Water year

1968

IWAO MATSUOKA

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, and with other State, county, and Federal agencies

United States Department of the Interior
Geological Survey - Water Resources Division

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS 1968

Part 1: Surface Water Records

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
Federal Water Pollution Control Administration,
U.S. Department of the Interior

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

1970

CALENDAR FOR WATER YEAR 1968

OCTOBER 1967

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

NOVEMBER 1967

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

DECEMBER 1967

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

JANUARY 1968

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

FEBRUARY 1968

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

MARCH 1968

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

APRIL 1968

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

MAY 1968

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

JUNE 1968

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

JULY 1968

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

AUGUST 1968

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

SEPTEMBER 1968

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

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1968

Part 1. Surface Water Records

INTRODUCTION

The surface-water records for the 1968 water year for gaging stations, partial-record stations, and miscellaneous sites within the State of Hawaii and other Pacific areas 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, district chief.

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." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Hawaii were contained in the above series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in a 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 and is primarily for local needs. The records later will be published in Geological Survey water-supply papers at 5-year intervals. These water-supply papers will be entirely on a water-year basis and will show daily discharge in cubic feet per second.

COOPERATION

Cooperative agreements between the U.S. Geological Survey and organizations of the State of Hawaii for the systematic collection of streamflow records began in 1909. Cooperative agreements with the Territory of Guam 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 agreements with the Survey are:

State of Hawaii, Department of Land and Natural Resources.
Government of Guam.
Government of American Samoa.
Trust Territory of the Pacific Islands.
City and County of Honolulu, Board of Water Supply.
City and County of Honolulu, Division of Engineering.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army; Public Works Center, U.S. Navy, Guam; and Federal Water Pollution Control Administration, U.S. Department of the Interior.

The following organizations aided in collecting records:

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

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

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.

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimes 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.

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

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

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

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, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

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.

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, a long reach of the channel, or an artificial structure.

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.

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

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

DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indention shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the

same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the 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 16-0958.00, includes the part number "16" and a 6-digit station number. In this report, the nonessential zeros are not shown. For example, the complete number 16-0958.00 would appear as 16-0958, just to the left of the station name. Also, the records are listed in downstream order by islands.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. Records of stage are obtained from a water-stage recorder that gives either a continuous chart of the fluctuations or, for a digital recorder, a tape punched at 15-minute intervals. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

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, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the

monthly and the yearly mean discharge are computed. 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 in effect the shifting-control method.

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 the daily discharge. 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.

The data in this report generally comprise a description of the station and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the 1968 water year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U.S. Coast and Geodetic Survey. Publication of

average discharge for the period of record has been temporarily discontinued owing to technical difficulties involved in the changeover from fiscal to water year. Under "Extremes" are given the maximum discharge and gage height or the maximum daily discharge, the minimum discharge if there is little or no regulation, and the minimum daily discharge if there is extensive regulation. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record is given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder or crest-stage indicator. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

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

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Maximum daily and minimum daily discharges for the month are listed in the lines headed "Max" and "Min," respectively. Discharge for the month is expressed in acre-feet (line headed "Ac-ft").

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. 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 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.

For gaging stations on lakes or reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and 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 are within 5 percent; "good," within 10 percent; and "fair," within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors.

OTHER DATA AVAILABLE

Data collected at partial-record stations and at miscellaneous sites are given at the end of this report. Data for 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 at miscellaneous sites are given in a third table. 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 is on file in the district office, such as discharge measurements and recorder charts or nonrecording-gage readings. Most gaging-station records in the State through fiscal year 1960 have been analyzed with an electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

At or near some gaging stations, water-quality records also are collected. Data are obtained on the chemical quality of the stream water, on water temperature, on suspended-sediment concentration, and on the particle-size distribution of suspended sediment and bed material. These data are given in Part 2 of this report. Under the "Remarks" paragraph of the gaging-station description, reference is made to water-quality records collected on a regular basis.

HAWAII, ISLAND OF KAUAI

16-0100. Kawaikoi Stream near Waimea

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

Drainage area.--4.1 sq mi, approximately.

Records available.--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 September 1968. 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, staff gage at site 300 ft downstream at different datum.

Extremes.--Maximum discharge during year, 4,960 cfs Nov. 26 (gage height, 11.20 ft), from rating curve extended above 470 cfs as explained below; minimum, 2.3 cfs Sept. 22.
1909-16, 1919-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	32	141	35	19	14	30	34	5.9	12	14	3.8
2	25	85	301	32	15	14	24	29	5.8	7.0	9.9	3.8
3	11	84	84	30	14	14	26	15	5.6	5.8	7.6	16
4	6.5	16	59	26	13	13	32	57	5.4	5.0	6.3	12
5	5.4	12	37	33	12	12	40	64	5.4	6.3	5.9	4.6
6	4.6	68	28	38	11	11	22	19	5.2	6.3	6.3	3.5
7	5.1	18	23	28	11	10	18	15	5.2	5.0	5.6	3.1
8	21	16	184	21	11	9.6	124	13	5.2	4.6	5.4	3.1
9	8.1	17	768	17	10	9.1	324	12	5.2	4.5	5.2	3.5
10	7.6	18	1,200	16	9.4	82	203	11	5.0	4.7	5.2	5.0
11	9.9	70	515	17	9.1	54	37	12	5.4	24	5.6	3.8
12	7.0	54	119	16	9.6	100	27	11	16	67	6.5	3.0
13	8.3	14	128	15	9.6	45	22	9.6	13	37	21	2.9
14	5.9	9.9	94	14	9.4	99	22	9.1	9.1	10	8.6	3.1
15	4.8	8.3	53	15	124	28	17	8.8	7.9	7.0	5.9	2.9
16	7.1	7.6	93	200	38	524	15	8.6	21	5.9	5.0	2.6
17	11	7.4	260	60	68	126	14	8.6	13	5.4	8.3	2.5
18	5.9	7.2	98	35	49	45	13	8.3	8.3	5.6	15	2.4
19	28	6.3	58	23	22	75	146	7.9	7.0	4.8	6.1	2.5
20	33	6.1	37	19	140	37	119	7.6	5.8	4.5	4.6	2.5
21	17	5.9	30	56	328	24	29	7.6	5.2	4.4	4.4	2.4
22	10	6.3	27	74	36	21	17	7.6	5.0	4.2	4.2	2.3
23	7.4	35	387	35	24	122	17	7.4	4.8	132	4.2	2.9
24	7.0	185	316	22	19	234	22	7.2	4.6	42	4.1	14
25	5.9	389	124	18	50	238	22	7.0	4.5	13	3.9	10
26	5.0	1,080	50	16	29	61	18	6.7	4.5	9.4	4.1	25
27	5.0	242	37	132	18	39	26	6.5	4.5	7.9	7.2	29
28	5.2	166	34	46	15	28	55	6.3	4.5	7.0	6.5	8.1
29	5.0	148	70	23	15	93	41	6.3	4.2	6.5	4.6	5.6
30	84	210	29	19	------	198	40	6.1	33	6.1	4.1	12
31	27	------	85	18	------	52	------	5.9	------	6.5	3.8	------
TOTAL	397.8	3,024.0	5,469	1,149	1,138.1	2,431.7	1,562	435.1	235.2	471.4	209.1	197.9
MEAN	12.8	101	176	37.1	39.2	78.4	52.1	14.0	7.84	15.2	6.75	6.60
MAX	84	1,080	1,200	200	328	524	324	64	33	132	21	29
MIN	4.1	5.9	23	14	9.1	9.1	13	5.9	4.2	4.2	3.8	2.3
AC-FT	789	6,000	10,850	2,280	2,260	4,820	3,100	863	467	935	415	393

CAL YR 1967: TOTAL 19,793.2 MEAN 54.2 MAX 1,200 MIN 4.1 AC-FT 39,260
WAT YR 1968: TOTAL 16,720.3 MEAN 45.7 MAX 1,200 MIN 2.3 AC-FT 33,160

Peak discharge (base, 2,100 cfs).--Nov. 26 (0400) 4,960 cfs (11.20 ft); Dec. 10 (1900) 4,550 cfs (10.83 ft).

16-0130. Mohihi Stream at altitude 3,420 ft, near Waimea

Location.--Lat 22°07'13", long 159°36'14", 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.

Records available.--June 1920 to October 1926, October 1936 to September 1968. 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).

Extremes.--Maximum discharge during year, 1,090 cfs Dec. 10 (gage height, 5.82 ft), from rating curve extended above 160 cfs; minimum, 0.89 cfs Sept. 22, 23.
1920-26, 1936-68: Maximum discharge, 1,930 cfs Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 78 cfs; minimum, 0.12 cfs Sept. 21, 1953.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	8.4	37	18	7.6	6.5	8.2	7.6	2.7	6.1	3.9	1.5
2	6.6	20	71	15	6.5	5.8	6.7	8.7	2.6	3.9	2.9	3.4
3	6.3	26	28	14	6.1	5.3	5.8	5.3	2.5	3.1	2.5	6.7
4	4.2	6.0	18	10	5.7	5.0	5.7	7.2	2.4	2.8	2.2	3.3
5	3.4	4.2	13	15	5.2	4.6	6.3	18	2.4	3.2	2.1	2.1
6	2.8	13	9.8	16	4.9	4.3	5.0	7.8	2.4	3.3	1.9	1.7
7	2.6	6.0	7.8	9.4	4.6	4.1	4.6	6.0	2.3	2.7	1.9	1.5
8	3.3	4.2	87	7.8	4.5	3.9	5.1	5.3	2.3	2.5	1.7	1.4
9	3.4	4.3	176	6.9	4.3	3.7	60	5.0	2.4	2.3	1.7	1.4
10	3.1	4.0	359	6.5	4.2	6.0	90	4.7	2.4	2.2	1.7	1.7
11	3.6	8.0	135	6.7	4.1	7.2	15	4.5	2.4	2.4	1.9	1.5
12	3.3	15	59	6.0	4.5	24	9.1	4.3	2.7	8.3	2.0	1.3
13	2.9	4.7	47	5.8	4.3	15	9.0	4.1	3.5	14	4.8	1.2
14	2.6	3.4	39	5.3	4.2	21	9.6	3.9	4.5	4.5	3.2	1.2
15	2.6	2.9	22	5.6	51	12	6.3	3.7	4.1	3.5	2.4	1.2
16	2.9	2.6	42	72	16	203	9.2	3.7	4.1	2.8	2.1	1.1
17	3.3	2.6	117	25	16	69	11	3.7	4.6	2.6	1.9	1.0
18	2.9	2.7	46	14	16	18	6.9	3.6	3.3	2.7	1.7	.97
19	9.5	2.5	28	10	10	15	22	3.4	2.8	2.3	1.7	.97
20	16	2.8	17	8.2	57	12	36	3.3	2.6	2.2	1.6	.94
21	8.0	2.7	13	30	143	7.4	12	3.3	2.5	2.1	1.5	.97
22	4.2	2.7	12	48	20	6.0	7.2	3.5	2.4	2.0	1.5	.94
23	3.4	21	181	18	12	21	6.0	3.5	2.5	21	1.7	.94
24	3.1	46	155	11	9.4	52	15	3.4	2.4	15	1.5	1.3
25	2.7	137	51	9.1	11	57	15	3.2	2.3	4.7	1.5	1.7
26	2.3	376	24	7.8	9.8	19	9.8	3.1	2.3	3.3	1.6	2.8
27	2.2	132	17	32	7.4	9.4	7.2	3.0	2.2	2.8	1.7	5.1
28	2.2	83	14	20	6.7	7.2	9.1	2.9	2.2	2.6	1.7	2.2
29	2.1	46	25	11	7.2	31	8.2	2.8	2.2	2.2	1.6	1.6
30	9.5	56	13	8.7	------	54	7.1	2.8	11	2.2	1.5	2.2
31	7.8	------	33	8.0	------	15	------	2.7	------	2.2	1.4	------
TOTAL	134.7	1045.7	1896.6	480.8	463.2	724.4	428.1	148.0	91.0	137.5	63.0	55.83
MEAN	4.35	34.9	61.2	15.5	16.0	23.4	14.3	4.77	3.03	4.44	2.03	1.86
MAX	16	376	359	72	143	203	90	18	11	21	4.8	6.7
MIN	1.9	2.5	7.8	5.3	4.1	3.7	4.6	2.7	2.2	2.0	1.4	0.94
AC-FT	267	2070	3760	954	919	1440	849	294	180	273	125	111

CAL YR 1967: TOTAL 6,205.25 MEAN 17.0 MAX 376 MIN 0.76 AC-FT 12,310
WAT YR 1968: TOTAL 5,668.83 MEAN 15.5 MAX 376 MIN 0.94 AC-FT 11,240

PEAK DISCHARGE (BASE, 380 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0200	5.54	924	12-23	0930	4.97	648
12-10	0730	5.82	1,090	2-21	0300	4.58	493
12-17	0630	4.70	540	3-16	2200	4.66	524

16-0140. Kokee ditch near Waimea

Location.--Lat 22°06'25", long 159°40'45", on left bank 1,000 ft west of road and 10.5 miles north of Waimea.

Records available.--September 1926 to September 1968.

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.

