IWAO MATSUOKA

1970

Water Resources Data for Hawaii and other Pacific Areas

Part 1. Surface Water Records

Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Hawaii, the Government of Guam, the Government of American Samoa, Trust Territory of the Pacific Islands, and with other State, county and Federal agencies

CALENDAR FOR WATER YEAR 1970

OCTOBER 1969

S	M	T	W	T	F	S
			1	2	3	4
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NOVEMBER 1969

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DECEMBER 1969

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JANUARY 1970

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FEBRUARY 1970

S	M	T	W	T	F	S
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MARCH 1970

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APRIL 1970

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MAY 1970

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24	25	26	27	28	29	30
31						

JUNE 1970

S	M	T	W	T	F	S
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JULY 1970

S	M	T	W	T	F	S
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19	20	21	22	23	24	25
26	27	28	29	30	31	

AUGUST 1970

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

SEPTEMBER 1970

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
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20	21	22	23	24	25	26
27	28	29	30			

1970

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Prepared in cooperation with

Hawaii Department of Land and Natural Resources,
Division of Water and Land Development
Government of Guam
Government of American Samoa
Trust Territory of the Pacific Islands
City and County of Honolulu
Corps of Engineers, U.S. Army

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
Room 330, First Insurance Bldg.
1100 Ward Avenue
Honolulu, Hawaii 96814

1972

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(Letters after station name designate type of data: (c), chemical; (t), water temperature; (s), sediment)

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1970

Part 1. Surface Water Records
Part 2. Water Quality Records

INTRODUCTION

Water resources data for the 1970 water year for Hawaii and other Pacific areas including records of streamflow or reservoir storage at gaging stations, partial-record stations, and miscellaneous sites, and records of water-quality data on the chemical and physical characteristics of surface water, are given in this report. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey under the direction of Mearle M. Miller, succeeded by W. L. Burnham, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State, Territorial, and Federal agencies in Hawaii and other Pacific areas.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual 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."

Beginning with the 1961 water year (fiscal year for Hawaii), streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis. The Hawaii reports have included records for other Pacific areas. Through June 1967, the Hawaii reports were on a fiscal-year basis (the 12-month period July 1 to June 30) and discharges (except for Guam and Okinawa) were published in million gallons a day.

Beginning with the 1967 water year, the Hawaii reports have been published on a water-year basis and with discharges entirely in cubic feet per second.

Distribution of these basic-data reports is limited; they are designed primarily for rapid release of data shortly after the end of the water year to meet local needs. The streamflow records for 1961-65 also are published in a Geological Survey water-supply series entitled, "Surface Water Supply of the United States 1961-65," and those for 1966-70 will be published in a similar series.

The Geological Survey has published records of chemical quality, water temperatures, and suspended sediment since 1941 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Beginning with the 1964 water year, water-quality records also have been released on a State-boundary basis in conjunction with streamflow records or in a separate volume.

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. Cooperative agreements with the Territory of Guam for the collection of streamflow records began in 1953, with the Territory of American Samoa in 1957, and with the Trust Territory of the Pacific Islands in 1968. 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.
Government of Guam, C. G. D. Camacho, governor.
Government of American Samoa, J. M. Haydon, governor.
Trust Territory of the Pacific Islands, E. E. Johnston, high commissioner.
City and County of Honolulu, Board of Water Supply, G. A. L. Yuen, manager and chief engineer.
City and County of Honolulu, Division of Engineering, A. C. Zane, director and chief engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 32 gaging stations and 15 water-quality stations published in this report.

The following organizations aided in collecting records:

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

DEFINITION OF TERMS

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

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

Bed material is the shifting portion of fragmented material of which the streambed is composed.

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, and represents a runoff of 0.0372 inch from 1 square mile.

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate or delayed incubation membrane filter method.

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

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.

Cubic foot per second (cfs) 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.

Discharge is the volume of water (or more broadly, total fluids), that passes a given point within a given period of time.

Mean discharge is the arithmetic average of individual daily mean discharges during a specific 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 tables is "Discharge (cfs)."

Drainage area of a stream at a specified 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 stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the 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 gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Hardness of water is a physical-chemical characteristic attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Micrograms per liter (µg/l, UG/L) is a more precise unit for expressing the concentration of chemical constituents in solution. One thousand micrograms per liter is equivalent to one milligram per liter. See milligrams per liter.

Table 1.--Factors for conversion of chemical constituents in milligrams or micrograms per liter to milliequivalents per liter

Ion	Multiply by	Ion	Multiply by
Aluminum (Al^{+3})*	0.11119	Iodide (I^{-1})	0.00788
Ammonia as NH_4^{+1}	.05544	Iron (Fe^{+3})*	.05372
Barium (Ba^{+2})	.01456	Lead (Pb^{+2})*	.00965
Bicarbonate (HCO_3^{-1})	.01639	Lithium (Li^{+1})*	.14411
Bromide (Br^{-1})	.01251	Magnesium (Mg^{+2})	.08226
Calcium (Ca^{+2})	.04990	Manganese (Mn^{+2})*	.03640
Carbonate (CO_3^{-2})	.03333	Nickel (Ni^{+2})*	.03406
Chloride (Cl^{-1})	.02821	Nitrate (NO_3^{-1})	.01613
Chromium (Cr^{+6})*	.11539	Nitrite (NO_2^{-1})	.02174
Cobalt (Co^{+2})*	.03394	Phosphate (PO_4^{-3})	.03159
Copper (Cu^{+2})*	.03148	Potassium (K^{+1})	.02557
Cyanide (CN^{-1})*	.03844	Sodium (Na^{+1})	.04350
Fluoride (F^{-1})	.05264	Strontium (Sr^{+2})*	.02283
Hydrogen (H^{+1})	.99209	Sulfate (SO_4^{-2})	.02082
Hydroxide (OH^{-1})	.05880	Zinc (Zn^{+2})*	.03060

*Constituent reported in micrograms per liter; multiply by factor and divide results by 1,000.

Table 2.--Factors for conversion of sediment concentration in parts per million to milligrams per liter*
(All values calculated to three significant figures)

Range of concentration (ppm)	Multiply by	Range of concentration (ppm)	Multiply by
0 - 15,900	1.00	322,000 - 341,000	1.26
16,000 - 46,800	1.02	342,000 - 361,000	1.28
46,900 - 76,500	1.04	362,000 - 380,000	1.30
76,600 - 105,000	1.06	381,000 - 399,000	1.32
106,000 - 133,000	1.08	400,000 - 416,000	1.34
134,000 - 159,000	1.10	417,000 - 434,000	1.36
160,000 - 185,000	1.12	435,000 - 451,000	1.38
186,000 - 210,000	1.14	452,000 - 467,000	1.40
211,000 - 233,000	1.16	468,000 - 483,000	1.42
234,000 - 256,000	1.18	484,000 - 498,000	1.44
257,000 - 279,000	1.20	499,000 - 514,000	1.46
280,000 - 300,000	1.22	515,000 - 528,000	1.48
301,000 - 321,000	1.24	529,000 - 542,000	1.50

*Based on water density of 1.000 g/ml and sediment density of 2.65 g/cc.

Milligrams per liter (mg/l, MG/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the weight of solute per unit volume of water. Milligrams or micrograms per liter may be converted to milliequivalents (one thousandth of a gram-equivalent weight of a constituent) per liter by multiplying by the factors in table 1, page 5. Concentration of suspended sediment also is expressed in mg/l, and is based on the weight of sediment per liter of water-sediment mixture. Sediment concentrations are determined in the laboratory as parts per million (ppm) and are converted to mg/l by using the factors in table 2, page 5.

Partial-record station is a particular site where limited streamflow 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 sieve and sedimentation methods.

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

Clay:	Smaller than 0.004 mm.
Silt:	Between 0.004 and 0.062 mm.
Sand:	Between 0.062 and 2.0 mm.
Gravel:	Between 2.0 and 64.0 mm.

The particle-size distributions given in this report are not necessarily representative of the particle sizes of sediment in transport in the natural stream. Most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis of the silt and clay.

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 discharge 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 by volume, that is discharged in a given time. It is computed by multiplying discharge times mg/l times 0.0027.

Total sediment discharge or total sediment load 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 is discharged during a given time (Colby and Hembree, 1955).

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).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. This ratio should be known especially for water used for irrigating farmland.

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 and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water. Commonly, the amount 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 or from well to well, and it may even vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

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

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

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

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

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.

DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16884600, which appears just to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "884600." In this report, the records are listed in downstream order by islands.

PART 1. SURFACE WATER 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 direct reading on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at 15-, 30- or 60-minute intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in standard textbooks, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6. Surface areas of lakes or reservoirs are determined from instrument surveys using standard methods. The configuration of the reservoir bottom is determined by sounding at many points.

For a stream-gaging station, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, 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), velocity-area studies, and logarithmic plotting. The application of the gage height to the rating table gives the discharge. The daily mean discharge is computed from gage heights, then the monthly and yearly mean discharge 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 determined 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.

For a lake or reservoir station, capacity tables giving the contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly change in contents are computed. Discharge over spillways is computed from a stage-discharge relation curve defined by discharge measurements.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys the computed contents may be increasingly in error due to the gradual accumulation of sediment.

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, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining

good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, adjoining good record, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of basic data. 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 is given. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the 1970 water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging stations gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, notations of revisions of previously published records, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps av available. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD." 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. 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. the maximum discharge (or contents), the maximum gage height, and the minimum discharge if there is little or no regulation (or minimum contents) are given under "EXTREMES." The maximum and minimum daily discharge are given if there is extensive regulation. In the first paragraph headed "Current year," the data given are for the complete current water year unless otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period

of record given in PERIOD OF RECORD paragraph. Reliable information concerning major floods or abnormally low flows that occurred outside the period of record is given in the third or last paragraph under "EXTREMES." Unless otherwise qualified, the maximum discharge (or contents) corresponds to the crest stage obtained by use of a water-stage recorder (graphic or digital) or crest-stage gage. If the maximum gage height did not occur at the same time as the maximum discharge (or contents), it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, 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 also under "REMARKS."

Previously published 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 "REVISIONS (FISCAL YEARS)" or "REVISIONS (WATER YEARS)" 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 fiscal or water years for which figures are revised in that report. In listing the years only one number is given; for instance, 1933 stands for either the fiscal year July 1, 1932, to June 30, 1933, or the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge were revised, that 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 figure was first published is given.

The daily table for stream-gaging stations gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in the discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharge for several parts of a day. For digital recorders, the daily mean discharge is always the average of the discharges at each punched reading.

The tables for reservoir stations give the monthend contents corresponding to the water-surface elevation at a given time, usually at 2400 on the last day of each month.

The monthly summary is given below the daily table. For stream-gaging stations 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 is also expressed in acre-feet (line headed "AC-FT").

For reservoir stations, the monthend table gives the gage height and contents at the end of the month, and the change in contents during the month.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges for the calendar and water years; likewise, the minimums in this summary are minimum daily discharges. For reservoir stations the yearly summary gives the change in contents for the calendar year and for the water year.

Peak discharges and their times of occurrence and corresponding gage heights for many stations are listed below the yearly summary. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can 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.

In a general footnote, introduced by the word "NOTE," certain periods are indicated 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-discharge relation, or of any other unusual condition at the gage are indicated only if they are a month or more in length and the accuracy of the records is affected. The methods

used in computing discharge for various unusual conditions have been explained in preceding paragraphs. Footnotes to reservoir tables may be used to explain the use of new capacity tables or for other special conditions.

Accuracy of Data

The accuracy of discharge 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 interpretation 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 is 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 and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversions, consumptive use, regulation, evaporation or other factors.

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, and in 1739 and 1751 for July 1950 to June 1960.

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.

Other Data Available

Data collected at partial-record stations and at miscellaneous sites are given in three tables at the end of the surface-water records in this report. The first is a table of discharge measurements at low-flow partial-record stations, the second is a table of annual maximum stage and discharge at crest-stage stations, and the third is a table of discharge measurements at miscellaneous sites. Data for crest-stage partial-record stations in the State of Hawaii are not included in this report. They are included in an annual progress report entitled "An Investigation of Floods in Hawaii," copies of which may be obtained from the district office.

Information of a more detailed nature than that published for most of the gaging stations, such as 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.

PART 2. WATER QUALITY RECORDS

Collection and examination of data

Water samples for analyses usually are collected at or near gaging stations. The discharge records at these stations are used in conjunction with the computations of the chemical constituents and sediment loads in this report.

Descriptive statements are given for water-quality stations located at or near streamflow stations. Given are location, drainage area, periods of record for the various water-quality data, extremes of pertinent data, and general remarks, in a format similar to that used for streamflow gaging stations.

Data on the quality of surface water were collected daily at some sites and less frequently at others. Water-quality information is presented for chemical quality, microbiological, water temperature, and fluvial sediment. Chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, sodium adsorption ratio, specific conductance, and pH. Microbiological information includes quantitative identification of certain bacteriological indicator organisms. Water-temperature data represent once-daily observations. Fluvial-sediment information is given for suspended-sediment discharges and concentrations and for particle-size distribution of suspended sediment and bed material.

Prior to the 1968 water year, data for chemical constituents and concentration of suspended sediment were reported in parts per million (ppm) and water temperatures were reported in degrees Fahrenheit (°F). In October 1967 the U.S. Geological Survey began to use the metric system; data for chemical constituents and concentrations of suspended sediment are now reported in milligrams per liter (mg/l) and water temperatures are given in degrees Celsius (centigrade, °C). In waters with a density of 1.000 g/ml (grams per milliliter), parts per million and milligrams per liter can be considered equal. In waters with a density greater than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter. To convert temperatures in degrees Fahrenheit to degrees Celsius, see table 3 on following page.

In October 1968, the Geological Survey began reporting many of the chemical constituents as well as the minor elements in micrograms per liter instead of milligrams per liter. (See "Definition of Terms," p. 3.)

Table 3.--Degrees Fahrenheit (°F) to degrees Celsius (°C)*
(Temperature reported to nearest 0.5°C)

°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
32	0.0	50	10.0	68	20.0	86	30.0	104	40.0
33	.5	51	10.5	69	20.5	87	30.5	105	40.5
34	1.0	52	11.0	70	21.0	88	31.0	106	41.0
35	1.5	53	11.5	71	21.5	89	31.5	107	41.5
36	2.0	54	12.0	72	22.0	90	32.0	108	42.0
37	3.0	55	13.0	73	23.0	91	33.0	109	43.0
38	3.5	56	13.5	74	23.5	92	33.5	110	43.5
39	4.0	57	14.0	75	24.0	93	34.0	111	44.0
40	4.5	58	14.5	76	24.5	94	34.5	112	44.5
41	5.0	59	15.0	77	25.0	95	35.0	113	45.0
42	5.5	60	15.5	78	25.5	96	35.5	114	45.5
43	6.0	61	16.0	79	26.0	97	36.0	115	46.0
44	6.5	62	16.5	80	26.5	98	36.5	116	46.5
45	7.0	63	17.0	81	27.0	99	37.0	117	47.0
46	8.0	64	18.0	82	28.0	100	38.0	118	48.0
47	8.5	65	18.5	83	28.5	101	38.5	119	48.5
48	9.0	66	19.0	84	29.0	102	39.0	120	49.0
49	9.5	67	19.5	85	29.5	103	39.5	121	49.5

*C 5/9 (°F - 32) or °F 9/5 (°C) + 32.

Temperature

Water temperatures are measured at most of the water-quality stations. For daily stations, the water temperatures are taken about the same time each day when sample is collected. Large streams have a small diurnal temperature change while small, shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature.

Solutes

The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Brown, Skougstad, and Fishman (1970). 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 at several verticals across the channel to determine accurately the solute load.

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 sub-divided 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 sub-divided day method. For periods when no samples are collected, daily loads of suspended sediment are 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 are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, 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 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.
1964	1966
1965	1966
1966	A1996
1967	A2016

A In preparation.

SELECTED REFERENCES

American Public Health Association, and others 1965, Standard methods for the examination of water and wastewater, 12th ed.: Am. Public Health Assoc., New York, 769 p.

Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. A1, 160 p.

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Guy, H. P., 1969, Laboratory theory and methods for sediment analysis: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. C1, 57 p.

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Hem, J. D., 1970, Study and interpretation of the chemical characteristics of natural water, 2d ed.: U.S. Geol. Survey Water-Supply Paper 1473, 363 p.

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Ritter, J. R., and Helley, E. J., 1969, Optical method for determining particle sizes of coarse sediment: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. C3.

U.S. Inter-Agency Committee on Water Resources, Subcommittee on Sedimentation, A study of methods used in measurement and analysis of sediment loads in streams. Published by the St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minn.

_____1941, Methods of analyzing sediment samples: Rept. 4.

_____1953, Accuracy of sediment size analyses made by the bottom withdrawal-tube method: Rept. 10.

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_____1957, The development and calibration of visual-accumulation tube: Rept. 11.

_____1957, Some fundamentals of particle size analysis: Rept. 12.

_____1959, Federal Inter-agency Sedimentation instruments and report: Rept. AA.

_____1961, The single stage sampler for suspended sediment: Rept. 13.

_____1963, Determinations of fluvial sediment discharge: Rept. 14.

PART 1. SURFACE WATER RECORDS

HAWAII, ISLAND OF KAUAI

16010000 Kawaikoi Stream near Waimea

LOCATION.--Lat 22°08'09", long 159°37'22", Kauai, on left bank at old trail crossing and 12.5 miles north of Waimea.

DRAINAGE AREA.--4.1 sq mi, approximately.

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.

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

AVERAGE DISCHARGE.--53 years (1911-12, 1913-14, 1919-70), 35.1 cfs (25,430 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,430 cfs Jan. 13 (gage height, 9.70 ft), from rating curve extended as explained below; minimum, 5.6 cfs Mar. 29, 30, June 19, Sept. 16.
Period of record: Maximum discharge, 11,300 cfs Jan. 13, 1967 (gage height, 15.33 ft), from rating curve extended above 470 cfs on basis of slope-area measurements at gage heights 12.12 and 13.43 ft; minimum, 1.14 cfs Sept. 21, 22, 1953.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	7.6	9.6	70	14	8.6	81	24	7.4	16	9.4	38
2	27	7.4	9.6	137	13	8.3	355	20	7.2	16	7.9	18
3	17	7.0	9.9	530	13	8.1	173	39	7.0	11	7.0	9.1
4	13	6.7	20	77	12	7.9	32	27	7.0	11	6.5	6.7
5	13	7.0	11	40	12	7.6	25	19	6.7	17	6.1	6.7
6	11	35	9.1	43	12	7.6	17	16	6.5	18	6.3	13
7	12	24	8.3	30	11	7.4	13	14	6.3	16	18	17
8	27	45	53	148	11	7.2	11	13	6.3	31	12	25
9	16	14	44	45	71	7.2	9.9	14	6.1	26	8.3	10
10	12	9.9	45	29	36	7.0	9.4	53	5.9	36	6.7	7.0
11	488	8.3	29	381	14	12	9.1	44	5.9	21	5.9	17
12	124	72	53	66	12	12	16	18	5.9	41	5.9	13
13	30	24	22	492	14	8.3	29	14	5.9	45	30	8.1
14	21	16	24	257	60	7.0	90	12	6.1	18	33	6.1
15	17	28	14	58	29	6.7	18	11	6.1	12	14	5.8
16	15	14	11	40	17	6.5	14	11	6.1	9.6	23	6.3
17	13	10	10	61	14	6.3	21	10	6.5	80	55	18
18	12	9.1	9.6	48	18	7.0	28	10	6.1	37	13	84
19	12	300	87	30	14	12	223	9.6	5.9	14	8.8	31
20	11	130	23	26	13	9.4	115	9.4	11	11	7.6	18
21	13	31	14	29	12	7.6	23	9.6	14	9.1	6.7	9.9
22	13	22	12	26	11	9.9	91	9.6	9.4	8.1	6.3	7.9
23	11	24	11	21	10	8.3	245	9.1	7.0	8.1	6.1	7.2
24	9.9	33	353	22	10	7.2	127	8.6	18	8.8	5.9	6.7
25	9.4	18	77	58	9.9	6.5	113	8.3	41	12	6.1	6.3
26	8.8	14	28	29	9.4	6.1	102	8.6	16	69	13	7.7
27	13	12	228	20	9.4	5.9	110	9.9	20	14	40	9.6
28	20	11	530	18	8.8	5.9	47	8.6	13	9.6	11	6.1
29	10	10	95	16	------	5.8	74	8.1	12	8.1	7.4	21
30	8.6	10	45	15	------	5.8	40	7.9	37	19	6.3	16
31	7.9	------	44	14	------	16	------	7.6	------	14	5.9	------
TOTAL	1,061.6	960.0	1,939.1	2,876	490.5	249.1	2,261.4	483.9	319.3	666.4	399.1	456.2
MEAN	34.2	32.0	62.6	92.8	17.5	8.04	75.4	15.6	10.6	21.5	12.9	15.2
MAX	488	300	530	530	71	16	355	53	41	80	55	84
MIN	7.9	6.7	8.3	14	8.8	5.8	9.1	7.6	5.9	8.1	5.9	5.8
AC-FT	2,110	1,900	3,850	5,700	973	494	4,490	960	633	1,320	792	905

CAL YR 1969 TOTAL 16,585.6 MEAN 45.4 MAX 554 MIN 6.7 AC-FT 32,900
WTR YR 1970 TOTAL 12,162.6 MEAN 33.3 MAX 530 MIN 5.8 AC-FT 24,120

PEAK DISCHARGE (BASE, 2,100 CFS).--Jan. 13 (2130) 3,430 cfs (9.70 ft); Apr. 19 (2330) 2,240 cfs (8.27 ft).

16013000 Mohihi Stream at altitude 3,420 ft, near Waimea

LOCATION.--Lat 22°07'13", long 159°36'14", Kauai, on left bank at upper trail crossing, 3.8 miles northeast of confluence with Waiahulu and Poomau Streams, and 12 miles northeast of Waimea.

DRAINAGE AREA.--1.6 sq mi, approximately.

PERIOD OF RECORD.--June 1920 to October 1926, October 1936 to current year. Published as "at altitude 3,500 ft, near Waimea" prior to July 1947 and July 1952 to June 1960, and as "near Waimea" July 1947 to June 1952.

GAGE.--Water-stage recorder. Altitude of gage is 3,420 ft (from topographic map).

AVERAGE DISCHARGE (prior to Mohihi Canal diversion).--38 years (1920-26, 1937-69), 8.62 cfs (6,250 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 560 cfs Jan. 13 (gage height, 4.75 ft), from rating curve extended above 160 cfs; maximum gage height, 5.28 ft Jan. 11; minimum discharge, not determined; minimum daily, 0.02 cfs Sept. 21-30.

Period of record: Maximum discharge, 1,930 cfs Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 78 cfs; minimum, not determined; minimum daily, 0.02 cfs Sept. 21-30, 1970; minimum prior to upstream diversion, 0.12 cfs Sept. 21, 1953.

REMARKS.--Records poor. Recording rain gage located at station. Beginning July 16, 1970, diversion by Mohihi Canal 0.7 mile above station for irrigation in vicinity of Kekaha. The following discharge measurements were made in the canal during the 1970 water year:

Date	Discharge (cfs)
Aug. 7	2.7
18	2.1
Sept. 21	3.0

REVISIONS (FISCAL YEARS).--WSP 1719: 1941, 1953-54.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	1.6	2.0	21	2.1	2.2	3.9	2.7	1.1	.94	.10	.60
2	6.1	1.5	2.0	4.7	1.9	2.1	115	2.3	.97	.67	.08	.20
3	4.1	1.5	1.9	89	1.8	2.0	67	5.8	.94	.49	.08	.10
4	3.0	1.5	2.1	10	1.7	1.9	11	3.7	.94	.42	.08	.08
5	2.5	1.5	1.9	2.5	1.7	1.9	4.7	2.4	.89	.42	.08	.08
6	2.2	2.1	1.9	3.7	1.7	1.9	3.4	1.9	.89	.67	.20	.08
7	2.1	2.2	1.9	1.7	1.5	1.9	2.7	1.7	.89	1.0	.60	.40
8	2.8	4.0	2.8	3.4	1.5	1.8	2.4	1.5	.84	1.2	.30	.80
9	3.2	1.6	3.9	2.5	1.9	1.8	2.2	1.4	.94	2.7	.20	.40
10	2.4	1.4	5.7	.84	20	1.8	2.1	1.5	.89	2.4	.10	.10
11	47	1.2	3.6	62	2.2	1.8	2.0	3.2	.89	1.5	.10	.10
12	20	6.4	4.9	12	1.7	2.0	2.1	2.1	.89	3.7	.10	.40
13	6.0	3.4	3.1	115	3.8	1.8	3.6	1.7	.89	3.2	.10	.20
14	4.1	2.5	3.3	130	21	1.7	18	1.5	.89	1.8	.30	.10
15	3.2	3.3	2.6	19	8.9	1.7	5.8	1.3	.89	1.1	.80	.10
16	2.8	2.4	2.2	9.6	4.7	1.7	3.6	1.4	.84	.49	.60	.20
17	2.4	2.0	2.1	33	3.7	1.7	3.5	1.4	.94	.15	.40	1.5
18	2.2	1.9	2.4	25	6.3	1.7	3.2	1.4	.94	.17	.06	15
19	2.1	19	2.2	8.4	4.3	2.2	12	1.4	.97	.15	.06	10
20	2.2	13	2.5	5.7	3.5	1.9	67	1.3	.94	.15	.06	1.2
21	2.3	4.6	2.2	4.9	3.2	1.8	10	1.4	1.1	.15	.06	.02
22	2.4	3.3	1.9	4.2	2.7	1.7	13	1.4	1.2	.14	.06	.02
23	2.1	3.5	1.9	3.5	2.6	1.7	45	1.4	1.0	.15	.06	.02
24	1.8	5.1	13	4.1	2.6	1.7	9.8	1.2	1.3	.15	.06	.02
25	1.5	3.1	7.5	16	2.5	1.6	12	1.3	1.6	.17	.06	.02
26	1.5	3.5	3.9	8.2	2.4	1.6	12	1.3	.94	5.0	.20	.02
27	1.4	2.3	57	4.1	2.3	1.5	16	1.2	.84	2.0	1.0	.02
28	1.8	2.2	106	3.2	2.2	1.5	4.9	1.0	.84	.20	.40	.02
29	1.7	2.2	45	2.7	------	1.5	9.8	.97	.58	.10	.10	.02
30	1.6	2.1	16	2.5	------	1.5	4.1	.97	1.7	.10	.10	.02
31	1.6	------	9.8	2.2	------	1.8	------	.97	------	.20	.10	------
TOTAL	151.1	105.9	319.2	614.64	116.4	55.4	471.8	54.71	29.47	31.68	6.60	31.84
MEAN	4.87	3.53	10.3	19.8	4.16	1.79	15.7	1.76	.98	1.02	.21	1.06
MAX	47	19	106	130	21	2.2	115	5.8	1.7	5.0	1.0	15
MIN	1.4	1.2	1.9	.84	1.5	1.5	2.0	.97	.58	.10	.06	.02
AC-FT	300	210	633	1,220	231	110	936	109	58	63	13	63

CAL YR 1969 TOTAL 2,979.4 MEAN 8.16 MAX 136 MIN 1.0 AC-FT 5,910
WTR YR 1970 TOTAL 1,988.74 MEAN 5.45 MAX 130 MIN .02 AC-FT 3,940

PEAK DISCHARGE (BASE, 380 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
1-11	1100	5.28	423	4-19	2400	4.66	524
1-13	2300	4.75	560				

NOTE.--No gage-height record July 27 to Sept. 30.

16014000 Kokee ditch near Waimea

LOCATION.--Lat 22°06'25", long 159°40'45", Kauai, on left bank 1,000 ft west of road and 10.5 miles 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 (by barometer). Prior to July 1, 1962, at datum 0.07 ft higher.

AVERAGE DISCHARGE.--44 years, 24.3 cfs (17,610 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 105 cfs Dec. 2, 1929, Mar. 4, 1933; no flow at times.

REMARKS.--Records good. Ditch diverts at altitude 3,400 ft from Mohihi Stream and all streams west which are tributary to Waimea River, for irrigation in vicinity of Kekaha.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	7.9	12	36	31	17	27	30	8.2	17	8.6	26
2	21	7.4	12	12	30	17	74	25	7.9	17	6.9	23
3	17	7.2	11	37	28	16	83	40	7.6	10	6.0	10
4	13	6.9	26	22	27	16	48	35	7.4	10	5.6	6.9
5	10	6.9	14	16	26	15	31	26	6.9	14	4.9	6.0
6	9.6	28	11	33	26	15	23	22	6.7	15	4.9	11
7	9.6	24	10	28	25	14	18	19	6.5	15	14	15
8	21	45	45	41	24	14	15	17	6.2	22	12	22
9	15	18	42	18	34	13	13	17	6.2	28	8.4	13
10	10	12	52	5.6	53	13	13	33	6.0	33	6.7	7.9
11	70	9.6	30	11	30	14	12	54	6.0	15	5.6	9.8
12	70	36	56	32	25	20	15	23	5.8	38	5.1	18
13	35	36	26	44	27	14	23	17	5.8	43	20	7.9
14	24	21	28	9.1	78	13	56	15	5.6	20	31	5.8
15	19	36	18	18	52	12	25	14	5.3	12	16	5.1
16	17	20	14	36	34	12	18	13	5.3	9.4	19	5.1
17	14	14	12	36	28	11	21	13	6.0	42	47	14
18	13	12	11	21	33	11	22	12	5.6	47	16	53
19	12	63	44	12	28	16	65	12	5.1	16	9.6	39
20	12	83	37	29	26	14	70	11	7.3	10	7.6	25
21	12	44	19	43	25	12	31	11	13	8.4	6.5	12
22	13	29	15	32	23	13	52	11	9.2	7.4	5.6	8.6
23	12	27	13	17	22	12	81	10	6.9	6.9	5.3	7.4
24	9.9	40	69	17	20	11	73	9.9	9.8	7.2	5.1	6.7
25	9.2	23	70	23	20	9.9	79	9.4	37	8.9	4.9	6.0
26	8.6	18	35	18	19	9.4	75	9.4	16	51	7.0	5.6
27	11	15	61	21	18	9.2	80	10	19	18	35	10
28	21	13	82	33	18	8.9	58	9.6	13	9.9	13	5.8
29	11	13	48	36	------	8.6	53	8.9	9.7	7.6	7.6	6.7
30	8.9	12	26	34	------	8.6	40	8.6	30	13	5.8	29
31	8.2	------	16	32	------	13	------	8.4	------	15	5.1	------
TOTAL	586.0	727.9	965	802.7	830	402.6	1,294	554.2	291.0	586.7	355.8	421.3
MEAN	18.9	24.3	31.1	25.9	29.6	13.0	43.1	17.9	9.70	18.9	11.5	14.0
MAX	70	83	82	44	78	20	83	54	37	51	47	53
MIN	8.2	6.9	10	5.6	18	8.6	12	8.4	5.1	6.9	4.9	5.1
AC-FT	1,160	1,440	1,910	1,590	1,650	799	2,570	1,100	577	1,160	706	836

CAL YR 1969 TOTAL 10,263.6 MEAN 28.1 MAX 83 MIN 5.6 AC-FT 20,360
WTR YR 1970 TOTAL 7,817.2 MEAN 21.4 MAX 83 MIN 4.9 AC-FT 15,510

16019000 Waialae Stream at altitude 3,820 ft, near Waimea

LOCATION.--Lat 22°05'20", long 159°34'18", Kauai, on left bank 5.0 miles northeast of mouth and 10.6 miles northeast of Waimea.

DRAINAGE AREA.--2.5 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--29 years (1920-31, 1952-70), 22.2 cfs (16,080 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,600 cfs Jan. 13 (gage height, 4.98 ft); minimum, 2.1 cfs Sept. 14. Period of record: Maximum discharge, 4,530 cfs Jan. 16, 1921 (gage height, 8.44 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 cfs May 17, 18, May 30 to June 2, 1966.

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

REVISIONS (FISCAL YEARS).--WSP 1319: Drainage area. WSP 1937: 1921, 1922-32(M), 1953(M), 1954.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	4.4	4.4	25	6.4	4.2	5.6	25	3.8	9.0	4.0	25
2	10	4.2	4.2	17	5.8	4.2	77	12	3.4	6.4	3.6	10
3	8.4	4.2	4.0	142	5.5	4.0	117	79	3.2	5.2	3.2	4.7
4	7.6	4.2	4.2	25	5.5	3.8	11	15	3.0	4.4	3.0	3.6
5	7.0	4.4	3.8	12	5.2	3.8	6.6	9.5	2.8	7.7	2.8	3.4
6	5.6	14	3.8	17	5.2	3.8	5.2	6.9	2.6	10	3.0	4.2
7	7.0	16	3.8	12	5.0	3.6	4.4	6.1	2.4	6.9	5.5	7.7
8	12	106	24	8.6	5.0	3.6	3.8	5.5	2.4	18	5.2	5.2
9	9.0	12	14	7.2	6.9	3.6	3.4	5.0	2.3	13	4.0	3.8
10	6.2	9.5	21	6.4	11	3.6	5.0	24	2.3	112	3.2	3.2
11	96	8.1	9.0	274	6.6	3.6	5.8	17	2.3	26	2.8	2.6
12	42	78	13	28	5.8	3.6	4.7	9.0	2.3	33	3.0	2.3
13	11	15	8.1	273	43	3.2	5.0	6.9	2.4	22	6.6	2.2
14	8.6	12	7.2	102	44	3.0	6.4	5.5	2.4	13	11	2.2
15	7.7	31	6.1	19	12	3.0	35	4.7	2.3	9.0	5.2	2.4
16	6.9	13	5.0	13	8.6	3.0	10	4.2	2.8	6.6	4.0	2.4
17	6.4	8.1	4.4	110	7.2	3.0	14	4.4	3.0	31	16	5.1
18	6.1	6.4	4.2	40	16	5.2	7.7	5.5	2.8	13	5.8	77
19	6.1	80	4.2	15	8.6	8.1	21	5.2	2.4	6.9	4.4	35
20	6.4	84	3.8	11	6.6	5.2	43	4.4	5.7	5.5	3.4	23
21	12	18	3.8	11	5.8	4.2	10	4.2	15	4.4	3.0	10
22	10	16	3.6	9.5	5.2	3.6	48	4.2	6.4	4.2	2.6	6.4
23	7.2	12	3.4	8.6	5.0	3.4	86	4.0	4.4	4.4	2.4	5.0
24	6.1	15	165	13	4.7	3.4	26	3.8	53	5.8	2.4	4.2
25	5.2	9.5	47	66	4.7	3.2	34	8.5	34	21	3.4	3.6
26	5.0	6.9	91	16	4.7	3.0	116	14	8.1	231	14	3.0
27	6.9	6.1	112	10	4.4	3.0	133	7.7	17	9.0	38	2.6
28	12	5.5	101	8.6	4.2	2.8	22	5.8	18	5.8	5.8	2.4
29	7.2	5.0	44	11	------	2.6	52	4.4	12	4.7	4.0	3.0
30	5.8	5.0	16	8.6	------	2.6	17	3.8	43	5.0	4.0	3.0
31	5.0	------	12	7.2	------	3.2	------	4.0	------	4.7	5.0	------
TOTAL	367.4	613.5	751.0	1,326.7	258.6	114.1	935.6	319.2	267.5	658.6	184.3	268.2
MEAN	11.9	20.5	24.2	42.8	9.24	3.68	31.2	10.3	8.92	21.2	5.95	8.94
MAX	96	106	165	274	44	8.1	133	79	53	231	38	77
MIN	5.0	4.2	3.4	6.4	4.2	2.6	3.4	3.8	2.3	4.2	2.4	2.2
AC-FT	729	1,220	1,490	2,630	513	226	1,860	633	531	1,310	366	532

CAL YR 1969 TOTAL 8,368.2 MEAN 22.9 MAX 807 MIN 2.2 AC-FT 16,600
WTR YR 1970 TOTAL 6,064.7 MEAN 16.6 MAX 274 MIN 2.2 AC-FT 12,030

PEAK DISCHARGE (BASE, 1,300 CFS).--Jan. 13 (1930) 1,600 cfs (4.98 ft); July 26 (0100) 1,300 cfs (4.50 ft).

16029100 Waimea ditch below wasteway, near Waimea

LOCATION.--Lat 21°59'10", long 159°39'59", Kauai, on left bank at tunnel No. 4 outlet and below wasteway, 1.3 miles downstream from intake, and 2 miles north of Waimea.

PERIOD OF RECORD.--February 1960 to current year.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 131.2 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--10 years, 3.91 cfs (2,830 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 14 cfs Mar. 11, 12, 1965; no flow at times.

REMARKS.--Records good. Ditch diverts from Waimea River for irrigation of sugarcane in vicinity of Waimea.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	1.4	1.3	3.7	2.8	3.9	.07	6.2	1.0	9.8	3.5	3.0
2	6.8	1.2	1.3	3.7	1.3	3.9	.66	6.2	.90	6.9	3.2	7.2
3	6.4	1.1	1.3	4.3	.77	3.7	6.0	6.4	.73	5.7	2.8	5.8
4	3.9	1.0	1.3	4.2	2.3	3.1	9.7	6.4	.52	4.8	2.4	3.8
5	2.4	.90	1.3	3.7	4.1	2.5	6.9	5.8	.38	4.8	2.3	3.1
6	2.1	1.0	1.6	3.6	5.8	2.2	4.1	3.1	.25	6.1	2.1	2.8
7	1.8	2.1	1.6	3.3	5.8	2.1	3.4	1.3	.12	4.5	2.0	3.0
8	1.9	3.3	1.8	3.3	5.4	1.9	3.9	.96	0	3.3	2.1	4.2
9	3.8	4.3	3.2	4.0	5.6	1.8	3.8	.62	0	7.0	2.4	3.9
10	2.8	3.2	3.6	3.5	7.1	1.7	1.9	.47	0	8.9	2.1	3.2
11	5.5	2.2	3.7	3.7	7.7	1.6	1.6	5.7	0	10	1.8	2.9
12	7.7	3.5	3.4	1.7	5.6	1.6	1.7	7.6	0	8.0	1.6	3.1
13	7.2	4.8	3.5	.29	5.8	1.4	1.3	5.0	0	9.5	1.4	2.8
14	5.6	3.7	2.8	.18	10	1.3	2.9	3.8	0	9.3	1.8	2.3
15	3.7	3.3	2.4	.18	11	1.1	4.3	3.2	0	6.1	4.8	2.1
16	2.6	3.1	2.0	.15	9.3	1.0	4.4	2.8	0	4.1	3.2	1.9
17	2.2	2.8	1.8	.47	6.9	.78	2.5	2.3	0	3.1	3.0	1.8
18	1.9	2.4	1.7	.96	9.2	.62	3.2	2.1	0	7.3	6.0	2.9
19	1.7	2.7	1.9	.62	9.1	.47	2.4	2.3	0	6.5	3.6	8.3
20	1.6	3.8	3.0	.38	6.9	.84	5.4	2.2	0	3.4	2.8	8.7
21	1.6	3.2	1.9	.18	6.0	.84	7.7	2.1	.07	2.2	2.4	8.7
22	3.1	2.8	1.7	.15	5.6	.57	6.0	1.9	2.4	1.9	2.1	6.4
23	2.4	2.8	1.6	.18	5.0	.78	7.3	1.9	1.2	2.4	1.5	4.4
24	1.8	2.1	2.5	.67	4.2	.96	7.3	1.8	.84	2.4	.38	3.8
25	1.6	2.9	4.0	1.2	4.2	.73	7.3	1.6	8.6	2.8	.34	3.3
26	1.4	2.8	3.5	1.7	4.1	.52	7.2	1.6	8.4	7.5	.38	3.0
27	1.8	2.4	4.4	1.0	4.0	.42	7.4	4.0	3.5	9.4	3.7	2.7
28	3.2	2.1	4.8	.40	3.9	.18	7.1	3.2	8.4	6.7	7.5	2.5
29	2.7	1.9	4.8	1.7	------	.09	6.9	2.2	8.1	4.3	4.3	2.3
30	1.8	1.8	4.3	3.0	------	.09	6.7	1.7	8.2	3.6	3.1	2.8
31	1.6	------	3.6	3.3	------	.09	------	1.4	------	3.4	2.8	------
TOTAL	101.2	76.60	81.6	59.41	159.47	42.78	141.03	97.85	53.61	175.7	83.40	116.7
MEAN	3.26	2.55	2.63	1.92	5.70	1.38	4.70	3.16	1.79	5.67	2.69	3.89
MAX	7.7	4.8	4.8	4.3	11	3.9	9.7	7.6	8.6	10	7.5	8.7
MIN	1.4	.90	1.3	.15	.77	.09	.07	.47	0	1.9	.34	1.8
AC-FT	201	152	162	118	316	85	280	194	106	349	165	231

CAL YR 1969 TOTAL 1,108.29 MEAN 3.04 MAX 9.2 MIN 0 AC-FT 2,200
WTR YR 1970 TOTAL 1,189.35 MEAN 3.26 MAX 11 MIN 0 AC-FT 2,360

16031000 Waimea River near Waimea

LOCATION.--Lat 21°59'02", long 159°39'46", on right bank 1.2 miles upstream from Makaweli River and 1.8 miles north of Waimea.

DRAINAGE AREA.--57.8 sq mi.

PERIOD OF RECORD.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968, current year.

GAGE.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from mouth of Makaweli River). Prior to Oct. 5, 1911, nonrecording gage at site 1 mile downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum.

AVERAGE DISCHARGE.--32 years (1910-17, 1944-68, 1969-70), 136 cfs (98,530 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 18,900 cfs Jan. 13 (gage height, 14.68 ft), from rating curve extended above 3,000 cfs on basis of slope-area measurement at gage height 18.7 ft; minimum, 8.1 cfs July 5.

Period of record: Maximum discharge, 37,100 cfs Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 5,200 cfs on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; practically no flow occasionally owing to upstream diversions.

Flood of Nov. 29, 1968, which destroyed the station, reached a stage of 16.50 ft, from floodmarks (discharge, 25,800 cfs, from rating curve extended as explained above).

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	24	15	160	92	29	27	35	12	30	17	14
2	54	24	14	105	91	29	451	44	13	9.8	17	53
3	43	23	14	1,140	87	28	441	114	11	8.5	17	20
4	27	23	14	244	77	27	99	72	11	8.3	17	14
5	24	24	14	102	39	26	34	34	11	8.3	17	13
6	22	26	13	102	32	26	27	23	11	9.8	17	13
7	22	46	13	91	30	26	24	19	12	13	17	15
8	23	212	23	166	30	27	23	17	12	11	19	20
9	34	71	43	132	32	28	22	16	11	31	20	17
10	29	32	66	53	105	28	27	15	11	105	18	16
11	611	26	36	2,220	36	30	26	50	12	31	17	16
12	361	281	27	481	29	29	29	22	12	60	17	17
13	72	144	34	2,180	31	29	27	14	11	27	18	16
14	31	60	19	2,330	177	28	53	13	11	31	22	15
15	22	121	19	330	69	28	53	12	11	14	27	15
16	20	88	16	176	41	29	45	12	11	9.8	19	16
17	20	51	15	359	33	28	30	12	11	9.0	30	16
18	20	32	14	398	42	29	34	12	12	55	31	107
19	20	413	33	176	41	30	41	13	12	18	18	87
20	20	390	35	135	33	34	357	13	12	9.8	16	97
21	22	105	13	110	31	30	50	12	14	8.8	16	44
22	32	60	11	105	30	30	67	13	20	8.5	16	20
23	26	46	11	87	29	29	369	12	11	8.8	19	14
24	22	55	396	88	28	28	85	11	9.8	9.0	22	13
25	21	52	377	208	28	27	187	11	70	11	22	13
26	24	34	94	172	28	27	109	13	29	425	22	13
27	37	18	482	98	28	27	389	20	10	66	79	13
28	40	16	990	100	28	27	88	13	25	19	32	13
29	34	14	427	112	------	27	92	11	16	13	16	14
30	26	14	127	102	------	27	71	11	26	13	16	17
31	24	------	72	97	------	27	------	12	------	14	14	------
TOTAL	1,931	2,525	3,477	12,359	1,377	874	3,377	701	460.8	1,095.4	665	771
MEAN	62.3	84.2	112	399	49.2	28.2	113	22.6	15.4	35.3	21.5	25.7
MAX	611	413	990	2,330	177	34	451	114	70	425	79	107
MIN	20	14	11	53	28	26	22	11	9.8	8.3	14	13
AC-FT	3,830	5,010	6,900	24,510	2,730	1,730	6,700	1,390	914	2,170	1,320	1,530

CAL YR 1969	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-
WTR YR 1970	TOTAL	29,613.2	MEAN	81.1	MAX	2,330	MIN	8.3	AC-FT	58,740

PEAK DISCHARGE (BASE, 8,700 CFS).--Jan. 13 (2230) 18,900 cfs (14.68 ft).

16036000 Makaweli River near Waimea

LOCATION.--Lat 21°58'31", long 159°38'55", Kauai, on left bank 0.7 mile upstream from mouth and 1.9 miles northeast of Waimea.

DRAINAGE AREA.--25 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--27 years, 88.1 cfs (63,830 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,910 cfs Jan. 13 (gage height, 6.63 ft), from rating curve extended as explained below; minimum, 17 cfs Aug. 22, 23.
Period of record: Maximum discharge, 15,900 cfs Apr. 15, 1963 (gage height, 12.25 ft), from rating curve extended above 3,200 cfs on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 cfs July 19, 1951.

REMARKS.--Records good. Olokele ditch diverts all low flow from Olokele River 9 miles above station for irrigation in vicinity of Makaweli.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	31	35	108	46	34	29	83	35	42	21	126
2	46	31	33	48	45	34	75	50	33	39	20	44
3	38	31	33	164	41	33	227	232	33	34	21	24
4	35	39	33	71	41	32	46	71	33	33	19	21
5	33	33	33	45	40	32	35	54	34	33	19	19
6	33	58	32	49	39	31	32	47	33	33	19	20
7	33	44	32	45	37	31	31	43	35	35	21	30
8	39	265	85	39	36	31	31	41	35	56	21	21
9	35	51	39	38	37	31	31	39	35	47	20	20
10	33	40	47	37	44	30	38	77	35	182	20	19
11	89	38	35	517	37	31	32	71	35	43	20	23
12	103	235	37	136	36	31	31	42	36	147	19	24
13	38	79	33	370	91	30	30	43	35	64	27	21
14	34	53	32	647	107	29	31	39	35	42	24	20
15	33	91	31	91	51	29	97	37	37	32	23	22
16	35	67	31	64	41	37	39	37	39	26	21	21
17	32	49	31	157	40	31	42	37	37	31	35	21
18	32	43	31	194	53	42	34	38	33	38	25	203
19	33	107	31	82	42	39	36	37	33	24	21	107
20	35	190	31	64	39	31	75	37	51	22	19	198
21	61	88	30	64	38	29	37	37	124	21	19	89
22	45	117	30	58	37	29	115	37	38	20	18	32
23	35	66	31	53	36	30	91	37	32	20	18	25
24	32	60	255	58	35	29	48	37	84	22	19	22
25	30	43	148	126	35	29	66	56	105	192	33	21
26	30	39	280	82	36	29	157	90	42	397	63	21
27	41	37	176	62	35	30	361	48	48	44	241	21
28	52	37	99	59	34	30	97	37	52	30	34	20
29	37	36	87	112	------	31	124	35	59	24	22	21
30	33	36	51	53	------	31	55	34	90	23	35	24
31	32	------	42	49	------	29	------	42	------	23	21	------
TOTAL	1,278	2,134	1,954	3,742	1,229	975	2,173	1,645	1,386	1,819	958	1,300
MEAN	41.2	71.1	63.0	121	43.9	31.5	72.4	53.1	46.2	58.7	30.9	43.3
MAX	103	265	280	647	107	42	361	232	124	397	241	203
MIN	30	31	30	37	34	29	29	34	32	20	18	19
AC-FT	2,530	4,230	3,880	7,420	2,440	1,930	4,310	3,260	2,750	3,610	1,900	2,580

CAL YR 1969 TOTAL 34,522 MEAN 94.6 MAX 3,330 MIN 30 AC-FT 68,470
WTR YR 1970 TOTAL 20,593 MEAN 56.4 MAX 647 MIN 18 AC-FT 40,850

PEAK DISCHARGE (BASE, 4,700 CFS).--No peak above base.

16049000 Hanapepe River below Manuahi Stream, near Eleele

LOCATION.--Lat 21°57'29", long 159°33'13", Kauai, on left bank 200 ft downstream from Manuahi Stream and 4 miles northeast of Eleele.

DRAINAGE AREA.--18.8 sq mi.

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 mile upstream not equivalent owing to intervening inflow.

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

AVERAGE DISCHARGE.--46 years (1917-20, 1927-70), 87.2 cfs (63,180 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,130 cfs Jan. 13 (gage height, 5.84 ft); minimum, 16 cfs Aug. 11, 12, 15, 16, 19-24.
Period of record: Maximum discharge, 39,000 cfs Apr. 15, 1963 (gage height, 14.87 ft), from rating curve extended above 7,600 cfs on basis of slope-area measurement of peak flow; minimum, 5.1 cfs May 21, 1954.

REMARKS.--Records good. Hanapepe ditch diverts 3 miles above station for irrigation in vicinity of Makaweli.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	18	21	216	24	23	27	151	29	57	21	184
2	55	18	21	48	23	23	38	67	27	36	23	57
3	23	18	20	66	23	23	150	460	26	26	21	22
4	20	25	21	38	23	23	32	138	26	23	19	19
5	20	20	20	27	23	23	27	74	27	25	19	18
6	19	30	20	57	23	23	26	49	27	35	19	20
7	21	23	20	32	23	23	26	39	31	36	26	26
8	25	246	61	26	23	23	25	37	28	57	21	21
9	20	41	21	23	25	23	25	44	26	30	17	19
10	20	91	21	23	25	23	44	156	26	209	17	18
11	31	38	21	427	23	22	25	109	27	60	16	17
12	33	201	21	99	23	22	25	55	28	116	16	17
13	19	68	20	354	55	23	25	62	31	71	21	17
14	18	43	20	373	43	23	25	37	31	61	20	17
15	20	103	20	64	24	23	65	35	27	44	16	20
16	19	108	20	40	23	24	27	32	47	29	16	17
17	18	34	20	68	23	23	27	35	29	57	26	18
18	18	26	20	77	31	31	25	37	27	30	17	210
19	18	65	20	38	24	30	29	30	26	24	16	134
20	18	156	20	30	23	23	78	29	74	20	16	301
21	62	66	20	37	23	23	27	30	185	19	16	183
22	31	149	20	29	23	24	108	33	49	18	16	49
23	20	65	20	27	23	24	95	37	30	21	16	27
24	18	38	268	34	23	24	32	30	136	29	16	20
25	18	27	113	48	23	24	41	91	189	109	27	19
26	18	24	223	37	23	24	103	85	71	477	96	17
27	74	23	131	32	23	25	446	49	80	121	306	17
28	39	22	47	71	23	25	150	35	96	102	27	17
29	22	21	29	94	------	25	193	32	122	70	21	17
30	20	22	24	27	------	25	70	28	176	27	56	17
31	20	------	27	25	------	25	------	68	------	24	21	------
TOTAL	829	1,829	1,370	2,587	711	742	2,036	2,194	1,754	2,063	1,001	1,555
MEAN	26.7	61.0	44.2	83.5	25.4	23.9	67.9	70.8	58.5	66.5	32.3	51.8
MAX	74	246	268	427	55	31	446	460	189	477	306	301
MIN	18	18	20	23	23	22	25	28	26	18	16	17
AC-FT	1,640	3,630	2,720	5,130	1,410	1,470	4,040	4,350	3,480	4,090	1,990	3,080

CAL YR 1969 TOTAL 33,224 MEAN 91.0 MAX 3,410 MIN 18 AC-FT 65,900
WTR YR 1970 TOTAL 18,671 MEAN 51.2 MAX 477 MIN 16 AC-FT 37,030

PEAK DISCHARGE (BASE, 3,600 CFS).--No peak above base.

16052500 Lawai Stream near Koloa

LOCATION.--Lat 21°54'03", long 159°30'19", Kauai, on right bank at private road bridge, 0.9 mile upstream from mouth, and 2.6 miles southwest of Koloa.

DRAINAGE AREA.--6.60 sq mi.

PERIOD OF RECORD.--Annual maximum, water years 1962-63, July 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 37.0 ft above mean sea level (by stadia survey). Apr. 24, 1962, to June 30, 1963, crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--7 years, 8.17 cfs (5,920 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 730 cfs Jan. 13 (gage height, 6.05 ft), from rating curve extended as explained below; minimum, 0.66 cfs Mar. 26 to Apr. 2, Apr. 6-9.
Period of record: Maximum discharge, 3,540 cfs Mar. 14, 1963 (gage height, 9.56 ft), from rating curve extended above 190 cfs on basis of slope-area measurements at gage heights 7.70 and 9.56 ft; minimum, 0.06 cfs Aug. 18, 1966.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Several diversions above station for irrigation of sugarcane in vicinity of Lawai.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.6	3.0	23	1.0	.81	.73	3.0	1.3	2.1	4.7	7.3
2	1.5	1.5	2.9	3.4	1.1	.81	1.0	5.0	1.2	2.7	4.7	7.3
3	1.6	1.5	2.7	3.1	1.1	.81	.73	8.0	2.3	1.9	4.9	6.2
4	1.2	1.5	2.7	4.6	1.1	.73	1.3	2.8	2.1	3.5	4.6	5.9
5	1.2	1.6	2.7	3.2	1.0	.73	.73	2.3	1.0	2.8	4.6	5.7
6	1.6	1.7	2.7	12	1.0	.73	1.6	2.1	.95	3.0	4.6	6.0
7	1.7	1.7	2.5	4.1	.95	.73	.66	1.7	.88	2.8	4.6	7.2
8	1.5	2.0	3.8	3.5	.95	.73	.66	1.6	1.0	3.0	4.4	6.0
9	3.4	1.9	2.8	3.2	.95	.73	.66	1.7	1.3	2.7	4.4	6.6
10	4.9	27	3.2	3.0	.95	.73	.81	2.1	1.4	2.6	4.4	5.9
11	1.6	2.0	3.0	36	.95	.73	.73	1.8	1.5	4.1	4.6	5.8
12	1.4	6.6	2.8	5.9	.95	.73	.73	2.1	1.2	3.0	4.6	5.8
13	1.4	4.0	2.7	29	.95	.95	1.1	2.0	.95	2.7	5.2	5.8
14	1.6	8.0	2.2	23	.95	.73	1.2	2.0	1.3	2.6	5.2	5.7
15	1.9	8.0	2.2	1.8	.88	.73	.88	2.3	1.5	2.6	5.0	5.7
16	2.3	4.0	2.2	1.5	.95	1.5	.95	1.4	1.7	3.1	4.9	5.6
17	2.5	3.0	2.1	1.6	.95	1.6	.95	1.4	1.7	2.7	5.4	5.6
18	1.8	2.6	2.2	1.4	.95	.81	.73	1.3	2.2	2.6	5.9	7.5
19	1.8	4.5	2.4	1.2	.88	.73	.73	1.3	2.4	2.6	5.9	7.1
20	1.8	8.0	1.6	1.2	.88	.73	.81	1.2	1.5	2.6	4.9	10
21	1.9	6.0	1.6	1.2	.88	.73	3.0	1.2	1.6	2.6	5.2	6.2
22	1.8	5.0	1.6	1.2	.88	.73	.73	1.1	1.8	2.6	5.2	5.4
23	1.7	9.6	1.6	1.1	.81	.73	1.6	1.0	2.5	2.6	4.9	4.6
24	1.7	6.6	5.2	1.1	.81	.73	1.8	1.0	2.5	2.6	4.5	4.1
25	1.7	4.0	3.7	1.3	.88	.73	.88	1.2	2.0	3.1	4.5	3.9
26	1.5	3.5	2.5	1.4	.81	.73	1.0	1.9	1.7	28	11	3.6
27	3.8	3.2	4.0	1.2	.81	.66	1.9	1.7	1.4	6.1	30	3.4
28	3.1	2.9	3.7	2.0	.81	.66	2.1	1.6	1.4	5.0	5.4	3.2
29	2.3	2.7	4.3	1.4	------	.66	2.5	1.5	1.4	4.9	4.5	3.1
30	2.5	2.7	3.2	1.2	------	.73	1.6	.95	2.1	5.4	5.4	3.1
31	2.3	------	3.0	1.1	------	.88	------	.95	------	5.0	4.5	------
TOTAL	62.5	138.9	86.8	179.9	26.08	24.75	34.80	61.20	47.78	123.6	182.6	169.3
MEAN	2.02	4.63	2.80	5.80	.93	.80	1.16	1.97	1.59	3.99	5.89	5.64
MAX	4.9	27	5.2	36	1.1	1.6	3.0	8.0	2.5	28	30	10
MIN	1.2	1.5	1.6	1.1	.81	.66	.66	.95	.88	1.9	4.4	3.1
AC-FT	124	276	172	357	52	49	69	121	95	245	362	336

CAL YR 1969 TOTAL 2,798.55 MEAN 7.67 MAX 400 MIN .36 AC-FT 5,550
WTR YR 1970 TOTAL 1,138.21 MEAN 3.12 MAX 36 MIN .66 AC-FT 2,260

PEAK DISCHARGE (BASE, 1,200 CFS).--No peak above base.

NOTE.--No gage-height record Nov. 13 to Dec. 16.

16053400 Upper Haiku ditch near Puhi

LOCATION.--Lat 21°58'48", long 159°27'12", Kauai, on right bank 20 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.8 mile downstream from intake on Papuaa Stream, and 3.6 miles west of Puhi.

PERIOD OF RECORD.--October 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 470 ft (from topographic map).

AVERAGE DISCHARGE.--6 years (1964-70), 9.01 cfs (6,530 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 36 cfs July 26, 1970; no flow at times.

REMARKS.--Records good. Ditch diverts from Papuaa Stream at Papuaa Reservoir and from Kamooloa Stream at intake 300 ft above Puuana Road crossing for irrigation of sugarcane in vicinity of Puhi.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	12	3.5	.64	.12	3.1	9.0	21	17	23	1.3	15
2	15	12	8.5	.20	.10	14	8.8	21	21	19	8.0	16
3	15	12	13	.12	.06	19	6.1	26	21	9.6	21	19
4	15	10	15	1.0	6.0	17	.32	21	20	8.3	22	18
5	15	9.0	20	.20	18	17	3.9	24	20	2.6	22	12
6	15	8.5	20	.14	21	15	13	26	19	19	22	12
7	15	12	20	.12	20	7.3	15	26	17	25	22	15
8	15	7.6	21	.10	20	.36	16	13	17	25	22	21
9	14	6.1	21	.10	20	15	15	1.3	16	25	18	18
10	14	13	21	.14	17	18	9.3	1.9	17	25	16	14
11	14	16	20	.70	19	17	.40	21	23	25	21	9.4
12	14	12	20	.10	21	15	13	23	20	26	20	.93
13	14	4.3	20	.93	16	4.7	13	19	7.6	26	19	5.1
14	14	6.7	20	.61	8.7	.10	17	24	4.8	26	14	18
15	14	6.6	19	.12	8.7	.10	16	19	18	26	6.2	22
16	14	7.4	18	.12	14	.08	13	3.9	19	26	12	23
17	14	6.6	18	.10	20	.08	8.7	9.3	18	26	18	22
18	14	2.9	13	.12	22	3.2	.48	25	18	25	17	10
19	14	1.2	13	.12	15	10	3.8	28	17	25	16	11
20	14	1.5	18	.12	12	5.1	2.5	26	11	25	15	22
21	14	1.1	13	.12	6.2	.32	2.0	26	8.1	28	9.2	22
22	14	1.0	9.1	.12	6.2	3.1	2.2	23	19	33	.40	21
23	14	6.4	8.5	.15	16	5.2	2.3	21	19	32	9.1	16
24	14	5.3	7.5	.12	14	8.9	2.2	20	19	32	16	11
25	14	4.5	1.3	.15	15	10	2.2	12	19	33	14	1.4
26	14	3.3	1.8	.15	17	5.3	4.1	16	20	36	15	5.1
27	14	2.6	1.4	.12	13	.23	9.0	21	13	34	16	24
28	13	2.0	.10	.12	3.1	.20	14	21	9.5	34	10	24
29	13	1.6	.08	.12	------	.20	17	21	20	33	.85	23
30	13	1.3	.08	.12	------	7.8	20	20	22	31	4.3	23
31	13	------	.08	.12	------	9.6	------	11	------	20	15	------
TOTAL	438	196.5	384.94	7.21	369.18	231.97	259.30	591.4	510.0	783.5	442.35	473.93
MEAN	14.1	6.55	12.4	.23	13.2	7.48	8.64	19.1	17.0	25.3	14.3	15.8
MAX	15	16	21	1.0	22	19	20	28	23	36	22	24
MIN	13	1.0	.08	.10	.06	.08	.32	1.3	4.8	2.6	.40	.93
AC-FT	869	390	764	14	732	460	514	1,170	1,010	1,550	877	940

CAL YR 1969 TOTAL 3,957.48 MEAN 10.8 MAX 27 MIN 0 AC-FT 7,850
WTR YR 1970 TOTAL 4,688.28 MEAN 12.8 MAX 36 MIN .06 AC-FT 9,300

16053600 Lower Haiku ditch near Puhi

LOCATION.--Lat 21°58'19", long 159°27'12", Kauai, on right bank 300 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.5 mile downstream from intake on Kamooloa Stream, and 3.2 miles west of Puhi.

PERIOD OF RECORD.--October 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 400 ft (from topographic map).

AVERAGE DISCHARGE.--6 years (1964-70), 8.09 cfs (5,860 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 53 cfs Dec. 1, 1968; no flow Feb. 3-5, 1967.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts from Kamooloa Stream 0.4 mile below Papuaa Stream for irrigation of sugarcane in vicinity of Puhi.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	.79	2.3	6.0	2.3	.98	.39	1.9	1.1	1.5	.89	2.3
2	2.1	.79	2.2	3.5	2.2	.98	.69	1.9	.99	1.1	.79	1.8
3	1.5	.79	2.0	4.0	2.2	.96	1.1	17	.99	.69	.79	.99
4	1.5	.89	1.9	10	2.1	.96	.69	8.4	.89	.79	.69	.89
5	1.4	.79	1.8	4.0	2.1	.96	.46	4.7	.89	.79	.69	.79
6	1.4	.79	1.7	3.7	1.9	.96	.46	3.4	.89	.79	.69	.69
7	1.4	.69	1.8	3.4	1.9	.96	.46	2.7	.89	.79	.79	.79
8	1.4	.79	1.9	3.2	1.9	.96	.46	2.6	.89	.99	.89	.89
9	1.2	.69	2.0	3.1	1.9	.96	.53	2.5	.79	1.1	.69	.89
10	1.4	.99	1.9	3.1	1.8	.89	1.2	3.6	.69	1.1	.61	.79
11	1.5	.89	1.6	15	1.7	.79	.79	2.9	.69	1.2	.61	.69
12	1.4	16	1.5	5.0	1.6	.79	.79	2.5	.69	2.7	.53	.69
13	1.2	4.4	1.4	25	1.5	.69	.79	2.3	.69	1.5	.61	.61
14	1.1	3.0	1.2	15	1.4	.69	.79	2.1	.69	1.5	.79	.53
15	1.2	3.3	1.2	8.0	1.5	.69	.61	2.1	.61	1.2	.61	.61
16	1.1	4.1	1.1	6.8	1.4	.69	.61	1.9	.69	.99	.53	.53
17	.99	2.3	1.0	8.0	1.3	.69	.61	1.6	.61	1.2	.69	.53
18	.99	2.1	1.0	6.4	1.4	.69	.61	1.6	.53	1.2	.53	.99
19	1.1	3.7	.98	4.5	1.3	.69	1.2	1.5	.53	1.4	.53	.89
20	1.1	6.1	.98	3.5	1.2	.61	3.4	1.4	.69	.99	.53	2.1
21	1.2	3.9	.96	3.0	1.1	.61	1.8	1.4	.99	.99	.53	2.2
22	1.8	3.9	.94	2.9	1.1	.61	1.2	1.4	.79	.79	.53	1.4
23	1.1	17	.92	2.8	1.1	.61	1.8	1.2	.61	.89	.46	1.2
24	.89	5.9	2.5	2.8	.98	.53	1.5	1.2	.79	.89	.53	1.1
25	.89	4.6	2.5	2.7	.98	.53	1.8	1.5	1.2	1.7	.69	.99
26	.89	3.7	2.4	2.7	.98	.46	1.6	2.3	.99	5.9	.99	.89
27	.99	3.2	10	2.9	.98	.46	2.3	1.9	.89	1.6	4.5	.89
28	1.1	2.9	4.0	3.7	.98	.46	1.8	1.4	.79	1.2	1.5	.89
29	.89	2.6	3.0	3.3	------	.39	3.0	1.2	1.9	1.1	.99	.89
30	.79	2.6	2.5	2.6	------	.39	2.1	1.1	2.9	1.2	.89	.89
31	.69	------	2.7	2.5	------	.39	------	1.2	------	.99	.79	------
TOTAL	38.01	104.19	63.88	173.1	42.80	22.03	35.54	84.4	27.28	40.77	25.88	30.33
MEAN	1.23	3.47	2.06	5.58	1.53	.71	1.18	2.72	.91	1.32	.83	1.01
MAX	2.1	17	10	25	2.3	.98	3.4	17	2.9	5.9	4.5	2.3
MIN	.69	.69	.92	2.5	.98	.39	.39	1.1	.53	.69	.46	.53
AC-FT	75	207	127	343	85	44	70	167	54	81	51	60

CAL YR 1969 TOTAL 2,080.38 MEAN 5.70 MAX 44 MIN .69 AC-FT 4,130
WTR YR 1970 TOTAL 688.21 MEAN 1.89 MAX 25 MIN .39 AC-FT 1,370

NOTE.--No gage-height record Dec. 17 to Jan. 26.

16053800 Kamooloa Stream near Puhi

LOCATION.--Lat 21°58'13", long 159°27'08", Kauai, on right bank at head of falls, 0.4 mile upstream from confluence with Kuia Stream, and 3.5 miles west of Puhi.

DRAINAGE AREA.--5.94 sq mi.

PERIOD OF RECORD.--November 1963 to May 1970 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is 390 ft (from topographic map).

AVERAGE DISCHARGE.--5 years (1964-69), 17.0 cfs (12,320 acre-ft per year).

EXTREMES.--Maximum discharge during period October 1969 to May 1970, 864 cfs Jan. 13 (gage height, 3.39 ft); minimum, 0.04 cfs Oct. 18, 19, 26, 31.
Period of record: Maximum discharge, 5,750 cfs Nov. 29, 1968 (gage height, 7.50 ft), from rating curve extended above 600 cfs on basis of slope-area measurements at gage heights 4.86 and 6.66 ft; minimum, 0.02 cfs Feb. 8, 9, 1967.

REMARKS.--Records good. Diversion by Kamooloa ditch 4.3 miles above station to Kuia Stream. Upper Haiku ditch (see sta 16053400) and Lower Haiku ditch (see sta 16053600) divert 1.3 miles and 0.4 mile, respectively, above station for irrigation of sugarcane in vicinity of Puhi. Since July 19, 1966, Koloa tunnel (see sta 16054400) has diverted 0.6 mile above station for irrigation of sugarcane in vicinity of Koloa.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1969 TO MAY 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.23	2.5	7.6	2.7	.32	.06	1.4				
2	.10	.20	2.4	4.1	2.4	.29	.10	1.5				
3	.09	.23	2.3	5.1	2.2	.17	.96	2.5				
4	.07	.12	2.0	24	2.1	.17	.78	2.0				
5	.09	.23	1.9	4.4	1.9	.14	.36	1.7				
6	.09	.72	1.8	4.5	1.7	.12	.26	1.6				
7	.10	.44	1.9	3.8	1.5	.14	.23	1.6				
8	.10	2.4	2.9	3.6	1.4	.12	.23	1.6				
9	.09	2.5	2.7	3.5	1.3	.10	.20	1.5				
10	.10	4.3	2.8	3.5	1.2	.10	.90	1.5				
11	.10	3.4	2.7	74	1.0	.10	.52	1.5				
12	.09	16	2.6	11	.96	.09	.29	1.4				
13	.07	4.1	1.6	102	1.0	.09	.20	1.3				
14	.07	3.2	1.3	82	1.2	.07	.20	1.3				
15	.07	3.6	1.1	21	.96	.07	.07	1.1				
16	.07	3.6	1.0	15	.72	.07	.06	.90				
17	.07	2.9	.96	16	.66	.07	.07	.84				
18	.06	2.9	.90	15	1.1	.09	.07	.72				
19	.04	3.1	.78	8.3	.78	.09	.23	.66				
20	.06	3.8	.66	3.4	.61	.07	.20	.61				
21	.06	3.3	.61	3.3	.56	.06	.74	.61				
22	.07	3.2	.56	3.2	.48	.07	.96	.61				
23	.06	9.5	.52	3.1	.40	.07	1.5	.61				
24	.06	3.7	3.4	3.1	.32	.07	1.0	.61				
25	.06	3.3	3.4	3.0	.32	.07	1.0	.61				
26	.04	3.1	3.0	3.0	.32	.07	1.1	.61				
27	.09	3.0	24	3.1	.32	.07	1.2	.56				
28	.07	2.9	3.8	3.4	.26	.07	1.2	.66				
29	.06	2.8	3.3	3.4	------	.07	1.4	.66				
30	.06	2.7	2.8	3.1	------	.07	1.3	.66				
31	.07	------	2.9	2.9	------	.07	------	.72	------			------
TOTAL	2.33	95.47	85.09	446.4	30.37	3.24	17.39	34.15				
MEAN	.075	3.18	2.74	14.4	1.08	.10	.58	1.10				
MAX	.10	16	24	102	2.7	.32	1.5	2.5				
MIN	.04	.12	.52	2.9	.26	.06	.06	.56				
AC-FT	4.6	189	169	885	60	6.4	34	68				

CAL YR 1969 TOTAL 3,480.46 MEAN 9.54 MAX 400 MIN .04 AC-FT 6,900
WTR YR 1970 TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 1,400 CFS).--No peak above base.

16054200 Koloa ditch near Koloa

LOCATION.--Lat 21°57'07", long 159°28'11", Kauai, on right bank at old county road bridge between Highways 50 and 52 at Knudsen Gap, 250 ft downstream from wasteway, and 3.0 miles north of Koloa.

PERIOD OF RECORD.--July 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 620 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 21.3 cfs (15,430 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 196 cfs Nov. 26, 1967; no flow Apr. 22-24, 1967.

REMARKS.--Records good. Ditch diverts from Kuia Stream 50 ft below the Waiahi-Kuia aqueduct outlet for power generation and irrigation of sugarcane in vicinity of Koloa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	8.7	13	93	13	6.0	4.7	56	28	15	7.3	72
2	43	7.8	13	46	12	6.2	10	49	15	18	7.6	54
3	33	7.1	11	86	12	6.0	34	108	7.6	22	6.6	40
4	29	10	11	81	11	5.9	10	77	6.8	19	5.0	34
5	26	8.7	11	48	11	5.9	5.9	57	6.6	24	4.9	32
6	24	20	15	58	11	5.9	4.6	46	6.2	19	5.0	32
7	24	15	14	36	10	5.7	3.8	41	7.3	9.4	6.2	38
8	18	42	31	29	10	5.5	3.7	39	6.2	9.7	8.7	36
9	12	33	22	24	10	5.7	3.8	46	4.0	14	5.2	30
10	17	34	27	20	10	5.5	17	71	4.0	31	4.7	29
11	23	15	24	43	9.2	5.5	6.4	56	4.0	17	4.4	22
12	25	13	19	34	8.7	5.5	6.2	44	4.1	26	5.2	19
13	12	8.9	10	27	10	5.4	5.5	44	4.3	25	8.0	15
14	11	7.6	9.2	23	13	5.2	6.8	38	4.1	36	10	11
15	14	19	8.2	15	8.7	5.4	6.0	38	3.8	33	7.1	10
16	12	44	8.2	12	7.8	5.4	5.2	34	5.0	26	6.8	7.1
17	8.9	18	9.7	11	7.6	5.2	5.9	35	4.6	33	12	6.6
18	8.5	10	9.4	11	11	6.8	5.9	30	4.0	29	7.6	44
19	9.4	34	8.9	12	7.8	6.0	11	11	3.8	28	6.4	42
20	13	48	8.0	11	7.3	5.4	45	9.2	10	15	6.2	76
21	35	32	7.8	14	7.1	5.2	14	8.7	25	5.7	6.0	72
22	34	36	7.3	12	6.9	5.2	18	9.2	9.2	5.4	6.0	54
23	16	51	6.8	11	6.8	5.0	38	14	5.5	5.0	5.7	43
24	11	34	49	11	6.8	4.7	26	11	17	6.0	5.5	38
25	8.5	27	39	11	6.8	4.6	19	20	36	16	13	29
26	8.0	22	40	11	6.8	4.7	23	36	16	65	25	11
27	24	19	54	13	6.4	4.6	29	28	13	18	74	10
28	24	17	40	21	6.2	4.6	34	21	14	11	34	9.4
29	11	16	43	38	------	4.4	52	22	31	8.0	38	9.2
30	12	15	33	19	------	4.6	44	17	34	8.2	42	8.7
31	12	------	32	14	------	4.7	------	31	------	7.1	36	------
TOTAL	600.3	672.8	634.5	895	254.9	166.4	498.4	1,147.1	340.1	604.5	420.1	934.0
MEAN	19.4	22.4	20.5	28.9	9.10	5.37	16.6	37.0	11.3	19.5	13.6	31.1
MAX	43	51	54	93	13	6.8	52	108	36	65	74	76
MIN	8.0	7.1	6.8	11	6.2	4.4	3.7	8.7	3.8	5.0	4.4	6.6
AC-FT	1,190	1,330	1,260	1,780	506	330	989	2,280	675	1,200	833	1,850

CAL YR 1969 TOTAL 6,006.63 MEAN 16.5 MAX 54 MIN .53 AC-FT 11,910
WTR YR 1970 TOTAL 7,168.1 MEAN 19.6 MAX 108 MIN 3.7 AC-FT 14,220

16054400 Koloa tunnel near Koloa

LOCATION.--Lat 21°56'05", long 159°27'39", Kauai, on left bank 80 ft upstream from Wilcox ditch crossing, 0.7 mile upstream from Waita Reservoir, and 2.0 miles north of Koloa.

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

GAGE.--Water-stage recorder. Datum of gage is 385.78 ft above mean sea level (Grove Farm Co. bench mark).

EXTREMES.--Period of record: Maximum daily discharge, 542 cfs Nov. 26, 1967; minimum daily, 1.4 cfs June 21-25, July 18, 1966.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Tunnel diverts from Kuia Stream to Waita Reservoir for irrigation of sugarcane in vicinity of Koloa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	4.2	6.0	162	21	6.8	4.2	11	11	5.3	3.9	10
2	17	4.8	5.6	36	21	6.4	4.2	10	5.3	5.0	3.6	7.2
3	10	3.9	5.0	81	21	6.4	5.0	157	5.0	4.8	3.6	5.6
4	8.2	3.6	5.0	128	17	6.4	4.5	40	4.8	4.5	3.6	5.0
5	7.2	3.4	5.0	52	7.2	6.2	4.2	26	4.5	5.0	3.9	4.8
6	6.8	4.5	7.0	53	11	6.2	4.2	18	4.5	5.6	3.9	4.5
7	7.5	3.6	6.0	36	11	5.6	4.2	14	4.5	5.6	4.5	5.0
8	6.4	13	9.0	30	11	5.3	4.8	21	4.5	6.2	5.3	5.3
9	5.3	7.9	7.0	26	11	5.0	4.5	36	4.2	6.4	3.9	5.3
10	6.2	13	8.0	25	11	5.3	5.6	42	4.2	9.6	3.4	4.8
11	7.5	11	6.4	22	12	5.6	4.8	28	4.2	7.2	3.4	4.5
12	8.9	60	5.6	18	12	5.6	4.8	17	4.5	11	3.2	4.2
13	5.3	20	4.2	18	12	7.8	5.0	23	4.2	7.9	3.4	4.2
14	5.0	13	3.9	15	11	9.3	5.0	20	4.2	8.6	3.6	4.2
15	5.3	15	3.6	13	12	9.3	5.0	18	4.2	7.2	3.4	4.5
16	5.6	20	3.4	13	11	8.6	4.8	37	4.5	6.2	3.4	3.9
17	4.8	13	3.4	14	7.9	3.9	4.8	34	5.0	9.6	3.6	3.9
18	4.8	12	7.8	14	8.6	3.9	4.8	17	4.5	7.2	3.4	7.2
19	4.8	15	7.6	26	8.6	4.2	5.3	11	4.5	6.4	3.2	6.8
20	5.0	22	5.2	23	8.6	3.9	8.0	10	4.8	5.6	3.0	10
21	12	18	6.5	24	8.6	3.9	7.9	9.6	5.0	5.3	3.0	14
22	12	17	9.1	21	8.6	3.9	5.6	9.6	4.8	6.2	2.8	7.9
23	5.9	45	6.1	21	9.3	3.9	7.9	9.6	4.5	5.9	2.8	7.2
24	4.5	25	65	21	7.9	3.9	6.8	9.3	4.5	5.9	3.0	5.9
25	4.5	17	31	23	7.9	4.2	7.9	13	4.8	10	3.9	5.6
26	4.2	11	29	21	7.9	4.2	6.4	16	5.0	44	4.2	5.0
27	12	8.0	100	19	7.5	3.9	21	7.2	4.8	8.9	23	4.8
28	9.3	7.0	43	19	7.2	3.9	23	6.2	4.8	7.2	5.3	5.0
29	5.6	6.6	35	30	------	3.9	29	5.9	5.0	6.2	4.5	5.0
30	5.0	6.2	25	21	------	3.9	11	5.6	5.2	6.2	4.5	4.8
31	5.3	------	25	21	------	4.2	------	12	------	5.3	4.2	------
TOTAL	229.9	423.7	489.4	1,046	310.8	165.5	224.2	694.0	145.5	246.0	134.4	176.1
MEAN	7.42	14.1	15.8	33.7	11.1	5.34	7.47	22.4	4.85	7.94	4.34	5.87
MAX	18	60	100	162	21	9.3	29	157	11	44	23	14
MIN	4.2	3.4	3.4	13	7.2	3.9	4.2	5.6	4.2	4.5	2.8	3.9
AC-FT	456	840	971	2,070	616	328	445	1,380	289	488	267	349

CAL YR 1969 TOTAL 5,779.3 MEAN 15.8 MAX 259 MIN 3.4 AC-FT 11,460
WTR YR 1970 TOTAL 4,285.5 MEAN 11.7 MAX 162 MIN 2.8 AC-FT 8,500

NOTE.--No gage-height record Nov. 10 to Dec. 10.

16055000 Huleia Stream near Lihue

LOCATION.--Lat 21°57'20", long 159°25'23", Kauai, on left bank 60 ft downstream from bridge on Kipu Road, 0.2 mile east of Kipu, and 3.6 miles southwest of Lihue.
DRAINAGE AREA.--17.6 sq mi.
PERIOD OF RECORD.--May 1912 to December 1915, annual maximum, water years 1962-67, March 1967 to October 1970 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).
GAGE.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). May 7, 1912, to Dec. 31, 1915, nonrecording gage at site 380 ft upstream at different datum. Apr. 23, 1962, to Feb. 28, 1967, crest-stage gage at site 60 ft upstream at datum 2.36 ft lower than present datum.
AVERAGE DISCHARGE.--6 years (1912-15, 1967-70), 28.0 cfs (20,290 acre-ft per year).
EXTREMES.--Water year 1970: Maximum discharge, 2,110 cfs Jan. 13 (gage height, 9.10 ft), from rating curve extended as explained below; minimum, 3.4 cfs Aug. 24.
October 1970: Maximum discharge during period, 44 cfs Oct. 1 (gage height, 3.28 ft); minimum, 3.8 cfs Oct. 28.
Period of record: Maximum discharge, 13,200 cfs Apr. 15, 1963 (gage height, 17.46 ft, present datum), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 16.37 ft; minimum, 3.4 cfs Aug. 24, 1970.
REMARKS.--Records good. Several diversions above station, including diversions into and out of the basin, principally for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	5.7	14	135	16	5.7	4.0	9.7	6.2	5.3	4.3	5.5
2	6.9	6.0	13	50	14	6.0	4.9	10	6.0	4.7	4.2	4.7
3	6.4	5.8	10	99	12	5.7	7.4	60	5.8	4.2	4.3	4.2
4	6.2	6.2	10	160	12	5.7	5.8	36	5.7	4.2	4.0	3.9
5	6.2	6.2	9.4	68	11	5.7	4.3	25	5.3	4.2	4.2	3.9
6	5.8	6.4	9.1	72	10	5.7	4.0	20	5.1	4.3	4.4	3.6
7	6.2	7.4	9.4	48	10	5.7	3.9	17	5.1	4.4	4.4	3.8
8	6.9	7.8	13	40	9.7	5.3	4.0	17	5.1	5.3	4.7	4.2
9	5.8	10	11	34	9.4	5.3	4.2	16	4.7	5.8	4.3	4.3
10	6.2	12	11	31	9.7	5.3	7.4	17	4.6	5.7	4.2	4.7
11	7.4	11	11	227	9.1	5.1	5.8	15	4.4	5.3	4.0	4.0
12	6.9	77	10	104	8.6	5.3	5.5	14	4.6	6.0	3.9	3.8
13	6.0	24	9.4	137	9.1	5.1	6.2	11	4.6	5.8	4.0	3.6
14	5.7	15	8.6	375	9.1	4.9	5.8	10	4.4	5.7	4.6	3.5
15	6.0	17	8.1	99	8.6	5.1	5.7	10	4.3	5.3	4.3	4.6
16	6.2	20	7.8	77	7.6	5.3	5.5	9.1	4.2	4.6	4.0	4.0
17	5.7	14	7.8	72	7.6	5.1	5.5	8.6	4.4	5.1	4.6	4.0
18	5.5	13	7.8	68	8.8	5.5	5.5	8.3	4.3	4.7	4.3	5.7
19	5.7	17	7.6	48	8.1	5.7	7.8	8.1	4.0	4.4	3.9	5.1
20	5.8	27	7.4	23	7.4	5.1	9.7	8.1	4.6	4.3	3.6	5.7
21	6.2	21	7.1	21	7.1	4.9	7.4	7.6	5.1	4.0	3.8	5.3
22	7.1	18	7.1	21	6.4	4.9	7.8	8.3	4.7	4.3	3.8	4.6
23	6.2	75	6.9	20	6.2	4.7	13	7.8	4.4	4.4	3.6	4.4
24	5.7	36	15	19	5.8	4.7	9.4	7.4	4.6	4.6	3.8	4.0
25	5.5	25	19	19	5.8	4.4	9.7	7.8	5.1	5.5	5.1	3.9
26	5.5	21	14	18	6.0	4.4	9.7	8.1	5.5	10	4.9	3.8
27	8.1	18	180	18	6.0	4.4	9.4	7.6	4.7	5.3	8.1	3.6
28	7.6	17	66	20	5.7	4.3	9.7	6.9	4.6	4.9	5.1	3.6
29	6.0	15	48	19	------	4.3	11	6.6	5.5	4.6	4.3	3.6
30	5.5	15	33	17	------	4.4	9.7	6.6	6.6	5.1	3.9	4.4
31	5.5	------	31	17	------	4.4	------	6.9	------	4.6	3.8	------
TOTAL	193.5	569.5	622.5	2,176	246.8	158.1	209.7	411.5	148.2	156.6	134.4	128.0
MEAN	6.24	19.0	20.1	70.2	8.81	5.10	6.99	13.3	4.94	5.05	4.34	4.27
MAX	8.1	77	180	375	16	6.0	13	60	6.6	10	8.1	5.7
MIN	5.5	5.7	6.9	17	5.7	4.3	3.9	6.6	4.0	4.0	3.6	3.5
AC-FT	384	1,130	1,230	4,320	490	314	416	816	294	311	267	254

CAL YR 1969 TOTAL 13,238.4 MEAN 36.3 MAX 1,040 MIN 5.3 AC-FT 26,260
WTR YR 1970 TOTAL 5,154.8 MEAN 14.1 MAX 375 MIN 3.5 AC-FT 10,220

PEAK DISCHARGE (BASE, 5,500 CFS).--No peak above base.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1970

DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT
1	9.5	6	4.9	11	4.2	16	5.2	21	4.2	26	4.4
2	13	7	4.4	12	4.0	17	4.6	22	4.3	27	4.0
3	11	8	4.4	13	4.0	18	4.0	23	4.7	28	4.4
4	6.2	9	4.3	14	4.0	19	4.0	24	4.0	29	4.7
5	5.3	10	4.3	15	4.0	20	4.0	25	4.0	30	4.7
										31	4.2

TOTAL	156.9
MEAN	5.06
MAX	13
MIN	4.0
AC-FT	311

PEAK DISCHARGE (BASE, 5,500 CFS).--No peak above base.

16056800 Waiahi-Kuia aqueduct near Puhi

LOCATION.--Lat 21°58'36", long 159°28'28", Kauai, on left bank 0.2 mile upstream from Kuia Stream, 4.8 miles west of Puhi, and 4.8 miles north of Koloa.

PERIOD OF RECORD.--July 1964 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 730 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 6.40 cfs (4,640 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 77 cfs Aug. 27, 1966; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Ditch diverts from Waiahi Stream into Kuia Stream, from which Koloa ditch (see sta 16054200) diverts 50 ft downstream for power generation and irrigation of sugarcane in vicinity of Koloa.

COOPERATION.--Gage-height record furnished by Lihue Plantation Co.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	.09	.01	4.2	.59		0	23	.90	.21	0	19
2	24	.09	.01	4.2	.59		0	21	.60	4.7	0	19
3	13	.09	.01	4.2	.59		5.8	30	.45	7.4	0	15
4	9.6	.94	.02	4.2	.59		9.6	25	.40	7.0	0	11
5	7.4	.21	.09	4.2	.59		9.0	21	.37	8.0	0	10
6	7.0	1.8	.59	4.2	.38		9.0	18	.35	5.3	0	11
7	8.0	1.4	.59	3.8	.38		9.0	16	.40	3.4	0	14
8	5.7	16	7.9	3.0	.38		9.0	16	.20	.67	0	10
9	4.6	7.9	3.8	2.4	.21		9.0	17	.15	1.1	0	10
10	4.9	9.7	5.0	2.0	.09		11	23	0	4.2	0	7.6
11	9.9	4.6	3.4	2.0	.09		9.6	20	0	1.6	0	7.8
12	11	13	2.1	2.4	.09		9.6	19	0	4.5	0	5.5
13	4.6	11	.01	2.4	.09		9.0	20	0	8.7	0	4.6
14	4.6	.09	0	4.6	0		9.0	16	0	14	0	2.1
15	6.2	.21	0	5.0	0		11	16	0	13	0	1.4
16	.38	.27	.35	3.4	0		9.6	13	0	9.6	0	.19
17	.21	.09	.40	3.4	0		9.0	15	0	13	D	.04
18	.21	.09	.33	3.4	0		9.0	9.4	0	10	0	10
19	.21	.09	.27	0	0		9.0	.38	0	9.6	0	10
20	.68	.21	.20	0	0		16	.38	1.5	4.9	0	16
21	8.9	.02	.19	0	0		10	.38	1.0	.38	0	21
22	5.2	.02	.19	0	0		16	.27	.70	.09	0	19
23	.82	.78	.21	0	0		21	.27	.50	0	0	16
24	.21	.09	15	0	0		19	.50	1.0	.12	0	13
25	.09	.09	14	0	0		13	.80	7.0	.09	0	6.9
26	.09	.09	17	0	0		15	1.4	1.1	3.0	1.1	.38
27	1.5	.09	22	0	0		23	1.1	.05	0	6.7	.21
28	.86	.02	16	0	0		23	.80	.09	0	8.1	.09
29	.21	.02	13	2.4	------		22	.90	.41	0	10	.06
30	.21	.01	7.0	1.4	------		18	.80	.82	0	14	0
31	.09	------	4.2	.59	------		------	1.2	------	0	11	------
TOTAL	161.37	69.10	133.87	67.39	4.66	0	352.2	347.58	17.99	134.56	50.9	260.87
MEAN	5.21	2.30	4.32	2.17	.17	0	11.7	11.2	.60	4.34	1.64	8.70
MAX	24	16	22	5.0	.59	0	23	30	7.0	14	14	21
MIN	.09	.01	0	0	0	0	0	.27	0	0	0	0
AC-FT	320	137	266	134	9.2	0	699	689	36	267	101	517

CAL YR 1969 TOTAL 1,060.89 MEAN 2.91 MAX 27 MIN 0 AC-FT 2,100
WTR YR 1970 TOTAL 1,600.49 MEAN 4.38 MAX 30 MIN 0 AC-FT 3,170

NOTE.--No gage-height record May 22 to June 25.

16060000 South Fork Wailua River near Lihue

LOCATION.--Lat 22°02'24", long 159°22'58", Kauai, on right bank 0.2 mile upstream from Wailua Falls and 4.3 miles north of Lihue.

DRAINAGE AREA.--22.4 sq mi.

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.

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

AVERAGE DISCHARGE.--53 years (1912-18, 1919-20, 1921-24, 1925-56, 1958-70), 118 cfs (85,490 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,890 cfs Nov. 12 (gage height, 14.12 ft); minimum, 2.9 cfs Mar. 28, 29.
Period of record: Maximum discharge, 87,300 cfs Apr. 15, 1963 (gage height, 22.90 ft), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.69 cfs Sept. 21, 1953.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	5.2	84	636	10	4.8	3.8	104	27	30	6.2	158
2	23	4.8	79	250	9.5	4.8	4.8	57	4.1	9.8	5.7	42
3	8.4	4.8	65	710	9.5	4.8	65	997	3.6	5.5	5.9	8.7
4	5.2	4.8	36	484	9.8	4.8	12	371	3.4	8.9	5.5	6.6
5	5.0	6.4	32	256	9.5	4.8	4.8	173	3.4	26	5.0	5.5
6	5.7	6.4	27	219	9.0	4.8	3.8	64	3.4	10	5.2	5.0
7	5.0	6.6	25	156	8.7	4.8	3.4	44	3.9	5.5	5.9	5.2
8	5.5	95	95	137	8.4	4.6	3.4	72	4.5	8.1	7.3	5.7
9	5.9	54	40	118	8.4	4.5	3.8	91	4.1	19	6.6	6.6
10	5.9	63	43	101	7.6	4.8	5.2	246	3.6	91	5.5	5.9
11	36	54	34	648	6.8	4.6	6.6	87	3.4	38	5.0	5.9
12	59	670	33	270	6.6	4.5	5.2	13	3.4	172	5.0	6.4
13	17	200	27	469	7.6	4.3	5.2	24	3.9	50	5.7	5.5
14	5.0	122	28	926	9.5	3.9	5.2	10	4.8	26	7.9	4.6
15	4.3	204	21	219	7.0	4.3	13	7.6	4.5	8.4	6.2	7.9
16	4.3	384	19	153	6.8	4.5	6.4	6.8	3.9	6.4	5.5	6.4
17	3.9	127	17	151	6.2	5.9	5.0	6.4	5.2	7.9	7.3	4.6
18	3.9	99	15	170	7.9	5.2	5.2	6.8	3.9	7.6	6.8	69
19	4.3	200	14	105	7.3	6.2	5.5	6.2	3.4	6.2	5.5	47
20	6.4	357	13	89	6.4	4.8	135	6.4	3.9	5.7	5.7	268
21	42	200	12	78	6.4	4.1	12	6.2	63	5.7	5.5	172
22	13	322	11	73	5.9	3.9	44	7.3	10	5.5	5.0	20
23	6.4	472	12	64	5.5	3.6	14	6.6	5.7	5.2	5.5	7.3
24	4.5	275	235	73	5.5	3.4	8.2	6.2	8.5	7.0	5.0	5.9
25	4.3	181	179	87	5.5	3.4	9.0	5.9	43	25	6.8	5.2
26	4.3	142	184	79	5.5	3.2	94	20	12	284	44	4.6
27	25	121	714	64	5.5	3.2	400	20	14	42	249	4.5
28	17	106	360	86	5.2	3.2	133	7.6	44	17	9.5	4.1
29	11	95	169	196	------	3.1	83	5.9	111	8.2	7.6	4.3
30	6.4	89	121	68	------	3.1	30	5.2	135	7.0	19	5.0
31	6.2	------	137	13	------	3.2	------	74	------	7.0	8.2	------
TOTAL	369.8	4,671.0	2,881	7,148	207.5	133.1	1,129.5	2,559.1	547.5	955.6	484.5	907.4
MEAN	11.9	156	92.9	231	7.41	4.29	37.7	82.5	18.3	30.8	15.6	30.2
MAX	59	670	714	926	10	6.2	400	997	135	284	249	268
MIN	3.9	4.8	11	13	5.2	3.1	3.4	5.2	3.4	5.2	5.0	4.1
AC-FT	734	9,260	5,710	14,180	412	264	2,240	5,070	1,090	1,900	961	1,800

CAL YR 1969 TOTAL 41,557.1 MEAN 114 MAX 2,940 MIN 3.8 AC-FT 82,430
WTR YR 1970 TOTAL 21,993.0 MEAN 60.3 MAX 997 MIN 3.1 AC-FT 43,620

PEAK DISCHARGE (BASE, 5,800 CFS).--No peak above base.

16061000 North Wailua ditch near Lihue

LOCATION.--Lat 22°03'55", long 159°28'12", Kauai, on left bank 300 ft downstream from intake, 8.3 miles west of Wailua, and 8.8 miles northwest of Lihue.

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

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

AVERAGE DISCHARGE.--38 years, 18.9 cfs (13,690 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 59 cfs Dec. 21, 1933, Apr. 24, 1934; no flow at times.

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

REVISIONS (FISCAL YEAR).--WSP 770: 1933.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	18	20	35	20	17	19	26	21	27	18	30
2	27	18	20	32	20	16	28	22	20	25	18	25
3	23	18	20	38	20	16	31	25	20	23	18	23
4	21	23	20	32	20	16	22	22	20	23	17	19
5	20	23	20	29	19	16	20	23	19	24	18	22
6	20	25	19	28	19	17	20	23	21	25	18	24
7	25	27	20	24	18	16	21	23	24	22	18	23
8	25	32	30	23	18	16	21	25	23	27	18	22
9	21	26	25	21	19	16	19	25	20	26	18	22
10	23	27	24	21	18	16	26	27	20	29	17	22
11	35	25	22	34	18	18	22	24	20	29	17	20
12	28	28	23	29	17	16	25	24	23	28	17	20
13	25	28	22	35	20	16	22	26	25	30	19	19
14	23	27	21	29	20	16	23	23	25	24	17	20
15	25	26	20	24	18	19	27	23	20	23	18	24
16	22	24	19	24	17	26	26	23	27	22	18	20
17	21	21	19	28	18	19	26	24	22	23	19	20
18	21	23	19	25	19	23	25	23	21	22	18	26
19	24	32	19	24	17	21	28	22	20	22	17	25
20	24	32	18	23	18	17	30	21	30	21	17	28
21	29	32	18	23	17	19	28	22	32	14	19	27
22	26	31	18	21	17	18	30	24	27	5.2	20	24
23	22	31	18	21	17	17	29	21	26	14	18	23
24	20	29	35	25	17	16	29	21	30	20	21	22
25	20	27	27	26	18	16	27	22	29	22	28	20
26	20	25	34	22	19	16	32	26	28	22	25	19
27	21	23	34	23	17	16	33	24	29	20	25	20
28	19	22	30	23	17	16	30	23	28	19	24	18
29	19	21	28	18	------	16	29	22	31	19	22	18
30	19	21	25	20	------	16	27	21	31	20	23	17
31	19	------	27	20	------	18	------	24	------	19	23	------
TOTAL	712	765	714	800	512	537	775	724	732	689.2	603	662
MEAN	23.0	25.5	23.0	25.8	18.3	17.3	25.8	23.4	24.4	22.2	19.5	22.1
MAX	35	32	35	38	20	26	33	27	32	30	28	30
MIN	19	18	18	18	17	16	19	21	19	5.2	17	17
AC-FT	1,410	1,520	1,420	1,590	1,020	1,070	1,540	1,440	1,450	1,370	1,200	1,310

CAL YR 1969 TOTAL 8,595 MEAN 23.5 MAX 36 MIN 13 AC-FT 17,050
WTR YR 1970 TOTAL 8,225.2 MEAN 22.5 MAX 38 MIN 5.2 AC-FT 16,310

16061200 North Wailua ditch below Waikoko Stream, near Lihue

LOCATION.--Lat 22°03'31", long 159°27'55", Kauai, on left bank 380 ft downstream from Waikoko Stream, 8.1 miles west of Wailua, and 8.1 miles 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 (from topographic map).

AVERAGE DISCHARGE.--5 years, 27.5 cfs (19,920 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 58 cfs Oct. 11, 1966; no flow Jan. 1-18, 1965.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	22	25	36	27	20	21	30	27	28	20	31
2	26	22	25	31	26	20	28	30	27	26	20	27
3	24	22	24	36	26	19	34	40	26	26	20	25
4	24	26	24	32	26	19	26	32	24	25	19	22
5	24	27	23	30	25	19	23	31	24	26	20	24
6	25	28	22	30	24	20	22	30	25	26	20	24
7	26	29	23	28	24	19	23	30	28	25	20	24
8	26	34	30	27	23	19	24	31	28	27	21	24
9	25	30	27	26	24	19	21	32	25	27	20	23
10	25	31	27	26	23	19	29	35	26	30	20	24
11	32	28	26	35	22	21	25	31	25	30	19	22
12	28	33	27	31	22	20	28	30	27	33	19	22
13	27	30	26	33	25	19	26	33	29	33	22	21
14	26	33	24	35	26	19	26	30	30	31	21	21
15	26	30	23	29	23	22	31	30	27	30	20	25
16	26	31	22	28	22	27	28	30	30	29	20	23
17	25	27	22	31	22	22	29	31	28	30	22	23
18	25	27	22	30	24	24	27	30	27	29	20	29
19	26	33	21	28	22	25	29	29	26	29	20	28
20	26	34	20	27	21	19	32	28	31	28	18	32
21	31	33	20	27	21	19	29	28	33	19	20	29
22	28	33	20	26	20	19	31	30	29	11	20	26
23	26	33	20	26	20	19	30	28	27	16	19	25
24	25	31	34	28	20	18	27	27	29	23	21	24
25	25	30	30	29	21	17	27	29	30	24	26	23
26	24	28	34	28	22	17	32	32	28	28	28	22
27	26	27	35	27	20	17	35	31	29	23	30	23
28	24	27	31	29	20	17	30	29	29	22	26	22
29	24	26	29	30	------	17	30	28	30	22	25	22
30	24	26	28	28	------	18	28	27	31	22	27	20
31	23	------	28	27	------	20	------	30	------	21	25	------
TOTAL	798	871	792	914	641	609	831	942	835	799	668	730
MEAN	25.7	29.0	25.5	29.5	22.9	19.6	27.7	30.4	27.8	25.8	21.5	24.3
MAX	32	34	35	36	27	27	35	40	33	33	30	32
MIN	23	22	20	26	20	17	21	27	24	11	18	20
AC-FT	1,580	1,730	1,570	1,810	1,270	1,210	1,650	1,870	1,660	1,580	1,320	1,450

CAL YR 1969 TOTAL 10,709 MEAN 29.3 MAX 57 MIN 20 AC-FT 21,240
WTR YR 1970 TOTAL 9,430 MEAN 25.8 MAX 40 MIN 11 AC-FT 18,700

16062000 Stable storm ditch near Lihue

LOCATION.--Lat 22°04'09", long 159°26'46", Kauai, on left bank 100 ft downstream from intake, 7.8 miles northwest of Lihue, and 8.2 miles 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 (by barometer).

AVERAGE DISCHARGE.--33 years (1937-70), 11.0 cfs (7,970 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 71 cfs Apr. 3, 1948; no flow at times each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.59	.33	.22	0	28	31	.12	.45	.45	37	24
2	.22	.74	.22	.22	15	27	39	.22	7.1	.45	40	.74
3	.22	.74	.22	.45	28	27	44	.33	17	.45	39	.74
4	.22	28	.22	.45	28	27	27	.22	22	.45	36	.74
5	.22	36	.22	.33	28	26	24	.12	30	.45	37	.59
6	.22	39	.22	.33	28	27	28	.12	32	.45	39	.59
7	.22	21	.22	.33	28	26	29	.12	35	.45	42	17
8	24	.59	.22	.22	27	26	29	.12	36	35	39	33
9	34	.45	.22	.22	12	27	28	.12	33	44	36	33
10	36	.45	.22	.22	.45	26	36	.12	33	23	36	34
11	21	.45	.22	.22	.45	28	31	.12	32	.45	33	32
12	.22	.45	.22	.12	.45	27	35	.12	35	.45	34	32
13	.22	.45	.22	.52	.45	26	32	.12	36	.45	42	31
14	.22	.33	.22	.12	.33	26	33	.12	37	.45	40	30
15	.22	.33	.22	.12	.33	28	39	.12	32	.45	34	37
16	.22	.45	.22	.12	15	36	35	.12	39	.45	36	31
17	23	.45	.22	.04	27	28	36	.12	34	.45	41	32
18	35	.33	.22	0	28	32	35	.04	32	.45	34	50
19	37	.33	.22	0	27	31	40	17	31	.45	33	44
20	37	.33	.22	0	26	28	31	22	44	25	31	39
21	48	.33	.22	0	26	28	21	22	50	39	31	.45
22	16	.33	.22	0	27	28	28	29	43	41	31	.33
23	.33	.33	.22	0	27	28	7.2	22	39	43	30	.33
24	23	.33	.22	0	27	27	26	20	46	44	34	.33
25	34	.33	.22	0	28	26	38	25	46	48	46	.33
26	26	.33	.22	0	30	27	18	31	43	17	52	.33
27	11	.33	.22	0	28	26	.12	16	44	19	16	.33
28	.12	.33	.22	0	27	26	.12	.45	43	39	32	22
29	.12	.33	.22	0	------	26	.22	.45	46	39	43	31
30	.22	.33	.22	0	------	27	.22	.45	13	46	51	30
31	.45	------	.22	0	------	28	------	.45	------	39	42	------
TOTAL	408.88	134.76	6.93	4.25	539.46	854	800.88	208.29	1,010.55	548.20	1,147	587.83
MEAN	13.2	4.49	.22	.14	19.3	27.5	26.7	6.72	33.7	17.7	37.0	19.6
MAX	48	39	.33	.52	30	36	44	31	50	48	52	50
MIN	.12	.33	.22	0	0	26	.12	.04	.45	.45	16	.33
AC-FT	811	267	14	8.4	1,070	1,690	1,590	413	2,000	1,090	2,280	1,170

CAL YR 1969 TOTAL 3,114.88 MEAN 8.53 MAX 57 MIN 0 AC-FT 6,180
WTR YR 1970 TOTAL 6,251.03 MEAN 17.1 MAX 52 MIN 0 AC-FT 12,400

16063000 North Fork Wailua River at altitude 650 ft, near Lihue

LOCATION.--Lat 22°04'02", long 159°26'21", Kauai, on right bank 0.5 mile downstream from intake of Stable storm ditch and 7.8 miles northwest of Lihue.

DRAINAGE AREA.--6.6 sq mi, approximately.

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.

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

AVERAGE DISCHARGE.--54 years (1915-18, 1919-70), 73.2 cfs (53,030 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,630 cfs Jan. 13 (gage height, 8.18 ft); minimum, 0.36 cfs Mar. 10-15, 25, 26, 28-30.
Period of record: Maximum discharge, 13,200 cfs Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 2,300 cfs on basis of slope-area measurement at gage height 10.65 ft; minimum, 0.23 cfs June 5, 1968.

REMARKS.--Records fair. 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 stas 16061000 and 16062000) divert water above station for power development and irrigation in vicinity of Lihue.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	48	74	270	48	.69	2.9	153	19	62	6.7	132
2	121	46	72	164	39	.69	10	160	12	48	10	56
3	88	45	68	381	13	.69	56	416	3.6	42	9.8	33
4	79	39	66	239	12	.69	4.6	126	4.0	42	7.0	32
5	74	11	62	148	12	.69	4.5	74	6.5	46	7.9	28
6	70	19	60	130	12	.69	.92	56	11	48	8.2	32
7	76	32	59	105	10	.66	.87	52	32	39	13	26
8	57	161	146	99	10	.66	.87	56	8.2	53	10	5.8
9	18	62	76	88	28	.53	.50	58	4.1	18	7.2	3.7
10	17	68	81	78	41	.39	8.3	102	4.0	74	7.2	3.3
11	220	53	67	316	39	.47	1.2	54	3.4	102	6.7	1.6
12	144	196	73	141	38	.47	3.5	46	6.3	100	7.0	1.3
13	81	144	60	577	42	.36	2.7	83	6.9	107	20	1.1
14	72	110	58	315	49	.36	3.4	38	10	79	15	1.0
15	75	109	53	130	39	.78	19	40	3.8	70	6.7	7.5
16	64	239	50	103	18	6.5	6.2	35	16	53	7.7	1.3
17	36	120	49	131	1.3	1.2	5.9	41	4.3	79	21	1.5
18	13	95	48	93	1.6	4.8	4.2	31	3.0	57	7.0	61
19	15	196	48	76	1.2	2.3	30	14	2.6	50	6.3	20
20	15	248	44	68	1.1	.50	227	4.8	27	24	5.6	106
21	60	197	44	67	1.1	.44	34	4.8	67	11	5.6	112
22	57	225	43	60	1.0	.47	66	7.8	21	12	5.4	48
23	59	220	43	58	.74	.44	80	4.6	8.7	15	4.8	35
24	32	181	185	60	.69	.39	41	4.6	31	22	7.7	28
25	11	134	82	74	.69	.39	21	9.9	49	30	36	24
26	15	112	168	57	.97	.39	88	49	20	169	110	23
27	38	101	277	65	.74	.39	246	20	27	44	150	23
28	53	92	201	106	.69	.36	120	22	22	14	47	11
29	51	84	136	104	------	.36	93	19	45	12	17	1.5
30	50	81	101	58	------	.39	63	18	86	19	49	1.3
31	48	------	126	51	------	.78	------	41	------	8.0	14	------
TOTAL	1,906	3,468	2,720	4,412	461.82	28.92	1,244.56	1,840.5	564.4	1,549.0	636.5	860.9
MEAN	61.5	116	87.7	142	16.5	.93	41.5	59.4	18.8	50.0	20.5	28.7
MAX	220	248	277	577	49	6.5	246	416	86	169	150	132
MIN	11	11	43	51	.69	.36	.50	4.6	2.6	8.0	4.8	1.0
AC-FT	3,780	6,880	5,400	8,750	916	57	2,470	3,650	1,120	3,070	1,260	1,710

CAL YR 1969 TOTAL 28,599.4 MEAN 78.4 MAX 1,180 MIN 2.0 AC-FT 56,730
WTR YR 1970 TOTAL 19,692.60 MEAN 54.0 MAX 577 MIN .36 AC-FT 39,060

PEAK DISCHARGE (BASE, 2,500 CFS).--Jan. 13 (2100) 3,630 cfs (8.18 ft).

16068000 East Branch of North Fork Wailua River near Lihue

LOCATION.--Lat 22°04'19", long 159°25'05", Kauai, on right bank 1,200 ft upstream from mouth and 7.5 miles northwest of Lihue.

DRAINAGE AREA.--6.2 sq mi, approximately.

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.

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

AVERAGE DISCHARGE.--55 years (1912-14, 1915-17, 1919-70), 48.4 cfs (35,070 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,580 cfs Nov. 16 (gage height, 6.38 ft); minimum, 7.6 cfs Aug. 23, 24.
Period of record: Maximum discharge, 18,400 cfs Nov. 12, 1955 (gage height, 14.7 ft, from floodmarks), from rating curve extended above 2,700 cfs; minimum, 6.8 cfs July 3, 13, 1926.

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

REVISIONS (FISCAL YEARS).--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	9.4	23	113	15	12	19	50	21	26	18	85
2	30	9.4	21	46	14	12	55	119	19	21	19	47
3	22	9.0	20	398	13	12	97	330	17	18	18	28
4	20	12	17	136	13	12	24	112	17	17	17	23
5	18	10	17	73	12	11	16	76	16	18	17	20
6	17	15	16	60	12	11	14	60	15	21	18	21
7	18	14	16	46	11	10	14	54	20	17	22	24
8	25	25	42	41	10	9.9	13	52	21	39	21	27
9	17	14	21	36	15	9.9	12	53	16	38	18	19
10	17	25	25	31	16	10	23	71	15	32	17	17
11	123	14	20	71	9.9	12	17	57	15	40	17	15
12	56	141	21	38	9.4	12	33	45	15	36	17	14
13	23	61	16	232	9.4	9.9	29	47	17	65	30	14
14	18	32	14	186	9.4	9.4	33	40	17	35	28	12
15	18	25	13	56	9.0	9.9	29	40	15	31	20	17
16	16	272	12	46	8.5	16	23	36	20	24	20	13
17	14	38	11	40	8.5	12	24	37	16	36	30	13
18	13	28	11	35	9.0	15	23	32	14	26	12	45
19	15	93	10	31	8.5	15	89	30	14	23	9.4	36
20	15	135	9.9	27	11	11	141	28	26	20	8.5	44
21	44	71	9.9	26	17	9.9	36	28	41	18	8.1	45
22	34	85	9.4	23	15	10	57	33	30	17	8.1	28
23	17	115	9.4	22	14	10	81	27	20	20	7.6	25
24	15	71	112	20	14	9.9	62	26	20	24	9.4	20
25	13	50	52	21	14	9.0	56	26	36	24	32	19
26	12	40	34	19	14	9.9	64	51	23	46	51	17
27	13	35	300	17	14	9.4	166	34	26	24	76	17
28	13	30	111	22	13	9.4	69	24	20	22	26	15
29	11	27	56	29	------	9.0	75	21	28	20	22	15
30	11	25	38	17	------	9.4	48	20	34	27	30	14
31	9.9	------	42	15	------	14	------	36	------	20	22	------
TOTAL	720.9	1,530.8	1,129.6	1,973	338.6	341.9	1,442	1,695	624	845	669.1	749
MEAN	23.3	51.0	36.4	63.6	12.1	11.0	48.1	54.7	20.8	27.3	21.6	25.0
MAX	123	272	300	398	17	16	166	330	41	65	76	85
MIN	9.9	9.0	9.4	15	8.5	9.0	12	20	14	17	7.6	12
AC-FT	1,430	3,040	2,240	3,910	672	678	2,860	3,360	1,240	1,680	1,330	1,490

CAL YR 1969 TOTAL 14,135.3 MEAN 38.7 MAX 445 MIN 9.0 AC-FT 28,040
WTR YR 1970 TOTAL 12,058.9 MEAN 33.0 MAX 398 MIN 7.6 AC-FT 23,920

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-16	0200	6.38	2,580	4-19	2330	5.52	1,770
1-13	2200	5.62	1,850				

HAWAII, ISLAND OF KAUAI

16069000 Wailua ditch near Kapaa

LOCATION.--Lat 22°04'34", long 159°24'04", Kauai, on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 miles west of Kapaa, and 7 miles north of Lihue.

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

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

AVERAGE DISCHARGE.--33 years (1937-70), 14.7 cfs (10,650 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 63 cfs June 4, 1937; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	7.1	0	2.4	.50	0	25	5.5	14	22	34	24
2	37	7.3	0	2.2	.50	6.4	25	4.3	17	13	33	25
3	27	18	0	2.4	.70	16	18	2.8	15	.09	32	24
4	8.2	25	0	2.4	.70	20	14	1.6	26	.04	32	24
5	8.3	25	0	2.5	.80	23	15	1.6	26	.03	30	23
6	25	24	0	2.4	.80	24	15	1.6	26	14	30	23
7	40	23	0	2.4	.80	23	15	.80	26	22	30	23
8	40	23	2.6	2.4	.80	22	15	1.3	26	23	30	25
9	39	22	3.0	2.2	3.4	23	15	3.2	26	23	30	28
10	21	22	0	2.4	8.3	23	15	3.1	26	23	29	28
11	9.4	23	0	2.1	8.5	21	15	12	26	23	28	28
12	9.2	9.7	0	1.9	8.5	20	16	19	25	23	27	28
13	17	0	0	1.8	8.5	19	15	19	25	22	28	28
14	24	0	0	1.3	8.5	17	16	19	25	22	29	27
15	22	0	1.5	1.3	8.5	15	15	19	26	23	29	27
16	22	0	2.1	1.3	10	17	15	19	29	24	29	31
17	21	1.7	2.4	1.3	13	19	15	19	29	27	30	32
18	21	2.2	2.6	1.3	13	19	16	19	29	27	31	30
19	20	1.9	2.4	1.1	13	19	16	19	28	27	30	30
20	20	1.9	2.2	1.1	13	19	16	19	28	27	29	31
21	21	5.8	2.1	.80	13	19	15	18	30	31	28	32
22	22	8.3	2.2	.70	13	18	15	18	32	33	28	31
23	24	0	2.4	.70	13	14	15	18	32	33	26	31
24	15	0	2.1	.70	13	11	16	18	31	33	25	30
25	6.9	0	2.4	.70	14	11	16	18	31	34	23	30
26	6.7	0	2.4	.70	9.1	11	16	18	30	35	21	29
27	18	0	2.6	.60	.20	12	13	18	30	36	23	29
28	24	0	2.4	.50	.06	12	7.3	17	29	36	24	28
29	24	0	2.1	.50	------	12	6.6	14	26	35	24	28
30	24	0	2.1	.60	------	12	6.0	14	22	35	24	27
31	13	------	2.4	.50	------	18	------	14	------	35	24	------
TOTAL	666.7	250.9	44.0	45.20	197.16	515.4	452.9	393.80	791	761.16	870	834
MEAN	21.5	8.36	1.42	1.46	7.04	16.6	15.1	12.7	26.4	24.6	28.1	27.8
MAX	40	25	3.0	2.5	14	24	25	19	32	36	34	32
MIN	6.7	0	0	.50	.06	0	6.0	.80	14	.03	21	23
AC-FT	1,320	498	87	90	391	1,020	898	781	1,570	1,510	1,730	1,650

CAL YR 1969 TOTAL 6,115.18 MEAN 16.8 MAX 54 MIN 0 AC-FT 12,130
WTR YR 1970 TOTAL 5,822.22 MEAN 16.0 MAX 40 MIN 0 AC-FT 11,550

HAWAII, ISLAND OF KAUAI

16070000 Aahoaka ditch near Kapaa

LOCATION.--Lat 22°03'30", long 159°23'49", Kauai, on left bank 10 ft upstream from tunnel entrance on canyon rim above Kaholalele Falls, 0.7 mile downstream from intake, 5.0 miles west of Kapaa, and 5.7 miles north of Lihue.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 400 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 5.4 cfs Sept. 18, 1969; no flow many days each year.

REMARKS.--Records fair. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in Aahoaka area between North and South Forks.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	1.7	0	.04				0				
2	4.5	1.7	0	.35				.09				
3	4.4	1.6	0	.20				.17				
4	4.2	1.5	0	.30				.06				
5	4.2	1.8	0	.16				0				
6	4.2	1.8	0	.06				0				
7	4.1	1.9	0	0				0				
8	4.0	1.4	0	0				0				
9	2.5	2.1	0	0				0				
10	1.9	2.1	0	0				0				
11	3.0	2.1	0	0				0				
12	3.3	1.2	0	0				0				
13	3.2	0	0	0				0				
14	3.1	0	0	.70				0				
15	3.1	.02	0	.10				0				
16	3.0	0	0	0				0				
17	2.4	0	0	0				0				
18	1.7	0	0	0				0				
19	1.7	0	0	0				0				
20	2.0	0	0	0				0				
21	2.4	0	0	0				0				
22	2.4	0	0	0				0				
23	2.4	.19	0	0				0				
24	2.0	0	0	0				0				
25	1.9	0	0	0				0				
26	1.4	0	0	0				0				
27	1.8	0	.72	0				0				
28	1.9	0	0	0				0				
29	1.8	0	0	0	------			0				
30	1.8	0	0	0	------			0				
31	1.7	------	0	0	------		------	0	------			------
TOTAL	86.6	21.11	.72	1.91	0	0	0	.32	0	0	0	0
MEAN	2.79	.70	.023	.062	0	0	0	.010	0	0	0	0
MAX	4.6	2.1	.72	.70	0	0	0	.17	0	0	0	0
MIN	1.4	0	0	0	0	0	0	0	0	0	0	0
AC-FT	172	42	1.4	3.8	0	0	0	.6	0	0	0	0

CAL YR 1969 TOTAL 399.65 MEAN 1.09 MAX 5.4 MIN 0 AC-FT 793
WTR YR 1970 TOTAL 110.66 MEAN .30 MAX 4.6 MIN 0 AC-FT 219

16071000 North Fork Wailua River near Kapaa

LOCATION.--Lat 22°03'08", long 159°22'22", Kauai, on right bank 1.1 miles upstream from confluence with South Fork, 3.5 miles southwest of Kapaa, and 5.0 miles north of Lihue.

DRAINAGE AREA.--18.7 sq mi.

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

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

AVERAGE DISCHARGE.--18 years, 131 cfs (94,910 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,720 cfs Jan. 13 (gage height, 7.48 ft); minimum, 5.1 cfs Sept. 12.
Period of record: Maximum discharge, 53,200 cfs Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks), from rating curve extended above 3,700 cfs on basis of slope-area measurement of peak flow; minimum, 2.12 cfs Oct. 28, 1953.

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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	46	87	500	74	30	11	191	37	68	9.2	185
2	96	46	84	200	58	26	16	181	12	73	9.2	134
3	67	43	80	700	17	13	121	872	11	70	8.2	75
4	58	41	75	400	18	12	20	330	9.2	70	6.9	63
5	56	24	74	245	19	12	11	178	9.2	77	6.9	54
6	52	22	72	225	25	13	10	107	9.2	61	6.9	54
7	48	27	70	161	45	12	10	92	30	36	8.2	62
8	52	170	183	146	45	13	10	87	11	48	9.6	20
9	16	66	92	136	49	14	9.6	98	9.2	45	8.2	15
10	11	67	105	114	67	19	9.6	157	9.2	97	8.2	5.6
11	229	57	87	150	56	17	11	110	8.7	89	7.8	5.6
12	204	369	94	193	66	17	9.2	80	8.7	156	7.8	5.6
13	72	240	75	500	64	17	9.6	117	8.7	167	10	6.0
14	56	150	72	950	79	13	38	70	9.2	106	9.2	5.6
15	58	146	66	197	61	12	66	70	8.7	89	7.8	7.8
16	53	582	64	166	52	18	19	61	12	64	7.8	6.9
17	42	146	63	154	23	22	27	67	11	95	12	6.4
18	22	105	62	142	21	18	24	55	8.7	70	6.9	77
19	20	248	62	118	20	17	41	42	8.2	58	6.4	29
20	20	376	59	116	18	12	416	26	16	40	6.4	139
21	71	212	58	112	22	12	95	24	62	12	6.0	188
22	63	298	57	94	19	12	129	33	22	12	6.0	91
23	53	336	57	100	17	12	194	32	17	13	5.6	71
24	41	259	310	110	17	11	103	30	39	22	5.6	55
25	30	170	201	129	18	11	96	30	87	26	16	45
26	28	139	181	111	18	12	128	85	34	162	45	41
27	33	118	747	83	29	12	396	48	49	44	215	37
28	48	107	350	72	29	11	206	48	34	9.6	71	26
29	41	98	229	297	------	11	178	46	62	7.8	35	7.8
30	39	92	148	87	------	14	114	43	102	12	59	7.4
31	42	------	157	78	------	12	------	86	------	11	27	------
TOTAL	1,793	4,800	4,121	6,786	1,046	457	2,528.0	3,496	754.9	1,910.4	654.8	1,525.7
MEAN	57.8	160	133	219	37.4	14.7	84.3	113	25.2	61.6	21.1	50.9
MAX	229	582	747	950	79	30	416	872	102	167	215	188
MIN	11	22	57	72	17	11	9.2	24	8.2	7.8	5.6	5.6
AC-FT	3,560	9,520	8,170	13,460	2,070	906	5,010	6,930	1,500	3,790	1,300	3,030

CAL YR 1969 TOTAL 44,906.5 MEAN 123 MAX 1,790 MIN 6.9 AC-FT 89,070
WTR YR 1970 TOTAL 29,872.8 MEAN 81.8 MAX 950 MIN 5.6 AC-FT 59,250

PEAK DISCHARGE (BASE, 4,100 CFS).--Jan. 13 (2300) 4,720 cfs (7.48 ft).

16071500 Left Branch Opaekaa Stream near Kapaa

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

DRAINAGE AREA.--0.7 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--10 years, 3.05 cfs (2,210 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 72 cfs Nov. 16 (gage height, 4.45 ft); minimum, 0.61 cfs Mar. 31, Apr. 1, 8, 9.
Period of record: Maximum discharge, 365 cfs Apr. 15, 1963 (gage height, 5.21 ft), from rating curve extended above 13 cfs; minimum, 0.09 cfs Sept. 27-30, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.1	3.8	9.5	4.0	1.8	.61	1.7	2.4	1.5	.94	2.4
2	2.4	2.2	3.5	5.8	3.9	1.7	.74	2.0	2.2	1.4	1.0	2.5
3	2.2	2.2	3.4	18	3.8	1.6	1.3	14	2.1	1.4	1.0	1.7
4	2.2	2.5	3.2	13	3.7	1.6	.78	8.3	2.1	1.3	.94	1.6
5	2.1	2.4	3.1	9.9	3.5	1.6	.70	5.9	2.1	1.2	.94	1.6
6	2.1	2.4	3.0	8.8	3.4	1.6	.66	4.9	2.0	1.3	1.0	1.7
7	2.2	2.4	2.9	7.6	3.3	1.6	.66	4.3	2.0	1.1	1.1	1.7
8	2.3	2.4	3.4	7.0	3.2	1.6	.61	4.1	2.0	1.4	1.1	1.6
9	2.2	2.5	2.8	6.6	3.2	1.5	.61	4.0	1.9	1.4	1.1	1.6
10	2.3	2.8	2.9	6.2	3.1	1.6	.83	4.2	1.9	1.3	1.1	1.6
11	3.0	2.5	2.7	7.8	2.9	1.3	.70	3.7	1.8	1.5	1.1	1.6
12	2.9	12	2.6	6.5	2.9	.87	.83	3.7	1.7	1.6	1.1	1.6
13	2.5	4.0	2.5	10	3.0	.78	.78	3.6	1.7	1.7	1.2	1.6
14	2.4	3.1	2.4	13	2.9	.78	.74	3.4	1.6	1.5	1.3	1.6
15	2.4	3.2	2.3	8.9	2.7	.78	.78	3.2	1.5	1.4	1.2	1.9
16	2.4	17	2.2	8.4	2.5	.83	.78	3.0	1.6	1.2	1.2	1.7
17	2.3	4.8	2.2	8.0	2.5	.78	.87	3.0	1.6	1.3	1.5	1.7
18	2.2	3.8	2.2	7.8	2.6	.78	.78	2.8	1.6	1.1	1.4	2.0
19	2.3	4.6	2.1	7.4	2.4	.78	1.1	2.7	1.5	1.1	1.4	1.9
20	2.3	8.3	2.0	7.0	2.5	.74	2.2	2.6	1.6	1.1	1.3	2.0
21	3.8	5.6	2.0	6.8	2.4	.74	1.1	2.6	1.7	1.0	1.4	2.0
22	3.3	6.2	2.0	6.5	2.2	.70	1.1	2.7	1.6	1.0	1.4	2.0
23	2.6	8.8	1.9	6.3	2.1	.70	1.6	2.6	1.6	1.0	1.3	2.0
24	2.3	8.3	3.0	6.2	2.0	.70	1.3	2.6	1.5	1.1	1.2	1.7
25	2.3	6.4	2.6	6.0	2.0	.66	1.1	2.5	1.5	1.0	1.6	1.7
26	2.3	5.6	2.2	5.6	2.0	.70	1.1	2.4	1.5	1.1	2.4	1.7
27	2.4	5.1	20	5.3	1.8	.66	4.0	2.3	1.5	.94	2.6	1.6
28	2.3	4.6	8.2	5.3	1.8	.66	2.3	2.3	1.4	.87	1.7	1.6
29	2.2	4.2	5.4	5.3	------	.66	2.0	2.2	1.6	.87	1.6	1.5
30	2.2	4.0	4.4	4.7	------	.66	1.7	2.2	1.8	.94	1.6	1.5
31	2.1	------	4.9	4.4	------	.66	------	2.9	------	.94	1.6	------
TOTAL	74.8	146.0	111.8	239.6	78.3	32.12	34.36	112.4	52.6	37.56	41.32	52.9
MEAN	2.41	4.87	3.61	7.73	2.80	1.04	1.15	3.63	1.75	1.21	1.33	1.76
MAX	3.8	17	20	18	4.0	1.8	4.0	14	2.4	1.7	2.6	2.5
MIN	2.1	2.1	1.9	4.4	1.8	.66	.61	1.7	1.4	.87	.94	1.5
AC-FT	148	290	222	475	155	64	68	223	104	75	82	105

CAL YR 1969 TOTAL 891.09 MEAN 2.44 MAX 20 MIN .83 AC-FT 1,770
WTR YR 1970 TOTAL 1,013.76 MEAN 2.78 MAX 20 MIN .61 AC-FT 2,010

PEAK DISCHARGE (BASE, 140 CFS).--No peak above base.

16077000 Makaleha ditch near Kealia

LOCATION.--Lat 22°07'00", long 159°22'04", Kauai, on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 miles northwest of Kealia, and 4.1 miles northwest of Kapaa.

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

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

AVERAGE DISCHARGE.--33 years (1937-70), 6.78 cfs (4,910 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 31 cfs Aug. 1, 1961; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	7.8	.14	.69	.04	7.9	13	17	8.7	11	7.0	23
2	15	7.4	.11	.52	.04	7.8	23	18	8.3	10	7.3	15
3	12	7.4	1.9	6.4	.02	7.8	23	18	7.9	7.4	6.8	9.0
4	11	9.1	8.6	4.6	.02	7.6	12	2.2	7.6	6.6	6.4	7.4
5	9.8	9.8	7.9	2.0	.04	7.5	11	1.5	7.5	8.3	6.6	6.9
6	9.8	11	7.6	1.2	.04	7.9	10	.87	7.3	9.3	7.7	8.5
7	13	10	7.6	.63	.04	7.8	11	.69	10	7.1	11	13
8	15	11	4.1	.47	.02	7.8	11	10	11	15	8.7	11
9	11	11	.04	.38	7.8	7.6	9.0	15	8.3	15	7.4	9.0
10	11	7.5	.04	.21	10	8.0	19	13	8.3	13	7.6	7.6
11	25	9.1	.04	.42	8.0	12	13	.33	7.9	13	6.8	6.9
12	13	6.0	.04	.28	7.9	10	20	4.6	8.9	15	7.9	6.2
13	.81	.93	.02	1.4	7.8	8.2	15	12	11	20	14	6.9
14	3.7	.81	.02	2.9	9.7	7.9	17	9.6	13	12	15	6.1
15	11	1.4	.02	.99	8.9	8.4	17	11	8.3	11	9.3	9.7
16	10	1.6	0	.58	8.0	15	13	9.3	13	9.0	11	7.1
17	9.4	.63	0	.38	8.0	9.7	12	10	10	11	16	6.5
18	9.1	.38	.04	.24	8.4	13	13	8.6	9.3	9.7	12	14
19	10	.63	.21	.17	8.2	12	18	8.3	9.9	8.2	8.7	12
20	10	1.8	0	.14	14	7.6	18	7.9	17	7.1	8.0	15
21	14	1.4	0	.11	10	7.6	12	8.2	20	6.4	7.3	17
22	14	.93	0	.09	8.7	8.4	14	11	17	6.2	7.4	9.3
23	10	1.6	0	.09	8.4	7.8	15	8.9	12	7.4	7.3	11
24	9.6	2.0	.15	.09	8.0	6.8	13	12	13	9.4	7.3	8.2
25	9.0	1.1	.09	.09	8.0	6.6	13	10	18	9.4	15	6.9
26	9.0	.69	.04	.09	8.4	6.5	13	16	12	14	15	6.6
27	6.7	.47	8.1	.09	8.0	6.4	11	12	13	8.4	22	7.0
28	3.5	.33	3.3	.09	7.9	6.8	7.0	9.6	8.9	7.9	12	6.5
29	8.0	.28	1.2	.06	------	6.8	21	8.9	12	6.9	12	5.9
30	8.0	.21	.69	.06	------	6.8	16	8.4	15	13	13	5.8
31	8.0	------	.47	.04	------	14	------	10	------	7.8	11	------
TOTAL	325.41	124.29	52.46	25.50	174.36	266.0	433.0	292.89	334.1	315.5	314.5	285.0
MEAN	10.5	4.14	1.69	.82	6.23	8.58	14.4	9.45	11.1	10.2	10.1	9.50
MAX	25	11	8.6	6.4	14	15	23	18	20	20	22	23
MIN	.81	.21	0	.04	.02	6.4	7.0	.33	7.3	6.2	6.4	5.8
AC-FT	645	247	104	51	346	528	859	581	663	626	624	565

CAL YR 1969 TOTAL 2,529.88 MEAN 6.93 MAX 25 MIN 0 AC-FT 5,020
WTR YR 1970 TOTAL 2,943.01 MEAN 8.06 MAX 25 MIN 0 AC-FT 5,840

16079000 Kapahi ditch near Kealia

LOCATION.--Lat 22°06'09", long 159°22'28", Kauai, on right bank 500 ft downstream from intake and 4.0 miles 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 1913 and as "at Kapahi, near Kealia" January to December 1913.

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

AVERAGE DISCHARGE.--52 years (1917-20, 1921-70), 6.58 cfs (4,770 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 138 cfs Feb. 6, 1913; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	3.9	4.5	.14	.06	3.9	6.9	.74	.51	2.9	3.9	9.6
2	6.6	3.9	13	.14	.10	3.9	31	1.0	2.6	.99	4.1	9.0
3	3.8	3.9	11	.82	.10	3.8	35	.93	3.6	.90	3.9	8.6
4	1.2	6.0	5.7	.31	.10	3.8	6.8	.19	3.5	.90	4.1	6.6
5	.90	5.9	5.6	.14	.10	3.6	4.6	.19	3.2	.74	4.2	6.1
6	2.7	6.8	5.4	.14	.10	3.8	3.9	.19	3.0	4.7	4.4	6.2
7	5.2	6.6	5.4	.10	.10	3.6	4.1	.14	7.0	6.4	5.9	8.3
8	8.4	12	10	.10	.10	3.6	3.8	.10	7.1	19	4.4	8.4
9	5.2	9.6	11	.14	5.0	3.6	3.5	.14	4.1	18	4.2	7.0
10	3.2	11	12	.10	6.4	3.9	8.5	.19	3.6	12	4.1	5.7
11	1.4	3.6	12	.14	4.4	8.3	5.9	.19	3.6	7.8	4.1	5.7
12	.74	1.1	7.1	.14	4.4	3.6	16	.66	3.6	9.6	4.1	5.0
13	.58	.57	.31	.40	4.4	2.9	10	.66	3.9	10	9.9	5.6
14	.45	.31	.19	.38	4.4	2.8	12	.74	4.6	9.8	9.2	4.7
15	.45	.42	.14	.25	4.2	2.9	13	.66	3.9	9.8	5.2	6.2
16	.45	.51	.14	.19	4.1	6.4	6.5	.51	6.0	6.8	6.1	5.2
17	1.7	.14	4.3	.14	4.2	3.5	6.1	.51	4.1	15	18	4.9
18	3.2	.14	12	.14	4.6	4.1	5.6	.38	3.8	8.2	6.6	11
19	.31	.31	6.7	.14	4.2	3.9	8.0	2.9	3.6	5.9	5.6	6.8
20	.25	.45	.31	.14	8.9	3.0	13	5.6	9.4	5.6	4.9	12
21	8.1	.19	.19	.10	6.4	2.8	.31	5.6	18	5.0	4.6	11
22	10	.14	7.8	.10	4.4	2.8	.14	2.4	12	4.6	4.6	4.2
23	6.4	.52	11	.10	4.1	2.8	.25	.45	4.9	4.9	4.4	6.6
24	4.9	.10	7.4	.10	4.1	2.6	.51	.38	4.9	7.2	5.2	4.9
25	4.6	.10	.14	.10	4.1	2.6	.31	.38	19	5.9	17	3.9
26	4.4	.10	.14	.10	4.2	2.6	.25	.38	5.6	16	14	3.8
27	3.1	.14	1.0	.10	4.1	2.6	.42	.51	1.2	4.9	15	3.9
28	1.6	.10	.25	.10	3.9	2.8	.38	.58	1.1	4.9	8.6	3.6
29	4.2	1.8	.19	.10	------	2.6	.66	.45	.99	4.1	8.0	3.6
30	4.1	.45	.14	.10	------	2.8	.66	.38	.99	6.9	12	3.3
31	3.9	------	.14	.10	------	6.1	------	.51	------	4.4	7.5	------
TOTAL	109.23	80.79	155.18	5.29	95.26	112.0	208.09	28.64	153.39	223.83	217.8	191.4
MEAN	3.52	2.69	5.01	.17	3.40	3.61	6.94	.92	5.11	7.22	7.03	6.38
MAX	10	12	13	.82	8.9	8.3	35	5.6	19	19	18	12
MIN	.25	.10	.14	.10	.06	2.6	.14	.10	.51	.74	3.9	3.3
AC-FT	217	160	308	10	189	222	413	57	304	444	432	380

CAL YR 1969 TOTAL 1,952.63 MEAN 5.35 MAX 37 MIN 0 AC-FT 3,870
WTR YR 1970 TOTAL 1,580.90 MEAN 4.33 MAX 35 MIN .06 AC-FT 3,140

16080000 Kapaa Stream at Kapahi ditch intake, near Kapaa

LOCATION.--Lat 22°06'15", long 159°22'29", Kauai, on right bank at Kapahi ditch intake, 4 miles northwest of Kapaa, and 4.5 miles northwest of Wailua.

DRAINAGE AREA.--3.3 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--34 years, 21.6 cfs (15,650 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,280 cfs Nov. 16 (gage height, 3.74 ft); no flow for many days. Period of record: Maximum discharge, 7,670 cfs Jan. 25, 1956 (gage height, 5.41 ft, present datum), from rating curve extended above 2,800 cfs; no flow at times.

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).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	0	8.4	60	13		0	10	5.1	8.1	0	28
2	.90	0	.52	46	13		.19	7.6	1.5	7.6	0	6.9
3	1.5	0	.15	413	12		24	253	0	5.6	0	0
4	3.5	0	0	104	13		.39	52	0	5.1	0	0
5	3.5	0	0	37	13		0	32	0	5.1	0	0
6	2.0	0	0	34	13		0	23	0	1.6	0	0
7	0	0	0	24	12		0	18	.05	0	0	.03
8	.40	2.2	16	30	12		0	13	1.4	.15	0	0
9	0	0	6.2	21	7.0		0	13	0	.07	0	0
10	1.5	1.3	8.3	18	0		0	30	0	0	0	0
11	125	4.3	7.6	31	0		0	28	0	11	0	0
12	57	106	18	20	0		.10	16	0	5.0	0	0
13	21	61	14	185	0		0	9.9	0	30	0	0
14	13	27	13	67	0		.06	7.6	0	2.6	0	0
15	6.2	62	11	24	0		1.6	9.1	0	.65	0	0
16	5.6	254	9.9	20	0		0	6.9	0	0	0	0
17	3.0	25	6.2	18	0		0	7.6	0	.13	.04	0
18	1.5	19	0	17	0		0	5.6	0	0	0	0
19	5.6	101	4.8	16	0		.33	3.6	0	0	0	0
20	5.6	103	11	14	2.7		85	0	0	0	0	0
21	1.0	39	9.9	13	0		11	0	.01	0	0	1.6
22	0	44	2.5	13	0		17	5.8	.04	0	0	1.0
23	0	110	0	13	0		32	5.6	0	0	0	0
24	0	52	93	13	0		16	12	0	0	0	0
25	0	28	24	16	0		25	7.6	.06	0	.09	0
26	0	21	23	13	0		25	17	4.1	2.0	18	0
27	1.3	18	424	13	0		125	12	12	0	18	0
28	7.5	16	61	19	0		30	5.6	6.9	0	.58	0
29	0	12	32	20	------		17	4.5	12	0	0	0
30	0	13	25	14	------		8.3	3.5	17	0	.05	0
31	0	------	40	13	------		------	12	------	0	0	------
TOTAL	269.20	1,118.8	869.47	1,359	110.7	0	417.97	631.5	60.16	84.70	36.76	37.53
MEAN	8.68	37.3	28.0	43.8	3.95	0	13.9	20.4	2.01	2.73	1.19	1.25
MAX	125	254	424	413	13	0	125	253	17	30	18	28
MIN	0	0	0	13	0	0	0	0	0	0	0	0
AC-FT	534	2,220	1,720	2,700	220	0	829	1,250	119	168	73	74

CAL YR 1969 TOTAL 7,543.39 MEAN 20.7 MAX 424 MIN 0 AC-FT 14,960
WTR YR 1970 TOTAL 4,995.79 MEAN 13.7 MAX 424 MIN 0 AC-FT 9,910

PEAK DISCHARGE (BASE, 1,900 CFS).--Nov. 16 (0030) 3,280 cfs (3.74 ft); Dec. 27 (1230) 2,020 cfs (3.05 ft).

16087000 Anahola ditch wasteway near Kealia

LOCATION.--Lat 22°08'16", long 159°22'28", Kauai, on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft north of Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles 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 above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--34 years, 5.06 cfs (3,670 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 84 cfs Nov. 12, 1955; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 miles below gaging station 16089000 on Anahola Stream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.37	.02	5.0	6.0	3.6	.12	.18	.84	.07	.02	.07	1.4
2	.56	.02	5.0	5.4	3.6	.11	.84	3.9	.07	.02	.37	.84
3	.07	.02	4.5	20	3.6	.10	.70	22	.07	.02	.07	.18
4	.07	.07	4.5	9.0	3.6	.10	.02	15	.07	.07	.37	.18
5	.07	.18	4.5	5.6	3.3	.09	0	11	.18	.07	.37	.37
6	.07	.07	4.3	5.4	3.6	.09	0	8.9	.18	.07	.37	.37
7	.07	.18	4.3	5.8	3.3	.08	0	7.6	.37	.02	.56	.37
8	.37	.72	12	8.0	3.3	.08	.02	7.3	.18	.56	.56	.84
9	.02	.37	6.3	5.4	8.6	.07	.02	8.9	.07	.56	.56	.18
10	.18	.37	9.2	5.2	7.0	.20	.18	17	.07	.37	.56	.56
11	1.2	.18	12	5.0	3.8	.40	.37	9.8	.07	.37	.37	.18
12	.99	8.2	14	5.8	3.3	.35	.56	7.6	.18	.37	.56	.18
13	.18	7.0	6.4	15	2.1	.10	.18	15	.37	.56	.84	.18
14	.02	5.0	5.0	5.2	.70	.08	.37	3.9	.37	.18	.84	.37
15	.02	4.3	3.8	5.0	.56	.07	.18	1.2	.07	.07	.07	.84
16	.02	15	3.6	4.9	.56	.37	.02	.84	.18	.02	.37	.18
17	.02	5.2	3.3	4.8	.56	.25	.37	.70	.02	.37	.84	.56
18	.02	4.3	3.1	4.8	.56	.31	.37	.56	.07	.02	.18	1.2
19	.18	20	4.9	4.7	.37	.31	.84	.56	.02	.02	.37	.56
20	.18	22	3.6	4.6	.84	.20	.70	.56	.18	.02	.37	1.2
21	.84	13	2.7	4.6	.45	.14	.70	.56	.18	.07	.37	1.2
22	.99	17	2.5	4.5	.23	.16	.84	.70	.07	.07	.56	.18
23	.02	23	2.5	4.3	.20	.12	.84	.37	0	.18	.56	.37
24	.02	18	22	4.3	.18	.08	.70	.37	0	.37	.70	.18
25	.07	12	12	6.2	.16	.07	.18	.37	.37	.18	1.6	.18
26	.07	8.9	13	4.3	.14	.07	.56	.99	.18	.37	.84	.37
27	.07	7.3	40	4.0	.13	.07	6.0	.70	.37	.07	1.2	.84
28	.07	6.4	21	11	.12	.07	14	.18	.02	.18	.18	.84
29	.07	5.8	15	9.8	------	.07	16	.18	.07	.18	.56	.99
30	.07	5.5	6.0	4.5	------	.18	6.4	.18	.18	.84	.99	.99
31	.07	------	5.4	3.8	------	.18	------	.56	------	.07	.18	------
TOTAL	7.04	210.10	261.4	196.9	58.46	4.69	52.14	148.32	4.30	6.36	16.41	16.88
MEAN	.23	7.00	8.43	6.35	2.09	.15	1.74	4.78	.14	.21	.53	.56
MAX	1.2	23	40	20	8.6	.40	16	22	.37	.84	1.6	1.4
MIN	.02	.02	2.5	3.8	.12	.07	0	.18	0	.02	.07	.18
AC-FT	14	417	518	391	116	9.3	103	294	8.5	13	33	33

CAL YR 1969 TOTAL 1,347.01 MEAN 3.69 MAX 40 MIN .02 AC-FT 2,670
WTR YR 1970 TOTAL 983.00 MEAN 2.69 MAX 40 MIN 0 AC-FT 1,950

NOTE.--No gage-height record Feb. 21 to Mar. 27.

16088000 Anahola ditch above Kaneha Reservoir, near Kealia

LOCATION.--Lat 22°08'10", long 159°22'28", Kauai, on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 5 miles northwest of Kealia.

