.1 mi (6.6 km) northeast of Honolulu Post Office.			9-21-82	6.36
Manoa Stream	Ala Wai Canal	Lat 21°19'01", long 157°48'33", 1.1 mi (1.8 km) downstream from confluence of Waihi and Waiakeakua Streams, 0.2 mi (0.3 km) southeast of Manoa School, and 3.5 mi (5.6 km) northeast of Honolulu Post Office.			9-21-82	6.76
Manoa Stream	Ala Wai Canal	Lat 21°18'28", long 157°48'49", 1.1 mi (1.8 km) upstream from confluence of Manoa and Palolo Streams, 0.9 (1.4 km) south of Manoa School, and 3.2 mi (5.2 km) east of Honolulu Post Office.			9-21-82	6.98
Manoa Stream (below diversion)	Ala Wai Canal	Lat 21°17'59", long 157°49'00", 2,500 ft (760 m) upstream from confluence of Manoa and Palolo Streams, 1.4 mi (2.3 km) south of Manoa School, and 3.1 mi (5.0 km) east of Honolulu Post Office.			9-21-82	6.89
Manoa ditch diversion		Lat 21°17'59", long 157°49'00", 2,500 ft (760 m) upstream from confluence of Manoa and Palolo Streams, 1.4 mi (2.3 km) south of Manoa School, and 3.1 mi (5.0 km) east of Honolulu Post Office.			9-21-82	.24
Manoa Stream	Ala Wai Canal	Lat 21°17'40", long 157°49'03", 200 ft (61 m) upstream of confluence of Manoa and Palolo Streams, 1.8 mi (2.9 km) south of Manoa School, and 3.1 mi (5.0 km) east of Honolulu Post Office.			9-21-82	8.15
Manoa-Palolo Drainage Canal	Ala Wai Canal	Lat 21°17'24", long 157°49'17", 0.3 mi (0.5 km) downstream from confluence of Manoa and Palolo Streams and 0.6 mi (1.0 km) upstream from point of discharge into Ala Wai Canal.			9-21-82	8.72
Kaluanui Stream	Pacific Ocean	Lat 21°35'30", long 157°54'30", 0.9 mi (1.4 km) downstream from Sacred Falls, 1.5 mi (2.4 km) west of Punaluu Beach Park, and 1.6 mi (2.6 km) south of cemetery in Hauula.			6- 2-82 6- 3-82 6- 4-82 6- 7-82 6- 8-82 6- 9-82 6-14-82 6-15-82	.54 .48 6.32 2.95 1.31 .99 1.49 1.12
Kaluanui Stream	Pacific Ocean	Lat 21°35'42", long 157°54'24", 1.2 mi (1.9 km) downstream from Sacred Falls, 1.6 mi (2.6 km) west of Punaluu Beach Park, and 1.4 mi (2.3 km) south of cemetery in Hauula.			6- 2-82 6- 3-82 6- 4-82 6- 7-82 6- 8-82 6- 9-82 6-14-82 6-15-82	.50 .41 5.49 3.71 1.99 1.42 2.17 1.58

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
Kaluanui Stream	Pacific Ocean	Lat 21°35'53", long 157°54'24", 1.4 mi (2.3 km) downstream from Sacred Falls, 1.7 mi (2.7 km) west of Punaluu Beach Park, and 1.2 mi (1.9 km) south of cemtery in Hauula.			6- 2-82 6- 4-82 6- 7-82 6- 8-82 6- 9-82 6-14-82 6-15-82	a.03 5.06 3.38 1.59 .92 2.03 1.28
Ihiihi Gulch	Kahawainui Stream	Lat 21°38'42", long 157°56'22", 0.5 mi (0.8 km) southwest of Laie Temple and 2.4 mi (3.9 km) southeast of Kahuku School.	1.28 (3.32)	1963	3-21-82	1770
		Hawaii, Island of Maui				
Waiaka development	Koolau ditch	Lat 20°48'54", long 156°07'16", at Nahiku weir, 100 ft (30 m) upstream from Koolau ditch station 16512000 and 0.6 mi (1.0 km) east from Puakaa State Park.			6- 3-82	1.01
16521000 Wailuanui Stream	Pacific Ocean	Lat 20°50'10", long 156°08'30", 500 ft (150 m) downstream from highway, 1.8 mi (2.9 km) southeast of Keanae Post Office, and 3.1 mi (5.0 km) northwest of Nahiku.	2.51 (6.50)	1932-35, 1939-47	6-25-82	.41
Diversion ditch from Wailuanui Stream		Lat 20°50'27", long 156°08'17", 0.3 mi (0.5 km) southeast from Keanae Valley Lookout Park, 0.5 mi (0.8 km) south of Wailua Homesteads, 0.9 mi (1.4 km) south from Keanae School.		1976, 1977	6-25-82	.39
Kahakuloa Stream	Pacific Ocean	Lat 20°57'20", long 156°34'11", at elevation 1,200 ft (366 m), 1.5 mi (2.4 km) upstream from confluence with Kapuna Stream, and 3.3 mi (5.3 km) upstream from mouth.			9-21-82	2.81
Kahakuloa Stream	Pacific Ocean	Lat 20°57'08", long 156°34'05", at elevation 1,040 ft (317 m), 1.1 mi (1.8 km) upstream from confluence with Kapuna Stream, 1.6 mi (2.6 km) upstream from gaging station 16618000, and 3.0 mi (4.8 km) upstream from mouth.			9-21-82	3.47
Unnamed right branch	Kahakuloa Stream	Lat 20°58'17", long 156°33'44", at elevation 720 ft (219 m), 0.3 mi (0.5 km) upstream from confluence of Kahakuloa and Kapuna Streams, and 2.2 mi (3.6 km) upstream from mouth.			9-21-82	.96
Kahakuloa Stream	Pacific Ocean	Lat 20°58'18", long 156°33'43", at elevation 710 ft (216 m), downstream of confluence with unnamed right branch, 0.3 mi (0.5 km) upstream from Kapuna Stream, and 2.1 mi (3.4 km) upstream from mouth.			9-21-82	5.49
Kapuna Stream	Kahakuloa Stream	Lat 20°58'34", long 156°33'44", at elevation 550 ft (168 m), upstream from confluence with Kahakuloa Stream, 0.5 mi (0.8 km) upstream from gaging station 16618000, and 1.9 mi (3.1 km) upstream from mouth.			9-21-82	3.56

a Estimated.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Maui--Continued				
Kahakuloa Stream	Pacific Ocean	Lat 20°58'35", long 156°33'43", at elevation 540 ft (165 m), downstream of confluence with Kapuna Stream, 0.5 mi (0.8 km) upstream from gaging station 16618000, and 1.8 mi (2.9 km) upstream from mouth.			9-21-82	9.64
16618000 Kahakuloa Stream	Pacific Ocean	Lat 20°58'54", long 156°33'26", 0.5 mi (0.8 km) downstream from Kapuna Stream, 1.3 mi (2.1 km) south of Kahakuloa, and 2.0 mi (3.2 km) west of Puu Makawana.	3.47 (8.99)	1939-43, 1947-71, 1975-82	9-21-82	8.19
Kahakuloa Stream	Pacific Ocean	Lat 20°59'21", long 156°33'16", at elevation 180 ft (55 m), 100 ft (30 m) upstream from diversion ditch, 0.5 mi (0.8 km) downstream from gaging station 16618000, and 0.9 mi (1.4 km) upstream from mouth.			9-21-82	7.35
Diversion ditch		Lat 20°59'22", long 156°33'15", at elevation 170 ft (52 m), diversion ditch from Kahakuloa Stream, 0.5 mi (0.8 km) downstream from gaging station 16618000, and 0.8 mi (1.3 km) upstream from mouth.			9-21-82	1.03
Kahakuloa Stream	Pacific Ocean	Lat 20°59'36", long 156°33'09", at elevation 120 ft (37 m), 0.6 mi (1.0 km) upstream from mouth and 0.8 mi (1.3 km) downstream from station 16618000.			9-21-82	5.98
Kahakuloa Stream	Pacific Ocean	Lat 20°59'54", long 156°33'05", at elevation 30 ft (9 m), 200 ft (61 m) upstream from Kahakuloa bridge, 1,200 ft (366 m) upstream from mouth, and 1.2 mi (1.9 km) downstream from station 16618000.			9-21-82	6.47
		Hawaii, Island of Hawaii				
Middle flume spring tunnel	Waiakea Stream	Lat 19°38'21", long 155°10'38", 7.7 mi (12.4 km) northwest of Mountain View and 8.4 mi (13.5 km) southwest of Hilo Post Office.			10-30-81	3.27
Kapehu Stream	Wailuku River	Lat 19°44'03", long 155°10'05", 2.5 mi (4.0 km) northwest of Piihonua and 4.9 mi (7.9 km) west of Hilo Post Office.	3.85 (9.97)		1-12-82 3- 3-82	10.9 6.48
Alia Stream	Pacific Ocean	Lat 19°50'06", long 155°09'12", at elevation 1,600 ft (488 m), 4.0 mi (6.4 km) northwest of Onomea Bay, and 4.6 mi (7.4 km) west of Pepeekeo Point.			8-25-82 9- 9-82	.53 .27
Alia Stream	Pacific Ocean	Lat 19°50'14", long 155°08'32", at elevation 1,200 ft (366 m), 3.5 mi (5.6 km) northwest of Onomea Bay and 3.9 mi (6.3 km) west of Pepeekeo Point.			8-25-82 9- 9-82	.98 .58
Alia Stream	Pacific Ocean	Lat 19°50'14", long 155°07'58", at elevation 1,000 ft (305 m), upstream of Mauka Loa Spring inflow, 3.0 mi (4.8 km) northwest of Onomea Bay, and 3.2 mi (5.1 km) west of Pepeekeo Point.			9- 9-82	1.07

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1982

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Hawaii--Continued				
Alia Stream	Pacific Ocean	Lat 19°50'18", long 155°07'46", at elevation 900 ft (274 m), 2.8 mi (4.5 km) northwest of Onomea Bay, and 3.0 mi (4.8 km) west of Pepeekeo Point.			8-25-82	6.01
Alia Stream	Pacific Ocean	Lat 19°50'23", long 155°07'07" at elevation 750 ft (229 m), 2.3 mi (3.7 km) northwest of Onomea Bay, and 2.3 mi (3.7 km) west of Pepeekeo Point.			8-25-82 9- 9-82	6.43 6.18
Diversion to Alia Stream	Alia Stream	Lat 19°50'38", long 155°06'31", at elevation 550 ft (168 m), 1.5 mi (2.4 km) west of Pepeekeo, and 1.7 mi (2.7 km) northwest of Onomea Bay.			9- 9-82	2.14
16717600 Alia Stream	Pacific Ocean	Lat 19°50'38", long 155°06'21", 10 ft (3.0 m) downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi (3.2 km) south of Honomu, and 8.0 mi (12.9 km) north of Hilo.	.58 (1.50)	1962-72≠, 1973-81	8-25-82 9- 9-82	21.8 13.9
Alia Stream	Pacific Ocean	Lat 19°50'49", long 155°05'58", at elevation 350 ft (107 m), 100 ft (30 m) above diversion to Pepeekeo Reservoir, 1.0 mi (1.6 km) west of Pepeekeo Point, and 2.0 mi (3.2 km) southwest of Honomu.			9- 9-82	18.3
Alia Stream	Pacific Ocean	Lat 19°50'51", long 155°05'55", at elevation 320 ft (98 m), 100 ft (30 m) below diversion to Pepeekeo Reservoir, 0.9 mi (1.4 km) west of Pepeekeo Point, and 2.0 mi (3.2 km) southeast of Honomu.			8-25-82 9- 9-82	11.0 4.55
Alia Stream	Pacific Ocean	Lat 19°51'02", long 155°05'46", at elevation 240 ft (73 m), at cane road crossing, 0.7 mi (1.1 km) west of Pepeekeo Point, and 1.9 mi (3.1 km) southeast of Honomu.			9- 9-82	3.92
Unnamed tributary	Alia Stream	Lat 19°51'08", long 155°05'47", at elevation 240 ft (73 m), at cane road crossing, 0.8 mi (1.3 km) west of Pepeekeo Point, and 1.8 mi (2.9 km) southeast of Honomu.			9- 9-82	1.76
Alia Stream	Pacific Ocean	Lat 19°51'17", long 155°05'15", at elevation 50 ft (15 m), 300 ft (91 m) upstream from mouth, and 0.4 mi (0.6 km) north of Pepeekeo Point.			8-25-82 9- 9-82	10.3 4.74

≠ Operated as a continuous-record gaging station.

Water-quality partial-record stations are particular sites where chemical-quality, biological and or sediment data are collected systematically over a period of years for use in hydrologic analyses. The data are collected usually less than quarterly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU

16228200 MOANALUA STREAM NEAR AIEA (LAT 21°22'37" LONG 157°52'58")

DATE	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)
OCT			
28...	230	356	221
NOV			
01...	61	83	14
02...	44	30	3.6
DEC			
20...	57	47	7.2
21...	89	26	6.2
25...	56	168	25
JAN			
06...	36	14	1.4
07...	72	30	5.8
19...	9.5	14	.36
20...	165	139	62
21...	378	291	297
22...	96	40	10
25...	86	87	20
MAR			
12...	149	157	63
13...	40	25	2.7
14...	67	70	13
15...	400	534	577
MAR			
21...	40	134	14
23...	231	343	214
27...	119	248	80
30...	154	284	118
31...	215	199	116
APR			
02...	92	212	53
03...	40	50	5.4
08...	45	44	5.3
09...	42	29	3.3
16...	20	50	2.7
17...	57	198	30
MAY			
18...	29	86	6.7
JUN			
16...	54	178	26
AUG			
25...	381	492	506
SEP			
01...	146	256	101

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
OCT									
27...	1235	15	128	7.0	27	61	--	--	27
27...	1305	10	125	6.9	12	99	--	--	89
27...	1330	95	114	6.9	15	110	--	--	72
27...	1345	30	117	6.9	15	99	--	--	90
27...	2230	55	130	6.9	18	99	--	--	120
27...	2245	230	122	6.9	20	120	--	--	133
27...	2300	10	121	7.0	29	110	--	--	132
27...	2330	40	114	7.0	20	69	--	--	77
27...	2345	400	102	7.0	15	54	--	--	55
27...	2400	140	92	7.0	14	67	--	--	52
28...	0015	25	88	7.1	20	110	--	--	38
28...	0030	30	85	7.2	25	84	--	--	43
28...	0033	30	157	7.4	35	240	--	--	583
NOV									
01...	1420	15	98	7.2	25	120	36	.05	292
01...	1720	22	57	7.5	35	69	38	.05	292
01...	1735	56	54	7.6	40	140	40	.05	242
01...	1750	107	38	7.6	40	100	33	.04	184
01...	1805	22	31	7.8	64	87	34	.05	138

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	LEAD, TOTAL RECOV-ERABLE (UO/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
OCT									
27...	<.09	.120	.88	1.00	--	.580	<30	100	.2
27...	.20	.110	1.4	1.50	1.7	.600	<30	100	.2
27...	.13	.100	1.7	1.80	1.9	.470	<30	100	.2
27...	.20	.110	1.2	1.30	1.5	.490	<30	100	.2
27...	.23	.120	1.4	1.50	1.7	.530	<30	100	.2
27...	.22	.100	1.2	1.30	1.5	.530	<30	100	.3
27...	.11	.110	.99	1.10	1.2	.590	<30	200	.2
27...	.14	.090	.75	.84	.98	.470	<30	100	.2
27...	.21	.100	.90	1.00	1.2	.370	<30	100	.1
27...	.22	.090	.78	.87	1.1	.350	<30	100	.2
28...	.18	.090	.77	.86	1.0	.390	<30	100	.1
28...	.16	.140	.96	1.10	1.3	.340	<30	100	.2
28...	.17	.240	2.6	2.80	3.0	1.10	<30	300	--
NOV									
01...	.59	.270	1.6	1.90	2.5	.420	<30	200	.2
01...	.55	.210	.89	1.10	1.7	.200	<30	200	.2
01...	.38	.180	1.3	1.50	1.9	.110	<30	200	.2
01...	.17	.180	.92	1.10	1.3	.240	<30	200	.2
01...	.16	.200	.80	1.00	1.2	.160	<30	100	.2

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
FEB											
02...	0710	22	82	20	72	--	--	301	130	200	.1
09...	0110	38	99	27	--	62	.08	282	100	200	.1
10...	1845	75	60	22	62	--	--	322	130	200	.1
10...	1900	95	50	23	27	--	--	230	130	200	.1
11...	1525	15	48	20	54	38	.05	258	<2	200	.1
11...	1610	30	47	26	36	44	.06	179	1	100	.1
11...	1625	38	60	17	17	41	.06	58	50	<100	.1
11...	1640	30	72	16	16	50	.07	77	50	<100	.1
MAR											
11...	2335	30	74	27	69	45	.06	278	<30	200	.4
11...	2350	22	78	30	68	65	.09	436	<30	300	.3
12...	1605	22	69	32	54	46	.06	344	<30	300	.3
12...	1620	22	78	35	61	60	.08	262	<30	200	.2
12...	1640	22	66	18	36	49	.07	112	<30	100	.1
14...	1325	30	106	30	100	80	.11	338	<30	200	.3
14...	1340	38	76	31	31	60	.08	277	<30	300	.2
14...	1635	30	76	33	66	59	.08	228	<30	300	.2
14...	1755	30	60	29	26	51	.07	231	<30	<100	.2
14...	1810	22	58	35	27	43	.06	173	<10	200	.2
15...	0030	38	58	29	<10	--	--	167	<30	200	.1
15...	0033	76	151	24	150	--	--	564	<30	600	.6
15...	0045	85	155	32	120	111	.15	367	<30	400	.6
18...	1310	85	80	31	71	59	.08	315	<10	500	.2
18...	1325	47	53	31	30	40	.05	213	<10	200	.1
21...	1255	85	49	39	21	--	--	112	--	--	.2
21...	1257	107	95	31	61	--	--	263	--	--	.1
21...	1310	107	94	80	66	90	.12	361	<10	400	.2
21...	1355	95	62	63	--	--	--	349	<10	300	.2
21...	1410	128	63	99	24	58	.08	155	<10	<100	.3
21...	1425	38	64	96	17	--	--	151	<10	100	.1
21...	1427	22	81	--	40	--	--	140	<10	100	.2