Extremes.--1926-68: Maximum daily discharge, 105 cfs Dec. 2, 1929, Mar. 4, 1933; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Kokee ditch diverts water at altitude 3,400 ft from all streams tributary to Waimea River west of Mohihi Stream for irrigation in vicinity of Kekaha.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	39	50	8.9	17	22	34	37	13	19	13	4.2
2	20	58	33	24	13	20	38	46	13	12	10	4.2
3	22	62	30	22	11	27	38	29	13	9.9	8.2	14
4	9.9	40	27	20	9.9	41	42	50	12	9.2	6.9	17
5	7.6	31	36	21	18	37	50	60	12	9.9	6.2	6.7
6	6.7	50	37	19	35	35	34	31	12	10	6.5	5.1
7	6.0	18	31	17	36	33	31	30	12	8.6	6.0	4.2
8	21	16	26	16	31	31	32	28	11	8.2	5.6	4.2
9	11	16	19	15	22	30	72	27	11	7.6	5.6	4.3
10	9.4	12	24	15	19	49	46	26	11	7.4	5.6	6.2
11	11	13	7.7	14	18	25	29	26	11	23	5.6	5.1
12	9.2	53	15	14	19	34	20	24	18	34	6.2	4.2
13	9.6	19	14	18	18	41	27	22	20	44	19	3.8
14	7.4	12	17	12	18	33	32	22	15	16	11	4.0
15	6.0	9.3	15	12	23	11	35	20	14	11	7.4	3.6
16	6.7	7.7	18	33	13	32	38	20	23	9.4	6.0	3.4
17	14	7.7	25	21	20	37	38	20	21	8.4	6.0	3.2
18	7.4	7.7	13	21	23	27	35	19	14	8.4	16	3.0
19	30	6.2	7.7	41	18	34	55	18	13	7.9	6.9	3.0
20	38	6.2	16	34	43	18	47	17	11	7.2	6.2	3.0
21	22	6.2	14	20	21	22	29	17	10	6.9	5.3	3.0
22	13	6.2	15	16	30	38	36	17	9.9	6.7	5.1	2.9
23	9.6	27	29	19	30	58	37	17	9.4	32	4.9	3.2
24	8.6	36	24	14	30	62	41	16	9.4	47	4.7	14
25	7.4	58	20	25	39	24	37	15	9.2	16	4.5	12
26	6.2	54	24	22	36	42	38	15	8.9	11	4.5	9.5
27	5.8	52	19	48	20	46	32	15	8.6	9.4	6.2	34
28	5.8	58	16	47	20	44	38	15	8.4	8.2	6.9	9.9
29	6.0	68	15	30	24	61	22	14	8.2	7.2	5.1	6.2
30	56	80	7.9	20	------	54	32	14	28	6.7	4.7	11
31	45	------	5.6	18	------	28	------	14	------	6.2	4.3	------
TOTAL	443.9	929.2	650.9	676.9	674.9	1096	1115	741	390.0	428.4	220.1	212.1
MEAN	14.3	31.0	21.0	21.8	23.3	35.4	37.2	23.9	13.0	13.8	7.10	7.07
MAX	56	80	50	48	43	62	72	60	28	47	19	34
MIN	5.6	6.2	5.6	8.9	9.9	11	20	14	8.2	6.2	4.3	2.9
AC-FT	880	1840	1290	1340	1340	2170	2210	1470	774	850	437	421

CAL YR 1967: TOTAL 9,022.6 MEAN 24.7 MAX 82 MIN 5.6 AC-FT 17,900
WAT YR 1968: TOTAL 7,578.4 MEAN 20.7 MAX 80 MIN 2.9 AC-FT 15,030

Note.--No gage-height record Oct. 31 to Dec. 20.

16-0160. Waimea River at altitude 840 ft, near Waimea

Location.--Lat 22°04'55", long 159°39'15", on right bank in Waimea Canyon, 0.5 mile upstream from Koaie Stream, and 8.8 miles north of Waimea.

Drainage area.--20.0 sq mi.

Records available.--February to October 1916, October 1917 to June 1918, May 1925 to January 1949, September 1949 to July 1950, February 1951 to September 1968. Published as Waiahulu Stream near Waimea prior to July 1952 and as "at altitude 890 ft, near Waimea" July 1952 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 840 ft (from topographic map). Prior to May 25, 1925, at datum 1.55 ft lower.

Extremes.--Maximum discharge during year, 5,300 cfs Dec. 10 (gage height, 9.10 ft), from rating curve extended above 500 cfs on basis of slope-area measurement at gage height 11.45 ft; minimum, 13 cfs on several days.
1916-18, 1925-68: Maximum discharge, 28,000 cfs Aug. 17, 1950 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 500 cfs; minimum, 8.0 cfs Nov. 4, 1927.

Remarks.--Records fair. Kokee ditch (see sta. no. 140) diverts above station for irrigation in vicinity of Kekaha.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	18	90	125	48	48	36	30	21	27	16	18
2	14	32	217	118	44	48	32	31	21	22	18	18
3	20	66	65	100	44	45	30	28	21	22	17	19
4	15	18	38	90	42	44	29	28	23	22	17	25
5	14	14	32	110	39	44	29	60	22	21	17	20
6	14	26	30	130	35	44	29	29	23	22	17	18
7	14	18	28	90	31	43	29	25	23	19	17	17
8	13	15	350	70	30	42	55	24	23	18	17	17
9	14	14	766	58	30	43	340	24	23	18	17	16
10	14	14	1640	54	29	63	382	24	23	18	17	17
11	14	23	1030	52	29	34	82	23	23	18	17	16
12	14	39	302	50	31	62	51	23	23	22	17	16
13	14	17	265	72	29	59	43	22	24	48	17	16
14	14	14	213	50	30	86	43	22	24	20	20	16
15	14	14	150	40	227	46	37	22	25	18	19	16
16	17	13	226	437	87	578	36	22	24	17	18	16
17	15	14	658	250	109	226	42	22	25	17	18	16
18	14	14	273	120	108	69	34	21	24	17	18	16
19	18	14	189	80	60	62	99	21	23	17	18	15
20	24	14	136	54	288	46	150	21	23	17	18	15
21	20	14	118	70	699	38	56	21	24	16	19	15
22	16	14	115	220	125	34	38	21	26	16	18	15
23	17	26	744	110	73	87	33	22	27	16	18	15
24	14	99	720	80	57	193	36	21	22	97	18	15
25	14	345	364	54	86	206	45	21	22	25	18	16
26	13	1120	206	49	66	75	35	21	22	17	18	16
27	13	325	153	226	50	40	31	21	22	16	18	25
28	13	153	138	130	49	35	32	21	22	16	18	20
29	13	104	176	68	49	48	33	21	21	16	18	16
30	38	199	119	55	------	212	30	21	29	15	18	15
31	23	------	163	52	------	60	------	21	------	15	18	------
TOTAL	497	2810	9714	3264	2624	2760	1977	754	698	685	549	511
MEAN	16.0	93.7	313	105	90.5	89.0	65.9	24.3	23.3	22.1	17.7	17.0
MAX	38	1120	1640	437	699	578	382	60	29	97	20	25
MIN	13	13	28	40	29	34	29	21	21	15	16	15
AC-FT	986	5570	19270	6470	5200	5470	3920	1500	1380	1360	1090	1010

CAL YR 1967: TOTAL 26,703 MEAN 73.2 MAX 1,640 MIN 13 AC-FT 52,960
WAT YR 1968: TOTAL 26,843 MEAN 73.3 MAX 1,640 MIN 13 AC-FT 53,240

PEAK DISCHARGE (BASE, 2,200 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0330	8.09	3,640	12-17	0700	7.53	2,850
12-10	1900	9.10	5,300	2-21	0130	7.04	2,270

16-0170. Koaie Stream at altitude 3,770 ft, near Waimea

Location.--Lat 22°06'57", long 159°33'53", on left bank 3 miles upstream from Left Branch, 6.5 miles east of Kokee ranger station, and 12.7 miles northeast of Waimea.

Drainage area.--3.33 sq mi.

Records available.--July 1919 to July 1932, June 1954 to September 1968 (discontinued). Prior to July 1960, published as "at altitude 3,700 ft, near Waimea."

Gage.--Water-stage recorder. Altitude of gage is 3,770 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,620 cfs Nov. 26 (gage height, 4.48 ft), from rating curve extended above 1,100 cfs; minimum, 0.64 cfs July 8-10.
1919-32, 1954-68: Maximum discharge, 6,510 cfs Oct. 23, 1956 (gage height, 5.88 ft), from rating curve extended above 540 cfs; minimum, 0.64 cfs July 8-10, 1968.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	106	22	7.1	6.0	10	40	1.0	7.1	20	9.5
2	81	62	182	17	4.9	4.9	6.6	28	1.0	3.2	10	19
3	11	42	64	18	4.9	4.0	5.5	11	.86	1.8	5.5	21
4	8.7	9.5	39	13	4.4	3.2	5.5	21	1.0	1.5	3.2	9.5
5	6.0	7.9	27	40	4.4	3.2	7.9	32	1.0	1.8	2.6	4.4
6	2.9	27	25	10	3.6	2.6	6.6	10	.86	1.2	2.0	2.9
7	2.9	11	14	8.0	3.2	2.6	4.4	7.1	.76	.86	1.8	2.2
8	6.0	21	421	6.5	2.6	2.2	7.6	6.0	1.3	.76	1.8	2.0
9	4.0	14	287	5.8	2.6	2.0	61	5.5	4.0	.64	1.8	2.0
10	3.6	28	798	5.1	2.2	11	132	4.9	2.6	.64	2.6	6.6
11	4.9	40	139	4.5	2.6	14	14	4.9	2.6	17	7.9	6.0
12	3.6	31	57	4.0	6.0	139	8.7	4.9	13	42	6.0	3.2
13	2.9	8.7	63	3.7	8.7	50	15	4.0	16	26	29	4.0
14	2.9	5.5	57	3.5	8.7	84	12	3.2	32	7.1	8.7	6.0
15	2.0	4.0	21	20	148	31	6.6	2.9	6.0	4.9	4.9	4.4
16	2.9	3.6	98	130	20	1110	6.6	2.6	9.5	2.2	4.4	2.9
17	2.6	4.9	320	30	25	115	6.0	2.2	8.7	39	3.6	2.2
18	1.8	5.5	50	18	19	20	6.0	2.0	6.0	7.9	2.9	2.0
19	62	11	27	9.0	19	26	54	1.5	4.4	2.6	2.0	2.0
20	69	64	14	6.0	175	18	48	1.5	2.9	4.0	2.0	1.5
21	23	8.7	11	15	308	9.5	14	1.5	3.2	3.6	2.0	1.5
22	10	28	20	60	15	6.6	7.9	2.9	10	2.6	18	1.5
23	6.6	170	760	20	8.7	50	8.7	2.6	6.6	121	5.5	1.8
24	6.6	237	400	9.0	6.0	102	236	2.2	8.7	36	3.2	4.9
25	4.0	401	45	6.0	12	115	81	2.2	3.2	8.7	3.2	15
26	2.6	1580	20	5.5	8.7	28	52	1.8	2.0	5.5	4.0	8.7
27	2.9	489	13	58	5.5	13	26	1.5	1.3	3.6	7.9	26
28	4.4	302	30	30	4.9	8.7	28	1.3	16	2.9	7.9	6.6
29	3.6	120	33	11	5.5	42	19	1.5	4.9	2.6	4.4	3.6
30	14	152	12	7.1	------	95	27	1.2	56	2.6	2.9	2.9
31	15	------	110	6.0	------	20	------	1.2	------	57	2.6	------
TOTAL	387.4	3902.3	4263	601.7	846.2	2138.5	923.6	215.1	227.38	418.30	184.3	185.8
MEAN	12.5	130	138	19.4	29.2	69.0	30.8	6.94	7.58	13.5	5.95	6.19
MAX	81	1580	798	130	308	1110	236	40	56	121	29	26
MIN	1.8	3.6	11	3.5	2.2	2.0	4.4	1.2	0.76	0.64	1.8	1.5
AC-FT	768	7740	8460	1190	1680	4240	1830	427	451	830	366	369

CAL YR 1967: TOTAL 18,541.0 MEAN 50.8 MAX 1,580 MIN 1.3 AC-FT 36,780
WAT YR 1968: TOTAL 14,293.58 MEAN 39.1 MAX 1,580 MIN 0.64 AC-FT 28,350

PEAK DISCHARGE (BASE, 1,400 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0400	4.48	3,620	3-16	2030	4.39	3,480
12-10	0430	2.84	1,470				

Note.--No gage-height record Dec. 22 to Jan. 26.

16-0190. Waialae Stream at altitude 3,820 ft, near Waimea

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

Drainage area.--2.5 sq mi, approximately.

Records available.--January 1920 to July 1932, June 1952 to September 1968. 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).

Extremes.--Maximum discharge during year, 2,760 cfs Nov. 26 (gage height, 6.55 ft), from rating curve extended above 1,100 cfs as explained below; minimum, 2.3 cfs June 3, 4, 7.
1920-32, 1952-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	6.6	78	21	7.7	9.5	8.6	23	2.4	10	12	10
2	74	33	144	17	6.4	7.2	6.9	16	2.4	6.4	8.6	9.5
3	12	21	64	18	6.1	6.4	6.4	6.9	2.3	5.0	5.8	7.7
4	9.5	5.8	30	12	6.4	5.5	5.8	10	2.4	4.2	5.0	5.5
5	6.9	4.7	20	42	5.2	5.2	5.8	18	2.4	4.0	4.4	4.2
6	5.0	11	16	18	4.7	5.0	5.5	6.9	2.4	3.6	4.0	3.8
7	4.4	5.8	11	9.5	4.2	5.0	5.0	5.8	2.3	3.4	4.0	3.6
8	5.2	18	420	7.7	4.0	4.4	4.7	5.0	3.0	3.2	3.8	3.4
9	4.2	9.5	174	6.6	3.8	4.2	20	5.0	3.6	3.0	3.8	3.4
10	4.2	14	447	6.1	3.6	6.4	102	4.4	3.2	3.2	4.0	4.0
11	5.2	32	123	5.8	3.8	6.4	11	4.7	3.2	16	5.5	4.2
12	4.2	18	40	5.2	12	65	7.2	4.2	8.6	42	5.8	3.8
13	3.8	6.6	55	5.0	8.1	29	6.9	3.8	15	28	15	4.4
14	3.8	5.2	50	4.4	9.0	60	6.9	3.4	30	10	6.6	5.0
15	3.2	4.4	17	28	164	33	5.8	3.4	6.4	7.2	5.5	4.2
16	3.0	3.8	91	163	17	775	5.2	3.4	5.8	5.5	5.0	3.8
17	2.8	5.5	272	28	23	105	11	3.2	6.4	47	4.2	3.4
18	11	5.5	57	16	16	18	8.1	3.2	5.8	11	4.0	3.4
19	81	14	24	10	24	16	28	3.0	4.7	6.6	3.8	3.2
20	51	59	14	7.7	216	14	31	2.8	3.8	6.6	3.6	3.2
21	16	7.2	10	20	260	8.6	10	3.0	4.4	7.2	11	3.2
22	7.7	20	22	74	18	7.2	6.6	3.6	10	6.1	10	3.0
23	6.9	153	463	25	11	27	6.6	3.4	6.6	126	5.5	3.2
24	6.4	161	350	10	9.5	64	254	3.2	7.2	27	4.4	5.8
25	4.7	201	52	7.2	14	68	75	3.0	4.4	9.0	4.0	5.2
26	3.8	1120	18	6.6	10	18	115	2.8	3.6	6.6	4.4	11
27	3.8	453	12	70	7.7	9.5	16	2.8	3.4	5.5	6.4	7.2
28	4.4	274	29	33	7.7	7.7	14	3.2	20	5.0	5.5	5.0
29	4.0	133	30	10	11	21	9.0	3.2	6.4	4.4	4.4	4.2
30	6.1	170	11	7.7	------	71	9.0	2.6	45	4.4	4.0	4.2
31	6.6	------	131	8.1	------	15	------	2.6	------	44	3.8	------
TOTAL	374.8	2975.6	3275	702.6	893.9	1497.2	807.0	169.5	227.1	471.1	177.8	145.7
MEAN	12.1	99.2	106	22.7	30.8	48.3	26.9	5.47	7.57	15.2	5.74	4.86
MAX	81	1120	463	163	260	775	254	23	45	126	15	11
MIN	2.8	3.8	10	4.4	3.6	4.2	4.7	2.6	2.3	3.0	3.6	3.0
AC-FT	743	5900	6500	1390	1770	2970	1600	336	450	934	353	289

CAL YR 1967: TOTAL 13,644.1 MEAN 37.4 MAX 1,120 MIN 2.3 AC-FT 27,060
WAT YR 1968: TOTAL 11,717.3 MEAN 32.0 MAX 1,120 MIN 2.3 AC-FT 23,240

PEAK DISCHARGE (BASE, 1,300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0700	6.55	2,760	12-23	0900	4.53	1,320
12- 8	2030	4.67	1,400	3-16	2100	5.32	1,830
12-17	0600	5.60	2,030				

16-0220. Kekaha ditch at Camp 1, near Waimea

Location.--Lat 22°02'35", long 159°38'30", on right bank 0.2 mile downstream from lower intake and 6.2 miles northeast of Waimea.