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

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

AVERAGE DISCHARGE.--46 years (1922-25, 1927-70), 4.19 cfs (3,040 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 62 cfs Nov. 12, 1947; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	2.2	.02	.09	0	1.9	6.1	11	3.7	5.9	3.1	15
2	9.3	2.1	.02	.06	0	1.8	18	12	3.1	4.5	4.7	6.4
3	4.8	2.1	.02	1.3	0	1.8	18	.36	2.9	4.2	3.4	4.5
4	4.4	2.6	.01	.23	0	1.7	7.3	.06	2.8	3.3	2.9	3.9
5	3.9	2.5	0	.09	0	1.7	4.5	.04	2.6	3.6	2.8	3.6
6	3.6	2.5	0	.06	0	1.7	3.7	.04	2.6	5.2	3.4	3.7
7	4.7	3.1	0	.06	0	1.7	3.3	.04	7.5	3.9	4.0	4.8
8	7.4	6.9	.03	.17	0	1.5	3.9	.04	5.1	13	4.7	6.1
9	3.9	3.7	0	.06	.02	1.4	3.0	.04	3.0	15	3.0	3.7
10	5.9	3.4	0	.06	.01	1.8	8.5	.09	2.8	12	2.8	5.7
11	23	2.6	.01	.06	0	4.6	12	.04	2.6	11	2.5	3.3
12	15	1.4	.05	.04	0	4.1	16	.04	3.1	13	3.4	2.9
13	8.1	.01	0	.43	1.0	1.7	9.3	.06	5.2	18	7.9	2.6
14	6.4	0	0	.09	4.8	1.5	14	3.8	7.9	13	8.8	2.5
15	5.3	.06	0	.06	3.4	1.5	11	5.4	3.1	9.9	3.4	6.2
16	4.5	.08	0	.06	2.1	5.0	6.8	5.3	6.2	6.4	4.7	3.4
17	4.0	0	0	.04	2.0	2.8	8.2	4.8	3.6	11	8.5	3.7
18	3.7	0	0	.04	2.1	3.9	9.4	4.2	2.9	7.1	3.3	9.4
19	4.5	.13	0	.04	1.8	3.9	17	3.9	3.3	5.3	3.1	6.7
20	4.4	.23	0	.04	12	2.1	14	3.6	9.2	4.5	2.8	8.9
21	9.6	.04	0	.04	6.9	1.8	10	3.7	13	3.9	3.0	9.2
22	11	.06	0	.04	3.4	1.9	14	8.4	8.7	3.7	4.0	4.5
23	4.0	.17	0	0	2.8	1.7	16	5.4	4.7	3.9	3.9	5.5
24	3.3	.06	.22	0	2.4	1.4	11	5.9	4.2	7.2	4.3	4.0
25	3.1	.04	.02	0	2.2	1.3	15	5.3	11	7.2	13	3.1
26	2.9	.04	.01	0	2.2	1.3	16	12	6.9	10	11	3.1
27	3.0	.04	2.5	0	2.1	1.3	14	9.9	9.2	4.2	11	2.6
28	3.0	.02	.09	.01	2.0	1.4	.17	4.7	4.7	3.6	5.2	2.4
29	2.6	.02	.06	.01	------	1.3	.13	3.7	7.3	3.1	5.5	2.5
30	2.5	.02	.04	0	------	1.5	4.0	3.4	8.4	10	10	2.4
31	2.4	------	.06	0	------	8.1	------	7.4	------	4.0	5.3	------
TOTAL	182.9	36.12	3.16	3.18	53.23	71.1	294.30	124.65	161.3	230.6	159.4	146.3
MEAN	5.90	1.20	.10	.10	1.90	2.29	9.81	4.02	5.38	7.44	5.14	4.88
MAX	23	6.9	2.5	1.3	12	8.1	18	12	13	18	13	15
MIN	2.4	0	0	0	0	1.3	.13	.04	2.6	3.1	2.5	2.4
AC-FT	363	72	6.3	6.3	106	141	584	247	320	457	316	290

CAL YR 1969 TOTAL 1,585.09 MEAN 4.34 MAX 26 MIN 0 AC-FT 3,140
WTR YR 1970 TOTAL 1,466.24 MEAN 4.02 MAX 23 MIN 0 AC-FT 2,910

16089000 Anahola Stream near Kealia

LOCATION.--Lat 22°09'05", long 159°21'17", Kauai, on right bank at intake of Lower Anahola ditch and 4.5 miles northwest of Kealia.

DRAINAGE AREA.--5.5 sq mi, approximately.

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.

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

AVERAGE DISCHARGE.--55 years (1913-17, 1919-70), 23.1 cfs (16,740 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,610 cfs Dec. 27 (gage height, 6.28 ft), from rating curve extended above 240 cfs on basis of slope-area measurement at gage height 10.6 ft; minimum, 2.6 cfs Aug. 23.
Period of record: Maximum discharge, 19,600 cfs Jan. 25, 1956 (gage height, 14.6 ft, from floodmarks), from rating curve extended above 590 cfs; minimum, 1.98 cfs Oct. 27, 1953.

REMARKS.--Records poor. Records include flow in Lower Anahola ditch (see sta 16091000). Anahola ditch (see sta 16088000) diverts 3 miles above station for irrigation in vicinity of Kealia.

REVISIONS (FISCAL YEARS).--WSP 1719: 1915, 1916-18(M). WRD Hawaii 1967: 1966(P).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	4.1	11	11	4.1	5.0	7.7	6.8	4.7	9.6	3.2	15
2	6.5	4.0	12	3.5	4.0	5.0	34	7.4	3.7	7.2	3.6	5.8
3	5.3	4.0	10	820	4.2	5.0	27	146	3.5	5.8	3.6	4.0
4	5.2	4.3	10	27	4.2	5.4	5.0	16	3.5	5.2	3.2	3.6
5	5.0	4.3	10	6.4	4.2	4.8	4.3	11	3.5	5.2	3.2	3.7
6	5.0	4.2	10	6.0	4.2	4.8	4.0	8.2	3.6	8.2	3.3	4.0
7	5.2	4.3	10	5.0	4.2	4.8	4.0	7.0	4.5	6.1	3.6	4.6
8	6.0	5.3	23	25	4.0	4.8	4.0	6.6	4.9	8.5	3.5	5.2
9	5.5	5.3	12	4.5	5.4	4.8	3.9	6.5	4.3	8.3	2.9	4.6
10	9.0	8.7	14	4.0	5.4	4.8	4.7	12	4.6	7.9	2.9	5.7
11	145	6.0	14	4.0	4.7	4.9	4.6	8.0	4.4	18	2.8	4.5
12	20	46	18	4.0	4.4	5.0	7.1	6.8	4.6	13	3.4	3.9
13	7.7	15	12	80	4.2	5.2	5.3	9.1	4.8	34	9.5	3.6
14	6.6	10	12	47	4.7	4.7	7.6	6.0	6.2	8.2	6.2	3.6
15	6.5	10	11	4.8	4.5	4.8	5.6	5.2	4.8	6.1	3.4	5.9
16	6.1	67	11	4.8	4.5	5.0	3.3	5.2	4.9	5.2	3.4	4.4
17	5.8	9.4	10	4.3	4.5	5.0	3.2	4.0	5.0	6.0	7.8	4.3
18	5.6	8.2	10	4.3	4.5	5.0	4.7	3.8	4.3	5.1	3.6	11
19	6.1	125	11	4.2	4.1	5.3	18	3.7	4.5	4.5	3.2	7.2
20	6.2	101	11	4.1	10	5.0	23	3.7	8.7	4.0	3.2	6.9
21	8.8	20	10	4.0	7.0	5.1	5.7	4.0	16	3.8	3.1	9.4
22	8.8	23	10	4.0	6.0	5.0	6.5	5.4	11	3.6	3.4	5.6
23	5.3	82	9.8	3.9	5.6	4.8	13	4.0	7.4	3.6	3.2	5.8
24	4.6	32	85	3.8	5.4	4.7	5.2	3.8	5.8	4.5	2.8	5.5
25	4.4	18	9.0	4.4	5.4	4.5	9.7	3.7	13	4.0	17	4.9
26	4.3	15	5.5	4.2	5.2	4.5	10	4.1	9.4	18	21	4.8
27	7.7	14	613	4.2	5.2	4.7	67	4.2	12	3.6	13	4.8
28	5.8	13	16	4.3	5.0	4.7	9.2	3.8	8.2	3.2	4.4	4.7
29	4.7	12	3.7	5.4	------	4.7	9.4	3.5	7.6	3.1	3.8	4.9
30	4.4	12	3.4	4.7	------	5.0	7.1	3.5	13	11	6.7	5.5
31	4.3	------	12	4.1	------	8.8	------	6.0	------	3.8	4.0	------
TOTAL	338.2	687.1	1,019.4	1,120.9	138.8	155.6	323.8	329.0	196.4	238.3	161.9	167.4
MEAN	10.9	22.9	32.9	36.2	4.96	5.02	10.8	10.6	6.55	7.69	5.22	5.58
MAX	145	125	613	820	10	8.8	67	146	16	34	21	15
MIN	4.3	4.0	3.4	3.5	4.0	4.5	3.2	3.5	3.5	3.1	2.8	3.6
AC-FT	671	1,360	2,020	2,220	275	309	642	653	390	473	321	332

CAL YR 1969 TOTAL 13,835.0 MEAN 37.9 MAX 624 MIN 3.4 AC-FT 27,440
WTR YR 1970 TOTAL 4,876.8 MEAN 13.4 MAX 820 MIN 2.8 AC-FT 9,670

PEAK DISCHARGE (BASE, 1,700 CFS).--Dec. 27 (1300) 2,610 cfs (6.28 ft).

NOTE.--No gage-height record Jan. 18 to Mar. 16.

16091000 Lower Anahola ditch near Kealia

LOCATION.--Lat 22°08'13", long 159°19'31", Kauai, on left bank 100 ft downstream from last wasteway, 1.3 miles southwest of mouth of Anahola Stream, and 2.5 miles 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 above mean sea level (Highway Department bench mark).

AVERAGE DISCHARGE.--33 years (1937-70), 3.10 cfs (2,250 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 18.6 cfs June 1, 1938; no flow at times each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	4.9		0	0	4.7	2.2	8.8	.03	6.0	4.4	4.6
2	5.1	4.8		0	0	5.2	2.8	6.2	0	4.8	4.0	5.3
3	4.8	5.0		.07	0	5.3	4.0	13	1.3	4.1	4.4	4.2
4	3.8	6.5		0	0	6.6	2.6	7.6	5.1	3.6	4.0	3.6
5	3.6	5.5		0	.01	5.9	2.0	0	5.1	3.5	4.1	3.3
6	3.7	4.8		0	.01	3.3	1.8	0	4.9	4.3	3.8	3.0
7	3.8	5.5		0	0	3.0	2.1	0	5.1	4.3	3.9	3.0
8	3.8	4.8		0	0	2.8	2.1	4.6	6.1	4.8	3.9	3.1
9	5.5	5.2		0	.01	2.8	2.0	7.9	5.6	7.2	3.8	3.2
10	6.0	5.8		0	.01	3.0	2.2	8.0	5.1	7.2	4.1	3.7
11	10	0		0	.02	3.0	2.2	8.0	5.1	6.3	3.8	4.1
12	9.8	.04		0	6.4	3.4	2.3	10	4.7	8.2	3.9	3.7
13	8.9	.02		0	11	3.0	2.7	12	4.5	9.2	4.5	3.2
14	7.6	0		0	4.4	2.6	3.1	12	4.9	7.5	5.3	3.0
15	11	.02		0	3.9	2.4	5.6	3.8	5.1	6.6	5.0	3.6
16	9.9	.02		0	8.3	2.8	5.8	2.8	5.0	6.0	4.2	4.1
17	8.3	0		0	9.1	3.2	4.5	7.1	5.2	6.0	5.4	3.6
18	5.8	0		0	8.5	2.7	5.9	7.2	4.6	6.0	5.3	3.8
19	5.8	0		0	4.9	2.6	7.5	7.1	4.5	5.3	4.2	4.8
20	5.8	0		0	9.9	2.6	8.8	6.7	5.6	5.1	3.8	4.3
21	.04	0		0	7.4	2.6	7.4	6.7	6.1	5.3	3.6	4.5
22	.03	0		0	4.8	2.6	7.0	8.5	5.9	5.2	3.5	4.8
23	0	0		0	7.1	2.5	8.0	7.9	5.2	5.2	3.5	3.9
24	0	0		0	6.4	2.0	7.2	7.5	4.3	5.3	3.5	3.8
25	0	0		0	5.9	2.0	7.6	6.9	4.9	5.3	4.1	3.9
26	0	0		0	6.7	1.9	8.1	7.5	5.7	6.3	5.1	3.2
27	0	0		0	6.5	1.8	11	7.6	5.6	5.8	5.2	3.0
28	2.9	0		0	3.6	1.8	12	6.9	5.1	5.1	4.7	3.1
29	6.9	0		0	------	1.8	12	6.2	4.6	5.4	4.2	3.1
30	6.4	0		0	------	1.8	11	5.8	6.0	6.6	4.0	3.0
31	5.7	------		0	------	2.1	------	1.8	------	5.5	4.3	------
TOTAL	150.57	52.90	0	.07	114.86	93.8	163.5	206.1	140.93	177.0	131.5	111.5
MEAN	4.86	1.76	0	.002	4.10	3.03	5.45	6.65	4.70	5.71	4.24	3.72
MAX	11	6.5	0	.07	11	6.6	12	13	6.1	9.2	5.4	5.3
MIN	0	0	0	0	0	1.8	1.8	0	0	3.5	3.5	3.0
AC-FT	299	105	0	.1	228	186	324	409	280	351	261	221

CAL YR 1969 TOTAL 1,432.96 MEAN 3.93 MAX 16 MIN 0 AC-FT 2,840
WTR YR 1970 TOTAL 1,342.73 MEAN 3.68 MAX 13 MIN 0 AC-FT 2,660

16093200 Anahola Stream at Anahola

LOCATION.--Lat 22°08'42", long 159°18'59", Kauai, on downstream side of old highway bridge at Anahola, 0.1 mile upstream from Highway 56, and 0.9 mile upstream from mouth.

DRAINAGE AREA.--9.89 sq mi.

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

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.

AVERAGE DISCHARGE.--5 years (1965-70), 44.7 cfs (32,390 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,660 cfs Dec. 27 (gage height, 11.88 ft); minimum, 4.6 cfs June 24.
Period of record: Maximum discharge, 13,000 cfs May 15, 1965 (gage height, 16.0 ft), from rating curve extended above 5,800 cfs on basis of contracted-opening measurement of peak flow; minimum, 3.8 cfs Aug. 21, Sept. 7, 1968.

REMARKS.--Records good. Anahola and Lower Anahola ditches (see stas 16088000 and 16091000) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	6.2	15	94	22	10	11	22	12	6.4	5.8	15
2	43	6.2	16	53	21	10	36	41	10	5.5	5.7	17
3	38	6.2	14	1,120	23	10	46	148	9.2	5.2	6.2	10
4	37	6.5	14	135	22	11	14	38	6.7	5.0	5.8	9.4
5	36	6.5	13	65	22	10	12	26	6.7	5.0	5.5	9.4
6	36	6.5	13	54	23	10	11	20	6.7	5.5	5.7	9.4
7	38	6.2	13	43	20	10	10	18	7.1	6.0	5.8	10
8	40	6.4	24	71	20	9.9	10	15	7.6	9.5	5.8	9.9
9	40	6.7	15	49	35	9.7	10	13	6.9	17	5.8	11
10	37	14	18	36	35	9.9	12	20	6.7	13	5.5	11
11	156	9.4	18	37	23	10	13	17	6.7	6.0	5.5	11
12	26	41	25	34	19	11	19	12	6.7	36	6.2	9.7
13	7.8	25	16	238	17	9.9	16	17	6.7	48	9.4	8.9
14	6.2	17	14	128	18	9.7	19	12	9.2	14	7.8	8.7
15	7.0	20	13	44	16	9.9	14	10	9.2	9.7	5.8	10
16	6.3	66	12	37	16	10	9.4	10	9.2	8.0	5.5	11
17	5.7	16	13	35	16	10	9.9	7.6	9.2	8.5	8.2	9.4
18	5.5	13	12	32	16	10	11	7.6	6.7	8.2	5.8	12
19	5.8	106	13	30	14	11	24	7.4	6.7	6.9	5.3	14
20	7.4	113	14	29	54	10	27	7.4	8.0	6.4	5.3	11
21	13	36	12	28	20	9.4	11	7.6	11	6.2	5.2	11
22	14	35	12	27	13	9.2	12	12	5.8	6.0	5.3	11
23	10	73	12	26	12	9.4	21	8.5	5.2	6.2	5.5	9.4
24	8.9	61	101	26	12	9.7	11	7.8	4.7	6.4	5.3	9.9
25	8.2	29	30	28	11	9.7	16	7.6	8.0	6.2	16	9.2
26	8.2	22	17	27	11	9.4	18	8.9	6.4	14	16	8.7
27	13	19	767	28	11	9.4	88	8.7	6.0	5.7	17	8.7
28	12	18	145	28	10	9.4	39	7.6	5.8	5.5	6.0	8.5
29	6.5	16	71	33	------	9.4	40	6.9	5.2	5.2	4.9	8.7
30	6.2	16	50	25	------	9.7	30	6.9	6.9	8.8	5.7	8.9
31	6.2	------	60	23	------	14	------	10	------	7.1	5.3	------
TOTAL	737.9	822.8	1,582	2,663	552	310.7	620.3	561.5	222.9	307.1	214.6	311.8
MEAN	23.8	27.4	51.0	85.9	19.7	10.0	20.7	18.1	7.43	9.91	6.92	10.4
MAX	156	113	767	1,120	54	14	88	148	12	48	17	17
MIN	5.5	6.2	12	23	10	9.2	9.4	6.9	4.7	5.0	4.9	8.5
AC-FT	1,460	1,630	3,140	5,280	1,090	616	1,230	1,110	442	609	426	618

CAL YR 1969 TOTAL 20,455.7 MEAN 56.0 MAX 767 MIN 5.5 AC-FT 40,570
WTR YR 1970 TOTAL 8,906.6 MEAN 24.4 MAX 1,120 MIN 4.7 AC-FT 17,670

PEAK DISCHARGE (BASE, 2,200 CFS).--Dec. 27 (1300) 4,660 cfs (11.88 ft); Jan. 3 (0830) 2,900 cfs (10.45 ft).

16097000 Pohakuhonu Stream near Kilauea

LOCATION.--Lat 22°10'52", long 159°25'40", Kauai, on left bank 0.8 mile upstream from confluence with Halaulani Stream, 1.2 miles upstream from Stone dam, and 2.5 miles southwest of Kilauea.

DRAINAGE AREA.--1.8 sq mi, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 401.7 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--12 years (1958-70), 8.21 cfs (5,950 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 844 cfs Dec. 27 (gage height, 3.96 ft); minimum, 1.0 cfs June 18, 19.

Period of record: Maximum discharge, 2,710 cfs Aug. 6, 1959 (gage height, 7.23 ft, from floodmark in well), from rating curve extended above 640 cfs on basis of slope-area measurement at gage height 11.0 ft; minimum, 1.0 cfs June 18, 19, 1970.

Flood of Jan. 24, 1956, reached a stage of 11.0 ft, from floodmarks (discharge, 5,600 cfs, by slope-area measurement).

REMARKS.--Records good. Kalihiwai ditch diverts 0.5 mile above station for domestic supply and irrigation of sugarcane. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	2.1	2.3	19	1.8	1.4	1.1	17	1.4	2.8	1.8	7.4
2	2.6	1.9	2.8	5.5	1.8	1.4	5.3	6.1	1.3	2.1	1.9	3.2
3	2.3	2.1	2.1	205	1.6	1.4	17	37	1.3	1.9	1.8	2.6
4	2.1	2.1	2.1	13	1.6	1.4	3.0	6.4	1.3	1.8	1.4	2.4
5	1.9	2.1	1.9	6.7	1.4	1.4	1.8	4.0	1.1	1.8	1.8	2.3
6	1.9	2.1	1.8	5.2	1.4	1.4	1.4	2.8	1.3	2.4	1.8	2.4
7	1.9	1.8	1.8	4.0	1.4	1.4	1.3	2.6	1.6	1.8	1.8	2.4
8	2.1	1.9	3.2	14	1.3	1.4	1.1	3.0	1.4	3.7	1.8	2.6
9	1.9	1.9	2.3	5.2	2.4	1.4	1.1	3.5	1.3	7.9	1.8	2.1
10	2.3	1.9	2.8	3.2	2.1	1.4	3.2	8.2	1.1	17	1.6	2.1
11	44	1.8	2.8	3.2	1.6	1.4	2.3	6.4	1.1	16	1.4	2.1
12	6.7	21	4.2	2.8	1.4	1.4	2.3	3.2	1.3	8.6	1.9	1.9
13	3.2	3.2	2.4	29	1.4	1.4	2.1	5.0	1.3	16	2.3	1.8
14	2.4	2.4	2.1	14	2.1	1.3	3.5	2.8	1.1	7.3	1.9	1.8
15	2.4	2.1	1.9	3.5	1.6	1.3	2.3	3.0	1.1	4.5	1.8	3.0
16	2.3	14	1.9	2.8	1.3	3.1	2.1	2.4	1.3	3.5	1.8	1.9
17	2.1	2.8	1.8	2.8	1.3	1.8	2.1	2.3	1.1	2.6	2.6	2.1
18	2.1	2.4	1.6	2.4	1.3	1.8	2.8	2.3	1.0	2.6	1.8	4.0
19	2.1	31	1.9	2.3	1.3	1.6	5.2	1.9	1.0	3.7	1.8	3.5
20	2.8	30	1.8	2.4	19	1.4	9.2	1.8	1.9	2.3	1.8	3.5
21	12	6.7	1.4	2.3	4.2	1.4	3.7	1.6	2.8	2.1	1.8	2.6
22	7.3	9.3	1.4	2.1	2.4	1.4	6.3	1.9	1.8	1.9	1.6	2.4
23	3.5	20	1.4	2.1	2.1	1.4	5.8	1.6	1.8	1.8	1.6	2.1
24	3.0	10	44	1.9	1.9	1.3	3.2	1.6	2.3	2.1	1.6	1.9
25	2.6	5.0	8.4	3.2	1.8	1.3	3.5	1.4	9.2	2.3	5.8	1.8
26	2.4	3.7	6.3	2.1	1.8	1.3	8.6	2.4	2.8	16	12	1.8
27	2.8	3.2	170	1.9	1.8	1.1	27	1.9	2.6	3.0	7.9	1.8
28	2.6	2.8	17	2.8	1.6	1.1	8.6	1.4	2.3	1.8	2.8	1.6
29	2.4	2.6	7.3	4.0	------	1.1	7.6	1.4	4.5	2.1	2.6	1.8
30	2.3	2.4	5.8	2.1	------	1.1	7.6	1.3	4.2	1.8	2.6	1.8
31	2.1	------	9.0	2.1	------	1.6	------	1.6	------	1.6	2.3	------
TOTAL	134.5	196.3	317.5	372.6	66.7	44.6	152.1	139.8	59.6	146.8	79.2	74.7
MEAN	4.34	6.54	10.2	12.0	2.38	1.44	5.07	4.51	1.99	4.74	2.55	2.49
MAX	44	31	170	205	19	3.1	27	37	9.2	17	12	7.4
MIN	1.9	1.8	1.4	1.9	1.3	1.1	1.1	1.3	1.0	1.6	1.4	1.6
AC-FT	267	389	630	739	132	88	302	277	118	291	157	148

CAL YR 1969 TOTAL 3,405.0 MEAN 9.33 MAX 236 MIN 1.4 AC-FT 6,750
WTR YR 1970 TOTAL 1,784.4 MEAN 4.89 MAX 205 MIN 1.0 AC-FT 3,540

PEAK DISCHARGE (BASE, 780 CFS).--Dec. 27 (1500) 844 cfs (3.96 ft).

16097500 Halaulani Stream at altitude 400 ft, near Kilauea

LOCATION.--Lat 22°10'54", long 159°25'17", Kauai, on left bank 0.5 mile upstream from confluence with Pohakuhonu Stream, 1 mile upstream from Stone Dam, and 2.5 miles south of Kilauea.

DRAINAGE AREA.--1.1 sq mi, approximately.

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

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

AVERAGE DISCHARGE.--12 years (1958-70), 11.7 cfs (8,480 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 659 cfs Dec. 27 (gage height, 4.83 ft, from peak-stage indicator), from rating curve extended as explained below; minimum not determined; minimum daily, 3.5 cfs Mar. 27-30, Apr. 1, 8, 9.
Period of record: Maximum discharge, 2,070 cfs Aug. 6, 1959 (gage height, 8.30 ft), from rating curve extended above 190 cfs on basis of slope-area measurement of peak flow; minimum, 1.8 cfs Sept. 6-8, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.2	6.0	7.6	19	6.0	4.6	3.5	16	6.5	8.2	6.3	23
2	9.3	6.0	8.4	6.0	6.0	4.6	9.0	11	6.2	7.1	8.3	12
3	7.1	6.0	7.0	200	5.9	4.6	16	35	6.0	6.5	6.1	8.6
4	6.8	6.0	6.8	15	5.4	4.6	8.0	20	5.9	6.4	5.8	7.6
5	6.3	6.0	6.0	7.0	5.0	4.6	6.0	13	5.7	6.7	5.7	7.3
6	6.1	6.1	6.0	5.0	5.0	4.6	4.8	10	5.7	9.1	6.1	7.6
7	6.6	6.0	6.0	5.0	5.0	4.6	4.0	8.0	7.4	6.9	5.9	7.4
8	8.5	6.0	9.0	14	5.0	4.6	3.5	9.0	6.3	14	6.7	9.6
9	6.4	6.0	7.0	5.6	7.4	4.6	3.5	11	5.6	18	6.3	6.8
10	11	6.0	8.4	5.4	6.0	4.6	9.0	15	5.4	22	5.7	7.0
11	63	6.0	9.0	5.4	5.2	4.6	7.2	11	5.4	23	5.3	6.1
12	19	20	11	9.0	5.0	4.6	7.2	10	5.6	23	5.7	5.8
13	10	9.4	8.0	30	5.0	4.6	7.0	9.4	6.0	34	7.7	5.6
14	8.6	8.0	6.6	12	6.4	4.0	7.0	9.0	6.2	20	7.8	5.6
15	8.1	7.0	6.2	10	5.0	4.0	7.0	9.4	5.4	14	6.0	9.6
16	7.3	14	5.6	9.0	5.0	9.0	6.8	8.0	6.4	11	6.5	5.9
17	6.9	9.4	5.2	9.0	5.0	5.8	6.4	7.8	5.5	11	10	6.1
18	6.5	8.0	5.0	7.4	5.0	5.4	8.0	7.6	5.2	9.8	6.3	14
19	7.0	30	5.4	7.4	5.0	5.0	10	7.4	5.2	11	5.8	12
20	9.2	30	5.0	8.0	20	4.6	15	7.1	7.6	8.0	5.4	11
21	21	7.0	4.5	7.2	13	4.5	10	6.9	12	7.3	5.4	11
22	20	10	4.5	7.0	8.0	4.5	11	9.4	6.9	6.9	5.4	9.1
23	9.1	20	4.5	6.6	7.0	4.5	12	7.2	5.8	6.9	5.1	7.8
24	7.7	12	45	6.2	6.2	4.1	11	7.5	6.2	8.6	5.8	6.9
25	7.1	11	9.0	10	5.8	4.0	12	6.9	16	11	18	6.4
26	6.7	10	6.0	7.0	5.8	4.0	16	12	7.8	18	23	5.9
27	9.3	9.0	150	6.0	5.8	3.5	25	9.8	8.4	7.8	19	5.7
28	7.3	8.0	16	9.0	5.2	3.5	18	7.4	6.8	7.1	9.4	5.5
29	6.4	7.4	7.0	12	------	3.5	17	6.7	11	6.5	8.5	5.9
30	6.2	7.0	6.0	9.0	------	3.5	16	6.5	12	8.6	11	5.5
31	6.1	------	9.2	7.6	------	5.0	------	8.3	------	6.5	8.3	------
TOTAL	329.8	303.3	400.9	476.8	180.1	142.2	296.9	323.3	212.1	364.9	248.3	248.3
MEAN	10.6	10.1	12.9	15.4	6.43	4.59	9.90	10.4	7.07	11.8	8.01	8.28
MAX	63	30	150	200	20	9.0	25	35	16	34	23	23
MIN	6.1	6.0	4.5	5.0	5.0	3.5	3.5	6.5	5.2	6.4	5.1	5.5
AC-FT	654	602	795	946	357	282	589	641	421	724	493	493

CAL YR 1969 TOTAL 4,389.2 MEAN 12.0 MAX 150 MIN 2.7 AC-FT 8,710
WTR YR 1970 TOTAL 3,526.9 MEAN 9.66 MAX 200 MIN 3.5 AC-FT 7,000

PEAK DISCHARGE (BASE, 580 CFS).--Dec. 27 (about 1500) 659 cfs (4.83 ft).

NOTE.--No gage-height record Oct. 31 to May 19.

16100000 Hanalei tunnel outlet near Lihue

LOCATION.--Lat 22°04'57", long 159°27'52", Kauai, on right bank at outlet of Hanalei tunnel, 2.2 miles downstream from intake on Kaapoko Stream, and 9.8 miles northwest of Lihue.

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

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

AVERAGE DISCHARGE.--38 years, 27.7 cfs (20,070 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 99 cfs Apr. 11, 25, 26, 1942; no flow at times.

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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	41	46	75	21	22	28	26	5.0	48	33	63
2	56	41	45	70	21	22	36	22	3.8	39	36	46
3	48	41	45	79	21	22	38	41	4.6	38	37	36
4	45	51	45	70	21	22	27	21	17	40	31	33
5	43	47	45	62	21	21	25	19	35	43	33	35
6	42	56	44	58	22	22	24	19	45	43	34	39
7	48	56	45	51	22	22	24	19	54	36	41	39
8	52	72	59	55	22	22	24	20	43	52	35	34
9	43	49	58	49	23	22	24	20	37	52	31	32
10	45	48	59	47	23	22	29	23	38	62	31	33
11	77	44	53	62	22	25	27	21	38	57	28	29
12	66	57	59	55	22	23	31	20	43	59	30	29
13	56	58	49	66	23	22	20	23	45	63	43	28
14	49	53	48	49	25	21	29	19	46	54	38	28
15	50	52	45	40	23	24	33	20	38	48	29	36
16	46	59	44	38	22	28	29	19	51	40	34	30
17	45	47	43	41	22	23	28	17	39	56	43	32
18	44	44	42	39	23	26	28	14	38	42	31	61
19	49	70	45	38	22	24	32	13	38	38	30	51
20	46	73	43	38	22	23	43	13	62	36	28	66
21	63	69	42	38	22	24	26	13	70	34	28	60
22	57	71	42	38	22	23	29	13	51	33	29	44
23	45	73	43	38	22	23	32	11	44	39	29	38
24	44	68	77	39	22	22	29	11	61	43	36	35
25	42	60	60	42	23	21	27	13	64	47	54	32
26	42	55	76	39	24	21	29	13	49	64	51	31
27	44	51	74	40	23	21	40	9.4	55	40	57	31
28	42	49	76	38	22	22	27	8.9	51	36	51	30
29	42	48	70	25	------	22	25	8.9	61	33	39	31
30	41	47	60	21	------	23	23	8.9	60	46	52	29
31	41	------	63	21	------	26	------	8.4	------	33	37	------
TOTAL	1,506	1,650	1,645	1,461	623	706	874	527.5	1,286.4	1,394	1,139	1,141
MEAN	48.6	55.0	53.1	47.1	22.3	22.8	29.1	17.0	42.9	45.0	36.7	38.0
MAX	77	73	77	79	25	28	43	41	70	64	57	66
MIN	41	41	42	21	21	21	23	8.4	3.8	33	28	28
AC-FT	2,990	3,270	3,260	2,900	1,240	1,400	1,730	1,050	2,550	2,760	2,260	2,260

CAL YR 1969 TOTAL 13,211.3 MEAN 36.2 MAX 77 MIN 1.1 AC-FT 26,200
WTR YR 1970 TOTAL 13,952.9 MEAN 38.2 MAX 79 MIN 3.8 AC-FT 27,680

HAWAII, ISLAND OF KAUAI

16103000 Hanalei River near Hanalei

LOCATION.--Lat 22°11'31", long 159°27'57", Kauai, on right bank 2.3 miles southeast of Hanalei and 4.9 miles upstream from mouth.

DRAINAGE AREA.--19.1 sq mi.

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

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

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--7 years (1963-70), 242 cfs (175,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 9,220 cfs Apr. 20 (gage height, 10.06 ft); minimum, 50 cfs Mar. 14, 15, 29, 30.

Period of record: Maximum discharge, 24,600 cfs (revised) Nov. 13, 1965, Jan. 31, 1969 (gage height, 14.23 ft), from rating curve extended above 9,600 cfs; minimum, 39 cfs Mar. 4, 1963.

REVISIONS.--The figure of maximum discharge for the water years 1966 and 1969 has been revised to 24,600 cfs Nov. 13, 1965 and Jan. 31, 1969 (gage height, 14.23 ft), superseding the figure published in WRD Hawaii, 1966 and 1969.

REMARKS.--Records poor. 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.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	155	62	64	350	62	55	114	500	80	82	76	300
2	155	62	64	300	60	55	510	220	62	76	77	100
3	92	62	64	1,800	62	54	627	800	60	69	73	80
4	82	70	64	450	62	54	135	150	60	66	70	66
5	78	68	64	250	62	54	88	90	62	76	67	72
6	77	67	64	175	60	54	75	80	70	90	68	80
7	78	66	64	150	60	54	70	70	130	78	73	86
8	83	64	350	400	60	54	66	90	60	186	74	91
9	76	66	200	230	100	53	62	110	57	208	66	82
10	123	100	150	130	84	52	127	250	56	390	65	76
11	1,600	80	120	120	64	66	96	150	55	198	62	70
12	434	300	150	200	60	59	155	100	55	266	62	66
13	148	120	110	1,200	90	52	139	110	59	276	90	63
14	112	100	90	400	130	51	265	70	57	150	86	61
15	102	90	80	200	80	51	269	76	55	120	69	75
16	92	250	70	100	61	77	142	84	62	90	69	68
17	87	100	66	110	61	57	150	110	59	230	129	66
18	82	80	64	94	61	69	137	90	55	110	75	450
19	81	800	66	88	59	71	526	80	54	91	68	350
20	86	500	62	80	84	57	1,120	70	79	81	63	400
21	240	300	60	76	73	53	270	90	142	76	61	200
22	162	400	58	70	61	54	496	64	76	73	61	110
23	80	600	58	66	59	54	617	60	63	73	61	90
24	74	150	1,300	80	58	52	372	150	96	86	65	80
25	70	100	370	180	57	52	300	250	205	126	163	68
26	66	90	900	80	58	52	600	150	82	645	400	60
27	72	80	1,000	70	57	52	900	80	92	119	500	56
28	76	70	600	150	56	51	310	66	86	92	150	56
29	72	68	250	100	------	51	290	60	130	81	90	56
30	66	66	150	70	------	52	280	120	119	136	140	56
31	63	------	200	64	------	77	------	100	------	83	90	------
TOTAL	4,864	5,031	6,972	7,833	1,901	1,749	9,308	4,490	2,378	4,523	3,263	3,534
MEAN	157	168	225	253	67.9	56.4	310	145	79.3	146	105	118
MAX	1,600	800	1,300	1,800	130	77	1,120	800	205	645	500	450
MIN	63	62	58	64	56	51	62	60	54	66	61	56
AC-FT	9,650	9,980	13,830	15,540	3,770	3,470	18,460	8,910	4,720	8,970	6,470	7,010

CAL YR 1969 TOTAL 87,681 MEAN 240 MAX 3,700 MIN 58 AC-FT 173,900
WTR YR 1970 TOTAL 55,846 MEAN 153 MAX 1,800 MIN 51 AC-FT 110,800

PEAK DISCHARGE (BASE, 9,200 CFS, REVISED).--Apr. 20 (0300) 9,220 cfs (10.06 ft).

NOTE.--No gage-height record Oct. 21 to Feb. 16, Apr. 25 to June 7.

16108000 Wainiha River near Hanalei

LOCATION.--Lat 22°08'10", long 159°33'40", Kauai, on left bank at Puwainui Falls, 1.5 miles upstream from Wainiha powerplant intake, and 6.0 miles southwest of Hanalei.

DRAINAGE AREA.--10.2 sq mi.

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

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

AVERAGE DISCHARGE.--15 years (1952-55, 1958-70), 143 cfs (103,600 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,720 cfs Jan. 13 (gage height, 5.62 ft), from rating curve extended as explained below; minimum, 39 cfs Mar. 14, 15.
Period of record: Maximum discharge recorded, 20,100 cfs Aug. 6, 1959 (gage height, 8.19 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurement at gage height 7.72 ft; minimum, 34.8 cfs Feb. 12, 1954.
Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft, from floodmarks (discharge, about 40,000 cfs, from unit-discharge study).

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	137	50	54	298	52	45	157	294	59	110	52	278
2	136	50	52	230	50	44	534	142	55	81	71	108
3	83	49	52	1,410	50	44	670	249	53	75	69	64
4	70	85	51	255	53	44	111	96	52	84	54	59
5	64	95	50	113	51	43	76	78	52	110	61	74
6	61	146	49	105	52	44	62	70	59	113	69	94
7	89	185	50	75	50	44	64	66	117	81	110	105
8	128	505	290	84	48	44	55	80	70	265	77	76
9	66	84	160	75	90	43	49	103	56	152	56	58
10	200	70	147	65	73	41	118	239	56	322	56	59
11	1,220	61	112	840	52	46	67	123	55	268	49	49
12	348	244	140	157	49	45	116	94	72	214	62	48
13	113	88	87	1,030	94	41	79	105	81	236	134	46
14	84	82	86	487	118	39	171	66	74	128	116	45
15	87	96	65	113	68	60	249	73	56	107	61	76
16	71	78	59	86	54	86	133	76	110	76	73	52
17	69	59	56	200	52	49	114	99	74	190	153	75
18	64	56	53	115	68	135	115	82	66	105	69	410
19	79	649	55	73	52	80	398	77	63	79	59	283
20	75	490	53	65	49	53	394	62	185	67	51	399
21	178	219	50	64	48	51	157	75	277	62	51	192
22	97	211	49	59	48	56	369	83	100	58	55	86
23	63	217	49	56	47	54	548	58	85	91	52	71
24	57	151	1,020	69	47	48	361	56	242	109	71	63
25	56	96	271	150	53	44	244	137	250	172	171	53
26	55	75	783	70	59	44	569	214	102	766	335	49
27	57	65	857	59	49	43	774	101	147	83	467	47
28	62	60	719	134	45	44	239	75	135	66	131	48
29	55	56	277	116	------	43	296	59	187	56	82	48
30	52	56	124	59	------	45	168	56	235	112	142	48
31	51	------	167	55	------	75	------	106	------	58	81	------
TOTAL	4,027	4,428	6,087	6,767	1,621	1,617	7,457	3,294	3,225	4,496	3,140	3,163
MEAN	130	148	196	218	57.9	52.2	249	106	108	145	101	105
MAX	1,220	649	1,020	1,410	118	135	774	294	277	766	467	410
MIN	51	49	49	55	45	39	49	56	52	56	49	45
AC-FT	7,990	8,780	12,070	13,420	3,220	3,210	14,790	6,530	6,400	8,920	6,230	6,270

CAL YR 1969 TOTAL 71,503 MEAN 196 MAX 2,810 MIN 49 AC-FT 141,800
WTR YR 1970 TOTAL 49,322 MEAN 135 MAX 1,410 MIN 39 AC-FT 97,830

PEAK DISCHARGE (BASE, 3,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
1-13	2030	5.62	4,720	7-26	0100	5.28	3,750
4-19	2300	5.29	3,780				

16130000 Nahonalu Valley near Mana

LOCATION.--Lat 22°02'41", long 159°45'17", Kauai, on left bank 1.1 miles northeast of Mana and 5.3 miles northwest of Kekaha School.

DRAINAGE AREA.--3.77 sq mi.

PERIOD OF RECORD.--Annual maximum, water years 1962-63, July 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 236.8 ft above mean sea level (by stadia survey). Prior to July 1, 1963, crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--7 years, 0.418 cfs (303 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 92 cfs Jan. 13 (gage height, 2.57 ft), from rating curve extended as explained below; no flow most of year.
Period of record: Maximum discharge, 973 cfs Dec. 16, 1964 (gage height, 5.16 ft), from rating curve extended above 23 cfs on basis of slope-area measurement at gage height 5.13 ft; no flow most of each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0		0								0
2		0		0								0
3		0		0								0
4		0		0								0
5		0		0								0
6		0		0								0
7		0		0								0
8		0		0								0
9		0		0								0
10		0		0								0
11		0		3.9								0
12		1.3		1.1								2.2
13		.20		7.9								.02
14		.02		9.3								0
15		.23		1.1								0
16		.02		.23								0
17		0		.23								0
18		0		.03								0
19		0		0								0
20		0		0								0
21		0		.06								0
22		0		.09								0
23		0		.02								0
24		0		.01								0
25		0		.01								0
26		0		0								0
27		0		0								0
28		0		0								0
29		0		0	------							0
30		0		0	------							0
31		------		0	------		------		------			------
TOTAL	0	1.77	0	23.98	0	0	0	0	0	0	0	2.22
MEAN	0	.059	0	.77	0	0	0	0	0	0	0	.074
MAX	0	1.3	0	9.3	0	0	0	0	0	0	0	2.2
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	3.5	0	48	0	0	0	0	0	0	0	4.4

CAL YR 1969 TOTAL 112.59 MEAN .31 MAX 37 MIN 0 AC-FT 223
WTR YR 1970 TOTAL 27.97 MEAN .077 MAX 9.3 MIN 0 AC-FT 55

PEAK DISCHARGE (BASE, 93 CFS).--No peak above base.

16200000 North Fork Kaukonahua Stream above Right Branch, near Wahiawa

LOCATION.--Lat 21°31'09", long 157°56'53", Oahu, on left bank 140 ft upstream from Mauka ditch intake and Right Branch, and 4.5 miles northeast of Wahiawa.

DRAINAGE AREA.--1.38 sq mi.

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 July 1960, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

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

AVERAGE DISCHARGE.--47 years (1913-24, 1926-52, 1960-70), 16.9 cfs (12,240 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,250 cfs July 25 (gage height, 9.59 ft), from rating curve extended above 82 cfs on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.32 cfs Mar. 13, 14. Period of record: Maximum discharge, 5,490 cfs Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 68 cfs by test of model of station site; maximum gage height, 12.46 ft Apr. 15, 1963; minimum discharge, 0.12 cfs Mar. 2, 13, 1941.

REMARKS.--Records good. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	2.1	3.0	39	2.9	.67	2.7	21	7.7	13	13	32
2	6.4	2.0	2.7	10	2.7	.72	23	43	7.0	9.6	28	10
3	4.8	1.8	2.5	75	2.6	.59	44	16	6.0	8.7	9.6	8.7
4	4.5	2.2	2.5	25	2.6	.51	4.8	9.9	6.9	12	7.4	7.4
5	4.2	3.8	2.2	11	2.3	.47	7.0	7.7	5.2	7.0	7.2	11
6	3.7	21	2.1	10	2.1	.47	3.0	6.4	6.8	6.8	6.2	14
7	3.6	15	2.1	6.8	1.9	.44	3.3	5.8	4.7	17	22	6.8
8	3.4	12	8.3	6.0	1.8	.44	1.8	11	4.3	30	19	42
9	3.3	5.0	6.9	5.2	1.8	.41	4.1	13	3.9	25	9.3	14
10	3.0	2.6	3.4	4.5	2.5	.41	33	44	3.6	58	5.6	14
11	42	2.2	2.1	38	1.6	.38	20	14	5.0	73	5.2	7.0
12	79	2.5	1.7	8.8	1.4	.35	76	19	20	32	4.7	7.4
13	7.7	3.4	4.0	19	1.4	.32	12	28	9.3	33	6.2	5.8
14	5.4	11	6.4	28	3.1	.32	13	13	16	18	10	12
15	9.0	3.2	1.8	6.2	2.1	9.9	9.1	25	6.8	11	6.8	12
16	4.7	2.1	1.5	4.8	1.2	46	13	13	12	9.0	7.7	5.8
17	3.9	1.7	1.3	4.3	1.1	14	14	14	6.2	9.3	11	8.5
18	3.4	1.6	1.2	3.9	1.0	51	8.7	11	4.0	20	13	40
19	3.6	1.4	1.2	3.6	.98	3.0	7.0	6.8	3.6	7.7	4.8	51
20	8.6	1.4	1.1	3.3	.92	1.7	19	5.8	74	6.6	4.2	45
21	62	189	.98	3.2	.87	1.3	25	9.4	68	6.0	4.2	23
22	6.2	74	.92	2.9	.82	1.9	8.4	27	26	6.4	4.2	33
23	4.2	23	.87	2.7	.72	1.3	5.8	7.0	13	61	3.7	13
24	3.6	7.7	160	2.6	.67	.92	6.4	5.6	59	37	30	9.6
25	3.2	67	83	2.7	.82	.67	9.0	10	28	354	30	7.7
26	3.0	7.9	43	4.6	.87	.87	24	80	14	132	149	6.8
27	2.8	5.2	109	68	.67	.72	55	23	23	16	53	6.2
28	2.7	4.3	55	39	.59	.55	18	17	14	19	37	5.6
29	2.6	3.7	44	7.0	------	.47	21	14	97	9.9	23	5.0
30	2.4	3.3	18	4.2	------	.51	16	7.7	47	17	56	4.7
31	2.2	------	35	3.3	------	1.6	------	56	------	9.9	14	------
TOTAL	304.9	483.1	607.77	452.6	44.03	142.91	507.1	584.1	602.0	1,074.9	605.0	469.0
MEAN	9.84	16.1	19.6	14.6	1.57	4.61	16.9	18.8	20.1	34.7	19.5	15.6
MAX	79	189	160	75	3.1	51	76	80	97	354	149	51
MIN	2.2	1.4	.87	2.6	.59	.32	1.8	5.6	3.6	6.0	3.7	4.7
AC-FT	605	958	1,210	898	87	283	1,010	1,160	1,190	2,130	1,200	930

CAL YR 1969 TOTAL 8,990.47 MEAN 24.6 MAX 970 MIN .87 AC-FT 17,830
WTR YR 1970 TOTAL 5,877.41 MEAN 16.1 MAX 354 MIN .32 AC-FT 11,660

PEAK DISCHARGE (BASE, 1,300 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-21	1700	7.17	1,800	7-25	2100	9.59	3,250
12-24	2230	7.88	2,230				

16208000 South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa

LOCATION.--Lat 21°29'32", long 157°59'55", Oahu, on right bank on upstream side of dam at East Pump Reservoir, 2.3 miles east of Wahiawa Post Office, and 7.1 miles north of Waipahu.

DRAINAGE AREA.--4.04 sq mi.

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

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

AVERAGE DISCHARGE (since termination of diversions to Schofield Barracks).--8 years (1960-62, 1964-70), 23.8 cfs (17,240 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,680 cfs Dec. 24 (gage height, 6.09 ft); minimum, 0.90 cfs Mar. 29, 30.
Period of record: Maximum discharge, 5,460 cfs Apr. 15, 1963 (gage height, 11.33 ft), from rating curve extended above 1,100 cfs on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963.

REMARKS.--Records good. Prior to 1960, diversions from reservoirs above station for use at Schofield Barracks. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	3.3	5.5	42	5.5	1.7	4.5	17	10	19	26	38
2	11	3.2	5.0	22	5.0	1.6	30	44	9.2	12	36	14
3	7.9	3.1	4.6	85	4.6	1.5	60	24	8.6	14	16	11
4	6.8	3.5	4.4	51	4.6	1.4	8.8	14	7.3	18	14	10
5	6.2	8.2	4.2	19	4.2	1.3	12	10	6.8	9.6	14	19
6	6.0	35	3.8	19	3.8	1.2	5.1	8.2	6.2	9.6	12	26
7	5.5	20	3.6	13	3.6	1.2	4.5	7.3	6.0	26	24	14
8	5.5	15	23	12	3.4	1.2	4.0	7.0	6.0	55	23	73
9	5.3	8.2	18	12	3.6	1.1	5.0	10	5.3	16	14	16
10	5.0	4.7	9.6	8.9	3.8	1.1	34	63	4.8	55	9.6	21
11	22	4.0	5.3	54	3.6	1.1	30	38	4.6	122	9.2	12
12	157	4.5	4.0	32	3.4	1.1	140	17	4.4	46	8.9	9.6
13	19	6.0	3.6	15	5.3	1.1	25	20	5.7	47	10	9.2
14	9.2	25	17	75	4.6	1.1	27	11	4.8	30	18	25
15	12	8.0	5.0	16	4.6	1.2	10	27	5.3	17	16	23
16	7.9	4.1	3.8	12	2.7	2.3	7.9	16	5.5	14	18	10
17	6.5	3.5	3.2	10	2.4	15	21	14	7.9	17	24	18
18	5.7	3.2	2.9	8.9	2.4	67	19	9.2	4.2	34	17	104
19	6.0	3.1	2.7	7.9	2.2	8.2	12	7.9	3.4	13	10	59
20	5.7	2.8	2.5	7.3	2.1	3.6	22	7.0	90	10	10	45
21	58	180	2.4	7.0	2.1	2.2	29	7.6	60	9.2	8.2	27
22	12	98	2.2	6.5	2.1	1.6	19	32	39	9.2	11	44
23	6.5	40	2.1	6.0	2.0	1.7	10	10	17	65	7.9	26
24	5.3	25	172	6.0	1.7	1.6	8.6	8.6	32	55	20	16
25	4.8	90	235	6.2	1.7	1.2	18	6.8	22	243	42	14
26	4.4	17	54	5.5	1.8	1.2	17	125	16	179	109	12
27	4.2	8.9	219	74	1.7	1.0	55	34	19	33	66	11
28	3.8	7.3	132	71	1.6	.96	43	35	11	80	20	10
29	3.6	6.2	112	14	------	.96	38	17	48	24	18	9.2
30	3.6	5.7	46	7.3	------	1.0	23	12	56	29	35	8.6
31	3.4	------	27	6.0	------	2.5	------	21	------	19	14	------
TOTAL	428.4	646.5	1,135.4	731.5	90.1	130.92	742.4	680.6	526.0	1,329.6	680.8	734.6
MEAN	13.8	21.6	36.6	23.6	3.22	4.22	24.7	22.0	17.5	42.9	22.0	24.5
MAX	157	180	235	85	5.5	67	140	125	90	243	109	104
MIN	3.4	2.8	2.1	5.5	1.6	.96	4.0	6.8	3.4	9.2	7.9	8.6
AC-FT	850	1,280	2,250	1,450	179	260	1,470	1,350	1,040	2,640	1,350	1,460

CAL YR 1969 TOTAL 12,585.1 MEAN 34.5 MAX 1,050 MIN 2.1 AC-FT 24,960
WTR YR 1970 TOTAL 7,856.82 MEAN 21.5 MAX 243 MIN .96 AC-FT 15,580

PEAK DISCHARGE (BASE, 700 CFS).--Dec. 24 (2330) 1,680 cfs (6.09 ft); July 25 (2100) 1,320 cfs (5.49 ft).

16208500 Right Branch of South Fork Kaukonahua Stream near Wahiawa

LOCATION.--Lat 21°29'58", long 157°59'07", Oahu, on left bank 500 ft downstream from Ku Tree Reservoir spillway, 1 mile upstream from mouth, and 3.1 miles east of Wahiawa Post Office.

DRAINAGE AREA.--0.86 sq mi.

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

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 980 ft (from topographic map).

AVERAGE DISCHARGE (since termination of upstream diversions).--10 years (1960-70), 2.03 cfs (1,470 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 954 cfs July 25 (gage height, 5.64 ft), from rating curve extended above 170 cfs; no flow for many days.
Period of record: Maximum discharge, 3,160 cfs Jan. 5, 1968 (gage height, 7.68 ft), from rating curve extended above 170 cfs; no flow at times.

REMARKS.--Records fair. Prior to 1960, diversions from reservoirs above station for use at Schofield Barracks. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEAR).--WSP 1937: 1960(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	.11	.64	5.0	.74	.31	0	1.7	.37	1.5	2.3	14
2	1.2	.10	.38	3.0	.74	.12	.36	.96	.13	1.0	3.4	2.6
3	.96	.17	.57	10	.64	0	4.6	.84	.17	1.6	1.5	1.4
4	.77	.27	.85	6.0	.69	0	.93	.61	.07	1.7	1.2	1.7
5	.66	1.2	.53	3.0	.58	.02	1.5	.34	.02	.64	1.5	8.2
6	.68	20	.44	2.5	.70	0	.38	.02	.04	.83	.80	7.6
7	.58	8.1	.56	2.0	.43	0	.67	.02	.01	2.4	2.3	2.8
8	.55	5.2	1.2	1.8	.33	.08	.19	.22	0	6.7	2.0	4.6
9	.59	1.3	1.6	1.6	.76	0	.07	1.3	0	1.7	1.5	2.3
10	.61	.81	1.1	1.5	.95	0	.03	12	0	2.9	1.0	1.6
11	1.8	.46	.35	7.0	.38	0	.03	2.8	0	4.5	.70	1.1
12	9.3	1.2	.43	4.0	.20	0	.15	.95	0	5.7	.60	.96
13	1.5	.97	.49	2.2	.55	0	.09	.39	0	4.0	1.0	.82
14	.64	6.2	.65	9.0	1.8	0	0	.28	0	3.0	1.7	1.5
15	1.3	2.5	.31	2.5	1.0	0	.01	1.1	0	1.4	1.2	1.6
16	.81	.83	.29	1.9	.49	0	.69	2.9	1.7	1.1	1.5	1.1
17	.61	.60	.23	1.6	.03	0	2.0	1.2	3.6	1.0	2.0	11
18	.45	.43	.21	1.5	.15	.29	2.6	.55	.29	.93	1.0	37
19	.77	.35	.37	1.4	.22	.43	.75	.25	.08	.67	.70	9.3
20	.45	.50	.42	1.1	.22	.49	.11	.03	6.1	.30	.60	5.6
21	2.8	10	.13	.93	.29	.06	.46	.12	6.3	.35	.50	2.4
22	.75	5.5	.11	.93	.37	.01	1.6	.03	2.0	.53	.80	3.5
23	.38	2.4	.12	.75	.51	.03	.81	.03	1.1	1.9	.45	2.0
24	.39	1.9	7.6	1.1	.09	.04	.24	.28	4.5	2.5	1.0	1.6
25	.29	5.6	23	1.1	.05	0	.01	.48	2.3	121	2.2	1.2
26	.27	2.0	3.7	.81	.12	0	4.4	13	1.1	42	2.6	1.1
27	.31	.87	27	1.4	.08	0	9.2	5.7	3.3	4.3	1.5	1.1
28	.37	.83	14	4.0	.02	0	11	5.3	1.5	3.7	.84	.97
29	.26	.54	13	1.4	------	0	6.8	.83	4.4	2.0	.42	.85
30	.14	.47	7.0	.88	------	0	2.8	.39	2.8	2.6	1.5	.78
31	.13	------	3.8	.77	------	0	------	.51	------	1.8	1.2	------
TOTAL	31.92	81.41	111.08	82.67	13.13	1.88	52.48	55.13	41.88	226.25	41.51	132.28
MEAN	1.03	2.71	3.58	2.67	.47	.061	1.75	1.78	1.40	7.30	1.34	4.41
MAX	9.3	20	27	10	1.8	.49	11	13	6.3	121	3.4	37
MIN	.13	.10	.11	.75	.02	0	0	.02	0	.30	.42	.78
AC-FT	63	161	220	164	26	3.7	104	109	83	449	82	262

CAL YR 1969 TOTAL 1,485.55 MEAN 4.07 MAX 120 MIN .06 AC-FT 2,950
WTR YR 1970 TOTAL 871.62 MEAN 2.39 MAX 121 MIN 0 AC-FT 1,730

16210900 Poamoho tunnel near Wahiawa

LOCATION.--Lat 21°31'12", long 157°58'51", Oahu, on left bank 5 ft downstream from tunnel outlet and 3.6 miles northeast of Wahiawa Post Office.

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

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

AVERAGE DISCHARGE.--12 years, 5.72 cfs (4,140 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 265 cfs Mar. 16, 1968; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	.78	1.4	14	2.2	.44	.03	2.3	.04	.05	7.1	.03
2	1.9	.70	1.2	6.6	1.9	.41	.04	2.3	.04	.04	6.6	.03
3	1.5	.66	1.1	53	1.8	.22	.39	3.2	.04	.04	6.6	.03
4	1.4	.74	1.2	21	2.1	.01	.02	.04	.05	.05	4.8	.03
5	1.3	.78	1.1	8.9	1.8	.01	.02	.03	.05	.05	4.2	.04
6	1.2	6.0	.88	9.6	1.5	.01	.02	.03	.05	.05	3.5	.04
7	1.1	8.1	.83	5.6	1.4	.01	.02	.03	.05	.05	5.4	.05
8	1.1	15	5.8	5.0	1.7	.02	.02	.03	.05	1.2	9.7	2.7
9	1.0	7.6	5.2	5.1	1.7	.02	.03	.03	.05	2.5	4.7	.02
10	.98	1.8	2.4	3.5	2.2	.02	.07	2.4	.05	14	2.8	.02
11	11	1.1	1.3	35	1.3	.02	.02	1.4	3.4	25	2.4	.03
12	64	2.8	.93	15	1.1	.02	2.8	3.1	3.5	5.0	2.2	.03
13	5.0	2.2	.88	9.6	1.1	.02	.02	14	.70	12	1.0	.02
14	2.7	12	3.7	51	3.4	.02	.02	3.1	9.1	11	0	.02
15	2.2	3.5	1.1	7.1	2.2	.03	.02	.03	.05	.06	0	.03
16	1.8	1.4	.74	5.1	1.1	4.8	.03	.04	.05	.03	0	.04
17	1.5	.98	.62	4.4	.88	.71	.02	.05	.04	.04	0	.03
18	1.3	.88	.58	3.8	.83	1.7	.02	.05	.04	.11	0	.66
19	2.4	.74	.58	3.4	.78	.02	.02	.05	.04	.03	0	6.5
20	2.7	.70	.58	3.2	.74	.03	.03	.05	14	.03	0	2.4
21	18	63	.47	3.0	.62	.03	.03	.06	32	.03	0	.03
22	3.3	38	.41	2.8	.58	.03	.04	16	1.6	.03	0	.03
23	1.8	15	.35	2.6	.54	.03	.04	.05	.04	4.2	0	.03
24	1.4	4.5	35	2.4	.50	.03	.04	.03	5.1	.89	0	.03
25	1.2	6.6	61	2.7	.54	.04	.03	1.6	1.2	64	0	.03
26	1.2	3.5	47	2.3	.58	.04	10	15	.05	79	7.0	.03
27	1.1	2.3	97	43	.47	.04	10	.72	11	17	.20	.03
28	.98	1.9	49	15	.41	.04	.04	.04	2.6	15	.58	.04
29	.88	1.6	22	5.8	------	.04	.06	.16	17	9.3	.02	.04
30	.83	1.4	12	3.3	------	.04	1.9	.05	3.4	9.7	11	.04
31	.83	------	7.3	2.6	------	.03	------	8.7	------	7.7	.02	------
TOTAL	139.70	206.26	363.65	355.4	35.97	8.93	25.84	74.67	105.38	278.18	79.82	13.08
MEAN	4.51	6.88	11.7	11.5	1.28	.29	.86	2.41	3.51	8.97	2.57	.44
MAX	64	63	97	53	3.4	4.8	10	16	32	79	11	6.5
MIN	.83	.66	.35	2.3	.41	.01	.02	.03	.04	.03	0	.02
AC-FT	277	409	721	705	71	18	51	148	209	552	158	26

CAL YR 1969 TOTAL 3,531.71 MEAN 9.68 MAX 97 MIN .35 AC-FT 7,010
WTR YR 1970 TOTAL 1,686.88 MEAN 4.62 MAX 97 MIN 0 AC-FT 3,350

16211000 Poamoho Stream near Wahiawa

LOCATION.--Lat 21°31'24", long 157°58'55", Oahu, on left bank 180 ft downstream from Poamoho tunnel intake and 3.7 miles northeast of Wahiawa Post Office.

DRAINAGE AREA.--1.79 sq mi.

PERIOD OF RECORD.--January 1947 to current year.

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

AVERAGE DISCHARGE.--23 years, 4.07 cfs (2,950 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,540 cfs July 25 (gage height, 10.11 ft), from rating curve extended as explained below; no flow part of each day Feb. 10, 12-14, 23.
Period of record: Maximum discharge, 3,630 cfs Mar. 16, 1968 (gage height, 10.32 ft), from rating curve extended above 75 cfs on basis of slope-area measurement at gage height 7.26 ft; no flow at times.

REMARKS.--Records good. Poamoho tunnel (see sta 16210900) diverts 180 ft above station to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1959(M). WRD Hawaii 1967: 1966(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.03	.04	.02	.02	.04	.49	8.6	2.6	4.6	.10	5.5
2	.01	.03	.03	.03	.02	.04	8.0	11	2.5	3.4	.15	2.6
3	.01	.03	.01	2.9	.02	.28	16	8.4	2.1	3.0	.18	1.9
4	.02	.03	.02	.07	.02	.43	2.9	5.4	1.6	3.4	.19	1.7
5	.03	.04	.04	.01	.02	.39	5.8	3.6	1.5	2.4	.16	2.2
6	.03	.05	.04	.01	.02	.38	1.7	2.9	1.5	2.2	.16	2.4
7	.02	.05	.05	.02	.01	.35	1.2	2.9	1.6	2.5	.21	1.9
8	.01	.01	.06	.03	.01	.35	.88	2.5	1.3	6.2	.12	9.0
9	.02	.01	.03	.05	.02	.32	3.4	2.9	1.1	5.5	.10	2.5
10	.02	.01	.04	.04	.04	.31	14	6.0	1.1	8.9	.10	1.8
11	.03	.01	.05	.19	.03	.32	3.0	6.4	4.0	8.2	.08	1.6
12	.21	.02	.06	.01	.04	.34	25	5.9	4.3	7.9	.12	3.2
13	.01	.01	.07	.02	.06	.30	7.5	8.7	4.7	8.2	1.6	1.4
14	.01	.02	.04	.52	.03	.25	6.9	7.2	5.5	8.2	2.8	1.2
15	.01	.01	.06	.01	.01	3.4	3.0	4.3	3.3	5.9	2.2	1.5
16	.01	.01	.06	.01	.01	27	6.6	3.2	3.2	4.4	2.2	1.3
17	.01	.01	.04	.01	.02	12	2.9	2.9	2.2	5.0	3.0	2.2
18	.02	.01	.04	.01	.03	15	2.8	2.3	1.5	5.1	2.1	11
19	.02	.01	.06	.02	.03	2.9	2.0	2.0	1.3	3.3	1.7	12
20	.02	.01	.09	.03	.01	1.4	5.5	1.8	4.4	2.8	1.6	13
21	.03	24	.08	.02	.02	.97	6.9	3.4	8.7	2.6	1.4	5.2
22	.01	1.6	.04	.02	.02	.96	2.9	7.7	6.8	2.9	1.2	3.7
23	.01	.01	.06	.02	.02	.75	2.5	3.7	4.3	5.8	1.2	2.6
24	.01	.01	27	.02	.01	.56	2.1	2.3	6.4	6.4	5.0	1.8
25	.01	.01	18	.02	.02	.46	2.7	4.3	6.8	397	4.0	1.5
26	.01	.01	1.6	.02	.03	.44	7.9	6.9	4.4	70	20	1.2
27	.01	.01	9.8	1.7	.03	.46	13	5.5	6.7	.06	14	1.2
28	.01	.01	.26	.20	.02	.38	7.1	3.5	6.7	.07	6.6	1.1
29	.01	.02	.04	.02	------	.30	7.7	3.4	8.0	.07	4.3	.93
30	.02	.02	.01	.02	------	.31	8.3	2.5	7.0	.09	13	.92
31	.02	------	.01	.02	------	.39	------	5.4	------	.08	3.5	------
TOTAL	.68	26.11	57.83	6.09	.64	71.78	180.67	147.5	117.1	586.17	93.07	100.05
MEAN	.022	.87	1.87	.20	.023	2.32	6.02	4.76	3.90	18.9	3.00	3.34
MAX	.21	24	27	2.9	.06	27	25	11	8.7	397	20	13
MIN	.01	.01	.01	.01	.01	.04	.49	1.8	1.1	.06	.08	.92
AC-FT	1.4	52	115	12	1.3	142	358	293	232	1,160	185	198

CAL YR 1969 TOTAL 1,928.17 MEAN 5.28 MAX 620 MIN .01 AC-FT 3,820
WTR YR 1970 TOTAL 1,387.69 MEAN 3.80 MAX 397 MIN .01 AC-FT 2,750

16-211600 Makaha Stream near Makaha

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

DRAINAGE AREA.--2.31 sq mi.

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

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

AVERAGE DISCHARGE.--11 years, 2.18 cfs (1,580 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 641 cfs Dec. 27 (gage height, 4.97 ft), from rating curve extended as explained below; minimum, 0.08 cfs Sept. 29, 30.
Period of record: Maximum discharge, 1,170 cfs Mar. 13, 1962 (gage height, 6.50 ft, from floodmarks), from rating curve extended above 51 cfs on basis of slope-area measurement of peak flow; no flow at times.
Maximum stage known since at least 1953, about 7.8 ft Nov. 24, 1954, from information by local resident (discharge, about 1,700 cfs).

REMARKS.--Records good. Wells and water-development tunnels in the vicinity and above the station may affect low-flow records. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.27	.27	.99	4.2	1.2	.99	.50	.50	.24	.27	.21	.15
2	.50	.27	.60	3.5	1.1	.92	.72	.45	.24	.24	.18	.13
3	.78	.24	1.8	85	1.1	.92	.85	.45	.24	.24	.18	.10
4	.45	.27	2.4	25	1.1	.85	.66	.60	.24	.24	.18	.10
5	.40	.27	1.1	12	1.1	.85	1.1	.55	.24	.21	.15	.10
6	.31	.72	.72	12	.99	.85	.72	.50	.24	.21	.18	.10
7	.27	.55	.55	6.5	.92	.78	.66	.45	.24	.18	.18	.10
8	.24	.78	.50	5.5	.92	.72	.60	.45	.24	.18	.15	.13
9	.24	.50	.85	4.6	8.6	.72	.55	.40	.24	.18	.18	.13
10	.24	.45	.72	3.2	6.3	.72	.50	.55	.24	.14	.18	.18
11	.93	.40	.55	30	2.6	.72	2.7	.78	.24	.24	.15	.18
12	5.9	2.4	.45	16	2.0	.72	2.1	.60	.24	.78	.15	.21
13	1.6	1.6	.40	13	2.2	.66	1.2	.55	.24	.50	.15	.24
14	1.1	7.5	.85	43	8.8	.66	.78	.45	.24	.45	.15	.18
15	.72	3.3	.55	14	5.5	.66	.66	.40	.24	.40	.15	.18
16	.60	1.8	.40	8.4	3.2	.66	.60	.35	.24	.31	.15	.15
17	.50	1.3	.35	6.2	2.5	.66	.50	.31	.21	.31	.15	.15
18	.45	1.1	.31	4.8	2.1	.72	.45	.31	.21	.27	.15	.13
19	.40	.92	.66	4.0	1.9	.66	.45	.31	.21	.27	.15	.13
20	.35	.78	.78	3.3	1.7	.66	.45	.27	.24	.24	.15	.13
21	.55	.72	.50	3.2	1.5	.66	.45	.31	.27	.24	.15	.21
22	.50	.60	.45	3.7	1.4	.85	.45	.31	.27	.24	.15	.24
23	.40	.60	.40	2.4	1.3	.78	.60	.31	.31	.21	.15	.21
24	.35	.55	1.1	2.2	1.2	.72	.55	.31	.31	.21	.15	.18
25	.31	.72	2.4	4.5	1.1	.66	.50	.27	.31	.24	.15	.15
26	.31	.66	1.1	2.5	1.1	.60	.45	.27	.80	.24	.15	.15
27	.31	.50	90	1.9	1.1	.55	.50	.24	.72	.27	.15	.13
28	.45	.45	35	1.7	1.1	.55	.78	.24	.40	.27	.15	.13
29	.40	.40	10	1.6	------	.55	.99	.24	.35	.27	.24	.10
30	.35	.40	5.7	1.5	------	.55	.60	.24	.31	.24	.15	.10
31	.31	------	4.4	1.3	------	.50	------	.24	------	.21	.15	------
TOTAL	20.49	31.02	166.58	330.7	65.63	22.07	22.62	12.21	8.76	8.50	5.01	4.50
MEAN	.66	1.03	5.37	10.7	2.34	.71	.75	.39	.29	.27	.16	.15
MAX	5.9	7.5	90	85	8.8	.99	2.7	.78	.80	.78	.24	.24
MIN	.24	.24	.31	1.3	.92	.50	.45	.24	.21	.14	.15	.10
AC-FT	41	62	330	656	130	44	45	24	17	17	9.9	8.9

CAL YR 1969 TOTAL 773.50 MEAN 2.12 MAX 90 MIN .24 AC-FT 1,530
WTR YR 1970 TOTAL 698.09 MEAN 1.91 MAX 90 MIN .10 AC-FT 1,380

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	1800	4.97	641	1-11	1930	3.46	215
1- 3	1600	3.85	312	1-14	0030	3.28	176

16211800 Kaupuni Stream at altitude 374 ft, near Waianae

LOCATION.--Lat 21°28'20", long 158°09'26", Oahu, on right bank at diversion dam, 2.6 miles northeast of Waianae Cemetery, and 2.8 miles northeast of junction of Waianae Valley Road and Farrington Highway.

DRAINAGE AREA.--3.58 sq mi.

PERIOD OF RECORD.--May 1960 to current year.

GAGE.--Water-stage recorder and concrete-masonry control. Datum of gage is 374 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--10 years, 1.18 cfs (855 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 301 cfs Jan. 11 (gage height, 3.39 ft); minimum, 0.02 cfs Sept. 23, 25-29.
Period of record: Maximum discharge, 1,340 cfs Dec. 23, 1964 (gage height, 4.75 ft), from rating curve extended above 160 cfs on basis of slope-area measurement at gage height 4.06 ft; no flow at times.

REMARKS.--Records good. Several water-development tunnels above station may affect flow. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.30	.22	.30	1.8	.52	.46	.38	.31	.21	.14	.13	.08
2	.33	.21	.30	1.1	.49	.45	.38	.31	.20	.14	.13	.08
3	.28	.21	.30	31	.66	.45	.39	.33	.21	.14	.12	.07
4	.26	.21	.30	10	.65	.45	.38	.38	.22	.14	.12	.08
5	.26	.22	.30	2.7	.49	.45	.35	.37	.21	.14	.13	.08
6	.26	.24	.26	3.3	.50	.44	.35	.35	.21	.14	.14	.08
7	.24	.24	.26	1.5	.50	.43	.36	.32	.20	.14	.14	.07
8	.24	.21	.30	1.0	.51	.43	.36	.31	.20	.14	.12	.08
9	.24	.21	.30	.85	1.2	.44	.51	.29	.21	.14	.11	.08
10	.26	.21	.30	.63	1.3	.46	.62	.30	.20	.14	.13	.09
11	.33	.21	.30	39	.59	.47	1.7	.31	.20	.16	.13	.09
12	.46	.23	.30	18	.56	.45	.64	.30	.21	.15	.09	.08
13	.51	.22	.26	8.0	.59	.43	.52	.30	.20	.14	.10	.09
14	.51	5.0	.26	40	1.7	.43	.48	.30	.20	.14	.10	.09
15	.53	1.1	.26	9.0	.85	.44	.46	.29	.19	.14	.10	.07
16	.50	.51	.26	4.8	.64	.43	.44	.28	.19	.14	.09	.07
17	.49	.42	.26	3.4	.73	.42	.44	.28	.19	.14	.08	.08
18	.39	.38	.26	2.6	.56	.47	.42	.28	.19	.14	.07	.07
19	.24	.34	.30	2.1	.53	.44	.43	.27	.19	.13	.08	.07
20	.24	.34	.26	1.6	.52	.44	.50	.28	.17	.14	.07	.07
21	.25	.34	.23	1.3	.50	.43	.50	.28	.17	.14	.07	.06
22	.24	.30	.23	1.1	.49	.44	.51	.28	.17	.14	.08	.06
23	.24	.30	.23	.84	.47	.43	.43	.28	.17	.15	.07	.05
24	.24	.30	.26	.76	.47	.40	.36	.26	.17	.14	.09	.05
25	.23	.30	.26	1.5	.46	.40	.36	.27	.17	.15	.08	.05
26	.23	.30	.26	.86	.46	.37	.36	.25	.17	.14	.09	.04
27	.24	.30	39	.70	.46	.38	.34	.24	.17	.14	.08	.03
28	.26	.30	14	.63	.45	.39	.34	.23	.14	.14	.07	.05
29	.25	.30	1.4	.57	------	.39	.37	.23	.17	.13	.08	.05
30	.24	.30	.57	.53	------	.38	.33	.23	.14	.13	.08	.04
31	.25	------	.53	.52	------	.37	------	.22	------	.13	.08	------
TOTAL	9.54	13.97	62.61	191.69	17.85	13.26	14.01	8.93	5.64	4.35	3.05	2.05
MEAN	.31	.47	2.02	6.18	.64	.43	.47	.29	.19	.14	.098	.068
MAX	.53	5.0	39	40	1.7	.47	1.7	.38	.22	.16	.14	.09
MIN	.23	.21	.23	.52	.45	.37	.33	.22	.14	.13	.07	.03
AC-FT	19	28	124	380	35	26	28	18	11	8.6	6.1	4.1

CAL YR 1969 TOTAL 647.32 MEAN 1.77 MAX 113 MIN .21 AC-FT 1,280
WTR YR 1970 TOTAL 346.95 MEAN .95 MAX 40 MIN .03 AC-FT 688

PEAK DISCHARGE (BASE, 90 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	1915	3.09	192	1-11	1945	3.39	301
1- 3	1600	2.92	145	1-14	0330	2.97	158

16212800 Kipapa Stream near Wahiawa

LOCATION.--Lat 21°28'15", long 157°57'50", Oahu, on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 miles southeast of Wahiawa Post Office, and 6.3 miles northeast of Waipahu.

DRAINAGE AREA.--4.29 sq mi.

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

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

AVERAGE DISCHARGE.--13 years, 11.3 cfs (8,190 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,440 cfs Dec. 24 (gage height, 7.97 ft), from rating curve extended as explained below; minimum, 0.12 cfs Mar. 29, 30.
Period of record: Maximum discharge, 5,680 cfs May 14, 1963 (gage height, 12.29 ft), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 7.96 and 12.29 ft; no flow at times.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	.50	.94	29	2.1	.29	.60	5.3	2.2	8.6	8.3	14
2	2.6	.46	.82	16	1.7	.26	3.0	44	1.6	4.9	8.0	4.7
3	2.5	.42	.70	54	1.5	.23	22	30	1.3	3.9	4.7	2.6
4	1.4	.42	.76	21	1.5	.21	4.5	8.6	1.1	4.5	3.0	2.0
5	1.2	.55	.65	11	1.3	.19	3.0	6.0	.94	2.7	2.5	2.2
6	1.1	21	.60	10	1.1	.23	1.7	3.2	.88	1.8	2.1	7.0
7	.88	8.5	.55	6.0	1.0	.23	.88	2.3	.76	2.0	2.3	4.1
8	.82	14	1.7	4.7	.94	.19	.55	1.8	.70	11	6.9	39
9	.82	3.0	12	3.9	.88	.17	.38	1.6	.60	3.7	5.1	6.2
10	.70	1.6	3.9	3.2	1.4	.17	.76	14	.55	4.7	1.8	4.3
11	13	1.1	1.3	32	1.1	.19	7.5	11	.65	28	1.5	2.6
12	108	2.1	.76	17	.70	.23	58	9.0	.82	12	1.4	2.9
13	12	9.5	.76	6.0	.76	.21	16	27	1.0	13	1.6	1.8
14	4.7	9.4	13	37	2.1	.17	5.8	6.5	3.5	7.4	2.1	2.9
15	3.5	8.0	1.6	8.9	2.7	2.1	2.9	8.5	1.8	3.7	2.2	3.5
16	3.2	2.9	.88	5.3	.94	7.8	2.6	3.7	1.0	2.6	1.6	1.6
17	2.0	1.6	.65	4.1	.60	3.2	3.7	3.5	.70	2.7	1.7	1.6
18	1.5	1.1	.55	3.3	.55	11	3.9	2.0	.50	8.3	1.2	11
19	1.3	.82	.50	2.7	.50	2.9	1.8	1.5	.38	2.7	.94	12
20	1.3	.70	.46	2.3	.46	.94	43	1.3	27	1.6	.94	26
21	18	21	.38	2.2	.50	.50	22	1.5	29	1.3	.82	8.9
22	4.9	29	.35	2.1	.50	.46	12	31	18	1.3	.76	5.5
23	1.8	25	.32	1.5	.55	.32	5.1	4.7	6.8	16	.65	4.1
24	1.2	5.5	84	1.4	.55	.21	3.9	2.2	19	28	1.8	2.9
25	.94	3.9	105	1.5	.76	.17	3.9	3.5	8.3	207	3.5	2.2
26	.82	4.3	46	1.3	.65	.15	5.5	37	5.3	138	55	1.5
27	.70	2.0	124	114	.35	.15	12	9.6	9.2	18	45	1.3
28	.65	1.3	83	20	.29	.15	9.9	4.5	4.5	27	6.8	1.1
29	.60	1.1	86	8.3	------	.12	7.4	8.2	39	8.9	5.5	.94
30	.60	.94	32	4.1	------	.15	4.9	3.7	24	12	19	.82
31	.55	------	16	2.7	------	.29	------	3.3	------	8.6	5.1	------
TOTAL	195.58	181.71	620.13	436.5	27.98	33.58	269.17	300.0	211.08	595.9	203.81	181.26
MEAN	6.31	6.06	20.0	14.1	1.00	1.08	8.97	9.68	7.04	19.2	6.57	6.04
MAX	108	29	124	114	2.7	11	58	44	39	207	55	39
MIN	.55	.42	.32	1.3	.29	.12	.38	1.3	.38	1.3	.65	.82
AC-FT	388	360	1,230	866	56	67	534	595	419	1,180	404	360

CAL YR 1969 TOTAL 5,413.87 MEAN 14.8 MAX 594 MIN .32 AC-FT 10,740
WTR YR 1970 TOTAL 3,256.70 MEAN 8.92 MAX 207 MIN .12 AC-FT 6,460

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-24	2230	7.97	1,440	7-25	2030	7.81	1,360
1-27	0600	7.08	1,010				

16213000 Waikele Stream at Waipahu

LOCATION.--Lat 21°23'09", long 158°00'48", Oahu, on left bank 300 ft upstream from bridge on Highway 90 and 0.3 mile southwest of sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 sq mi.

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

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

AVERAGE DISCHARGE.--17 years (1952-59, 1960-70), 38.9 cfs (28,180 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,410 cfs July 25 (gage height, 6.84 ft); minimum, 5.7 cfs Sept. 29, 30.
Period of record: Maximum discharge, 13,600 cfs Nov. 28, 1954 (gage height, 14.82 ft, site and datum then in use), from rating curve extended above 730 cfs on basis of slope-area measurement of peak flow; minimum, 3.7 cfs Sept. 28, 29, 1962.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Diversions above station for irrigation of sugarcane in vicinity of Waipahu. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1639: 1955(M). WSP 1937: Drainage area. WRD Hawaii 1967: 1966.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	16	37	77	39	18	25	19	13	20	19	9.9
2	17	18	35	66	39	18	24	34	12	17	19	12
3	18	18	28	89	38	17	38	70	11	12	18	9.4
4	17	17	24	105	37	18	41	40	10	13	18	8.6
5	17	18	26	60	36	17	32	22	10	11	16	8.3
6	18	35	34	61	35	20	26	18	9.8	10	16	7.4
7	15	55	30	50	31	19	22	16	9.7	12	15	7.4
8	15	39	24	45	31	16	22	15	9.5	25	12	34
9	15	28	25	44	34	19	20	14	9.2	17	20	27
10	15	24	34	42	36	20	19	15	9.1	20	12	12
11	15	24	26	118	35	19	18	34	9.0	45	9.4	9.6
12	160	37	24	121	35	18	126	24	9.1	25	8.0	8.0
13	61	43	29	57	35	18	61	42	10	14	8.6	6.6
14	28	147	31	130	36	18	37	27	16	16	7.7	6.1
15	22	68	24	64	35	18	30	21	13	13	7.7	7.0
16	20	48	24	50	36	20	24	19	11	12	7.2	8.6
17	20	43	24	48	30	19	17	16	10	11	8.6	8.0
18	18	41	21	46	21	22	19	14	8.9	11	9.4	7.2
19	18	41	20	45	19	34	20	13	8.8	16	8.0	15
20	16	40	33	44	22	22	56	12	45	11	7.4	31
21	31	41	33	44	22	20	43	11	28	10	9.8	27
22	30	71	26	45	24	20	34	26	40	16	8.3	14
23	20	92	26	45	24	18	22	29	25	16	8.0	12
24	18	53	31	47	21	18	18	16	31	35	7.4	10
25	17	44	387	48	22	21	17	12	25	347	7.4	8.3
26	17	46	96	44	21	20	28	37	15	562	24	7.4
27	20	42	175	188	19	22	27	36	18	51	85	6.6
28	20	38	253	73	17	22	29	21	14	78	20	5.9
29	17	38	202	60	------	22	26	18	64	43	11	5.7
30	16	37	100	44	------	20	22	20	35	28	14	5.9
31	16	------	70	40	------	20	------	15	------	31	14	------
TOTAL	764	1,302	1,952	2,040	830	613	943	726	539.1	1,548	455.9	345.9
MEAN	24.6	43.4	63.0	65.8	29.6	19.8	31.4	23.4	18.0	49.9	14.7	11.5
MAX	160	147	387	188	39	34	126	70	64	562	85	34
MIN	15	16	20	40	17	16	17	11	8.8	10	7.2	5.7
AC-FT	1,520	2,580	3,870	4,050	1,650	1,220	1,870	1,440	1,070	3,070	904	686

CAL YR 1969 TOTAL 25,362 MEAN 69.5 MAX 2,410 MIN 15 AC-FT 50,310
WTR YR 1970 TOTAL 12,058.9 MEAN 33.0 MAX 562 MIN 5.7 AC-FT 23,920

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-14	1400	4.62	1,200	7-25	2230	6.84	3,410
12-25	0300	4.83	1,380				

NOTE.--No gage-height record June 1 to July 12.

16216000 Waiawa Stream near Pearl City

LOCATION.--Lat 21°23'55", long 157°58'50", Oahu, on left bank 100 ft upstream from lower bridge on Highway 90, 0.6 mile northwest of Pearl City, and 2.0 miles northeast of Waipahu.

DRAINAGE AREA.--26.4 sq mi.

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

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

AVERAGE DISCHARGE.--18 years, 32.4 cfs (23,470 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 15,400 cfs July 25 (gage height, 18.10 ft), from rating curve extended as explained below; minimum, 3.6 cfs Oct. 8.
Period of record: Maximum discharge, 23,400 cfs Jan. 5, 1968 (gage height, 20.56 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 17.1 and 20.56 ft; minimum, 2.0 cfs June 11, 12, 1965.

REMARKS.--Records fair. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversions and return flows above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	6.9	5.1	58	6.5	5.3	4.9	10	6.9	24	16	13
2	9.1	7.9	5.1	33	5.8	4.9	4.9	21	7.2	13	13	12
3	9.1	6.7	5.8	132	5.5	6.0	5.5	24	7.4	9.4	13	7.4
4	7.6	5.3	5.3	61	5.3	6.5	6.0	19	6.2	10	9.7	6.7
5	7.4	6.2	4.9	30	5.3	8.2	6.9	9.1	6.0	8.2	8.8	6.5
6	7.2	37	5.1	48	5.3	7.9	5.3	6.7	5.5	6.2	7.2	6.0
7	6.0	30	5.1	22	4.7	7.2	5.5	6.0	5.3	6.0	6.2	5.8
8	5.1	21	5.8	15	4.7	6.9	5.3	6.0	5.3	13	5.8	30
9	6.5	14	5.8	12	5.1	6.0	6.0	5.5	6.2	12	10	19
10	6.2	9.7	7.9	9.7	4.9	5.5	5.8	5.5	6.7	8.8	6.2	9.1
11	7.6	9.4	6.9	13	4.5	5.1	6.0	18	6.5	54	5.1	6.5
12	316	35	7.5	37	4.9	5.1	82	12	5.8	33	5.3	6.2
13	34	50	6.9	14	4.9	5.3	29	30	4.9	26	4.9	6.2
14	15	222	6.9	87	6.0	4.9	13	18	4.7	30	4.7	6.7
15	11	65	7.9	29	5.3	4.9	8.5	14	4.3	18	4.9	6.5
16	9.1	24	7.2	16	5.3	5.3	7.4	10	4.9	12	5.1	6.0
17	6.5	14	5.5	12	5.8	5.8	9.1	6.9	5.5	9.1	4.9	5.8
18	6.2	10	5.1	10	5.8	6.2	8.5	6.6	5.3	12	4.7	4.9
19	6.5	8.5	5.3	8.2	5.5	7.2	8.8	5.1	5.3	10	4.7	6.5
20	7.6	7.6	5.1	7.2	6.0	6.5	71	5.3	8.2	6.0	5.8	22
21	47	109	4.9	6.9	6.2	6.0	26	5.5	35	5.3	5.3	17
22	19	78	6.0	6.2	6.2	5.5	19	5.3	20	5.5	5.5	9.4
23	8.5	66	6.5	6.2	5.8	5.3	11	8.8	10	6.1	5.1	8.8
24	7.6	21	10	6.2	6.0	6.9	8.8	5.8	8.5	35	4.9	6.0
25	7.4	13	722	9.7	7.2	6.0	6.9	6.2	11	2,000	5.3	5.8
26	5.5	12	57	10	6.2	6.0	5.8	23	9.7	2,030	22	4.9
27	5.8	7.9	143	234	6.2	5.3	10	20	8.5	84	71	5.3
28	5.3	6.2	156	34	5.3	4.9	13	12	10	47	16	4.3
29	5.1	5.3	140	22	------	4.7	18	12	47	29	9.7	4.0
30	6.5	5.1	87	10	------	4.7	13	9.1	38	27	14	4.0
31	7.2	------	70	7.6	------	5.5	------	7.9	------	24	11	------
TOTAL	615.5	913.7	1,522.6	1,006.9	156.2	181.5	430.9	354.3	315.8	4,613.6	315.8	262.3
MEAN	19.9	30.5	49.1	32.5	5.58	5.85	14.4	11.4	10.5	149	10.2	8.74
MAX	316	222	722	234	7.2	8.2	82	30	47	2,030	71	30
MIN	5.1	5.1	4.9	6.2	4.5	4.7	4.9	5.1	4.3	5.3	4.7	4.0
AC-FT	1,220	1,810	3,020	2,000	310	360	855	703	626	9,150	626	520

CAL YR 1969 TOTAL 20,970.9 MEAN 57.5 MAX 3,270 MIN 3.4 AC-FT 41,600
WTR YR 1970 TOTAL 10,689.1 MEAN 29.3 MAX 2,030 MIN 4.0 AC-FT 21,200

PEAK DISCHARGE (BASE, 2,300 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-25	0130	10.07	3,810	7-25	2200	18.10	15,400
1-27	0700	8.76	2,780				

16223000 Waimalu Stream near Aiea

LOCATION.--Lat 21°23'34", long 157°57'03", Oahu, on right bank 350 ft downstream from bridge on Moanalua Road and 1.3 miles northwest of Aiea Post Office.

DRAINAGE AREA.--6.07 sq mi.

PERIOD OF RECORD.--January 1952 to June 1962, July 1963 to September 1970 (discontinued).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.97 ft above mean sea level. Prior to Feb. 21, 1961, at site 350 ft upstream at different datums and Feb. 21, 1961, to June 30, 1962, at present site at datum 0.13 ft lower than present datum.

AVERAGE DISCHARGE.--16 years (1952-61, 1963-70), 8.27 cfs (5,990 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,560 cfs July 25 (gage height, 5.13 ft), from rating curve extended as explained below; minimum, 0.05 cfs Oct. 8, 10.

Period of record: Maximum discharge, 8,020 cfs Jan. 5, 1968 (gage height, 6.82 ft), from rating curve extended above 1,200 cfs on basis of slope-area measurement at gage height 6.30 ft; no flow Sept. 25, Sept. 28 to Oct. 1, 1958.

Maximum discharge of flood of May 14, 1963, was 5,320 cfs, by slope-area measurement.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Some return of irrigation water above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.46	.40	9.5	.51	.23	.23	4.2	.27	4.9	3.3	2.7
2	.27	.37	.35	9.6	.50	.26	.23	8.6	.27	2.2	6.6	2.5
3	.23	.54	.33	93	.60	.23	.20	12	.24	1.4	4.4	1.0
4	.26	.51	.30	30	.41	.26	.21	3.8	.20	1.0	2.4	.39
5	.31	.63	.27	11	.43	.25	.26	1.4	.24	.57	1.4	.24
6	.20	8.4	.26	18	.33	.26	.40	.52	.39	.27	.80	.60
7	.19	6.4	.26	8.8	.23	.26	.19	.24	.18	.25	.62	.27
8	.18	3.5	.26	4.5	.23	.25	.22	.18	.26	.24	.30	.50
9	.19	1.9	.24	2.3	.44	.26	.17	.16	.40	.23	3.1	.27
10	.24	1.1	.50	.95	.26	.29	.20	.16	.26	.42	1.1	.25
11	.42	.81	.20	2.5	.24	.22	.63	.29	.19	15	.31	.22
12	72	15	.19	4.3	.25	.21	18	.86	.23	10	.25	.20
13	13	16	.36	3.5	.27	.21	8.0	5.1	.20	6.8	.23	.40
14	4.0	55	.25	45	.26	.22	2.6	2.8	.19	11	.26	.80
15	1.9	28	.22	12	.19	.20	1.1	1.5	.24	5.0	.40	1.1
16	1.2	7.0	.26	4.5	.36	.22	.45	1.3	.33	2.5	.23	.36
17	.79	3.4	.23	1.5	.26	.33	.33	.78	.19	1.2	.20	.28
18	.52	2.2	.22	1.1	.32	.29	.29	.64	.17	3.0	.17	1.8
19	.42	2.0	.23	.80	.22	.21	.24	.25	.17	2.2	.17	3.0
20	.42	2.0	.21	.70	.20	.21	18	.22	.30	.89	.17	4.5
21	28	19	.21	1.1	.20	.21	3.3	.21	13	.31	.15	2.0
22	7.7	24	.21	.60	.19	.20	1.5	.32	5.5	.27	.19	1.0
23	2.5	21	.21	.55	.18	.20	.46	1.5	1.8	1.9	.13	.70
24	1.3	5.8	7.0	.54	.23	.16	.27	.50	.66	22	.19	.50
25	.79	2.0	112	.53	.24	.20	.28	.24	.93	457	.14	.40
26	.42	1.0	25	.52	.37	.18	.24	6.5	3.0	241	5.6	.30
27	.46	.70	100	13	.57	.21	.22	5.8	2.5	26	18	.25
28	.39	.50	71	5.0	.23	.16	.24	2.8	2.0	12	3.4	.22
29	.40	.40	33	2.6	------	.14	3.4	1.5	12	6.5	6.4	.20
30	.38	.50	16	1.2	------	.17	4.4	.62	8.4	5.2	10	.18
31	.38	------	8.4	.60	------	.25	------	.33	------	4.0	3.7	------
TOTAL	139.78	230.12	378.57	289.79	8.72	6.95	66.26	65.32	54.71	845.25	74.31	27.13
MEAN	4.51	7.67	12.2	9.35	.31	.22	2.21	2.11	1.82	27.3	2.40	.90
MAX	72	55	112	93	.60	.33	18	12	13	457	18	4.5
MIN	.18	.37	.19	.52	.18	.14	.17	.16	.17	.23	.13	.18
AC-FT	277	456	751	575	17	14	131	130	109	1,680	147	54

CAL YR 1969 TOTAL 4,603.74 MEAN 12.6 MAX 365 MIN .18 AC-FT 9,130
WTR YR 1970 TOTAL 2,186.91 MEAN 5.99 MAX 457 MIN .13 AC-FT 4,340

PEAK DISCHARGE (BASE, 550 CFS).--Dec. 24 (about 2400) 680 cfs (2.75 ft); July 25 (2145) 4,560 cfs (5.13 ft).

NOTE.--No gage-height record Dec. 21 to Feb. 3.

16224500 Kalauao Stream at Moanalua Road, at Aiea

LOCATION.--Lat 21°23'07", long 157°56'22", Oahu, on left bank at downstream side of Moanalua Road bridge, 0.4 mile northwest of Aiea Post Office, and 2.3 miles southeast of Pearl City Post Office.

DRAINAGE AREA.--2.59 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 12.75 ft above mean sea level. Nov. 15, 1965, to June 16, 1966, at datum 1.00 ft lower.

AVERAGE DISCHARGE.--13 years, 3.03 cfs (2,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 900 cfs July 25 (gage height, 3.76 ft); no flow for many days. Period of record: Maximum discharge, 2,580 cfs May 14, 1963 (gage height, 6.63 ft), from rating curve extended above 77 cfs on basis of slope-area measurements at gage heights 6.29 and 6.63 ft; no flow for many days in 1970.

REMARKS.--Records poor. Some return of irrigation water above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.10	.09	4.3	.21	.09	.09	.33	.06	.47	.98	.15
2	.13	.10	.09	4.3	.21	.09	.09	1.7	.06	0	1.9	.03
3	.12	.10	.09	53	.20	.09	.07	3.3	.04	0	.95	0
4	.10	.10	.08	14	.19	.09	.07	1.0	.04	0	.26	0
5	.11	.26	.09	3.5	.18	.08	.13	.21	.05	0	.14	0
6	.12	1.1	.08	7.5	.17	.11	.29	.15	.06	0	.11	0
7	.09	1.3	.08	2.7	.17	.13	.29	.13	.06	0	.05	0
8	.09	.53	.08	1.2	.17	.08	.19	.11	.05	0	0	.01
9	.08	.21	.15	.61	.18	.08	.15	.09	.06	0	0	0
10	.08	.13	.21	.32	.16	.11	.08	.10	.08	0	0	0
11	.12	.12	.19	1.0	.16	.07	1.3	.10	.07	2.3	0	0
12	11	12	.17	2.3	.15	.06	3.7	.09	.07	.72	0	0
13	2.1	5.1	.21	1.3	.15	.09	1.8	.08	.06	.12	0	0
14	.38	23	.27	20	.17	.15	.19	.08	.06	1.2	0	0
15	.16	11	.25	3.3	.15	.09	.12	.09	.15	.33	0	0
16	.13	1.9	.23	1.2	.15	.07	.14	.10	.29	0	.02	0
17	.12	.60	.21	.63	.15	.06	.13	.07	.23	0	0	0
18	.11	.28	.19	.35	.13	.06	.13	.07	.12	0	0	0
19	.11	.19	.27	.26	.12	.06	.13	.07	.03	0	0	0
20	.11	.17	.23	.24	.19	.06	3.5	.07	.05	0	0	0
21	2.5	2.6	.17	.46	.13	.06	.30	.07	.05	0	0	0
22	1.2	4.5	.17	.23	.12	.06	.14	.07	.03	0	0	0
23	.19	3.1	.17	.24	.11	.06	.12	.07	.01	0	0	0
24	.13	.60	1.3	.21	.11	.08	.12	.07	0	6.0	0	0
25	.13	.17	35	.22	.11	.09	.12	.06	0	113	0	0
26	.14	.09	3.2	.20	.11	.09	.13	.07	0	128	2.5	0
27	.14	.08	37	4.4	.11	.10	.12	.05	0	8.4	4.2	0
28	.13	.08	33	1.9	.10	.09	.15	.05	0	4.6	.38	0
29	.11	.08	18	.81	------	.07	.18	.05	.08	2.1	.01	0
30	.10	.08	9.9	.27	------	.08	.33	.05	.46	2.7	2.0	0
31	.10	------	3.7	.21	------	.07	------	.05	------	2.1	.88	------
TOTAL	20.27	69.67	144.87	131.16	4.26	2.57	14.30	8.60	2.32	272.04	14.38	.19
MEAN	.65	2.32	4.67	4.23	.15	.083	.48	.28	.077	8.78	.46	.006
MAX	11	23	37	53	.21	.15	3.7	3.3	.46	128	4.2	.15
MIN	.08	.08	.08	.20	.10	.06	.07	.05	0	0	0	0
AC-FT	40	138	287	260	8.5	5.1	28	17	4.6	540	29	.4

CAL YR 1969 TOTAL 1,761.07 MEAN 4.82 MAX 250 MIN .04 AC-FT 3,490
WTR YR 1970 TOTAL 684.63 MEAN 1.88 MAX 128 MIN 0 AC-FT 1,360

PEAK DISCHARGE (BASE, 240 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-12	1815	2.43	267	7-25	2145	3.76	900
1- 3	1830	2.46	279				

16226000 North Halawa Stream near Aiea

LOCATION.--Lat 21°23'45", long 157°53'37", Oahu, on left bank 2.7 miles upstream from confluence with South Halawa Stream and 2.7 miles northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 sq mi.

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

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

AVERAGE DISCHARGE.--20 years (1929-32, 1953-70), 5.51 cfs (3,990 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,190 cfs July 25 (gage height, 12.24 ft), from rating curve extended above 44 cfs on basis of slope-area measurements at gage heights 10.3, 13.04 and 13.46 ft; no flow for many days.
Period of record: Maximum discharge, 6,650 cfs Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 420 cfs; maximum gage height, 13.46 ft May 14, 1963; no flow at times each year.

REMARKS.--Records good. Recording rain gage located at station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	0	.09	8.6	.39		0	.43	.09	1.8	3.7	1.3
2	.07	0	.06	7.5	.24		0	6.8	.05	.58	4.6	.94
3	.05	0	.03	119	.14		0	4.4	.03	.39	3.0	.58
4	.03	0	.02	32	.09		0	1.8	.02	.22	1.8	.43
5	.02	0	.02	11	.06		0	.63	.02	.10	1.1	.24
6	.01	.02	.01	16	.05		0	.39	.02	.06	.80	.14
7	.01	1.4	0	6.2	.03		0	.18	.01	.56	1.0	.09
8	0	1.6	0	3.6	.02		0	.09	0	2.2	1.2	1.0
9	0	.94	0	2.3	.02		0	.06	0	.87	2.0	1.0
10	0	.48	0	1.6	.01		0	.05	0	.39	1.0	.53
11	.37	.29	0	1.5	.01		0	.04	0	6.8	.70	.35
12	23	.49	0	3.1	.01		16	.04	0	3.7	.50	.18
13	3.8	.94	0	1.8	.01		6.2	.03	0	3.0	.60	.14
14	1.2	19	0	15	.01		1.8	.02	0	3.1	.90	.13
15	.53	8.8	0	4.8	0		.43	.02	0	1.9	1.0	.26
16	.35	2.8	0	2.5	0		.58	.06	0	1.0	.60	.20
17	.18	1.2	0	1.6	0		.43	.06	0	.63	.66	.11
18	.09	.74	0	1.1	0		.35	.04	0	1.2	.52	.10
19	.05	.48	0	.87	0		.22	.02	0	1.0	.45	1.3
20	.03	.26	0	.68	0		5.0	.02	0	.48	.43	4.0
21	6.0	8.7	0	.53	0		.74	.02	0	.26	.35	2.1
22	1.5	9.6	0	.43	0		.35	.01	0	.14	.30	1.8
23	.39	8.8	0	.29	0		.26	.01	0	.96	.25	1.4
24	.22	3.6	.17	.20	0		.14	.01	0	4.6	.70	.74
25	.10	1.7	55	.16	0		.08	0	0	233	3.0	.48
26	.06	1.0	8.8	.14	0		.06	.01	0	111	30	.32
27	.03	.63	71	8.3	0		.04	0	0	14	10	.16
28	.02	.43	75	9.7	0		.05	.04	0	12	5.0	.09
29	.01	.24	33	2.4	------		.06	.14	4.1	6.0	3.0	.06
30	.01	.13	20	.94	------		.16	.24	3.1	11	8.0	.04
31	0	------	7.7	.58	------		------	.18	------	7.5	1.8	------
TOTAL	38.23	74.27	270.90	264.42	1.09	0	32.95	15.84	7.44	430.44	88.96	20.21
MEAN	1.23	2.48	8.74	8.53	.039	0	1.10	.51	.25	13.9	2.87	.67
MAX	23	19	75	119	.39	0	16	6.8	4.1	233	30	4.0
MIN	0	0	0	.14	0	0	0	0	0	.06	.25	.04
AC-FT	76	147	537	524	2.2	0	65	31	15	854	176	40

CAL YR 1969 TOTAL 3,347.34 MEAN 9.17 MAX 326 MIN 0 AC-FT 6,640
WTR YR 1970 TOTAL 1,244.75 MEAN 3.41 MAX 233 MIN 0 AC-FT 2,470

PEAK DISCHARGE (BASE, 470 CFS).--Jan. 3 (1730) 487 cfs (8.59 ft); July 25 (2100) 2,190 cfs (12.24 ft).

16227500 Moanalua Stream near Kaneohe

LOCATION.--Lat 21°23'29", long 157°51'05", Oahu, on left bank 3.3 miles northeast of Tripler Hospital and 3.6 miles southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.94 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 820 cfs July 25 (gage height, 6.30 ft, from floodmark in well), from rating curve extended as explained below; no flow for many days.
Period of record: Maximum discharge, 1,200 cfs Feb. 1, 1969 (gage height, 6.99 ft), from rating curve extended above 18 cfs on basis of slope-area measurement at gage height 5.94 ft; no flow for many days each year.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage and evaporation pan located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	1.8	.30		0	0	0	.02	.87	.10
2	0	0	0	1.5	.25		0	1.5	0	0	.71	.06
3	0	0	0	101	.19		0	1.7	0	0	.55	0
4	0	0	0	7.0	.12		0	.75	0	0	.46	0
5	0	0	0	3.1	.04		0	.28	0	0	.41	0
6	0	0	0	6.1	0		0	0	0	0	.32	0
7	0	0	0	2.2	0		0	0	0	0	.25	0
8	0	0	0	1.4	0		0	0	0	0	.23	.41
9	0	0	0	1.1	0		0	0	0	0	.16	.19
10	0	0	0	.91	0		0	0	0	0	.02	0
11	0	0	0	.83	0		0	0	0	0	0	0
12	1.1	0	0	.75	0		2.3	0	0	0	0	0
13	.12	0	0	.75	0		.35	.58	0	0	0	0
14	0	1.2	0	6.7	0		0	.32	0	0	0	0
15	0	.10	0	1.2	0		0	.04	0	0	0	0
16	0	0	0	.76	0		0	0	0	0	0	0
17	0	0	0	.55	0		0	0	0	0	0	0
18	0	0	0	.40	0		0	0	0	0	0	0
19	0	0	0	.33	0		0	0	0	0	0	0
20	0	0	0	.28	0		1.7	0	0	0	0	.46
21	.08	0	0	.26	0		.25	0	0	0	0	.23
22	0	.04	0	.25	0		0	.02	0	0	0	0
23	0	.30	0	.25	0		0	0	0	0	0	0
24	0	.02	4.3	.25	0		0	0	0	0	0	0
25	0	0	8.4	.25	0		0	0	0	120	0	0
26	0	0	.38	.21	0		0	.02	0	21	0	0
27	0	0	36	11	0		0	.08	0	2.5	.35	0
28	0	0	16	2.1	0		0	0	0	5.6	.04	0
29	0	0	7.0	1.0	------		0	.71	.41	1.5	0	0
30	0	0	2.9	.55	------		0	.10	.25	1.3	.10	0
31	0	------	.99	.41	------		------	0	------	1.2	.04	------
TOTAL	1.30	1.66	75.97	155.19	.90	0	4.60	6.10	.66	153.12	4.51	1.45
MEAN	.042	.055	2.45	5.01	.032	0	.15	.20	.022	4.94	.15	.048
MAX	1.1	1.2	36	101	.30	0	2.3	1.7	.41	120	.87	.46
MIN	0	0	0	.21	0	0	0	0	0	0	0	0
AC-FT	2.6	3.3	151	308	1.8	0	9.1	12	1.3	304	9.0	2.9

CAL YR 1969 TOTAL 810.67 MEAN 2.22 MAX 194 MIN 0 AC-FT 1,610
WTR YR 1970 TOTAL 405.46 MEAN 1.11 MAX 120 MIN 0 AC-FT 804

PEAK DISCHARGE (BASE, 250 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	1845	4.96	358	7-25	/1930	6.30	820
1- 3	0610	5.94	689				

/ About.
NOTE.--No gage-height record July 3-30.

16227700 Moanalua Stream tributary near Kaneohe

LOCATION.--Lat 21°23'27", long 157°50'59", Oahu, on left bank 3.4 miles northeast of Tripler Hospital and 3.6 miles southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.62 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 680 cfs July 25 (gage height, 5.19 ft), from rating curve extended as explained below; no flow for many days.
Period of record: Maximum discharge, 892 cfs Feb. 1, 1969 (gage height, 5.57 ft), from rating curve extended above 28 cfs on basis of slope-area measurement at gage height 5.19 ft; no flow for many days each year.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.28	.04	.08	.61	.17	.11	0	1.6	.01	.11	.52	.27
2	.28	.02	.05	.48	.17	.11	.01	1.6	0	.05	.52	.22
3	.28	.01	.05	40	.17	.11	.02	.17	0	.05	.38	.22
4	.24	0	.06	5.0	.14	.10	.01	.08	0	.05	.38	.22
5	.24	.02	.08	1.6	.14	.11	.01	.04	0	.02	.38	.22
6	.24	.08	.06	2.0	.13	.07	0	.02	0	0	.38	.18
7	.20	.13	.05	.78	.14	.07	0	.01	0	.06	.38	.14
8	.11	.08	.05	.57	.14	.05	0	0	0	.05	.38	.22
9	.11	.07	.07	.45	.15	.05	0	0	0	.04	.38	.18
10	.11	.05	.05	.38	.15	.05	0	.01	0	.03	.32	.14
11	.11	.04	.05	.35	.14	.02	.02	.01	0	.10	.38	.14
12	.72	.03	.05	.32	.14	.02	.24	.01	0	.14	.44	.14
13	.17	.02	.05	.31	.15	.02	.17	.06	0	.13	.44	.14
14	.11	2.0	.03	1.0	.15	.03	.12	.10	0	.17	.44	.06
15	.11	.17	.03	.30	.14	.05	.03	.11	0	.13	.38	.06
16	.16	.10	.02	.26	.16	.11	.03	.10	0	.10	.32	.06
17	.11	.08	.02	.24	.20	.06	0	.06	0	.09	.32	.06
18	.11	.06	.01	.20	.20	.13	0	.04	0	.14	.27	.14
19	.11	.05	.01	.20	.20	.11	.01	.01	0	.12	.22	.18
20	.12	.04	0	.17	.20	.05	.50	0	.11	.10	.22	.27
21	.53	1.3	0	.17	.19	.06	.07	.01	.31	.08	.22	.32
22	.11	1.2	0	.17	.17	.04	.03	.06	.13	.08	.22	.38
23	.08	.51	0	.14	.18	.02	.02	.01	.04	.49	.22	.38
24	.08	.20	3.0	.12	.17	.02	.01	0	.03	1.8	.18	.38
25	.06	.15	3.9	.15	.10	.01	0	0	.09	77	.18	.38
26	.05	.11	.19	.15	.11	.02	0	.33	.16	16	.27	.32
27	.05	.11	11	2.8	.11	0	0	.18	.12	2.1	.44	.22
28	.05	.07	6.5	.30	.11	0	0	.15	.10	5.4	.52	.18
29	.05	.08	2.8	.24	------	0	0	.10	.96	1.2	.44	.18
30	.05	.07	1.1	.20	------	0	0	.07	.21	.77	.44	.18
31	.05	------	.55	.18	------	0	------	.05	------	.60	.27	------
TOTAL	5.08	6.89	29.91	59.84	4.32	1.60	1.30	4.99	2.27	107.20	10.85	6.18
MEAN	.16	.23	.96	1.93	.15	.052	.043	.16	.076	3.46	.35	.21
MAX	.72	2.0	11	40	.20	.13	.50	1.6	.96	77	.52	.38
MIN	.05	0	0	.12	.10	0	0	0	0	0	.18	.06
AC-FT	10	14	59	119	8.6	3.2	2.6	9.9	4.5	213	22	12

CAL YR 1969 TOTAL 441.73 MEAN 1.21 MAX 81 MIN 0 AC-FT 876
WTR YR 1970 TOTAL 240.43 MEAN .66 MAX 77 MIN 0 AC-FT 477

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
1- 3	0625	4.26	318	7-26	0025	3.88	215
7-25	1915	5.19	680				

16228000 Moanalua Stream near Honolulu

LOCATION.--Lat 21°22'53", long 157°52'22", Oahu, on left bank 1.8 miles northeast of Tripler Hospital and 5.0 miles north of Honolulu Post Office.

DRAINAGE AREA.--2.73 sq mi.

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

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

AVERAGE DISCHARGE.--44 years, 3.25 cfs (2,350 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,910 cfs July 25 (gage height, 9.42 ft), from rating curve extended above 120 cfs on basis of slope-area measurement at gage height 11.82 ft; no flow most of year.
Period of record: Maximum discharge, 4,580 cfs Nov. 18, 1930 (gage height, 12.58 ft, present datum), from rating curve extended above 110 cfs by test of model of station site; no flow at times each year.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	0	3.2	.06			0		0	1.2	
2		0	0	3.5	.05			12		0	.94	
3		0	0	100	.03			.06		0	.45	
4		0	0	28	.01			.04		0	.19	
5		0	0	9.6	0			.01		0	.08	
6		0	0	12	0			0		0	.07	
7		0	0	4.8	0			0		0	.06	
8		0	0	2.8	0			0		0	.05	
9		0	0	1.5	0			0		0	.04	
10		0	0	1.0	0			0		0	.01	
11		0	0	.88	0			0		0	0	
12		0	0	.49	0			0		0	0	
13		0	0	.37	0			0		0	0	
14		4.5	0	7.8	0			0		0	0	
15		1.1	0	1.9	0			0		0	0	
16		.34	0	.83	0			0		0	0	
17		.17	0	.34	0			0		0	0	
18		.10	0	.17	0			0		0	0	
19		.07	0	.08	0			0		0	0	
20		.06	0	.07	0			0		0	0	
21		2.4	0	.06	0			0		0	0	
22		2.2	0	.05	0			0		0	0	
23		2.3	0	.05	0			0		0	0	
24		.78	.66	.05	0			0		0	0	
25		.19	24	.04	0			0		242	0	
26		.08	1.7	.01	0			0		79	0	
27		.07	39	8.5	0			0		11	0	
28		.06	41	1.5	0			0		12	0	
29		.05	24	.83	------			0		4.8	0	
30		.02	12	.17	------			0		2.6	0	
31		------	4.4	.08	------		------	0	------	1.9	0	------
TOTAL	0	14.49	146.76	190.67	.15	0	0	12.11	0	353.3	3.09	0
MEAN	0	.48	4.73	6.15	.005	0	0	.39	0	11.4	.10	0
MAX	0	4.5	41	100	.06	0	0	12	0	242	1.2	0
MIN	0	0	0	.01	0	0	0	0	0	0	0	0
AC-FT	0	29	291	378	.3	0	0	24	0	701	6.1	0

CAL YR 1969 TOTAL 1,650.82 MEAN 4.52 MAX 290 MIN 0 AC-FT 3,270
WTR YR 1970 TOTAL 720.57 MEAN 1.97 MAX 242 MIN 0 AC-FT 1,430

PEAK DISCHARGE (BASE, 240 CFS).--Jan. 3 (1800) 406 cfs (5.20 ft); July 25 (2030) 1,910 cfs (9.42 ft).

16228900 Kalihi Stream near Kaneohe

LOCATION.--Lat 21°22'35", long 157°49'32", Oahu, on right bank 800 ft downstream from Likelike Highway and 2.8 miles southwest of Castle High School in Kaneohe.

DRAINAGE AREA.--0.60 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 840 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 590 cfs July 25 (gage height, 3.80 ft), from rating curve extended as explained below; minimum, 0.08 cfs Mar. 15, 17.
Period of record: Maximum discharge, 1,510 cfs Feb. 1, 1969 (gage height, 5.36 ft), from rating curve extended above 49 cfs on basis of slope-area measurements at gage heights 3.88 and 4.96 ft; minimum, 0.07 cfs on several days in 1968.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.46	.20	.40	2.3	.65	.16	.18	.48	.26	.28	.94	.40
2	.43	.20	.26	2.2	.58	.16	.28	2.3	.23	.26	1.1	.26
3	.40	.20	.26	28	.55	.16	.28	.90	.20	.26	.76	.23
4	.34	.20	.28	5.8	.49	.14	.18	.76	.18	.23	.65	.19
5	.31	.28	.23	3.1	.46	.16	.18	.58	.18	.20	.62	.20
6	.31	.29	.23	4.9	.40	.14	.18	.49	.23	.23	.55	.18
7	.28	.23	.26	2.6	.34	.14	.16	.43	.18	.31	.49	.16
8	.28	.20	.22	2.2	.34	.14	.16	.40	.17	.40	.46	.31
9	.31	.20	.18	2.0	.53	.12	.20	.37	.16	.23	.40	.14
10	.39	.20	.16	1.9	.37	.12	.23	.52	.16	.26	.34	.14
11	.65	.20	.16	1.8	.28	.10	.22	.52	.18	.62	.31	.12
12	2.9	.23	.16	1.6	.28	.10	.37	.62	.18	.40	.28	.14
13	1.1	.23	.18	1.7	.36	.10	.18	.79	.16	.46	.28	.18
14	.62	4.3	.16	2.4	.71	.10	.20	.55	.43	.46	.28	.16
15	.52	.76	.16	1.6	.31	.19	.18	.52	.16	.28	.31	.16
16	.46	.40	.16	1.3	.23	.37	.20	.43	.16	.23	.31	.16
17	.40	.28	.16	1.1	.23	.10	.18	.37	.16	.34	.31	.18
18	.37	.26	.16	.95	.20	.19	.23	.34	.16	.69	.28	.26
19	.34	.26	.16	.82	.18	.10	.28	.31	.18	.40	.26	.36
20	.44	.23	.16	.76	.18	.10	3.1	.31	.76	.26	.26	.26
21	1.2	.71	.16	.66	.18	.12	.46	.40	.49	.23	.26	.16
22	.49	.97	.16	.56	.18	.14	.28	.95	.26	.28	.23	.37
23	.40	1.3	.16	.49	.18	.10	.26	.46	.18	1.0	.26	.28
24	.34	.72	1.9	.45	.20	.10	.23	.34	.28	1.3	.34	.18
25	.31	.49	3.5	.58	.23	.14	.23	.43	.31	25	.23	.16
26	.31	.40	1.4	.60	.18	.14	.23	.62	.28	7.8	.43	.16
27	.28	.37	14	12	.18	.16	.24	.46	.26	2.0	.38	.16
28	.26	.34	8.7	2.4	.16	.16	.20	.34	.20	3.3	.34	.16
29	.23	.34	4.5	1.2	------	.16	.18	.34	.69	1.8	.46	.16
30	.26	.31	2.8	.90	------	.18	.18	.31	.43	1.5	.58	.16
31	.20	------	2.8	.76	------	.18	------	.28	------	1.1	.34	------
TOTAL	15.59	15.30	44.18	89.63	9.16	4.47	9.66	16.92	7.86	52.11	13.04	6.14
MEAN	.50	.51	1.43	2.89	.33	.14	.32	.55	.26	1.68	.42	.20
MAX	2.9	4.3	14	28	.71	.37	3.1	2.3	.76	25	1.1	.40
MIN	.20	.20	.16	.45	.16	.10	.16	.28	.16	.20	.23	.12
AC-FT	31	30	88	178	18	8.9	19	34	16	103	26	12

CAL YR 1969 TOTAL 653.82 MEAN 1.79 MAX 182 MIN .16 AC-FT 1,300
WTR YR 1970 TOTAL 284.06 MEAN .78 MAX 28 MIN .10 AC-FT 563

PEAK DISCHARGE (BASE, 200 CFS).--Jan. 27 (about 0430) 211 cfs (2.68 ft); July 25 (1900) 590 cfs (3.80 ft).

16229000 Kalihi Stream near Honolulu

LOCATION.--Lat 21°21'59", long 157°50'49", Oahu, on right bank 1.9 miles upstream from Kamanaiki Stream and 4.1 miles north of Honolulu Post Office.

DRAINAGE AREA.--2.61 sq mi.

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

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

AVERAGE DISCHARGE.--56 years (1914-70), 7.02 cfs (5,090 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,350 cfs July 25 (gage height, 9.96 ft), from rating curve extended as explained below; minimum, 0.57 cfs Mar. 29.
Period of record: Maximum discharge, about 12,400 cfs Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 280 cfs on basis of indirect measurements at gage heights 8.9, 10.96 and 11.27 ft; minimum, 0.09 cfs Oct. 22, 1933, July 29, 1966.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	1.2	1.8	8.4	3.2	1.2	.82	2.8	1.5	3.8	7.1	3.0
2	2.8	1.0	1.6	7.1	2.8	1.2	1.9	13	1.4	3.0	7.7	1.9
3	2.6	.91	1.5	111	2.6	1.1	3.0	3.1	1.4	3.0	5.9	1.8
4	2.3	.91	1.5	30	2.6	1.1	1.6	2.5	1.2	2.6	4.9	1.6
5	2.0	.91	1.4	14	2.4	1.1	1.6	1.8	1.2	2.2	4.6	2.1
6	1.9	1.6	1.4	26	2.3	1.1	1.4	1.6	1.5	2.0	4.2	2.2
7	1.8	1.2	1.4	9.8	2.2	1.1	1.2	1.4	1.2	2.6	4.2	1.6
8	1.8	1.2	1.5	8.0	2.0	1.1	1.0	1.4	1.2	3.6	3.6	3.0
9	1.9	1.0	1.4	6.8	2.4	1.0	1.3	1.3	1.2	2.6	3.4	1.8
10	2.6	.91	1.4	5.9	2.3	1.0	2.6	2.4	1.1	2.6	3.2	1.8
11	3.2	.82	1.2	5.9	1.9	1.0	2.4	2.6	1.3	7.7	3.0	1.6
12	16	.82	1.1	5.1	1.8	1.2	6.5	2.0	1.5	5.4	3.0	1.5
13	5.4	.82	1.3	5.4	2.0	1.2	3.0	3.0	1.4	5.1	3.0	1.6
14	3.8	4.7	1.3	9.6	3.4	.91	2.2	2.1	3.2	7.4	2.6	1.6
15	3.2	3.2	1.1	5.1	2.0	1.3	1.9	2.2	1.6	4.0	2.6	1.4
16	3.0	2.0	1.1	4.4	1.8	2.6	1.8	1.8	1.3	3.2	2.6	1.4
17	2.6	1.5	1.0	4.2	1.6	1.5	1.5	1.6	1.2	4.2	2.8	1.3
18	2.3	1.3	1.0	3.8	1.6	2.4	1.8	1.4	1.1	7.4	2.4	2.6
19	2.0	1.1	1.0	3.6	1.6	1.4	1.6	1.3	1.1	4.0	3.0	4.0
20	2.3	1.1	.91	3.4	1.5	1.2	6.7	1.3	5.1	3.2	2.4	3.6
21	10	6.8	.91	3.2	1.5	1.1	2.2	1.5	4.6	3.0	2.3	2.3
22	3.4	7.5	.82	3.0	1.5	1.2	1.6	2.1	2.4	3.0	2.0	3.5
23	2.6	6.2	.82	2.8	1.4	1.0	1.5	1.4	1.9	7.7	1.9	3.2
24	2.3	3.8	10	3.0	1.3	.91	1.3	1.3	2.7	11	3.0	2.2
25	2.2	3.0	32	2.8	1.4	.82	1.3	1.7	4.4	139	3.0	1.6
26	1.8	2.8	4.4	3.7	1.3	.82	1.4	3.1	3.2	68	4.2	1.5
27	1.6	2.3	59	27	1.2	1.0	1.9	2.4	3.2	9.0	3.7	1.4
28	1.4	1.9	51	7.4	1.2	.73	1.9	1.9	3.2	19	2.3	1.3
29	1.3	1.9	28	4.9	------	.65	2.0	1.6	8.4	11	2.0	1.3
30	1.3	1.9	13	3.8	------	.73	1.9	1.6	5.1	9.8	3.4	1.3
31	1.3	------	8.4	3.4	------	.82	------	1.6	------	7.7	2.2	------
TOTAL	95.7	66.30	234.26	342.5	54.8	35.49	62.82	70.8	70.8	367.8	106.2	61.0
MEAN	3.09	2.21	7.56	11.0	1.96	1.14	2.09	2.28	2.36	11.9	3.43	2.03
MAX	16	7.5	59	111	3.4	2.6	6.7	13	8.4	139	7.7	4.0
MIN	1.3	.82	.82	2.8	1.2	.65	.82	1.3	1.1	2.0	1.9	1.3
AC-FT	190	132	465	679	109	70	125	140	140	730	211	121

CAL YR 1969 TOTAL 3,242.56 MEAN 8.88 MAX 255 MIN .82 AC-FT 6,430
WTR YR 1970 TOTAL 1,568.47 MEAN 4.30 MAX 139 MIN .65 AC-FT 3,110

PEAK DISCHARGE (BASE, 390 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	1830	7.39	726	7-25	1930	9.96	2,350
1- 3	1730	7.36	714				

16229300 Kalihi Stream at Kalihi

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

DRAINAGE AREA.--5.18 sq mi.

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 (from topographic map). Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

AVERAGE DISCHARGE.--8 years, 13.9 cfs (10,070 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,810 cfs July 25 (gage height, 6.71 ft), from rating curve extended above 780 cfs on basis of slope-area measurements at gage heights 8.0 and 8.24 ft; minimum, 1.1 cfs Mar. 21.

Period of record: Maximum discharge, about 7,000 cfs Nov. 14, 1965; minimum, 0.16 cfs June 24, 1966. Flood of May 14, 1960, reached a stage of 8.0 ft, from floodmarks, present site and datum (discharge, 6,350 cfs, from slope-area measurement of peak flow).

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	1.7	5.0	21	3.8	1.7	2.2	7.5	2.6	5.2	9.1	6.9
2	3.6	1.6	2.4	18	3.3	1.6	4.6	20	4.2	3.8	8.6	2.4
3	3.6	1.6	2.4	162	3.0	1.5	6.8	6.4	3.0	4.9	6.0	2.3
4	3.6	1.5	2.4	42	3.0	1.5	2.4	5.6	2.6	3.6	5.2	2.2
5	2.8	3.1	2.2	20	2.8	1.5	4.6	3.6	2.3	2.3	5.2	2.6
6	2.4	14	2.2	61	2.8	1.4	2.2	3.0	2.6	2.3	4.2	3.3
7	2.4	5.2	2.2	17	2.4	1.4	1.7	2.4	2.2	2.8	4.2	2.4
8	2.4	4.6	2.6	13	2.3	1.4	1.4	2.4	1.8	4.6	4.2	4.6
9	2.3	2.4	3.0	11	2.6	1.3	1.7	2.3	1.7	2.6	3.6	2.6
10	2.8	2.2	2.3	8.6	3.0	1.3	7.6	5.0	1.4	3.3	3.3	2.3
11	4.9	1.8	1.8	8.6	2.3	1.3	6.4	6.1	1.4	12	3.3	2.2
12	24	5.8	1.7	7.7	2.3	1.2	12	3.6	2.2	7.2	3.0	1.8
13	7.7	2.2	2.0	8.9	3.9	1.2	4.9	7.3	2.6	11	2.8	2.3
14	6.4	67	2.2	18	7.9	1.2	3.6	4.2	4.2	13	2.8	2.2
15	3.6	13	2.0	7.7	2.8	1.6	3.6	4.6	2.0	5.2	2.8	1.8
16	3.0	5.6	1.6	6.4	2.2	3.5	9.1	3.6	1.7	3.3	3.8	2.4
17	2.6	3.8	1.7	5.6	2.2	2.2	3.6	3.0	1.6	6.7	3.8	1.8
18	2.4	3.0	1.5	5.2	2.0	3.8	4.6	2.4	1.5	11	2.8	6.0
19	2.3	3.3	1.6	4.9	2.0	1.6	3.8	2.3	1.4	4.6	2.4	9.6
20	2.4	3.0	1.5	4.9	2.0	1.3	8.1	2.3	6.8	3.0	2.4	6.8
21	19	25	1.5	4.6	1.8	1.4	3.0	3.0	7.2	2.6	2.4	3.6
22	4.9	14	1.5	3.8	1.8	1.6	3.0	4.2	3.0	3.0	2.4	4.9
23	3.3	12	1.5	3.6	1.7	1.5	3.0	2.8	2.3	9.1	2.4	4.2
24	2.8	8.6	28	4.2	1.7	1.4	2.2	2.3	3.8	14	3.6	2.8
25	2.4	5.2	99	4.6	1.7	1.5	2.2	3.3	6.0	392	3.8	2.4
26	2.4	3.8	14	4.6	1.7	1.4	4.2	7.3	4.6	248	6.4	2.3
27	2.3	3.3	89	29	1.6	1.4	6.4	4.6	8.8	27	5.6	2.0
28	1.8	2.8	113	10	1.6	1.4	6.4	3.3	6.4	51	3.3	1.8
29	1.7	2.4	69	6.4	------	1.3	7.2	2.6	14	19	3.0	1.8
30	1.7	2.4	34	4.9	------	1.5	4.3	2.6	8.2	17	6.0	1.8
31	1.7	------	23	4.2	------	1.6	------	3.6	------	12	3.0	------
TOTAL	132.8	225.9	517.8	531.4	72.2	49.5	136.8	137.2	114.1	907.1	125.4	96.1
MEAN	4.28	7.53	16.7	17.1	2.58	1.60	4.56	4.43	3.80	29.3	4.05	3.20
MAX	24	67	113	162	7.9	3.8	12	20	14	392	9.1	9.6
MIN	1.7	1.5	1.5	3.6	1.6	1.2	1.4	2.3	1.4	2.3	2.4	1.8
AC-FT	263	448	1,030	1,050	143	98	271	272	226	1,800	249	191

CAL YR 1969 TOTAL 5,837.4 MEAN 16.0 MAX 781 MIN 1.5 AC-FT 11,580
WTR YR 1970 TOTAL 3,046.3 MEAN 8.35 MAX 392 MIN 1.2 AC-FT 6,040

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	2000	4.19	1,070	7-25	2000	6.71	3,810
1- 3	1800	4.23	1,100				

16232000 Nuuanu Stream below reservoir 2 wasteway, near Honolulu

LOCATION.--Lat 21°20'55", long 157°49'40", Oahu, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mile downstream from reservoir 2 wasteway, and 3.5 miles northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 sq mi.

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

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

AVERAGE DISCHARGE.--54 years (1914-16, 1917-20, 1921-70), 7.47 cfs (5,410 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,030 cfs July 25 (gage height, 5.34 ft), from rating curve extended above 420 cfs on basis of slope-area measurement at gage height 6.69 ft; minimum, 1.2 cfs probably June 19.

Period of record: Maximum discharge, 6,990 cfs Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 420 cfs by test of model of station site; minimum, 0.09 cfs Sept. 10, 11, 1925.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Low-flow regulation by reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively). Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 985: 1921-35(M). WSP 1319: 1931. WSP 1569: Drainage area. WSP 1639: 1931, 1935.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	2.4	2.6	7.1	5.0	3.4	2.4	2.4	1.8	2.6	3.5	4.0
2	3.0	2.2	2.4	5.9	4.9	3.3	3.4	2.4	1.6	2.5	3.3	2.6
3	3.1	2.2	2.5	45	4.8	3.2	4.2	2.4	1.5	2.9	3.1	2.5
4	3.1	2.2	2.7	13	4.7	3.2	2.7	2.3	1.5	2.1	3.0	2.5
5	3.2	2.4	2.5	7.9	4.6	3.2	2.6	2.1	1.5	2.0	2.9	3.2
6	2.7	2.6	2.4	12	4.6	3.1	2.4	2.0	1.7	2.0	2.8	3.6
7	2.6	2.5	2.6	7.4	4.5	3.0	2.4	2.0	1.7	2.1	2.7	3.6
8	2.7	4.1	2.4	7.1	4.5	3.0	2.1	2.0	1.6	2.5	2.6	4.2
9	2.6	2.6	2.4	6.8	5.1	2.9	2.2	2.0	1.5	1.5	2.5	3.7
10	2.8	2.3	2.4	6.6	5.0	2.9	3.1	2.2	1.4	1.5	2.8	4.1
11	3.0	2.2	2.2	6.6	5.0	2.8	3.1	2.0	1.7	3.2	2.8	3.9
12	7.4	2.2	2.2	6.3	5.0	2.8	3.0	2.5	1.7	2.7	2.7	4.0
13	3.1	2.3	2.3	6.5	5.1	2.7	2.7	4.1	1.8	6.4	2.6	4.1
14	2.8	25	2.2	11	4.9	2.6	2.4	2.1	2.5	4.9	2.6	4.3
15	3.0	4.3	2.2	6.2	4.3	3.0	2.4	2.7	1.7	2.6	2.6	4.2
16	3.0	3.4	2.1	6.0	4.0	3.6	2.8	2.2	1.6	2.1	2.6	4.4
17	2.8	2.9	1.7	5.9	4.0	2.8	2.4	2.1	1.6	2.5	3.0	4.2
18	2.7	3.2	1.8	5.7	4.0	3.9	2.4	1.8	1.5	4.2	2.6	4.7
19	2.0	3.5	1.9	5.6	3.9	2.8	2.7	1.8	1.4	2.4	2.5	5.5
20	2.6	3.7	2.0	5.5	3.9	2.6	3.2	1.8	3.5	1.9	2.5	5.1
21	5.8	10	2.0	5.5	3.8	2.6	2.6	2.0	3.7	2.0	2.5	3.3
22	3.1	9.3	2.0	5.2	3.7	2.6	2.3	3.4	2.2	1.8	2.5	3.0
23	2.8	7.3	1.9	5.0	3.7	2.5	2.0	2.0	2.0	3.9	2.5	3.0
24	2.6	5.5	2.8	5.1	3.5	2.4	2.0	1.8	2.2	4.8	2.8	2.8
25	2.7	5.2	18	5.3	3.7	2.3	2.0	2.2	3.5	94	3.0	2.8
26	2.8	4.2	3.8	5.9	3.5	2.2	2.1	2.8	2.7	61	5.0	2.6
27	2.2	3.4	46	20	3.4	2.2	2.4	2.2	4.0	20	3.6	2.6
28	2.2	3.2	25	6.5	3.4	2.2	2.4	1.9	3.0	30	3.2	2.5
29	2.4	2.8	16	5.7	------	2.2	2.4	1.8	5.0	10	3.1	2.5
30	2.4	2.8	8.7	5.4	------	2.2	2.4	2.0	2.8	5.0	4.5	2.5
31	2.4	------	6.6	5.1	------	2.2	------	2.2	------	4.0	3.0	------
TOTAL	93.5	131.9	178.3	258.8	120.5	86.4	77.2	69.2	65.9	291.1	91.4	106.0
MEAN	3.02	4.40	5.75	8.35	4.30	2.79	2.57	2.23	2.20	9.39	2.95	3.53
MAX	7.4	25	46	45	5.1	3.9	4.2	4.1	5.0	94	5.0	5.5
MIN	2.2	2.2	1.7	5.0	3.4	2.2	2.0	1.8	1.4	1.5	2.5	2.5
AC-FT	185	262	354	513	239	171	153	137	131	577	181	210

CAL YR 1969 TOTAL 3,401.2 MEAN 9.32 MAX 122 MIN 1.7 AC-FT 6,750
WTR YR 1970 TOTAL 1,570.2 MEAN 4.30 MAX 94 MIN 1.4 AC-FT 3,110

PEAK DISCHARGE (BASE, 240 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-14	1300	3.93	306	1- 3	1700	3.83	286
12-27	1930	4.19	377	7-25	2200	5.34	1,030

NOTE.--No gage height record July 27 to Sept. 4.

16238500 Waihi Stream at Honolulu

LOCATION.--Lat 21°19'54", long 157°48'13", Oahu, on left bank 100 ft upstream from bridge on Waaloa Way, 700 ft upstream from confluence with Waiakeakua Stream, and 4.2 miles northeast of Honolulu Post Office.

DRAINAGE AREA.--1.14 sq mi.

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.

GAGE.--Water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 290.84 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, nonrecording gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft upstream at different datum and Aug. 4, 1925, to Mar. 15, 1928, at present site at datum 3.35 ft lower.

AVERAGE DISCHARGE.--52 years (1913-20, 1925-70), 3.72 cfs (2,700 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 411 cfs July 25 (gage height, 3.46 ft), from rating curve extended above 120 cfs by test of model of station site; minimum, 0.36 cfs Dec. 23, 24.
Period of record: Maximum discharge, 3,250 cfs Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 60 cfs; minimum, 0.08 cfs Dec. 16, 18, 1913, Jan. 16-18, Feb. 4, 6, 1915, Mar. 16, 22, 1926.

REMARKS.--Records fair. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	.62	.92	7.1	.83	.56	.69	2.0	1.2	3.7	3.6	3.7
2	2.1	.59	.69	4.0	.76	.48	3.8	2.0	1.6	2.6	4.6	2.2
3	1.7	.58	.69	23	.74	.48	6.1	2.3	1.1	3.4	3.2	1.8
4	1.5	.58	1.2	8.0	.73	.54	2.1	1.8	.84	2.5	2.8	1.6
5	1.4	1.6	.62	4.8	.65	.62	3.8	1.3	.84	2.0	3.0	1.8
6	1.3	3.2	.55	5.7	.63	.62	2.4	1.1	1.0	1.8	2.3	1.6
7	1.2	1.3	.62	3.4	.60	.55	1.7	.96	.84	1.8	2.4	1.5
8	1.2	1.1	.92	2.9	.58	.62	1.2	.97	.76	2.2	2.5	5.1
9	1.2	.84	.96	2.6	.84	.70	1.1	1.0	.69	1.7	2.0	1.7
10	1.4	.69	.97	2.3	.78	.55	1.6	1.8	.76	2.3	1.8	1.5
11	3.5	.66	.66	2.2	1.1	.48	3.2	2.0	1.2	4.8	1.6	1.3
12	8.8	.64	.73	2.0	1.1	.55	7.6	2.5	1.7	4.3	1.6	1.2
13	2.6	.65	.77	2.3	1.0	.55	4.0	5.8	1.8	9.5	1.5	1.1
14	1.7	10	.63	6.6	.94	.48	2.8	3.2	5.6	7.2	1.5	1.2
15	1.5	4.3	.56	4.5	.92	.66	2.5	4.4	1.7	3.6	1.5	1.0
16	1.3	2.5	.55	10	.88	1.6	2.1	2.7	1.4	2.5	1.8	2.0
17	1.2	2.0	.55	3.5	.77	.84	1.7	2.1	1.1	3.4	1.5	1.3
18	1.0	1.9	.55	2.6	.70	5.0	2.1	1.6	.77	7.1	1.2	3.0
19	1.1	1.8	.55	20	.69	1.3	2.8	1.3	.74	2.6	1.1	6.3
20	1.3	1.7	.45	5.2	.74	.92	4.2	1.2	6.9	2.0	.99	5.6
21	10	4.3	.42	2.6	.62	.84	2.0	1.7	4.7	1.8	.93	3.1
22	2.1	7.6	.42	2.2	.84	.76	2.5	5.4	2.6	1.8	.85	2.3
23	1.4	3.8	.39	1.9	2.8	.76	2.3	1.8	1.9	9.3	.72	2.3
24	1.1	2.6	2.6	1.7	.98	.76	1.8	1.4	2.4	6.6	2.0	1.6
25	.98	1.8	19	1.3	.70	.69	1.7	2.0	7.3	43	1.5	1.4
26	.89	1.5	3.2	1.1	.54	.69	2.0	3.8	5.0	46	9.2	1.2
27	.82	1.2	34	5.2	.74	.62	2.0	3.2	3.7	7.4	6.7	1.1
28	.79	1.0	22	2.0	.47	.55	2.1	2.4	2.7	13	3.5	.99
29	.74	.92	23	1.2	------	.48	3.3	1.8	11	4.9	3.5	.89
30	.72	.84	9.1	1.0	------	.55	2.2	1.6	5.2	6.2	8.7	.85
31	.66	------	5.7	.91	------	.62	------	1.6	------	4.3	3.8	------
TOTAL	59.30	62.81	133.97	143.81	23.67	25.42	79.39	68.73	79.04	215.3	83.89	62.23
MEAN	1.91	2.09	4.32	4.64	.85	.82	2.65	2.22	2.63	6.95	2.71	2.07
MAX	10	10	34	23	2.8	5.0	7.6	5.8	11	46	9.2	6.3
MIN	.66	.58	.39	.91	.47	.48	.69	.96	.69	1.7	.72	.85
AC-FT	118	125	266	285	47	50	157	136	157	427	166	123

CAL YR 1969 TOTAL 1,582.08 MEAN 4.33 MAX 92 MIN .39 AC-FT 3,140
WTR YR 1970 TOTAL 1,037.56 MEAN 2.84 MAX 46 MIN .39 AC-FT 2,060

PEAK DISCHARGE (BASE, 310 CFS).--July 25 (2145) 411 cfs (3.46 ft).

16240500 Waiakeakua Stream at Honolulu

LOCATION.--Lat 21°19'52", long 157°48'08", Oahu, on right bank 5 ft downstream from bridge on Waaloa Way, 500 ft upstream from confluence with Waihi Stream, and 4.2 miles northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 sq mi.

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.

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

AVERAGE DISCHARGE.--52 years (1913-20, 1925-70), 5.23 cfs (3,790 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 303 cfs Nov. 14 (gage height, 3.21 ft), from rating curve extended above 110 cfs on basis of slope-area measurement at gage height 5.28 ft; minimum, 1.9 cfs June 9, 10.
Period of record: Maximum discharge, 3,090 cfs Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 58 cfs; minimum, 0.6 cfs June 7, 8, 1926.

REMARKS.--Records good. 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. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M). (FISCAL AND WATER YEAR).--WRD Hawaii 1967: 1966(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	3.4	3.2	6.5	3.0	2.4	3.5	3.3	4.8	4.2	4.5	4.5
2	4.7	3.3	3.1	4.9	2.8	2.4	10	3.1	4.2	3.3	4.9	3.3
3	4.5	3.2	3.3	28	2.8	2.4	6.9	3.5	3.5	4.2	4.1	3.1
4	4.2	3.2	3.2	11	2.8	2.4	5.7	3.2	3.0	3.3	3.8	3.1
5	4.1	4.5	3.0	7.0	2.7	2.4	4.5	3.0	2.7	3.0	4.3	3.2
6	4.0	4.5	3.0	7.0	2.7	2.4	3.8	2.7	2.4	2.7	3.6	3.1
7	4.0	3.6	3.1	5.2	2.7	2.3	3.1	2.6	2.3	3.3	3.7	3.0
8	4.0	3.3	3.1	4.7	2.7	2.3	3.0	2.7	2.2	4.0	4.0	5.7
9	4.0	3.2	3.4	4.3	3.2	2.3	3.0	2.6	2.1	3.1	3.3	3.2
10	4.2	3.1	3.3	4.2	3.1	2.2	2.8	3.3	1.9	3.6	3.2	3.2
11	7.1	3.1	3.0	4.2	2.7	2.2	8.0	4.1	2.5	6.8	3.1	3.0
12	14	3.2	3.2	4.1	2.7	2.2	8.7	4.0	2.5	5.0	3.1	2.8
13	5.4	3.2	3.2	4.5	3.0	2.2	4.7	6.5	2.5	7.2	3.0	2.7
14	4.3	24	3.1	8.4	4.0	2.2	4.6	4.3	4.9	5.7	3.0	3.0
15	4.1	4.7	3.0	4.1	2.8	2.8	3.7	4.6	2.5	3.8	2.8	2.7
16	3.8	3.8	2.8	3.8	2.6	3.5	3.4	3.3	2.3	3.2	3.2	3.3
17	3.7	3.6	2.8	3.7	2.6	2.7	3.3	3.2	2.2	4.1	3.0	3.1
18	3.6	3.4	2.7	3.7	2.6	7.1	3.8	2.8	2.2	6.7	2.7	4.0
19	3.7	3.4	2.7	3.6	2.5	3.1	6.4	2.7	2.2	3.6	2.7	5.9
20	4.0	3.3	2.7	3.4	2.5	2.6	3.8	2.7	8.1	3.1	2.6	6.8
21	9.6	6.3	2.7	3.4	2.5	2.7	3.7	3.1	4.9	3.0	2.6	4.0
22	4.7	8.0	2.7	3.3	2.5	2.6	3.8	5.1	3.1	3.2	2.6	3.6
23	3.8	5.8	3.0	3.3	2.4	2.5	3.7	3.1	2.7	8.6	2.5	3.4
24	3.7	4.5	5.1	3.3	2.4	2.5	3.2	2.8	3.1	7.8	3.6	3.1
25	3.6	4.0	23	3.6	2.5	2.4	3.1	3.3	6.3	28	3.1	2.8
26	3.6	3.7	3.8	3.5	2.4	2.4	3.6	7.6	5.4	34	9.7	2.7
27	3.4	3.4	29	5.9	2.4	2.4	3.2	6.2	4.5	7.0	7.5	2.7
28	3.4	3.3	20	4.2	2.4	2.3	3.6	4.6	3.7	12	4.9	2.7
29	3.4	3.3	19	3.4	------	2.3	4.9	5.4	7.8	5.7	5.0	2.6
30	3.4	3.3	7.8	3.2	------	2.4	3.3	4.5	4.9	6.2	7.4	2.6
31	3.4	------	6.7	3.1	------	2.4	------	3.5	------	4.9	4.5	------
TOTAL	142.3	136.6	183.7	166.5	76.0	81.0	132.8	117.4	107.4	204.3	122.0	102.9
MEAN	4.59	4.55	5.93	5.37	2.71	2.61	4.43	3.79	3.58	6.59	3.94	3.43
MAX	14	24	29	28	4.0	7.1	10	7.6	8.1	34	9.7	6.8
MIN	3.4	3.1	2.7	3.1	2.4	2.2	2.8	2.6	1.9	2.7	2.5	2.6
AC-FT	282	271	364	330	151	161	263	233	213	405	242	204

CAL YR 1969 TOTAL 2,432.4 MEAN 6.66 MAX 121 MIN 2.7 AC-FT 4,820
WTR YR 1970 TOTAL 1,572.9 MEAN 4.31 MAX 34 MIN 1.9 AC-FT 3,120

PEAK DISCHARGE (BASE, 310 CFS).--No peak above base.