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
JUN											
04...	1645	38	49	--	21	85	--	--	--	--	--
04...	1646	38	45	7.2	--	--	15	.00	5.0	.5	3.0
04...	1647	38	46	7.3	--	--	15	.00	5.2	.5	3.1
04...	1648	38	46	7.2	--	--	16	.00	5.6	.5	3.7

DATE	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
JUN											
04...	--	--	--	--	--	--	--	--	--	--	261
04...	30	.4	.7	16	<5.0	2.1	.1	3.1	--	--	--
04...	30	.4	.7	17	<5.0	1.9	.2	2.3	--	--	--
04...	32	.4	.7	17	5.0	2.3	<.1	3.3	32	.04	--

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)
JUN											
04...	.10	.16	.100	.080	1.6	.32	.56	1.70	1.3	.40	1.8
04...	--	.27	--	--	--	--	--	--	--	--	--
04...	--	.14	--	--	--	--	--	--	--	--	--
04...	--	.11	--	--	--	--	--	--	--	--	--

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)
JUN											
04...	.500	.070	<30	--	400	--	--	--	--	--	--
04...	--	--	--	59	--	4	.1	<.10	.11	.60	<.00
04...	--	--	--	66	--	2	.2	<.10	.09	.70	<.00
04...	--	--	--	64	--	3	.2	--	--	--	--

DATE	TIME	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	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)
JUN											
04...	1646	.01	<.00	1.2	.01	<.00	<.00	<.01	.02	<.00	.00
04...	1647	.01	<.00	1.1	.02	<.00	<.00	<.01	.03	<.00	.00

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

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)
JUN											
04...	1646	.13	<.01	<.01	<.01	<.01	<.10	<.10	<.01	<1	<.01
04...	1647	.13	<.01	<.01	<.01	<.01	<.10	<.10	<.01	<1	<.01

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
AUG										
16...	1030	56	--	7.6	11	27	10000	35	.05	41
16...	1031	56	43	--	7.9	--	8400	23	.03	21
25...	1725	75	44	--	39	53	--	46	.06	91
25...	1730	75	42	--	33	26	--	34	.05	76
25...	1745	47	52	--	19	27	--	49	.07	57
25...	1750	30	55	--	22	47	--	35	.05	33
25...	1805	22	68	--	17	25	--	56	.08	27
25...	1810	22	78	--	20	29	--	58	.08	24
25...	1845	75	36	--	15	25	--	33	.04	21
25...	1850	38	38	--	15	26	--	35	.05	38

DATE	TIME	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
AUG											
16...	1030	<.10	<.10	.130	.160	.77	.64	.90	.10	.80	.170

DATE	TIME	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
AUG							
16...	1030	.060	<10	<100	<.1	4.2	1.1
16...	1031	--	<10	<100	<.1	--	--
25...	1725	--	<10	<100	.1	--	--
25...	1730	--	<10	<100	.1	--	--
25...	1745	--	<10	<100	.1	--	--
25...	1750	--	<10	<100	<.1	--	--
25...	1805	--	10	<100	<.1	--	--
25...	1810	--	<10	<100	<.1	--	--
25...	1845	--	<10	<100	.1	--	--
25...	1850	--	<10	<100	<.1	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	OXYOEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
SEP												
01...	1103	47	74	14	99	>23000	44	.06	212	<10	300	.2
01...	1112	160	36	42	21	20000	28	.04	73	<10	200	.1
01...	1125	107	46	41	42	>26000	32	.04	66	<10	<100	.1
01...	1137	56	48	40	18	K18000	36	.05	57	<10	<100	.1
01...	1150	250	50	42	30	>24000	40	.05	50	<10	<100	.1
01...	1202	140	53	37	31	>11000	51	.07	41	<10	<100	.1
01...	1215	140	56	40	36	>9400	47	.06	52	<10	<100	.1
01...	1227	85	57	38	29	>15000	44	.06	33	<10	<100	.1
01...	1240	38	58	33	18	>26000	40	.05	47	10	<100	.1
01...	1252	47	59	28	18	26000	52	.07	44	<10	<100	.1
01...	1305	30	60	31	25	>11000	43	.06	38	<10	<100	.1
01...	1317	30	54	32	21	25000	33	.04	44	<10	<100	.1
01...	1325	30	54	6.0	38	--	25	.03	77	<10	100	1.1
01...	1350	22	54	31	36	--	31	.04	59	<10	100	.2
01...	1400	22	57	11	35	--	47	.06	45	<10	100	.5
02...	0015	22	55	13	30	--	--	--	60	<10	<100	1.5

212553158011000 DRAIN B NEAR MILILANI TOWN (LAT 21°25'53" LONG 158°01'10")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
AUG											
15...	1715	5.2	61	5.3	35	4300	--	--	32	--	--
16...	0710	14	64	5.5	37	9300	--	--	41	--	--
16...	0725	32	38	8.3	34	26000	32	.04	64	<.10	<.10
16...	0735	14	26	9.4	33	25000	25	.03	96	<.10	<.10
16...	0745	5.2	30	9.4	25	17000	31	.04	48	.11	.12
16...	0800	7.0	32	11	<10	K35000	36	.05	41	.14	.13
16...	0815	5.2	38	4.5	26	21000	37	.05	17	.15	.16
16...	0835	9.0	45	23	27	28000	--	--	45	--	--
16...	1030	2.5	39	10	17	K17000	26	.04	22	<.10	<.10

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.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

212553158011000 DRAIN B NEAR MILILANI TOWN (LAT 21°25'53" LONG 158°01'10")

DATE	TIME	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)
AUG											
16...	0725	.110	.110	1.2	1.1	--	1.30	.10	1.2	--	.180
16...	0735	.140	.160	1.5	.74	--	1.60	.70	.90	--	.180
16...	0745	.110	.170	1.4	.63	.92	1.50	.70	.80	1.6	.170
16...	0800	.110	.120	.99	.88	1.1	1.10	.10	1.0	1.2	.150
16...	0815	.120	.140	.48	.36	.96	.60	.00	.50	.75	.120
16...	1030	.160	.140	1.2	.46	--	1.40	.50	.60	--	.140

DATE	TIME	PHOSPHORUS, DISSOLVED (MG/L AS P)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)
AUG							
15...	1715	--	<10	<100	<.1	--	--
16...	0710	--	10	100	<.1	--	--
16...	0725	.070	<10	100	<.1	--	--
16...	0735	.060	<10	100	<.1	--	--
16...	0745	.090	<10	100	<.1	--	--
16...	0800	.090	<10	<100	<.1	--	--
16...	0815	.080	<10	<100	<.1	--	--
16...	0835	--	<10	<100	<.1	--	--
16...	1030	.060	<10	100	<.1	4.2	.4

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (UMHOS)	TURBIDITY (NTU)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)
SEP												
01...	1115	22	36	22	49	11000	37	.05	91	<10	200	.1
01...	1150	28	30	12	41	K31000	16	.02	47	<10	<100	.1
01...	1152	--	--	--	--	22000	--	--	--	--	--	--
01...	1210	46	29	14	36	16000	15	.02	43	<10	<100	<.1
01...	1225	28	43	18	29	--	28	.04	22	<10	<100	<.1

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.