Records available.--November 1907 to June 1915, March 1916 to August 1917, October 1917 to September 1968 (discontinued). (August 1932 to June 1933 monthly discharge only, published in WSP 1319; figures of daily discharge published in WSP 755 are unreliable.) Published as "at intake, near Waimea" January 1910 to December 1911 and as "at Flume No. 4, near Waimea" March 1916 to June 1917.

Gage.--Water-stage recorder. Altitude of gage is 520 ft (by barometer). Prior to July 12, 1921, staff gage at several sites within 1 mile of present site at various datums.

Extremes.--1907-68: Maximum daily discharge, 104 cfs Jan. 6, Mar. 3, 6, 7, 17, 18, 24-26, 29-31, 1921; no flow at times.

Remarks.--Records good. Ditch diverts from Waimea River 1 mile downstream from Waialae Stream for irrigation in vicinity of Kekaha.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	72	82	52	53	42	78	77	56	62	80	50
2	67	73	85	53	55	40	79	78	55	70	69	65
3	73	77	82	53	59	46	78	72	54	62	59	69
4	66	77	80	53	48	57	79	62	53	61	55	69
5	64	61	80	53	47	63	80	67	53	60	52	57
6	52	70	79	53	46	66	80	78	52	58	51	50
7	48	76	77	53	45	68	80	78	52	57	49	50
8	51	60	64	52	49	69	82	79	52	55	49	50
9	51	77	51	51	48	69	77	78	55	54	49	48
10	48	66	44	53	49	66	78	64	57	53	49	49
11	49	78	59	53	49	71	79	42	56	57	52	53
12	49	77	57	53	52	73	79	49	65	68	54	49
13	46	70	59	53	47	69	81	72	74	70	71	50
14	46	58	57	52	38	71	79	69	60	73	66	50
15	44	52	55	53	5.3	63	78	68	71	68	54	51
16	52	47	53	47	36	56	79	67	67	61	52	47
17	56	52	42	49	58	58	80	66	74	61	56	48
18	46	54	51	53	58	69	79	65	68	73	52	46
19	80	50	55	52	60	71	73	63	63	62	50	44
20	82	77	56	49	46	71	77	62	60	56	51	46
21	80	64	53	50	32	71	77	61	57	61	49	44
22	70	69	52	46	.50	71	76	63	70	56	66	46
23	67	80	43	49	5.8	71	78	63	65	62	57	44
24	69	80	46	49	29	72	79	61	68	76	51	48
25	57	71	53	50	38	73	68	60	63	74	48	60
26	49	51	53	53	36	71	57	59	57	63	49	57
27	46	54	53	46	37	72	57	58	53	58	52	72
28	46	56	53	48	44	71	62	58	59	54	56	58
29	46	79	53	49	44	71	69	59	54	52	50	50
30	55	83	53	52	------	78	78	57	47	52	48	50
31	77	------	53	52	------	75	------	56	------	60	46	------
TOTAL	1789	2011	1833	1584	1214.60	2054	2276	2011	1790	1909	1692	1570
MEAN	57.7	67.0	59.1	51.1	41.9	66.3	75.9	64.9	59.7	61.6	54.6	52.3
MAX	82	83	85	53	60	78	82	79	74	76	80	72
MIN	44	47	42	46	0.50	40	57	42	47	52	46	44
AC-FT	3550	3990	3640	3140	2410	4070	4510	3990	3550	3790	3360	3110

CAL YR 1967: TOTAL 23,336.10 MEAN 63.9 MAX 87 MIN 0.02 AC-FT 46,290
WAT YR 1968: TOTAL 21,733.60 MEAN 59.4 MAX 85 MIN 0.50 AC-FT 43,110

16-0291. Waimea ditch below wasteway, near Waimea

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

Records available.--February 1960 to September 1968.

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

Extremes.--1960-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	6.8	0.25		0	0.12	9.1	4.8	4.0	4.4	9.4	1.8
2	4.9	7.0	.25		0	.09	8.6	4.8	3.8	2.6	6.0	2.8
3	6.9	8.4	.25		0	.09	7.9	4.6	3.7	3.4	3.7	5.4
4	4.2	2.5	.25		0	3.0	7.4	4.6	3.7	4.1	2.8	8.0
5	3.3	1.3	.25		0	5.0	4.9	5.2	3.8	4.3	2.6	3.4
6	3.2	3.5	6.6		0	4.8	3.0	4.8	4.0	3.8	2.4	2.8
7	2.8	7.6	11		0	4.6	2.8	4.4	4.2	3.5	2.3	2.5
8	2.6	4.4	4.6		0	4.4	3.0	4.2	4.3	3.5	2.0	2.5
9	2.6	6.1	.25		0	4.2	5.4	3.9	4.4	3.3	1.9	2.5
10	2.6	9.3	.22		0	4.4	6.4	3.5	5.0	3.3	1.8	2.5
11	2.6	5.5	.22		0	4.6	4.4	4.3	4.8	3.1	1.8	2.5
12	3.0	6.2	.18		3.0	4.6	2.9	4.3	5.0	7.7	2.0	2.5
13	3.2	4.2	.15		4.6	5.0	2.8	3.3	6.8	10	3.0	2.4
14	3.1	3.0	.15		4.4	5.0	2.8	2.9	8.5	9.4	4.8	2.4
15	3.3	2.5	.15		5.2	5.0	3.7	4.4	9.2	5.4	2.6	2.4
16	3.3	2.3	.12		4.4	4.7	7.8	5.6	5.6	4.0	2.1	2.3
17	3.7	2.4	.22		3.1	3.0	9.8	5.4	6.4	3.7	1.9	2.1
18	3.5	2.3	.18		3.0	4.3	10	5.2	5.2	9.5	2.1	2.0
19	7.7	2.0	.18		3.1	4.8	6.2	5.2	4.4	5.4	1.7	1.8
20	9.9	3.9	.15		2.9	4.6	3.7	5.0	4.1	3.6	1.4	1.7
21	8.9	4.7	.12		.97	4.4	3.6	4.8	3.8	3.4	1.7	1.3
22	2.8	5.4	.09		.15	4.2	4.3	4.6	4.2	3.4	1.1	1.1
23	3.1	6.4	.15		.18	4.1	4.8	4.8	5.6	3.6	1.6	1.3
24	6.1	4.1	.18		.22	4.6	5.2	4.8	4.4	11	1.1	1.1
25	4.6	3.4	.18		.22	4.6	5.4	4.6	4.6	9.2	.96	1.3
26	4.0	2.9	.18		.18	4.4	5.2	4.3	3.7	4.6	.84	2.0
27	3.7	2.1	0		.12	4.8	5.2	3.5	3.3	3.4	.84	4.6
28	3.8	.52	0		.12	5.0	5.2	3.8	3.2	3.2	1.1	3.7
29	4.0	.29	0		.12	5.0	5.0	4.4	8.3	2.8	2.0	2.3
30	5.0	.25	0		------	5.4	5.0	4.3	4.2	2.8	1.8	1.9
31	9.3	------	0		------	9.7	------	4.1	------	2.7	1.8	------
TOTAL	134.4	121.26	26.52	0	35.98	132.50	161.5	138.4	146.2	148.1	73.14	76.9
MEAN	4.34	4.04	0.855	0	1.24	4.27	5.38	4.46	4.87	4.78	2.36	2.56
MAX	9.9	9.3	11	0	5.2	9.7	10	5.6	9.2	11	9.4	8.0
MIN	2.6	0.25	0	0	0	0.09	2.8	2.9	3.2	2.6	0.84	1.1
AC-FT	267	241	53	0	71	263	320	275	290	294	145	153

CAL YR 1967: TOTAL 1,353.41 MEAN 3.71 MAX 11 MIN 0 AC-FT 2,680
WAT YR 1968: TOTAL 1,194.90 MEAN 3.26 MAX 11 MIN 0 AC-FT 2,370

16-0310. 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.

Records available.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968.

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

Extremes.--Maximum discharge during year, 11,400 cfs Dec. 10 (gage height, 11.77 ft), from rating curve extended above 5,200 cfs as explained below; minimum, 0.01 cfs Sept. 6.
1910-19, 1943-68: 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.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.9	456	390	135	102	66	88	6.2	84	51	1.2
2	88	5.9	1,020	287	114	92	45	110	6.2	12	5.6	2.6
3	50	237	402	279	100	73	34	54	6.0	4.6	1.8	28
4	5.6	26	218	221	106	53	28	46	5.6	3.6	1.4	33
5	3.3	4.9	161	285	94	46	29	132	5.8	5.3	1.3	1.9
6	3.7	14	100	328	86	47	32	51	5.8	3.9	1.7	.40
7	2.1	23	77	192	77	40	26	28	5.6	3.2	1.7	.74
8	2.0	2.0	2,860	164	66	34	40	23	6.8	2.8	1.6	1.0
9	2.3	18	3,260	150	64	32	647	18	6.2	2.5	1.6	.70
10	2.5	4.3	6,120	138	61	67	1,270	17	5.8	2.3	2.3	.89
11	2.4	22	2,900	135	59	45	235	47	4.9	2.4	2.6	1.1
12	1.7	132	1,080	130	73	113	132	45	4.7	44	3.0	1.7
13	1.5	16	865	184	90	270	90	15	10	136	12	.80
14	1.2	3.6	700	118	76	270	100	13	64	18	9.1	1.7
15	1.2	2.5	440	108	1,130	137	70	9.7	20	2.5	1.6	1.7
16	5.7	1.7	815	1,320	360	2,870	47	7.8	5.4	1.2	1.0	1.2
17	21	2.6	2,850	606	279	1,640	62	8.0	5.1	18	2.9	.62
18	2.3	4.0	1,200	279	311	275	82	7.5	4.0	46	6.5	1.7
19	92	3.6	692	197	194	189	217	7.5	2.9	2.5	2.6	1.7
20	98	85	416	142	1,290	150	447	7.5	3.3	1.4	3.3	1.8
21	81	13	333	167	3,630	102	189	7.2	2.9	1.5	3.4	2.1
22	19	1.7	299	613	554	80	102	7.2	3.0	1.2	4.9	2.3
23	6.4	241	4,190	279	303	133	72	7.8	4.9	151	6.4	2.7
24	11	576	3,700	180	192	513	418	7.5	3.3	230	2.9	2.0
25	1.2	1,210	1,500	142	204	561	297	7.0	3.7	19	2.3	3.0
26	.42	6,350	708	122	192	252	178	7.5	2.9	3.6	2.3	4.9
27	.30	2,940	458	847	132	94	153	7.8	2.5	2.4	2.6	29
28	.30	1,330	412	584	108	78	98	7.0	2.5	2.3	3.2	4.8
29	.25	578	618	243	116	62	92	6.2	28	2.8	2.4	1.8
30	10	938	328	172	------	566	69	6.2	76	2.3	1.5	.89
31	30	------	649	145	------	172	------	6.2	------	15	1.2	------
TOTAL	548.17	14,787.7	39,827	9,147	10,196	9,158	5,367	812.6	314.0	827.3	147.7	137.94
MEAN	17.7	493	1,285	295	352	295	179	26.2	10.5	26.7	4.76	4.60
MAX	98	6,350	6,120	1,320	3,630	2,870	1,270	132	76	230	51	33
MIN	0.25	1.7	77	108	59	32	26	6.2	2.5	1.2	1.0	0.40
AC-FT	1,090	29,330	79,000	18,140	20,220	18,160	10,650	1,610	623	1,640	293	274

CAL YR 1967: TOTAL 98,258.43 MEAN 269 MAX 6,350 MIN 0.25 AC-FT 194,900
WAT YR 1968: TOTAL 91,270.41 MEAN 249 MAX 6,350 MIN 0.25 AC-FT 181,000

PEAK DISCHARGE (BASE, 8,700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0600	11.63	11,100	12-23	1030	11.47	10,700
12-10	1830	11.77	11,400	2-21	0300	11.42	10,600

16-0360. Makaweli River near Waimea

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

Drainage area.--25 sq mi, approximately.