16244000 Pukele Stream near Honolulu

LOCATION.--Lat 21°18'35", long 157°47'30", Oahu, on right bank 200 ft upstream from bridge on Palolo Avenue, 0.6 mile upstream from confluence with Waiomao Stream, and 4.8 miles east of Honolulu Post Office.

DRAINAGE AREA.--1.18 sq mi.

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

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

AVERAGE DISCHARGE.--44 years, 2.04 cfs (1,480 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 145 cfs Jan. 3 (gage height, 3.33 ft); minimum, 0.36 cfs on many days in March and June.
Period of record: Maximum discharge, 2,600 cfs Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 71 cfs by test of model of station site; minimum, 0.08 cfs Oct. 31, 1929.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	.56	.67	2.5	.73	.43	.40	.80	.43	.87	1.6	1.3
2	.94	.56	.61	1.8	.67	.43	.43	.80	.43	.87	1.6	1.0
3	.87	.51	.61	20	.67	.43	1.5	.80	.43	1.0	1.4	.89
4	.80	.51	.56	9.5	.61	.43	.47	.80	.47	.94	1.4	.80
5	.80	.56	.56	4.2	.61	.43	.61	.73	.47	.87	1.3	.80
6	.73	.61	.51	3.3	.61	.43	.51	.67	.47	.87	1.2	.80
7	.73	.51	.51	2.3	.56	.43	.51	.61	.43	.87	1.1	.78
8	.67	.51	.61	1.9	.56	.40	.56	.56	.43	.80	1.1	1.6
9	.67	.51	.51	1.9	.61	.40	.56	.56	.43	.73	.94	1.1
10	.67	.47	.47	1.8	.56	.40	1.2	.61	.43	.67	.87	.90
11	.67	.47	.47	1.8	.56	.40	.61	.56	.40	1.0	.87	.82
12	4.2	.47	.43	1.7	.51	.40	2.8	.56	.40	.87	.80	.78
13	1.2	.47	.47	1.6	.56	.40	1.4	.61	.36	3.3	.73	.75
14	.73	9.8	.43	4.0	.56	.40	.80	.56	.36	3.9	.73	.70
15	.73	1.5	.43	1.5	.51	.40	.80	.61	.36	1.1	.67	.67
16	.80	.56	.43	1.4	.47	.36	.94	.56	.36	.87	.67	.64
17	.73	.56	.43	1.4	.47	.36	.87	.56	.36	1.2	.61	.62
18	.73	.61	.40	1.4	.47	1.2	.94	.56	.36	1.3	.56	.60
19	.73	.61	.40	1.3	.47	.43	.87	.56	.36	1.0	.56	.59
20	.73	.61	.40	1.3	.47	.40	2.8	.56	.40	1.0	.56	1.8
21	1.6	.61	.40	1.2	.47	.40	.80	.56	.40	.94	.51	1.0
22	.73	1.2	.40	1.1	.47	.40	1.1	.56	.40	1.0	.51	.85
23	.73	1.5	.40	1.1	.47	.40	1.2	.51	.40	2.6	.47	.80
24	.73	.73	.43	1.1	.43	.40	.94	.51	.36	3.7	.51	.70
25	.73	.67	8.7	1.0	.43	.40	1.0	.51	.73	7.5	.47	.80
26	.67	.73	.73	.94	.43	.36	1.1	.61	.43	21	1.8	.65
27	.67	.73	15	1.2	.43	.36	.94	.51	1.3	3.0	1.3	.62
28	.61	.73	20	.87	.43	.36	1.1	.47	1.1	5.3	.97	.59
29	.61	.67	17	.73	------	.36	1.1	.43	2.0	2.0	.92	.57
30	.61	.67	6.1	.73	------	.36	.94	.43	1.4	1.7	2.2	.56
31	.56	------	3.2	.73	------	.40	------	.43	------	1.5	1.1	------
TOTAL	27.38	29.21	82.27	77.30	14.80	13.16	29.80	18.17	16.66	74.27	30.03	25.08
MEAN	.88	.97	2.65	2.49	.53	.42	.99	.59	.56	2.40	.97	.84
MAX	4.2	9.8	20	20	.73	1.2	2.8	.80	2.0	21	2.2	1.8
MIN	.56	.47	.40	.73	.43	.36	.40	.43	.36	.67	.47	.56
AC-FT	54	58	163	153	29	26	59	36	33	147	60	50

CAL YR 1969 TOTAL 932.00 MEAN 2.55 MAX 53 MIN .40 AC-FT 1,850
WTR YR 1970 TOTAL 438.13 MEAN 1.20 MAX 21 MIN .36 AC-FT 869

PEAK DISCHARGE (BASE, 140 CFS).--Jan. 3 (1745) 145 cfs (3.33 ft).

16246000 Waiomao Stream near Honolulu

LOCATION.--Lat 21°18'35", long 157°47'10", Oahu, on left bank 300 ft west of road, 0.8 mile upstream from confluence with Pukele Stream, and 5 miles east of Honolulu Post Office.

DRAINAGE AREA.--1.04 sq mi.

PERIOD OF RECORD.--April to December 1911, May to December 1912, June 1926 to current year. Prior to July 1960, published as "above Pukele Stream, near Honolulu."

GAGE.--Water-stage recorder and V-notch weir. Datum of gage is 373.66 ft above mean sea level (Honolulu Board of Water Supply bench mark). Apr. 12, 1911, to Dec. 31, 1912, nonrecording gage at site 0.5 mile downstream at different datum.

AVERAGE DISCHARGE.--44 years, 1.86 cfs (1,350 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 243 cfs Jan. 3 (gage height, 3.95 ft); no flow Mar. 8-15.
Period of record: Maximum discharge, 1,550 cfs Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 98 cfs by test of model of station site; no flow at times.

REMARKS.--Records fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1639: 1927-28(M), 1930, 1932.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.04	.26	2.6	.20	.01	.03	.50	.20	1.0	.78	1.3
2	.32	.02	.15	1.2	.17	.01	.83	.54	.17	.68	1.4	.63
3	.26	.02	.13	31	.15	.01	3.2	.38	.13	.78	.73	.42
4	.20	.01	.15	10	.13	.01	1.1	.46	.11	.58	.50	.32
5	.17	.07	.15	4.3	.13	.01	2.3	.42	.07	.42	.58	.26
6	.15	.94	.13	3.2	.09	.01	.94	.29	.06	.26	.42	.23
7	.13	.32	.11	1.6	.07	.01	.58	.26	.05	.20	.29	.20
8	.07	.17	.55	1.1	.06	0	.32	.20	.02	.54	.50	1.9
9	.06	.13	.38	.73	.18	0	.20	.17	.01	.32	.29	.54
10	.09	.07	.38	.54	.46	0	1.2	.40	.03	.32	.23	.26
11	.63	.05	.17	.51	.20	0	.46	1.1	.01	2.3	.15	.20
12	5.5	.03	.17	.46	.13	0	3.1	.95	.05	1.5	.15	.17
13	1.5	.03	.23	.54	.19	0	1.4	3.0	.06	4.6	.13	.15
14	.58	14	.15	5.2	.87	0	.73	1.2	.73	4.4	.13	.13
15	.38	2.2	.09	1.2	.63	0	.83	.94	.29	1.0	.11	.13
16	.29	.63	.07	.58	.26	.01	.58	.58	.15	.50	.20	.13
17	.23	.35	.05	.42	.15	.01	.38	.38	.09	.58	.15	.09
18	.20	.23	.03	.35	.11	2.6	.50	.29	.06	1.9	.07	.09
19	.20	.17	.02	.29	.07	.54	.38	.23	.05	.54	.05	.42
20	.29	.15	.01	.26	.06	.26	.68	.17	1.9	.35	.04	3.5
21	3.5	.43	.01	.23	.05	.15	1.2	.35	1.7	.26	.03	.78
22	.83	2.0	.01	.26	.04	.11	1.9	.72	.54	.35	.01	.58
23	.42	2.6	.01	.20	.02	.06	2.1	.46	.29	4.5	.01	.42
24	.32	.94	.08	.17	.01	.04	1.1	.26	.29	4.0	.06	.26
25	.29	.50	10	.26	.02	.02	.94	.29	2.4	10	.07	.15
26	.23	.38	1.1	.23	.01	.01	1.1	1.1	1.2	15	3.2	.26
27	.15	.26	25	3.1	.02	.01	.78	.58	1.6	2.8	2.0	.15
28	.11	.20	28	1.2	.01	.01	.73	.35	1.2	6.4	.78	.09
29	.07	.17	21	.63	------	.01	1.2	.26	2.8	1.7	.78	.06
30	.07	.15	6.2	.35	------	.01	.78	.20	1.9	1.5	2.6	.05
31	.06	------	3.0	.29	------	.01	------	.35	------	1.0	1.1	------
TOTAL	17.62	27.26	97.79	73.00	4.49	3.93	31.57	17.38	18.16	70.28	17.54	13.87
MEAN	.57	.91	3.15	2.35	.16	.13	1.05	.56	.61	2.27	.57	.46
MAX	5.5	14	28	31	.87	2.6	3.2	3.0	2.8	15	3.2	3.5
MIN	.06	.01	.01	.17	.01	0	.03	.17	.01	.20	.01	.05
AC-FT	35	54	194	145	8.9	7.8	63	34	36	139	35	28

CAL YR 1969 TOTAL 854.90 MEAN 2.34 MAX 87 MIN .01 AC-FT 1,700
WTR YR 1970 TOTAL 392.89 MEAN 1.08 MAX 31 MIN 0 AC-FT 779

PEAK DISCHARGE (BASE, 110 CFS).--Dec. 27 (1930) 158 cfs (3.51 ft); Jan. 3 (1730) 243 cfs (3.95 ft).

16247000 Palolo Stream near Honolulu

LOCATION.--Lat 21°17'35", long 157°48'25", Oahu, on left bank 250 ft downstream from bridge on Palolo Avenue and 3.9 miles east of Honolulu Post Office.

DRAINAGE AREA.--3.63 sq mi.

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

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

AVERAGE DISCHARGE.--18 years, 6.06 cfs (4,390 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 835 cfs Nov. 14 (gage height, 3.24 ft), from rating curve extended as explained below; minimum, 0.48 cfs June 10.
Period of record: Maximum discharge, 4,270 cfs Dec. 18, 1967 (gage height, 5.98 ft), from rating curve extended above 140 cfs on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 and 4.13 ft; minimum, 0.02 cfs June 25, 1958.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	.93	2.5	7.6	1.7	1.2	2.0	2.5	.58	2.9	2.5	6.0
2	1.9	.93	1.1	6.8	1.6	1.0	5.0	2.0	.70	2.0	3.4	2.5
3	1.9	.93	1.1	80	1.6	1.0	8.1	1.6	.70	2.9	2.5	1.4
4	1.6	.85	1.2	27	1.6	.93	3.6	2.0	.63	2.3	1.8	1.4
5	1.2	1.9	1.2	6.5	1.6	.93	5.6	1.9	.63	2.0	2.1	1.6
6	1.2	5.0	.97	6.5	1.6	.93	2.5	1.6	.63	1.9	1.6	1.4
7	1.1	1.6	.98	2.3	1.6	.93	2.3	1.6	.58	1.9	1.4	1.4
8	1.1	1.3	4.8	2.0	1.6	.93	2.0	1.6	.58	2.7	1.7	5.0
9	1.1	1.3	2.7	2.0	2.3	.85	2.0	1.7	.53	1.9	1.3	1.9
10	1.2	1.2	1.8	2.0	2.7	.85	4.3	2.7	.58	1.9	1.3	1.4
11	2.7	1.3	1.5	3.7	1.9	.85	2.0	2.9	.58	5.6	1.2	1.4
12	18	1.5	2.6	2.2	1.7	.77	8.7	2.3	.63	3.3	1.2	1.4
13	3.6	1.8	2.1	3.7	2.9	.70	2.9	3.9	.85	13	1.2	1.4
14	1.7	69	1.7	29	4.3	.70	2.5	2.0	1.2	7.4	1.1	1.6
15	1.3	4.0	1.6	4.4	1.7	.63	2.7	2.5	.85	2.5	1.1	1.3
16	1.3	1.6	1.5	2.6	1.2	1.1	3.3	1.9	.77	6.8	1.3	1.1
17	1.3	1.2	1.5	2.2	1.2	.85	2.9	1.6	.70	12	1.0	1.1
18	1.3	1.2	1.5	1.9	1.3	6.2	3.9	1.6	.70	3.3	.90	1.0
19	1.3	1.2	1.6	1.8	1.3	1.7	3.6	1.4	.63	2.7	.90	2.0
20	1.4	1.2	1.5	1.6	1.2	1.2	9.3	1.4	3.3	2.5	.90	22
21	9.3	1.3	1.5	1.5	1.2	1.1	1.9	1.3	2.7	2.7	.81	5.0
22	2.3	2.6	1.6	1.5	1.2	1.1	2.9	1.4	1.6	1.9	.80	3.9
23	1.3	3.9	1.5	1.5	1.2	1.1	3.6	1.3	1.4	11	.73	2.8
24	1.2	1.7	4.3	1.6	1.1	1.1	2.0	1.2	1.6	13	.90	1.7
25	1.1	1.4	31	2.1	1.2	1.0	2.3	1.9	6.8	21	1.1	1.2
26	1.1	1.3	1.6	1.8	1.1	1.0	2.7	1.7	2.7	67	18	1.3
27	1.0	1.3	60	6.2	1.1	1.0	2.7	.93	3.9	8.0	8.8	.90
28	1.0	1.3	74	2.9	1.1	1.0	3.9	.70	2.9	18	4.0	.90
29	.93	1.3	76	2.3	------	1.0	3.9	.63	6.8	6.5	1.8	.85
30	.93	1.3	25	1.7	------	1.9	2.9	.63	4.3	5.8	12	.85
31	.93	------	11	1.6	------	1.4	------	.77	------	4.4	4.5	------
TOTAL	69.19	117.34	322.95	220.5	45.8	36.95	108.0	53.16	51.05	240.8	83.84	77.70
MEAN	2.23	3.91	10.4	7.11	1.64	1.19	3.60	1.71	1.70	7.77	2.70	2.59
MAX	18	69	76	80	4.3	6.2	9.3	3.9	6.8	67	18	22
MIN	.93	.85	.97	1.5	1.1	.63	1.9	.63	.53	1.9	.73	.85
AC-FT	137	233	641	437	91	73	214	105	101	478	166	154

CAL YR 1969 TOTAL 2,765.48 MEAN 7.58 MAX 180 MIN .85 AC-FT 5,490
WTR YR 1970 TOTAL 1,427.28 MEAN 3.91 MAX 80 MIN .53 AC-FT 2,830

PEAK DISCHARGE (BASE, 340 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-14	1330	3.24	835	1- 3	1745	2.88	557
12-27	1930	2.61	362				

NOTE.--No gage-height record Aug. 2 to Sept. 3.

16249000 Waimanalo Stream at Waimanalo

LOCATION.--Lat 21°21'12", long 157°43'52", Oahu, on right bank 40 ft upstream from Highway 72 and 2.3 miles northwest of Waimanalo Post Office.
DRAINAGE AREA.--2.16 sq mi.
PERIOD OF RECORD.--January 1967 to December 1970 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).
GAGE.--Water-stage recorder. Datum of gage is 18.89 ft above mean sea level.
EXTREMES.--Water year 1970: Maximum discharge, 1,280 cfs Jan. 26 (gage height, 6.51 ft), from rating curve extended as explained below; minimum, 0.16 cfs Sept. 26, 28.
October to December 1970: Maximum discharge during period, 4,560 cfs Nov. 26 (gage height, 10.00 ft), from rating curve extended as explained below; minimum, 0.30 cfs Nov. 3.
Period of record: Maximum discharge, 4,560 cfs Nov. 26, 1970 (gage height, 10.00 ft), from rating curve extended above 81 cfs on basis of slope-area measurements at gage heights 6.72, 8.0, 9.54 and 10.0 ft; minimum, 0.16 cfs Sept. 26, 28, 1970.
REMARKS.--Records poor. Water from Maunawili basin is diverted by Maunawili ditch into two reservoirs in Waimanalo basin, above station, for irrigation near Waimanalo; flow at station is affected by leakage, releases, and spill from these reservoirs. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	.68	1.6	2.4	2.6	2.6	.87	1.4	1.8	.60	.40	.58
2	.87	.68	1.8	2.5	1.8	1.9	1.0	.87	.68	.60	1.4	.48
3	.87	.68	1.6	28	2.2	1.4	1.4	2.8	.60	.60	1.8	.40
4	.76	.68	2.4	11	1.0	1.8	1.2	4.8	.64	.68	.44	.40
5	.87	.76	2.6	5.4	.68	1.2	3.4	4.2	.54	.68	.40	.40
6	.87	.68	2.4	2.6	.76	1.2	1.6	3.7	.54	1.0	.54	.40
7	.76	.68	2.8	2.6	.68	1.0	.76	3.2	.54	.76	.36	.40
8	.76	.68	2.2	1.4	2.2	2.0	.87	1.8	.68	.76	.36	.80
9	.87	.68	2.8	1.2	1.4	1.6	.76	1.0	.60	.68	.40	.50
10	1.0	.76	2.6	1.0	2.2	.87	.76	2.6	.68	.76	.44	.52
11	1.0	.68	1.8	2.2	1.8	1.0	.76	2.0	.87	.76	.49	.53
12	1.2	.68	1.4	2.6	2.4	1.0	.87	1.0	.68	.76	.40	.45
13	1.6	.68	.87	14	2.2	.87	.87	.87	.60	.87	.40	.45
14	2.9	3.4	.76	19	3.2	1.0	.87	.87	.68	.76	.40	.45
15	2.0	2.8	.87	2.8	4.2	1.2	.76	1.0	.60	2.0	.40	.45
16	2.6	2.8	.76	1.6	3.9	1.8	.87	.87	.60	.54	.44	.45
17	3.5	2.6	.87	1.2	3.4	.87	.76	.87	.60	.76	.40	.52
18	1.0	2.6	.76	1.2	2.0	1.0	.87	.87	.60	.76	.44	.46
19	1.7	1.8	.76	1.2	3.0	1.6	.87	.87	.60	.44	.44	.62
20	3.0	1.4	.76	1.0	2.0	1.8	3.1	.68	.87	.54	.44	.68
21	1.3	1.6	.76	1.0	1.6	.87	40	.67	.76	.54	.44	.60
22	1.2	1.4	.87	1.4	4.2	2.8	3.7	1.2	1.0	.60	.40	.60
23	1.0	2.4	.76	.87	2.0	1.4	2.2	.76	.87	.87	.44	.44
24	1.1	1.4	1.0	1.0	1.6	.68	1.4	.68	.87	.68	.49	.44
25	.76	1.0	2.4	1.6	2.0	.76	3.0	.76	.68	.68	.45	.40
26	1.0	1.4	3.4	112	3.2	.76	3.2	.68	.68	.79	.54	.36
27	1.4	.76	22	43	2.0	1.0	1.6	.68	.60	.81	.54	.44
28	.76	1.0	23	3.4	.87	1.4	1.2	.76	.61	1.2	.50	.49
29	.76	.76	10	1.8	------	1.4	2.0	.87	.60	2.4	.54	.44
30	.68	1.2	4.8	1.8	------	1.4	.87	1.0	.60	3.1	.65	.49
31	.68	------	2.6	2.0	------	.87	------	3.2	------	2.2	.65	------
TOTAL	39.77	39.32	104.00	274.77	61.09	41.05	82.39	47.53	21.27	29.18	16.43	14.64
MEAN	1.28	1.31	3.35	8.86	2.18	1.32	2.75	1.53	.71	.94	.53	.49
MAX	3.5	3.4	23	112	4.2	2.8	40	4.8	1.8	3.1	1.8	.80
MIN	.68	.68	.76	.87	.68	.68	.76	.67	.54	.44	.36	.36
AC-FT	79	78	206	545	121	81	163	94	42	58	33	29

CAL YR 1969 TOTAL 1,567.42 MEAN 4.29 MAX 73 MIN .60 AC-FT 3,110
WTR YR 1970 TOTAL 771.44 MEAN 2.11 MAX 112 MIN .36 AC-FT 1,530

PEAK DISCHARGE (BASE, 450 CFS).--Jan. 26 (2100) 1,280 cfs (6.51 ft); Apr. 21 (0030) 740 cfs (5.10 ft).

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER TO DECEMBER 1970

DAY	OCT	NOV	DEC	DAY	OCT	NOV	DEC	DAY	OCT	NOV	DEC	DAY	OCT	NOV	DEC	DAY	OCT	NOV	DEC
1	.49	2.5	8.2	7	1.4	4.2	2.5	13	.49	2.3	1.4	19	2.2	2.8	2.6	25	2.4	9.4	1.4
2	5.4	2.0	5.9	8	1.4	4.2	2.9	14	.49	5.1	1.2	20	2.2	90	2.8	26	2.2	226	1.3
3	12	.49	4.5	9	1.0	3.7	2.0	15	.49	7.6	1.1	21	4.2	5.3	2.4	27	.76	9.8	1.2
4	5.2	.87	3.8	10	.99	3.7	5.1	16	1.8	14	1.2	22	3.7	2.1	2.0	28	1.8	14	1.2
5	9.4	1.8	3.1	11	2.6	2.8	2.5	17	3.0	68	1.8	23	1.9	2.6	1.6	29	.57	30	1.3
6	2.6	3.7	2.8	12	.60	2.5	1.8	18	3.2	4.5	2.8	24	.54	3.6	1.5	30	.68	12	1.5
																31	.44		1.4
TOTAL																	76.14	541.56	76.8
MEAN																	2.46	18.1	2.48
MAX																	12	226	8.2
MIN																	.44	.49	1.1
AC-FT																	151	1,070	152

CAL YR 1970 TOTAL 1,282.85 MEAN 3.5 MAX 226 MIN .36 AC-FT 2,540

PEAK DISCHARGE (BASE, 450 CFS).--Nov. 20 (1200) 508 cfs (4.31 ft); Nov. 26 (0130) 4,560 cfs (10.00 ft).

16254000 Makawao Stream near Kailua

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

DRAINAGE AREA.--2.04 sq mi.

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

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

AVERAGE DISCHARGE.--14 years (1913-15, 1958-70), 5.78 cfs (4,190 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 596 cfs Jan. 26 (gage height, 5.67 ft); minimum, 1.3 cfs Sept. 26, 28-30.

Period of record: Maximum discharge, 6,000 cfs Feb. 4, 1965 (gage height, 12.41 ft), from rating curve extended above 470 cfs on basis of slope-area measurement of peak flow; minimum, 0.43 cfs Sept. 8-12, 14, 16-20, 22, 23, 1964.

REMARKS.--Records good. Maunawili ditch diverts 1.5 miles above station for irrigation in vicinity of Waimanalo. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	1.9	2.3	7.1	6.4	3.0	2.6	2.6	2.0	2.0	1.9	1.7
2	2.3	1.8	2.1	6.2	6.2	3.0	3.1	2.6	2.0	1.9	2.0	1.5
3	2.3	1.8	2.0	33	5.6	3.0	3.2	2.8	2.0	2.0	2.4	1.5
4	2.3	1.8	3.1	20	6.1	3.0	2.6	2.8	2.0	1.8	2.1	1.5
5	2.2	1.9	2.1	15	6.9	3.0	2.6	2.8	2.0	1.8	1.9	1.5
6	2.2	2.0	2.0	15	6.1	2.8	2.4	2.7	2.0	1.8	1.6	1.5
7	2.1	1.9	2.0	11	4.7	2.7	2.4	2.4	1.9	1.8	1.6	1.5
8	2.1	1.8	2.0	9.3	4.5	2.7	2.3	2.3	1.9	2.1	1.7	2.0
9	2.2	1.8	2.1	8.8	4.7	2.7	2.1	2.3	1.9	1.8	1.6	1.6
10	2.2	1.8	2.3	8.8	4.2	2.6	2.1	2.4	2.0	1.8	1.6	1.7
11	2.6	1.8	2.8	9.1	4.0	2.6	2.1	2.4	2.1	2.1	1.6	1.7
12	3.2	1.8	2.8	7.1	3.8	2.6	2.2	2.6	2.1	2.0	1.5	1.6
13	2.4	1.8	3.0	8.4	4.0	2.6	2.1	2.7	2.1	2.1	1.5	1.6
14	2.3	11	3.0	16	4.7	2.6	2.0	2.6	2.1	1.9	1.5	1.6
15	2.2	4.3	3.0	7.8	4.0	2.7	2.0	2.3	2.0	1.8	1.5	1.6
16	2.1	3.2	3.0	7.8	3.5	2.8	2.0	2.3	2.0	1.8	1.6	1.7
17	2.0	2.7	3.0	7.6	3.4	2.6	1.9	2.3	1.9	1.8	1.5	1.5
18	2.0	2.3	2.6	7.1	3.4	2.8	2.0	2.3	2.0	2.0	1.6	1.7
19	2.0	2.3	1.9	6.9	3.4	2.6	2.2	2.2	2.0	1.8	1.5	1.8
20	2.0	2.2	1.8	6.4	3.4	2.6	4.1	2.2	2.4	1.8	1.5	1.8
21	2.4	2.1	1.8	6.4	3.4	2.4	11	2.2	2.1	1.8	1.5	1.6
22	2.2	2.2	1.8	6.0	3.2	2.4	3.2	3.4	1.9	1.8	1.6	1.6
23	2.1	2.3	1.8	5.8	3.1	2.4	2.8	2.3	2.0	2.1	1.5	1.6
24	2.1	2.2	2.1	5.4	3.0	2.4	2.7	2.3	2.1	2.0	1.6	1.6
25	2.0	2.1	3.5	5.6	3.1	2.4	2.7	2.3	2.2	2.2	1.5	1.6
26	2.0	2.0	2.2	48	3.1	2.4	2.8	2.2	2.2	2.1	1.7	1.4
27	2.0	2.0	19	25	3.0	2.4	2.7	2.1	2.0	1.9	1.7	1.4
28	2.0	2.0	18	11	3.0	2.4	2.6	2.1	2.0	3.0	1.6	1.4
29	2.0	2.0	14	9.3	------	2.4	2.7	2.1	2.0	2.0	1.7	1.3
30	1.9	2.1	8.1	7.8	------	2.4	2.6	2.1	1.9	1.9	1.8	1.3
31	1.9	------	8.7	6.9	------	2.3	------	2.0	------	1.9	1.8	------
TOTAL	67.6	72.9	129.9	355.6	117.9	81.3	83.8	74.7	60.8	60.6	51.7	47.4
MEAN	2.18	2.43	4.19	11.5	4.21	2.62	2.79	2.41	2.03	1.95	1.67	1.58
MAX	3.2	11	19	48	6.9	3.0	11	3.4	2.4	3.0	2.4	2.0
MIN	1.9	1.8	1.8	5.4	3.0	2.3	1.9	2.0	1.9	1.8	1.5	1.3
AC-FT	134	145	258	705	234	161	166	148	121	120	103	94

CAL YR 1969 TOTAL 2,389.9 MEAN 6.55 MAX 96 MIN 1.8 AC-FT 4,740
WTR YR 1970 TOTAL 1,204.2 MEAN 3.30 MAX 48 MIN 1.3 AC-FT 2,390

PEAK DISCHARGE (BASE, 390 CFS).--Jan. 26 (2000) 596 cfs (5.67 ft).

16260500 Maunawili Stream at Highway 61, near Kailua

LOCATION.--Lat 21°22'51", long 157°45'48", Oahu, on right bank at downstream side of bridge on Highway 61, 0.6 mile west of Maunawili School, and 1.6 miles southwest of Kailua Post Office.

DRAINAGE AREA.--5.34 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1922, 1956-62, 1965-67, and annual maximum, water years 1958-67, January 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 9.79 ft above mean sea level (levels by Sunn, Low, Tom and Hara, Inc.). Oct. 16, 1957, to Dec. 31, 1966, crest-stage gage at site 400 ft upstream at datum 3.46 ft higher.

EXTREMES.--Current year: Maximum discharge, 940 cfs Jan. 26 (gage height, 7.65 ft); minimum, 2.3 cfs Sept. 30.
Period of record: Maximum discharge, 9,690 cfs Feb. 4, 1965 (gage height, 15.62 ft, site and datum then in use), from rating curve extended above 700 cfs on basis of contracted-opening measurement of peak flow; minimum, 2.3 cfs Sept. 30, 1970.
A discharge of 1.97 cfs was measured June 8, 1959.

REMARKS.--Records fair. Maunawili ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (WATER YEAR).--WRD Hawaii 1968: 1967(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	5.8	4.3	16	17	8.0	5.8	6.6	4.8	4.1	5.6	5.8
2	8.6	5.8	3.8	13	16	7.8	7.3	6.8	4.6	3.6	6.9	5.4
3	6.2	5.4	3.6	101	15	7.8	8.3	7.8	4.3	3.9	6.8	4.3
4	6.4	5.4	7.1	57	16	8.0	6.0	7.8	4.4	3.6	6.2	3.9
5	6.4	5.4	3.9	32	16	7.8	6.0	6.8	4.6	3.6	5.8	4.4
6	6.2	6.9	3.8	39	15	7.6	6.0	6.6	4.3	3.8	4.8	4.6
7	6.2	5.8	3.8	24	13	7.6	5.6	6.4	4.3	3.9	5.0	5.6
8	6.2	5.8	3.6	19	12	7.3	5.4	6.2	4.3	4.8	5.4	9.6
9	6.4	5.6	3.6	17	14	7.3	5.4	6.2	4.3	3.9	4.8	5.2
10	6.8	5.4	3.9	16	12	7.3	5.4	6.6	4.3	3.9	4.6	4.8
11	11	4.8	4.1	17	11	7.0	5.6	6.6	4.3	5.0	4.3	4.8
12	20	4.6	4.3	14	11	7.0	7.0	6.8	4.3	4.8	4.3	4.6
13	8.6	4.8	4.3	20	11	6.8	6.6	7.3	4.3	5.4	4.6	4.6
14	5.8	59	4.1	49	14	6.8	6.6	6.2	4.6	5.0	4.6	4.6
15	5.8	11	4.1	18	11	7.3	6.4	6.0	4.3	4.4	4.8	4.4
16	5.6	7.0	4.1	15	10	7.9	6.0	5.8	4.3	4.3	5.2	4.0
17	5.4	5.8	4.3	14	9.9	6.8	5.8	5.8	4.1	5.0	4.1	3.8
18	5.4	5.2	4.1	13	9.6	7.7	5.8	5.6	4.1	6.3	4.1	4.3
19	5.0	4.8	3.8	12	9.3	6.6	6.4	4.6	4.3	4.6	4.1	5.3
20	5.0	4.8	3.4	11	9.2	6.4	15	4.6	5.8	4.4	3.9	5.2
21	8.3	4.8	3.6	11	9.2	6.4	27	4.6	5.0	4.4	3.9	4.6
22	8.3	5.0	3.6	10	8.8	6.6	7.6	7.5	4.4	4.4	3.9	4.4
23	7.0	5.4	3.4	10	8.6	6.2	6.8	5.4	4.6	6.8	3.9	4.8
24	7.0	4.8	3.9	9.3	8.2	6.2	6.6	6.2	5.4	6.8	5.0	4.1
25	6.8	4.4	9.7	11	8.6	6.0	6.6	5.6	5.0	9.9	4.3	4.3
26	6.6	4.4	4.1	120	8.6	6.0	6.8	4.8	5.0	13	5.4	4.3
27	6.5	4.3	68	67	8.4	6.0	6.6	4.8	3.9	6.4	5.4	4.6
28	6.2	4.1	56	33	8.3	6.4	6.6	4.6	4.1	12	4.6	4.3
29	5.8	4.1	40	26	------	6.4	7.0	4.8	4.8	5.8	5.4	3.9
30	5.8	3.8	20	21	------	6.2	6.8	5.0	4.4	7.3	6.3	3.4
31	5.6	------	19	19	------	6.0	------	5.0	------	7.0	5.0	------
TOTAL	218.5	214.2	313.3	854.3	320.7	215.2	220.8	185.4	135.2	172.1	153.0	141.9
MEAN	7.05	7.14	10.1	27.6	11.5	6.94	7.36	5.98	4.51	5.55	4.94	4.73
MAX	20	59	68	120	17	8.0	27	7.8	5.8	13	6.9	9.6
MIN	5.0	3.8	3.4	9.3	8.2	6.0	5.4	4.6	3.9	3.6	3.9	3.4
AC-FT	433	425	621	1,690	636	427	438	368	268	341	303	281

CAL YR 1969 TOTAL 6,847.2 MEAN 18.8 MAX 355 MIN 3.4 AC-FT 13,580
WTR YR 1970 TOTAL 3,144.6 MEAN 8.62 MAX 120 MIN 3.4 AC-FT 6,240

PEAK DISCHARGE (BASE, 700 CFS).--Jan. 26 (2000) 940 cfs (7.65 ft).

16270500 Kamooalii Stream below Kuou Stream, near Kaneohe

LOCATION.--Lat 21°23'42", long 157°48'26", Oahu, on right bank 100 ft downstream from Kuou Stream, 1.1 miles southwest of Castle High School, and 1.9 miles south of Kaneohe Post Office.

DRAINAGE AREA.--3.21 sq mi.

PERIOD OF RECORD.--March 1967 to September 1970 (discontinued as a continuous-record station; converted to a crest-stage and low-flow partial-record station).

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 118 ft (from topographic map). Control rebuilt and datum lowered 2.80 ft Apr. 22, 1969.

EXTREMES.--Current year: Maximum discharge, 352 cfs Dec. 27 (gage height, 6.63 ft), from rating curve extended above 130 cfs; minimum, 4.7 cfs Sept. 28, 29.
Period of record: Maximum discharge, 10,800 cfs Feb. 1, 1969 (gage height, 12.42 ft, control and datum then in use), from rating curve extended above 1,800 cfs; minimum, 4.7 cfs Sept. 28, 29, 1970.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	6.4	6.7	11	8.5	8.8	7.0	7.5	6.7	5.6	6.2	5.9
2	6.7	6.4	6.4	10	8.5	8.8	7.7	14	6.7	5.3	6.4	5.6
3	6.7	6.4	6.4	56	8.7	8.8	7.4	8.8	6.4	5.9	6.2	5.3
4	6.7	6.2	6.4	21	8.8	8.8	7.4	7.7	6.4	5.6	6.2	5.3
5	6.7	6.2	6.2	15	9.2	8.8	7.4	7.4	6.4	6.2	6.2	5.6
6	6.7	6.7	6.2	34	9.6	8.5	7.4	7.0	6.4	6.2	5.9	5.6
7	7.0	6.7	6.2	13	9.6	8.5	7.0	7.0	6.4	5.9	5.6	5.6
8	7.0	6.4	6.2	11	10	8.5	7.0	7.0	6.4	6.2	5.6	6.4
9	7.0	6.2	6.2	8.8	11	8.5	7.0	7.0	6.4	5.3	5.6	5.3
10	8.1	6.2	6.2	8.1	11	8.1	7.0	7.0	6.4	5.6	5.3	5.0
11	7.7	6.2	5.9	11	10	8.1	7.0	7.0	6.2	7.0	5.3	5.0
12	9.6	6.2	5.9	9.2	9.6	7.7	7.7	7.0	5.9	6.7	5.3	5.0
13	7.7	6.2	5.9	11	10	7.7	6.7	7.0	5.9	6.7	5.3	5.0
14	7.4	29	5.9	24	13	7.7	6.7	6.7	5.9	6.2	5.3	5.0
15	7.0	9.2	5.9	11	10	8.1	6.7	6.7	5.9	5.9	5.3	5.0
16	7.0	7.0	5.9	9.6	10	7.7	6.7	6.7	5.9	5.9	5.3	5.3
17	6.7	6.7	5.9	9.2	9.6	7.0	6.7	6.7	5.9	6.4	5.3	5.0
18	6.7	6.4	5.9	8.5	9.6	7.4	6.7	6.7	5.6	7.4	5.6	5.3
19	6.7	6.4	5.6	8.5	9.6	7.0	7.2	6.7	5.6	6.7	5.3	5.6
20	7.0	6.4	5.6	8.1	9.6	7.0	14	6.7	6.2	6.7	5.3	5.3
21	7.7	6.4	5.6	8.5	9.6	7.0	7.4	6.4	5.9	6.4	5.3	5.0
22	7.0	6.7	5.3	8.1	9.6	7.0	7.0	7.0	5.6	6.7	5.3	5.6
23	7.0	7.0	5.3	8.1	9.6	7.0	7.0	6.4	5.6	10	5.6	5.3
24	7.0	6.7	6.4	7.7	9.2	7.0	7.0	6.4	5.6	6.7	5.9	5.0
25	6.7	6.7	8.0	8.1	9.2	7.0	7.0	6.4	5.6	10	5.6	5.0
26	6.7	6.4	5.6	24	9.2	7.0	6.7	6.4	5.6	9.2	5.9	5.0
27	6.7	6.4	39	43	8.8	7.0	6.7	6.4	5.6	6.7	6.2	5.0
28	6.4	6.4	23	14	8.8	7.0	6.7	6.4	5.3	11	5.6	5.0
29	6.4	6.4	16	10	------	7.0	6.4	11	5.6	6.7	5.6	5.0
30	6.4	6.4	11	8.8	------	7.0	6.4	7.0	5.6	6.7	5.6	5.0
31	6.4	------	9.2	8.8	------	7.0	------	6.7	------	6.4	5.6	------
TOTAL	217.2	219.0	255.9	447.1	269.9	238.5	216.7	224.8	179.6	209.9	174.7	158.0
MEAN	7.01	7.30	8.25	14.4	9.64	7.69	7.22	7.25	5.99	6.77	5.64	5.27
MAX	9.6	29	39	56	13	8.8	14	14	6.7	11	6.4	6.4
MIN	6.4	6.2	5.3	7.7	8.5	7.0	6.4	6.4	5.3	5.3	5.3	5.0
AC-FT	431	434	508	887	535	473	430	446	356	416	347	313

CAL YR 1969 TOTAL 6,216.8 MEAN 17.0 MAX 810 MIN 5.3 AC-FT 12,330
WTR YR 1970 TOTAL 2,811.3 MEAN 7.70 MAX 56 MIN 5.0 AC-FT 5,580

PEAK DISCHARGE (BASE, 900 CFS).--No peak above base.

16270900 Luluku Stream at altitude 220 ft, near Kaneohe

LOCATION.--Lat 21°23'42", long 157°48'46", Oahu, on left bank 0.5 mile upstream from mouth, 1.4 miles southwest of Castle High School, and 1.9 miles south of Kaneohe Post Office.

DRAINAGE AREA.--0.44 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1960-63, 1965-67, July 1967 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 220 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 89 cfs May 1 (gage height, 3.49 ft), from rating curve extended as explained below; minimum, 0.42 cfs Sept. 29, 30.
Period of record: Maximum discharge, 620 cfs Feb. 1, 1969 (gage height, 6.09 ft), from rating curve extended above 10 cfs on basis of slope-area measurement of peak flow; minimum, 0.42 cfs Sept. 29, 30, 1970. A discharge of 0.37 cfs was measured Sept. 15, 1961.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Honolulu Board of Water Supply diverts water from tunnel in drainage area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.5	1.6	2.3	2.0	1.6	.83	3.4	.63	1.3	1.2	.92
2	1.6	1.5	1.6	2.1	2.0	1.5	1.2	.96	.63	1.3	1.2	.83
3	1.6	1.5	1.8	8.5	2.0	1.4	1.3	.92	.66	1.0	1.0	.71
4	1.6	1.5	1.8	3.4	1.8	1.4	1.1	.86	.66	.74	1.0	.63
5	1.7	1.6	1.8	2.8	1.8	1.4	1.1	.89	.77	.71	.92	.66
6	1.9	1.6	1.8	3.3	1.9	1.3	1.1	.86	.80	.92	.89	.74
7	1.8	1.6	1.8	2.6	1.8	1.3	1.1	.84	.80	1.0	.83	.68
8	1.6	1.5	1.8	2.5	1.8	1.3	1.1	.82	.68	.96	.89	.83
9	1.6	1.5	1.9	2.3	2.0	1.2	1.0	.80	.66	.96	.89	.86
10	1.6	1.5	1.8	2.2	1.9	1.3	1.0	.90	.74	1.0	.80	.86
11	1.8	1.5	1.7	2.5	1.8	1.2	1.1	.90	.63	1.2	.77	.83
12	2.0	1.6	1.8	2.2	1.8	1.3	1.2	.90	.66	1.0	.80	.68
13	1.7	1.5	1.7	2.5	1.8	1.2	1.0	.86	.66	1.1	.83	.71
14	1.7	2.4	1.7	3.4	2.3	1.2	1.0	.82	.77	1.1	.83	.74
15	1.7	1.7	1.7	2.1	2.0	1.3	.92	.76	.66	.96	.89	.68
16	1.7	1.6	1.7	2.2	1.9	1.4	1.0	.70	.77	.89	.96	.80
17	1.6	1.6	1.7	2.1	1.8	1.2	.77	.70	.71	.83	.96	.83
18	1.6	1.6	1.7	2.1	1.9	1.4	.77	.74	.74	1.0	.74	.96
19	1.6	1.6	1.7	2.0	1.8	1.3	1.2	.82	.71	.89	.77	.98
20	1.7	1.6	1.8	2.0	1.8	1.2	1.7	.82	1.1	.77	.71	.92
21	1.9	1.6	1.7	2.0	1.8	1.2	1.1	.82	1.2	.66	.71	.77
22	1.7	1.6	1.6	2.0	1.8	1.2	.92	.89	1.2	.74	.66	.83
23	1.6	1.7	1.6	2.0	1.8	1.2	.92	.83	1.2	1.3	.60	.68
24	1.6	1.6	2.2	2.0	1.7	1.2	.89	.86	1.4	1.4	.83	.74
25	1.6	1.6	2.2	2.0	1.7	1.2	.80	.63	1.3	1.9	.86	.71
26	1.6	1.6	1.8	2.5	1.6	1.4	.86	.74	1.3	1.6	1.1	.68
27	1.6	1.6	4.9	6.7	1.6	1.3	.89	.66	1.3	1.1	.92	.68
28	1.6	1.6	3.4	2.6	1.5	1.2	.89	.63	1.2	2.1	.89	.66
29	1.6	1.6	2.6	2.2	------	1.2	.89	1.2	1.4	1.2	.86	.60
30	1.6	1.6	2.1	2.1	------	.83	.89	.74	1.3	1.3	.89	.58
31	1.5	------	2.1	2.0	------	.89	------	.71	------	1.2	.89	------
TOTAL	51.6	48.1	61.1	83.2	51.4	39.22	30.54	27.98	27.24	34.13	27.09	22.78
MEAN	1.66	1.60	1.97	2.68	1.84	1.27	1.02	.90	.91	1.10	.87	.76
MAX	2.0	2.4	4.9	8.5	2.3	1.6	1.7	3.4	1.4	2.1	1.2	.98
MIN	1.5	1.5	1.6	2.0	1.5	.83	.77	.63	.63	.66	.60	.58
AC-FT	102	95	121	165	102	78	61	56	54	68	54	45

CAL YR 1969 TOTAL 769.4 MEAN 2.11 MAX 67 MIN 1.2 AC-FT 1,530
WTR YR 1970 TOTAL 504.38 MEAN 1.38 MAX 8.5 MIN .58 AC-FT 1,000

PEAK DISCHARGE (BASE, 180 CFS).--No peak above base.

NOTE.--No gage-height record Oct. 31 to Dec. 2.

16273900 Kamooalii Stream at Kaneohe

LOCATION.--Lat 21°24'51", long 157°48'12", Oahu, on right bank 500 ft upstream from Highway 83 and 0.2 mile south of Parker School in Kaneohe.

DRAINAGE AREA.--4.38 sq mi.

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

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

AVERAGE DISCHARGE.--8 years (1959-63, 1966-70), 16.8 cfs (12,170 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 385 cfs Dec. 27 (gage height, 2.75 ft); minimum, 6.2 cfs on several days in September.

Period of record: Maximum discharge, 12,000 cfs Feb. 1, 1969 (gage height, 10.16 ft), from rating curve extended above 380 cfs on basis of slope-area measurements at gage heights 5.26, 7.14, 7.47 and 10.16 ft; minimum, 3.4 cfs Aug. 28, 1962.

Flood of Oct. 23, 1958, reached a stage of 8.3 ft, from floodmarks, former site and datum (discharge, 6,610 cfs, from rating curve extended above 120 cfs on basis of slope-area measurement at gage height 5.69 ft). Discharge for peaks of Feb. 4 and May 2, 1965, 6,190 and 5,400 cfs, respectively; results of slope-area measurements of peak flow.

REMARKS.--Records fair. Many diversions for irrigation above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	10	12	24	15	12	9.7	8.5	8.5	8.2	8.5	7.6
2	11	10	9.7	16	14	12	12	21	8.2	7.9	8.9	6.7
3	11	10	9.3	86	14	12	11	13	8.2	7.6	8.2	6.4
4	11	10	9.7	26	14	12	10	11	8.5	7.3	7.9	6.4
5	11	11	10	19	14	12	10	10	8.5	7.0	8.2	6.4
6	10	13	8.9	44	14	12	10	9.7	8.5	7.3	7.9	7.0
7	10	11	9.3	19	14	12	10	9.3	7.9	7.6	7.9	6.7
8	10	10	9.7	17	14	12	9.7	8.9	7.9	7.9	8.2	8.3
9	10	10	9.3	16	16	12	9.7	8.5	7.6	7.3	7.6	6.7
10	12	10	8.9	15	14	12	10	9.7	7.6	7.3	7.3	7.0
11	12	10	8.5	19	14	11	10	9.7	7.6	8.8	7.0	7.0
12	16	12	8.9	16	14	12	11	9.7	7.6	7.6	7.3	6.4
13	12	10	9.7	19	14	11	9.7	9.3	7.6	7.6	7.3	6.7
14	11	40	8.9	34	19	11	9.7	8.5	7.9	8.1	7.3	6.4
15	11	19	8.5	16	14	12	9.3	8.5	7.6	7.3	7.3	6.4
16	11	10	8.5	16	13	13	9.3	8.5	7.6	7.0	7.6	6.7
17	10	9.7	8.5	16	13	11	8.9	8.2	7.3	7.6	7.6	6.7
18	10	9.7	8.5	15	13	12	8.9	7.9	7.3	9.0	7.3	7.6
19	10	9.7	9.3	14	13	11	9.7	7.9	7.3	7.6	7.0	7.9
20	11	9.3	8.5	14	12	11	20	7.9	9.7	7.3	7.0	7.3
21	14	9.7	8.5	14	12	11	12	8.5	9.3	7.3	7.0	6.7
22	12	10	8.5	14	12	10	8.9	11	8.2	7.6	6.7	7.0
23	11	11	8.5	14	12	10	8.9	8.5	8.2	11	6.7	6.7
24	11	9.7	12	14	12	10	8.5	8.5	8.5	10	7.9	6.7
25	11	11	15	15	12	10	8.5	8.5	8.5	13	7.3	6.7
26	11	9.7	10	34	12	10	8.5	9.7	8.5	12	7.6	6.7
27	10	9.7	54	54	12	10	8.5	8.5	8.2	9.3	7.6	6.4
28	10	9.3	31	21	12	10	9.7	8.2	7.9	16	7.0	6.4
29	10	9.3	23	16	------	10	9.3	17	8.9	9.7	7.0	6.2
30	10	9.7	16	16	------	9.7	8.9	9.3	8.5	9.3	7.2	6.2
31	10	------	16	16	------	9.7	------	8.5	------	8.9	7.2	------
TOTAL	341	343.5	387.1	689	378	345.4	300.3	301.9	243.6	267.4	232.5	204.0
MEAN	11.0	11.5	12.5	22.2	13.5	11.1	10.0	9.74	8.12	8.63	7.50	6.80
MAX	16	40	54	86	19	13	20	21	9.7	16	8.9	8.3
MIN	10	9.3	8.5	14	12	9.7	8.5	7.9	7.3	7.0	6.7	6.2
AC-FT	676	681	768	1,370	750	685	596	599	483	530	461	405

CAL YR 1969 TOTAL 8,652.4 MEAN 23.7 MAX 1,170 MIN 8.5 AC-FT 17,160
WTR YR 1970 TOTAL 4,033.7 MEAN 11.1 MAX 86 MIN 6.2 AC-FT 8,000

PEAK DISCHARGE (BASE, 950 CFS).--No peak above base.

16275000 Haiku Stream near Heeia

LOCATION.--Lat 21°24'45", long 157°49'35", Oahu, on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heeia.

DRAINAGE AREA.--0.97 sq mi.

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

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

AVERAGE DISCHARGE (since diversion from tunnel began).--27 years (1943-70), 2.23 cfs (1,620 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 290 cfs Jan. 3 (gage height, 2.96 ft), from rating curve extended as explained below; minimum, 1.1 cfs Aug. 12, Sept. 28-30.
Period of record: Maximum discharge, 5,740 cfs May 2, 1965 (gage height, 7.94 ft), from rating curve extended above 57 cfs on basis of slope-area measurements at gage heights 3.87, 3.88 and 7.94 ft; minimum, 0.20 cfs July 20, 1957, Sept. 17, 1961.

REMARKS.--Records good. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.4	1.5	2.3	2.0	1.6	1.6	5.5	1.6	1.4	1.4	1.4
2	1.5	1.4	1.5	5.6	2.0	1.6	1.6	6.2	1.6	1.4	1.4	1.3
3	1.5	1.4	1.5	43	2.0	1.5	1.7	3.3	1.6	1.4	1.4	1.3
4	1.5	1.4	1.5	5.9	1.9	1.6	1.6	2.7	1.6	1.4	1.4	1.3
5	1.5	1.5	1.5	2.8	1.9	1.6	1.6	1.9	1.6	1.4	1.4	1.3
6	1.4	1.5	1.5	2.9	1.9	1.5	1.6	1.7	1.6	1.4	1.4	1.3
7	1.4	1.5	1.5	2.3	1.8	1.5	1.6	1.6	1.5	1.5	1.3	1.3
8	1.4	1.4	1.4	2.1	1.8	1.5	1.6	1.6	1.5	1.4	1.4	1.5
9	1.5	1.4	1.4	2.0	1.9	1.5	1.6	1.6	1.5	1.4	1.3	1.3
10	1.5	1.4	1.4	1.9	1.8	1.5	1.6	1.6	1.5	1.4	1.3	1.3
11	1.6	1.4	1.4	2.0	1.8	1.5	1.7	1.6	1.5	1.5	1.3	1.3
12	2.4	1.5	1.4	1.9	1.7	1.5	1.7	1.6	1.5	1.4	1.3	1.3
13	1.9	1.4	1.4	2.0	1.8	1.5	1.7	1.7	1.5	1.4	1.3	1.3
14	1.6	2.3	1.4	4.1	1.9	1.5	1.7	1.6	1.5	1.4	1.3	1.3
15	1.5	1.8	1.4	2.5	1.7	1.5	1.6	1.6	1.4	1.4	1.3	1.3
16	1.5	1.6	1.4	2.1	1.7	1.5	1.6	1.6	1.4	1.4	1.3	1.3
17	1.5	1.5	1.4	2.0	1.7	1.5	1.6	1.6	1.4	1.4	1.4	1.3
18	1.5	1.5	1.4	2.0	1.7	1.5	1.6	1.6	1.4	1.5	1.4	1.3
19	1.5	1.5	1.4	1.9	1.7	1.5	1.6	1.5	1.4	1.4	1.4	1.2
20	1.5	1.5	1.4	1.9	1.6	1.5	2.6	1.5	1.5	1.3	1.3	1.3
21	1.6	1.5	1.4	1.9	1.6	1.5	1.9	1.6	1.4	1.4	1.3	1.3
22	1.5	1.5	1.4	1.8	1.6	1.5	1.6	1.8	1.4	1.4	1.3	1.3
23	1.5	1.6	1.4	1.8	1.6	1.5	1.6	1.7	1.4	1.5	1.3	1.2
24	1.5	1.5	2.2	1.8	1.6	1.5	1.6	1.6	1.4	1.4	1.4	1.2
25	1.5	1.5	2.6	1.9	1.6	1.5	1.6	1.6	1.4	2.2	1.4	1.2
26	1.5	1.5	1.7	2.1	1.6	1.5	1.6	1.6	1.4	4.3	1.4	1.2
27	1.4	1.5	13	7.2	1.6	1.4	1.5	1.6	1.4	1.7	1.4	1.2
28	1.4	1.5	7.5	4.4	1.6	1.4	1.5	1.6	1.4	1.6	1.4	1.2
29	1.4	1.5	3.5	2.8	------	1.4	1.5	2.4	1.5	1.5	1.4	1.2
30	1.4	1.5	2.7	2.3	------	1.5	1.5	1.9	1.4	1.5	1.4	1.2
31	1.4	------	2.2	2.1	------	1.6	------	1.7	------	1.5	1.4	------
TOTAL	47.3	45.4	68.3	123.3	49.1	46.7	49.4	62.7	44.2	48.2	42.1	38.4
MEAN	1.53	1.51	2.20	3.98	1.75	1.51	1.65	2.02	1.47	1.55	1.36	1.28
MAX	2.4	2.3	13	43	2.0	1.6	2.6	6.2	1.6	4.3	1.4	1.5
MIN	1.4	1.4	1.4	1.8	1.6	1.4	1.5	1.5	1.4	1.3	1.3	1.2
AC-FT	94	90	135	245	97	93	98	124	88	96	84	76

CAL YR 1969 TOTAL 942.9 MEAN 2.58 MAX 120 MIN 1.1 AC-FT 1,870
WTR YR 1970 TOTAL 665.1 MEAN 1.82 MAX 43 MIN 1.2 AC-FT 1,320

PEAK DISCHARGE (BASE, 340 CFS).--No peak above base.

16278000 Iolekaa Stream mauka near Heeia

LOCATION.--Lat 21°25'15", long 157°49'50", Oahu, on left bank 0.7 mile upstream from confluence with Haiku Stream, 1.5 miles southwest of Heeia, and 1.8 miles west of Kaneohe Post Office.

DRAINAGE AREA.--0.29 sq mi.

PERIOD OF RECORD.--March 1940 to February 1970 (discontinued).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 320 ft above mean sea level (transit levels by U.S. Navy).

AVERAGE DISCHARGE (prior to upstream diversion).--24 years (1940-42, 1943-65), 0.644 cfs (467 acre-ft per year).

EXTREMES.--Maximum discharge during period October 1969 to February 1970, 38 cfs Jan. 3 (gage height, 1.76 ft), from rating curve extended as explained below; minimum, 0.14 cfs Dec. 25.
Period of record: Maximum discharge, 797 cfs May 2, 1965 (gage height, 5.6 ft), from rating curve extended above 3.3 cfs by test of model of station site; minimum, 0.06 cfs Feb. 12, 1967.

REMARKS.--Records fair. Diversion 400 ft above station for irrigation since July 1966.

REVISIONS (FISCAL YEARS).--WSP 935: 1940. WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1969 TO FEBRUARY 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.21	.22	.23	.23							
2	.19	.20	.22	.19	.23							
3	.19	.20	.23	5.9	.22							
4	.19	.20	.23	1.2	.22							
5	.19	.20	.23	.57	.22							
6	.19	.20	.23	.80	.23							
7	.19	.20	.23	.46	.23							
8	.19	.20	.23	.42	.24							
9	.20	.20	.23	.38	.24							
10	.19	.20	.23	.38	.25							
11	.22	.20	.23	.46	.24							
12	.32	.20	.23	.38	.25							
13	.20	.20	.23	.38	.25							
14	.19	.36	.23	.88	.27							
15	.20	.21	.23	.40	.25							
16	.20	.21	.23	.34	.25							
17	.20	.21	.23	.31	.26							
18	.20	.21	.23	.29	.26							
19	.20	.21	.23	.29	.26							
20	.20	.21	.23	.29	.25							
21	.23	.22	.24	.29	.25							
22	.19	.22	.23	.29	.25							
23	.20	.23	.23	.31	.25							
24	.20	.22	.50	.31	.25							
25	.20	.22	.20	.31	.25							
26	.20	.22	.16	.38	.25							
27	.20	.22	2.4	1.3	.25							
28	.20	.22	.55	.33	.25							
29	.21	.22	.28	.25	------							
30	.21	.22	.23	.23	------							
31	.21	------	.20	.23	------		------		------			------
TOTAL	6.28	6.44	9.80	18.78	6.85							
MEAN	.20	.21	.32	.61	.24							
MAX	.32	.36	2.4	5.9	.27							
MIN	.18	.20	.16	.19	.22							
AC-FT	12	13	19	37	14							

CAL YR 1969	TOTAL	157.81	MEAN	.43	MAX	29	MIN	.15	AC-FT	313
WTR YR 1970	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

16283000 Kahaluu Stream near Heeia

LOCATION.--Lat 21°26'20", long 157°51'20", Oahu, on left bank 40 ft upstream from intake of Libby ditch, 0.5 mile upstream from forest-reserve boundary, and 3.0 miles northwest of Heeia.

DRAINAGE AREA.--0.28 sq mi.

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

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 357.52 ft above mean sea level (levels by Wright, Harvey & Wright).

AVERAGE DISCHARGE (since diversion from tunnel began).--23 years (1947-70), 0.797 cfs (577 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 253 cfs Jan. 27 (gage height, 4.82 ft), from rating curve extended as explained below; minimum, 0.14 cfs on several days.
Period of record: Maximum discharge, 1,730 cfs Feb. 4, 1965 (gage height, 8.46 ft, from floodmarks), from rating curve extended above 16 cfs by test of model of station site; minimum, 0.05 cfs at times in 1958, 1962 and 1963.

REMARKS.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. Recording rain gage located at station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1937-39, 1943-44.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.27	.22	.32	1.8	.32	.27	.18	.38	.22	.22	.18	.22
2	.27	.22	.38	1.3	.27	.27	.24	3.8	.22	.22	.22	.22
3	.22	.22	.38	8.3	.27	.27	.27	2.1	.22	.22	.18	.22
4	.22	.22	.44	2.6	.32	.27	.22	.87	.18	.22	.18	.22
5	.22	.27	.44	.95	.22	.27	.18	.44	.18	.22	.22	.22
6	.22	.22	.44	1.0	.27	.27	.18	.32	.18	.22	.22	.22
7	.22	.22	.44	.79	.27	.27	.18	.27	.18	.27	.22	.22
8	.22	.22	.38	.71	.22	.22	.18	.27	.18	.32	.22	.27
9	.22	.22	.44	.64	.27	.22	.18	.22	.18	.22	.22	.22
10	.27	.22	.38	.64	.38	.22	.22	.27	.18	.22	.22	.22
11	.44	.22	.32	.79	.38	.22	.27	.22	.18	.50	.22	.22
12	1.8	.27	.32	.64	.32	.18	.27	.27	.18	.32	.22	.22
13	.50	.27	.38	.82	.27	.18	.22	.22	.18	.27	.27	.22
14	.32	1.1	.38	2.7	.44	.18	.22	.22	.18	.27	.27	.22
15	.32	.64	.32	.57	.44	.22	.22	.22	.18	.22	.27	.22
16	.27	.50	.32	.50	.44	.22	.22	.27	.18	.22	.27	.18
17	.27	.44	.32	.50	.38	.18	.22	.22	.18	.22	.27	.18
18	.27	.44	.32	.50	.38	.27	.27	.20	.18	.27	.27	.18
19	.27	.44	.32	.44	.50	.18	.32	.18	.18	.22	.22	.18
20	.27	.44	.32	.44	.38	.18	2.9	.18	.27	.22	.22	.18
21	.92	.44	.32	.38	.38	.18	.64	.22	.22	.22	.22	.18
22	.38	.44	.32	.38	.44	.18	.38	.27	.22	.22	.22	.22
23	.32	.43	.27	.38	.44	.18	.32	.22	.22	.32	.22	.18
24	.27	.38	2.1	.44	.38	.14	.27	.22	.22	.27	.22	.18
25	.27	.32	1.9	.44	.38	.14	.27	.22	.22	1.7	.22	.18
26	.27	.32	.50	.68	.44	.14	.27	.22	.22	1.7	.27	.18
27	.22	.32	4.2	9.4	.32	.14	.27	.22	.22	.22	.22	.18
28	.22	.32	2.5	1.6	.32	.18	.32	.22	.22	.18	.22	.18
29	.22	.32	1.4	.64	------	.18	.32	.22	.22	.14	.22	.14
30	.22	.32	.87	.44	------	.18	.32	.22	.22	.18	.22	.14
31	.22	------	.57	.38	------	.18	------	.22	------	.18	.22	------
TOTAL	10.61	10.62	22.31	41.79	9.84	6.38	10.54	13.61	6.01	10.41	7.05	6.01
MEAN	.34	.35	.72	1.35	.35	.21	.35	.44	.20	.34	.23	.20
MAX	1.8	1.1	4.2	9.4	.50	.27	2.9	3.8	.27	1.7	.27	.27
MIN	.22	.22	.27	.38	.22	.14	.18	.18	.18	.14	.18	.14
AC-FT	21	21	44	83	20	13	21	27	12	21	14	12

CAL YR 1969 TOTAL 261.46 MEAN .72 MAX 36 MIN .22 AC-FT 519
WTR YR 1970 TOTAL 155.18 MEAN .43 MAX 9.4 MIN .14 AC-FT 308

PEAK DISCHARGE (BASE, 47 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-24	2230	2.41	61	1-27	0400	4.82	253
1- 3	1800	2.18	50				

16283500 Kahaluu Stream at Kahaluu

LOCATION.--Lat 21°27'23", long 157°50'15", Oahu, on right bank at downstream side of private road bridge, 0.1 mile downstream from Ahuimanu Stream, and 0.5 mile south of Kahaluu.

DRAINAGE AREA.--3.73 sq mi.

PERIOD OF RECORD.--Annual maximum gage height, water years 1960-62, 1965, February 1967 to April 1970 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Nov. 20, 1959, to Sept. 30, 1962, and Oct. 1, 1964, to June 30, 1965, crest-stage gage at same site and datum.

EXTREMES.--Maximum discharge during period October 1969 to April 1970, 1,760 cfs Jan. 27 (gage height, 13.20 ft), from rating curve extended as explained below; minimum, 2.0 cfs Mar. 31.
Period of record: Maximum gage height, 17.71 ft May 2, 1965 (discharge not determined); maximum discharge determined, 4,310 cfs Feb. 1, 1969 (gage height, 16.98 ft), from rating curve extended above 240 cfs on basis of slope-area measurement at gage height 14.55 ft; minimum discharge, 2.0 cfs Mar. 31, 1970.

REMARKS.--Records fair. Honolulu Board of Water Supply diverts water from tunnel in drainage area. Effluent of about 0.2 cfs from sewage treatment plant enters Ahuimanu Stream above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1969 TO APRIL 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	4.6	5.4	44	11	4.2	2.8					
2	3.8	4.6	3.8	35	10	3.8	5.0					
3	3.8	4.6	5.4	167	9.6	3.8	4.2					
4	3.8	5.0	5.0	70	9.6	5.0	3.8					
5	3.8	6.4	6.4	35	9.0	4.2	3.5					
6	3.5	5.9	4.6	50	10	3.8	3.5					
7	4.2	5.4	5.4	24	8.4	3.5	3.2					
8	3.5	4.6	5.0	20	7.4	3.2	2.8					
9	4.6	4.2	6.4	15	8.4	3.5	3.2					
10	6.3	4.2	5.4	14	7.4	3.5	3.5					
11	9.9	4.2	4.6	30	7.4	3.2	3.5					
12	34	9.0	4.6	19	7.4	3.3	3.8					
13	9.0	6.4	4.6	36	7.9	3.2	3.8					
14	6.4	28	4.6	104	10	2.8	3.2					
15	6.4	8.4	5.0	24	7.9	4.6	2.8					
16	5.9	5.9	5.0	18	6.9	5.4	4.2					
17	5.4	5.0	5.4	16	7.4	3.5	4.6					
18	5.4	4.6	5.0	14	6.4	3.5	5.9					
19	5.0	4.6	4.6	14	5.9	2.6	5.0					
20	5.4	4.2	4.6	12	5.9	3.5	24					
21	14	5.0	5.0	12	5.4	4.6	11					
22	6.9	5.4	4.6	11	5.4	3.5	5.9					
23	5.9	8.4	5.4	10	5.0	3.2	5.4					
24	5.9	5.0	28	10	4.6	2.8	5.0					
25	5.4	5.0	32	11	4.2	2.8	5.0					
26	5.0	4.6	8.4	30	4.2	2.8	6.4					
27	5.0	4.2	85	148	4.2	2.6	5.0					
28	5.0	4.2	61	35	4.2	2.8	5.9					
29	4.6	4.2	38	18	------	2.8	4.2					
30	4.6	4.2	20	15	------	3.2	3.8					
31	4.6	------	15	14	------	2.6	------		------			------
TOTAL	200.8	180.0	403.2	1,075	201.1	107.8	153.9					
MEAN	6.48	6.00	13.0	34.7	7.18	3.48	5.13					
MAX	34	28	85	167	11	5.4	24					
MIN	3.5	4.2	3.8	10	4.2	2.6	2.8					
AC-FT	398	357	800	2,130	399	214	305					

CAL YR 1969	TOTAL	6,391.0	MEAN	17.5	MAX	1,010	MIN	3.2	AC-FT	12,680
WTR YR 1970	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-27	1930	10.91	664	1-27	0400	13.20	1,760
1- 3	1800	11.05	720				

16283600 South Fork Waihee Stream near Heeia

LOCATION.--Lat 21°26'42", long 157°52'10", Oahu, on left bank 0.6 mile upstream from confluence with North Fork, 3.0 miles southwest of Waiahole School, and 4.0 miles northwest of Heeia.

DRAINAGE AREA.--0.03 sq mi.

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

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

AVERAGE DISCHARGE.--8 years, 2.15 cfs (1,560 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 122 cfs Jan. 27 (gage height, 2.98 ft), from rating curve extended above 3.9 cfs; minimum, 1.6 cfs several days.
Period of record: Maximum discharge, 279 cfs May 2, 1965 (gage height, 3.96 ft), from rating curve extended above 3.9 cfs; minimum, 1.4 cfs many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	2.1	1.9	2.6	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.9
2	2.2	2.2	1.8	2.2	1.9	1.9	2.0	2.6	1.8	1.8	1.7	1.9
3	2.2	2.2	1.9	4.6	1.9	1.9	2.0	2.5	1.8	1.8	1.7	1.9
4	2.2	2.2	1.9	2.2	1.9	1.9	1.9	2.1	1.8	1.8	1.7	1.9
5	2.2	2.2	1.9	2.0	1.9	1.9	1.9	2.1	1.8	1.8	1.7	1.9
6	2.2	2.4	1.9	2.2	1.9	1.9	1.8	2.0	1.7	1.8	1.7	1.9
7	2.2	2.4	1.9	1.9	1.9	1.9	1.8	2.0	1.7	1.8	1.8	1.9
8	2.2	2.2	1.9	1.9	1.9	1.9	1.8	2.0	1.7	1.8	1.9	2.0
9	2.2	2.2	1.9	1.9	2.0	1.9	1.8	2.0	1.7	1.8	1.9	1.9
10	2.2	2.2	1.9	1.9	1.9	1.9	1.8	2.0	1.7	1.8	1.9	1.9
11	2.6	2.2	1.9	2.2	1.9	1.9	1.9	2.0	1.7	2.3	1.9	1.9
12	3.1	2.5	1.9	1.9	1.9	1.9	1.9	2.0	1.7	1.9	1.9	1.9
13	2.2	2.2	1.9	2.1	2.0	1.9	1.9	2.0	1.7	1.9	1.9	1.9
14	2.2	3.0	1.9	2.6	2.0	2.0	1.9	1.9	1.6	1.8	1.9	1.9
15	2.2	2.2	1.9	2.1	1.9	2.0	1.9	1.9	1.6	1.8	1.9	1.9
16	2.2	2.1	1.8	2.1	1.9	2.0	1.9	1.9	1.6	1.8	1.9	1.9
17	2.2	2.1	1.8	2.1	1.9	2.0	1.9	1.9	1.6	1.7	1.9	1.8
18	2.2	2.1	1.8	2.0	1.9	2.0	1.9	1.9	1.8	1.9	1.9	1.8
19	2.2	2.1	1.8	1.9	1.9	2.0	2.2	1.9	1.8	1.8	1.9	1.8
20	2.2	2.1	1.8	1.9	1.9	2.0	2.6	1.9	1.9	1.7	1.9	2.1
21	2.6	2.1	1.8	1.9	1.9	2.0	1.9	1.9	1.9	1.7	1.9	1.8
22	2.2	2.1	1.8	1.9	1.9	2.0	1.9	2.2	1.9	1.7	1.9	1.8
23	2.4	2.0	1.8	1.8	1.9	1.9	1.9	2.0	1.9	1.8	1.9	1.8
24	2.2	2.0	3.1	1.8	1.9	1.9	1.9	1.9	1.9	1.7	1.9	1.8
25	2.2	2.0	2.6	1.7	1.9	2.0	1.8	1.9	1.9	3.0	1.9	1.7
26	2.2	2.0	2.2	1.9	1.9	2.0	1.8	2.0	1.9	2.2	1.9	1.7
27	2.2	2.0	3.8	5.4	1.9	2.0	1.8	1.9	1.8	1.8	1.9	1.7
28	2.1	1.9	2.8	2.5	1.9	2.0	1.8	1.8	1.8	1.8	1.9	1.7
29	2.1	1.9	2.7	2.1	------	1.9	1.8	1.8	1.9	1.8	1.9	1.6
30	2.1	1.9	2.2	2.0	------	1.9	1.7	1.8	1.8	1.8	1.9	1.6
31	2.1	------	2.2	2.0	------	1.9	------	1.8	------	1.8	1.9	------
TOTAL	69.7	64.8	64.4	69.3	53.5	60.2	57.0	61.4	53.2	57.7	57.6	55.2
MEAN	2.25	2.16	2.08	2.24	1.91	1.94	1.90	1.98	1.77	1.86	1.86	1.84
MAX	3.1	3.0	3.8	5.4	2.0	2.0	2.6	2.6	1.9	3.0	1.9	2.1
MIN	2.1	1.9	1.8	1.7	1.9	1.9	1.7	1.8	1.6	1.7	1.7	1.6
AC-FT	138	129	128	137	106	119	113	122	106	114	114	109

CAL YR 1969 TOTAL 861.8 MEAN 2.36 MAX 18 MIN 1.8 AC-FT 1,710
WTR YR 1970 TOTAL 724.0 MEAN 1.98 MAX 5.4 MIN 1.6 AC-FT 1,440

PEAK DISCHARGE (BASE, 31 CFS).--Dec. 24 (2230) 45 cfs (2.10 ft); Jan. 27 (0400) 122 cfs (2.98 ft).

16283700 North Fork Waihee Stream near Heeia

LOCATION.--Lat 21°26'46", long 157°52'18", Oahu, on left bank 0.6 mile upstream from confluence with South Fork, 2.8 miles southwest of Waiahole School, and 4.3 miles northwest of Heeia.

DRAINAGE AREA.--0.03 sq mi.

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

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

AVERAGE DISCHARGE.--8 years, 2.08 cfs (1,510 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 120 cfs Jan. 27 (gage height, 2.36 ft), from rating curve extended above 19 cfs; minimum, 1.7 cfs Sept. 30.
Period of record: Maximum discharge, 376 cfs Feb. 4, 1965 (gage height, 3.38 ft), from rating curve extended above 19 cfs; minimum, 1.3 cfs on many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	2.3	2.2	2.4	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
2	2.4	2.3	2.2	2.3	2.1	2.0	2.0	2.5	1.9	2.0	2.0	1.9
3	2.3	2.3	2.2	4.1	2.1	2.0	2.0	2.4	1.9	2.0	1.9	1.9
4	2.3	2.3	2.2	2.4	2.1	2.0	2.0	2.1	1.9	2.0	1.9	1.9
5	2.3	2.4	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
6	2.3	2.4	2.2	2.4	2.1	2.0	2.0	2.0	1.9	2.0	1.8	1.9
7	2.3	2.4	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.8	1.9
8	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	2.0
9	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
10	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
11	2.7	2.3	2.2	2.3	2.1	2.0	2.0	2.0	1.9	2.2	1.9	1.9
12	2.9	2.4	2.2	2.2	2.1	2.0	2.1	2.0	1.9	2.0	1.9	1.9
13	2.3	2.3	2.2	2.3	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
14	2.3	2.8	2.2	2.5	2.2	2.0	2.0	2.0	1.9	2.0	1.9	1.9
15	2.3	2.4	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
16	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9
17	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9
18	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9
19	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9
20	2.4	2.3	2.2	2.2	2.0	2.0	2.7	2.0	2.0	2.0	1.9	2.1
21	2.5	2.3	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9
22	2.3	2.4	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.0	1.9	1.9
23	2.3	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8
24	2.3	2.3	3.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8
25	2.3	2.2	2.5	2.1	2.0	2.0	2.0	1.9	2.0	2.8	1.9	1.8
26	2.3	2.2	2.2	2.2	2.0	2.0	2.0	1.9	2.0	2.2	1.9	1.8
27	2.3	2.2	3.4	5.4	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.8
28	2.3	2.2	2.7	2.3	2.0	2.0	2.0	1.9	2.0	2.0	1.9	1.8
29	2.3	2.2	2.4	2.2	------	2.0	2.0	1.9	2.1	1.9	1.9	1.8
30	2.3	2.2	2.3	2.1	------	2.0	2.0	1.9	2.0	2.0	1.9	1.8
31	2.3	------	2.3	2.1	------	2.0	------	1.9	------	2.0	1.9	------
TOTAL	73.0	69.6	71.7	74.1	57.7	62.0	60.9	62.4	58.3	63.1	58.8	56.5
MEAN	2.35	2.32	2.31	2.39	2.06	2.00	2.03	2.01	1.94	2.04	1.90	1.88
MAX	2.9	2.8	3.4	5.4	2.2	2.0	2.7	2.5	2.1	2.8	2.0	2.1
MIN	2.3	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.8
AC-FT	145	138	142	147	114	123	121	124	116	125	117	112

CAL YR 1969 TOTAL 849.3 MEAN 2.33 MAX 16 MIN 1.9 AC-FT 1,680
WTR YR 1970 TOTAL 768.1 MEAN 2.10 MAX 5.4 MIN 1.8 AC-FT 1,520

PEAK DISCHARGE (BASE, 31 CFS).--Dec. 24 (2200) 54 cfs (1.83 ft); Jan. 27 (0430) 120 cfs (2.36 ft).

16284000 Waihee Stream near Heeia

LOCATION.--Lat 21°27'00", long 157°51'40", Oahu, on left bank 70 ft upstream from intake of Kihe ditch, 120 ft downstream from forest-reserve boundary, 3.5 miles northwest of Heeia, and 4.0 miles northwest of Kaneohe Post Office.

DRAINAGE AREA.--0.93 sq mi.

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

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

AVERAGE DISCHARGE.--34 years (1936-70), 9.09 cfs (6,590 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, about 700 cfs Jan. 27; minimum, 3.8 cfs Aug. 22, 23. Period of record: Maximum discharge, 5,110 cfs Feb. 4, 1965 (gage height, 8.72 ft, from floodmarks), from rating curve extended above 77 cfs on basis of slope-area measurements at gage heights 6.06 and 8.72 ft; minimum, 3.4 cfs Oct. 15, 16, 1962.

REMARKS.--Records fair. Honolulu Board of Water Supply diverts water from tunnel in drainage area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1956-57. WSP 1937: 1940-43(M), 1947(M), 1948(P), 1949-50(M), 1953(M), 1955(M), 1958(M), 1959(P). (WATER YEAR).--WRD Hawaii 1968: 1967(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	5.0	4.6	8.5	6.3	5.6	5.4	6.3	5.8	4.9	5.2	4.4
2	5.5	5.0	4.6	8.1	6.0	5.6	5.4	10	5.8	4.8	5.2	4.3
3	5.5	5.0	5.0	22	5.8	5.6	5.6	9.7	5.8	4.9	5.1	4.3
4	5.5	4.8	4.8	14	5.6	5.8	5.6	8.8	5.8	5.1	4.9	4.3
5	5.5	5.0	4.8	8.5	5.6	5.6	5.8	7.4	5.8	5.2	4.8	4.3
6	5.5	5.0	4.8	8.3	5.4	5.6	5.8	6.8	5.8	4.8	4.6	4.1
7	5.5	4.8	4.8	6.8	5.4	5.6	5.8	6.5	5.4	4.6	4.3	4.1
8	5.5	4.8	5.0	6.2	5.4	5.6	6.0	6.3	5.4	4.6	4.3	4.8
9	5.5	4.8	5.1	5.8	5.4	5.6	6.0	6.1	5.4	4.6	4.4	4.6
10	5.5	4.8	4.8	5.5	5.4	5.6	6.1	6.3	5.6	4.6	4.4	4.6
11	6.4	4.8	4.8	6.2	5.4	5.6	6.1	6.1	5.6	5.8	4.4	4.6
12	11	5.5	4.8	5.8	5.4	5.6	6.5	6.3	5.6	4.9	4.3	4.4
13	6.8	5.1	4.8	6.0	5.6	5.4	6.0	6.3	5.4	5.1	4.3	4.4
14	5.7	6.7	4.6	12	6.1	5.4	6.0	6.2	5.2	4.9	4.3	4.5
15	5.5	5.3	4.6	7.4	5.6	5.6	6.0	6.0	5.2	4.9	4.3	4.6
16	5.3	5.1	4.6	6.8	5.6	5.6	6.0	6.0	5.2	4.8	4.4	4.6
17	5.3	5.0	4.6	6.2	5.6	5.4	5.8	6.0	5.4	4.8	4.4	4.6
18	5.1	4.8	4.6	5.7	5.6	5.6	5.8	5.8	5.2	4.9	4.3	4.8
19	5.1	4.8	4.6	5.7	5.6	5.6	5.6	5.8	4.9	4.4	4.1	4.8
20	5.1	4.8	4.6	5.7	5.6	6.0	9.7	6.0	5.1	4.3	4.1	5.1
21	6.4	4.8	4.6	5.7	5.6	6.0	6.5	6.1	5.6	4.1	4.1	4.9
22	5.1	4.8	4.6	5.7	5.6	6.0	6.0	6.6	5.4	4.1	4.0	4.9
23	5.0	5.0	4.6	5.7	5.6	6.0	6.0	6.1	5.2	4.8	3.8	4.6
24	5.0	4.8	8.4	5.7	5.6	6.0	6.0	6.0	5.2	4.9	4.0	4.4
25	5.0	4.8	6.5	5.8	5.4	5.8	6.0	6.0	5.2	8.5	4.1	4.4
26	5.0	4.8	5.0	6.4	5.4	5.6	6.0	6.1	5.2	8.2	4.6	4.3
27	5.1	4.8	12	27	5.4	5.6	6.0	6.0	5.2	6.0	4.4	4.3
28	5.1	4.8	11	9.7	5.4	5.6	6.1	6.0	5.2	5.6	4.6	4.3
29	5.0	4.8	9.2	7.6	------	5.6	6.0	6.0	5.4	5.2	4.6	4.3
30	5.0	4.6	7.2	6.8	------	5.6	6.1	6.0	5.2	5.6	4.6	4.3
31	5.0	------	6.0	6.5	------	5.4	------	5.8	------	5.2	4.4	------
TOTAL	173.0	148.9	174.0	253.8	156.4	175.2	181.7	201.4	162.2	159.1	137.3	134.9
MEAN	5.58	4.96	5.61	8.19	5.59	5.65	6.06	6.50	5.41	5.13	4.43	4.50
MAX	11	6.7	12	27	6.3	6.0	9.7	10	5.8	8.5	5.2	5.1
MIN	5.0	4.6	4.6	5.5	5.4	5.4	5.4	5.8	4.9	4.1	3.8	4.1
AC-FT	343	295	345	503	310	348	360	399	322	316	272	268

CAL YR 1969 TOTAL 2,444.4 MEAN 6.70 MAX 180 MIN 4.6 AC-FT 4,850
WTR YR 1970 TOTAL 2,057.9 MEAN 5.64 MAX 27 MIN 3.8 AC-FT 4,080

PEAK DISCHARGE (BASE, 140 CFS).--Jan. 27 (about 0500) about 700 cfs.

NOTE.--No gage-height record Jan. 27.

16284500 Waihee Stream at Kahaluu

LOCATION.--Lat 21°27'31", long 157°50'26", Oahu, on left bank 20 ft upstream from Ahaolelo Road, 300 ft upstream from mouth, and 0.3 mile southwest of Kahaluu.

DRAINAGE AREA.--2.26 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1958, 1960-63, 1965-66, October 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

EXTREMES.--Current year: Maximum discharge, 984 cfs Jan. 27 (gage height, 7.24 ft), from rating curve extended above 170 cfs; minimum, 6.6 cfs Sept. 27.
Period of record: Maximum discharge, 3,020 cfs Feb. 1, 1969 (gage height, 11.70 ft), from rating curve extended above 170 cfs; minimum, 6.6 cfs Sept. 27, 1970.

REMARKS.--Records fair. Diversions above station for irrigation of taro and other crops. Honolulu Board of Water Supply diverts water from tunnel and well in drainage area. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	11	11	28	18	12	9.9	9.9	11	10	11	8.8
2	11	11	11	24	17	13	11	24	10	9.9	11	8.3
3	11	11	13	57	17	13	12	22	9.9	9.9	11	8.3
4	11	11	13	34	17	14	11	16	10	10	10	7.9
5	11	11	14	24	15	14	11	14	10	9.9	10	8.3
6	10	12	12	28	15	13	11	13	10	9.8	9.7	8.3
7	10	12	12	20	14	13	11	12	10	9.7	8.8	7.9
8	10	11	12	18	13	13	11	12	9.9	9.7	8.8	10
9	11	10	12	18	16	13	11	11	9.9	9.7	8.8	8.8
10	11	10	11	17	15	14	11	11	11	9.7	8.8	8.8
11	15	9.9	11	21	14	14	12	11	11	13	9.0	8.8
12	27	11	11	18	13	14	12	11	11	10	8.8	8.8
13	15	11	11	22	13	14	12	12	10	11	8.6	8.8
14	12	15	11	34	15	14	11	11	9.6	11	8.8	8.8
15	12	12	11	19	12	14	11	11	9.2	11	8.8	8.1
16	12	11	11	17	12	14	11	11	9.2	10	9.2	8.3
17	11	10	11	16	12	12	11	11	8.8	10	8.8	7.9
18	11	10	11	16	12	12	11	11	8.8	12	8.8	8.5
19	11	10	11	15	12	12	11	11	8.8	11	8.8	10
20	11	10	11	15	12	12	14	11	10	11	9.0	10
21	15	10	11	15	12	12	11	11	11	10	8.8	9.2
22	11	11	11	15	12	12	11	15	10	10	8.8	9.2
23	11	12	11	15	12	11	10	12	10	13	8.3	8.8
24	11	11	15	15	12	11	10	11	10	15	8.8	8.3
25	10	11	26	15	11	11	9.9	11	10	18	8.8	8.3
26	11	11	16	16	11	11	9.6	12	10	18	10	7.9
27	11	10	30	109	11	10	9.9	11	10	11	9.7	7.9
28	9.9	10	31	28	12	10	11	11	10	10	9.2	7.9
29	9.9	11	28	22	------	9.9	10	11	11	10	8.8	7.9
30	12	11	22	20	------	10	10	11	10	11	8.8	7.9
31	11	------	18	19	------	9.9	------	11	------	11	8.3	------
TOTAL	366.8	327.9	450	750	377	381.8	328.3	382.9	300.1	345.3	284.8	256.7
MEAN	11.8	10.9	14.5	24.2	13.5	12.3	10.9	12.4	10.0	11.1	9.19	8.56
MAX	27	15	31	109	18	14	14	24	11	18	11	10
MIN	9.9	9.9	11	15	11	9.9	9.6	9.9	8.8	9.7	8.3	7.9
AC-FT	728	650	893	1,490	748	757	651	759	595	685	565	509

CAL YR 1969 TOTAL 6,058.3 MEAN 16.6 MAX 669 MIN 9.8 AC-FT 12,020
WTR YR 1970 TOTAL 4,551.6 MEAN 12.5 MAX 109 MIN 7.9 AC-FT 9,030

PEAK DISCHARGE (BASE, 300 CFS).--Jan. 27 (0600) 984 cfs (7.24 ft).

16294900 Waikane Stream at altitude 75 ft, at Waikane

LOCATION.--Lat 21°30'00", long 157°51'54", Oahu, on right bank 0.3 mile downstream from Waikeekee Stream, 0.7 mile west of Waikane, and 1.2 miles northwest of Waiahole School.

DRAINAGE AREA.--2.22 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (from topographic map).

AVERAGE DISCHARGE.--10 years (1960-70), 9.98 cfs (7,230 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,760 cfs Jan. 27 (gage height, 8.82 ft), from rating curve extended as explained below; minimum, 2.2 cfs Aug. 22, 23.
Period of record: Maximum discharge, 8,800 cfs Feb. 4, 1965 (gage height, 10.76 ft), from rating curve extended above 120 cfs on basis of slope-area measurements at gage heights 4.88, 9.46, and 10.76 ft; minimum, 1.2 cfs Oct. 10, 11, 1962.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Waiahole tunnel diverts from two tributaries above station for irrigation in vicinity of Waipahu. Recording rain gage located at station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	3.6	3.0	24	11	3.6	2.8	10	4.9	3.4	3.8	3.2
2	4.2	3.4	2.8	20	9.5	3.6	3.2	50	4.7	3.0	3.4	3.0
3	3.8	3.4	2.8	169	8.3	3.4	4.5	12	4.7	2.8	3.2	2.8
4	3.8	3.2	3.0	65	8.0	3.8	3.0	8.0	4.7	2.8	3.0	2.6
5	3.6	3.6	3.4	33	7.6	4.0	2.9	6.6	4.4	2.8	3.0	2.6
6	3.4	3.6	3.0	25	7.0	3.6	2.8	6.2	4.2	2.8	2.8	3.0
7	3.4	3.4	3.2	18	6.4	3.4	3.0	6.0	4.2	3.2	3.2	2.8
8	3.4	3.4	3.6	14	6.4	3.4	2.8	5.8	4.0	4.0	3.6	14
9	3.4	3.2	3.2	12	6.8	3.4	3.1	5.6	3.8	3.4	3.2	4.7
10	3.8	3.2	3.2	11	6.4	3.6	3.5	7.0	3.8	3.0	3.0	4.0
11	8.3	3.2	3.0	30	5.5	3.6	4.5	5.6	3.8	6.8	3.0	3.4
12	47	4.2	2.8	18	5.2	3.4	9.0	8.0	3.8	4.2	2.8	3.0
13	9.8	3.4	3.2	14	5.2	3.4	5.0	16	3.6	4.7	3.0	2.8
14	7.0	4.4	3.4	32	6.1	3.4	4.5	9.0	3.8	3.8	3.4	2.8
15	6.1	3.6	3.0	16	5.2	3.8	4.0	7.8	3.6	3.4	3.0	2.8
16	5.2	3.4	2.8	13	4.7	3.8	3.5	6.8	3.6	3.0	3.0	2.8
17	4.9	3.0	2.8	12	4.7	3.4	3.1	6.0	3.4	3.0	3.0	2.8
18	4.7	3.0	2.8	11	4.7	4.2	3.0	5.4	3.2	4.0	3.0	2.8
19	4.4	3.0	2.8	9.9	4.4	3.4	3.0	5.4	3.4	3.0	2.8	3.8
20	4.4	2.8	2.8	9.1	4.2	3.2	11	5.4	5.1	2.8	2.6	4.0
21	6.6	2.8	2.8	8.7	4.2	3.2	6.0	5.4	4.9	2.8	2.6	3.6
22	4.7	3.4	2.8	8.3	4.2	3.2	4.0	22	4.0	2.8	2.4	3.2
23	4.2	6.4	2.8	7.6	4.0	3.0	3.5	8.7	3.6	4.7	2.4	3.0
24	4.0	3.4	50	7.3	3.8	3.0	3.5	6.1	3.6	7.0	3.4	2.8
25	4.0	3.8	40	7.3	3.8	3.0	3.5	5.5	3.4	4.9	2.6	2.8
26	4.0	3.4	8.7	8.5	3.8	3.0	3.5	7.3	3.4	4.2	7.6	2.8
27	3.8	3.0	99	407	3.8	2.8	4.0	6.4	3.2	3.6	7.2	2.8
28	3.8	3.0	70	32	3.8	2.8	3.5	5.2	2.8	4.4	3.4	2.8
29	3.6	2.8	41	19	------	2.8	3.5	4.9	3.8	3.4	3.2	2.6
30	3.6	2.8	23	14	------	2.8	3.2	4.9	4.4	4.7	3.6	2.6
31	3.6	------	18	12	------	2.8	------	4.9	------	3.6	3.4	------
TOTAL	184.3	102.8	418.7	1,087.7	158.7	103.8	120.4	273.9	117.8	116.0	103.6	102.7
MEAN	5.95	3.43	13.5	35.1	5.67	3.35	4.01	8.84	3.93	3.74	3.34	3.42
MAX	47	6.4	99	407	11	4.2	11	50	5.1	7.0	7.6	14
MIN	3.4	2.8	2.8	7.3	3.8	2.8	2.8	4.9	2.8	2.8	2.4	2.6
AC-FT	366	204	830	2,160	315	206	239	543	234	230	205	204

CAL YR 1969 TOTAL 4,882.3 MEAN 13.4 MAX 866 MIN 2.8 AC-FT 9,680
WTR YR 1970 TOTAL 2,890.4 MEAN 7.92 MAX 407 MIN 2.4 AC-FT 5,730

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-24	2200	5.08	802	1-27	0400	8.82	3,760
1- 3	1630	5.27	895				

NOTE.--No gage-height record Mar. 31 to May 22.

16296500 Kahana Stream at altitude 30 ft, near Kahana

LOCATION.--Lat 21°32'38", long 157°53'07", Oahu, on right bank 600 ft upstream from Kawa Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 sq mi.

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

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

AVERAGE DISCHARGE.--11 years (1959-70), 38.3 cfs (27,750 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,940 cfs Jan. 27 (gage height, 6.18 ft), from rating curve extended as explained below; minimum, 15 cfs Sept. 30.
Period of record: Maximum discharge, 5,430 cfs Apr. 15, 1963 (gage height, 8.10 ft), from rating curve extended above 530 cfs on basis of computation of peak flow over submerged weir; minimum, 10 cfs Sept. 17, 18, 20, 1961.

REMARKS.--Records fair. Approximately 9 cfs is diverted by Waiahole Water Co. at 800-ft elevation, 2.3 miles above station. Recording rain gage located at station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1937: 1959-60.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	19	20	95	32	19	17	23	27	28	25	27
2	25	19	19	54	29	18	20	176	25	25	26	22
3	23	18	19	296	28	18	32	120	24	25	22	20
4	22	19	19	134	27	18	19	56	23	24	21	19
5	21	19	19	61	26	19	18	41	23	22	21	18
6	21	20	19	53	25	18	17	35	23	21	20	18
7	21	19	19	39	24	18	17	30	21	23	23	17
8	20	19	20	36	24	18	17	28	21	28	23	51
9	20	18	20	31	26	18	17	28	20	23	20	19
10	20	18	19	28	25	18	21	35	20	25	20	20
11	33	18	18	101	23	17	20	30	21	57	19	18
12	129	21	18	44	22	17	68	43	21	29	19	18
13	29	20	18	44	23	17	27	118	21	31	19	17
14	25	25	19	94	24	17	23	50	34	26	20	17
15	25	20	17	39	22	25	21	40	22	25	19	17
16	23	18	17	35	21	27	20	33	21	23	19	16
17	22	18	17	33	21	23	20	29	20	23	19	16
18	21	17	17	31	21	39	20	27	20	27	19	17
19	21	17	17	29	21	21	23	25	20	22	18	34
20	22	17	16	28	20	19	96	24	35	21	18	35
21	39	43	16	27	20	18	35	25	60	20	17	26
22	23	117	16	26	20	18	25	105	38	21	17	23
23	21	66	16	25	19	17	23	38	28	37	17	20
24	21	26	162	25	19	17	22	28	31	39	24	19
25	21	37	142	24	20	17	22	29	27	45	19	18
26	20	23	61	38	19	17	23	37	26	46	133	17
27	20	21	258	458	19	17	26	33	25	25	89	17
28	20	21	182	104	19	17	24	27	23	27	38	16
29	20	20	87	51	------	17	25	42	61	23	31	16
30	19	20	46	40	------	16	23	28	38	26	60	16
31	19	------	55	35	------	16	------	44	------	23	27	------
TOTAL	810	773	1,408	2,158	639	591	781	1,427	819	860	882	624
MEAN	26.1	25.8	45.4	69.6	22.8	19.1	26.0	46.0	27.3	27.7	28.5	20.8
MAX	129	117	258	458	32	39	96	176	61	57	133	51
MIN	19	17	16	24	19	16	17	23	20	20	17	16
AC-FT	1,610	1,530	2,790	4,280	1,270	1,170	1,550	2,830	1,620	1,710	1,750	1,240

CAL YR 1969 TOTAL 17,633 MEAN 48.3 MAX 1,330 MIN 16 AC-FT 34,980
WTR YR 1970 TOTAL 11,772 MEAN 32.3 MAX 458 MIN 16 AC-FT 23,350

PEAK DISCHARGE (BASE, 1,600 CFS).--Dec. 24 (2230) 2,610 cfs (5.87 ft); Jan. 27 (0430) 2,940 cfs (6.18 ft).

16302000 Punaluu ditch near Punaluu

LOCATION.--Lat 21°33'41", long 157°54'11", Oahu, on right bank 1,000 ft downstream from intake, 1.5 miles west of Kahana, and 1.7 miles southwest of Punaluu.

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

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

AVERAGE DISCHARGE.--17 years, 11.0 cfs (7,970 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 54 cfs Oct. 31, 1964; no flow for several days in 1963, 1966, 1969.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Ditch diverts from Punaluu Stream for irrigation of sugarcane in vicinity of Punaluu.

REVISIONS (FISCAL YEARS).--WSP 1719: 1954-55.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	15	14	.03	.50	8.8	10	12	8.1	9.4	12	12
2	11	16	14	7.8	.50	9.6	11	24	8.1	9.2	12	12
3	16	15	13	28	.50	9.6	11	16	8.0	9.6	11	11
4	16	15	7.7	23	.50	9.6	11	12	7.9	10	11	11
5	16	14	4.6	19	.50	9.6	11	10	7.8	10	11	11
6	15	14	4.3	19	.50	11	11	9.5	8.1	10	11	12
7	15	13	4.2	18	.50	10	10	8.7	8.1	9.6	12	11
8	15	13	4.2	17	.50	10	10	8.3	8.0	9.6	11	11
9	15	15	4.2	16	.65	10	10	8.1	7.9	9.4	11	11
10	14	15	4.1	16	.60	9.6	10	7.6	7.9	11	11	11
11	16	15	4.1	17	.50	9.6	11	6.7	8.2	14	11	11
12	24	15	4.1	12	.45	9.6	15	8.1	8.0	13	12	11
13	18	15	4.1	11	.37	9.6	12	11	8.0	13	12	11
14	17	16	4.0	12	.40	9.6	11	9.2	9.3	13	11	11
15	16	16	3.9	8.7	.37	9.4	11	8.4	8.1	13	11	11
16	16	16	4.0	8.1	3.9	8.8	11	8.2	7.8	13	11	11
17	16	15	3.9	10	8.6	8.4	11	8.1	7.7	12	12	11
18	16	15	3.8	13	8.6	8.6	11	8.0	7.7	12	11	11
19	16	15	3.8	13	8.6	9.6	11	7.9	8.0	13	11	13
20	16	15	3.5	15	8.6	10	15	7.8	9.0	12	11	13
21	17	18	3.2	15	9.2	10	13	7.9	12	11	11	12
22	16	19	3.0	15	9.8	10	12	11	10	11	11	11
23	16	17	3.1	15	9.2	10	12	8.2	10	12	11	11
24	16	15	3.5	15	8.6	10	11	8.0	10	12	12	11
25	16	15	.02	18	9.2	10	11	7.9	10	13	11	11
26	17	15	.02	7.0	10	10	12	8.3	9.9	13	14	11
27	15	15	.02	.50	9.2	10	13	7.7	9.1	12	13	11
28	16	11	.02	.50	8.6	10	12	7.5	9.5	12	13	11
29	16	7.7	.02	.50	------	10	12	8.2	10	12	12	11
30	16	14	.02	.50	------	10	11	7.5	9.7	12	14	11
31	15	------	.02	.50	------	10	------	8.6	------	7.9	13	------
TOTAL	492	444.7	126.44	371.13	119.44	301.0	343	290.4	261.9	353.7	361	338
MEAN	15.9	14.8	4.08	12.0	4.27	9.71	11.4	9.37	8.73	11.4	11.6	11.3
MAX	24	19	14	28	10	11	15	24	12	14	14	13
MIN	11	7.7	.02	.03	.37	8.4	10	6.7	7.7	7.9	11	11
AC-FT	976	882	251	736	237	597	680	576	519	702	716	670

CAL YR 1969 TOTAL 3,235.29 MEAN 8.86 MAX 24 MIN 0 AC-FT 6,420
WTR YR 1970 TOTAL 3,802.71 MEAN 10.4 MAX 28 MIN .02 AC-FT 7,540

NOTE.--No gage-height record Feb. 17 to Mar. 26.

16303000 Punaluu Stream near Punaluu

LOCATION.--Lat 21°33'33", long 157°54'06", Oahu, on left bank at Punaluu ditch diversion dam, 1.4 miles west of Kahana, and 1.8 miles southwest of Punaluu.

DRAINAGE AREA.--2.78 sq mi.

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

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

AVERAGE DISCHARGE.--17 years, 15.8 cfs (11,450 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,350 cfs Dec. 24 (gage height, 3.77 ft), from rating curve extended as explained below; minimum, 2.8 cfs several days.
Period of record: Maximum discharge, 3,180 cfs Feb. 1, 1969 (gage height, 6.33 ft), from rating curve extended above 170 cfs on basis of slope-area measurement at gage height 5.77 ft; no flow at times.

REMARKS.--Records fair. Records do not include flow of Punaluu ditch (see sta 16302000). Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1956(P), 1957(M), 1959(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	3.7	3.4	40	24	8.6	5.0	8.8	12	9.1	7.7	5.7
2	5.3	3.7	3.1	26	21	8.2	5.7	101	12	8.6	7.2	5.3
3	5.0	3.7	3.1	100	18	8.2	8.2	61	12	8.6	6.8	5.0
4	4.7	4.1	9.1	49	16	8.2	5.3	31	11	8.6	6.8	5.0
5	4.7	4.7	11	23	15	7.7	5.0	23	11	8.2	6.3	5.0
6	4.4	5.3	11	19	14	6.8	4.7	19	12	8.2	6.3	5.0
7	4.4	5.3	12	15	13	6.8	5.0	17	10	8.6	6.8	4.7
8	4.1	4.7	13	13	16	6.3	4.7	16	10	9.6	6.3	6.0
9	4.4	4.1	12	10	25	6.3	5.0	15	10	9.1	6.3	4.7
10	4.7	3.7	12	9.6	20	6.8	5.7	16	10	13	6.8	4.7
11	9.6	3.7	12	40	19	6.3	5.7	14	11	27	7.2	4.4
12	46	4.4	11	23	18	6.3	19	20	10	11	6.8	4.4
13	9.6	4.4	12	39	19	6.3	8.2	27	10	10	6.8	4.1
14	7.2	5.3	12	61	20	6.3	6.8	19	15	8.6	6.0	4.1
15	6.3	3.7	12	30	19	7.7	5.7	15	9.6	8.2	5.7	4.1
16	5.7	3.1	11	20	15	11	5.7	15	9.1	7.7	5.7	4.1
17	5.7	3.1	11	16	11	9.1	5.3	14	9.1	7.2	5.7	4.4
18	5.3	3.1	11	14	11	10	5.3	13	8.6	7.7	5.7	5.0
19	5.0	2.8	11	13	11	6.8	5.3	13	8.9	7.2	5.7	11
20	5.7	2.8	11	12	11	6.3	22	13	9.6	6.8	5.3	8.6
21	7.2	11	11	11	11	6.3	9.1	13	14	6.3	5.3	6.0
22	5.0	15	11	10	10	6.3	6.8	29	9.1	6.0	5.3	6.0
23	4.7	8.9	10	9.0	10	6.0	6.3	15	8.6	6.3	5.0	5.0
24	4.7	4.7	68	9.0	10	5.7	6.3	13	9.6	7.7	6.1	4.7
25	4.7	5.0	67	10	10	5.7	6.3	13	9.1	16	5.3	4.7
26	4.4	4.1	37	25	9.6	5.7	6.3	15	9.1	13	15	4.4
27	4.1	3.7	106	120	8.6	5.3	7.2	15	9.1	9.1	11	4.4
28	4.1	6.9	80	53	8.6	5.0	6.3	13	8.6	9.1	6.8	4.1
29	4.1	9.0	42	40	------	5.0	6.3	17	12	8.7	6.3	4.1
30	4.1	3.1	31	35	------	5.0	6.0	12	10	8.7	9.5	4.1
31	3.7	------	30	29	------	5.0	------	15	------	8.2	5.7	------
TOTAL	203.9	150.8	696.7	923.6	413.8	211.0	210.2	640.8	310.1	292.1	209.2	152.8
MEAN	6.58	5.03	22.5	29.8	14.8	6.81	7.01	20.7	10.3	9.42	6.75	5.09
MAX	46	15	106	120	25	11	22	101	15	27	15	11
MIN	3.7	2.8	3.1	9.0	8.6	5.0	4.7	8.8	8.6	6.0	5.0	4.1
AC-FT	404	299	1,380	1,830	821	419	417	1,270	615	579	415	303

CAL YR 1969 TOTAL 7,756.7 MEAN 21.3 MAX 648 MIN 2.8 AC-FT 15,390
WTR YR 1970 TOTAL 4,415.0 MEAN 12.1 MAX 120 MIN 2.8 AC-FT 8,760

PEAK DISCHARGE (BASE, 930 CFS).--Dec. 24 (2230) 1,350 cfs (3.77 ft): May 2 (1830) 1,100 cfs (3.42 ft).

16304200 Kaluanui Stream near Punaluu

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

DRAINAGE AREA.--1.11 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 867 cfs Dec. 24 (gage height, 8.78 ft), from rating curve extended as explained below; minimum, 0.02 cfs Mar. 31, Apr. 1.
Period of record: Maximum discharge, 2,010 cfs Feb. 1, 1969 (gage height, 10.0 ft), from rating curve extended above 14 cfs on basis of slope-area measurements at gage heights 8.85 and 10.0 ft; minimum, 0.02 cfs Mar. 31, Apr. 1, 1970.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	.33	.33	7.4	.85	.09	.16	2.2	1.9	3.1	1.5	3.7
2	1.4	.31	.33	3.2	.70	.08	4.9	59	1.6	2.3	1.4	2.1
3	.89	.29	.33	56	.59	.07	8.8	25	1.6	1.9	1.1	1.7
4	.77	.27	2.0	11	.56	.07	1.2	7.5	1.3	2.3	.81	1.5
5	.70	.27	.66	4.6	.48	.11	2.3	5.1	1.0	1.8	.81	1.3
6	.62	1.8	.35	5.9	.42	.07	.81	3.7	2.6	1.8	.73	1.5
7	.56	.66	.63	2.6	.37	.04	1.4	3.4	1.3	2.0	1.9	1.6
8	.50	1.1	5.9	3.4	.35	.04	1.3	3.7	1.1	5.1	2.1	5.1
9	.66	.50	4.2	2.2	5.1	.04	.85	3.4	.94	2.3	1.6	1.8
10	.53	.35	1.6	1.5	2.4	.04	4.2	5.1	.85	7.7	.94	2.2
11	18	.33	1.0	11	.62	.06	2.8	4.6	.92	16	.89	1.5
12	30	1.5	.62	3.9	.40	.06	15	5.8	1.8	7.0	.73	1.1
13	2.6	1.4	1.2	15	.37	.06	3.7	9.2	1.6	6.2	1.2	.94
14	1.8	3.1	1.7	22	4.2	.05	2.6	4.1	4.9	3.7	2.6	.89
15	1.6	1.0	.59	2.8	1.7	2.2	1.3	3.4	1.6	2.5	1.3	1.5
16	1.2	.50	.45	1.9	.62	4.5	.99	2.5	1.6	2.4	3.5	1.2
17	.99	.37	.35	1.5	.42	1.1	1.0	2.5	1.5	3.1	4.3	1.2
18	.85	.27	.31	1.1	.35	6.4	1.8	2.2	1.1	5.1	2.4	2.2
19	1.1	.20	.35	.94	.33	.85	1.8	1.8	.89	2.3	1.6	7.7
20	2.5	.29	.70	.81	.27	.48	20	1.6	5.6	1.8	1.3	5.4
21	4.6	1.1	.37	.73	.24	.35	5.1	2.9	7.2	1.6	1.0	4.8
22	1.5	40	.26	.77	.20	.92	1.7	16	3.4	1.6	.89	2.5
23	.89	28	.19	.56	.18	.35	1.5	2.5	2.4	7.0	.81	1.9
24	.77	2.5	71	.48	.14	.22	1.0	1.9	5.0	5.2	13	1.6
25	.66	1.4	11	.90	.13	.16	1.1	2.3	3.1	8.0	3.4	1.2
26	.59	2.1	6.4	5.9	.19	.12	2.3	7.1	4.6	4.8	13	1.1
27	.53	.70	64	25	.17	.08	6.1	3.4	2.6	2.3	7.0	.94
28	.48	.40	20	8.2	.13	.07	3.2	2.1	2.1	1.9	3.5	.94
29	.45	.35	6.8	2.9	------	.05	3.9	6.2	7.9	1.7	3.1	.81
30	.40	.33	4.3	1.6	------	.04	2.3	2.1	6.2	4.5	4.2	.73
31	.37	------	7.1	1.1	------	.02	------	4.5	------	1.7	2.8	------
TOTAL	79.61	91.72	215.02	206.89	22.48	18.79	105.11	206.8	80.20	120.7	85.41	62.65
MEAN	2.57	3.06	6.94	6.67	.80	.61	3.50	6.67	2.67	3.89	2.76	2.09
MAX	30	40	71	56	5.1	6.4	20	59	7.9	16	13	7.7
MIN	.37	.20	.19	.48	.13	.02	.16	1.6	.85	1.6	.73	.73
AC-FT	158	182	426	410	45	37	208	410	159	239	169	124

CAL YR 1969 TOTAL 1,914.50 MEAN 5.25 MAX 230 MIN .19 AC-FT 3,800
WTR YR 1970 TOTAL 1,295.38 MEAN 3.55 MAX 71 MIN .02 AC-FT 2,570

PEAK DISCHARGE (BASE, 500 CFS).--Dec. 24 (2130) 867 cfs (8.78 ft).

16308990 Malaekahana Stream near Laie

LOCATION.--Lat 21°38'09", long 157°57'54", Oahu, on left bank 2.3 miles southwest of Laie Temple and 3.0 miles south of Kahuku School.

DRAINAGE AREA.--0.64 sq mi.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 2.14 cfs (1,550 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 296 cfs Dec. 27 (gage height, 4.78 ft), from rating curve extended as explained below; minimum, 0.01 cfs Sept. 30.
Period of record: Maximum discharge, 500 cfs Jan. 6, 1964 (gage height, 5.54 ft), from rating curve extended above 6.6 cfs on basis of slope-area measurement at gage height 4.89 ft; no flow at times most years.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.05	.04	4.4	.32	.15	.03	.32	.38	.17	.21	.53
2	.18	.05	.03	2.0	.29	.15	2.3	6.2	.23	.11	.23	.19
3	.14	.05	.03	23	.25	.13	4.1	9.7	.15	.05	.23	.07
4	.10	.05	.73	3.4	.23	.17	.32	1.5	.13	.05	.19	.05
5	.09	.05	.23	1.3	.23	.19	.09	.71	.11	.04	.13	.03
6	.08	.05	.08	3.8	.21	.17	.06	.47	.98	.03	.10	.03
7	.07	.05	.08	.91	.19	.15	.05	.35	.44	.05	.11	.02
8	.09	.32	1.4	1.1	.19	.15	.04	.29	.35	.27	.35	.68
9	.12	.17	.25	1.2	3.5	.13	.14	.38	.25	.29	.21	.23
10	.10	.10	.23	.55	2.2	.15	.17	.41	.13	4.3	.17	.08
11	6.0	.11	.11	10	.32	.13	.27	.51	.10	11	.13	.05
12	30	.77	.06	2.9	.27	.13	1.1	1.3	.08	5.8	.10	.05
13	4.0	1.2	.05	8.1	.25	.13	.41	.67	.07	3.4	.10	.03
14	1.0	1.5	.06	37	7.6	.13	.17	.91	.10	.55	.11	.02
15	.40	.62	.10	1.8	1.4	.50	.08	.67	.13	.44	.10	.02
16	.30	.15	.05	1.0	.59	1.4	.04	.47	.10	.25	.51	.02
17	.23	.10	.04	.71	.41	.59	.02	.25	.08	.40	1.4	.02
18	.20	.07	.03	.59	.35	1.9	.02	.21	.10	1.2	.32	.62
19	.22	.06	.03	.51	.32	.44	.03	.17	.08	.35	.13	4.0
20	.20	.05	.08	.44	.27	.19	11	.13	.06	.23	.05	2.0
21	3.0	.05	.08	.41	.25	.13	16	.15	3.9	.17	.04	1.4
22	.60	.06	.05	.38	.23	.11	.59	8.8	.80	.13	.02	.44
23	.25	2.9	.04	.35	.21	.11	.35	.38	.38	1.3	.02	.27
24	.13	.35	36	.35	.19	.10	.27	.17	1.5	.55	2.0	.17
25	.11	.34	5.5	.41	.19	.09	.21	.19	.41	2.4	.35	.15
26	.09	.23	1.3	.75	.19	.08	.35	2.6	.44	2.1	3.7	.07
27	.08	.11	38	14	.17	.07	1.0	.94	.35	.55	2.6	.04
28	.07	.07	13	3.9	.15	.07	.71	.19	.15	.23	.19	.02
29	.07	.06	3.3	1.2	------	.06	.97	3.4	4.2	.19	.09	.02
30	.06	.05	1.5	.55	------	.05	.38	.32	1.7	.23	.87	.03
31	.06	------	2.7	.41	------	.03	------	1.2	------	.19	.17	------
TOTAL	48.24	9.79	105.18	127.42	20.97	7.98	41.27	43.96	17.88	37.02	14.93	11.35
MEAN	1.56	.33	3.39	4.11	.75	.26	1.38	1.42	.60	1.19	.48	.38
MAX	30	2.9	38	37	7.6	1.9	16	9.7	4.2	11	3.7	4.0
MIN	.06	.05	.03	.35	.15	.03	.02	.13	.06	.03	.02	.02
AC-FT	96	19	209	253	42	16	82	87	35	73	30	23

CAL YR 1969 TOTAL 750.10 MEAN 2.06 MAX 68 MIN .03 AC-FT 1,490
WTR YR 1970 TOTAL 485.99 MEAN 1.33 MAX 38 MIN .02 AC-FT 964

PEAK DISCHARGE (BASE, 190 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-24	2030	4.59	258	1-14	0230	4.65	270
12-27	1530	4.78	296	4-21	0030	4.66	272

16325000 Kamananui Stream at Pupukea Military Road, near Maunawai

LOCATION.--Lat 21°37'25", long 158°01'04", Oahu, on right bank 75 ft upstream from Pupukea Military Road and 3.5 miles southeast of Maunawai.

DRAINAGE AREA.--3.13 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961, 1963, June 1963 to current year.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 590 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 13.3 cfs (9,640 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,330 cfs Dec. 27 (gage height, 8.28 ft), from rating curve extended as explained below; minimum, 0.68 cfs Dec. 23, 24.
Period of record: Maximum discharge, 1,720 cfs Apr. 20, 1968 (gage height, 9.13 ft), from rating curve extended above 42 cfs on basis of slope-area measurement at gage height 8.12 ft; minimum, 0.01 cfs Nov. 12, 13, 1968.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	1.6	.80	32	4.5	1.5	1.2	4.7	2.9	5.6	2.1	5.6
2	3.1	1.6	.80	16	4.2	1.5	7.1	12	1.8	3.8	2.5	3.5
3	2.5	1.6	.80	429	4.0	1.4	19	12	1.7	2.9	1.9	2.5
4	2.1	1.6	3.1	98	3.8	1.4	5.0	6.9	1.4	2.8	1.6	2.2
5	1.9	1.9	2.2	24	3.6	1.5	3.1	3.5	1.2	2.2	1.5	1.8
6	1.9	2.2	1.0	42	3.5	1.6	2.9	2.8	2.6	1.9	1.4	1.9
7	1.8	2.4	.88	14	3.3	1.4	1.6	2.5	2.6	2.4	2.0	1.7
8	1.9	5.0	4.8	14	3.1	1.4	1.0	2.4	1.4	3.5	2.6	4.7
9	2.1	2.4	2.6	12	7.6	1.3	2.1	2.9	1.1	4.0	2.5	3.6
10	2.0	1.6	2.5	9.0	18	1.2	3.3	3.8	1.1	47	1.4	2.0
11	26	1.4	1.2	45	3.5	1.2	5.2	5.2	1.1	70	1.2	1.6
12	175	2.9	.93	56	2.6	1.2	9.4	5.2	1.2	26	1.2	1.4
13	11	6.6	1.1	50	2.5	1.1	7.0	9.4	1.8	22	1.3	1.3
14	5.2	3.0	1.8	177	19	1.1	3.5	5.6	1.6	13	1.7	1.4
15	4.0	4.5	1.2	18	7.1	2.4	2.5	3.7	2.2	6.2	2.0	1.5
16	3.3	2.0	.84	13	3.3	8.2	1.9	2.9	1.4	4.7	3.7	1.7
17	3.0	1.4	.74	10	2.6	4.8	1.7	2.2	1.7	6.2	7.5	1.4
18	2.8	1.2	.71	9.2	2.4	10	2.1	1.9	1.4	8.5	3.0	7.8
19	3.2	1.2	.74	8.0	2.2	3.9	3.6	1.7	1.1	4.7	1.9	17
20	2.9	1.1	1.2	7.3	2.1	1.4	26	1.5	8.0	3.3	1.2	9.7
21	9.0	1.4	.98	6.9	1.9	1.2	38	1.5	24	3.0	1.1	7.3
22	5.0	4.3	.77	6.7	1.8	1.3	5.4	20	10	3.0	1.1	4.0
23	2.9	17	.68	5.7	1.8	1.3	4.2	4.4	4.8	6.5	1.0	3.1
24	2.3	2.9	167	5.6	1.7	1.1	2.9	2.2	11	5.0	6.2	2.6
25	2.1	2.3	55	5.7	1.7	.98	3.1	2.2	6.5	38	4.1	2.9
26	2.0	2.6	12	6.4	1.7	.88	3.8	12	4.1	23	20	1.5
27	2.0	2.2	288	34	1.6	.80	9.9	6.0	4.7	4.4	29	1.2
28	1.9	.98	132	17	1.6	.84	8.4	3.0	2.8	3.0	4.2	1.1
29	1.8	.88	39	10	------	.80	8.4	3.8	22	2.5	3.0	1.0
30	1.8	.84	20	5.9	------	.84	5.6	3.5	15	2.6	5.8	1.9
31	1.7	------	20	5.1	------	.93	------	6.5	------	2.9	3.5	------
TOTAL	291.1	82.60	765.37	1,192.5	116.7	60.47	198.9	157.9	144.2	334.6	123.2	100.9
MEAN	9.39	2.75	24.7	38.5	4.17	1.95	6.63	5.09	4.81	10.8	3.97	3.36
MAX	175	17	288	429	19	10	38	20	24	70	29	17
MIN	1.7	.84	.68	5.1	1.6	.80	1.0	1.5	1.1	1.9	1.0	1.0
AC-FT	577	164	1,520	2,370	231	120	395	313	286	664	244	200

CAL YR 1969 TOTAL 5,858.07 MEAN 16.0 MAX 422 MIN .68 AC-FT 11,620
WTR YR 1970 TOTAL 3,568.44 MEAN 9.78 MAX 429 MIN .68 AC-FT 7,080

PEAK DISCHARGE (BASE, 650 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-12	0230	6.22	665	1- 3	1530	7.26	958
12-24	2130	7.40	1,000	1-14	0300	6.37	702
12-27	1500	8.28	1,330				

16329000 Kaiwikoele Stream tributary near Maunawai

LOCATION.--Lat 21°36'49", long 158°01'23", Oahu, on left bank at upstream side of Paalaa Uka Pupukea Road, 0.2 mile upstream from mouth, 2.3 miles south of Camp Pupukea, and 3.6 miles southeast of Maunawai.

DRAINAGE AREA.--0.97 sq mi.

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

GAGE.--Water-stage recorder and concrete-ford control. Altitude of gage is 730 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 178 cfs July 25 (gage height, 7.11 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 1,080 cfs Feb. 1, 1969 (gage height, 8.65 ft), from rating curve extended above 24 cfs on basis of slope-area measurement at gage height 8.34 ft; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			0	0						0		
2			0	0						0		
3			0	15						0		
4			0	4.8						0		
5			0	.08						0		
6			0	.22						0		
7			0	0						0		
8			0	0						0		
9			0	0						0		
10			0	0						0		
11			0	.73						0		
12			0	.36						0		
13			0	0						0		
14			0	28						0		
15			0	.64						0		
16			0	0						0		
17			0	0						0		
18			0	0						0		
19			0	0						0		
20			0	0						0		
21			0	0						0		
22			0	0						0		
23			0	0						0		
24			0	0						0		
25			6.9	0						22		
26			0	0						18		
27			24	0						.06		
28			9.5	0						0		
29			1.5	0	------					0		
30			0	0	------					0		
31		------	0	0	------		------		------	0		------
TOTAL	0	0	41.9	49.83	0	0	0	0	0	40.06	0	0
MEAN	0	0	1.35	1.61	0	0	0	0	0	1.29	0	0
MAX	0	0	24	28	0	0	0	0	0	22	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	83	99	0	0	0	0	0	79	0	0

CAL YR 1969 TOTAL 213.83 MEAN .59 MAX 110 MIN 0 AC-FT 424
WTR YR 1970 TOTAL 131.79 MEAN .36 MAX 28 MIN 0 AC-FT 261

PEAK DISCHARGE (BASE, 100 CFS).--Dec. 27 (1730) 119 cfs (6.87 ft); July 25 (2200) 178 cfs (7.11 ft).

HAWAII, ISLAND OF OAHU

16330000 Kamananui Stream at Maunawai

LOCATION.--Lat 21°38'20", long 158°03'27", Oahu, on right bank at Maunawai, 25 ft upstream from Elehaha Stream, 4.9 miles northeast of Waialua School, and 7.3 miles southwest of Kahuku School.

DRAINAGE AREA.--9.79 sq mi.

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

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

AVERAGE DISCHARGE.--12 years, 16.8 cfs (12,170 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,730 cfs Dec. 27 (gage height, 7.14 ft), from rating curve extended as explained below; minimum, 0.28 cfs Dec. 19-21.
Period of record: Maximum discharge, 5,270 cfs Mar. 16, 1968 (gage height, 10.14 ft), from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights 6.25, 8.13 and 10.14 ft; no flow at times.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1937: 1958-60.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	1.3	.47	32	5.3	1.8	1.0	4.4	5.3	8.4	3.9	4.6
2	3.0	1.2	.42	31	4.8	1.7	7.5	12	2.6	4.6	3.9	5.0
3	3.0	1.2	.42	430	4.4	1.7	23	15	2.0	3.4	3.6	2.7
4	2.3	1.1	1.9	144	4.2	1.8	6.0	9.8	1.5	3.0	3.0	2.1
5	1.8	1.1	5.0	42	3.9	2.0	4.0	4.2	1.2	2.3	2.6	1.6
6	1.5	1.1	2.0	47	3.7	1.8	3.0	2.9	1.1	1.9	2.3	1.6
7	1.3	1.5	1.1	24	3.6	1.7	1.8	2.3	4.2	1.9	2.3	1.4
8	1.2	4.2	4.4	17	3.4	1.6	.80	2.0	2.1	2.6	4.4	2.8
9	1.2	3.6	4.8	21	3.6	1.5	2.3	2.3	1.3	4.6	3.6	5.5
10	1.2	1.8	3.4	12	25	1.4	3.5	3.2	.97	57	2.6	2.4
11	4.7	1.2	1.8	54	5.3	1.3	5.6	5.0	.80	83	1.8	1.6
12	262	2.9	1.2	62	3.7	1.3	10	5.0	.74	30	1.5	1.2
13	22	9.1	.74	38	3.2	1.2	7.2	9.1	1.1	34	1.5	.97
14	8.4	3.9	.88	404	29	1.2	3.8	5.8	1.6	20	1.9	.80
15	5.3	6.0	2.0	42	18	2.5	2.6	3.6	2.0	9.1	2.0	.88
16	4.4	3.0	1.1	24	6.3	9.0	1.6	2.7	1.8	5.5	3.7	1.1
17	3.7	1.6	.62	20	4.4	5.8	.94	2.0	1.4	5.8	8.7	.97
18	3.4	1.2	.42	16	3.7	11	1.4	1.5	1.4	8.8	5.3	4.5
19	3.4	.88	.31	13	3.4	4.2	3.8	1.2	.97	7.2	3.6	16
20	3.4	.74	.28	11	3.2	1.6	30	1.1	2.0	4.2	2.1	9.8
21	12	.80	.80	10	2.9	1.3	45	.97	29	3.4	1.4	9.8
22	7.8	1.9	.62	9.8	2.6	1.4	7.0	23	13	3.2	1.1	5.5
23	4.6	17	.42	7.8	2.4	1.3	4.5	7.2	6.0	5.5	.97	3.7
24	3.0	5.5	9.5	7.2	2.1	1.1	3.0	3.0	9.0	7.8	4.0	2.9
25	2.6	2.9	239	7.2	2.0	.90	2.3	2.3	9.8	77	6.6	3.2
26	2.1	3.6	17	8.1	2.0	.80	3.7	12	5.3	121	19	1.9
27	2.0	2.3	348	46	2.0	.70	9.4	9.8	5.3	14	35	1.3
28	1.8	1.2	246	22	1.9	.80	8.4	4.8	3.7	6.9	6.9	.97
29	1.6	.88	71	17	------	.60	8.1	2.9	25	5.0	3.6	.74
30	1.5	.62	30	8.1	------	.70	6.0	6.0	16	4.8	5.3	.62
31	1.4	------	23	6.0	------	.80	------	6.6	------	5.3	5.3	------
TOTAL	380.8	85.32	1,018.60	1,633.2	160.0	66.50	217.24	173.67	158.18	551.2	153.47	98.15
MEAN	12.3	2.84	32.9	52.7	5.71	2.15	7.24	5.60	5.27	17.8	4.95	3.27
MAX	262	17	348	430	29	11	45	23	29	121	35	16
MIN	1.2	.62	.28	6.0	1.9	.60	.80	.97	.74	1.9	.97	.62
AC-FT	755	169	2,020	3,240	317	132	431	344	314	1,090	304	195

CAL YR 1969 TOTAL 8,690.74 MEAN 23.8 MAX 787 MIN .28 AC-FT 17,240
WTR YR 1970 TOTAL 4,696.33 MEAN 12.9 MAX 430 MIN .28 AC-FT 9,320

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-25	0030	6.41	1,360	1- 3	1900	6.13	1,240
12-27	1800	7.14	1,730	1-14	0530	5.85	1,130

NOTE.--No gage-height record Mar. 1 to Apr. 23.

16343000 Helemano Stream at Haleiwa

LOCATION.--Lat 21°34'40", long 158°06'12", Oahu, on left bank at upstream side of private road bridge, 0.3 mile east of Weed Circle, and 1.1 miles southeast of Waialua School at Haleiwa.

DRAINAGE AREA.--14.2 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 1.57 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 5,820 cfs July 25 (gage height, 14.13 ft), from rating curve extended as explained below; minimum, 0.06 cfs Dec. 20.

Period of record: Maximum discharge, 11,300 cfs Feb. 1, 1969 (gage height, 17.63 ft, from floodmark in well), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 10.54, 14.2, 15.34 and 17.63 ft; minimum, 0.01 cfs several days in 1968.

REMARKS.--Records fair. Minor regulation by reservoir on upstream tributary. Diversions into basin for irrigation of sugarcane; low flow affected by irrigation return flow and releases. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.37	.31	.26	2.9	.73	.24	.43	1.3	.22	4.2	2.7	.73
2	.31	.40	.16	2.0	.43	.24	.43	50	.64	2.1	1.5	.24
3	.22	.51	.20	200	.37	.22	.43	23	1.2	1.3	1.4	.16
4	.20	.55	.20	40	.31	.40	1.9	9.6	.55	.47	.83	.09
5	.22	.51	.16	10	.26	.26	1.1	3.2	.90	.51	.51	.10
6	.24	1.0	.16	8.0	.26	.26	.51	1.7	.47	.31	.37	.10
7	.26	.47	.15	1.4	.26	.28	.59	1.0	.22	.26	.26	.09
8	.24	.40	.16	1.1	.24	.18	.88	.94	.18	.28	.26	.12
9	.59	.43	.18	1.7	.68	.16	.40	.40	.22	.28	.22	.09
10	.37	.43	.24	.90	.43	.16	.68	.40	.22	22	.20	.09
11	.51	.47	.28	10	.28	.18	.37	.68	.20	25	.22	.09
12	118	1.5	.37	8.0	.22	.20	20	1.5	.20	13	.28	.10
13	20	1.2	.40	6.8	.59	.20	15	6.6	.22	3.6	.40	.10
14	4.8	.51	.40	84	.73	.20	3.1	6.2	.20	3.2	.34	.09
15	1.4	2.1	.43	18	.34	.22	1.0	2.7	.20	3.1	.22	.10
16	.55	3.6	.47	6.6	.22	.22	.83	1.0	.20	1.1	.26	.13
17	.43	2.0	.47	4.3	.22	.22	.59	.40	.20	.59	.34	.15
18	.22	.63	.47	2.6	.55	1.4	1.1	.31	.20	.59	.34	.16
19	.20	.37	.51	1.7	.40	8.3	.37	.73	.20	.43	.28	.18
20	.22	.58	.09	1.1	.22	.94	.34	1.1	.20	.83	.24	2.7
21	.24	.28	.07	1.3	.20	.31	3.9	.63	.22	.47	.24	3.6
22	.26	49	.09	1.5	.18	.22	5.4	1.2	5.4	.28	.28	1.2
23	1.4	55	.10	1.0	.20	.22	3.6	8.4	2.3	.20	.28	.34
24	.94	9.3	.15	.68	.20	.22	2.8	1.3	.78	.31	.34	.20
25	.34	3.0	320	.59	.31	.34	.37	.47	.34	441	.28	.16
26	.24	1.1	27	.55	.26	.51	.40	.31	.78	655	.20	.16
27	.26	.73	210	64	.24	.51	3.4	6.5	.94	26	18	.15
28	.28	.78	90	21	.24	.40	11	3.0	.47	10	4.6	.15
29	.31	.43	7.0	15	------	.37	2.8	.83	.28	6.0	1.0	.13
30	.47	.26	2.7	4.4	------	.40	1.5	.37	7.3	3.8	.34	.16
31	.37	------	2.3	1.8	------	.40	------	.28	------	4.6	1.5	------
TOTAL	154.46	137.85	665.17	522.92	9.57	18.38	85.22	136.05	25.65	1,230.81	38.23	11.86
MEAN	4.98	4.60	21.5	16.9	.34	.59	2.84	4.39	.86	39.7	1.23	.40
MAX	118	55	320	200	.73	8.3	20	50	7.3	655	18	3.6
MIN	.20	.26	.07	.55	.18	.16	.34	.28	.18	.20	.20	.09
AC-FT	306	273	1,320	1,040	19	36	169	270	51	2,440	76	24

CAL YR 1969 TOTAL 10,096.40 MEAN 27.7 MAX 3,600 MIN .07 AC-FT 20,030
WTR YR 1970 TOTAL 3,036.17 MEAN 8.32 MAX 655 MIN .07 AC-FT 6,020

PEAK DISCHARGE (BASE, 1,200 CFS) / About.

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-24	2400	9.43	1,820	7-25	2400	14.13	5,820
12-27	/1800	-	/1,600				

16345000 Opaeula Stream near Wahiawa

LOCATION.--Lat 21°33'55", long 158°00'10", Oahu, on left bank 4.3 miles northeast of Leilehua High School in Wahiawa and 8.1 miles east of Waialua School.

DRAINAGE AREA.--2.98 sq mi.

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

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

AVERAGE DISCHARGE.--11 years, 14.7 cfs (10,650 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,720 cfs Dec. 24 (gage height, 7.25 ft), from rating curve extended as explained below; minimum, 0.28 cfs Mar. 10-15.
Period of record: Maximum discharge, 3,900 cfs Feb. 1, 1969 (gage height, 10.12 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 6.74 and 10.12 ft; minimum, 0.06 cfs Nov. 13, 1968.

REMARKS.--Records good. No diversion above station. Records of chemical analyses and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEAR).--WSP 1937: 1960.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	.94	.94	17	3.1	.62	.55	9.1	4.7	8.4	6.2	11
2	3.0	.86	.90	10	2.6	.58	13	79	3.2	5.8	5.2	6.2
3	3.1	.82	1.1	289	2.3	.55	36	44	2.5	3.8	4.6	3.6
4	2.0	.74	1.4	60	2.2	.49	8.1	12	2.2	4.2	3.2	2.9
5	1.7	.74	2.3	19	2.1	.46	13	9.4	1.8	4.2	2.8	2.6
6	1.6	6.4	1.7	17	1.8	.43	5.4	5.2	1.6	3.1	2.4	2.9
7	1.4	5.1	1.0	9.7	1.7	.40	2.8	4.2	2.0	2.6	3.7	4.2
8	1.3	8.5	17	8.3	1.6	.38	2.1	3.9	1.9	13	18	15
9	1.2	3.8	16	13	1.6	.32	2.1	5.4	1.4	8.1	6.0	7.3
10	1.2	1.8	7.3	5.6	14	.30	15	12	1.3	38	2.9	4.9
11	30	1.2	3.5	33	3.6	.28	7.8	14	1.1	55	2.0	4.1
12	156	1.2	2.5	27	1.9	.28	66	9.4	1.9	17	1.7	2.4
13	13	8.0	1.6	26	1.6	.28	22	27	3.6	20	1.8	2.0
14	5.6	3.4	14	110	8.0	.28	11	8.8	9.7	15	4.5	1.8
15	4.1	10	3.2	12	9.0	1.3	5.2	6.0	5.4	6.9	4.4	2.8
16	3.3	2.9	1.7	7.1	3.2	22	3.6	5.1	2.4	5.2	5.4	4.6
17	2.6	1.6	1.1	5.6	2.0	9.5	3.5	4.1	2.5	7.9	16	3.6
18	2.1	1.1	.86	4.7	1.5	26	9.1	4.6	2.1	23	8.8	12
19	2.1	.82	.82	4.2	1.3	7.6	6.9	3.0	1.4	6.7	4.1	34
20	2.0	.74	.82	3.8	1.1	2.6	39	2.5	11	3.9	2.5	14
21	16	2.1	.86	3.5	.99	1.7	19	2.4	31	3.0	2.3	15
22	6.0	47	.90	3.4	.90	1.6	6.2	32	11	2.9	1.7	7.1
23	3.4	36	.66	3.0	.82	2.3	4.9	8.8	5.4	14	1.5	6.4
24	2.1	6.4	84	2.6	.74	1.3	4.2	3.6	20	14	16	3.8
25	1.7	3.2	183	3.0	.74	.86	3.8	3.0	12	165	11	2.8
26	1.5	5.4	29	4.1	.74	.70	6.4	26	8.3	66	50	2.2
27	1.4	2.6	249	82	.78	.58	33	13	10	9.4	41	1.9
28	1.3	1.6	118	32	.74	.49	15	5.4	6.7	5.8	7.5	1.7
29	1.1	1.2	34	16	------	.38	12	6.0	25	4.6	11	1.5
30	1.0	.99	16	5.4	------	.35	9.9	6.6	18	15	14	1.4
31	.99	------	12	3.9	------	.43	------	8.0	------	8.6	6.4	------
TOTAL	278.99	167.15	807.16	840.9	72.65	85.34	386.55	383.5	211.1	560.1	268.6	185.7
MEAN	9.00	5.57	26.0	27.1	2.59	2.75	12.9	12.4	7.04	18.1	8.66	6.19
MAX	156	47	249	289	14	26	66	79	31	165	50	34
MIN	.99	.74	.66	2.6	.74	.28	.55	2.4	1.1	2.6	1.5	1.4
AC-FT	553	332	1,600	1,670	144	169	767	761	419	1,110	533	368

CAL YR 1969 TOTAL 6,788.28 MEAN 18.6 MAX 825 MIN .66 AC-FT 13,460
WTR YR 1970 TOTAL 4,247.74 MEAN 11.6 MAX 289 MIN .28 AC-FT 8,430

PEAK DISCHARGE (BASE, 1,200 CFS).--Dec. 24 (2400) 1,720 cfs (7.25 ft).

16400000 Halawa Stream near Halawa

LOCATION.--Lat 21°09'31", long 156°45'53", Molokai, on right bank 600 ft downstream from Hipuapua Stream and 1.5 miles west of Halawa.

DRAINAGE AREA.--4.62 sq mi.

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

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

AVERAGE DISCHARGE.--46 years (1917-31, 1938-70), 30.2 cfs (21,880 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,470 cfs Apr. 21 (gage height, 9.24 ft), from rating curve extended as explained below; minimum, 2.2 cfs Mar. 14.
Period of record: Maximum discharge, 26,900 cfs Feb. 4, 1965 (gage height, 19.91 ft, from floodmarks), from rating curve extended above 86 cfs on basis of slope-area measurement of peak flow; minimum, 0.76 cfs about Nov. 23, 1962.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	4.6	8.3	150	8.3	4.0	37	14	6.6	15	15	21
2	12	4.4	6.1	54	7.4	5.4	124	37	6.0	41	14	12
3	8.5	4.3	5.4	118	6.7	3.8	48	16	5.4	24	12	9.3
4	7.6	4.2	66	60	8.5	3.4	31	11	43	22	8.2	7.3
5	6.9	23	19	59	9.8	3.2	62	8.9	18	45	7.3	11
6	6.4	67	8.5	27	6.4	3.2	15	14	12	16	13	19
7	6.1	23	9.5	17	5.8	3.0	11	11	6.9	64	14	15
8	16	12	30	32	5.4	2.8	7.8	42	5.6	60	36	18
9	7.8	6.7	43	29	74	2.8	6.9	30	5.1	28	10	7.8
10	32	5.5	13	12	45	2.8	25	68	4.8	36	6.9	8.0
11	10	5.1	8.5	25	8.9	2.6	98	38	5.2	95	5.8	6.6
12	15	6.3	6.7	31	6.9	2.5	87	19	20	37	5.8	8.5
13	67	4.7	42	36	6.4	2.3	62	30	18	47	7.6	6.1
14	15	4.4	129	102	40	2.3	47	30	13	19	6.6	6.9
15	14	4.2	17	20	68	7.8	23	48	6.4	14	20	11
16	9.5	3.9	12	13	10	20	34	15	5.8	11	15	6.0
17	7.8	3.8	9.1	10	7.1	5.4	15	11	16	38	9.5	26
18	6.6	3.7	7.3	8.8	6.0	27	20	8.7	6.3	29	9.3	32
19	6.7	3.6	49	7.8	5.5	11	21	7.4	5.2	11	6.6	54
20	6.3	3.6	22	7.1	5.8	7.3	63	6.6	28	8.3	8.3	39
21	77	5.8	8.3	8.1	5.2	4.0	199	7.6	67	7.6	8.0	15
22	11	54	6.7	25	4.8	3.2	64	58	26	7.4	6.4	22
23	8.0	27	6.1	11	4.2	3.0	81	23	8.9	90	6.1	12
24	7.8	7.6	33	13	3.8	3.9	24	27	20	62	58	8.3
25	7.6	5.6	107	15	3.9	3.0	57	25	25	37	15	7.1
26	6.4	5.2	107	127	4.0	2.7	29	44	15	27	75	6.1
27	5.6	4.4	27	72	4.6	2.8	40	11	22	21	20	9.0
28	5.4	4.2	69	38	4.3	10	17	9.9	16	82	44	5.1
29	5.5	66	148	15	------	5.1	17	8.3	67	15	36	4.6
30	5.1	64	40	11	------	3.7	12	7.8	31	32	51	4.3
31	4.8	------	38	9.5	------	5.8	------	15	------	33	14	------
TOTAL	417.4	441.8	1,101.5	1,163.3	376.7	169.8	1,377.7	702.2	535.2	1,074.3	564.4	418.0
MEAN	13.5	14.7	35.5	37.5	13.5	5.48	45.9	22.7	17.8	34.7	18.2	13.9
MAX	77	67	148	150	74	27	199	68	67	95	75	54
MIN	4.8	3.6	5.4	7.1	3.8	2.3	6.9	6.6	4.8	7.4	5.8	4.3
AC-FT	828	876	2,180	2,310	747	337	2,730	1,390	1,060	2,130	1,120	829

CAL YR 1969 TOTAL 11,352.9 MEAN 31.1 MAX 350 MIN 3.3 AC-FT 22,520
WTR YR 1970 TOTAL 8,342.3 MEAN 22.9 MAX 199 MIN 2.3 AC-FT 16,550

PEAK DISCHARGE (BASE, 1,900 CFS).--Apr. 21 (0400) 2,470 cfs (9.24 ft).

16403600 Kapuhi Stream near Pelekunu

LOCATION.--Lat 21°07'57", long 156°52'56", Molokai, on left bank 400 ft downstream from Kawailena Stream, 2.1 miles south of former village of Pelekunu, and 5.6 miles north of Kamalo.

DRAINAGE AREA.--1.20 sq mi.

PERIOD OF RECORD.--August 1968 to September 1970 (discontinued as continuous-record station; converted to a low-flow partial-record station).

GAGE.--Water-stage recorder. Altitude of gage is 870 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 390 cfs Dec. 28 (gage height, 4.27 ft), from rating curve extended above 14 cfs; minimum, 2.2 cfs Sept. 15, 16.
Period of record: Maximum discharge, 1,220 cfs Jan. 8, 1969 (gage height, 5.82 ft, from peak-stage indicator), from rating curve extended above 14 cfs; minimum, 1.8 cfs Sept. 20, 1968.

REMARKS.--Records good except those above 30 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	2.5	2.4	10	3.9	3.6	20	5.0	2.8	3.9	3.0	4.2
2	2.8	2.4	2.4	6.8	3.6	3.4	34	4.8	2.7	3.5	2.9	3.0
3	2.7	2.4	2.4	21	3.5	3.2	12	4.2	2.7	4.7	3.0	2.9
4	2.6	2.4	3.1	13	3.5	3.1	9.0	4.1	2.9	3.8	2.8	2.7
5	2.5	5.1	2.7	8.7	3.4	3.1	13	3.8	2.7	5.3	2.6	3.8
6	2.5	18	2.4	7.4	3.2	3.0	6.3	3.6	2.6	3.6	2.9	3.5
7	2.4	8.6	3.2	5.8	3.2	2.9	4.8	3.5	2.5	5.5	2.8	3.4
8	2.7	4.8	3.2	12	3.1	2.9	4.1	5.8	2.4	5.7	3.2	2.8
9	2.6	3.6	3.9	8.0	12	2.8	3.9	6.3	2.4	3.6	2.6	2.7
10	2.4	3.2	3.7	6.1	10	2.8	3.6	12	2.4	3.6	2.5	2.7
11	4.1	3.0	3.0	26	4.4	2.7	5.2	6.8	2.5	8.8	2.4	2.5
12	8.9	2.9	3.5	17	3.9	2.8	6.8	5.2	2.9	5.0	2.5	2.4
13	8.0	2.9	6.4	18	4.1	2.7	6.6	5.6	3.0	5.0	2.6	2.4
14	4.1	2.8	18	48	27	2.8	6.3	4.1	3.2	4.1	2.7	2.4
15	3.5	2.7	4.6	15	16	3.1	5.2	4.6	2.5	3.4	3.5	2.4
16	3.2	2.7	3.5	9.5	7.7	3.9	9.5	3.9	4.2	3.2	3.4	2.3
17	2.9	2.7	3.2	7.4	6.3	2.9	5.4	3.8	4.1	3.4	3.6	4.6
18	2.8	2.6	3.0	6.3	5.4	3.5	6.3	3.4	2.6	3.5	2.8	5.8
19	2.9	2.5	6.2	5.8	5.0	3.5	5.4	3.2	2.4	2.9	2.8	5.4
20	2.7	2.5	4.4	5.4	4.6	2.9	4.4	3.2	3.1	2.8	2.6	3.6
21	12	2.7	3.2	5.2	4.4	2.7	7.1	3.2	6.4	2.8	2.4	2.8
22	3.4	2.7	3.0	7.7	4.1	2.6	19	3.4	3.1	3.0	2.4	2.7
23	3.1	2.7	2.9	5.4	3.9	2.8	35	3.0	2.8	7.6	2.5	2.7
24	2.9	2.6	7.2	4.4	3.8	2.6	14	3.1	4.7	3.6	3.5	2.6
25	2.9	2.5	30	5.9	3.8	2.6	12	3.1	5.0	5.3	3.0	2.5
26	2.8	2.4	22	10	3.6	2.5	9.1	4.6	3.1	3.2	15	2.4
27	2.7	2.4	9.5	7.1	3.5	2.6	8.4	3.1	3.8	3.4	4.8	2.4
28	2.7	2.4	67	5.6	3.5	2.6	6.8	3.0	3.4	7.5	3.8	2.4
29	2.6	3.1	44	4.8	------	2.5	6.3	2.9	8.3	3.5	3.2	2.4
30	2.6	2.7	16	4.2	------	2.6	5.6	2.9	5.6	3.5	5.0	2.4
31	2.5	------	9.9	4.1	------	3.7	------	2.8	------	3.2	3.4	------
TOTAL	109.6	106.5	299.9	321.6	164.4	91.4	295.1	132.0	102.8	131.9	106.2	90.8
MEAN	3.54	3.55	9.67	10.4	5.87	2.95	9.84	4.26	3.43	4.25	3.43	3.03
MAX	12	18	67	48	27	3.9	35	12	8.3	8.8	15	5.8
MIN	2.4	2.4	2.4	4.1	3.1	2.5	3.6	2.8	2.4	2.8	2.4	2.3
AC-FT	217	211	595	638	326	181	585	262	204	262	211	180

CAL YR 1969 TOTAL 3,023.4 MEAN 8.28 MAX 150 MIN 2.4 AC-FT 6,000
WTR YR 1970 TOTAL 1,952.2 MEAN 5.35 MAX 67 MIN 2.3 AC-FT 3,870

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1000	4.27	390	1-14	0700	4.20	365
1-11	2100	4.15	348				

16403900 Kawainui Stream near Pelekunu

LOCATION.--Lat 21°07'59", long 156°52'38", Molokai, on right bank 900 ft upstream from confluence with Kapuhi Stream, 2.1 miles south of former village of Pelekunu, and 5.7 miles north of Kamalo.