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)					
OCT , 1981					
15...	1105	6.5	28	5.8	17.5
DEC					
07...	1225	1030	36	5.6	15.0
JAN , 1982					
27...	1035	75	43	5.7	13.0
MAR					
15...	1120	32	26	5.9	14.5
APR , 1982					
22...	1120	114	28	5.6	13.5
JUN					
03...	1245	6.8	31	6.0	18.0
JUL					
21...	1010	22	30	5.7	18.5
SEP					
09...	1155	6.3	27	6.5	19.5
16014000 - KOKEE DITCH NR WAIMEA, KAUAI, HI (LAT 22 06 42 LONG 159 40 43)					
OCT , 1981					
15...	1430	9.9	31	5.8	18.0
DEC					
09...	1420	32	28	6.3	14.0
JAN , 1982					
27...	1405	2.6	48	6.6	13.5
MAR					
11...	1430	24	40	6.4	13.5
APR , 1982					
27...	1020	56	38	5.7	14.0
JUN					
14...	1020	15	45	5.7	16.5
JUL					
22...	1010	42	42	5.7	16.5
SEP					
09...	1430	12	38	6.3	19.0
16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)					
OCT , 1981					
14...	1355	14	120	7.3	22.0
DEC					
10...	1405	20	110	7.3	19.5
JAN , 1982					
26...	1430	115	93	6.5	17.5
MAR					
04...	1150	44	105	7.3	19.0
12...	1430	300	55	6.4	18.5
APR , 1982					
20...	1445	188	75	6.5	19.5
JUL					
09...	1330	92	68	6.8	23.5
AUG					
23...	1220	170	62	6.7	22.5
16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE, KAUAI, HI (LAT 21 57 29 LONG 159 33 13)					
OCT , 1981					
14...	1015	18	120	7.1	21.0
DEC					
10...	1050	65	100	7.4	17.5
JAN , 1982					
26...	1055	91	92	7.3	16.5
MAR					
09...	0945	20	130	7.3	18.5
APR , 1982					
20...	1015	68	97	6.7	19.5
JUN					
15...	1055	26	90	7.4	21.0
JUL					
09...	1015	270	58	6.9	21.0
SEP					
08...	0955	35	130	6.9	22.0
16060000 - SF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 02 24 LONG 159 22 58)					
OCT , 1981					
01...	1340	6.3	95	6.7	26.0
NOV					
05...	1420	200	90	7.2	21.5
DEC					
01...	1345	148	89	7.2	21.0
JAN , 1982					
05...	1345	53	110	7.2	19.0
FEB					
02...	1335	111	95	7.4	18.5
MAR					
01...	1430	91	102	7.1	20.0
APR , 1982					
01...	1435	1310	58	6.3	20.0
MAY					
04...	0900	60	65	6.9	19.0
JUN					
01...	1400	33	120	6.8	22.0
JUL					
01...	1345	86	60	6.7	23.0
AUG					
03...	1350	152	70	6.4	22.0
SEP					
01...	1410	203	70	6.7	21.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16061000 - NORTH WAILUA DITCH NR LIHUE, KAUAI, HI (LAT 22 03 56 LONG 159 28 14)					
OCT , 1981					
02...	1250	21	65	6.7	20.5
NOV					
04...	1415	6.6	71	7.4	20.5
DEC					
02...	1300	26	70	7.4	19.0
JAN , 1982					
06...	1335	33	34	7.0	18.5
FEB					
03...	1305	19	74	7.5	17.0
MAR					
02...	1215	13	70	7.5	18.5
APR , 1982					
02...	1155	8.8	60	7.5	18.5
MAY					
03...	1450	21	70	6.3	18.5
JUN					
02...	1255	24	70	7.4	21.0
30...	1335	30	31	6.8	19.5
AUG					
04...	1230	19	65	6.7	20.5
31...	1240	7.8	70	7.4	22.0
SEP					
21...	1045	23	--	--	20.0
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE, KAUAI, HI (LAT 22 03 34 LONG 159 28 00)					
OCT , 1981					
20...	1040	20	75	7.4	18.5
NOV					
20...	1320	21	75	7.4	20.5
DEC					
17...	1135	19	77	7.5	17.5
JAN , 1982					
20...	0915	30	45	6.9	18.5
FEB					
18...	1110	21	77	7.0	19.0
MAR					
24...	0915	30	45	6.9	18.5
APR , 1982					
19...	1145	16	73	7.2	19.5
MAY					
20...	1230	22	75	7.4	21.0
JUN					
21...	1105	21	75	7.3	20.0
JUL					
19...	1155	22	75	7.4	20.5
AUG					
19...	1020	16	75	6.9	21.5
SEP					
20...	1040	16	77	7.3	20.0
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)					
OCT , 1981					
20...	0915	20	87	7.1	19.0
NOV					
20...	0935	.02	125	6.5	22.0
JAN , 1982					
20...	1335	.31	72	6.7	20.0
FEB					
18...	0940	.24	97	7.7	20.0
MAR					
22...	1015	.03	125	6.5	20.0
APR					
19...	0925	.06	120	6.4	23.0
MAY , 1982					
20...	0950	.08	120	6.5	22.0
JUN					
21...	0830	.26	75	6.8	22.0
JUL					
19...	0940	.38	80	6.8	22.0
AUG					
19...	0745	.18	80	6.7	22.0
SEP					
20...	0910	.02	110	6.5	23.0
16063000 - NF WAILUA RIVER AT ALT 650 FT NR LIHUE, KAUAI, HI (LAT 22 04 02 LONG 159 26 21)					
OCT , 1981					
02...	1040	34	75	6.6	20.5
NOV					
05...	1115	121	80	7.4	20.0
DEC					
02...	1040	78	85	7.3	19.0
JAN , 1982					
06...	1200	405	45	7.1	19.0
FEB					
03...	1030	36	90	7.2	16.5
MAR					
02...	1000	320	43	7.1	18.5
APR , 1982					
02...	0955	482	45	7.1	18.0
MAY					
04...	1240	43	70	7.4	19.0
JUN					
02...	1045	32	75	6.6	20.5
JUL					
01...	1045	53	73	6.9	21.0
AUG					
04...	1050	98	73	6.8	20.0
31...	1000	106	82	7.4	21.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)					
OCT , 1981					
26...	1030	26	93	7.3	19.5
NOV					
24...	1040	97	78	6.9	18.5
DEC					
23...	1035	85	78	6.9	21.0
JAN , 1982					
21...	1225	725	41	6.6	18.5
FEB					
22...	1010	80	65	6.6	19.0
MAR					
25...	1300	120	73	6.7	18.5
APR , 1982					
26...	0925	55	86	6.7	19.5
MAY					
25...	1000	43	87	6.5	19.0
JUN					
25...	0945	33	95	6.9	22.0
JUL					
27...	1015	42	100	6.8	21.0
AUG					
26...	1005	100	79	6.5	21.5
SEP					
27...	0900	43	90	6.5	20.5
16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)					
OCT , 1981					
20...	1235	28	87	7.3	24.5
NOV					
20...	1105	30	78	7.1	23.5
DEC					
17...	1335	9.9	80	7.2	22.0
FEB , 1982					
18...	1305	21	88	6.9	23.5
MAR					
22...	1350	.15	90	6.8	21.5
MAY , 1982					
20...	1425	25	87	7.3	22.0
JUN					
22...	0920	15	90	6.5	26.5
JUL					
19...	1415	14	78	7.1	22.0
AUG					
19...	1255	25	86	7.1	21.5
SEP					
20...	1415	14	85	7.2	23.0
16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)					
OCT , 1981					
08...	0945	66	83	6.8	22.0
NOV					
17...	0940	94	80	7.4	18.0
JAN , 1982					
11...	0955	112	95	7.4	19.0
FEB					
26...	1135	491	65	7.0	19.5
APR , 1982					
16...	0945	241	93	6.6	21.0
MAY					
26...	1035	83	97	6.8	22.5
JUN					
29...	1040	44	95	7.3	23.0
AUG					
12...	0945	166	78	6.7	22.5
16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)					
OCT , 1981					
08...	1300	1.3	100	6.6	22.5
NOV					
17...	1240	2.9	88	6.9	21.0
JAN , 1982					
11...	1215	2.9	87	7.0	21.0
FEB					
26...	1400	10	74	6.8	21.0
APR , 1982					
16...	1400	7.0	78	6.2	21.0
MAY					
26...	1250	2.8	89	6.7	22.5
JUN					
29...	1245	1.8	96	6.8	22.5
AUG					
12...	1125	2.9	85	6.5	22.5
16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)					
OCT , 1981					
20...	1235	8.1	70	7.0	22.0
NOV					
23...	1205	26	42	7.4	18.5
DEC					
17...	1305	9.5	65	7.2	19.0
JAN , 1982					
20...	1220	7.8	85	6.9	18.5
FEB					
18...	1220	8.0	72	7.4	19.5
MAR					
22...	1110	1.4	102	6.5	20.0
APR , 1982					
19...	1040	.42	105	7.3	21.0
MAY					
20...	1140	.37	107	6.9	20.5
JUN					
21...	1105	.48	108	6.5	21.5
JUL					
20...	1250	1.2	100	6.5	20.0
AUG					
20...	1035	2.1	102	6.6	21.5
SEP					
20...	1055	1.2	100	6.5	20.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)					
OCT , 1981					
20...	1440	3.0	78	7.2	22.5
NOV					
24...	0930	.29	80	6.9	20.5
DEC					
17...	1440	4.7	72	7.0	19.0
JAN , 1982					
20...	1435	22	85	7.0	19.5
FEB					
18...	1400	4.4	75	7.2	20.5
MAR					
22...	0930	.20	150	6.1	20.5
APR , 1982					
19...	0920	.12	112	6.7	22.0
MAY					
20...	1005	.33	105	6.9	22.0
JUN					
21...	0915	15	100	6.5	20.0
JUL					
20...	1410	.46	100	6.7	21.0
AUG					
20...	0850	8.8	105	6.8	21.0
SEP					
20...	0920	15	114	6.7	20.5
16080000 KAPAA STR AT KAPAHI DITCH INTK NR KAPAA, KAUAI, HI (LAT 22 06 15 LONG 159 22 29)					
OCT , 1981					
02...	0900	4.4	80	6.8	24.0
NOV					
05...	0950	32	40	7.3	19.5
DEC					
02...	1020	20	48	7.2	20.0
JAN , 1982					
06...	0920	29	70	7.0	18.5
MAR					
02...	1045	83	70	6.9	18.5
MAR , 1982					
31...	1505	323	59	7.6	19.0
JUL					
02...	0920	27	82	7.0	20.5
AUG					
04...	1000	27	85	6.6	22.0
SEP					
02...	1425	29	85	6.6	21.0
16087000 - ANAHOLA DITCH WASTEWAY NR KEALIA, KAUAI, HI (LAT 22 08 16 LONG 159 22 28)					
OCT , 1981					
02...	1430	.10	80	7.0	25.0
NOV					
05...	1425	8.8	65	7.3	21.0
DEC					
02...	1450	.18	65	7.3	22.0
JAN , 1982					
06...	1425	8.0	75	7.1	18.5
FEB					
03...	1335	.47	85	7.4	19.0
MAR					
02...	1210	12	53	6.5	18.5
APR , 1982					
02...	0945	12	51	6.0	19.0
MAY					
04...	1020	.03	80	6.8	19.5
JUN					
02...	1035	.10	83	6.5	21.0
JUL					
02...	1105	.77	53	6.7	20.5
AUG					
04...	1130	3.0	68	6.6	21.5
SEP					
02...	1125	12	68	6.6	20.0
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)					
OCT , 1981					
20...	0920	2.7	78	7.0	21.0
NOV					
23...	0905	23	65	6.9	18.5
DEC					
17...	1010	3.8	60	7.0	19.0
JAN , 1982					
20...	0930	2.4	80	7.3	19.0
FEB					
18...	0950	3.0	78	7.3	19.5
MAR					
22...	1400	.05	97	5.4	21.5
31...	1505	323	59	7.6	19.0
APR , 1982					
19...	1250	.01	100	6.6	23.5
MAY					
20...	1410	5.5	74	6.8	20.5
JUN					
21...	1345	9.4	49	6.4	22.5
JUL					
20...	0920	1.1	75	6.9	19.5
AUG					
20...	1230	.01	112	6.1	25.5
SEP					
20...	1300	4.4	78	6.4	21.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16089000 - ANAHOLA STREAM NR KEALIA, KAUAI, HI (LAT 22 09 05 LONG 159 21 17)					
OCT , 1981					
02...	1150	6.6	72	6.8	24.0
NOV					
05...	1310	23	35	7.0	19.5
DEC					
02...	1250	15	45	7.3	21.0
JAN , 1982					
06...	1240	24	75	7.1	18.5
FEB					
03...	1120	7.9	95	7.3	18.0
MAR					
02...	1430	63	70	6.9	20.5
23...	1310	125	60	6.5	19.0
MAR , 1982					
30...	1300	229	50	6.9	19.5
MAY					
04...	1315	12	103	7.5	23.0
JUN					
02...	1245	12	108	6.7	22.5
JUL					
02...	1350	22	71	7.0	22.0
AUG					
04...	1410	28	83	6.7	23.5
SEP					
02...	0915	38	83	6.7	20.5
16091000 - LOWER ANAHOLA DITCH NR KEALIA, KAUAI, HI (LAT 22 08 14 LONG 159 19 31)					
OCT , 1981					
20...	1055	1.6	95	7.1	22.0
NOV					
23...	1045	.15	100	7.3	19.0
JAN , 1982					
20...	1105	2.2	110	7.2	19.0
FEB					
18...	1105	.27	110	6.9	21.0
MAR , 1982					
22...	1230	.19	150	6.3	22.5
APR					
19...	1150	.03	180	6.8	24.0
MAY					
20...	1245	.01	165	6.5	24.5
JUN					
21...	1235	.03	150	6.3	27.0
16093200 - ANAHOLA STREAM AT ANAHOLA, KAUAI, HI (LAT 22 08 42 LONG 159 18 59)					
OCT , 1981					
08...	1320	6.3	140	7.2	23.0
NOV					
19...	1015	32	98	7.2	20.0
JAN , 1982					
12...	0930	39	170	7.1	19.0
MAR					
03...	0945	346	80	6.9	20.5
APR , 1982					
14...	0945	71	112	6.4	20.0
MAY					
27...	1040	23	130	6.7	21.0
JUL					
07...	1045	134	65	6.6	19.0
AUG					
10...	1020	31	118	6.8	23.5
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA, KAUAI, HI (LAT 22 10 54 LONG 159 25 17)					
OCT , 1981					
13...	1045	15	95	6.9	20.0
NOV					
17...	1035	9.4	55	7.2	20.5
JAN , 1982					
08...	1140	9.2	92	7.1	18.0
FEB					
25...	1005	38	70	6.8	19.0
APR , 1982					
13...	1045	36	65	6.4	20.5
MAY					
18...	1135	36	70	6.7	21.5
JUN					
28...	1100	18	76	6.8	22.0
AUG					
11...	1040	21	78	6.7	22.0
16100000 - HANALEI TUNNEL OUTLET NR LIHUE, KAUAI, HI (LAT 22 05 02 LONG 159 27 50)					
OCT , 1981					
01...	1010	30	78	6.6	19.5
NOV					
04...	1025	43	71	7.4	18.5
DEC					
01...	1025	30	75	7.4	19.5
JAN , 1982					
05...	1040	48	46	7.3	18.0
FEB					
02...	1015	24	72	7.4	18.0
MAR					
01...	1035	3.8	98	7.3	17.0
APR , 1982					
01...	1020	36	43	6.3	18.0
MAY					
03...	1135	6.3	77	6.4	18.5
JUN					
01...	1055	4.9	85	6.7	17.0
30...	1050	24	36	6.8	19.5
AUG					
03...	1050	8.6	70	6.5	20.0
SEP					
01...	1015	6.6	65	6.5	20.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
		16103000	- HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)								
OCT , 1981						APR , 1982					
06...	1010	92	92	6.7	21.5	12...	1040	193	89	6.3	19.0
NOV						MAY					
16...	1020	107	88	7.4	20.0	24...	1110	322	82	7.0	20.5
JAN , 1982						JUL					
13...	1040	94	98	7.4	19.0	06...	1120	458	73	7.0	22.0
FEB						AUG					
24...	1105	431	66	6.6	20.0	09...	1005	153	70	6.7	21.5
		16108000	- WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)								
OCT , 1981						APR , 1982					
07...	1300	137	35	6.5	21.0	15...	1300	94	59	6.7	19.0
JAN , 1982						JUN					
22...	1325	132	55	7.4	17.5	11...	1230	68	67	6.8	19.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16200000 - NF KAUKONAHUA STR AB RB NR WAHIAWA, OAHU, HI (LAT 21 31 09 LONG 157 56 53)					
OCT , 1981					
15...	1205	2.2	46	6.7	21.5
NOV					
30...	1240	77	50	6.0	19.0
JAN , 1982					
05...	1300	3.1	70	7.3	20.5
MAR					
04...	1420	2.1	53	6.6	20.0
APR , 1982					
22...	1515	14	42	6.5	19.0
JUN					
02...	1440	5.5	50	6.7	21.5
JUL					
20...	1400	10	47	6.8	24.0
SEP					
21...	1345	4.9	48	6.7	22.5
16208000 - S F KAUKONAHUA STR AT E PUMP RE WAHIAWA, OAHU, H (LAT 21 29 32 LONG 157 59 54)					
OCT , 1981					
09...	1355	1.8	47	6.2	24.0
JAN , 1982					
14...	1440	6.8	60	6.8	21.5
MAR					
10...	1450	26	62	7.0	20.0
APR					
26...	1610	18	54	7.2	22.0
JUN , 1982					
07...	1630	7.2	58	6.6	23.0
JUL					
26...	1230	12	52	6.3	24.5
SEP					
28...	1330	11	55	6.5	23.5
16211600 - MAKAHA STREAM NR MAKAHA, OAHU, HI (LAT 21 30 16 LONG 158 10 59)					
OCT , 1981					
13...	1300	.03	175	6.9	23.5
NOV					
17...	1215	1.8	140	--	20.5
DEC					
14...	1320	.59	220	8.5	20.5
16...	1000	.59	210	8.5	20.0
17...	0920	.30	180	8.3	20.0
17...	1510	.39	175	8.2	21.5
18...	1405	.38	165	7.4	22.5
20...	1430	1.7	110	7.2	20.5
22...	1005	2.8	95	6.9	20.5
22...	1535	2.4	88	7.1	20.5
23...	1300	2.1	115	7.4	20.0
JAN , 1982					
12...	1250	10	85	6.9	19.5
MAR					
05...	1430	3.5	96	6.9	20.0
APR					
23...	1445	4.8	110	7.1	18.5
JUN					
08...	1530	.78	115	7.2	22.0
JUL					
29...	1535	2.0	210	6.8	22.0
SEP					
22...	1515	.29	120	7.0	21.5
16216000 - WAIAWA STREAM NR PEARL CITY, OAHU, HI (LAT 21 23 57 LONG 157 58 51)					
OCT , 1981					
19...	1250	2.3	1000	7.1	24.0
DEC					
10...	1130	3.8	600	6.8	21.5
JAN , 1982					
20...	1310	402	120	7.0	21.0
FEB					
03...	1330	7.1	660	7.2	23.5
APR , 1982					
01...	1555	175	120	7.4	22.0
MAY					
10...	1210	6.0	580	7.0	24.5
JUN					
22...	1220	3.6	725	7.3	26.5
AUG					
05...	1225	8.9	430	7.0	26.5
16224500 - KALAUAO STREAM AT MOANALUA RD, AT AIEA, OAHU, HI (LAT 21 23 07 LONG 157 56 29)					
DEC , 1981					
08...	1430	.33	350	6.9	21.0
JAN , 1982					
20...	1145	100	140	6.8	20.5
MAR					
17...	1400	2.7	220	6.9	22.5
MAY , 1982					
10...	1420	.25	650	6.8	26.0
24...	1000	.24	675	--	23.5
JUN					
22...	1550	.23	650	6.7	27.0
16226000 - NORTH HALAWA STREAM NR AIEA, OAHU, HI (LAT 21 23 46 LONG 157 53 37)					
NOV , 1981					
04...	1600	8.0	120	6.9	23.0
DEC					
08...	1115	.82	140	6.9	19.0
FEB , 1982					
02 ..	1245	1.6	120	6.9	21.0
MAY , 1982					
06...	1320	1.8	125	6.7	22.0
JUN					
21...	1230	2.0	100	7.4	24.0
AUG					
03...	1200	4.4	105	7.3	23.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16232000 - NUUANU STR BL RES 2 WASTEWAY NR HONOLULU, OAHU, (LAT 21 20 57 LONG 157 49 40)					
OCT , 1981					
23...	1500	.94	130	7.1	22.5
DEC					
04...	1345	3.3	130	7.3	21.0
FEB , 1982					
01...	1545	10	135	7.0	20.5
MAR					
19...	1505	9.5	125	7.2	22.5
MAY , 1982					
05...	1515	5.9	150	7.2	22.0
JUN					
18...	1210	4.9	100	7.4	23.0
AUG					
02...	1520	7.3	120	7.1	24.0
16238500 - WAIHI STREAM AT HONOLULU, OAHU, HI (LAT 21 19 55 LONG 157 48 12)					
OCT , 1981					
22...	1345	.25	180	6.9	22.0
DEC					
09...	1130	1.3	160	6.8	19.0
JAN , 1982					
25...	1600	6.6	100	6.7	20.0
MAR					
25...	1500	6.4	145	7.0	20.5
MAY , 1982					
07...	1540	2.4	145	6.8	22.0
JUN					
16...	1350	40	34	7.1	21.5
JUL					
30...	1255	4.7	100	7.0	23.5
16240500 - WAIAKEAKUA STREAM AT HONOLULU, OAHU, HI (LAT 21 19 53 LONG 157 48 08)					
OCT , 1981					
22...	1040	2.0	140	7.5	21.0
DEC					
09...	0945	2.6	130	6.9	19.0
JAN , 1982					
25...	1450	11	110	7.0	20.0
MAR , 1982					
29...	1320	5.7	125	7.1	21.0
MAY					
07...	1320	5.9	130	7.0	21.5
JUN					
16...	1545	23	55	7.1	21.5
16244000 - PUKELE STREAM NEAR HONOLULU, OAHU, HI (LAT 21 18 36 LONG 157 47 27)					
OCT , 1981					
23...	1150	.29	220	6.4	22.5
DEC					
09...	1345	.78	220	6.7	21.5
FEB , 1982					
01...	1300	2.1	245	6.3	21.5
MAR					
29...	1545	2.1	230	6.6	22.0
MAY , 1982					
05...	1030	1.8	235	6.8	22.0
JUN					
18...	1550	.78	220	6.7	23.0
AUG					
02...	1150	1.6	170	6.7	23.0
16254000 - MAKAWAO STREAM NEAR KAILUA, OAHU, HI (LAT 21 21 49 LONG 157 46 02)					
NOV , 1981					
10...	1415	2.5	210	7.3	22.5
FEB , 1982					
22...	1415	7.6	210	7.3	22.0
APR , 1982					
14...	1310	11	200	7.5	21.5
AUG					
10...	1005	4.4	200	7.5	21.5
16283600 - SF WAIHEE STR NR HEEIA, OAHU, HI (LAT 21 26 47 LONG 157 52 12)					
OCT , 1981					
20...	1130	.66	140	7.4	19.5
NOV					
13...	1035	.61	140	7.3	20.0
DEC					
22...	0945	.81	130	7.4	20.0
FEB , 1982					
16...	1230	.66	130	7.4	20.0
APR , 1982					
09...	1130	.91	150	7.0	19.0
MAY					
19...	1415	.30	160	7.1	19.5
JUL					
02...	0940	.44	115	7.4	20.5
AUG					
11...	1110	.36	120	7.5	20.5
16283700 - NF WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 26 48 LONG 157 52 18)					
OCT , 1981					
20...	1130	1.0	120	7.6	21.5
NOV					
13...	1245	.78	110	7.4	19.5
FEB , 1982					
16...	1250	.88	110	7.5	20.5
MAY , 1982					
19...	1340	.73	145	7.6	19.0
JUL					
02...	1155	.95	130	7.5	20.0
AUG					
11...	1300	.83	110	7.6	19.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16284000 - WAIHEE STREAM NR HFEIA, OAHU, HI (LAT 21 27 01 LONG 157 51 38)					
OCT , 1981					
20...	1330	1.4	140	7.1	21.0
NOV					
13...	1430	1.5	130	7.2	21.0
16284200 - WAIHEE STREAM NR KAHALUU, OAHU, HI (LAT 21 27 04 LONG 157 51 36)					
OCT , 1981					
20...	1345	4.5	160	7.4	21.0
NOV					
13...	1545	4.6	150	7.1	21.0
DEC					
22...	1455	12	150	7.0	21.0
JAN , 1982					
20...	1400	16	150	7.4	21.0
16294900 - WAIKANE STREAM AT ALT 75 FT AT WAIKANE, OAHU, HI (LAT 21 30 00 LONG 157 51 54)					
NOV , 1981					
05...	1340	9.0	160	7.1	23.0
FEB , 1982					
12...	1340	8.5	120	7.1	22.0
16303000 - PUNALUU STREAM NR PUNALUU, OAHU, HI (LAT 21 33 33 LONG 157 54 06)					
NOV , 1981					
09...	1130	17	125	--	21.0
APR , 1982					
07...	1145	43	120	7.2	21.5
16325000 - KAMANANUI STR AT PUPUKEA MIL RD NR MAUNAWAI, OA (LAT 21 37 25 LONG 158 01 04)					
OCT , 1981					
06...	1025	2.0	65	6.8	24.0
NOV					
19...	1245	18	60	6.9	22.0
JAN , 1982					
26...	1430	15	65	6.2	19.5
MAR					
01...	1145	5.4	80	7.0	21.0
16330000 - KAMANANUI STREAM AT MAUNAWAI, OAHU, HI (LAT 21 38 20 LONG 158 03 27)					
OCT , 1981					
06...	1410	2.3	80	6.8	25.5
NOV					
18...	1215	32	65	6.7	22.5
JAN , 1982					
15...	1340	10	100	7.1	21.5
FEB					
26...	1700	18	75	6.9	22.0
16343000 - HELEMANO STREAM AT HALEIWA, OAHU, HI (LAT 21 34 40 LONG 158 06 12)					
NOV , 1981					
18...	1600	6.7	75	6.6	24.5
JAN , 1982					
14...	1150	2.9	150	6.7	22.0
MAR					
03...	1520	.32	300	7.1	23.0
APR					
21...	1420	4.8	78	6.8	24.0
16345000 - OPAEULA STREAM NR WAHIAWA, OAHU, HI (LAT 21 33 55 LONG 158 00 10)					
OCT , 1981					
07...	1520	1.5	52	6.4	26.5
JAN , 1982					
06...	1300	32	40	6.4	20.0
MAR					
03...	1200	4.4	42	6.3	21.5
APR					
19...	1740	14	36	6.4	24.0
FEB , 1982					
16...	1510	2.4	130	7.0	22.5
FEB , 1982					
17...	1000	5.8	140	7.4	20.0
APR					
09...	1420	12	150	7.2	20.0
JUN					
01...	1100	7.0	160	7.0	21.0
AUG					
11...	1535	7.5	150	7.4	21.0
APR , 1982					
14...	0830	17	150	7.1	21.5
JUL					
13...	0945	6.1	165	7.4	22.0
MAY , 1982					
19...	1320	30	140	7.2	22.5
APR , 1982					
20...	1230	13	65	6.9	22.5
JUN					
01...	1200	2.7	75	6.8	22.5
JUL					
27...	1330	20	95	6.8	25.0
SEP					
17...	1230	3.5	68	6.8	26.0
APR , 1982					
20...	1630	27	75	7.3	23.0
JUN					
01...	1450	3.5	85	6.9	23.0
JUL					
19...	1615	25	70	6.8	24.0
SEP					
17...	1650	5.1	78	6.8	25.5
JUN , 1982					
04...	1150	.16	520	6.7	23.5
JUL					
22...	1535	.47	140	6.4	26.0
SEP					
24...	1620	.50	105	6.8	25.5
JUN , 1982					
03...	1115	2.4	45	6.6	23.5
JUL					
22...	1210	15	42	6.5	24.5
SEP					
24...	1210	3.4	48	6.7	24.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MOLOKAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16403900 - KAWAINUI STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 07 59 LONG 156 52 38)					
OCT , 1981					
27...	1150	83	65	6.3	19.5
JAN , 1982					
19...	0830	8.6	122	7.3	18.0
JUN , 1982					
09...	1030	2.7	134	7.4	20.5
JUL					
30...	1230	4.9	114	7.7	22.0
16404000 - PELEKUNU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 11 LONG 156 52 43)					
OCT , 1981					
27...	0920	18	108	6.9	19.5
JAN , 1982					
19...	1350	14	120	7.5	19.5
FEB , 1982					
11...	1035	543	44	6.7	18.0
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)					
OCT , 1981					
27...	0920	1.4	150	6.9	18.5
JAN , 1982					
19...	1010	1.9	142	7.6	19.5
FEB					
09...	1340	4.8	114	6.7	18.5
APR , 1982					
13...	1225	3.0	132	6.8	19.0
JUN					
09...	1145	1.6	140	7.5	21.5
JUL					
29...	1100	1.3	144	7.8	22.0
16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 16)					
OCT , 1981					
20...	1015	2.4	--	--	17.0
DEC					
09...	1050	.87	--	--	14.5
JAN , 1982					
27...	0945	9.4	--	--	17.0
MAR					
16...	1045	4.9	--	--	18.0
MAY , 1982					
04...	0950	.06	--	--	18.5
JUN					
30...	1040	10	--	--	20.0
AUG					
24...	1005	3.9	--	--	20.0
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 27 LONG 156 59 50)					
OCT , 1981					
20...	1625	4.8	96	7.1	18.0
DEC					
08...	1005	13	68	6.6	15.0
JAN , 1982					
27...	1830	18	53	6.7	17.0
MAR					
16...	1720	8.0	78	7.0	19.0
MAY , 1982					
04...	1750	3.5	118	7.5	18.0
JUN					
29...	0900	12	67	6.4	19.5
AUG					
24...	1615	8.5	84	7.3	20.0
16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLO,H (LAT 21 08 43 LONG 156 55 18)					
OCT , 1981					
20...	1315	1.1	97	7.1	18.5
DEC					
09...	1510	3.3	74	6.8	16.5
JAN , 1982					
27...	1320	24	48	6.5	18.0
MAR , 1982					
16...	1315	2.5	76	6.9	19.0
MAY					
04...	1225	5.0	78	7.2	19.0
JUN					
30...	1330	2.6	79	6.6	20.5
16406000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA, MOLOKAI (LAT 21 09 45 LONG 156 55 54)					
OCT , 1981					
20...	1400	6.5	114	7.1	21.0
DEC					
09...	1230	10	104	7.0	18.0
JAN , 1982					
27...	1155	60	63	6.7	18.0
MAR					
16...	1300	13	106	7.1	22.0
MAY , 1982					
04...	1350	17	106	7.2	20.0
JUN					
30...	1345	16	102	6.7	22.5
AUG					
24...	1330	10	112	7.5	22.0
16419500 - PAPIO GULCH AT HALAWA, MOLOKAI, HI (LAT 21 08 55 LONG 156 44 16)					
DEC , 1981					
07...	1425	.16	130	6.2	19.5
JAN , 1982					
25...	1730	3.6	94	6.6	19.5
MAR					
15...	1530	2.9	97	6.4	20.0
MAY , 1982					
03...	1700	1.6	132	6.3	21.0
JUN					
28...	1530	2.8	84	6.2	22.0
AUG					
23...	1620	.52	134	6.7	23.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16501000 - PALIKEA STREAM BL DIV DAM NR KIPAHULU, MAUI, H (LAT 20 41 03 LONG 156 04 10)											
OCT , 1981						APR , 1982					
06...	1010	7.4	31	6.3	18.0	21...	1110	54	16	6.4	16.5
NOV						JUN					
19...	1000	6.4	28	6.8	19.5	18...	1145	1.0	36	6.9	21.5
JAN , 1982						AUG					
13...	1005	1.9	43	6.8	17.5	12...	0930	56	23	6.8	20.0
MAR											
03...	0945	.03	44	6.8	19.5						
16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)											
OCT , 1981						APR , 1982					
05...	1530	14	21	5.7	19.5	20...	1550	12	35	6.4	19.0
NOV						JUN					
18...	1515	6.7	28	7.0	19.0	18...	1050	3.2	46	7.1	20.0
JAN , 1982						AUG					
12...	1735	4.1	41	7.0	18.0	13...	1000	18	30	6.6	20.0
MAR											
04...	0945	48	23	6.7	17.5						
16512000 - KOOLAU DITCH AT NAHIKU WEIR NR NAHIKU, MAUI, H (LAT 20 48 56 LONG 156 07 15)											
OCT , 1981						APR , 1982					
05...	1245	72	28	5.7	18.5	20...	1435	53	39	6.7	19.0
NOV						JUN					
18...	1455	33	39	7.0	19.5	16...	1610	17	48	7.4	21.0
JAN , 1982						AUG					
12...	1525	21	46	7.2	19.0	11...	1615	69	34	6.8	22.0
MAR											
04...	1200	85	26	6.6	17.0						
16518000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 16 LONG 156 08 37)											
OCT , 1981						APR , 1982					
05...	1010	67	22	5.8	18.0	20...	1025	17	30	6.2	18.0
NOV						22...	0955	180	14	7.1	16.5
18...	1225	12	26	6.6	19.0	JUN					
JAN , 1982						16...	1305	4.5	38	7.0	22.0
12...	1400	7.8	35	7.1	18.0	AUG					
MAR						11...	1300	27	27	6.9	21.5
02...	1425	15	30	6.9	18.0						
16523000 - KOOLAU DITCH NR KEANAE, MAUI, HI (LAT 20 49 53 LONG 156 10 30)											
OCT , 1981						APR , 1982					
05...	1130	223	25	5.7	19.5	20...	1135	151	38	6.8	18.0
NOV						JUN					
18...	1230	115	37	6.9	19.0	16...	1015	50	50	7.2	20.0
JAN , 1982						AUG					
12...	1100	70	43	7.2	18.0	11...	1150	197	31	6.8	20.5
MAR											
02...	1140	159	35	6.9	18.5						
16531000 - KULA DIV FROM HAIPUAENA STR NR OLINDA, MAUI, HI (LAT 20 48 24 LONG 156 13 27)											
OCT , 1981						APR , 1982					
01...	1000	.92	18	5.1	15.0	23...	1415	1.2	12	7.1	13.0
DEC						JUN					
01...	1030	9.4	19	5.5	12.5	15...	1000	.15	14	7.1	15.0
JAN , 1982						AUG					
06...	1050	.08	15	6.2	11.5	18...	1020	.66	12	6.7	16.0
MAR											
10...	1100	10	16	6.2	12.0						