Records available.--July 1943 to September 1968. 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). July 27, 1943, to June 15, 1959, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 11,500 cfs Nov. 26 (gage height, 10.60 ft), from rating curve extended above 3,200 cfs as explained below; minimum, 9.6 cfs Nov. 5.
1943-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	10	295	167	53	57	40	122	33	35	53	54
2	226	24	505	171	48	49	35	60	32	28	29	36
3	32	47	308	135	46	45	32	43	32	25	26	27
4	27	13	182	232	42	41	31	49	32	24	25	26
5	22	10	137	241	43	37	31	53	33	26	25	25
6	17	23	143	132	41	37	31	41	32	24	25	24
7	16	13	82	102	39	37	31	40	31	24	25	24
8	19	48	1,740	95	35	35	31	40	44	25	25	26
9	18	21	798	92	34	34	31	40	35	23	30	24
10	21	30	800	83	34	33	126	40	33	23	26	30
11	17	25	278	53	34	33	43	39	36	44	25	27
12	15	54	146	50	49	199	35	37	37	51	27	24
13	15	15	139	50	44	107	34	37	48	60	30	24
14	15	12	146	47	42	100	35	37	120	29	27	26
15	14	11	88	100	497	120	35	36	39	27	26	25
16	14	11	231	534	120	4,200	35	35	38	23	25	24
17	15	15	1,030	180	79	900	61	35	40	222	26	24
18	14	15	311	125	66	180	53	35	37	50	27	25
19	127	15	178	103	57	110	98	35	37	31	25	25
20	215	177	112	94	536	70	144	34	33	39	25	25
21	89	26	114	109	1,600	60	59	34	34	31	40	25
22	23	71	109	151	240	50	42	35	56	27	39	25
23	32	446	1,690	122	148	54	49	35	35	180	27	26
24	23	992	1,010	92	92	60	744	33	37	83	25	37
25	14	422	385	86	111	170	454	33	34	31	30	29
26	12	4,750	201	71	80	130	231	33	33	28	25	77
27	12	2,030	157	274	60	100	117	33	33	27	26	41
28	20	1,120	157	162	51	100	102	33	60	27	27	26
29	12	507	193	73	74	85	53	33	37	26	25	25
30	12	607	122	58	------	70	53	33	126	25	25	25
31	12	------	386	58	------	50	------	33	------	130	25	------
TOTAL	1,169	11,560	12,173	4,042	4,395	7,353	2,896	1,256	1,287	1,448	866	881
MEAN	37.7	385	393	130	152	237	96.5	40.5	42.9	46.7	27.9	29.4
MAX	226	4,750	1,740	534	1,600	4,200	744	122	126	222	53	77
MIN	12	10	82	47	34	33	31	33	31	23	25	24
AC-FT	2,320	22,930	24,140	8,020	8,720	14,580	5,740	2,490	2,550	2,870	1,720	1,750

CAL YR 1967: TOTAL 52,856 MEAN 145 MAX 4,750 MIN 10 AC-FT 104,800
WAT YR 1968: TOTAL 49,326 MEAN 135 MAX 4,750 MIN 10 AC-FT 97,840

PEAK DISCHARGE (BASE, 4,700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0730	10.60	11,500	12-23	1000	7.42	5,030
12- 8	1200	7.62	5,370	3-16	about 2200	-	about 7,400
12-17	0730	8.06	6,130				

16-0490. Hanapepe River below Manuahi Stream, near Eleele

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

Drainage area.--18.8 sq mi.

Records available.--July 1917 to January 1921, December 1926 to September 1968. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site half a mile upstream not equivalent owing to 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, staff gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 7,600 cfs Nov. 26 (gage height, 8.28 ft); minimum, 12 cfs Nov. 16, 17. 1917-21, 1926-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	16	355	124	30	35	27	145	35	36	123	35
2	197	21	515	105	26	31	26	74	34	23	44	58
3	41	24	289	92	27	29	24	40	33	20	26	16
4	49	16	181	73	25	27	23	51	42	41	21	14
5	31	15	136	204	23	27	23	48	37	39	20	14
6	22	19	171	113	22	32	23	31	21	27	20	14
7	23	16	89	66	20	29	22	29	20	27	19	14
8	30	27	1,150	54	20	28	23	28	32	24	17	14
9	32	16	465	46	20	28	23	28	23	20	27	41
10	26	22	190	41	19	27	31	27	21	20	22	25
11	22	36	112	39	19	27	21	27	27	39	20	17
12	20	46	73	36	29	270	20	25	28	63	18	16
13	19	17	55	33	20	158	20	24	29	57	66	19
14	17	16	51	30	23	104	22	24	88	31	20	17
15	17	15	42	29	246	119	56	24	19	24	19	16
16	17	12	85	269	44	2,120	88	22	40	21	18	16
17	17	34	296	107	28	592	134	22	24	374	18	16
18	18	19	108	46	23	135	43	22	23	57	19	16
19	165	15	66	33	23	69	48	22	24	25	18	17
20	270	88	46	27	142	47	110	24	20	41	20	15
21	95	21	38	26	600	40	37	24	22	29	26	15
22	38	74	35	51	90	37	32	24	31	31	30	15
23	114	417	1,090	58	52	51	61	24	21	231	20	16
24	41	1,170	562	32	44	52	560	23	24	108	19	23
25	23	483	209	27	48	127	588	21	19	38	34	19
26	19	2,220	111	25	37	104	225	21	17	27	23	67
27	23	1,190	81	367	35	92	119	21	19	23	31	28
28	25	732	67	208	37	92	124	22	35	20	19	15
29	22	372	77	61	41	80	57	23	20	20	17	14
30	20	486	54	42	------	49	62	23	144	20	16	14
31	18	------	287	34	------	31	------	24	------	141	16	------
TOTAL	1,503	7,655	7,086	2,498	1,813	4,689	2,672	987	972	1,697	826	636
MEAN	48.5	255	229	80.6	62.5	151	89.1	31.8	32.4	54.7	26.6	21.2
MAX	270	2,220	1,150	367	600	2,120	588	145	144	374	123	67
MIN	17	12	35	25	19	27	20	21	17	20	16	14
AC-FT	2,980	15,180	14,050	4,950	3,600	9,300	5,300	1,960	1,930	3,370	1,640	1,260

CAL YR 1967: TOTAL 39,187.2 MEAN 107 MAX 2,220 MIN 8.4 AC-FT 77,730
WAT YR 1968: TOTAL 33,034 MEAN 90.3 MAX 2,220 MIN 12 AC-FT 65,520

PEAK DISCHARGE (BASE, 3,600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0800	8.28	7,600	3-16	2230	8.13	7,220
12- 8	1230	7.82	6,590				

16-0525. Lawai Stream near Koloa

Location.--Lat 21°54'03", long 159°30'19", 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.

Records available.--Water years 1962-63 (annual maximums), July 1963 to September 1968.

Gage.--Digital 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 and July 1, 1963, to July 5, 1967, graphic water-stage recorder, at same site and datum.

Extremes.--Maximum discharge during year, 1,560 cfs Dec. 8 (gage height, 7.28 ft), from rating curve extended above 190 cfs as explained below; minimum, 0.09 cfs Nov. 15, 16.
1961-68: 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.
1963-68: Minimum discharge, 0.06 cfs Aug. 18, 1966.

Remarks.--Records fair. Several diversions above station for irrigation of sugarcane in vicinity of Lawai.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	0.46	13	12	12	4.8	5.2	4.1	3.0	2.8	3.2	1.7
2	3.5	.33	38	11	12	4.7	5.0	3.7	2.8	3.6	2.8	1.5
3	2.4	.33	9.6	10	17	4.6	5.0	3.4	2.8	3.0	2.4	1.4
4	2.0	.15	7.6	8.5	11	4.4	5.2	3.4	2.8	2.4	2.1	1.5
5	1.9	.13	5.3	25	11	4.4	5.4	3.7	2.8	2.3	2.1	1.4
6	2.3	.15	5.3	12	9.6	5.0	4.8	3.4	2.8	2.2	2.1	1.3
7	2.0	.13	5.2	7.5	7.7	4.8	4.8	3.4	3.0	2.1	2.4	1.4
8	2.0	.58	210	5.8	5.8	4.8	10	4.2	2.8	2.4	2.1	1.4
9	2.8	11	74	3.4	6.0	4.6	5.8	4.0	2.8	2.4	1.9	1.6
10	3.0	1.7	44	3.4	5.4	4.4	5.0	3.7	2.8	2.0	1.9	1.4
11	2.4	.20	32	3.6	5.4	4.4	4.8	3.4	2.8	2.3	1.9	1.5
12	2.3	.22	22	3.2	6.4	5.9	4.8	3.4	2.8	2.3	1.7	1.4
13	1.3	.40	18	3.2	5.6	5.0	4.7	3.4	2.8	2.3	1.9	1.3
14	1.2	.27	16	3.0	5.9	5.4	4.6	3.4	2.8	2.2	1.8	1.4
15	1.0	.13	15	3.0	13	5.0	9.4	3.2	2.6	2.1	1.7	1.3
16	2.3	.22	13	75	5.4	36	5.0	3.2	2.6	2.3	1.7	1.3
17	6.2	.84	51	14	5.4	10	22	3.6	2.6	2.6	1.6	1.6
18	1.6	1.3	18	5.9	5.2	6.8	5.9	3.2	3.2	2.6	1.6	1.2
19	3.4	.20	15	4.4	5.0	6.2	8.9	3.2	3.6	2.0	1.6	1.2
20	3.0	1.2	12	4.0	5.8	5.9	4.8	3.4	2.8	1.9	2.3	1.2
21	1.6	.25	8.5	3.6	44	5.4	4.8	3.4	2.4	1.9	2.1	1.2
22	.90	.84	5.4	45	5.9	5.4	4.8	3.2	2.4	1.9	2.1	1.2
23	2.3	15	107	36	5.3	5.4	4.7	3.2	2.4	4.0	2.2	1.2
24	2.2	53	43	11	5.2	5.4	18	3.2	2.8	2.8	1.5	1.2
25	.77	21	22	9.2	5.2	5.8	13	3.2	3.0	4.0	1.6	1.2
26	.84	156	15	8.3	5.6	5.9	5.0	3.0	2.4	4.3	1.5	1.7
27	1.6	47	12	88	5.3	8.7	4.0	3.0	2.4	3.0	1.5	1.6
28	.52	26	11	34	5.4	5.6	4.0	3.0	2.4	2.4	1.4	1.3
29	.40	7.9	10	18	5.0	5.3	4.1	3.2	2.4	2.2	1.4	1.2
30	1.5	13	8.3	16	------	5.3	4.4	3.0	3.0	2.0	1.4	1.2
31	.65	------	41	13	------	5.2	------	3.0	------	2.4	1.4	------
TOTAL	61.88	359.93	907.2	500.0	247.5	200.5	197.9	104.8	82.6	78.7	58.9	41.0
MEAN	2.00	12.0	29.3	16.1	8.53	6.47	6.50	3.38	2.75	2.54	1.90	1.37
MAX	6.2	156	210	88	44	36	22	4.2	3.6	4.3	3.2	1.7
MIN	0.40	0.13	5.2	3.0	5.0	4.4	4.0	3.0	2.4	1.9	1.4	1.2
AC-FT	123	714	1,800	992	491	398	393	208	164	156	117	81

CAL YR 1967: TOTAL 3,525.04 MEAN 9.66 MAX 210 MIN 0.13 AC-FT 6,990
WAT YR 1968: TOTAL 2,840.91 MEAN 7.76 MAX 210 MIN 0.13 AC-FT 5,630

Peak discharge (base, 1,200 cfs).--Dec. 8 (1215) 1,560 cfs (7.28 ft).

16-0534. Upper Haiku ditch near Puhi

Location.--Lat 21°58'48", long 159°27'12", 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.

Records available.--October 1963 to September 1968.

Gage.--Graphic water-stage recorder. Altitude of gage is 470 ft (from topographic map). Prior to Dec. 13, 1966, digital water-stage recorder at same site and datum.

Extremes.--1963-68: Maximum daily discharge, 35 cfs July 23, 1968; no flow at times.

Remarks.--Records fair. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	17	3.8	0.15	0.12	16	9.5	30	2.2	19	27	1.0
2	18	18	3.1	.20	.12	2.8	24	27	4.4	20	22	10
3	18	13	1.1	.15	.23	2.8	23	16	26	13	20	19
4	18	3.2	.63	.15	.12	17	23	.12	26	1.5	28	21
5	19	4.9	.63	1.9	.12	12	17	1.3	25	1.2	29	22
6	14	17	.79	.28	.12	25	1.9	15	27	1.1	31	13
7	2.9	22	.32	.15	.15	24	1.5	17	20	1.1	30	.68
8	3.0	20	10	.15	.15	16	23	18	9.2	16	28	5.8
9	16	20	2.5	.15	.17	2.5	26	23	9.2	19	26	17
10	20	23	.79	.15	.17	2.5	25	14	22	18	11	16
11	18	20	.44	.17	.17	20	16	.23	26	20	3.9	16
12	16	13	.23	.20	22	21	2.2	1.3	24	19	22	15
13	13	21	.17	.23	26	13	2.0	18	23	15	27	9.9
14	2.4	21	.15	.23	24	6.1	2.0	23	16	11	27	.53
15	2.5	22	.15	.20	19	.19	26	23	1.0	18	24	4.2
16	16	22	.20	1.7	10	3.5	29	22	6.8	19	15	15
17	16	15	1.4	.17	1.9	1.8	27	24	20	21	1.3	16
18	15	1.8	.15	.15	2.1	.15	26	2.6	21	22	4.6	10
19	16	1.8	.15	.17	16	.15	22	2.5	20	15	24	9.5
20	13	17	.15	.23	19	.15	14	18	20	1.6	28	7.8
21	3.3	20	.15	.23	8.6	.15	12	23	12	6.6	27	.63
22	3.3	16	.15	5.8	.10	.15	22	23	.48	30	25	2.7
23	15	5.1	5.7	5.6	.10	.15	25	24	6.7	35	20	10
24	17	15	2.0	.46	.12	.12	24	17	22	29	12	9.2
25	20	9.8	.28	3.8	.12	17	24	2.3	20	31	9.8	14
26	22	20	.15	2.7	.12	19	15	2.2	18	32	21	13
27	16	10	.15	1.3	3.6	17	.36	22	15	30	27	9.0
28	3.2	5.3	.20	.15	16	18	1.6	29	10	31	27	.44
29	3.2	4.5	.20	.12	21	14	20	30	.73	32	26	9.5
30	20	5.8	.17	.12	------	2.9	29	29	6.2	28	18	15
31	16	------	1.8	.12	------	2.8	------	18	------	26	1.0	------
TOTAL	398.2	424.2	37.80	27.28	191.40	277.91	513.06	515.55	459.91	582.1	642.6	312.88
MEAN	12.8	14.1	1.22	0.880	6.60	8.96	17.1	16.6	15.3	18.8	20.7	10.4
MAX	22	23	10	5.8	26	25	29	30	27	35	31	22
MIN	2.4	1.8	0.15	0.12	0.10	0.12	0.36	0.12	0.48	1.1	1.0	0.44
AC-FT	790	841	75	54	380	551	1020	1020	912	1150	1270	621

CAL YR 1967: TOTAL 3,008.99 MEAN 8.24 MAX 28 MIN 0 AC-FT 5,970
WAT YR 1968: TOTAL 4,382.89 MEAN 12.0 MAX 35 MIN 0.10 AC-FT 8,690

16-0536. Lower Haiku ditch near Puhi

Location.--Lat 21°58'19", long 159°27'12", 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.