DRAINAGE AREA.--1.17 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 770 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 542 cfs Jan. 14 (gage height, 4.95 ft), from rating curve extended above 43 cfs; minimum, 1.4 cfs Mar. 29.
Period of record: Maximum discharge, 1,630 cfs Jan. 8, 1969 (gage height, 7.36 ft), from rating curve extended above 43 cfs; minimum, 0.70 cfs Sept. 22, 1968.

REMARKS.--Records good except those for period of no gage-height record and those above 90 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	2.1	1.8	16	3.9	3.2	14	7.4	3.0	8.8	5.4	9.4
2	3.7	2.0	1.7	10	3.7	2.7	43	7.4	2.9	7.8	4.9	7.0
3	3.3	1.9	1.7	28	3.5	2.2	19	6.3	2.6	9.2	4.7	6.3
4	3.0	1.8	2.8	20	3.4	2.1	16	5.4	3.1	8.0	3.8	5.2
5	2.7	7.0	2.0	13	3.2	2.1	21	4.9	2.6	11	3.5	6.9
6	2.5	22	1.6	10	3.1	2.0	12	4.5	2.4	8.3	4.5	6.4
7	2.3	10	3.2	8.2	2.8	1.9	8.3	4.3	2.1	11	4.1	5.7
8	2.8	6.0	3.9	12	2.7	1.8	6.7	9.2	2.1	12	5.3	5.0
9	2.5	5.0	5.4	10	10	1.8	5.8	11	1.9	8.4	3.5	4.1
10	2.2	4.4	4.4	7.9	10	1.8	5.3	18	1.9	8.3	3.0	3.8
11	3.5	4.0	3.4	23	5.0	1.7	8.6	15	2.1	14	2.7	3.4
12	11	3.8	3.1	16	4.0	1.8	12	12	3.5	11	2.8	3.2
13	7.0	3.4	7.4	30	4.3	1.7	12	12	4.1	11	3.2	2.9
14	5.0	3.1	21	74	18	1.8	12	9.3	5.2	9.1	3.3	2.9
15	4.0	2.8	8.4	24	15	2.9	9.1	9.9	2.7	7.2	5.8	2.7
16	3.0	2.5	5.7	15	8.3	4.4	15	8.4	6.1	6.3	5.9	2.6
17	2.7	2.6	4.3	11	6.5	1.8	9.9	7.6	6.0	6.6	6.2	6.6
18	2.6	2.3	3.7	9.1	5.4	4.1	12	6.3	3.2	5.7	4.2	9.3
19	2.7	2.2	6.5	7.8	4.7	3.4	9.1	5.6	2.7	4.4	4.3	9.4
20	2.5	2.3	5.4	6.7	4.2	2.1	9.0	5.0	5.4	3.9	3.4	8.4
21	15	2.7	3.9	6.1	3.9	1.8	14	5.2	11	3.8	2.9	5.8
22	4.0	2.9	3.4	8.7	3.6	1.6	28	5.2	6.1	4.1	2.7	5.0
23	3.0	2.5	3.1	6.0	3.3	1.9	52	4.0	4.5	10	2.7	4.2
24	2.7	2.2	9.3	4.8	3.0	1.5	22	3.8	7.6	6.7	5.9	3.7
25	2.5	2.1	33	5.7	3.2	1.5	18	4.1	8.7	10	4.7	3.3
26	2.4	1.9	33	9.4	2.9	1.5	14	9.2	6.0	6.8	24	3.1
27	2.3	1.8	16	8.7	2.8	1.6	13	5.0	6.4	7.0	13	2.9
28	2.4	1.8	91	7.5	2.6	1.7	10	4.2	6.0	13	10	2.7
29	2.2	2.8	82	5.6	------	1.5	9.3	3.5	13	7.8	8.0	2.4
30	2.1	2.2	30	4.8	------	1.5	8.3	3.5	12	7.8	11	2.3
31	2.0	------	17	4.2	------	2.7	------	3.3	------	6.4	8.4	------
TOTAL	113.6	114.1	419.1	423.2	147.0	66.1	448.4	220.5	146.9	255.4	177.8	146.6
MEAN	3.66	3.80	13.5	13.7	5.25	2.13	14.9	7.11	4.90	8.24	5.74	4.89
MAX	15	22	91	74	18	4.4	52	18	13	14	24	9.4
MIN	2.0	1.8	1.6	4.2	2.6	1.5	5.3	3.3	1.9	3.8	2.7	2.3
AC-FT	225	226	831	839	292	131	889	437	291	507	353	291

CAL YR 1969 TOTAL 3,674.3 MEAN 10.1 MAX 149 MIN 1.4 AC-FT 7,290
WTR YR 1970 TOTAL 2,678.7 MEAN 7.34 MAX 91 MIN 1.5 AC-FT 5,310

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1000	4.53	409	1-13	1200	4.40	370
1-11	2100	4.67	451	1-14	0600	4.95	542

NOTE.--No gage-height record Oct. 1 to Nov. 11.

16404200 Pilipililau Stream near Pelekunu

LOCATION.--Lat 21°08'08", long 156°53'09", Molokai, on right bank 500 ft downstream from left-bank tributary, 1.9 miles south of former village of Pelekunu, and 5.8 miles north of Kamalo.

DRAINAGE AREA.--0.49 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 113 cfs Jan. 3 (gage height, 3.14 ft), from rating curve extended above 3.8 cfs; minimum, 0.65 cfs on several days.
Period of record: Maximum discharge, 168 cfs Nov. 28, 1968 (gage height, 3.41 ft), from rating curve extended above 3.8 cfs; minimum, 0.53 cfs Nov. 22, 1968.

REMARKS.--Records good except those above 8 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.84	.74	.77	1.7	1.2	1.2	1.9	1.4	.96	.96	.74	.71
2	.80	.74	.74	1.4	1.2	1.1	7.0	1.3	.92	.88	.74	.68
3	.80	.71	.74	8.0	1.1	1.1	1.7	1.3	.92	.96	.74	.68
4	.77	.71	.97	3.1	1.1	1.1	1.6	1.2	.96	.92	.71	.68
5	.77	.84	.77	2.1	1.1	1.1	2.4	1.2	.92	.96	.71	.77
6	.74	2.7	.74	1.7	1.1	1.0	1.4	1.2	.88	.92	.77	.74
7	.74	1.4	.80	1.5	1.1	1.0	1.2	1.1	.88	1.1	.74	.74
8	.77	1.0	.77	3.2	1.0	1.0	1.1	1.2	.84	1.0	.74	.71
9	.77	.84	.80	2.1	3.1	1.0	1.1	1.2	.84	.92	.74	.71
10	.77	.80	.84	1.5	4.1	1.0	1.1	1.4	.84	.92	.71	.71
11	.84	.77	.77	3.7	1.4	1.0	1.9	1.2	.88	1.5	.71	.68
12	1.9	.77	.80	3.1	1.3	1.0	1.8	1.1	.88	.92	.71	.68
13	1.4	.77	1.3	3.1	1.3	1.0	1.9	1.1	.88	.92	.71	.65
14	.92	.77	3.2	8.1	5.0	1.0	1.6	1.1	.88	.88	.71	.68
15	.84	.77	.92	2.8	4.3	1.0	1.3	1.1	.84	.80	.77	.65
16	.80	.74	.84	2.2	1.9	1.1	1.4	1.0	.92	.80	.74	.65
17	.80	.74	.80	1.9	1.6	1.0	1.4	1.0	.88	.88	.74	.80
18	.80	.74	.77	1.8	1.5	1.1	1.6	1.0	.88	.84	.71	.77
19	.80	.74	2.0	1.6	1.4	1.1	1.2	1.0	.88	.80	.71	.77
20	.80	.74	1.2	1.5	1.4	1.0	1.2	1.0	.96	.77	.71	.74
21	2.3	.77	.88	1.5	1.4	1.0	1.8	1.0	1.0	.77	.71	.71
22	.88	.77	.84	1.6	1.3	1.0	2.3	1.0	.88	.80	.68	.68
23	.84	.77	.80	1.4	1.2	1.0	7.2	1.0	.88	.96	.71	.68
24	.80	.77	1.3	1.3	1.2	.96	2.8	1.0	.92	.84	.74	.68
25	.80	.74	6.3	1.4	1.2	.96	2.4	1.0	.92	.92	.74	.68
26	.77	.74	3.9	2.6	1.2	.96	1.9	1.1	.88	.77	1.0	.68
27	.74	.74	1.6	1.6	1.2	.96	1.8	.96	.88	.88	.71	.68
28	.74	.77	9.6	1.4	1.1	.96	1.6	.96	.88	1.3	.71	.68
29	.74	.96	7.4	1.3	------	.96	1.5	.96	.96	.84	.71	.68
30	.74	.77	2.7	1.3	------	.96	1.4	.96	1.0	.80	.74	.68
31	.74	------	1.8	1.2	------	1.1	------	.96	------	.77	.71	------
TOTAL	27.76	25.83	57.66	72.7	47.0	31.72	60.5	34.00	27.04	28.30	22.72	21.03
MEAN	.90	.86	1.86	2.35	1.68	1.02	2.02	1.10	.90	.91	.73	.70
MAX	2.3	2.7	9.6	8.1	5.0	1.2	7.2	1.4	1.0	1.5	1.0	.80
MIN	.74	.71	.74	1.2	1.0	.96	1.1	.96	.84	.77	.68	.65
AC-FT	55	51	114	144	93	63	120	67	54	56	45	42

CAL YR 1969 TOTAL 739.61 MEAN 2.03 MAX 21 MIN .71 AC-FT 1,470
WTR YR 1970 TOTAL 456.26 MEAN 1.25 MAX 9.6 MIN .65 AC-FT 905

PEAK DISCHARGE (BASE, 80 CFS).--Jan. 3 (1730) 113 cfs (3.14 ft).

16405100 Molokai tunnel at east portal

LOCATION.--Lat 21°08'38", long 156°55'16", Molokai, on left bank 100 ft downstream from the east portal, 5.3 miles southeast of Kalaupapa, and 7.5 miles northeast of Kaunakakai.

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

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

EXTREMES.--Period of record: Maximum daily discharge, 23 cfs Apr. 2, 1970; no flow at times each year.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells in Waikolu Valley near the east portal.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	1.5	2.5	5.2	2.0	1.9	19	2.8	2.0	6.6	3.4	6.0
2	2.4	1.5	2.5	3.4	1.9	2.0	23	2.6	2.6	4.0	3.2	3.2
3	1.9	1.5	2.4	4.6	1.8	1.6	8.6	2.4	2.6	5.8	3.0	2.6
4	1.8	1.5	4.6	6.6	1.8	1.5	7.9	2.6	3.0	4.6	3.0	1.9
5	1.6	1.6	4.4	5.0	1.8	1.5	14	2.5	3.0	5.2	3.0	2.6
6	2.2	6.4	3.0	3.6	1.8	1.4	4.0	2.5	2.8	3.2	3.0	4.0
7	2.4	2.4	2.5	3.0	1.8	1.4	2.8	2.4	2.8	5.8	3.0	4.0
8	2.5	1.8	4.6	3.8	1.8	1.4	2.2	3.4	2.8	5.5	3.8	2.2
9	2.5	.60	6.6	5.5	3.3	1.4	1.9	7.3	2.8	3.2	3.6	1.6
10	2.4	.27	6.3	3.0	5.9	.56	1.9	11	2.8	2.4	3.2	1.4
11	4.9	.82	5.2	3.0	2.5	.04	5.4	7.9	3.0	9.9	3.2	1.3
12	12	.82	3.8	4.2	2.0	.02	12	4.4	3.0	5.2	3.2	1.2
13	9.7	.36	8.9	3.8	2.1	0	12	5.0	4.0	5.2	3.2	1.1
14	4.8	.74	12	8.9	21	0	9.2	4.0	5.0	3.2	3.6	1.2
15	3.8	2.0	5.0	4.4	16	0	6.3	4.8	4.0	2.8	8.9	1.1
16	3.0	2.0	3.0	3.0	3.6	.25	7.3	4.2	4.8	2.6	8.6	1.1
17	2.0	2.0	3.0	2.8	2.1	.17	4.4	4.0	7.9	2.5	7.0	1.5
18	1.9	2.2	2.8	2.6	2.2	.17	9.9	3.6	4.0	4.2	4.2	9.0
19	1.8	2.2	5.0	2.5	1.8	.82	5.8	3.2	3.4	3.6	3.8	7.0
20	1.8	2.2	5.8	2.5	1.6	.74	4.6	3.2	3.6	3.0	3.8	4.0
21	8.4	2.2	2.5	2.4	1.6	.23	5.8	3.2	10	2.8	3.4	3.0
22	3.0	1.5	2.5	3.2	1.6	.14	5.8	3.2	4.6	3.0	3.0	2.0
23	2.2	1.6	2.6	2.8	1.6	.12	12	3.2	2.4	7.3	2.8	1.7
24	2.0	2.0	3.6	2.4	1.5	.45	7.6	3.0	6.2	6.0	4.6	1.5
25	1.9	2.2	14	3.4	1.4	1.4	7.3	3.2	7.3	7.3	4.2	1.4
26	1.8	1.8	10	5.2	1.5	1.4	3.2	3.0	4.0	4.2	14	1.3
27	2.2	1.4	6.3	4.4	1.5	1.4	2.2	4.0	5.2	3.6	7.9	1.2
28	1.6	2.5	12	4.4	1.5	1.4	1.9	3.4	3.0	10	4.8	1.2
29	1.6	5.2	14	3.0	------	1.3	4.0	3.2	8.6	4.4	7.0	1.1
30	1.5	4.0	6.6	2.5	------	1.5	2.8	3.2	9.9	4.0	7.0	1.1
31	1.5	------	4.4	2.2	------	2.4	------	3.0	------	3.8	4.2	------
TOTAL	96.1	58.81	172.4	117.3	91.0	28.61	214.8	121.4	131.1	144.9	144.6	73.5
MEAN	3.10	1.96	5.56	3.78	3.25	.92	7.16	3.92	4.37	4.67	4.66	2.45
MAX	12	6.4	14	8.9	21	2.4	23	11	10	10	14	9.0
MIN	1.5	.27	2.4	2.2	1.4	0	1.9	2.4	2.0	2.4	2.8	1.1
AC-FT	191	117	342	233	181	57	426	241	260	287	287	146

CAL YR 1969 TOTAL 1,160.63 MEAN 3.18 MAX 14 MIN 0 AC-FT 2,300
WTR YR 1970 TOTAL 1,394.52 MEAN 3.82 MAX 23 MIN 0 AC-FT 2,770

16405300 Molokai tunnel at west portal

LOCATION.--Lat 21°07'27", long 156°59'50", Molokai, on left bank 50 ft upstream from the west portal, 2.5 miles northeast of Kaunakakai, and 4.7 miles south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from tunnel plans).

AVERAGE DISCHARGE.--5 years, 4.99 cfs (3,620 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 27 cfs Apr. 2, 1970; minimum daily, 1.8 cfs Oct. 15, 1967.

REMARKS.--Records excellent. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	4.1	5.6	7.7	4.8	4.8	19	5.3	4.6	10	5.3	8.0
2	5.8	4.1	5.3	6.3	4.6	5.0	27	5.0	4.8	6.1	5.0	5.6
3	5.3	4.1	5.3	7.2	4.6	4.3	12	4.8	4.8	8.0	5.3	4.8
4	5.0	4.1	7.2	9.7	4.6	4.1	10	5.3	5.3	7.2	4.8	4.3
5	4.8	4.1	7.4	8.0	4.6	4.1	17	5.0	5.3	7.4	4.6	4.6
6	5.6	8.4	6.1	6.3	4.6	4.1	6.9	5.0	5.0	5.8	4.6	6.1
7	5.6	4.8	4.8	5.8	4.6	4.1	5.3	5.0	5.0	8.2	4.6	6.3
8	5.6	4.3	7.4	5.8	4.6	4.1	4.8	5.6	5.0	8.2	5.3	4.3
9	5.6	3.5	9.4	8.5	5.0	4.1	4.3	9.7	5.0	5.6	5.8	3.9
10	5.6	3.1	8.5	5.8	9.4	3.7	4.1	12	5.0	4.6	5.3	3.5
11	6.9	3.9	8.8	5.6	5.6	3.0	6.3	11	5.0	11	5.0	3.5
12	13	4.1	6.3	6.9	4.8	3.0	14	6.9	5.0	7.7	5.0	3.5
13	13	3.5	11	6.3	4.6	3.0	15	7.7	6.1	7.7	5.3	3.3
14	8.2	3.7	15	11	21	3.0	13	6.3	7.2	5.6	6.6	3.5
15	7.2	5.0	8.0	7.9	20	3.0	8.8	7.7	5.8	4.8	11	3.3
16	6.1	5.0	6.1	5.8	6.9	3.1	9.4	6.9	6.6	4.8	11	3.3
17	5.0	5.0	5.8	5.6	4.8	3.1	6.3	6.9	11	4.6	9.1	4.3
18	4.8	5.0	5.6	5.3	5.0	3.1	12	6.6	6.3	6.6	6.9	10
19	4.6	5.3	6.9	5.3	4.8	3.5	8.4	6.1	5.8	5.8	6.3	8.2
20	5.3	5.3	10	5.3	4.8	3.7	8.4	5.8	5.8	5.3	6.6	7.2
21	11	5.3	5.3	5.0	4.6	3.1	8.8	6.1	13	5.0	5.8	4.3
22	6.3	4.3	5.3	5.8	4.6	3.0	8.0	6.1	7.7	5.3	5.6	3.9
23	5.0	4.3	5.3	5.8	4.6	3.0	16	5.3	5.0	9.1	5.3	3.7
24	4.8	5.0	5.3	5.3	4.8	3.1	10	5.6	8.2	8.0	6.9	3.5
25	4.8	5.0	16	5.6	4.6	4.1	11	5.3	9.4	9.1	6.6	3.5
26	4.6	4.8	13	8.5	4.6	4.1	6.3	6.9	6.3	6.6	14	3.3
27	5.0	4.3	9.1	7.2	4.6	3.9	6.3	6.6	7.7	5.3	10	3.3
28	4.3	5.0	14	7.2	4.6	3.9	5.0	6.1	5.3	11	6.6	3.1
29	4.3	8.0	16	5.8	------	3.9	6.3	5.6	10	6.6	8.8	3.1
30	4.1	6.9	10	5.3	------	4.1	5.6	5.6	10	5.6	9.1	3.1
31	4.1	------	6.9	5.0	------	4.8	------	5.6	------	5.6	6.3	------
TOTAL	189.0	143.3	256.7	202.6	170.7	114.9	295.3	199.4	197.0	212.2	208.4	136.3
MEAN	6.10	4.78	8.28	6.54	6.10	3.71	9.84	6.43	6.57	6.85	6.72	4.54
MAX	13	8.4	16	11	21	5.0	27	12	13	11	14	10
MIN	4.1	3.1	4.8	5.0	4.6	3.0	4.1	4.8	4.6	4.6	4.6	3.1
AC-FT	375	284	509	402	339	228	586	396	391	421	413	270

CAL YR 1969 TOTAL 2,433.8 MEAN 6.67 MAX 18 MIN 3.1 AC-FT 4,830
WTR YR 1970 TOTAL 2,325.8 MEAN 6.37 MAX 27 MIN 3.0 AC-FT 4,610

16405500 Waikolu Stream at altitude 900 ft, near Kalaupapa

LOCATION.--Lat 21°08'43", long 156°55'18", Molokai, on right bank 1.8 miles southwest of Haupu Bay, 2.3 miles upstream from mouth, and 5.2 miles southeast of Kalaupapa.

DRAINAGE AREA.--1.99 sq mi.

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

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

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--9 years (1960-61, 1962-70), 9.52 cfs (6,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 850 cfs Jan. 3 (gage height, 4.38 ft, from floodmarks), from rating curve extended above 43 cfs; minimum, 0.46 cfs Aug. 6-11, 13, 14.
Period of record: Maximum discharge, 2,080 cfs Apr. 13, 1965 (gage height, 6.12 ft), from rating curve extended above 43 cfs; minimum, 0.34 cfs Oct. 20, 1967.
Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum (discharge, 6,220 cfs, by slope-area measurement).

REMARKS.--Records fair except those for period of no gage-height record and those above 90 cfs, which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEAR).--WSP 1719: 1959. (WATER YEAR).--WRD Hawaii 1969: 1965(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.3	.90	1.8	1.5	1.9	31	1.9	.72	3.0	.56	1.1
2	1.3	1.3	.90	1.5	1.7	1.9	81	2.1	.90	1.1	.56	1.5
3	1.3	1.3	.72	55	1.7	1.9	11	2.7	.90	1.9	.56	1.3
4	1.5	1.3	3.4	16	1.7	1.7	14	3.3	.72	1.5	.56	.56
5	1.5	1.5	.90	7.0	1.9	1.7	25	3.9	.72	1.9	.56	.90
6	1.3	59	.72	3.5	1.9	1.5	2.4	4.3	.72	1.3	.46	1.1
7	1.3	26	.72	2.0	1.7	1.5	1.5	4.6	.90	3.6	.46	1.5
8	1.5	7.5	1.1	10	1.9	1.3	1.3	3.9	.90	2.1	.46	.72
9	1.5	3.3	1.9	5.0	35	1.3	1.1	4.6	.90	1.3	.46	.72
10	1.5	2.7	4.2	2.0	24	2.1	1.1	8.6	.90	1.1	.46	.90
11	3.7	1.7	1.9	10	1.9	2.4	9.5	3.6	.90	9.9	.56	.72
12	37	1.5	3.2	8.0	1.7	2.7	11	1.7	.90	1.9	.56	.72
13	19	1.9	38	12	1.5	2.7	14	2.1	.90	2.1	.46	.72
14	2.4	1.7	47	45	41	2.7	5.9	1.7	.72	1.3	.46	.90
15	1.7	1.1	2.1	5.0	13	2.7	2.7	1.9	.72	1.1	4.7	.72
16	1.5	1.1	1.1	2.5	1.9	3.6	3.0	1.7	1.1	.90	1.5	.56
17	1.3	.90	.90	1.8	1.7	3.0	3.9	1.5	2.4	.90	1.1	4.0
18	1.3	.90	.90	1.6	1.3	3.3	8.2	1.3	.90	.90	.56	8.7
19	1.3	1.1	12	1.5	1.1	4.6	3.4	1.3	.72	.90	.72	3.6
20	1.5	1.1	4.0	1.5	1.1	4.3	2.4	1.1	.72	.90	.56	1.9
21	25	1.1	2.0	1.5	1.1	3.3	5.4	1.1	2.7	.72	.56	.90
22	1.7	1.3	1.3	2.7	1.1	3.0	28	1.1	1.1	.72	.56	.72
23	1.5	1.3	1.1	2.4	1.1	3.0	80	1.1	.90	2.7	.56	.72
24	1.5	1.3	3.0	1.9	1.1	2.1	10	.90	1.6	1.3	.72	.72
25	1.5	1.3	50	2.1	1.3	1.5	11	.90	2.1	1.5	.56	.90
26	1.5	1.1	10	9.1	1.5	1.5	2.7	1.1	.90	.72	17	.90
27	1.3	1.1	3.0	4.0	1.7	1.3	6.7	.90	1.3	.56	1.9	.90
28	1.1	1.1	70	2.1	1.7	1.3	3.6	.90	.90	8.8	.90	.90
29	1.1	4.6	25	1.7	------	1.3	1.9	.90	2.4	.72	1.5	.72
30	1.1	.90	4.0	1.5	------	1.3	1.7	.72	6.3	.56	1.5	.72
31	1.3	------	2.0	1.5	------	1.3	------	.72	------	.56	.72	------
TOTAL	123.5	133.30	297.96	223.2	149.8	69.7	384.4	68.14	38.46	58.46	42.76	40.94
MEAN	3.98	4.44	9.61	7.20	5.35	2.25	12.8	2.20	1.28	1.89	1.38	1.36
MAX	37	59	70	55	41	4.6	81	8.6	6.3	9.9	17	8.7
MIN	1.1	.90	.72	1.5	1.1	1.3	1.1	.72	.72	.56	.46	.56
AC-FT	245	264	591	443	297	138	762	135	76	116	85	81

CAL YR 1969 TOTAL 3,217.86 MEAN 8.82 MAX 110 MIN .72 AC-FT 6,380
WTR YR 1970 TOTAL 1,630.62 MEAN 4.47 MAX 81 MIN .46 AC-FT 3,230

PEAK DISCHARGE (BASE, 570 CFS).--Jan. 3 (about 1700) 850 cfs (4.38 ft); Apr. 2 (1000) 695 cfs (4.07 ft).

NOTE.--No gage-height record Dec. 18 to Jan. 19.

16408000 Waikolu Stream below pipeline crossing, near Kalaupapa

LOCATION.--Lat 21°09'45", long 156°55'54", Molokai, on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 sq mi.

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."

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

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--10 years (1960-70), 17.6 cfs (12,750 acre-ft per year).

EXTREMES.--Current year: Maximum gage height, 4.16 ft Jan. 3 (discharge not determined); minimum discharge, 6.0 cfs Aug. 22-25.
Period of record: Maximum discharge, 6,600 cfs Oct. 31, 1961 (gage height, 13.75 ft, present datum, from floodmarks), from rating curve extended above 39 cfs on basis of slope-area measurement of peak flow; minimum, 2.0 cfs Nov. 1, 2, 1925, June 5, 1926.

REMARKS.--Records fair except those above 80 cfs, which are poor. Diversion aoove station for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	9.6	8.0	13	8.9	8.3	31	10	7.5	12	7.5	6.8
2	10	9.3	8.0	10	8.9	7.8	91	10	7.5	9.3	7.5	7.1
3	10	9.3	7.8	81	8.9	7.5	21	10	7.3	10	7.3	7.1
4	10	9.3	12	28	8.7	7.5	22	9.8	7.5	9.6	7.1	6.4
5	10	9.8	8.3	20	8.7	8.0	43	9.6	7.3	10	7.0	6.8
6	9.8	62	7.8	12	8.7	8.3	14	9.6	7.1	8.9	7.0	7.1
7	9.8	26	8.7	11	8.5	8.3	11	9.3	7.1	11	7.0	7.1
8	10	16	8.3	27	8.5	8.3	10	9.8	7.1	10	7.1	6.5
9	9.6	11	8.9	17	38	8.3	10	10	7.1	8.9	7.0	6.6
10	9.6	10	11	11	34	8.7	9.8	14	7.0	8.5	6.8	6.5
11	11	9.3	9.6	28	8.7	9.1	23	11	7.0	19	6.8	6.5
12	34	8.9	9.0	26	8.2	9.6	23	8.9	7.0	10	7.0	6.5
13	27	9.1	39	31	8.2	9.3	26	9.1	7.0	10	7.0	6.4
14	11	9.2	74	82	45	9.6	17	8.5	7.0	8.9	6.8	6.6
15	10	8.5	15	14	23	9.3	13	8.5	7.0	8.5	11	6.5
16	9.8	8.5	11	11	9.1	10	13	8.3	7.0	8.3	8.7	6.5
17	9.6	8.3	10	10	8.5	9.8	12	8.0	8.0	8.7	7.6	10
18	9.6	8.3	9.6	9.8	8.2	9.6	19	8.0	6.8	8.2	7.0	14
19	9.6	8.3	22	9.6	8.0	11	14	8.0	6.6	8.0	6.8	8.7
20	9.6	8.2	14	9.6	8.0	11	13	8.0	6.8	7.8	6.5	7.6
21	39	8.2	9.8	9.8	7.8	9.6	24	8.0	8.5	7.8	6.2	6.5
22	11	8.2	9.3	12	7.8	9.1	33	8.0	7.3	7.8	6.2	6.4
23	10	8.2	9.1	10	7.6	9.1	92	7.8	7.1	11	6.0	6.4
24	11	8.2	13	9.8	7.6	8.9	22	7.6	8.2	9.1	6.2	6.2
25	10	8.2	89	10	7.6	8.0	22	7.6	8.7	8.7	6.0	6.2
26	9.8	8.2	36	15	7.6	8.0	13	7.8	7.8	7.8	18	6.2
27	9.6	8.2	15	12	7.6	8.0	15	7.6	8.2	7.8	8.5	6.2
28	9.6	8.3	99	10	7.8	8.0	12	7.5	7.8	16	8.0	6.2
29	9.6	14	70	9.3	------	8.0	11	7.5	9.3	8.3	8.9	6.2
30	9.6	8.2	16	9.1	------	8.2	10	7.5	11	8.0	7.3	6.5
31	9.6	------	12	9.1	------	8.2	------	7.5	------	7.6	6.5	------
TOTAL	379.8	346.8	680.2	577.1	338.1	272.4	689.8	272.8	226.6	295.5	234.3	210.3
MEAN	12.3	11.6	21.9	18.6	12.1	8.79	23.0	8.80	7.55	9.53	7.56	7.01
MAX	39	62	99	82	45	11	92	14	11	19	18	14
MIN	9.6	8.2	7.8	9.1	7.6	7.5	9.8	7.5	6.6	7.6	6.0	6.2
AC-FT	753	688	1,350	1,140	671	540	1,370	541	449	586	465	417

CAL YR 1969 TOTAL 7,932.5 MEAN 21.7 MAX 135 MIN 7.8 AC-FT 15,730
WTR YR 1970 TOTAL 4,523.7 MEAN 12.4 MAX 99 MIN 6.0 AC-FT 8,970

16411400 Kakaako Gulch near Mauna Loa

LOCATION.--Lat 21°10'39", long 157°12'31", Molokai, on left bank 1.0 mile downstream from Kamakahi Gulch and 3.0 miles north of Mauna Loa School.

DRAINAGE AREA.--5.34 sq mi.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 0.720 cfs (522 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 47 cfs Aug. 29 (gage height, 0.85 ft), from rating curve developed as explained below; no flow most of time.
Period of record: Maximum discharge, 1,760 cfs Nov. 12, 1965 (gage height, 6.28 ft), from rating curve based on slope-area measurements at gage heights 0.72, 1.43 and 6.28 ft; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0	0						0	
2				0	0						0	
3				0	0						0	
4				0	0						0	
5				0	0						0	
6				0	0						0	
7				0	0						0	
8				0	0						0	
9				0	0						0	
10				0	0						0	
11				0	0						0	
12				0	0						0	
13				0	0						0	
14				1.3	12						0	
15				0	2.0						0	
16				0	0						0	
17				0	0						0	
18				0	0						0	
19				0	0						0	
20				0	0						0	
21				0	0						0	
22				0	0						0	
23				0	0						0	
24				0	0						0	
25				0	0						0	
26				0	0						0	
27				0	0						0	
28				0	0						0	
29				0	------						4.3	
30				0	------						1.5	
31		------		0	------		------		------		0	------
TOTAL	0	0	0	1.3	14.0	0	0	0	0	0	5.8	0
MEAN	0	0	0	.042	.50	0	0	0	0	0	.19	0
MAX	0	0	0	1.3	12	0	0	0	0	0	4.3	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	2.6	28	0	0	0	0	0	12	0

CAL YR 1969	TOTAL 71.9	MEAN .20	MAX 40	MIN 0	AC-FT 143
WTR YR 1970	TOTAL 21.1	MEAN .058	MAX 12	MIN 0	AC-FT 42

PEAK DISCHARGE (BASE, 300 CFS).--No peak above base.

16414000 Kaunakakai Gulch at Kaunakakai

LOCATION.--Lat 21°06'21", long 157°00'34", Molokai, on left bank 0.6 mile upstream from Molokai Ranch pipeline crossing, 1.3 miles northeast of Kaunakakai Post Office, and 1.7 miles upstream from mouth.

DRAINAGE AREA.--6.57 sq mi.

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

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

AVERAGE DISCHARGE.--20 years (1950-70), 1.67 cfs (1,210 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 273 cfs Dec. 28 (gage height, 4.75 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 3,060 cfs Oct. 31, 1961 (gage height, 9.30 ft), from rating curve extended above 620 cfs on basis of slope-area measurement of peak flow; no flow at times each year.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1	0	0	0	0	0		.34				
2	0	0	0	0	0		25				
3	0	0	0	0	0		2.4				
4	0	0	0	5.3	0		0				
5	0	0	0	.88	0		1.7				
6	0	.92	0	0	0		.48				
7	0	0	0	0	0		0				
8	0	0	0	0	0		0				
9	0	0	0	0	0		0				
10	0	0	0	0	0		0				
11	0	0	0	0	0		0				
12	1.9	0	0	6.9	0		0				
13	5.8	0	0	.92	0		1.0				
14	1.3	0	4.5	46	11		0				
15	0	0	0	8.1	20		0				
16	0	0	0	.58	1.7		0				
17	0	0	0	0	0		0				
18	0	0	0	0	0		0				
19	0	0	0	0	0		0				
20	0	0	0	0	0		0				
21	1.3	0	0	0	0		0				
22	0	0	0	0	0		0				
23	0	0	0	0	0		14				
24	0	0	0	0	0		2.6				
25	0	0	7.8	0	0		0				
26	0	0	5.6	0	0		0				
27	0	0	.57	0	0		0				
28	0	0	37	0	0		0				
29	0	0	21	0	------		0				
30	0	0	4.6	0	------		0				
31	0	------	.13	0	------		------		------		
TOTAL	10.3	.92	81.20	68.68	32.7	0	47.52	0	0	0	0
MEAN	.33	.031	2.62	2.22	1.17	0	1.58	0	0	0	0
MAX	5.8	.92	37	46	20	0	25	0	0	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0
AC-FT	20	1.8	161	136	65	0	94	0	0	0	0

CAL YR 1969 TOTAL 375.88 MEAN 1.03 MAX 55 MIN 0 AC-FT 746
WTR YR 1970 TOTAL 241.32 MEAN .66 MAX 46 MIN 0 AC-FT 479

PEAK DISCHARGE (BASE, 160 CFS).--Dec. 28 (1300) 273 cfs (4.75 ft); Jan. 14 (0900) 227 cfs (4.56 ft).

16415000 East Fork Kawela Gulch near Kamalo

LOCATION.--Lat 21°06'46", long 156°54'23", Molokai, on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo, and 7.6 miles northeast of Kaunakakai.

DRAINAGE AREA.--0.45 sq mi.

PERIOD OF RECORD.--September 1946 to current year. Published as Right Branch of East Fork Kawela Stream near Kamalo prior to July 1958 and as Right Branch of East Fork Kawela Gulch near Kamalo July 1958 to June 1960.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

AVERAGE DISCHARGE.--24 years, 2.38 cfs (1,720 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 168 cfs Dec. 28 (gage height, 4.24 ft), from rating curve extended as explained below; no flow for many days.
Period of record: Maximum discharge, 2,260 cfs Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 6.6 cfs on basis of slope-area measurement at gage height 6.50 ft; no flow at times each year.

REMARKS.--Records good. Molokai Ranch diverts from gage pool. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1319: Drainage area. WSP 1719: 1947-49. WSP 1937: 1948(M), 1951(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	0	0	2.3	0	.01	23	.69	0	2.8	.01	3.4
2	.28	0	0	.51	0	.03	24	.43	0	1.4	0	.69
3	.01	0	0	3.8	0	.01	7.0	.04	0	3.7	0	.32
4	0	0	.02	2.5	0	0	5.4	0	0	2.7	0	.03
5	0	1.8	.11	1.2	0	0	9.2	0	0	4.5	0	2.4
6	0	18	0	.85	0	0	1.7	0	0	1.3	.27	3.0
7	0	7.9	.50	.59	0	0	.91	0	0	3.7	.55	2.2
8	0	2.3	2.0	1.1	0	0	.39	3.0	0	3.7	2.2	.35
9	.02	.28	3.6	2.0	2.0	0	.23	4.1	0	.85	.45	.01
10	0	0	2.9	.12	5.6	0	.20	11	0	.35	0	0
11	2.3	0	1.5	11	.23	0	1.0	4.0	0	5.1	0	0
12	8.6	0	.59	6.1	0	0	4.1	1.4	.17	2.5	0	0
13	7.0	0	5.0	6.7	0	0	3.5	1.9	1.6	3.0	0	0
14	1.7	0	11	20	15	0	3.1	.59	1.9	1.3	1.0	0
15	.69	0	.91	1.8	4.7	0	2.5	1.3	.07	.18	3.2	0
16	.04	0	.14	.35	.80	.81	5.1	.97	4.3	0	2.8	0
17	0	0	0	.09	.20	.02	1.0	1.1	4.7	0	2.7	2.7
18	0	0	0	0	.04	.59	3.5	.12	.44	1.1	.69	5.3
19	0	0	.89	.34	.01	1.6	3.0	0	0	.03	.74	4.0
20	0	0	1.4	.47	0	.64	1.8	0	1.1	0	.47	2.1
21	6.2	0	.01	.02	0	.01	3.1	0	7.0	0	.01	.27
22	.43	0	0	.82	0	0	14	0	1.6	0	0	0
23	.01	0	0	.64	0	0	21	0	.48	5.6	0	0
24	0	0	2.8	.02	0	0	5.1	0	4.2	2.0	1.7	0
25	0	0	23	1.2	0	0	5.7	0	3.7	2.5	1.2	0
26	0	0	12	4.1	0	0	1.4	2.0	1.0	.43	12	0
27	0	0	3.1	1.7	0	0	3.4	.51	3.0	.15	3.1	0
28	0	0	33	1.2	0	0	1.5	.08	.99	5.4	1.2	0
29	0	.15	20	.32	------	0	2.2	0	8.2	.39	1.6	0
30	0	.10	2.8	.01	------	0	.69	0	4.7	.43	2.4	0
31	0	------	.74	0	------	.84	------	0	------	.55	.64	------
TOTAL	28.38	30.53	128.01	71.85	28.58	4.56	158.72	33.23	49.15	55.66	38.93	26.77
MEAN	.92	1.02	4.13	2.32	1.02	.15	5.29	1.07	1.64	1.80	1.26	.89
MAX	8.6	18	33	20	15	1.6	24	11	8.2	5.6	12	5.3
MIN	0	0	0	0	0	0	.20	0	0	0	0	0
AC-FT	56	61	254	143	57	9.0	315	66	97	110	77	53

CAL YR 1969 TOTAL 973.55 MEAN 2.67 MAX 36 MIN 0 AC-FT 1,930
WTR YR 1970 TOTAL 654.37 MEAN 1.79 MAX 33 MIN 0 AC-FT 1,300

PEAK DISCHARGE (BASE, 160 CFS).--Dec. 28 (1000) 168 cfs (4.24 ft).

16416000 Punaula Gulch near Pukoo

LOCATION.--Lat 21°05'50", long 156°48'48", Molokai, on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

DRAINAGE AREA.--0.24 sq mi.

PERIOD OF RECORD.--March 1947 to current year. Prior to July 1958, published as Punaula Stream near Pukoo.

GAGE.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

AVERAGE DISCHARGE.--23 years, 1.26 cfs (913 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 622 cfs Apr. 21 (gage height, 7.62 ft), from rating curve extended as explained below; minimum, 0.03 cfs Mar. 26, 27.
Period of record: Maximum discharge, 622 cfs Apr. 21, 1970 (gage height, 7.62 ft), from rating curve extended above 14 cfs by test of model of station site; minimum, 0.02 cfs Mar. 13, 1947, Feb. 19, 1954.

REMARKS.--Records good. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1319: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.30	.06	.12	3.0	.12	.09	3.4	.65	.14	.60	.48	.70
2	.54	.05	.08	.70	.11	.12	7.6	1.1	.11	1.9	.52	.36
3	.28	.05	.07	4.9	.10	.11	1.7	.44	.10	2.1	.26	.70
4	.20	.07	.14	1.2	.10	.10	1.5	.36	.16	.70	.20	.26
5	.14	.20	.12	.76	.10	.09	2.9	.26	.24	2.6	.18	.65
6	.12	4.7	.08	1.2	.09	.09	.36	.40	.12	.65	.40	.95
7	.11	1.9	.40	.36	.08	.09	.20	.40	.09	2.3	.44	.44
8	.41	.36	.85	.58	.07	.09	.12	1.7	.08	3.9	1.1	.56
9	.18	.18	1.7	.54	.23	.09	.10	1.5	.07	.88	.30	.26
10	.54	.12	.40	.22	1.0	.08	.51	4.1	.06	.95	.20	.24
11	.54	.11	.26	3.0	.11	.07	5.4	1.8	.06	3.8	.14	.20
12	.59	.12	.11	1.2	.08	.07	4.1	.82	.33	1.0	.12	.26
13	3.2	.10	2.0	1.6	.07	.06	4.9	1.8	.60	1.4	.12	.18
14	.44	.09	3.4	4.8	1.7	.06	1.8	1.7	.24	.40	.12	.18
15	.33	.07	.36	.48	1.6	.08	.52	1.9	.12	.28	.94	.12
16	.20	.07	.22	.24	.22	.32	2.1	.70	.08	.24	1.2	.11
17	.14	.07	.14	.20	.11	.07	.33	.36	.44	1.2	.54	.45
18	.11	.06	.10	.14	.09	.56	.33	.26	.12	.70	.52	.88
19	.12	.05	.22	.12	.09	.40	.47	.20	.08	.26	.20	2.8
20	.11	.07	.30	.11	.08	.12	1.2	.18	1.1	.20	.18	1.3
21	3.8	.22	.10	.11	.08	.07	28	.22	2.7	.22	.18	.56
22	.28	1.2	.07	.16	.07	.04	3.8	.28	1.2	.30	.20	.82
23	.20	1.5	.06	.16	.07	.06	6.2	.65	.30	3.4	.14	.44
24	.14	.24	1.2	.11	.07	.06	1.0	.52	.36	1.0	2.6	.26
25	.12	.12	4.7	.10	.07	.04	3.4	.82	1.1	1.1	1.2	.18
26	.10	.10	5.1	2.0	.07	.03	1.3	1.7	.56	.70	4.3	.12
27	.09	.08	.60	1.3	.07	.03	1.6	.48	1.1	.88	1.1	.11
28	.08	.06	8.7	1.9	.08	.07	.56	.30	.30	3.1	2.2	.10
29	.08	.29	8.3	.30	------	.06	.60	.18	5.0	.40	1.3	.08
30	.07	.64	1.2	.20	------	.05	.70	.14	1.8	3.8	2.4	.07
31	.06	------	2.0	.14	------	.71	------	.28	------	2.9	.36	------
TOTAL	13.62	12.95	43.10	31.83	6.73	3.98	86.70	26.20	18.76	43.86	24.14	14.34
MEAN	.44	.43	1.39	1.03	.24	.13	2.89	.85	.63	1.41	.78	.48
MAX	3.8	4.7	8.7	4.9	1.7	.71	28	4.1	5.0	3.9	4.3	2.8
MIN	.06	.05	.06	.10	.07	.03	.10	.14	.06	.20	.12	.07
AC-FT	27	26	85	63	13	7.9	172	52	37	87	48	28

CAL YR 1969 TOTAL 461.43 MEAN 1.26 MAX 20 MIN .05 AC-FT 915
WTR YR 1970 TOTAL 326.21 MEAN .89 MAX 28 MIN .03 AC-FT 647

PEAK DISCHARGE (BASE, 140 CFS).--Jan. 14 (0700) 168 cfs (3.47 ft); Apr. 21 (0330) 622 cfs (7.62 ft).

16419500 Papio Gulch at Halawa

LOCATION.--Lat 21°08'55", long 156°44'16", Molokai, on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mile south of Halawa.

DRAINAGE AREA.--0.94 sq mi.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 640 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 1.14 cfs (826 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 28 cfs Jan. 26 (gage height, 2.27 ft); no flow for many days.
Period of record: Maximum discharge, 2,720 cfs Apr. 13, 1965 (gage height, 11.25 ft), from rating curve extended above 17 cfs on basis of slope-area measurements at gage heights 4.60, 7.15, and 11.25 ft; no flow at times.

REMARKS.--Records good. Diversión above station for domestic use at Puu O Hoku Ranch.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.09	.28	2.9	.34	.07	.05	.14	.03	.07	.22	.01
2	.20	.08	.16	1.8	.28	.08	1.2	.14	.04	.04	.06	0
3	.16	.07	.09	2.1	.26	.07	.46	.18	.03	.10	.05	0
4	.18	.07	.94	1.7	.26	.06	.28	.12	.08	.05	.02	0
5	.14	.20	.49	1.6	.24	.07	.52	.10	.20	.09	.01	0
6	.18	.80	.20	.81	.22	.06	.24	.12	.10	.09	.02	0
7	.12	.30	.14	.52	.18	.06	.10	.12	.04	.22	.03	0
8	.12	.20	.20	.40	.16	.05	.06	.24	.03	.40	.06	0
9	.16	.10	.52	.84	.30	.04	.06	.22	.01	.24	.08	0
10	.50	.07	.26	.31	2.3	.05	.05	.22	0	.07	.02	0
11	.31	.05	.10	.31	.22	.05	.14	.31	0	1.7	.01	0
12	.24	.08	.08	1.0	.12	.04	.58	.14	0	.34	0	0
13	1.1	.06	.22	1.2	.16	.04	.49	.10	0	.24	0	0
14	.52	.04	1.1	3.1	.18	.03	.52	.09	.02	.18	0	0
15	.28	.02	.37	.78	.40	.07	.20	.22	.02	.06	0	0
16	.20	.02	.18	.55	.18	.07	.10	.14	0	.03	0	0
17	.16	.01	.12	.40	.10	.06	.08	.09	0	.03	0	0
18	.12	0	.10	.24	.10	.04	.06	.07	0	.22	0	0
19	.18	0	.32	.22	.08	.04	.08	.04	0	.09	0	0
20	.16	0	.88	.20	.09	.05	.09	.03	0	.03	0	.04
21	.87	0	.20	.22	.12	.04	3.0	.03	.01	.03	0	.03
22	.31	0	.09	.34	.10	.03	.52	.08	.05	.03	0	0
23	.18	.43	.07	.22	.08	.03	1.6	.89	.01	.12	0	0
24	.16	.18	.09	.24	.06	.02	.43	.18	0	1.0	0	0
25	.18	.07	2.2	.27	.05	.01	.85	.10	0	.58	0	0
26	.16	.04	1.0	6.4	.06	.01	.61	.20	0	.24	0	0
27	.14	.01	.64	1.8	.07	.01	.55	.16	.02	.09	.02	0
28	.14	.01	.64	.92	.07	.01	.28	.05	.02	1.3	0	0
29	.12	.33	3.2	.58	------	.01	.20	.04	.04	.28	.04	0
30	.10	1.5	1.1	.43	------	.01	.16	.04	.07	.12	.05	0
31	.08	------	.55	.37	------	.01	------	.03	------	.22	.03	------
TOTAL	7.69	4.83	16.53	32.77	6.78	1.29	13.56	4.63	.82	8.30	.72	.08
MEAN	.25	.16	.53	1.06	.24	.042	.45	.15	.027	.27	.023	.003
MAX	1.1	1.5	3.2	6.4	2.3	.08	3.0	.89	.20	1.7	.22	.04
MIN	.08	0	.07	.20	.05	.01	.05	.03	0	.03	0	0
AC-FT	15	9.6	33	65	13	2.6	27	9.2	1.6	16	1.4	.2

CAL YR 1969 TOTAL 279.61 MEAN .77 MAX 24 MIN 0 AC-FT 555
WTR YR 1970 TOTAL 98.00 MEAN .27 MAX 6.4 MIN 0 AC-FT 194

PEAK DISCHARGE (BASE, 210 CFS).--No peak above base.

16500100 Kepuni Gulch near Kahikinui House

LOCATION.--Lat 20°37'21", long 156°15'16", Maui, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 miles east of Kahikinui House, and 8.5 miles west of Kaupo.

DRAINAGE AREA.--1.91 sq mi.

PERIOD OF RECORD.--May 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). Prior to Feb. 13, 1964, at site 50 ft downstream at different datum.

AVERAGE DISCHARGE.--7 years, 0.194 cfs (141 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 242 cfs Jan. 14 (gage height, 4.84 ft), from rating curve defined as explained below; no flow most of time.
Period of record: Maximum discharge, 964 cfs Jan. 17, 1968 (gage height, 8.23 ft), from rating curve defined only by computation of peak flow over dam at gage heights 4.80, 6.38 and 7.95 ft; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0								
2				0								
3				0								
4				0								
5				0								
6				0								
7				0								
8				0								
9				0								
10				0								
11				0								
12				0								
13				0								
14				10								
15				0								
16				0								
17				0								
18				0								
19				0								
20				0								
21				0								
22				0								
23				0								
24				0								
25				0								
26				0								
27				0								
28				0								
29				0	------							
30				0	------							
31		------		0	------		------		------			------
TOTAL	0	0	0	10	0	0	0	0	0	0	0	0
MEAN	0	0	0	.32	0	0	0	0	0	0	0	0
MAX	0	0	0	10	0	0	0	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	20	0	0	0	0	0	0	0	0

CAL YR 1969 TOTAL 23.65 MEAN .065 MAX 21 MIN 0 AC-FT 47
WTR YR 1970 TOTAL 10 MEAN .027 MAX 10 MIN 0 AC-FT 20

PEAK DISCHARGE (BASE, 78 CFS).--Jan. 14 (1030) 242 cfs (4.84 ft).

16501000 Palikea Stream below diversion dam, near Kipahulu

LOCATION.--Lat 20°41'05", long 156°04'10", Maui, on left bank 50 ft downstream from old diversion dam, 2 miles northwest of Kipahulu, and 2.1 miles upstream from mouth.

DRAINAGE AREA.--6.29 sq mi.

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, near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

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

AVERAGE DISCHARGE.--35 years (1927-28, 1932-34, 1936-37, 1939-70), 58.7 cfs (42,530 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,300 cfs Apr. 21 (gage height, 9.55 ft); minimum, 0.01 cfs Nov. 3-5, Dec. 19-23.
Period of record: Maximum discharge, 16,100 cfs Jan. 23, 1965 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 3,300 cfs on basis of computations of peak flow over dam at gage heights 12.68 and 17.5 ft; no flow at times.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	.02	.05	180	.46	.02	91	95	1.6	54	11	15
2	.86	.02	.03	55	.26	.02	281	782	1.0	83	37	23
3	.62	.02	.02	18	.08	.02	196	66	.69	54	53	10
4	.42	.01	.81	43	.03	.03	66	12	31	56	8.8	2.8
5	.26	8.8	.55	2.3	.66	.03	77	3.1	2.2	106	1.1	74
6	.11	283	.11	99	.14	.03	5.6	4.4	.95	84	4.6	21
7	.08	283	27	4.8	.03	.03	1.5	11	.62	92	55	2.4
8	.08	60	31	1.4	.03	.03	.55	137	.48	66	61	8.9
9	.05	31	48	.95	.02	.03	.69	121	.36	20	4.8	.95
10	.03	2.8	81	.62	.02	.03	36	198	.26	35	1.0	.48
11	.02	1.2	22	8.1	.03	.02	97	56	.69	33	.62	.36
12	.02	15	1.2	27	.03	.03	254	47	5.2	25	.55	.42
13	.02	22	.55	217	.03	.03	109	36	23	30	.36	.36
14	.03	8.3	9.0	734	27	.03	59	16	32	56	.26	.42
15	.08	4.6	.55	15	87	.02	100	27	18	5.7	.31	.31
16	.11	.95	.08	2.4	1.5	114	296	76	71	4.9	.62	.08
17	.11	19	.03	1.2	1.1	.58	159	86	40	2.0	4.1	99
18	.14	1.2	.02	.95	.62	28	72	17	3.3	4.3	.77	139
19	.14	.48	.01	.62	.14	40	74	12	.86	.62	8.3	123
20	.14	.48	.01	.42	.62	7.6	658	2.3	12	.26	1.6	65
21	98	184	.01	.31	.11	.11	826	19	79	.11	.86	15
22	4.2	178	.01	.14	.03	.02	378	44	22	.11	.36	11
23	.05	72	.01	.05	.03	8.3	540	3.1	19	64	21	1.9
24	.02	14	.03	2.7	.03	.78	79	1.2	54	21	142	.62
25	.02	2.8	962	.48	.03	.03	22	4.1	68	140	54	.31
26	.02	1.5	1,040	2.0	.03	.02	102	251	5.7	23	610	.14
27	.02	.86	76	1.0	.03	.02	162	31	50	20	121	.11
28	.02	.48	524	10	.03	.03	66	10	99	122	76	.03
29	.02	.31	489	1.4	------	.42	51	28	157	3.1	20	.02
30	.02	.21	91	.36	------	.08	172	37	43	8.5	202	.02
31	.02	------	40	.14	------	.05	------	15	------	4.3	7.0	------
TOTAL	107.63	1,196.04	3,444.08	1,430.34	120.12	200.44	5,031.34	2,248.2	841.91	1,217.90	1,509.01	615.63
MEAN	3.47	39.9	111	46.1	4.29	6.47	168	72.5	28.1	39.3	48.7	20.5
MAX	98	283	1,040	734	87	114	826	782	157	140	610	139
MIN	.02	.01	.01	.05	.02	.02	.55	1.2	.26	.11	.26	.02
AC-FT	213	2,370	6,830	2,840	238	398	9,980	4,460	1,670	2,420	2,990	1,220

CAL YR 1969 TOTAL 35,683.45 MEAN 97.8 MAX 2,580 MIN .01 AC-FT 70,780
WTR YR 1970 TOTAL 17,962.64 MEAN 49.2 MAX 1,040 MIN .01 AC-FT 35,630

PEAK DISCHARGE (BASE, 2,800 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-26	0500	9.23	3,300	4-21	0800	9.55	4,300
1-14	1030	9.39	3,580				

16508000 Hanawi Stream near Nahiku

LOCATION.--Lat 20°48'35", long 156°07'00", Maui, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

DRAINAGE AREA.--3.49 sq mi.

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

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

AVERAGE DISCHARGE.--48 years (1922-70), 23.0 cfs (16,660 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,030 cfs Dec. 28 (gage height, 7.08 ft), from rating curve extended as explained below; minimum, 2.5 cfs Nov. 27-29.

Period of record: Maximum discharge, about 5,570 cfs Jan. 18, 1916 (gage height, 11.6 ft, present site and datum), from rating curve extended above 410 cfs by test of model of station site; minimum, 1.6 cfs Nov. 14, 19, 20, 1962, Feb. 10, 11, 16, 17, 1963.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	3.1	3.5	19	4.4	7.0	164	42	5.4	33	9.7	9.3
2	7.4	3.0	3.1	7.9	4.2	13	193	87	5.1	44	11	11
3	6.4	2.9	2.9	214	4.1	4.6	118	20	4.8	15	8.5	9.6
4	5.8	2.8	3.0	146	3.9	5.5	44	15	4.9	26	7.6	9.8
5	5.4	2.9	4.4	16	3.8	5.5	60	13	5.1	25	7.9	18
6	5.2	100	3.1	20	3.7	3.3	13	12	4.4	33	12	9.9
7	5.0	50	3.6	10	3.6	7.7	8.6	11	4.2	37	22	10
8	4.9	15	5.1	8.6	3.5	5.1	6.7	14	4.1	16	11	9.9
9	4.6	5.0	14	7.9	3.5	3.3	6.7	22	3.9	30	7.8	7.4
10	4.4	4.1	57	7.3	4.6	3.0	13	57	3.9	36	6.6	6.5
11	4.2	3.7	12	7.0	3.6	2.9	85	27	3.8	18	6.1	6.1
12	4.2	3.4	4.5	7.0	3.4	2.9	174	15	3.8	12	6.1	5.7
13	4.4	3.2	48	72	3.3	2.8	76	12	3.7	12	6.0	5.4
14	4.0	3.1	134	192	3.5	2.8	43	9.5	3.6	9.9	6.0	5.4
15	3.9	3.0	18	12	5.0	3.2	60	9.3	3.6	8.1	9.8	5.2
16	3.8	2.9	6.5	6.9	3.8	4.5	43	15	4.1	16	13	5.9
17	3.7	2.9	4.9	6.2	3.2	3.1	66	23	7.9	14	14	40
18	3.6	2.7	4.2	5.8	3.1	11	46	13	5.5	24	12	37
19	3.5	2.7	3.9	5.5	3.0	9.3	20	14	4.6	8.3	18	19
20	3.5	2.7	3.7	5.2	2.9	8.2	88	9.6	4.1	6.6	8.3	13
21	4.8	3.0	3.5	5.0	2.9	4.0	267	9.6	5.0	5.8	6.7	8.0
22	3.8	3.0	3.3	5.9	2.9	3.6	196	8.4	6.0	5.8	6.5	8.9
23	3.4	2.8	3.1	6.8	2.9	15	414	7.0	6.5	22	11	8.9
24	5.2	2.7	4.8	5.0	2.9	7.1	139	6.4	8.4	9.4	20	6.3
25	4.4	2.8	368	4.7	3.1	4.0	47	7.6	13	22	78	5.6
26	3.6	2.8	317	9.7	3.4	5.2	39	62	6.3	11	118	6.3
27	3.4	2.6	30	17	3.3	12	52	11	5.2	41	29	5.2
28	3.3	2.5	691	6.9	2.9	12	27	9.5	8.3	27	25	4.9
29	3.2	76	271	5.5	------	27	33	6.9	8.9	9.2	13	4.7
30	3.2	8.3	21	5.1	------	16	39	6.4	22	8.6	19	4.4
31	3.1	------	14	4.7	------	18	------	5.8	------	10	9.6	------
TOTAL	140.3	325.6	2,066.1	852.6	98.4	232.6	2,581.0	581.0	180.1	595.7	539.2	307.3
MEAN	4.53	10.9	66.6	27.5	3.51	7.50	86.0	18.7	6.00	19.2	17.4	10.2
MAX	11	100	691	214	5.0	27	414	87	22	44	118	40
MIN	3.1	2.5	2.9	4.7	2.9	2.8	6.7	5.8	3.6	5.8	6.0	4.4
AC-FT	278	646	4,100	1,690	195	461	5,120	1,150	357	1,180	1,070	610

CAL YR 1969 TOTAL 19,245.1 MEAN 52.7 MAX 1,150 MIN 2.5 AC-FT 38,170
WTR YR 1970 TOTAL 8,499.9 MEAN 23.3 MAX 691 MIN 2.5 AC-FT 16,860

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1330	7.08	2,030	4-21	0815	6.73	1,860
1- 3	2245	6.30	1,660				

16512000 Koolau ditch at Nahiku weir, near Nahiku

LOCATION.--Lat 20°48'55", long 156°07'15", Maui, on right bank between Kapaula and Waiohue Gulches, 1.8 miles southwest of Nahiku, and 3.8 miles 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 above mean sea level. Prior to Apr. 28, 1922, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--51 years, 34.3 cfs (24,850 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 99 cfs Apr. 27, May 11, 1963, May 25, 1964; no flow at times.

REMARKS.--Records excellent. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	13	20	56	19	16	80	79	27	70	39	46
2	32	12	17	65	18	24	72	87	26	84	42	50
3	29	12	15	42	17	7.8	67	68	24	60	36	46
4	27	12	15	78	16	6.9	76	56	25	69	34	44
5	26	12	18	54	15	8.4	74	50	25	70	34	62
6	24	76	16	50	15	7.0	50	23	23	66	42	45
7	23	79	15	39	15	19	30	6.1	22	79	66	42
8	22	47	16	36	14	18	23	32	21	62	48	41
9	21	25	33	33	15	13	32	64	20	78	36	33
10	20	21	39	30	17	12	46	88	19	82	32	30
11	19	19	52	28	14	11	78	76	18	66	30	28
12	19	17	24	27	13	11	89	60	18	52	29	26
13	19	16	33	42	13	11	88	48	17	51	28	24
14	18	15	77	81	14	10	78	41	17	42	27	24
15	17	15	63	38	18	12	80	40	17	36	36	24
16	16	14	35	27	15	16	81	52	19	51	37	25
17	16	14	30	24	13	11	84	66	31	50	50	54
18	15	13	26	22	12	32	80	50	23	66	39	72
19	15	13	22	21	12	30	66	49	21	39	55	69
20	15	12	21	21	12	29	76	41	20	33	35	54
21	21	13	19	20	11	17	77	41	24	30	31	39
22	16	14	18	23	11	14	84	38	25	30	30	41
23	15	14	17	24	11	35	89	33	26	60	45	37
24	20	12	17	20	10	29	74	31	31	41	66	32
25	21	13	77	19	7.1	18	60	33	46	63	83	28
26	17	13	83	32	1.9	20	61	60	29	48	82	32
27	15	12	61	49	8.4	22	85	45	25	60	71	26
28	14	11	77	30	10	38	68	42	34	69	80	26
29	14	34	70	24	------	53	76	34	37	41	60	24
30	13	49	48	22	------	43	80	32	45	39	64	22
31	13	------	49	20	------	51	------	29	------	41	47	------
TOTAL	616	642	1,123	1,097	367.4	645.1	2,104	1,494.1	755	1,728	1,434	1,146
MEAN	19.9	21.4	36.2	35.4	13.1	20.8	70.1	48.2	25.2	55.7	46.3	38.2
MAX	44	79	83	81	19	53	89	88	46	84	83	72
MIN	13	11	15	19	1.9	6.9	23	6.1	17	30	27	22
AC-FT	1,220	1,270	2,230	2,180	729	1,280	4,170	2,960	1,500	3,430	2,840	2,270

CAL YR 1969 TOTAL 16,928 MEAN 46.4 MAX 93 MIN 11 AC-FT 33,580
WTR YR 1970 TOTAL 13,151.6 MEAN 36.0 MAX 89 MIN 1.9 AC-FT 26,090

16518000 West Wailuaiki Stream near Keanae

LOCATION.--Lat 20°49'15", long 156°08'37", Maui, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

DRAINAGE AREA.--3.66 sq mi.

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.

GAGE.--Water-stage recorder. Datum of gage is 1,343.6 ft above mean sea level (by vertical angles).

AVERAGE DISCHARGE.--50 years (1914-15, 1916-17, 1922-70), 36.2 cfs (26,230 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,170 cfs Dec. 28 (gage height, 8.72 ft), from rating curve extended above 650 cfs; minimum, 2.4 cfs Nov. 4, 28.
Period of record: Maximum discharge, 9,900 cfs Jan. 14, 1923 (gage height, 13.5 ft, from floodmarks), from rating curve extended above 650 cfs; minimum, 0.5 cfs July 26, 1922.

REMARKS.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft below station, for domestic supply and irrigation of sugarcane in central Maui.

REVISIONS.--WSP 1569: Drainage area. All published peak discharges prior to Oct. 1, 1967, and above 3,270 cfs (gage height, 9.18 ft) have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	2.7	6.3	39	4.8	32	277	29	6.7	58	13	12
2	10	2.6	5.0	18	4.5	43	317	68	6.2	91	12	17
3	9.1	2.5	4.2	257	4.3	9.6	182	18	5.6	26	9.6	14
4	8.0	2.4	4.4	157	4.0	18	75	14	5.6	45	9.3	15
5	7.0	3.1	12	22	3.8	14	90	12	6.2	42	10	28
6	6.4	186	4.7	29	3.6	7.0	24	10	5.3	55	18	12
7	6.6	78	5.9	14	3.5	19	16	9.4	4.8	55	32	12
8	6.4	21	8.0	11	3.3	9.4	12	12	4.4	25	14	14
9	5.8	8.9	38	10	3.5	6.3	12	24	4.1	43	9.4	9.3
10	5.8	6.6	115	8.3	17	5.5	22	75	3.9	55	7.8	8.2
11	5.1	5.6	28	7.3	5.3	4.8	132	34	3.7	31	7.0	7.2
12	4.8	4.8	9.3	9.6	3.9	5.0	271	14	3.6	18	8.3	6.4
13	7.2	4.3	93	17	3.4	7.2	130	11	3.4	18	7.0	6.0
14	4.7	4.1	213	115	5.3	4.3	74	9.3	3.3	13	6.4	6.3
15	4.3	3.8	36	20	21	5.0	75	9.6	3.3	11	11	5.6
16	4.1	3.6	13	10	6.9	5.8	55	24	4.2	34	20	7.5
17	3.8	3.4	9.3	8.2	4.4	3.9	80	24	11	20	20	80
18	3.6	3.2	7.7	6.8	3.8	26	66	14	7.6	34	12	52
19	3.6	3.0	6.8	6.3	3.9	25	32	15	5.1	13	25	34
20	3.3	3.3	6.8	5.8	3.6	26	40	10	4.4	10	9.6	18
21	7.9	3.7	5.4	5.3	3.2	8.2	157	11	5.9	8.5	8.0	10
22	5.2	3.4	4.7	9.4	3.7	7.8	253	9.1	8.7	9.6	7.7	11
23	5.2	3.6	4.4	11	11	35	587	9.1	8.0	45	13	9.4
24	12	3.4	6.1	6.7	5.0	14	191	8.2	10	14	32	7.2
25	18	3.2	466	5.5	6.3	8.3	60	16	18	21	118	6.7
26	6.7	3.7	183	17	6.2	9.4	39	96	7.3	13	175	17
27	4.2	2.8	31	35	5.9	27	52	15	6.0	59	38	12
28	3.6	2.4	980	8.7	4.1	25	31	11	10	43	30	7.3
29	3.3	169	394	6.7	------	45	37	8.9	10	12	15	6.2
30	3.1	13	32	5.9	------	27	32	7.8	36	13	24	5.5
31	2.9	------	30	5.2	------	30	------	7.2	------	13	12	------
TOTAL	203.7	561.1	2,763.0	887.7	159.2	513.5	3,421	635.6	222.3	948.1	734.1	456.8
MEAN	6.57	18.7	89.1	28.6	5.69	16.6	114	20.5	7.41	30.6	23.7	15.2
MAX	22	186	980	257	21	45	587	96	36	91	175	80
MIN	2.9	2.4	4.2	5.2	3.2	3.9	12	7.2	3.3	8.5	6.4	5.5
AC-FT	404	1,110	5,480	1,760	316	1,020	6,790	1,260	441	1,880	1,460	906

CAL YR 1969 TOTAL 23,977.3 MEAN 65.7 MAX 1,080 MIN 2.4 AC-FT 47,560
WTR YR 1970 TOTAL 11,506.1 MEAN 31.5 MAX 980 MIN 2.4 AC-FT 22,820

PEAK DISCHARGE (BASE, 1,900 CFS).--Dec. 28 (1500) 3,170 cfs (8.72 ft); Jan. 3 (2230) 1,990 cfs (7.31 ft).

16523000 Koolau ditch near Keanae

LOCATION.--Lat 20°49'53", long 156°10'30", Maui, on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office, and 5.1 miles southeast of Kailua.

PERIOD OF RECORD.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,237.7 ft above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--54 years (1910-12, 1918-70), 102 cfs (73,900 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 266 cfs Apr. 19, 1935; no flow at times.

REMARKS.--Records excellent. Ditch diverts at altitude 1,260 ft from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	164	36	57	188	51	98	218	212	78	204	132	136
2	98	34	48	122	48	152	219	219	73	217	139	170
3	85	34	43	132	47	58	203	190	68	205	105	148
4	78	32	44	219	44	86	218	155	71	205	99	147
5	72	38	94	175	42	88	220	132	77	203	101	189
6	68	209	47	164	41	45	190	97	66	185	157	132
7	68	214	54	121	40	121	130	74	60	217	200	132
8	66	155	69	106	38	77	102	135	57	201	158	130
9	59	78	164	96	40	50	115	188	54	199	101	95
10	57	62	180	82	99	45	134	218	51	217	86	89
11	53	54	160	76	45	41	220	206	50	210	79	78
12	53	49	78	82	39	42	187	168	49	183	85	73
13	63	45	175	113	37	50	208	126	45	176	77	69
14	51	44	222	210	44	38	220	109	44	134	74	70
15	48	43	146	144	108	46	219	112	43	115	113	66
16	47	40	111	83	56	65	219	181	53	169	113	78
17	44	39	86	71	40	40	219	182	126	156	171	176
18	42	37	74	65	38	134	219	156	78	203	119	211
19	43	36	67	59	36	136	212	156	63	121	187	216
20	40	37	67	56	36	139	212	113	55	98	103	169
21	80	40	56	54	34	64	219	121	79	85	85	106
22	54	40	51	86	35	57	223	105	96	93	83	112
23	47	39	48	94	15	158	226	91	92	194	143	103
24	89	39	56	62	0	104	220	85	109	135	208	80
25	113	38	224	53	2.9	67	215	115	169	175	218	74
26	63	39	222	108	14	75	200	204	79	144	219	117
27	47	34	196	160	17	96	220	154	72	162	212	100
28	42	32	225	90	33	153	212	130	119	203	218	77
29	40	174	171	69	------	179	215	98	129	123	179	69
30	38	110	125	61	------	176	215	91	127	122	196	63
31	37	------	160	55	------	178	------	82	------	133	133	------
TOTAL	1,949	1,901	3,520	3,256	1,119.9	2,858	6,049	4,405	2,332	5,187	4,293	3,475
MEAN	62.9	63.4	114	105	40.0	92.2	202	142	77.7	167	138	116
MAX	164	214	225	219	108	179	226	219	169	217	219	216
MIN	37	32	43	53	0	38	102	74	43	85	74	63
AC-FT	3,870	3,770	6,980	6,460	2,220	5,670	12,000	8,740	4,630	10,290	8,520	6,890

CAL YR 1969 TOTAL 45,682.12 MEAN 125 MAX 225 MIN .12 AC-FT 90,610
WTR YR 1970 TOTAL 40,344.9 MEAN 111 MAX 226 MIN 0 AC-FT 80,020

16531000 Kula diversion from Haipuaena Stream near Olinda

LOCATION.--Lat 20°48'24", long 156°13'27", Maui, on left bank of Haipuaena Stream, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

PERIOD OF RECORD.--July 1945 to current year.

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

AVERAGE DISCHARGE.--25 years, 0.667 cfs (483 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 3.17 cfs Mar. 20, 1948; no flow Nov. 4, 1964.

REMARKS.--Records excellent. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	.04	.38	2.0	.08	.72	2.0	.99	.52	1.6	.40	.52
2	.62	.04	.21	1.2	.06	1.3	.30	1.7	.38	1.7	.52	.98
3	.40	.03	.15	1.0	.05	.70	.23	1.2	1.0	1.2	.40	.73
4	.32	.03	.12	1.4	.04	.38	.17	.64	1.6	1.1	.30	.59
5	.25	.05	.19	.88	.04	.36	.18	.40	1.1	1.1	.25	1.2
6	.18	.91	.18	1.6	.04	.25	.15	.30	.81	1.5	.52	.61
7	.15	1.6	.18	.87	.03	.21	.41	.25	.40	2.1	1.1	.36
8	.12	1.3	.36	.49	.03	.25	.47	.19	.30	1.5	.52	.84
9	.10	.57	1.3	.54	.03	.15	.38	.26	.21	1.3	.34	.47
10	.09	.34	1.0	.36	1.3	.11	.86	1.1	.15	1.6	.21	.38
11	.07	.21	.90	.28	.49	.08	1.5	1.0	.30	1.5	.17	.26
12	.07	.17	.54	.81	.25	.08	.91	.68	.59	1.0	.24	.76
13	.38	.12	1.3	.52	.14	.07	1.4	.76	.83	1.3	.34	.56
14	.30	.10	1.8	.47	.57	.06	1.9	.38	.80	.85	.23	.32
15	.17	.08	1.2	.28	1.6	.07	1.7	.38	.40	.57	.21	.25
16	.11	.07	.62	.38	.77	.08	1.5	.74	.34	1.1	.41	.25
17	.08	.06	.40	.36	.36	.08	2.0	.88	.88	1.1	.94	1.2
18	.06	.05	.28	.26	.21	1.3	2.1	.38	.40	1.5	.43	.97
19	.05	.04	.27	.21	.17	1.5	2.2	.28	.28	.59	.52	.94
20	.05	.04	.63	.15	.12	1.4	1.6	.21	.26	.38	.32	.79
21	.89	.04	.26	.12	.09	.52	1.7	.33	1.2	.28	.21	1.0
22	.63	.53	.17	.14	.09	.34	2.3	.64	1.1	.28	.18	1.5
23	.36	.59	.12	.14	.49	1.3	1.5	.32	.64	1.6	.48	.85
24	.19	.28	.12	.11	.38	1.1	1.7	.23	.52	1.1	1.2	.45
25	.18	.17	.61	.09	.46	.47	1.8	.45	.88	.77	1.1	.36
26	.21	.14	.09	.54	.64	.40	1.3	1.3	.73	.77	.78	.75
27	.14	.10	.08	.59	.40	.75	1.8	1.3	.64	1.1	1.2	.76
28	.10	.07	.07	.32	.25	1.4	1.4	1.8	.67	1.4	1.3	.49
29	.08	.98	1.5	.19	------	1.2	1.2	1.1	1.4	.49	1.1	.34
30	.06	.76	1.6	.12	------	1.3	.79	1.2	1.2	.68	1.5	.26
31	.04	------	1.3	.10	------	1.4	------	1.1	------	.54	.64	------
TOTAL	7.85	9.51	17.93	16.52	9.18	19.33	37.45	22.49	20.53	33.60	18.06	19.74
MEAN	.25	.32	.58	.53	.33	.62	1.25	.73	.68	1.08	.58	.66
MAX	1.4	1.6	1.8	2.0	1.6	1.5	2.3	1.8	1.6	2.1	1.5	1.5
MIN	.04	.03	.07	.09	.03	.06	.15	.19	.15	.28	.17	.25
AC-FT	16	19	36	33	18	38	74	45	41	67	36	39

CAL YR 1969 TOTAL 306.76 MEAN .84 MAX 2.9 MIN .03 AC-FT 608
WTR YR 1970 TOTAL 232.19 MEAN .64 MAX 2.3 MIN .03 AC-FT 461

16538000 Spreckels ditch at Haipuaena weir, near Huelo

LOCATION.--Lat 20°51'15", long 156°11'25", Maui, on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 miles west of Keanae, and 4.5 miles southeast of Huelo.

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

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft 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 upstream at different datum.

AVERAGE DISCHARGE (since termination of powerplant diversion).--9 years (1961-70), 30.6 cfs (22,170 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 150 cfs Feb. 10, 1955, Feb. 18, 1956; no flow at times.

REMARKS.--Records excellent. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 cfs 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.

REVISIONS (FISCAL YEARS).--WSP 770: 1932-33.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	7.6	10	78	9.1	64	98	64	14	85	33	29
2	19	7.3	8.5	45	8.5	60	102	70	13	109	27	35
3	17	7.0	7.6	54	8.2	16	97	34	24	57	17	30
4	15	6.4	8.5	87	7.6	21	76	24	17	73	17	32
5	14	10	26	41	7.3	22	85	20	21	68	23	57
6	13	104	8.5	31	7.0	12	40	18	15	71	38	25
7	13	84	11	16	6.4	45	28	17	10	82	70	28
8	13	33	14	18	6.2	20	21	38	9.1	47	37	30
9	11	15	52	20	6.9	12	26	61	8.5	74	19	18
10	10	12	57	14	40	10	46	96	8.2	79	16	16
11	9.8	10	36	13	10	9.1	96	60	7.9	60	14	14
12	10	9.4	13	27	7.3	11	106	33	9.4	43	22	16
13	20	14	63	13	6.4	15	99	22	7.9	44	15	13
14	12	9.8	98	61	15	8.5	82	20	8.5	29	13	13
15	9.8	8.2	50	30	57	12	88	28	7.9	22	22	12
16	8.5	7.9	19	13	12	14	78	67	12	48	32	14
17	7.9	7.3	14	11	8.2	9.5	87	55	52	47	40	80
18	7.6	7.0	12	9.8	7.3	57	81	38	25	57	28	79
19	8.2	7.0	13	9.1	6.7	45	69	32	17	23	48	78
20	7.3	7.3	16	8.5	6.4	40	66	24	13	18	19	36
21	43	7.3	10	8.2	5.9	15	89	26	28	16	16	19
22	28	8.2	9.1	24	6.2	14	103	21	41	21	17	26
23	14	9.4	8.5	29	9.7	64	102	17	29	86	40	19
24	37	7.6	12	14	7.9	28	92	15	36	28	81	14
25	44	7.6	107	9.8	12	16	70	10	52	38	114	16
26	19	7.9	96	33	18	18	51	55	19	26	118	54
27	12	5.9	34	62	13	37	77	29	17	56	70	49
28	10	5.4	98	21	8.2	60	43	28	49	72	81	20
29	9.1	78	77	14	------	65	47	16	42	21	41	16
30	8.5	24	42	12	------	62	58	18	54	24	64	13
31	7.9	------	48	10	------	50	------	16	------	27	24	------
TOTAL	504.6	535.5	1,078.7	836.4	324.4	932.1	2,203	1,072	667.4	1,551	1,216	901
MEAN	16.3	17.9	34.8	27.0	11.6	30.1	73.4	34.6	22.2	50.0	39.2	30.0
MAX	46	104	107	87	57	65	106	96	54	109	118	80
MIN	7.3	5.4	7.6	8.2	5.9	8.5	21	10	7.9	16	13	12
AC-FT	1,000	1,060	2,140	1,660	643	1,850	4,370	2,130	1,320	3,080	2,410	1,790

CAL YR 1969 TOTAL 15,751.0 MEAN 43.2 MAX 128 MIN 5.2 AC-FT 31,240
WTR YR 1970 TOTAL 11,822.1 MEAN 32.4 MAX 118 MIN 5.4 AC-FT 23,450

16541000 Koolau ditch at Haipuaena, near Huelo

LOCATION.--Lat 20°51'17", long 156°11'19", Maui, on right bank at Haipuaena Stream, 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 miles southeast of Kailua, and 4.5 miles 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 (from topographic map). Prior to Mar. 21, 1933, at datum 1.94 ft lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower, than present datum.

AVERAGE DISCHARGE.--38 years, 120 cfs (86,940 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 300 cfs July 1, 17, 1963; no flow at times.

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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	204	37	56	212	52	110	266	222	76	228	131	133
2	99	35	46	126	49	156	268	235	72	266	138	170
3	88	34	42	149	47	56	266	188	67	204	104	144
4	79	33	44	251	44	80	242	150	70	215	99	146
5	73	37	91	183	43	85	253	128	76	206	102	188
6	68	264	46	168	41	41	188	94	64	208	156	132
7	69	235	54	122	39	117	126	69	59	228	204	130
8	67	156	65	107	38	74	98	132	56	198	161	129
9	60	80	168	96	39	46	111	199	52	220	101	96
10	58	62	194	83	100	41	147	262	50	232	88	86
11	56	55	165	77	45	38	264	217	48	214	80	79
12	54	50	78	85	38	38	241	166	48	178	86	73
13	64	48	183	109	37	48	258	122	46	174	78	69
14	52	44	266	230	45	35	244	105	44	133	75	70
15	50	42	155	151	108	42	248	108	43	112	113	65
16	48	39	111	86	54	61	240	193	54	166	117	77
17	45	38	87	72	40	36	248	192	128	156	169	202
18	43	36	72	64	37	143	240	150	79	208	119	226
19	44	35	66	60	37	134	222	152	63	120	183	225
20	42	36	64	57	35	136	225	110	55	97	102	166
21	87	38	56	54	34	60	260	117	78	87	86	105
22	56	39	50	86	34	55	283	102	98	93	85	111
23	48	38	48	96	12	157	293	89	90	218	143	109
24	103	37	59	63	.16	111	274	82	106	135	227	81
25	118	37	271	54	.16	63	230	126	171	180	280	73
26	64	38	262	111	.16	73	208	253	82	145	284	138
27	48	33	196	178	7.2	92	233	158	71	182	228	111
28	44	30	276	92	30	168	212	129	122	219	233	78
29	42	207	223	69	------	202	215	99	133	123	178	68
30	39	110	129	61	------	175	226	90	143	124	208	62
31	38	------	172	56	------	162	------	81	------	131	133	------
TOTAL	2,050	2,003	3,795	3,408	1,085.68	2,835	6,829	4,520	2,344	5,400	4,491	3,542
MEAN	66.1	66.8	122	110	38.8	91.5	228	146	78.1	174	145	118
MAX	204	264	276	251	108	202	293	262	171	266	284	226
MIN	38	30	42	54	.16	35	98	69	43	87	75	62
AC-FT	4,070	3,970	7,530	6,760	2,150	5,620	13,550	8,970	4,650	10,710	8,910	7,030

CAL YR 1969 TOTAL 48,989.62 MEAN 134 MAX 282 MIN .92 AC-FT 97,170
WTR YR 1970 TOTAL 42,302.68 MEAN 116 MAX 293 MIN .16 AC-FT 83,910

16541500 Manuel Luis ditch at Puohokamoa Gulch, near Huelo

LOCATION.--Lat 20°51'48", long 156°11'00", Maui, on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 miles west of Keanae, and 4.4 miles southeast of Huelo.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

AVERAGE DISCHARGE.--51 years (1918-24, 1925-70), 8.74 cfs (6,330 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 142 cfs Jan. 3, 1927; no flow at times.

REMARKS.--Records excellent. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui.

REVISIONS (FISCAL YEARS).--WSP 1719: 1918-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	.30	.74	24	1.0	3.7	49	8.2	1.1	16	2.4	2.8
2	1.8	.30	.58	4.7	1.0	1.6	94	15	1.0	42	2.0	2.4
3	1.4	.24	.50	34	.91	.48	57	3.6	1.2	5.8	1.8	2.2
4	1.2	.24	.96	49	.82	.87	15	2.9	1.3	7.5	1.5	2.2
5	1.1	.30	1.0	11	.82	1.1	30	2.4	1.0	6.1	1.4	4.1
6	1.0	69	.58	7.8	.73	.48	3.0	2.1	1.0	17	1.6	1.8
7	.92	4.0	.58	4.3	.73	.49	2.2	1.9	.82	10	7.1	1.6
8	.92	1.6	.58	3.6	.64	.56	1.9	5.7	.73	3.2	3.4	2.1
9	.83	.74	3.6	3.3	.94	.34	1.8	5.1	.64	13	1.4	1.3
10	.74	.58	30	2.2	2.4	.28	5.2	26	.64	12	1.2	1.1
11	.66	.50	2.8	1.9	.82	.28	50	6.7	.56	8.2	1.1	1.0
12	.66	.43	.92	2.7	.64	.28	65	3.9	.56	3.3	1.1	1.0
13	.92	.66	17	1.6	.64	.28	34	2.9	.48	3.6	1.1	1.0
14	.66	.58	57	10	.94	.28	14	2.4	.48	2.4	1.0	1.2
15	.58	.43	14	2.0	2.8	.34	15	2.1	.48	2.0	1.5	1.0
16	.50	.43	2.9	1.2	1.0	.64	20	7.3	.73	2.8	1.7	.91
17	.43	.43	2.1	1.1	.73	.34	9.5	6.9	4.0	3.7	2.8	22
18	.43	.36	1.5	1.0	.73	5.8	13	2.0	.91	4.2	1.2	9.9
19	.43	.36	1.5	.91	.64	1.0	6.5	1.6	.73	1.5	2.6	11
20	.43	.36	1.4	.91	.64	.48	19	1.4	.73	1.2	1.1	2.8
21	3.8	.43	1.0	.82	.64	.34	50	1.8	2.2	1.0	.91	1.6
22	.85	.50	.92	2.8	.73	.28	61	1.6	1.7	1.1	.91	1.9
23	.50	.43	.83	2.0	4.1	1.2	122	1.2	.91	10	1.6	1.5
24	15	.43	1.0	1.2	.73	1.1	44	1.1	1.6	1.9	11	1.2
25	6.2	.43	92	1.0	2.5	.41	8.6	1.2	3.4	8.7	45	1.1
26	.83	.43	47	2.4	13	.34	6.8	32	1.0	3.8	75	9.5
27	.50	.36	6.8	18	10	4.8	5.9	2.2	1.1	8.6	14	4.2
28	.43	.30	109	2.0	.48	4.7	3.5	2.0	4.3	14	12	1.2
29	.36	38	94	1.4	------	19	2.9	1.5	4.2	3.2	6.1	.91
30	.36	2.3	9.3	1.2	------	2.5	6.1	1.4	13	2.6	12	.82
31	.30	------	11	1.1	------	2.1	------	1.3	------	3.0	3.5	-----
TOTAL	47.64	125.45	513.09	201.14	51.75	56.39	815.9	157.4	52.50	223.4	221.02	97.34
MEAN	1.54	4.18	16.6	6.49	1.85	1.82	27.2	5.08	1.75	7.21	7.13	3.24
MAX	15	69	109	49	13	19	122	32	13	42	75	22
MIN	.30	.24	.50	.82	.48	.28	1.8	1.1	.48	1.0	.91	.82
AC-FT	94	249	1,020	399	103	112	1,620	312	104	443	438	193

CAL YR 1969 TOTAL 6,026.93 MEAN 16.5 MAX 134 MIN .24 AC-FT 11,950
WTR YR 1970 TOTAL 2,563.02 MEAN 7.02 MAX 122 MIN .24 AC-FT 5,080

16545000 Puohokamoa Stream above Spreckels ditch, near Huelo

LOCATION.--Lat 20°51'21", long 156°11'29", Maui, on right bank 150 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

DRAINAGE AREA.--2.35 sq mi.

PERIOD OF RECORD.--June 1913 to current year. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1954, published as "near Huelo." Records for December 1910 to May 1913 at site 700 ft downstream not equivalent owing to inflow of Spreckels ditch.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 1,322.04 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to May 31, 1934, at site 130 ft downstream at different datum.

AVERAGE DISCHARGE.--57 years, 33.1 cfs (23,980 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,050 cfs Dec. 28 (gage height, 6.82 ft), from rating curve extended above 920 cfs; minimum, 2.2 cfs Nov. 28.
Period of record: Maximum discharge, 3,650 cfs Apr. 16, 1960 (gage height, 9.31 ft), from rating curve extended above 630 cfs; minimum, 0.6 cfs Oct. 26, 1917.

REMARKS.--Records good. Kula pipeline (see sta 16531000) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use.

REVISIONS (FISCAL YEARS).--WSP 1319: 1914. WSP 1719: 1920, 1930, 1933. WSP 1937: Drainage area. (WATER YEARS).--WRD Hawaii 1968: 1966-67(P). Published records for some peak discharges in the water year 1965 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	3.2	5.7	101	5.1	53	164	41	9.4	78	19	19
2	14	3.0	4.2	30	4.5	46	235	60	8.6	130	17	25
3	11	3.0	3.7	293	4.5	9.8	156	23	11	42	10	21
4	10	2.8	4.5	146	4.0	7.0	74	17	15	58	9.8	24
5	9.4	3.6	14	29	3.7	7.8	99	14	14	47	12	38
6	8.6	202	4.2	39	3.7	5.1	30	12	12	85	27	18
7	8.6	53	5.1	17	3.5	21	20	10	6.4	60	50	18
8	8.2	24	5.7	14	3.2	11	15	19	5.1	33	26	20
9	7.4	9.0	37	15	3.4	5.4	16	39	4.5	56	13	12
10	6.7	6.7	90	9.8	22	4.5	36	109	4.2	55	9.4	9.8
11	5.7	5.7	25	9.0	4.8	4.0	221	43	4.2	41	8.2	7.8
12	6.4	5.1	8.2	23	3.5	4.2	185	20	5.1	29	13	7.4
13	10	5.7	81	8.6	3.0	7.6	125	14	4.0	29	10	8.2
14	6.4	4.8	177	53	10	4.0	73	12	4.8	21	7.4	7.4
15	4.2	4.0	37	18	39	5.1	95	18	3.7	16	13	6.7
16	4.0	3.7	14	8.6	7.5	5.7	81	51	5.4	37	23	7.0
17	3.7	3.5	9.4	7.0	4.0	4.2	78	42	32	29	29	97
18	3.5	3.2	7.0	6.4	3.5	44	72	20	14	39	18	58
19	3.7	3.0	7.8	5.7	3.2	29	45	18	8.2	17	31	52
20	3.2	3.2	12	5.7	3.0	24	55	14	6.7	12	13	26
21	37	3.0	5.4	5.1	2.8	7.8	101	15	17	9.8	9.8	15
22	14	3.5	4.8	12	2.8	6.7	171	12	25	14	9.4	20
23	8.2	4.5	4.5	15	3.7	45	416	9.8	17	65	21	14
24	53	3.0	7.5	7.8	3.0	17	133	9.0	18	22	61	8.6
25	20	2.8	382	5.7	4.8	8.2	49	13	30	22	131	7.8
26	8.9	3.2	117	18	8.2	8.6	43	122	12	17	206	131
27	5.7	2.4	28	60	5.7	41	55	27	9.0	45	55	35
28	4.8	2.2	700	12	3.5	44	30	22	23	57	58	15
29	4.2	126	336	7.8	------	64	32	15	30	17	30	10
30	3.7	16	37	6.4	------	39	44	12	47	18	54	8.2
31	3.5	------	44	5.7	------	32	------	13	------	19	20	------
TOTAL	326.7	518.8	2,218.7	994.3	173.6	615.7	2,949	865.8	406.3	1,219.8	1,014.0	746.9
MEAN	10.5	17.3	71.6	32.1	6.20	19.9	98.3	27.9	13.5	39.3	32.7	24.9
MAX	53	202	700	293	39	64	416	122	47	130	206	131
MIN	3.2	2.2	3.7	5.1	2.8	4.0	15	9.0	3.7	9.8	7.4	6.7
AC-FT	648	1,030	4,400	1,970	344	1,220	5,850	1,720	806	2,420	2,010	1,480

CAL YR 1969 TOTAL 21,825.8 MEAN 59.8 MAX 923 MIN 2.2 AC-FT 43,290
WTR YR 1970 TOTAL 12,049.6 MEAN 33.0 MAX 700 MIN 2.2 AC-FT 23,900

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1400	6.82	3,050	4-11	2200	4.75	1,280
1- 3	2230	5.48	1,820	9-26	1830	4.72	1,260

16570000 Nailiilihaele Stream near Huelo

LOCATION.--Lat 20°52'28", long 156°13'06", Maui, on left bank 200 ft upstream from Wailoa ditch intake, 1,000 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.4 miles southeast of Huelo Church.

DRAINAGE AREA.--3.49 sq mi.

PERIOD OF RECORD.--December 1910 to December 1911, October 1913 to June 1918, August to October 1919, December 1919 to June 1924, January 1925 to current year. Gage-height records for July to December 1912 at site 700 ft downstream not equivalent owing to diversion. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 1,205 ft above mean sea level (by vertical angles). Dec. 9, 1910, to Dec. 31, 1911, nonrecording gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, water-stage recorder at present site at datum 0.50 ft higher.

AVERAGE DISCHARGE (since termination of upstream diversion).--46 years (1922-23, 1925-70), 35.5 cfs (25,720 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,700 cfs Dec. 28 (gage height, 8.17 ft), from rating curve extended above 600 cfs; minimum, 4.3 cfs Nov. 28.
Period of record: Maximum discharge, 6,410 cfs Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 600 cfs; minimum, 0.70 cfs July 14, 1920.

REMARKS.--Records good. No diversion above station since 1922. All low flow diverted into Wailoa ditch (see sta 16588000) 200 ft below station for domestic supply, power, and irrigation.

REVISIONS (FISCAL YEARS).--WSP 1569: 1925-56. (WATER YEAR).--WRD Hawaii 1969: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	6.0	8.6	104	9.3	58	169	78	12	79	19	26
2	15	5.6	6.9	37	8.7	32	216	79	12	186	20	28
3	14	5.4	6.2	334	8.3	11	161	30	11	53	15	26
4	12	5.1	11	239	7.8	9.0	83	24	13	68	14	26
5	11	6.3	18	48	7.3	10	121	20	14	56	18	47
6	10	261	7.6	77	7.0	7.8	34	18	12	93	30	23
7	11	69	9.4	26	6.7	30	25	16	9.5	74	78	25
8	9.8	27	9.5	26	6.3	15	21	43	8.7	36	36	22
9	8.3	13	31	27	7.0	8.8	23	51	8.2	77	18	16
10	7.6	11	90	17	29	7.8	50	145	7.9	84	15	14
11	7.2	9.0	20	15	8.5	7.1	412	56	7.5	59	14	13
12	7.9	8.3	11	42	6.5	6.9	179	29	7.6	36	16	12
13	11	11	88	15	6.0	7.9	110	21	7.2	39	14	11
14	6.9	8.6	221	48	24	6.7	96	19	6.9	26	12	12
15	6.2	7.2	40	19	55	9.9	97	26	6.6	21	18	11
16	6.0	6.6	17	15	11	11	140	89	9.0	33	21	11
17	5.6	6.2	15	13	8.1	7.1	90	64	43	35	33	91
18	5.4	6.0	13	12	7.2	59	85	31	18	41	23	69
19	5.6	5.6	15	11	6.7	32	46	27	12	19	39	82
20	5.4	5.6	16	10	6.6	20	150	21	10	16	17	30
21	25	5.6	10	9.4	6.2	11	181	24	24	15	14	18
22	12	6.0	9.3	25	6.3	9.5	163	20	30	16	14	21
23	9.0	6.0	8.6	24	7.0	55	402	16	20	76	25	16
24	75	5.6	19	12	6.2	19	129	14	26	23	75	13
25	23	5.1	433	9.8	8.4	12	55	15	41	39	219	11
26	11	5.4	164	22	11	12	53	160	17	23	258	106
27	8.0	4.8	29	118	8.9	44	59	31	15	50	66	25
28	7.2	4.5	640	18	6.5	53	33	22	46	77	77	14
29	6.6	144	355	13	------	78	36	16	41	21	40	12
30	6.2	20	42	11	------	49	84	16	72	19	78	11
31	6.0	------	66	10	------	42	------	14	------	20	26	------
TOTAL	385.9	690.5	2,430.1	1,407.2	297.5	741.5	3,503	1,235	568.1	1,510	1,362	842
MEAN	12.4	23.0	78.4	45.4	10.6	23.9	117	39.8	18.9	48.7	43.9	28.1
MAX	75	261	640	334	55	78	412	160	72	186	258	106
MIN	5.4	4.5	6.2	9.4	6.0	6.7	21	14	6.6	15	12	11
AC-FT	765	1,370	4,820	2,790	590	1,470	6,950	2,450	1,130	3,000	2,700	1,670

CAL YR 1969 TOTAL 25,688.4 MEAN 70.4 MAX 888 MIN 4.5 AC-FT 50,950
WTR YR 1970 TOTAL 14,972.8 MEAN 41.0 MAX 640 MIN 4.5 AC-FT 29,700

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1415	8.17	2,700	4-20	2045	6.13	1,240
1- 3	2130	7.33	2,020	5-26	0530	6.54	1,480
4-11	2045	7.56	2,190				

16574500 Kailua Stream near Kailiili

LOCATION.--Lat 20°50'28", long 156°14'24", Maui, on right bank 0.4 mile downstream from Haiku-uka boundary trail, 2.1 miles east of Kailiili, and 3.9 miles south of Kailua.

DRAINAGE AREA.--1.10 sq mi.

PERIOD OF RECORD.--June 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,840 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 6.83 cfs (4,950 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,020 cfs Dec. 28 (gage height, 8.68 ft), from rating curve extended above 39 cfs; minimum, 0.12 cfs Nov. 28, 29, Feb. 8, 9.
Period of record: Maximum discharge, 1,780 cfs Feb. 3, 1965 (gage height, 10.51 ft), from rating curve extended above 39 cfs; minimum, 0.03 cfs June 17, 18, 1966.

REMARKS.--Records good except those above 80 cfs, which are fair. Diversion above station at altitude 4,250 ft by Maui County Board of Water Supply for irrigation and domestic use.

REVISIONS.--WRD Hawaii 1969: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	.22	.74	39	.36	11	65	2.3	.67	14	1.1	1.4
2	1.6	.20	.42	7.3	.28	9.4	104	4.6	.56	23	1.1	2.2
3	1.2	.18	.26	49	.24	1.8	48	2.0	.75	5.2	.74	1.8
4	.90	.16	.26	33	.22	.94	16	1.5	1.4	9.8	.63	2.2
5	.70	.15	.94	3.3	.20	.70	19	1.2	.98	6.4	.63	4.5
6	.59	47	.50	13	.16	.48	4.0	1.1	.63	167	1.7	1.8
7	.53	14	.36	2.6	.15	.93	2.3	.94	.48	9.3	6.0	1.6
8	.50	4.4	.42	1.8	.13	.94	1.7	.90	.36	3.2	1.7	1.7
9	.45	1.4	4.7	2.4	.12	.45	1.8	1.7	.28	6.0	.90	1.1
10	.39	.86	28	1.3	3.6	.33	3.7	13	.22	4.8	.59	.78
11	.33	.59	7.0	1.0	.98	.26	21	5.4	.20	4.0	.45	.63
12	.31	.45	1.4	9.0	.48	.24	61	1.8	.20	2.5	.95	.50
13	.45	.45	11	1.4	.28	.53	23	1.4	.18	2.3	.90	.45
14	.36	.50	43	31	4.5	.26	13	1.2	.18	1.6	.50	.56
15	.31	.39	7.9	6.6	14	.24	22	1.5	.16	1.2	.67	.50
16	.28	.31	1.8	1.9	2.0	.22	10	3.5	.16	5.3	2.1	.45
17	.26	.28	1.2	1.2	.90	.18	22	3.7	1.4	2.4	3.2	23
18	.24	.26	.82	.94	.59	5.0	13	1.4	1.0	3.6	1.5	11
19	.22	.24	.94	.78	.50	5.8	9.5	1.2	.45	1.5	1.7	8.4
20	.20	.24	2.0	.63	.36	4.5	6.1	.90	.31	1.0	.90	3.3
21	6.7	.22	.74	.53	.28	1.4	8.6	.86	.74	.74	.59	1.7
22	2.0	.20	.50	1.1	.24	1.0	60	.86	1.4	.98	.50	2.1
23	.74	.18	.39	1.4	.31	8.2	157	.63	1.2	12	.63	1.4
24	2.0	.18	.33	.63	.28	3.6	24	.53	1.1	2.8	3.8	.90
25	2.4	.18	125	.48	.42	1.4	6.4	.63	1.3	1.7	7.8	.70
26	1.5	.16	26	1.2	.67	1.0	8.0	21	.74	1.3	36	23
27	.63	.15	3.9	5.8	.59	7.0	8.8	2.2	.45	4.4	6.5	4.5
28	.39	.13	274	1.4	.39	4.7	3.9	1.6	.74	6.4	3.3	1.8
29	.31	18	123	.74	------	4.4	3.7	1.1	2.2	1.5	2.0	1.1
30	.26	2.1	5.7	.56	------	5.3	2.9	.86	7.8	1.6	5.4	.78
31	.24	------	5.0	.45	------	5.2	------	.78	------	1.4	1.7	------
TOTAL	32.09	93.78	678.22	221.44	33.23	87.40	749.4	82.29	28.24	308.92	96.18	105.85
MEAN	1.04	3.13	21.9	7.14	1.19	2.82	25.0	2.65	.94	9.97	3.10	3.53
MAX	6.7	47	274	49	14	11	157	21	7.8	167	36	23
MIN	.20	.13	.26	.45	.12	.18	1.7	.53	.16	.74	.45	.45
AC-FT	64	186	1,350	439	66	173	1,490	163	56	613	191	210

CAL YR 1969 TOTAL 4,923.08 MEAN 13.5 MAX 371 MIN .13 AC-FT 9,760
WTR YR 1970 TOTAL 2,517.04 MEAN 6.90 MAX 274 MIN .12 AC-FT 4,990

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-25	0900	6.00	340	1- 3	2200	6.47	434
12-28	1400	8.68	1,020	4-12	1800	8.04	812

16585000 Hoolawanui Stream near Huelo

LOCATION.--Lat 20°53'15", long 156°14'55", Maui, on right bank 250 ft upstream from Wailoa ditch intake, 2 miles west of Kailua, and 2 miles southwest of Huelo.

DRAINAGE AREA.--1.34 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to June 20, 1914, nonrecording gage at site 180 ft downstream at different datum. June 20, 1914, to Oct. 24, 1933, water-stage recorder at site 80 ft downstream at datum 4.43 ft lower.

AVERAGE DISCHARGE.--59 years (1911-70), 11.9 cfs (8,620 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,280 cfs Dec. 28 (gage height, 4.92 ft), from rating curve extended above 140 cfs; minimum, 0.88 cfs Nov. 4, 5.
Period of record: Maximum discharge, 5,010 cfs Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 150 cfs; minimum, 0.23 cfs Oct. 25, 1917.

REMARKS.--Records good except those above 300 cfs, which are fair. No diversion above station. All low flow diverted into Wailoa ditch (see sta 16588000) 250 ft below station for domestic supply, power, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	1.4	2.3	32	4.2	9.5	33	17	4.9	15	4.9	8.2
2	5.9	1.2	2.0	19	4.0	7.4	50	16	4.7	40	5.2	8.7
3	5.4	1.2	1.8	102	3.8	3.1	42	11	4.4	12	4.4	8.8
4	5.2	1.1	4.1	87	3.6	2.5	29	9.2	4.4	15	4.4	7.9
5	4.7	1.6	4.2	25	3.3	2.3	33	8.5	4.2	13	5.4	11
6	4.4	42	2.5	39	3.1	2.2	15	7.9	3.8	21	6.4	7.6
7	4.4	14	3.1	16	2.9	5.1	12	7.3	3.6	17	15	8.7
8	4.2	7.6	2.9	15	2.7	3.9	9.8	11	3.3	10	8.2	6.7
9	4.0	4.4	5.2	13	2.9	2.3	9.5	11	3.1	15	4.9	5.6
10	3.6	3.8	16	9.8	6.5	2.0	11	28	2.9	18	4.2	5.4
11	3.3	3.3	6.8	8.8	2.7	1.8	95	14	2.7	15	4.0	5.2
12	3.6	3.1	4.0	19	2.3	1.8	43	11	2.7	9.8	4.4	4.7
13	4.2	2.9	19	8.2	2.2	1.6	35	8.5	2.5	11	3.8	4.4
14	3.1	3.1	49	16	9.6	1.4	25	7.6	2.3	8.2	3.6	4.4
15	2.9	2.7	12	8.8	13	2.2	29	9.3	2.3	7.3	4.4	4.0
16	2.7	2.5	7.9	7.3	4.2	2.3	42	21	2.7	8.8	4.8	4.0
17	2.5	2.3	6.4	6.7	3.1	1.4	25	17	7.1	8.8	7.5	15
18	2.3	2.2	5.6	6.2	2.9	9.9	29	9.2	4.2	12	5.6	15
19	2.5	2.2	6.2	5.6	2.7	6.4	18	9.2	2.9	6.4	8.7	20
20	2.5	2.0	6.7	5.4	2.5	4.2	17	7.6	2.7	5.9	4.2	8.5
21	4.2	2.0	4.7	5.2	2.3	2.7	34	7.9	4.7	5.4	3.6	5.9
22	3.1	2.0	4.2	9.5	2.3	2.3	34	7.6	5.8	5.6	3.3	6.2
23	2.3	1.8	4.0	7.3	2.3	9.1	101	6.2	4.4	14	4.2	4.9
24	9.7	1.6	4.2	5.2	2.2	5.1	41	5.6	5.6	6.7	10	4.4
25	5.0	1.4	95	4.4	2.5	3.3	21	5.9	7.0	7.7	32	4.2
26	2.5	1.4	39	6.4	2.3	2.9	21	37	3.6	6.5	47	8.4
27	2.2	1.2	16	19	2.3	6.7	18	8.2	3.1	8.6	14	6.2
28	2.0	1.3	216	6.4	1.8	10	13	7.0	7.4	15	14	4.0
29	1.8	21	137	5.4	------	14	13	5.9	7.4	5.9	9.8	3.6
30	1.8	4.7	28	4.7	------	9.7	24	5.6	12	5.6	19	3.3
31	1.6	------	24	4.4	------	11	------	5.2	------	5.4	7.9	------
TOTAL	117.1	143.0	739.8	527.7	100.2	150.1	922.3	343.4	132.4	355.6	278.8	214.9
MEAN	3.78	4.77	23.9	17.0	3.58	4.84	30.7	11.1	4.41	11.5	8.99	7.16
MAX	9.7	42	216	102	13	14	101	37	12	40	47	20
MIN	1.6	1.1	1.8	4.4	1.8	1.4	9.5	5.2	2.3	5.4	3.3	3.3
AC-FT	232	284	1,470	1,050	199	298	1,830	681	263	705	553	426

CAL YR 1969 TOTAL 7,608.8 MEAN 20.8 MAX 382 MIN 1.1 AC-FT 15,090
WTR YR 1970 TOTAL 4,025.3 MEAN 11.0 MAX 216 MIN 1.1 AC-FT 7,980

PEAK DISCHARGE (BASE, 620 CFS).--Dec. 28 (1500) 1,280 cfs (4.92 ft); Apr. 11 (2300) 865 cfs (4.09 ft).

HAWAII, ISLAND OF MAUI

16587000 Honopou Stream near Huelo

LOCATION.--Lat 20°53'20", long 156°15'20", Maui, on left bank 75 ft upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo, and 2.5 miles west of Kailua.

DRAINAGE AREA.--0.64 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--59 years (1911-70), 4.80 cfs (3,480 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,050 cfs Dec. 28 (gage height, 4.05 ft), from rating curve extended as explained below; minimum, 0.63 cfs Nov. 3-5, Mar. 14, 17.
Period of record: Maximum discharge, 5,710 cfs Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 110 cfs by test of model of station site; minimum, 0.02 cfs several days in 1933, 1934.

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

REVISIONS (FISCAL YEARS).--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	.72	1.1	14	2.4	1.9	9.1	7.8	2.2	4.2	2.0	4.8
2	2.5	.72	.91	10	2.2	1.4	15	7.9	2.2	18	2.0	4.6
3	2.4	.72	.81	46	2.0	1.0	10	5.0	2.0	5.2	1.9	5.1
4	2.2	.63	2.3	47	1.9	.91	9.7	4.6	2.0	4.8	1.8	4.2
5	2.0	.81	1.5	16	1.9	.91	13	4.4	1.9	4.7	2.2	4.8
6	1.9	13	1.0	25	1.8	.81	6.6	4.0	1.8	5.8	2.2	3.6
7	2.0	4.6	1.1	11	1.6	1.2	5.4	3.6	1.6	5.7	6.3	4.4
8	1.9	2.4	1.0	10	1.5	1.0	4.8	5.5	1.5	3.8	3.1	3.2
9	1.8	1.8	1.6	8.5	1.9	.81	4.8	4.8	1.4	6.4	1.9	2.9
10	1.6	1.6	5.1	7.1	2.7	.72	4.2	9.0	1.4	7.7	1.8	2.7
11	1.5	1.5	2.1	7.7	1.5	.72	59	5.3	1.2	6.6	1.5	2.5
12	1.5	1.4	1.4	8.1	1.4	.72	21	4.9	1.2	4.6	1.8	2.4
13	1.5	1.2	3.3	5.2	1.2	.72	11	4.0	1.2	5.0	1.6	2.2
14	1.4	1.1	18	8.5	5.5	.72	10	3.4	1.2	3.8	1.5	2.0
15	1.2	1.1	4.8	4.6	5.7	.81	9.4	4.1	1.1	3.4	1.8	1.9
16	1.2	1.0	3.0	4.2	1.9	.81	20	8.1	1.2	3.4	1.8	1.9
17	1.1	1.0	2.7	3.8	1.6	.72	9.8	8.2	2.0	3.9	2.1	5.4
18	1.1	.91	2.5	3.6	1.5	2.7	12	4.4	1.5	3.8	1.8	4.8
19	1.2	.91	2.7	3.2	1.5	1.7	8.2	4.2	1.4	2.9	2.4	9.3
20	1.1	.91	2.5	3.0	1.4	.91	8.8	3.6	1.2	2.5	1.5	3.0
21	1.6	.91	2.0	3.0	1.4	.72	18	3.7	1.9	2.5	1.2	2.7
22	1.1	.91	1.9	6.0	1.2	.72	13	3.4	1.8	2.5	1.2	2.7
23	1.0	.81	1.8	3.2	1.1	1.8	38	3.0	1.4	5.3	1.4	2.4
24	2.1	.81	2.8	2.9	1.1	1.1	17	2.7	1.9	2.9	2.9	2.0
25	1.6	.81	34	2.5	1.1	.91	11	2.7	2.7	4.0	14	1.9
26	1.0	.81	18	4.1	1.1	.91	9.8	14	1.4	3.2	20	2.0
27	.91	.81	7.8	9.9	1.0	1.0	8.5	3.2	1.2	3.6	6.8	1.9
28	.91	.94	95	3.2	.91	1.9	6.8	3.0	2.7	4.9	6.8	1.8
29	.81	5.7	52	2.9	------	3.1	6.4	2.7	2.9	2.5	5.7	1.8
30	.81	1.8	17	2.7	------	2.2	9.3	2.5	4.8	2.4	11	1.6
31	.81	------	15	2.5	------	2.4	------	2.4	------	2.2	5.0	------
TOTAL	47.65	52.34	306.72	289.4	52.01	37.95	389.6	150.1	53.9	142.2	119.0	96.5
MEAN	1.54	1.74	9.89	9.34	1.86	1.22	13.0	4.84	1.80	4.59	3.84	3.22
MAX	3.9	13	95	47	5.7	3.1	59	14	4.8	18	20	9.3
MIN	.81	.63	.81	2.5	.91	.72	4.2	2.4	1.1	2.2	1.2	1.6
AC-FT	95	104	608	574	103	75	773	298	107	282	236	191

CAL YR 1969 TOTAL 3,086.22 MEAN 8.46 MAX 110 MIN .63 AC-FT 6,120
WTR YR 1970 TOTAL 1,737.37 MEAN 4.76 MAX 95 MIN .63 AC-FT 3,450

PEAK DISCHARGE (BASE, 170 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1130	4.05	1,050	4-11	2300	3.78	802
1- 3	2000	3.13	302	4-16	0830	2.81	175
1- 6	0900	3.10	285				

16588000 Wailoa ditch at Honopou, near Huelo

LOCATION.--Lat 20°53'20", long 156°15'19", Maui, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, and 2.2 miles southwest of Huelo.

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

AVERAGE DISCHARGE.--47 years (1923-70), 174 cfs (126,100 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 326 cfs Apr. 1, 1967; no flow Jan. 24-27, 1923.

REMARKS.--Records excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft. Water is used for domestic supply, power, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	267	68	111	110	108	168	277	283	152	286	225	273
2	203	66	90	108	100	188	279	254	144	296	257	302
3	176	64	82	113	96	133	278	220	151	277	198	290
4	159	61	103	113	91	124	276	254	165	278	188	295
5	147	70	153	188	86	153	277	241	167	278	196	302
6	136	292	95	167	83	88	274	200	143	277	263	273
7	138	312	110	122	80	185	256	163	116	280	300	270
8	137	270	113	200	76	144	216	260	107	276	295	265
9	120	163	224	215	77	97	241	260	100	278	210	201
10	112	125	246	178	188	85	225	266	96	281	177	180
11	104	109	256	165	101	78	246	277	92	280	159	162
12	106	100	156	198	80	76	197	229	96	277	184	152
13	150	107	214	175	74	104	266	232	90	277	165	145
14	105	96	153	167	113	73	284	206	89	278	149	150
15	95	84	241	156	213	93	288	235	84	237	219	136
16	90	78	221	165	136	120	286	289	107	268	204	150
17	84	76	174	144	92	74	281	287	258	260	290	278
18	81	71	147	131	82	217	281	276	183	279	237	309
19	84	68	136	122	78	230	257	270	136	238	302	314
20	76	70	148	115	75	244	271	222	116	196	207	298
21	177	73	117	109	70	128	283	234	205	174	171	229
22	148	74	104	212	41	111	284	205	244	192	169	254
23	111	82	97	218	5.2	245	270	176	201	272	247	222
24	121	72	102	136	3.7	214	259	162	229	266	308	169
25	192	70	194	112	3.9	133	247	176	288	273	320	155
26	146	74	190	177	4.4	146	235	274	178	251	322	210
27	98	62	152	275	22	137	271	290	154	248	314	276
28	86	58	122	202	61	222	281	260	222	283	314	185
29	81	213	104	150	------	218	281	202	259	248	308	154
30	76	193	108	129	------	250	283	182	223	240	314	137
31	72	------	109	117	------	267	------	173	------	261	288	------
TOTAL	3,878	3,321	4,572	4,889	2,240.2	4,745	7,950	7,258	4,795	8,105	7,500	6,736
MEAN	125	111	147	158	80.0	153	265	234	160	261	242	225
MAX	267	312	256	275	213	267	288	290	288	296	322	314
MIN	72	58	82	108	3.7	73	197	162	84	174	149	136
AC-FT	7,690	6,590	9,070	9,700	4,440	9,410	15,770	14,400	9,510	16,080	14,880	13,360

CAL YR 1969 TOTAL 68,830 MEAN 189 MAX 317 MIN 58 AC-FT 136,500
WTR YR 1970 TOTAL 65,989.2 MEAN 181 MAX 322 MIN 3.7 AC-FT 130,900

16589000 New Hamakua ditch at Honopou, near Huelo

LOCATION.--Lat 20°53'28", long 156°15'22", Maui, on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, and 2.1 miles southwest of Huelo.

PERIOD OF RECORD.--January 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft higher.

AVERAGE DISCHARGE.--52 years, 37.2 cfs (26,950 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 182 cfs Nov. 2, 1967; no flow at times.

REMARKS.--Records excellent. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	.48	1.2	.02	0	55	155	145	1.9	145	25	10
2	6.2	.43	.89	.02	3.5	90	133	149	1.7	163	21	66
3	4.4	.38	.70	.02	2.0	6.8	114	134	1.6	156	3.6	22
4	2.5	.38	3.7	.03	1.8	12	114	38	1.8	152	2.9	35
5	2.3	.38	48	.01	1.7	15	114	8.1	1.5	138	3.0	98
6	2.1	140	1.0	.03	1.5	1.0	108	6.0	1.5	108	65	22
7	2.0	143	1.0	.01	1.4	35	30	4.2	1.2	160	126	23
8	2.0	66	5.3	.01	1.3	40	4.9	61	1.2	135	73	18
9	1.7	1.6	84	.01	1.4	.96	64	91	1.1	122	3.2	3.2
10	1.5	1.1	75	.01	43	.82	13	135	1.0	160	2.5	2.6
11	1.3	.96	73	.01	2.3	.70	117	147	1.0	155	2.3	2.4
12	1.2	.82	1.7	.01	1.2	.70	141	114	1.0	120	2.2	2.2
13	1.6	.92	98	.01	1.2	.64	149	23	.96	111	2.2	2.0
14	1.2	.82	75	.01	18	.58	150	9.0	.89	28	2.0	1.9
15	1.1	.64	39	0	133	.70	150	13	.82	9.4	2.5	1.8
16	.96	.58	11	0	6.2	.82	154	122	.96	78	10	1.8
17	.89	.48	2.9	0	1.7	.58	153	115	56	52	72	79
18	.82	.48	2.3	0	1.4	79	154	40	1.5	137	10	139
19	.82	.43	9.1	0	1.3	52	153	48	1.2	9.0	89	151
20	.70	.38	20	.01	1.2	37	152	7.3	1.0	3.1	2.9	79
21	50	.38	1.7	.01	1.2	.96	155	19	7.9	2.6	1.7	4.4
22	9.6	.38	1.4	.02	15	.70	155	22	22	2.5	1.6	4.9
23	.96	.38	1.3	.01	36	76	156	7.7	7.7	124	12	3.9
24	40	.30	1.5	.01	24	37	151	5.6	8.2	44	136	2.2
25	83	.26	23	.01	31	.96	151	32	89	80	160	2.1
26	7.1	.26	.04	.02	43	.76	149	137	4.0	59	162	37
27	.89	.22	.02	.02	31	28	148	47	2.8	71	152	63
28	.76	.22	.06	.01	7.7	122	117	29	52	147	153	3.0
29	.64	116	.05	0	------	141	119	5.8	80	13	102	1.7
30	.58	60	.02	0	------	119	129	5.5	46	6.6	137	1.6
31	.53	------	.02	0	------	106	------	4.0	------	14	20	------
TOTAL	304.35	538.66	581.90	.33	414.0	1,061.68	3,752.9	1,724.2	399.43	2,705.2	1,557.6	883.7
MEAN	9.82	18.0	18.8	.011	14.8	34.2	125	55.6	13.3	87.3	50.2	29.5
MAX	83	143	98	.03	133	141	156	149	89	163	162	151
MIN	.53	.22	.02	0	0	.58	4.9	4.0	.82	2.5	1.6	1.6
AC-FT	604	1,070	1,150	.7	821	2,110	7,440	3,420	792	5,370	3,090	1,750

CAL YR 1969 TOTAL 15,461.14 MEAN 42.4 MAX 162 MIN .01 AC-FT 30,670
WTR YR 1970 TOTAL 13,923.95 MEAN 38.1 MAX 163 MIN 0 AC-FT 27,620

16592000 Lowrie ditch at Honopou Gulch, near Huelo

LOCATION.--Lat 20°54'57", long 156°15'07", Maui, on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.7 miles 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 above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

AVERAGE DISCHARGE.--56 years (1910-26, 1930-70), 39.3 cfs (28,470 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 116 cfs Oct. 31, 1921; no flow at times.

REMARKS.--Records excellent. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	12	25	2.7	25	32	66	71	25	75	28	37
2	31	11	23	1.8	35	59	79	78	21	89	27	36
3	40	9.3	22	1.3	34	15	79	40	16	75	31	39
4	29	8.2	32	1.3	33	30	78	30	21	67	30	34
5	19	9.3	23	19	28	29	78	28	17	61	36	52
6	27	81	11	15	17	21	51	28	16	45	34	30
7	19	77	11	1.6	14	7.9	22	31	13	78	68	34
8	19	46	15	1.3	13	15	21	50	11	55	45	32
9	18	22	32	1.3	14	16	28	49	18	58	31	32
10	18	31	41	1.2	43	17	34	82	16	79	39	30
11	15	24	49	1.1	14	11	96	67	12	75	32	32
12	14	21	17	1.2	13	7.7	79	32	9.1	40	26	30
13	18	18	46	.93	12	6.8	78	27	7.9	54	19	20
14	20	13	63	1.3	22	7.1	78	27	7.1	32	15	17
15	13	6.8	40	.84	70	8.8	78	25	6.6	29	17	15
16	12	7.2	28	.76	20	8.5	78	52	7.4	47	14	15
17	11	10	29	.68	15	6.8	78	68	15	34	30	40
18	11	9.1	33	.68	14	41	78	24	8.3	59	31	72
19	12	7.7	34	.60	13	28	78	23	11	26	25	91
20	12	7.1	21	2.8	13	19	80	25	10	32	25	56
21	28	7.1	16	11	12	19	83	24	14	39	26	40
22	24	8.2	29	23	14	15	78	23	12	37	13	40
23	19	7.9	23	9.3	34	27	80	22	13	70	12	34
24	28	7.1	22	7.1	31	26	79	27	15	39	57	30
25	47	8.0	84	5.0	30	34	79	14	19	64	101	23
26	26	6.8	32	11	38	21	74	70	10	51	106	33
27	19	6.4	2.4	7.5	32	8.9	78	26	15	49	84	47
28	18	6.1	5.4	3.7	14	47	69	18	17	87	75	31
29	19	73	4.2	14	------	76	54	16	52	33	55	29
30	12	45	1.6	13	------	27	60	17	31	31	76	30
31	16	------	1.4	22	------	57	------	24	------	35	41	------
TOTAL	660	606.3	816.0	183.99	667	744.5	2,071	1,138	466.4	1,645	1,249	1,081
MEAN	21.3	20.2	26.3	5.94	23.8	24.0	69.0	36.7	15.5	53.1	40.3	36.0
MAX	47	81	84	23	70	76	96	82	52	89	106	91
MIN	11	6.1	1.4	.60	12	6.8	21	14	6.6	26	12	15
AC-FT	1,310	1,200	1,620	365	1,320	1,480	4,110	2,260	925	3,260	2,480	2,140

CAL YR 1969 TOTAL 11,947.04 MEAN 32.7 MAX 92 MIN .60 AC-FT 23,700
WTR YR 1970 TOTAL 11,328.19 MEAN 31.0 MAX 106 MIN .60 AC-FT 22,470

16594000 Haiku ditch at Honopou Gulch, near Kailua

LOCATION.--Lat 20°55'05", long 156°14'55", Maui, on right bank on west side of Honopou Gulch, 160 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles 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 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 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mile downstream at different datum.

AVERAGE DISCHARGE.--55 years (1910-11, 1913-14, 1915-28, 1930-70), 27.0 cfs (19,560 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 209 cfs Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

REMARKS.--Records excellent. Ditch diverts from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	1.5	1.4	.44	.16	27	43	39	1.9	59	2.7	3.4
2	4.4	1.5	1.2	.14	.19	54	78	52	1.8	73	2.5	3.4
3	4.0	1.5	1.1	.14	.16	1.4	93	16	1.8	48	1.6	3.4
4	3.8	1.4	1.5	.14	.16	1.4	81	5.2	2.2	55	1.4	3.3
5	3.5	1.6	1.4	.14	.16	1.3	80	4.7	1.7	51	1.3	19
6	3.5	85	1.1	.22	.19	1.3	18	4.6	1.6	30	1.3	3.2
7	3.5	84	1.1	.14	.14	1.2	3.3	4.3	1.4	71	27	3.1
8	3.8	27	1.0	.14	.12	1.1	2.2	5.3	1.4	13	14	2.8
9	3.3	1.9	13	.16	.11	1.0	1.9	11	1.4	27	1.5	2.5
10	3.2	1.6	23	.14	.14	1.0	10	72	1.4	53	1.4	2.5
11	3.1	1.4	36	.16	.22	.94	96	33	1.4	31	1.1	2.4
12	3.4	1.4	1.4	.07	.50	1.0	100	4.4	1.4	5.4	1.0	2.3
13	3.5	1.4	9.5	.07	.60	.94	71	3.2	1.4	8.1	.94	2.3
14	3.1	1.4	16	.27	2.6	1.1	55	2.4	1.4	4.4	.88	2.4
15	2.8	1.3	40	.03	1.1	1.2	59	2.3	1.4	3.8	.94	2.2
16	2.5	1.3	3.5	.05	2.5	1.1	59	21	1.4	11	.88	2.2
17	2.0	1.2	2.7	.05	2.0	.94	57	28	1.5	6.1	1.0	25
18	2.0	1.2	4.5	.05	1.8	18	55	2.8	1.4	41	.82	67
19	2.0	1.3	2.6	.05	1.6	1.6	65	2.6	1.4	3.7	1.4	103
20	2.0	1.2	1.5	.50	1.4	1.2	74	2.5	1.4	3.2	1.8	24
21	3.0	1.2	1.5	.55	1.4	1.1	65	2.5	1.6	3.2	1.7	4.1
22	4.0	1.3	1.4	1.9	1.3	1.0	59	2.4	1.4	3.2	1.7	4.0
23	2.2	1.1	1.3	.31	1.4	1.2	66	2.3	1.4	57	1.7	3.4
24	25	1.1	1.3	.14	2.0	7.3	79	2.2	1.6	8.5	34	3.1
25	17	1.0	14	.12	1.2	9.3	87	2.1	2.0	25	88	2.9
26	2.1	1.0	.88	.41	3.1	1.4	46	60	1.5	17	72	17
27	1.9	1.1	.60	.25	2.7	1.8	72	4.8	1.5	21	38	28
28	1.8	1.1	.99	.16	1.0	20	23	2.7	1.8	69	28	12
29	1.7	57	.41	.12	------	58	8.8	2.3	14	3.7	13	11
30	1.6	20	.14	.11	------	4.6	26	2.2	17	3.2	26	11
31	1.6	------	.12	.12	------	25	------	2.0	------	2.9	4.8	------
TOTAL	141.3	306.0	186.14	7.29	29.95	249.42	1,633.2	401.8	74.5	811.4	374.36	375.9
MEAN	4.56	10.2	6.00	.24	1.07	8.05	54.4	13.0	2.48	26.2	12.1	12.5
MAX	25	85	40	1.9	3.1	58	100	72	17	73	88	103
MIN	1.6	1.0	.12	.03	.11	.94	1.9	2.0	1.4	2.9	.82	2.2
AC-FT	280	607	369	14	59	495	3,240	797	148	1,610	743	746

CAL YR 1969 TOTAL 6,183.40 MEAN 16.9 MAX 102 MIN .11 AC-FT 12,260
WTR YR 1970 TOTAL 4,591.26 MEAN 12.6 MAX 103 MIN .03 AC-FT 9,110

16596200 Halehaku Gulch near Kailiili

LOCATION.--Lat 20°50'53", long 156°15'13", Maui, on left bank 1.2 miles east of Kailiili, 3.1 miles northeast of Olinda Prison Camp, and 3.9 miles east of Makawao.

DRAINAGE AREA.--0.13 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,610 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 1.00 cfs (724 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 54 cfs Dec. 28 (gage height, 2.72 ft), from rating curve extended above 2.3 cfs; minimum, 0.12 cfs June 27, 28.
Period of record: Maximum discharge, 60 cfs Nov. 29, 1968 (gage height, 2.83 ft), from rating curve extended above 2.3 cfs; minimum, 0.04 cfs Oct. 19, 20, 1967, Nov. 27, 28, 1968.

REMARKS.--Records good except those above 5 cfs, which are fair. No diversion above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.17	.26	3.8	.42	.62	3.0	1.3	.42	.86	.56	.68
2	.68	.17	.23	2.8	.37	1.0	6.2	1.3	.37	1.9	.51	.68
3	.62	.17	.20	3.9	.33	.62	4.7	1.2	.37	1.1	.46	.62
4	.56	.17	.20	5.4	.33	.46	3.3	1.0	.33	1.5	.42	.62
5	.51	.14	.20	2.4	.33	.42	2.8	.93	.33	1.2	.42	.80
6	.46	1.8	.17	2.6	.33	.37	2.0	.86	.29	1.9	.42	.74
7	.42	1.5	.17	1.9	.29	.37	1.6	.80	.26	1.9	.56	.68
8	.42	1.0	.17	1.6	.29	.33	1.2	.74	.26	1.2	.42	.62
9	.37	.62	.23	1.4	.26	.29	1.1	.68	.23	1.1	.42	.56
10	.37	.51	.99	1.2	.33	.29	1.0	1.2	.23	1.0	.37	.56
11	.33	.42	.80	1.1	.26	.26	2.0	1.2	.23	1.1	.37	.51
12	.33	.37	.46	1.3	.26	.26	3.2	.86	.20	.93	.33	.46
13	.33	.33	1.2	.93	.23	.23	3.6	.80	.20	.86	.33	.42
14	.29	.33	3.6	1.3	.42	.23	2.8	.74	.17	.74	.33	.42
15	.29	.33	1.5	1.3	.74	.23	3.2	.74	.17	.68	.33	.37
16	.26	.29	1.0	1.2	.46	.23	2.8	.80	.17	.80	.42	.33
17	.26	.29	.74	1.1	.37	.23	3.2	.80	.17	.68	.42	1.0
18	.23	.26	.62	.93	.33	.33	3.0	.68	.17	.68	.33	1.2
19	.23	.26	.62	.86	.33	.42	2.2	.62	.17	.62	.33	1.1
20	.23	.23	.56	.80	.29	.46	1.9	.56	.17	.56	.33	.93
21	.33	.23	.51	.74	.29	.37	2.0	.56	.17	.56	.33	.68
22	.26	.20	.46	.68	.29	.33	3.5	.51	.17	.51	.29	.62
23	.20	.20	.42	.68	.29	.62	8.6	.46	.17	.74	.29	.56
24	.26	.20	.40	.56	.26	.68	4.7	.42	.14	.68	.37	.51
25	.23	.20	5.1	.51	.26	.56	2.8	.42	.14	.62	.68	.46
26	.26	.17	2.8	.46	.26	.46	2.2	1.1	.14	.62	2.1	.86
27	.23	.14	1.8	.68	.26	.62	2.0	.62	.12	.68	1.3	1.0
28	.20	.14	12	.51	.26	.80	1.7	.56	.12	.86	.93	.86
29	.20	1.1	9.6	.46	------	.93	1.6	.51	.17	.68	.86	.80
30	.20	.42	3.1	.46	------	1.0	1.5	.46	.23	.62	.93	.80
31	.17	------	2.2	.42	------	1.1	------	.42	------	.56	.80	------
TOTAL	10.53	12.36	52.31	43.98	9.14	15.12	85.4	23.85	6.48	28.44	16.96	20.45
MEAN	.34	.41	1.69	1.42	.33	.49	2.85	.77	.22	.92	.55	.68
MAX	.80	1.8	12	5.4	.74	1.1	8.6	1.3	.42	1.9	2.1	1.2
MIN	.17	.14	.17	.42	.23	.23	1.0	.42	.12	.51	.29	.33
AC-FT	21	25	104	87	18	30	169	47	13	56	34	41

CAL YR 1969 TOTAL 613.73 MEAN 1.68 MAX 18 MIN .14 AC-FT 1,220
WTR YR 1970 TOTAL 325.02 MEAN .89 MAX 12 MIN .12 AC-FT 645

PEAK DISCHARGE (BASE, 13 CFS).--Dec. 28 (1430) 54 cfs (2.72 ft); Jan. 3 (2330) 15 cfs (1.67 ft).

16599500 Opana tunnel at Kailiili

LOCATION.--Lat 20°51'04", long 156°16'17", Maui, on left bank at tunnel outlet, 0.3 mile north of Kailiili, and 2.7 miles 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 (from topographic map).

AVERAGE DISCHARGE.--5 years, 3.81 cfs (2,760 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 13 cfs Apr. 1, 1969; minimum daily, 0.23 cfs Oct. 5, 6, 1965.

REMARKS.--Records good. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	.79	1.8	9.0	2.6	3.5	8.8	5.7	2.3	5.7	2.0	2.0
2	3.2	.72	1.4	8.6	2.5	5.8	11	5.7	2.2	7.7	2.0	2.4
3	2.6	.72	1.1	8.2	2.4	3.3	10	5.4	2.0	5.1	1.8	2.2
4	2.3	.65	1.3	10	2.3	2.3	8.6	4.9	2.2	5.4	1.8	2.3
5	2.0	.86	1.8	8.2	2.2	2.0	8.6	4.6	2.2	4.8	1.6	3.1
6	1.8	8.7	1.3	9.0	2.0	1.8	6.8	4.4	1.8	5.3	1.8	2.5
7	1.8	8.2	1.2	8.1	2.0	2.0	5.7	4.1	1.8	6.8	2.5	2.2
8	1.8	5.2	1.2	7.0	1.8	1.8	5.2	3.9	1.6	4.5	2.0	2.0
9	1.6	3.0	2.3	6.8	2.0	1.6	4.9	3.9	1.4	4.1	1.6	1.8
10	1.6	2.2	5.3	6.0	4.1	1.4	4.8	5.1	1.4	4.1	1.4	1.6
11	1.6	1.8	6.2	5.5	2.5	1.4	6.2	5.1	1.4	4.2	1.3	1.4
12	1.6	1.6	3.0	7.9	2.0	1.3	9.2	4.2	1.4	3.4	1.4	1.3
13	1.6	1.6	5.0	5.7	1.8	1.4	8.8	3.9	1.4	3.2	1.6	1.2
14	1.4	1.8	9.4	8.1	3.6	1.3	8.2	3.6	1.4	2.9	1.3	1.3
15	1.4	1.4	6.8	7.5	8.6	1.2	8.4	3.6	1.3	2.6	1.3	1.2
16	1.3	1.2	4.2	5.8	4.4	1.2	8.1	3.9	1.3	3.7	1.8	1.1
17	1.2	1.1	3.4	5.1	2.9	1.1	8.8	3.8	1.6	3.0	2.4	3.9
18	1.1	1.0	3.0	4.6	2.3	3.4	8.4	3.3	1.6	3.3	1.8	6.8
19	1.1	.94	3.0	4.4	2.2	3.8	8.1	3.1	1.4	2.6	1.6	6.0
20	1.1	.94	3.8	4.1	2.0	3.9	8.2	2.9	1.2	2.3	1.4	4.5
21	2.7	.94	2.6	3.8	1.8	2.5	8.4	2.8	1.3	2.0	1.2	3.0
22	2.3	.94	2.3	4.1	1.6	2.0	9.8	2.8	1.4	2.2	1.1	2.6
23	1.4	1.0	2.0	3.8	1.8	3.6	12	2.5	1.4	5.0	1.1	2.2
24	1.6	.94	2.1	3.4	1.8	3.8	9.6	2.4	1.3	3.8	1.6	1.8
25	1.6	.86	11	3.3	1.6	2.5	8.4	2.4	1.3	3.1	2.3	1.6
26	2.2	.79	9.4	3.4	1.6	2.0	7.9	6.2	1.1	3.0	7.8	3.1
27	1.4	.72	7.2	4.2	1.6	2.9	8.2	4.1	1.0	3.1	5.2	5.2
28	1.2	.65	12	3.6	1.4	3.8	7.2	3.3	1.1	4.2	3.2	3.2
29	1.0	5.1	11	3.2	------	3.6	6.6	3.1	1.4	2.9	2.4	2.2
30	.94	3.0	9.0	2.9	------	3.8	6.2	2.6	1.8	2.6	3.8	2.0
31	.86	------	8.2	2.8	------	4.6	------	2.5	------	2.6	2.4	------
TOTAL	54.20	59.36	143.3	178.1	69.4	80.6	241.1	119.8	46.0	119.2	66.5	77.7
MEAN	1.75	1.98	4.62	5.75	2.48	2.60	8.04	3.86	1.53	3.85	2.15	2.59
MAX	4.9	8.7	12	10	8.6	5.8	12	6.2	2.3	7.7	7.8	6.8
MIN	.86	.65	1.1	2.8	1.4	1.1	4.8	2.4	1.0	2.0	1.1	1.1
AC-FT	108	118	284	353	138	160	478	238	91	236	132	154

CAL YR 1969 TOTAL 1,896.36 MEAN 5.20 MAX 13 MIN .65 AC-FT 3,760
WTR YR 1970 TOTAL 1,255.26 MEAN 3.44 MAX 12 MIN .65 AC-FT 2,490

16602400 Awalau Gulch at Kailiili

LOCATION.--Lat 20°51'11", long 156°16'25", Maui, on left bank 150 ft downstream from Left Fork, 0.4 mile north of Kailiili, and 2.6 miles east of Makawao.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,260 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 3.56 cfs (2,580 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 327 cfs Dec. 28 (gage height, 2.87 ft), from rating curve extended as explained below; minimum, 0.10 cfs Nov. 28.
Period of record: Maximum discharge, 343 cfs Nov. 29, 1968 (gage height, 3.00 ft), from rating curve extended above 26 cfs on basis of slope-area measurement of peak flow; minimum, 0.07 cfs Dec. 4-6, 1966, several days in 1968.

REMARKS.--Records good. Two pipes divert from Left Fork, above station, for ranch use. Excess water from Opana tunnel spills into Awalau Gulch 0.2 mile above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	.19	1.1	9.6	2.5	3.8	16	9.6	1.6	5.5	1.4	1.4
2	3.1	.18	.75	7.4	2.3	5.5	14	8.4	1.4	11	1.2	2.0
3	2.3	.16	.50	11	2.2	2.7	13	7.4	1.3	5.5	1.1	1.5
4	1.8	.16	.94	14	1.9	1.6	9.6	6.6	1.4	6.6	.88	1.9
5	1.6	.27	1.4	9.6	1.9	1.2	11	5.5	1.4	5.0	.82	2.7
6	1.2	7.5	.75	13	1.8	1.2	8.4	5.0	1.2	6.8	1.1	1.6
7	1.2	6.6	.65	9.6	1.6	1.4	6.6	4.6	1.0	9.6	1.9	1.3
8	1.2	4.6	.65	9.6	1.2	1.3	6.0	4.6	.70	4.3	1.2	1.2
9	1.0	2.5	1.8	9.6	1.4	.69	5.5	4.6	.65	3.9	.76	.76
10	.84	1.5	4.4	7.4	3.6	.60	5.5	9.6	.65	4.3	.48	.56
11	.71	1.1	4.6	7.3	1.9	.56	9.7	6.0	.65	4.6	.34	.48
12	.65	.85	2.3	10	1.3	.57	13	5.0	.82	3.6	.59	.43
13	.88	.99	4.3	7.4	1.2	.64	13	4.6	.48	3.1	.77	.32
14	.75	1.3	7.4	9.6	4.4	.51	12	3.9	.44	2.5	.28	.37
15	.59	.74	5.5	9.6	8.4	.45	13	4.3	.58	2.0	.34	.43
16	.47	.63	3.6	7.4	3.9	.26	14	4.6	.40	3.6	.85	.19
17	.44	.47	2.9	6.6	2.3	.26	11	4.3	1.1	2.5	1.8	4.4
18	.35	.44	2.5	5.5	1.9	2.6	12	3.6	.70	2.9	1.1	9.6
19	.28	.38	2.5	4.6	1.6	3.6	11	3.4	.53	2.0	.94	7.4
20	.26	.37	3.4	3.9	1.2	3.4	11	3.1	.47	1.5	.52	3.9
21	1.7	.33	2.0	3.6	1.2	1.6	12	2.9	.31	1.2	.24	2.2
22	1.8	.39	1.6	3.9	1.2	1.2	12	2.7	.39	1.4	.21	1.9
23	.69	.44	1.5	3.6	1.3	3.0	18	2.5	.52	5.6	.21	1.3
24	.93	.41	1.4	3.6	1.2	3.1	11	2.2	.53	3.6	.80	.94
25	.99	.24	9.9	3.4	1.0	1.6	11	2.2	.43	2.7	2.0	.69
26	1.8	.16	6.0	3.6	1.1	1.2	13	9.0	.39	2.5	11	3.1
27	.76	.13	5.5	4.6	.88	2.5	12	3.9	.26	2.2	5.5	5.0
28	.48	.11	33	3.6	.75	3.4	12	3.1	.46	3.9	2.7	2.3
29	.32	4.2	13	3.4	------	3.1	13	2.3	.60	2.2	1.8	1.3
30	.24	2.0	7.4	2.7	------	3.9	11	2.3	1.2	1.9	3.9	1.2
31	.19	------	7.4	2.7	------	4.6	------	2.0	------	1.8	1.9	------
TOTAL	34.12	39.34	140.64	211.4	57.13	62.04	340.3	143.8	22.56	119.8	48.63	62.37
MEAN	1.10	1.31	4.54	6.82	2.04	2.00	11.3	4.64	.75	3.86	1.57	2.08
MAX	4.6	7.5	33	14	8.4	5.5	18	9.6	1.6	11	11	9.6
MIN	.19	.11	.50	2.7	.75	.26	5.5	2.0	.26	1.2	.21	.19
AC-FT	68	78	279	419	113	123	675	285	45	238	96	124

CAL YR 1969 TOTAL 1,864.90 MEAN 5.11 MAX 61 MIN .11 AC-FT 3,700
WTR YR 1970 TOTAL 1,282.13 MEAN 3.51 MAX 33 MIN .11 AC-FT 2,540

PEAK DISCHARGE (BASE, 34 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-28	1500	2.87	327	4-11	2200	1.05	42
1- 3	1830	1.30	85	4-16	0800	1.01	36
1- 6	0930	1.13	56	4-23	0300	1.02	37
1-11	2330	1.05	42				

16618000 Kahakuloa Stream near Honokohau

LOCATION.--Lat 20°58'54", long 156°33'26", Maui, on right bank 0.5 mile downstream from Kapuna Stream, 1.3 miles south of Kahakuloa, 2 miles west of Puu Makawana, and 4.3 miles southeast of Honokohau.

DRAINAGE AREA.--3.47 sq mi.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1 mile upstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

AVERAGE DISCHARGE.--26 years (1939-42, 1947-70), 16.9 cfs (12,240 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,040 cfs Dec. 29 (gage height, 5.96 ft), from rating curve extended above 510 cfs on basis of slope-area measurements at gage heights 6.70 and 8.48 ft; minimum, 5.4 cfs Mar. 11-14, 17, 18, 22, 23.
Period of record: Maximum discharge, 3,080 cfs Dec. 14, 1942 (gage height, 7.02 ft, control then in use), from rating curve extended above 86 cfs by test of model of station site; minimum, 3.02 cfs Feb. 9-11, 1954.

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

REVISIONS (FISCAL YEARS).--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	6.4	6.9	106	7.3	6.9	36	9.0	7.3	17	6.6	9.0
2	8.2	6.4	6.2	28	7.1	6.6	35	8.7	6.6	59	6.4	8.0
3	7.5	6.2	6.0	87	6.9	6.2	39	7.3	6.0	23	6.0	8.2
4	7.3	6.2	6.2	92	7.1	5.9	16	7.1	22	11	6.4	7.3
5	7.1	6.4	7.3	21	6.9	5.7	31	6.6	12	11	6.0	13
6	6.9	54	6.2	29	6.6	5.7	9.2	6.9	20	12	6.2	7.7
7	9.0	9.5	6.6	12	6.4	5.9	8.4	7.1	7.5	32	19	13
8	9.0	7.5	6.6	9.8	6.2	5.9	7.3	18	6.6	11	8.7	8.7
9	7.3	7.1	12	9.0	6.6	5.7	6.6	10	6.2	23	6.6	7.1
10	6.9	6.6	46	8.2	18	5.5	15	17	6.0	15	6.0	7.5
11	6.9	6.2	13	12	6.9	5.5	68	13	7.4	18	5.9	6.4
12	11	6.2	7.3	36	6.4	5.4	78	9.6	9.0	10	6.9	6.0
13	16	9.0	24	14	6.2	5.4	32	14	7.5	11	7.1	5.9
14	9.0	9.0	75	74	26	5.5	17	9.5	8.4	8.0	5.9	5.7
15	7.5	7.5	16	14	31	6.9	17	8.7	6.2	6.9	9.8	5.7
16	7.1	6.4	7.7	9.8	8.2	6.4	18	9.2	6.0	6.6	7.1	5.7
17	6.9	6.2	6.9	8.4	6.9	5.5	9.8	15	17	20	6.0	7.2
18	6.9	6.2	6.6	8.0	6.6	30	34	7.7	7.1	19	5.9	12
19	7.7	6.2	6.4	7.7	6.4	9.8	45	6.6	7.1	8.0	5.9	45
20	8.9	6.2	6.9	7.3	6.2	6.4	19	6.4	14	6.9	5.9	10
21	30	7.0	6.0	7.5	6.2	5.7	18	6.9	22	7.1	5.7	7.3
22	11	8.9	5.9	16	6.0	5.4	15	6.9	14	7.5	5.5	7.7
23	8.7	8.0	5.9	18	6.0	11	66	6.2	8.2	28	6.4	7.3
24	18	6.4	5.9	10	5.9	7.9	25	7.1	8.7	10	39	6.0
25	14	6.2	91	8.0	6.4	5.7	31	6.0	37	28	32	5.9
26	8.0	6.0	11	83	7.1	5.9	11	40	10	11	107	8.4
27	7.1	5.9	8.2	32	8.0	5.5	10	22	8.4	13	18	11
28	6.9	5.9	90	12	6.2	16	9.0	9.0	7.1	34	30	6.0
29	6.9	23	80	9.0	------	13	10	9.3	29	8.7	34	5.7
30	6.6	16	18	8.2	------	6.4	8.0	14	26	9.0	55	5.7
31	6.6	------	44	7.7	------	11	------	11	------	8.7	9.5	------
TOTAL	289.9	278.7	639.7	804.6	241.7	240.3	744.3	335.8	360.3	493.4	486.4	270.1
MEAN	9.35	9.29	20.6	26.0	8.63	7.75	24.8	10.8	12.0	15.9	15.7	9.00
MAX	30	54	91	106	31	30	78	40	37	59	107	45
MIN	6.6	5.9	5.9	7.3	5.9	5.4	6.6	6.0	6.0	6.6	5.5	5.7
AC-FT	575	553	1,270	1,600	479	477	1,480	666	715	979	965	536

CAL YR 1969 TOTAL 8,247.2 MEAN 22.6 MAX 252 MIN 5.7 AC-FT 16,360
WTR YR 1970 TOTAL 5,185.2 MEAN 14.2 MAX 107 MIN 5.4 AC-FT 10,280

PEAK DISCHARGE (BASE, 500 CFS).--Dec. 29 (0400) 1,040 cfs (5.96 ft); Jan. 1 (1830) 990 cfs (5.90 ft).