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16538000 - SPRECKELS DITCH AT HAIPUAENA WEIR NR HUELO, MA (LAT 20 51 15 LONG 156 11 25)					
OCT , 1981					
07...	1010	18	33	5.9	19.0
NOV					
20...	1010	16	32	6.3	18.5
JAN , 1982					
14...	1310	8.7	49	6.9	19.0
MAR					
09...	1425	34	30	6.8	17.0
APR , 1982					
19...	1100	32	28	7.4	18.5
JUN					
09...	1000	9.7	38	7.1	20.0
AUG					
09...	1210	56	29	6.6	21.5
16541000 - KOOLAU DITCH AT HAIPUAENA NR HUELO, MAUI, HI (LAT 20 51 17 LONG 156 11 19)					
OCT , 1981					
07...	1400	74	40	6.1	20.0
NOV					
20...	1315	83	43	6.6	18.5
JAN , 1982					
14...	1500	55	47	6.9	18.5
MAR					
05...	1220	163	34	6.7	17.0
APR , 1982					
19...	1430	119	36	7.0	18.0
JUN					
09...	1240	99	46	7.0	19.5
AUG					
09...	1555	181	39	6.8	20.5
16541500 - MANUEL LUIS DITCH AT PUOHOKAMOA GL NR HUELO, MA (LAT 20 51 48 LONG 156 10 59)					
OCT , 1981					
07...	1245	1.0	53	5.8	21.5
NOV					
20...	1000	1.5	57	6.4	20.5
JAN , 1982					
14...	1255	1.0	60	6.6	20.0
MAR					
04...	1500	20	27	6.7	17.5
APR , 1982					
22...	1250	29	33	6.5	17.5
JUN					
09...	1445	.70	59	7.0	22.0
AUG					
13...	1235	2.2	53	6.6	22.0
16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)					
OCT , 1981					
01...	1220	.96	54	6.2	20.5
NOV					
23...	1200	11	40	5.6	19.5
JAN , 1982					
05...	1155	1.3	55	7.1	17.5
MAR					
09...	1525	3.7	51	6.9	18.0
APR , 1982					
22...	1340	19	45	6.7	17.5
JUN					
25...	1110	.94	55	6.9	21.5
AUG					
17...	1105	7.1	42	6.7	22.0
SEP					
27...	1240	2.3	49	6.9	22.0
16588000 - WAILOA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 19)					
OCT , 1981					
01...	1120	113	42	6.3	20.0
NOV					
23...	1200	298	20	5.3	18.5
JAN , 1982					
05...	1115	83	49	7.2	17.0
MAR					
09...	1310	266	32	6.8	16.5
APR , 1982					
22...	1240	241	22	6.5	16.5
JUN					
25...	1010	66	47	6.8	20.0
AUG					
17...	1000	295	35	6.8	20.0
16589000 - NEW HAMAKUA DITCH AT HONOPOU NR HUELO, MAUI, H (LAT 20 53 28 LONG 156 15 22)					
OCT , 1981					
01...	1455	86	39	6.2	20.0
NOV					
23...	1515	157	21	5.5	18.5
JAN , 1982					
05...	1315	.92	63	7.2	19.0
MAR					
09...	1130	118	35	6.9	17.0
APR , 1982					
22...	1500	58	28	6.1	16.5
JUN					
25...	1215	.55	64	7.0	24.0
AUG					
17...	1315	76	49	6.7	22.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16592000 - LOWRIE DITCH AT HONOPOU GULCH NR HUELO, MAUI, (LAT 20 54 57 LONG 156 15 08)					
OCT , 1981					
08...	1450	14	52	6.2	22.5
NOV					
20...	1530	33	60	6.5	21.5
JAN , 1982					
11...	1245	1.9	65	6.7	22.0
MAR					
19...	1245	1.6	67	6.4	23.5
APR , 1982					
19...	1215	1.1	80	6.4	24.0
JUN					
08...	1410	25	52	6.7	23.5
AUG					
10...	1425	79	32	6.7	22.5
16594000 - HAIKU DITCH AT HONOPOU GULCH NR KAILUA, MAUI, HI (LAT 20 55 07 LONG 156 14 58)					
OCT , 1981					
08...	1230	1.7	68	6.1	22.0
NOV					
20...	1600	4.4	84	6.1	22.0
JAN , 1982					
11...	1030	.28	96	5.6	21.0
MAR					
19...	1100	.19	90	5.9	22.5
APR , 1982					
19...	1015	31	59	6.5	19.5
JUN					
08...	1020	1.9	100	6.6	23.0
AUG					
10...	1510	96	31	6.8	23.0
16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)					
OCT , 1981					
01...	1410	.58	55	5.8	20.0
DEC					
01...	1340	12	26	5.8	16.5
JAN , 1982					
06...	1430	1.9	50	6.5	16.0
MAR					
10...	1515	12	25	6.7	15.0
APR , 1982					
23...	1145	7.0	32	6.4	16.0
JUN					
15...	1455	1.5	53	6.7	21.0
AUG					
18...	1420	5.0	39	6.5	19.5
16607000 - IAO STREAM AT WAILUKU, MAUI, HI (LAT 20 53 38 LONG 156 30 27)					
NOV , 1981					
30...	1010	35	86	7.0	19.0
16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)					
OCT , 1981					
09...	1125	13	66	7.1	18.5
NOV					
30...	1410	51	48	7.1	18.0
JAN , 1982					
19...	1125	16	68	7.7	18.0
MAR					
22...	1115	156	19	7.3	19.0
APR , 1982					
05...	1400	33	55	6.8	19.5
MAY					
10...	1300	55	58	7.3	18.0
JUN					
23...	1300	24	73	7.1	21.0
AUG					
18...	1245	33	61	7.1	20.0
16638300 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 36)					
NOV , 1981					
24...	1030	58	51	6.5	18.0
25...	1045	.46	90	6.7	21.0
JAN , 1982					
22...	1225	20	73	6.9	19.5
MAR , 1982					
23...	1500	69	26	7.1	19.0
AUG					
02...	1325	4.7	48	6.8	24.0
10...	1035	320	25	6.9	20.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF HAWAII