Records available.--October 1963 to September 1968.

Gage.--Graphic water-stage recorder. Altitude of gage is 400 ft (from topographic map). Prior to Mar. 18, 1964, digital water-stage recorder at same site and datum.

Extremes.--1963-68: Maximum daily discharge, 51 cfs May 27, 1964, May 5, Nov. 19, 1965; no flow Feb. 3-5, 1967.

Remarks.--Records good. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.8	21	16	6.7	2.5	2.7	3.7	1.4	1.4	3.4	1.2
2	5.2	2.1	26	16	9.8	2.3	2.6	4.3	1.4	1.1	2.9	1.1
3	3.2	2.1	21	16	22	2.2	2.5	2.9	1.4	1.2	2.3	1.1
4	4.4	1.8	19	15	16	2.2	2.3	3.0	1.4	2.7	1.9	1.1
5	2.7	1.8	19	25	9.0	2.2	2.6	3.7	1.4	1.8	1.8	1.1
6	2.9	1.8	19	18	5.8	2.3	2.2	2.7	1.4	1.2	1.6	.99
7	2.9	1.8	17	15	5.2	2.2	2.2	2.7	1.4	1.1	1.5	.99
8	3.2	1.8	42	15	3.4	1.9	2.1	2.7	1.4	1.1	1.5	.99
9	2.7	1.8	30	14	3.2	1.9	2.1	2.7	1.4	.99	1.5	2.5
10	2.6	1.8	25	14	3.0	1.8	2.1	2.6	1.2	.89	1.8	1.9
11	2.5	2.1	19	13	2.9	1.8	1.9	2.5	1.2	1.2	1.6	1.2
12	2.5	2.3	18	13	3.4	6.4	1.9	2.3	1.4	1.4	1.5	1.1
13	2.3	1.8	17	12	3.0	7.5	1.8	2.2	1.4	1.5	1.6	1.1
14	2.2	1.8	16	7.5	2.5	13	1.8	2.2	1.5	1.1	1.5	1.2
15	2.2	1.6	15	6.8	10	7.6	3.5	2.1	1.4	.99	1.5	1.1
16	2.1	1.5	15	26	3.0	21	5.3	2.1	1.2	.89	1.2	1.1
17	2.1	1.8	25	14	2.5	30	4.6	2.1	1.2	6.2	1.1	.99
18	1.9	2.1	16	8.6	2.2	15	3.0	2.1	1.1	2.6	1.1	.99
19	2.9	1.6	15	11	2.1	13	3.3	1.9	1.1	.99	1.1	1.5
20	4.3	1.6	14	13	2.2	11	4.6	1.9	1.1	.89	1.1	1.6
21	3.9	1.5	14	12	9.6	9.6	3.0	1.9	1.1	.89	1.4	1.6
22	2.6	2.1	14	22	3.6	6.6	2.6	1.8	1.1	.79	1.1	1.6
23	2.5	4.9	36	15	3.0	5.8	3.3	1.8	1.1	2.8	1.1	1.6
24	2.6	31	24	11	2.6	9.8	2.9	1.8	1.2	3.3	1.1	1.9
25	2.3	22	18	7.5	2.6	15	2.6	1.6	1.1	1.6	2.1	2.2
26	2.3	43	16	7.0	2.6	7.5	2.7	1.6	1.1	1.2	1.6	3.1
27	2.3	25	12	19	5.0	3.7	2.6	1.6	1.1	1.2	1.5	3.3
28	2.2	16	16	18	2.7	3.3	2.7	1.6	1.1	1.1	1.4	2.1
29	2.2	19	15	12	2.6	3.2	2.6	1.6	.99	.99	1.2	1.8
30	2.1	23	14	7.9	------	3.4	3.3	1.6	1.9	.89	1.2	1.6
31	1.9	------	26	4.2	------	3.0	------	1.5	------	2.1	1.1	------
TOTAL	83.9	224.3	614	424.5	152.2	218.7	83.4	70.8	38.19	48.10	48.3	45.65
MEAN	2.71	7.48	19.8	13.7	5.25	7.05	2.78	2.28	1.27	1.55	1.56	1.52
MAX	5.2	43	42	26	22	30	5.3	4.3	1.9	6.2	3.4	3.3
MIN	1.9	1.5	12	4.2	2.1	1.8	1.8	1.5	0.99	0.79	1.1	0.99
AC-FT	166	445	1,220	842	302	434	165	140	76	95	96	91

CAL YR 1967: TOTAL 3,594.82 MEAN 9.85 MAX 44 MIN 0 AC-FT 7,130
WAT YR 1968: TOTAL 2,052.04 MEAN 5.61 MAX 43 MIN 0.79 AC-FT 4,070

16-0538. Kamooloa Stream near Puhi

Location.--Lat 21°58'13", long 159°27'08", 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.

Records available.--November 1963 to September 1968.

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

Extremes.--Maximum discharge during year, 2,850 cfs Mar. 16 (gage height, 5.62 ft), from rating curve extended above 600 cfs as explained below; minimum, 0.04 cfs on many days.
1963-68: Maximum discharge, 4,250 cfs Dec. 16, 1964 (gage height, 6.66 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. no. 534) and Lower Haiku ditch (see sta. no. 536) 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. no. 544) has diverted 0.6 mile above station for irrigation of sugarcane in vicinity of Koloa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.67	0.29	83	27	0.44	0.15	0.10	0.10	0.09	0.07	0.09	0.06
2	.84	.32	138	28	.44	.12	.09	.12	.07	.06	.07	.04
3	.73	.32	84	34	1.6	.10	.09	.10	.07	.06	.04	.06
4	.62	.29	68	28	.62	.10	.09	.12	.07	.09	.04	.06
5	.29	.29	66	90	.48	.10	.10	.15	.07	.07	.04	.04
6	.32	.29	71	57	.40	.09	.09	.12	.07	.06	.04	.04
7	.32	.26	54	33	.36	.09	.09	.12	.07	.06	.04	.06
8	.29	.26	480	29	.32	.07	.09	.15	.09	.06	.04	.06
9	.29	.22	208	27	.32	.07	.09	.17	.07	.06	.04	.10
10	.29	.22	86	24	.29	.07	.09	.15	.07	.06	.06	.09
11	.29	.29	59	19	.29	.07	.09	.12	.06	.09	.06	.06
12	.32	.29	48	13	.32	.12	.09	.12	.07	.09	.06	.06
13	.29	.26	40	11	.32	.15	.09	.10	.07	.07	.09	.06
14	.29	.22	29	.62	.17	.22	.09	.10	.07	.07	.06	.07
15	.29	.22	18	.58	15	.20	2.6	.10	.06	.06	.12	.06
16	.26	.22	22	53	.20	216	.94	.10	.06	.06	.07	.06
17	.26	.29	87	25	.17	139	.26	.10	.06	.12	.06	.06
18	.26	.26	38	.62	.15	36	.17	.10	.06	.10	.07	.04
19	.29	.22	22	2.8	.15	28	.17	.09	.06	.07	.06	.07
20	.29	.26	12	5.9	.15	15	.17	.10	.06	.06	.07	.06
21	.29	.29	11	5.3	.40	3.2	.12	.10	.06	.07	.07	.07
22	.26	.36	10	38	.22	1.1	.12	.10	.06	.07	.06	.06
23	.26	.48	259	17	.20	5.0	.15	.09	.04	.10	.04	.06
24	.29	36	128	7.5	.17	16	.12	.09	.06	.10	.04	.09
25	.26	1.6	77	.48	.15	15	.12	.09	.04	.07	.07	.09
26	.29	92	39	.40	.15	.26	.10	.09	.04	.06	.06	.12
27	.29	19	19	65	.12	.17	.10	.09	.04	.06	.04	.10
28	.29	8.8	18	46	.12	.15	.10	.09	.04	.06	.04	.09
29	.29	54	19	10	.12	.12	.09	.09	.04	.06	.04	.09
30	.26	82	12	.53	------	.15	.15	.09	.10	.04	.04	.09
31	.29	------	72	.48	------	.12	------	.09	------	.10	.04	------
TOTAL	10.57	299.82	2,377	699.21	23.84	476.99	6.76	3.34	1.89	2.23	1.76	2.07
MEAN	0.341	9.99	76.7	22.6	0.822	15.4	0.225	0.108	0.063	0.072	0.057	0.069
MAX	0.84	92	480	90	15	216	2.6	0.17	0.10	0.12	0.12	0.12
MIN	0.26	0.22	10	0.40	0.12	0.07	0.09	0.09	0.04	0.04	0.04	0.04
AC-FT	21	595	4,710	1,390	47	946	13	6.6	3.7	4.4	3.5	4.1

CAL YR 1967: TOTAL 7,191.92 MEAN 19.7 MAX 480 MIN 0.02 AC-FT 14,260
WAT YR 1968: TOTAL 3,905.48 MEAN 10.7 MAX 480 MIN 0.04 AC-FT 7,750

Peak discharge (base, 1,400 cfs).--Dec. 8 (1430) 2,670 cfs (5.46 ft); Mar. 16 (2300) 2,850 cfs (5.62 ft).

16-0542. Koloa ditch near Koloa

Location.--Lat 21°57'07", long 159°28'11", 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.

Records available.--July 1964 to September 1968.

Gage.--Graphic water-stage recorder. Altitude of gage is 620 ft (from topographic map). Prior to Jan. 4, 1967, digital water-stage recorder at same site and datum.

Extremes.--1964-68: Maximum daily discharge, 196 cfs Nov. 26, 1967; no flow Apr. 22-24, 1967.

Remarks.--Records fair. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	34	34	34	24	11	9.4	28	6.8	16	46	16
2	59	42	31	31	22	10	8.7	27	6.6	6.8	38	9.8
3	26	46	28	27	27	8.9	8.2	19	6.6	11	39	17
4	39	32	26	22	22	8.7	7.8	24	6.9	29	36	8.9
5	22	29	27	24	20	9.2	8.0	27	6.6	19	22	7.6
6	17	38	34	15	18	16	7.3	19	5.4	8.2	9.7	7.1
7	22	21	29	12	16	9.2	7.3	16	5.7	6.8	8.9	7.1
8	26	16	22	16	14	8.2	7.3	17	9.5	6.0	7.6	7.1
9	21	11	12	16	13	7.8	7.1	16	7.1	5.5	11	27
10	19	26	10	14	13	7.6	7.6	14	6.9	5.4	16	30
11	19	51	22	16	13	7.6	6.9	13	6.2	18	9.4	13
12	15	61	28	20	19	33	6.6	12	6.4	25	7.6	8.5
13	13	29	24	19	14	38	6.6	11	5.9	30	26	12
14	11	11	24	17	15	42	5.1	11	12	21	8.7	11
15	11	9.7	28	17	36	36	.86	10	5.4	13	12	10
16	10	9.4	29	54	26	35	7.8	10	5.7	6.8	10	8.0
17	10	38	36	23	20	15	21	9.7	5.4	23	9.4	7.6
18	10	38	29	29	16	18	19	9.4	5.9	26	10	8.2
19	47	27	25	25	16	10	18	9.4	7.3	12	8.7	8.9
20	73	50	27	22	29	9.4	18	10	5.2	23	12	8.2
21	46	12	24	21	44	8.9	13	10	5.0	24	14	7.3
22	29	53	23	34	20	8.7	14	8.9	5.7	26	20	7.1
23	32	123	43	24	16	8.9	22	8.7	4.9	39	9.7	6.8
24	40	180	40	26	15	9.2	23	8.2	5.0	43	8.7	9.2
25	27	150	34	25	15	10	25	8.2	4.7	35	27	19
26	15	196	30	22	13	8.9	27	8.2	4.6	17	19	12
27	14	126	30	34	12	8.5	22	8.0	4.6	12	21	35
28	17	61	30	34	15	8.5	23	7.6	7.1	18	11	10
29	24	45	29	30	14	11	22	7.3	4.9	18	9.2	8.2
30	18	50	27	27	------	15	26	7.1	26	6.6	8.0	7.8
31	37	------	37	25	------	12	------	7.1	------	34	7.8	------
TOTAL	783	1615.1	872	755	557	450.2	405.56	401.8	206.0	584.1	503.4	355.4
MEAN	25.3	53.8	28.1	24.4	19.2	14.5	13.5	13.0	6.87	18.8	16.2	11.8
MAX	73	196	43	54	44	42	27	28	26	43	46	35
MIN	10	9.4	10	12	12	7.6	0.86	7.1	4.6	5.4	7.6	6.8
AC-FT	1550	3200	1730	1500	1100	893	804	797	409	1160	998	705

CAL YR 1967: TOTAL 7,982.35 MEAN 21.9 MAX 196 MIN 0 AC-FT 15,830
WAT YR 1968: TOTAL 7,488.56 MEAN 20.5 MAX 196 MIN 0.86 AC-FT 14,850

16-0544. Koloa tunnel near Koloa

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

Records available.--February 1966 to September 1968.

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

Extremes.--1966-68: Maximum daily discharge, 542 cfs Nov. 26, 1967; minimum daily, 1.4 cfs June 21-25, July 18, 1966.