16620000 Honokohau Stream near Honokohau

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

DRAINAGE AREA.--4.11 sq mi.

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.

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

AVERAGE DISCHARGE.--54 years (1913-19, 1922-70), 40.5 cfs (29,340 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,310 cfs Dec. 25 (gage height, 5.73 ft), from rating curve extended above 180 cfs; minimum, 16 cfs Feb. 23, 24, Mar. 4-14, 17, 22, 26, 27.
Period of record: Maximum discharge, 3,740 cfs Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft), from rating curve extended above 180 cfs; minimum, 8.4 cfs May 1, 1945, Jan. 5, 1946.

REMARKS.--Records good. No diversion above station. All medium and low flow, together with the inflow from 2 development tunnels below station, is diverted into Honokohau ditch.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	20	18	47	19	68	112	94	22	42	31	27
2	26	20	18	27	18	30	122	28	21	118	28	25
3	24	20	18	94	18	18	110	22	20	48	22	29
4	24	19	18	90	18	17	54	21	24	36	24	25
5	24	33	19	25	18	16	92	20	26	38	24	45
6	23	190	17	48	18	16	23	21	27	61	30	26
7	25	38	20	23	17	17	22	21	21	62	66	40
8	32	22	20	21	17	18	25	48	21	26	36	25
9	24	21	38	21	18	16	35	75	20	111	22	22
10	23	20	100	20	28	16	68	100	20	53	21	22
11	22	19	26	53	18	16	161	34	31	46	20	21
12	50	19	19	69	17	16	165	94	40	29	24	21
13	45	20	46	48	17	16	98	32	40	48	24	20
14	25	20	87	117	59	20	41	25	25	27	22	22
15	23	19	28	25	37	42	92	41	28	22	61	22
16	22	19	21	21	19	30	54	67	33	22	29	21
17	21	19	20	20	18	17	36	67	65	53	26	88
18	22	19	19	20	17	76	90	36	22	33	22	41
19	22	19	20	19	17	31	125	24	24	22	25	94
20	48	19	21	19	17	20	30	23	59	21	22	33
21	137	23	19	19	17	17	55	44	91	22	22	41
22	33	22	19	21	17	16	80	30	30	58	24	29
23	23	20	18	21	16	81	267	21	25	103	36	25
24	24	18	35	19	16	22	102	22	52	30	86	21
25	23	19	316	19	22	18	50	22	79	143	92	20
26	21	19	45	72	24	17	45	155	30	45	301	20
27	21	18	55	113	21	25	31	50	33	36	49	20
28	21	18	271	26	17	47	24	30	88	66	106	20
29	21	26	227	21	------	23	41	24	60	24	92	19
30	20	21	56	19	------	39	40	43	101	26	132	19
31	20	------	65	19	------	42	------	29	------	25	26	------
TOTAL	931	799	1,719	1,196	575	863	2,290	1,363	1,178	1,496	1,545	903
MEAN	30.0	26.6	55.5	38.6	20.5	27.8	76.3	44.0	39.3	48.3	49.8	30.1
MAX	137	190	316	117	59	81	267	155	101	143	301	94
MIN	20	18	17	19	16	16	22	20	20	21	20	19
AC-FT	1,850	1,580	3,410	2,370	1,140	1,710	4,540	2,700	2,340	2,970	3,060	1,790

CAL YR 1969 TOTAL 20,535 MEAN 56.3 MAX 489 MIN 12 AC-FT 40,730
WTR YR 1970 TOTAL 14,858 MEAN 40.7 MAX 316 MIN 16 AC-FT 29,470

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-25	0600	5.73	1,310	8-26	0300	5.41	1,120
12-28	1000	5.66	1,270				

16638500 Kahoma Stream at Lahaina

LOCATION.--Lat 20°53'10", long 156°40'36", Maui, on right bank 0.2 mile west of Kelawea, 0.6 mile northeast of Lahaina, 0.6 mile downstream from Kanaha Stream, and 0.9 mile upstream from mouth.

DRAINAGE AREA.--5.22 sq mi.

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

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

AVERAGE DISCHARGE.--7 years (1963-70), 4.25 cfs (3,080 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 963 cfs Dec. 28 (gage height, 7.52 ft), from rating curve extended as explained below; no flow many days.

Period of record: Maximum discharge, 2,490 cfs July 11, 1965 (gage height, 11.03 ft), from rating curve extended above 21 cfs on basis of slope-area measurements at gage heights 5.90, 6.01, 7.58, 8.07 and 11.03 ft; no flow many days each year.

Maximum discharge of flood of May 13, 1960, 7,750 cfs, by slope-area measurement at site 0.5 mile upstream.

REMARKS.--Records fair except those below 5.0 cfs, which are 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.

REVISIONS (WATER YEARS).--WRD Hawaii 1968: 1966-67(P). Published records of some peak discharges in the water years 1963-65 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	.17	9.6	13	33	4.6	0	.57	0	1.4
2	0	0	0	0	4.0	2.0	104	4.1	0	.21	0	.48
3	.26	0	0	0	.38	0	41	4.4	0	.02	0	.25
4	0	0	0	0	0	0	33	2.7	0	.07	0	.02
5	0	0	0	.94	0	0	42	3.3	0	0	0	.06
6	.03	124	0	10	0	0	1.2	1.5	0	.06	0	.08
7	.76	3.6	0	7.3	0	0	4.2	.36	0	2.1	0	0
8	.81	.03	0	8.2	0	0	7.9	.82	0	1.5	0	0
9	.06	0	.96	9.6	0	0	5.0	17	0	3.2	0	0
10	0	0	14	9.2	0	0	4.2	64	0	2.1	0	0
11	0	0	.83	9.2	0	0	9.9	6.6	0	2.8	0	0
12	0	.05	0	54	0	0	23	3.7	0	.15	0	0
13	.04	0	.08	11	0	.01	7.4	1.8	0	.01	0	0
14	0	0	0	39	.62	0	7.0	1.4	0	0	0	0
15	0	.10	0	10	0	0	40	2.9	0	0	3.7	0
16	0	0	0	10	0	0	11	11	0	0	1.6	0
17	0	0	0	7.9	0	.04	5.6	34	0	.01	1.4	1.6
18	.13	0	0	7.6	0	.24	37	3.2	0	0	0	1.2
19	0	0	0	7.3	0	0	16	2.9	0	0	0	.45
20	0	0	0	7.3	0	.06	5.8	1.4	1.0	0	0	0
21	53	0	0	7.3	0	0	11	.10	2.3	0	0	0
22	.81	0	0	7.9	0	0	54	.58	.61	0	.02	0
23	.16	0	0	11	0	.51	155	2.5	1.3	3.9	0	0
24	.03	0	0	13	0	1.0	8.7	2.5	1.6	.24	0	0
25	0	0	185	13	0	.90	5.9	.89	.28	0	.10	0
26	0	0	21	12	0	.79	55	39	.58	0	68	0
27	.06	0	6.5	11	0	.18	18	.67	.68	0	.13	0
28	0	0	269	6.5	0	0	7.0	0	3.0	.09	.29	0
29	.12	.01	122	5.2	------	0	7.6	0	1.9	0	.23	0
30	.22	0	3.0	5.0	------	.04	89	0	.92	0	21	0
31	0	------	.08	10	------	.43	------	0	------	0	.15	------
TOTAL	56.49	127.79	622.45	310.61	14.60	19.20	849.4	217.92	14.17	17.03	96.62	5.54
MEAN	1.82	4.26	20.1	10.0	.52	.62	28.3	7.03	.47	.55	3.12	.18
MAX	53	124	269	54	9.6	13	155	64	3.0	3.9	68	1.6
MIN	0	0	0	0	0	0	1.2	0	0	0	0	0
AC-FT	112	253	1,230	616	29	38	1,680	432	28	34	192	11

CAL YR 1969 TOTAL 4,691.45 MEAN 12.9 MAX 269 MIN 0 AC-FT 9,310
WTR YR 1970 TOTAL 2,351.82 MEAN 6.44 MAX 269 MIN 0 AC-FT 4,660

PEAK DISCHARGE (BASE, 390 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-21	1630	6.75	688	4-23	0900	5.95	420
12-25	0630	6.65	652	4-26	1700	5.92	411
12-28	1000	7.52	963	4-30	1530	6.67	660

16646200 Olowalu Stream at Olowalu

LOCATION.--Lat 20°49'23", long 156°37'15", Maui, on downstream side of center pier of plantation road bridge, 0.6 mile northeast of Olowalu, and 5.5 miles southeast of Lahaina.

DRAINAGE AREA.--4.08 sq mi.

PERIOD OF RECORD.--May 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

AVERAGE DISCHARGE.--7 years, 4.15 cfs (3,010 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 252 cfs Jan. 12 (gage height, 3.05 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 1,300 cfs Mar. 24, 1967 (gage height, 5.40 ft), from rating curve extended above 66 cfs on basis of slope-area measurements at gage heights 3.39, 3.58, 3.72, 5.31 and 5.40 ft; no flow most of time each year.
Maximum discharge of flood of Nov. 2, 1961, 743 cfs, by slope-area measurement.

REMARKS.--Records good. All low flow is diverted 1.5 miles above station by Olowalu ditch for domestic use and irrigation of sugarcane in vicinity of Olowalu. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	1.1	0	.11	3.1	2.7	0	3.0	0	0
2	0	0	0	.10	0	.02	27	1.0	0	11	0	0
3	0	0	0	0	0	0	12	0	0	7.2	0	0
4	0	0	0	.01	0	0	7.5	0	0	1.8	0	0
5	0	0	0	0	0	0	12	0	0	.19	0	0
6	0	29	0	4.4	0	0	1.4	0	0	1.6	0	0
7	0	.90	0	.76	0	0	0	0	0	2.6	0	.02
8	0	0	0	0	0	0	0	.19	0	.04	0	0
9	0	0	0	0	0	0	0	1.9	0	0	0	0
10	0	0	1.4	0	0	0	.09	5.5	0	.77	0	0
11	0	0	.08	0	0	0	5.9	2.6	0	.02	0	0
12	0	0	0	36	0	0	15	0	0	0	0	0
13	0	0	0	12	0	0	12	0	0	0	0	0
14	0	0	0	36	21	0	4.0	0	0	0	0	0
15	0	0	0	15	6.7	0	3.7	0	0	0	0	0
16	0	0	0	6.0	1.3	0	.37	.48	0	0	0	0
17	0	0	0	3.8	0	0	0	1.9	0	0	0	0
18	0	0	0	2.5	0	.34	13	0	0	0	0	.23
19	0	0	0	2.2	0	0	6.6	0	0	0	0	1.2
20	0	0	0	.51	0	0	2.8	0	0	0	0	0
21	2.4	0	0	0	0	0	.15	0	0	0	0	0
22	.11	0	0	0	0	0	2.0	0	0	0	0	0
23	0	0	0	0	0	0	51	0	0	.59	0	0
24	0	0	0	0	0	0	29	0	0	0	0	0
25	0	0	50	0	0	0	8.8	0	1.6	0	0	0
26	0	0	3.1	4.6	0	0	4.0	9.7	0	0	24	0
27	0	0	0	5.0	0	0	2.2	.36	0	0	4.1	0
28	0	0	45	1.3	0	0	.35	0	2.2	0	3.5	0
29	0	0	79	.03	------	0	0	0	3.2	0	3.8	0
30	0	0	9.8	0	------	0	3.1	0	1.4	0	2.5	0
31	0	------	3.2	0	------	0	------	0	------	0	0	------
TOTAL	2.51	29.90	191.58	131.31	29.0	.47	227.06	26.33	8.4	28.81	37.9	1.45
MEAN	.081	1.00	6.18	4.24	1.04	.015	7.57	.85	.28	.93	1.22	.048
MAX	2.4	29	79	36	21	.34	51	9.7	3.2	11	24	1.2
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	5.0	59	380	260	58	.9	450	52	17	57	75	2.9

CAL YR 1969 TOTAL 2,404.97 MEAN 6.59 MAX 150 MIN 0 AC-FT 4,770
WTR YR 1970 TOTAL 714.72 MEAN 1.96 MAX 79 MIN 0 AC-FT 1,420

PEAK DISCHARGE (BASE, 340 CFS).--No peak above base.

16660000 Kulanihakoi Gulch near Kihei

LOCATION.--Lat 20°46'06", long 156°27'03" Maui, on right bank 0.5 mile northeast of Lihue Cemetery, 0.8 mile upstream from mouth, and 1.3 miles southeast of Kihei.

DRAINAGE AREA.--14.4 sq mi.

PERIOD OF RECORD.--October 1962 to September 1970 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).

GAGE.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

AVERAGE DISCHARGE.--7 years (1963-70), 0.319 cfs (231 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 348 cfs Sept. 11 (gage height, 1.80 ft, from floodmarks), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 2,740 cfs Mar. 24, 1967 (gage height, 6.39 ft), from rating curve extended above 150 cfs on basis of slope-area measurement of peak flow; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0								0
2				0								0
3				0								0
4				0								0
5				0								0
6				0								0
7				0								0
8				0								0
9				0								0
10				0								0
11				0								8.2
12				0								0
13				0								0
14				9.0								0
15				0								0
16				0								0
17				0								0
18				0								0
19				0								0
20				0								0
21				0								0
22				0								0
23				0								0
24				0								0
25				0								0
26				0								0
27				0								0
28				0								0
29				0	------							0
30				0	------							0
31		------		0	------		------		------			------
TOTAL	0	0	0	9.0	0	0	0	0	0	0	0	8.2
MEAN	0	0	0	.29	0	0	0	0	0	0	0	.27
MAX	0	0	0	9.0	0	0	0	0	0	0	0	8.2
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	18	0	0	0	0	0	0	0	16

CAL YR 1969 TOTAL 0 MEAN 0 MAX 0 MIN 0 AC-FT 0
WTR YR 1970 TOTAL 17.2 MEAN .047 MAX 9.0 MIN 0 AC-FT 34

PEAK DISCHARGE (BASE, 62 CFS).--Jan. 14 (about 1300) 235 cfs (1.50 ft); Sept. 11 (about 1900) 348 cfs (1.80 ft).

NOTE.--No gage-height record Sept. 11-18.

16700000 Waiakea Stream near Mountain View

LOCATION.--Lat 19°38'30", long 155°10'28", Hawaii, on left bank 200 ft upstream from Olaa Flume Road, 7.3 miles northwest of Mountain View, and 8.0 miles southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 sq mi.

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

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

AVERAGE DISCHARGE.--40 years, 11.8 cfs (8,550 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 565 cfs Aug. 26 (gage height, 4.45 ft), from rating curve extended above 160 cfs; minimum, 0.20 cfs Mar. 12-14.
Period of record: Maximum discharge, 565 cfs Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 cfs; maximum gage height, 4.45 ft Aug. 26, 1970; no flow at times.

REMARKS.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

REVISIONS (FISCAL YEARS).--WSP 1937: 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).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	2.0	6.4	7.8	1.7	.28	.90	55	28	12	6.6	36
2	9.0	2.0	6.2	7.5	1.6	.28	3.2	68	26	14	6.5	31
3	8.4	1.9	6.0	6.9	1.4	.28	7.2	51	23	15	6.7	28
4	7.6	1.7	5.7	6.7	1.3	.28	10	43	21	16	6.2	26
5	7.1	1.7	5.4	6.4	1.2	.32	7.9	34	19	18	6.6	23
6	6.6	10	5.2	6.2	1.2	.32	6.7	30	17	16	6.7	21
7	6.4	13	5.0	6.0	1.1	.44	5.7	26	16	18	6.1	19
8	6.1	11	5.4	5.6	1.0	.48	5.2	26	14	24	6.2	18
9	5.8	11	5.6	5.4	1.0	.32	6.6	24	13	24	5.7	17
10	5.6	11	5.5	5.1	.95	.28	9.5	30	12	27	5.2	16
11	5.3	10	5.2	4.9	.85	.28	16	29	11	24	5.0	14
12	5.0	9.8	4.8	4.7	.80	.20	18	29	10	23	4.8	14
13	4.8	9.2	4.7	4.5	.75	.20	18	27	9.7	22	4.6	13
14	4.6	8.3	6.6	4.3	.70	.24	18	24	9.3	20	4.4	12
15	4.4	7.3	7.1	4.1	.65	.36	24	25	8.7	19	4.2	11
16	4.2	6.7	6.3	3.9	.60	1.3	27	22	8.2	19	4.0	10
17	4.0	6.7	5.8	3.7	.56	.40	30	21	9.9	18	4.0	12
18	3.9	6.2	5.6	3.4	.52	.60	28	20	12	17	3.9	12
19	3.7	5.8	5.2	3.2	.48	.75	27	21	11	16	4.3	12
20	3.4	5.6	5.0	3.0	.48	.60	26	20	10	15	4.6	12
21	4.0	5.7	4.8	2.8	.44	.40	39	19	9.5	14	4.6	11
22	3.8	6.4	4.6	2.6	.44	.40	30	18	9.0	13	6.0	13
23	3.3	6.2	4.5	2.9	.40	2.1	45	17	9.0	12	6.2	12
24	3.2	5.7	4.2	2.4	.36	2.7	40	17	8.5	11	7.0	12
25	3.0	6.2	4.1	2.2	.36	1.4	35	16	10	11	47	11
26	2.7	8.1	15	2.0	.36	1.0	40	39	9.3	10	122	11
27	2.5	7.5	11	1.9	.32	.95	65	39	8.4	9.4	77	14
28	2.4	7.1	9.3	1.9	.32	1.0	56	41	8.5	8.9	72	13
29	2.3	6.9	8.8	2.0	------	.90	52	39	10	8.1	62	13
30	2.2	6.6	8.4	2.1	------	.75	54	35	8.5	7.5	58	12
31	2.1	------	7.9	1.9	------	.85	------	31	------	7.1	44	------
TOTAL	147.1	207.3	195.3	128.0	21.84	20.66	750.90	936	379.5	489.0	612.1	479
MEAN	4.75	6.91	6.30	4.13	.78	.67	25.0	30.2	12.7	15.8	19.7	16.0
MAX	9.7	13	15	7.8	1.7	2.7	65	68	28	27	122	36
MIN	2.1	1.7	4.1	1.9	.32	.20	.90	16	8.2	7.1	3.9	10
AC-FT	292	411	387	254	43	41	1,490	1,860	753	970	1,210	950

CAL YR 1969 TOTAL 6,599.60 MEAN 18.1 MAX 153 MIN 1.1 AC-FT 13,090
WTR YR 1970 TOTAL 4,366.70 MEAN 12.0 MAX 122 MIN .20 AC-FT 8,660

PEAK DISCHARGE (BASE, 100 CFS).--May 2 (0130) 142 cfs (3.64 ft); Aug. 26 (0230) 565 cfs (4.45 ft).

16701750 Wailuku River near Humuula

LOCATION.--Lat 19°42'55", long 155°18'36", Hawaii, on right bank 300 ft upstream from trail terminus, 10 miles east of Humuula, and 14 miles west of Hilo.

DRAINAGE AREA.--34.8 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 2.95 cfs (2,140 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,370 cfs Aug. 26 (gage height, 8.42 ft), from rating curve extended above 18 cfs; no flow for many days.
Period of record: Maximum discharge, 2,600 cfs Aug. 8, 1967 (gage height, 10.27 ft), from rating curve extended above 18 cfs; no flow at times in 1965, 1969-70.

REMARKS.--Records good except those above 40 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.01	.05	.12	.04	0	0	17	2.3	.24	.10	1.8
2	.07	0	.05	.09	.07	0	.19	14	1.4	1.0	.12	1.6
3	.07	0	.04	.07	.05	0	1.0	7.3	1.0	.33	.13	1.1
4	.07	0	.03	.07	.04	0	.70	5.1	1.0	.24	.10	.68
5	.07	0	.03	.07	.03	0	.18	3.8	.76	1.7	.09	1.2
6	.07	1.2	.03	.09	.03	0	.09	2.6	.58	3.2	.10	.87
7	.07	1.7	.05	.10	.03	0	.04	1.8	.46	2.6	.07	.68
8	.07	.94	.07	.09	.03	0	.01	1.7	.36	2.2	.12	.54
9	.06	.24	.09	.09	.02	0	0	2.2	.33	.76	.09	.48
10	.06	.15	.09	.09	.01	0	.20	6.7	.27	2.0	.06	.42
11	.06	.10	.13	.09	0	0	2.0	4.4	.24	.70	.05	.35
12	.05	.07	.07	.09	0	0	.50	1.8	.22	.64	.04	.31
13	.05	.06	.05	.10	0	0	.25	1.0	.20	.46	.04	.31
14	.04	.07	.05	.10	0	0	.20	.82	.20	.33	.03	.31
15	.04	.05	.07	.10	0	0	.40	.82	.18	.27	.03	.27
16	.03	.04	.06	.12	0	.01	1.0	.82	.18	.36	.03	.27
17	.03	.06	.05	.12	0	0	3.2	1.0	.16	.40	.07	.61
18	.03	.04	.03	.10	0	0	.46	3.0	.18	1.1	.06	1.8
19	.03	.03	.03	.10	0	.01	.30	1.6	.13	.30	.06	1.0
20	.03	.03	.03	.09	0	0	.58	.82	.12	.20	.03	.54
21	.10	.03	.03	.09	0	0	3.4	.58	.10	.16	.03	.27
22	.05	.12	.02	.09	0	0	3.0	.52	.12	.15	.03	.42
23	.04	.15	.02	.12	0	.01	63	.46	.12	.15	.10	.35
24	.03	.13	.03	.05	0	.05	48	.36	.12	.15	.18	.19
25	.02	.07	.05	.03	0	0	6.0	1.5	.13	.13	28	.13
26	.02	2.3	5.5	.03	0	0	11	19	.10	.13	235	.10
27	.02	.24	.88	.09	0	0	63	7.0	.07	.13	20	.16
28	.02	.13	.30	.15	0	0	9.1	13	.10	.13	7.6	.10
29	.01	.10	.40	.07	------	0	8.9	7.5	.15	.12	4.6	.07
30	.01	.07	.20	.05	------	0	9.3	4.5	.09	.12	6.4	.07
31	.01	------	.13	.03	------	0	------	3.3	------	.10	2.8	------
TOTAL	1.42	8.13	8.66	2.69	.35	.08	236.00	136.00	11.37	20.50	306.16	17.00
MEAN	.046	.27	.28	.087	.013	.003	7.87	4.39	.38	.66	9.88	.57
MAX	.10	2.3	5.5	.15	.07	.05	63	19	2.3	3.2	235	1.8
MIN	.01	0	.02	.03	0	0	0	.36	.07	.10	.03	.07
AC-FT	2.8	16	17	5.3	.7	.2	468	270	23	41	607	34

CAL YR 1969 TOTAL 1,424.29 MEAN 3.90 MAX 157 MIN 0 AC-FT 2,830
WTR YR 1970 TOTAL 748.36 MEAN 2.05 MAX 235 MIN 0 AC-FT 1,480

PEAK DISCHARGE (BASE, 310 CFS).--Aug. 26 (0430) 1,370 cfs (8.42 ft).

HAWAII, ISLAND OF HAWAII

16701800 Wailuku River near Kaumana

LOCATION.--Lat 19°43'15", long 155°16'08", Hawaii, on right bank 0.2 mile upstream from Waipahoehoe Gulch and 8.4 miles west of Kaumana.

DRAINAGE AREA.--43.4 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 6,300 cfs Aug. 26 (gage height, 11.15 ft), from rating curve extended above 2,200 cfs; no flow Mar. 13, 14.
Period of record: Maximum discharge, 9,580 cfs Aug. 8, 1967 (gage height, 13.35 ft), from rating curve extended above 2,200 cfs; no flow Mar. 13, 14, 1970.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	.15	1.4	1.5	.46	.03	.25	53	13	6.9	1.1	16
2	1.2	.15	1.2	1.4	.79	.28	2.2	50	10	16	1.2	16
3	1.3	.13	1.2	1.2	.43	.31	16	20	9.2	7.0	1.4	12
4	1.2	.15	1.2	2.2	.31	.22	9.1	12	9.9	6.6	1.1	16
5	1.1	.15	1.1	1.7	.28	.52	3.4	8.0	7.2	19	1.0	14
6	1.0	23	1.0	1.3	.25	.22	1.8	7.0	5.7	33	1.2	10
7	1.0	25	1.9	1.2	.22	.11	1.4	6.0	4.6	24	.91	8.3
8	.91	11	2.7	1.0	.19	.17	1.1	10	4.1	22	1.4	6.5
9	.94	4.9	2.4	.91	.17	.11	1.0	14	3.4	12	.94	5.7
10	.82	2.2	1.6	.85	.17	.06	3.8	45	3.0	24	.73	4.9
11	.76	1.6	2.2	.82	.15	.02	19	24	2.5	12	.67	4.3
12	.73	1.5	1.2	.76	.13	.02	8.5	15	2.2	12	.65	3.8
13	.67	1.5	1.1	.76	.13	0	5.1	9.0	2.1	9.0	.61	3.5
14	.61	1.8	1.4	.70	.11	0	5.4	7.0	2.4	7.4	.55	3.0
15	.58	1.2	2.1	.64	.11	.01	12	8.0	1.8	6.8	.52	2.7
16	.55	1.0	1.7	.67	.11	1.0	15	7.0	2.2	8.8	.55	2.3
17	.55	1.7	1.1	.61	.09	.52	40	10	1.7	13	1.0	6.6
18	.52	1.2	1.0	.58	.06	.52	9.4	18	3.4	14	.76	18
19	.58	.97	.94	.52	.06	.94	8.3	16	2.0	6.3	.82	9.2
20	.49	.91	.88	.52	.05	.55	10	6.0	1.4	4.7	.70	5.9
21	1.0	1.2	.79	.46	.05	.25	61	7.0	1.2	3.8	.55	3.8
22	.76	3.8	.76	.31	.04	.17	31	6.8	1.4	3.5	.73	5.9
23	.49	3.1	.73	.82	.04	.65	400	6.5	1.4	3.3	1.3	5.7
24	.40	2.1	.76	.76	.03	2.8	100	5.2	2.0	2.8	2.1	3.7
25	.37	1.7	.94	.52	.02	.82	30	12	2.6	2.3	331	3.0
26	.34	37	101	.43	.02	.52	60	277	1.7	2.0	1,480	3.1
27	.31	3.8	8.9	.55	.02	.37	120	273	1.4	2.1	180	7.2
28	.25	2.2	3.4	1.0	.02	.49	30	240	1.8	2.3	67	3.7
29	.25	1.7	3.5	.58	------	.58	40	45	3.4	1.6	31	2.7
30	.22	1.5	2.0	.46	------	.37	45	24	1.7	1.4	60	2.2
31	.17	------	1.6	.40	------	.28	------	17	------	1.2	21	------
TOTAL	21.47	138.31	153.70	26.13	4.51	12.91	1,089.75	1,258.5	110.4	290.8	2,192.49	209.7
MEAN	.69	4.61	4.96	.84	.16	.42	36.3	40.6	3.68	9.38	70.7	6.99
MAX	1.4	37	101	2.2	.79	2.8	400	277	13	33	1,480	18
MIN	.17	.13	.73	.31	.02	0	.25	5.2	1.2	1.2	.52	2.2
AC-FT	43	274	305	52	9.0	26	2,160	2,500	219	577	4,350	416

CAL YR 1969 TOTAL 14,941.05 MEAN 40.9 MAX 1,570 MIN .13 AC-FT 29,640
WTR YR 1970 TOTAL 5,508.67 MEAN 15.1 MAX 1,480 MIN 0 AC-FT 10,930

PEAK DISCHARGE (BASE, 1,500 CFS).--May 27 (2130) 1,840 cfs (6.74 ft); Aug. 26 (0530) 6,300 cfs (11.15 ft).

16704000 Wailuku River at Piihonua

LOCATION.--Lat 19°42'58", long 155°09'13", Hawaii, on left bank 0.2 mile downstream from Hookelekele Stream, 0.9 mile west of Piihonua, and 4.1 miles west of Hilo Post Office.

DRAINAGE AREA.--125 sq mi.

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."

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (from topographic map).

AVERAGE DISCHARGE.--39 years (1928-39, 1941-47, 1948-70), 284 cfs (205,800 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 27,300 cfs Aug. 26 (gage height, 19.96 ft); minimum, 2.4 cfs Mar. 11-16.
Period of record: Maximum discharge, 63,400 cfs Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 11,000 cfs; minimum, 0.25 cfs Mar. 9, 1941.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts about 6 cfs above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63.

REVISIONS (FISCAL YEARS).--WSP 865: 1929-36(M). WSP 965: 1941. Published records for July 1928 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	8.0	50	67	5.5	2.8	25	1,880	254	247	34	366
2	44	7.5	41	81	9.2	2.8	53	2,140	204	445	35	351
3	43	7.0	37	46	5.7	2.9	616	855	178	290	53	251
4	45	6.5	32	51	4.1	3.6	443	517	204	340	40	390
5	38	6.5	29	58	3.0	5.7	222	359	161	626	55	308
6	34	504	28	36	2.9	6.3	146	266	130	816	60	229
7	39	883	72	31	2.8	6.1	97	224	107	730	39	174
8	31	432	70	27	2.8	15	70	393	93	756	70	143
9	31	288	89	23	2.8	7.0	84	494	79	405	44	121
10	26	158	70	21	2.8	3.5	165	1,480	68	795	34	98
11	23	108	61	19	2.8	2.5	473	848	62	321	30	87
12	22	84	42	17	2.8	2.4	350	513	58	267	28	80
13	21	116	35	16	2.8	2.4	287	323	59	207	24	66
14	20	96	77	15	2.8	2.4	297	238	78	171	21	58
15	19	58	114	12	2.8	2.4	900	297	66	157	20	54
16	19	47	79	11	2.8	38	678	232	81	275	20	50
17	18	90	52	11	2.8	25	1,310	361	73	205	28	83
18	18	54	41	9.3	2.8	20	411	635	185	367	25	150
19	19	34	34	8.0	2.8	42	412	553	105	167	48	159
20	18	34	30	6.6	2.8	29	401	319	74	125	47	132
21	77	60	26	5.9	2.8	18	1,340	241	67	99	35	87
22	54	129	24	5.5	2.8	11	1,080	195	76	87	54	129
23	24	118	22	19	2.8	76	6,660	180	70	81	81	120
24	20	79	20	20	2.8	165	3,920	141	62	75	106	80
25	57	226	21	11	2.8	50	949	222	154	66	3,830	63
26	16	642	1,170	7.5	2.8	31	1,780	3,350	96	73	8,960	66
27	12	149	206	5.9	2.8	25	4,030	2,020	77	68	1,550	338
28	11	99	112	7.1	2.8	34	983	1,510	94	101	1,120	164
29	9.5	79	89	7.4	------	30	1,350	650	149	53	650	103
30	9.0	64	67	7.0	------	26	1,420	451	89	43	1,230	78
31	8.5	------	53	5.5	------	27	------	349	------	39	507	------
TOTAL	879.0	4,666.5	2,893	667.7	92.0	714.8	30,952	22,236	3,253	8,497	18,878	4,578
MEAN	28.4	156	93.3	21.5	3.29	23.1	1,032	717	108	274	609	153
MAX	77	883	1,170	81	9.2	165	6,660	3,350	254	816	8,960	390
MIN	8.5	6.5	20	5.5	2.8	2.4	25	141	58	39	20	50
AC-FT	1,740	9,260	5,740	1,320	182	1,420	61,390	44,110	6,450	16,850	37,440	9,080

CAL YR 1969 TOTAL 166,798.5 MEAN 457 MAX 10,900 MIN 6.5 AC-FT 330,800
WTR YR 1970 TOTAL 98,307.0 MEAN 269 MAX 8,960 MIN 2.4 AC-FT 195,000

PEAK DISCHARGE (BASE, 8,700 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-23	2100	16.62	13,600	5-26	0930	15.76	11,000
4-27	0145	16.28	12,500	8-26	0530	19.96	27,300

16717000 Honolii Stream near Papaikou

(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hawaii, on left bank 0.7 mile downstream from Pohakupaa Stream, 4.1 miles west of Papaikou, and 4.8 miles northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 sq mi.

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 (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 mile upstream at different datum.

EXTREMES.--Current year: Maximum discharge, 8,360 cfs Aug. 26 (gage height, 15.86 ft); minimum, 4.7 cfs Feb. 24, 25.
Period of record: Maximum discharge, 9,450 cfs Aug. 3, 1967 (gage height, 16.95 ft); minimum, 0.8 cfs Jan. 31, 1912.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 cfs above station for fluming cane and domestic use. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	11	22	45	11	6.9	36	552	45	177	20	66
2	23	11	20	33	15	26	116	804	41	243	24	74
3	25	13	18	24	12	36	644	147	42	130	47	54
4	22	13	17	36	9.4	20	327	74	65	142	31	124
5	20	12	17	31	8.2	27	131	54	45	349	71	96
6	19	401	18	22	7.4	18	64	45	37	337	52	60
7	21	530	49	20	6.9	24	43	45	32	346	32	44
8	18	144	64	18	6.5	32	33	160	30	322	65	37
9	19	103	79	16	6.2	17	37	188	26	103	35	33
10	17	46	57	15	6.2	12	298	706	23	347	26	29
11	16	34	57	14	5.9	9.4	434	228	23	66	25	26
12	15	33	33	14	5.7	7.8	365	110	24	63	22	25
13	14	26	30	13	5.4	8.2	138	59	28	52	21	23
14	13	42	74	12	5.2	9.0	132	47	42	48	19	22
15	13	29	113	11	5.1	11	635	103	32	51	17	21
16	12	24	56	11	5.0	30	424	69	39	121	18	21
17	13	45	37	12	73	21	816	157	47	65	30	92
18	12	28	29	11	33	56	87	506	115	118	30	125
19	14	22	25	9.9	13	58	104	213	52	48	57	80
20	14	20	22	9.2	9.1	43	136	77	31	36	40	58
21	94	41	20	8.8	7.1	26	863	59	30	31	30	35
22	42	64	18	8.6	5.8	23	414	54	38	30	57	78
23	21	55	17	26	5.5	175	3,090	51	45	30	74	58
24	18	43	16	25	5.0	154	1,190	40	57	27	111	35
25	36	66	18	15	5.0	53	110	95	135	34	2,400	29
26	27	241	678	12	5.0	36	690	1,600	50	37	2,710	35
27	19	50	74	10	5.6	35	1,500	616	38	65	493	171
28	16	33	38	9.4	5.3	47	157	308	51	60	289	51
29	14	31	33	10	------	38	681	108	66	27	106	33
30	13	28	32	18	------	25	560	76	37	23	528	27
31	12	------	26	13	------	41	------	65	------	21	82	------
TOTAL	660	2,239	1,807	532.9	293.5	1,125.3	14,255	7,424	1,366	3,549	7,562	1,662
MEAN	21.3	74.6	58.3	17.2	10.5	36.3	475	239	45.5	114	244	55.4
MAX	94	530	678	45	73	175	3,090	1,600	135	349	2,710	171
MIN	12	11	16	8.6	5.0	6.9	33	40	23	21	17	21
AC-FT	1,310	4,440	3,580	1,060	582	2,230	28,270	14,730	2,710	7,040	15,000	3,300

CAL YR 1969 TOTAL 67,425.8 MEAN 185 MAX 3,690 MIN 7.8 AC-FT 133,700
WTR YR 1970 TOTAL 42,475.7 MEAN 116 MAX 3,090 MIN 5.0 AC-FT 84,250

PEAK DISCHARGE (BASE, 4,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-23	0745	14.76	7,260	5-26	0900	13.17	5,670
4-27	0100	14.18	6,680	8-26	0515	15.86	8,360

16717600 Alia Stream near Hilo

LOCATION.--Lat 19°50'38", long 155°06'21", Hawaii, on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 miles south of Honomu, and 8 miles north of Hilo.

DRAINAGE AREA.--0.58 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 489 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--8 years, 12.8 cfs (9,270 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 280 cfs Apr. 21 (gage height, 3.76 ft); minimum, 3.4 cfs probably occurred Feb. 19.
Period of record: Maximum discharge, 393 cfs Nov. 8, 1964 (gage height, 4.12 ft); minimum, 0.85 cfs Nov. 13, 14, 1968.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Spring water not used by sugar mills enters stream above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	4.2	5.6	17	7.5	5.4	12	31	14	14	9.6	13
2	13	4.0	5.1	17	7.0	8.7	15	52	14	13	8.7	13
3	12	5.3	5.3	15	7.0	11	20	26	14	14	8.7	12
4	11	4.7	5.4	22	6.5	8.3	16	20	14	13	8.3	13
5	10	4.3	9.6	17	6.5	10	16	20	12	14	10	12
6	9.9	11	7.0	15	6.0	7.0	15	17	12	15	11	11
7	9.9	14	11	14	5.5	9.4	14	16	13	16	13	10
8	9.4	14	13	13	5.0	11	13	20	12	16	12	9.6
9	9.2	13	13	12	5.5	7.2	14	18	12	15	12	11
10	8.7	11	13	11	8.5	5.3	34	20	12	25	12	11
11	8.3	8.1	12	10	8.0	4.3	20	17	12	14	12	11
12	8.1	7.2	8.5	11	7.5	4.0	27	16	12	13	12	10
13	7.7	6.4	8.1	10	7.0	4.3	18	13	11	13	11	9.6
14	7.4	6.0	16	9.4	7.5	5.6	16	12	11	12	11	9.4
15	7.2	6.2	16	8.7	9.0	9.2	16	12	11	12	10	9.6
16	7.0	5.6	14	8.5	8.5	9.6	27	12	11	13	11	10
17	7.0	9.4	11	8.0	8.0	8.3	16	13	11	13	11	12
18	6.8	8.5	8.7	8.0	6.5	10	15	13	11	12	11	12
19	6.6	6.4	6.6	7.5	5.0	11	15	14	11	12	13	11
20	6.4	6.0	6.6	7.0	6.0	11	17	14	10	11	12	11
21	11	11	5.8	6.5	4.9	9.4	70	14	9.9	11	12	11
22	12	8.1	5.4	12	5.6	9.9	20	13	10	11	12	12
23	8.5	8.1	4.7	20	5.1	13	35	13	10	10	13	11
24	7.4	7.4	4.5	10	5.1	13	33	13	10	11	14	10
25	10	7.0	5.6	9.5	5.1	13	19	14	11	9.9	85	10
26	11	9.2	21	9.0	5.4	10	17	37	10	11	67	11
27	7.4	9.0	13	8.5	5.3	8.5	19	23	11	10	28	11
28	6.4	7.0	10	8.0	4.7	12	15	18	10	9.6	24	11
29	6.0	7.0	12	8.0	------	11	15	16	11	9.4	18	12
30	5.4	7.4	12	9.0	------	9.0	34	15	11	10	24	11
31	4.5	------	14	8.5	------	12	------	15	------	10	15	------
TOTAL	270.2	236.5	303.5	350.1	179.2	281.4	633	567	343.9	392.9	531.3	331.2
MEAN	8.72	7.88	9.79	11.3	6.40	9.08	21.1	18.3	11.5	12.7	17.1	11.0
MAX	15	14	21	22	9.0	13	70	52	14	25	85	13
MIN	4.5	4.0	4.5	6.5	4.7	4.0	12	12	9.9	9.4	8.3	9.4
AC-FT	536	469	602	694	355	558	1,260	1,120	682	779	1,050	657

CAL YR 1969 TOTAL 6,161.1 MEAN 16.9 MAX 111 MIN 4.0 AC-FT 12,220
WTR YR 1970 TOTAL 4,420.2 MEAN 12.1 MAX 85 MIN 4.0 AC-FT 8,770

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-10	1730	3.28	171	4-30	2300	3.60	240
4-21	0330	3.76	280	8-25	1700	3.53	222
4-23	1800	3.57	232				

NOTE.--No gage-height record Jan. 16 to Feb. 20.

16717800 Pohakupuka Stream near Papaaloa

LOCATION.--Lat 19°57'20", long 155°11'20", Hawaii, on right bank 200 ft downstream from Highway 19, 2.8 miles northwest of Honohina, and 3.0 miles southwest of Papaaloa.

DRAINAGE AREA.--2.76 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 250 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--8 years, 28.8 cfs (20,870 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,360 cfs Aug. 26 (gage height, 9.38 ft), from rating curve extended above 1,100 cfs; minimum, 1.2 cfs Mar. 12.
Period of record: Maximum discharge, 5,340 cfs Nov. 26, 1967 (gage height, 13.37 ft), from rating curve extended above 1,100 cfs; minimum, 0.28 cfs Nov. 9, 1962.

REMARKS.--Records good. No diversion above station. Irrigation ditches in basin occasionally overflow, but amount reaching stream is small.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	2.5	2.4	8.5	3.1	1.5	34	174	12	68	4.9	15
2	6.4	2.4	2.1	5.6	2.9	5.7	61	59	11	54	5.0	16
3	5.5	2.4	2.0	4.5	2.8	7.2	107	24	29	40	6.6	13
4	5.2	2.2	40	78	2.7	3.1	85	17	23	64	6.6	46
5	4.9	2.1	19	9.3	2.7	2.9	35	14	13	94	47	23
6	4.7	118	3.6	6.3	2.6	2.4	12	13	10	113	21	15
7	4.8	114	6.8	5.2	2.5	3.1	7.8	13	10	82	12	11
8	4.4	27	7.0	4.6	2.5	5.7	6.2	51	9.7	97	26	9.9
9	4.2	7.2	8.0	4.2	2.5	2.8	9.9	36	9.5	54	8.2	9.3
10	4.0	4.8	7.7	3.9	4.4	1.8	100	142	9.4	145	6.0	8.6
11	3.5	3.8	7.1	3.6	3.9	1.3	83	61	9.2	16	5.6	8.1
12	3.6	3.4	3.8	3.5	2.9	1.2	128	37	8.9	13	5.6	7.8
13	3.5	3.0	6.0	3.5	2.6	2.0	41	16	8.9	11	5.9	7.5
14	3.3	2.8	105	3.3	2.7	2.7	46	13	9.1	8.9	5.0	7.2
15	3.2	2.6	68	3.3	4.8	1.9	159	19	9.0	9.2	4.7	7.1
16	2.9	2.5	17	3.2	4.4	1.4	107	16	8.6	38	4.3	7.2
17	3.0	2.8	6.6	3.1	3.1	1.5	126	59	13	23	7.9	34
18	3.0	3.0	4.8	3.0	2.5	4.3	15	84	38	34	11	26
19	2.9	2.5	4.1	3.0	2.2	16	12	60	17	9.6	24	13
20	2.9	2.3	12	2.9	2.5	9.2	16	22	9.0	7.8	13	13
21	13	2.8	3.9	2.9	1.7	3.7	222	16	11	7.0	15	12
22	7.6	2.9	3.2	8.3	1.7	4.7	95	14	16	6.8	29	28
23	3.4	2.9	2.9	140	1.6	56	550	12	13	6.6	25	19
24	3.1	2.5	2.8	7.7	3.5	52	353	12	16	6.4	27	9.4
25	27	2.2	3.7	4.9	2.9	11	41	22	41	6.0	931	7.4
26	6.6	21	150	4.3	2.5	6.9	153	299	11	6.0	760	7.2
27	3.3	4.6	12	3.7	1.8	7.1	209	164	7.7	8.4	112	6.8
28	2.9	3.0	7.7	3.4	1.5	8.5	37	101	9.4	10	96	6.1
29	2.6	3.5	16	3.4	------	5.9	168	22	10	5.9	29	5.8
30	2.6	3.1	19	4.6	------	4.3	221	15	6.8	5.3	104	5.5
31	2.5	------	7.3	3.5	------	55	------	13	------	5.2	24	------
TOTAL	162.5	359.8	561.5	349.2	77.5	292.8	3,239.9	1,620	409.2	1,055.1	2,382.3	404.9
MEAN	5.24	12.0	18.1	11.3	2.77	9.45	108	52.3	13.6	34.0	76.8	13.5
MAX	27	118	150	140	4.8	56	550	299	41	145	931	46
MIN	2.5	2.1	2.0	2.9	1.5	1.2	6.2	12	6.8	5.2	4.3	5.5
AC-FT	322	714	1,110	693	154	581	6,430	3,210	812	2,090	4,730	803

CAL YR 1969	TOTAL 18,404.8	MEAN 50.4	MAX 756	MIN 2.0	AC-FT 36,510
WTR YR 1970	TOTAL 10,914.7	MEAN 29.9	MAX 931	MIN 1.2	AC-FT 21,650

PEAK DISCHARGE (BASE, 1,400 CFS).--Apr. 26 (2330) 1,540 cfs (7.95 ft); Aug. 26 (0330) 2,360 cfs (9.38 ft).

16717820 Manowaiopae Stream near Laupahoehoe

LOCATION.--Lat 19°58'35", long 155°14'45", Hawaii, on left bank 1.0 mile upstream from mouth, 1.2 miles south of Laupahoehoe, and 1.5 miles west of Papaaloa.

DRAINAGE AREA.--1.04 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 8.42 cfs (6,100 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,320 cfs Aug. 26 (gage height, 4.78 ft), from rating curve extended above 150 cfs; minimum, 0.60 cfs Dec. 9-14.
Period of record: Maximum discharge, 1,890 cfs Nov. 26, 1967 (gage height, 5.43 ft), from rating curve extended above 150 cfs; minimum, 0.11 cfs Oct. 13, 15, 16, 1965.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts from 0.02 to 0.15 cfs by pipeline from 5 springs along the stream above station for domestic use in the Laupahoehoe area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	1.2	.95	1.3	2.0	1.5	2.7	50	7.7	5.5	3.0	10
2	2.3	1.2	.95	1.4	1.9	1.5	2.3	19	7.5	4.4	2.9	9.3
3	2.2	1.2	.95	1.5	1.9	1.5	9.8	17	22	5.2	2.8	8.4
4	2.2	1.1	8.6	58	1.9	1.5	13	16	7.7	10	2.7	8.7
5	2.1	1.1	6.0	3.0	1.9	1.4	3.8	14	6.6	13	6.9	7.5
6	2.0	4.9	.67	2.7	1.9	1.4	2.0	12	6.3	19	3.6	7.0
7	2.0	6.6	.67	2.7	1.8	1.4	1.8	12	5.9	11	2.7	6.5
8	1.9	2.3	.66	2.7	1.8	1.4	2.0	12	5.6	16	2.6	6.2
9	1.9	1.3	.63	2.7	1.8	1.3	1.9	12	5.3	17	2.5	5.9
10	1.9	1.2	.64	2.6	2.1	1.3	9.1	22	5.2	26	2.4	5.7
11	1.8	1.2	.62	2.6	1.8	1.3	8.8	15	5.0	5.9	2.3	5.5
12	1.7	1.1	.60	2.6	1.7	1.3	9.9	10	4.8	5.8	2.3	5.2
13	1.7	1.1	.63	2.6	1.7	1.3	7.7	9.0	4.6	5.7	2.2	5.1
14	1.7	1.1	13	2.6	3.1	1.3	7.7	8.6	4.4	5.6	2.2	5.0
15	1.6	1.1	8.8	2.5	3.6	1.2	31	8.5	4.3	5.5	2.2	4.7
16	1.6	1.1	.91	2.5	2.0	1.2	11	8.1	4.2	8.0	2.1	4.7
17	1.6	1.1	.76	2.4	1.6	1.2	21	13	4.7	6.2	2.1	4.9
18	1.6	1.1	.72	2.4	1.2	1.2	6.3	18	5.5	6.0	2.1	4.7
19	1.5	1.1	.84	2.3	1.2	1.2	6.2	13	3.9	4.6	2.2	4.4
20	1.5	1.1	2.3	2.3	1.1	1.2	6.2	8.0	3.6	4.4	2.0	4.2
21	1.6	1.1	.80	2.2	1.0	1.1	19	7.2	3.5	4.3	2.1	4.4
22	1.5	1.1	.80	2.9	1.0	1.1	16	7.1	3.6	4.1	2.4	4.3
23	1.4	1.0	.80	45	1.0	5.4	102	7.0	3.3	4.0	2.7	3.8
24	1.4	1.0	.84	2.4	1.6	4.7	117	6.8	3.3	3.8	3.4	3.6
25	1.5	1.0	.86	2.2	1.6	1.2	16	6.8	4.0	3.7	377	3.5
26	1.4	1.0	12	2.2	1.6	1.1	50	58	2.9	3.6	271	3.4
27	1.3	1.0	1.2	2.1	1.6	1.1	34	37	2.8	3.6	25	3.3
28	1.3	1.0	1.2	2.1	1.6	1.1	15	28	2.8	3.4	24	3.2
29	1.3	1.0	1.2	2.1	------	1.1	39	8.8	2.6	3.3	15	3.3
30	1.3	.97	1.4	2.0	------	1.1	85	8.2	2.5	3.2	18	3.0
31	1.2	------	1.3	2.0	------	7.6	------	7.9	------	3.1	12	------
TOTAL	52.5	43.37	72.30	170.6	49.0	53.2	657.2	480.0	156.1	224.9	806.4	159.4
MEAN	1.69	1.45	2.33	5.50	1.75	1.72	21.9	15.5	5.20	7.25	26.0	5.31
MAX	2.5	6.6	13	58	3.6	7.6	117	58	22	26	377	10
MIN	1.2	.97	.60	1.3	1.0	1.1	1.8	6.8	2.5	3.1	2.0	3.0
AC-FT	104	86	143	338	97	106	1,300	952	310	446	1,600	316

CAL YR 1969 TOTAL 5,215.67 MEAN 14.3 MAX 247 MIN .60 AC-FT 10,350
WTR YR 1970 TOTAL 2,924.97 MEAN 8.01 MAX 377 MIN .60 AC-FT 5,800

PEAK DISCHARGE (BASE, 470 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
1- 4	0330	3.48	486	4-30	2400	3.91	706
4-24	0145	4.25	925	8-26	0615	4.78	1,320
4-26	2315	3.50	495				

16720000 Kawainui Stream near Kamuela

LOCATION.--Lat 20°05'18", long 155°40'58", Hawaii, on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 miles north of Kamuela.

DRAINAGE AREA.--1.58 sq mi.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 13.9 cfs (10,070 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 782 cfs Jan. 6 (gage height, 6.15 ft), from rating curve extended as explained below; minimum, 0.10 cfs Feb. 9, 10, Aug. 1.
Period of record: Maximum discharge, 2,400 cfs Jan. 11, 1967 (gage height, 9.15 ft), from rating curve extended above 53 cfs on basis of computation of peak flow over dam; minimum, 0.03 cfs Oct. 5, 6, 1965.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	.54	3.6	2.7	1.7	29	71	71	2.8	102	.14	7.2
2	4.3	.48	1.7	1.4	1.1	36	30	10	8.2	58	.27	13
3	2.3	.59	1.0	8.7	.81	9.0	35	3.5	5.2	59	2.2	4.7
4	1.5	.54	12	47	.64	4.3	36	2.2	4.7	67	8.3	29
5	1.1	1.1	86	.16	.50	2.1	55	1.4	2.4	43	41	18
6	.89	84	3.5	106	.38	3.5	15	1.4	1.6	72	18	24
7	.96	32	3.0	11	.28	33	24	21	4.8	36	18	12
8	2.0	7.5	4.4	2.3	.20	11	31	72	11	25	15	6.3
9	2.3	2.7	5.3	1.6	.13	3.2	16	61	5.7	48	5.9	3.0
10	1.1	1.4	39	.82	14	2.2	12	86	3.8	92	2.7	1.9
11	.73	.95	16	.48	5.6	1.3	24	30	5.1	4.1	2.8	1.3
12	.62	.63	2.9	28	1.9	4.3	30	27	15	13	14	.99
13	.60	.46	40	3.0	1.1	17	28	6.5	19	2.4	9.5	.82
14	.53	.34	72	51	.68	19	20	3.1	16	.77	6.8	.90
15	.44	.26	27	14	19	16	48	25	22	1.7	18	.82
16	.43	.19	5.8	3.1	6.0	8.7	33	22	9.8	24	10	.82
17	.40	.63	2.2	4.9	2.1	3.3	43	31	78	21	50	38
18	.36	.48	1.4	2.2	1.2	31	7.2	61	60	19	48	16
19	.30	.32	.94	1.2	.87	39	34	26	21	5.0	52	12
20	1.6	.25	2.3	.82	.60	23	9.6	23	4.3	1.2	17	5.5
21	2.2	.34	1.0	.54	.44	8.1	5.5	9.3	4.4	.42	6.7	16
22	3.1	.49	.68	1.7	.37	25	32	5.9	12	1.7	24	36
23	1.4	.65	.53	28	4.4	62	271	2.8	15	21	31	8.8
24	15	.51	.47	8.4	3.3	24	58	1.8	11	8.8	25	3.6
25	6.5	.43	.41	2.4	9.4	6.2	12	1.3	26	1.2	156	1.9
26	2.0	3.6	.37	2.2	6.3	3.0	60	42	6.5	3.3	144	1.3
27	1.2	4.1	.40	2.7	6.5	7.6	59	45	3.9	11	40	.99
28	1.2	1.3	5.3	2.4	3.2	9.7	7.6	44	55	5.7	65	.82
29	1.2	43	12	4.3	------	3.1	48	10	27	.85	25	.65
30	.90	11	11	8.7	------	7.7	123	7.0	11	.46	28	.54
31	.65	------	3.0	5.2	------	41	------	6.7	------	.39	13	------
TOTAL	79.81	200.78	365.20	356.92	92.70	493.3	1,277.9	759.9	472.2	748.99	897.31	266.85
MEAN	2.57	6.69	11.8	11.5	3.31	15.9	42.6	24.5	15.7	24.2	28.9	8.90
MAX	22	84	86	106	19	62	271	86	78	102	156	38
MIN	.30	.19	.37	.16	.13	1.3	5.5	1.3	1.6	.39	.14	.54
AC-FT	158	398	724	708	184	978	2,530	1,510	937	1,490	1,780	529

CAL YR 1969	TOTAL 6,414.45	MEAN 17.6	MAX 171	MIN .08	AC-FT 12,720
WTR YR 1970	TOTAL 6,011.86	MEAN 16.5	MAX 271	MIN .13	AC-FT 11,920

PEAK DISCHARGE (BASE, 440 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0145	5.62	616	7-10	0100	6.14	779
1- 6	1330	6.15	782	8-25	2400	5.39	547
4-23	0400	5.31	523				

16720300 Kawaiki Stream near Kamuela

LOCATION.--Lat 20°05'13", long 155°40'59", Hawaii, on right bank 0.2 mile upstream from Upper Hamakua ditch intake and 4.4 miles north of Kamuela.

DRAINAGE AREA.--0.45 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 190 cfs Apr. 23 (gage height, 3.90 ft), from rating curve extended above 33 cfs; minimum, 0.07 cfs Nov. 20, 25, Feb. 9, 10.
Period of record: Maximum discharge, 190 cfs Apr. 23, 1970 (gage height, 3.90 ft), from rating curve extended above 33 cfs; minimum, 0.03 cfs Nov. 12-15, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	.14	1.2	1.0	.43	8.2	18	17	.91	25	.69	1.7
2	.95	.11	.42	.41	.31	8.0	7.9	2.2	3.4	13	.96	3.1
3	.61	.19	.25	3.0	.24	2.2	10	.94	1.7	14	1.8	1.4
4	.48	.15	4.3	16	.20	1.1	10	.74	1.9	15	4.4	8.5
5	.42	.29	21	1.1	.15	.52	14	.63	.82	12	16	4.8
6	.36	18	.83	22	.11	1.3	3.8	.69	.64	19	7.3	6.9
7	.42	7.0	.89	2.2	.10	10	7.4	7.5	2.2	8.2	7.4	2.7
8	.76	1.4	1.5	.57	.08	2.1	7.5	19	3.4	6.7	5.6	1.6
9	.54	.52	1.6	.67	.07	.72	3.5	17	1.8	17	1.6	.95
10	.36	.31	11	.35	3.8	.58	4.6	22	1.2	23	.78	.76
11	.28	.23	3.3	.28	1.2	.36	7.0	7.6	2.1	1.9	1.0	.61
12	.28	.18	.71	7.5	.38	2.2	7.1	7.6	4.5	5.5	5.4	.61
13	.28	.15	11	.71	.23	4.7	8.0	1.8	5.8	1.5	2.5	.54
14	.24	.13	19	13	.17	7.5	6.0	1.1	5.3	.92	2.5	.61
15	.21	.10	6.0	2.8	4.6	5.0	12	9.3	7.2	1.7	4.3	.54
16	.18	.09	1.5	1.2	1.2	2.0	8.8	5.7	2.2	9.8	2.3	.55
17	.18	.21	.60	1.3	.42	.82	9.6	8.0	20	9.5	12	10
18	.18	.12	.41	.46	.24	6.6	2.2	14	15	7.1	12	4.0
19	.15	.09	.32	.32	.18	8.0	11	6.1	5.4	2.7	14	2.5
20	.32	.08	.59	.25	.13	6.4	2.3	7.2	1.0	1.2	4.4	.90
21	.68	.09	.32	.21	.10	2.0	1.6	2.4	1.7	.77	2.1	4.0
22	1.3	.16	.25	.77	.11	7.5	10	1.5	4.2	1.6	8.0	9.0
23	.42	.17	.22	8.2	1.8	18	65	.78	4.3	9.4	8.6	2.0
24	8.1	.10	.21	2.0	.84	6.0	14	.62	2.8	3.5	6.3	.85
25	1.9	.11	.19	.55	2.7	1.5	2.9	.57	7.7	1.6	43	.75
26	.54	1.5	.19	.96	2.0	.76	13	15	1.5	2.5	34	.70
27	.32	.95	.23	1.1	1.8	3.2	13	14	1.0	5.2	10	.60
28	.42	.28	2.0	.91	.95	2.8	1.9	13	14	2.5	17	.55
29	.48	12	3.2	1.7	------	.90	13	2.7	5.7	.95	7.8	.40
30	.28	2.7	3.0	2.4	------	2.3	29	2.6	2.1	.76	6.6	.30
31	.18	------	.93	1.2	------	9.9	------	2.3	------	.66	3.8	------
TOTAL	27.62	47.55	97.16	95.12	24.54	133.16	324.1	211.57	131.47	224.16	254.13	72.42
MEAN	.89	1.59	3.13	3.07	.88	4.30	10.8	6.82	4.38	7.23	8.20	2.41
MAX	8.1	18	21	22	4.6	18	65	22	20	25	43	10
MIN	.15	.08	.19	.21	.07	.36	1.6	.57	.64	.66	.69	.30
AC-FT	55	94	193	189	49	264	643	420	261	445	504	144

CAL YR 1969 TOTAL 1,774.88 MEAN 4.86 MAX 49 MIN .08 AC-FT 3,520
WTR YR 1970 TOTAL 1,643.00 MEAN 4.50 MAX 65 MIN .07 AC-FT 3,260

PEAK DISCHARGE (BASE, 90 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0145	3.78	178	4-26	1700	2.79	93
1- 6	1315	3.53	153	7-10	0100	3.48	148
4-23	1330	3.90	190	8-25	2300	3.14	119

16720500 Upper Hamakua ditch below Kawaiki Stream, near Kamuela

LOCATION.--Lat 20°05'15", long 155°40'42", Hawaii, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 miles north of Kamuela.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 9.64 cfs (6,980 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 49 cfs Nov. 2, 1967; minimum daily, 0.05 cfs Oct. 4-6, 1965.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	.56	5.4	3.9	2.1	14	27	27	3.9	27	1.9	10
2	5.4	.45	2.3	1.8	1.3	24	26	15	14	26	2.5	17
3	2.9	.67	1.4	2.8	1.0	14	26	4.8	8.2	27	7.5	6.5
4	1.9	.62	5.8	24	.78	5.9	24	3.1	7.8	27	14	22
5	1.4	1.0	21	6.6	.62	2.9	26	2.3	3.2	26	26	25
6	1.2	19	4.4	15	.50	6.1	22	2.4	2.3	27	24	21
7	1.3	26	4.3	10	.42	25	21	12	7.3	25	26	18
8	2.5	9.9	7.0	3.1	.38	14	23	27	18	24	24	9.3
9	3.0	3.4	7.7	2.7	.34	4.3	19	26	8.6	22	8.1	3.8
10	1.4	1.8	24	1.5	16	3.1	13	27	5.4	26	3.2	2.7
11	.94	1.2	17	1.0	7.5	1.7	26	25	8.1	13	3.6	1.9
12	.84	.84	3.8	13	2.3	5.9	24	25	22	20	16	1.4
13	.84	.72	19	4.1	1.2	19	25	9.8	19	8.4	14	1.3
14	.72	.62	26	12	.78	18	23	4.8	20	4.0	10	1.3
15	.62	.50	21	9.7	22	20	26	25	19	7.2	24	1.3
16	.56	.42	8.8	4.6	7.9	13	26	24	14	23	14	1.2
17	.56	.89	3.1	6.2	2.5	4.4	23	21	23	18	26	16
18	.50	.72	1.9	2.5	1.4	21	11	26	27	26	26	19
19	.45	.56	1.3	1.4	.84	24	19	24	22	15	26	19
20	2.0	.45	3.0	1.0	.62	23	15	24	5.9	5.4	20	8.2
21	3.1	.45	1.4	.78	.50	13	8.7	16	6.9	3.0	10	9.8
22	4.4	.67	.94	1.9	.56	23	25	9.2	19	7.6	25	26
23	1.8	.89	.78	20	7.2	23	27	3.5	18	26	26	14
24	9.3	.72	.78	8.3	4.4	22	27	2.4	15	16	24	4.7
25	9.8	.67	.67	2.9	14	8.9	19	2.0	25	6.8	27	2.5
26	2.5	5.8	.62	3.2	9.8	3.8	17	23	9.6	10	27	1.7
27	1.4	5.7	.72	3.6	9.6	12	27	26	5.3	18	26	1.4
28	1.4	1.8	8.6	3.5	4.3	14	13	26	26	13	27	1.2
29	1.6	19	17	6.9	------	4.3	26	16	23	4.0	26	.94
30	.94	16	16	13	------	12	27	12	15	3.0	23	.84
31	.72	------	4.3	7.2	------	24	------	11	------	2.5	18	------
TOTAL	85.99	122.02	240.01	198.18	120.84	423.3	661.7	502.3	421.5	506.9	575.8	268.98
MEAN	2.77	4.07	7.74	6.39	4.32	13.7	22.1	16.2	14.1	16.4	18.6	8.97
MAX	20	26	26	24	22	25	27	27	27	27	27	26
MIN	.45	.42	.62	.78	.34	1.7	8.7	2.0	2.3	2.5	1.9	.84
AC-FT	171	242	476	393	240	840	1,310	996	836	1,010	1,140	534

CAL YR 1969 TOTAL 3,587.00 MEAN 9.83 MAX 27 MIN .42 AC-FT 7,110
WTR YR 1970 TOTAL 4,127.52 MEAN 11.3 MAX 27 MIN .34 AC-FT 8,190

16724800 Upper Hamakua ditch above Alakahi Stream, near Kamuela

LOCATION.--Lat 20°04'31", long 155°40'26", Hawaii, on right bank 0.1 mile upstream from Alakahi Stream and 3.6 miles north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,890 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 30 cfs Apr. 12, 1969; no flow at times each year.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	.01	3.7	2.7	1.3	8.1	21	25	3.6	23	1.8	8.7
2	4.7	0	1.1	.94	.68	16	20	14	10	22	2.1	13
3	2.2	0	.52	1.5	.44	8.5	20	5.1	6.5	23	5.3	5.7
4	1.4	0	3.3	20	.26	4.2	19	3.3	6.1	23	10	17
5	1.0	.11	19	5.1	.10	1.7	21	2.3	2.7	22	21	20
6	.80	15	3.6	13	.01	2.6	17	2.3	1.9	24	19	17
7	.84	21	2.9	8.3	0	15	15	10	4.9	21	21	14
8	1.5	7.8	4.3	2.5	0	9.5	17	23	13	20	20	7.5
9	2.0	2.4	4.9	2.0	0	2.8	14	23	6.2	20	7.1	3.5
10	.86	1.0	17	1.0	9.1	1.8	9.3	24	4.2	25	2.9	2.4
11	.57	.58	13	.63	5.0	.86	19	22	5.2	11	2.8	1.7
12	.44	.33	3.1	8.9	1.3	2.7	18	22	15	17	11	1.3
13	.38	.16	15	3.3	.50	12	19	8.9	14	7.8	10	1.0
14	.28	.06	22	8.9	.20	11	17	4.4	15	4.2	7.2	.97
15	.15	0	17	8.2	12	12	21	20	14	6.0	17	.98
16	.07	0	6.8	2.8	5.3	8.4	20	20	11	19	10	.85
17	.02	.10	2.3	4.6	1.4	2.9	18	17	18	15	20	11
18	0	.03	1.2	1.8	.59	14	7.6	23	23	22	22	13
19	0	0	.82	.91	.29	16	16	20	18	13	22	13
20	.50	0	1.9	.56	.09	16	12	20	4.9	5.3	16	5.4
21	1.8	0	.84	.35	.01	8.4	5.6	12	5.2	3.1	7.8	7.8
22	2.5	0	.53	.83	.01	16	19	7.1	15	5.4	20	19
23	.80	0	.35	13	3.2	18	29	3.3	13	20	21	10
24	8.0	0	.26	6.0	2.4	17	24	2.2	11	14	19	3.7
25	7.5	0	.18	1.9	7.0	6.3	16	1.8	20	5.3	26	1.8
26	1.4	1.7	.11	1.9	5.3	2.9	15	19	7.2	8.8	27	1.2
27	.69	3.2	.11	2.6	5.5	7.1	24	23	3.9	13	24	.98
28	.60	.66	4.6	2.3	2.3	10	11	23	20	12	26	.83
29	.73	13	10	3.5	------	3.1	23	14	19	3.7	24	.67
30	.35	11	10	8.0	------	6.9	25	9.6	11	2.5	21	.54
31	.13	------	2.8	4.9	------	17	------	9.3	------	2.2	15	------
TOTAL	59.21	78.14	173.22	142.92	64.28	278.76	532.5	433.6	322.5	433.3	479.0	204.52
MEAN	1.91	2.60	5.59	4.61	2.30	8.99	17.8	14.0	10.8	14.0	15.5	6.82
MAX	17	21	22	20	12	18	29	25	23	25	27	20
MIN	0	0	.11	.35	0	.86	5.6	1.8	1.9	2.2	1.8	.54
AC-FT	117	155	344	283	127	553	1,060	860	640	859	950	406

CAL YR 1969 TOTAL 3,049.64 MEAN 8.36 MAX 30 MIN 0 AC-FT 6,050
WTR YR 1970 TOTAL 3,201.95 MEAN 8.77 MAX 29 MIN 0 AC-FT 6,350

16725000 Alakahi Stream near Kamuela

LOCATION.--Lat 20°04'27", long 155°40'25", Hawaii, on right bank 25 ft upstream from Upper Hamakua ditch intake and 3.5 miles north of Kamuela.

DRAINAGE AREA.--0.87 sq mi.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,900 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 6.80 cfs (4,930 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 199 cfs Dec. 5 (gage height, 5.06 ft), from rating curve extended as explained below; minimum, 0.14 cfs Feb. 6, 7.
Period of record: Maximum discharge, 1,420 cfs Jan. 11, 1967 (gage height, 8.65 ft), from rating curve extended above 28 cfs on basis of computation of peak flow over dam; minimum, 0.03 cfs on several days in 1965.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mile above station for ranch use in Kamuela area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	.33	3.9	2.1	.90	10	28	23	2.6	35	2.1	4.6
2	2.6	.27	1.4	.98	.46	12	15	4.8	5.3	25	2.6	5.2
3	1.5	.31	.78	1.8	.36	4.7	23	3.0	4.0	24	3.1	3.8
4	1.2	.29	3.4	22	.29	2.7	11	2.4	3.7	28	6.2	14
5	.95	.27	27	2.9	.22	1.3	5.4	1.9	2.2	18	27	7.8
6	.75	19	2.2	26	.15	1.3	13	1.8	1.6	31	14	13
7	.80	11	1.4	5.9	.18	14	13	14	3.0	16	12	8.4
8	.85	3.3	1.7	2.0	.26	5.0	4.6	33	5.6	13	10	4.5
9	1.3	1.4	1.7	1.6	.26	2.0	12	25	3.3	22	4.4	3.2
10	.65	.78	14	1.0	2.9	1.4	16	33	2.8	34	2.8	2.6
11	.39	.48	7.5	.68	2.2	.85	15	13	2.9	4.6	2.5	2.2
12	.36	.38	1.7	11	.90	1.8	10	12	6.2	9.3	9.2	1.9
13	.39	.34	16	2.1	.46	8.2	15	4.0	10	3.9	5.7	1.7
14	.46	.29	29	17	.40	12	8.2	3.0	10	2.9	4.8	1.6
15	.43	.24	12	7.2	5.0	8.3	19	15	11	3.5	8.0	1.6
16	.39	.22	3.1	2.1	2.6	4.3	14	9.2	5.1	16	5.3	1.6
17	.39	.24	1.6	3.1	1.0	2.0	14	12	26	14	17	6.5
18	.39	.23	.91	1.3	.60	7.6	4.3	22	24	14	21	13
19	.39	.22	.73	.81	.46	10	17	9.8	12	6.3	27	7.3
20	.50	.22	.90	.50	.36	10	4.3	12	3.4	3.7	11	4.0
21	1.3	.22	.65	.37	.32	4.0	3.0	4.8	3.3	2.7	4.8	3.3
22	2.1	.24	.47	.55	.36	13	20	3.4	7.5	2.9	16	25
23	1.1	.23	.41	12	1.5	27	78	2.4	6.2	13	15	7.0
24	11	.21	.38	4.2	1.9	15	20	1.7	5.2	8.9	14	4.0
25	4.7	.22	.36	1.4	2.8	3.6	5.5	1.4	14	4.0	47	2.6
26	1.5	.78	.34	1.0	2.4	2.3	23	22	4.1	5.0	59	2.0
27	.85	1.8	.34	1.5	2.9	4.2	16	26	2.7	8.2	25	1.8
28	.70	.64	1.5	1.6	1.4	6.0	4.5	25	21	5.3	30	1.6
29	1.0	19	3.3	1.2	------	2.4	22	5.8	11	3.0	20	1.4
30	.65	6.8	4.8	3.0	------	2.8	40	4.8	4.3	2.2	15	1.3
31	.46	------	2.0	2.3	------	15	------	5.0	------	1.9	7.7	------
TOTAL	51.05	69.95	145.47	141.19	33.54	214.75	493.8	356.2	224.0	381.3	449.2	158.5
MEAN	1.65	2.33	4.69	4.55	1.20	6.93	16.5	11.5	7.47	12.3	14.5	5.28
MAX	11	19	29	26	5.0	27	78	33	26	35	59	25
MIN	.36	.21	.34	.37	.15	.85	3.0	1.4	1.6	1.9	2.1	1.3
AC-FT	101	139	289	280	67	426	979	707	444	756	891	314

CAL YR 1969 TOTAL 3,066.83 MEAN 8.40 MAX 60 MIN .21 AC-FT 6,080
WTR YR 1970 TOTAL 2,718.95 MEAN 7.45 MAX 78 MIN .15 AC-FT 5,390

PEAK DISCHARGE (BASE, 93 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0145	5.06	199	7-10	0030	4.47	126
1- 6	1345	4.46	125	8-26	0145	4.72	153
4-23	1100	4.83	167				

16733000 Lower Hamakua ditch wasteway near Kukuihaele

LOCATION.--Lat 20°07'07", long 155°35'09", Hawaii, on left bank 50 ft downstream from Lower Hamakua ditch, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 980 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 2.42 cfs (1,750 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 19 cfs Dec. 30, 1965, Jan. 2, 1966; no flow most of the time each year.

REMARKS.--Records good except those for period of no gage-height record, which are fair. The wasteway diverts excess water from Lower Hamakua ditch (see sta 16733100).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	0	0	0	0	0	7.4	5.7	0	5.3	0	0
2	2.4	0	0	0	0	6.1	5.9	1.2	0	11	0	0
3	0	0	0	0	0	0	4.5	0	0	5.6	0	0
4	0	0	0	0	0	0	6.5	0	0	6.3	2.6	2.0
5	0	0	0	0	0	0	5.5	0	0	2.2	12	.96
6	0	3.8	0	3.0	0	0	1.4	0	0	0	4.3	0
7	0	2.5	0	1.8	0	7.2	0	1.8	0	0	.34	0
8	0	0	0	0	0	8.5	.49	12	0	0	0	0
9	0	0	0	0	0	.67	1.5	11	0	1.5	0	0
10	0	0	6.0	0	4.3	0	0	9.0	0	5.5	0	0
11	0	0	9.0	0	2.4	0	5.0	4.4	0	0	0	0
12	0	0	2.0	0	0	0	5.7	2.8	0	0	0	0
13	0	0	3.0	0	0	8.2	5.7	0	4.1	1.0	0	0
14	0	0	3.0	0	0	5.5	2.4	0	12	8.0	0	0
15	0	0	3.0	0	5.8	9.6	6.9	4.3	7.2	5.7	0	0
16	0	0	2.0	0	4.2	6.5	6.0	5.7	4.6	7.6	0	0
17	0	0	1.0	0	.08	1.9	7.6	2.2	4.7	7.6	0	0
18	0	0	0	0	0	6.8	.32	6.0	9.1	6.8	.86	0
19	0	0	0	0	0	6.6	0	6.7	6.7	3.5	5.0	0
20	0	0	0	0	0	9.3	0	0	0	0	0	0
21	.91	0	0	0	0	2.1	0	0	0	0	0	0
22	0	0	0	.82	0	4.1	3.2	.03	0	0	0	0
23	0	0	0	9.1	0	6.2	8.0	0	0	5.0	0	0
24	1.4	0	0	7.8	0	8.6	0	0	0	7.1	0	0
25	3.0	0	0	.84	0	2.3	0	0	6.7	3.8	5.4	0
26	0	0	0	0	0	0	0	4.4	5.0	7.9	.77	0
27	0	0	0	0	0	0	0	5.0	0	3.6	1.8	0
28	0	0	0	0	0	0	0	7.6	7.0	4.3	11	0
29	0	6.0	1.0	0	------	0	8.6	3.5	9.3	.89	11	0
30	0	7.5	3.0	0	------	0	9.4	0	.64	0	9.6	0
31	0	------	0	0	------	4.3	------	0	------	0	2.3	------
TOTAL	14.71	19.8	33.0	23.36	16.78	104.47	102.01	93.33	77.04	110.19	66.97	2.96
MEAN	.47	.66	1.06	.75	.60	3.37	3.40	3.01	2.57	3.55	2.16	.099
MAX	7.0	7.5	9.0	9.1	5.8	9.6	9.4	12	12	11	12	2.0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	29	39	65	46	33	207	202	185	153	219	133	5.9

CAL YR 1969 TOTAL 1,296.59 MEAN 3.55 MAX 16 MIN 0 AC-FT 2,570
WTR YR 1970 TOTAL 664.62 MEAN 1.82 MAX 12 MIN 0 AC-FT 1,320

NOTE.--No gage-height record Dec. 3 to Jan. 6.

16733100 Lower Hamakua ditch below main weir, near Kukuihaele

LOCATION.--Lat 20°07'07", long 155°35'09", Hawaii, on left bank 30 ft upstream from main weir, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 990 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 46.1 cfs (33,400 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 68 cfs Mar. 2, 1964; minimum daily, 0.08 cfs Dec. 6, 1965.

REMARKS.--Records good. At high flow, water can be diverted from the ditch 0.1 mile upstream and at the gage (see sta 1673300D) to prevent flume damage downstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	44	45	40	39	44	54	56	46	62	53	53
2	50	44	39	36	38	50	53	54	48	56	53	54
3	46	45	38	36	37	43	52	52	48	57	52	56
4	44	44	41	34	37	40	53	48	48	56	56	54
5	44	44	44	28	37	39	54	50	44	52	56	56
6	46	50	37	37	36	41	51	53	43	57	54	57
7	51	53	35	42	36	54	52	56	44	51	56	54
8	50	45	37	39	36	51	56	57	53	51	56	53
9	51	42	42	37	36	43	53	56	46	56	53	51
10	50	44	52	36	44	41	50	56	45	56	50	50
11	48	42	53	31	39	40	56	53	45	47	48	47
12	48	43	44	33	36	40	53	53	53	48	52	46
13	48	43	47	41	35	53	54	52	57	50	54	46
14	47	44	47	32	34	52	53	51	52	58	50	46
15	47	42	46	46	44	54	54	54	56	57	56	46
16	46	40	46	39	40	52	56	53	56	58	52	45
17	46	43	45	40	36	43	56	54	52	58	56	52
18	46	45	18	37	35	51	51	57	56	56	58	53
19	46	45	23	36	35	53	54	53	57	56	56	52
20	48	45	42	36	34	56	44	57	47	56	54	48
21	53	45	39	35	34	50	52	54	46	56	51	48
22	56	45	37	38	35	57	58	51	56	58	54	54
23	48	45	36	51	41	57	57	47	51	59	54	50
24	50	44	36	42	41	52	47	47	53	58	54	46
25	51	44	36	37	41	46	45	46	57	57	51	44
26	47	47	36	35	42	41	46	54	52	57	35	43
27	45	42	36	37	45	45	45	56	52	58	41	42
28	46	37	39	38	39	52	56	56	57	58	58	42
29	46	48	44	38	------	41	57	54	56	57	56	41
30	45	47	48	44	------	41	59	53	54	54	52	44
31	45	------	39	44	------	53	------	52	------	53	54	------
TOTAL	1,491	1,331	1,247	1,175	1,062	1,475	1,501	1,645	1,530	1,723	1,635	1,473
MEAN	48.1	44.4	40.2	37.9	37.9	47.6	52.7	53.1	51.0	55.6	52.7	49.1
MAX	57	53	53	51	45	57	59	57	57	62	58	57
MIN	44	37	18	28	34	39	44	46	43	47	35	41
AC-FT	2,960	2,640	2,470	2,330	2,110	2,930	3,140	3,260	3,030	3,420	3,240	2,920

CAL YR 1969 TOTAL 18,121 MEAN 49.6 MAX 62 MIN 18 AC-FT 35,940
WTR YR 1970 TOTAL 17,368 MEAN 47.6 MAX 62 MIN 18 AC-FT 34,450

16733200 Honokaa diversion at Honokaa

LOCATION.--Lat 20°05'12", long 155°28'36", Hawaii, on left bank 50 ft downstream from Lower Hamakua ditch and 0.5 mile northwest of Honokaa Hospital.

PERIOD OF RECORD.--March 1964 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 950 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 15.7 cfs (11,370 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 23 cfs Apr. 25, May 22, 1964; no flow Dec. 8, 1965.

REMARKS.--Records good. The diversion is from Lower Hamakua ditch (see sta 16733300) for use in Honokaa Sugar Co. mill.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	16	14	14	14	13	19	20	18	18	18	18
2	19	16	14	14	14	16	19	20	17	17	18	17
3	19	15	13	14	13	16	19	19	16	17	17	17
4	17	15	13	14	13	16	19	20	16	17	16	17
5	16	16	14	12	13	15	19	19	16	17	17	17
6	16	17	13	15	13	15	19	19	16	17	18	17
7	17	20	13	12	13	16	18	19	16	17	19	17
8	16	19	13	12	12	17	19	19	16	17	19	17
9	16	17	14	12	12	16	19	20	16	17	19	17
10	16	16	16	12	14	16	18	20	16	18	16	16
11	16	16	17	12	15	16	18	20	15	17	16	16
12	16	16	16	11	13	16	18	20	16	17	16	16
13	16	16	16	13	12	18	18	20	17	16	16	16
14	16	16	16	11	12	18	18	20	17	17	16	15
15	16	16	16	13	13	17	18	20	17	17	16	16
16	16	16	16	14	13	20	18	20	18	18	16	16
17	16	16	16	13	12	18	18	20	17	19	16	16
18	16	16	12	16	12	18	18	20	18	19	16	17
19	16	16	6.6	14	12	19	18	19	18	19	16	17
20	16	16	16	13	12	20	16	20	15	18	17	17
21	18	16	15	13	12	19	17	20	14	17	16	16
22	19	16	14	13	12	20	18	19	16	18	16	18
23	19	16	14	16	13	20	20	19	16	18	16	18
24	17	16	14	16	13	20	19	19	17	18	16	17
25	16	15	14	15	13	18	17	18	17	18	18	15
26	16	14	14	13	13	16	17	18	17	18	14	15
27	16	14	14	13	13	16	16	18	17	18	14	15
28	16	14	14	13	13	16	18	19	17	18	20	15
29	16	14	14	14	------	16	19	19	18	18	20	15
30	16	14	14	16	------	15	20	19	18	18	20	15
31	16	------	14	16	------	18	------	19	------	17	20	------
TOTAL	517	476	439.6	419	359	530	547	601	498	545	528	491
MEAN	16.7	15.9	14.2	13.5	12.8	17.1	18.2	19.4	16.6	17.6	17.0	16.4
MAX	20	20	17	16	15	20	20	20	18	19	20	18
MIN	16	14	6.6	11	12	13	16	18	14	16	14	15
AC-FT	1,030	944	872	831	712	1,050	1,080	1,190	988	1,080	1,050	974

CAL YR 1969 TOTAL 6,153.6 MEAN 16.9 MAX 20 MIN 6.6 AC-FT 12,210
WTR YR 1970 TOTAL 5,950.6 MEAN 16.3 MAX 20 MIN 6.6 AC-FT 11,800

16733300 Lower Hamakua ditch below Honokaa diversion, at Honokaa

LOCATION.--Lat 20°05'12", long 155°28'34", Hawaii, on right bank 50 ft downstream from tunnel, 100 ft downstream from Honokaa diversion, and 0.5 mile northwest of Honokaa Hospital.

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 950 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 23.5 cfs (17,030 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 40 cfs May 19, 1968; no flow Dec. 7, 8, 1965, Apr. 16, 1967.

REMARKS.--Records good. Excess water is spilled at wasteway 8.5 miles above station (see sta 16733000) and water for Honokaa Sugar Co. mill is diverted 100 ft above station (see sta 16733200).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	24	28	22	21	22	28	29	25	32	28	30
2	28	24	23	19	20	27	28	28	26	32	30	30
3	24	25	21	18	19	23	28	26	28	32	28	33
4	24	25	20	18	19	18	28	24	28	31	29	33
5	24	25	29	13	19	19	28	24	26	28	30	33
6	25	26	21	18	19	19	28	27	24	32	30	33
7	29	29	18	24	18	26	26	27	24	28	31	33
8	28	25	19	23	19	28	28	31	30	24	31	31
9	29	22	24	20	18	22	28	30	26	28	29	29
10	28	25	26	19	22	21	25	31	25	33	28	28
11	27	24	31	18	21	18	29	28	25	26	28	27
12	27	24	24	13	19	18	29	28	31	26	29	27
13	27	24	25	25	18	26	29	27	28	24	33	27
14	26	24	26	16	18	26	29	26	29	32	28	26
15	26	22	25	26	24	28	30	28	29	32	32	25
16	26	20	25	22	23	27	30	28	31	33	31	23
17	26	21	24	21	20	21	31	27	28	30	30	25
18	25	24	13	16	18	26	28	30	32	31	32	29
19	25	24	6.7	16	18	24	29	28	31	30	30	29
20	25	24	21	17	18	28	23	30	28	28	29	28
21	27	24	19	17	18	25	26	29	27	26	27	25
22	29	24	18	18	18	26	31	27	31	28	30	28
23	25	24	18	29	21	28	30	24	28	29	31	26
24	26	24	18	23	22	27	26	24	29	29	30	25
25	31	24	18	18	22	24	25	24	32	31	30	23
26	28	28	18	17	22	22	24	29	29	32	24	23
27	26	24	18	18	25	20	24	31	29	31	20	23
28	26	21	20	19	21	29	28	32	32	32	30	22
29	26	26	23	20	------	21	31	29	32	31	31	20
30	25	31	27	23	------	21	33	29	30	29	28	21
31	25	------	22	25	------	27	------	28	------	28	28	------
TOTAL	824	731	668.7	611	560	737	840	863	853	918	905	815
MEAN	26.6	24.4	21.6	19.7	20.0	23.8	28.0	27.8	28.4	29.6	29.2	27.2
MAX	31	31	31	29	25	29	33	32	32	33	33	33
MIN	24	20	6.7	13	18	18	23	24	24	24	20	20
AC-FT	1,630	1,450	1,330	1,210	1,110	1,460	1,670	1,710	1,690	1,820	1,800	1,620

CAL YR 1969 TOTAL 9,923.7 MEAN 27.2 MAX 36 MIN 6.7 AC-FT 19,680
WTR YR 1970 TOTAL 9,325.7 MEAN 25.5 MAX 33 MIN 6.7 AC-FT 18,500

16743000 Awini ditch at East Honokane Iki Gulch, near Niulii

LOCATION.--Lat 20°09'55", long 155°43'10", Hawaii, at upper end of flume across East Honokane Iki Gulch and 4.5 miles southeast of Niulii.

PERIOD OF RECORD.--October 1927 to June 1938, September 1938 to June 1949, July 1950 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

AVERAGE DISCHARGE.--40 years (1927-37, 1938-48, 1950-70), 17.9 cfs (12,970 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 58 cfs Nov. 2, 1967, Dec. 13, 1968; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts at altitude 2,000 ft from all streams between the Waikoloa and the Honokane for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	3.1	14	13	6.4	20	32	23	20	43	12	12
2	18	2.7	9.1	12	5.1	18	22	11	22	43	20	13
3	12	4.2	6.8	11	4.7	9.5	28	9.2	22	42	15	11
4	9.7	4.2	18	35	4.4	9.2	25	8.4	20	41	17	17
5	8.4	3.5	36	11	4.1	9.5	32	8.0	16	34	33	13
6	7.4	31	14	21	3.9	9.0	16	8.0	14	40	24	12
7	8.3	40	14	12	3.8	20	15	17	13	36	25	12
8	7.3	21	11	7.6	3.7	13	22	40	21	30	24	12
9	8.1	11	9.8	6.4	3.6	9.0	22	36	18	36	17	10
10	6.7	6.9	20	5.2	22	8.0	11	38	16	38	13	9.2
11	5.7	5.2	20	4.6	8.5	7.5	15	36	18	21	12	8.5
12	5.1	4.4	10	9.3	5.8	6.5	21	37	32	24	16	8.0
13	5.0	3.8	33	6.8	4.5	10	17	32	32	19	18	7.6
14	4.4	3.1	46	8.8	5.7	12	13	28	35	15	13	7.7
15	4.1	2.7	28	10	30	15	40	38	34	15	20	7.7
16	3.9	2.4	16	6.4	10	10	40	38	28	29	18	7.7
17	3.8	2.4	12	6.7	7.0	9.0	37	34	38	28	24	17
18	3.6	2.2	9.7	5.2	5.2	18	26	44	44	34	31	14
19	3.1	1.7	9.1	4.5	4.5	12	32	40	33	23	32	12
20	3.9	1.5	20	4.0	4.2	15	22	36	22	18	22	11
21	12	2.3	10	3.8	3.9	10	17	32	18	15	18	14
22	12	2.5	7.7	20	5.5	10	28	27	26	15	23	18
23	6.4	2.6	6.7	34	10	20	42	22	26	24	23	11
24	15	2.8	6.2	15	7.6	17	35	18	23	20	24	10
25	23	2.5	5.7	8.4	8.4	10	17	17	33	16	39	8.4
26	9.8	9.4	5.3	7.7	8.5	8.7	18	36	23	21	34	6.7
27	5.7	10	5.0	9.8	9.8	11	20	42	19	17	24	5.8
28	7.8	5.3	8.8	7.6	6.4	12	10	44	38	20	31	5.3
29	12	37	17	6.2	------	8.5	20	32	33	14	20	4.9
30	5.8	29	23	9.1	------	9.8	34	28	23	12	19	5.9
31	4.0	------	11	9.5	------	16	------	25	------	16	14	------
TOTAL	270.0	260.4	462.9	331.6	207.2	373.2	729	884.6	760	799	675	312.4
MEAN	8.71	8.68	14.9	10.7	7.40	12.0	24.3	28.5	25.3	25.8	21.8	10.4
MAX	28	40	46	35	30	20	42	44	44	43	39	18
MIN	3.1	1.5	5.0	3.8	3.6	6.5	10	8.0	13	12	12	4.9
AC-FT	536	517	918	658	411	740	1,450	1,750	1,510	1,580	1,340	620

CAL YR 1969 TOTAL 6,263.0 MEAN 17.2 MAX 55 MIN 1.5 AC-FT 12,420
WTR YR 1970 TOTAL 6,065.3 MEAN 16.6 MAX 46 MIN 1.5 AC-FT 12,030

NOTE.--No gage-height record Apr. 9 to May 27.

16744000 East Honokane Iki intake to Awini ditch near Niulii

LOCATION.--Lat 20°09'55", long 155°43'15", Hawaii, on intake tunnel leading from East Branch Honokane Iki Stream to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

PERIOD OF RECORD.--October 1927 to May 1928, July 1928 to December 1936, July 1937 to June 1938, July 1939 to July 1940, September 1940 to June 1949, July 1951 to current year. Prior to July 1960, published as "at East Honokane Iki Gulch, near Niulii."

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

AVERAGE DISCHARGE.--35 years (1928-36, 1940-48, 1951-70), 1.76 cfs (1,280 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 13.0 cfs Aug. 6, 1957; no flow at times.

REMARKS.--Records good. Records are of diversion from East Branch Honokane Iki Stream to Awini ditch (see sta 16743000) for irrigation in vicinity of Kohala.

REVISIONS (FISCAL YEARS).--WSP 725: 1928-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	.05	.84	.49	.54	1.4	6.4	1.8	.91	8.3	.48	.05
2	.66	.05	.44	.39	.44	.66	4.1	1.2	1.2	5.7	1.5	.05
3	.39	.05	.29	2.0	.34	.44	4.9	1.0	.97	5.7	.60	.05
4	.24	.05	1.3	3.1	.29	.39	3.8	.97	.72	5.3	1.2	.16
5	.20	.05	1.2	1.2	.24	.39	5.0	.91	.54	3.9	3.1	.05
6	.16	2.6	.60	1.6	.20	.39	2.8	.84	.44	5.0	2.2	.05
7	.20	2.8	.54	1.2	.20	.78	2.8	.97	.39	2.8	2.2	.07
8	.20	1.6	.54	.97	.16	.44	4.1	1.0	.49	2.8	2.2	.10
9	.16	.60	.54	.84	.13	.34	2.9	.91	.39	3.5	1.1	.10
10	.16	.34	.72	.72	4.3	.29	1.8	.66	.29	2.6	.66	.07
11	.13	.20	.66	.60	1.3	.29	2.7	.54	1.1	1.4	.54	.07
12	.10	.16	.60	.34	.49	.34	2.6	.49	2.9	1.4	1.2	.07
13	.10	.13	.92	.16	.29	.39	2.4	.39	4.1	.97	1.4	.10
14	.07	.10	.84	.13	.42	.44	3.4	.34	3.7	.91	.72	.13
15	.07	.10	.54	.07	2.9	.54	7.0	3.0	4.2	.91	1.9	.16
16	.07	.07	.49	.05	.91	.44	4.8	3.5	1.8	1.6	1.4	.16
17	.07	.07	.84	.05	.66	.39	4.0	3.8	7.3	1.6	2.4	.44
18	.05	.07	.91	.05	.44	.71	2.5	5.4	6.8	1.8	2.9	1.0
19	.05	.05	1.9	.05	.34	.39	2.7	3.1	3.0	1.1	2.9	1.8
20	.42	.05	3.5	.05	.29	.34	1.8	2.8	1.0	.72	2.0	.91
21	.90	.05	.97	.03	.24	.20	1.6	2.0	.66	.39	1.4	2.1
22	.66	.05	.66	.55	.39	.24	1.9	1.5	1.5	.29	2.1	3.0
23	.20	.05	.54	.78	1.1	.73	3.5	1.1	1.4	1.5	2.3	.72
24	1.5	.05	.44	.39	.72	1.5	1.2	.84	.97	.90	2.3	.29
25	1.5	.05	.44	.29	.78	1.4	.78	.78	3.4	.50	3.0	.20
26	.39	.10	.39	.29	.72	.91	1.9	6.8	.91	.80	1.0	.15
27	.20	.16	.34	.72	.97	1.7	.42	6.4	.70	.50	.24	.10
28	.36	.13	.91	.84	.44	1.6	.05	8.0	6.7	.90	.39	.07
29	.66	4.5	2.5	.54	------	.72	4.5	2.0	3.6	.60	.13	.05
30	.20	1.7	3.2	1.6	------	1.1	7.3	1.8	1.0	.49	.10	.20
31	.10	------	.72	1.5	------	3.7	------	1.3	------	1.2	.05	------
TOTAL	12.17	16.03	29.32	21.59	20.24	23.59	95.65	66.14	63.08	66.08	45.61	12.47
MEAN	.39	.53	.95	.70	.72	.76	3.19	2.13	2.10	2.13	1.47	.42
MAX	2.0	4.5	3.5	3.1	4.3	3.7	7.3	8.0	7.3	8.3	3.1	3.0
MIN	.05	.05	.29	.03	.13	.20	.05	.34	.29	.29	.05	.05
AC-FT	24	32	58	43	40	47	190	131	125	131	90	25

CAL YR 1969 TOTAL 503.76 MEAN 1.38 MAX 10 MIN .03 AC-FT 999
WTR YR 1970 TOTAL 471.97 MEAN 1.29 MAX 8.3 MIN .03 AC-FT 936

16745500 Awini ditch at Awini weir, near Kohala

LOCATION.--Lat 20°08'20", long 155°43'55", Hawaii, on right bank at Awini weir, 6 miles south of Niulii, and 8 miles southeast of Kohala.

PERIOD OF RECORD.--July 1907 to June 1917 (published as Kohala ditch at Awini weir, near Kohala), May 1963 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 1,840 ft (from topographic map). July 1, 1907, to June 30, 1917, nonrecording gage at same site at different datum.

AVERAGE DISCHARGE.--16 years (1907-16, 1963-70), 19.4 cfs (14,060 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 56 cfs May 20, 24, 1964; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts at altitude 2,000 ft from all streams between the Waikoloa and the Honokane and empties into Kohala ditch (see sta 16750900) for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	1.4	14	14	6.1	17	37	28	25	47	12	12
2	22	1.1	8.3	13	4.9	21	31	12	28	48	25	14
3	13	2.0	6.7	12	4.4	10	35	9.4	26	47	18	12
4	10	3.0	14	39	3.8	9.4	32	8.6	22	47	21	19
5	8.6	2.7	40	12	3.5	10	36	8.0	19	41	36	14
6	7.0	25	14	25	3.3	8.3	22	8.0	16	45	30	12
7	6.1	41	15	14	3.0	23	20	20	14	43	30	12
8	5.5	25	12	7.0	3.0	14	27	46	23	36	29	13
9	6.1	11	10	6.0	2.7	9.4	27	41	20	41	20	11
10	4.9	6.7	24	4.5	21	7.7	13	43	18	42	15	9.8
11	3.8	4.9	24	3.5	7.7	5.5	17	40	19	27	13	9.0
12	3.3	4.1	12	10	3.8	4.9	25	41	39	30	18	8.0
13	3.0	2.7	37	6.0	2.5	12	20	36	37	25	22	7.7
14	2.2	1.1	50	9.0	2.5	14	15	32	42	19	15	7.7
15	2.0	.93	30	12	26	17	44	44	39	18	24	7.7
16	1.6	.80	18	5.5	9.0	12	44	43	34	34	21	7.4
17	1.6	.80	13	6.0	5.8	9.4	41	39	42	31	28	18
18	1.4	1.2	10	4.5	4.4	22	30	49	49	39	35	17
19	.93	.92	10	3.5	3.5	14	36	44	39	29	38	15
20	1.5	1.1	24	3.0	3.3	17	27	41	27	24	27	12
21	11	.69	12	3.5	3.0	9.8	20	36	21	18	22	16
22	11	.30	7.0	17	3.5	11	32	31	31	17	28	26
23	4.9	.39	6.0	31	10	24	46	26	31	30	28	13
24	12	.49	5.0	15	8.0	19	39	22	28	25	30	11
25	27	.39	4.5	7.7	9.0	12	20	20	38	19	43	9.0
26	11	6.1	4.0	7.0	9.0	10	21	41	28	25	38	7.0
27	5.8	8.3	3.5	9.8	11	13	25	47	22	21	28	6.1
28	6.8	3.8	9.0	8.0	7.0	16	11	51	44	24	34	5.5
29	12	30	20	5.8	------	9.8	24	39	40	16	24	5.2
30	4.9	31	27	9.5	------	11	38	34	28	13	21	5.8
31	2.7	------	12	10	------	21	------	31	------	19	15	------
TOTAL	245.63	218.91	496.0	333.8	184.7	414.2	855	1,011.0	888	940	788	342.9
MEAN	7.92	7.30	16.0	10.8	6.60	13.4	28.5	32.6	29.6	30.3	25.4	11.4
MAX	32	41	50	39	26	24	46	51	49	48	43	26
MIN	.93	.30	3.5	3.0	2.5	4.9	11	8.0	14	13	12	5.2
AC-FT	487	434	984	662	366	822	1,700	2,010	1,760	1,860	1,560	680

CAL YR 1969 TOTAL 6,541.14 MEAN 17.9 MAX 55 MIN .30 AC-FT 12,970
WTR YR 1970 TOTAL 6,718.14 MEAN 18.4 MAX 51 MIN .30 AC-FT 13,330

NOTE.--No gage-height record Dec. 5 to Jan. 20.

16750900 Kohala ditch at Honokane, near Niulii

LOCATION.--Lat 20°09'50", long 155°43'50", Hawaii, on land of Honokane, on Honokane trail at tunnel adit, 28 ft from right side of tunnel, and 4.4 miles south of Niulii.

PERIOD OF RECORD.--May 1963 to current year.

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

AVERAGE DISCHARGE.--7 years, 37.2 cfs (26,950 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 96 cfs May 24, 1964; no flow at times.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream. Water is used for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	20	42	32	26	37	78	77	46	75	34	49
2	43	19	29	32	24	65	68	37	48	75	43	58
3	34	20	25	33	12	40	68	28	52	73	40	43
4	29	21	31	60	2.6	32	67	29	50	74	43	65
5	27	21	68	30	2.3	30	71	33	40	72	68	65
6	27	58	34	47	9.5	27	54	33	35	74	66	60
7	29	64	31	37	20	43	48	44	34	72	60	54
8	28	46	29	32	20	58	56	72	47	64	60	44
9	30	31	29	29	20	48	61	70	44	66	45	37
10	28	26	41	27	51	43	38	72	38	67	37	34
11	26	23	50	25	43	38	47	69	36	49	34	32
12	26	22	30	44	32	38	59	69	60	32	39	30
13	25	22	49	30	28	43	58	61	58	43	47	30
14	25	22	67	39	26	48	46	57	63	38	39	29
15	24	20	56	38	56	53	74	63	60	38	52	29
16	24	19	38	32	47	48	67	63	60	58	52	28
17	24	19	36	42	30	43	74	62	63	52	68	50
18	24	19	32	29	26	62	51	67	72	62	67	40
19	24	20	30	26	24	53	54	64	64	46	73	54
20	24	19	51	24	24	53	58	63	52	40	56	40
21	32	21	32	22	24	48	42	60	43	36	45	38
22	31	22	29	38	24	48	51	56	54	36	52	71
23	26	22	25	68	31	68	93	50	55	58	57	46
24	33	22	26	47	30	53	75	44	56	56	60	36
25	46	22	25	31	31	37	44	41	61	43	85	31
26	29	27	25	28	30	31	43	58	54	48	85	28
27	24	29	25	31	33	34	58	72	43	48	59	27
28	25	25	31	28	29	39	32	75	65	52	63	26
29	31	54	41	26	------	30	47	60	66	40	50	25
30	24	61	56	30	------	32	60	57	58	35	47	26
31	22	------	34	35	------	55	------	52	------	40	45	------
TOTAL	899	836	1,147	1,072	755.4	1,377	1,742	1,758	1,577	1,682	1,671	1,225
MEAN	29.0	27.9	37.0	34.6	27.0	44.4	58.1	56.7	52.6	54.3	53.9	40.8
MAX	55	64	68	68	56	68	93	77	72	75	85	71
MIN	22	19	25	22	2.3	27	32	28	34	35	34	25
AC-FT	1,780	1,660	2,280	2,130	1,500	2,730	3,460	3,490	3,130	3,340	3,310	2,430

CAL YR 1969 TOTAL 14,327.8 MEAN 39.3 MAX 83 MIN 3.8 AC-FT 28,420
WTR YR 1970 TOTAL 15,741.4 MEAN 43.1 MAX 93 MIN 2.3 AC-FT 31,220

NOTE.--No gage-height record Dec. 15 to Jan. 20, Feb. 11 to Mar. 24, May 30 to July 28, Aug. 6 to Sept. 30.

16751000 Kohala ditch at Pololu, near Niulii

LOCATION.--Lat 20°10'19", long 155°44'20", Hawaii, on right bank of open section of ditch, on land of Pololu, 0.5 mile upstream from Pololu Stream, and 3.7 miles south of Niulii.

PERIOD OF RECORD.--August 1927 to June 1938, September 1938 to current year.

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

AVERAGE DISCHARGE.--42 years (1927-37, 1938-70), 41.2 cfs (29,850 acre-ft per year).

EXTREMES.--Period of record: Maximum daily discharge, 102 cfs May 24, Oct. 19, 1964; no flow at times.

REMARKS.--Records good. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream and all streams west. Water is used for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	23	43	33	30	39	68	62	48	72	35	51
2	47	22	30	34	28	67	68	38	50	72	46	60
3	36	23	27	35	18	42	67	30	54	71	42	45
4	32	24	39	62	3.4	34	66	31	52	72	46	64
5	30	24	64	31	3.3	32	65	35	42	70	65	64
6	30	53	36	49	11	28	60	35	37	72	64	61
7	32	69	34	39	24	45	50	46	36	70	61	56
8	31	52	32	33	24	60	59	70	49	66	62	46
9	32	35	31	30	24	50	64	68	46	68	47	39
10	30	28	45	28	50	45	42	70	40	69	39	36
11	29	26	50	26	45	40	50	67	38	51	36	34
12	28	25	32	46	33	40	61	67	62	54	41	32
13	28	25	56	31	29	45	61	63	60	45	49	31
14	28	25	72	41	27	50	50	59	65	40	41	31
15	27	22	58	40	59	55	66	65	62	40	54	31
16	27	21	40	34	49	50	65	65	62	60	54	30
17	27	22	38	44	31	45	67	64	65	54	69	52
18	27	22	34	30	27	65	56	69	70	64	68	42
19	27	22	31	27	25	55	57	66	66	48	71	56
20	26	21	53	25	24	55	60	65	54	42	58	42
21	36	24	34	25	24	50	45	62	45	38	47	40
22	34	24	30	42	24	50	54	58	56	38	54	69
23	29	24	26	68	33	70	72	52	57	60	59	48
24	34	25	27	52	32	55	68	46	58	58	62	38
25	52	24	26	34	33	39	48	43	63	45	75	33
26	32	30	26	31	32	33	45	60	56	50	75	30
27	28	32	26	34	35	35	60	66	45	50	61	29
28	27	28	33	31	30	43	34	68	67	54	65	28
29	34	54	43	29	------	32	49	63	68	42	52	27
30	27	65	58	32	------	33	62	59	60	37	49	28
31	24	------	36	39	------	56	------	54	------	41	47	------
TOTAL	991	914	1,210	1,135	807.7	1,438	1,739	1,766	1,633	1,713	1,694	1,273
MEAN	32.0	30.5	39.0	36.6	28.8	46.4	58.0	57.0	54.4	55.3	54.6	42.4
MAX	60	69	72	68	59	70	72	70	70	72	75	69
MIN	24	21	26	25	3.3	28	34	30	36	37	35	27
AC-FT	1,970	1,810	2,400	2,250	1,600	2,850	3,450	3,500	3,240	3,400	3,360	2,530

CAL YR 1969 TOTAL 15,280.3 MEAN 41.9 MAX 82 MIN 3.0 AC-FT 30,310
WTR YR 1970 TOTAL 16,313.7 MEAN 44.7 MAX 75 MIN 3.3 AC-FT 32,360

16756000 Kohakohau Stream near Kamuela

LOCATION.--Lat 20°02'38", long 155°41'10", Hawaii, on left bank 0.6 mile upstream from Oolamakapehu Gulch and 1.7 miles northwest of Kamuela.

DRAINAGE AREA.--2.51 sq mi.

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1967, at site 0.5 mile upstream at different datums.

AVERAGE DISCHARGE.--14 years, 9.25 cfs (6,700 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 496 cfs Jan. 6 (gage height, 4.76 ft), from rating curve extended above 46 cfs on basis of computation of flow over dam at gage height 6.20 ft; no flow part of Nov. 25, 26.
Period of record: Maximum discharge, 3,880 cfs Aug. 7, 1958 (gage height, 10.76 ft, site and datum then in use), from rating curve extended above 70 cfs by test of model of station site; no flow Oct. 18, 19, Oct. 27 to Nov. 28, 1968.

REMARKS.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	.24	4.2	1.3	.88	3.1	49	46	2.7	53	1.7	5.0
2	3.5	.21	1.4	.81	.76	19	25	10	4.1	43	1.7	6.0
3	2.2	.20	.95	.60	.71	2.6	23	4.6	3.6	35	1.6	3.5
4	1.7	.13	.81	19	.63	1.7	31	3.1	2.5	47	2.6	18
5	1.4	.09	54	2.5	.56	1.2	37	2.5	2.0	30	34	12
6	1.3	16	3.1	64	.50	.95	10	2.2	1.7	48	23	21
7	.90	11	1.9	11	.46	12	12	9.8	1.8	33	16	9.5
8	.85	2.9	1.6	2.8	.43	7.7	15	49	4.9	18	14	4.0
9	.80	1.3	1.3	1.8	.40	1.8	11	37	2.9	30	4.6	2.7
10	.70	.96	11	1.3	.84	1.2	6.5	56	2.5	73	2.5	2.1
11	.60	.72	15	1.1	.76	.92	19	26	2.0	8.6	2.0	1.7
12	.55	.55	2.4	20	.52	.82	17	21	4.1	15	5.8	1.6
13	.50	.43	22	2.8	.41	4.0	20	6.4	6.1	5.6	6.2	1.3
14	.45	.33	42	42	.35	7.8	11	3.5	7.7	3.8	3.0	1.2
15	.40	.25	23	16	1.1	7.1	31	15	9.0	3.3	6.8	1.2
16	.35	.18	3.8	5.2	1.0	4.2	19	18	7.4	21	6.0	1.2
17	.30	.15	2.0	8.7	.73	1.7	27	12	37	16	20	9.1
18	.25	.07	1.4	2.7	.55	6.4	4.7	37	46	25	27	6.0
19	.25	.05	1.2	1.8	.45	12	16	20	22	8.0	39	4.2
20	.20	.04	1.1	1.4	.38	11	10	20	4.3	3.7	14	2.3
21	.25	.03	.89	1.2	.30	3.0	3.3	7.8	2.9	2.7	4.1	2.9
22	.30	.03	.74	1.2	.24	15	14	4.2	7.2	2.8	14	23
23	.25	.04	.63	5.6	.64	33	168	2.7	5.2	15	21	4.7
24	.10	.02	.60	3.6	.76	24	51	2.1	5.9	15	16	2.3
25	2.5	.01	.52	1.7	.68	3.8	12	1.8	18	3.8	116	1.6
26	1.0	.01	.43	1.3	.65	2.2	23	28	5.4	5.7	97	1.4
27	.75	.03	.43	1.1	.75	2.5	36	36	2.7	5.2	31	1.2
28	.50	.03	.47	1.0	.56	4.3	7.8	39	27	6.1	43	1.2
29	.35	7.8	.56	.94	------	2.0	25	9.5	22	2.9	21	.95
30	.30	7.2	5.3	1.0	------	2.0	64	4.3	4.7	2.2	20	.88
31	.28	------	1.8	1.1	------	20	------	4.2	------	1.9	9.5	------
TOTAL	37.78	51.00	206.53	226.55	17.00	218.99	798.3	538.7	275.3	583.3	624.1	153.73
MEAN	1.22	1.70	6.66	7.31	.61	7.06	26.6	17.4	9.18	18.8	20.1	5.12
MAX	14	16	54	64	1.1	33	168	56	46	73	116	23
MIN	.10	.01	.43	.60	.24	.82	3.3	1.8	1.7	1.9	1.6	.88
AC-FT	75	101	410	449	34	434	1,580	1,070	546	1,160	1,240	305

CAL YR 1969 TOTAL 3,981.02 MEAN 10.9 MAX 104 MIN .01 AC-FT 7,900
WTR YR 1970 TOTAL 3,731.28 MEAN 10.2 MAX 168 MIN .01 AC-FT 7,400

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0215	4.43	332	4-23	1330	4.40	320
1- 6	1330	4.76	496	8-25	2200	4.40	320

16756500 Keanuiomano Stream near Kamuela

LOCATION.--Lat 20°01'48", long 155°42'05", Hawaii, on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 miles west of Kamuela.

DRAINAGE AREA.--4.30 sq mi.

PERIOD OF RECORD.--November 1963 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,410 ft (from topographic map).

AVERAGE DISCHARGE.--6 years (1964-70), 10.1 cfs (7,320 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 810 cfs Jan. 6 (gage height, 5.70 ft); no flow Nov. 4, 5, 20-28, Feb. 23.
Period of record: Maximum discharge, 3,540 cfs Apr. 20, 1968 (gage height, 10.02 ft), from rating curve extended above 910 cfs on basis of contracted-opening measurement at gage height 8.26 ft; no flow at times most years.

REMARKS.--Records good. Two Parker Ranch pipeline diversions above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	.01	4.1	.55	.59	.17	73	78	2.3	85	1.1	5.4
2	3.1	.01	1.0	.38	.48	16	24	12	2.9	63	1.1	5.8
3	1.4	.01	.61	.23	.40	2.2	18	4.6	3.5	35	.97	3.6
4	.85	0	.41	17	.33	1.3	42	3.0	2.0	70	1.4	17
5	.68	0	82	2.1	.27	.82	48	2.2	1.6	27	34	9.4
6	.59	13	3.1	129	.21	.55	9.4	1.8	1.3	71	21	22
7	.46	7.2	1.4	16	.15	8.0	8.9	5.8	1.2	48	11	10
8	.43	1.6	1.0	3.1	.12	8.2	12	73	3.9	15	9.4	4.2
9	.42	.55	.91	3.1	.09	1.5	10	60	2.4	50	3.8	2.5
10	.28	.40	5.6	2.3	.12	.85	4.0	94	2.0	138	1.7	2.0
11	.21	.30	16	1.6	.45	.59	14	35	1.5	7.2	1.3	1.5
12	.18	.14	2.0	24	.26	.41	14	18	3.0	12	3.4	1.3
13	.16	.10	20	2.8	.14	2.6	17	6.6	3.7	4.0	5.5	1.2
14	.14	.09	48	80	.08	4.4	9.7	3.5	6.2	2.3	2.3	1.1
15	.12	.08	30	23	.14	6.1	30	13	6.0	2.0	5.3	.94
16	.10	.06	3.7	3.8	.61	4.0	14	16	7.9	19	5.7	.85
17	.09	.05	1.7	11	.40	1.3	35	10	50	17	17	4.8
18	.08	.05	1.0	2.6	.30	3.6	4.4	43	80	24	28	8.3
19	.07	.02	.68	1.3	.17	8.7	21	18	22	7.2	64	3.9
20	.05	0	.70	1.0	.10	8.0	11	16	4.6	3.4	16	2.2
21	.07	0	.59	.82	.05	2.6	2.8	7.4	2.2	2.2	3.9	1.5
22	.09	0	.45	.70	.02	11	8.3	3.9	5.8	2.1	12	25
23	.08	0	.38	3.8	0	50	394	2.5	4.2	9.9	18	5.1
24	.01	0	.30	3.1	.31	29	101	1.8	5.1	14	19	2.2
25	1.6	0	.23	1.4	.24	3.7	12	1.4	13	3.4	219	1.4
26	.52	0	.18	1.0	.33	1.8	27	32	5.7	4.6	278	1.2
27	.31	0	.15	.82	.28	1.2	51	37	2.3	3.5	58	1.0
28	.15	0	.14	.70	.27	2.0	8.4	43	21	4.7	67	.88
29	.11	2.9	.17	.61	------	.73	23	10	18	1.8	29	.79
30	.09	5.6	2.9	.61	------	.70	110	4.3	4.5	1.4	21	.66
31	.07	------	1.6	.68	------	16	------	3.7	------	1.2	27	------
TOTAL	23.51	32.17	231.00	339.10	6.91	198.82	1,156.9	660.5	289.8	746.9	985.87	147.72
MEAN	.76	1.07	7.45	10.9	.25	6.41	38.6	21.3	9.66	24.2	31.8	4.92
MAX	11	13	82	129	.61	50	394	94	80	138	278	25
MIN	.01	0	.14	.23	0	.17	2.8	1.4	1.2	1.2	.97	.66
AC-FT	47	64	458	673	14	394	2,290	1,310	575	1,490	1,960	293

CAL YR 1969 TOTAL 4,653.23 MEAN 12.7 MAX 218 MIN 0 AC-FT 9,230
WTR YR 1970 TOTAL 4,821.20 MEAN 13.2 MAX 394 MIN 0 AC-FT 9,560

PEAK DISCHARGE (BASE, 550 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0230	5.43	675	7-10	0100	5.27	598
1- 6	1430	5.70	810	8-25	2330	5.53	725
4-23	1430	5.40	660				

16757000 Waikoloa Stream near Kamuela

LOCATION.--Lat 20°03'17", long 155°40'01", Hawaii, on left bank 0.2 mile south of Puu Iki and 2.2 miles north of Kamuela.

DRAINAGE AREA.--0.78 sq mi.

PERIOD OF RECORD.--May 1947 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,570 ft (from topographic map).

AVERAGE DISCHARGE.--23 years, 7.21 cfs (5,220 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 370 cfs Dec. 5 (gage height, 3.95 ft), from rating curve extended above 95 cfs; minimum, 1.3 cfs Nov. 24.
Period of record: Maximum discharge, 1,930 cfs Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 95 cfs; minimum, 0.74 cfs Sept. 28 to Oct. 7, 1965.

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

REVISIONS (FISCAL YEARS).--WSP 1155: 1948(M). WSP 1569: Drainage area. WSP 1937: 1949-50(P), 1951-60. WRD Hawaii 1967: 1966(M). Published records for high-water periods in fiscal years 1948-51, 1954-60, and water years 1960-61, 1963 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	1.7	3.8	3.2	2.1	5.1	29	27	4.4	25	3.2	6.1
2	4.2	1.6	2.4	2.3	1.8	8.3	12	8.6	6.3	19	3.4	5.2
3	3.1	1.7	1.9	3.5	1.8	3.6	10	5.6	5.2	20	3.1	4.4
4	2.8	1.6	2.8	20	1.8	3.7	18	4.4	4.3	24	3.6	8.9
5	2.7	1.6	43	3.7	1.8	2.2	20	4.0	3.6	13	24	8.0
6	2.6	9.8	3.6	27	1.7	2.3	7.2	3.8	3.2	27	11	9.1
7	2.6	7.2	2.8	6.3	1.8	9.5	8.8	14	5.2	16	8.6	6.5
8	2.7	3.2	2.8	3.0	1.7	4.8	9.4	35	7.8	11	7.5	4.4
9	2.6	2.3	2.4	2.6	1.7	2.8	7.5	24	4.8	28	4.6	3.7
10	2.4	1.9	4.1	2.3	4.6	2.4	7.2	26	4.2	42	3.6	3.4
11	2.2	1.7	5.4	2.1	3.4	2.1	12	14	4.3	8.3	3.4	3.1
12	2.2	1.7	2.8	7.5	2.3	2.7	10	13	5.2	11	7.2	3.0
13	2.2	1.7	17	3.2	1.8	6.3	12	6.5	8.0	6.3	6.1	2.8
14	2.1	1.7	34	16	1.8	11	8.0	4.8	9.8	4.8	4.8	2.7
15	2.1	1.7	14	8.3	5.4	8.5	16	15	9.4	4.4	8.0	2.7
16	2.1	1.6	4.3	3.8	3.6	4.8	10	11	5.6	11	5.6	2.6
17	2.1	1.7	2.8	5.4	2.2	2.8	13	9.1	18	13	9.8	3.7
18	2.1	1.6	2.4	3.0	1.7	3.1	5.0	17	23	14	14	5.0
19	2.1	1.6	2.2	2.3	1.5	6.3	17	10	13	8.9	25	5.0
20	2.2	1.5	2.6	2.2	1.5	5.9	6.7	12	4.8	5.2	11	3.4
21	2.3	1.5	2.3	1.9	1.4	3.6	4.0	6.7	4.6	4.0	5.6	5.3
22	2.8	1.5	2.1	2.4	1.5	8.4	7.0	4.8	10	4.2	15	15
23	2.3	1.4	1.9	14	3.4	21	108	4.0	6.7	10	13	5.9
24	6.9	1.3	1.8	5.0	3.0	15	34	3.6	5.6	8.3	11	3.6
25	5.4	1.4	1.8	2.8	2.8	4.0	9.8	3.4	12	5.4	68	2.8
26	2.7	1.6	1.7	2.4	2.7	3.0	14	17	5.6	7.2	72	2.7
27	2.2	1.7	1.8	2.4	2.8	5.1	16	20	3.8	5.9	22	2.6
28	2.2	1.5	2.2	2.4	2.2	6.3	7.2	32	15	5.9	31	2.6
29	2.1	15	2.7	2.3	------	3.2	14	8.9	9.4	4.2	21	2.3
30	1.9	5.9	13	2.8	------	3.8	35	7.2	5.2	3.6	14	2.2
31	1.7	------	4.0	2.7	------	18	------	6.3	------	3.2	8.6	------
TOTAL	88.2	81.9	192.4	168.8	65.8	189.6	487.8	378.7	228.0	373.8	448.7	138.7
MEAN	2.85	2.73	6.21	5.45	2.35	6.12	16.3	12.2	7.60	12.1	14.5	4.62
MAX	8.6	15	43	27	5.4	21	108	35	23	42	72	15
MIN	1.7	1.3	1.7	1.9	1.4	2.1	4.0	3.4	3.2	3.2	3.1	2.2
AC-FT	175	162	382	335	131	376	968	751	452	741	890	275

CAL YR 1969 TOTAL 2,964.8 MEAN 8.12 MAX 71 MIN 1.3 AC-FT 5,880
WTR YR 1970 TOTAL 2,842.4 MEAN 7.79 MAX 108 MIN 1.3 AC-FT 5,640

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0200	3.95	370	7-10	0130	3.38	211
4-23	1300	3.39	214	8-25	2400	3.38	211

16758000 Waikoloa Stream at Marine Dam, near Kamuela

LOCATION.--Lat 20°02'48", long 155°39'58", Hawaii, on right bank 160 ft upstream from Marine Dam, 0.4 mile east of Puu Ohu, and 1.6 miles north of Kamuela.

DRAINAGE AREA.--1.18 sq mi.

PERIOD OF RECORD.--May 1947 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,460 ft (from topographic map).

AVERAGE DISCHARGE.--23 years, 8.95 cfs (6,480 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 380 cfs Dec. 5 (gage height, 3.95 ft), from rating curve extended as explained below; minimum, 1.4 cfs Nov. 24, 25.
Period of record: Maximum discharge, 3,390 cfs Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 120 cfs on basis of computations of flow over dam at gage heights 5.46 and 5.96 ft; minimum, 0.59 cfs Oct. 3-6, 1965.

REMARKS.--Records good. Diversion above station for livestock and domestic use.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WRD Hawaii 1967: 1966(M). Published records for high-water periods in fiscal years 1948-52, 1954-60, and water years 1960-63 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	1.8	4.6	3.6	2.4	8.0	38	38	6.0	37	4.3	8.2
2	5.3	1.8	2.6	2.6	2.2	11	15	13	8.1	29	4.4	6.9
3	3.8	1.8	2.2	2.4	2.0	4.5	14	7.2	7.2	26	4.0	5.9
4	3.3	1.7	3.6	30	2.0	3.3	24	5.8	6.0	34	4.8	12
5	3.0	1.7	54	4.8	1.9	2.5	26	4.8	4.6	18	32	11
6	2.9	11	4.3	37	1.8	2.5	9.2	4.6	4.1	37	15	13
7	2.9	9.2	3.2	10	1.8	12	12	17	5.3	23	12	8.7
8	2.9	3.8	3.0	3.6	1.8	6.9	13	52	11	15	11	5.8
9	2.9	2.6	2.6	2.9	1.7	3.2	9.2	36	6.4	40	6.4	5.0
10	2.6	2.2	5.1	2.5	5.5	2.6	9.5	37	5.5	45	4.8	4.5
11	2.5	1.9	6.9	2.3	3.6	2.2	15	19	5.1	12	4.6	4.1
12	2.4	1.8	3.2	9.5	2.4	2.8	13	18	8.6	15	8.1	3.8
13	2.4	1.8	22	3.6	2.0	7.8	15	9.2	12	8.4	8.6	3.3
14	2.3	1.7	47	24	1.9	9.5	10	6.7	13	6.7	6.4	3.6
15	2.3	1.7	19	12	6.7	11	23	20	13	6.0	11	3.4
16	2.3	1.6	5.3	5.5	4.0	6.4	14	15	8.6	15	7.9	3.4
17	2.3	1.7	3.5	7.8	2.5	3.2	17	13	24	20	13	5.7
18	2.2	1.6	2.8	3.6	2.0	3.3	6.4	23	33	20	22	6.9
19	2.2	1.5	2.5	2.8	1.9	7.8	25	14	18	13	37	6.7
20	2.4	1.5	2.9	2.4	1.8	6.7	11	15	7.2	7.5	17	4.5
21	2.5	1.5	2.4	2.3	1.7	4.0	5.1	9.2	6.4	5.8	8.1	6.1
22	3.0	1.5	2.2	2.8	1.8	11	9.2	6.7	14	5.8	19	20
23	2.5	1.5	2.0	20	3.8	30	133	5.1	9.5	13	20	7.8
24	8.1	1.4	2.0	6.9	3.2	19	53	4.4	7.5	12	16	5.0
25	7.2	1.4	1.9	3.5	3.0	5.1	13	4.1	16	7.5	95	4.0
26	3.2	1.7	1.9	2.8	2.9	3.5	18	27	7.8	11	100	3.7
27	2.6	1.7	1.9	2.8	3.0	6.2	22	35	5.3	8.6	27	3.5
28	2.4	1.6	2.2	2.6	2.4	7.8	9.8	40	21	8.4	45	3.3
29	2.3	18	2.6	2.5	------	3.8	17	13	15	5.8	31	3.2
30	2.0	7.8	15	3.0	------	4.4	48	9.2	7.2	5.1	19	3.1
31	1.9	------	5.1	3.0	------	23	------	8.9	------	4.4	11	------
TOTAL	101.6	92.5	239.5	225.1	73.7	235.0	647.4	530.9	316.4	515.0	625.4	186.1
MEAN	3.28	3.08	7.73	7.26	2.63	7.58	21.6	17.1	10.5	16.6	20.2	6.20
MAX	11	18	54	37	6.7	30	133	52	33	45	100	20
MIN	1.9	1.4	1.9	2.3	1.7	2.2	5.1	4.1	4.1	4.4	4.0	3.1
AC-FT	202	183	475	446	146	466	1,280	1,050	628	1,020	1,240	369

CAL YR 1969 TOTAL 3,824.4 MEAN 10.5 MAX 91 MIN 1.4 AC-FT 7,590
WTR YR 1970 TOTAL 3,788.6 MEAN 10.4 MAX 133 MIN 1.4 AC-FT 7,510

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0200	3.95	380	7-10	0045	3.48	226
4-23	1415	3.56	248	8-25	2330	3.58	254

16759000 Hauani Gulch near Kamuela

LOCATION.--Lat 20°02'28", long 155°39'05", Hawaii, on left bank 800 ft downstream from small tributary and 1.8 miles northeast of Kamuela.

DRAINAGE AREA.--0.47 sq mi.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since Feb. 27, 1963. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark).

AVERAGE DISCHARGE.--14 years, 1.61 cfs (1,170 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 156 cfs Dec. 5 (gage height, 3.03 ft), from rating curve extended above 37 cfs; minimum, 0.10 cfs Nov. 19, 22, 24, 25.
Period of record: Maximum discharge, 503 cfs Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 11 cfs on basis of slope-conveyance study; no flow at times.

REMARKS.--Records good. Diversion above station for livestock and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	.14	.29	.33	.25	.41	8.1	6.4	.83	12	.65	1.4
2	.69	.14	.20	.22	.21	.90	2.9	1.9	1.5	6.4	.59	1.3
3	.51	.15	.17	.20	.20	.32	1.9	.98	.94	6.4	.54	1.1
4	.41	.14	3.1	7.1	.19	.29	5.9	.78	.83	10	.65	1.6
5	.37	.13	15	.70	.18	.18	6.3	.65	.69	3.0	5.7	1.5
6	.37	1.9	.59	8.4	.18	.23	1.5	.62	.61	8.3	1.7	1.5
7	.37	.99	.38	1.5	.17	1.8	1.5	3.8	.96	3.7	1.1	1.1
8	.34	.37	.35	.50	.16	.77	1.6	15	1.4	1.9	1.2	.88
9	.28	.22	.30	.36	.15	.28	1.3	11	.86	13	.83	.85
10	.27	.19	1.1	.29	.81	.21	1.2	7.6	.78	13	.61	.77
11	.25	.17	1.2	.23	.34	.16	1.5	3.2	.83	1.7	.61	.69
12	.25	.16	.39	.88	.20	.24	1.7	3.3	1.1	1.7	1.6	.64
13	.25	.15	3.4	.35	.17	1.2	2.0	1.2	1.6	1.1	.94	.61
14	.24	.14	11	7.3	.15	2.3	1.4	.94	2.0	.95	.78	.59
15	.20	.14	4.1	1.7	.83	2.6	3.6	3.6	1.8	.90	1.3	.56
16	.20	.13	.86	1.0	.35	.93	1.8	1.9	1.1	2.3	.83	.56
17	.20	.14	.52	1.2	.19	.36	2.0	1.9	8.2	4.8	1.6	1.9
18	.20	.13	.38	.46	.15	.30	.91	3.6	7.2	3.9	5.1	1.2
19	.20	.12	.33	.33	.13	.76	9.1	2.1	3.5	2.3	8.0	.96
20	.22	.12	.38	.27	.12	.74	1.8	2.4	1.1	1.2	2.7	.62
21	.25	.12	.30	.24	.12	.40	.79	1.1	1.5	.95	1.4	.70
22	.28	.12	.26	.74	.13	1.8	1.5	.89	2.0	.92	2.6	1.9
23	.20	.12	.23	6.6	.20	8.2	43	.72	1.4	1.9	3.4	.87
24	.67	.12	.22	1.0	.19	3.5	13	.67	1.1	1.6	2.5	.64
25	.50	.11	.20	.47	.16	.81	1.8	.61	2.8	1.1	32	.52
26	.20	.15	.20	.36	.18	.46	2.8	5.2	1.2	1.6	31	.47
27	.18	.13	.19	.33	.21	.73	3.1	7.4	.89	1.5	6.7	.44
28	.16	.12	.22	.33	.15	.83	1.3	8.9	5.3	1.2	12	.41
29	.16	2.0	.23	.29	------	.38	2.3	1.8	2.5	.86	7.0	.41
30	.16	.77	.34	.35	------	.35	9.4	1.3	1.2	.76	3.2	.37
31	.15	------	.33	.35	------	4.1	------	1.1	------	.69	1.7	------
TOTAL	10.03	9.53	46.76	44.38	6.47	36.54	137.00	102.56	57.72	111.63	140.53	27.06
MEAN	.32	.32	1.51	1.43	.23	1.18	4.57	3.31	1.92	3.60	4.53	.90
MAX	1.3	2.0	15	8.4	.83	8.2	43	15	8.2	13	32	1.9
MIN	.15	.11	.17	.20	.12	.16	.79	.61	.61	.69	.54	.37
AC-FT	20	19	93	88	13	72	272	203	114	221	279	54

CAL YR 1969 TOTAL 728.96 MEAN 2.00 MAX 31 MIN .10 AC-FT 1,450
WTR YR 1970 TOTAL 730.21 MEAN 2.00 MAX 43 MIN .11 AC-FT 1,450

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12- 5	0130	3.03	156	4-23	1645	2.70	95
4-19	1745	2.80	110	8-25	2300	2.98	146

16759200 Right Branch Waiaha Stream near Holualoa

LOCATION.--Lat 19°38'41", long 155°54'55", Hawaii, on right bank 1,000 ft upstream from reservoir, 1.0 mile northeast of Holualoa Makai Camp, and 2.9 miles northeast of Holualoa School.

DRAINAGE AREA.--1.89 sq mi.

PERIOD OF RECORD.--April 1960 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (from topographic map).

AVERAGE DISCHARGE.--10 years, 0.432 cfs (313 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 85 cfs Nov. 23 (gage height, 3.38 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 1,630 cfs Oct. 3, 1968 (gage height, 5.78 ft), from rating curve extended above 9.1 cfs on basis of slope-area measurements at gage heights 4.07 and 5.78 ft; no flow at times each year.

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

REVISIONS (WATER YEARS).--WRD Hawaii 1969: 1967(P). Published records for high-water periods in water years 1963-65 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	0	.02	0			0	0	.02	.01	.03	.04
2	.01	0	.02	0			0	0	.01	.07	.04	.02
3	.02	0	.01	0			0	0	.01	.06	.04	.02
4	.03	0	.02	0			0	0	.01	.03	.03	.01
5	.05	0	.03	.01			0	0	0	.02	.02	.01
6	.04	0	.04	.03			0	0	0	.03	.01	0
7	.02	0	.03	.01			0	0	0	.04	.01	0
8	.01	0	.02	0			0	.01	0	.02	.01	0
9	.01	0	.03	0			0	.01	0	.01	.01	0
10	.01	0	.03	0			0	.08	0	.09	.01	0
11	.01	0	.03	0			0	.12	0	.08	0	0
12	.01	0	.02	.09			0	.09	0	.07	0	0
13	.01	0	.02	.01			0	.06	.01	.06	0	0
14	.01	0	.02	.29			0	.02	.04	.02	0	.01
15	.01	0	.01	.11			.04	.02	.17	.02	0	1.5
16	.01	0	.01	.02			.01	.02	.05	.01	0	.45
17	0	0	.01	.02			0	.07	.03	.01	0	.11
18	0	0	.01	.01			0	.12	.02	.01	0	.06
19	0	0	0	0			0	.10	.06	.01	0	.03
20	0	0	0	0			0	.07	.02	.01	0	.02
21	0	0	0	0			0	.07	.02	0	.01	.04
22	0	0	0	0			0	.09	.01	0	.01	.03
23	0	4.4	0	0			.40	.10	.01	0	.01	.03
24	0	.25	0	0			.19	.10	.01	.02	0	.02
25	0	.10	0	0			.11	.07	.01	.02	0	.02
26	0	.06	0	0			.03	.16	0	.01	.24	.01
27	0	.04	0	0			.02	.11	.01	.01	3.8	.48
28	0	.02	0	0			.01	.06	.01	.01	.48	.64
29	0	.02	0	0	------		0	.04	.01	.01	.25	3.0
30	0	.02	0	0	------		0	.04	.01	.02	.16	.48
31	0	------	0	0	------		------	.02	------	.02	.07	------
TOTAL	.27	4.91	.38	.60	0	0	.81	1.65	.55	.80	5.24	7.03
MEAN	.009	.16	.012	.019	0	0	.027	.053	.018	.026	.17	.23
MAX	.05	4.4	.04	.29	0	0	.40	.16	.17	.09	3.8	3.0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	.5	9.7	.8	1.2	0	0	1.6	3.3	1.1	1.6	10	14

CAL YR 1969 TOTAL 132.86 MEAN .36 MAX 17 MIN 0 AC-FT 264
WTR YR 1970 TOTAL 22.24 MEAN .061 MAX 4.4 MIN 0 AC-FT 44

PEAK DISCHARGE (BASE, 78 CFS).--Nov. 23 (1700) 85 cfs (3.38 ft).

16759300 Waiaha Stream at Luawai, near Holualoa

LOCATION.--Lat 19°38'12", long 155°55'45", Hawaii, on right bank at Luawai, 1.8 miles northeast of Holualoa School, and 4.2 miles southeast of Honokohau School.

DRAINAGE AREA.--8.74 sq mi.

PERIOD OF RECORD.--April 1960 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

AVERAGE DISCHARGE.--10 years, 0.895 cfs (648 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 167 cfs Nov. 23 (gage height, 3.53 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 3,100 cfs Oct. 3, 1968 (gage height, 8.46 ft), from rating curve extended above 33 cfs on basis of slope-area measurements at gage heights 4.34, 4.51, and 8.46 ft; no flow at times each year.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Huehue Ranch diverts entire low flow of a tributary above station for domestic use.

REVISIONS (WATER YEAR).--Published records for a high-water period in the water year 1965 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0			0	0	.01	0	0	.01
2	0	0	0	0			0	0	0	.05	0	0
3	0	0	0	0			0	0	0	.04	0	0
4	.02	0	.04	0			0	0	0	.02	0	0
5	.02	0	.05	0			0	0	0	.01	0	0
6	.01	0	0	0			0	0	0	0	0	0
7	0	0	0	0			0	0	0	0	0	0
8	0	0	0	0			0	0	0	0	0	0
9	0	0	0	0			0	0	0	0	0	0
10	0	0	0	0			0	.10	0	0	0	0
11	0	0	0	0			0	.15	0	0	0	0
12	0	0	0	0			0	.10	0	0	0	0
13	0	0	0	0			0	.03	0	0	0	0
14	0	0	0	.40			0	0	.02	0	0	0
15	0	0	0	.05			.06	0	.30	0	0	4.0
16	0	0	0	0			0	0	.02	0	0	.60
17	0	0	0	0			0	.04	.01	0	0	.15
18	0	0	0	0			0	.07	0	0	0	.04
19	0	0	0	0			0	.05	.03	0	0	.01
20	0	0	0	0			0	.04	.01	0	0	0
21	0	0	0	0			0	.04	.01	0	0	.02
22	0	0	0	0			0	.04	0	0	0	.01
23	0	11	0	0			.60	.05	0	0	0	.01
24	0	.50	0	0			.25	.05	0	0	0	0
25	0	.05	0	0			.04	.04	0	0	0	0
26	0	0	0	0			.02	.30	0	0	.35	0
27	0	0	0	0			0	.07	0	0	6.5	.60
28	0	0	0	0			0	.03	0	0	.60	1.0
29	0	0	0	0	------		0	.02	0	0	.40	6.0
30	0	0	0	0	------		0	.02	0	0	.25	.60
31	0	------	0	0	------		------	.01	------	0	.04	------
TOTAL	.05	11.55	.09	.45	0	0	.97	1.25	.41	.12	8.14	13.05
MEAN	.002	.39	.003	.015	0	0	.032	.040	.014	.004	.26	.44
MAX	.02	11	.05	.40	0	0	.60	.30	.30	.05	6.5	6.0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	.1	23	.2	.9	0	0	1.9	2.5	.8	.2	16	26

CAL YR 1969 TOTAL 309.20 MEAN .85 MAX 97 MIN 0 AC-FT 613
WTR YR 1970 TOTAL 36.08 MEAN .099 MAX 11 MIN 0 AC-FT 72

PEAK DISCHARGE (BASE, 140 CFS).--Nov. 23 (1630) 167 cfs (3.53 ft).

NOTE.--No gage-height record Nov. 24 to Sept. 30.

16759800 Kiilae Stream near Honaunau

LOCATION.--Lat 19°24'52", long 155°50'56", Hawaii, on right bank 2.4 miles northeast of Kealia and 3.0 miles southeast of Honaunau Post Office.

DRAINAGE AREA.--0.67 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

AVERAGE DISCHARGE.--12 years, 0.229 cfs (166 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 28 cfs Apr. 4 (gage height, 1.61 ft); no flow most of time. Period of record: Maximum discharge, 104 cfs Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 5.7 cfs; no flow at times each year.

REMARKS.--Records good. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	0	0	0	0	0	0	0	.03	.02	0	0
2	.10	0	0	0	0	0	.55	0	0	.43	0	0
3	.01	0	0	0	0	0	.04	0	0	.07	0	.01
4	.11	0	.03	.01	0	0	2.2	0	0	.07	0	0
5	.04	0	.01	0	0	0	.07	0	0	.13	0	0
6	.02	0	0	1.1	0	0	.01	.01	0	.22	0	0
7	0	.51	0	.03	0	0	0	.01	0	.21	0	0
8	.05	.02	0	0	0	0	0	.02	0	.02	.07	.02
9	0	0	0	0	0	0	0	.36	0	0	.01	0
10	.02	0	0	0	0	0	0	.40	0	0	0	0
11	.01	0	0	0	0	0	0	.76	0	0	0	0
12	0	0	0	0	0	0	1.5	.10	.06	0	0	0
13	0	0	0	0	0	0	1.3	0	.02	.17	0	.03
14	0	.72	0	.04	0	0	.50	0	0	.02	0	.28
15	0	.04	0	.01	0	0	.15	0	.45	.01	0	.30
16	0	.02	0	0	0	0	.07	0	.10	0	0	.10
17	0	.01	0	0	0	0	1.3	.12	.34	0	.04	.03
18	0	0	0	0	0	.39	.12	.10	.14	0	0	.03
19	0	0	0	0	0	.04	.16	.16	.06	0	.06	0
20	0	0	0	0	0	0	.06	.14	0	0	.01	.38
21	0	0	0	0	1.2	0	.04	.03	0	0	0	.04
22	0	0	0	0	.03	0	.02	0	0	0	0	.10
23	0	0	0	0	0	.04	.03	.04	0	0	0	.03
24	0	0	0	0	0	0	.30	.12	0	.07	.12	0
25	0	0	0	0	0	0	.11	.04	0	0	.07	0
26	0	0	0	0	0	0	.04	.03	.07	0	0	0
27	0	0	.27	0	0	0	.10	.02	.12	0	0	.73
28	0	0	.03	.06	0	0	.04	.02	.68	0	0	.12
29	0	0	0	0	------	0	0	0	.10	0	0	.02
30	0	0	0	0	------	0	0	0	.04	0	.11	.01
31	0	------	.01	0	------	0	------	.14	------	0	0	------
TOTAL	.41	1.32	.35	1.25	1.23	.47	8.71	2.62	2.21	1.44	.49	2.73
MEAN	.013	.044	.011	.040	.044	.015	.29	.085	.074	.047	.016	.091
MAX	.11	.72	.27	1.1	1.2	.39	2.2	.76	.68	.43	.12	.80
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	.8	2.6	.7	2.5	2.4	.9	17	5.2	4.4	2.9	1.0	5.4

CAL YR 1969 TOTAL 45.90 MEAN .13 MAX 4.7 MIN 0 AC-FT 91
WTR YR 1970 TOTAL 23.23 MEAN .064 MAX 2.2 MIN 0 AC-FT 46

PEAK DISCHARGE (BASE, 25 CFS).--Apr. 4 (0500) 28 cfs (1.61 ft).

16764000 Hilea Gulch tributary near Honuapo

LOCATION.--Lat 19°10'27", long 155°35'58", Hawaii, on right bank 0.5 mile upstream from mouth, 6.6 miles northwest of Honuapo, and 6.7 miles west of Punaluu.

DRAINAGE AREA.--9.17 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 975 cfs May 28 (gage height, 5.87 ft), from rating curve extended above 75 cfs; no flow for many days.
Period of record: Maximum discharge, 1,220 cfs Dec. 30, 1966 (gage height, 6.35 ft), from rating curve extended above 75 cfs; no flow at times each year.