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16700000 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)					
OCT , 1981					
27...	0925	4.5	40	6.8	17.0
DEC					
23...	0955	6.4	42	7.0	16.0
JAN , 1982					
26...	0925	29	40	7.0	17.0
FEB					
22...	1115	3.1	38	6.8	17.5
APR , 1982					
23...	0940	13	36	6.8	17.0
JUN					
23...	0945	7.3	38	6.9	17.0
SEP					
28...	0910	12	34	6.9	16.0
16700900 - OLAA FLUME SPRING NR KAUMANA, HAWAII, HI (LAT 19 41 59 LONG 155 11 13)					
OCT , 1981					
02...	1445	9.1	34	6.8	17.0
NOV					
15...	0910	8.9	32	6.7	17.0
DEC					
10...	1050	9.3	32	6.8	17.0
APR , 1982					
21...	1300	7.7	30	6.7	17.0
MAY , 1982					
19...	1045	11	30	6.6	17.0
JUN					
23...	1455	4.7	34	6.8	17.0
AUG					
24...	1600	7.9	32	6.8	17.0
16700950 - LYMAN SPRINGS NO. 2 NEAR PIIHONUA, HAWAII, HI (LAT 19 42 02 LONG 155 10 36)					
OCT , 1981					
23...	1000	3.8	35	6.7	17.0
FEB , 1982					
04...	1030	5.1	31	6.7	17.5
MAY , 1982					
04...	1050	5.4	35	6.5	17.0
JUL					
26...	1135	5.2	34	6.6	18.5
16701750 - WAILUKU RIVER NR HUMUULA, HAWAII, HI (LAT 19 42 55 LONG 155 18 36)					
NOV , 1981					
18...	1210	.16	40	6.8	16.0
MAR , 1982					
18...	1230	28	20	6.7	15.0
JUN , 1982					
22...	1155	.10	34	6.9	20.0
16701800 - WAILUKU RIVER NR KAUMANA, HAWAII, HI (LAT 19 43 15 LONG 155 16 08)					
OCT , 1981					
14...	1440	2.7	27	7.0	19.0
DEC					
11...	1100	5.9	25	7.0	15.0
FEB , 1982					
01...	1130	8.8	24	6.8	14.0
MAR					
22...	1140	24	19	6.8	15.5
MAY , 1982					
18...	1135	8.4	21	6.9	18.0
JUN					
30...	1050	1.9	25	6.9	18.0
AUG					
02...	0930	73	18	6.8	17.0
16704000 - WAILUKU RIVER AT PIIHONUA, HAWAII, HI (LAT 19 42 56 LONG 155 09 12)					
NOV , 1981					
02...	1030	39	40	7.0	19.0
JAN , 1982					
12...	1425	24	42	7.0	18.0
MAR					
05...	1010	4.4	56	7.0	17.0
JUN , 1982					
01...	1430	62	38	7.2	19.0
29...	1130	70	35	7.1	18.0
16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII, HI (LAT 20 05 18 LONG 155 40 58)					
OCT , 1981					
16...	1230	1.2	28	6.4	14.0
DEC					
11...	1040	6.6	26	6.4	13.0
FEB , 1982					
17...	1200	.82	22	6.0	16.0
MAY , 1982					
05...	1015	3.0	16	5.7	16.0
JUN					
24...	1310	.28	23	6.0	15.0
AUG					
19...	1210	5.2	18	5.8	15.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16720300 - KAWAIKI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)					
OCT , 1981					
16...	1120	.61	28	6.3	14.0
DEC					
11...	1000	2.2	25	6.0	13.0
FEB , 1982					
17...	1140	.68	20	6.0	15.0
MAY , 1982					
05...	1245	1.3	18	6.0	17.0
JUN					
24...	1225	.32	25	6.1	15.0
AUG					
19...	1125	2.5	23	6.1	15.0
16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA, (LAT 20 05 15 LONG 155 40 42)					
OCT , 1981					
16...	1035	1.7	28	6.4	15.0
DEC					
11...	0925	5.8	26	6.4	12.0
FEB , 1982					
17...	1420	1.4	23	6.4	16.0
APR					
22...	1300	17	18	5.3	15.0
MAY , 1982					
05...	1335	3.8	20	6.2	15.0
JUN					
24...	1055	.42	23	6.2	15.0
AUG					
19...	1055	7.2	25	6.2	15.0
16724800 - UP HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA, HI (LAT 20 04 31 LONG 155 40 26)					
OCT , 1981					
16...	0930	.80	30	6.5	13.0
DEC					
11...	0840	5.1	23	6.4	13.0
FEB , 1982					
17...	1625	1.0	30	6.6	16.5
APR , 1982					
22...	1430	13	19	5.5	15.0
JUN					
24...	0950	.30	29	6.2	15.0
AUG					
19...	0940	8.1	22	6.2	15.0
16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)					
OCT , 1981					
16...	0850	.90	28	6.4	12.0
DEC					
11...	0810	5.1	24	6.4	12.0
FEB , 1982					
17...	1630	1.2	23	6.3	17.0
APR , 1982					
22...	1525	19	18	5.2	15.0
JUN					
24...	0920	.60	25	5.8	16.0
AUG					
19...	0925	5.4	26	6.2	15.0
16726000 - UP HAMAKUA DITCH AB HAIMEA RES DIV NR KAMUELA, (LAT 20 03 31 LONG 155 37 40)					
OCT , 1981					
08...	1330	1.2	30	6.4	15.0
NOV					
13...	1235	25	27	6.4	16.0
FEB , 1982					
04...	1205	3.8	26	6.3	15.0
MAR					
19...	1145	8.2	26	6.4	15.0
MAY , 1982					
04...	1255	9.8	28	6.3	15.0
JUN					
09...	1255	1.5	25	6.4	15.0
AUG					
06...	1255	7.5	28	6.2	15.0
16727000 - UPPER HAMAKUA D AB PUUKAPU RES NR KAMUELA, HI (LAT 20 02 53 LONG 155 37 17)					
NOV , 1981					
13...	1320	8.6	27	6.3	17.0
FEB , 1982					
04...	1215	2.1	25	6.3	15.0
MAR					
19...	1200	4.8	26	6.3	15.0
MAY , 1982					
04...	1300	4.2	23	6.2	14.0
AUG					
06...	1330	5.0	24	6.0	16.0
16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 02 38 LONG 155 41 10)					
NOV , 1981					
13...	1020	31	26	6.3	15.0
FEB , 1982					
04...	1045	1.9	26	6.4	15.0
MAR					
19...	1055	3.1	25	6.4	14.0
MAY , 1982					
04...	1000	4.0	26	6.3	14.0
JUN					
09...	1030	.67	30	6.2	16.0
AUG					
06...	1025	4.7	26	6.1	15.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16758000 - WAIKOLOA STR AT MARINE DAM NR KAMUELA, HAWAII, H (LAT 20 02 48 LONG 155 39 58)					
OCT , 1981					
08...	1030	2.2	48	6.7	15.0
NOV					
13...	0925	30	28	6.4	14.0
FEB , 1982					
04...	1005	4.1	26	6.4	15.0
MAY , 1982					
04...	1055	8.1	23	6.2	14.0
JUN					
09...	1120	3.5	25	6.3	15.0
AUG					
06...	1135	7.8	26	6.0	15.0
16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)					
OCT , 1981					
08...	0855	.07	32	6.4	15.0
DEC					
11...	1300	.78	25	6.3	15.0
MAR , 1982					
19...	0940	.56	23	6.3	15.0
JUN , 1982					
09...	0935	.31	26	6.0	16.0
AUG					
06...	0925	.11	24	6.2	16.0
16759200 - R BR WAIAHA STREAM NEAR HOLUALOA, HAWAII, HI (LAT 19 38 41 LONG 155 54 55)					
MAR , 1982					
31...	1115	.05	45	6.6	17.0
JUN					
09...	1335	.05	36	6.5	21.0
AUG , 1982					
11...	0935	.02	46	6.7	19.0
16759800 - KIILAE STREAM NEAR HONAUNAU, HAWAII, HI (LAT 19 24 52 LONG 155 50 56)					
NOV , 1981					
05...	0900	.06	22	6.4	16.0
JAN , 1982					
19...	0930	.04	26	5.9	15.0
MAR , 1982					
30...	0920	.01	28	6.5	16.0
JUN					
08...	0900	.18	21	6.2	18.0
16764000 - HILFA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)					
OCT , 1981					
06...	1050	.83	40	6.9	16.0
NOV					
19...	1015	.10	45	6.7	16.0
JAN , 1982					
14...	1050	.19	46	6.8	17.0
MAY , 1982					
21...	1130	.65	65	6.9	16.0
JUL					
29...	1020	.80	50	6.8	16.0
AUG					
13...	1150	.45	52	6.7	17.0
16767000 - NINOLE GULCH NEAR PUNALUU, HAWAII, HI (LAT 19 10 44 LONG 155 33 46)					
JUL , 1982					
21...	1600	.33	20	7.0	20.0

HAWAII, ISLAND OF KAUAI

220354159205601. Local number, 2-0320-01.
LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, in Wailua Houselots, Wailua. Owner: Kauai County, Department of Water.
AQUIFER.--Koloa Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 8 in (0.2 m), depth 240 ft (73.2 m), cased to 193 ft (58.8 m), open end.
DATUM.--Land-surface datum is 155 ft (47.2 m) above mean sea level. Measuring point: Top edge of steel pump-base at breather hole, 155.98 ft (47.543 m) above mean sea level.
REMARKS.--Water-quality records for 1960, 1966, 1972-80 are available in files of district office. Water pumped from this well is used frequently for public supply.
PERIOD OF RECORD.--February 1960, June 1973 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft (6.108 m) above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft (1.009 m) below mean sea level, May 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	8.14	JAN 12	10.34	APR 14	12.38	MAY 27	11.39	JUL 6	11.40	AUG 10	12.31
NOV 18	6.81	MAR 3	11.06								

HAWAII, ISLAND OF OAHU

212154158015201. Local number, 3-2101-03.
LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, in Honouliuli. Owner: Hawaii Meat Co.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 10 in (0.25 m), depth 355 ft (108 m), cased to 165 ft (50.3 m), open hole. Water overflows casing at 13.53 ft (4.124 m) above mean sea level since 1978.
DATUM.--Land-surface datum is 11 ft (3.4 m) above mean sea level. Measuring point: Top of horizontal flange below petcock, 13.31 (4.057 m) above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: April 1910 to June 1921, September 1923 to current year.
WATER QUALITY: 1910-16, 1920-21, 1923-75, 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft (8.888 m) above mean sea level, April 1918; lowest measured, 11.16 ft (3.402 m) above mean seal level, Sept. 2, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	12.66	MAY 13	18.35	AUG 9	18.20

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC , 1981			
18...	1115	844	170
18...	1145	1050	240
DEC , 1981			
18...	1220	1590	420

212238157561101. Local number, 3-2256-10.
LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, in Pearl Harbor Navy Reservation near Kamehameha Highway, Aiea. Owner: U.S. Navy.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 12 in (0.30 m), depth 173 ft (52.7 m), cased to 143 ft (43.0 m), open hole.
DATUM.--Land-surface datum is 10 ft (3.0 m) above mean sea level. Measuring point: Top of 10 in (0.25 m) stilling pipe for water-level recorder, 26.15 ft (7.971 m) above mean sea level.
REMARKS.--Recording gage intalled Sept. 9, 1968. Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.
PERIOD OF RECORD.--January 1928 to February 1931, September 1934 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft (7.894 m) above mean sea level, Jan. 16, 1928; lowest, 12.97 ft (3.953 m) above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.16	14.35	14.67	15.51	16.99	17.23	17.98	18.09	17.90	18.18	17.81	18.02
10	14.10	14.37	14.68	15.84	17.13	17.19	18.13	18.10	17.86	18.07	17.87	17.95
15	14.04	14.47	14.72	15.99	17.28	17.35	18.35	18.07	17.91	17.94	17.82	17.93
20	14.01	14.40	14.79	16.26	17.37	17.64	18.38	18.05	17.99	17.94	17.95	17.91
25	14.04	14.52	15.09	16.51	17.39	17.88	18.26	18.05	17.90	18.02	17.88	17.83
EOM	14.22	14.66	15.35	16.73	17.43	17.95	18.08	17.98	17.93	17.91	17.90	17.86

WTR YEAR 1982 MAX 18.45 APR 19, 1982 MIN 13.89 OCT 23, 1981

212927158014807. Local number, 3-2901-07
LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, at Kamehameha Highway and Wilikina Drive, Wahiawa. Owner: U.S. Army.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug domestic high-level water-table well, size 8 x 8 ft (2 x 2 m), length of 30-degree inclined shaft 1,148 ft (349.9 m).
DATUM.--Land-surface datum is 850 ft (259 m) above mean sea level. Measuring point: Top of pump chamber floor at recorder, 287.00 ft (87.478 m) above mean sea level.
REMARKS.--Recorder is located on the pump chamber floor at the bottom of shaft. Recording gage installed November 1938. Water pumped from this well is used continually for public supply.
PERIOD OF RECORD.--
WATER LEVEL: August 1936 to current year.
WATER QUALITY: 1966-72, 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft (86.685 m) above mean sea level, May 12, 1969; lowest, 269.52 ft (82.150 m) above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	274.03	273.97	273.91	274.08	274.64	275.54	276.70	277.91	279.24	280.19	280.72	281.10
10	273.97	273.84	273.91	274.15	274.82	275.61	276.87	278.20	279.42	280.18	280.78	281.11
15	274.12	273.92	273.94	274.20	274.90	275.80	277.12	278.38	279.62	280.40	280.94	280.78
20	273.82	273.91	274.02	274.32	275.13	276.04	277.34	278.48	279.78	280.60	280.93	280.75
25	273.96	273.85	274.10	274.24	275.30	276.18	277.48	278.96	279.92	280.57	280.60	281.06
EOM	273.99	273.93	274.02	274.52	275.31	276.48	277.70	278.97	279.99	280.68	281.02	281.10

Note:--Well being pumped throughout the year.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
NONPUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	274.38	JAN 1	274.16	APR 1	276.66	MAY 25	278.94	JUL 1	280.19	AUG 1	280.88
NOV 1	274.12	FEB 1	274.69	MAY 1	277.89	JUN 1	279.15	JUL 16	280.55	SEP 1	281.24
DEC 1	274.05	MAR 1	275.44								

Note:--Water levels are measured after all pumps being shut off for 2 hours.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981				
14...	1000	170	22.0	16
NOV				
27...	1030	160	22.0	16
JAN , 1982				
26...	1015	170	22.0	18
MAR				
10...	1000	170	22.0	16
APR , 1982				
22...	1000	200	22.5	17
JUN				
02...	1015	168	22.0	14
JUL				
20...	0920	190	22.5	17
SEP				
28...	1100	180	23.5	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 (180 m) southwest of Kamehameha Highway (Highway 83), Kahana. Owner: Mary E. Foster Estate.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 10 in (0.25 m), depth 441 ft (134 m), cased to 177 ft (53.9 m), open hole.
DATUM.--Land-surface datum is 6 ft (2 m) above mean sea level. Measuring point: Top of "T", 7.31 ft (2.228 m) above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: April 1935 to current year.
WATER QUALITY: 1935 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft (6.49 m) above mean sea level, Mar. 29, 1966; lowest measured, 14.39 ft (4.386 m) above mean sea level, Sept. 9, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 23	15.34	FEB 24	15.30	APR 13	19.63	MAY 21	19.54

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981					JUN , 1982				
16...	1110	950	22.0	230	10...	1400	870	22.0	220
MAR , 1982					AUG				
15...	1140	930	22.5	220	02...	0825	890	21.5	210
MAY					SEP				
04...	1355	910	22.5	220	26...	1425	850	22.0	220

213446158104901. Local number, 3-3410-08.
LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, near Dillingham Air Force Base south of Farrington Highway, Mokuleia. Owner: Waialua Sugar Co., Inc.
AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTIC.--Drilled observation artesian basal water-table well, diameter 1.0 mi (0.03 m), depth 447 ft (136 m), cased to 447 ft (136 m), perforated 410 to 447 ft (125 to 136 m).
DATUM.--Land-surface datum is 16 ft (4.9 m) above mean sea level. Measuring point: Top of 12 in (0.30 m) stilling well, 20.53 ft (6.258 m) above mean sea level.
REMARKS.--Recording gage was operated January 1963 to February 1972. Present one-inch galvanized pipe was installed inside of existing 6-inch well and space between the two casings grouted on Sept. 13, 1948.
PERIOD OF RECORD.--
WATER LEVEL: January 1929 to current year.
WATER QUALITY: 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.98 ft (6.090 m) above mean sea level, Jan. 5, 1969; lowest measured, 16.08 ft (4.901 m) above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	18.61	MAR 15	18.80	MAY 4	18.71	JUN 10	18.34	AUG 2	18.87	SEP 26	18.78

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB 1982					MAY , 1982				
24...	1450	290	23.0	35	21...	1405	280	23.0	37
APR									
13...	1235	280	22.5	36					

HAWAII, ISLAND OF OAHU--Continued

214125158013401. Local number, 3-4101-03.
LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, on Kamehameha Highway at Waialee. Owner: State of Hawaii.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 8 in (0.2 m), depth 61 ft (19 m), cased to 36 ft (11 m), open hole.
DATUM.--Land-surface datum is 22 ft (6.7 m) above mean sea level. Measuring point: Top of 4-inch (0.1 m) pipe, 21.89 ft (6.672 m) above mean sea level.
REMARKS.--Water-quality records for 1929-74 are available in files of district office.
PERIOD OF RECORD.--February 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft (4.755 m) above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft (3.344 m) above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 19	13.14	APR 13	12.89	MAY 21	13.30	JUL 16	13.97

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.
LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft (30 m) north of Highway 45, and 0.8 mi (1 km) west of Pukoo. Owner: P. Friel.
AQUIFER.--East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug observation basal water-table well, 4 x 6 ft (1 x 2 m), depth 22 ft (6.7 m).
DATUM.--Land-surface datum is 19 ft (5.8 m) above mean sea level. Measuring point: Top of 2 x 2 in (0.05 x 0.05 m) steel plate bolted to top of concrete well wall, 21.23 ft (6.471 m) above mean sea level.
REMARKS.--Recording gage was operated Aug. 8, 1970 to Jan. 22, 1973. Water-quality records for 1970-1973 are available in files of district office.
PERIOD OF RECORD.--August 1970 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft (1.862 m) above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft (1.119 m) above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	4.41	JAN 26	5.18	MAR 15	4.69	MAY 3	4.70	JUN 28	4.24	AUG 23	4.38
DEC 7	4.40										

HAWAII, ISLAND OF MOLOKAI--Continued

210605157012001. Local number, 4-0601-01.
LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, in Kaunakakai Gulch, Kaunakakai. Owner: State of Hawaii.
AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 59 ft (18 m), cased to 20 ft (6.1 m), open hole.
DATUM.--Land-surface datum in 51 ft (16 m) above mean sea level. Measuring point: Top of 15 in (0.38 m) surface casing 51.95 ft (15.834 m) above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: May 1954 to current year.
WATER QUALITY: 1954 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft (1.006 m) above mean sea level, Jan. 20, 1969; lowest measured, 1.6 ft (0.49 m) above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	3.03	JAN 26	3.06	MAR 17	2.80	MAY 6	2.65	JUL 1	2.56	AUG 26	2.73
DEC 10	2.82										

WATER QUALITY DATA, WATER YEAR, OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981				
21...	1535	330	24.5	32
DEC				
10...	0800	250	24.0	18
JAN , 1982				
26...	1710	180	24.0	10
MAR				
17...	1545	220	24.0	12
MAY , 1982				
06...	0745	230	24.0	14
JUL				
01...	1230	260	24.5	16
AUG				
26...	1345	290	24.5	21

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)
AUG							
26...	1345	6.6	1	<100	<1	<10	2

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
AUG							
26...	190	<1	30	<.1	<1	<1	10

203912156255901. Local number, 6-3925-01.
LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.75 mi (1.2 km) east of Makena. Owner: State of Hawaii.
AQUIFER.--Hana Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 382 ft (116 m), cased to 363 ft (111 m), open hole.
DATUM.--Land-surface datum is 352 ft (107 m) above mean sea level. Measuring point: Top of 2 in (0.05 m) pipe attached to the casing cover, 352.29 ft (107.378 m) above mean sea level.
REMARKS.--Water-quality records for 1964 are available in files of district office.
PERIOD OF RECORD.--August 1964, June 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft (0.143 m) above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft (0.125 m) below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	0.19	NOV 30	0.09	JAN 8	0.25	MAR 25	-0.19	APR 28	-0.36	AUG 19	-0.27

204827156242201. Local number, 6-4824-01.
LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft (305 m) south of intersection with Kalaloa Gulch, and 4 mi (6 km) east of Kihei. Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 647 ft (197 m), cased to 598 ft (182 m), screened 598 to 638 ft (182 to 194 m), open hole.
DATUM.--Land-surface datum is 593 ft (181 m) above mean sea level. Measuring point: Top of 3 in (0.08 m) pipe attached to the steel casing cover, 594.75 ft (181.280 m) above mean sea level.
REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.
PERIOD OF RECORD.--March 1971, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft (1.585 m) above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft (1.113 m) above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	4.10	JAN 20	4.54	MAR 26	4.54	APR 29	4.37	JUN 24	3.90	AUG 20	4.44
DEC 2	4.28										

204818156310301. Local number, 6-4831-01.
LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi (1.1 km) north of Maalaea and 0.9 mi (1.4 km) southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.
AQUIFER.--Wailuku Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 219 ft (66.8 m), cased to 187 ft (57.0 m), open hole.
DATUM.--Land-surface datum is 166 ft (50.6 m) above mean sea level. Measuring point: Top of 8 in (0.2 m) casing, 166.60 ft (50.780 m) above mean sea level.
REMARKS.--Water-quality records for 1965-67 are available in files of district office. Recording gage was operated January to July 1974.
PERIOD OF RECORD.--September 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.66 ft (1.725 m) above mean sea level, Nov. 26, 1980; lowest measured, 4.74 ft (1.445 m) above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.60	JAN 20	5.61	MAR 24	5.48	APR 29	5.30	JUN 24	5.19	AUG 20	5.48
DEC 2	5.46										