Remarks.--Records good. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	5.9	26	6.4	11	11	12	37	4.5	4.5	41	4.8
2	17	5.9	11	6.4	11	9.6	14	27	4.2	4.2	20	4.2
3	6.2	6.2	10	6.4	10	8.9	12	15	5.9	6.5	21	4.8
4	8.2	5.0	10	6.8	10	11	13	14	5.9	15	16	3.9
5	6.2	5.0	10	7.2	18	9.6	13	14	4.5	7.5	11	3.6
6	6.2	5.3	10	7.2	16	11	10	9.6	4.5	3.2	6.2	3.4
7	5.9	5.9	10	7.2	21	10	9.6	9.3	5.9	3.0	6.2	3.4
8	6.2	7.2	12	7.2	22	8.9	12	10	3.9	3.2	5.6	3.4
9	7.5	6.4	7.2	7.2	18	7.5	13	10	3.6	3.0	5.9	10
10	7.2	6.2	6.8	7.2	16	7.5	12	9.6	4.2	3.0	5.3	7.9
11	7.2	6.4	6.8	7.2	20	8.6	10	10	3.9	4.8	5.0	3.9
12	7.2	7.2	6.4	7.2	19	52	8.2	9.3	5.0	6.2	5.6	3.4
13	6.4	6.4	6.4	13	13	34	8.2	8.6	4.5	13	8.9	3.4
14	5.0	6.4	6.4	23	13	53	8.9	8.6	5.6	6.0	5.9	3.6
15	5.0	5.9	6.8	19	59	58	87	7.9	3.4	5.9	6.8	3.4
16	6.4	5.6	6.8	48	14	101	59	7.9	3.4	3.2	5.0	3.2
17	5.6	7.4	7.2	34	11	8.9	107	7.2	3.6	33	4.5	3.2
18	5.0	5.0	6.4	25	10	7.9	24	6.4	3.4	12	4.5	3.2
19	6.4	4.5	6.4	13	10	7.2	22	6.2	3.4	5.0	4.8	3.0
20	7.5	5.6	6.4	10	19	20	23	7.2	3.2	6.5	4.8	2.6
21	7.2	5.3	6.4	10	119	27	12	7.2	3.2	5.9	5.0	2.6
22	6.2	7.2	6.4	10	11	33	14	7.2	3.0	8.9	5.3	2.4
23	7.9	40	7.9	10	17	18	21	7.2	3.0	29	4.5	2.6
24	7.9	298	6.4	25	15	10	22	7.2	3.2	26	3.9	3.0
25	7.2	120	5.6	22	15	10	40	5.9	3.2	18	7.7	3.4
26	7.2	542	5.6	15	15	19	38	5.6	3.0	6.4	5.3	13
27	6.4	267	5.6	11	15	20	25	6.8	3.0	5.9	5.3	9.7
28	5.9	117	5.6	10	14	15	35	7.2	3.0	5.6	5.3	2.6
29	5.9	52	5.6	28	13	13	17	7.5	3.0	7.9	4.8	2.1
30	6.8	78	5.9	24	------	17	26	6.8	16	5.6	4.5	2.1
31	6.4	------	7.2	11	------	12	------	5.9	------	20	3.9	------
TOTAL	212.1	1645.9	247.2	444.6	575	639.6	727.9	309.3	130.1	287.9	249.5	125.8
MEAN	6.84	54.9	7.97	14.3	19.8	20.6	24.3	9.98	4.34	9.29	8.05	4.19
MAX	17	542	26	48	119	101	107	37	16	33	41	13
MIN	4.8	4.5	5.6	6.4	10	7.2	8.2	5.6	3.0	3.0	3.9	2.1
AC-FT	421	3260	490	882	1140	1270	1440	613	258	571	495	250

CAL YR 1967: TOTAL 6,730.8 MEAN 18.4 MAX 542 MIN 3.2 AC-FT 13,350
WAT YR 1968: TOTAL 5,594.9 MEAN 15.3 MAX 542 MIN 2.1 AC-FT 11,100

16-0550. Huleia Stream near Lihue

Location.--Lat 21°57'20", long 159°25'23", on left bank 60 ft downstream from bridge on Kipu Road, 0.2 mile east of Kipu, and 3.6 miles southwest of Lihue. Prior to Mar. 1, 1967, crest-stage gage only, at site 60 ft upstream.

Drainage area.--17.6 sq mi.

Records available.--May 1912 to December 1915, water years 1962-67 (annual maximums), March 1967 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). May 7, 1912, to Dec. 31, 1915, staff 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.

Extremes.--Maximum discharge during year, 6,070 cfs Dec. 8 (gage height, 13.13 ft), from rating curve extended above 1,300 cfs as explained below; minimum, 4.3 cfs Oct. 18.
1912-15, 1961-68: 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.
1912-15, 1967-68: Minimum discharge, 3.9 cfs July 6, Sept. 13, 1967.

Remarks.--Records good except those for period of no gage-height record, which are poor. Several diversions above station, including diversions into and out of the basin, principally for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	4.7	191	94	15	14	15	13	10	13	15	12
2	7.8	5.3	312	83	15	14	15	13	9.7	11	15	12
3	6.2	5.7	197	85	15	14	15	13	9.7	10	13	11
4	6.9	4.6	154	68	15	14	15	13	10	12	12	11
5	5.7	4.4	141	206	15	14	15	13	11	12	13	11
6	5.7	4.6	136	173	15	14	14	13	10	10	12	11
7	6.0	4.4	104	92	15	14	14	13	10	9.4	12	12
8	6.2	4.7	1,130	74	14	14	14	17	11	9.7	13	12
9	5.7	4.6	438	62	14	14	14	15	10	9.1	13	14
10	5.7	4.9	224	56	14	14	14	14	9.7	9.1	12	15
11	5.3	5.3	158	50	14	14	14	13	10	11	12	13
12	5.3	6.0	122	42	14	14	14	13	12	11	12	13
13	5.1	4.9	104	38	14	14	14	13	11	11	14	13
14	4.7	4.9	82	19	14	14	14	13	11	11	12	14
15	4.7	4.6	68	16	66	14	25	13	10	10	15	13
16	4.6	4.6	67	205	16	400	15	12	10	10	13	12
17	4.4	5.7	229	117	15	270	14	12	10	21	12	12
18	4.4	5.7	105	30	15	70	14	12	10	16	12	12
19	5.7	5.3	74	26	15	50	14	12	10	9.4	12	15
20	6.2	5.3	56	35	15	30	14	13	10	9.4	12	13
21	6.2	4.7	52	33	15	24	14	13	9.7	9.1	12	12
22	5.1	5.5	46	170	15	20	14	12	9.7	9.1	12	12
23	5.1	7.8	675	92	15	30	14	12	9.4	11	13	12
24	5.1	196	306	35	15	70	14	12	10	14	12	13
25	4.9	82	176	16	15	66	14	12	10	11	12	14
26	5.3	312	110	15	15	15	13	12	10	11	13	14
27	5.5	115	78	200	15	15	13	11	10	11	12	18
28	5.1	73	74	88	15	15	13	12	11	10	12	13
29	4.9	110	74	38	15	15	13	11	11	9.4	11	12
30	4.7	159	56	16	------	15	13	10	14	9.7	11	11
31	4.6	------	214	15	------	15	------	10	------	13	11	------
TOTAL	168.1	1165.2	5953	2289	480	1330	432	390	309.9	343.4	387	382
MEAN	5.42	38.8	192	73.8	16.6	42.9	14.4	12.6	10.3	11.1	12.5	12.7
MAX	7.8	312	1130	206	66	400	25	17	14	21	15	18
MIN	4.4	4.4	46	15	14	14	13	10	9.4	9.1	11	11
AC-FT	333	2310	11810	4540	952	2640	857	774	615	681	768	758

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 13,629.6 MEAN 37.2 MAX 1,130 MIN 4.4 AC-FT 27,030

Peak discharge (base, 5,500 cfs).--Dec. 8 (1300) 6,070 cfs (13.13 ft).

Note.--No gage-height record Jan. 24 to May 6.

16-0568. Waiahi-Kuia aqueduct near Puhi

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

Records available.--July 1964 to September 1968.

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

Extremes.--1964-68: Maximum daily discharge, 77 cfs Aug. 27, 1966; no flow at times.

Remarks.--Records good. Ditch diverts from Waiahi Stream into Kuia Stream, from which Koloa ditch (see sta. no. 542) 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	13	0.09	0.07					0	4.0	22	5.1
2	5.2	22	.09	0					0	.38	27	4.7
3	1.4	18	.02	0					0	7.3	38	3.4
4	2.0	12	.01	0					0	13	31	1.4
5	1.1	11	0	0					0	2.7	15	.21
6	1.1	16	0	.02					0	.38	2.7	.09
7	1.4	4.5	0	0					0	.21	2.4	.02
8	1.4	3.3	.62	0					0	.09	2.0	.02
9	3.5	1.7	.21	0					0	.09	4.1	11
10	3.0	14	.09	0					0	.21	4.2	14
11	2.7	29	.01	0					0	4.2	2.4	2.0
12	2.4	27	0	0					0	6.7	1.7	.59
13	2.4	9.0	0	0					0	11	12	1.8
14	2.0	1.7	0	0					0	10	2.4	1.2
15	2.0	1.7	0	0					0	2.6	2.4	.78
16	1.7	2.0	0	0					.10	2.7	.82	.47
17	2.4	13	.01	0					.09	6.2	11	.29
18	2.4	15	0	0					.53	19	.82	1.4
19	11	12	0	0					.92	19	.21	2.4
20	18	19	0	0					.02	19	.59	.59
21	9.6	1.8	0	0					.01	19	3.0	.38
22	5.0	24	0	0					.09	11	4.6	.21
23	14	40	.06	0					0	2.7	.01	.06
24	18	20	0	0					.10	19	0	4.5
25	8.7	5.9	0	0					0	27	8.1	4.4
26	3.4	1.7	0	0					0	10	2.0	3.8
27	4.4	.59	0	0					0	2.7	3.7	7.2
28	8.0	.21	0	0					1.7	8.8	.21	.38
29	5.0	.09	0	0					.02	8.7	0	.17
30	8.7	.09	0	0	------				14	1.7	0	.01
31	15	------	.09	0	------		------		------	15	0	------
TOTAL	168.6	339.28	1.30	0.09	0	0	0	0	17.58	254.36	194.46	72.57
MEAN	5.44	11.3	0.042	0.003	0	0	0	0	0.586	8.21	6.27	2.42
MAX	18	40	0.62	0.07	0	0	0	0	14	27	38	14
MIN	1.1	0.09	0	0	0	0	0	0	0	0.09	0	0.01
AC-FT	334	673	2.6	0.2	0	0	0	0	35	505	386	144

CAL YR 1967: TOTAL 2,077.78 MEAN 5.69 MAX 56 MIN 0 AC-FT 4,120
WAT YR 1968: TOTAL 1,048.24 MEAN 2.86 MAX 40 MIN 0 AC-FT 2,080

Note.--No gage-height record Dec. 12 to June 15.

16-0600. South Fork Wailua River near Lihue

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

Drainage area.--22.4 sq mi.

Records available.--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 September 1968. 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.

Extremes.--Maximum discharge during year, 14,200 cfs Dec. 8 (gage height, 16.85 ft); minimum, 2.3 cfs Sept. 8. 1911-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	6.6	484	190	72	8.4	30	52	4.3	9.2	246	3.9
2	86	6.6	638	192	53	8.4	10	28	4.1	5.5	86	22
3	12	11	509	219	119	7.6	9.2	15	3.9	4.5	16	12
4	9.2	6.6	397	164	154	7.6	9.2	42	4.3	72	5.7	3.4
5	9.8	5.7	379	667	55	8.2	9.2	53	4.8	15	4.1	2.8
6	7.9	5.9	382	407	15	14	9.0	20	4.1	5.9	3.8	2.6
7	10	5.5	281	191	19	9.5	8.7	12	4.1	5.0	3.9	2.4
8	68	5.5	2,010	134	40	7.6	8.4	11	4.6	4.5	4.1	2.6
9	25	7.0	898	102	12	6.8	8.4	13	5.9	3.9	4.3	97
10	14	6.2	1,050	89	11	6.4	41	11	4.8	3.8	7.0	15
11	8.4	6.4	480	81	10	6.6	9.5	11	4.5	4.6	5.0	5.7
12	7.0	7.6	285	76	33	245	6.6	9.8	7.0	6.6	4.3	4.5
13	6.4	5.7	225	70	52	273	6.4	9.2	6.6	7.6	45	4.3
14	5.9	5.6	199	64	23	437	7.3	9.2	38	5.5	10	4.1
15	6.2	5.5	167	62	174	291	28	9.0	7.6	5.5	4.8	3.8
16	5.9	5.4	240	627	67	992	83	8.4	5.9	4.5	4.3	3.6
17	5.2	5.4	602	314	25	1,490	40	7.9	6.2	271	3.8	3.4
18	5.7	6.0	265	134	18	336	17	7.9	5.5	50	3.8	3.6
19	111	12	177	112	14	179	25	7.3	5.9	6.2	3.8	4.1
20	338	80	145	102	30	141	184	7.3	5.7	15	3.2	3.8
21	116	20	131	108	524	84	123	8.4	4.8	12	3.2	3.6
22	40	45	106	210	101	43	338	7.9	5.2	6.8	5.0	3.1
23	11	300	1,170	131	75	81	162	7.3	5.0	44	4.1	3.4
24	6.8	1,000	928	105	64	135	216	6.6	4.8	74	3.2	6.0
25	6.2	450	454	82	74	206	357	6.4	4.8	7.3	4.6	10
26	5.7	1,500	190	62	43	146	235	6.2	4.1	5.0	5.7	25
27	6.4	950	169	781	9.2	98	134	5.7	3.9	11	4.8	24
28	7.5	771	122	383	8.4	70	158	5.0	3.9	5.7	4.6	5.0
29	48	516	153	127	8.2	55	54	6.8	4.8	4.3	3.4	3.9
30	14	593	110	89	------	80	18	4.8	65	4.1	3.1	3.8
31	10	------	315	78	------	54	------	4.5	------	110	2.9	------
TOTAL	1,021.6	6,351.2	13,661	6,153	1,902.8	5,527.1	2,344.9	413.6	244.1	790.0	513.5	292.4
MEAN	33.0	212	441	198	65.6	178	78.2	13.3	8.14	25.5	16.6	9.75
MAX	338	1,500	2,010	781	524	1,490	357	53	65	271	246	97
MIN	5.2	5.4	106	62	8.2	6.4	6.4	4.5	3.9	3.8	2.9	2.4
AC-FT	2,030	12,600	27,100	12,200	3,770	10,960	4,650	820	484	1,570	1,020	580

CAL YR 1967: TOTAL 68,565.6 MEAN 188 MAX 2,190 MIN 5.2 AC-FT 136,000
WAT YR 1968: TOTAL 39,215.2 MEAN 107 MAX 2,010 MIN 2.4 AC-FT 77,780

PEAK DISCHARGE (BASE, 5,800 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	about 0800	15.50	8,700	12-23	1100	15.22	7,750
12- 8	1300	16.85	14,200	3-17	0100	15.36	8,220

16-0610. North Wailua ditch near Lihue.

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

Records available.--July 1932 to September 1968.

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.).