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

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	.07	.02	2.1	1.0	2.9	.14	11	.57	42	33	.73
2	.87	.10	.02	.33	.15	.37	.06	50	.42	19	23	.40
3	1.1	.03	.01	7.3	.02	.11	.07	4.7	.84	3.3	4.0	.29
4	1.0	.03	.01	12	0	1.8	.09	1.6	1.5	4.2	.83	.64
5	.44	.02	2.9	7.0	0	.27	.03	.86	.75	20	.51	.43
6	6.4	.01	.50	3.0	0	.04	.03	.67	.27	12	.42	.27
7	2.0	2.6	.65	1.0	0	.02	.02	14	.20	5.7	.33	.21
8	3.6	1.8	.26	.50	0	.01	.02	37	.20	2.8	.30	.14
9	4.8	.48	.03	.30	0	0	.16	28	.14	48	.26	3.1
10	6.3	.51	.01	.20	0	0	37	42	.58	74	.22	2.7
11	19	.33	.01	.10	0	0	86	7.5	.65	42	.19	7.6
12	3.1	.11	0	0	0	0	5.6	2.3	5.4	31	.43	1.1
13	1.8	2.2	0	0	0	0	29	.93	23	14	.30	.59
14	1.7	1.3	0	0	0	1.0	8.9	2.3	9.4	13	.15	21
15	1.7	.15	0	0	0	.88	2.2	11	31	14	6.3	2.3
16	1.7	.90	.04	0	0	.23	9.8	7.1	6.8	24	37	.90
17	1.6	2.3	0	0	0	.02	13	2.1	17	28	3.0	.68
18	3.7	.18	0	0	0	.01	11	.54	3.6	5.5	.49	4.0
19	4.3	.13	0	0	0	0	48	.55	.89	1.1	.28	.41
20	.28	.10	0	0	0	0	9.4	1.5	.39	.62	.44	.29
21	11	.19	0	0	0	0	23	.68	.30	.53	14	.77
22	1.4	2.6	0	0	0	0	4.3	.58	.44	.48	6.3	3.3
23	.16	.54	0	0	0	18	2.3	1.0	4.0	.58	8.8	12
24	8.3	.35	0	0	0	1.4	29	2.0	1.2	.52	3.8	1.9
25	2.6	50	0	0	0	.08	3.6	1.4	1.5	.52	6.0	.27
26	.87	6.9	2.5	.14	0	.05	40	.81	14	2.0	103	.17
27	.89	1.5	.09	2.3	0	.02	55	9.2	24	53	25	.25
28	.18	.16	.26	.21	0	.12	5.3	104	14	55	44	.26
29	1.9	.09	20	.02	------	.12	.74	30	8.1	5.2	5.4	.12
30	.36	.03	1.1	0	------	.40	19	7.7	3.2	4.1	14	.09
31	.12	------	9.8	0	------	.25	------	2.0	------	9.9	3.3	------
TOTAL	94.57	75.71	38.21	36.50	1.17	28.10	442.76	385.02	174.34	536.05	345.05	66.91
MEAN	3.05	2.52	1.23	1.18	.042	.91	14.8	12.4	5.81	17.3	11.1	2.23
MAX	19	50	20	12	1.0	18	86	104	31	74	103	21
MIN	.12	.01	0	0	0	0	.02	.54	.14	.48	.15	.09
AC-FT	188	150	76	72	2.3	56	878	764	346	1,060	684	133

CAL YR 1969 TOTAL 2,429.91 MEAN 6.66 MAX 236 MIN 0 AC-FT 4,820
WTR YR 1970 TOTAL 2,224.39 MEAN 6.09 MAX 104 MIN 0 AC-FT 4,410

PEAK DISCHARGE (BASE, 600 CFS).--Apr. 11 (1600) 726 cfs (5.29 ft); May 28 (1715) 975 cfs (5.87 ft).

16-765000 Hilea Gulch tributary No. 2 near Honuapo

LOCATION.--Lat 19°10'17", long 155°36'05", Hawaii, on right bank 0.5 mile upstream from mouth, 6.3 miles northwest of Honuapo, and 6.6 miles west of Punaluu.

DRAINAGE AREA.--1.86 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 2,880 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 462 cfs May 28 (gage height, 6.84 ft), from rating curve extended above 41 cfs; no flow most of time.
Period of record: Maximum discharge, 523 cfs Dec. 30, 1966 (gage height, 7.16 ft), from rating curve extended above 41 cfs; no flow many days each year.

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

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0		0		0	0	4.8	0	27	12	0
2	0	0		0		0	0	20	0	8.0	7.8	0
3	0	0		.03		0	0	.91	0	.52	.56	0
4	0	0		0		0	0	0	0	.92	0	0
5	0	0		0		0	0	0	0	9.3	0	0
6	.70	0		0		0	0	0	0	3.3	0	0
7	0	.29		0		0	0	3.8	0	1.4	0	0
8	.07	0		0		0	0	16	0	.22	0	0
9	0	0		0		0	0	11	0	22	0	.20
10	0	0		0		0	12	18	0	34	0	.02
11	.24	0		0		0	27	1.7	0	20	0	.66
12	0	0		0		0	.45	.21	.36	12	0	.01
13	0	0		0		0	12	0	7.1	4.0	0	0
14	0	0		0		0	2.1	0	1.8	4.3	0	3.8
15	0	0		0		0	.22	1.8	11	5.7	.93	.05
16	0	0		0		0	1.5	2.2	1.5	9.9	11	0
17	0	0		0		0	1.7	.39	4.3	11	.28	.09
18	0	0		0		0	1.7	0	.40	1.4	0	1.0
19	0	0		0		0	15	0	0	0	0	0
20	0	0		0		0	3.3	0	0	0	0	0
21	1.1	0		0		0	5.3	0	0	0	2.2	0
22	.06	0		0		0	.65	0	0	0	.70	0
23	0	0		0		6.0	.02	0	.41	0	1.3	1.8
24	.72	0		0		.13	9.1	0	.06	0	.32	.09
25	.01	12		0		0	.52	.07	0	0	0	0
26	0	0		0		0	21	.08	4.4	0	53	0
27	0	0		0		0	25	2.3	9.0	30	9.4	0
28	0	0		0		0	1.6	66	4.4	27	20	0
29	0	0		0	------	0	0	12	1.9	1.3	.76	0
30	0	0		0	------	0	9.3	2.5	.21	1.4	2.8	0
31	0	------		0	------	0	------	.03	------	2.0	.32	------
TOTAL	2.90	12.29	0	.03	0	6.13	149.46	163.79	46.84	236.66	123.37	7.72
MEAN	.094	.41	0	.001	0	.20	4.98	5.28	1.56	7.63	3.98	.26
MAX	1.1	12	0	.03	0	6.0	27	66	11	34	53	3.8
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	5.8	24	0	.06	0	12	296	325	93	469	245	15

CAL YR 1969 TOTAL 919.95 MEAN 2.52 MAX 148 MIN 0 AC-FT 1,820
WTR YR 1970 TOTAL 749.19 MEAN 2.05 MAX 66 MIN 0 AC-FT 1,490

PEAK DISCHARGE (BASE, 310 CFS).--May 28 (1800) 462 cfs (6.84 ft); July 9 (1700) 362 cfs (6.27 ft).

16767000 Ninole Gulch near Punaluu

LOCATION.--Lat 19°1D'44", long 155°33'46", Hawaii, on right bank 300 ft downstream from forest-reserve boundary, 4.6 miles northwest of Punaluu, and 6.0 miles north of Honuapo.

DRAINAGE AREA.--15.5 sq mi.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,430 cfs Apr. 11 (gage height, 6.62 ft), from rating curve extended above 30 cfs; no flow for many days.
Period of record: Maximum discharge, 2,430 cfs Apr. 11, 1970 (gage height, 6.62 ft), from rating curve extended above 30 cfs; no flow for many days each year.

REMARKS.--Records good except those above 60 cfs, which are poor. No diversion above station.

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	.14	0	.18	0	.33	0	13	14	0
2	0	0	0	0	0	0	0	17	0	.42	1.4	0
3	0	0	0	.99	0	0	0	.12	0	.01	.04	0
4	0	0	0	2.1	0	0	0	0	0	0	0	0
5	0	0	.02	0	0	0	0	0	0	0	0	0
6	.71	0	0	0	0	0	0	0	0	.02	0	0
7	.05	0	0	0	0	0	0	0	0	0	0	0
8	.02	0	0	0	0	0	0	5.1	0	0	0	0
9	0	0	0	0	0	0	0	1.7	0	54	0	.13
10	.77	0	0	0	0	0	31	7.3	0	61	0	.01
11	1.6	0	0	0	0	0	183	.16	0	22	0	4.6
12	0	0	0	0	0	0	.63	0	1.0	15	0	0
13	0	5.3	0	0	0	0	11	0	15	5.0	0	0
14	0	.58	0	0	0	0	4.3	0	4.0	4.5	0	5.5
15	0	0	0	0	0	0	.05	0	15	5.0	0	.02
16	0	0	0	0	0	0	.31	1.8	.15	10	12	0
17	0	0	0	0	0	0	2.1	.03	.34	12	.03	0
18	.04	0	0	0	0	0	1.3	0	.06	2.0	0	0
19	0	0	0	0	0	0	20	0	0	.50	0	0
20	0	0	0	0	0	0	1.6	0	0	0	0	0
21	.64	0	0	0	0	0	2.9	0	0	0	1.9	0
22	.01	0	0	0	0	0	.02	0	0	0	.16	0
23	.19	0	0	0	0	0	0	0	0	0	.37	.73
24	0	0	0	0	0	0	2.7	0	0	0	1.0	0
25	.22	40	0	0	0	0	.17	0	0	0	2.0	0
26	0	.53	0	0	0	0	41	0	0	.30	85	0
27	0	0	0	0	0	0	20	2.1	0	35	17	0
28	0	0	0	0	0	0	.26	120	0	40	2.0	0
29	0	0	26	0	------	0	0	20	0	1.5	.18	0
30	0	0	.25	0	------	0	.53	3.0	0	1.0	1.2	0
31	0	------	1.6	0	------	0	------	.50	------	3.0	.07	------
TOTAL	4.25	46.41	27.87	3.23	0	0.18	322.87	179.14	35.55	285.25	138.35	10.99
MEAN	.14	1.55	.90	.10	0	.006	10.8	5.78	1.19	9.20	4.46	.37
MAX	1.6	40	26	2.1	0	.18	183	120	15	61	85	5.5
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	8.4	92	55	6.4	0	.4	640	355	71	566	274	22

CAL YR 1969 TOTAL 1,386.43 MEAN 3.80 MAX 324 MIN 0 AC-FT 2,750
WTR YR 1970 TOTAL 1,054.09 MEAN 2.89 MAX 183 MIN 0 AC-FT 2,090

PEAK DISCHARGE (BASE, 1,000 CFS).--Apr. 11 (1530) 2,430 cfs (6.62 ft); May 28 (1530) 1,040 cfs (5.59 ft).

16770500 Paauau Gulch at Pahala

LOCATION.--Lat 19°12'39", long 155°28'48", Hawaii, on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mile north of Pahala.

DRAINAGE AREA.--1.74 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 972 ft above mean sea level (by stadia survey).

AVERAGE DISCHARGE.--8 years, 0.663 cfs (480 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 131 cfs Aug. 26 (gage height, 3.52 ft); no flow most of time. Period of record: Maximum discharge, 3,600 cfs Jan. 5, 1969 (gage height, 5.90 ft), from rating curve extended above 360 cfs on basis of slope-area measurement at gage height 4.40 ft; no flow most of time.

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

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1				0				0			0	0
2				0				2.6			0	0
3				4.5				0			0	0
4				.53				0			0	0
5				0				0			0	0
6				0				0			0	0
7				0				0			0	0
8				0				0			0	0
9				0				0			0	0
10				0				0			0	0
11				0				0			0	.01
12				0				0			0	0
13				0				0			0	0
14				0				0			0	0
15				0				0			0	0
16				0				0			0	0
17				0				0			0	0
18				0				0			0	0
19				0				0			0	0
20				0				0			0	0
21				.02				0			0	0
22				.08				0			0	0
23				.09				0			0	0
24				0				0			0	0
25				0				0			.27	0
26				0				0			22	0
27				.10				0			.16	0
28				0				0			.05	0
29				0	------			0			0	0
30				0	------			0			0	0
31		------		0	------		------	0	------		0	------
TOTAL	0	0	0	5.32	0	0	0	2.6	0	0	22.48	.01
MEAN	0	0	0	.17	0	0	0	.084	0	0	.73	.0003
MAX	0	0	0	4.5	0	0	0	2.6	0	0	22	.01
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	11	0	0	0	5.2	0	0	45	.02

CAL YR 1969 TOTAL 397.67 MEAN 1.09 MAX 336 MIN 0 AC-FT 789
WTR YR 1970 TOTAL 30.41 MEAN .083 MAX 22 MIN 0 AC-FT 60

PEAK DISCHARGE (BASE, 160 CFS).--No peak above base.

16800000 Denni Spring

LOCATION.--Lat 15°11'57" N., long 145°46'05" E., Saipan, 2.8 miles southeast of Tanapag, 3.1 miles east of Garapan, and 5.6 miles northeast of Chalan Kanoa.

PERIOD OF RECORD.--August 1952 to June 1954 (published as Donni Spring near Garapan), February to April 1968, January 1969 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 261 ft (from U.S. Navy).

EXTREMES.--Period of record: Maximum daily discharge, 2.6 cfs Oct. 19-22, 1969, Jan. 22-24, 1970; minimum daily, 0.02 cfs Sept. 16, 17, 1969.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.84	.45	.60	1.1	.84	.50	.28	.24	.15	.36	.72
2	.10	.84	.50	.60	1.0	.78	.50	.24	.24	.15	.36	.96
3	.10	.78	.55	.60	.96	.78	.45	.24	.24	.15	.32	1.1
4	.10	.78	.55	.60	.96	.78	.45	.24	.24	.15	.32	1.2
5	.10	.72	.50	.60	.90	.78	.45	.24	.24	.15	.28	1.2
6	.10	.72	.50	.60	.90	.78	.45	.24	.24	.15	.28	1.1
7	.10	.66	.50	.60	1.1	.78	.45	.24	.24	.15	.36	1.1
8	.10	.66	.50	.66	1.2	.78	.40	.24	.24	.15	.55	1.0
9	.10	.60	.55	.66	1.2	.78	.40	.24	.24	.12	.55	.96
10	.10	.60	.72	.66	1.1	.78	.40	.24	.24	.12	.60	.90
11	.10	.55	.78	.66	1.1	.78	.40	.24	.24	.12	.60	.90
12	.10	.55	.78	.66	1.1	.78	.40	.21	.21	.12	.55	.84
13	.10	.55	.78	.66	1.1	.78	.40	.21	.21	.12	.55	.78
14	.10	.55	.72	.66	1.1	.72	.36	.21	.21	.12	.55	.78
15	.10	.50	.66	.66	1.1	.72	.36	.24	.21	.12	.55	.72
16	.15	.50	.66	.66	1.1	.72	.36	.24	.21	.12	.66	.72
17	1.1	.50	.60	.66	1.1	.72	.36	.24	.21	.12	.78	.66
18	2.0	.50	.60	.60	1.0	.72	.36	.24	.21	.12	.78	.66
19	2.6	.50	.66	.66	1.0	.66	.36	.24	.21	.12	.78	.66
20	2.6	.50	1.0	1.1	1.0	.66	.36	.24	.18	.12	.72	.60
21	2.6	.50	1.1	2.0	1.0	.66	.36	.24	.18	.12	.66	.60
22	2.6	.50	1.1	2.6	1.0	.66	.36	.24	.18	.12	.66	.60
23	2.2	.50	1.0	2.6	.96	.60	.32	.24	.18	.12	.72	.55
24	2.0	.45	.96	2.6	.96	.60	.32	.24	.15	.18	.73	.55
25	1.5	.45	.84	2.2	.90	.60	.32	.24	.15	.36	.78	.55
26	1.4	.45	.78	2.0	.90	.55	.32	.24	.15	.36	.78	.55
27	1.3	.45	.72	1.7	.84	.55	.32	.24	.15	.32	.72	.55
28	1.1	.45	.66	1.5	.84	.55	.32	.24	.15	.32	.72	.55
29	1.1	.45	.66	1.4	------	.55	.28	.24	.15	.32	.66	.50
30	.96	.45	.60	1.3	------	.55	.28	.24	.15	.32	.66	.50
31	.90	------	.60	1.2	------	.55	------	.24	------	.36	.66	------
TOTAL	27.61	17.05	21.58	34.26	28.52	21.54	11.37	7.39	6.09	5.54	18.30	23.06
MEAN	.89	.57	.70	1.11	1.02	.69	.38	.24	.20	.18	.59	.77
MAX	2.6	.84	1.1	2.6	1.2	.84	.50	.28	.24	.36	.78	1.2
MIN	.10	.45	.45	.60	.84	.55	.28	.21	.15	.12	.28	.50
AC-FT	55	34	43	68	57	43	23	15	12	11	36	46

CAL YR 1969 TOTAL 121.58 MEAN .33 MAX 2.6 MIN .02 AC-FT 241
WTR YR 1970 TOTAL 222.31 MEAN .61 MAX 2.6 MIN .10 AC-FT 441

16801000 South Fork Talofofo Stream

LOCATION.--Lat 15°13'01" N., long 145°46'42" E., Saipan, on right bank 300 ft upstream from confluence with Middle and North Forks, 2.4 miles southeast of Tanapag, and 3.8 miles east of Garapan.

DRAINAGE AREA.--0.73 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 664 cfs Oct. 16 (gage height, 7.22 ft), from rating curve extended above 30 cfs; no flow for many days.
Period of record: Maximum discharge, 1,230 cfs Nov. 19, 1968 (gage height, 7.18 ft), from rating curve extended above 1.2 cfs on basis of estimate of discharge from high-water marks; maximum gage height, 8.14 ft Nov. 2, 1968, from floodmark (backwater from vegetation); no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	.70	.21	.80	1.2	.55	.18	0	0	0	.01	17
2	0	.65	.03	.76	1.2	.55	.13	0	0	0	0	3.1
3	0	.60	0	.83	1.1	.52	.04	.04	0	0	0	1.5
4	0	.60	0	.80	1.2	.52	.01	0	0	0	.54	1.1
5	0	.50	0	.80	1.0	.58	.01	0	0	0	.28	.90
6	0	.50	0	.86	6.8	.49	.01	0	0	0	.43	.70
7	0	.40	0	1.5	1.9	.49	.32	0	0	0	8.6	.70
8	0	.40	0	1.2	1.6	.49	.08	0	0	0	1.8	.62
9	0	.35	2.7	1.0	1.4	.46	.07	0	0	0	1.4	.55
10	0	.30	1.0	1.0	1.4	.40	.01	0	0	0	1.5	.48
11	0	.30	.90	1.0	2.2	.50	0	0	0	0	1.2	.48
12	0	.30	.86	.95	3.3	.72	.01	0	0	0	.76	.48
13	0	.35	.80	.90	2.1	.40	0	0	0	0	.86	.48
14	0	.30	.64	.86	1.7	.35	0	0	0	0	.83	.48
15	0	.30	.60	.86	1.4	.30	.06	0	0	0	1.8	.48
16	127	.30	.55	.83	1.3	.30	.02	0	.27	0	3.0	.41
17	23	.25	.50	.80	1.2	.30	0	0	1.0	0	1.2	.35
18	4.0	.20	1.5	.80	1.2	.30	0	0	.17	0	.90	.30
19	2.5	.20	9.2	2.1	1.1	.25	0	0	0	0	.83	.25
20	1.5	.15	2.0	13	.90	.25	0	0	0	0	1.9	.41
21	1.1	.15	1.2	7.2	.86	.20	0	0	0	0	1.0	.21
22	1.0	.10	1.1	3.7	.80	.20	0	0	0	.01	2.9	1.3
23	1.0	.10	1.0	2.7	.72	.15	0	0	0	0	1.9	.48
24	1.5	.05	1.0	2.2	.69	.10	0	0	0	.96	1.1	1.2
25	1.3	0	.90	2.0	.64	.20	0	0	0	.11	.86	1.3
26	1.2	0	.80	1.8	.62	.20	0	0	0	0	.76	.90
27	1.1	0	.75	1.7	.55	.30	0	0	0	0	.76	.62
28	1.0	0	.70	1.5	.55	.20	0	0	0	0	.78	.30
29	.90	0	.65	2.0	------	.15	0	0	0	0	5.1	.15
30	.80	.49	.62	1.5	------	.10	0	0	0	.71	1.5	.12
31	.70	------	.69	1.4	------	.10	------	0	------	.17	1.4	------
TOTAL	169.60	8.54	30.90	59.35	40.63	10.62	.95	.04	1.44	1.96	45.90	37.35
MEAN	5.47	.28	1.00	1.91	1.45	.34	.032	.001	.048	.063	1.48	1.25
MAX	127	.70	9.2	13	6.8	.72	.32	.04	1.0	.96	8.6	17
MIN	0	0	0	.76	.55	.10	0	0	0	0	0	.12
AC-FT	336	17	61	118	81	21	1.9	.08	2.9	3.9	91	74

CAL YR 1969 TOTAL 227.83 MEAN .62 MAX 127 MIN 0 AC-FT 452
WTR YR 1970 TOTAL 407.28 MEAN 1.12 MAX 127 MIN 0 AC-FT 808

PEAK DISCHARGE (BASE, 400 CFS).--Oct. 16 (1730) 664 cfs (7.22 ft).

NOTE.--No gage-height record Oct. 18 to Nov. 25.

16801500 Middle Fork Talofofo Stream

LOCATION.--Lat 15°13'05" N., long 145°46'36" E., Saipan, on left bank 700 ft upstream from confluence with South and North Forks, 2.2 miles southeast of Tanapag, and 3.7 miles east of Garapan.

DRAINAGE AREA.--0.35 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 370 cfs Oct. 16 (gage height, 4.66 ft), from rating curve extended above 1.1 cfs; minimum, 0.13 cfs July 18, 19.
Period of record: Maximum discharge, 526 cfs Nov. 19, 1968 (gage height, 5.22 ft), from rating curve extended above 1.1 cfs; minimum, 0.08 cfs July 3, 1969.

REMARKS.--Records fair except those above 2.0 cfs, which are poor. No diversion above station.

REVISIONS (WATER YEARS).--WRD Hawaii 1969: 1968.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.27	.43	2.4	.57	.62	.52	.62	.33	.55	.23	.23	6.7
2	.27	.43	1.4	.47	.62	.52	.43	.33	.50	.27	.27	1.7
3	.25	.39	.43	.62	.68	.57	.43	.30	.50	.27	.36	.68
4	.23	.39	.33	.47	.81	.47	.47	.27	.45	.25	1.6	.52
5	.27	.39	.33	.39	.68	.62	.39	.27	.45	.27	.39	.39
6	.30	.39	.30	.47	3.5	.57	.36	.30	.40	.25	.39	.36
7	.17	.36	.36	1.5	.96	.57	.68	.30	.40	.29	4.8	.52
8	.21	.36	.36	.52	.68	.57	.39	.33	.35	.25	.62	1.1
9	.23	.36	2.5	.47	.62	.52	.52	.36	.35	.38	.81	1.5
10	.19	.36	.68	.39	.57	.47	.50	.33	.30	.27	1.3	1.6
11	.19	.33	.47	.62	1.7	.66	.40	.27	.30	.25	.52	1.1
12	.17	.36	.39	.47	2.3	.82	.40	.25	.25	.23	.25	.52
13	.17	.47	.39	.39	1.2	.39	.30	.30	.25	.21	.27	.52
14	.17	.36	.33	.36	.88	.36	.20	.30	.30	.25	.25	.52
15	.17	.47	.30	.36	.81	.36	.50	.30	.30	.21	.50	.52
16	49	.39	.33	.36	.68	.36	.40	.33	.68	.27	1.0	.47
17	12	.36	.30	.36	.62	.43	.35	.30	1.4	.23	.50	.47
18	2.0	.33	.78	.47	.62	.43	.30	.30	.30	.17	.40	.52
19	1.3	.33	6.2	2.7	.68	.47	.25	.30	.27	.17	.30	.62
20	.68	.36	1.0	9.4	.68	.62	.25	.25	.30	.27	1.0	1.5
21	.52	.36	.68	4.7	.62	.52	.25	.25	.36	.17	.50	.62
22	.50	.43	.62	2.2	.62	.39	.30	.25	.36	.25	1.7	2.3
23	.50	.33	.57	1.4	.68	.39	.30	.25	.33	.21	1.1	.81
24	.80	.43	.52	1.1	.62	.39	.30	.25	.30	1.2	.47	1.6
25	.60	.30	.47	.88	.57	.52	.30	.30	.30	.21	.36	1.1
26	.60	.30	.52	.74	.52	.62	.30	.35	.30	.19	.33	.64
27	.55	.30	.47	.68	.52	.74	.30	.40	.30	.30	.36	.52
28	.55	.30	.43	.62	.52	.68	.30	.35	.27	.43	.47	.62
29	.55	.30	.43	1.1	------	.62	.35	.43	.25	.21	4.6	.68
30	.52	1.2	.43	.96	------	.57	.35	.52	.25	.81	.81	.57
31	.47	------	.47	.62	------	.57	------	.57	------	.30	1.1	------
TOTAL	74.40	11.87	25.19	36.36	24.58	16.31	11.19	9.94	11.62	9.27	27.56	30.79
MEAN	2.40	.40	.81	1.17	.88	.53	.37	.32	.39	.30	.89	1.03
MAX	49	1.2	6.2	9.4	3.5	.82	.68	.57	1.4	1.2	4.8	6.7
MIN	.17	.30	.30	.36	.52	.36	.20	.25	.25	.17	.23	.36
AC-FT	148	24	50	72	49	32	22	20	23	18	55	61

CAL YR 1969 TOTAL 198.76 MEAN .54 MAX 49 MIN .10 AC-FT 394
WTR YR 1970 TOTAL 289.08 MEAN .79 MAX 49 MIN .17 AC-FT 573

PEAK DISCHARGE (BASE, 150 CFS).--Oct. 16 (1730) 370 cfs (4.66 ft).

16808300 Finile Creek at Agat
(Formerly published as Finile River at Agat)

LOCATION.--Lat 13°22'41" N., long 144°39'26" E., Guam, on right bank 0.4 mile upstream from estuary and 0.4 mile southeast of Agat School.

DRAINAGE AREA.--0.26 sq mi.

PERIOD OF RECORD.--April 1960 to current year. Prior to October 1969, published as Finile River at Agat.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

AVERAGE DISCHARGE.--10 years, 1.51 cfs (1,090 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 319 cfs Oct. 17 (gage height, 3.81 ft, from floodmark in well), from rating curve extended as explained below; minimum, 0.11 cfs July 13.
Period of record: Maximum discharge, 319 cfs Oct. 17, 1969 (gage height, 3.81 ft, from floodmark in well), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 3.66 ft; minimum, 0.09 cfs June 1, 3, July 6, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.39	3.2	2.2	2.2	1.0	.62	.39	.34	.22	.19	.26	1.7
2	.39	2.6	2.0	2.0	1.0	.56	.44	.30	.22	.16	.22	1.0
3	.39	3.4	1.4	2.0	1.0	.56	.39	.26	.44	.16	.44	.86
4	.44	2.6	1.4	1.9	.95	.56	.39	.26	.26	.16	1.4	.86
5	1.0	2.4	1.2	1.9	.95	.56	.39	.30	.22	.16	.62	.95
6	.50	2.0	1.5	1.9	.95	.56	.34	.26	.22	.16	.62	1.6
7	.56	2.0	1.2	1.8	.95	.50	.34	.26	.22	.16	.98	2.6
8	.39	2.4	1.2	1.8	.86	.50	.34	.26	.19	.13	.44	1.2
9	.39	1.8	1.0	1.8	.86	.50	.34	.22	.52	.28	.39	1.0
10	.95	1.6	1.4	1.6	.86	.50	.34	.22	.50	.19	.39	.95
11	.50	1.5	.95	1.6	1.2	.50	.39	.22	.26	.16	.62	3.8
12	.39	1.4	.95	1.5	1.0	.50	.34	.22	.26	.16	.62	1.2
13	.39	2.9	.95	1.5	.86	.50	.34	.22	.22	.13	.56	1.0
14	.39	3.4	1.4	1.4	1.0	.56	.34	.22	.19	.13	.56	1.0
15	.44	2.6	.95	1.4	1.2	.50	.34	.22	.19	.13	.50	.95
16	2.8	3.0	.86	1.4	.86	.50	.34	.22	.19	.19	.39	.78
17	30	1.9	.86	1.4	.86	.44	.34	.30	.22	2.2	.34	2.7
18	11	2.0	3.0	1.4	.78	.44	.44	.26	.19	.26	.39	1.2
19	2.2	2.8	37	3.1	.78	.44	.34	.26	.19	.19	1.3	1.0
20	2.4	1.8	5.0	1.6	.78	.44	.34	.22	.16	.26	3.4	1.0
21	2.3	1.6	4.0	1.8	.70	.44	.34	.26	.16	.62	1.2	.95
22	1.6	1.4	3.5	1.5	.70	.44	.34	.22	.16	.30	1.2	1.2
23	1.5	1.6	3.1	1.5	.70	.44	.30	.22	.16	1.1	.95	.86
24	2.2	2.2	2.9	1.8	.70	.44	.30	.22	.16	1.6	.86	.86
25	2.0	1.4	2.7	1.9	.62	.39	.30	.22	.16	.44	.78	.86
26	4.5	1.2	2.6	1.2	.62	.39	.30	.22	.16	.34	4.3	.78
27	2.4	1.2	2.6	1.2	.62	.44	.30	.22	.26	.44	1.0	.70
28	1.6	1.2	2.6	1.2	.62	.56	.26	.22	.30	.39	.78	.70
29	6.5	1.2	2.4	1.2	------	.50	.26	.22	.26	.30	1.5	1.0
30	9.6	1.2	2.4	1.2	------	.44	.26	.22	.26	.26	.86	.95
31	2.6	------	2.2	1.0	------	.44	------	.22	------	.26	.78	------
TOTAL	92.71	61.5	97.42	50.7	23.98	15.16	10.21	7.50	7.12	11.61	28.65	36.21
MEAN	2.99	2.05	3.14	1.64	.86	.49	.34	.24	.24	.37	.92	1.21
MAX	30	3.4	37	3.1	1.2	.62	.44	.34	.52	2.2	4.3	3.8
MIN	.39	1.2	.86	1.0	.62	.39	.26	.22	.16	.13	.22	.70
AC-FT	184	122	193	101	48	30	20	15	14	23	57	72

CAL YR 1969 TOTAL 362.65 MEAN .99 MAX 37 MIN .13 AC-FT 719
WTR YR 1970 TOTAL 442.77 MEAN 1.21 MAX 37 MIN .13 AC-FT 878

PEAK DISCHARGE (BASE, 170 CFS).--Oct. 17 (about 0100) 319 cfs (3.81 ft); Dec. 19 (0430) 248 cfs (3.30 ft).

NOTE.--No gage-height record Oct. 17.

16816000 Umatac River at Umatac

LOCATION.--Lat 13°17'45" N., long 144°39'50" E., Guam, on left bank 0.2 mile upstream from mouth, 0.3 mile southeast of Umatac, and 5.7 miles northwest of Inarajan.

DRAINAGE AREA.--2.04 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 8 ft (from topographic map). Prior to Oct. 16, 1953, at datum 0.62 ft higher.

AVERAGE DISCHARGE.--18 years, 8.60 cfs (6,230 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 5,330 cfs Dec. 19 (gage height, 6.00 ft), from rating curve extended as explained below; minimum, 0.30 cfs Apr. 25-27, May 26.
Period of record: Maximum discharge, 7,460 cfs Oct. 19, 1960 (gage height, 7.04 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 3.51 and 7.04 ft; minimum, 0.20 cfs June 23, 1960.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Upstream diversion at Piga Spring for domestic use at Umatac. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	25	9.2	3.0	3.8	2.2	1.3	.74	.64	1.3	1.1	5.6
2	6.0	12	7.6	5.0	3.5	2.0	1.6	.74	.64	.94	.90	10
3	4.6	10	5.3	4.0	3.2	2.0	1.6	.64	1.2	.84	1.5	5.0
4	6.0	12	5.3	3.0	3.0	2.0	1.3	.64	.84	.74	3.0	12
5	50	9.0	7.9	3.0	3.0	2.0	1.3	.84	.74	.74	4.5	6.8
6	6.8	8.0	5.0	3.0	3.0	1.8	1.3	.74	.64	.74	2.4	12
7	5.6	6.8	4.3	4.0	3.8	1.6	1.2	.74	.56	.84	8.5	45
8	6.0	6.4	4.6	3.0	4.0	1.6	1.1	.74	.56	.74	4.6	11
9	4.6	6.8	4.0	2.5	3.0	1.6	.74	.74	.74	.74	3.0	7.2
10	3.8	5.6	8.2	2.5	3.0	1.6	.74	.64	3.2	.74	3.5	5.5
11	3.0	5.3	4.3	4.0	5.9	1.6	.84	.64	1.3	.84	42	20
12	2.6	5.3	3.8	3.0	5.0	1.6	.74	.56	1.1	.74	6.8	7.0
13	2.6	36	5.5	3.0	3.5	1.6	.74	.64	.84	.74	5.0	5.0
14	3.2	9.5	6.2	3.0	12	2.0	.74	.56	.94	.74	13	6.0
15	26	45	4.0	2.5	6.4	1.6	.74	.42	1.1	2.0	6.8	5.0
16	77	13	3.5	2.5	4.0	1.5	.84	.36	.84	6.7	4.3	5.0
17	178	14	3.5	2.5	3.5	1.5	.84	.36	1.3	10	3.5	50
18	61	11	50	2.5	3.0	1.5	.74	.74	1.1	2.8	3.0	20
19	24	9.0	563	50	3.0	1.5	.49	.74	1.1	1.5	6.7	10
20	20	7.2	60	15	2.8	1.3	.42	.36	.84	1.8	8.4	25
21	15	6.8	25	15	2.8	1.3	.49	.36	.74	2.0	6.0	10
22	13	6.0	15	25	2.8	1.2	.42	.36	.74	1.6	6.0	25
23	11	5.6	15	6.0	2.8	1.2	.42	.36	.64	2.2	15	40
24	10	21	12	9.8	2.8	1.2	.36	.36	.64	22	7.2	15
25	15	7.2	10	52	2.6	1.2	.30	.36	.64	3.2	5.0	10
26	36	8.4	10	10	2.4	1.2	.30	.30	.64	1.6	3.8	8.0
27	39	5.6	8.0	6.8	2.4	1.3	.36	.49	.74	1.2	5.3	6.0
28	51	5.0	7.0	5.6	2.4	1.2	.74	.74	2.2	7.9	4.3	5.0
29	177	6.4	6.0	5.0	------	1.3	.74	.84	1.8	2.2	5.3	5.0
30	59	5.3	5.0	4.3	------	1.3	.74	.74	2.6	1.3	4.6	15
31	19	------	4.0	4.0	------	1.3	------	.64	------	.94	5.4	------
TOTAL	944.6	334.2	882.2	264.5	103.4	47.8	24.18	18.13	31.60	82.36	200.40	412.1
MEAN	30.5	11.1	28.5	8.53	3.69	1.54	.81	.58	1.05	2.66	6.46	13.7
MAX	178	45	563	52	12	2.2	1.6	.84	3.2	22	42	50
MIN	2.6	5.0	3.5	2.5	2.4	1.2	.30	.30	.56	.74	.90	5.0
AC-FT	1,870	663	1,750	525	205	95	48	36	63	163	397	817

CAL YR 1969 TOTAL 2,898.49 MEAN 7.94 MAX 563 MIN .36 AC-FT 5,750
WTR YR 1970 TOTAL 3,345.47 MEAN 9.17 MAX 563 MIN .30 AC-FT 6,640

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 5	1030	3.53	1,490	12-19	0300	6.00	5,330
10-29	2300	3.89	1,910				

NOTE.--No gage-height record Dec. 20 to Jan. 21.

16821000 Geus River near Merizo

LOCATION.--Lat 13°16'15" N., long 144°40'40" E., Guam, on left bank 0.7 mile northeast of Merizo, 2.2 miles southeast of Umatac, and 4.7 miles west of Inarajan.

DRAINAGE AREA.--0.95 sq mi.

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

GAGE.--Water-stage recorder and broad-crested weir. Altitude of gage is 60 ft (from topographic map).

AVERAGE DISCHARGE.--17 years, 3.17 cfs (2,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,290 cfs Dec. 19 (gage height, 3.98 ft), from rating curve extended as explained below; no flow June 9, 10.
Period of record: Maximum discharge, 2,940 cfs Oct. 19, 1960 (gage height, 4.16 ft), from rating curve extended above 66 cfs on basis of slope-area measurements at gage heights 4.00 and 4.16 ft; no flow at times in 1966, 1969-70.

REMARKS.--Records fair. Water is diverted 0.5 mile upstream for domestic use and at station for irrigation.

REVISIONS (FISCAL YEARS).--WSP 1937: 1954(P), 1959(P).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	4.3	1.0	1.2	.82	.31	.28	.06	.04	.16	.25	1.3
2	6.0	3.2	1.4	1.2	.87	.31	.34	.05	.05	.12	.28	2.2
3	2.2	2.2	.93	1.2	.82	.31	.25	.05	.20	.09	.23	.87
4	1.6	2.5	.63	1.0	.63	.31	.23	.05	.18	.08	2.4	9.2
5	28	2.2	.55	1.0	.59	.31	.20	.07	.07	.10	1.0	4.4
6	4.4	2.2	.43	1.1	.55	.28	.18	.07	.06	.06	.68	3.2
7	3.2	1.6	.40	1.1	.47	.31	.16	.10	.06	.06	5.0	30
8	2.6	1.4	.51	.98	.59	.31	.18	.23	.03	.07	2.4	7.0
9	2.4	1.2	.47	1.0	.59	.37	.18	.28	0	.07	.93	5.0
10	2.2	1.3	.68	.93	.55	.43	.16	.16	0	.08	1.1	3.2
11	1.4	1.0	.59	1.1	.98	.43	.28	.05	.10	.08	3.5	4.4
12	1.0	1.3	.55	.93	1.4	.55	.10	.05	.14	.08	1.6	3.9
13	1.0	8.2	.63	.87	1.4	.31	.07	.06	.12	.07	.87	3.1
14	.98	3.9	1.0	.93	3.3	.51	.07	.06	.09	.07	2.2	2.6
15	17	7.1	.72	.77	4.6	.37	.10	.05	.10	.06	1.9	2.5
16	60	5.0	.59	.82	1.4	.34	.23	.04	.10	.77	1.1	4.4
17	102	3.3	.55	.77	.93	.37	.23	.06	.14	1.0	.87	16
18	28	3.1	.82	1.0	.63	.37	.16	.08	.10	.40	.82	3.1
19	9.1	2.2	224	4.6	.55	.37	.12	.08	.09	.08	1.0	1.2
20	4.2	1.6	8.7	2.0	.47	.34	.14	.07	.09	.05	1.2	.87
21	2.8	1.3	3.3	3.0	.43	.31	.20	.06	.08	.68	1.2	.59
22	2.5	1.1	2.0	5.6	.37	.31	.14	.06	.06	.23	1.0	.55
23	1.4	.98	2.1	5.0	.40	.28	.14	.07	.05	.68	.87	.51
24	1.4	3.9	1.9	2.6	.43	.28	.10	.04	.05	3.5	.68	.40
25	2.1	1.9	1.8	15	.31	.31	.09	.07	.14	.93	.59	.40
26	4.3	1.6	1.7	4.2	.20	.31	.07	.07	.12	.47	.37	.34
27	5.6	1.4	1.6	2.2	.31	.37	.06	.07	.10	.28	.18	.31
28	3.0	.87	1.4	1.5	.40	.28	.08	.07	.18	1.0	.47	.28
29	30	1.0	1.3	1.2	------	.28	.09	.05	.18	.47	.72	.25
30	31	1.4	1.3	1.0	------	.31	.06	.05	.20	.31	.93	.37
31	4.8	------	1.2	.87	------	.28	------	.04	------	.25	.68	------
TOTAL	395.18	74.25	264.75	66.67	25.07	10.53	4.69	2.37	2.92	12.35	37.02	112.44
MEAN	12.7	2.48	8.54	2.15	.90	.34	.16	.077	.097	.40	1.19	3.75
MAX	102	8.2	224	15	4.6	.55	.34	.28	.20	3.5	5.0	30
MIN	.98	.87	.40	.77	.28	.28	.06	.04	0	.05	.18	.25
AC-FT	784	147	525	132	50	21	9.3	4.7	5.8	25	73	223

CAL YR 1969 TOTAL 953.67 MEAN 2.61 MAX 224 MIN 0 AC-FT 1,890
WTR YR 1970 TOTAL 1,008.24 MEAN 2.76 MAX 224 MIN 0 AC-FT 2,000

PEAK DISCHARGE (BASE, 350 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 1	1630	2.93	514	10-29	2330	2.96	538
10- 5	1000	3.40	1,020	12-19	0400	3.98	2,290
10-16	2300	3.15	705				

16835000 Inarajan River near Inarajan

LOCATION.--Lat 13°16'40" N., long 144°44'15" E., Guam, on right bank 0.6 mile northwest of Inarajan and 4.9 miles east of Merizo.

DRAINAGE AREA.--4.49 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

AVERAGE DISCHARGE.--18 years, 17.2 cfs (12,460 acre-ft per year).

EXTREMES.--Current year: Maximum gage height, 12.72 ft Dec. 19 (discharge not determined); minimum discharge, 1.8 cfs June 8, 9.
Period of record: Maximum gage height, 12.90 ft Oct. 11, 1963 (discharge not determined); minimum discharge, 0.99 cfs July 14, 1959.

REMARKS.--Records good. Stage-discharge relation not determined above gage height 11.0 ft owing to ungaged overbank flow. Village of Inarajan diverts about 40,000 gallons a day above station for domestic use.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	60	17	15	9.5	5.5	4.1	2.6	2.0	3.0	6.3	32
2	15	31	19	15	9.1	5.3	4.9	2.6	2.0	2.4	6.0	21
3	8.0	28	13	15	8.4	5.1	3.9	2.5	6.8	2.1	7.2	11
4	6.0	29	12	15	8.1	5.3	3.6	2.5	2.2	2.0	88	11
5	30	24	12	14	7.8	5.1	3.9	2.8	2.0	2.0	12	18
6	9.5	20	12	14	8.4	5.1	3.7	2.6	2.0	2.0	8.1	26
7	14	19	11	14	8.4	4.9	3.4	2.5	1.9	2.8	29	86
8	8.1	18	11	13	8.1	4.9	3.4	2.6	1.8	2.6	12	19
9	7.2	18	11	12	7.2	4.9	3.2	2.5	1.8	2.1	7.8	14
10	6.9	18	15	12	7.2	4.7	3.2	2.5	8.0	2.0	9.1	12
11	6.6	14	11	16	14	4.7	3.6	2.4	3.0	2.1	163	38
12	5.7	17	10	13	12	4.7	3.2	2.4	2.4	2.0	16	18
13	6.0	72	18	12	11	4.7	3.1	2.4	2.6	2.0	16	16
14	6.6	20	19	11	37	5.3	3.2	2.2	2.4	1.9	33	11
15	174	58	16	11	16	4.9	3.2	2.2	2.4	2.4	16	10
16	241	28	14	11	9.8	4.3	3.9	2.1	2.4	8.3	9.8	12
17	488	28	12	10	8.4	4.3	3.6	2.4	3.2	17	8.1	220
18	98	23	29	18	7.8	4.1	3.4	3.1	2.4	4.9	7.2	25
19	50	20	694	40	7.2	4.1	3.1	2.5	2.4	3.1	11	15
20	25	16	50	17	6.6	4.1	3.2	2.2	2.2	8.4	16	30
21	50	15	30	20	7.2	4.1	3.2	2.4	2.0	10	9.8	15
22	25	14	20	24	6.6	3.9	3.1	2.2	2.0	5.1	8.4	25
23	20	14	30	22	6.9	3.7	3.1	2.0	2.0	15	9.1	20
24	18	33	25	49	6.3	3.7	3.1	2.0	2.0	44	8.7	15
25	23	14	20	165	6.0	3.7	3.0	2.2	1.9	11	8.4	40
26	56	15	20	20	5.7	3.7	2.8	2.0	2.1	5.3	7.8	20
27	51	14	15	15	5.5	4.1	2.8	2.0	3.1	6.6	7.5	15
28	57	12	15	12	5.5	3.9	3.0	2.4	4.5	15	8.7	13
29	232	20	14	11	------	4.1	2.8	2.0	3.9	33	17	11
30	152	14	14	10	------	4.1	2.6	2.0	3.9	9.5	9.8	10
31	34	------	14	9.5	------	4.5	------	2.0	------	6.3	14	------
TOTAL	2,017.6	726	1,223	655.5	261.7	139.5	100.3	72.8	83.3	235.9	590.8	829
MEAN	65.1	24.2	39.5	21.1	9.35	4.50	3.34	2.35	2.78	7.61	19.1	27.6
MAX	488	72	694	165	37	5.5	4.9	3.1	8.0	44	163	220
MIN	5.7	12	10	9.5	5.5	3.7	2.6	2.0	1.8	1.9	6.0	10
AC-FT	4,000	1,440	2,430	1,300	519	277	199	144	165	468	1,170	1,640

CAL YR 1969 TOTAL 5,328.0 MEAN 14.6 MAX 694 MIN 1.4 AC-FT 10,570
WTR YR 1970 TOTAL 6,935.4 MEAN 19.0 MAX 694 MIN 1.8 AC-FT 13,760

PEAK DISCHARGE (BASE, 1,700 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-17	0030	12.29	Unknown	8-11	0530	11.31	Unknown
12-19	0600	12.72	Unknown	9-17	0030	12.10	Unknown

16840000 Tinaga River near Inarajan
(Formerly published as Pauliluc River near Inarajan)

LOCATION.--Lat 13°17'05" N., long 144°45'00" E., Guam, on right bank 0.3 mile upstream from mouth, 0.9 mile northeast of Inarajan, and 3.8 miles south of Talofofo.

DRAINAGE AREA.--1.86 sq mi.

PERIOD OF RECORD.--October 1952 to current year. Prior to October 1969, published as Pauliluc River near Inarajan.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

AVERAGE DISCHARGE.--18 years, 5.69 cfs (4,120 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,950 cfs Dec. 19 (gage height, 11.00 ft), from rating curve extended above 210 cfs; minimum, 0.17 cfs occurred during period June 10 to July 8.
Period of record: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended above 210 cfs; minimum, 0.15 cfs May 16, 21-23, 29, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	16	6.0	3.9	2.2	1.2	1.0	.99	.29	.80	1.4	4.9
2	3.5	9.3	6.4	3.5	2.2	1.2	1.2	.93	.27	.60	1.2	3.0
3	1.8	7.3	3.5	3.5	2.0	1.1	1.0	.88	1.3	.50	1.6	1.8
4	1.7	9.3	3.5	3.0	1.9	1.1	.93	.78	.58	.45	20	1.5
5	18	7.3	4.1	2.9	1.8	1.1	1.0	.78	.35	.40	4.0	2.8
6	4.5	5.5	3.5	2.9	2.0	1.0	1.2	.74	.27	.35	1.7	6.7
7	2.5	4.7	2.9	2.6	2.2	.99	1.2	.78	.25	.30	8.0	26
8	2.2	4.5	2.8	2.5	2.0	.99	1.1	.93	.32	.37	4.0	3.5
9	2.8	4.5	2.5	2.4	1.7	.99	1.2	.88	.62	.35	2.0	2.6
10	2.2	4.7	5.3	2.5	1.7	.99	.93	.54	2.0	.30	2.5	2.4
11	1.8	3.7	3.0	3.4	4.7	.99	.78	.58	.70	.35	29	20
12	1.6	3.7	3.0	2.5	3.2	.99	.74	.62	.60	.30	3.2	5.5
13	1.8	9.8	3.7	2.2	2.5	.99	.88	.47	.70	.30	3.9	4.3
14	2.1	5.8	3.2	2.2	6.4	1.1	.88	.41	.60	.25	3.2	2.8
15	86	17	2.6	2.1	4.1	1.0	.88	.41	.60	.50	1.7	2.4
16	73	9.3	2.4	1.9	2.4	.99	.93	.44	.50	2.0	1.4	2.2
17	155	6.1	2.4	1.9	2.0	1.0	.88	.54	.90	5.0	1.2	41
18	32	5.8	11	3.2	1.9	.88	.78	.58	.70	1.5	1.2	11
19	15	4.3	336	9.3	1.8	.83	.74	.50	.50	1.2	2.9	3.4
20	8.5	3.7	8.9	3.4	1.6	.83	.74	.32	.45	2.0	4.3	6.7
21	14	3.5	7.0	4.5	1.7	.83	.74	.41	.40	3.0	5.2	2.9
22	6.7	3.5	4.9	3.5	1.7	.78	.70	.38	.35	1.3	2.5	2.8
23	4.9	3.4	6.7	3.4	1.6	.78	.70	.44	.30	5.0	1.9	13
24	4.9	5.5	5.8	8.7	1.5	.74	.66	.83	.30	10	1.5	4.3
25	6.7	3.4	5.5	39	1.4	.74	.66	.74	.25	4.0	1.3	3.9
26	11	4.1	4.7	4.3	1.4	.74	.62	.44	.40	1.3	1.2	2.9
27	12	4.3	4.5	3.4	1.3	.78	.62	.38	.70	1.5	1.2	2.8
28	27	3.2	4.1	3.0	1.3	.78	.70	.32	1.2	5.0	1.2	2.5
29	62	4.1	3.7	2.8	------	.88	.70	.32	1.0	8.0	2.0	2.1
30	34	3.2	3.7	2.6	------	.93	.88	.32	1.0	2.5	2.8	2.2
31	8.9	------	3.4	2.4	------	.99	------	.38	------	1.5	6.0	------
TOTAL	614.7	180.5	470.7	139.4	62.2	29.23	25.97	18.06	18.40	60.92	125.2	193.9
MEAN	19.8	6.02	15.2	4.50	2.22	.94	.87	.58	.61	1.97	4.04	6.46
MAX	155	17	336	39	6.4	1.2	1.2	.99	2.0	10	29	41
MIN	1.6	3.2	2.4	1.9	1.3	.74	.62	.32	.25	.25	1.2	1.5
AC-FT	1,220	358	934	277	123	58	52	36	37	121	248	385

CAL YR 1969 TOTAL 1,569.60 MEAN 4.30 MAX 336 MIN .35 AC-FT 3,110
WTR YR 1970 TOTAL 1,939.18 MEAN 5.31 MAX 336 MIN .25 AC-FT 3,850

PEAK DISCHARGE (BASE, 400 CFS).--Oct. 17 (0030) 712 cfs (5.96 ft); Dec. 19 (0300) 1,950 cfs (11.00 ft).

NOTE.--No gage-height record June 10 to Aug. 10.

16847000 Imong River near Agat

LOCATION.--Lat 13°20'14" N., long 144°41'55" E., Guam, on left bank 500 ft upstream from Fena Valley Reservoir, 1.4 miles southwest of Fena Dam spillway, and 4.3 miles southeast of Agat School.

DRAINAGE AREA.--1.93 sq mi.

PERIOD OF RECORD.--March 1960 to current year.

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

AVERAGE DISCHARGE.--10 years, 10.8 cfs (7,820 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,550 cfs Dec. 19 (gage height, 8.50 ft), from rating curve extended as explained below; minimum, 0.74 cfs May 23.
Period of record: Maximum discharge, 3,370 cfs Oct. 19, 1960 (gage height, 10.06 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 7.46 and 10.06 ft; minimum, 0.37 cfs May 21, 22, 26, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	40	9.4	7.0	5.6	3.8	2.8	1.6	2.0	2.2	4.0	6.7
2	8.0	20	10	6.0	5.6	3.5	3.0	1.5	2.0	2.2	3.5	6.7
3	5.0	15	7.5	7.0	5.2	3.5	2.8	1.5	3.0	2.0	4.0	4.9
4	15	13	6.7	6.0	5.2	3.8	2.6	1.4	2.0	1.8	7.6	4.9
5	30	12	12	5.0	5.2	3.8	2.6	1.8	2.0	1.8	15	5.2
6	10	11	7.1	5.0	5.2	3.8	2.2	1.4	2.0	2.0	13	12
7	15	10	5.6	6.0	5.6	3.5	2.2	1.4	1.8	2.6	23	27
8	8.0	9.0	6.7	5.0	5.6	3.8	2.2	1.8	1.8	2.0	8.5	9.5
9	6.0	8.0	5.2	4.5	4.9	3.5	2.2	1.4	1.8	2.0	5.2	6.3
10	5.0	7.5	6.3	4.5	6.5	3.8	2.2	1.5	4.3	2.0	8.8	7.1
11	4.0	7.0	4.9	8.0	10	3.5	2.2	1.4	2.4	2.0	35	12
12	3.5	10	4.6	6.0	8.0	4.0	2.2	1.2	2.2	1.8	8.5	8.5
13	3.0	30	5.9	5.0	5.9	3.5	2.2	1.1	2.0	1.8	5.9	6.7
14	3.5	12	7.1	4.5	11	4.0	2.2	1.1	2.2	1.8	7.1	5.2
15	45	25	4.9	4.0	8.5	3.2	2.2	1.1	2.8	5.2	4.6	4.9
16	83	15	4.3	4.0	6.7	3.2	2.2	1.1	2.6	6.7	4.0	4.8
17	138	12	4.9	4.0	5.9	3.0	2.2	1.2	3.2	5.9	4.3	28
18	54	10	17	7.0	5.2	3.0	2.2	3.9	2.4	2.8	4.6	25
19	19	9.0	498	25	4.9	3.0	2.0	1.6	2.0	2.8	7.5	8.5
20	11	8.0	50	8.0	4.6	3.0	2.2	1.1	2.0	2.6	6.7	21
21	18	7.5	20	15	4.6	3.0	2.0	2.0	1.8	3.0	5.6	7.5
22	9.5	7.1	15	19	4.6	2.8	2.0	1.5	1.8	2.6	5.2	33
23	7.5	7.1	15	9.0	4.6	2.8	2.0	1.1	1.8	4.0	6.8	10
24	7.5	12	12	12	4.3	2.8	2.0	1.2	1.8	25	8.6	19
25	7.1	6.7	10	36	4.0	2.8	2.0	1.5	1.8	7.1	6.7	9.5
26	15	7.1	9.0	11	4.0	2.8	2.0	1.9	1.8	5.9	6.3	7.1
27	14	6.3	8.0	8.5	3.8	2.8	1.8	2.0	2.6	7.1	7.9	6.7
28	33	5.9	8.0	7.1	3.8	3.0	1.8	2.4	3.5	9.0	7.1	6.3
29	99	6.7	7.0	6.7	------	3.2	1.8	2.0	3.5	4.9	5.2	9.0
30	251	5.9	7.0	6.3	------	2.8	1.6	2.0	3.5	4.9	4.6	20
31	30	------	6.0	5.9	------	3.0	------	2.0	------	3.8	6.4	------
TOTAL	977.6	355.8	795.1	268.0	159.0	102.0	65.6	49.7	70.4	131.3	251.2	343.0
MEAN	31.5	11.9	25.6	8.65	5.68	3.29	2.19	1.60	2.35	4.24	8.10	11.4
MAX	251	40	498	36	11	4.0	3.0	3.9	4.3	25	35	33
MIN	3.0	5.9	4.3	4.0	3.8	2.8	1.6	1.1	1.8	1.8	3.5	4.8
AC-FT	1,940	706	1,580	532	315	202	130	99	140	260	498	680

CAL YR 1969 TOTAL 2,958.4 MEAN 8.11 MAX 498 MIN 1.0 AC-FT 5,870
WTR YR 1970 TOTAL 3,568.7 MEAN 9.78 MAX 498 MIN 1.1 AC-FT 7,080

PEAK DISCHARGE (BASE, 1,400 CFS).--Oct. 29 (2400) 1,910 cfs (7.12 ft); Dec. 19 (0230) 2,550 cfs (8.50 ft).

NOTE.--No gage-height record Dec. 20 to Jan. 21.

16849000 Fena Dam spillway near Agat

LOCATION.--Lat 13°21'30" N., long 144°42'10" E., Guam, on left bank 4.0 miles southeast of Agat and 5.5 miles southwest of Yona.

DRAINAGE AREA.--5.81 sq mi.

PERIOD OF RECORD.--September 1951 to July 1952, November 1952 to current year.

GAGE.--Water-stage recorder and concrete-dam control. Datum of gage is 111.35 ft above mean sea level (from U.S. Navy construction plans).

AVERAGE DISCHARGE.--17 years (1953-70), 18.4 cfs (13,330 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,720 cfs Dec. 19 (gage height, 2.96 ft), from rating curve extended above 130 cfs on basis of broad-crested weir formula; no flow for many days.
Period of record: Maximum discharge, not determined, occurred Oct. 15, 1953 (gage height, at least 4.5 ft); no flow for many days each year.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. About 10 cfs is diverted from Fena Valley Reservoir and tributary springs for military and civilian use. Records represent only flow over spillway.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	50	20	6.0	4.3							0
2	0	25	38	9.9	2.8							0
3	0	15	14	7.9	1.5							0
4	0	20	12	6.0	.54							0
5	0	17	25	6.0	.54							0
6	0	12	20	6.0	.54							0
7	0	8.0	9.9	7.9	2.8							0
8	0	20	14	2.8	2.8							0
9	0	17	12	.54	1.5							0
10	0	12	7.9	1.5	.54							0
11	0	9.0	6.0	7.9	22							0
12	0	6.0	4.3	2.8	12							.12
13	0	75	6.0	0	6.0							7.9
14	0	25	22	0	4.3							12
15	0	60	9.9	0	12							9.9
16	0	30	6.0	0	1.5							7.9
17	0	25	6.0	0	0							89
18	0	20	28	.75	0							79
19	0	15	1,080	111	0							28
20	0	12	131	31	0							79
21	0	12	52	31	0							28
22	0	9.9	31	57	0							94
23	0	14	28	28	0							38
24	0	38	25	31	0							52
25	0	12	22	117	0							25
26	0	12	20	34	0							17
27	0	7.9	17	17	0							12
28	0	6.0	14	9.9	0							7.9
29	0	7.9	12	7.9	------							14
30	100	9.9	9.9	7.9	------							48
31	40	------	4.3	6.0	------		------		------			------
TOTAL	140	602.6	1,707.2	554.69	75.66	0	0	0	0	0	0	648.72
MEAN	4.52	20.1	55.1	17.9	2.70	0	0	0	0	0	0	21.6
MAX	100	75	1,080	117	22	0	0	0	0	0	0	94
MIN	0	6.0	4.3	0	0	0	0	0	0	0	0	0
AC-FT	278	1,200	3,390	1,100	150	0	0	0	0	0	0	1,290

CAL YR 1969 TOTAL 2,449.80 MEAN 6.71 MAX 1,080 MIN 0 AC-FT 4,860
WTR YR 1970 TOTAL 3,728.87 MEAN 10.2 MAX 1,080 MIN 0 AC-FT 7,400

NOTE.--No gage-height record Oct. 15 to Nov. 19.

16855000 Ugum River near Talofofo

LOCATION.--Lat 13°20'00" N., long 144°44'55" E., Guam, on left bank 0.3 mile upstream from confluence with Talofofo River, 1.3 miles south of Talofofo, and 4.2 miles north of Inarajan.

DRAINAGE AREA.--6.96 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level.

AVERAGE DISCHARGE.--18 years, 29.4 cfs (21,300 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 5,460 cfs Dec. 19 (gage height, 11.86 ft), from rating curve extended as explained below; minimum, 4.8 cfs July 14.
Period of record: Maximum discharge, 7,660 cfs Dec. 4, 1963 (gage height, 12.06 ft), from rating curve extended above 910 cfs on basis of slope-area measurements at gage heights 11.30, 11.36, 11.87 and 11.90 ft; minimum, 1.1 cfs July 18, 1965.

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

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	100	32	26	19	12	10	8.0	7.0	10	12	25
2	23	70	38	24	18	12	10	7.6	7.0	8.0	11	24
3	14	60	24	26	17	12	9.6	7.3	13	7.3	14	18
4	36	50	24	23	16	12	9.2	7.0	8.0	7.0	60	18
5	111	45	39	22	16	12	9.2	8.4	7.0	6.6	39	19
6	30	40	23	22	16	11	9.2	7.3	6.6	6.5	48	50
7	41	35	21	24	19	11	8.8	7.0	6.6	8.0	57	92
8	24	35	21	21	18	11	8.8	7.3	6.6	9.0	30	36
9	19	30	19	21	16	11	8.8	7.0	6.6	7.0	19	25
10	16	30	32	20	15	11	8.8	6.6	18	6.0	19	24
11	13	25	20	27	34	11	8.8	6.6	11	5.9	129	51
12	12	30	18	21	22	11	8.4	6.6	8.0	5.9	31	31
13	11	120	22	19	18	11	8.4	6.6	7.6	5.3	23	30
14	12	40	27	19	29	12	8.4	6.2	7.6	4.8	33	23
15	181	100	19	18	28	11	8.4	6.2	9.2	13	23	21
16	204	60	18	18	19	10	9.2	6.2	8.4	23	16	21
17	416	50	18	18	16	10	8.8	6.2	11	48	15	126
18	156	40	47	23	15	10	8.4	6.6	9.2	19	15	86
19	86	35	1,140	93	15	10	8.0	7.6	7.6	10	21	36
20	61	29	100	31	14	10	8.4	6.2	7.3	13	31	47
21	93	26	50	44	15	10	8.4	6.2	7.0	15	26	30
22	56	25	40	50	15	9.6	8.0	6.6	7.0	11	19	53
23	45	24	45	40	14	9.2	7.6	6.2	6.6	14	21	78
24	44	49	39	50	14	9.2	7.6	6.2	7.0	57	19	47
25	49	27	34	150	13	9.2	7.6	6.2	6.6	24	18	42
26	83	30	32	50	13	9.2	7.6	7.0	6.6	16	15	30
27	78	26	30	35	13	10	7.6	7.3	8.0	24	21	26
28	128	23	28	30	13	10	7.6	9.6	14	29	21	24
29	287	24	26	25	------	10	7.6	8.0	13	24	15	35
30	150	23	26	21	------	10	8.0	7.3	11	15	15	70
31	50	------	25	19	------	10	------	7.0	------	12	19	------
TOTAL	2,584	1,301	2,077	1,030	490	327.4	255.2	216.1	260.1	464.3	855	1,238
MEAN	83.4	43.4	67.0	33.2	17.5	10.6	8.51	6.97	8.67	15.0	27.6	41.3
MAX	416	120	1,140	150	34	12	10	9.6	18	57	129	126
MIN	11	23	18	18	13	9.2	7.6	6.2	6.6	4.8	11	18
AC-FT	5,130	2,580	4,120	2,040	972	649	506	429	516	921	1,700	2,460

CAL YR 1969 TOTAL 8,407.1 MEAN 23.0 MAX 1,140 MIN 2.8 AC-FT 16,680
WTR YR 1970 TOTAL 11,098.1 MEAN 30.4 MAX 1,140 MIN 4.8 AC-FT 22,010

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-17	0130	11.08	1,740	12-19	0500	11.86	5,460
10-29	2330	10.60	1,520				

16858000 Ylig River near Yona

LOCATION.--Lat 13°23'20" N., long 144°45'00" E., Guam, on right bank 2 miles upstream from mouth, 2.1 miles southwest of Yona, and 5.8 miles south of Agana.

DRAINAGE AREA.--6.58 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

AVERAGE DISCHARGE.--18 years, 28.0 cfs (20,290 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 4,720 cfs Dec. 19 (gage height, 19.32 ft, from floodmark in well), from rating curve extended as explained below; minimum, 0.60 cfs June 7, 8, 26.
Period of record: Maximum discharge, 4,900 cfs Sept. 9, 1963 (gage height, 19.77 ft, from floodmarks), from rating curve extended above 620 cfs on basis of slope-area measurements at gage heights 11.24 and 15.87 ft; minimum not determined; minimum daily, 0.10 cfs May 15 to June 14, June 16-20, 1966.

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

REVISIONS (FISCAL YEARS).--WSP 1937: 1957-58.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	102	138	21	14	6.0	5.1	1.2	.94	1.8	11	29
2	12	47	60	15	13	5.5	4.5	1.2	.87	1.4	8.6	18
3	23	98	31	14	12	5.3	4.3	1.2	1.7	1.1	11	13
4	81	86	43	13	11	5.1	3.4	1.2	1.6	.94	13	13
5	20	49	26	12	11	5.1	3.1	1.2	.94	.87	19	18
6	15	37	24	15	11	4.7	2.9	1.3	.73	.80	14	40
7	73	38	20	13	12	4.5	2.8	1.3	.66	1.0	26	91
8	114	49	19	11	11	4.7	2.7	1.2	.66	1.2	15	28
9	23	36	18	11	9.5	4.3	2.7	1.2	.66	1.3	13	22
10	18	30	30	10	9.2	4.3	2.5	1.2	14	1.6	19	18
11	15	26	17	11	42	4.3	2.7	1.2	4.9	1.5	17	213
12	13	24	15	9.5	17	4.3	2.5	1.1	2.1	1.5	12	50
13	12	132	15	8.9	12	4.1	2.2	1.0	1.7	1.4	11	32
14	20	84	15	8.3	13	4.5	2.2	1.0	1.5	1.0	33	24
15	13	105	14	8.0	14	4.3	2.1	.94	1.5	9.6	15	22
16	261	122	13	7.8	11	4.1	2.2	.94	1.8	13	12	20
17	630	43	12	7.5	9.8	3.9	2.2	.94	1.9	15	9.8	137
18	398	37	75	8.0	9.2	3.9	2.4	2.1	1.6	4.5	10	50
19	112	50	1,000	93	8.6	3.7	2.1	4.5	1.3	2.8	8.6	30
20	53	30	100	17	8.0	3.5	1.9	1.6	1.1	4.1	30	24
21	94	27	40	38	8.0	3.5	1.9	1.3	.94	15	17	22
22	35	24	30	18	8.0	3.4	1.7	1.4	.80	11	13	76
23	31	24	30	14	8.0	3.2	1.6	1.3	.80	13	15	28
24	84	40	26	174	7.8	3.1	1.6	1.0	.73	75	14	22
25	33	22	23	180	7.0	2.9	1.6	1.0	.66	20	11	22
26	39	23	21	33	6.5	2.9	1.5	1.0	.60	18	15	18
27	82	19	20	24	6.2	3.2	1.4	1.1	.94	47	13	16
28	30	21	19	20	6.0	5.3	1.3	1.0	2.7	23	12	16
29	152	24	17	18	------	3.9	1.3	1.4	3.2	14	9.8	96
30	485	21	17	16	------	3.5	1.3	1.2	2.0	11	37	43
31	63	------	15	14	------	3.7	------	.87	------	9.5	17	------
TOTAL	3,049	1,470	1,943	863.0	315.8	128.7	71.7	40.09	55.53	322.91	481.8	1,251
MEAN	98.4	49.0	62.7	27.8	11.3	4.15	2.39	1.29	1.85	10.4	15.5	41.7
MAX	630	132	1,000	180	42	6.0	5.1	4.5	14	75	37	213
MIN	12	19	12	7.5	6.0	2.9	1.3	.87	.60	.80	8.6	13
AC-FT	6,050	2,920	3,850	1,710	626	255	142	80	110	640	956	2,480

CAL YR 1969 TOTAL 8,800.16 MEAN 24.1 MAX 1,000 MIN .13 AC-FT 17,460
WTR YR 1970 TOTAL 9,992.53 MEAN 27.4 MAX 1,000 MIN .60 AC-FT 19,820

PEAK DISCHARGE (BASE, 2,000 CFS).--Oct. 30 (0200) 2,910 cfs (14.20 ft); Dec. 19 (about 0300) 4,720 cfs (19.32 ft).

NOTE.--No gage-height record Dec. 18-22.

16865000 Pago River near Ordot

LOCATION.--Lat 13°26'10" N., long 144°45'15" E., Guam, on left bank 0.8 mile south of Ordot, 2.5 miles south of Agana, and 3.6 miles southeast of Asan.

DRAINAGE AREA.--6.17 sq mi.

PERIOD OF RECORD.--September 1951 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (from topographic map).

AVERAGE DISCHARGE.--19 years, 25.0 cfs (18,110 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 7,400 cfs Dec. 19 (gage height, 17.77 ft, from floodmark in well), from rating curve extended as explained below; minimum, 0.23 cfs June 9.
Period of record: Maximum discharge, 9,470 cfs Aug. 2, 1962 (gage height, 18.87 ft, from floodmarks), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 13.22, 15.07 and 18.87 ft; no flow for many days in 1959 and 1966.

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

REVISIONS (FISCAL YEARS).--WSP 1937: 1954(M), 1958(M), drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	38	125	14	8.4	3.6	4.0	.70	.90	1.7	24	5.7
2	8.9	26	50	10	8.4	3.3	3.1	.70	.78	1.0	10	7.9
3	10	28	25	8.9	7.0	3.1	2.1	.70	.78	.68	18	6.1
4	86	35	30	8.4	6.6	3.1	1.7	.75	.78	.42	14	7.0
5	22	26	20	7.4	6.1	3.3	1.5	.68	.49	.35	9.4	8.4
6	15	22	20	7.4	6.1	3.1	1.5	.78	.35	.49	59	24
7	18	16	15	7.0	7.0	2.8	1.5	.78	.90	.49	42	60
8	16	16	15	6.6	6.1	3.1	1.5	.58	.42	.68	15	22
9	11	13	15	5.7	5.7	3.1	1.7	.68	.23	1.5	8.4	16
10	9.4	12	25	5.3	4.9	2.8	1.7	1.3	9.7	1.2	10	16
11	8.4	10	15	7.0	27	2.8	1.7	.42	4.0	.90	10	119
12	7.0	10	12	5.3	8.4	2.8	1.3	.58	1.9	.68	7.4	37
13	6.1	100	12	4.9	6.6	4.0	1.5	.58	1.3	.49	6.6	22
14	7.0	80	10	4.6	7.0	3.1	1.7	.68	1.3	1.5	31	16
15	6.1	90	10	4.6	7.9	2.8	1.3	.58	1.7	8.9	11	16
16	160	100	10	4.3	6.1	2.6	1.5	.78	.78	12	8.4	12
17	550	30	10	4.0	5.7	2.4	1.5	.42	.68	11	7.0	84
18	391	25	50	4.6	4.9	2.1	1.3	.78	.58	3.6	17	45
19	128	40	1,000	73	4.6	2.1	1.2	2.8	.35	1.9	8.4	26
20	55	25	100	12	4.6	1.9	1.0	1.2	.35	1.7	34	20
21	36	20	40	35	4.6	1.7	1.0	.58	.29	16	16	23
22	25	15	30	14	4.9	1.7	1.0	.58	.29	13	14	53
23	19	15	25	10	7.0	1.5	1.0	.90	.29	7.0	10	27
24	30	30	23	165	5.3	1.5	.90	.90	.29	62	8.9	19
25	30	20	18	134	4.3	1.5	.90	.90	.35	17	7.9	16
26	33	30	16	28	4.0	1.7	.90	.58	.58	14	7.9	13
27	46	15	15	18	3.6	2.0	.80	.78	.49	28	7.4	11
28	21	14	14	15	3.6	4.0	.80	.68	2.6	18	7.9	9.4
29	152	17	12	13	------	2.0	.80	1.2	4.9	11	6.1	40
30	254	21	12	11	------	1.7	.80	.90	2.6	8.4	6.6	14
31	52	------	10	9.4	------	2.8	------	.68	------	7.0	6.1	------
TOTAL	2,223.9	939	1,784	657.4	186.4	80.0	43.20	25.15	40.95	252.58	449.4	795.5
MEAN	71.7	31.3	57.5	21.2	6.66	2.58	1.44	.81	1.37	8.15	14.5	26.5
MAX	550	100	1,000	165	27	4.0	4.0	2.8	9.7	62	59	119
MIN	6.1	10	10	4.0	3.6	1.5	.80	.42	.23	.35	6.1	5.7
AC-FT	4,410	1,860	3,540	1,300	370	159	86	50	81	501	891	1,580

CAL YR 1969 TOTAL 6,933.84 MEAN 19.0 MAX 1,000 MIN .10 AC-FT 13,750
WTR YR 1970 TOTAL 7,477.48 MEAN 20.5 MAX 1,000 MIN .23 AC-FT 14,830

PEAK DISCHARGE (BASE, 2,700 CFS).--Oct. 30 (about 0030) 2,710 cfs (10.52 ft); Dec. 19 (0300) 7,400 cfs (17.77 ft).

NOTE.--No gage-height record Dec. 1-23.

16875200 Benoki-gawa at Benoki

LOCATION.--Lat 26°47'06" N., long 128°14'59" E., Okinawa, on left bank 0.9 mile southeast of Benoki and 1.6 miles east of Sate.

DRAINAGE AREA.--3.8 sq mi, approximately.

PERIOD OF RECORD.--December 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 220 ft (from topographic map).

AVERAGE DISCHARGE.--6 years (1964-70), 24.7 cfs (17,900 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 7,200 cfs Oct. 6 (gage height, 10.70 ft), from rating curve extended above 2,400 cfs; minimum, 5.0 cfs Jan. 13, 14.
Period of record: Maximum discharge, 7,200 cfs Oct. 6, 1969 (gage height, 10.70 ft), from rating curve extended above 2,400 cfs; minimum, 2.5 cfs Oct. 15, 16, 1967.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	10	12	5.6	12	7.1	20	14	88	16	10	25
2	279	9.7	11	5.7	11	6.5	19	14	54	18	9.9	22
3	35	9.5	10	6.2	9.7	95	17	13	41	52	12	20
4	372	9.3	9.3	7.0	10	12	16	13	34	292	9.9	18
5	283	9.0	9.2	6.1	11	9.9	15	12	41	90	10	178
6	600	8.9	8.6	5.6	8.8	17	14	12	34	79	9.0	46
7	1,430	9.1	9.7	5.4	8.4	26	14	11	29	366	8.8	28
8	277	9.0	9.9	6.0	8.2	40	13	12	27	86	8.2	24
9	99	8.6	8.4	5.8	7.9	20	13	11	25	225	8.0	23
10	59	8.4	8.0	6.1	7.4	19	12	16	23	146	9.2	20
11	42	8.1	7.7	5.5	7.2	16	12	11	22	64	10	19
12	30	8.0	7.5	5.2	11	14	11	9.6	20	46	15	22
13	25	7.9	7.2	5.0	12	14	10	17	24	37	283	19
14	22	10	7.0	6.2	7.9	12	10	38	24	32	25	17
15	54	17	6.9	48	7.5	50	12	44	177	28	45	16
16	24	13	6.8	13	7.2	34	10	82	77	26	21	15
17	19	11	6.6	8.5	6.8	20	22	48	58	24	17	17
18	17	8.1	7.9	7.6	6.6	19	220	24	40	22	15	15
19	19	7.6	15	9.2	6.5	17	23	20	31	20	14	14
20	16	8.3	7.7	8.9	6.4	15	74	19	26	18	15	13
21	14	8.8	7.0	7.4	6.4	15	45	17	25	17	13	13
22	15	51	6.8	6.8	6.2	14	26	18	22	16	12	12
23	22	16	6.5	6.9	6.1	13	35	16	107	15	11	12
24	14	12	6.4	8.5	6.0	12	27	85	30	14	11	11
25	13	9.9	6.2	8.2	5.8	12	23	23	24	14	11	11
26	12	11	6.4	6.9	7.0	21	20	60	22	23	9.9	11
27	12	9.7	6.9	7.4	12	101	19	29	20	14	39	11
28	11	8.6	6.2	9.9	7.9	59	18	24	19	13	390	14
29	11	22	6.0	23	------	28	16	21	18	12	73	11
30	11	19	5.8	51	------	24	16	213	17	11	40	267
31	10	------	5.7	17	------	21	------	606	------	12	30	------
TOTAL	3,855.8	358.5	246.3	329.6	230.9	783.5	802	1,552.6	1,199	1,848	1,194.9	944
MEAN	124	12.0	7.95	10.6	8.25	25.3	26.7	50.1	40.0	59.6	38.5	31.5
MAX	1,430	51	15	51	12	101	220	606	177	366	390	267
MIN	8.8	7.6	5.7	5.0	5.8	6.5	10	9.6	17	11	8.0	11
AC-FT	7,650	711	489	654	458	1,550	1,590	3,080	2,380	3,670	2,370	1,870

CAL YR 1969 TOTAL 14,171.9 MEAN 38.8 MAX 1,430 MIN 3.2 AC-FT 28,110
WTR YR 1970 TOTAL 13,345.1 MEAN 36.6 MAX 1,430 MIN 5.0 AC-FT 26,470

PEAK DISCHARGE (BASE, 2,900 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	0600	8.55	3,480	5-31	0700	8.73	3,720
10- 6	2130	10.70	7,200	7- 7	1400	8.55	3,480
10- 7	1530	9.25	4,480	9- 5	1100	8.29	3,170
5-30	2330	8.25	3,120	9-30	0430	8.76	3,760

16875500 Yona-gawa at Yona

LOCATION.--Lat 26°45'10" N., long 128°13'18" E., Okinawa, on left bank 0.9 mile southeast of Yona and 2.7 miles east of Hentona School.

DRAINAGE AREA.--1.7 sq mi, approximately.

PERIOD OF RECORD.--December 1963 to current year.

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

AVERAGE DISCHARGE.--6 years (1964-70), 10.2 cfs (7,390 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 1,490 cfs May 31 (gage height, 5.18 ft), from rating curve extended above 350 cfs; minimum, 1.7 cfs Jan. 13, 14.
Period of record: Maximum discharge, 1,550 cfs May 12, 1966 (gage height, 5.27 ft), from rating curve extended above 350 cfs; minimum, 1.4 cfs Oct. 15, 16, 1967, Jan. 13, 14, 1969.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	4.1	4.1	2.1	5.6	3.2	7.6	5.9	27	6.8	4.8	12
2	81	4.1	3.8	2.2	4.8	3.2	6.8	5.6	17	6.8	4.1	10
3	12	4.1	3.6	2.2	4.1	45	6.2	5.4	14	15	11	8.7
4	74	3.8	3.4	2.2	4.4	6.5	5.6	5.4	12	96	5.1	7.9
5	96	3.6	3.4	2.2	4.1	5.1	5.4	4.8	13	46	4.1	36
6	76	3.6	3.2	2.1	3.6	5.4	5.1	4.6	11	19	3.8	17
7	340	3.4	4.7	1.9	3.2	6.8	4.8	4.6	9.1	119	3.6	12
8	80	3.2	4.1	2.1	3.2	14	4.6	4.8	7.9	47	3.4	10
9	35	3.2	3.4	2.2	3.0	7.6	4.4	4.4	7.2	70	3.4	9.1
10	22	3.0	3.2	2.2	2.8	8.0	4.1	6.1	6.8	70	4.1	8.3
11	17	3.0	3.0	2.1	2.6	6.8	4.4	4.6	6.2	31	5.1	7.2
12	14	3.0	3.0	1.9	4.0	5.9	4.1	3.8	5.9	21	6.2	8.5
13	12	2.8	3.0	1.7	4.6	5.9	3.8	6.1	7.9	17	95	8.3
14	10	4.2	2.8	2.4	3.2	5.4	3.6	8.7	11	14	14	6.8
15	15	11	2.8	7.8	3.0	16	4.4	5.4	93	13	18	6.2
16	9.1	4.6	2.8	3.0	3.0	14	3.8	12	35	11	10	5.6
17	8.7	3.8	2.8	2.4	2.8	9.1	5.6	7.9	30	11	8.3	9.6
18	7.9	3.2	2.8	2.6	2.6	7.9	83	5.6	21	9.1	7.2	7.6
19	7.9	3.0	3.6	3.6	2.6	6.8	17	5.1	16	8.3	7.0	6.5
20	6.8	3.6	2.8	3.0	2.4	5.9	22	5.4	13	7.9	6.5	5.6
21	6.2	3.9	2.6	2.4	2.4	6.2	18	4.8	12	7.2	5.6	5.4
22	7.9	17	2.6	2.2	2.4	5.4	12	5.6	10	6.5	5.6	5.1
23	9.9	6.2	2.4	2.4	2.4	5.1	17	5.1	44	6.2	5.4	5.1
24	6.2	4.8	2.4	2.6	2.4	4.6	13	44	16	5.6	5.1	4.8
25	5.6	4.1	2.4	2.8	2.2	4.6	10	11	12	5.9	4.6	4.6
26	5.4	4.1	2.4	2.2	2.8	5.4	9.1	31	10	5.9	4.4	4.6
27	5.1	3.6	2.4	2.6	5.3	34	8.3	15	9.1	5.1	13	4.1
28	5.1	3.4	2.4	4.4	3.6	21	7.6	11	8.7	4.8	114	5.1
29	4.8	5.1	2.2	15	------	12	6.8	9.1	7.6	4.6	37	4.4
30	4.6	5.4	2.1	24	------	9.5	6.2	17	7.2	4.4	21	22
31	4.4	------	2.1	8.7	------	8.3	------	186	------	5.4	14	------
TOTAL	993.5	135.9	92.3	121.2	93.1	304.6	309.3	455.8	500.6	700.5	454.4	268.1
MEAN	32.0	4.53	2.98	3.91	3.33	9.83	10.3	14.7	16.7	22.6	14.7	8.94
MAX	340	17	4.7	24	5.6	45	83	186	93	119	114	36
MIN	3.9	2.8	2.1	1.7	2.2	3.2	3.6	3.0	5.9	4.4	3.4	4.1
AC-FT	1,970	270	183	240	185	604	614	904	993	1,390	901	532

CAL YR 1969 TOTAL 5,371.4 MEAN 14.7 MAX 340 MIN 1.4 AC-FT 10,650
WTR YR 1970 TOTAL 4,429.3 MEAN 12.1 MAX 340 MIN 1.7 AC-FT 8,790

PEAK DISCHARGE (BASE, 900 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	0500	4.69	1,180	4-17	2400	4.50	1,070
10- 6	2030	4.55	1,100	5-31	0700	5.18	1,490
10- 7	1500	4.91	1,320	7- 7	1330	4.57	1,110

16877000 Right Branch of South Fork Henan-gawa near Tsuha

LOCATION,--Lat 26°37'42" N., long 128°05'52" E., Okinawa, on right bank 1.6 miles upstream from Henan-gawa bridge at Highway 1 and 1.6 miles south of Tsuha.

DRAINAGE AREA,--0.7 sq mi, approximately.

PERIOD OF RECORD,--November 1963 to current year.

GAGE,--Water-stage recorder. Concrete control since May 14, 1965. Altitude of gage is 50 ft (from topographic map).

AVERAGE DISCHARGE,--6 years (1964-70), 2.90 cfs (2,100 acre-ft per year).

EXTREMES,--Current year: Maximum discharge, 1,110 cfs Oct. 2 (gage height, 4.83 ft), from rating curve extended as explained below; minimum, 0.45 cfs Feb. 23-25.
Period of record: Maximum discharge, 1,620 cfs June 5, 1969 (gage height, 5.60 ft), from rating curve extended above 150 cfs on basis of slope-area measurement at gage height 5.46 ft; minimum, 0.32 cfs Dec. 25-31, 1968, Jan. 1-5, 13, 14, 1969.

REMARKS,--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.4	.92	.61	.81	.57	1.8	1.5	4.8	1.8	1.5	2.8
2	20	1.3	.92	.70	.66	.57	1.8	1.5	3.5	1.9	1.4	2.6
3	2.1	1.3	.92	.66	.66	16	1.6	1.5	2.8	2.9	1.3	2.2
4	34	1.2	.86	.61	.75	1.4	1.5	1.8	2.6	36	1.3	2.0
5	57	1.2	.86	.61	.70	1.2	1.4	1.5	4.1	7.6	1.3	2.1
6	16	1.2	.86	.61	.61	1.1	1.3	1.4	2.9	4.0	1.2	2.0
7	120	1.2	.98	.61	.61	1.2	1.3	1.3	2.4	30	1.2	2.2
8	19	1.2	.98	.75	.61	2.1	1.2	1.5	2.1	10	1.2	2.0
9	9.0	1.2	.81	.75	.61	1.3	1.2	1.3	1.9	15	1.1	1.7
10	6.0	1.2	.81	.81	.57	1.9	1.2	1.3	1.8	20	1.2	1.6
11	4.6	1.1	.81	.70	.57	1.5	1.2	1.2	1.7	7.6	1.4	1.5
12	3.7	1.0	.81	.66	1.1	1.2	1.1	1.1	1.7	5.8	2.1	1.5
13	3.2	1.0	.75	.61	.86	1.4	1.0	1.9	2.4	4.6	16	1.6
14	2.8	1.5	.75	.92	.66	1.1	1.0	2.3	7.6	4.0	2.0	1.5
15	2.9	1.6	.75	1.8	.61	2.0	1.2	1.3	28	3.5	2.1	1.4
16	2.5	1.4	.75	.81	.66	4.1	1.1	2.6	17	3.2	1.6	1.5
17	2.4	1.2	.75	.70	.57	1.8	1.1	2.2	16	3.0	1.5	1.7
18	2.4	1.0	.75	.66	.57	1.5	31	1.4	7.9	2.8	1.3	1.5
19	2.4	.98	.81	.86	.53	1.3	3.4	1.2	5.8	2.6	6.1	1.3
20	2.0	1.2	.75	.75	.53	1.2	5.8	1.3	4.6	2.5	2.9	1.2
21	1.9	1.1	.75	.61	.49	1.2	5.3	1.2	3.9	2.2	1.7	1.2
22	1.8	3.0	.75	.61	.49	1.1	3.0	1.3	3.5	2.1	1.5	1.2
23	1.7	1.4	.70	.69	.45	1.0	4.3	1.3	3.5	1.9	1.4	1.2
24	2.0	1.2	.70	.81	.45	.98	3.4	17	3.0	1.8	1.3	1.3
25	1.6	1.0	.61	.81	.45	1.0	2.5	3.0	2.8	1.7	1.2	1.4
26	1.5	.98	.61	.61	.56	1.2	2.2	17	2.6	1.6	1.2	1.2
27	1.5	.98	.66	.82	1.4	14	2.0	5.3	2.4	1.7	1.3	1.2
28	1.5	.92	.61	.86	.70	6.0	1.9	3.5	2.2	1.5	22	1.1
29	1.4	1.2	.61	.98	------	2.6	1.8	2.9	2.1	1.5	16	1.2
30	1.5	1.1	.61	3.0	------	2.5	1.7	2.6	2.0	1.5	5.3	1.2
31	1.5	------	.61	1.0	------	2.2	------	33	------	1.5	3.4	------
TOTAL	331.4	37.26	23.82	25.99	18.24	78.22	90.3	119.2	149.6	187.8	106.0	48.1
MEAN	10.7	1.24	.77	.84	.65	2.52	3.01	3.85	4.99	6.06	3.42	1.60
MAX	120	3.0	.98	3.0	1.4	16	31	33	28	36	22	2.8
MIN	1.4	.92	.61	.61	.45	.57	1.0	1.1	1.7	1.5	1.1	1.1
AC-FT	657	74	47	52	36	155	179	236	297	373	210	95

CAL YR 1969 TOTAL 1,581.54 MEAN 4.33 MAX 120 MIN .32 AC-FT 3,140
WTR YR 1970 TOTAL 1,215.93 MEAN 3.33 MAX 120 MIN .45 AC-FT 2,410

PEAK DISCHARGE (BASE, 450 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	0500	4.83	1,110	3- 3	0030	3.65	495
10- 5	0830	3.58	467	5-31	0730	4.50	920
10- 7	1100	3.76	542	7- 7	1200	3.55	455

16878200 Hanechi-okawa at Kawakami

LOCATION.--Lat 26°36'28" N., long 128°01'16" E., Okinawa, on left bank 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.

DRAINAGE AREA.--4.4 sq mi, approximately.

PERIOD OF RECORD.--November 1963 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 50 ft (from topographic map). Prior to May 3, 1965, at datum 1.00 ft lower.

AVERAGE DISCHARGE.--6 years (1964-70) 21.3 cfs (15,430 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 8,120 cfs Oct. 7 (gage height, 6.14 ft), from rating curve extended above 950 cfs; minimum, 2.5 cfs Jan. 13.
Period of record: Maximum discharge, 8,120 cfs Oct. 7, 1969 (gage height, 6.14 ft), from rating curve extended above 950 cfs; minimum, 0.88 cfs Oct. 15, 16, 1967.
A discharge of 0.40 cfs was measured Oct. 21, 1963.

REMARKS.--Records good except those above 2,000 cfs, which are fair. No diversion above station. Records include small diversion from gage pool for irrigation below station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	6.9	5.0	2.8	7.6	4.8	15	10	46	12	7.6	31
2	129	6.5	4.7	3.0	6.2	4.0	14	9.7	33	11	6.7	27
3	20	6.7	4.3	3.5	5.4	80	12	9.7	27	20	8.6	22
4	292	6.2	4.1	3.4	5.4	12	11	11	22	147	7.4	20
5	322	5.7	4.0	2.9	6.0	9.2	10	8.7	32	63	6.2	22
6	146	5.7	4.1	2.7	4.8	8.2	9.4	8.0	31	31	6.0	31
7	2,210	5.6	5.7	2.7	4.3	8.2	9.0	8.0	20	100	5.6	29
8	240	5.4	6.2	3.0	4.2	12	8.7	8.7	16	51	5.2	31
9	96	5.1	4.4	3.1	4.2	10	8.2	8.4	15	188	5.2	24
10	63	4.8	4.1	3.7	3.7	11	7.8	7.8	14	197	5.2	16
11	44	4.4	4.0	3.1	3.6	11	7.8	6.9	12	76	6.6	14
12	35	4.4	3.8	2.7	5.8	9.2	7.2	6.2	12	51	10	13
13	29	4.3	3.6	2.8	7.1	9.0	6.7	8.2	12	40	116	12
14	25	6.9	3.5	6.6	4.7	7.8	6.3	13	114	33	24	12
15	24	15	3.4	22	4.2	9.4	7.8	9.0	305	29	219	10
16	20	8.2	3.5	8.4	4.0	27	7.1	12	120	24	65	10
17	20	6.0	3.4	5.6	3.6	14	6.6	12	146	20	37	14
18	20	5.0	3.6	5.0	3.5	12	151	8.4	86	16	27	12
19	23	4.4	6.3	5.4	3.4	10	35	7.2	55	15	25	10
20	14	5.6	4.1	5.4	3.3	9.2	29	7.4	44	14	29	9.2
21	12	5.6	3.6	4.3	3.3	9.0	40	6.9	40	12	18	8.4
22	12	18	3.4	4.0	3.3	8.2	25	6.9	33	12	14	7.8
23	11	11	3.3	4.1	3.2	7.4	28	6.5	29	10	13	8.2
24	14	7.4	3.3	5.7	3.1	6.9	27	130	27	10	12	8.4
25	12	5.7	3.2	6.7	3.1	6.9	18	29	24	9.7	11	8.7
26	10	5.2	3.2	5.0	3.6	8.0	15	116	20	10	10	9.5
27	9.0	4.8	3.3	5.2	9.9	65	14	55	16	10	11	7.6
28	8.2	4.3	3.0	5.8	5.7	55	13	33	14	8.4	87	7.2
29	7.8	5.8	2.9	5.1	------	29	12	25	14	8.0	103	7.6
30	7.4	7.1	2.8	23	------	24	11	22	12	7.4	58	7.8
31	7.6	------	2.8	12	------	20	------	128	------	7.6	40	------
TOTAL	3,888.5	197.7	120.6	178.7	130.2	517.4	572.6	738.6	1,391	1,243.1	999.3	450.4
MEAN	125	6.59	3.89	5.76	4.65	16.7	19.1	23.8	46.4	40.1	32.2	15.0
MAX	2,210	18	6.3	23	9.9	80	151	130	305	197	219	31
MIN	5.5	4.3	2.8	2.7	3.1	4.0	6.3	6.2	12	7.4	5.2	7.2
AC-FT	7,710	392	239	354	258	1,030	1,140	1,470	2,760	2,470	1,980	893

CAL YR 1969 TOTAL 13,025.5 MEAN 35.7 MAX 2,210 MIN 1.8 AC-FT 25,840
WTR YR 1970 TOTAL 10,428.1 MEAN 28.6 MAX 2,210 MIN 2.7 AC-FT 20,680

PEAK DISCHARGE (BASE, 1,200 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	0530	3.25	1,360	6-14	2330	3.97	2,510
10- 4	1230	3.85	2,290	8-15	1530	3.61	1,900
10- 7	1300	6.14	8,120				

16879900 Yonabaru-gawa below Zukeyama Dam

LOCATION.--Lat 26°23'00" N., long 127°48'25" E., Okinawa, on right bank 0.2 mile downstream from Zukeyama Dam, 1.5 miles northwest of Noborikawa, and 3.5 miles northeast of Kadena Circle.

DRAINAGE AREA.--1.9 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 765 cfs Oct. 7 (gage height, 8.05 ft), from rating curve extended above 42 cfs; minimum, 0.31 cfs Sept. 27-29.
Period of record: Maximum discharge, 960 cfs Aug. 20, 1969 (gage height, 10.00 ft), from rating curve extended above 42 cfs; minimum, 0.14 cfs Jan. 7, 8, 1969.

REMARKS.--Records good except those above 90 cfs, which are fair. Flow regulated by Zukeyama Reservoir (capacity, 2,070 acre-ft). No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	2.3	2.0	.64	1.0	2.1	3.9	2.0	6.2	2.4	3.8	2.3
2	21	2.1	3.0	.89	.49	.91	4.4	1.7	3.6	2.8	5.1	2.1
3	12	2.4	2.5	1.7	.64	65	3.4	1.9	2.9	5.9	6.5	2.0
4	78	2.9	.86	2.3	1.5	7.2	3.6	2.2	2.8	39	6.5	1.8
5	126	1.8	.68	2.5	2.0	2.0	1.4	2.0	22	30	6.5	3.1
6	90	.43	.97	.56	1.2	2.3	1.3	1.8	24	7.0	6.5	6.7
7	306	.52	2.3	.56	1.0	3.4	2.0	1.8	6.5	5.0	6.7	3.4
8	51	.49	4.6	1.4	1.6	8.2	2.3	2.1	4.1	4.0	6.7	2.5
9	18	1.2	1.6	1.5	3.1	4.4	2.2	2.5	3.4	15	6.7	2.6
10	14	1.2	.76	2.3	1.0	5.7	2.4	2.5	3.1	70	6.7	1.8
11	12	.46	.60	1.5	.49	5.8	3.2	2.9	2.9	20	1.8	1.4
12	9.5	.49	1.0	1.0	1.4	2.9	2.9	.86	2.8	13	.46	1.3
13	6.7	.76	2.0	.86	2.0	4.1	1.7	9.6	15	9.0	.68	1.8
14	5.5	19	.72	5.0	1.4	2.5	1.2	27	31	7.2	.34	7.9
15	7.0	8.3	.49	18	1.5	10	3.6	7.5	104	6.2	.69	7.5
16	5.8	3.6	.56	5.5	1.8	16	4.1	6.7	50	5.4	.43	7.5
17	5.0	3.3	.72	2.5	.68	5.5	2.8	7.2	37	4.6	.81	7.5
18	4.6	1.2	1.0	1.6	.60	5.0	72	3.6	16	4.0	1.2	7.5
19	4.6	.81	2.2	5.0	.72	4.1	14	2.6	10	3.5	2.0	7.5
20	4.4	3.8	1.4	4.1	.81	2.6	7.6	3.2	8.2	2.9	3.2	7.2
21	3.6	4.6	1.1	1.9	.91	2.4	8.5	2.8	6.5	2.5	2.2	7.2
22	2.9	17	1.1	1.4	.97	2.8	4.6	3.8	5.5	2.3	2.1	7.2
23	3.6	6.7	1.1	1.8	.97	1.4	7.0	3.6	4.6	2.1	3.2	7.0
24	5.3	3.9	1.0	2.4	2.5	.97	8.8	8.4	3.9	1.8	2.4	.43
25	4.6	1.8	1.0	3.2	4.1	1.1	4.8	5.0	3.8	1.5	3.2	.40
26	2.9	1.4	1.4	2.0	3.7	1.6	2.9	54	3.6	2.3	2.8	.34
27	2.8	1.6	2.2	2.0	6.5	17	2.5	23	3.2	4.4	2.6	.31
28	2.1	1.2	1.3	2.6	4.1	28	2.8	8.2	3.1	2.8	6.0	.31
29	1.8	4.4	.43	2.3	------	5.3	2.2	5.0	2.9	2.0	23	2.8
30	1.7	5.5	.49	7.7	------	3.9	2.2	4.4	2.8	1.5	8.2	6.7
31	2.0	------	.64	5.3	------	5.8	------	11	------	3.9	3.6	------
TOTAL	825.4	105.16	41.72	92.01	48.76	229.98	186.3	220.86	395.4	284.0	132.61	118.09
MEAN	26.6	3.51	1.35	2.97	1.74	7.42	6.21	7.12	13.2	9.16	4.28	3.94
MAX	306	19	4.6	18	6.5	65	72	54	104	70	23	7.9
MIN	1.7	.43	.43	.56	.49	.91	1.2	.86	2.8	1.5	.34	.31
AC-FT	1,640	209	83	183	97	456	370	438	784	563	263	234

CAL YR 1969 TOTAL 3,650.57 MEAN 10.0 MAX 389 MIN .16 AC-FT 7,240
WTR YR 1970 TOTAL 2,680.29 MEAN 7.34 MAX 306 MIN .31 AC-FT 5,320

16880300 Bishi-gawa at Kadena

LOCATION.--Lat 26°21'54" N., long 127°45'59" E., Okinawa, on left bank at Bishi-gawa Pumping Station, 0.6 mile northeast of Kadena Circle, and 3.1 miles west of Chibana.

DRAINAGE AREA.--14 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,640 cfs Oct. 7 (gage height, 8.95 ft), from rating curve extended as explained below; no flow part of many days.
Period of record: Maximum discharge, 4,480 cfs Aug. 20, 1969 (gage height, 12.65 ft), from rating curve extended above 44 cfs on basis of theoretical rating for the artificial control; no flow at times each year.

REMARKS.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Pumping station diverts water from the gage pool for domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	14	20	8.2	18	17	17	5.9	20	7.4	2.2	8.2
2	90	16	17	6.6	14	8.3	17	5.9	9.0	5.2	1.0	2.8
3	56	17	16	7.4	9.0	294	16	7.4	7.4	20	2.8	1.6
4	468	15	11	16	11	21	11	6.6	8.2	194	.90	2.8
5	791	17	5.2	11	11	13	11	6.6	169	156	1.2	8.2
6	434	13	9.0	5.2	9.8	16	5.2	5.2	114	26	1.2	37
7	1,740	11	15	1.9	7.6	21	8.2	3.9	22	22	.90	17
8	296	12	17	9.0	11	62	8.2	2.8	16	20	.90	13
9	47	13	12	16	13	18	8.2	3.9	14	46	.90	8.2
10	28	11	5.9	16	5.1	50	5.9	5.9	8.6	651	11	2.8
11	43	9.8	9.8	9.8	4.8	20	17	4.5	5.2	50	14	.68
12	47	9.8	6.6	7.4	11	12	13	1.6	5.9	34	18	.31
13	40	8.2	8.2	3.9	12	14	6.6	53	61	24	47	.06
14	36	99	9.8	45	5.9	18	5.7	150	116	19	11	1.0
15	42	40	5.2	144	5.9	90	22	23	828	18	27	4.5
16	38	29	5.9	24	6.6	86	20	29	328	18	42	2.2
17	34	21	3.3	15	3.3	21	16	28	255	14	26	3.3
18	29	14	2.7	21	1.6	29	610	6.6	56	13	8.3	5.9
19	35	8.2	9.0	35	1.2	27	59	8.2	26	11	17	3.9
20	28	19	9.0	27	1.6	21	18	13	23	9.0	15	2.8
21	27	26	2.8	17	.70	18	21	9.0	22	7.4	7.4	3.3
22	26	139	1.6	14	1.6	12	11	15	15	5.9	6.5	2.8
23	26	42	3.3	13	.90	9.0	36	18	12	3.9	13	28
24	27	27	2.8	23	.65	8.2	19	32	9.0	3.3	6.3	20
25	27	18	2.8	26	2.2	8.2	12	14	12	2.2	6.4	74
26	21	14	4.3	16	24	23	14	205	14	3.3	5.2	28
27	20	13	5.9	17	45	202	11	97	13	7.4	1.6	5.9
28	19	13	5.9	30	9.0	255	7.4	20	9.0	9.0	24	1.2
29	18	29	3.3	20	------	24	6.6	12	9.0	4.5	22	.25
30	22	29	2.8	44	------	15	7.4	8.2	8.2	2.8	24	7.4
31	16	------	3.3	34	------	20	------	156	------	12	15	------
TOTAL	4,641	747.0	236.4	683.4	247.45	1,452.7	1,040.4	957.2	2,215.5	1,419.3	379.70	297.10
MEAN	150	24.9	7.63	22.0	8.84	46.9	34.7	30.9	73.9	45.8	12.2	9.90
MAX	1,740	139	20	144	45	294	610	205	828	651	47	74
MIN	16	8.2	1.6	1.9	.65	8.2	5.2	1.6	5.2	2.2	.90	.06
AC-FT	9,210	1,480	469	1,360	491	2,880	2,060	1,900	4,390	2,820	753	589

CAL YR 1969 TOTAL 24,467.31 MEAN 67.0 MAX 2,470 MIN 0 AC-FT 48,530
WTR YR 1970 TOTAL 14,317.15 MEAN 39.2 MAX 1,740 MIN .06 AC-FT 28,400

PEAK DISCHARGE (BASE, 1,200 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-5	0530	6.25	1,540	6-15	0030	6.00	1,440
10-7	1230	8.95	2,640				

16880500 Nagata-gawa at Kadena

LOCATION.--Lat 26°22'23" N., long 127°45'50" E., Okinawa, on left bank 1.0 mile northeast of Kadena Circle and 3.4 miles northwest of Chibana.

DRAINAGE AREA.--4.0 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,940 cfs Oct. 7 (gage height, 13.20 ft), from rating curve extended above 66 cfs; minimum, 2.3 cfs Feb. 25, 26.
Period of record: Maximum discharge, 2,050 cfs Aug. 20, 1969 (gage height, 13.75 ft), from rating curve extended above 66 cfs; minimum, 0.95 cfs Aug. 26, 27, 1967.

REMARKS.--Records fair. No diversion above station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	7.8	5.1	2.7	4.0	4.3	5.7	4.3	7.5	6.0	5.7	4.5
2	28	7.3	4.7	3.1	3.4	3.1	5.5	4.2	6.0	6.2	5.3	4.5
3	13	7.0	4.7	4.0	3.1	166	4.9	4.0	5.5	11	5.3	4.5
4	180	6.5	4.2	3.4	3.3	8.6	4.3	4.0	5.1	76	4.9	4.3
5	220	6.2	4.2	3.3	4.0	5.1	4.2	3.8	52	17	5.3	5.7
6	84	6.0	4.0	2.9	3.3	4.7	4.0	3.6	23	8.3	4.5	8.7
7	812	6.0	4.3	2.7	3.0	6.2	4.0	3.6	7.5	8.6	4.3	5.3
8	69	5.7	4.9	3.3	3.2	16	4.2	3.8	6.2	8.8	4.5	5.7
9	24	5.5	4.0	3.8	3.8	6.5	4.0	4.3	5.7	27	4.2	5.7
10	18	5.3	3.8	3.6	3.0	11	4.0	4.2	5.5	185	4.3	4.2
11	16	5.3	3.6	3.1	2.9	7.8	4.3	4.2	5.3	17	9.2	3.8
12	15	5.1	3.4	2.9	5.5	5.3	4.2	3.4	5.1	11	8.3	3.6
13	14	5.1	3.4	2.6	4.7	5.1	3.8	20	11	10	15	3.4
14	14	25	3.3	7.6	3.3	4.5	3.4	35	30	9.0	6.5	3.1
15	15	9.4	3.3	36	3.0	32	5.9	7.8	110	8.6	5.7	3.0
16	14	6.5	3.3	6.0	2.9	22	5.3	9.1	72	7.8	7.0	3.0
17	13	5.5	3.3	4.3	2.7	7.8	4.3	8.3	58	7.5	5.5	4.3
18	13	5.1	3.1	5.1	2.7	7.3	176	5.3	18	7.0	4.7	3.8
19	14	4.9	4.7	9.0	2.6	6.2	13	4.5	13	6.7	4.7	3.1
20	13	7.4	3.8	7.3	2.6	4.9	8.7	4.7	11	6.5	5.3	3.0
21	11	6.8	3.3	4.2	2.5	5.1	13	4.7	9.3	6.2	4.5	2.9
22	12	20	3.1	3.4	2.5	5.3	7.0	4.9	9.0	6.2	4.3	2.7
23	13	9.3	3.0	3.3	2.4	4.3	13	4.7	7.8	5.7	5.3	3.1
24	11	6.2	3.0	4.6	2.4	4.2	12	12	7.5	5.5	4.5	9.1
25	11	5.3	3.0	5.3	2.4	4.0	6.5	5.5	7.0	5.5	6.0	57
26	10	4.9	3.0	3.6	5.8	5.3	5.5	153	7.3	7.0	4.7	9.3
27	9.3	4.5	3.0	3.6	31	44	5.3	20	6.7	8.0	4.3	5.1
28	9.0	4.3	2.9	4.3	4.7	70	5.1	8.0	6.5	6.2	11	3.8
29	8.3	8.0	2.9	4.3	------	12	4.7	6.2	6.2	5.7	29	4.3
30	8.0	8.3	2.9	8.3	------	8.0	4.5	5.7	6.2	5.5	9.3	7.0
31	7.8	------	2.7	6.5	------	6.7	------	20	------	5.7	5.3	------
TOTAL	1,714.4	220.2	111.9	168.1	120.7	503.3	350.3	386.8	530.9	512.2	208.4	191.5
MEAN	55.3	7.34	3.61	5.42	4.31	16.2	11.7	12.5	17.7	16.5	6.72	6.38
MAX	812	25	5.1	36	31	166	176	153	110	185	29	57
MIN	7.8	4.3	2.7	2.6	2.4	3.1	3.4	3.4	5.1	5.5	4.2	2.7
AC-FT	3,400	437	222	333	239	998	695	767	1,050	1,020	413	380

CAL YR 1969 TOTAL 9,052.8 MEAN 24.8 MAX 865 MIN 1.6 AC-FT 17,960
WTR YR 1970 TOTAL 5,018.7 MEAN 13.7 MAX 812 MIN 2.4 AC-FT 9,950

PEAK DISCHARGE (BASE, 800 CFS).--Oct. 7 (0800) 1,940 cfs (13.20 ft).

16880600 Hiza-gawa at Kadena

LOCATION.--Lat 26°21'49" N., long 127°45'23" E., Okinawa, on left bank 600 ft downstream from Highway 1, 0.3 mile northwest of Kadena Circle, and 3.7 miles west of Chibana.

DRAINAGE AREA.--19 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 12 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 5,380 cfs Oct. 7 (gage height, 7.10 ft), from rating curve extended as explained below; minimum, 1.3 cfs Feb. 24.
Period of record: Maximum discharge, 7,550 cfs Aug. 20, 1969 (gage height, 8.60 ft), from rating curve extended above 240 cfs on basis of theoretical rating for the artificial control; no flow at times each year except 1970.

REMARKS.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Upstream pumping stations on both Bishi-gawa and Nagata-gawa divert water for domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	39	34	15	28	26	30	11	56	20	13	16
2	187	36	28	13	16	15	28	11	26	22	5.9	9.8
3	126	39	28	13	11	460	26	11	20	53	11	9.8
4	714	34	22	18	11	59	20	11	20	303	8.3	11
5	1,120	36	16	16	13	28	18	9.8	232	213	13	18
6	575	32	22	9.8	13	28	13	8.3	190	59	9.8	55
7	3,000	30	30	4.8	11	44	16	7.0	44	44	11	28
8	432	32	34	11	15	116	18	7.0	28	44	15	20
9	134	34	22	20	18	44	16	9.8	22	104	8.3	16
10	104	32	16	20	8.3	78	13	13	18	934	18	8.3
11	85	34	22	13	11	65	30	11	15	113	41	4.8
12	76	34	18	9.8	20	30	26	8.3	16	56	32	3.1
13	68	20	20	7.0	22	38	15	77	94	44	98	2.4
14	59	155	22	62	13	30	11	217	207	36	28	4.8
15	71	72	15	196	13	118	30	65	1,090	36	39	7.0
16	62	39	16	59	13	154	32	63	473	34	56	4.8
17	56	32	13	34	11	54	22	71	363	30	39	8.3
18	54	24	13	30	11	51	828	28	117	26	16	9.8
19	59	18	22	49	11	39	114	18	71	24	31	7.0
20	54	40	24	46	13	28	55	22	56	22	34	5.9
21	51	41	15	28	11	26	74	22	49	22	16	5.9
22	49	212	13	24	11	28	39	24	41	20	13	5.9
23	54	85	15	26	7.0	16	60	28	36	15	22	30
24	51	41	15	34	3.9	16	68	75	32	16	13	60
25	49	30	16	39	4.8	13	34	34	32	24	15	113
26	44	24	18	22	29	32	26	349	28	30	13	44
27	41	22	22	25	113	260	22	166	26	32	11	15
28	41	22	22	44	26	361	16	46	24	28	59	8.3
29	41	47	13	26	------	82	15	26	26	24	85	8.3
30	44	62	7.0	65	------	46	13	20	22	18	51	22
31	44	------	9.8	54	------	36	------	220	------	26	32	------
TOTAL	7,658	1,398	602.8	1,033.4	488.0	2,421	1,728	1,689.2	3,474	2,472	857.3	562.2
MEAN	247	46.6	19.4	33.3	17.4	78.1	57.6	54.5	116	79.7	27.7	18.7
MAX	3,000	212	34	196	113	460	828	349	1,090	934	98	113
MIN	41	18	7.0	4.8	3.9	13	11	7.0	15	15	5.9	2.4
AC-FT	15,190	2,770	1,200	2,050	968	4,800	3,430	3,350	6,890	4,900	1,700	1,120

CAL YR 1969 TOTAL 38,066.68 MEAN 104 MAX 3,870 MIN 0 AC-FT 75,510
WTR YR 1970 TOTAL 24,383.9 MEAN 66.8 MAX 3,000 MIN 2.4 AC-FT 48,370

PEAK DISCHARGE (BASE, 2,000 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 5	0600	4.55	2,350	6-15	0030	4.24	2,040
10- 7	0730	7.10	5,380				

16880900 Machinato-gawa near Ojana

LOCATION.--Lat 26°14'43" N., long 127°44'16" E., Okinawa, on right bank at upstream side of bridge on dirt road, 1.4 miles south of Ojana, and 2.4 miles northeast of Shuri.

DRAINAGE AREA.--1.7 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

AVERAGE DISCHARGE.--5 years, 6.04 cfs (4,380 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 744 cfs June 14 (gage height, 7.05 ft); no flow for many days. Period of record: Maximum discharge, 2,040 cfs Aug. 5, 1965 (gage height, 12.90 ft), from rating curve extended above 550 cfs; no flow for many days each year.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	.08	1.4	.09	4.8	4.2	2.6	.68	7.1	.12	0	1.3
2	5.2	.06	.92	.12	3.0	2.6	2.1	.55	3.4	.12	0	.92
3	2.3	.04	.83	.18	2.3	59	1.7	.55	2.0	2.4	0	.61
4	113	0	.55	.30	1.8	6.8	1.2	.50	1.3	25	0	.75
5	94	0	.41	.41	1.7	3.8	1.0	.41	21	43	0	.50
6	51	0	.37	.45	1.6	4.6	.83	.33	16	6.8	0	8.1
7	116	0	1.5	.45	1.3	8.5	.75	.30	4.5	3.4	0	5.0
8	29	0	1.8	.33	1.2	26	.75	.30	2.4	2.3	0	2.4
9	7.1	0	.75	.55	1.2	8.2	.68	.27	1.4	2.0	0	1.3
10	3.8	0	.45	.83	.92	42	.55	.24	.92	38	0	.75
11	2.6	0	.33	.45	.83	14	2.8	.21	.61	6.2	.09	.41
12	1.6	0	.27	.33	1.5	5.9	2.0	.16	.45	2.8	.14	.30
13	.92	0	.21	.24	2.0	11	1.2	5.0	4.3	1.8	2.3	3.0
14	.55	2.1	.18	4.3	1.2	6.5	.83	22	87	1.1	2.0	1.1
15	15	.61	.16	23	1.3	16	4.3	6.2	65	.83	.14	.55
16	4.8	.30	.14	6.5	1.7	20	3.8	4.5	52	.55	53	.33
17	2.8	.24	.14	3.4	1.1	7.8	2.4	5.3	35	.41	7.8	.50
18	1.8	.14	.12	2.4	.83	8.2	73	2.8	8.5	.30	2.3	.30
19	1.2	.08	.16	3.2	.68	5.0	10	1.7	4.0	.21	1.6	.45
20	.83	.12	.24	4.2	.55	3.2	11	1.3	2.4	.16	2.4	.18
21	.55	.33	.24	2.6	.50	2.6	17	1.2	1.7	.09	1.1	.09
22	.41	11	.24	1.8	.45	2.6	7.1	1.7	1.4	.04	.61	0
23	.37	5.0	.21	1.4	.41	2.0	9.8	2.0	.83	0	.50	0
24	.37	2.0	.12	1.8	.33	1.7	9.7	6.2	.61	0	.30	.26
25	.33	1.1	.12	2.6	.33	1.4	4.5	3.6	.45	0	.12	12
26	.27	.61	.12	1.8	7.6	2.8	3.0	37	.33	0	.04	3.0
27	.24	.45	.10	6.5	14	50	2.3	18	.27	0	0	1.3
28	.14	.33	.09	7.8	5.3	40	1.7	6.2	.55	0	4.9	.68
29	.14	.92	.09	4.5	------	8.2	1.3	3.4	.30	0	10	1.3
30	.10	2.8	.09	16	------	5.0	.92	2.3	.18	0	7.8	2.0
31	.09	------	.09	8.5	------	3.6	------	23	------	0	3.0	------
TOTAL	459.61	28.31	12.44	107.03	60.43	383.2	180.81	157.90	325.90	137.63	100.14	49.38
MEAN	14.8	.94	.40	3.45	2.16	12.4	6.03	5.09	10.9	4.44	3.23	1.65
MAX	116	11	1.8	23	14	59	73	37	87	43	53	12
MIN	.09	0	.09	.09	.33	1.4	.55	.16	.18	0	0	0
AC-FT	912	56	25	212	120	760	359	313	646	273	199	98

CAL YR 1969 TOTAL 2,974.25 MEAN 8.15 MAX 382 MIN 0 AC-FT 5,900
WTR YR 1970 TOTAL 2,002.78 MEAN 5.49 MAX 116 MIN 0 AC-FT 3,970

PEAK DISCHARGE (BASE, 530 CFS).--Oct. 4 (1800) 681 cfs (6.68 ft); June 14 (2200) 744 cfs (7.05 ft).

16882050 Tengan Reservoir at Yamashiro

LOCATION.--Lat 26°24'23" N., long 127°48'46" E., Okinawa, in control tower at Tengan Dam, 0.4 mile west of Yamashiro, and 1.8 miles northwest of Enobi.

DRAINAGE AREA.--1.0 sq mi, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is at Okinawa datum, which is 3.76 ft below mean sea level (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum contents, 1,030 acre-ft Aug. 13 (gage height, 201.79 ft); minimum, 894 acre-ft Aug. 13 (gage height, 197.36 ft).
Period of record: Maximum contents, 1,030 acre-ft Aug. 20, 1969, Aug. 13, 1970; maximum gage height, 201.79 ft Aug. 13, 1970; no usable contents for several days during the period Nov. 22, 1968 to Feb. 15, 1969.

REMARKS.--Reservoir is formed by earthfill dam with ungated concrete spillway and concrete outlet tunnel controlled by two 7-ft by 7-ft regulating gates. Storage began Mar. 29, 1968; dam completed Nov. 22, 1968. During the period Sept. 30, 1967, to Mar. 29, 1968, water was stored and released several times to test dam structures. Usable capacity, 967 acre-ft between gage heights 130.00 ft (invert of outlet tunnel) and 199.72 ft (crest of spillway). Dead storage below gage height 130.00 ft, about 21 acre-ft. Diversion from reservoir of about 0.5 cfs for local irrigation and domestic use. Spillway flow (see sta 16882070) bypasses station below dam (see sta 16882100). Reservoir is used to store water for controlled release down Tengan-gawa for pickup at Kawasaki pumping station for domestic water supply. Figures given herein represent usable contents.

COOPERATION.--Capacity curve furnished by Corps of Engineers.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1969 to SEPTEMBER 1970

	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	199.83	971	-
Oct. 31	199.86	972	+1
Nov. 30	199.84	971	-1
Dec. 31	199.83	971	0
CAL YR 1969	-	-	+953
Jan. 31	199.82	970	-1
Feb. 28	199.64	965	-5
Mar. 31	199.82	970	+5
Apr. 30	199.85	971	+1
May 31	199.86	972	+1
June 30	199.87	972	0
July 31	199.76	969	-3
Aug. 31	199.83	971	+2
Sept. 30	198.57	932	-39
WTR YR	-	-	-39

16882070 Tengan Dam spillway at Yamashiro

LOCATION.--Lat 26°24'23" N., long 127°48'46" E., Okinawa, in control tower at Tengan Dam, 0.4 mile west of Yamashiro, and 1.8 miles northwest of Enobi.

DRAINAGE AREA.--1.0 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete spillway. Datum of gage is at Okinawa datum, which is 3.76 ft below mean sea level (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum discharge, 1,020 cfs Oct. 7 (gage height, 201.79 ft), from rating curve extended as explained below; no flow for many days.
Period of record: Maximum discharge, 1,020 cfs Oct. 7, 1969 (gage height, 201.79 ft), from rating curve extended above 11 cfs on basis of theoretical rating for artificial control; no flow for many days each year.

REMARKS.--Records fair. Spillway flow begins at gage height 199.72 ft, bypasses station below dam (see sta 16882100), and re-enters Tengan-gawa 0.3 mile below that station. Controlled releases from reservoir are through outlet tunnel in base of dam. Records represent only flow over spillway.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	7.7	5.3	4.6	4.0	0	5.3	6.0	6.8	7.7	1.4	4.6
2	24	7.7	6.0	4.6	4.0	0	6.0	6.0	7.7	8.7	1.8	5.3
3	0	6.8	4.6	5.3	4.6	43	6.0	6.0	7.7	5.1	1.8	5.3
4	62	5.3	4.6	5.3	5.3	1.8	6.0	6.0	7.7	6.0	1.8	6.0
5	86	4.0	5.3	4.6	6.0	4.0	6.0	6.0	20	0	1.8	6.8
6	61	4.6	5.3	3.5	5.3	5.3	6.0	6.0	8.7	0	1.4	.35
7	212	6.0	6.0	3.5	5.3	6.0	6.0	6.0	8.7	0	1.0	0
8	0	6.8	4.6	5.3	5.3	8.7	6.0	6.0	7.7	0	.60	0
9	0	6.0	4.0	4.6	5.3	6.0	6.0	6.0	7.7	0	.30	0
10	0	5.3	4.0	4.6	4.0	6.8	6.0	6.0	7.7	48	0	0
11	0	5.3	4.6	4.0	4.0	6.8	6.0	4.6	7.7	.25	3.5	0
12	0	4.6	5.3	4.0	5.3	5.3	6.0	4.0	7.7	0	1.2	0
13	.60	4.6	4.0	4.0	6.8	5.3	5.3	8.7	12	0	0	0
14	6.8	19	4.0	6.0	5.3	4.6	5.3	7.7	19	0	0	0
15	12	7.7	5.3	11	5.3	6.0	6.8	2.6	60	0	0	0
16	8.7	6.0	5.3	6.8	1.7	9.8	6.8	6.0	13	0	0	0
17	7.7	5.3	6.0	6.8	0	6.8	6.0	23	11	0	0	0
18	7.7	5.3	6.0	6.0	0	7.7	36	6.0	.92	0	0	0
19	7.7	5.3	6.8	7.7	0	6.8	6.8	6.0	0	0	0	0
20	6.8	6.0	6.0	7.7	0	6.0	8.7	6.0	3.5	0	0	0
21	6.0	6.8	6.0	6.8	0	6.8	7.7	6.8	8.7	0	0	0
22	4.6	15	5.3	6.0	0	6.0	6.8	8.7	8.7	0	0	0
23	5.3	7.7	5.3	6.0	0	4.6	9.8	6.8	8.7	0	0	0
24	7.7	6.0	5.3	6.8	0	5.3	9.8	11	7.7	0	0	0
25	6.8	5.3	5.3	7.7	0	5.3	6.8	7.7	7.7	0	0	0
26	6.0	5.3	4.6	6.8	0	5.3	6.0	54	7.7	0	0	0
27	6.0	6.0	4.0	6.8	0	12	6.0	6.8	7.7	0	0	0
28	6.0	6.0	4.0	6.0	0	14	6.0	8.7	7.7	.60	0	0
29	6.0	6.8	4.6	6.8	------	6.0	6.0	8.7	7.7	1.0	.25	0
30	6.8	6.0	4.6	8.7	------	3.5	6.0	7.7	7.7	1.0	4.6	0
31	6.8	------	4.6	4.6	------	2.2	------	7.7	------	1.4	4.6	------
TOTAL	589.00	200.2	156.6	182.9	77.5	217.7	223.9	269.2	305.22	79.75	26.05	28.35
MEAN	19.0	6.67	5.05	5.90	2.77	7.02	7.46	8.68	10.2	2.57	.84	.95
MAX	212	19	6.8	11	6.8	43	36	54	60	48	4.6	6.8
MIN	0	4.0	4.0	3.5	0	0	5.3	2.6	0	0	0	0
AC-FT	1,170	397	311	363	154	432	444	534	605	158	52	56

CAL YR 1969 TOTAL 1,851.36 MEAN 5.07 MAX 279 MIN 0 AC-FT 3,670
WTR YR 1970 TOTAL 2,356.37 MEAN 6.46 MAX 212 MIN 0 AC-FT 4,670

16882100 Tengan-gawa below Tengan Dam

LOCATION.--Lat 26°24'21" N., long 127°48'58" E., Okinawa, on right bank 800 ft downstream from Tengan Dam at Yamashiro, 0.7 mile south of Iha, and 0.8 mile west of Higashi-onna.

DRAINAGE AREA.--1.1 sq mi, approximately.

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

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 188 cfs Oct. 7 (gage height, 3.15 ft), from rating curve extended above 51 cfs; minimum daily, 0.26 cfs Oct. 11, Nov. 10.
Period of record: Maximum discharge, 241 cfs May 20, 1969 (gage height, 5.31 ft), from rating curve extended above 99 cfs; minimum daily, 0.09 cfs Dec. 5, 1967, Jan. 11, Sept. 27, 1969.

REMARKS.--Records fair. Flow regulated by Tengan Reservoir 800 ft upstream (see sta 16882050). Diversion from reservoir of about 0.5 cfs for local irrigation and domestic use, and any flow over reservoir spillway (see sta 16882070) will by-pass station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	.32	.32	.29	.49	.68	.62	.49	.57	.53	.86	.48
2	3.2	.29	.32	.29	.45	.68	.62	.49	.53	.57	.86	.48
3	8.9	.29	.29	.29	.45	7.0	.57	.49	.53	8.7	.92	.48
4	5.2	.29	.29	.29	.45	.53	.57	.49	.53	20	.99	.53
5	17	.32	.29	.29	.45	.57	.57	.49	4.6	21	.99	.92
6	15	.32	.29	.29	.45	.57	.57	.49	4.3	.80	.99	13
7	107	.32	.32	.29	.45	.57	.57	.49	.57	.74	.99	8.1
8	49	.32	.32	.29	.45	.74	.57	.49	.53	.80	.99	.48
9	.35	.29	.32	.29	.45	.62	.57	.49	.53	1.0	.99	.48
10	.32	.26	.32	.29	.41	.68	.57	.49	.53	16	1.1	.48
11	.26	.29	.32	.29	.41	.62	.57	.45	.53	13	1.1	.48
12	.29	.32	.32	.29	.45	.57	.57	.45	.53	8.5	47	.48
13	.32	.29	.32	.29	.45	.62	.57	1.2	7.8	8.5	28	.48
14	.38	.66	.32	.50	.45	.62	.57	12	4.1	5.7	.63	.48
15	.41	.32	.32	.90	.45	3.0	.57	1.6	18	.74	1.0	.90
16	.41	.35	.32	.70	5.0	.68	.57	.76	15	.74	.68	1.8
17	.41	.35	.32	.70	.68	.62	.57	1.4	15	.74	.68	1.8
18	.38	.38	.32	.70	.62	.62	12	.49	14	.74	.63	2.9
19	.38	.38	.32	.64	.62	.62	.57	.53	.80	.74	.63	3.9
20	.35	.41	.32	.64	.62	.62	1.9	.57	.57	.74	.68	3.9
21	.35	.35	.32	.64	.62	.62	1.0	.53	.57	.68	.63	4.0
22	.38	.55	.29	.64	.62	.62	.57	.57	.57	.68	.53	4.0
23	.35	.35	.29	.60	.86	.57	1.2	.53	.57	.68	.53	4.4
24	.45	.32	.29	.60	2.3	.57	.62	.62	.57	.68	.53	.83
25	.35	.29	.29	.60	2.3	.62	.57	.53	.57	.74	.58	.44
26	.35	.29	.29	.60	2.3	.62	.53	7.8	.57	.86	.48	.44
27	.32	.29	.29	.46	.80	11	.53	3.6	.57	.86	.48	.44
28	.35	.29	.29	.46	.68	13	.49	.57	.57	.86	.68	1.7
29	.32	.35	.29	.53	------	.57	.49	.53	.57	.80	.85	2.9
30	.32	.32	.29	.57	------	4.5	.49	.53	.57	.80	.53	2.8
31	.29	------	.29	.53	------	.57	------	3.1	------	.80	.48	------
TOTAL	213.87	10.17	9.50	14.78	24.73	54.49	30.75	43.26	95.25	118.72	97.01	64.50
MEAN	6.90	.34	.31	.48	.88	1.76	1.03	1.40	3.18	3.83	3.13	2.15
MAX	107	.66	.32	.90	5.0	13	12	12	18	21	47	13
MIN	.26	.26	.29	.29	.41	.53	.49	.45	.53	.53	.48	.44
AC-FT	424	20	19	29	49	108	61	86	189	235	192	128

CAL YR 1969 TOTAL 933.85 MEAN 2.56 MAX 107 MIN .09 AC-FT 1,850
WTR YR 1970 TOTAL 777.03 MEAN 2.13 MAX 107 MIN .26 AC-FT 1,540

NOTE.--No gage-height record Dec. 30 to Jan. 29.

16882400 Tengan-gawa at Tengan

LOCATION.--Lat 26°22'54" N., long 127°51'39" E., Okinawa, on right bank at upstream side of bridge on Highway 24, 0.2 mile south of Tengan, and 3.4 miles northeast of Chibana.

DRAINAGE AREA.--10 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 3,090 cfs Oct. 7 (gage height, 11.62 ft), from rating curve extended above 1,200 cfs; minimum, 0.80 cfs Feb. 23.
Period of record: Maximum discharge, 4,500 cfs Aug. 20, 1969 (gage height, 16.33 ft), from rating curve extended above 1,200 cfs; no flow part of each day Jan. 15, 21, Feb. 1, Dec. 21, 23, 1968, and probably Dec. 24-30, 1968, Jan. 9, 10, 1969.

REMARKS.--Records good. Slight regulation by Tengan Reservoir 5 miles upstream (see sta 16882050). Upstream pumping stations divert water for domestic use. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	23	14	3.2	7.2	5.6	9.2	7.0	14	11	8.5	6.4
2	102	22	12	3.1	6.2	2.8	9.4	6.4	9.9	9.9	7.8	5.5
3	55	22	11	4.7	7.2	190	8.2	5.6	11	24	11	3.6
4	428	20	9.2	4.4	10	10	6.8	6.8	7.6	110	9.0	4.2
5	578	20	9.4	3.6	11	5.6	6.6	5.1	88	65	7.6	4.9
6	416	20	8.0	3.2	10	4.2	6.4	5.1	62	22	7.4	9.0
7	1,310	17	11	2.8	12	8.3	6.4	4.4	18	16	6.6	6.0
8	251	18	16	3.9	7.6	28	6.4	5.5	11	16	6.0	5.0
9	99	18	9.9	4.0	12	9.9	5.8	4.6	9.0	25	5.8	4.0
10	70	16	7.4	4.4	12	20	5.5	4.7	8.5	391	6.0	3.5
11	51	15	7.6	3.1	4.7	16	6.2	5.8	7.6	44	11	3.1
12	46	18	7.2	2.8	3.3	6.8	6.0	4.7	6.4	28	32	2.9
13	40	14	6.6	2.3	5.9	10	5.5	30	45	26	74	3.4
14	39	80	6.4	13	3.2	7.4	4.9	76	108	23	12	3.4
15	43	29	6.0	58	2.4	32	9.7	15	597	17	24	2.1
16	38	21	5.8	17	8.9	34	8.0	22	241	15	19	1.6
17	36	20	5.8	9.4	2.9	13	6.4	23	163	13	12	2.0
18	33	16	5.6	8.0	1.8	11	353	9.9	58	12	8.0	2.9
19	32	15	6.2	13	1.8	8.7	26	7.2	33	11	6.4	3.7
20	32	21	6.2	13	2.0	6.0	19	6.4	28	10	5.6	3.2
21	30	21	5.5	8.0	1.2	7.4	25	8.5	27	9.7	5.4	3.6
22	30	79	5.1	6.8	2.3	6.6	13	13	25	9.4	5.2	3.9
23	30	28	4.6	6.0	1.5	4.7	25	9.9	23	9.2	5.0	3.9
24	32	19	4.2	10	1.6	3.7	24	20	22	8.7	5.0	2.1
25	29	14	4.0	12	2.3	3.7	14	10	17	8.7	6.0	97
26	27	14	3.9	4.7	5.7	8.9	10	165	17	9.2	4.7	17
27	26	12	3.7	10	25	115	9.7	42	14	9.0	4.5	13
28	24	11	4.2	14	4.4	144	9.2	15	12	9.0	15	6.3
29	24	16	3.7	7.9	------	22	7.4	11	11	8.5	100	3.7
30	26	23	3.4	19	------	18	7.0	10	11	8.0	20	13
31	25	------	3.7	16	------	11	------	34	------	7.7	8.0	------
TOTAL	4,064	682	217.3	291.3	176.1	774.3	659.7	593.6	1,705.0	986.0	458.5	243.9
MEAN	131	22.7	7.01	9.40	6.29	25.0	22.0	19.1	56.8	31.8	14.8	8.13
MAX	1,310	80	16	58	25	190	353	165	597	391	100	97
MIN	24	11	3.4	2.3	1.2	2.8	4.9	4.4	6.4	7.7	4.5	1.6
AC-FT	8,060	1,350	431	578	349	1,540	1,310	1,180	3,380	1,960	909	484

CAL YR 1969 TOTAL 19,231.50 MEAN 52.7 MAX 1,900 MIN .10 AC-FT 38,150
WTR YR 1970 TOTAL 10,851.7 MEAN 29.7 MAX 1,310 MIN 1.2 AC-FT 21,520

PEAK DISCHARGE (BASE, 2,000 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 5	0800	8.55	2,110	6-15	0400	9.50	2,420
10- 7	1030	11.62	3,090				

16882600 Okukubi-gawa at Kin, Okinawa

LOCATION.--Lat 26°27'40" N., long 127°56'03" E., Okinawa, on right bank 250 ft downstream from Hansen Dam, 0.7 mile northeast of Kin, and 1.8 miles southwest of Kanna.

DRAINAGE AREA.--5.0 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 0.74 ft above mean sea level or 4.50 ft above Okinawa datum (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum discharge, 2,940 cfs Oct. 4 (gage height, 9.95 ft), from rating curve extended above 120 cfs; minimum daily, 0.41 cfs Jan. 4-7, 11-13.
Period of record: Maximum discharge, 3,150 cfs Aug. 20, 1969 (gage height, 10.80 ft), from rating curve extended above 120 cfs; minimum daily, 0.10 cfs Mar. 17-20, 1968.

REMARKS.--Records fair except those above 300 cfs, which are poor. Flow regulated by Hansen Reservoir, 250 ft upstream (capacity, 421 acre-ft). Diversion from Hansen Reservoir for irrigation and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	5.9	3.6	.46	2.2	4.8	6.2	1.4	10	5.3	.60	9.3
2	160	4.8	3.4	.46	3.0	2.6	6.2	1.9	7.5	3.8	.60	7.5
3	28	3.6	2.4	.46	2.8	160	7.7	1.9	6.5	16	.68	2.6
4	681	2.6	1.6	.41	2.6	7.9	1.5	2.2	5.6	162	.68	1.4
5	600	1.8	3.0	.41	2.8	4.0	1.8	2.8	65	116	.68	1.0
6	194	1.9	3.2	.41	2.4	3.6	2.6	2.1	30	15	.68	5.0
7	817	2.6	12	.41	2.2	4.8	3.2	1.8	10	20	.68	6.2
8	82	2.8	9.7	.46	2.8	14	3.0	2.4	7.2	25	.68	3.8
9	29	1.1	4.8	.46	3.8	6.9	2.8	3.4	6.5	68	.68	4.3
10	18	1.0	4.3	.46	2.1	7.2	2.6	3.4	5.0	246	.76	2.1
11	14	3.0	4.0	.41	2.1	9.7	3.4	3.4	5.6	23	.76	1.2
12	12	.85	3.8	.41	2.2	4.8	3.6	1.9	5.0	14	.76	.94
13	13	.60	3.6	.41	4.0	4.5	2.6	16	9.6	13	34	.85
14	12	4.6	3.4	5.1	.76	3.6	2.2	36	298	8.9	7.9	1.2
15	20	12	3.4	30	.53	8.8	5.0	8.2	292	9.7	29	1.6
16	14	5.6	3.4	5.3	.53	25	5.3	17	198	10	19	.76
17	10	1.4	3.6	3.4	.60	9.7	24	16	96	8.9	4.5	.85
18	7.9	2.1	3.8	1.4	.60	5.6	161	5.6	31	5.3	3.2	1.1
19	8.9	2.4	4.3	2.1	.60	4.3	14	3.6	16	2.4	1.6	.76
20	12	5.0	3.8	4.5	.60	3.4	14	4.0	11	6.5	5.3	.76
21	7.9	5.6	3.8	3.6	.60	4.8	10	4.5	11	7.5	.85	.68
22	6.9	30	2.6	2.8	.53	7.5	6.2	6.9	11	7.2	.85	.68
23	8.6	8.9	.68	3.2	.46	4.8	16	7.9	9.7	2.1	2.2	.76
24	11	5.6	.76	4.8	.46	3.6	9.7	62	9.7	.60	1.1	.76
25	7.9	4.3	3.2	5.6	.46	1.8	5.3	10	8.2	.60	.85	.76
26	6.5	4.0	3.4	1.8	.53	4.0	4.3	280	6.9	4.0	.85	.76
27	7.2	3.4	3.4	1.6	.85	128	3.6	33	8.6	.94	1.4	.68
28	5.6	2.6	3.0	3.8	4.8	90	3.4	12	7.5	1.2	24	.68
29	5.9	6.2	2.4	1.1	------	16	2.8	8.9	6.2	1.5	95	.68
30	6.5	7.9	1.8	16	------	7.5	2.2	8.6	5.6	.85	234	.76
31	6.2	------	.53	6.2	------	6.5	------	25	------	.60	42	------
TOTAL	2,822.3	144.15	110.67	107.93	47.91	569.7	336.2	593.8	1,199.9	805.89	515.84	60.42
MEAN	91.0	4.81	3.57	3.48	1.71	18.4	11.2	19.2	40.0	26.0	16.6	2.01
MAX	817	30	12	30	4.8	160	161	280	298	246	234	9.3
MIN	5.6	.60	.53	.41	.46	1.8	1.5	1.4	5.0	.60	.60	.68
AC-FT	5,600	286	220	214	95	1,130	667	1,180	2,380	1,600	1,020	120

CAL YR 1969 TOTAL 10,466.45 MEAN 28.7 MAX 1,070 MIN .20 AC-FT 20,760
WTR YR 1970 TOTAL 7,314.71 MEAN 20.0 MAX 817 MIN .41 AC-FT 14,510

16882800 Kanna-gawa near Kanna

LOCATION.--Lat 26°29'20" N., long 127°56'46" E., Okinawa, on left bank 1.6 miles northwest of Kanna-shogakko (elementary school), 1.7 miles upstream from bridge at mouth, and 2.6 miles northeast of Kin.

DRAINAGE AREA.--0.9 sq mi, approximately.

PERIOD OF RECORD.--June 1963 to current year.

GAGE.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 70 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.40 ft higher.

AVERAGE DISCHARGE.--7 years, 3.60 cfs (2,610 acre-ft per year).

EXTREMES.--Current year: Maximum discharge about 1,300 cfs Oct. 7; minimum, 0.90 cfs Feb. 25.
Period of record: Maximum discharge, 1,390 cfs Aug. 5, 1965 (gage height, 6.80 ft, from floodmarks), from rating curve extended above 43 cfs on basis of theoretical rating for artificial control; minimum, 0.12 cfs July 24, 26, 27, 1963.

REMARKS.--Records good except those for periods of no gage-height record, which are poor. No diversion above station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	2.4	1.8	1.2	1.4	1.2	2.0	1.9	7.0	3.0	2.5	3.1
2	20	2.4	1.9	1.4	1.3	1.1	2.0	1.9	5.0	3.0	2.6	2.9
3	9.0	2.4	1.7	1.4	1.3	12	1.8	1.8	4.2	4.0	2.9	2.6
4	45	2.3	1.6	1.3	1.3	1.7	1.7	3.6	3.8	23	2.6	2.4
5	60	2.2	1.6	1.2	1.3	1.4	1.6	1.9	6.0	21	2.4	2.6
6	17	2.2	1.6	1.2	1.2	1.4	1.6	1.7	4.5	4.6	2.3	2.8
7	120	2.2	2.6	1.2	1.2	1.4	1.6	1.7	3.5	6.1	2.2	2.6
8	25	2.2	1.9	1.3	1.3	2.7	1.5	2.0	2.9	8.0	2.1	3.2
9	12	2.1	1.6	1.5	1.2	1.6	1.5	1.7	2.7	14	2.1	2.5
10	8.0	2.0	1.6	1.3	1.1	2.4	1.4	1.7	2.6	19	2.1	2.3
11	6.2	2.0	1.6	1.2	1.1	2.0	1.4	1.6	2.6	8.2	2.5	2.3
12	5.2	2.0	1.5	1.1	2.0	1.5	1.3	1.5	2.6	6.5	3.0	2.3
13	4.7	2.0	1.5	1.1	1.4	1.5	1.2	4.5	4.7	5.8	11	2.3
14	4.7	3.3	1.4	3.0	1.2	1.4	1.2	5.0	35	5.1	2.7	2.2
15	5.6	2.8	1.4	5.0	1.1	2.2	1.8	2.1	19	4.8	6.0	2.2
16	4.5	2.2	1.4	1.7	1.1	4.2	1.4	3.8	15	4.5	3.5	2.2
17	4.0	2.0	1.4	1.4	1.0	1.9	1.3	2.8	16	4.2	2.6	2.8
18	3.8	1.9	1.4	1.3	1.0	1.8	30	2.0	11	3.9	2.5	2.4
19	4.0	1.8	1.7	1.4	1.0	1.5	4.0	1.9	7.0	3.7	3.5	2.2
20	3.6	2.5	1.4	1.3	1.0	1.4	4.2	2.1	5.8	3.5	3.3	2.2
21	3.4	2.2	1.4	1.2	1.0	1.7	6.2	1.8	5.0	3.4	2.3	2.3
22	3.3	5.4	1.4	1.2	1.0	1.6	3.3	2.1	4.7	3.2	2.3	2.0
23	3.2	2.6	1.4	1.2	.98	1.4	4.5	2.0	4.2	3.2	2.2	2.0
24	3.3	2.0	1.4	1.6	.98	1.3	4.0	15	3.9	3.0	2.0	1.9
25	3.2	1.9	1.3	1.4	.98	1.4	2.8	4.5	3.8	3.0	1.9	2.4
26	3.0	1.9	1.4	1.2	2.1	1.8	2.5	15	3.6	3.2	1.8	2.0
27	2.8	1.8	1.3	1.3	2.0	14	2.4	7.2	3.4	3.0	2.4	1.8
28	2.7	1.7	1.2	1.4	1.4	11	2.2	5.0	3.2	2.8	6.7	1.8
29	2.6	2.6	1.2	1.2	------	3.0	2.1	4.2	3.1	2.7	15	2.0
30	2.6	2.0	1.2	2.8	------	2.5	2.0	3.8	3.2	2.6	14	1.9
31	2.6	------	1.2	1.8	------	2.2	------	30	------	2.6	4.4	------
TOTAL	398.5	69.0	47.0	47.8	34.94	88.2	96.5	137.8	199.0	188.6	119.4	70.2
MEAN	12.9	2.30	1.52	1.54	1.25	2.85	3.22	4.45	6.63	6.08	3.85	2.34
MAX	120	5.4	2.6	5.0	2.1	14	30	30	35	23	15	3.2
MIN	2.6	1.7	1.2	1.1	.98	1.1	1.2	1.5	2.6	2.6	1.8	1.8
AC-FT	790	137	93	95	69	175	191	273	395	374	237	139

CAL YR 1969 TOTAL 2,403.36 MEAN 6.58 MAX 191 MIN .58 AC-FT 4,770
WTR YR 1970 TOTAL 1,496.94 MEAN 4.10 MAX 120 MIN .98 AC-FT 2,970

PEAK DISCHARGE (BASE, 580 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	/0500	-	/920	10- 7	/0830	-	/1,300
10- 4	/1200	-	/660	5-26	/1300	-	/620
10- 5	/0630	-	/1,200				

/ About.

NOTE.--No gage-height record Oct. 1-25, Apr. 10 to June 7.

16883300 Left Fork O-kawa near Kushi

LOCATION.--Lat 26°31'18" N., long 127°59'50" E., Okinawa, on left bank 1.1 miles northwest of Kushi and 1.1 miles north of Katabaru.

DRAINAGE AREA.--0.3 sq mi, approximately.

PERIOD OF RECORD.--June 1963 to current year.

GAGE.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 60 ft (from topographic map). Prior to Nov. 20, 1963, at datum 0.40 ft higher.