HAWAII, ISLAND OF MAUI-Continued

204909156281401. Local number, 6-4928-02.
LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.5 mi (4.0 km) north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.
AQUIFER.--Honomanu Volcanic Series.
WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft (2 x 3 m) vertical shaft, depth 53 ft (16 m).
DATUM.--Land-surface datum is 50 ft (15 m) above mean sea level. Measuring point: Top of angle iron at well, 50.08 ft (15.264 m) above mean sea level.
REMARKS.--Recording gage installed Mar. 22, 1972. Water-quality records for 1973 are available in files of district office.
PERIOD OF RECORD.--March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.09 ft (1.551 m) above mean sea level, Jan. 12, 1980; lowest, 3.05 ft (0.930 m) above mean sea level, Mar. 5-6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.86	3.91	3.99	3.96	4.22	4.04	4.05	4.03	3.83	3.81	3.98	4.31
10	3.84	3.90	4.02	4.07	4.31	4.03	4.05	3.99	3.73	3.85	4.07	4.27
15	3.88	3.96	4.07	4.11	4.27	4.18	4.01	3.98	3.68	3.90	4.15	4.25
20	3.81	3.90	3.96	4.11	4.17	4.21	4.01	3.92	3.70	3.98	4.20	4.23
25	3.75	3.90	4.01	4.14	4.07	4.15	3.96	3.89	3.73	3.94	4.21	4.13
EOM	3.81	3.96	4.01	4.18	4.06	4.09	3.96	3.86	3.74	3.85	4.29	4.09

WTR YEAR 1982 MAX 4.36 SEP 6, 1982 MIN 3.65 JUN 12-13, AND 20, 1982

205552156193101. Local number, 6-5519-01.
LOCATION.--Lat 20°55'52", long 156°19'31", Hydrologic Unit 20020000, at Haiku School 1.0 mi (1.6 km) north of Haiku and 2.7 mi (4.3 km) northeast of Paia. Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 400 ft (122 m), cased to 363 ft (111 m), perforated 363 to 383 ft (111 to 117 m).
DATUM.--Land-surface datum is 365 ft (111 m) above mean sea level. Measuring point: Top of 2.5 in (0.06 m) coupling pipe attached to the casing cover, 366.26 ft (111.636 m) above mean sea level.
REMARKS.--Water-quality records for 1967, 1980 are available in files of district office.
PERIOD OF RECORD.--May 1967, December 1970, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.85 ft (1.783 m) above mean sea level, Jan. 16, 1980; lowest measured, 4.75 ft (1.448 m) above mean sea level, Mar. 7, 1977,

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.71	NOV 20	5.60	JAN 14	5.56	MAR 19	5.60	APR 19	5.46	JUN 8	5.38

205856156400101. Local number, 6-5840-01.
LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi (1.4 km) east of Kahana and 1.5 mi (2.4 km) southwest of Honokahua. Owner: State of Hawaii.
AQUIFER.--Honolua Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 274 ft (83.5 m), cased to 274 ft (83.5 m), perforated 264 to 274 ft (80.5 to 83.5 m). Hole was drilled to depth of 284 ft (86.6 m) but plugged back 10 ft (3.0 m) with cement.
DATUM.--Land-surface datum is 257 ft (78.3 m) above mean sea level. Measuring point: Top of 2.2 in (0.06 m) coupling pipe attached to casing cover 257.34 ft (78.437 m), above mean sea level.
REMARKS.--Recording gage installed Aug. 6, 1975. Water-quality records for 1964, 1980 are available in files of district office.
PERIOD OF RECORD.--June 1964 to July 1964, March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.68 ft (1.122 m) above mean sea level, Sept. 20, 1981; lowest, 2.43 ft (0.741 m) above mean sea level Mar. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.42	3.26	3.06	3.04	3.22	2.95	2.94	3.00	2.87	2.83	2.87	3.21
10	3.42	3.15	3.11	3.13	3.23	2.92	2.90	2.89	2.75	2.87	2.91	3.18
15	3.49	3.22	3.20	3.14	3.31	3.08	2.87	2.90	2.83	2.84	3.03	3.16
20	3.40	3.15	3.12	3.35	3.10	3.00	2.88	2.86	2.94	2.88	3.15	3.19
25	3.31	3.15	3.18	3.13	3.10	2.97	3.29	2.82	2.97	2.85	3.09	3.10
EOM	3.30	3.07	3.04	3.15	3.00	2.94	3.00	2.86	2.90	2.82	3.15	3.10

WTR YEAR 1982 MAX 3.58 OCT 16, 1981 MIN 2.62 JUNE 11, 1982

193017154502101. Local number, 8-3080-02.
LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi (0.8 km) south of intersection of Highway 132 and Highway 137 near Pahoa. Owner: County of Hawaii.
AQUIFER.--Puna Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Dug basal water-table well, diameter 66 in (1.7 m), depth 46 ft (14 m), with two horizontal infiltration tunnels 2 x 50 ft (0.6 x 15 m) extending in opposite directions from 3 ft (0.9 m) above bottom of well.
DATUM.--Land-surface datum is 39 ft (12 m) above mean sea level. Measuring point: Top of steel manhole cover at 1-inch (0.03 m) hole, 39.50 ft (12.040 m) above mean sea level.
REMARKS.--Water-quality records for 1972-81 are available in files of district office. Water pumped from this shaft is used frequently for public supply.
PERIOD OF RECORD.--March 1972 to August 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.10 ft (1.250 m) above mean sea level, Apr. 18, 1979; lowest measured, 1.71 ft (0.521 m) above mean sea level, July 11, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	4.06	FEB 3	3.90	APR 15	4.37	JUL 14	3.72	SEP 15	4.06

193339154594801. Local number, 8-3389-01.
LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 4.9 mi (7.9 km) southeast of Keaau on Orchid Land Estate subdivision. Owner: County of Hawaii.
AQUIFER.--Puna Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 475 ft (145 m), cased to 403 ft (123 m), perforated 403 to 475 ft (123 to 145 m).
DATUM.--Land-surface datum is 427 ft (130 m) above mean sea level. Measuring point: Top of casing, 428.14 ft (130.497 m) above mean sea level.
REMARKS.--Water-quality records for 1961 are available in files of district office.
PERIOD OF RECORD.--September 1974 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.37 ft (8.038 m) above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft (4.874 m) above mean sea level, Apr. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	17.01	DEC 28	17.64	FEB 23	19.15	APR 27	21.30	MAY 26	19.70	SEP 21	21.88
NOV 24	17.39	JAN 26	18.62	MAR 26	20.90	MAY 26	20.09	JUL 13	18.38		

HAWAII, ISLAND OF HAWAII-Continued

194134155005601. Local number, 8-4100-01.
LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi (8.9 km) southeast of Hilo Post Office and 5.0 mi (8.0 km) northeast of Keaau. Owner: Hawaiian Paradise Corporation.
AQUIFER.--Kau Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 55 ft (17 m), cased to 39 ft (12 m), perforated 39 to 55 ft (12 to 17 m).
DATUM.--Land-surface datum is 45 ft (14 m) above mean sea level. Measuring point: Top of casing, 46.84 ft (14.277 m) above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: November 1971 to August 1975 records available in files of district office; November 1975 to current year.
WATER QUALITY: 1971, 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.73 ft (1.746 m) above mean sea level, Apr. 9, 1980; lowest measured, 2.24 ft (0.683 m) above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	4.67	FEB 9	5.36	APR 13	5.00	JUL 13	4.69	SEP 28	5.44

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981					JUL , 1982				
21...	0925	1550	18.5	400	13...	0950	1600	18.5	440
FEB , 1982					SEP				
09...	0915	1400	18.5	400	28...	0940	1050	18.5	280
APR									
13 ..	1030	1350	18.5	340					

195947155485801. Local number, 8-5948-01.
LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi (1.1 km) east of Hapuna Beach Park and 3.1 mi (5.0 km) southeast of Kawaihae. Owner: State of Hawaii.
AQUIFER.--Hamakua Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 268 ft (81.7 m), cased to 246 ft (75.0 m), screened 246 to 266 ft (75.0 to 81.1 m).
DATUM.--Land-surface datum is 244 ft (74.4 m) above mean sea level. Measuring point: Hole in pumpbase, 246.47 ft (75.1 m), above mean sea level.
REMARKS.--Water pumped from this well is used frequently for irrigation.
PERIOD OF RECORD.--
WATER LEVEL: April 1970, March 1973 to August 1975 records available in files of district office; October 1975 to current year.
WATER QUALITY: 1970, 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.27 ft (1.301 m) above mean sea level, Jan. 15, 1982; lowest measured, 1.4 ft (0.43 m), above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 15	4.27	MAR 9	3.77	MAY 25	3.44	AUG 5	3.07	SEP 22	4.18

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
JAN , 1982					AUG , 1982				
15...	1230	1650	26.5	460	05...	1250	1700	25.5	450
MAR					SEP				
09...	1320	1700	25.5	450	22...	1415	1750	25.5	440
MAY									
25...	1225	1700	25.5	450					

200132155471001. Local number, B-6147-01.
LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi (5.0 km) east of Kawaihae and 2.8 mi (4.5 km) northeast of Hapuna Beach Park. Owner: State of Hawaii.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 1,008 ft (307.2 m), cased to 997 ft (304 m), perforated 997 to 1,008 ft (304 to 307.2 m). Hole was drilled to 1,040 ft (317.0 m) but was finally plugged back to 1,008 ft (307.2 m).
DATUM.--Land-surface datum is 982 ft (299 m) above mean sea level. Measuring point: Top of pipe coupling on casing cover 983.1 ft (299.6 m).
REMARKS.--Water-quality records for 1963-64 are available in files of district office.
PERIOD OF RECORD.--June to July 1963, June 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.2 ft (1.9 m), above mean sea level, Aug. 23, 1978, lowest measured, 4.4 ft (1.3 m) above mean sea level Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 2	5.69	MAY 25	5.68	AUG 5	6.07	SEP 22	5.74

201603155521801. Local number, B-7652-01.
LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi (0.5 km) west of Upolu Point Airfield, 3.1 mi (5.0 km) northwest of Hawi, and 1.9 mi (3.1 km) west of Hoea Camp. Owner: Kohala Corporation.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Dug observation basal water-table well.
DATUM.--Land-surface datum is 7.43 ft (2.265 m) above mean sea level. Measuring point: Top of 4 in (0.1 m) steel I-beam placed across sump, 7.75 ft (2.362 m) above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: March 1973 to August 1975 records available in files of district office; October 1975 to current year.
WATER QUALITY: 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft (0.942 m) above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft (0.442 m) above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	2.48	FEB 2	2.53	APR 5	2.30	JUN 7	1.60	AUG 9	2.34

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981				
13...	1145	1700	22.0	530
FEB , 1982				
02...	1130	2000	22.0	540
APR				
05...	1300	2000	22.0	540
JUN , 1982				
07...	1125	2100	22.0	560
AUG				
09...	1240	2200	22.0	600

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI					
220018159444701	2-0044-10	22 00 18	159 44 47	81-10-16	1215	560	22.5	87
				81-12-04	1145	560	22.0	80
				82-01-18	1345	630	21.5	100
				82-03-10	1300	600	21.5	90
				82-04-21	1255	590	22.0	92
				82-06-10	1305	570	22.0	89
				82-07-13	1045	580	23.0	78
				82-08-25	1045	620	24.0	86
220018159444702	2-0044-13	22 00 18	159 44 47	81-10-16	1215	560	22.0	84
				81-12-04	1145	560	22.0	83
				82-01-18	1345	540	21.5	80
				82-03-10	1300	600	21.5	90
				82-04-21	1255	530	22.0	75
				82-06-10	1305	560	22.0	87
				82-07-13	1045	520	23.0	82
				82-08-25	1045	530	23.0	88
220019159444801	2-0044-14	22 00 19	159 44 48	81-10-16	1215	580	22.5	90
				81-12-04	1145	570	22.0	89
				82-01-18	1345	590	21.5	94
				82-03-10	1300	550	21.5	79
				82-04-21	1255	600	21.5	93
				82-06-10	1305	590	23.0	96
				82-07-13	1045	580	23.0	93
				82-08-25	1045	580	22.5	92
220016159442701	2-0044-15	22 00 16	159 44 27	81-10-16	1000	5100	22.5	1500
				81-12-04	0940	4200	22.0	1200
				82-01-18	1005	910	22.5	180
				82-03-10	0945	1750	21.5	410
				82-04-21	0950	670	21.5	110
				82-06-10	1000	2900	22.0	780
				82-07-13	1000	3200	21.5	850
				82-08-25	1000	4000	22.0	920
220136159205501	2-0120-01	22 01 36	159 20 55	82-01-12	1515	840	25.0	130
				82-03-03	1510	810	24.0	160
				82-04-16	1515	750	24.5	170
				82-05-27	1425	520	28.0	95
				82-07-07	1430	490	28.5	100
				82-08-12	1430	520	28.0	120
220134159205401	2-0120-02	22 01 34	159 20 54	81-10-08	1500	810	25.0	120
				81-11-17	1515	800	24.5	120
				82-03-03	1505	800	25.0	120
				82-04-16	1515	800	25.0	120
				82-05-27	1415	800	25.0	130
				82-07-07	1425	810	25.0	130
				82-08-12	1425	810	26.0	130
220148159453501	2-0145-10	22 01 48	159 45 35	81-12-04	1020	1290	21.0	280
				82-01-18	1105	750	21.5	120
				82-04-21	1040	620	21.0	93
				82-06-10	1050	1000	21.0	200
				82-07-13	1115	1350	21.0	270
				82-08-25	1110	1010	21.5	190
220341159453901	2-0345-04	22 03 41	159 45 39	81-10-16	1130	1900	22.5	480
				81-12-04	1100	1850	22.0	460
				82-01-18	1200	640	22.5	98
				82-03-03	1200	--	22.5	--
				82-03-10	1120	1100	22.0	220
				82-04-21	1200	750	21.5	130
				82-06-10	1110	790	22.0	150
				82-07-13	1200	1650	22.0	390
				82-08-25	1215	1550	22.0	330

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENT-I FIER	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued								
220530159450401	2-0545-01	22 05 30	159 45 07	81-10-16	1200	900	24.5	160
				81-12-04	1125	910	23.0	160
				82-03-10	1140	1000	22.5	180
				82-04-21	1230	1080	24.0	200
				82-06-10	1140	1000	24.0	180
				82-07-13	1215	990	24.0	180
				82-08-25	1245	1000	24.0	180
220827159185401	2-0818-01	22 08 27	159 18 54	82-01-12	1315	230	24.0	18
				82-02-25	1500	250	23.0	17
				82-05-27	1245	250	25.0	19
				82-08-10	1330	260	23.0	21
220826159185401	2-0818-02	22 08 26	159 18 54	82-05-27	1245	250	25.0	19
				82-06-28	1515	240	23.5	18
221038159203801	2-1020-03	22 10 38	159 20 38	81-10-08	1145	225	22.5	18
				82-08-10	1125	200	22.0	18
221141159252501	2-1125-01	22 11 41	159 25 25	82-01-12	1030	155	24.0	13
				82-06-28	1330	160	23.5	13
221141159252502	2-1125-02	22 11 41	159 25 25	82-05-27	0830	160	23.0	12
221201159293401	2-1229-03	22 12 01	159 29 34	81-10-06	1145	230	23.0	22
				82-01-13	1245	220	23.0	19
				82-02-24	1145	230	22.5	22
				82-04-02	1215	220	23.0	20
				82-05-24	1300	220	23.0	22
221247159324801	2-1232-01	22 12 47	159 32 48	82-04-12	1400	120	23.0	17
				82-07-06	1340	130	23.0	20
				82-08-09	1410	130	23.0	18
215528159303001	2-5530-02	21 55 28	159 30 30	81-10-19	1045	260	22.5	26
				81-12-08	1015	260	22.0	25
				82-03-09	1335	255	22.0	22
				82-04-23	1030	275	22.0	26
				82-06-14	1410	260	22.5	24
				82-07-14	1145	260	23.0	25
215522159342601	2-5534-03	21 55 22	159 34 26	82-01-15	1000	500	23.0	49
215635159355001	2-5635-01	21 56 35	159 35 50	81-12-08	0840	780	22.0	150
				82-01-15	0830	790	22.5	140
				82-03-09	1210	800	22.0	140
				82-04-23	0845	770	22.5	150
				82-07-14	1000	700	23.5	150
				82-08-27	1000	800	24.0	140
215635159355002	2-5635-02	21 56 35	159 35 50	81-10-19	0945	1000	23.0	210
215854159424601	2-5842-02	21 58 54	159 42 46	81-10-16	0930	710	24.0	110
				81-12-04	0905	700	24.0	100
				82-01-18	0915	670	23.5	88
				82-03-10	0900	650	23.5	87
				82-04-21	0905	650	23.5	89
				82-06-10	0925	680	23.5	95
				82-07-13	0915	690	24.0	100
				82-08-25	0915	750	24.0	100
215843159422901	2-5842-03	21 58 43	159 42 29	81-10-16	0900	1100	24.0	230
				81-12-04	0845	730	24.0	120
				82-01-18	0845	680	23.5	98
				82-03-10	0840	900	23.5	160
				82-04-21	0845	780	23.5	140
				82-06-10	0900	1000	24.0	200
				82-07-13	0900	1050	23.5	210
				82-08-25	0845	1200	24.0	240