Extremes.--1932-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	20	17	19	20	20	20	23	18	27	33	27
2	25	23	18	19	20	20	20	20	18	22	27	24
3	21	21	18	20	22	19	20	20	18	23	25	22
4	22	20	18	20	21	20	20	21	22	27	23	20
5	21	20	18	18	21	22	20	20	19	25	22	19
6	20	20	17	18	20	22	19	20	21	22	22	19
7	22	20	17	18	20	20	19	20	21	21	21	19
8	22	21	20	17	20	19	19	20	26	20	21	19
9	22	20	15	19	20	19	20	20	25	20	27	27
10	22	21	20	19	20	20	23	20	24	20	25	25
11	21	21	11	20	20	22	20	20	23	27	23	22
12	20	20	8.0	21	20	28	20	20	24	27	23	22
13	20	20	14	21	20	27	21	19	29	25	25	25
14	20	19	19	20	20	25	20	19	28	25	21	21
15	20	19	18	20	24	24	20	19	22	21	23	21
16	20	19	21	28	21	30	19	20	26	21	20	20
17	20	19	20	23	21	26	19	19	25	29	25	20
18	20	18	17	23	20	22	19	19	24	25	22	19
19	25	19	16	21	21	22	21	18	25	25	21	20
20	26	24	20	21	25	21	20	20	22	28	21	18
21	23	21	19	22	26	20	20	21	26	26	26	20
22	21	23	20	23	21	21	21	21	22	25	24	18
23	22	27	24	23	22	23	21	20	23	30	21	21
24	20	28	25	21	21	24	23	19	23	28	20	28
25	20	26	16	21	22	24	23	19	20	27	26	22
26	20	29	13	20	21	21	6.4	19	21	27	24	27
27	22	22	15	22	20	20	0	18	20	25	23	24
28	22	21	19	21	20	20	.02	21	25	23	20	20
29	21	16	18	23	21	23	.03	21	20	22	19	20
30	21	18	18	21	------	22	7.9	19	31	23	19	21
31	20	------	19	20	------	21	------	19	------	32	18	------
TOTAL	661	635	548.0	642	610	687	521.35	614	691	768	710	650
MEAN	21.3	21.2	17.7	20.7	21.0	22.2	17.4	19.8	23.0	24.8	22.9	21.7
MAX	26	29	25	28	26	30	23	23	31	32	33	28
MIN	20	16	8.0	17	20	19	0	18	18	20	18	18
AC-FT	1310	1260	1090	1270	1210	1360	1030	1220	1370	1520	1410	1290

CAL YR 1967: TOTAL 6,941.68 MEAN 19.0 MAX 29 MIN 0.01 AC-FT 13,770
WAT YR 1968: TOTAL 7,737.35 MEAN 21.1 MAX 33 MIN 0 AC-FT 15,350

Note.--No gage-height record Dec. 27 to Feb. 12.

16-0612. North Wailua ditch below Waikoko Stream, near Lihue

Location.--Lat 22°03'31", long 159°27'55", on left bank 380 ft downstream from Waikoko Stream, 8.1 miles west of Wailua, and 8.1 miles northwest of Lihue.

Records available.--January 1965 to September 1968.

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

Extremes.--1965-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	25	12	31	25	23	23	31	20	28	37	30
2	35	28	37	33	25	22	22	30	20	25	33	29
3	28	27	36	32	29	21	21	28	19	26	30	28
4	31	25	35	31	27	22	21	29	24	29	29	25
5	27	25	34	38	25	26	21	28	21	26	28	23
6	27	26	34	32	24	28	20	27	23	24	27	22
7	28	24	32	27	23	24	19	26	22	22	27	21
8	28	26	46	27	22	22	19	27	29	21	26	22
9	29	25	36	27	22	21	22	27	28	20	31	28
10	28	27	45	26	21	23	29	27	27	20	29	28
11	27	28	32	27	21	26	23	27	27	28	28	24
12	26	28	22	28	23	40	21	25	29	27	28	22
13	25	26	26	27	21	38	23	24	31	27	30	25
14	24	23	30	26	22	36	24	24	30	26	27	23
15	23	22	28	27	32	33	26	23	25	23	27	22
16	22	22	34	39	26	45	25	23	26	22	25	21
17	24	22	38	31	25	37	23	23	25	31	27	20
18	24	21	31	30	22	29	22	22	25	27	26	19
19	34	22	28	29	23	27	27	21	26	26	25	21
20	36	31	29	28	31	26	27	25	23	29	24	18
21	31	27	27	33	38	25	32	25	26	26	28	21
22	28	28	27	33	28	25	38	26	25	25	28	18
23	27	37	46	31	27	27	35	23	24	30	25	20
24	26	45	47	29	26	27	38	22	24	28	23	28
25	25	40	33	28	29	29	40	21	21	28	30	25
26	24	50	26	27	26	26	34	21	22	27	29	30
27	27	41	27	45	25	25	22	20	20	26	29	28
28	30	41	30	31	25	23	24	23	25	25	25	25
29	28	36	29	28	25	25	15	24	21	25	23	22
30	28	21	27	27	------	26	21	21	31	24	22	22
31	26	------	35	26	------	24	------	21	------	33	21	------
TOTAL	849	869	999	934	738	851	757	764	739	804	847	710
MEAN	27.4	29.0	32.2	30.1	25.4	27.5	25.2	24.6	24.6	25.9	27.3	23.7
MAX	36	50	47	45	38	45	40	31	31	33	37	30
MIN	22	21	12	26	21	21	15	20	19	20	21	18
AC-FT	1680	1720	1980	1850	1460	1690	1500	1520	1470	1590	1680	1410

CAL YR 1967: TOTAL 9,956.51 MEAN 27.3 MAX 50 MIN 0.08 AC-FT 19,750
WAT YR 1968: TOTAL 9,861 MEAN 26.9 MAX 50 MIN 12 AC-FT 19,560

16-0620. Stable storm ditch near Lihue

Location.--Lat 22°04'09", long 159°26'46", on left bank 100 ft downstream from intake, 7.8 miles northwest of Lihue, and 8.2 miles west of Kapaa.

Records available.--December 1936 to September 1968.

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

Extremes.--1936-68: Maximum daily discharge, 71 cfs Apr. 3, 1948; no flow at times each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	033	0.45	0.22	0.33	30	0.33	0.22	31	36	0.45	43
2	10	.33	.33	.22	.33	31	.33	.22	29	31	.45	38
3	.04	.33	.33	.22	.33	30	.33	.22	29	33	.45	36
4	34	.33	.33	.22	.33	30	.33	.22	36	32	.45	34
5	38	.45	.33	.33	.33	36	18	.22	31	30	.45	32
6	38	.45	.33	.33	.22	41	24	.22	34	28	25	30
7	39	30	.33	.33	.22	31	24	.22	31	28	37	26
8	16	45	1.1	.22	.22	18	25	.12	35	27	36	26
9	.22	43	.45	.22	.22	.45	32	.12	35	27	40	42
10	.22	28	.59	.22	.22	.45	19	.12	34	27	39	42
11	.22	.33	.59	.22	.22	29	8.7	.12	35	36	37	37
12	.22	.33	.59	.22	.22	17	16	.12	38	36	36	35
13	.22	30	.45	.22	.22	.74	27	18	44	35	42	38
14	.22	39	.45	.22	.22	.74	27	17	40	34	37	30
15	.22	38	.45	.33	.33	.74	31	23	34	30	39	31
16	.22	37	.45	.22	.22	1.4	17	25	37	29	33	30
17	25	25	.45	.22	.22	.74	.22	31	37	22	38	30
18	36	.33	.45	.33	.22	.59	.22	31	35	20	36	28
19	53	.33	.45	.33	.22	.59	.22	30	37	25	33	30
20	40	35	.33	.33	.22	.45	.22	32	33	39	33	28
21	.33	42	.33	.33	.22	.33	.22	34	35	12	40	25
22	.33	28	.33	.33	.12	.33	.22	35	33	24	41	27
23	.33	.59	.45	.33	0	.33	.22	31	33	13	35	30
24	.33	.59	.45	.33	0	.45	.22	29	34	.33	33	40
25	.33	.45	.45	.33	0	.74	.22	28	30	.22	38	34
26	24	.83	.33	.33	0	.45	.22	28	30	24	38	40
27	33	.45	.33	.33	0	.33	.22	28	30	12	35	38
28	.33	.45	.33	.33	10	.33	.22	33	35	.33	30	34
29	.33	.45	.33	.33	26	.33	.22	32	30	20	29	32
30	.33	.45	.33	.33	------	.33	.22	28	46	34	31	31
31	.45	------	.33	.33	------	.33	------	31	------	17	27	------
TOTAL	430.89	427.80	13.22	8.80	41.40	304.17	273.10	546.14	1031	761.88	920.25	997
MEAN	13.9	14.3	0.426	0.284	1.43	9.81	9.10	17.6	34.4	24.6	29.7	33.2
MAX	53	45	1.1	0.33	26	41	32	35	46	39	42	43
MIN	0.04	0.33	0.33	0.22	0	0.33	0.22	0.12	29	0.22	0.45	25
AC-FT	855	849	26	17	82	603	542	1.080	2040	1.510	1.830	1.980

CAL YR 1967: TOTAL 2,076.34 MEAN 5.69 MAX 53 MIN 0 AC-FT 4,120
WAT YR 1968: TOTAL 5,755.65 MEAN 15.7 MAX 53 MIN 0 AC-FT 11,420

16-0630. North Fork Wailua River at altitude 650 ft, near Lihue

Location.--Lat 22°04'02", long 159°26'21", 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.

Records available.--September 1914 to March 1915, May 1915 to October 1918, December 1918, March 1919, June 1919 to September 1968. 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.

Extremes.--Maximum discharge during year, 4,860 cfs Dec. 8 (gage height, 9.10 ft), from rating curve extended above 2,300 cfs as explained below; minimum, 0.23 cfs June 5.
1914-68: Maximum discharge, 13,200 cfs Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 730 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. no. 1000) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see sta. nos. 610, 620) divert water above station for power development and irrigation in vicinity of Lihue.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	81	260	90	40	2.7	30	144	0.44	8.3	236	16
2	159	151	270	119	35	.62	24	79	.44	1.8	115	42
3	88	109	250	104	99	.62	22	49	.40	10	71	1.6
4	72	77	230	120	47	.62	23	96	2.0	7.4	60	.76
5	8.7	75	230	256	36	6.9	12	65	.29	2.1	56	.94
6	4.3	88	230	119	33	3.6	.76	43	.52	1.0	41	1.2
7	32	26	207	84	30	.54	.44	36	.68	.85	2.1	1.1
8	69	24	868	67	29	8.1	.44	43	6.4	.76	2.1	1.2
9	58	3.8	585	56	29	23	18	43	2.8	.72	12	126
10	96	59	984	50	28	40	136	44	1.0	.72	4.5	25
11	79	110	304	46	26	34	18	44	2.3	6.3	3.5	2.8
12	69	98	193	40	29	310	10	33	2.0	14	3.2	2.3
13	65	28	162	38	24	258	3.0	12	18	8.7	24	4.5
14	58	1.4	126	35	24	239	3.4	7.3	44	2.9	3.2	1.7
15	56	1.0	98	49	123	162	64	2.1	.76	1.4	6.1	1.8
16	52	.94	220	257	26	680	45	1.2	2.5	1.0	3.1	1.7
17	19	24	345	77	23	542	36	1.3	1.7	193	11	1.7
18	14	56	154	47	21	126	29	1.0	1.0	35	2.5	1.6
19	114	82	98	40	23	102	180	1.2	12	19	2.6	2.0
20	185	117	73	34	142	67	162	1.3	.62	34	2.8	1.7
21	144	19	62	110	307	47	148	2.6	3.9	29	18	1.6
22	100	81	77	91	54	54	144	1.9	1.5	15	8.8	1.5
23	105	322	669	47	40	112	126	.72	1.9	143	2.3	1.8
24	81	599	689	36	35	130	234	.72	1.7	92	2.3	53
25	71	348	183	34	58	152	227	.72	.58	81	8.5	2.5
26	25	760	122	33	34	62	183	.72	.54	54	5.8	67
27	66	450	98	549	33	44	150	.72	.54	26	4.8	5.5
28	136	370	90	139	23	35	165	24	4.7	49	4.5	1.5
29	104	300	86	69	5.3	96	107	2.1	.58	22	4.5	1.5
30	139	320	69	47	------	94	102	.85	104	2.6	1.8	1.5
31	92	------	191	44	------	43	------	.85	------	219	.72	------
TOTAL	2,369.8	4,781.14	8,223	2927	1,456.3	3,475.70	2,403.04	782.30	219.79	1,081.55	723.72	375.00
MEAN	76.4	159	265	94.4	50.2	112	80.1	25.2	7.33	34.9	23.3	12.5
MAX	185	760	984	549	307	680	234	144	104	219	236	126
MIN	4.3	0.94	62	33	5.3	0.54	0.44	0.72	0.29	0.72	0.72	0.76
AC-FT	4,700	9,480	16,310	5,810	2,890	6,890	4,770	1,550	436	2,150	1,440	744

CAL YR 1967: TOTAL 49,288.49 MEAN 135 MAX 1,990 MIN 0.42 AC-FT 97,760
WAT YR 1968: TOTAL 28,818.34 MEAN 78.7 MAX 984 MIN 0.29 AC-FT 57,160

PEAK DISCHARGE (BASE, 2,500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0230	8.87	4,540	12-23	0900	7.92	3,340
12- 8	1200	9.10	4,860	3-16	2330	8.02	3,450
12-17	0700	7.79	3,210				

16-0680. East Branch of North Fork Wailua River near Lihue

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

Drainage area.--6.2 sq mi, approximately.

Records available.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to September 1968. 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, staff 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.