AVERAGE DISCHARGE.--7 years, 0.886 cfs (642 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 348 cfs Oct. 7 (gage height, 4.74 ft), from rating curve extended as explained below; minium, 0.21 cfs Feb. 9-12, 23-26, Mar. 1, 2.
Period of record: Maximum discharge, 438 cfs Aug. 5, 1965 (gage height, 5.19 ft), from rating curve extended above 23 cfs on basis of theoretical rating for the artificial control; minimum, 0.05 cfs July 17-27, 29, Oct. 23, 1963.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	.58	.43	.27	.27	.22	.45	.39	1.6	.71	.60	.82
2	5.6	.55	.43	.30	.25	.21	.43	.39	1.2	.71	.58	.77
3	2.2	.55	.39	.38	.24	3.3	.37	.37	1.0	.90	.65	.74
4	12	.53	.39	.37	.25	.35	.33	.80	.92	8.0	.58	.71
5	16	.51	.39	.32	.24	.27	.32	.39	1.6	7.0	.60	.93
6	4.0	.51	.39	.32	.22	.27	.32	.35	1.0	1.3	.55	.77
7	50	.51	.45	.32	.22	.30	.30	.35	.80	1.5	.51	.82
8	5.4	.51	.39	.35	.23	.68	.30	.41	.68	1.8	.51	.77
9	2.5	.49	.35	.30	.22	.35	.28	.35	.64	3.0	.49	.65
10	1.8	.47	.37	.28	.21	.55	.28	.35	.60	4.5	.53	.60
11	1.5	.47	.35	.27	.21	.45	.28	.33	.60	2.1	.65	.58
12	1.3	.47	.35	.25	.48	.30	.25	.30	.60	1.7	1.4	.55
13	1.1	.45	.33	.24	.32	.31	.24	.91	1.0	1.5	4.5	.60
14	1.1	.73	.33	.50	.25	.27	.24	1.1	11	1.4	.80	.55
15	1.3	.82	.33	1.2	.25	.44	.36	.47	5.0	1.3	3.5	.53
16	1.0	.55	.33	.35	.24	.95	.28	.86	3.5	1.2	1.0	.51
17	.94	.47	.32	.28	.22	.39	.27	.63	3.7	1.1	.82	.68
18	.88	.45	.33	.27	.22	.35	8.7	.43	2.5	1.0	.68	.57
19	.95	.43	.41	.30	.22	.30	.97	.39	1.7	.94	1.2	.51
20	.82	.56	.32	.27	.22	.27	1.0	.43	1.4	.90	.94	.51
21	.77	.53	.30	.25	.22	.32	1.5	.37	1.3	.86	.68	.55
22	.77	1.2	.30	.24	.22	.30	.74	.45	1.1	.82	.76	.49
23	.74	.60	.30	.27	.22	.25	.88	.41	1.0	.80	.74	.62
24	.77	.47	.30	.32	.21	.24	.90	4.1	.97	.78	.63	.55
25	.74	.47	.30	.30	.21	.24	.60	.97	.91	.74	.58	.67
26	.68	.47	.30	.25	.26	.35	.53	4.0	.84	.80	.55	.61
27	.65	.47	.28	.30	.49	4.6	.51	2.0	.80	.76	.60	.51
28	.63	.45	.28	.30	.27	3.1	.47	1.3	.74	.71	3.8	.49
29	.60	.69	.27	.25	------	.85	.43	1.0	.72	.68	2.5	.79
30	.69	.51	.27	.72	------	.60	.41	.90	.74	.65	1.2	.69
31	.60	------	.27	.33	------	.51	------	8.0	------	.63	.94	------
TOTAL	118.85	16.47	10.55	10.67	7.08	21.89	22.94	33.50	50.16	50.79	34.07	19.14
MEAN	3.83	.55	.34	.34	.25	.71	.76	1.08	1.67	1.64	1.10	.64
MAX	50	1.2	.45	1.2	.49	4.6	8.7	8.0	11	8.0	4.5	.93
MIN	.60	.43	.27	.24	.21	.21	.24	.30	.60	.63	.49	.49
AC-FT	236	33	21	21	14	43	46	66	99	101	68	38

CAL YR 1969 TOTAL 537.56 MEAN 1.47 MAX 50 MIN .12 AC-FT 1,070
WTR YR 1970 TOTAL 396.11 MEAN 1.09 MAX 50 MIN .21 AC-FT 786

PEAK DISCHARGE (BASE, 100 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 2	0400	3.90	192	10- 7	0730	4.74	348
10- 4	1100	3.46	127	5-26	/1230	3.33	112
10- 5	0530	4.34	272	6-14	/2400	-	/130

/ About.
NOTE.--No gage-height record June 26 to July 27.

16883550 Oura-gawa at Okawa

LOCATION.--Lat 26°34'10" N., long 128°02'23" E., Okinawa, on left bank 0.4 mile north of Okawa and 1.8 miles northwest of Sedake.

DRAINAGE AREA.--1.9 sq mi, approximately.

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

GAGE.--Water-stage recorder. Concrete control since Mar. 10, 1967. Altitude of gage is 30 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,130 cfs Oct. 7 (gage height, 7.90 ft), from rating curve extended above 130 cfs; no flow Dec. 30 to Jan. 3, Jan. 7-9, 13.
Period of record: Maximum discharge, 1,130 cfs Oct. 7, 1969 (gage height, 7.90 ft), from rating curve extended above 130 cfs; no flow at times each year.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.42	1.2	.97	0	1.8	.74	5.3	3.2	18	2.3	2.5	8.8
2	34	1.1	.70	0	1.2	.60	4.5	3.0	12	2.0	2.0	7.5
3	6.8	1.0	.62	0	.87	30	3.8	2.6	9.0	4.5	2.5	5.9
4	85	.93	.48	.03	.78	3.5	3.4	4.1	7.0	50	2.0	5.3
5	131	.86	.36	.03	.87	2.2	3.0	3.0	12	22	1.6	5.9
6	37	.82	.31	.03	.62	1.6	2.6	2.4	11	11	1.3	9.8
7	420	.78	.42	0	.48	1.5	2.3	2.1	7.2	35	1.1	7.6
8	66	.72	.97	0	.48	3.0	2.1	2.0	5.4	17	.92	7.1
9	31	.68	.55	0	.78	2.2	2.0	1.8	4.5	70	.87	5.3
10	21	.64	.36	.05	.70	2.5	1.8	1.8	3.8	70	.78	4.8
11	16	.60	.27	.07	.55	2.3	1.8	1.5	3.2	26	1.8	4.3
12	13	.56	.23	.02	1.1	1.7	1.5	1.2	2.6	19	4.9	3.8
13	11	.50	.19	0	1.5	3.0	1.3	3.1	8.3	14	61	3.6
14	10	1.5	.13	.02	.70	2.1	1.1	5.0	45	12	8.8	3.4
15	8.8	5.4	.11	7.0	.42	3.5	1.7	2.4	120	11	29	3.2
16	7.5	1.8	.09	1.8	.36	10	1.4	4.4	40	9.2	12	3.0
17	6.8	1.1	.09	.87	.23	6.0	1.2	5.6	54	8.2	7.1	3.5
18	5.6	.83	.07	.48	.16	4.2	54	2.4	30	7.5	5.0	3.2
19	4.8	.64	.23	.42	.11	3.2	12	1.8	21	6.8	10	2.4
20	3.8	.90	.31	.70	.09	2.5	10	2.0	16	5.9	8.5	2.1
21	3.4	.87	.19	.48	.07	2.4	15	1.4	13	5.3	5.3	2.0
22	3.1	7.2	.09	.27	.07	1.8	8.0	.87	10	4.8	4.3	1.8
23	2.8	3.0	.05	.19	.07	1.4	10	.78	8.0	4.3	3.8	2.0
24	3.2	1.5	.03	.27	.07	1.2	9.6	66	7.0	4.0	3.6	2.0
25	2.7	1.1	.02	1.3	.05	1.2	7.5	11	5.8	3.8	3.2	2.1
26	2.3	.87	.02	.62	.35	4.0	6.2	51	4.8	4.0	2.6	1.8
27	2.0	.70	.03	.55	1.7	40	5.0	19	4.0	4.0	3.3	1.5
28	1.8	.55	.04	1.2	1.0	22	4.5	11	3.5	3.4	48	1.3
29	1.6	1.2	.01	.87	------	11	4.0	8.2	3.0	3.0	28	1.4
30	1.5	1.7	0	7.2	------	8.5	3.8	6.5	2.6	2.5	17	1.8
31	1.3	------	0	3.4	------	6.5	------	56	------	2.5	12	------
TOTAL	945.22	41.25	7.94	27.87	17.18	186.34	190.4	287.15	491.7	445.0	294.77	118.2
MEAN	30.5	1.38	.26	.90	.61	6.01	6.35	9.26	16.4	14.4	9.51	3.94
MAX	420	7.2	.97	7.2	1.8	40	54	66	120	70	61	9.8
MIN	.42	.50	0	0	.05	.60	1.1	.78	2.6	2.0	.78	1.3
AC-FT	1,870	82	16	55	34	370	378	570	975	883	585	234

CAL YR 1969 TOTAL 4,268.84 MEAN 11.7 MAX 420 MIN 0 AC-FT 8,470
WTR YR 1970 TOTAL 3,053.02 MEAN 8.36 MAX 420 MIN 0 AC-FT 6,060

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 4	/1200	-	/900	5-24	0700	6.21	820
10- 5	/0630	-	/560	5-31	0730	4.96	595
10- 7	1300	7.90	1,130	6-14	/2400	-	/990

/ About.
NOTE.--No gage-height record Oct. 15 to Nov. 20.

16884100 Fukuji-gawa near Yubaru

LOCATION.--Lat 26°38'32" N., long 128°13'00" E., Okinawa, on left bank 1.1 miles north of Yubaru and 2.4 miles northeast of Miyaji.

DRAINAGE AREA.--5.8 sq mi, approximately.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 30.9 cfs (22,390 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 8,800 cfs Oct. 7 (gage height, 14.77 ft), from rating curve extended as explained below; minimum, 3.4 cfs Jan. 13, 14.
Period of record: Maximum discharge, 10,400 cfs Aug. 5, 1965 (gage height, 17.20 ft), from rating curve extended above 2,600 cfs on basis of slope-area measurement of peak flow; minimum, 2.2 cfs Jan. 9, 10, 1969.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	7.1	8.1	3.8	7.1	7.1	18	12	42	13	10	17
2	59	6.6	7.1	4.2	5.4	6.4	17	12	33	15	9.1	15
3	13	7.1	7.1	5.0	5.0	504	16	11	29	27	9.6	14
4	51	7.1	6.6	4.2	5.4	16	15	15	27	353	9.6	13
5	488	6.2	6.2	4.2	5.4	12	14	11	41	132	9.6	19
6	169	6.2	5.8	4.2	4.6	11	14	11	35	29	9.6	16
7	1,490	6.2	6.2	3.8	4.6	14	13	10	27	180	9.6	13
8	140	6.2	7.1	4.2	4.6	36	13	11	25	124	9.1	14
9	49	5.8	5.8	4.6	5.0	16	13	11	24	108	9.1	12
10	31	5.4	5.4	5.0	4.6	18	12	11	24	240	9.6	11
11	21	5.4	5.4	4.2	4.6	18	13	11	23	41	12	11
12	16	5.4	5.0	3.8	8.2	13	11	9.6	23	32	11	11
13	13	5.4	5.0	3.4	18	24	11	14	29	27	394	14
14	12	12	5.0	5.0	7.1	15	11	29	30	25	27	11
15	12	10	5.0	16	6.8	51	12	15	588	23	57	10
16	15	9.1	5.0	9.1	7.6	53	11	27	305	21	19	9.6
17	12	7.1	5.0	5.4	5.8	21	11	24	147	20	15	9.6
18	11	5.4	4.6	4.6	5.8	17	600	12	45	18	12	9.1
19	10	5.0	5.4	5.0	5.4	15	25	11	31	17	16	9.1
20	8.6	11	5.0	5.8	5.4	13	38	12	26	16	20	8.6
21	8.1	9.6	4.6	5.0	5.4	14	40	11	24	16	12	8.6
22	8.1	85	4.6	4.2	5.4	12	20	11	21	15	14	8.6
23	8.1	18	4.6	4.6	5.4	11	40	12	20	14	11	8.6
24	27	9.1	4.6	6.2	5.4	10	29	302	21	14	11	9.3
25	16	7.1	4.6	5.8	5.0	10	17	24	18	13	11	15
26	9.6	6.6	4.6	4.6	5.9	15	15	519	16	15	9.6	9.1
27	8.6	7.1	4.6	5.9	16	301	14	42	16	12	26	8.6
28	7.6	5.8	4.2	17	7.6	93	13	24	15	12	342	8.6
29	7.6	9.8	4.2	34	------	24	12	21	14	12	72	13
30	7.6	17	3.8	116	------	25	12	21	14	11	31	9.6
31	9.6	------	3.8	16	------	22	------	975	------	13	21	------
TOTAL	2,742.3	314.8	164.0	324.8	182.5	1,417.5	1,100	2,241.6	1,733	1,608	1,238.5	346.0
MEAN	88.5	10.5	5.29	10.5	6.52	45.7	36.7	72.3	57.8	51.9	40.0	11.5
MAX	1,490	85	8.1	116	18	504	600	975	588	353	394	19
MIN	3.8	5.0	3.8	3.4	4.6	6.4	11	9.6	14	11	9.1	8.6
AC-FT	5,440	624	325	644	362	2,810	2,180	4,450	3,440	3,190	2,460	686

CAL YR 1969 TOTAL 15,446.5 MEAN 42.3 MAX 1,490 MIN 2.2 AC-FT 30,640
WTR YR 1970 TOTAL 13,413.0 MEAN 36.7 MAX 1,490 MIN 3.4 AC-FT 26,600

PEAK DISCHARGE (BASE, 3,800 CFS, REVISED) / About

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 7	1500	14.77	8,800	5-26	1130	9.89	5,270
3- 3	0130	10.50	5,760	5-31	0800	14.50	8,610
4-18	/0100	-	/7,100	6-15	0100	9.70	5,120

16884300 Miyagi-gawa at Miyagi

LOCATION.--Lat 26°37'33" N., long 128°11'08" E., Okinawa, on left bank 0.3 mile north of Miyagi, 0.7 mile upstream from Highway 13, and 1.1 miles east of Kawata.

DRAINAGE AREA.--1.8 sq mi, approximately.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Concrete control since Oct. 30, 1969. Altitude of gage is 20 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,640 cfs Oct. 7 (gage height, 8.72 ft), from rating curve extended above 25 cfs; minimum, 1.1 cfs Jan. 13, 14.

REMARKS.--Records good except those above 50 cfs, which are fair. No diversion above station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	2.3	2.3	1.2	2.2	1.6	4.6	3.4	10	4.1	3.4	5.1
2	8.7	2.2	2.2	1.2	1.6	1.6	4.3	3.2	8.8	5.0	3.0	5.1
3	2.3	2.2	2.0	1.2	1.4	191	3.9	3.2	7.3	11	2.8	4.3
4	20	2.0	1.8	1.2	1.6	4.9	3.6	6.0	6.6	92	2.7	4.1
5	180	1.8	1.8	1.2	1.7	4.1	3.4	3.4	10	26	2.7	4.3
6	37	1.8	1.8	1.2	1.4	3.6	3.2	3.2	9.2	8.8	2.7	5.1
7	548	1.8	2.0	1.2	1.4	3.9	3.2	3.0	6.3	33	2.5	4.6
8	36	1.8	2.2	1.2	1.4	7.7	3.0	4.1	5.7	35	2.3	3.6
9	11	1.7	1.8	1.3	1.4	4.1	2.8	3.2	5.1	38	2.3	3.4
10	7.3	1.6	1.7	1.6	1.3	5.6	2.8	3.2	4.9	70	2.5	3.2
11	5.4	1.6	1.7	1.2	1.3	5.1	2.8	3.2	4.6	14	3.2	3.0
12	4.6	1.6	1.7	1.2	1.6	3.4	2.7	2.8	4.6	11	3.6	3.0
13	4.1	1.7	1.6	1.2	2.2	6.3	2.5	4.2	5.4	9.2	90	8.3
14	3.6	3.6	1.6	1.7	1.4	4.1	2.3	8.4	7.0	8.0	6.6	3.6
15	3.6	3.0	1.6	3.6	1.6	6.3	2.8	4.1	200	7.7	7.9	3.2
16	4.9	3.4	1.6	2.2	2.3	12	2.7	6.7	124	7.0	3.9	3.0
17	3.6	2.8	1.6	1.6	1.4	5.4	2.7	5.7	54	6.6	3.2	3.0
18	3.4	2.0	1.6	1.4	1.3	4.3	134	3.2	18	6.0	2.8	3.0
19	3.2	1.7	1.6	1.4	1.3	3.6	8.8	3.0	12	5.7	6.7	3.0
20	3.0	2.3	1.4	1.4	1.3	3.2	7.4	3.4	10	5.4	5.4	2.8
21	2.7	2.7	1.3	1.2	1.3	3.4	10	3.0	8.8	4.9	3.2	2.7
22	2.7	15	1.3	1.2	1.3	3.2	5.7	2.8	7.7	4.6	2.8	2.8
23	2.5	4.3	1.3	1.4	1.3	3.0	7.7	3.0	7.3	4.3	2.7	2.7
24	5.9	2.7	1.3	1.8	1.3	2.7	7.7	131	7.0	4.1	2.5	2.9
25	3.8	2.3	1.3	1.6	1.2	2.5	5.1	8.0	6.3	4.1	2.3	3.0
26	3.0	2.2	1.3	1.3	1.3	3.2	4.6	150	6.0	5.5	2.2	2.7
27	2.7	2.0	1.3	1.6	3.9	78	4.3	14	5.4	3.9	5.5	2.7
28	2.4	1.8	1.2	2.2	1.8	25	4.1	8.4	5.1	3.4	74	2.5
29	2.2	2.7	1.2	3.4	------	7.7	3.9	6.6	4.9	3.4	26	4.2
30	2.1	3.4	1.2	6.1	------	7.3	3.6	6.3	4.3	3.2	9.6	2.8
31	2.7	------	1.2	3.2	------	5.7	------	157	------	3.9	6.0	------
TOTAL	923.6	82.0	49.5	54.4	44.5	423.5	260.2	570.7	576.3	448.8	297.0	107.7
MEAN	29.8	2.73	1.60	1.75	1.59	13.7	8.67	18.4	19.2	14.5	9.58	3.59
MAX	548	15	2.3	6.1	3.9	191	134	157	200	92	90	8.3
MIN	1.2	1.6	1.2	1.2	1.2	1.6	2.3	2.8	4.3	3.2	2.2	2.5
AC-FT	1,830	163	98	108	88	840	516	1,130	1,140	890	589	214

CAL YR 1969 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1970 TOTAL 3,838.2 MEAN 10.5 MAX 548 MIN 1.2 AC-FT 7,610

PEAK DISCHARGE (BASE, 1,400 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 7	1500	8.72	2,640	5-26	1100	6.22	1,540
3- 3	0130	8.17	2,420	5-31	0730	6.92	1,850
4-18	0200	5.92	1,400	6-15	0130	6.31	1,580
5-24	0700	6.72	1,760	6-16	1400	6.35	1,600

RYUKYU ISLANDS, ISLAND OF OKINAWA

16884500 Ara-kawa at Arakawa

LOCATION.--Lat 26°39'43" N., long 128°15'22" E., Okinawa, on right bank at Arakawa, 100 ft upstream from bridge on access road, 0.5 mile upstream from mouth, and 4.0 miles southwest of Aha.

DRAINAGE AREA.--3.8 sq mi, approximately.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Concrete control since Oct. 29, 1969. Altitude of gage is 150 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, about 5,600 cfs Oct. 7; minimum, 3.2 cfs Jan. 13, 14.

REMARKS.--Records good except those for period of no gage-height record and those above 300 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	5.8	9.0	3.8	12	6.3	17	10	39	8.6	7.1	16
2	50	5.6	8.0	4.0	9.3	9.6	16	9.6	26	10	6.3	14
3	13	6.1	8.0	4.6	8.0	261	14	9.0	20	28	5.8	12
4	60	5.8	6.9	4.2	8.6	15	13	10	16	306	6.3	12
5	400	5.2	6.6	4.4	7.7	11	12	8.3	28	78	5.8	21
6	160	5.0	6.3	4.0	6.6	11	11	8.0	22	25	6.3	18
7	1,100	5.0	6.9	3.6	6.1	14	11	7.7	15	202	6.9	13
8	120	5.0	7.4	4.2	5.8	35	10	8.3	13	72	5.6	14
9	49	4.8	6.1	4.2	6.1	16	9.6	7.7	12	98	5.6	11
10	30	4.6	5.6	5.0	5.2	19	9.0	7.7	11	176	6.9	10
11	22	4.6	5.6	4.0	5.2	16	9.6	7.7	10	42	13	9.6
12	18	4.6	5.4	3.6	11	12	8.3	6.3	10	30	13	9.0
13	14	4.6	5.2	3.4	17	18	7.7	11	20	24	347	12
14	12	7.7	5.2	5.2	7.1	12	7.4	22	86	20	24	9.0
15	19	8.3	5.0	17	6.6	92	9.3	13	326	17	66	9.0
16	13	6.6	5.0	9.3	6.3	54	7.7	30	176	15	18	8.0
17	11	5.6	5.0	5.8	5.6	23	7.5	21	104	14	13	8.0
18	9.3	4.8	4.8	5.0	5.4	19	373	11	42	13	11	8.0
19	9.3	4.4	5.6	6.3	5.2	15	25	9.3	29	11	13	7.7
20	8.3	15	5.0	7.4	5.2	13	37	10	23	11	14	6.9
21	7.7	9.5	4.6	5.2	5.2	14	38	8.6	19	10	9.3	6.6
22	8.0	71	4.4	4.6	5.0	12	20	9.0	17	9.3	11	6.9
23	8.3	15	4.4	5.4	5.0	11	36	10	16	8.6	9.0	6.6
24	15	9.6	4.4	5.8	4.8	9.6	29	167	19	8.3	7.7	6.6
25	9.0	7.7	4.2	6.3	4.8	9.6	19	21	13	8.3	7.1	17
26	7.6	7.4	4.2	4.8	5.0	15	16	345	12	9.6	6.6	8.6
27	6.9	7.1	4.4	8.9	11	213	14	42	11	7.7	30	6.3
28	6.2	6.1	4.4	20	6.6	77	13	24	11	7.1	321	6.3
29	6.0	13	4.0	36	------	27	12	18	10	6.9	57	8.6
30	7.0	16	4.0	69	------	26	11	18	9.3	6.6	30	11
31	6.9	------	3.8	20	------	20	------	611	------	6.6	20	------
TOTAL	2,210.0	281.5	169.4	295.0	197.4	1,106.1	823.1	1,501.2	1,165.3	1,289.6	1,103.3	312.7
MEAN	71.3	9.38	5.46	9.52	7.05	35.7	27.4	48.4	38.8	41.6	35.6	10.4
MAX	1,100	71	9.0	69	17	261	373	611	326	306	347	21
MIN	3.5	4.4	3.8	3.4	4.8	6.3	7.4	6.3	9.3	6.6	5.6	6.3
AC-FT	4,380	558	336	585	392	2,190	1,630	2,980	2,310	2,560	2,190	620

CAL YR 1969	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-		
WTR YR 1970	TOTAL	10,454.6	MEAN	28.6	MAX	1,100	MIN	3.4	AC-FT	20,740		

PEAK DISCHARGE (BASE, 2,600 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 7	/1500	-	/5,600	5-31	0730	12.99	5,260
3- 3	0100	7.08	2,630	6-14	2400	8.27	3,240
4-18	0100	11.47	4,690	7- 4	1130	7.83	3,020
5-26	1130	9.40	3,800				

/ About.

NOTE.--No gage-height record Oct. 1-8.

RYUKYU ISLANDS, ISLAND OF OKINAWA

16884600 Aha-gawa at Aha

LOCATION.--Lat 26°42'41" N., long 128°16'55" E., Okinawa, on right bank 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.

DRAINAGE AREA.--9.5 sq mi, approximately.

PERIOD OF RECORD.--December 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Oct. 13, 1966, at datum 1.00 ft higher.

AVERAGE DISCHARGE.--6 years (1964-70), 59.8 cfs (43,330 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 17,800 cfs Oct. 7 (gage height, 13.00 ft), from rating curve extended as explained below; minimum, 9.8 cfs Jan. 13, 14.
Period of record: Maximum discharge, 17,800 cfs Oct. 7, 1969 (gage height, 13.00 ft), from rating curve extended above 88 cfs on basis of slope-area measurement at gage height 9.72 ft; minimum, 6.7 cfs Jan. 4, 8-10, 1969.
A discharge of 5.08 cfs was measured Oct. 22, 1963.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	19	27	11	44	21	48	41	132	37	21	45
2	411	20	25	11	35	42	46	39	82	39	20	42
3	44	23	28	15	31	457	42	37	67	89	23	37
4	253	21	22	16	30	43	38	34	57	775	23	35
5	689	19	21	14	29	32	36	31	73	173	21	122
6	465	17	22	12	24	30	35	29	64	77	21	57
7	2,950	17	31	11	22	43	33	28	45	601	19	44
8	420	17	31	12	21	88	33	28	39	186	18	38
9	146	17	22	13	21	44	32	26	36	257	16	35
10	91	16	20	16	19	47	31	30	34	319	17	34
11	67	15	19	12	18	43	30	27	33	123	29	31
12	54	14	18	10	32	34	29	24	32	93	33	30
13	45	14	18	9.8	51	38	28	36	52	75	641	36
14	39	25	16	15	24	34	26	67	49	63	60	28
15	72	40	16	86	21	175	29	43	734	53	140	28
16	41	22	16	38	20	122	25	97	240	48	49	26
17	34	16	17	22	18	64	25	64	184	43	38	29
18	31	13	17	19	18	53	931	35	113	39	33	28
19	33	13	23	26	17	46	81	31	86	38	36	25
20	27	40	18	32	16	43	118	30	74	37	38	25
21	26	26	15	21	16	42	122	28	66	34	30	25
22	27	212	14	18	15	41	71	34	58	31	29	25
23	41	45	14	10	15	37	125	33	136	29	26	23
24	53	29	14	22	15	36	91	294	78	27	24	22
25	32	23	13	24	14	36	69	66	52	27	23	26
26	25	24	13	18	15	44	50	689	48	30	21	22
27	23	23	14	35	34	392	53	118	45	24	62	20
28	21	19	15	109	25	189	50	82	42	22	812	23
29	21	39	13	122	------	74	45	66	39	21	139	21
30	23	46	12	218	------	62	43	71	39	20	77	63
31	21	------	12	69	------	53	------	1,400	------	23	54	------
TOTAL	6,239	884	576	1,074.8	660	2,505	2,423	3,658	2,829	3,453	2,593	1,045
MEAN	201	29.5	18.6	34.7	23.6	80.8	80.8	118	94.3	111	83.6	34.8
MAX	2,950	212	31	218	51	457	931	1,400	734	775	812	122
MIN	14	13	12	9.8	14	21	25	24	32	20	16	20
AC-FT	12,380	1,750	1,140	2,130	1,310	4,970	4,810	7,260	5,610	6,850	5,140	2,070

CAL YR 1969 TOTAL 31,714.6 MEAN 86.9 MAX 2,950 MIN 6.7 AC-FT 62,910
WTR YR 1970 TOTAL 27,939.8 MEAN 76.5 MAX 2,950 MIN 9.8 AC-FT 55,420

PEAK DISCHARGE (BASE, 7,900 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 7	1500	13.00	17,800	7- 4	1130	9.80	8,760
4-18	0100	11.75	14,000	7- 7	1330	9.55	8,160
5-31	0730	11.80	14,200				

16884800 Fun-gawa near Aha

LOCATION.--Lat 26°44'33" N., long 128°16'53" E., Okinawa, on right bank 50 ft downstream from bridge, 2.0 miles north of Aha School, and 2.2 miles west of Ada.

DRAINAGE AREA.--3.3 sq mi, approximately.

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 380 ft (from topographic map).

AVERAGE DISCHARGE.--6 years, 23.0 cfs (16,660 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 5,260 cfs Oct. 7 (gage height, 16.72 ft), from rating curve extended as explained below; minimum, 4.3 cfs Jan. 13, 14.

Period of record: Maximum discharge, 5,860 cfs May 12, 1966 (gage height, 17.91 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft; minimum, 2.2 cfs Oct. 15, 16, 1967, Jan. 4, 5, 8-10, 14, 1969.

Flood of Oct. 25, 1963, reached a stage of 18.1 ft, from floodmarks, and that of Dec. 2, 1963, a stage of 21.5 ft, from floodmarks (discharge, 5,950 and 7,650 cfs, respectively, from rating curve extended as explained above).

REMARKS.--Records good. No diversion above station. Records of suspended sediment loads for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	9.0	9.6	4.7	14	6.6	16	11	41	12	8.2	18
2	140	8.5	9.3	5.0	12	37	17	11	28	15	7.6	16
3	20	8.5	8.8	5.6	11	139	14	9.9	23	57	12	14
4	235	8.2	7.9	6.7	11	12	13	9.9	20	296	7.9	13
5	254	7.4	7.6	5.6	10	9.6	12	9.0	30	95	7.9	116
6	453	7.4	7.4	4.9	8.8	16	12	8.8	24	31	7.6	28
7	1,130	7.4	10	4.7	8.2	25	11	8.5	17	275	6.8	18
8	148	7.4	9.0	4.9	8.5	43	11	8.8	16	113	6.6	15
9	55	7.1	7.6	5.0	7.9	17	10	8.2	14	157	6.3	14
10	37	6.6	7.1	5.4	7.4	18	9.9	13	13	143	6.6	13
11	29	6.3	6.8	4.7	7.1	14	9.9	8.8	12	49	8.2	12
12	24	6.3	6.6	4.5	13	12	9.0	7.6	12	37	9.9	11
13	21	6.1	6.3	4.3	14	12	8.8	20	14	30	301	12
14	19	9.6	6.3	5.6	7.9	11	8.2	57	14	26	19	9.9
15	45	13	6.1	52	7.6	49	9.9	50	196	23	84	9.6
16	23	7.9	6.1	13	7.1	34	8.5	79	68	21	19	9.0
17	17	7.1	6.1	7.9	6.8	18	75	45	55	19	14	10
18	17	6.3	6.7	7.1	6.6	16	198	20	31	17	12	9.0
19	16	6.1	11	8.2	6.3	14	19	16	24	16	12	8.5
20	14	10	6.3	8.5	6.3	13	65	14	20	15	12	8.2
21	13	10	5.9	6.8	6.1	12	36	13	18	14	9.9	7.9
22	26	79	5.6	6.3	6.1	12	20	16	16	13	10	7.9
23	34	15	5.6	6.9	5.9	11	43	14	151	12	8.8	7.9
24	17	11	5.6	8.8	5.6	9.9	24	120	35	11	8.2	7.4
25	14	8.8	5.4	8.5	5.6	11	18	20	21	11	8.5	7.6
26	13	9.5	5.4	6.8	6.3	21	16	283	18	15	7.4	7.1
27	12	8.2	6.3	19	11	138	15	38	16	9.9	42	6.6
28	11	7.4	5.6	29	7.1	61	14	25	15	9.3	471	12
29	11	23	5.2	23	------	25	13	20	14	9.0	69	6.8
30	9.9	16	4.9	80	------	20	12	106	13	8.5	31	274
31	9.3	------	4.9	19	------	17	------	499	------	8.8	21	------
TOTAL	2,874.2	344.1	213.0	382.4	235.2	854.1	748.2	1,569.5	989	1,568.5	1,255.4	709.4
MEAN	92.7	11.5	6.87	12.3	8.40	27.6	24.9	50.6	33.0	50.6	40.5	23.6
MAX	1,130	79	11	80	14	139	198	499	196	296	471	274
MIN	7.0	6.1	4.9	4.3	5.6	6.6	8.2	7.6	12	8.5	6.3	6.6
AC-FT	5,700	683	422	758	467	1,690	1,480	3,110	1,960	3,110	2,490	1,410

CAL YR 1969 TOTAL 12,666.0 MEAN 34.7 MAX 1,130 MIN 2.2 AC-FT 25,120
WTR YR 1970 TOTAL 11,743.0 MEAN 32.2 MAX 1,130 MIN 4.3 AC-FT 23,290

PEAK DISCHARGE (BASE, 2,700 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10- 6	2130	15.60	4,700	7- 4	1230	12.35	3,160
10- 7	1500	16.72	5,260	7- 7	1430	13.25	3,560
4-17	2400	14.68	4,240	9- 5	1030	13.12	3,500
5-31	0730	15.32	4,560	9-30	0330	15.50	4,650

16890600 Adeiddo River, Babelthuap

LOCATION.--Lat 7°36'01" N., long 134°35'38" E., Babelthuap, on right bank at Ngardmau, 0.3 mile upstream from left-bank tributary, and 0.6 mile northwest of Mount Megilon.

DRAINAGE AREA.--4.43 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Maximum discharge, 2,140 cfs July 12 (gage height, 12.80 ft), from rating curve extended above 68 cfs; minimum, 4.1 cfs May 16.

REMARKS.--Records good except those for period of no gage-height record and those above 150 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	64	20	17	16	12	10	5.9	20	44	45	39
2	35	52	20	16	30	12	9.6	5.7	18	46	42	34
3	30	42	19	25	55	11	9.4	5.4	15	39	39	41
4	30	40	17	20	20	11	9.4	5.2	15	36	47	35
5	25	40	16	40	18	11	8.9	5.2	22	34	40	33
6	40	33	16	30	16	10	8.4	5.2	18	41	34	63
7	35	32	21	25	16	10	8.2	6.6	19	33	32	47
8	30	32	17	20	15	9.8	8.2	6.6	16	64	30	40
9	30	30	23	25	15	11	8.7	9.6	16	76	30	36
10	29	28	20	20	20	12	9.8	9.1	17	73	30	33
11	28	28	16	19	15	11	8.0	8.7	14	57	27	31
12	27	27	15	18	14	10	7.5	7.1	14	519	33	29
13	26	27	15	18	14	9.8	7.1	5.4	19	137	56	28
14	30	27	15	17	14	12	8.7	4.5	15	132	49	28
15	28	26	14	17	18	10	8.0	4.3	18	98	60	38
16	27	23	14	16	14	14	9.6	7.1	17	82	47	27
17	26	23	47	15	26	12	7.1	21	29	72	41	25
18	25	24	22	15	16	9.4	6.4	9.4	24	67	43	24
19	24	21	20	20	16	12	6.1	7.3	21	71	38	23
20	23	21	50	23	15	14	5.9	8.0	20	70	34	22
21	22	26	30	25	14	9.6	5.7	13	31	58	89	20
22	24	28	25	21	14	9.1	5.7	11	50	50	70	30
23	21	37	20	23	20	8.7	5.7	20	29	51	53	40
24	20	46	25	20	16	8.7	5.4	13	27	34	47	60
25	20	28	20	19	14	9.8	5.4	10	26	61	54	36
26	21	25	18	18	13	8.7	5.2	15	29	83	48	33
27	82	21	16	38	13	9.4	5.2	19	33	62	42	32
28	31	20	25	23	13	19	5.7	15	58	71	41	29
29	27	19	18	19	------	15	12	21	39	58	47	27
30	26	19	17	18	------	10	6.6	18	45	51	48	26
31	163	------	20	17	------	11	------	15	------	54	39	------
TOTAL	1,045	909	651	657	500	343.0	227.6	317.3	734	2,454	1,375	1,009
MEAN	33.7	30.3	21.0	21.2	17.9	11.1	7.59	10.2	24.5	79.2	44.4	33.6
MAX	163	64	50	40	55	19	12	21	58	519	89	63
MIN	20	19	14	15	13	8.7	5.2	4.3	14	33	27	20
AC-FT	2,070	1,800	1,290	1,300	992	680	451	629	1,460	4,870	2,730	2,000

CAL YR 1969 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1970 TOTAL 10,221.9 MEAN 28.0 MAX 519 MIN 4.3 AC-FT 20,280

PEAK DISCHARGE (BASE, 500 CFS).--Oct. 31 (1100) 1,200 cfs (9.85 ft); July 12 (1100) 2,140 cfs (12.80 ft).

NOTE.--No gage-height record Dec. 19 to Jan. 18.

16891200 Gihmel River, Babelthuap

LOCATION.--Lat 7°21'59" N., long 134°32'06" E., Babelthuap, on right bank at Garuruon, 400 ft downstream from dam, and 0.5 mile upstream from coast road.

DRAINAGE AREA.--1.09 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Maximum discharge, 44 cfs July 12 (gage height, 4.88 ft), from rating curve extended above 2.7 cfs; minimum, 0.01 cfs Apr. 10, 12, 13.

REMARKS.--Records poor. An 8-inch pipeline diverts an average of about 0.75 cfs from above the dam, 400 ft upstream from the gage, for consumption on the island of Koror.

Discharge measurements made prior to beginning of continuous discharge record

Date	Discharge (cfs)	Date	Discharge (cfs)
Mar. 27, 1968	2.8	Dec. 12	0.54
May 17	6.3	Apr. 22, 1969	.18
Aug. 8	6.9	July 1	3.5
Oct. 10	1.6	Sept. 29	5.1

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	3.1	.74	.56	.65	.47	.32	.32	.65	4.6	2.5	3.0
2	4.0	2.5	.92	.39	1.8	.47	.15	.32	.74	4.7	2.5	2.5
3	3.7	2.5	1.0	2.2	3.3	.56	.20	.32	.92	4.2	2.0	2.5
4	3.2	2.5	.92	1.0	1.8	.56	.32	.32	1.0	4.0	2.0	2.0
5	3.3	1.6	1.0	2.2	1.5	.47	.32	.39	.92	4.3	2.0	2.0
6	5.3	1.4	3.4	2.5	1.4	.56	.47	.32	1.0	4.4	1.7	4.0
7	4.0	1.0	2.3	1.5	1.3	.47	.20	.26	5.0	4.1	1.7	2.5
8	4.6	.92	1.4	1.1	1.2	.15	.10	.26	2.0	5.8	1.6	1.9
9	4.2	.92	1.5	1.3	1.1	.47	.03	.20	.50	6.0	2.1	1.7
10	4.0	.39	1.4	1.1	1.0	.47	.15	.20	.30	6.8	2.0	1.6
11	3.2	.65	1.3	.83	.65	.47	.06	.15	.25	6.2	1.8	1.6
12	4.0	1.6	1.2	.65	.26	.39	.03	.15	.25	14	2.3	1.5
13	3.6	1.6	1.1	1.0	.26	.26	.06	.15	.30	7.0	2.7	1.4
14	3.9	1.7	1.0	1.0	.56	.32	.10	.10	.50	12	5.0	3.6
15	4.0	1.1	.90	1.0	3.5	.10	.15	.10	.26	7.0	3.8	11
16	3.8	.83	.80	1.3	1.7	.32	.47	.10	.20	6.0	2.9	5.3
17	3.7	1.0	2.0	1.0	2.1	.32	.39	.05	.32	5.0	2.4	4.4
18	3.6	1.0	.83	.83	1.5	.26	.39	.03	.39	5.0	2.7	3.6
19	3.1	.83	.74	2.1	1.7	.56	.47	.03	.65	4.0	2.5	3.4
20	3.2	1.7	1.9	2.5	1.4	.92	.47	.10	.56	4.0	2.3	3.5
21	2.9	1.5	1.4	1.4	1.0	.47	.47	.26	.92	3.5	5.2	3.4
22	3.1	1.6	.92	1.5	1.0	.26	.56	.26	.83	3.0	8.6	6.2
23	3.0	2.2	.74	2.7	1.0	.20	.47	.26	.74	2.5	5.6	6.0
24	3.1	2.1	1.0	2.6	1.0	.26	.56	.26	.92	4.0	4.5	8.0
25	4.1	2.1	.74	1.9	.83	.10	.47	.32	1.0	3.5	3.7	5.0
26	4.3	1.4	.56	1.6	.65	.03	.39	.39	1.0	4.1	3.8	6.0
27	4.8	1.2	.47	1.4	.83	.03	.32	.65	.92	3.8	3.0	7.0
28	3.0	1.0	.56	1.5	.39	.06	.32	.83	2.0	3.8	3.0	6.0
29	2.1	1.1	.83	1.2	------	.39	.32	.74	1.6	3.5	2.5	4.9
30	1.4	1.0	.65	1.0	------	.39	.32	.74	3.3	3.0	2.5	4.9
31	3.6	------	.47	.83	------	.32	------	.65	------	3.0	2.5	------
TOTAL	111.8	44.04	34.69	43.69	35.38	11.08	9.05	9.23	29.94	156.8	93.4	120.4
MEAN	3.61	1.47	1.12	1.41	1.26	.36	.30	.30	1.00	5.06	3.01	4.01
MAX	5.3	3.1	3.4	2.7	3.5	.92	.56	.83	5.0	14	8.6	11
MIN	1.4	.39	.47	.39	.26	.03	.03	.03	.20	2.5	1.6	1.4
AC-FT	222	87	69	87	70	22	18	18	59	311	185	239

CAL YR 1969 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1970 TOTAL 699.50 MEAN 1.92 MAX 14 MIN .03 AC-FT 1,390

PEAK DISCHARGE (BASE, 30 CFS).--July 12 (0800) 44 cfs (4.88 ft).

16891300 Gaden River, Babelthuap

LOCATION.--Lat 7°22'57" N., long 134°33'40" E., Babelthuap, on left bank 750 ft upstream from confluence with Kumekumeyel River, 1.0 mile southwest of Mount Kabekobekushi, and 1.8 miles north of Airai.

DRAINAGE AREA.--4.23 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 7 ft (from topographic map).

EXTREMES.--Maximum discharge, 976 cfs July 12 (gage height, 10.74 ft), from rating curve extended above 60 cfs; minimum, 4.3 cfs May 15.

REMARKS.--Records fair except those above 150 cfs, which are poor. No diversion above station.

Discharge measurement made prior to beginning of continuous discharge record

Sept. 25, 1969..... 29 cfs

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	36	14	15	10	9.7	5.1	4.7	5.8	43	31	34
2	28	31	14	15	21	9.6	5.0	4.6	14	39	28	24
3	26	24	14	22	44	10	5.0	4.6	7.4	30	26	22
4	24	42	12	14	15	9.2	5.0	4.6	7.0	27	23	19
5	22	24	12	38	12	8.8	4.9	4.6	10	37	20	18
6	36	21	12	28	11	8.4	4.7	4.6	20	31	18	44
7	24	20	59	18	11	8.2	4.7	4.5	25	24	18	27
8	21	18	22	16	10	7.2	4.6	4.6	15	40	18	26
9	19	18	20	22	10	7.1	4.5	5.4	11	42	17	21
10	18	17	22	15	10	7.6	5.6	4.8	9.0	40	18	18
11	17	16	18	14	9.9	7.6	4.8	4.9	7.0	33	16	18
12	16	17	16	14	9.7	7.7	4.7	4.7	6.3	330	18	17
13	15	24	14	16	9.6	7.1	4.6	4.6	8.0	87	29	15
14	17	23	13	12	12	7.4	4.8	4.5	17	207	64	29
15	16	20	12	13	32	7.0	8.6	4.4	14	91	58	53
16	14	15	12	12	16	6.8	13	4.5	11	64	52	89
17	13	14	37	11	47	7.4	5.4	11	29	51	31	46
18	12	14	18	10	21	6.2	4.9	4.9	18	49	28	31
19	12	13	17	12	20	16	4.7	4.5	28	40	26	26
20	12	14	49	11	14	9.2	4.6	4.8	22	38	26	27
21	12	33	27	14	12	6.8	4.6	7.6	31	32	69	23
22	11	17	20	23	11	6.4	4.5	6.1	24	27	129	33
23	11	18	18	22	14	6.2	4.5	11	18	25	52	37
24	12	42	20	17	13	5.8	4.4	5.1	15	33	42	72
25	74	27	16	12	10	6.6	4.4	5.5	13	29	38	43
26	25	25	16	11	10	5.9	4.4	5.7	12	79	42	40
27	84	18	14	14	10	6.2	4.5	29	15	43	33	97
28	29	16	23	12	10	5.6	4.7	9.6	54	76	35	46
29	29	18	16	10	------	7.4	7.5	8.6	24	49	28	43
30	22	15	15	9.7	------	5.5	4.8	7.8	53	37	31	38
31	61	------	18	9.6	------	5.5	------	7.1	------	42	25	------
TOTAL	767	650	610	482.3	435.2	236.1	157.5	202.9	543.5	1,815	1,089	1,076
MEAN	24.7	21.7	19.7	15.6	15.5	7.62	5.25	6.55	18.1	58.5	35.1	35.9
MAX	84	42	59	38	47	16	13	29	54	330	129	97
MIN	11	13	12	9.6	9.6	5.5	4.4	4.4	5.8	24	16	15
AC-FT	1,520	1,290	1,210	957	863	468	312	402	1,080	3,600	2,160	2,130

CAL YR 1969 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1970 TOTAL 8,064.5 MEAN 22.1 MAX 330 MIN 4.4 AC-FT 16,000

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
7-12	1200	10.74	976	9-16	1930	7.90	551
7-14	1530	9.62	808				

CAROLINE ISLANDS, YAP ISLANDS

16892400 Aringel Stream, Yap

LOCATION.--Lat 9°31'01" N., long 138°05'11" E., Yap, on right bank at Aringel and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.24 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 35 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 408 cfs Aug. 21 (gage height, 6.35 ft), from rating curve extended above 20 cfs; no flow for many days.
Period of record: Maximum discharge, 408 cfs Aug. 21, 1970 (gage height, 6.35 ft), from rating curve extended above 20 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	2.2	.21	3.1	.87	.03		.15	.17	8.1	.37	5.8
2	.11	.60	.13	.49	.72	.02		.11	.08	1.2	.17	9.0
3	.10	.23	.09	.23	.11	.01		.05	.05	.60	.13	11
4	.13	5.2	.06	.10	.06	.01		.02	.04	.92	.09	2.3
5	.25	5.6	.09	.05	.03	.01		.01	2.3	2.0	.05	.60
6	4.4	.80	.08	.05	.02	.01		.01	.33	.72	.99	.52
7	.43	.31	.27	.04	.01	.01		0	.09	3.5	.98	.68
8	.31	.17	.90	.03	.01	.01		0	.05	.56	6.7	.33
9	.33	.19	1.8	.04	.02	0		0	.03	.31	2.9	.17
10	.15	.11	.84	.03	.01	0		.42	.02	.19	6.4	.11
11	.09	.08	.43	.02	0	0		1.4	.01	.10	13	.09
12	.06	.07	.25	.01	0	0		.37	.05	.10	4.1	.05
13	.84	.04	.13	.01	0	0		.17	.64	.23	1.0	.04
14	.46	.04	.13	.02	0	0		.05	.27	.10	.35	.03
15	.19	.03	.17	.01	0	5.9		.03	.23	.10	14	.02
16	.11	.04	.46	0	0	.46		.04	.25	.07	.72	.02
17	.23	.07	.19	0	.01	.09		.58	.15	.05	.27	.02
18	3.6	.37	.11	0	.01	.05		.52	.17	.07	.11	.04
19	.84	.23	.08	0	0	.04		.10	.15	.10	.07	7.3
20	.31	.31	.05	0	0	.02		.04	.11	.05	.05	1.1
21	.17	2.3	.04	.01	0	.02		.03	1.1	.04	28	.84
22	.10	2.1	.03	.03	.27	.01		.02	.76	.03	1.5	.37
23	.06	3.8	.03	.69	11	0		.02	.19	4.4	.46	3.3
24	.04	3.3	.02	2.0	.40	0		.02	.07	4.5	1.4	.92
25	.04	.96	.02	.25	.10	0		.01	.05	.33	.84	.40
26	.47	.46	.01	.09	.05	0		0	.06	.11	9.1	.29
27	9.4	1.2	5.0	.06	.05	0		1.8	.07	.07	4.1	.17
28	1.1	.29	1.1	.04	.05	0		1.4	6.9	.37	2.1	.15
29	.37	.27	.21	.02	------	0		.92	1.5	.17	7.1	.27
30	.52	.37	.09	.02	------	0		.40	.88	4.5	.96	5.5
31	4.1	------	3.4	.02	------	0	------	.17	------	1.5	11	------
TOTAL	29.48	31.74	16.42	7.46	13.80	6.70	0	8.86	16.77	35.09	119.01	51.43
MEAN	.95	1.06	.53	.24	.49	.22	0	.29	.56	1.13	3.84	1.71
MAX	9.4	5.6	5.0	3.1	11	5.9	0	1.8	6.9	8.1	28	11
MIN	.04	.03	.01	0	0	0	0	0	.01	.03	.05	.02
AC-FT	58	63	33	15	27	13	0	18	33	70	236	102

CAL YR 1969 TOTAL 397.59 MEAN 1.09 MAX 32 MIN 0 AC-FT 789
WTR YR 1970 TOTAL 336.76 MEAN .92 MAX 28 MIN 0 AC-FT 668

PEAK DISCHARGE (BASE, 200 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-27	1130	5.12	225	8-26	1830	5.40	265
8-15	0800	5.44	271	8-31	1030	5.28	247
8-21	0130	6.35	408	9-19	1630	5.30	250

16892800 Dalolab Stream, Yap

LOCATION.--Lat 9°31'04" N., long 138°06'04" E., Yap, on left bank at Talagu and 0.9 mile upstream from mouth.

DRAINAGE AREA.--0.09 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 143 cfs Aug. 21 (gage height, 4.42 ft), from rating curve extended above 17 cfs; no flow for many days.
Period of record: Maximum discharge, 143 cfs Aug. 21, 1970 (gage height, 4.42 ft), from rating curve extended above 17 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.82	.02	1.5	.41	0		.08	.02	3.2	.08	1.0
2	.02	.15	.01	.20	.26	0		.01	.01	.30	.03	4.0
3	.02	.04	.01	.07	.03	0		0	0	.08	.02	3.0
4	.01	3.0	.01	.04	.01	0		0	0	.51	.02	1.0
5	.01	2.1	.02	.02	.01	0		0	.54	1.1	.01	.30
6	1.7	.35	.01	.02	0	0		0	.05	.10	.13	.20
7	.68	.05	.06	.01	0	0		0	.01	.59	.19	.20
8	.05	.02	.12	.01	0	0		0	0	.06	11	.10
9	.05	.04	.35	.01	0	0		0	0	.03	.77	.05
10	.02	.03	.22	.01	0	0		.01	0	.02	2.3	.02
11	.01	.03	.06	0	0	0		.23	0	.01	4.6	.01
12	.01	.02	.02	0	0	0		.01	.29	.01	1.3	.01
13	.36	.01	.01	0	0	0		0	.27	.01	.30	0
14	.08	.01	.01	0	0	0		0	.03	0	.08	0
15	.02	.01	.05	0	0	1.7		0	.02	.01	5.1	0
16	.02	.02	.03	0	0	.02		0	.01	0	.22	0
17	.03	.05	.02	0	0	0		.75	0	0	.06	0
18	.98	.26	.01	0	0	0		.12	0	.14	.03	.02
19	.18	.06	.01	0	0	0		.01	0	.05	.01	5.0
20	.03	.18	.01	0	0	0		0	0	.01	.01	.50
21	.02	1.2	.01	0	0	0		0	.49	.01	13	.20
22	.01	1.1	.01	.09	.02	0		0	.12	0	.49	.10
23	.01	1.8	0	.49	2.9	0		0	.01	1.7	.14	2.0
24	0	1.2	0	.42	.05	0		0	0	1.7	.12	.50
25	0	.40	0	.05	.01	0		0	0	.06	.14	.20
26	.08	.08	.01	.02	0	0		0	.01	.01	3.5	.10
27	2.8	.40	2.0	.01	0	0		.55	.02	.01	1.0	.06
28	.35	.04	.50	.01	0	0		.44	2.7	.04	.80	.05
29	.06	.12	.10	0	------	0		.27	.44	.02	2.0	.10
30	.06	.10	.05	0	------	0		.06	.22	1.5	.50	3.4
31	1.4	------	1.5	0	------	0	------	.02	------	.36	3.0	------
TOTAL	8.50	13.69	5.24	2.98	3.70	1.72	0	2.56	5.26	11.64	50.95	22.12
MEAN	.27	.46	.17	.096	.13	.056	0	.083	.18	.38	1.64	.74
MAX	2.8	3.0	2.0	1.5	2.9	1.7	0	.75	2.7	3.2	13	5.0
MIN	0	.01	0	0	0	0	0	0	0	0	.01	0
AC-FT	17	27	10	5.9	7.3	3.4	0	5.1	10	23	101	44

CAL YR 1969 TOTAL 131.84 MEAN .36 MAX 11 MIN 0 AC-FT 262
WTR YR 1970 TOTAL 128.36 MEAN .35 MAX 13 MIN 0 AC-FT 255

PEAK DISCHARGE (BASE, 75 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-27	1100	3.51	75	8-26	/1030	3.77	92
8- 8	2000	3.76	91	9-19	/1630	4.33	135
8-21	1400	4.42	143				

/ About.
NOTE.--No gage-height record Aug. 26 to Sept. 29.

16892900 Pemgoy Stream, Yap

LOCATION.--Lat 9°31'07" N., long 138°06'18" E., Yap, on right bank at Talagu, 100 ft upstream from Talagu Stream, and 0.8 mile upstream from mouth.

DRAINAGE AREA.--0.17 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 207 cfs Sept. 19 (gage height, 4.47 ft), from rating curve extended above 11 cfs; no flow for many days.
Period of record: Maximum discharge, 207 cfs Sept. 19, 1970 (gage height, 4.47 ft), from rating curve extended above 11 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	1.5	.07	2.5	.48	.02		.15	.06	4.8	.09	3.1
2	.08	.40	.05	.14	.30	.02		.06	.06	.44	.05	4.7
3	.08	.10	.04	.06	.05	.01		.01	.04	.20	.05	4.0
4	.06	4.0	.04	.06	.03	.01		0	.04	.68	.05	1.2
5	.04	3.0	.05	.04	.02	.01		0	.23	2.5	.04	.39
6	3.0	.50	.04	.03	.02	.01		0	.08	.16	.32	.27
7	.20	.20	.10	.02	.01	.01		0	.03	.23	.23	.27
8	.10	.10	.20	.02	.01	.01		0	.01	.14	3.5	.18
9	.07	.10	.50	.02	.01	0		0	0	.08	1.5	.11
10	.06	.06	.30	.02	0	0		0	0	.06	3.0	.06
11	.04	.05	.15	.01	0	0		.66	0	.04	7.3	.06
12	.03	.04	.10	.01	.01	0		.07	.24	.03	2.1	.05
13	.12	.03	.05	.01	.01	0		.03	.63	.02	.56	.04
14	.16	.03	.04	.01	.01	.01		0	.06	.06	.14	.03
15	.06	.02	.10	.01	.01	2.8		0	.05	.18	6.8	.03
16	.06	.03	.10	0	.02	.09		.01	.03	.05	.40	.02
17	.08	.10	.05	0	.02	.05		2.3	.03	.01	.15	.02
18	1.5	.30	.04	0	.03	.03		.20	.02	.02	.05	.14
19	.44	.08	.03	0	.02	.02		.07	.01	.02	.03	8.8
20	.10	.14	.03	0	.01	.02		.03	0	.06	.02	.68
21	.06	1.5	.02	.01	0	.01		.02	.79	.06	15	.16
22	.06	1.4	.02	.50	.06	0		.01	.39	.01	.80	.12
23	.05	2.0	.02	1.1	5.9	0		.01	.06	2.6	.20	3.3
24	.04	1.5	.01	1.7	.12	.01		0	.02	1.9	.20	.80
25	.04	.50	.01	.16	.06	0		0	.01	.10	.20	.27
26	.12	.18	.02	.08	.04	0		0	.08	.04	4.4	.18
27	1.8	.50	3.0	.06	.03	0		1.7	.12	.02	1.5	.12
28	.80	.09	.80	.04	.03	0		.92	4.2	.02	1.2	.11
29	.16	.16	.15	.03	------	0		.80	.92	.02	2.3	.11
30	.18	.30	.05	.03	------	0		.16	.26	2.5	.68	4.7
31	2.0	------	1.1	.03	------	0	------	.07	------	.44	3.2	------
TOTAL	11.69	18.91	7.28	6.70	7.31	3.14	0	7.28	8.47	17.49	56.06	34.02
MEAN	.36	.63	.23	.22	.26	.10	0	.23	.28	.56	1.81	1.13
MAX	3.0	4.0	3.0	2.5	5.9	2.8	0	2.3	4.2	4.8	15	8.8
MIN	.03	.02	.01	0	0	0	0	0	0	.01	.02	.02
AC-FT	23	38	14	13	15	6.2	0	14	17	35	111	67

CAL YR 1969 TOTAL 198.44 MEAN .54 MAX 17 MIN 0 AC-FT 394
WTR YR 1970 TOTAL 178.35 MEAN .49 MAX 15 MIN 0 AC-FT 354

PEAK DISCHARGE (BASE, 70 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
8- 8	1930	3.13	79	8-26	1800	3.05	74
8-15	0630	3.08	76	9-19	1630	4.47	207
8-21	/1300	≠4.39	198				

/ About.
≠ From floodmark.

16893000 Talagu Stream, Yap

LOCATION.--Lat 9°31'08" N., long 138°06'13" E., Yap, on left bank at Talagu, 300 ft upstream from mouth, and 0.9 mile upstream from mouth of Pengoy Stream.

DRAINAGE AREA.--0.07 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 145 cfs Aug. 21 (gage height, 3.30 ft), from rating curve extended above 29 cfs; no flow for many days.
Period of record: Maximum discharge, 145 cfs Aug. 21, 1970 (gage height, 3.30 ft), from rating curve extended above 29 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	1.7	.06	2.4	.21	0		0	0	3.3	.01	1.5
2	.03	.29	.04	.17	.13	0		0	0	.29	0	3.9
3	.03	.08	.02	.05	.01	0		0	0	.05	0	3.1
4	.01	2.6	.01	.03	0	0		0	0	.68	0	1.4
5	0	3.1	.02	.01	0	0		0	.05	1.6	0	.22
6	2.5	.63	.02	.01	0	0		0	0	.06	.02	.22
7	.17	.13	.06	.01	0	0		0	0	.22	.08	.29
8	.06	.04	.10	.01	0	0		0	0	.03	2.5	.13
9	.05	.08	.22	.01	0	0		0	0	.01	1.0	.04
10	.03	.03	.17	.01	0	0		0	0	0	2.4	.01
11	.01	.02	.13	0	0	0		.09	0	0	4.5	.01
12	.01	.02	.04	0	0	0		0	.13	0	1.2	0
13	.05	.01	.01	0	0	0		0	.08	0	.13	0
14	.13	0	.01	.01	0	0		0	0	0	.01	0
15	.04	0	.02	0	0	1.7		0	0	.01	5.3	0
16	.02	.02	.08	0	0	0		0	0	0	.06	0
17	.05	.10	.03	0	0	0		1.3	0	0	0	0
18	.63	.38	.02	0	0	0		.10	0	.01	0	.04
19	.38	.10	.01	0	0	0		0	0	.01	0	5.4
20	.06	.13	.01	0	0	0		0	0	0	0	.50
21	.02	1.5	.01	0	0	0		0	.43	0	12	.06
22	.01	1.4	.01	.37	.05	0		0	.06	0	.29	.02
23	.01	1.9	0	.29	3.0	0		0	0	1.4	.01	1.6
24	0	1.7	0	1.0	.05	0		0	0	1.5	0	1.2
25	0	.29	0	.04	.01	0		0	0	.02	0	.10
26	.02	.08	.01	.01	0	0		0	.02	0	3.3	.06
27	2.1	.29	2.5	0	0	0		.48	.01	0	1.0	.03
28	.63	.06	.76	0	0	0		.17	3.5	0	.76	.06
29	.08	.13	.08	0	------	0		.10	1.0	0	1.7	.10
30	.10	.22	.04	0	------	0		.01	.17	1.8	.22	2.9
31	1.3	------	1.7	0	------	0	------	0	------	.38	2.2	------
TOTAL	8.57	17.03	6.19	4.43	3.46	1.7	0	2.25	5.45	11.37	38.69	22.89
MEAN	.28	.57	.20	.14	.12	.055	0	.073	.18	.37	1.25	.76
MAX	2.5	3.1	2.5	2.4	3.0	1.7	0	1.3	3.5	3.3	12	5.4
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	17	34	12	8.8	6.9	3.4	0	4.5	11	23	77	45

CAL YR 1969 TOTAL 136.48 MEAN .37 MAX 12 MIN 0 AC-FT 271
WTR YR 1970 TOTAL 122.03 MEAN .33 MAX 12 MIN 0 AC-FT 242

PEAK DISCHARGE (BASE, 50 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
2-23	/0700	≠2.63	85	8-21	1300	3.30	145
8- 8	2000	2.15	53	8-26	1800	2.31	63
8-15	0630	2.34	65	9-19	1700	3.23	138

/ About.
≠ From floodmark in well.

16893100 Burong Stream, Yap

LOCATION.--Lat 9°31'59" N., long 138°07'05" E., Yap, on left bank at Dugor and 0.1 mile upstream from mouth.

DRAINAGE AREA.--0.29 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 184 cfs Sept. 19 (gage height, 4.33 ft), from rating curve extended above 15 cfs; no flow for many days.
Period of record: Maximum discharge, 184 cfs Sept. 19, 1970 (gage height, 4.33 ft), from rating curve extended above 15 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	2.3	.37	3.0	.37	.03		.10	.49	6.5	.34	5.1
2	.12	.55	.20	.50	.49	.02		0	.09	2.3	.16	9.9
3	.09	.81	.12	.25	.09	.01		0	.01	.60	.09	6.1
4	.05	7.5	.07	.10	.03	.01		0	0	.46	.06	1.0
5	.03	6.1	.07	.05	.02	0		0	.04	3.2	.04	.40
6	4.9	1.0	.07	.05	.01	0		0	.05	.37	.20	.22
7	.46	.37	.12	.04	.01	0		0	.01	.25	.40	.52
8	.18	.18	.16	.03	.01	0		0	0	.18	4.9	.28
9	.15	.10	.52	.03	.01	0		0	0	.40	4.0	.10
10	.07	.07	.43	.02	0	0		0	0	.40	7.3	.08
11	.04	.05	.34	.01	0	0		.32	0	.10	13	.04
12	.03	.03	.16	.01	0	0		.01	.12	.05	3.2	.02
13	.30	.01	.08	0	0	0		0	.34	.03	1.2	.02
14	.40	.01	.16	0	0	0		0	.14	.03	.34	.01
15	.03	.01	.28	0	0	2.9		0	.07	.12	15	.01
16	.06	.02	.40	0	0	.14		0	.03	.03	.96	.01
17	.06	.03	.14	0	.07	.04		1.7	.01	.01	.31	.01
18	.25	.55	.08	0	.09	.05		.37	0	0	.14	1.6
19	.60	.16	.06	0	.02	.04		.02	0	0	.08	14
20	.37	1.8	.04	0	.01	.01		.02	0	1.6	.05	1.6
21	.18	5.0	.03	.01	0	.01		.14	.47	.55	20	.73
22	.09	2.4	.02	1.3	.28	0		.01	.25	.14	2.2	.52
23	.06	3.6	.02	1.0	7.4	0		0	.03	3.6	.52	3.0
24	.03	2.4	.01	2.2	5.8	0		.01	.01	5.1	.18	4.5
25	.03	.86	.01	.25	.10	0		.01	0	.43	.09	1.2
26	.06	.37	.01	.08	.06	0		0	.01	.14	7.2	.46
27	3.0	1.0	5.0	.04	.05	0		1.0	.07	.08	3.4	.22
28	.68	.34	1.0	.03	.03	0		1.2	7.0	.91	2.5	.64
29	.20	1.6	.20	.02	------	0		2.6	1.9	.25	.43	1.1
30	.25	1.6	.10	.02	------	0		.37	3.4	8.8	.31	6.6
31	1.8	------	4.0	.01	------	0	------	.16	------	1.4	3.6	------
TOTAL	14.76	40.82	14.27	9.05	14.95	3.26	0	8.04	14.54	38.03	92.20	59.99
MEAN	.48	1.36	.46	.29	.53	.11	0	.26	.48	1.23	2.97	2.00
MAX	4.9	7.5	5.0	3.0	7.4	2.9	0	2.6	7.0	8.8	20	14
MIN	.03	.01	.01	0	0	0	0	0	0	0	.04	.01
AC-FT	29	81	28	18	30	6.5	0	16	29	75	183	119

CAL YR 1969 TOTAL 302.43 MEAN .83 MAX 25 MIN 0 AC-FT 600
WTR YR 1970 TOTAL 309.91 MEAN .85 MAX 20 MIN 0 AC-FT 615

PEAK DISCHARGE (BASE, 75 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
8-15	0700	3.92	132	8-26	1830	3.32	78
8-21	0130	3.56	98	9-19	1630	4.33	184

NOTE.--No gage-height record Dec. 22 to Jan. 21.

16893300 Bileiy Spring, Gagil-Tomil

LOCATION.--Lat 9°32'19" N., long 138°10'59" E., Gagil-Tomil, on right bank at Binau, 200 ft downstream from main spring, and 0.6 mile upstream from mouth.

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

GAGE.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 1.4 cfs Aug. 5, 1969; no flow for many days in 1968 and 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.15	.18	.22	.06	.02	.01	.02	.02	.12	.08	.29
2	.22	.15	.18	.22	.06	.02	.01	.02	.01	.11	.08	.48
3	.22	.15	.16	.22	.06	.02	.01	.01	.01	.10	.08	.51
4	.21	.21	.16	.21	.05	.02	.01	.01	.02	.10	.08	.51
5	.21	.38	.16	.19	.05	.02	.01	.01	.02	.10	.07	.42
6	.22	.32	.16	.19	.05	.02	.01	.01	.01	.09	.07	.39
7	.19	.30	.15	.18	.04	.02	.01	.01	.01	.09	.07	.33
8	.18	.26	.15	.18	.04	.02	.01	.01	.01	.09	.07	.29
9	.16	.24	.15	.16	.05	.02	.01	.01	.01	.08	.07	.26
10	.15	.21	.14	.14	.04	.02	.01	.01	.01	.08	.08	.23
11	.14	.19	.14	.13	.04	.02	.01	.03	.01	.08	.27	.20
12	.13	.19	.13	.12	.04	.02	.01	.02	.02	.08	.23	.19
13	.16	.18	.13	.11	.04	.02	.01	.01	.01	.08	.21	.17
14	.14	.18	.13	.11	.03	.02	.01	.01	.02	.07	.20	.16
15	.12	.16	.13	.10	.03	.04	.01	.01	.01	.06	.29	.15
16	.10	.15	.11	.10	.03	.02	.01	.01	.01	.06	.27	.14
17	.13	.14	.11	.09	.03	.02	.01	.02	.01	.06	.23	.14
18	.11	.14	.11	.09	.03	.02	.01	.01	.01	.06	.20	.13
19	.11	.13	.11	.08	.03	.02	.01	.02	.01	.06	.18	.14
20	.10	.14	.11	.09	.03	.02	.01	.01	.01	.06	.15	.14
21	.11	.16	.10	.09	.03	.02	.01	.01	.02	.06	.87	.13
22	.11	.16	.10	.08	.04	.02	.01	.01	.02	.06	.64	.13
23	.11	.18	.10	.08	.09	.01	.01	.02	.02	.06	.51	.16
24	.11	.19	.10	.09	.08	.02	.01	.02	.01	.06	.42	.29
25	.11	.19	.09	.07	.08	.01	.01	.01	.01	.06	.33	.36
26	.10	.19	.09	.07	.06	.01	.01	.01	.02	.06	.36	.29
27	.10	.19	.18	.06	.04	.01	.01	.02	.02	.06	.39	.26
28	.10	.18	.16	.06	.02	.01	.01	.02	.04	.06	.33	.23
29	.10	.19	.15	.06	------	.01	.01	.02	.05	.06	.31	.21
30	.10	.19	.16	.06	------	.01	.01	.02	.09	.10	.29	.19
31	.13	------	.18	.06	------	.01	------	.02	------	.08	.29	------
TOTAL	4.40	5.79	4.21	3.71	1.27	.56	.30	.45	.55	2.35	7.72	7.52
MEAN	.14	.19	.14	.12	.045	.018	.010	.015	.018	.076	.25	.25
MAX	.22	.38	.18	.22	.09	.04	.01	.03	.09	.12	.87	.51
MIN	.10	.13	.09	.06	.02	.01	.01	.01	.01	.06	.07	.13
AC-FT	8.7	11	8.4	7.4	2.5	1.1	.6	.9	1.1	4.7	15	15

CAL YR 1969 TOTAL 41.09 MEAN .11 MAX 1.4 MIN 0 AC-FT 82
WTR YR 1970 TOTAL 38.83 MEAN .11 MAX .87 MIN .01 AC-FT 77

16893700 Wichen River at altitude 55 m, Moen

LOCATION.--Lat 7°26'45" N., long 151°52'02" E., Moen, on left bank at Peniesence, 1.0 mile upstream from mouth, and 1.6 miles west of Saint Xaviers Academy.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 193 cfs Nov. 25 (gage height, 4.08 ft), from rating curve extended above 13 cfs; minimum, 0.05 cfs Feb. 7, 9-11.
Period of record: Maximum discharge, 193 cfs Nov. 25, 1969 (gage height, 4.08 ft), from rating curve extended above 13 cfs; minimum, 0.01 cfs Mar. 29-31, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.52	2.3	.60	4.0	.34	.64	.07	.34	.85	1.1	.37	2.8
2	.44	1.2	.74	1.6	.25	.40	.07	.40	.69	1.1	.37	.92
3	.37	9.7	.60	2.5	.19	.34	.10	.92	.69	.79	.34	.64
4	.34	4.3	.52	6.5	.13	.37	.10	.52	.92	.64	.31	.56
5	.31	1.8	.44	4.6	.10	.37	.16	.40	1.1	.56	.69	.60
6	.31	1.1	.48	1.3	.07	.34	.13	.44	.79	.52	.56	.48
7	.28	.85	1.9	.85	.05	.31	.13	3.3	.64	.44	.40	.40
8	.25	.64	2.2	.64	.07	.28	.13	1.1	.52	.44	.31	.52
9	.25	.60	.74	.56	.05	.31	.13	2.2	.48	.37	.28	.44
10	.25	.52	.60	.52	.05	.40	.13	1.6	.52	.34	1.7	.40
11	.25	.48	.48	.44	.05	.48	.22	1.1	.48	.34	3.1	.37
12	.22	.64	.44	.34	.10	.48	.40	.85	.44	.34	.60	.34
13	.25	1.3	.37	.31	.10	.37	.37	.64	.40	.34	.52	.31
14	.34	.64	.34	.64	.10	.34	.48	.79	.37	.34	.40	.28
15	.28	.56	.31	.40	.10	.37	.74	6.1	.37	.40	.31	.28
16	.25	.48	.28	.44	.10	.31	.37	4.0	.34	.74	.64	.25
17	.25	.85	.34	5.2	.31	.31	.31	4.6	2.2	.52	.74	.25
18	.25	.64	2.6	1.0	5.6	.31	.28	1.5	2.2	.44	.56	.22
19	.22	.56	4.4	.64	9.0	.28	.28	.92	.92	.40	.48	.19
20	.22	.56	.92	.48	1.5	.28	.25	.79	.69	.37	.44	.28
21	.22	.52	.60	.40	.85	.28	.25	.60	.56	.37	.40	.28
22	.22	4.7	.44	.37	.64	.28	.34	.48	.52	.34	.64	.22
23	.37	1.0	.37	.34	.64	.25	5.6	.44	.64	.34	.52	.34
24	.28	2.3	.37	.31	.52	.22	.56	.37	.85	.34	.48	.56
25	.40	19	.37	.31	.48	.19	.44	4.2	.64	.31	.44	.34
26	.31	1.5	.40	.31	.44	.13	2.2	1.0	.52	.31	.40	.48
27	11	.85	.34	.28	.34	.10	2.0	.79	.56	.34	.74	1.3
28	1.3	.74	.40	.31	.74	.13	1.2	.60	8.0	.60	.69	.79
29	.64	.64	.34	5.7	------	.13	.60	2.4	2.0	.52	.64	.69
30	1.1	.60	.37	.74	------	.10	.40	5.5	1.6	.37	.48	.64
31	1.6	------	.40	.44	------	.07	------	1.3	------	.34	.56	------
TOTAL	23.29	61.57	23.70	42.47	22.91	9.17	18.44	50.19	31.50	14.71	19.11	16.17
MEAN	.75	2.05	.76	1.37	.82	.30	.61	1.62	1.05	.47	.62	.54
MAX	11	19	4.4	6.5	9.0	.64	5.6	6.1	8.0	1.1	3.1	2.8
MIN	.22	.48	.28	.28	.05	.07	.07	.34	.34	.31	.28	.19
AC-FT	46	122	47	84	45	18	37	100	62	29	38	32

CAL YR 1969 TOTAL 340.02 MEAN .93 MAX 19 MIN .02 AC-FT 674
WTR YR 1970 TOTAL 333.23 MEAN .91 MAX 19 MIN .05 AC-FT 661

PEAK DISCHARGE (BASE, 70 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-27	1300	3.30	125	11-25	0700	4.08	193
11- 3	0300	2.68	80	2-18	2300	2.64	77

16893800 Wichen River at altitude 18 m, Moen

LOCATION.--Lat 7°27'05" N., long 151°52'18" E., Moen, on left bank at Peniesence and 0.5 mile upstream from mouth.

DRAINAGE AREA.--0.60 sq mi.

PERIOD OF RECORD.--April 1955 to March 1956 (published as "at Peniesence"), May 1968 to current year. All figures of discharge above 3 cfs (2 mgd) prior to April 1956 are unreliable and should not be used.

GAGE.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map). Prior to Apr. 1, 1956, non-recording gage at site 100 ft downstream at different datum.

EXTREMES.--Current year: Maximum discharge, 724 cfs Nov. 25 (gage height, 6.18 ft), from rating curve extended above 26 cfs; minimum, 0.07 cfs Mar. 24-26, Apr. 1.
Period of record: Maximum discharge, 724 cfs Nov. 25, 1969 (gage height, 6.18 ft), from rating curve extended above 26 cfs; minimum, 0.03 cfs Mar. 31, 1969.
REVISIONS.--The maximum daily discharge for the period April 1955 to March 1956, published in WSP 1751, is unreliable owing to undefined high-water rating and should not be used.

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

REVISIONS.--WRD Hawaii 1968: Drainage area. Figures of daily discharge above 3 cfs (2 mgd) for the period April 1955 to March 1956, published in WSP 1751, are unreliable owing to undefined high-water rating and should not be used.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	4.1	1.6	7.9	.56	1.6	.10	.40	1.7	2.7	.64	7.5
2	.80	2.9	3.0	3.9	.48	.96	.10	.56	1.1	2.6	.56	2.1
3	.70	12	1.8	6.1	.32	.64	.14	2.4	1.4	1.8	.48	1.4
4	.60	6.0	.80	13	.25	.53	.14	1.0	2.6	1.3	.48	1.1
5	.55	3.9	.80	8.4	.19	.72	.19	.48	3.4	1.1	2.0	1.2
6	.65	2.6	.90	3.6	.19	.64	.10	.64	2.0	1.0	.80	.90
7	.65	2.0	4.0	1.8	.14	.56	.14	7.6	1.6	.72	.64	.65
8	.55	1.5	5.9	1.4	.48	.56	.25	2.8	1.0	.72	.48	1.0
9	.47	1.3	2.0	1.2	.19	.56	.25	5.2	.80	.64	.40	.80
10	.50	1.1	1.2	1.0	.14	.56	.14	3.9	.96	.56	5.8	.65
11	.35	1.0	1.1	.80	.14	.64	.14	2.8	.80	.56	9.3	.60
12	.32	1.4	1.0	.64	.14	.72	1.1	2.0	.80	.56	1.3	.55
13	.32	3.4	.90	.56	.10	.56	1.0	1.8	.64	.48	1.0	.50
14	.80	1.7	.80	1.4	.10	.50	1.7	2.0	.56	.32	.64	.45
15	.41	1.2	.70	.96	.10	.55	1.9	13	.56	.96	.48	.45
16	.32	1.0	.60	.80	.10	.50	.72	10	.40	2.2	1.5	.40
17	.26	2.0	.50	9.2	.48	.50	.56	12	5.5	1.0	1.7	.40
18	.20	1.5	5.3	2.3	18	.50	.48	3.4	5.2	.80	1.1	.48
19	.18	1.1	9.2	1.4	21	.45	.48	2.0	2.4	.72	.96	.32
20	.18	1.1	2.7	.96	3.6	.40	.40	2.2	1.6	.64	.80	.72
21	.17	.95	1.2	.72	2.0	.40	.32	1.2	1.1	.64	.72	.56
22	.16	6.2	.90	.64	1.4	.35	.79	.96	.80	.56	1.6	.25
23	.75	2.3	.80	.56	1.4	.30	14	.80	1.1	.56	1.0	.56
24	.47	3.3	1.3	.48	.96	.25	.96	.56	2.2	.56	1.0	1.4
25	.80	46	1.0	.56	.80	.25	.72	9.0	1.3	.48	.96	.48
26	.44	5.3	.90	.48	.64	.19	4.8	2.3	.96	.48	.90	.96
27	13	2.4	.70	.40	.56	.25	4.6	1.7	1.0	.64	1.7	4.7
28	4.0	2.0	.80	.40	2.2	.19	2.8	1.1	20	1.3	1.5	2.2
29	2.1	1.8	.70	16	------	.19	1.4	4.6	3.3	1.0	1.4	1.6
30	3.1	1.3	.70	1.8	------	.14	.80	11	3.2	.64	.90	1.2
31	3.0	------	.70	.80	------	.14	------	2.8	------	.56	1.1	------
TOTAL	37.75	124.35	54.50	90.16	56.66	15.30	41.22	112.20	69.98	28.80	43.84	36.08
MEAN	1.22	4.15	1.76	2.91	2.02	.49	1.37	3.62	2.33	.93	1.41	1.20
MAX	13	46	9.2	16	21	1.6	14	13	20	2.7	9.3	7.5
MIN	.16	.95	.50	.40	.10	.14	.10	.40	.40	.32	.40	.25
AC-FT	75	247	108	179	112	30	82	223	139	57	87	72

CAL YR 1969 TOTAL 652.14 MEAN 1.79 MAX 46 MIN .03 AC-FT 1,290
WTR YR 1970 TOTAL 710.84 MEAN 1.95 MAX 46 MIN .10 AC-FT 1,410

PEAK DISCHARGE (BASE, 170 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-27	1230	3.92	180	1-29	0200	3.69	192
11-25	0800	6.18	724	2-18	2300	3.95	229

16894200 Nachiponong Stream, Moen

LOCATION.--Lat 7°25'45" N., long 151°51'31" E., Moen, on left bank at Wichap, 300 ft downstream from dam site, and 0.2 mile upstream from mouth.

DRAINAGE AREA.--0.16 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 33 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 26 cfs Nov. 25 (gage height, 3.32 ft), from rating curve extended above 0.4 cfs; minimum, 0.03 cfs Feb. 15, Apr. 4.
Period of record: Maximum discharge, 26 cfs Nov. 25, 1969 (gage height, 3.32 ft, from rating curve extended above 0.4 cfs; no flow Mar. 26-31, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.69	.22	.90	.22	.34	.06	.18	.38	.58	.25	1.1
2	.16	.55	.43	.72	.17	.23	.06	.79	.36	.60	.22	.53
3	.11	1.4	.39	.69	.14	.18	.07	.58	.34	.46	.18	.36
4	1.2	1.2	.36	1.1	.14	.16	.05	.22	.60	.46	.17	.34
5	.55	1.1	.34	.69	.14	.14	.08	.17	.72	.32	.64	.63
6	.36	.93	.36	.50	.18	.13	.06	.22	.43	.32	.24	.34
7	.25	.66	.57	.46	.10	.12	.05	1.0	.31	.27	.17	.23
8	.17	.46	.72	.43	.11	.11	.05	.50	.29	.23	.16	.29
9	.13	.43	.48	.32	.06	.10	.05	1.2	.34	.18	.14	.18
10	.14	.38	.36	.32	.06	.16	.04	.90	.46	.29	.61	.16
11	.17	.34	.29	.31	.06	.25	.04	.72	.31	.22	1.2	.16
12	.17	.46	.25	.25	.06	.25	.13	.53	.31	.17	.27	.17
13	.13	1.1	.22	.25	.06	.22	.06	.46	.22	.16	.32	.11
14	.11	.53	.17	.48	.04	.18	.25	.46	.18	.12	.27	.08
15	.12	.31	.18	.29	.04	.18	.50	1.2	.18	.27	.25	.08
16	.11	.27	.18	.29	.04	.17	.08	.96	.16	.82	.32	.10
17	.16	.65	.43	1.0	.34	.15	.10	.81	.77	.31	.23	.11
18	.11	.36	.81	.55	1.2	.15	.08	.55	1.1	.18	.31	.13
19	.10	.27	1.0	.48	1.4	.14	.08	.48	.60	.17	.20	.10
20	.10	.32	.34	.38	.55	.13	.07	.38	.31	.14	.27	.13
21	.17	.29	.27	.34	.46	.12	.07	.29	.25	.14	.29	.11
22	.10	1.1	.25	.32	.38	.10	.15	.27	.17	.13	.47	.08
23	.20	.41	.22	.25	.38	.10	2.0	.20	.27	.12	.25	.52
24	.27	.74	.20	.18	.29	.09	.31	.18	.46	.12	.31	.36
25	.32	2.6	.18	.20	.20	.08	.32	1.3	.20	.12	.20	.16
26	.18	.72	.23	.27	.16	.07	1.4	.50	.20	.16	.29	.34
27	2.0	.48	.25	.20	.14	.10	.85	.46	.20	.17	1.0	1.0
28	.61	.38	.43	.16	.85	.12	.50	.38	2.5	.41	.99	.55
29	.29	.29	.27	1.0	------	.06	.31	.75	.75	.34	.38	.34
30	.53	.27	.27	.48	------	.05	.25	1.4	.84	.17	.23	.31
31	.94	------	.29	.34	------	.05	------	.53	------	.14	.46	------
TOTAL	10.28	19.69	10.96	14.15	7.97	4.43	8.12	18.57	14.21	8.29	11.29	9.10
MEAN	.33	.66	.35	.46	.28	.14	.27	.60	.47	.27	.36	.30
MAX	2.0	2.6	1.0	1.1	1.4	.34	2.0	1.4	2.5	.82	1.2	1.1
MIN	.10	.27	.17	.16	.04	.05	.04	.17	.16	.12	.14	.08
AC-FT	20	39	22	28	16	8.8	16	37	28	16	22	18

CAL YR 1969	TOTAL 116.78	MEAN .32	MAX 2.6	MIN 0	AC-FT 232
WTR YR 1970	TOTAL 137.06	MEAN .38	MAX 2.6	MIN .04	AC-FT 272

PEAK DISCHARGE (BASE, 10 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-27	1100	2.70	20	2-18	2300	2.52	13
11-25	0700	3.32	26				

16895000 Echapachik Stream, Tol

LOCATION.--Lat 7°20'57" N., long 151°37'26" E., Tol, on right bank 0.2 mile upstream from mouth and 0.6 mile north of Mount Tumuital.

DRAINAGE AREA.--0.15 sq mi.

PERIOD OF RECORD.--April 1955 to March 1957 (published as "at Fasan"), May 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Apr. 1, 1957, non-recording gage at same site at different datum.

EXTREMES.--Current year: Maximum discharge, 51 cfs Sept. 1 (gage height, 3.23 ft), from rating curve extended above 0.7 cfs; minimum, 0.05 cfs Feb. 16.
Period of record: Maximum discharge, 51 cfs Sept. 1, 1970 (gage height, 3.23 ft), from rating curve extended above 0.7 cfs; no flow Mar. 24, 25, 1957, and for many days in 1969.

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

REVISIONS.--WRD Hawaii 1968: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.82	.64	.53	.14	.22	.06	.24	.22	1.6	.11	9.2
2	.14	.53	.75	1.0	.13	.20	.06	.18	.17	.67	.12	.75
3	.12	7.5	.67	.75	.13	.18	.08	.16	.16	.32	.11	.20
4	.12	1.7	.55	3.7	.13	.14	.07	.14	.18	.25	.10	.12
5	.10	1.0	.49	3.0	.13	.15	.09	.12	.67	.25	.12	.09
6	.10	.75	.43	1.3	.14	.13	.07	.09	.75	.20	.12	.08
7	.23	.64	.52	.75	.13	.11	.06	.15	.46	.20	.12	.08
8	.24	.52	1.0	.52	.14	.10	.06	.12	.32	.15	.11	.09
9	.22	.40	1.3	.40	.13	.09	.09	.62	.20	.15	.11	.08
10	.16	.36	.90	.34	.12	.17	.06	1.3	.17	.10	.13	.08
11	.10	.38	.61	.30	.10	.32	.06	.67	.14	.09	.14	.07
12	.09	.75	.52	.26	.09	.28	.18	.38	.19	.12	.12	.07
13	.10	1.3	.43	.24	.09	.24	.13	.22	.16	.12	.40	.07
14	.09	.75	.38	.32	.08	.17	.24	.17	.12	.13	.38	.06
15	.08	.43	.32	.24	.08	.13	.24	2.1	.18	.12	.22	.06
16	.09	.30	.30	.50	.07	.11	.22	.67	.17	.20	.17	.07
17	.09	.43	.28	2.4	2.7	.10	.19	.36	.28	.17	.14	.09
18	.09	.46	.36	1.4	8.6	.09	.14	.26	.43	.15	.13	.15
19	.09	.36	1.5	.75	5.2	.09	.11	.24	1.2	.14	.12	.12
20	.08	.24	1.2	.40	1.4	.08	.11	.22	.49	.13	.11	.11
21	.08	.19	.64	.22	.85	.08	.10	.18	.26	.12	.10	.10
22	.10	.20	.43	.18	.52	.08	.13	.16	.18	.11	.11	.11
23	2.0	.22	.34	.15	.38	.07	1.0	.16	.14	.10	.22	.25
24	1.4	.26	.28	.12	.30	.07	.43	.15	.16	.12	.24	.34
25	.93	3.5	.24	.11	.24	.07	.26	1.9	.13	.11	.19	.22
26	1.6	2.3	.22	.11	.18	.07	.50	.61	.11	.10	.15	.13
27	3.7	1.2	.18	.10	.17	.07	2.6	.43	.14	.14	1.2	.95
28	2.4	.75	.22	.10	.28	.06	1.7	.36	1.6	.14	1.0	.43
29	1.3	.58	.17	.15	------	.06	.58	.32	.49	.13	.40	.40
30	1.2	.61	.19	.16	------	.06	.34	.40	.49	.12	.36	.28
31	1.0	------	.22	.15	------	.06	------	.34	------	.11	.35	------
TOTAL	18.23	29.43	16.28	20.65	22.65	3.85	9.96	13.42	10.36	6.56	7.40	14.85
MEAN	.59	.98	.53	.67	.81	.12	.33	.43	.35	.21	.24	.50
MAX	3.7	7.5	1.5	3.7	8.6	.32	2.6	2.1	1.6	1.6	1.2	9.2
MIN	.08	.19	.17	.10	.07	.06	.06	.09	.11	.09	.10	.06
AC-FT	36	58	32	41	45	7.6	20	27	21	13	15	29

CAL YR 1969 TOTAL 126.60 MEAN .35 MAX 7.5 MIN 0 AC-FT 251
WTR YR 1970 TOTAL 173.64 MEAN .48 MAX 9.2 MIN .06 AC-FT 344

PEAK DISCHARGE (BASE, 10 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11- 3	0100	2.84	42	9- 1	0500	3.23	51
2-18	2230	3.01	48				

16896800 Chun Stream, Dublon Island

LOCATION.--Lat 7°22'36" N., long 151°52'13" E., Dublon Island, on right bank at Chun, 0.4 mile upstream from mouth, and 1.8 miles west of Penienuk.

DRAINAGE AREA.--0.09 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 39 cfs Feb. 18 (gage height, 3.00 ft), from rating curve extended above 0.8 cfs; minimum, 0.07 cfs Feb. 13, 14.
Period of record: Maximum discharge, 39 cfs Feb. 18, 1970 (gage height, 3.00 ft), from rating curve extended above 0.8 cfs; minimum, 0.01 cfs May 16, 1968, and on many days February to April, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.63	.48	.86	.21	.62	.11	.23	.23	.40	.26	.51
2	.30	.48	.70	.70	.17	.48	.11	.26	.21	.35	.25	.37
3	.28	.52	.58	.51	.17	.40	.12	.54	.21	.30	.21	.30
4	.32	.70	.51	1.5	.17	.37	.10	.30	.30	.30	.21	.28
5	.28	.52	.44	1.2	.17	.34	.10	.23	.65	.35	.28	.40
6	.34	.48	.48	.70	.19	.30	.10	.19	.40	.40	.21	.34
7	.41	.41	.62	.60	.21	.26	.12	.19	.34	.40	.17	.30
8	.30	.41	.70	.58	.25	.25	.16	.17	.30	.44	.17	.30
9	.26	.38	.40	.51	.21	.23	.17	.34	.26	.40	.17	.28
10	.28	.34	.34	.51	.17	.25	.16	.48	.25	.40	.84	.28
11	.24	.34	.30	.51	.10	.30	.14	.30	.25	.37	1.0	.28
12	.24	.34	.26	.48	.09	.25	.21	.26	.24	.34	.44	.26
13	.78	.41	.25	.44	.08	.23	.23	.25	.22	.30	.37	.26
14	.78	.32	.26	.82	.08	.23	.23	.23	.20	.28	.34	.25
15	.45	.30	.26	.65	.08	.21	.30	1.5	.18	.48	.30	.25
16	.38	.30	.26	.65	.08	.21	.19	.92	.16	.30	.28	.25
17	.32	.52	.28	1.7	.37	.19	.19	.51	.30	.26	.26	.25
18	.30	.38	.37	1.1	2.8	.21	.23	.37	.40	.25	.28	.25
19	.28	.34	.87	.65	2.1	.23	.28	.34	.30	.23	.26	.26
20	.30	.38	.65	.48	1.0	.17	.26	.26	.25	.23	.26	.28
21	.30	.32	.51	.37	.87	.17	.28	.23	.25	.23	.25	.34
22	.26	.41	.34	.34	.65	.17	.26	.21	.20	.23	.25	.26
23	.38	.32	.26	.30	.65	.17	1.3	.19	.25	.23	.23	.28
24	.32	.32	.26	.30	.54	.17	.28	.16	.30	.23	.23	.44
25	.34	2.6	.23	.28	.51	.16	.23	.65	.20	.23	.21	.30
26	.30	.85	.23	.26	.44	.16	.70	.30	.20	.23	.21	.34
27	.74	.62	.23	.26	.37	.16	.76	.23	.25	.25	.30	.87
28	.59	.55	.37	.25	.92	.16	.51	.19	2.0	.28	.25	.40
29	.41	.51	.25	.25	------	.14	.34	.21	1.0	.28	.25	.34
30	.41	.48	.30	.23	------	.12	.26	.48	.50	.25	.23	.37
31	.45	------	.28	.23	------	.12	------	.28	------	.25	.25	------
TOTAL	11.66	15.48	12.27	18.22	13.65	7.43	8.43	11.00	10.80	9.47	9.22	9.89
MEAN	.38	.52	.40	.59	.49	.24	.28	.35	.36	.31	.30	.33
MAX	.78	2.6	.87	1.7	2.8	.62	1.3	1.5	2.0	.48	1.0	.87
MIN	.24	.30	.23	.23	.08	.12	.10	.16	.16	.23	.17	.25
AC-FT	23	31	24	36	27	15	17	22	21	19	18	20

CAL YR 1969 TOTAL 112.09 MEAN .31 MAX 2.6 MIN .02 AC-FT 222
WTR YR 1970 TOTAL 137.52 MEAN .38 MAX 2.8 MIN .08 AC-FT 273

PEAK DISCHARGE (BASE, 10 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-25	0700	2.51	32	5-15	0900	2.64	19
2-18	2200	3.00	39				

16897200 Tumunu Stream, Dublon Island

LOCATION.--Lat 7°22'42" N., long 151°52'51" E., Dublon Island, on left bank at Roro, 0.1 mile upstream from mouth, and 1.1 miles west of Penienuk.

DRAINAGE AREA.--0.26 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 168 cfs Feb. 18 (gage height, 5.08 ft), from rating curve extended above 5.4 cfs; minimum, 0.08 cfs Feb. 14-16.
Period of record: Maximum discharge, 168 cfs Feb. 18, 1970 (gage height, 5.08 ft), from rating curve extended above 5.4 cfs; minimum, 0.02 cfs Mar. 1, 2, 1969.

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

REVISIONS (WATER YEARS).--WRD Hawaii 1969: 1968(P).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	1.5	.86	1.4	.27	1.1	.15	.27	.31	1.0	.43	1.1
2	.70	1.3	1.2	1.2	.27	.73	.15	.47	.27	.90	.47	.86
3	.62	1.3	.63	.73	.25	.63	.20	1.0	.31	.80	.39	.67
4	.58	1.9	.47	4.3	.25	.59	.17	.31	.43	.70	.35	.63
5	.50	1.5	.31	3.3	.24	.51	.18	.22	1.1	.80	.73	.98
6	.66	1.4	.25	2.1	.22	.47	.17	.18	.98	.90	.51	.67
7	.70	1.3	.43	1.2	.20	.47	.15	.22	.67	.85	.31	.59
8	.54	1.2	1.9	1.0	.22	.39	.15	.15	.59	.80	.24	.59
9	.45	1.1	1.1	.98	.18	.31	.15	.47	.55	.63	.22	.59
10	.48	1.0	.67	.73	.18	.35	.13	.80	.55	.63	2.0	.55
11	.42	1.0	.55	.59	.17	.43	.13	.59	.47	.59	2.4	.55
12	.35	.95	.47	.47	.15	.39	.31	.43	.43	.55	1.5	.51
13	1.2	1.0	.39	.35	.13	.35	.35	.35	.31	.47	1.2	.47
14	1.2	.86	.31	2.5	.15	.35	.35	.31	.25	.43	1.0	.43
15	.82	.78	.24	1.1	.12	.31	.59	3.6	.24	.80	.98	.39
16	.74	.74	.24	.70	.10	.31	.25	2.0	.22	.55	.80	.39
17	.70	1.0	.35	3.0	1.8	.27	.20	1.3	.55	.39	.73	.31
18	.66	.95	.55	2.2	18	.27	.17	.86	.67	.35	.80	.31
19	.62	.86	2.1	1.3	6.6	.25	.15	.67	.55	.27	.63	.27
20	.62	.86	1.0	.92	1.5	.24	.15	.51	.39	.25	.63	.35
21	.58	.82	.59	.80	1.2	.24	.13	.39	.31	.25	.59	.43
22	.54	1.0	.43	.59	1.1	.22	.18	.35	.27	.25	.51	.27
23	.70	.86	.39	.43	1.1	.22	2.0	.31	.31	.25	.47	.31
24	.58	.86	.39	.43	1.0	.20	.51	.24	.51	.27	.47	.63
25	.66	11	.25	.39	.98	.20	.43	1.3	.27	.25	.39	.39
26	.62	4.0	.31	.35	.80	.20	1.0	.55	.24	.24	.35	.51
27	1.6	2.8	.27	.35	.67	.20	1.6	.43	.35	.31	.55	1.7
28	1.6	1.7	.67	.35	2.1	.22	.92	.35	4.0	.47	.43	.63
29	1.2	1.3	.39	.47	------	.20	.55	.39	2.0	.47	.35	.47
30	1.4	.92	.47	.35	------	.18	.39	.63	1.0	.35	.27	.67
31	1.3	------	.43	.31	------	.17	------	.43	------	.35	.39	------
TOTAL	24.16	47.76	18.61	34.89	39.95	10.97	11.96	20.08	19.10	16.12	21.09	17.22
MEAN	.78	1.59	.60	1.13	1.43	.35	.40	.65	.64	.52	.68	.57
MAX	1.6	11	2.1	4.3	18	1.1	2.0	3.6	4.0	1.0	2.4	1.7
MIN	.35	.74	.24	.31	.10	.17	.13	.15	.22	.24	.22	.27
AC-FT	48	95	37	69	79	22	24	40	38	32	42	34

CAL YR 1969 TOTAL 237.95 MEAN .65 MAX 11 MIN .04 AC-FT 472
WTR YR 1970 TOTAL 281.91 MEAN .77 MAX 18 MIN .10 AC-FT 559

PEAK DISCHARGE (BASE, 30 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
11-25	0700	4.54	129	5-15	0830	2.66	30
2-18	2230	5.08	168				

16897600 Nanopil River

LOCATION.--Lat 6°55'11" N., long 158°12'36" E., Ponape, on left bank 1.4 miles northeast of Mount Tamatamansakir and 1.4 miles southeast of Rekisau.

DRAINAGE AREA.--2.93 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 390 ft (from topographic map).

EXTREMES.--Maximum discharge during period, 3,450 cfs Sept. 4 (gage height, 6.85 ft), from rating curve extended above 110 cfs; minimum, 3.8 cfs Mar. 3-6, 23.

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

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						5.4	4.3	10	48	39	22	41
2						4.9	16	42	25	37	9.2	27
3						4.3	16	21	16	26	56	17
4						4.3	8.4	11	11	101	42	121
5						4.3	21	20	26	39	35	38
6						4.3	163	17	123	20	31	25
7						41	179	11	35	34	16	43
8						9.2	31	25	100	52	32	23
9						30	57	91	40	23	35	14
10						273	26	99	31	16	71	198
11						72	79	23	100	30	47	100
12						20	88	16	53	61	48	67
13						11	35	22	63	21	88	35
14						8.4	24	13	53	17	43	19
15						6.8	17	31	29	13	26	17
16						5.7	12	84	42	163	14	19
17						5.2	11	96	102	26	22	10
18						5.4	20	42	39	14	23	12
19						4.9	10	28	20	30	101	23
20						4.6	8.0	191	15	26	56	18
21						4.6	38	62	16	24	115	12
22						5.4	31	25	37	13	100	16
23						22	45	17	150	62	107	59
24						19	76	19	35	24	44	59
25						41	59	19	71	147	26	48
26						19	169	14	66	30	14	74
27						7.6	93	8.8	86	16	10	54
28						25	21	128	32	12	56	29
29					------	12	22	54	33	7.6	146	122
30					------	7.2	16	85	88	6.0	181	33
31		------			------	5.2	------	43	------	7.6	57	------
TOTAL						692.7	1,395.7	1,367.8	1,585	1,137.2	1,673.2	1,373
MEAN						22.3	46.5	44.1	52.8	36.7	54.0	45.8
MAX						273	179	191	150	163	181	198
MIN						4.3	4.3	8.8	11	6.0	9.2	10
AC-FT						1,370	2,770	2,710	3,140	2,260	3,320	2,720

WTR YR 1970 TOTAL - MEAN - MAX - MIN - AC-FT -

/ From floodmark in well.

PEAK DISCHARGE (BASE, 2,000 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
4-26	0200	/6.52	2,460	8-29	1430	6.60	2,700
7-25	1330	6.62	2,760	9- 4	1100	6.85	3,450

16897900 Lui River

LOCATION.--Lat 6°55'36" N., long 158°12'55" E., Ponape, on right bank 300 ft upstream from right-bank tributary and 1.3 miles southeast of Rekisau.

DRAINAGE AREA.--0.47 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 270 ft (from topographic map).

EXTREMES.--Maximum discharge during period, 298 cfs July 16 (gage height, 3.44 ft), from rating curve extended above 13 cfs; minimum, 0.26 cfs Mar. 30 to Apr. 1.

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

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.34	.34	.62	5.8	4.8	2.0	7.0
2						.38	2.4	5.1	2.8	5.6	1.3	4.0
3						.38	1.4	1.9	1.7	3.1	5.0	2.0
4						.38	.51	.92	1.2	9.7	4.0	10
5						.51	.47	3.4	2.0	4.4	3.0	5.0
6						.62	8.6	1.9	16	2.3	2.5	3.0
7						.92	21	1.0	4.6	3.4	2.0	5.0
8						.30	4.0	2.3	18	5.2	3.4	3.0
9						.85	7.1	9.8	6.0	2.8	7.1	2.0
10						24	2.8	10	4.4	2.1	10	20
11						6.3	6.0	2.3	11	2.6	5.0	10
12						1.5	9.7	1.2	9.4	5.0	5.0	7.0
13						.78	3.1	3.0	8.7	2.4	14	4.0
14						.55	2.3	1.2	6.9	1.5	5.6	2.5
15						.51	1.1	3.0	3.7	1.2	3.0	2.0
16						.42	.70	7.0	6.9	24	1.8	1.5
17						.38	.78	7.0	20	3.2	2.0	.80
18						.38	1.2	4.0	6.6	1.8	2.0	1.0
19					/2.8	.34	.62	2.5	2.5	5.5	15	2.0
20						.47	.47	22	2.3	4.0	6.0	1.5
21						.51	2.9	7.2	1.8	3.8	18	1.0
22						.62	2.4	3.0	3.7	1.9	7.0	1.8
23						1.2	3.2	2.0	13	1.5	20	6.0
24						.62	9.2	2.4	4.0	2.0	5.0	8.0
25						2.5	7.6	3.0	7.8	7.6	3.0	4.0
26					/.48	.92	19	2.6	6.8	3.0	1.8	10
27						.42	3.7	1.2	10	2.0	1.2	11
28						.85	1.8	14	4.0	1.5	6.0	5.5
29				------		.38	1.2	6.3	4.0	1.2	10	15
30				------		.30	.92	17	7.5	1.0	15	7.5
31		------		------		.30	------	3.7	------	1.2	10	------
TOTAL						48.93	126.51	152.54	203.1	121.3	196.7	163.10
MEAN						1.58	4.22	4.92	6.77	3.91	6.35	5.44
MAX						24	21	22	20	24	20	20
MIN						.30	.34	.62	1.2	1.0	1.2	.80
AC-FT						97	251	303	403	241	390	324

WTR YR 1970 TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 250 CFS).--June 8 (0500) 272 cfs (3.31 ft); July 16 (0730) 298 cfs (3.44 ft).

/ Result of discharge measurement.

NOTE.--No gage-height record Aug. 15 to Sept. 26.

16898200 Lui River at mouth

LOCATION.--Lat 6°57'07" N., long 158°13'16" E., Ponape, on right bank 0.4 mile upstream from mouth and 1.3 miles west of Tolenot Peak.

DRAINAGE AREA.--2.06 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 40 ft (from topographic map).

EXTREMES.--Maximum discharge during period, 1,280 cfs June 17 (gage height, 4.14 ft), from rating curve extended above 92 cfs; minimum, 3.0 cfs Mar. 6.

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

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						3.7	3.6	6.2	25	24	11	28
2						3.5	7.9	13	16	26	8.7	20
3						3.4	6.1	7.9	12	18	19	15
4						3.3	4.0	5.6	9.8	30	20	16
5						3.3	5.0	9.8	9.5	20	21	19
6						3.2	25	7.3	42	14	15	14
7						4.1	100	5.3	18	18	11	14
8						3.3	15	7.1	84	24	12	11
9						5.0	25	30	27	15	39	8.5
10						114	12	30	20	13	33	105
11						31	35	12	41	14	27	40
12						11	40	7.3	40	24	22	57
13						7.1	25	9.5	40	15	46	27
14					/4.8	5.9	12	7.1	32	10	22	16
15						5.1	9.0	8.1	22	8.9	15	14
16						4.7	7.0	22	29	138	12	12
17						4.2	6.5	23	113	20	9.3	9.1
18						4.1	10	21	27	14	9.1	9.3
19						3.9	7.0	16	17	19	36	8.5
20						3.9	6.5	94	15	15	29	8.1
21						3.7	14	37	12	15	102	6.8
22						3.5	12	19	13	9.3	34	6.6
23						4.8	12	14	49	8.3	117	20
24						4.9	27	15	19	8.5	27	27
25						7.1	27	18	32	16	18	18
26						5.3	68	15	27	11	14	56
27						4.3	18	10	64	8.7	11	48
28						5.6	12	92	27	8.3	20	35
29					------	4.5	8.9	34	22	6.8	18	53
30					------	4.0	7.3	68	32	5.6	65	41
31		------			------	3.7	------	21	------	6.4	35	------
TOTAL						279.1	567.8	685.2	936.3	583.8	878.1	762.9
MEAN						9.00	18.9	22.1	31.2	18.8	28.3	25.4
MAX						114	100	94	113	138	117	105
MIN						3.2	3.6	5.3	9.5	5.6	8.7	6.6
AC-FT						554	1,130	1,360	1,860	1,160	1,740	1,510

WTR YR 1970 TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 1,200 CFS).--June 17 (0200) 1,280 cfs (4.14 ft); Aug. 21 (1430) 1,260 cfs (4.12 ft).

/ Result of discharge measurement.

16898300 Tawannu River

LOCATION.--Lat 6°56'57" N., long 158°12'50" E., Ponape, on left bank 1.3 miles northeast of Rekisau and 1.8 miles west of Tolenot Peak.

DRAINAGE AREA.--1.00 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 110 ft (from topographic map).

EXTREMES.--Maximum discharge during period, 357 cfs Aug. 21 (gage height, 2.99 ft), from rating curve extended above 76 cfs; minimum, 0.10 cfs Apr. 1.

REMARKS.--Records fair. During dry periods, up to 360,000 gal per day is diverted 100 ft above station for domestic use in Kolonia.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.92	.15	2.3	9.7	9.7	3.0	10
2						.80	.35	3.9	6.3	11	2.6	8.9
3						.68	.40	2.7	5.1	8.1	7.7	6.0
4						.50	.40	1.8	4.0	9.7	8.9	5.8
5						.45	2.0	3.0	3.8	7.7	8.9	6.0
6						.40	15	2.4	14	5.8	7.3	4.8
7						.50	40	1.8	8.9	6.5	5.8	4.6
8						.35	8.0	1.9	22	9.3	5.1	3.8
9						1.0	10	9.9	10	6.0	16	3.0
10						39	5.0	16	7.3	5.1	17	26
11						13	15	5.8	20	5.3	15	17
12						5.5	20	4.0	17	8.9	11	24
13						3.5	10	4.0	18	5.8	19	12
14					/.78	2.6	5.0	3.1	14	4.3	11	7.3
15						2.2	3.0	3.8	9.3	3.7	7.7	5.3
16						1.7	2.2	11	10	47	5.8	4.3
17						1.2	2.5	14	36	9.7	4.6	3.3
18						1.2	4.0	13	11	6.0	4.1	3.1
19						1.0	2.2	10	7.7	5.5	9.3	3.0
20						.98	2.0	34	6.0	4.8	10	3.1
21						.92	3.4	16	4.8	4.3	38	2.4
22					/1.9	.74	3.1	8.1	4.6	3.0	14	2.3
23						.92	2.7	6.0	17	2.6	38	7.3
24						.86	3.8	6.3	8.1	2.3	12	9.3
25						1.4	5.8	7.7	12	3.3	7.7	6.5
26						1.1	17	6.9	10	3.0	6.0	17
27						.74	6.5	4.8	23	2.5	4.6	16
28						.80	4.8	34	12	2.4	4.8	12
29					------	.50	3.7	15	9.7	1.9	7.7	14
30					------	.40	2.7	16	13	1.5	25	14
31		------			------	.30	------	8.5	------	1.9	11	------
TOTAL						86.16	200.70	277.7	354.3	208.6	348.6	262.1
MEAN						2.78	6.69	8.96	11.8	6.73	11.2	8.74
MAX						39	40	34	36	47	38	26
MIN						.30	.15	1.8	3.8	1.5	2.6	2.3
AC-FT						171	398	551	703	414	691	520

WTR YR 1970 TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 300 CFS).--Aug. 21 (1400) 357 cfs (2.99 ft).

/ Result of discharge measurement.

16906000 Vaitolu Stream at Aoa

LOCATION.--Lat 14°16'19" S., long 170°35'32" W., Tutuila, on left bank 0.5 mile upstream from mouth and 0.7 mile southwest of Aoa.

DRAINAGE AREA.--0.18 sq mi.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as "near Aoa."

GAGE.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

AVERAGE DISCHARGE (since upstream diversion began).--6 years (1964-70), 0.338 cfs (245 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 188 cfs Mar. 12 (gage height, 4.16 ft), from rating curve extended above 0.4 cfs; minimum, 0.01 cfs several days.
Period of record: Maximum discharge, 804 cfs Dec. 19, 1962 (gage height, 6.16 ft), from rating curve extended above 3.3 cfs; no flow at times in 1964-66.

REMARKS.--Records poor. Small diversion above station for domestic use since Sept. 14, 1964. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS (WATER YEARS).--WRD Hawaii 1969: 1963(M), drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.13	.03	.40	.21	.24	.53	.56	.30	.05	.07	.14
2	.04	.04	.02	.47	.35	.15	.48	.43	.27	.05	.05	.07
3	.05	.04	.05	.43	.26	.09	1.8	1.5	.20	.05	.05	.04
4	.04	.04	.01	.44	.19	.20	.48	.45	.10	.10	.05	.02
5	.04	.09	.01	.29	.23	.26	.31	.35	.13	.07	.05	.02
6	.04	.12	.01	1.7	.28	.11	.30	.29	.06	.06	.05	.02
7	.09	.04	.04	.17	.25	.42	.29	.36	.04	.05	.05	.02
8	.05	.02	.02	.09	.23	.95	1.6	.35	.03	.05	.05	.03
9	.05	.02	.01	.30	.20	4.1	1.1	.29	.03	.05	.05	.18
10	.05	.02	1.0	.57	.16	.91	.64	.26	.45	.05	.15	.08
11	.04	.02	1.3	.33	.13	1.6	.48	.27	.78	.13	.12	.03
12	.04	.02	.45	.24	.12	8.1	.48	.31	.60	.21	.05	.03
13	.18	.02	.13	.26	.12	.54	2.7	.26	.42	.60	.05	.02
14	.15	.20	.53	.22	.18	.38	2.1	.24	.54	.15	.05	.19
15	.10	.03	.23	.22	.15	.38	3.7	.22	.27	.08	.05	.04
16	.07	.02	.25	.22	.14	.78	1.2	.19	.21	.09	.03	.03
17	.06	.02	.19	.24	.13	.73	.90	.19	.16	.07	.04	.24
18	.06	.02	.17	.27	.13	.45	.70	.21	.11	.05	.05	.48
19	.06	.06	.26	.29	.16	.64	.57	.62	.20	.05	.04	.10
20	.06	.07	.68	.29	.22	.45	.52	.76	.40	.03	.04	.07
21	.05	1.1	.95	.45	.14	.45	.45	.31	1.1	.05	.04	.04
22	.04	.21	.55	.43	.11	.51	.42	.22	.35	.05	.03	1.3
23	.06	.44	.52	.31	.25	.40	.40	.18	.21	.05	.03	1.5
24	.43	1.5	.37	.27	.01	.40	.50	.18	.10	.05	.03	.45
25	.54	.48	.54	.31	.30	.42	.43	.15	.07	.04	.03	.19
26	.25	.15	3.0	.29	.24	.54	.35	.12	.05	.04	.02	.14
27	.23	.07	4.6	.20	.21	.82	.33	.12	.21	.04	.03	.15
28	.09	.04	1.4	1.0	.19	.71	.33	.17	.12	.05	.05	.13
29	.05	.03	.83	.50	------	.57	.41	.12	.08	.05	.18	.12
30	.04	.04	.57	.31	------	.93	.33	.10	.06	.05	2.7	.08
31	.07	------	.43	.25	------	.54	------	.09	------	.05	.40	------
TOTAL	3.16	5.10	19.15	11.76	6.09	27.77	24.83	9.87	7.65	2.56	4.68	5.95
MEAN	.10	.17	.62	.38	.22	.90	.83	.32	.26	.083	.15	.20
MAX	.54	1.5	4.6	1.7	.81	8.1	3.7	1.5	1.1	.60	2.7	1.5
MIN	.04	.02	.01	.09	.11	.09	.29	.09	.03	.03	.02	.02
AC-FT	6.3	10	38	23	12	55	49	20	15	5.1	9.3	12

CAL YR 1969 TOTAL 142.47 MEAN .39 MAX 9.6 MIN .01 AC-FT 283
WTR YR 1970 TOTAL 128.57 MEAN .35 MAX 8.1 MIN .01 AC-FT 255

PEAK DISCHARGE (BASE, 150 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-26	1830	4.02	163	4- 3	0330	3.97	155
12-27	1530	3.99	158	4-13	1500	4.11	179
3-12	0100	4.16	188				

NOTE.--No gage-height record Jan. 27 to Mar. 3, June 2 to July 8.

16912000 Pago Stream at Afono

LOCATION.--Lat 14°16'03" S., long 170°39'02" W., Tutuila, on left bank 0.2 mile south of Afono and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.60 sq mi.

PERIOD OF RECORD.--October 1958 to current year. Prior to July 1960, published as Afono Stream at Afono.

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

AVERAGE DISCHARGE.--11 years (1959-70), 3.43 cfs (2,490 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 910 cfs June 21 (gage height, 4.90 ft), from rating curve extended above 12 cfs; minimum, 0.52 cfs Aug. 27.
Period of record: Maximum discharge, 1,350 cfs July 5, 1969 (gage height, 5.49 ft), from rating curve extended above 22 cfs; minimum, 0.25 cfs at times in 1961 and 1968.

REMARKS.--Records good except those for period of no gage-height record, which are poor. About 0.06 cfs is diverted above station for domestic use in Afono. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.72	2.0	1.4	2.1	1.8	1.6	5.0	1.9	1.1	1.9	1.0	3.4
2	.66	1.5	1.3	2.0	6.4	1.2	4.5	3.6	1.7	1.6	1.1	2.3
3	1.1	1.3	1.2	2.0	2.6	1.0	8.0	5.0	1.2	1.5	.85	1.9
4	.90	1.2	1.1	2.2	1.8	.93	4.9	4.7	1.1	1.9	.78	1.5
5	.90	2.1	1.0	3.1	2.2	1.1	3.0	1.8	1.2	1.6	.78	1.4
6	1.0	1.6	1.0	4.6	3.8	1.3	2.0	1.3	1.1	1.4	.78	1.3
7	1.2	1.3	.98	3.0	3.8	4.0	1.9	1.8	1.0	1.4	.78	1.2
8	1.0	1.2	.94	2.5	2.3	18	28	3.2	1.0	1.3	.78	1.1
9	.91	1.1	1.0	5.0	1.8	34	11	1.8	.93	1.3	.85	1.5
10	.90	1.3	5.5	3.4	1.5	12	4.7	1.3	12	1.2	1.8	1.8
11	.90	1.2	8.1	3.0	1.4	8.2	3.4	1.2	18	1.9	2.2	1.2
12	.92	1.1	2.3	2.7	1.3	70	2.8	1.3	12	4.0	1.2	1.1
13	1.2	1.1	1.1	2.5	1.1	8.6	4.3	1.2	6.3	7.6	1.1	1.1
14	1.5	1.0	2.5	2.0	1.6	5.4	7.9	1.6	9.4	3.4	.93	4.0
15	1.2	1.7	1.6	1.9	1.3	4.4	16	1.8	4.7	2.2	1.0	2.3
16	1.1	1.1	1.7	1.6	1.1	3.8	4.7	1.2	3.2	1.8	.78	2.8
17	1.0	1.0	1.3	1.6	1.1	4.0	3.4	1.1	2.5	1.6	.71	4.7
18	1.7	1.0	1.1	1.5	1.0	3.6	3.0	.93	2.0	1.4	.78	9.8
19	1.4	1.8	1.4	1.4	1.3	3.2	2.5	21	1.9	1.3	.64	3.0
20	1.2	1.5	1.7	1.3	1.6	3.0	2.2	19	8.2	1.2	.71	2.0
21	1.1	6.6	2.2	1.3	1.1	3.0	1.9	4.4	52	1.2	.78	1.6
22	1.0	3.0	3.0	1.2	1.0	5.7	1.8	2.6	6.3	1.1	.85	5.6
23	1.0	2.5	2.0	1.3	1.5	3.6	1.6	2.2	4.2	1.1	.64	16
24	2.1	12	1.7	1.3	9.0	2.8	1.8	1.9	3.4	1.0	.64	3.6
25	5.2	4.9	1.6	1.9	3.4	2.8	1.9	1.5	2.6	1.0	.64	2.6
26	3.0	3.5	21	1.5	1.8	2.5	1.6	1.5	2.3	1.0	.58	2.0
27	1.5	2.5	15	1.2	1.4	2.2	1.5	1.3	4.6	.93	.58	2.5
28	1.3	2.0	6.1	11	1.3	3.4	1.5	1.3	3.4	.93	.78	1.9
29	1.2	1.6	4.4	2.8	------	3.0	1.9	1.2	2.5	.93	3.6	1.6
30	1.2	1.4	3.0	2.6	------	25	1.9	1.2	2.0	.93	33	1.4
31	1.5	------	2.5	2.0	------	6.3	------	1.1	------	.93	6.3	------
TOTAL	41.51	67.1	100.72	77.5	61.3	249.63	140.6	96.93	173.83	52.55	67.94	88.2
MEAN	1.34	2.24	3.25	2.50	2.19	8.05	4.69	3.13	5.79	1.70	2.19	2.94
MAX	5.2	12	21	11	9.0	70	28	21	52	7.6	33	16
MIN	.66	1.0	.94	1.2	1.0	.93	1.5	.93	.93	.93	.58	1.1
AC-FT	82	133	200	154	122	495	279	192	345	104	135	175

CAL YR 1969 TOTAL 1,031.16 MEAN 2.83 MAX 86 MIN .43 AC-FT 2,050
WTR YR 1970 TOTAL 1,217.81 MEAN 3.34 MAX 70 MIN .58 AC-FT 2,420

PEAK DISCHARGE (BASE, 210 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-26	/1830	3.51	228	6-21	0530	4.90	910
3-12	0200	4.01	434	8-30	0900	3.59	282
4- 8	1900	4.70	780				

/ About.
NOTE.--No gage-height record Oct. 1 to Jan. 12.

16917500 Leele Stream at mouth, at Fagasa

LOCATION.--Lat 14°17'28" S., long 170°43'09" W., Tutuila, on left bank at Fagasa and 200 ft upstream from mouth.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 390 cfs Aug. 30 (gage height, 3.82 ft), from rating curve extended as explained below; minimum, 0.22 cfs Oct. 12.
Period of record: Maximum discharge, 390 cfs Aug. 30, 1970 (gage height, 3.82 ft), from rating curve extended above 13 cfs on basis of slope-area measurement at gage height 3.61 ft; minimum, 0.11 cfs July 15, 1968.

REMARKS.--Records good. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.41	3.7	.69	.82	1.1	.64	1.9	.63	.46	.83	.83	1.7
2	.46	1.9	1.2	.75	1.4	.50	1.4	2.0	.57	.61	2.4	.99
3	.57	1.2	.75	.75	.90	.41	3.3	1.7	.32	.55	1.4	.68
4	.51	2.5	.63	.63	.69	.41	1.4	1.1	.28	.75	.83	.55
5	1.3	5.4	.57	.57	.98	3.5	.90	.63	.36	.55	.61	.44
6	1.4	3.3	.51	1.7	1.6	.98	.98	.57	.32	.49	4.2	.49
7	3.0	2.2	.51	3.2	1.7	2.2	.90	.69	.28	.75	1.1	.39
8	.63	1.2	1.5	1.4	.90	7.6	2.7	1.5	.28	.68	.68	.39
9	.41	.98	1.2	3.3	.69	4.8	2.7	.63	.28	.55	.91	1.7
10	.32	1.2	.75	1.9	.63	3.1	1.4	.57	9.7	.49	4.3	1.7
11	.28	1.1	10	1.2	.51	2.4	.90	.46	10	2.4	3.3	.55
12	.28	1.3	2.2	.82	.51	12	1.5	.69	7.7	7.4	1.2	.55
13	6.2	.82	2.1	1.4	.41	2.2	5.8	.51	4.7	6.1	.83	.69
14	5.5	2.7	4.3	.82	.82	1.2	4.5	.57	5.3	1.7	.61	1.5
15	3.9	1.1	1.6	.75	.51	.98	8.2	.63	3.5	.99	.55	1.7
16	2.2	.90	1.0	.69	.46	.90	1.8	1.0	1.7	.83	.49	1.6
17	1.2	.90	.75	.75	.41	.75	1.2	.63	1.4	.75	.44	6.0
18	3.6	.90	.75	.69	.41	.69	.90	.93	1.1	.68	.68	5.3
19	3.4	4.0	.90	.92	.41	1.2	.75	6.2	.91	.61	.39	2.3
20	2.6	1.8	1.0	1.3	.41	.90	.63	4.8	.83	.55	.49	1.2
21	2.2	6.3	1.4	3.0	.36	1.8	.57	1.4	6.0	.49	.75	.91
22	1.1	2.1	5.7	1.2	.32	6.3	.63	.75	1.5	.44	.55	2.1
23	.75	8.8	2.8	.75	.65	2.1	.51	.63	.99	.49	.39	3.5
24	3.5	4.6	2.1	.95	1.1	1.9	.69	.51	.99	.44	.34	1.2
25	6.7	1.9	1.7	.69	1.0	1.9	1.2	.57	.75	.39	.39	.83
26	4.9	1.2	19	1.4	.70	1.6	.57	.46	.68	.39	.39	.75
27	11	.90	15	5.7	.60	1.2	.51	.41	.75	.39	.34	.98
28	3.2	.75	3.3	4.8	.60	1.7	.51	.57	.75	.39	.68	.68
29	1.4	.82	1.4	1.4	------	1.6	.68	.41	.68	.44	4.6	.68
30	1.1	.98	1.1	3.0	------	6.5	.63	.36	.75	.49	31	.61
31	15	------	.90	1.4	------	3.1	------	.36	------	.91	3.9	------
TOTAL	89.02	67.45	87.31	48.65	20.78	77.06	50.26	32.87	63.83	33.52	69.57	42.66
MEAN	2.87	2.25	2.82	1.57	.74	2.49	1.68	1.06	2.13	1.08	2.24	1.42
MAX	15	8.8	19	5.7	1.7	12	8.2	6.2	10	7.4	31	6.0
MIN	.28	.75	.51	.57	.32	.41	.51	.36	.28	.39	.34	.39
AC-FT	177	134	173	97	41	153	100	65	127	66	138	85

CAL YR 1969 TOTAL 725.85 MEAN 1.99 MAX 27 MIN .22 AC-FT 1,440
WTR YR 1970 TOTAL 682.98 MEAN 1.87 MAX 31 MIN .28 AC-FT 1,350

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-31	1300	3.32	172	8-30	1000	3.82	390
12-26	2030	3.43	212				

16920500 Aasu Stream at Aasu

LOCATION.--Lat 14°17'51" S., long 170°45'30" W., Tutuila, on right bank at Aasu and 200 ft upstream from mouth.

DRAINAGE AREA.--1.03 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

AVERAGE DISCHARGE.--11 years (1959-70), 6.59 cfs (4,770 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 372 cfs Aug. 30 (gage height, 4.62 ft), from rating curve extended as explained below; minimum, 1.2 cfs Oct. 2.
Period of record: Maximum discharge, 392 cfs Aug. 10, 1962 (gage height, 4.72 ft), from rating curve extended above 20 cfs on basis of slope-area measurement at gage height 4.57 ft; minimum, 0.50 cfs Sept. 29 to Oct. 1, 1961.

REMARKS.--Records fair. Small diversion above station for domestic use. Recording rain gage located at station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area. Published records for high-water periods in the water years 1959-66 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	8.3	4.2	8.3	7.7	2.6	9.6	5.1	3.1	4.0	2.7	15
2	1.2	7.7	4.9	8.3	8.0	2.0	7.7	4.2	3.8	3.3	13	12
3	1.8	6.4	3.8	7.3	6.4	1.8	8.3	3.1	2.9	3.1	6.1	9.6
4	1.4	10	3.3	6.4	5.8	1.6	7.7	2.7	2.6	3.1	3.8	8.0
5	13	15	3.1	5.5	6.1	3.7	8.3	2.6	2.7	2.9	3.1	7.0
6	8.5	12	2.9	12	7.5	2.4	8.4	2.7	2.4	2.7	26	6.1
7	18	9.0	2.9	9.6	8.0	2.8	8.0	3.7	1.8	2.7	10	5.5
8	6.7	7.3	2.6	7.3	6.4	23	7.3	4.0	1.8	2.6	8.3	4.7
9	5.2	6.7	3.3	8.6	5.0	19	7.3	2.9	1.8	2.2	8.0	6.8
10	4.7	6.4	2.6	8.0	4.5	12	6.1	2.6	28	2.6	12	6.7
11	4.2	5.8	35	7.3	4.0	10	4.7	2.6	16	5.0	12	4.7
12	4.0	5.2	11	6.1	3.8	45	4.7	4.4	20	11	8.3	7.1
13	15	4.7	9.2	6.7	3.3	19	6.6	3.8	15	14	7.3	6.4
14	13	7.2	18	5.5	6.6	15	8.3	3.1	14	7.3	6.4	5.5
15	12	4.7	10	5.5	4.5	12	36	2.9	17	5.2	6.1	5.0
16	9.6	4.2	6.0	4.7	3.5	11	13	2.8	12	5.0	5.5	5.7
17	8.3	5.2	4.7	4.7	3.3	8.6	10	3.1	10	4.7	5.0	14
18	17	4.0	3.9	4.5	3.3	8.0	9.0	2.9	8.6	4.2	5.0	17
19	17	8.0	4.4	4.2	3.1	7.3	8.0	15	8.0	4.0	4.0	12
20	11	6.1	5.0	4.2	2.9	6.4	7.3	17	7.0	3.8	4.2	8.6
21	9.6	8.0	9.0	3.8	2.9	6.4	6.4	8.0	14	3.5	5.0	7.3
22	8.6	6.1	25	3.3	2.7	18	5.8	6.4	8.0	3.1	4.2	9.4
23	8.3	11	14	3.1	2.7	8.6	5.5	5.8	6.7	3.3	3.3	12
24	9.0	9.3	11	8.9	4.5	8.5	5.5	5.5	5.8	2.9	3.1	8.0
25	10	7.3	10	5.5	3.8	8.3	6.4	5.0	5.2	2.7	2.7	7.0
26	9.3	5.8	68	4.0	2.7	8.0	4.5	4.5	4.7	2.6	2.6	7.7
27	19	5.2	51	8.5	2.4	7.7	4.2	4.0	4.2	2.4	2.4	14
28	12	4.7	22	23	2.4	7.3	4.0	4.8	4.5	2.2	4.2	7.7
29	9.3	4.5	14	9.3	------	9.6	3.5	3.8	4.2	2.2	8.8	7.3
30	8.3	4.5	11	11	------	7.7	3.5	3.5	3.8	2.2	70	6.4
31	10	------	9.6	8.3	------	9.3	------	3.5	------	2.9	21	------
TOTAL	286.4	210.3	385.4	223.4	127.8	312.6	235.6	146.0	239.6	123.4	284.1	254.2
MEAN	9.24	7.01	12.4	7.21	4.56	10.1	7.85	4.71	7.99	3.98	9.16	8.47
MAX	19	15	68	23	8.0	45	36	17	28	14	70	17
MIN	1.2	4.0	2.6	3.1	2.4	1.6	3.5	2.6	1.8	2.2	2.4	4.7
AC-FT	568	417	764	443	253	620	467	290	475	245	564	504

CAL YR 1969 TOTAL 2,579.7 MEAN 7.07 MAX 68 MIN 1.1 AC-FT 5,120
WTR YR 1970 TOTAL 2,828.8 MEAN 7.75 MAX 70 MIN 1.2 AC-FT 5,610

PEAK DISCHARGE (BASE, 160 CFS, REVISED)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-26	Unknown	-	/350	6-10	1200	3.43	170
3-12	0300	3.78	222	8-30	0930	4.62	372
4-15	0500	3.71	212				

/ About.

16931000 Atauloma Stream at Afao

LOCATION.--Lat 14°20'10" S., long 170°48'02" W., Tutuila, on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

DRAINAGE AREA.--0.24 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

AVERAGE DISCHARGE.--11 years (1959-70), 1.54 cfs (1,120 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 370 cfs Aug. 30 (gage height, 3.37 ft), from rating curve extended above 26 cfs; minimum, 0.32 cfs Aug. 27.
Period of record: Maximum discharge, 605 cfs Aug. 10, 1967 (gage height, 3.99 ft), from rating curve extended above 26 cfs; minimum, 0.06 cfs Oct. 21, 1963.

REMARKS.--Records good. About 10,000 gal per day diverted above station for use at Atauloma School. Recording rain gage located at station.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	1.1	.57	1.1	1.9	.68	2.6	1.4	.95	.92	.57	2.0
2	.36	1.1	.57	1.5	1.4	.48	2.0	1.1	.86	.74	6.2	1.4
3	.48	.92	.52	1.2	1.2	.52	2.4	.74	.68	.68	1.5	1.2
4	.40	1.0	.48	1.6	1.1	.48	1.5	.68	.52	.68	.86	1.1
5	8.4	2.9	.48	1.1	1.2	.44	1.4	.62	.57	.62	.68	.99
6	2.5	2.0	.48	7.5	1.9	.44	1.8	.62	.48	.57	13	.92
7	2.0	1.4	.62	2.6	1.5	1.0	1.6	.68	.48	.68	1.8	.86
8	1.1	1.1	.44	1.9	1.4	2.1	1.7	.68	.44	.57	1.2	.80
9	.80	.99	.58	4.4	1.1	3.0	1.3	.62	.48	.48	1.1	.86
10	.68	1.1	.44	4.0	1.2	1.6	1.1	.57	10	.48	1.4	.80
11	.62	.92	2.7	2.2	.86	2.5	.99	.57	4.9	1.1	1.6	.62
12	.57	.80	1.2	1.5	.80	21	1.5	1.8	5.6	2.3	1.1	1.5
13	4.4	.74	1.2	1.4	.74	2.8	1.6	.92	2.3	3.2	.99	1.1
14	2.6	.80	1.5	1.1	4.6	1.8	3.0	.68	1.7	1.4	.99	.92
15	2.0	.74	1.3	1.1	1.6	1.4	12	.62	2.3	.92	.80	.80
16	1.4	.79	.86	1.1	1.1	1.4	2.3	1.4	1.8	.80	.68	1.2
17	1.1	1.1	.74	1.9	.99	1.1	1.5	1.1	1.4	.68	.62	5.7
18	2.1	.80	.74	1.5	.80	1.2	1.3	.74	1.3	.62	.57	5.2
19	2.6	.86	.68	1.2	.86	.99	1.1	16	1.1	.57	.52	2.6
20	1.6	.86	.74	.99	.80	1.2	.99	10	.92	.52	.62	1.7
21	1.1	1.5	.62	1.1	.68	.99	.92	2.0	3.6	.52	.80	1.3
22	.99	.92	11	1.1	.74	2.3	.86	1.3	1.4	.48	.62	2.3
23	1.4	3.1	3.5	.99	.57	1.7	.86	1.1	1.1	.48	.52	2.5
24	2.9	1.9	2.1	.86	.74	2.4	.99	.99	1.1	.44	.48	1.5
25	4.6	1.2	2.2	4.1	.93	1.8	2.0	.86	.86	.40	.44	1.2
26	3.3	.92	7.8	1.5	.57	1.4	.99	.74	.80	.40	.40	1.6
27	3.2	.74	9.0	7.2	.48	3.5	.92	.60	.99	.40	.36	2.3
28	1.8	.68	2.6	10	.57	2.6	.86	.00	1.5	.40	.48	1.3
29	1.3	.62	1.9	2.8	------	2.8	.80	.74	.99	.40	1.3	1.1
30	1.1	.80	1.5	2.2	------	5.3	.68	.74	.92	.44	41	1.1
31	1.3	------	1.2	1.6	------	2.6	------	.68	------	.66	3.5	------
TOTAL	59.10	34.40	60.26	74.34	32.33	73.52	53.56	52.17	52.04	23.55	86.70	40.47
MEAN	1.91	1.15	1.94	2.40	1.15	2.37	1.79	1.68	1.73	.76	2.80	1.62
MAX	8.4	3.1	11	10	4.6	21	12	16	10	3.2	41	5.7
MIN	.36	.62	.44	.86	.48	.44	.68	.57	.44	.40	.36	.62
AC-FT	117	68	120	147	64	146	106	103	103	47	172	96

CAL YR 1969 TOTAL 660.25 MEAN 1.81 MAX 16 MIN .35 AC-FT 1,310
WTR YR 1970 TOTAL 650.44 MEAN 1.78 MAX 41 MIN .36 AC-FT 1,290

PEAK DISCHARGE (BASE, 110 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-22	1700	2.30	118	5-19	1630	3.16	305
1-27	1200	2.30	118	5-20	0030	2.35	126
3-12	0230	3.24	327	8- 2	0400	2.27	114
4-15	0430	2.52	156	8-30	0730	3.37	370

16944200 Papa Stream at Nuuuli

LOCATION.--Lat 14°18'48" S., long 170°42'33" W., Tutuila, on right bank 500 ft downstream from Tauese Stream and 0.8 mile northwest of Nuuuli.

DRAINAGE AREA.--0.78 sq mi.

PERIOD OF RECORD.--June 1966 to September 1967, November 1968 to current year.

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

EXTREMES.--Current year: Maximum discharge, 1,110 cfs Aug. 30 (gage height, 4.59 ft, from floodmark in well), from rating curve extended as explained below; no flow for many days.

Period of record: Maximum discharge, 1,110 cfs Aug. 30, 1970 (gage height, 4.59 ft, from floodmark in well), from rating curve extended above 66 cfs on basis of flow-over-road measurement at gage height 3.32 ft; no flow for many days each year.

Flood of Oct. 9, 1967, reached a stage of 3.32 ft, from floodmarks (discharge, 470 cfs, from rating curve extended as explained above).

REMARKS.--Records poor. Diversion by frequent pumping from gage pool for domestic use in the Nuuuli area. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	4.2	1.6	2.5	2.8	1.6	5.7	1.3	.17	2.5	0	7.0
2	0	2.2	1.6	2.4	3.4	.71	3.6	5.7	.81	1.6	4.5	4.4
3	0	1.5	1.2	2.3	2.2	.64	7.1	3.0	0	1.4	2.5	3.4
4	.40	1.6	1.0	2.0	1.5	.79	3.4	2.0	.02	1.9	1.3	3.0
5	4.0	3.5	.87	1.8	3.4	1.4	2.3	1.2	.31	1.4	1.2	2.5
6	3.2	3.0	.96	4.0	4.3	.64	2.9	1.2	.22	.50	6.4	2.0
7	6.1	2.3	.71	3.0	3.8	5.9	2.6	1.4	0	.71	2.2	1.7
8	.90	1.7	2.9	2.5	2.3	14	13	2.2	0	1.6	1.7	2.5
9	.56	1.4	2.7	3.2	1.5	23	6.9	1.4	0	1.4	1.6	3.5
10	.50	2.2	1.7	2.5	1.2	10	4.5	1.2	21	.24	6.4	2.5
11	.44	1.7	27	2.2	1.0	6.7	3.0	1.0	17	8.4	5.4	1.9
12	.40	2.0	6.8	2.0	1.2	57	4.8	1.8	8.7	19	3.0	3.5
13	4.5	1.6	5.0	2.5	.71	6.6	17	1.1	4.8	24	2.8	3.0
14	3.5	5.8	13	1.9	2.6	3.8	13	1.6	7.8	7.2	1.7	2.5
15	2.6	2.5	5.1	1.7	1.6	2.2	31	1.5	6.0	4.5	1.4	1.9
16	1.2	1.9	3.2	1.6	1.4	1.9	6.0	1.2	4.0	3.8	1.4	5.1
17	.50	2.2	2.3	1.5	.87	1.5	4.3	.79	4.3	3.0	1.2	23
18	7.5	1.6	1.9	1.4	.57	1.0	3.2	1.6	3.4	2.5	1.2	10
19	4.2	11	1.9	1.3	.79	3.6	2.5	16	3.0	2.2	1.4	6.6
20	2.6	5.6	2.0	1.2	.87	2.8	1.6	18	3.0	2.0	.50	4.3
21	1.9	12	3.5	1.3	.57	7.6	1.2	5.7	21	2.0	.71	3.2
22	.96	4.8	19	1.9	.36	26	1.4	2.8	4.3	1.6	.71	10
23	1.7	26	9.2	1.0	4.3	5.7	1.5	2.3	3.0	.96	.43	13
24	9.5	11	4.5	.87	9.2	4.4	1.9	1.5	2.8	.36	0	5.1
25	9.5	5.4	5.5	.96	2.3	3.6	1.9	1.7	3.2	0	0	3.2
26	5.4	3.8	67	2.9	1.5	2.6	1.5	1.7	2.8	0	0	2.5
27	15	3.0	48	16	.87	1.9	1.2	1.6	3.0	0	0	2.6
28	5.4	2.3	9.6	12	.71	2.8	1.2	2.5	2.5	0	.60	1.9
29	3.0	1.9	5.1	4.8	------	4.3	1.5	1.6	2.5	0	5.0	2.0
30	2.2	2.4	3.6	7.8	------	32	.96	.52	2.8	0	80	2.0
31	26	------	2.8	3.8	------	9.5	------	.71	------	0	19	------
TOTAL	123.66	132.1	261.24	96.83	57.82	246.18	152.66	87.82	132.43	94.77	154.25	139.8
MEAN	3.99	4.40	8.43	3.12	2.07	7.94	5.09	2.83	4.41	3.06	4.98	4.66
MAX	26	26	67	16	9.2	57	31	18	21	24	80	23
MIN	0	1.4	.71	.87	.36	.64	.96	.52	0	0	0	1.7
AC-FT	245	262	518	192	115	488	303	174	263	188	306	277

CAL YR 1969 TOTAL 1,344.71 MEAN 3.68 MAX 67 MIN 0 AC-FT 2,670
WTR YR 1970 TOTAL 1,679.56 MEAN 4.60 MAX 80 MIN 0 AC-FT 3,330

PEAK DISCHARGE (BASE, 180 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-31	1300	2.97	324	3-22	0030	2.60	215
11-23	1030	3.20	415	4-15	0400	2.72	246
12-26	2100	3.54	570	6-10	1100	3.07	363
3- 9	1930	2.89	297	8-30	/1000	4.59	1,110
3-12	0230	3.50	550				

/ About.
NOTE.--No gage-height record Aug. 28 to Sept. 17.

16948000 Afuelo Stream at Matuu

LOCATION.--Lat 14°18'07" S., long 170°41'07" W., Tutuila, on left bank 0.2 mile northwest of Matuu and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.25 sq mi.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as Matuu Stream at Matuu.

GAGE.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map).

AVERAGE DISCHARGE.--12 years, 1.53 cfs (1,110 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 437 cfs Aug. 30 (gage height, 4.37 ft), from rating curve extended as explained below; minimum, 0.14 cfs July 29, 30.
Period of record: Maximum discharge, 490 cfs Oct. 9, 1967 (gage height, 4.55 ft), from rating curve extended above 8.4 cfs on basis of slope-area measurement of peak flow; minimum, 0.09 cfs Oct. 14, 15, 1965.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area. Published records for high-water periods in the water years 1958-66 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.23	3.9	.64	.90	1.2	.70	2.8	.60	.32	.60	.32	1.6
2	.23	2.7	.62	.87	1.3	.39	1.9	2.0	.35	.47	1.4	.94
3	.26	1.4	.58	.86	.88	.35	4.4	1.7	.29	.39	.82	.70
4	.26	1.9	.55	.63	.56	.32	1.8	1.3	.26	.43	.56	.56
5	.23	3.5	.53	.59	3.0	.39	1.2	.76	.29	.35	.32	.43
6	.23	3.8	.51	2.6	2.6	.39	1.2	.56	.26	.29	1.2	.39
7	.70	1.6	.50	1.3	1.7	1.4	1.2	.76	.23	.43	.47	.35
8	.26	1.1	.48	.95	1.2	4.0	6.2	1.2	.23	.43	.29	.32
9	.21	.94	.47	3.5	.76	7.6	3.6	.65	.23	.35	.29	1.1
10	.16	1.5	.47	1.5	.60	2.7	1.5	.56	6.1	.35	1.5	1.1
11	.16	.94	1.5	.89	.47	2.3	1.0	.47	7.2	1.6	1.5	.47
12	.16	1.0	1.2	.78	.43	16	.94	.76	4.6	3.6	.60	.60
13	2.5	.70	1.1	1.3	.35	1.9	5.2	.76	3.3	4.8	.43	1.4
14	1.7	2.3	1.5	.80	.82	1.2	4.3	1.0	4.4	1.5	.29	1.3
15	1.4	.94	1.1	.73	.47	.94	8.4	.82	3.8	.88	.35	1.5
16	.65	.65	.80	.68	.35	1.0	1.7	.60	1.5	.65	.26	1.1
17	.39	.60	.60	.64	.29	.94	1.2	.43	1.3	.51	.23	3.5
18	6.2	.56	.74	.59	.26	.76	.94	.51	.94	.43	.56	2.4
19	2.0	1.5	.91	.52	.32	3.2	.76	5.9	.76	.35	.29	1.2
20	.94	1.2	1.5	.65	.32	1.9	.65	5.7	.65	.32	.29	.70
21	1.0	4.1	2.0	.56	.26	3.6	.60	1.9	8.7	.29	.43	.47
22	.56	2.0	2.8	.52	.26	7.3	.51	1.1	1.6	.26	.39	1.9
23	1.7	7.4	1.7	.50	2.3	2.3	.47	.76	1.2	.26	.26	3.3
24	6.0	4.0	1.3	.61	4.8	1.6	.51	.60	.94	.23	.23	1.2
25	6.1	2.2	.75	.54	1.2	1.6	.88	.56	.88	.18	.21	.76
26	2.2	1.4	9.1	.58	.56	1.2	.47	.43	.76	.21	.18	.60
27	4.7	1.1	6.3	3.5	.43	1.0	.39	.35	.82	.23	.16	.76
28	2.0	.93	3.4	3.3	.35	1.6	.39	.65	.88	.21	.18	.47
29	.94	.81	1.8	1.2	------	1.5	.47	.35	.65	.21	.56	.51
30	.70	.70	1.2	2.0	------	14	.51	.32	.56	.18	34	.51
31	12	------	.90	1.0	------	4.4	------	.32	------	.35	2.8	------
TOTAL	56.77	57.37	47.55	35.59	28.04	88.48	56.09	34.38	54.00	21.34	51.37	32.14
MEAN	1.83	1.91	1.53	1.15	1.00	2.85	1.07	1.11	1.80	.69	1.66	1.07
MAX	12	7.4	9.1	3.5	4.8	16	8.4	5.9	8.7	4.8	34	3.5
MIN	.16	.56	.47	.50	.26	.32	.39	.32	.23	.18	.16	.32
AC-FT	113	114	94	71	56	176	111	68	107	42	102	64

CAL YR 1969 TOTAL 583.00 MEAN 1.60 MAX 19 MIN .16 AC-FT 1,160
WTR YR 1970 TOTAL 563.12 MEAN 1.54 MAX 34 MIN .16 AC-FT 1,120

PEAK DISCHARGE (BASE, 95 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
10-31	1300	2.78	113	3-12	0230	3.97	139
11-23	Unknown	2.74	108	3-30	1200	2.75	110
12-26	Unknown	3.90	318	8-30	1000	4.37	437
3- 9	1930	2.71	104				

NOTE.--No gage-height record Nov. 18 to Jan. 26.

16960000 Alega Stream at Alega

LOCATION.--Lat 14°16'58" S., long 170°38'19" W., Tutuila, on left bank 300 ft upstream from left-bank tributary, 0.2 mile northwest of Alega, and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.19 sq mi.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as West Branch Alega Stream at Alega.

GAGE.--Water-stage recorder. Altitude of gage is 180 ft (from topographic map).