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE		DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
215937159434201	2-5943-01	21 59 37	159 43 42	01	81-10-16	0945	1210	24.0	260
					82-01-18	0940	930	24.0	170
					82-03-10	0930	1000	24.0	180
					82-04-21	0930	980	24.0	180
					82-06-10	0945	1010	24.0	180
					82-07-13	0945	1000	23.5	190
					82-08-25	0940	1110	24.0	200
HAWAII, ISLAND OF OAHU									
211646157465201	3-1646-01	21 16 46	157 46 52		82-02-04	0900	650	22.5	130
					82-04-01	0900	650	23.0	130
					82-05-05	1100	625	23.0	130
					82-06-24	0950	750	22.5	180
					82-08-02	1230	775	23.0	180
211832157515501	3-1851-19(A)	21 18 32	157 51 55		82-03-31	1545	20000	23.5	7800
					82-05-11	1605	22000	23.5	8200
					82-06-25	1430	22500	23.5	8400
					82-08-09	1530	22000	23.5	8400
211832157515502	3-1851-19(B)	21 18 32	157 51 55		82-03-31	1550	2500	23.5	610
					82-05-11	1615	2500	23.5	730
					82-06-25	1440	2500	23.5	760
					82-08-09	1525	2600	23.5	770
212038157422501	3-2042-13	21 20 02	157 42 06		82-02-25	1100	6800	25.0	2200
212133158035501	3-2103-03	21 21 33	158 03 55		81-10-27	0920	1100	23.0	220
					82-05-11	0900	1100	23.5	220
					82-08-09	0915	1100	23.0	230
212106157533701	3-2153-02	21 21 06	157 53 37		81-10-26	1520	390	22.0	66
					82-01-29	1545	380	22.0	64
					82-04-01	1210	400	22.0	71
					82-05-04	1235	400	22.0	73
					82-07-29	1520	395	22.0	74
212234158015300	3-2201-03	21 22 34	158 01 53		82-01-25	0955	872	--	160
					82-07-14	1115	910	--	170
					82-08-10	1255	785	--	150
212220158021811	3-2202-03	21 22 20	158 02 18		82-01-25	1015	902	--	180
					82-02-05	1000	948	--	200
					82-02-26	1235	910	--	180
					82-03-05	1135	917	--	190
					82-07-14	1130	900	--	180
					82-08-10	1305	908	--	190
					82-09-23	1145	--	--	190
212252158025001	3-2202-21	21 22 52	158 02 50		82-01-08	0945	877	--	170
					82-01-25	1045	819	--	140
					82-02-05	1030	885	--	180
					82-02-26	1150	840	--	110
					82-03-05	1110	839	--	160
					82-04-01	1350	841	--	170
					82-07-14	1150	849	--	180
					82-08-10	1320	864	--	180
					82-09-23	1200	--	--	180

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212259157554201	3-2255-35	21 22 59	157 55 42	81-10-27	1445	1000	22.0	240
				82-05-11	1430	1000	22.0	230
				82-08-09	1500	900	23.0	220
212300158004801	3-2300-06	21 23 00	158 00 48	82-02-04	1520	650	21.5	140
				82-03-31	1300	600	21.5	130
				82-05-11	1115	650	22.0	150
				82-06-25	1015	650	21.5	160
				82-08-09	1220	630	21.5	150
212343158001001	3-2300-11	21 23 43	158 00 10	81-10-27	1200	875	22.5	200
				82-03-31	1355	830	22.5	190
				82-05-11	1150	850	22.5	193
				82-06-25	1045	850	22.5	200
				82-08-09	1300	850	22.5	200
212358158010905	3-2301-05	21 23 58	158 01 09	82-01-08	1050	239	--	28
				82-02-01	1120	265	--	38
				82-02-05	1100	246	--	36
				82-03-05	1230	211	--	30
				82-07-14	1055	174	--	34
212358158010901	3-2301-09	21 23 58	158 01 09	81-10-27	1140	500	22.5	90
				81-12-29	1432	602	--	120
				82-03-31	1340	650	22.5	130
				82-05-11	1140	700	23.0	150
				82-06-25	1035	690	22.5	140
				82-08-09	1245	640	24.0	130
212332157582201	3-2358-02	21 23 32	157 58 22	81-10-27	1330	1200	20.5	320
				82-02-03	1450	6500	20.5	2000
				82-03-31	1500	7500	20.5	2400
				82-05-11	1320	7600	20.5	2400
				82-06-24	1400	7600	20.5	2400
				82-08-06	1450	7600	20.5	2400
212342157584301	3-2358-22	21 23 42	157 58 43	81-10-27	1210	800	20.5	200
				82-03-31	1435	1400	20.5	380
				82-05-11	1205	1400	20.5	400
				82-06-25	1100	1400	20.5	400
				82-08-06	1415	1400	20.5	380
212343157584701	3-2358-29	21 23 43	157 58 47	81-10-27	1215	1050	20.5	280
				82-03-31	1440	4500	20.5	1400
				82-05-11	1210	4750	20.5	1400
				82-06-25	1105	4600	20.5	1400
				82-08-06	1420	4300	20.5	1200
212336157591801	3-2359-05	21 23 36	157 59 18	81-10-27	1225	1900	22.5	530
				82-03-31	1420	3000	22.0	820
				82-05-11	1220	3000	22.0	880
				82-06-25	1115	3000	22.0	820
				82-08-06	1400	2900	22.0	820
212422157485601	3-2448-01	21 24 22	157 48 56	82-02-23	1225	200	21.0	16
				82-04-14	1130	200	21.0	18
				82-06-01	1300	190	20.0	18
212436157590111	3-2459-01	21 24 36	157 59 01	82-02-19	1305	3060	--	850
				82-03-05	1030	3120	--	900
				82-07-14	1225	3350	--	950
				82-08-10	1200	3340	--	980
				82-09-23	1315	--	--	950

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212501158080701	3-2508-02	21 25 01	158 08 07	81-10-09	1115	1300	28.0	260
				82-03-09	1450	1240	28.0	270
				82-04-29	1145	1320	27.5	260
				82-06-11	1100	1350	28.0	260
				82-07-30	1205	1200	28.0	270
				82-09-29	1105	1200	28.0	270
212556157500301	3-255C-01	21 25 56	157 50 03	82-02-25	0950	150	23.0	16
				82-04-14	1050	140	23.0	16
				82-06-01	1145	120	23.0	14
212517157582501	3-2558-09	21 25 17	157 58 25	81-11-25	1515	2217	--	670
				81-12-29	1315	3220	--	980
				82-01-25	1215	3610	--	1100
				82-02-26	1050	1840	--	500
212506157582301	3-2558-10	21 25 06	157 58 23	81-10-27	1405	900	21.5	220
				82-05-11	1345	850	21.5	200
				82-08-09	1415	900	21.5	230
212617158033801	3-2603-01	21 26 17	158 03 38	81-10-27	1100	360	22.5	45
				82-03-31	1200	360	21.5	51
				82-08-09	1145	360	22.5	49
212656158071801	3-2607-01	21 26 56	158 07 18	81-10-09	1230	360	24.5	44
				82-03-09	1400	340	24.5	45
				82-04-29	1025	350	24.5	44
				82-06-11	1000	340	24.5	48
				82-07-30	1130	460	24.5	48
				82-09-29	0940	330	24.5	47
212803158000701	3-2800-01	21 28 03	158 00 06	81-10-16	1345	160	22.5	16
				82-05-05	1520	155	22.0	15
				82-06-07	1110	158	22.0	15
				82-08-02	1145	160	22.0	15
				82-09-29	1250	160	22.5	18
212813158080201	3-2808-01	21 28 13	158 08 04	81-10-09	1300	1250	27.0	160
				82-03-09	1345	1150	26.5	160
				82-04-29	1050	1300	26.5	180
				82-06-11	0930	1200	25.0	190
				82-07-30	1050	1300	25.5	200
				82-09-29	1020	1400	26.5	260
212828158092001	3-2809-06	21 28 27	158 09 20	81-10-13	0940	340	23.0	29
				82-01-13	1330	360	22.5	32
				82-03-11	1000	390	23.0	48
				82-04-23	1045	380	22.5	42
				82-06-08	0920	370	22.5	39
				82-06-08	0925	370	22.5	39
				82-07-29	1010	500	22.5	34
				82-09-22	0950	340	22.5	39
212859158124301	3-2812-01	21 28 59	158 12 43	81-10-13	1110	600	26.0	100
				82-03-11	1140	580	25.0	110
				82-04-23	1200	590	24.0	100
				82-06-08	1115	570	24.5	100
				82-07-29	1130	725	25.5	110
				82-09-22	1130	590	22.5	110
212945158014301	3-2901-09	21 29 45	158 01 43	81-10-14	1150	200	22.0	20
				82-03-11	1420	190	22.0	18
				82-05-05	1425	190	22.0	19
				82-06-10	1630	190	22.0	19
				82-07-26	1700	195	22.0	18
				82-09-26	1720	190	22.0	23

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
				HAWAII, ISLAND OF OAHU--Continued				
212939158112301	3-2911-02	21 29 39	158 11 23	81-10-13	1215	270	21.5	23
				82-01-12	1430	260	21.5	24
				82-03-11	1205	265	21.5	23
				82-04-23	1530	270	22.0	25
				82-06-08	1600	270	21.5	25
				82-07-29	1155	420	21.5	28
				82-09-22	1550	250	21.5	25
213224158135901	3-3213-06	21 32 24	158 13 59	81-10-13	1030	875	25.0	200
				82-03-11	1040	860	23.5	210
				82-04-23	1130	850	24.0	200
				82-06-08	1025	825	23.5	270
				82-07-29	1100	880	24.0	200
				82-09-22	1100	800	24.0	220
213243157510001	3-3251-01	21 32 43	157 51 00	82-04-13	1300	1000	23.0	240
				82-05-21	1420	1000	23.0	250
213427158055501	3-3405-02	21 34 27	158 05 55	81-10-14	1410	500	22.5	90
				82-03-12	1500	720	22.5	150
				82-06-10	1610	610	22.2	130
				82-07-19	1700	690	22.5	150
				82-09-26	1650	640	22.5	150
213411158074501	3-3407-25	21 34 11	158 07 45	81-10-16	0940	2400	23.0	660
				82-06-04	1535	2200	23.0	580
				82-08-02	0840	2100	23.0	530
				82-09-26	1345	2100	23.0	560
213444158075501	3-3407-30	21 34 44	158 07 55	81-10-16	1205	6750	25.5	2000
				82-05-04	0900	3500	25.0	1100
				82-06-04	1515	5700	25.0	1700
				82-07-30	1450	7500	25.5	2100
				82-09-26	1320	7500	25.0	2300
213438158091101	3-3409-16	21 34 36	158 09 12	81-10-16	1000	850	22.5	200
				82-03-15	1100	950	22.5	200
				82-05-04	1325	900	23.5	200
				82-06-10	1540	800	28.0	180
				82-08-02	0720	700	25.0	150
				82-09-26	1405	725	28.5	180
213512158061601	3-3506-03	21 35 12	158 06 16	81-10-07	1650	655	22.0	130
				82-04-28	0900	600	22.5	110
				82-06-03	1400	590	22.0	130
				82-09-24	1345	520	22.5	120
213636158053701	3-3605-03	21 36 36	158 05 37	81-10-07	1240	2100	21.5	620
				82-01-19	1135	1700	22.0	470
				82-03-11	1015	1800	21.5	510
				82-04-28	1415	1580	22.0	440
				82-06-03	1540	2450	21.5	660
				82-07-27	1100	1750	21.5	480
				82-09-26	0920	1450	21.5	560
213636158053702	3-3605-21	21 36 35	158 05 40	81-10-07	1255	1720	21.5	420
				82-03-12	1000	1450	22.0	400
				82-04-28	1430	1450	22.0	390
				82-06-03	1600	1600	21.5	410
				82-07-27	1110	1500	22.0	410
				82-09-26	1000	1380	21.5	420
213656157550401	3-3655-01	21 36 56	157 55 04	82-02-19	1500	240	21.5	30
				82-04-13	1210	250	21.5	30
				82-05-21	1345	250	22.0	35

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
213902157561601	3-3956-04	21 39 02	157 56 16	82-02-19	1430	450	21.5	110
				82-04-13	1150	500	21.5	100
				82-05-21	1310	520	21.5	100
				82-07-16	1420	550	22.0	120
214157158000101	3-4100-01	21 41 57	158 00 01	82-02-19	1150	350	22.0	58
				82-04-13	0840	350	21.0	60
				82-05-21	0955	380	21.0	68
214131158011601	3-4101-08	21 41 31	158 01 16	82-02-19	1310	240	21.5	30
				82-05-21	1105	240	21.0	36
214233157583501	3-4258-04	21 42 33	157 58 35	82-02-19	1030	2000	23.5	540
				82-05-21	0930	2100	23.0	570
				82-07-16	1125	2000	23.0	560
HAWAII, ISLAND OF MOLOKAI								
210856157011201	4-0801-01	21 08 56	157 01 12	82-07-01	j 0815	333	--	66
				82-08-26	j 0915	--	--	69
210857156010701	4-0801-02	21 08 57	157 01 07	81-10-07	j 1020	357	--	71
				82-01-28	j 0900	353	--	69
				82-05-25	j 1500	342	--	70
210903157013001	4-0901-01	21 09 03	157 01 30	81-10-22	0915	300	--	56
				81-12-10	0920	290	21.0	57
				82-01-28	1045	350	--	74
				82-05-06	0905	380	--	86
				82-08-26	1225	400	--	92
210825157014501	SMPL P-A	21 08 25	157 01 45	81-10-22	0855	102	19.0	11
				81-12-10	0855	106	18.0	9.5
				82-01-28	0845	53	17.0	8.0
				82-05-06	0845	116	19.0	11
				82-07-01	0950	77	19.5	8.5
				82-08-26	0810	54	20.0	7.5
210855157021001	SMPL P-B2	21 08 55	157 02 10	81-10-22	0930	280	20.5	52
				81-12-10	0935	290	21.0	56
				82-01-28	1100	54	20.5	7.5
				82-05-06	0915	360	21.5	82
				82-08-26	1210	380	22.5	81
210928157024801	SMPL P-C	21 09 28	157 02 48	81-10-22	0945	118	19.0	14
				81-12-10	0945	215	19.5	36
				82-01-28	1025	52	17.5	8.0
				82-05-06	0930	175	19.5	28
				82-08-26	1200	70	20.5	10
210923157031501	SMPL P-D	21 09 23	157 03 15	81-10-22	1000	140	22.5	22
				81-12-10	1000	110	19.0	15
				82-01-28	1015	95	20.0	12
				82-05-06	0945	90	22.0	14
				82-07-01	1035	96	25.0	12
				82-08-26	1150	90	25.5	11

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MAUI					
203835156065001	6-3806-01	20 38 35	156 06 50	82-02-05	1210	680	21.0	180
204126156262101	6-4126-02	20 41 26	156 26 21	81-11-30	1310	1900	19.5	470
				82-01-08	0920	1800	19.0	450
				82-03-25	1305	1850	20.5	470
				82-04-28	1300	1800	21.0	500
				82-06-22	1230	1850	20.5	460
				82-08-19	1040	1700	20.0	450
204601156001501	6-4600-01	20 46 01	156 00 15	81-10-06	1705	610	--	120
				81-11-18	1615	590	--	110
				82-01-13	1800	570	21.0	95
				82-03-03	1500	530	21.0	84
				82-04-20	1800	440	--	64
				82-06-18	0725	430	22.0	61
				82-08-13	0720	420	22.0	66
204636156002601	6-4600-02	20 46 36	156 00 26	82-03-03	1610	500	19.5	120
				82-06-18	0740	220	19.5	37
204633156003201	6-4600-03	20 46 36	156 00 30	81-10-06	1720	930	19.0	240
				81-11-19	1600	670	18.5	170
				82-01-13	1825	340	19.0	75
				82-03-03	1550	200	20.0	34
				82-04-21	1740	140	20.0	16
				82-06-18	0755	120	20.5	14
				82-08-13	0750	120	20.0	12
204635156270101	6-4627-14	20 46 35	156 27 01	81-10-09	1005	1750	23.0	350
				81-11-30	1440	1750	23.0	350
				82-01-08	1330	1750	22.5	360
				82-03-25	1330	1750	23.0	360
				82-04-28	1100	1480	24.0	360
				82-06-22	1410	1800	23.5	360
				82-08-19	1325	1650	23.5	360
204845156255001	6-4825-01	20 48 45	156 25 50	82-06-30	j1225	1690	--	360
				82-07-26	j1245	1470	--	290
				82-09-15	j1230	1620	--	340
204931156371201	6-4937-01	20 49 31	156 37 12	81-11-10	j1410	2750	--	750
				81-12-01	j0930	795	--	150
205102156282501	6-5128-02	20 51 02	156 28 25	82-07-27	j1245	1950	--	410
				82-09-15	j --	1890	--	380
205243156243201	6-5224-02	20 52 43	156 24 32	82-06-30	j1030	1610	--	370
				82-07-27	j1045	1380	--	300
				82-09-15	j --	1560	--	360
205329156305501	6-5330-10	20 53 29	156 30 55	81-10-08	1005	580	22.5	120
205320156394501	6-5339-02	20 53 20	156 39 45	81-11-25	1410	930	21.5	180
205343156401101	6-5340-02	20 53 43	156 40 11	81-11-10	j1040	2580	--	700
				82-07-21	j --	513	--	100
205416156244301	6-5424-01	20 54 16	156 24 43	82-06-30	j0900	2430	--	620
				82-07-26	j1205	2380	--	600
				82-09-15	j0800	2330	--	600
205511156222101	6-5522-01	20 55 11	156 22 21	82-06-30	j1000	1140	--	260
				82-07-26	j1025	1170	--	260
205838156383101	6-5838-02	20 58 38	156 38 31	81-10-02	1040	320	19.5	62
				81-11-25	1320	330	20.0	65
				82-01-11	1120	290	20.5	56
				82-04-26	1510	370	20.0	80
				82-06-22	1400	380	20.5	87
				82-08-19	1045	300	20.0	60

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENT-I FIER	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII								
190832155310901	B-0831-02	19 08 32	155 31 09	82-03-16	1130	650	18.5	150
				82-05-14	0910	650	18.5	150
				82-07-21	1105	600	19.0	150
191108155281701	B-1128-02	19 11 08	155 28 17	82-03-16	1100	115	19.5	9.0
				82-05-14	0825	115	19.0	10
191114155294801	B-1129-01	19 11 14	155 29 48	82-05-14	0955	92	18.0	5.0
192108155021201	B-2102-01	19 21 08	155 02 12	81-10-15	1245	1070	25.0	270
				82-02-03	1435	150	24.0	18
				82-04-15	1320	205	24.5	32
				82-07-14	1350	1200	24.5	310
				82-09-15	1330	870	24.5	230
192646155532001	B-2653-01	19 26 46	155 53 20	82-03-29	1610	175	19.0	24
				82-06-07	1550	200	18.5	31
192738155534201	B-2753-01	19 27 38	155 53 42	81-11-04	1430	640	19.5	150
				82-01-18	1500	640	19.5	110
192728154530101	B-2783-01	19 27 28	154 53 01	81-10-15	0935	10500	55.0	3800
				82-02-03	1320	7000	52.0	2300
				82-04-15	1050	4800	52.0	1400
				82-07-14	1130	9400	53.0	3000
				82-09-15	1100	11000	53.0	3900
192924154564701	B-2986-01	19 29 24	154 56 47	81-10-15	0835	120	23.0	5.0
				82-07-14	1030	120	22.0	7.0
192923154564701	B-2986-02	19 29 23	154 56 47	82-04-15	1000	115	22.5	5.0
				82-09-15	1445	120	22.0	7.0
193113154555801	B-3185-01	19 31 13	154 55 58	82-04-15	1440	120	21.0	12
				82-07-13	1530	120	21.0	13
				82-09-15	1525	120	21.0	14
193508155570701	B-3557-03	19 35 08	155 57 07	81-11-06	0900	135	20.0	9.5
				82-03-29	1410	135	21.0	9.0
193505155570701	B-3557-04	19 35 05	155 57 07	81-11-06	0920	185	20.0	22
				82-01-19	1155	190	20.5	24
				82-06-09	0745	190	20.0	26
				82-08-09	1610	200	20.0	30
193803155020201	B-3802-01	19 38 03	155 02 02	81-10-20	1015	77	18.5	3.0
193805155020201	B-3802-03	19 38 05	155 02 02	81-10-20	0950	75	19.5	3.5
				82-04-15	1540	88	18.5	4.0
				82-06-16	0955	85	18.5	6.5
				82-08-25	1040	90	18.5	6.0
193937155004301	B-3900-01	19 39 37	155 00 43	81-10-20	0855	360	19.0	76
				82-02-03	1030	340	19.5	56
				82-04-20	1025	265	19.0	39
				82-06-16	1035	340	19.0	58
				82-08-25	1125	250	19.0	35
194037155035301	B-4003-01	19 40 37	155 03 53	81-10-20	1045	76	20.5	1.5
				82-02-03	0910	80	20.0	4.0
				82-04-20	1115	90	19.5	4.0
				82-06-16	1120	93	20.0	6.0
				82-08-25	1210	90	20.0	5.0
194040155035201	B-4003-02	19 40 40	155 03 52	81-10-20	1035	78	20.5	2.5
				82-02-03	0855	80	20.0	5.0
				82-04-20	1105	90	19.5	3.5
				82-06-16	1110	90	20.0	6.0
				82-08-25	1200	90	20.0	6.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

STATION NUMBER	LOCAL IDENT-I FIER	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII-CONTINUED								
194222155035001	B-4203-05	19 42 22	155 03 50	82-04-15	0905	130	20.5	17
				82-08-25	1010	115	20.0	12
194222155034801	B-4203-06	19 42 22	155 03 48	81-10-19	1150	190	26.0	34
				82-02-03	0810	130	24.0	19
194337155041801	B-4304-01	19 43 37	155 04 18	81-10-15	1510	14000	21.5	4600
				82-02-05	0830	9800	20.5	3200
				82-04-20	1145	3800	21.0	1100
				82-06-16	1215	40000	20.0	15000
				82-09-08	0950	4200	22.0	1200
194715155061301	B-4706-01	19 47 16	155 06 13	82-02-08	1005	115	18.0	3.5
194818155582301	B-4858-02	19 48 18	155 58 23	81-11-06	1040	2200	20.5	420
				82-01-19	1345	2200	21.0	420
				82-03-29	1315	2100	20.5	420
				82-06-07	1400	2200	20.5	420
				82-08-09	1445	2200	20.5	420
195035155054501	B-5005-01	19 50 35	155 05 45	81-10-30	0940	180	19.5	12
				82-01-14	1400	180	21.0	12
				82-04-05	1010	180	22.0	13
195043155053801	B-5005-02	19 50 43	155 05 38	81-10-30	0925	240	21.5	24
				82-01-14	1345	190	22.0	15
				82-07-13	1335	240	21.0	21
				82-09-27	0955	230	22.0	20
195049155051601	B-5005-04	19 50 49	155 05 16	82-07-13	1405	17500	17.5	5900
				82-09-27	1025	17500	17.5	6000
195051155051501	B-5005-05	19 50 51	155 05 15	81-10-30	0910	14500	18.0	4800
195546155480301	B-5548-01	19 55 46	155 48 03	81-11-06	1330	2200	28.5	560
				82-03-29	1140	2100	28.5	550
195724155455301	B-5745-01	19 57 24	155 45 53	81-11-06	1245	300	27.0	26
				82-01-27	1210	290	26.5	25
				82-03-23	1100	285	27.0	26
195722155455201	B-5745-02	19 57 22	155 45 52	82-05-25	1105	310	26.0	27
				82-08-05	1035	300	26.0	26
				82-09-27	1410	300	26.0	27
195912155464201	B-5946-02	19 59 12	155 46 43	81-11-06	1140	310	26.0	28
200121155480801	B-6148-02	20 01 21	155 48 08	82-08-05	1330	1550	27.0	400
				82-09-22	1335	1600	27.0	400

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI

220354159205602 - 2-0320-03 W9-1B CNTY, WAILUA KAUAI

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
AUG 11...	0900	430	7.2	23.0	112	.00	15	18	44	46	1.8	2.2

DATE	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
AUG 11...	113	14	53	<.1	73	293	1.3	<1	100	<1	<10

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
AUG 11...	1	70	50	17	1	<10	3	<.1	<1	<1	20

221318159335901 - 2-1333-01 W66 HAENA KAUAI

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981 06...	1330	220	21.5	18
JAN , 1982 13...	1400	220	21.5	18
JUL , 1982 06...	1320	215	21.5	19
AUG 09...	1350	205	22.0	18

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)
AUG 09...	1350	7.2	<1	100	<1	<10	6

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
AUG 09...	280	5	<10	<.1	<1	<1	20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

215454159274201 - 2-5427-01 W16A CNTY, KOLOA KAUAI

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981				
19...	1100	240	23.5	24
DEC				
08...	1115	240	22.0	22
MAR , 1982				
08...	1420	230	22.5	23
APR , 1982				
23...	1100	245	20.5	26
JUN				
16...	1455	240	22.5	24
JUL				
14...	1345	240	24.0	23

DATE	TIME	PH (UNITS)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
JUL											
14...	1345	6.9	70	.00	9.8	11	20	38	1.1	1.2	80

DATE	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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)
JUL											
14...	5.0	<.1	57	177	.44	<1	<100	<1	<10	7	100

DATE	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, SUSPENDED RECOV. (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
JUL										
14...	70	33	1	20	20	5	<.1	<1	<1	120

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

215535159302601 - 2-5530-03 W22 CNTY, LAWAI KAUAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981				
19...	1040	230	22.5	23
DEC				
08...	1030	230	22.0	20
JAN , 1982				
15...	1030	220	22.5	20
JUN , 1982				
14...	1425	230	22.5	22
AUG				
13...	1135	220	23.0	--
27...	0845	220	22.5	22

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
AUG							
13...	1135	7.0	<1	100	<1	<10	24

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
AUG							
13...	10	3	<10	<.1	<1	<1	20

215803159401201 - 2-5840-02 W26 CNTY, WAIMEA KAUAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981				
16...	1310	720	25.0	140
MAR , 1982				
10...	1320	640	22.5	100
APR				
21...	1350	630	24.5	100
JUN , 1982				
10...	1330	660	24.5	110
JUL				
13...	1430	690	24.0	120
AUG				
25...	1445	710	24.0	120

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
JUL							
13...	1430	7.3	<1	<100	<1	10	4

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
JUL							
13...	<10	<1	10	.2	1	<1	10

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF KAUAI--Continued

215901159235301 - 2-5923-01 STATE, KILOHANA KAUAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
APR 23...	1515	280	--	25.0	16	--	--	--	--
AUG 13...	0825	250	7.7	25.0	--	<1	<100	<1	10

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
APR 23...	--	--	--	--	--	--	--	--
AUG 13...	2	80	5	<10	<.1	<1	<1	20

215906159395601 - 2-5939-01 S9 CNTY, WAIMEA KAUAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981 16...	1345	750	23.0	150
DEC 04...	1345	720	23.5	130
JAN , 1982 18...	1425	480	23.0	58
MAR 10...	1345	420	23.0	46
APR 21...	1415	460	23.0	56
JUN , 1982 10...	1400	580	23.0	95
JUL 13...	1515	680	23.5	110
AUG 13...	0945	800	24.0	170
25...	1515	600	23.5	94

DATE	TIME	PH (UNITS)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
AUG 13...	0945	7.0	226	110	26	39	69	39	2.0	4.2	116

DATE	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)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
AUG 13...	23	<.1	51	456	.88	<1	100	<1	<10	2	50

DATE	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
AUG 13...	40	13	2	40	5	35	<.1	<1	<1	10

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU

211828157515801 - 3-1851-22 W101 STATE, ALA MOANA OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DENSITY (GM/ML AT 20 C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM
MAY 05...	0920	12500	8.0	23.0	1.004	2520	2500	300	430	1800	60

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
MAY 05...	16	76	47	480	4200	.2	20	7330	.38	30	500

212036158044101 - 3-2004-04 CAMPBELL EST, HONOULIULI OAHU

DATE	TIME	DEPTH TO TOP OF SAMPLE INTERVAL (FT)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD)	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	NITROGEN DISSOLVED (MG/L AS N)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)
JAN 12...	0800	--	--	1090	--	--	--	--	--
12...	0835	E180	E141.00	1070	7.1	23.5	3.7	240	130
12...	0902	--	--	1080	--	23.5	--	--	--
12...	1700	--	--	1080	--	23.5	--	--	--

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
JAN 12...	--	--	--	--	--	--	--	--	250
12...	35	37	120	51	3.4	6.6	110	39	250
12...	--	--	--	--	--	--	--	--	240
12...	--	--	--	--	--	--	--	--	240

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)
JAN 12...	--	--	--	--	--	--	--	--
12...	.2	74	641	3.0	.160	.55	.71	.070
12...	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--

E Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF OAHU--Continued

212238157561102 - 3-2256-12 W187C NAVY, AIEA OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAR , 1982				
30...	1230	675	23.5	170
MAY				
06...	1530	680	24.5	160
JUN , 1982				
24...	1435	700	26.0	170
AUG				
24...	1100	690	26.0	180

DATE	TIME	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
AUG										
24...	1100	<.10	<.01	<.10	<.01	<.01	<.01	<.01	<.01	<.01

DATE	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)	MIREX, TOTAL (UG/L)
AUG										
24...	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01

DATE	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
AUG									
24...	<.10	<.10	<.01	<1	<.01	<.01	<.01	<.01	<.01

212426158010801 - 3-2401-01 W251-1 NAVY, WAIKELE GULCH OAHU

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM
MAY										
24...	1030	200	710	24.5	225	160	24	40	55	34
28...	0933	200	580	24.5	182	100	20	32	48	36

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
MAY									
24...	1.6	2.5	64	57	160	<.1	47	433	2.1
28...	1.6	2.3	82	37	110	<.1	62	378	4.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MOLOKAI

210402156495801 - 4-0449-01 S6 CNTY, UALAPUE MOLOKAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981				
19...	1650	310	20.5	57
JAN , 1982				
26...	1415	360	20.0	65
MAR , 1982				
15...	1630	330	21.0	59
AUG				
25...	1005	320	20.5	56

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
AUG							
25...	1005	6.9	1	<100	<1	<10	13

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
AUG							
25...	90	2	20	<.1	<1	<1	10

210419156570501 - 4-0457-01 S4 CNTY, KAWELA MOLOKAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981				
19...	1755	430	23.0	96
JAN , 1982				
26...	1625	240	23.5	38
MAR				
17...	1620	210	23.5	34
MAY , 1982				
05...	1735	200	22.5	30
AUG				
23...	1820	230	23.0	40

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
AUG							
23...	1820	6.7	1	<100	<1	<10	9

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
AUG							
23...	40	<1	10	<.1	<1	<1	20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI

205330156305401 - 6-5330-11 W15F CNTY, WAILUKU MAUI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT , 1981				
08...	0950	490	23.0	79
DEC				
02...	0915	430	22.5	84
JAN , 1982				
20...	1205	530	22.5	98
MAR				
25...	1435	560	22.5	110
APR , 1982				
29...	1305	590	22.5	120
JUN				
24...	1220	590	22.5	120
JUL				
08...	1320	580	22.5	--
AUG				
20...	1405	600	22.5	120

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
JUL							
08...	1320	7.1	2	100	<1	10	4

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
JUL							
08...	<10	<1	<10	.1	<1	<1	20

205322156394501 - 6-5339-01 W29I CNTY, LAHAINA MAUI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
NOV , 1981				
25...	1420	940	22.0	180
JUN , 1982				
24...	1210	820	21.5	160
JUL , 1982				
06...	1210	810	21.5	--
AUG				
19...	1450	810	21.5	160

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)
JUL							
08...	1210	7.2	2	200	<1	<10	3

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
JUL							
08...	30	1	10	.1	<1	<1	50

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI--Continued

205405156305401 - 6-5430-05 STATE, WAIEHU MONITOR WELL MAUI

DATE	TIME	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
JUL										
20...	1400	56	.00	13	5.6	46	62	2.8	3.7	72
21...	0825	53	.00	12	5.7	44	62	2.7	3.5	73
21...	0945	43	2.0	9.2	4.8	91	79	6.2	8.1	41
21...	1120	205	170	41	25	330	75	10	23	35
21...	1315	1242	1200	250	150	760	57	9.9	50	38
21...	1610	2998	3000	640	340	2300	62	19	87	40
21...	1720	6458	6400	1300	780	7900	72	44	210	38
21...	1825	4803	4800	1000	560	5300	70	34	150	33
21...	1925	7078	7100	1400	870	8900	72	47	240	23

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
JUL									
20...	15	53	.2	39	220	.32	<3	<1	j
21...	14	44	.2	40	211	.84	<3	1	j
21...	17	140	.1	34	330	.22	<3	<1	j
21...	67	620	.1	32	1160	1.2	<10	<10	j
21...	170	2000	.1	28	3450	<.10	30	10	j
21...	590	5200	<.1	20	9200	<.10	70	30	j
21...	1800	16000	<.1	17	28000	.65	190	410	j
21...	1300	11000	<.1	18	19400	2.8	<3	110	j
21...	2000	18000	<.1	22	31500	6.0	170	240	j

205651156401001 - 6-5640-01 836 PNR MILL, HONOKOWAI MAUI

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
NOV									
10...	0915	545	--	--	120	--	--	--	--
DEC									
01...	0800	438	--	--	90	--	--	--	--
MAR									
11...	1200	602	--	--	130	--	--	--	--
JUL									
08...	0845	490	7.5	20.5	100	1	100	1	<10
21...	--	575	--	--	130	--	--	--	--

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
NOV									
10...	--	--	--	--	--	--	--	--	j
DEC									
01...	--	--	--	--	--	--	--	--	j
MAR									
11...	--	--	--	--	--	--	--	--	j
JUL									
08...	16	560	5	10	.1	<1	1	330	--
21...	--	--	--	--	--	--	--	--	j

< Actual value is known to be less than the value shown.
j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF MAUI--Continued

205705156390801 - 6-5739-01 AMFAC, KAANAPALI MAUI

DATE	TIME	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
FEB 08...	1500	98	51	16	14	62	57	2.8	3.8	47

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
FEB 08...	17	120	.1	40	308	1.6	10	<10	j

205837156384601 - 6-5838-01 STATE, NAPILI MAUI

DATE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT , 1981 02...	1015	620	20.5	150
JAN , 1982 11...	1100	620	20.5	140
APR 26...	1450	630	--	150
JUL , 1982 26...	0950	640	21.0	150
AUG 19...	1030	620	21.0	150

DATE	TIME	PH (UNITS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)
JUL 26...	0950	7.7	1	<100	<1	10	4

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
JUL 26...	40	<1	10	.2	<1	1	10

< Actual value is known to be less than the value shown.
j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982

HAWAII, ISLAND OF HAWAII

192855154532501 - 8-2883-03 THERMAL PWR JV, KAPOHO HAWAII

DATE	TIME	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
JAN 28.	1030	164	54	65	.5	1000	88	36	94	110

DATE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
JAN 28...	210	1600	.5	93	3140	1.8	70	10	j

j Collected by non-USGS agency.

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October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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