AVERAGE DISCHARGE.--12 years, 1.31 cfs (949 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 232 cfs Apr. 8 (gage height, 4.48 ft, from recorded range in stage), from rating curve extended above 5.3 cfs; minimum, 0.48 cfs Aug. 24-28.
Period of record: Maximum discharge, 232 cfs Apr. 8, 1970 (gage height, 4.48 ft, from recorded range in stage), from rating curve extended above 5.3 cfs; minimum, 0.30 cfs Aug. 17, 1968.

REMARKS.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station. Records of chemical analyses for the water year 1970 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.75	1.2	.86	1.2	.75	.85	2.9	1.3	.80	1.0	.65	.98
2	.70	1.0	.80	1.2	1.2	.75	2.4	1.2	.86	.98	.65	.80
3	.80	.80	.75	1.2	.80	.60	4.4	2.7	.75	.92	.60	.65
4	.75	.67	.75	1.0	.75	.56	2.6	1.6	.75	1.1	.56	.60
5	.75	1.4	.75	.92	.90	.60	2.2	1.2	.80	.92	.56	.56
6	.80	1.2	.75	2.4	1.2	.65	2.0	1.0	.75	.86	.56	.56
7	.86	.92	.70	1.3	1.3	1.7	1.9	1.3	.75	.86	.52	.56
8	.70	.75	.65	1.0	1.0	3.9	20	1.1	.75	.80	.52	.56
9	.70	.70	.70	3.1	.93	6.9	10	.98	.75	.80	.52	.66
10	.70	.75	.85	2.0	.84	4.1	3.8	.92	2.8	.75	.75	.52
11	.70	.70	1.1	1.3	.80	3.2	2.3	.86	3.0	1.0	.70	.57
12	.65	.65	.90	1.1	.76	21	1.8	.86	2.6	1.2	.56	.65
13	.86	.65	.78	1.2	.80	4.7	2.8	.86	1.6	2.4	.56	.65
14	.86	1.2	1.0	.92	.95	3.3	3.3	.86	2.4	1.2	.52	1.3
15	.75	.86	.85	.92	.85	3.0	5.6	.86	1.7	.92	.56	.65
16	.75	.75	.72	.86	.74	2.7	2.7	.86	1.2	.86	.52	.80
17	.70	.70	.70	.86	.72	2.6	2.1	.80	1.2	.80	.52	.92
18	1.1	.65	.65	.80	.70	2.4	1.9	.80	1.0	.80	.56	2.2
19	.86	1.4	.75	.75	.75	2.3	1.6	4.6	.98	.75	.52	.86
20	.80	.98	.87	.80	.95	2.1	1.4	4.6	2.9	.70	.52	.75
21	.75	3.7	.98	.75	.80	2.2	1.3	1.8	16	.65	.52	.70
22	.70	1.2	1.7	.70	.77	2.7	1.2	1.4	3.0	.65	.52	2.2
23	.75	2.4	1.4	.70	.90	2.0	1.2	1.2	2.1	.65	.52	4.3
24	1.6	4.7	.92	.70	2.5	2.0	1.2	1.1	1.6	.65	.48	1.4
25	2.4	2.0	.80	1.0	1.5	1.8	1.3	1.0	1.4	.65	.52	.98
26	1.2	1.4	7.9	.70	1.1	1.7	1.2	.98	1.3	.65	.48	.92
27	.92	1.2	6.6	.75	.90	1.7	1.1	.92	2.3	.65	.48	.92
28	.80	1.0	2.8	1.6	.75	2.1	1.1	.98	1.6	.60	.52	.80
29	.75	.98	1.8	1.1	------	1.7	1.3	.86	1.3	.60	.70	.75
30	.75	1.0	1.5	.92	------	4.9	1.1	.86	1.2	.60	7.8	.75
31	1.2	------	1.3	.75	------	3.2	------	.86	------	.60	1.4	------
TOTAL	27.36	37.51	43.58	34.50	26.91	93.91	89.7	41.22	60.14	26.57	25.37	29.52
MEAN	.88	1.25	1.41	1.11	.96	3.03	2.99	1.33	2.00	.86	.82	.98
MAX	2.4	4.7	7.9	3.1	2.5	21	20	4.6	16	2.4	7.8	4.3
MIN	.65	.65	.65	.70	.70	.56	1.1	.80	.75	.60	.48	.52
AC-FT	54	74	86	68	53	186	178	82	119	53	50	59

CAL YR 1969 TOTAL 470.70 MEAN 1.29 MAX 11 MIN .44 AC-FT 934
WTR YR 1970 TOTAL 536.29 MEAN 1.47 MAX 21 MIN .48 AC-FT 1,060

PEAK DISCHARGE (BASE, 42 CFS)

DATE	TIME	G. H.	DISCHARGE	DATE	TIME	G. H.	DISCHARGE
12-26	1830	2.78	59	5-19	2100	2.56	46
3- 9	1900	2.53	44	6-21	0430	4.03	174
3-12	0230	3.67	134	8-30	0800	2.69	53
4- 8	Unknown	4.48	232				

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1970

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Kauai				
16011000	Waiakoali Stream near Waimea	Lat 22°07'25", long 159°37'25", Kauai, 0.3 mile upstream from mouth and 12 miles northeast of Waimea.	1.7	1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-70	3-13-70 8- 3-70	1.2 1.0
16012000	Kauaikinana Stream near Waimea	Lat 22°07'45", long 159°38'05", Kauai, 0.6 mile upstream from mouth and 12 miles northeast of Waimea.	1.17	1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-70	3-13-70 8-18-70	1.8 1.7
16029500	Mokihana Stream near Waimea	Lat 21°59'35", long 159°40'03", Kauai, 500 ft upstream from mouth and 2.5 miles north of Waimea.	4.77	1962, 1964-70	3-12-70 7-24-70	1.3 0
		Hawaii, Island of Oahu				
16201000	Right Branch of North Fork Kaukonahua Stream near Wahiawa	Lat 21°31'10", long 157°56'52", Oahu, 200 ft upstream from mouth and 4.5 miles east of Leilehua High School in Wahiawa.	1.17	1913-53≠, 1960-62, 1966, 1968-70	10-29-69 3- 3-70 6- 4-70 7-21-70	1.5 .55 3.6 4.3
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'35", long 157°59'10", Oahu, 0.7 mile west of Pearl City and 1.5 miles east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970	6- 3-70 7-20-70	9.9 11
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'04", long 157°56'46", Oahu, 300 ft downstream from Highway 90 and 0.8 mile west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970	6- 3-70 7-20-70	19 16
16291000	Waiahole Stream at altitude 250 ft, near Waiahole	Lat 21°28'35", long 157°52'30", Oahu, 1.5 miles southwest of Waiahole School and 2.7 miles northwest of Kahaluu.	.99	1955-68≠, 1970	3-30-70	3.6
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", Molokai, 500 ft upstream from Kawailena Stream, 2.2 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	.51	1968-70	10- 3-69 11-12-69 1-16-70 3- 4-70 4-22-70 6-17-70 8- 5-70	1.1 1.2 4.3 1.1 8.1 2.1 1.1

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Molokai--Continued				
16403500	Kawailena Stream near Pelekunu	Lat 21°07'52", long 156°53'05", Molokai, 800 ft upstream from mouth, 2.2 miles south of former village of Pelekunu, and 5.5 miles north of Kamalo.	0.65	1968-70	10- 3-69	1.6
					11-12-69	1.6
					1-16-70	3.9
					3- 4-70	2.0
					4-22-70	7.5
					6-17-70	1.9
					8- 5-70	1.4
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'46", long 156°52'31", Molokai, 400 ft upstream from Kawaipoko Stream, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	.79	1968-70	10- 2-69	2.9
					11-11-69	2.9
					1-15-70	15
					3- 3-70	1.8
					4-21-70	7.6
					6-16-70	5.0
					8- 4-70	2.7
16403800	Kawaipoko Stream near Pelekunu b/	Lat 21°07'48", long 156°52'30", Molokai, 300 ft upstream from mouth, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	.26	1968-70	10- 2-69	.90
					11-11-69	.87
					1-15-70	4.0
					3- 3-70	.27
					4-21-70	4.0
					6-16-70	.93
					8- 4-70	.74
16404000	Pelekunu Stream near Pelekunu	Lat 21°08'11", long 156°52'43", Molokai, 0.4 mile upstream from Pilipililau Stream, 1.8 miles south of former village of Pelekunu, and 5.8 miles north of Kamalo. a/	a2.59	1920-29≠, 1937-57≠, 1968-70	10- 2-69	7.2
					11-11-69	8.0
					1-15-70	34
					3- 3-70	5.6
					4-21-70	19
					6-16-70	10
					8- 4-70	5.8
		Hawaii, Island of Maui				
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'15", long 156°04'42", Maui, on downstream side of Highway 31, 1.3 miles west of Kipahulu, and 3.2 miles east of Kaupo.	.76	1963-68≠, 1970	6-10-70	.24
16502000	Hahalawe Gulch near Kipahulu	Lat 20°40'54", long 156°02'50", Maui, at old ditch intake, 0.7 mile upstream from mouth, and 1.8 miles northeast of Kipahulu Church.	.43	1927-69≠, 1970	10- 1-69	2.6
					2-26-70	.87
					6-10-70	1.6
					7-29-70	2.7
					9-10-70	2.0
		Mariana Islands, Island of Saipan				
16800500	Hasngot Stream	Lat 15°12'44" N., long 145°46'23" E., Saipan, 750 ft upstream from right-bank tributary, 0.5 mile upstream from mouth, and 3.4 miles east of Garapan.	.43	1968-70	10- 2-69	.08
					10-16-69	.07
					10-30-69	.28
					11-13-69	.26
					11-26-69	.16
					12-11-69	.27
					12-30-69	.22
					1- 8-70	.26
					1-22-70	.76
					2- 5-70	.53
					2-19-70	.38
					3- 5-70	.31
					3-19-70	.22
					4- 2-70	.16
					4-16-70	.10
					4-30-70	.06
					5-14-70	.05
					5-28-70	.06
					6-12-70	.05
					6-26-70	.12
					7- 9-70	.08
					7-23-70	.05
					8- 6-70	.15
					8-21-70	.22
					9- 3-70	.06
					9-17-70	.16

≠ Operated as a continuous-record gaging station.
a Revised.
b Formerly published as Kawaipoka Stream near Pelekunu.

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Saipan--Continued				
16802000	Talofofo Stream	Lat 15°13'04" N., long 145°46'44" E., Saipan, 200 ft downstream from confluence of South, Middle and North Forks, 2.4 miles southeast of Tanapag, and 3.8 miles east of Garapan.	1.56	1968-70	10- 2-69	0.10
					10-16-69	.07
					10-30-69	.99
					11-13-69	.69
					11-26-69	.10
					12-11-69	.92
					12-30-69	.40
					1- 8-70	1.0
					1-22-70	.47
					2- 5-70	1.3
					2-19-70	1.0
					3- 5-70	.64
					3-19-70	.28
					4- 2-70	.05
					4-16-70	.14
					4-30-70	.09
					5-14-70	.03
					5-28-70	.10
					6-12-70	.02
					6-18-70	.17
					6-26-70	.06
					7- 9-70	.19
					7-23-70	.02
					8- 6-70	.41
					8-20-70	2.2
					9- 3-70	2.8
					9-17-70	.40
16802500	East Achugau Spring	Lat 15°14'06" N., long 145°46'43" E., Saipan, at spring 0.4 mile east of Mount Dogas and 2.0 miles east of Tanapag.	-	1965, 1969-70	10- 3-69	.05
					10-18-69	.28
					10-31-69	.12
					11-15-69	.12
					11-28-69	.09
					12-12-69	.05
					12-31-69	.11
					1- 9-70	.12
					1-23-70	.25
					2- 6-70	.43
					2-20-70	.16
					3- 6-70	.10
					3-20-70	.15
					4- 3-70	.12
					4-17-70	.10
					5- 1-70	.10
					5-15-70	.10
					6- 1-70	.08
					6-15-70	.06
					6-30-70	.06
					7-10-70	.06
					7-24-70	.85
					8- 7-70	.44
					8-21-70	.05
					9- 4-70	.15
					9-18-70	.12
16804000	West Achugau Spring	Lat 15°14'10" N., long 145°46'10" E., Saipan, at spring 0.9 mile upstream from mouth of Achugau Stream and 1.3 miles east of Tanapag.	-	1968-70	10- 3-69	.02
					10-31-69	.30
					11-15-69	.15
					11-28-69	.08
					12-12-69	.19
					12-31-69	.27
					1- 9-70	.29
					2- 6-70	.43
					2-20-70	.26
					3- 6-70	.13
					3-20-70	.14
					4- 3-70	.14
					4-10-70	.07
					4-17-70	.05
					5- 1-70	.06
					5-15-70	.06
					6- 1-70	.06
					6-15-70	.03
					6-30-70	.02
					7-10-70	.02
					7-24-70	.11
					8-21-70	.26
					9-18-70	.26

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Guam				
16807300	Fonte River at dam, near Nimitz Hill	Lat 13°27'26" N., long 144°43'37" E., Guam, at old diversion dam, 0.4 mile south of Navy Headquarters building on Nimitz Hill, and 1.3 miles south of Coontz Junction at Adelup.	0.68	1961-70	3-20-70 4-28-70 6- 3-70	0.30 .17 .14
16807700	Masso River at dam, near Piti	Lat 13°27'21" N., long 144°41'33" E., Guam, at foot of spillway of old earthfill dam, 200 ft downstream from left-bank tributary, and 0.2 mile southeast of New Piti School.	.67	1962, 1964-65, 1967-70	3-20-70 4-28-70 6- 3-70	.17 .07 .10
16808200	Faata Springs at Agat	Lat 13°22'35" N., long 144°39'47" E., Guam, 0.7 mile south of Agat Junior High School and 0.8 mile southwest of Santa Rita Catholic Church.	-	1963-70	3-20-70 4-28-70 6- 4-70	.27 .21 .20
16808500	Taleyfac River near Agat	Lat 13°21'35" N., long 144°38'57" E., Guam, 800 ft upstream from bridge on Highway 2 at Biyae and 1.7 miles south of Mount Carmel School in Agat.	1.94	1959-70	3-20-70 4-28-70 6- 4-70	.62 .42 .32
16809200	Cetti River above tributary, near Umatac	Lat 13°18'59" N., long 144°39'24" E., Guam, 20 ft upstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.3 miles north of Sanchez School in Umatac.	.37	1961-62, 1964-66, 1969-70	3-19-70 4-27-70 5-28-70	.31 .22 .26
16809400	Cetti River near Umatac	Lat 13°18'58" N., long 144°39'23" E., Guam, 30 ft downstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.3 miles north of Sanchez School in Umatac.	.74	1960-67≠, 1968-70	3-19-70 4-27-70 5-28-70	.58 .22 .40
16809600	La Sa Fua River near Umatac	Lat 13°18'23" N., long 144°39'45" E., Guam, 0.6 mile north of Sanchez School in Umatac and 0.8 mile upstream from mouth.	1.06	1953-60≠, 1961-63, 1966, 1969-70	3-19-70 4-29-70 6- 3-70	1.2 .58 .36
16812000	Madog River near Umatac	Lat 13°17'24" N., long 144°40'30" E., Guam, 50 ft downstream from right-bank tributary and 1.1 miles southeast of Sanchez School in Umatac.	.34	1960-70	3-19-70 4-27-70 5-28-70	.28 .19 .11
16813000	Piga Spring near Umatac	Lat 13°17'56" N., long 144°40'49" E., Guam, on left bank of Astaban River right-bank tributary, 0.3 mile west of Mount Bolanos, and 1.3 miles east of Sanchez School in Umatac.	-	1955, 1961-65, 1967-70	3-19-70 4-27-70 5-28-70	.15 .16 .13
16814000	Astaban River at Umatac	Lat 13°17'41" N., long 144°40'15" E., Guam, 200 ft upstream from mouth and 0.7 mile southeast of Sanchez School in Umatac.	.37	1960-70	3-19-70 4-27-70 5-28-70	.08 .08 .07
16815800	Laelae River at Umatac	Lat 13°17'50" N., long 144°39'51" E., Guam, 100 ft upstream from mouth and 0.2 mile east of Sanchez School in Umatac.	.95	1960-70	3-19-70 4-27-70 5-28-70	.66 .31 .55
16817000	Toguan River near Umatac	Lat 13°17'03" N., long 144°39'36" E., Guam, at Highway 4 bridge, 100 ft upstream from mouth, and 0.9 mile south of Umatac.	.47	1952, 1960-70	3-19-70 4-27-70 5-28-70	.09 .11 .05
16820000	Geus River above Siligin Spring tributary, near Merizo	Lat 13°16'38" N., long 144°40'56" E., Guam, 100 ft upstream from Siligin Spring tributary, 0.1 mile upstream from dam, and 1.5 miles northeast of Merizo School.	.50	1960-70	3-23-70 4-27-70 6- 2-70	.16 .07 .07
16820500	Siligin Spring near Merizo	Lat 13°16'38" N., long 144°40'55" E., Guam, 120 ft upstream from mouth of Siligin Spring tributary, 0.1 mile upstream from diversion dam, and 1.5 miles northeast of Merizo School.	-	1954, 1961-70	3-23-70 4-27-70 6- 2-70	.05 .04 .03

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Guam--Continued				
16820700	Geus River below Siligin Spring tributary, near Merizo	Lat 13°16'35" N., long 144°40'53" E., Guam, 100 ft upstream from diversion dam, 300 ft downstream from Siligin Spring tributary, and 1.4 miles northeast of Merizo School.	0.67	1962-70	3-23-70 4-27-70 6- 2-70	0.34 .32 .30
16825000	Ajayan River near Inarajan	Lat 13°15'16" N., long 144°42'56" E., Guam, 0.4 mile upstream from mouth and 2.4 miles southwest of Inarajan Catholic Church.	1.15	1962-70	3-23-70 5- 6-70 6- 2-70	.14 .11 .12
16828000	Agfayan River near Inarajan	Lat 13°16'05" N., long 144°43'42" E., Guam, 0.6 mile upstream from mouth and 1.2 miles west of Inarajan Catholic Church.	1.64	1962-65, 1967-70	3-23-70 4-22-70 5-20-70 6- 2-70 6-18-70 8-11-70 9-16-70	.11 .39 .08 .25 .32 6.3 1.2
16830000	Pasamano River near Inarajan	Lat 13°16'59" N., long 144°43'26" E., Guam, 25 ft upstream from confluence with Yledigao River and 1.7 miles northwest of Inarajan Catholic Church.	1.40	1960-70	3-23-70 4-22-70 6- 2-70	1.2 .84 .58
16831000	Yledigao River near Inarajan	Lat 13°17'00" N., long 144°43'26" E., Guam, 75 ft upstream from confluence with Pasamano River and 1.7 miles northwest of Inarajan Catholic Church.	1.07	1960-70	3-23-70 4-22-70 6- 2-70	.93 1.1 .51
16833000	Fintasa River near Inarajan	Lat 13°17'18" N., long 144°43'54" E., Guam, 100 ft upstream from falls, 0.4 mile upstream from confluence with Fensol River, and 1.5 miles northwest of Inarajan Catholic Church.	.79	1960-70	3-23-70 4-22-70 6- 2-70	.88 .69 .42
16834000	Fensol River near Inarajan	Lat 13°17'09" N., long 144°44'08" E., Guam, 300 ft upstream from confluence with Fintasa River and 1.1 miles northwest of Inarajan Catholic Church.	.40	1960-70	3-23-70 4-22-70 6- 2-70	.14 .14 .09
16842000	Asalonso River near Talofofo	Lat 13°19'43" N., long 144°45'34" E., Guam, 10 ft downstream from left-bank tributary, 500 ft downstream from bridge on Highway 4, and 1.6 miles south of Talofofo. a/	a1.83	1952, 1961-70	3-20-70 4-29-70 6- 8-70	.43 .31 .29
b16853000	Ugum River above Bubulao River, near Talofofo b/	Lat 13°19'08" N., long 144°43'46" E., Guam, 50 ft upstream from Bubulao River, 0.8 mile northwest of NASA Tracking Station, and 2.8 miles southwest of Talofofo. a/	2.64	1961-70	3-26-70 6- 2-70	3.3 1.7
16854000	Bubulao River near Talofofo c/	Lat 13°19'08" N., long 144°43'45" E., Guam, 50 ft upstream from mouth, 0.8 mile northwest of NASA Tracking Station, and 2.8 miles southwest of Talofofo.	2.91	1961-70	3-26-70 6- 2-70	3.6 2.6
16859000	Manengon River near Yona	Lat 13°24'02" N., long 144°45'01" E., Guam, 200 ft downstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.7 miles west of Saint Francis School at Yona.	2.01	1960-62, 1964-66, 1968-70	3-20-70 4-28-70 6- 4-70	.42 .48 .24
16867000	Janum Spring near Yigo	Lat 13°30'56" N., long 144°54'47" E., Guam, in cave at sea level in limestone cliff on edge of reef, 1.3 miles south of Mount Santa Rosa, and 2.2 miles southeast of Yigo. a/	-	1953-56, 1958, 1960-62, 1964-65, 1967-70	6-22-70	3.2

a Revised.
b Formerly published as 16-8545, Right Branch Ugum River near Talofofo.
c Formerly published as Left Branch Ugum River near Talofofo.

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record)	Measurements	
					Date	Discharge (cfs)
		Ryukyu Islands, Island of Okinawa				
16875700	Hiji-gawa at Hiji	Lat 26°43'12" N., long 128°10'40" E., Okinawa, at Hiji, 0.4 mile upstream from Taihoza-gawa, and 1.1 miles east of Hama.	3.3	1964-70	1- 6-70 9-22-70	2.7 7.1
16875800	Taihoza-gawa at Hiji	Lat 26°43'21" N., long 128°10'55" E., Okinawa, 0.2 mile east of Hiji, 0.6 mile upstream from mouth, and 1.4 miles northeast of Hama.	2.3	1964-70	1- 6-70 9-22-70	1.7 5.6
16876500	Taiho-okawa at Taiho	Lat 26°39'01" N., long 128°08'37" E., Okinawa, 1.0 mile east of Taiho and 1.7 miles north of Taira.	5.2	1964-70	2-24-70 9-23-70	5.0 9.9
16877200	North Fork Henan-gawa at Tsuha	Lat 26°38'28" N., long 128°05'47" E., Okinawa, 0.4 mile upstream from confluence with South Fork and 0.8 mile south of Tsuha.	1.4	1964-70	2-25-70 9-22-70	1.1 1.8
16878000	Makiya-okawa at Makiya	Lat 26°37'10" N., long 128°02'18" E., Okinawa, 0.3 mile south of Makiya, 0.5 mile east of Nakaoshi, and 0.6 mile upstream from mouth.	1.7	1964-70	12-23-69 9-23-70	1.3 2.8
16879400	Yofuke-gawa at Yofuke	Lat 26°34'02" N., long 127°59'43" E., Okinawa, 0.6 mile southeast of Yofuke and 0.6 mile northeast of Sukuta.	1.2	1964-70	1- 9-70	.40
16879600	Fukuchi-gawa at Kyoda	Lat 26°32'37" N., long 127°58'40" E., Okinawa, 0.7 mile southeast of Kyoda and 1.5 miles southwest of Sukuta.	1.1	1964-70	1- 9-70	.41
16883500	Suginda-gawa at Suginda	Lat 26°32'41" N., long 128°01'56" E., Okinawa, 0.1 mile west of Suginda and 0.4 mile south of Futami.	.9	1964-70	1- 5-70 9-23-70	.95 4.8
16883600	Oura-gawa at Oura	Lat 26°33'32" N., long 128°02'35" E., Okinawa, 0.5 mile north of Oura and 1.0 mile northwest of Sedake.	3.1	1964-70	11- 6-69 11-20-69 1- 5-70 9-23-70	3.7 3.7 2.6 6.5
16883800	Teema-gawa at Mihara	Lat 26°33'11" N., long 128°04'48" E., Okinawa, downstream from Mihara-gawa, 0.1 mile southeast of Mihara-sho-chugakko (school), and 0.9 mile east of Teema.	3.2	1964-70	1- 5-70 9-23-70	4.5 4.4
		Caroline Islands, Palau Islands				
16891320	Kumekumeyel River, Babelthuap	Lat 7°23'01" N., long 134°33'34" E., Babelthuap, 100 ft upstream from confinence with Gaden River, 1.1 miles west of Mount Kabekobekushi, and 1.9 miles north of Airai.	1.55	1970	4-15-70 4-29-70 5-18-70 6-10-70 7- 1-70 7-23-70 8-19-70 9- 8-70	1.6 1.8 1.5 3.4 9.3 8.8 12 7.6
16891700	Unnamed west coast stream, Arakabesan	Lat 7°21'14" N., long 134°27'10" E., Arakabesan, 0.1 mile upstream from mouth and 0.15 mile north of village of Arakabesan.	.08	1970	4-15-70	.01
16891750	Unnamed south coast stream, Arakabesan	Lat 7°20'41" N., long 134°27'29" E., Arakabesan, 0.1 mile upstream from mouth and 0.6 mile southeast of village of Arakabesan.	.03	1970	4-15-70 5- 5-70 5-14-70 6- 9-70 6-29-70 7-24-70 8-20-70 9-10-70 9-30-70	.02 .02 .04 .04 .09 .08 .10 .10 .12

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Caroline Islands, Yap Islands				
16892450	Fara Swamp outlets, Yap	Lat 9°29'06" N., long 138°04'06" E. and lat 9°29'12" N., long 138°04'03" E., Yap, 0.9 mile northwest of Lamer and 4.1 miles southwest of Colonia.	0.29	1968-70	10-16-69	0.10
					6-14-70	.07
					7-30-70	.30
					9- 1-70	4.4
16892460	Galngun Swamp outlet, Yap	Lat 9°29'02" N., long 138°04'23" E., Yap, 0.5 mile northwest of Lamer and 3.9 miles southwest of Colonia.	.16	1968-70	7-14-70	.15
					7-30-70	.24
					9- 1-70	2.8
					9-18-70	.15
16892500	Tamaney Stream, Yap	Lat 9°29'45" N., long 138°05'34" E., Yap, at abandoned German dam, 0.5 mile northwest of Inuf, and 2.3 miles southwest of Colonia.	.21	1968-70	10-14-69	.15
					11- 6-69	.24
					11-20-69	.06
					5-12-70	.39
					7-14-70	.07
					7-30-70	.39
					9- 2-70	3.8
					9-22-70	.38
16892600	Ripu Stream, Yap	Lat 9°30'05" N., long 138°06'02" E., Yap, 1,000 ft upstream from mouth and 1.6 miles southwest of Colonia.	.24	1968-70	10-16-69	.19
					11- 4-69	.15
					11-20-69	.07
					7-14-70	.10
					7-31-70	.05
					9- 2-70	3.3
					9-22-70	.21
16892700	Thalomar Stream, Yap	Lat 9°30'27" N., long 138°06'05" E., Yap, 5 ft upstream from confluence with Dinay Stream and 1.4 miles southwest of Colonia.	.14	1965, 1968-70	10-14-69	.32
					11- 4-69	.25
					7-14-70	.08
					7-30-70	.74
					9- 2-70	3.8
					9-23-70	.26
16893050	Mabu Stream, Yap	Lat 9°31'07" N., long 138°06'52" E., Yap, 500 ft upstream from mouth and 0.4 mile northwest of Colonia.	.30	1968-70	10- 8-69	.14
					11- 4-69	.37
					11-20-69	.11
					1-21-70	.42
					7-14-70	.03
					7-30-70	.08
					9- 2-70	7.2
					9-24-70	1.6
16893310	Bileiy Stream, Gagil-Tomil	Lat 9°32'15" N., long 138°11'11" E., Gagil-Tomil, 0.3 mile downstream from Bileiy Spring, 0.4 mile upstream from mouth, and 0.4 mile south of Gatjapar.	.15	1968-70	11- 6-69	.88
					11-18-69	.32
					1-14-70	.24
					1-29-70	.20
					8-31-70	1.2
					9-15-70	.15
					9-29-70	.19
16893350	Yanbilang Stream, Gagil-Tomil	Lat 9°32'45" N., long 138°11'26"E., Gagil-Tomil, 500 ft upstream from mouth and 0.3 mile northeast of Gatjapar.	.03	1968-70	10-15-69	.02
					11- 6-69	.12
					8-31-70	.71
					9-29-70	.07
		Caroline Islands, Truk Islands				
16893900	Pou Stream, Moen	Lat 7°26'53" N., long 151°51'21" E., Moen, 0.6 mile north of Mount Teroken and 0.4 mile upstream from mouth.	.17	1968-70	11- 5-69	1.7
					12- 3-69	.62
					4-17-70	.08
					4-30-70	.31
					5-13-70	.32
16894300	Nefounumas Spring, Moen	Lat 7°25'50" N., long 151°51'35" E., Moen, 0.2 mile upstream from mouth of Nefounumas Stream and 0.6 mile southeast of Mount Teroken.	-	1969-70	11- 5-69	.24
16895100	Afeibung Stream, Tol	Lat 7°20'55" N., long 151°37'22" E., Tol, 0.3 mile upstream from mouth and 0.6 mile northwest of Mount Tumuital.	.08	1968-70	10- 7-69	.80
					3- 3-70	.08
					3-20-70	.04
					4- 2-70	.02
					4-16-70	.02
					5-11-70	.11
					7-10-70	.09
					9-15-70	.04

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Caroline Islands, Truk Islands--Continued				
16897000	Fansinifo Stream, Dublon Island	Lat 7°22'39" N., long 151°52'44" E., Dublon Island, 700 ft upstream from mouth and 0.5 mile northeast of Mount Tolomen.	0.06	1955-57≠, 1969-70	10-15-69	0.29
					10-27-69	.61
					11-26-69	1.2
					1- 7-70	.52
					1-23-70	.15
					1-30-70	.12
					3-27-70	.07
					4-13-70	.07
					5- 5-70	.07
					7- 7-70	.13
					7-22-70	.06
		Caroline Islands, Island of Ponape				
16897800	Tawenjokola River at mouth	Lat 6°56'42" N., long 158°13'50" E., Ponape, 0.1 mile upstream from mouth and 1.1 miles southwest of Tolenot Peak.	10.9	1970	2-22-70	42
16898000	Lui River tributary No. 2	Lat 6°55'20" N., long 158°12'55" E., Ponape, 0.3 mile upstream from mouth and 1.5 miles southeast of Rekisau.	.04	1970	2-19-70	1.1
					3-25-70	.40
					5-11-70	.35
					5-19-70	1.1
					6- 4-70	.29
					6-18-70	1.2
					7-21-70	1.2
					8- 7-70	.37
					9- 1-70	2.1
					9-24-70	2.1
16898100	Lui River tributary	Lat 6°57'04" N., long 158°13'15" E., Ponape, at mouth and 1.4 miles southwest of Tolenot Peak.	.36	1970	2-14-70	1.6
					5-11-70	1.2
					5-20-70	10
					6-19-70	4.8
					7-20-70	1.4
					9- 2-70	4.6
					9-22-70	.99
		Samoa Islands, Island of Tutuila				
16905000	Lepa Stream at Aoa	Lat 14°16'21" S., long 170°35'17" W., Tutuila, 0.5 mile upstream from mouth and 0.6 mile southwest of Aoa.	.09	1959-61, 1963-65, 1967-68, 1970	9-12-70	.07
16907000	Panota Stream at Masausi	Lat 14°15'54" S., long 170°36'09" W., Tutuila, 0.1 mile southeast of Masausi and 0.2 mile upstream from mouth.	.06	1959-60, 1962-64, 1968, 1970	9-12-70	.09
16908000	Vaipito Stream at Masausi	Lat 14°16'05" S., long 170°36'18" W., Tutuila, 0.2 mile south of Masausi and 0.3 mile upstream from mouth.	.08	1959-60, 1962-64, 1967-68, 1970	9-12-70	.07
16909500	Talaloa Stream at Masefau	Lat 14°15'51" S., long 170°38'07" W., Tutuila, 50 ft downstream from right-bank tributary, 0.5 mile southwest of Masefau, and 0.5 mile upstream from mouth.	.47	1959-60, 1962-64, 1967-68, 1970	9-12-70	.54
16916000	Leua Stream at Fagasa	Lat 14°17'24" S., long 170°43'00" W., Tutuila, 0.2 mile northeast of Fagasa and 0.2 mile upstream from mouth.	.14	1959-61, 1963-65, 1968, 1970	9-13-70	.29
16926000	Vaitele Stream at Poloa	Lat 14°19'18" S., long 170°49'36" W., Tutuila, 750 ft upstream from unnamed tributary on right and 0.4 mile east of Poloa.	.11	1959-61, 1963-64, 1970	9-14-70	.49
16928000	Afutele Stream at Agugulu	Lat 14°20'05" S., long 170°49'06" W., Tutuila, 30 ft downstream from right-bank tributary at Agugulu and 0.1 mile upstream from mouth.	.17	1959-61, 1963-65, 1968, 1970	9-14-70	.57
					9-29-70	.59

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1970--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Samoa Islands, Island of Tutuila--Continued				
16929000	Vaialae Stream at Utumea	Lat 14°19'56" S., long 170°48'50" W., Tutuila, 0.1 mile north of Utumea and 0.1 mile upstream from mouth.	0.15	1959-61, 1963-65, 1968, 1970	9-14-70	0.56
16930000	Soonapule Stream at Seetaga	Lat 14°19'42" S., long 170°48'36" W., Tutuila, 50 ft upstream from Utanuatele Stream and 0.1 mile north of Seetaga.	.16	1959-61, 1963-64, 1968, 1970	9-14-70	.56
16930200	Utanuatele Stream at Seetaga	Lat 14°19'41" S., long 170°48'35" W., Tutuila, 200 ft upstream from mouth and 0.2 mile north of Seetaga.	.21	1960-61, 1963-64, 1968, 1970	9-14-70	.60
16932000	Asili Stream near Asili	Lat 14°19'46" S., long 170°47'42" W., Tutuila, 0.4 mile north of Asili and 0.5 mile upstream from mouth.	.55	1959-61, 1963-65, 1968, 1970	9-14-70	2.0
16941000	Mapusagatuai Stream at Mapusaga	Lat 14°19'38" S., long 170°44'48" W., Tutuila, 0.3 mile west of Mapusaga and 1.2 miles upstream from mouth.	.08	1959-61, 1963-65, 1968, 1970	9-17-70	.20
16949700	Vaima Stream at Pago Pago	Lat 14°17'30" S., long 170°42'29" W., Tutuila, 0.4 mile upstream from mouth and 1.0 mile southwest of Pago Pago.	.05	1959-65, 1967-68, 1970	9-13-70 9-30-70	.22 .35
16949800	Utumoa Stream near Pago Pago	Lat 14°17'35" S., long 170°42'20" W., Tutuila, 0.6 mile upstream from mouth and 1.1 miles south of Pago Pago.	.07	1960-61, 1963-65, 1967-68, 1970	9-13-70 9-30-70	.40 .24
16951000	Vaipito Stream at Pago Pago	Lat 14°16'57" S., long 170°42'16" W., Tutuila, 800 ft upstream from Pago Stream and 0.3 mile southwest of highway junction in Pago Pago.	.75	1966-67, 1969-70	8- 4-70	1.6
16952500	Lalolamauta Stream at Aua	Lat 14°16'25" S., long 170°39'31" W., Tutuila, 300 ft upstream from Amano Stream and 0.4 mile east of Aua.	.14	1959-61, 1963-65, 1968, 1970	9-15-70	.83
16956000	Vaitele Stream at Lauliituai	Lat 14°17'05" S., long 170°39'07" W., Tutuila, 200 ft upstream from left-bank tributary, 0.5 mile north of Lauliituai, and 0.7 mile upstream from mouth.	.19	1959-61, 1963-65, 1968, 1970	9-15-70	.75
16959000	Visa Stream at Aumi	Lat 14°17'27" S., long 170°38'36" W., Tutuila, 100 ft upstream from highway bridge and 0.2 mile east of Aumi.	.16	1957-58≠, 1963-64, 1968-70	9-11-70	.26
16963000	Televai Stream at Amouli	Lat 14°16'25" S., long 170°34'55" W., Tutuila, 50 ft downstream from right-bank tributary, 0.1 mile upstream from Tuavaa Stream, and 0.3 mile north of Amouli.	.10	1959-61, 1963-65, 1968, 1970	9-12-70	.10
16964000	Leafu Stream at Auasi	Lat 14°16'28" S., long 170°34'26" W., Tutuila, 0.1 mile north of Auasi and 0.2 mile upstream from mouth.	.12	1959-61, 1963-65, 1968, 1970	9-15-70	.07
16965000	Vaialili Stream at Alao	Lat 14°16'15" S., long 170°34'08" W., Tutuila, 0.2 mile upstream from Vaifusi Stream and 0.5 mile southwest of Alao.	.10	1959-61, 1963-65, 1968, 1970	9-15-70	.07
16966000	Vaifusi Stream at Alao	Lat 14°16'08" S., long 170°34'05" W., Tutuila, 400 ft upstream from mouth and 0.3 mile west of Alao.	.02	1959-61, 1963-65, 1968, 1970	9-15-70	.01

≠ Operated as a continuous-record gaging station.

Crest-stage partial-record stations

Crest-stage partial-record station records for the State of Hawaii are published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations not included in that report. 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 of 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 obtained, and discharge measurements 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 1970

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Ryukyu Islands, Island of Okinawa					
16881200	Kanegusuku-gawa at Kanegusuku	Lat 26°11'31" N., long 127°43'36" E., Okinawa, 0.2 mile northwest of Kanegusuku and 1.3 miles east of Kokubu.	3.0	1964-70#	6-14-70	7.2	(/)
16881500	Mukue-gawa near Itomancho	Lat 26°07'58" N., long 127°41'22" E., Okinawa, at highway bridge, 0.6 mile west of Yoza, and 0.9 mile northeast of Itomancho.	6.4	1964-70#	6-14-70	8.4	(/)

/ Not determined.
Gage heights only.

Discharge measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1970

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Hawaii, Island of Molokai						
Left-bank tributary	Pilipililau Stream	Lat 21°08'11", long 156°53'07", Molokai, 200 ft upstream from mouth, 1.9 miles south of former village of Pelekunu, and 5.8 miles north of Kanalo.		1969	10- 3-69 11-12-69 1-16-70 3- 4-70 4-22-70 6-17-70 8- 5-70	0.15 .16 .77 .22 .86 .16 .11
Waikolu Stream	Pacific Ocean	Lat 21°08'54", long 156°55'25", Molokai, at altitude 780 ft, 0.4 mile northwest of Molokai tunnel east portal, and 5.4 miles southeast of lighthouse near Kalaupapa.		1960-61, 1969	10- 1-69 11-14-69 1-19-70 3- 6-70 8- 7-70	2.5 2.8 2.6 2.6 1.2
Waikolu Stream	Pacific Ocean	Lat 21°09'02", long 156°55'28", Molokai, at altitude 700 ft, 0.5 mile northwest of Molokai tunnel east portal, and 5.3 miles southeast of lighthouse near Kalaupapa.			6-19-70 8- 7-70	1.8 1.6
Waikolu Stream	Pacific Ocean	Lat 21°09'05", long 156°55'32", Molokai, at altitude 640 ft, 0.6 mile northwest of Molokai tunnel east portal, and 5.2 miles southeast of lighthouse near Kalaupapa.			8- 7-70	2.6
Waikolu Stream	Pacific Ocean	Lat 21°09'10", long 156°55'33", Molokai, at altitude 600 ft, 0.7 mile northwest of Molokai tunnel east portal, and 5.1 miles southeast of lighthouse near Kalaupapa.		1969	10- 1-69 11-14-69 1-19-70 3- 6-70 6-19-70 8- 7-70	4.5 5.3 4.5 3.7 3.1 2.7
Waikolu Stream	Pacific Ocean	Lat 21°09'11", long 156°55'33", Molokai, at altitude 590 ft, 0.7 mile northwest of Molokai tunnel east portal, and 5.1 miles southeast of lighthouse near Kalaupapa.			8- 7-70	2.7
Waikolu Stream	Pacific Ocean	Lat 21°09'17", long 156°55'35", Molokai, at altitude 520 ft, 0.8 mile northwest of Molokai tunnel east portal, and 4.9 miles southeast of lighthouse near Kalaupapa.			8- 7-70	3.0
Hawaii, Island of Maui						
Right-bank tributary	Manawainui Stream	Lat 20°41'35", long 156°07'48", Maui, 20 ft downstream from Kaupo Ranch pipeline intake, 3.7 miles north of Kaupo, and 4.0 miles northwest of Mokuia Point.			5-27-70	.92
Manawainui Stream	Pacific Ocean	Lat 20°40'35", long 156°07'28", Maui, 0.4 mile upstream from Healani Stream, 2.5 miles north of Kaupo, and 2.9 miles northwest of Mokuia Point.			3- 4-70	1.1
Manawainui Stream	Pacific Ocean	Lat 20°40'22", long 156°07'33", Maui, 400 ft upstream from Healani Stream, 2.3 miles north of Kaupo, and 2.7 miles northwest of Mokuia Point.			3- 4-70	1.8
Kalepa Gulch	Pacific Ocean	Lat 20°39'05", long 156°05'24", Maui, 300 ft upstream from Highway 31, 0.2 mile north of Kalepa Point, and 2.4 miles east of Kaupo.			6-10-70	0
Alelele Stream	Pacific Ocean	Lat 20°39'05", long 156°05'15", Maui, 100 ft downstream from Highway 31, 0.3 mile northeast at Kalepa Point, and 2.6 miles east of Kaupo.			6-10-70	.64

Discharge measurements made at miscellaneous sites during water year 1970--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Maui--Continued				
Lelekea Stream	Pacific Ocean	Lat 20°39'15", long 156°05'02", Maui, at upstream side of Highway 31, 0.5 mile northeast of Kalepa Point, and 2.8 miles east of Kaupo.			6-10-70	0
Opelu Gulch	Pacific Ocean	Lat 20°39'15", long 156°04'36", Maui, at upstream side of Highway 31, 0.7 mile northwest of Kakanoni Point, and 1.3 miles west of Kipahulu.			6-10-70	0
Koukouai Gulch	Pacific Ocean	Lat 20°39'15", long 156°03'48", Maui, at upstream side of Highway 31, 0.5 mile northwest of Ahole Rock and 0.5 mile southwest of Kipahulu.			6-10-70	.26
Kalena Stream	Pacific Ocean	Lat 20°39'20", long 156°03'41", Maui, at upstream side of Highway 31, 0.4 mile southwest of Kipahulu, and 0.5 mile northwest of Ahole Rock.			6-10-70	0
Puaaluu Gulch	Pacific Ocean	Lat 20°40'39", long 156°03'00", Maui, 0.5 mile upstream from Highway 31, 1.0 mile northwest of Kuloa Point, and 1.4 miles north of Kipahulu.			6-10-70	.28
		Hawaii, Island of Hawaii				
West Branch Honokane Iki Stream	Honokane Iki Stream	Lat 20°09'47", long 155°43'25", Hawaii, 30 ft downstream from trail crossing, 1.8 miles upstream from confluence with East Branch, and 4.5 miles south of Niulii.		1961-69	11-19-69 1-21-70 3-25-70 5-27-70 7-28-70	.04 .18 1.2 13 1.1
East Branch Honokane Nui Stream	Honokane Nui Stream	Lat 20°08'58", long 155°43'59", Hawaii, at trail crossing, 0.2 mile upstream from confluence with West Branch, and 5.3 miles south of Niulii.		1964-69	11-18-69 1-20-70 3-24-70 7-28-70	3.2 2.8 9.1 9.0
Kawa Springs	Pacific Ocean	Lat 19°06'51", long 155°31'47", Hawaii, 0.2 mile southwest of Keeku Heiau and 2.0 miles northeast of sugar mill at Honuapo.		1964-69	5-21-70	10
Mountain House tunnel	Hilea Gulch	Lat 19°09'30", long 155°36'58", Hawaii, 6.1 miles north of Waiohinu and 6.1 miles northwest of Honuapo.			7-16-70	9.0
Ninole Springs	Pacific Ocean	Lat 19°07'57", long 155°30'54", Hawaii, 0.7 mile southwest of Punaluu and 3.6 miles northeast of Honuapo.		1963-69	5-21-70	25
		Ryukyu Islands, Island of Okinawa				
Fun-gawa	Aha-gawa	Lat 26°42'51" N., long 128°17'19" E., Okinawa, 700 ft upstream from mouth and 0.2 mile east of Aha School.		1968	12-15-69 5- 7-70	10 17
		Caroline Islands, Palau Islands				
Tabagaten River	Pacific Ocean	Lat 7°27'00" N., long 134°32'05" E., Babelthuap, 0.3 mile downstream from left-bank tributary, 0.7 mile northeast of Mount Karukail, and 1.0 mile south of Ngatpang.	6.34		7-16-69 9-26-69 11- 6-69 12-23-69 1-15-70 3-24-70 4-14-70 4-28-70 5-25-70 6-18-70 7-15-70 7-29-70 8-14-70 9-11-70 9-26-70	77 32 27 32 21 8.5 7.7 3.8 8.4 54 124 51 124 34 65
		Samoa Islands, Island of Tutuila				
Fagalii Stream	Pacific Ocean	Lat 14°18'45" S., long 170°49'25" W., Tutuila, at Fagalii, 600 ft upstream from mouth, and 700 ft downstream from left-bank tributary.			8- 5-70	.80

PART 2. WATER QUALITY RECORDS

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hawaii, at gaging station 0.7 mile downstream from Pohakupaa Stream, 4.1 miles west of Papaikou, and 4.8 miles northwest of Hilo Post Office.
DRAINAGE AREA.--11.6 sq mi.
PERIOD OF RECORD.--Chemical analyses: September 1969 to September 1970.
Sediment records: Water years 1969-70 (partial-record station).
REMARKS.--Sediment data for this station on page 276.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
OCT.												
14...	0945	13	19.0	22	7.5	4.1	4.1	.3	48	0	--	4.0
NOV.												
26...	0935	162	16.0	2.3	1.1	.6	1.7	.3	4	0	.0	4.0
DEC.												
17...	1100	36	17.0	8.4	2.7	1.6	2.2	.2	15	0	.0	4.0
JAN.												
29...	1045	10	17.0	23	7.6	4.2	3.7	.3	48	0	1.0	4.0
FEB.												
25...	0920	5.5	17.0	23	8.8	4.7	4.8	.4	53	0	1.6	4.5
MAR.												
30...	1030	25	18.0	7.5	2.9	1.8	2.5	.1	18	0	1.6	4.0
MAY												
05...	1420	52	19.0	7.8	2.5	1.4	2.3	.2	14	0	.6	3.5
JUNE												
08...	1405	31	19.5	11	3.7	2.0	2.7	.3	22	0	.0	4.0
JULY												
23...	1015	26	19.5	12	3.9	2.2	2.7	.4	22	0	.0	3.0
AUG.												
20...	1410	33	24.0	7.8	3.1	2.1	2.4	.2	19	0	.0	3.0
SEPT.												
24...	--	34	21.0	--	--	--	--	--	--	--	--	--

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	ALKA-LINITY AS CACO3 (MG/L)	TUR-BID-ITY (JTU)
OCT.												
14...	.1	--	--	.10	36	0	20	.3	87	6.9	39	--
NOV.												
26...	.0	.4	12	.02	5	2	40	.3	20	6.1	3	--
DEC.												
17...	.0	.2	27	.04	13	8	26	.3	37	6.9	12	--
JAN.												
29...	.2	.0	68	.09	37	0	18	.3	88	7.2	39	--
FEB.												
25...	.1	.2	74	.10	42	0	20	.3	99	7.4	43	--
MAR.												
30...	.1	.2	30	.04	15	0	27	.3	43	6.8	15	--
MAY												
05...	.1	.1	25	.03	12	1	29	.3	33	7.1	11	1.0
JUNE												
08...	.2	.1	35	.05	17	0	25	.3	46	6.7	18	1.0
JULY												
23...	.1	.5	36	.04	19	0	23	.3	50	6.9	18	1.0
AUG.												
20...	.0	.1	28	.04	16	1	24	.3	41	6.7	16	4.0
SEPT.												
24...	--	--	--	--	--	--	--	--	--	--	--	--

10717000 HONOLII STREAM NEAR PAPAIKOU--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TOTAL IRON (FE) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL ALUM-INUM (AL) (UG/L)	TOTAL COPPER (CU) (UG/L)	ALDRIN (UG/L)	ALDRIN IN BOTTOM DE-POSITS (UG/KG)	DDD (UG/L)	DDD IN BOTTOM DE-POSITS (UG/KG)	DDE (UG/L)	DDE IN BOTTOM DE-POSITS (UG/KG)	DDT (UG/L)	DDT IN BOTTOM DE-POSITS (UG/KG)
OCT.												
14...	160	--	160	--	--	--	--	--	--	--	--	--
NOV.												
26...	650	--	490	--	--	--	--	--	--	--	--	--
DEC.												
17...	330	--	290	--	.00	.00	.00	.00	.00	.00	.00	.00
JAN.												
29...	130	--	100	--	--	--	--	--	--	--	--	--
FEB.												
25...	90	--	110	--	--	--	--	--	--	--	--	--
MAR.												
30...	240	0	230	0	--	--	--	--	--	--	--	--
JUNE												
08...	230	0	170	0	--	--	--	--	--	--	--	--
JULY												
23...	270	0	240	0	--	--	--	--	--	--	--	--
AUG.												
20...	700	0	360	0	--	--	--	--	--	--	--	--
SEPT.												
24...	340	0	300	0	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN (UG/L)	DI-ELDRIN IN BOTTOM DE-POSITS (UG/KG)	ENDRIN (UG/L)	ENDRIN IN BOTTOM DE-POSITS (UG/KG)	HEPTA-CHLOR (UG/L)	HEPTA-CHLOR IN BOTTOM DE-POSITS (UG/KG)	LINDANE (UG/L)	LINDANE IN BOTTOM DE-POSITS (UG/KG)	2,4-D (UG/L)	2,4,5-T (UG/L)	SILVEX (UG/L)
OCT.											
14...	--	--	--	--	--	--	--	--	--	--	--
NOV.											
26...	--	--	--	--	--	--	--	--	--	--	--
DEC.											
17...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
JAN.											
29...	--	--	--	--	--	--	--	--	--	--	--
FEB.											
25...	--	--	--	--	--	--	--	--	--	--	--
MAR.											
30...	--	--	--	--	--	--	--	--	--	--	--
JUNE											
08...	--	--	--	--	--	--	--	--	--	--	--
JULY											
23...	--	--	--	--	--	--	--	--	--	--	--
AUG.											
20...	--	--	--	--	--	--	--	--	--	--	--
SEPT.											
24...	--	--	--	--	--	--	--	--	--	--	--

FIELD DETERMINATIONS, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	DIS-SOLVED OXYGEN (MG/L)	COLI-FORM (COL-ONIES PER 100 ML)	TEMP (°C)
DEC.					
17...	40	--	9.1	66	
MAR.					
30...	40	7.2	9.5	110	
JUNE					
08...	45	7.6	8.3	32	
JULY					
23...	50	7.0	--	73	
AUG.					
20...	40	6.8	--	93	
SEPT.					
24...	--	6.1	--	90	

16884600 AHA-GAWA AT AHA

LOCATION.--Lat 26°42'41 N., long 128°16'55" E., Okinawa, at gaging station 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.
DRAINAGE AREA.--9.5 sq mi, approximately.
PERIOD OF RECORD.--Chemical analyses: Water years 1966, 1968-70 (partial-record station).
Water temperatures: March 1968 to September 1970.
Sediment records: Water years 1964-67 (partial-record station), March 1968 to September 1970.
EXTREMES, 1969-70.--Water temperatures: Maximum, 27.0°C Aug. 2, 6, 7, 21; minimum, 9.5°C Feb. 1.
Sediment concentrations: Maximum daily, 2,560 mg/l Oct. 7; minimum daily, 1 mg/l on many days.
Sediment loads: Maximum daily, 48,300 tons Oct. 7; minimum daily, 0.03 ton on several days during December and January.
EXTREMES, 1968-70.--Water temperatures: Maximum, 31.0°C Aug. 17, 1968; minimum, 9.5°C Feb. 1, 1970.
Sediment concentrations: Maximum daily, 2,560 mg/l Oct. 7, 1969; minimum daily, 1 mg/l on many days each year.
Sediment loads: Maximum daily, 48,300 tons Oct. 7, 1969; minimum daily, 0.03 ton on several days each year.
REMARKS.--Chemical analyses for this station on page 272-273.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	16.5	15.5	15.0	9.5	---	---	21.0	18.5	---	26.0	22.0
2	23.0	19.0	16.0	14.5	10.0	---	---	22.0	19.0	22.0	27.0	23.0
3	23.0	18.5	14.5	14.0	13.0	---	---	18.0	19.5	22.0	26.0	23.0
4	23.0	19.0	14.0	14.0	11.5	---	---	21.0	16.5	---	23.5	24.0
5	21.5	16.5	14.0	11.0	12.0	---	---	21.0	18.0	24.0	23.5	24.0
6	21.5	17.0	14.5	11.0	14.0	---	---	21.0	16.0	23.5	27.0	26.5
7	21.0	17.0	17.0	11.5	14.0	---	---	20.0	18.0	20.5	27.0	21.5
8	21.5	17.0	15.5	12.0	13.0	---	---	22.0	21.5	20.5	25.0	24.5
9	20.0	16.0	14.0	11.5	12.0	---	---	21.0	20.5	20.5	25.0	25.5
10	18.5	16.5	13.0	13.0	11.0	---	---	20.0	19.0	22.0	26.0	24.0
11	19.0	18.0	13.5	13.5	11.0	---	---	19.0	19.5	23.0	24.0	23.5
12	18.5	16.5	15.5	13.5	11.5	---	---	23.0	21.0	21.5	25.5	21.5
13	19.5	17.0	13.5	13.0	13.5	---	---	20.0	20.0	---	---	21.0
14	19.0	18.5	11.5	12.0	11.5	---	---	19.0	20.5	24.0	24.5	23.0
15	20.0	---	12.0	11.5	11.5	---	---	20.0	19.5	24.5	23.0	23.5
16	23.0	18.5	14.5	10.5	14.0	---	---	19.0	19.0	25.5	---	23.5
17	20.5	19.0	13.5	---	10.0	---	18.0	18.0	19.0	---	23.0	23.0
18	20.5	16.5	16.0	---	13.0	---	18.0	18.0	19.0	23.0	26.0	24.0
19	18.5	16.5	13.0	---	13.5	---	18.0	18.0	23.5	23.0	26.0	23.0
20	20.5	---	14.0	---	14.0	---	19.0	21.0	23.0	24.5	24.0	21.5
21	23.0	18.0	14.0	---	14.0	---	18.0	---	22.0	25.5	27.0	26.0
22	20.5	---	13.5	---	---	---	18.0	20.0	23.0	25.5	24.0	24.0
23	20.0	18.0	13.5	---	19.5	---	18.0	20.0	23.0	24.5	24.5	---
24	24.0	16.5	12.0	---	---	---	18.0	19.5	22.0	22.0	24.5	25.0
25	20.5	15.0	12.0	---	---	---	17.0	20.5	23.0	26.0	25.5	24.5
26	25.0	14.5	13.0	---	---	---	---	18.5	23.0	25.0	24.0	24.5
27	24.5	14.0	13.5	13.5	---	---	---	20.0	23.0	26.0	23.5	20.5
28	25.0	16.0	12.0	14.5	---	---	17.0	21.0	25.0	23.5	21.5	25.0
29	16.5	15.5	11.5	14.5	---	---	18.0	21.0	21.5	25.5	22.0	21.0
30	21.0	15.5	13.0	13.0	---	---	20.0	21.0	21.5	25.5	21.5	20.5
31	16.5	---	14.5	12.0	---	---	---	20.0	---	22.0	21.5	---
MONTH	21.0	17.0	14.0	---	12.5	---	---	20.0	20.5	23.5	24.5	23.5

18884600 AHA-GAWA AT AHA--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	14	3	.10	19	2	.10	27	3	.20
2	411	834	4730	20	2	.10	25	4	.30
3	44	8	1.0	23	5	.30	28	3	.20
4	253	198	455	21	3	.20	22	2	.10
5	689	487	3000	19	2	.10	21	1	.10
6	465	657	4520	17	3	.10	22	1	.10
7	2950	2560	48300	17	3	.10	31	8	.70
8	420	32	46	17	3	.10	31	3	.30
9	146	4	1.6	17	3	.10	22	2	.10
10	91	2	.50	16	3	.10	20	1	.10
11	67	2	.40	15	3	.10	19	1	.10
12	54	2	.30	14	3	.10	18	1	.05
13	45	2	.20	14	3	.10	18	1	.05
14	39	2	.20	25	8	.50	16	1	.04
15	72	30	14	40	17	3.4	16	1	.04
16	41	4	.40	22	6	.40	16	1	.04
17	34	2	.20	16	2	.10	17	1	.05
18	31	2	.20	13	1	.04	17	1	.05
19	33	5	.40	13	1	.04	23	5	.30
20	27	2	.10	40	17	3.2	18	2	.10
21	26	2	.10	26	8	.60	15	1	.04
22	27	4	.30	212	122	116	14	1	.04
23	41	19	2.1	45	6	.70	14	1	.04
24	53	22	3.1	29	3	.20	14	1	.04
25	32	6	.50	23	2	.10	13	1	.04
26	25	5	.30	24	4	.30	13	1	.04
27	23	4	.20	23	3	.20	14	2	.10
28	21	3	.20	19	2	.10	15	2	.10
29	21	3	.20	39	10	1.1	13	1	.04
30	23	6	.40	46	4	.50	12	1	.03
31	21	3	.20	--	--	--	12	1	.03
TOTAL	6239	--	61078.20	884	--	129.08	576	--	3.56

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	11	1	.03	44	4	.50	21	4	.20
2	11	2	.10	35	2	.20	42	264	351
3	15	5	.20	31	2	.20	457	1030	6940
4	16	6	.30	30	3	.20	43	6	.70
5	14	5	.20	29	3	.20	32	3	.30
6	12	2	.10	24	2	.10	30	3	.20
7	11	1	.03	22	1	.10	43	8	.90
8	12	2	.10	21	1	.10	88	57	17
9	13	3	.10	21	3	.20	44	5	.60
10	16	4	.20	19	2	.10	47	12	1.5
11	12	2	.10	18	2	.10	43	5	.60
12	10	1	.03	32	15	2.2	34	3	.30
13	9.8	1	.03	51	13	2.6	38	7	.70
14	15	6	.20	24	4	.30	34	3	.30
15	86	20	4.6	21	4	.20	175	397	780
16	38	10	1.0	20	4	.20	122	17	6.1
17	22	4	.20	18	3	.10	64	4	.70
18	19	2	.10	18	2	.10	53	3	.40
19	26	6	.40	17	2	.10	46	2	.20
20	32	4	.30	16	2	.10	43	2	.20
21	21	3	.20	16	2	.10	42	2	.20
22	18	2	.10	15	2	.10	41	2	.20
23	18	5	.20	15	2	.10	37	2	.20
24	22	5	.30	15	1	.04	36	2	.20
25	24	4	.30	14	1	.04	36	2	.20
26	18	2	.10	15	3	.10	44	6	.70
27	35	26	5.7	34	10	.90	392	532	1570
28	109	102	130	25	5	.30	189	31	21
29	122	60	33	--	--	--	74	5	1.0
30	218	334	573	--	--	--	62	5	.80
31	69	6	1.1	--	--	--	53	3	.40
TOTAL	1074.8	--	752.32	660	--	9.58	2505	--	9696.80

16884600 AHA-GAWA AT AHA--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

	APRIL			MAY			JUNE		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	48	2	.30	41	2	.20	132	10	3.6
2	46	2	.20	39	2	.20	82	4	.90
3	42	2	.20	37	2	.20	67	3	.50
4	38	1	.10	34	2	.20	57	2	.30
5	36	1	.10	31	2	.20	73	18	3.5
6	35	1	.10	29	2	.20	64	6	1.0
7	33	1	.10	28	1	.10	45	3	.40
8	33	1	.10	28	3	.20	39	3	.30
9	32	1	.10	26	2	.10	36	3	.30
10	31	1	.10	30	5	.40	34	3	.30
11	30	1	.10	27	3	.20	33	3	.30
12	29	1	.10	24	2	.10	32	3	.30
13	28	1	.10	36	15	3.2	52	35	9.4
14	26	1	.10	67	46	9.0	49	20	2.6
15	29	5	.40	43	8	.90	734	937	8550
16	25	2	.10	97	86	31	240	243	530
17	25	3	.20	64	14	2.4	184	20	13
18	931	1080	14200	35	4	.40	113	8	2.4
19	81	4	.90	31	3	.30	86	4	.90
20	118	159	128	30	3	.20	74	3	.60
21	122	11	4.8	28	2	.20	66	2	.40
22	71	3	.60	34	6	.60	58	2	.30
23	125	50	19	33	4	.40	136	321	469
24	91	6	1.5	294	792	1640	78	10	2.1
25	69	3	.60	66	5	.90	52	3	.40
26	58	3	.50	689	816	5220	48	2	.30
27	53	2	.30	118	7	2.2	45	2	.20
28	50	2	.30	82	4	.90	42	2	.20
29	45	2	.20	66	3	.50	39	2	.20
30	43	2	.20	71	6	1.2	39	2	.20
31	--	--	--	1400	1060	9980	--	--	--
TOTAL	2423	--	14359.40	3658	--	16896.60	2829	--	9593.90

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	37	2	.20	21	2	.10	45	3	.40
2	39	3	.30	20	2	.10	42	3	.30
3	89	62	41	23	4	.20	37	2	.20
4	775	1150	11400	23	3	.20	35	2	.20
5	173	34	27	21	3	.20	122	321	482
6	77	4	.80	21	3	.20	57	8	1.2
7	601	441	3720	19	2	.10	44	4	.50
8	186	97	61	18	2	.10	38	3	.30
9	257	77	62	16	2	.10	35	2	.20
10	319	451	915	17	4	.20	34	2	.20
11	123	16	5.3	29	37	3.1	31	2	.20
12	93	7	1.8	33	50	4.5	30	2	.20
13	75	5	1.0	641	1400	1090	36	50	4.9
14	63	4	.70	60	22	3.6	28	3	.20
15	53	4	.60	140	181	113	28	3	.20
16	48	4	.50	49	14	1.9	26	2	.10
17	43	3	.30	38	10	1.0	29	6	.50
18	39	2	.20	33	6	.50	28	4	.30
19	38	2	.20	36	10	1.0	25	2	.10
20	37	2	.20	38	8	.80	25	2	.10
21	34	2	.20	30	3	.20	25	2	.10
22	31	2	.20	29	5	.40	25	3	.20
23	29	2	.20	26	3	.20	23	3	.20
24	27	2	.10	24	3	.20	22	3	.20
25	27	3	.20	23	3	.20	26	6	.40
26	30	4	.30	21	3	.20	22	3	.20
27	24	2	.10	62	142	70	20	2	.10
28	22	2	.10	812	630	3850	23	5	.30
29	21	2	.10	139	28	15	21	3	.20
30	20	2	.10	77	8	1.7	63	70	34
31	23	3	.20	54	4	.60	--	--	--
TOTAL	3453	--	16239.90	2593	--	5159.60	1045	--	528.20

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 27939.8
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) 134447.14

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU												
16213000 WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48")												
DEC., 1969												
08...	1245	25	23.0	62	13	11	68	3.7	79	0	25	96
12...	1250	20	22.5	59	13	11	68	3.3	74	0	23	98
JAN., 1970												
22...	1230	43	--	32	10	8.7	56	2.5	32	21	18	76
MAR.												
06...	1040	20	21.5	52	13	11	69	3.1	76	0	24	96
APR.												
20...	0800	113	21.5	12	3.7	3.0	16	1.9	22	0	6.4	24
JULY												
17...	0845	11	22.0	51	11	9.8	68	2.5	72	0	23	94
SEP.												
14...	1330	6.1	23.5	53	12	11	69	2.8	78	0	24	96
16220300 KALIHI STREAM AT KALIHI (LAT 21°20'29", LONG 157°52'36")												
MAR., 1970												
18...	1100	7.7	22.0	8.5	12	7.5	21	1.8	67	0	11	29
MAY												
04...	1510	5.2	23.0	11	13	7.1	21	1.4	72	0	10	29
JUNE												
16...	0800	1.8	23.0	7.9	14	8.2	23	1.3	83	0	9.0	31
JULY												
17...	0900	7.2	22.0	12	13	7.0	19	1.5	71	0	9.0	26
SEP.												
04...	1200	2.0	23.5	11	15	7.1	21	1.3	78	0	8.0	28
16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48")												
OCT., 1969												
03...	--	6.0	21.5	27	11	8.5	18	.9	80	0	--	21
NOV.												
13...	0920	5.0	21.0	30	11	8.7	19	1.4	83	0	7.6	23
JAN., 1970												
05...	1140	33	21.0	28	10	7.6	15	1.0	66	0	7.4	21
FEB.												
27...	1400	8.0	21.0	27	12	8.8	18	.9	81	0	7.2	22
APR.												
01...	1530	5.5	23.0	25	11	8.7	18	.9	80	0	7.0	22
MAY												
21...	1800	4.4	--	26	11	9.3	19	1.2	78	0	7.6	23
JULY												
01...	1400	4.1	24.0	27	11	8.6	18	1.1	79	0	6.4	22
AUG.												
12...	1215	4.8	24.5	24	11	8.2	18	1.4	76	0	7.0	22
SEP.												
16...	1045	4.3	--	26	11	8.6	19	1.6	80	0	7.6	24
16270500 KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'26")												
FEB., 1970												
24...	1400	9.4	20.5	21	8.0	7.0	14	.8	59	0	4.4	20
APR.												
02...	1055	7.7	22.5	19	8.0	7.2	14	1.0	61	0	5.0	20
MAY												
19...	1230	6.6	24.4	22	8.2	7.2	15	.9	61	0	5.0	20
JUNE												
30...	1215	5.3	24.5	22	8.8	7.2	15	.9	60	0	4.6	19
AUG.												
11...	1410	5.1	24.0	21	8.3	7.3	15	.8	62	0	4.0	19
SEP.												
22...	--	5.6	24.0	21	8.6	7.9	15	.9	64	0	4.6	19
16273900 KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12")												
OCT., 1969												
06...	1350	13	26.0	22	9.0	6.6	15	.8	48	7	--	20
NOV.												
18...	0825	9.4	20.5	23	10	7.1	15	1.1	67	0	6.0	20
FEB., 1970												
24...	1045	12	20.5	20	9.2	6.8	14	.8	62	0	4.6	20
APR.												
02...	0930	12	23.0	13	9.2	5.7	13	.9	56	0	5.2	18
MAY												
19...	1030	7.9	--	20	9.5	6.9	15	.9	59	2	5.4	20
JUNE												
30...	1445	8.2	30.0	22	9.4	6.5	15	1.0	50	6	5.0	20
AUG.												
11...	1145	7.3	26.5	19	9.4	6.6	15	.9	60	0	5.0	20
SEP.												
16...	1600	7.0	26.5	20	12	7.6	15	.8	71	0	5.2	20

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16213000 WAIKELE STREAM AT WAIPAHU--Continued												
DEC., 1969												
08...	.4	8.6	327	.44	78	13	64	3.4	502	7.4	--	--
12...	.3	5.2	317	.43	78	17	64	3.4	503	7.1	--	--
JAN., 1970												
22...	.5	.2	241	.33	61	0	66	3.1	407	9.1	--	--
MAR.												
06...	.3	6.0	311	.42	78	15	65	3.4	499	7.2	--	--
APR.												
20...	.1	2.6	81	.11	22	4	59	1.5	128	6.8	65	31000
JULY												
17...	.3	6.4	301	.41	68	9	66	3.6	484	6.8	1.0	--
SEP.												
14...	.2	7.6	314	.43	75	11	66	3.5	501	7.0	--	--
16229300 KALIHI STREAM AT KALIHI--Continued												
MAR., 1970												
18...	.1	.5	124	.17	61	6	42	1.2	224	7.2	--	--
MAY												
04...	.2	.1	128	.17	62	3	42	1.2	225	7.2	--	51000
JUNE												
16...	.3	.2	136	.18	69	1	42	1.2	246	7.4	--	59000
JULY												
17...	.2	.4	123	.17	62	4	40	1.1	222	7.0	6.0	--
SEP.												
04...	.0	.0	129	.18	67	3	40	1.1	239	6.9	1.0	--
16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA--Continued												
OCT., 1969												
03...	.1	--	--	.15	62	0	38	1.0	208	7.4	--	--
NOV.												
13...	.1	.1	142	.19	64	0	39	1.0	220	7.2	--	--
JAN., 1970												
05...	.1	.0	122	.17	56	2	36	.9	182	7.2	--	--
FEB.												
27...	.2	.2	136	.18	66	0	37	1.0	211	7.3	--	--
APR.												
01...	.2	1.1	133	.18	64	0	38	1.0	212	7.2	--	--
MAY												
21...	.1	2.9	138	.19	66	2	38	1.0	217	7.3	1.0	--
JULY												
01...	.1	.3	134	.18	63	0	38	1.0	211	7.2	2.0	1300
AUG.												
12...	.4	.0	129	.18	61	0	38	1.0	210	6.6	15	--
SEP.												
16...	.1	.0	137	.19	63	0	39	1.0	216	7.1	2.0	--
16270500 KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE--Continued												
FEB., 1970												
24...	.1	1.2	106	.14	49	0	38	.9	166	7.2	--	--
APR.												
02...	.1	.9	105	.14	50	0	37	.9	170	7.3	--	1900
MAY												
15...	.1	1.8	110	.15	50	0	39	.9	171	7.4	1.0	--
JUNE												
30...	.1	.5	106	.14	47	0	41	1.0	169	7.0	25	2900
AUG.												
11...	.3	.6	107	.15	51	0	39	.9	174	6.7	1.0	--
SEP.												
22...	.2	1.0	109	.15	54	2	37	.9	176	7.1	2.0	--
16273900 KAMOOALII STREAM AT KANEOHE--Continued												
OCT., 1969												
06...	.1	--	--	.12	50	0	39	.9	173	9.2	--	--
NOV.												
18...	.0	.9	116	.16	54	0	37	.9	180	7.3	--	--
FEB., 1970												
24...	.0	.4	107	.15	51	0	37	.9	172	8.3	--	--
APR.												
02...	.1	1.3	94	.13	47	0	37	.8	157	6.8	--	52000
MAY												
19...	.1	.3	109	.15	52	0	38	.9	176	8.6	1.0	--
JUNE												
30...	.1	.8	111	.15	50	0	39	.9	172	8.6	8.0	2200
AUG.												
11...	.2	.0	106	.14	51	2	39	.9	172	8.3	3.0	--
SEP.												
16...	.2	.0	116	.16	62	4	34	.8	189	6.8	25	--

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

HAWAII, ISLAND OF OAHU

16283500 KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15")

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
OCT., 1969												
02...	1135	4.2	24.0	24	15	8.3	17	1.1	88	0	--	22
NOV.												
24...	0905	5.0	21.0	19	15	8.6	18	1.6	91	0	7.0	22
FEB., 1970												
18...	1250	7.9	23.5	24	15	8.4	17	1.1	83	0	9.0	23
APR.												
02...	1330	6.1	24.5	21	17	8.7	18	1.2	89	0	8.6	24
MAY												
18...	1030	3.7	--	25	17	9.3	18	1.2	94	0	9.0	24
SEP.												
15...	1445	2.5	27.0	25	16	9.0	19	1.2	96	0	6.4	23

16284500 WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'28")

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
OCT., 1969												
02...	0930	11	19.5	27	9.2	5.8	13	1.2	58	0	--	18
NOV.												
24...	1430	10	21.5	27	8.9	5.6	13	1.3	55	0	3.0	18
JAN., 1970												
12...	1050	18	19.0	23	8.8	5.4	13	1.2	52	0	5.0	17
FEB.												
26...	1130	11	20.0	26	8.6	5.5	13	1.0	54	0	5.2	18
APR.												
01...	0930	10	20.5	24	9.2	5.7	13	1.3	57	0	3.6	18
MAY												
15...	1435	10	24.0	27	8.7	5.5	13	1.3	55	0	3.0	18
JUNE												
29...	1000	11	23.0	25	9.2	5.7	13	1.7	58	0	4.0	18
AUG.												
10...	0945	8.8	24.0	24	9.6	5.8	13	1.9	52	0	4.0	19
SEP.												
15...	1130	7.9	23.5	25	8.9	6.0	13	1.0	56	0	3.6	17

RYUKYU ISLANDS, ISLAND OF OKINAWA

16884200 FUKUJI-GAWA AT FUKUJI (LAT 26°38'16" N., LONG 128°10'13" E.)

DATE	SILICA (SIO2) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)
NOV.											
10...	15	200	4.0	3.4	20	22	0	8.0	30	.1	.0

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SIO2) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
16884600 AHA-GAWA AT AHA (LAT 26°42'41" N., LONG 128°16'55" E.)												
JUNE												
03...	67	14	60	2.0	2.4	13	1.0	13	0	7.5	20	.0
SEPT.												
17...	25	18	70	3.2	2.2	15	.5	21	0	6.0	21	.0

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16283500 KAHALUU STREAM AT KAHALUU--Continued												
OCT., 1969												
02...	.1	--	--	.16	72	0	34	.9	221	7.2	--	--
NOV.												
24...	.0	.1	136	.18	73	0	34	.9	228	7.1	--	--
FEB., 1970												
18...	.2	.8	140	.19	72	4	34	.9	225	7.1	--	--
APR.												
02...	.1	1.5	144	.20	79	6	33	.9	233	7.0	--	--
MAY												
18...	.1	2.4	152	.21	81	4	32	.9	245	7.1	1.0	--
SEP.												
15...	.1	1.5	148	.20	77	0	34	.9	238	7.1	6.0	--
16284500 WAIHEE STREAM AT KAHALUU--Continued												
OCT., 1969												
02...	.1	--	--	.12	47	0	37	.8	159	7.0	--	--
NOV.												
24...	.0	.0	104	.14	45	0	38	.8	153	6.9	--	--
JAN., 1970												
12...	.2	.1	100	.14	44	0	38	.9	152	7.3	--	--
FEB.												
26...	.1	.9	105	.14	44	0	38	.9	152	7.0	--	--
APR.												
01...	.1	3.6	106	.14	47	0	37	.8	160	6.7	--	--
MAY												
15...	.2	2.4	106	.14	44	0	38	.8	154	6.8	1.0	--
JUNE												
29...	.1	2.8	108	.15	47	0	37	.8	161	7.0	--	83000
AUG.												
10...	.2	3.4	107	.15	48	6	36	.8	166	6.1	2.0	--
SEP.												
15...	.2	1.1	104	.14	47	1	37	.8	154	6.7	6.0	--

DATE	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	ALKA-LINITY AS CACO3 (MG/L)	COLOR (PLAT-INUM-COBALT UNITS)
RYUKYU ISLANDS, ISLAND OF OKINAWA--Continued										
16884200 FUKUJI-GAWA AT FUKUJI--Continued										
NOV.										
10...	92	.13	24	6	64	1.8	120	7.5	18	5

DATE	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	ALKA-LINITY AS CACO3 (MG/L)	COLOR (PLAT-INUM-COBALT UNITS)
16884000 AHA-GAWA AT AHA--Continued											
JUNE											
03...	.1	66	.09	15	5	64	1.5	80	7.3	11	5
SEPT.											
17...	.0	76	.10	17	0	65	1.6	90	7.8	17	1

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
HAWAII, ISLAND OF OAHU																	
16213000 WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48")																	
OCT 23, 1969	1005	22.0	20	11	.59	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1410	--	1180	3940	12600	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1415	--	1150	3980	12400	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1420	--	1130	3380	10300	29	42	61	77	94	96	98	99	100			VPWC
NOV 14.....	1430	--	1100	3580	10600	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1440	--	1060	3110	8900	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1450	--	1020	2770	7630	--	--	--	--	--	--	--	--	--	--	--	
NOV 27.....	1300	22.0	40	8	.86	--	--	--	--	--	--	--	--	--	--	--	
JAN 22, 1970	1200	21.5	44	8	.95	--	--	--	--	--	--	--	--	--	--	--	
FEB 27.....	1420	22.0	20	5	.27	--	--	--	--	--	--	--	--	--	--	--	
APR 20.....	0800	21.5	113	136	41	--	--	--	--	--	--	--	--	--	--	--	
APR 20.....	0900	21.0	94	129	33	--	--	--	--	--	--	--	--	--	--	--	
APR 20.....	1000	21.0	81	119	26	--	--	--	--	--	--	--	--	--	--	--	
JUN 1.....	0825	22.0	14	9	.34	--	--	--	--	--	--	--	--	--	--	--	
JUL 17.....	0900	22.0	11	6	.18	--	--	--	--	--	--	--	--	--	--	--	
AUG 27.....	1030	23.5	669	58	105	--	--	--	--	--	--	--	--	--	--	--	
AUG 28.....	0830	23.0	22	11	.65	--	--	--	--	--	--	--	--	--	--	--	
16229300 KALIHI STREAM AT KALIHI (LAT 21°20'29", LONG 157°52'36")																	
OCT 28, 1969	1015	23.0	1.8	4	.02	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1220	--	167	622	280	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1230	--	154	673	280	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1240	--	162	620	271	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1300	--	295	398	317	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1310	--	400	406	438	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1540	--	112	260	79	--	--	--	--	--	--	--	--	--	--	--	
DEC 29.....	0900	20.0	87	31	7.3	--	--	--	--	--	--	--	--	--	--	--	
FEB 3, 1970	1530	23.0	2.8	7	.05	--	--	--	--	--	--	--	--	--	--	--	
MAR 19.....	1330	22.5	1.6	2	.01	--	--	--	--	--	--	--	--	--	--	--	
APR 30.....	1600	22.0	3.6	20	.19	--	--	--	--	--	--	--	--	--	--	--	
JUN 16.....	0800	23.0	1.8	6	.03	--	--	--	--	--	--	--	--	--	--	--	
JUL 17.....	0945	23.0	6.4	14	.24	--	--	--	--	--	--	--	--	--	--	--	
SEP 4.....	1200	23.5	2.0	5	.03	--	--	--	--	--	--	--	--	--	--	--	
16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48")																	
OCT 13, 1969	1315	21.5	6.0	1	.02	--	--	--	--	--	--	--	--	--	--	--	
OCT 14.....	1435	23.5	5.6	19	.29	--	--	--	--	--	--	--	--	--	--	--	
NOV 13.....	0920	21.0	5.0	2	.03	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1340	21.0	500	1550	2090	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1345	21.0	504	1540	2100	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1350	21.0	518	1710	2390	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1400	--	440	1050	1250	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1415	--	404	1000	1090	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1430	--	295	755	601	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1745	22.0	46	365	45	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1750	22.0	63	330	56	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1800	--	69	300	56	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1805	--	80	330	71	--	--	--	--	--	--	--	--	--	--	--	
DEC 29.....	0700	--	79	94	20	--	--	--	--	--	--	--	--	--	--	--	
DEC 29.....	1220	22.0	41	20	2.2	--	--	--	--	--	--	--	--	--	--	--	
JAN 3, 1970	1320	22.0	51	123	17	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1330	22.0	76	201	41	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1335	22.0	130	481	169	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1345	22.0	176	615	292	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1350	22.0	208	516	290	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1415	22.0	212	406	232	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1430	22.0	195	346	182	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1750	21.0	140	105	40	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1805	--	147	57	23	--	--	--	--	--	--	--	--	--	--	--	
JAN 5.....	1130	20.0	33	9	.80	--	--	--	--	--	--	--	--	--	--	--	
JAN 3.....	1400	22.0	228	440	271	48	61	--	88	--	100	--	--	--	--	--	PWC
JAN 6.....	0705	20.0	72	248	48	--	--	--	--	--	--	--	--	--	--	--	
APR 21.....	0710	20.5	15	52	2.1	--	--	--	--	--	--	--	--	--	--	--	
SEP 16.....	0915		5.6	10	.15	--	--	--	--	--	--	--	--	--	--	--	

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
HAWAII, ISLAND OF OAHU--Continued																	
16270500 KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'28")																	
OCT 6, 1969	1030	20.0	7.0	2	.04	--	--	--	--	--	--	--	--	--	--	--	
OCT 17.....	0745	21.0	6.7	3	.05	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	0815	21.0	8.5	52	1.2	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	0800	21.0	7.0	22	.42	--	--	--	--	--	--	--	--	--	--	--	
NOV 14, 1969	1400	20.5	145	1130	442	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1435	20.5	105	566	160	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1515	--	76	546	112	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1555	--	46	475	59	--	--	--	--	--	--	--	--	--	--	--	
JAN 5, 1970	1415	21.0	15	3	.12	--	--	--	--	--	--	--	--	--	--	--	
JAN 6.....	0750	19.0	37	288	29	--	--	--	--	--	--	--	--	--	--	--	
JAN 6.....	0800	19.0	34	246	23	--	--	--	--	--	--	--	--	--	--	--	
JAN 6.....	0810	19.0	32	204	18	--	--	--	--	--	--	--	--	--	--	--	
JAN 6.....	0830	19.5	29	184	14	--	--	--	--	--	--	--	--	--	--	--	
FEB 24.....	1400	20.5	9.2	6	.15	--	--	--	--	--	--	--	--	--	--	--	
APR 2.....	1110	22.5	7.7	8	.17	--	--	--	--	--	--	--	--	--	--	--	
MAY 19.....	1230	24.5	6.7	6	.11	--	--	--	--	--	--	--	--	--	--	--	
JUN 30.....	1215	24.5	6.4	5	.09	--	--	--	--	--	--	--	--	--	--	--	
AUG 11.....	1410	24.0	5.0	9	.12	--	--	--	--	--	--	--	--	--	--	--	
SEP 22.....	1500	24.0	5.6	8	.12	--	--	--	--	--	--	--	--	--	--	--	
16273800 KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12")																	
DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
OCT 6, 1969	1345	26.0	10	6	.16	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1245	20.5	E 120	1880	609	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1255	20.5	E 150	2340	948	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1310	20.5	E 300	3180	2580	--	--	--	--	--	--	--	--	--	--	--	
JAN 6, 1970	1030	21.0	27	45	3.3	--	--	--	--	--	--	--	--	--	--	--	
FEB 24.....	1115	20.5	12	12	.39	--	--	--	--	--	--	--	--	--	--	--	
APR 2.....	1015	23.0	12	43	1.4	--	--	--	--	--	--	--	--	--	--	--	
APR 21.....	1325	25.5	9.7	56	1.5	--	--	--	--	--	--	--	--	--	--	--	
MAY 19.....	1030	25.0	8.2	8	.18	--	--	--	--	--	--	--	--	--	--	--	
JUN 30.....	1445	26.5	7.9	19	.41	--	--	--	--	--	--	--	--	--	--	--	
AUG 11.....	1145	26.5	7.6	10	.21	--	--	--	--	--	--	--	--	--	--	--	
SEP 16.....	1600	26.5	6.4	62	1.1	--	--	--	--	--	--	--	--	--	--	--	
16283500 KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15")																	
OCT 2, 1969	1130	24.0	4.2	47	.53	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	0900	21.0	5.0	20	.27	--	--	--	--	--	--	--	--	--	--	--	
JAN 14, 1970	0910	20.5	88	52	12	--	--	--	--	--	--	--	--	--	--	--	
FEB 18.....	1330	23.5	7.9	26	.55	--	--	--	--	--	--	--	--	--	--	--	
16284500 WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'26")																	
OCT 2, 1969	0920	19.5	11	11	.33	--	--	--	--	--	--	--	--	--	--	--	
OCT 14.....	1115	22.0	12	14	.45	--	--	--	--	--	--	--	--	--	--	--	
NOV 7.....	1200	23.0	11	12	.36	--	--	--	--	--	--	--	--	--	--	--	
NOV 13.....	0950	21.0	11	14	.42	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	0745	--	12	17	.55	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1500	--	40	138	15	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1515	--	37	148	15	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1545	--	30	95	7.7	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1700	--	21	49	2.8	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	1425	21.5	10	13	.35	--	--	--	--	--	--	--	--	--	--	--	
JAN 6, 1970	1230	20.5	24	23	1.5	--	--	--	--	--	--	--	--	--	--	--	
JAN 14.....	0740	20.0	38	79	8.1	--	--	--	--	--	--	--	--	--	--	--	
JAN 14.....	0800	20.0	37	86	8.6	--	--	--	--	--	--	--	--	--	--	--	
JAN 14.....	0820	20.0	36	82	8.0	--	--	--	--	--	--	--	--	--	--	--	
JAN 14.....	0830	20.0	35	79	7.5	--	--	--	--	--	--	--	--	--	--	--	
FEB 26.....	1130	20.0	11	10	.30	--	--	--	--	--	--	--	--	--	--	--	
APR 1.....	0930	20.5	9.9	17	.45	--	--	--	--	--	--	--	--	--	--	--	
APR 21.....	1405	22.5	11	22	.65	--	--	--	--	--	--	--	--	--	--	--	
MAY 15.....	1330	24.0	11	33	.98	--	--	--	--	--	--	--	--	--	--	--	
MAY 22.....	0915	21.5	43	813	94	--	--	--	--	--	--	--	--	--	--	--	
JUN 29.....	1000	23.0	11	23	.68	--	--	--	--	--	--	--	--	--	--	--	
SEP 15.....	1130	23.5	7.9	21	.45	--	--	--	--	--	--	--	--	--	--	--	

E Estimated.

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
HAWAII, ISLAND OF HAWAII																	
16717000 HONOLII STREAM NEAR PAPAIKOU (LAT 19°46'00", LONG 155°09'16") (Hydrologic bench-mark station)																	
OCT 14, 1969	0940	19.0	14	0	0	--	--	--	--	--	--	--	--	--	--	--	
NOV 26.....	0925	16.0	162	8	3.5	--	--	--	--	--	--	--	--	--	--	--	
DEC 17.....	1040	17.5	36	2	.19	--	--	--	--	--	--	--	--	--	--	--	
JAN 29, 1970	1035	17.0	10	2	.05	--	--	--	--	--	--	--	--	--	--	--	
FEB 25.....	0915	17.0	5.5	2	.03	--	--	--	--	--	--	--	--	--	--	--	
MAR 30.....	1030	18.0	25	0	0	--	--	--	--	--	--	--	--	--	--	--	
MAY 5.....	1420	19.0	52	2	.28	--	--	--	--	--	--	--	--	--	--	--	
JUN 8.....	1300	19.5	31	3	.25	--	--	--	--	--	--	--	--	--	--	--	
JUL 23.....	1010	19.5	30	2	.16	--	--	--	--	--	--	--	--	--	--	--	
AUG 20.....	1400	24.0	34	3	.28	--	--	--	--	--	--	--	--	--	--	--	
SEP 24.....	1515	19.5	34	1	.09	--	--	--	--	--	--	--	--	--	--	--	
RYUKYU ISLANDS, ISLAND OF OKINAWA																	
16875200 BENOKI-GAWA AT BENOKI (LAT 26°47'06" N., LONG 128°14'59" E.)																	
DEC 16, 1969	1010	13.0	6.8	5	.09	--	--	--	--	--	--	--	--	--	--	--	
MAR 12, 1970	1340	--	14	2	.08	--	--	--	--	--	--	--	--	--	--	--	
APR 16.....	1350	--	10	17	.46	--	--	--	--	--	--	--	--	--	--	--	
16875500 YONA-GAWA AT YONA (LAT 26°45'10" N., LONG 128°13'18")																	
OCT 2, 1969	0430	--	1040	G 4920	13800	--	--	--	--	--	--	--	--	--	--	--	
OCT 3.....	1135	--	11	6	.18	--	--	--	--	--	--	--	--	--	--	--	
OCT 6.....	2030	--	1040	G13700	38500	--	--	--	--	--	--	--	--	--	--	--	
DEC 16.....	1100	13.5	2.8	9	.07	--	--	--	--	--	--	--	--	--	--	--	
MAR 12, 1970	1105	14.5	5.9	1	.02	--	--	--	--	--	--	--	--	--	--	--	
MAY 24.....	0730	--	153	G 990	409	--	--	--	--	--	--	--	--	--	--	--	
MAY 24.....	1000	--	358	G 533	515	--	--	--	--	--	--	--	--	--	--	--	
MAY 28.....	1330	23.5	11	4	.12	--	--	--	--	--	--	--	--	--	--	--	
MAY 30.....	2320	--	153	G 741	306	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	0630	--	570	G 616	948	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	0635	--	664	G 3280	5880	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	0640	--	1040	G 1940	5450	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	0645	--	1070	G 1540	4450	--	--	--	--	--	--	--	--	--	--	--	
JUL 15.....	1205	--	13	12	.42	--	--	--	--	--	--	--	--	--	--	--	
AUG 13.....	0535	--	153	G 1560	644	--	--	--	--	--	--	--	--	--	--	--	
16877000 RIGHT BRANCH OF SOUTH FORK HENAN-GAWA NEAR TSUHA (LAT 26°37'42" N., LONG 128°05'52" E.)																	
JAN 29, 1970	1150	15.0	.81	2	0	--	--	--	--	--	--	--	--	--	--	--	
MAR 4.....	1430	15.0	1.3	2	.01	--	--	--	--	--	--	--	--	--	--	--	
16878200 HANECHI-OKAWA AT KAWAKAMI (LAT 26°36'28" N., LONG 128°01'16" E.)																	
DEC 2, 1969	1410	18.5	4.7	2	.03	--	--	--	--	--	--	--	--	--	--	--	
JAN 29, 1970	1335	16.5	5.0	1	.01	--	--	--	--	--	--	--	--	--	--	--	
MAR 3.....	0200	--	406	G 4580	5020	--	--	--	--	--	--	--	--	--	--	--	
MAR 4.....	1050	15.0	13	8	.28	--	--	--	--	--	--	--	--	--	--	--	
APR 3.....	1235	--	12	3	.10	--	--	--	--	--	--	--	--	--	--	--	
APR 18.....	0230	--	406	G 5520	6050	--	--	--	--	--	--	--	--	--	--	--	
JUN 14.....	2240	--	406	G 2830	3100	--	--	--	--	--	--	--	--	--	--	--	
JUN 14.....	2330	--	2240	G 6710	40600	--	--	--	--	--	--	--	--	--	--	--	
JUN 18.....	1330	25.0	87	52	12	--	--	--	--	--	--	--	--	--	--	--	
JUL 4.....	1120	--	406	G 3400	3730	--	--	--	--	--	--	--	--	--	--	--	
JUL 16.....	1125	--	24	6	.39	--	--	--	--	--	--	--	--	--	--	--	
AUG 15.....	1515	--	406	G 2870	3150	--	--	--	--	--	--	--	--	--	--	--	
16880500 NAGATA-GAWA AT KADENA (LAT 26°22'23" N., LONG 127°45'50" E.)																	
OCT 8, 1969	1350	--	46	52	6.5	--	--	--	--	--	--	--	--	--	--	--	
OCT 8.....	1425	--	44	54	6.4	--	--	--	--	--	--	--	--	--	--	--	
OCT 8.....	1515	--	42	55	6.2	--	--	--	--	--	--	--	--	--	--	--	
JAN 28, 1970	0850	15.0	5.0	13	.18	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1220	--	51	58	8.0	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1330	--	61	68	11	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1410	--	67	76	14	--	--	--	--	--	--	--	--	--	--	--	
MAR 31.....	0900	--	7.2	20	.39	--	--	--	--	--	--	--	--	--	--	--	

G Samples collected with single-stage sampler.

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
RYUKYU ISLANDS, ISLAND OF OKINAWA--Continued																	
16880900 MACHINATO-GAWA NEAR OJANA (LAT 26°14'43" N., LONG 127°44'16" E.)																	
JAN 29, 1970	0850	15.5	4.5	34	.41	--	--	--	--	--	--	--	--	--	--	--	
16882400 TENGAN-GAWA AT TENGAN (LAT 26°22'54" N., LONG 127°51'39" E.)																	
JAN 28, 1970	1405	18.0	18	10	.49	--	--	--	--	--	--	--	--	--	--	--	
MAR 3.....	1410	16.0	73	106	21	--	--	--	--	--	--	--	--	--	--	--	
MAR 3.....	1445	16.0	63	95	16	--	--	--	--	--	--	--	--	--	--	--	
MAR 3.....	1515	16.0	59	74	12	--	--	--	--	--	--	--	--	--	--	--	
16882800 KANNA-GAWA NEAR KANNA (LAT 26°29'20" N., LONG 127°56'46" E.)																	
NOV 22, 1969	1400	19.5	5.1	11	.15	--	--	--	--	--	--	--	--	--	--	--	
DEC 19.....	1045	15.0	1.8	1	0	--	--	--	--	--	--	--	--	--	--	--	
JAN 30, 1970	1010	15.0	23	72	4.5	--	--	--	--	--	--	--	--	--	--	--	
FEB 27.....	1015	16.5	1.9	7	.04	--	--	--	--	--	--	--	--	--	--	--	
16883300 LEFT FORK O-KAWA NEAR KUSHI (LAT 26°31'18" N., LONG 127°59'50" E.)																	
NOV 22, 1969	1120	19.0	1.8	6	.03	--	--	--	--	--	--	--	--	--	--	--	
DEC 19.....	1140	15.0	.44	5	.01	--	--	--	--	--	--	--	--	--	--	--	
JAN 30, 1970	1230	15.0	1.6	3	.01	--	--	--	--	--	--	--	--	--	--	--	
FEB 27.....	1335	18.0	.34	3	0	--	--	--	--	--	--	--	--	--	--	--	
16883550 OURA-GAWA AT OKAWA (LAT 26°34'10" N., LONG 128°02'23" E.)																	
NOV 22, 1969	1255	19.5	12	5	.16	--	--	--	--	--	--	--	--	--	--	--	
DEC 19.....	1415	17.0	.31	1	0	--	--	--	--	--	--	--	--	--	--	--	
MAR 13, 1970	1020	15.0	3.4	5	.05	--	--	--	--	--	--	--	--	--	--	--	
MAR 18.....	1130	14.0	4.0	1	.01	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1030	--	6.5	24	.42	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1130	--	122	535	176	--	--	--	--	--	--	--	--	--	--	--	
MAR 27.....	1420	--	105	3	.85	--	--	--	--	--	--	--	--	--	--	--	
JUN 16.....	1050	19.0	24	4	.26	--	--	--	--	--	--	--	--	--	--	--	
JUN 16.....	1300	19.0	98	118	31	--	--	--	--	--	--	--	--	--	--	--	
JUN 16.....	1310	19.0	149	325	131	--	--	--	--	--	--	--	--	--	--	--	
JUL 10.....	1010	--	58	62	9.7	--	--	--	--	--	--	--	--	--	--	--	
JUL 10.....	1135	--	63	8	1.4	--	--	--	--	--	--	--	--	--	--	--	
16884100 FUKUJI-GAWA NEAR YUBARU (LAT 26°38'32" N., LONG 128°13'00" E.)																	
OCT 14, 1969	1200	--	12	0	0	--	--	--	--	--	--	--	--	--	--	--	
JUN 18, 1970	1050	20.5	49	3	.40	--	--	--	--	--	--	--	--	--	--	--	
SEP 28.....	1205	25.0	8.1	3	.07	--	--	--	--	--	--	--	--	--	--	--	
16884200 FUKUJI GATA AT FUKUJI (LAT 26°38'16" N., LONG 128°10'13" E.)																	
OCT 6, 1969	1025	25.0	120	1960	635	--	--	--	--	--	--	--	--	--	--	--	
OCT 6.....	1150	25.0	112	1330	402	--	--	--	--	--	--	--	--	--	--	--	
NOV 3.....	0700	19.5	16	3	.13	--	--	--	--	--	--	--	--	--	--	--	
NOV 6.....	0700	18.5	13	1	.04	--	--	--	--	--	--	--	--	--	--	--	
NOV 21.....	0700	20.0	22	45	2.7	--	--	--	--	--	--	--	--	--	--	--	
DEC 1.....	0700	16.0	17	40	1.8	--	--	--	--	--	--	--	--	--	--	--	
16884300 MIYAGI-GAWA AT MIYAGI (LAT 26°37'33" N., LONG 128°11'08" E.)																	
MAR 16, 1970	1445	15.0	14	55	2.1	--	--	--	--	--	--	--	--	--	--	--	
MAY 15.....	1325	21.0	3.9	1	.01	--	--	--	--	--	--	--	--	--	--	--	
JUN 2.....	1330		7.7	8	.17	--	--	--	--	--	--	--	--	--	--	--	
JUN 15.....	1330	23.0	26	36	2.5	--	--	--	--	--	--	--	--	--	--	--	
SEP 24.....	1315	27.0	2.4	10	.06	--	--	--	--	--	--	--	--	--	--	--	
16884800 FUN-GAWA NEAR AHA (LAT 26°44'33" N., LONG 128°16'53" E.)																	
OCT 2, 1969	1530		230	41	25	--	--	--	--	--	--	--	--	--	--	--	
OCT 2.....	1615		156	15	6.3	--	--	--	--	--	--	--	--	--	--	--	
MAR 13, 1970	0945	15.0	13	11	.39	--	--	--	--	--	--	--	--	--	--	--	
APR 15.....	1205		11	1	.03	--	--	--	--	--	--	--	--	--	--	--	

PARTICLE SIZE OF BED MATERIAL, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

DATE	TIME	NUMBER OF SAMPLING POINTS	DISCHARGE (CFS)	PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .062	.125	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0	64.0	128.0	METHOD OF ANALYSIS
HAWAII, ISLAND OF OAHU																
16213000 WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48")																
NOV 3, 1969	1000		18	1	2	6	19	56	79	89	95	100	--	--	--	S
16229300 KALIHI STREAM AT KALIHI (LAT 21°20'29", LONG 157°52'36")																
OCT 7, 1969	1000		2.4	--	--	--	1	5	11	18	23	31	38	69	100	S

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU												
16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA (LAT 21°31'09", LONG 157°56'53")												
APR., 1970												
21...	1130	16	19.0	2.3	.7	.9	4.5	.3	5	0	1.0	9.0
16204000 NORTH FORK KAUKONAHUA STREAM NEAR WAHIAWA (LAT 21°30'54", LONG 157°59'19")												
JUNE, 1970												
11...	1800	14	22.0	7.4	1.3	1.6	6.3	.4	9	0	1.6	11
16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA (LAT 21°29'32", LONG 157°59'55")												
APR., 1970												
16...	1640	9.6	22.0	3.2	1.2	1.3	5.4	.6	9	0	1.0	10
JULY												
07...	1620	15	21.5	5.4	1.4	1.8	6.2	.5	12	0	.0	11
16208500 RIGHT BRANCH OF SOUTH FORK KAUKONAHUA STREAM NEAR WAHIAWA (LAT 21°29'58", LONG 157°59'07")												
JULY, 1970												
06...	0830	.45	22.0	2.5	2.0	1.2	7.8	.5	8	0	2.4	15
16211000 POAMOHO STREAM NEAR WAHIAWA (LAT 21°31'24", LONG 157°58'55")												
APR., 1970												
14...	1240	7.8	20.0	3.0	.8	1.1	5.6	.4	6	0	2.0	10
JULY												
22...	1050	2.9	22.0	6.8	1.1	1.5	6.4	.6	4	0	1.6	12
16211600 MAKAHA STREAM NEAR MAKAHA (LAT 21°30'16", LONG 158°10'59")												
APR., 1970												
15...	1105	.68	--	24	5.7	5.3	10	.8	45	0	3.4	14
JULY												
10...	1300	.15	22.0	35	7.8	7.3	12	1.2	62	0	3.6	16
16211800 KAUPUNI STRAM AT ALTITUDE 374 FT, NEAR WAIANAE (LAT 21°28'20", LONG 158°09'26")												
APR., 1970												
15...	0930	.50	20.5	51	19	12	22	2.2	122	0	14	24
JULY												
10...	1425	.12	24.0	54	25	15	27	2.9	140	0	26	30
16212800 KIPAPA STREAM NEAR WAHIAWA (LAT 21°28'15", LONG 157°57'50")												
MAR., 1970												
05...	1500	.29	22.0	7.4	2.2	2.5	8.7	.9	14	0	3.0	15
APR.												
20...	1410	13	21.0	2.0	.6	.7	3.5	.4	4	0	1.4	6.0
JULY												
07...	1110	1.9	22.5	5.4	1.6	1.9	7.1	.8	9	0	1.6	14
16216000 WAIAWA STREAM NEAR PEARL CITY (LAT 21°23'55", LONG 157°58'50")												
MAY, 1970												
04...	0930	19	22.0	15	10	7.9	34	1.9	38	0	12	64
JUNE												
05...	0820	7.0	21.0	43	49	42	184	6.2	107	0	60	390
JULY												
27...	0910	76	22.5	16	12	5.4	33	2.2	34	0	12	72
SEP.												
09...	1100	19	22.5	20	26	23	88	3.3	46	0	29	200
16223000 WAIMALU STREAM NEAR AIEA (LAT 21°23'34", LONG 157°57'03")												
MAY, 1970												
04...	1045	3.3	23.0	11	8.3	7.4	22	1.2	32	0	8.0	48
JUNE												
12...	1400	.26	--	32	54	45	130	5.8	119	0	54	325
JULY												
24...	1010	18	25.0	8.6	3.7	2.7	11	1.0	14	0	5.0	20
SEP.												
14...	0905	.35	24.0	31	87	150	908	33	124	0	255	1750

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC CONDU-CTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA--Continued												
APR., 1970												
21...	.1	.3	22	.03	5	1	63	.8	35	6.1	--	--
16204000 NORTH FORK KAUKONAHUA STREAM NEAR WAHIAWA--Continued												
JUNE, 1970												
11...	.1	.5	35	.05	10	2	57	.9	53	6.6	1.0	--
16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA--Continued												
APR., 1970												
16...	.0	.2	27	.04	9	1	56	.8	46	6.3	8.0	--
JULY												
07...	.0	.0	32	.04	11	1	54	.8	56	6.6	4.0	1000
16208500 RIGHT BRANCH OF SOUTH FORK KAUKONAHUA STREAM NEAR WAIHAWA--Continued												
JULY, 1970												
06...	.1	.0	35	.05	11	5	62	1.1	66	6.6	5.0	940
16211000 POAMOHO STREAM NEAR WAIHAWA--Continued												
APR., 1970												
14...	.0	.4	26	.04	7	2	63	1.0	42	6.1	4.0	--
JULY												
22...	.1	.5	33	.04	9	5	59	.9	54	6.7	1.0	0
16211600 MAKAHA STREAM NEAR MAKAHA--Continued												
APR., 1970												
15...	.1	.2	86	.12	36	0	37	.7	121	7.1	1.0	--
JULY												
10...	.2	.2	114	.16	50	0	34	.7	160	6.8	.0	--
16211800 KAUPUNI STREAM AT ALTITUDE 374 FT, NEAR WAIANAE--Continued												
APR., 1970												
15...	.2	.2	205	.28	97	0	32	1.0	290	7.1	.0	--
JULY												
10...	.2	.3	249	.34	124	10	31	1.1	375	7.0	.0	1700
16212800 KIPAPA STREAM NEAR WAHIAWA--Continued												
MAR., 1970												
05...	.0	.0	47	.06	16	4	55	1.0	78	7.1	--	--
APR.												
20...	.1	.4	17	.02	5	1	61	.7	27	6.0	--	--
JULY												
07...	.1	.0	37	.05	12	5	55	.9	63	6.3	2.0	1500
16216000 WAIAWA STREAM NEAR PEARL CITY--Continued												
MAY , 1970												
04...	.2	2.6	167	.23	58	27	55	2.0	301	6.6	--	7400
JUNE												
05...	.3	12	840	1.14	300	212	57	4.6	1540	6.9	1.0	--
JULY												
27...	.1	2.0	176	.24	69	41	50	1.7	331	6.6	15	9700
SEP.												
09...	.0	3.3	416	.57	160	122	54	3.0	806	7.1	7.0	--
16223000 WAIMALU STREAM NEAR AIEA--Continued												
MAY , 1970												
04...	.2	.1	122	.17	51	25	48	1.3	228	6.6	--	5700
JUNE												
12...	.1	.7	706	.96	320	217	46	3.2	1350	7.4	--	--
JULY												
24...	.1	.5	60	.08	20	9	53	1.1	104	6.3	15	--
SEP.												
14...	.1	2.4	3280	4.46	835	733	69	14	5860	7.2	--	--

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU--Continued												
16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA (LAT 21°23'07", LONG 157°56'22")												
MAY , 1970												
04...	1430	.78	23.0	19	10	7.5	21	1.6	72	0	8.0	26
JUNE												
05...	1030	.10	22.0	47	20	20	71	2.3	140	0	26	102
16226000 NORTH HALAWA STREAM NEAR AIEA (LAT 21°23'45", LONG 157°53'37")												
JULY, 1970												
23...	1100	1.1	--	20	5.1	3.8	13	1.0	38	0	3.6	17
16227500 MOANALUA STREAM NEAR KANEOHE (LAT 21°23'29", LONG 157°51'05")												
MAY , 1970												
14...	1200	.35	23.5	13	3.8	3.1	12	.8	22	0	4.0	19
JULY												
30...	1120	1.2	21.5	11	3.3	3.0	11	.8	21	0	3.0	18
16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE (LAT 21°23'27", LONG 157°50'59")												
MAY , 1970												
14...	1440	.11	25.0	13	4.2	3.6	12	1.0	28	0	3.6	20
JULY												
30...	1305	.63	21.5	9.1	2.5	2.4	10	.9	15	0	2.6	18
16228000 MOANALUA STREAM NEAR HONOLULU (LAT 21°22'53", LONG 157°52'22")												
JULY, 1970												
30...	1620	2.6	24.0	14	4.3	3.6	12	1.1	27	0	4.0	20
16228900 KALIHI STREAM NEAR KANEOHE (LAT 21°22'35", LONG 157°49'32")												
MAR., 1970												
16...	0900	.41	18.5	5.9	6.6	3.4	12	.8	28	0	6.6	21
JUNE												
06...	1400	.16	20.0	12	5.2	3.1	11	.5	27	0	4.4	18
SEP.												
04...	0930	.24	20.5	11	5.8	4.1	11	.5	30	0	5.0	17
16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU (LAT 21°20'55", LONG 157°49'40")												
MAR., 1970												
18...	1315	3.9	21.0	8.7	4.1	4.7	9.4	.7	26	0	6.0	15
JUNE												
08...	0930	1.8	21.0	10	4.3	5.3	10	.5	34	0	7.4	15
16238500 WAIHI STREAM AT HONOLULU (LAT 21°19'54", LONG 157°48'13")												
MAR., 1970												
17...	1030	.70	21.0	13	7.7	6.8	10	.9	48	0	7.6	17
APR.												
30...	1050	2.8	19.5	14	6.9	6.2	10	.6	46	0	4.6	17
JUNE												
10...	1000	.62	21.0	16	7.9	7.7	10	.7	57	0	5.4	17
JULY												
27...	1430	7.0	21.5	15	5.8	5.7	10	.9	40	0	4.0	16
SEP.												
02...	--	2.0	22.0	14	6.6	5.8	9.8	.7	44	0	3.4	16
16240500 WAIAKEAKUA STREAM AT HONOLULU (LAT 21°19'52", LONG 157°48'08")												
MAR., 1970												
17...	0900	2.7	20.0	17	6.5	5.4	10	.7	50	0	3.4	14
APR.												
30...	0850	3.9	19.5	17	6.6	5.2	9.8	.5	46	0	4.0	14
JUNE												
09...	1330	2.0	21.0	20	7.1	5.3	9.9	.5	51	0	2.4	13
JULY												
27...	1400	6.8	21.5	17	6.0	4.0	9.2	.8	35	0	5.0	14
SEP.												
02...	1400	3.4	21.5	18	6.8	5.2	9.7	.5	48	0	3.0	12

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA--Continued												
MAY , 1970												
04...	.2	.2	128	.17	56	0	44	1.2	211	7.1	--	20000
JUNE												
05...	.2	3.8	361	.49	133	18	53	2.7	605	7.1	.0	--
16226000 NORTH HALAWA STREAM NEAR AIEA--Continued												
JULY, 1970												
23...	.1	.3	83	.11	28	0	49	1.1	126	6.4	.0	--
16227500 MOANALUA STREAM NEAR KANEOHE--Continued												
MAY , 1970												
14...	.1	.0	67	.09	23	5	53	1.1	108	7.2	1.0	--
JULY												
30...	.1	.0	60	.08	21	4	53	1.1	100	7.1	1.0	1200
16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE--Continued												
MAY , 1970												
14...	.1	.8	72	.10	26	3	50	1.0	116	7.1	1.0	--
JULY												
30...	.1	.0	53	.07	16	4	56	1.1	90	6.8	1.0	1600
16228000 MOANALUA STREAM NEAR HONOLULU--Continued												
JULY, 1970												
30...	.1	.0	72	.10	26	4	49	1.0	121	7.1	2.0	2100
16228900 KALIHI STREAM NEAR KANEOHE--Continued												
MAR., 1970												
18...	.1	.2	71	.10	31	8	45	.9	126	6.8	--	--
JUNE												
06...	.1	.0	67	.09	26	4	48	.9	110	6.9	.0	--
SEP.												
04...	.0	.0	69	.09	32	7	43	.9	119	6.3	.0	--
16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU--Continued												
MAR., 1970												
18...	.0	.4	62	.08	30	8	40	.8	110	7.1	--	4700
JUNE												
08...	.1	.0	70	.10	33	5	40	.8	115	7.0	1.0	--
16238500 WAIHI STREAM AT HONOLULU--Continued												
MAR., 1970												
17...	.0	.8	88	.12	47	8	31	.6	146	7.2	--	--
APR.												
30...	.1	.0	82	.11	43	5	33	.7	133	6.7	--	2100
JUNE												
10...	.1	.0	93	.13	51	4	29	.6	151	7.1	2.0	--
JULY												
27...	.1	.4	78	.11	38	5	36	.7	128	6.6	2.0	7100
SEP.												
02...	.0	.1	78	.11	41	5	34	.7	132	6.5	2.0	--
16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued												
MAR., 1970												
17...	.0	.3	82	.11	39	0	35	.7	128	7.3	--	--
APR.												
30...	.1	.5	81	.11	38	1	36	.7	121	6.8	--	4900
JUNE												
09...	.1	.0	83	.11	40	0	35	.7	128	7.1	1.0	--
JULY												
27...	.1	1.9	75	.10	31	2	38	.7	115	6.6	2.0	6800
SEP.												
02...	.0	.5	80	.11	39	0	35	.7	126	7.0	2.0	--

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU--Continued												
16244000 PUKELE STREAM NEAR HONOLULU (LAT 21°18'35", LONG 157°47'30")												
APR., 1970												
29...	1245	.93	20.5	19	9.4	9.2	17	1.1	64	0	8.4	23
JUNE												
11...	1230	.38	23.5	23	9.7	10	18	1.0	66	0	7.0	24
SEP.												
03...	1200	.89	22.0	20	9.2	8.3	17	1.1	57	0	7.6	23
16246000 WAIOMAO STREAM NEAR HONOLULU (LAT 21°18'35", LONG 157°47'10")												
APR., 1970												
29...	1445	1.4	--	10	5.0	3.7	11	.8	28	0	4.0	19
JUNE												
11...	1400	.04	22.5	18	12	9.0	20	1.3	72	0	8.4	32
JULY												
17...	1410	.50	22.0	14	6.7	4.4	13	1.0	36	0	5.0	20
SEP.												
02...	1000	.61	21.5	12	5.6	4.4	11	.8	36	0	3.0	17
16247000 PALOLO STREAM NEAR HONOLULU (LAT 21°17'35", LONG 157°48'25")												
JUNE, 1970												
11...	1110	.56	25.0	7.4	15	8.9	26	1.2	0	31	12	47
16...	1310	1.4	33.0	10	13	2.3	26	1.5	16	10	12	44
SEP.												
03...	0930	1.4	24.0	17	12	10	21	1.0	72	0	9.0	32
16249000 WAIMANALO STREAM AT WAIMANALO (LAT 21°21'12", LONG 157°43'52")												
APR., 1970												
07...	0930	.69	21.5	28	22	14	27	1.6	128	0	15	34
MAY												
21...	1545	.75	26.0	28	24	16	29	1.9	147	0	18	34
JUNE												
29...	1530	.53	26.5	29	23	15	28	1.6	154	0	11	30
SEP.												
22...	1130	.61	24.5	26	25	15	25	3.3	158	0	6.2	30
16254000 MAKAWAO STREAM NEAR KAILUA (LAT 21°21'49", LONG 157°46'02")												
APR., 1970												
03...	1500	2.9	20.5	25	9.2	7.6	15	.8	68	0	5.0	20
MAY												
21...	1345	2.3	22.0	28	10	8.5	17	.8	72	0	5.6	22
JULY												
01...	1030	2.0	22.0	29	10	8.0	17	.8	73	0	5.4	22
SEP.												
23...	1110	1.6	--	27	10	8.0	16	.8	71	0	6.0	21
16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'46")												
APR., 1970												
03...	0915	1.4	18.0	23	7.6	5.0	13	.8	51	0	3.4	17
MAY												
21...	1100	.82	20.0	24	7.9	5.5	13	1.0	50	0	4.4	18
JUNE												
30...	1030	1.4	20.0	35	7.6	4.6	12	.9	50	0	3.4	16
SEP.												
22...	1325	.81	21.0	24	8.0	5.3	12	.9	50	0	3.6	17
16275000 HAIKU STREAM NEAR HEEIA (LAT 21°24'45", LONG 157°49'35")												
APR., 1970												
03...	1130	1.7	19.0	22	8.1	5.4	12	.7	53	0	3.0	17
JUNE												
29...	1315	1.5	21.0	24	8.2	5.4	12	.8	54	0	3.0	17
SEP.												
23...	1330	1.2	--	24	8.2	5.6	12	.8	54	0	3.0	16
16283000 KAHALUU STREAM NEAR HEEIA (LAT 21°26'20", LONG 157°51'20")												
JUNE, 1970												
29...	1145	.22	21.0	22	7.5	5.0	12	.9	50	0	3.0	16
SEP.												
23...	1530	.18	21.0	23	8.0	5.4	12	.8	53	0	1.0	16

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC CONDU-CTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16244000 PUKELE STREAM NEAR HONOLULU--Continued												
APR., 1970												
29...	.2	8.4	127	.17	62	9	37	.9	207	6.8	--	--
JUNE												
11...	.1	13	138	.19	65	11	37	1.0	221	6.8	1.0	--
SEP.												
03...	.0	9.0	123	.17	57	11	39	1.0	205	7.0	1.0	--
16246000 WAIOMAO STREAM NEAR HONOLULU--Continued												
APR., 1970												
29...	.2	.2	68	.09	28	5	45	.9	112	6.7	--	--
JUNE												
11...	.1	1.0	137	.19	67	8	39	1.1	236	7.0	1.0	--
JULY												
17...	.1	.4	83	.11	35	5	44	1.0	140	6.9	1.0	--
SEP.												
02...	.0	.1	72	.10	32	3	42	.8	119	7.0	3.0	--
16247000 PALOLO STREAM NEAR HONOLULU--Continued												
JUNE, 1970												
11...	.1	.5	150	.20	74	20	43	1.3	299	10.2	1.0	--
16...	.2	.1	128	.17	46	17	54	1.7	248	9.9	--	9600
SEP.												
03...	.0	3.2	140	.19	71	12	39	1.1	249	7.5	1.0	--
16249000 WAIMANALO STREAM AT WAIMANALO--Continued												
APR., 1970												
07...	.1	2.3	207	.28	113	8	34	1.1	353	7.1	--	--
MAY												
21...	.2	2.6	226	.31	126	6	33	1.1	375	7.6	1.0	--
JUNE												
25...	.2	.7	214	.29	119	0	33	1.1	356	7.5	--	--
SEP.												
22...	.2	.6	209	.28	124	0	30	1.0	357	7.2	.0	--
16254000 MAKAWAO STREAM NEAR KAILUA--Continued												
APR., 1970												
03...	.2	.0	116	.16	55	0	37	.9	183	6.9	--	--
MAY												
21...	.1	.4	127	.17	60	1	38	1.0	193	7.3	1.0	--
JULY												
01...	.2	.0	128	.17	58	0	39	1.0	193	7.5	5.0	1900
SEP.												
23...	.3	.0	124	.17	58	0	37	.9	191	7.3	1.0	--
16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued												
APR., 1970												
03...	.1	.2	95	.13	40	0	41	.9	142	7.2	--	--
MAY												
21...	.1	.1	99	.13	42	1	39	.9	144	7.2	.0	--
JUNE												
30...	.1	.0	105	.14	38	0	40	.8	140	7.1	1.0	1600
SEP.												
22...	.2	.0	96	.13	42	1	38	.8	143	7.1	1.0	--
16275000 HAIKU STREAM NEAR HEEIA--Continued												
APR., 1970												
03...	.1	.1	94	.13	42	0	38	.8	144	7.5	--	--
JUNE												
29...	.1	.0	98	.13	43	0	37	.8	144	7.6	--	770
SEP.												
23...	.1	.0	97	.13	44	0	37	.8	146	7.3	.0	--
16283000 KAHALUU STREAM NEAR HEEIA--Continued												
JUNE, 1970												
29...	.2	.1	92	.13	39	0	39	.8	138	7.7	--	530
SEP.												
23...	.1	.0	93	.13	42	0	38	.8	141	7.2	.0	--

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU--Continued												
16284000 WAIHEE STREAM NEAR HEEIA (LAT 21°27'00", LONG 157°51'40")												
JUNE, 1970												
22...	1415	5.5	21.0	25	6.6	4.0	11	.8	46	0	3.0	14
16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE (LAT 21°30'00", LONG 157°51'54")												
SEP., 1970												
18...	1425	2.8	23.0	24	7.4	6.4	14	.7	56	0	3.2	20
16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA (LAT 21°32'38", LONG 157°53'07")												
MAY, 1970												
12...	1530	24	--	18	6.0	4.1	10	.5	40	0	2.0	14
JUNE												
25...	1410	29	--	18	5.5	3.9	10	.5	38	0	2.4	13
16303000 PUNALUU STREAM NEAR PUNALUU (LAT 21°33'33", LONG 157°54'06")												
APR., 1970												
10...	1445	7.0	--	24	5.8	4.2	9.5	.8	42	0	2.4	13
JUNE												
24...	1130	10	21.0	24	5.9	4.2	10	.8	42	0	3.0	14
SEP.												
28...	1120	4.4	20.5	26	6.2	5.1	9.9	.8	45	0	4.0	14
16304200 KALUANUI STREAM NEAR PUNALUU (LAT 21°35'22", LONG 157°54'38")												
MAY, 1970												
12...	1200	8.0	20.5	3.6	1.5	1.6	7.2	.5	6	0	2.4	14
JUNE												
25...	1145	2.1	--	2.7	1.1	1.6	7.0	.5	5	0	2.0	14
SEP.												
18...	1130	2.1	22.0	3.8	1.0	1.7	6.7	.4	6	0	.6	14
16308990 MALAEKAHANA STREAM NEAR LAIE (LAT 21°38'09", LONG 157°57'54")												
MAY, 1970												
11...	1345	.44	--	7.6	2.4	2.4	11	.9	13	0	3.6	19
JUNE												
23...	1245	.32	26.0	3.7	1.6	1.9	9.1	.8	8	0	4.0	16
SEP.												
17...	1130	.02	23.0	6.3	2.3	3.1	10	1.1	21	0	.6	17
16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI (LAT 21°37'25", LONG 158°01'04")												
APR., 1970												
17...	1120	1.3	21.5	3.5	1.6	2.2	8.3	.8	11	0	3.4	16
JULY												
08...	1020	2.4	--	6.9	1.4	1.9	8.6	.8	8	0	2.4	16
16330000 KAMANANUI STREAM AT MAUNAWAI (LAT 21°38'20", LONG 158°03'27")												
APR., 1970												
17...	1330	.94	25.0	5.0	2.8	2.7	9.3	.9	18	0	3.0	17
JULY												
08...	1330	2.5	24.5	4.6	2.2	2.1	8.4	.8	12	0	2.4	16
16343000 HELEMANO STREAM AT HALEIWA (LAT 21°34'40", LONG 158°06'12")												
APR., 1970												
17...	1020	.59	22.0	8.2	3.4	3.2	9.5	1.0	26	0	4.0	14
JULY												
22...	0845	.24	22.5	12	4.2	3.2	12	1.1	28	0	4.0	18
16345000 OPAEULA STREAM NEAR WAHIAWA (LAT 21°33'55", LONG 158°00'10")												
APR., 1970												
16...	1130	3.8	22.5	1.5	.7	1.0	5.5	.5	4	0	3.0	10
JULY												
22...	0920	2.7	23.0	1.9	.7	1.0	4.9	.6	4	0	.0	9.0

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
HAWAII, ISLAND OF OAHU--Continued												
16284000 WAIHEE STREAM NEAR HEEIA--Continued												
JUNE, 1970												
22...	.1	.0	88	.12	33	0	41	.8	124	7.5	--	1500
16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE--Continued												
SEP., 1970												
18...	.2	.0	104	.14	45	0	40	.9	159	7.0	.0	--
16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA--Continued												
MAY, 1970												
12...	.1	.0	75	.10	32	0	40	.8	114	7.2	1.0	--
JUNE												
25...	.1	.3	73	.10	30	0	42	.8	110	7.3	--	470
16303000 PUNALUU STREAM NEAR PUNALUU--Continued												
APR., 1970												
10...	.1	.2	81	.11	32	0	39	.7	114	7.0	--	--
JUNE												
24...	.1	.2	83	.11	32	0	40	.8	117	7.5	--	530
SEP.												
28...	.1	.0	88	.12	37	0	36	.7	121	7.4	.0	--
16304200 KALUANUI STREAM NEAR PUNALUU--Continued												
MAY, 1970												
12...	.1	.3	34	.05	10	5	59	1.0	59	6.7	1.0	--
JUNE												
25...	.2	.5	32	.04	9	5	60	1.0	56	6.7	--	4300
SEP.												
18...	.1	.1	31	.04	10	5	59	.9	57	6.0	1.0	--
16308990 MALAEKAHANA STREAM NEAR LAIE--Continued												
MAY, 1970												
11...	.1	.1	54	.07	16	6	58	1.2	90	7.2	1.0	--
JUNE												
23...	.1	.3	41	.06	12	6	61	1.2	74	6.8	--	1300
SEP.												
17...	.1	.0	50	.07	19	2	52	1.0	91	6.7	1.0	--
16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued												
APR., 1970												
17...	.1	.6	42	.06	13	4	56	1.0	70	6.5	32	1500
JULY												
08...	.1	.1	42	.06	12	5	60	1.1	72	6.0	7.0	1700
16330000 KAMANANUI STREAM AT MAUNAWAI--Continued												
APR., 1970												
17...	.1	.4	50	.07	18	3	51	1.0	86	6.8	25	1000
JULY												
08...	.1	.1	43	.06	14	4	55	1.0	77	6.4	10	1600
16343000 HELEMANO STREAM AT HALEIWA--Continued												
APR., 1970												
17...	.1	.2	57	.08	22	0	47	.9	95	6.7	25	2200
JULY												
22...	.1	.4	69	.09	24	1	51	1.1	115	6.4	1.0	1600
16345000 OPAEULA STREAM NEAR WAHIAWA--Continued												
APR., 1970												
16...	.0	.3	24	.03	6	2	65	1.0	43	6.2	4.0	--
JULY												
22...	.1	.5	21	.03	6	2	62	.9	38	5.9	5.0	--

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF MOLOKAI												
16400000 HALAWA STREAM NEAR HALAWA (LAT 21°09'31", LONG 156°45'53")												
MAR., 1970												
08...	1000	2.8	18.5	8.3	1.6	1.6	8.2	.7	11	0	2.2	14
JUNE												
20...	1055	5.2	20.0	6.9	1.1	1.2	6.9	.6	8	0	2.0	12
16404600 PELEKUNU STREAM NEAR PELEKUNU (LAT 21°08'12", LONG 156°52'46")												
MAR., 1970												
03...	1440	5.6	19.5	21	11	3.2	9.0	.8	43	0	11	11
AUG.												
04...	1640	5.8	21.5	19	11	3.8	8.8	.7	42	0	13	10
16405300 MOLOKAI TUNNEL AT WEST PORTAL (LAT 21°07'27", LONG 156°59'50")												
MAR., 1970												
02...	1130	5.8	17.0	26	5.6	2.8	9.4	1.5	36	0	2.4	12
JUNE												
15...	1535	6.7	18.0	30	5.5	2.8	9.1	1.6	38	0	1.0	11
16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA (LAT 21°08'43", LONG 156°55'18"												
MAR., 1970												
07...	1115	1.2	19.0	29	6.0	3.1	9.4	1.6	38	0	2.0	12
JUNE												
24...	0930	.59	18.5	30	5.7	3.0	9.2	1.6	39	0	1.4	11
16415000 EAST FORK KAWELA GULCH NEAR KAMALO (LAT 21°06'46", LONG 156°54'23")												
MAR., 1970												
09...	1030	.40	13.5	9.6	.8	.9	5.7	.4	6	0	.2	9.5
AUG.												
12...	0900	.40	16.0	5.8	.8	1.0	5.0	.2	4	0	.0	8.5
16416000 PUNAULA GULCH NEAR PUKOO (LAT 21°05'50", LONG 156°48'48")												
MAR., 1970												
10...	1000	.08	18.0	5.2	1.3	1.3	6.1	.6	10	0	2.8	9.0
JUNE												
28...	0945	2.2	18.0	3.9	1.1	1.1	5.7	.6	6	0	.0	11
SAMOA ISLANDS, ISLAND OF TUTUILA												
16944200 PAPA STREAM AT NUUULI (LAT 14°18'48" S., LONG 170°42'33" W.)												
AUG., 1970												
05...	1600	2.1	26.0	20	4.3	2.9	7.0	1.2	31	0	1.0	9.5
16948000 AFUELO STREAM AT MATUU (LAT 14°18'07" S., LONG 170°41'07" W.)												
AUG., 1970												
04...	1530	.43	26.0	20	5.2	3.4	9.8	1.3	36	0	2.0	14
SEP.												
13...	1420	1.1	24.5	17	4.2	2.9	8.7	1.3	28	0	.4	14
16949800 UTUMOA STREAM NEAR PAGO PAGO (LAT 14°17'35" S., LONG 170°42'20" W.)												
SEP., 1970												
13...	0830	.40	--	26	6.1	2.8	8.3	1.4	40	0	.0	10
16951000 VAIPITO STREAM AT PAGO PAGO (LAT 14°16'57" S., LONG 170°42'16" W.)												
AUG., 1970												
04...	1345	1.6	27.0	18	14	4.1	8.8	1.2	64	0	2.6	11
SEP.												
17...	1645	1.9	24.0	13	6.6	2.7	6.3	1.2	36	0	.6	8.0
16950000 VAITELE STREAM AT LAULITUAI (LAT 14°17'05" S., LONG 170°39'07" W.)												
SEP., 1970												
15...	1430	.75	24.0	26	2.5	1.6	8.9	2.1	22	0	.0	12
16959000 VISA STREAM AT AUMI (LAT 14°17'27" S., LONG 170°38'36" W.)												
SEP., 1970												
11...	1700	.26	24.0	30	5.4	3.3	12	1.9	40	0	1.6	16

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	ALKA-LINITY AS CACO3 (MG/L)
HAWAII, ISLAND OF MOLOKAI--Continued												
16400000 HALAWA STREAM NEAR HALAWA--Continued												
MAR., 1970 08...	.0	.0	42	.06	11	2	61	1.1	67	6.6	--	9
JUNE 20...	.1	.0	35	.05	8	1	64	1.1	54	6.3	1.0	7
16404000 PELEKUNU STREAM NEAR PELEKUNU--Continued												
MAR., 1970 03...	.1	.0	88	.12	41	6	32	.6	126	6.9	--	35
AUG. 04...	.0	.0	87	.12	43	9	30	.6	128	7.2	.0	34
16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued												
MAR., 1970 02...	.1	1.0	79	.11	26	0	43	.8	101	6.9	--	30
JUNE 15...	.2	.1	80	.11	25	0	42	.8	102	6.8	.0	31
16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued												
MAR., 1970 07...	.1	.5	83	.11	28	0	41	.8	106	6.9	--	31
JUNE 24...	.1	.4	81	.11	27	0	41	.8	106	6.9	.0	32
16415000 EAST FORK KAWELA GULCH NEAR KAMALO--Continued												
MAR., 1970 09...	.1	.2	30	.04	6	0	68	1.1	42	6.1	--	5
AUG. 12...	.0	.3	24	.03	6	3	63	.9	38	5.6	.0	3
16416000 PUNAULA GULCH NEAR PUKOO--Continued												
MAR., 1970 10...	.0	.1	31	.04	9	0	59	.9	51	6.5	--	8
JUNE 28...	.1	.3	27	.04	7	2	61	.9	47	6.4	5.0	5
SAMOA ISLANDS, ISLAND OF TUTUILA--Continued												
16944200 PAPA STREAM AT NUUULI--Continued												
AUG., 1970 05...	.2	.0	61	.08	23	0	39	.6	84	7.0	1.0	1000
16948000 AFUELO STREAM AT MATUU--Continued												
AUG., 1970 04...	.2	.0	74	.10	27	0	43	.8	107	7.2	2.0	3100
SEP. 13...	.2	.0	63	.09	23	0	44	.8	92	6.8	4.0	11000
16949800 UTUMOA STREAM NEAR PAGO PAGO--Continued												
SEP., 1970 13...	.2	.0	75	.10	27	0	39	.7	95	7.0	2.0	4700
16951000 VAIPITO STREAM AT PAGO PAGO--Continued												
AUG., 1970 04...	.2	.0	91	.12	52	0	26	.5	143	7.7	1.0	7100
SEP. 17...	.2	.0	57	.08	27	0	32	.5	86	7.0	15	4700
16956000 VAITELE STREAM AT LAULITUAI--Continued												
SEP., 1970 15...	.2	.0	64	.09	13	0	56	1.1	75	6.8	3.0	17000
16959000 VISA STREAM AT AUMI--Continued												
SEP., 1970 11...	.2	.0	90	.12	27	0	47	1.0	118	6.8	1.0	18000

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	TIME	DIS-CHARGE (CFS)	TEMP-ERATURE (DEG C)	SILICA (SIO2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	SODIUM (NA) (MG/L)	PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	SULFATE (SO4) (MG/L)	CHLO-RIDE (CL) (MG/L)
SAMOA ISLANDS, ISLAND OF TUTUILA												
16906000 VAITOLU STREAM AT AOA (LAT 14°10'19" S., LONG 170°35'32" W.)												
SEP., 1970 12...	1330	.02	24.5	23	5.8	9.0	12	1.1	58	0	.0	22
16909500 TALALOA STREAM AT MASEFAU (LAT 14°15'51" S., Long 170°38'07" W.)												
SEP., 1970 12...	1040	.54	25.5	24	5.4	3.6	11	.8	42	0	.4	14
16912000 PAGO STREAM AT AFONO (LAT 14°16'03" S., Long 170°39'02" W.)												
SEP., 1970 16...	1030	3.1	24.0	22	4.2	2.6	8.3	1.3	29	0	.4	12
16914000 LEAFU STREAM AT VATIA (LAT 14°15'24" S., LONG 170°40'44" W.)												
SEP., 1970 16...	1220	1.5	24.0	15	3.7	4.4	8.0	.8	32	0	.4	15
16917500 LEELE STREAM AT MOUTH, AT FAGASA (LAT 14°17'28" S., LONG 170°43'09" W.)												
AUG., 1970 04...	1415	.80	27.0	21	7.8	3.3	8.0	1.1	46	0	2.0	9.0
SEP. 13...	1110	.82	24.5	20	9.9	3.5	8.0	1.2	52	0	.4	9.0
16920500 AASU STREAM AT AASU (LAT 14°17'51" S., LONG 170°45'30" W.)												
SEP., 1970 16...	1420	5.0	24.0	20	5.7	4.6	6.7	.9	45	0	.6	9.0
16960000 ALEGA STREAM AT ALEGA (LAT 14°16'58" S., LONG 170°38'19" W.)												
SEP., 1970 11...	1630	.57	23.5	30	6.2	3.3	11	1.8	42	0	.4	14

DATE	TOTAL IRON (FE) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL ALUM-INUM (AL) (UG/L)	TOTAL COPPER (CU) (UG/L)	ALKA-LINITY AS CACO3 (MG/L)
16906000 VAITOLU STREAM AT AOA--Continued					
SEP., 1970 12...	100	0	100	0	48
16909500 TALALOA STREAM AT MASEFAU--Continued					
SEP., 1970 12...	210	10	110	0	34
16912000 PAGO STREAM AT AFONO--Continued					
SEP., 1970 16...	--	--	--	--	24
16914000 LEAFU STREAM AT VATIA--Continued					
SEP., 1970 16...	--	--	--	--	26
16917500 LEELE STREAM AT MOUTH, AT FAGASA--Continued					
AUG., 1970 04...	60	10	80	0	38
SEP. 13...	30	0	90	0	43
16920500 AASU STREAM AT AASU--Continued					
SEP., 1970 16...	--	--	--	--	37
16944200 PAPA STREAM AT NUUULI--Continued					
AUG., 1970 05...	--	--	--	--	25

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	NITRATE (NO3) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	SPECI-FIC CONDU-CTANCE (MICRO-MHOS)	PH (UNITS)	TUR-BID-ITY (JTU)	COLI-FORM (COL-ONIES PER 100 ML)
SAMOA ISLANDS, ISLAND OF TUTUILA--Continued												
16906000 VAITOLU STREAM AT AOA--Continued												
SEP., 1970 12...	.2	.0	102	.14	52	4	33	.7	162	7.0	4.0	27000
16909500 TALALOA STREAM AT MASEFAU--Continued												
SEP., 1970 12...	.2	.0	80	.11	29	0	45	.9	106	6.9	1.0	23000
16912000 PAGO STREAM AT AFONO--Continued												
SEP., 1970 16...	.2	.0	65	.09	21	0	44	.8	86	7.1	4.0	20000
16914000 LEAFU STREAM AT VATIA--Continued												
SEP., 1970 16...	.1	.1	64	.09	27	1	38	.7	95	6.9	25	13000
16917500 LEELE STREAM AT MOUTH, AT FAGASA--Continued												
AUG., 1970 04...	.2	.0	75	.10	33	0	34	.6	108	7.5	2.0	18000
SEP. 13...	.5	.0	78	.11	39	0	30	.6	118	6.9	2.0	8000
16920500 AASU STREAM AT AASU--Continued												
SEP., 1970 16...	.1	.0	70	.10	33	0	30	.5	98	7.1	2.0	4000
16960000 ALEGA STREAM AT ALEGA--Continued												
SEP., 1970 11...	.2	.4	88	.12	29	0	43	.9	115	6.7	1.0	14000

DATE	TOTAL IRON (FE) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL ALUM-INUM (AL) (UG/L)	TOTAL COPPER (CU) (UG/L)	ALKA-LINITY AS CACO3 (MG/L)
16948000 AFUELO STREAM AT MATUU--Continued					
AUG., 1970 04...	100	10	40	0	30
SEP. 13...	130	10	170	0	23
16949800 UTUMOA STREAM NEAR PAGO PAGO--Continued					
SEP., 1970 13...	40	10	90	0	33
16951000 VAIPITO STREAM AT PAGO PAGO--Continued					
AUG., 1970 04...	70	10	0	0	52
SEP. 17...	--	--	--	--	30
16956000 VAITELE STREAM AT LAULITUAI--Continued					
SEP., 1970 15...	50	0	120	0	18
16959000 VISA STREAM AT AUMI--Continued					
SEP., 1970 11...	40	10	70	0	33
16960000 ALEGA STREAM AT ALEGA--Continued					
SEP., 1970 11...	50	0	60	0	34

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
HAWAII, ISLAND OF OAHU																	
16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA (LAT 21°29'32", LONG 157°59'55")																	
APR 16, 1970	1645	22.0	9.6	2	.05	--	--	--	--	--	--	--	--	--	--	--	
16211000 POAMOHO STREAM NEAR WAHIAWA (LAT 21°31'24", LONG 157°58'55")																	
APR 14, 1970	1245	20.0	7.8	2	.04	--	--	--	--	--	--	--	--	--	--	--	
16211600 MAKAHA STREAM NEAR MAKAHA (LAT 21°30'16", LONG 158°10'59")																	
APR 15, 1970	1110		.72	1	0	--	--	--	--	--	--	--	--	--	--	--	
16211800 KAUPUNI STREAM AT ALTITUDE 374 FT, NEAR WAIANAE (LAT 21°28'20", LONG 158°09'26")																	
APR 15, 1970	0835	20.5	.51	1	0	--	--	--	--	--	--	--	--	--	--	--	
16212800 KIPAPA STREAM NEAR WAHIAWA (LAT 21°28'15", LONG 157°57'50")																	
MAR 4, 1970	1345	22.0	.29	1	0	--	--	--	--	--	--	--	--	--	--	--	
APR 20.....	1400	21.0	13	62	2.2	--	--	--	--	--	--	--	--	--	--	--	
APR 20.....	1500	21.0	12	53	1.7	--	--	--	--	--	--	--	--	--	--	--	
16216000 WAIAWA STREAM NEAR PEARL CITY (LAT 21°23'55", LONG 157°58'50")																	
NOV 14, 1969	1510	--	920	1440	3580	44	57	70	80	91	94	97	100	--	--	--	VPWC
DEC 10.....	1000	22.0	7.2	11	.21	--	--	--	--	--	--	--	--	--	--	--	
MAR 20, 1970	1010	22.5	6.0	11	.18	--	--	--	--	--	--	--	--	--	--	--	
JUN 16.....	0830	22.5	4.9	8	.11	--	--	--	--	--	--	--	--	--	--	--	
JUL 27.....	0900	22.5	85	32	7.3	--	--	--	--	--	--	--	--	--	--	--	
SEP 9.....	1100	22.5	19	15	.77	--	--	--	--	--	--	--	--	--	--	--	
16223000 WAIMALU STREAM NEAR AIEA (LAT 21°23'34", LONG 157°57'03")																	
FEB 3, 1970	1000	22.5	.46	78	.10	--	--	--	--	--	--	--	--	--	--	--	
MAR 20.....	1200	23.5	.20	43	.02	--	--	--	--	--	--	--	--	--	--	--	
MAY 4.....	1045	23.0	3.5	18	.17	--	--	--	--	--	--	--	--	--	--	--	
JUN 12.....	1400	--	.32	52	.04	--	--	--	--	--	--	--	--	--	--	--	
JUL 24.....	1010	25.0	20	17	.92	--	--	--	--	--	--	--	--	--	--	--	
16227500 MOANALUA STREAM NEAR KANEOHE (LAT 21°23'29", LONG 157°51'05")																	
NOV 14, 1969	1420	20.0	19	23	1.2	--	--	--	--	--	--	--	--	--	--	--	
16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE (LAT 21°23'27", LONG 157°50'59")																	
NOV 14, 1969	1315	20.0	30	367	30	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1335	20.0	28	197	15	--	--	--	--	--	--	--	--	--	--	--	
16228000 MOANALUA STREAM NEAR HONOLULU (LAT 21°22'53", LONG 157°52'22")																	
JAN 14, 1970	1030	21.5	45	23	2.8	--	--	--	--	--	--	--	--	--	--	--	
16228200 MOANALUA STREAM NEAR AIEA (LAT 21°22'37", LONG 157°53'03")																	
NOV 14, 1969	1325		28	2020	153	--	--	--	--	--	--	--	--	--	--	--	
NOV 14.....	1335		25	1750	118	--	--	--	--	--	--	--	--	--	--	--	
16238500 WAIHI STREAM AT HONOLULU (LAT 21°19'54", LONG 157°48'13")																	
APR 30, 1970	1050	19.5	2.8	5	.04	--	--	--	--	--	--	--	--	--	--	--	
16240500 WAIAKEAKUA STREAM AT HONOLULU (LAT 21°19'52", LONG 157°48'08")																	
APR 30, 1970	0850	19.5	3.8	9	.09	--	--	--	--	--	--	--	--	--	--	--	
16249000 WAIMANALO STREAM AT WAIMANALO (LAT 21°21'12", LONG 157°43'52")																	
APR 21, 1970	1030		9.8	20	.53	--	--	--	--	--	--	--	--	--	--	--	
16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI (LAT 21°37'25", LONG 158°01'04")																	
APR 17, 1970	1120	21.5	1.7	2	.01	--	--	--	--	--	--	--	--	--	--	--	
16330000 KAMANANUI STREAM AT MAUNAWAI (LAT 21°38'20", LONG 158°03'27")																	
APR 17, 1970	1330	25.0	.90	2	0	--	--	--	--	--	--	--	--	--	--	--	
AUG 26.....	1215	24.5	60	39	6.3	--	--	--	--	--	--	--	--	--	--	--	
AUG 26.....	1230	24.5	55	36	5.3	--	--	--	--	--	--	--	--	--	--	--	
AUG 26.....	1310	24.5	47	24	3.0	--	--	--	--	--	--	--	--	--	--	--	
AUG 26.....	1500	25.0	45	22	2.7	--	--	--	--	--	--	--	--	--	--	--	

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

DATE	TIME	WATER TEMPERATURE (C)	DISCHARGE (CFS)	CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS/DAY)	PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002	.004	.008	.016	.031	.062	.125	.250	.500	1.00	2.00	METHOD OF ANALYSIS
HAWAII, ISLAND OF OAHU--Continued																	
16343000 HELEMANO STREAM AT HALEIWA (LAT 21°34'40", LONG 158°00'12")																	
APR 17, 1970	1015	22.0	.73	3	.01	--	--	--	--	--	--	--	--	--	--	--	
16345000 OPAEULA STREAM NEAR WAHIAWA (LAT 21°33'55", LONG 158°00'10")																	
APR 16, 1970	1140	22.5	3.8	1	.01	--	--	--	--	--	--	--	--	--	--	--	

PARTICLE SIZE OF BED MATERIAL, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

DATE	TIME	WATER TEMPERATURE (C)	NUMBER OF SAMPLING POINTS	DISCHARGE (CFS)	PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .062	.125	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0	64.0	METHOD OF ANALYSIS
16216000 WAIAWA STREAM NEAR PEARL CITY (LAT 21°23'55", LONG 157°58'50")																
NOV 4, 1969	0900			10	--	1	2	8	16	23	30	39	47	64	100	S
16223000 WAIMALU STREAM NEAR AIEA (LAT 21°23'34", LONG 157°57'03")																
NOV 4, 1969	1100			.4	1	2	8	23	38	48	56	63	73	85	100	S
16249000 WAIMANALO STREAM AT WAIMANALO (LAT 21°21'12", LONG 157°43'52")																
NOV 4, 1969	1300			.7	1	2	6	19	38	51	62	74	88	100	--	S

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