Extremes.--Maximum discharge during year, 3,300 cfs Dec. 8 (gage height, 7.04 ft); minimum, 9.0 cfs Sept. 22, 23. 1912-68: 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 fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	24	139	41	23	15	38	69	15	20	77	13
2	61	56	141	50	21	15	33	61	15	15	46	11
3	32	52	113	53	61	14	30	45	15	14	31	10
4	33	26	93	40	41	14	31	68	15	15	25	12
5	27	24	94	164	30	15	39	65	15	12	23	9.9
6	25	25	79	76	27	18	26	42	15	12	21	9.9
7	26	22	73	44	25	15	24	38	14	11	19	9.9
8	30	23	543	38	24	14	23	35	17	10	19	10
9	35	21	665	33	23	14	50	34	15	10	27	256
10	34	26	775	30	22	14	93	38	15	10	26	35
11	32	27	286	28	22	28	33	37	17	17	23	19
12	25	33	152	25	21	96	28	30	21	20	18	15
13	24	22	109	24	21	91	28	28	18	23	29	17
14	23	20	96	22	20	148	24	26	19	14	19	14
15	21	19	73	24	22	62	29	25	15	12	24	12
16	21	18	83	149	19	217	82	24	19	11	17	12
17	20	18	237	48	18	488	41	23	20	60	17	10
18	26	20	91	29	17	91	28	22	19	21	17	10
19	73	17	67	24	17	65	86	21	22	16	14	14
20	88	28	57	23	17	48	207	21	17	35	14	10
21	45	21	52	24	80	38	97	21	16	17	19	10
22	30	33	47	24	22	37	231	20	15	16	29	9.4
23	30	155	226	20	19	87	73	19	14	109	24	10
24	25	403	157	19	17	108	51	18	15	46	14	34
25	22	192	78	18	18	144	51	18	15	23	25	19
26	20	465	56	17	17	65	52	17	14	30	24	33
27	24	293	47	193	16	50	56	17	13	21	18	27
28	39	262	52	65	16	39	64	17	14	16	15	14
29	39	149	50	33	15	69	51	17	13	18	13	11
30	46	178	37	28	------	87	56	16	57	15	12	11
31	26	------	66	24	------	50	------	16	------	67	12	------
TOTAL	1026	2672	4834	1430	711	2256	1755	948	524	736	711	688.1
MEAN	33.1	89.1	156	46.1	24.5	72.8	58.5	30.6	17.5	23.7	22.9	22.9
MAX	88	465	775	193	80	488	231	69	57	109	77	256
MIN	20	17	37	17	15	14	23	16	13	10	12	9.4
AC-FT	2040	5300	9590	2840	1410	4470	3480	1880	1040	1460	1410	1360

CAL YR 1967: TOTAL 29,063 MEAN 79.6 MAX 1,780 MIN 17 AC-FT 57,650
WAT YR 1968: TOTAL 18,291.1 MEAN 50.0 MAX 775 MIN 9.4 AC-FT 36,280

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0230	5.33	1,610	4-22	0100	5.35	1,630
12- 8	1330	7.04	3,300	9- 9	0130	6.15	2,350
3-16	2400	6.37	2,570				

16-0690. Wailua ditch near Kapaa

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

Records available.--November 1936 to September 1968.

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

Extremes.--1936-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	15	0.14	0.09	0.50	4.3	5.9	3.1	19	23	24	5.2
2	17	20	.20	.06	.40	4.4	5.7	3.1	19	22	19	5.2
3	17	16	.40	.06	.40	4.3	8.4	2.2	19	16	12	11
4	17	8.7	.40	.04	.40	4.4	10	1.6	18	7.3	12	16
5	17	8.7	.50	.04	.50	4.4	10	1.6	18	7.3	12	16
6	17	15	.60	.04	.50	4.4	10	1.6	18	7.3	12	16
7	18	20	.70	.03	.50	4.4	10	3.4	18	7.3	12	16
8	18	20	.80	.03	2.6	7.6	10	7.1	18	6.6	12	16
9	18	20	.90	.03	4.6	13	10	7.1	18	9.1	12	9.8
10	18	16	1.1	.03	4.8	15	10	5.6	14	11	13	.06
11	17	7.4	1.0	.04	4.1	16	7.0	2.7	7.4	11	13	.04
12	15	7.6	.80	.04	4.3	16	5.2	2.7	7.4	12	13	.04
13	10	15	.60	.06	4.1	16	5.2	2.6	7.6	13	18	.04
14	10	20	.40	.09	3.9	9.8	5.2	2.6	7.6	13	24	.20
15	10	19	.40	.14	4.1	6.0	5.2	6.5	7.6	15	24	.14
16	18	19	.30	.20	4.1	5.7	5.2	14	7.4	17	23	9.3
17	23	10	.30	.20	4.1	6.9	5.2	15	7.6	17	23	17
18	23	2.1	.30	.20	3.9	6.7	5.0	15	7.6	21	23	20
19	15	2.1	.30	.20	3.9	6.7	4.8	15	9.6	22	23	22
20	2.9	9.9	.20	.30	3.9	6.7	5.3	15	24	22	25	21
21	.03	12	.30	.30	3.4	5.1	1.8	15	23	23	26	21
22	.02	9.2	.30	.30	3.8	3.6	.14	15	23	24	26	20
23	13	1.9	.30	.40	3.8	3.2	.14	15	23	25	26	19
24	21	1.8	.40	.40	3.9	3.2	1.6	15	23	25	25	19
25	21	1.8	.40	.30	3.9	3.1	2.7	15	22	25	25	19
26	21	1.6	.30	.30	3.9	3.1	2.4	15	24	25	25	19
27	16	.90	.30	.30	3.8	3.2	2.7	15	24	25	25	19
28	7.6	.30	.30	.40	3.9	3.4	2.7	15	23	25	25	19
29	7.6	.20	.30	.50	3.9	3.6	2.9	18	23	25	25	19
30	7.6	.20	.20	.50	------	3.8	2.9	19	23	25	18	18
31	7.4	------	.14	.50	------	3.9	------	19	------	24	5.7	------
TOTAL	440.15	301.40	13.58	6.12	89.90	201.9	163.28	303.5	503.8	550.9	600.7	393.02
MEAN	14.2	10.0	0.438	0.197	3.10	6.51	5.44	9.79	16.8	17.8	19.4	13.1
MAX	23	20	1.1	0.50	4.8	16	10	19	24	25	26	22
MIN	0.02	0.20	0.14	0.03	0.40	3.1	0.14	1.6	7.4	6.6	5.7	0.04
AC-FT	873	598	27	12	178	400	324	602	999	1090	1.190	780

CAL YR 1967: TOTAL 3,301.72 MEAN 9.05 MAX 25 MIN 0.01 AC-FT 6,550
WAT YR 1968: TOTAL 3,568.25 MEAN 9.75 MAX 26 MIN 0.02 AC-FT 7,080

16-0700. Aahoaka ditch near Kapaa

Location.--Lat 22°03'30", long 159°23'49", 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.

Records available.--November 1966 to September 1968.

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

Extremes.--1966-68: Maximum daily discharge, 5.3 cfs Aug. 14, 1967; no flow for 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	0	0.53	0	0	0	0		0	2.6	2.6	2.0
2	2.0	.63	.62	0	0	0	0		0	2.0	2.5	1.9
3	1.2	.44	0	0	.42	0	0		0	1.6	2.5	1.8
4	1.1	0	0	0	0	0	0		0	2.6	2.4	1.0
5	.74	0	0	.39	0	0	0		0	2.4	2.7	.81
6	.96	0	0	0	0	0	0		0	2.0	2.4	.74
7	.78	0	0	0	0	0	0		0	2.0	2.8	.74
8	1.1	0	.89	0	0	0	0		0	2.1	2.5	.81
9	1.1	0	.95	0	0	0	0		0	2.2	2.6	.97
10	.56	0	2.2	0	0	0	0		0	2.1	2.4	0
11	1.1	0	1.1	0	0	0	0		0	2.6	2.4	0
12	.81	.18	.46	0	0	0	0		0	2.5	2.4	0
13	.74	0	0	0	0	0	0		0	2.7	2.5	0
14	.64	0	0	0	0	0	0		0	2.7	2.4	0
15	.64	0	0	0	0	0	1.4		0	2.8	2.8	0
16	.56	0	0	.53	0	.08	3.3		0	2.8	2.5	0
17	.89	0	.29	0	0	.18	3.6		0	3.0	2.8	.58
18	.46	0	0	0	0	0	3.6		0	3.1	2.5	.89
19	.68	0	0	0	0	0	3.8		0	2.7	2.5	1.2
20	1.1	.37	0	0	0	0	1.3		0	3.4	2.4	1.2
21	.75	0	0	0	0	0	0		0	3.0	2.5	.89
22	.46	0	0	0	0	0	.11		0	2.9	2.5	.81
23	.56	1.2	.31	0	0	0	0		0	3.0	1.7	.81
24	0	2.4	0	0	0	0	0		0	3.6	1.2	1.3
25	0	2.2	0	0	0	0	0		0	3.4	1.7	1.4
26	0	3.8	0	0	0	0	0		0	3.4	1.8	1.2
27	0	2.8	0	.07	0	0	0		.45	2.8	1.8	1.4
28	.11	2.3	.06	0	0	0	0		1.1	2.9	1.2	.89
29	.18	1.1	0	0	0	0	0		.96	2.7	1.0	.74
30	.53	1.4	0	0	------	0	0		2.2	2.7	1.1	.64
31	0	------	0	0	------	0	------		------	2.6	2.0	------
TOTAL	21.35	18.82	7.41	0.99	0.42	0.26	17.11	0	4.71	82.9	69.1	24.72
MEAN	0.689	0.627	0.239	0.032	0.014	0.008	0.570	0	0.157	2.67	2.23	0.824
MAX	2.0	3.8	2.2	0.53	0.42	0.18	3.8	0	2.2	3.6	2.8	2.0
MIN	0	0	0	0	0	0	0	0	0	1.6	1.0	0
AC-FT	42	37	15	2.0	0.8	0.5	34	0	9.3	164	137	49

CAL YR 1967: TOTAL 538.31 MEAN 1.47 MAX 5.3 MIN 0 AC-FT 1,070
WAT YR 1968: TOTAL 247.79 MEAN 0.677 MAX 3.8 MIN 0 AC-FT 491

16-0710. North Fork Wailua River near Kapaa

Location.--Lat 22°03'08", long 159°22'22", 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.

Records available.--July 1952 to September 1968.

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

Extremes.--Maximum discharge during year, 6,100 cfs Dec. 8 (gage height, 8.24 ft); minimum, 4.2 cfs Sept. 6. 1952-68: 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 fair. Wailua and Aahoaka ditches (see sta. nos. 690 and 700) divert above station for irrigation of sugarcane in vicinities of Kapaa and Wailua, respectively.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	86	395	173	100	28	98	193	22	18	237	27
2	123	135	428	197	92	22	86	152	23	9.6	129	44
3	87	145	383	195	202	22	68	105	21	8.2	84	18
4	67	78	333	182	143	21	66	150	20	18	71	5.6
5	29	70	331	498	96	22	62	137	18	8.2	55	4.6
6	18	83	327	266	87	40	34	96	17	8.2	33	4.6
7	23	50	286	176	84	30	30	84	17	8.2	11	4.6
8	58	34	1,430	156	83	28	30	78	19	9.2	6.0	5.1
9	94	25	1,300	114	84	42	64	77	18	9.6	9.8	241
10	83	43	1,880	89	81	55	189	91	17	10	13	70
11	78	81	681	72	81	43	65	101	17	12	10	31
12	62	104	412	74	75	335	61	71	18	12	7.8	25
13	64	52	321	83	71	306	38	58	18	25	28	30
14	58	82	272	72	64	487	44	38	52	9.6	12	26
15	57	19	217	84	140	267	70	26	15	9.6	15	25
16	48	18	121	469	68	698	123	22	16	9.6	11	24
17	32	18	611	213	62	1,250	98	22	17	117	10	22
18	55	61	296	134	59	293	70	20	16	44	17	19
19	121	69	205	118	61	214	214	20	27	17	10	22
20	235	140	173	114	102	163	646	22	17	39	9.2	21
21	178	31	153	155	377	132	332	25	15	18	9.2	19
22	118	82	146	156	87	123	500	24	17	28	27	19
23	102	403	928	103	70	200	1,259	20	16	123	8.7	18
24	75	979	806	92	64	231	294	16	16	117	7.8	47
25	53	517	318	91	79	295	267	17	13	68	12	39
26	48	1,390	217	87	62	163	228	17	14	64	10	65
27	50	820	186	670	59	121	216	18	14	29	12	45
28	115	691	177	264	54	103	226	22	13	33	7.8	15
29	133	473	181	141	30	180	173	28	13	30	7.8	13
30	142	522	143	114	------	203	165	19	83	18	7.4	13
31	100	------	288	107	------	121	------	21	------	193	14	------
TOTAL	2518	7241	14148	5419	2713	6208	4816	1790	619	1120.0	902.5	962.5
MEAN	81.2	241	456	175	93.6	200	161	57.7	20.6	36.1	29.1	32.1
MAX	235	1,390	1,880	670	377	1,250	646	193	83	193	237	241
MIN	18	18	143	72	30	21	30	16	13	8.2	6.0	4.6
AC-FT	4990	14360	28060	10750	5380	12310	9550	3550	1230	2220	1790	1910

CAL YR 1967: TOTAL 83,427 MEAN 229 MAX 4,200 MIN 16 AC-FT 165,500
WAT YR 1968: TOTAL 48,455.0 MEAN 132 MAX 1,880 MIN 4.6 AC-FT 96,110

PEAK DISCHARGE (BASE, 4,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0230	7.52	4,780	12-23	0900	7.09	4,140
12- 8	1230	8.24	6,100	3-17	0100	7.32	4,480

16-0715. Left Branch Opaekaa Stream near Kapaa

Location.--Lat 22°04'43", long 159°23'55", 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.

Records available.--May 1960 to September 1968. 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).

Extremes.--Maximum discharge during year, 178 cfs Apr. 20 (gage height, 4.30 ft), from rating curve extended above 31 cfs by logarithmic plotting; minimum, 0.09 cfs Sept. 27-30.
1960-68: 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 except those for period of no gage-height record, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.69	1.6	6.6	3.3	2.1	0.89	1.7	2.0	0.13	1.1	1.0	0.57
2	1.6	1.4	5.6	3.4	2.0	.79	1.5	1.7	.13	.89	1.4	.46
3	1.0	1.3	5.2	3.5	3.4	.69	1.5	1.5	.13	.89	.89	.46
4	1.3	1.3	4.6	3.0	2.9	.69	1.4	1.7	.13	.89	.79	.46
5	1.3	1.3	5.5	6.0	2.2	.69	1.5	1.6	.13	.79	.57	.36
6	1.2	1.2	4.6	4.8	2.0	.89	1.3	1.4	.10	.36	.57	.36
7	1.2	1.2	3.9	3.6	1.9	.69	1.2	1.3	.10	.36	.57	.36
8	1.2	1.2	21	3.3	1.9	.69	1.2	1.3	.13	.26	.57	.36
9	1.4	1.2	23	3.0	1.8	.69	1.3	1.4	.10	.26	.69	7.0
10	1.3	1.2	45	3.0	1.7	.57	2.2	1.5	.10	.18	.79	.26
11	1.3	1.2	18	2.8	1.7	.57	1.4	1.2	.10	.46	.69	.17
12	1.2	1.2	10	2.7	1.7	1.0	1.2	1.1	.10	.36	.57	.14
13	1.2	1.1	7.9	2.5	1.6	2.6	1.1	1.0	.12	.57	.69	.13
14	1.2	1.1	6.6	2.5	1.5	5.9	1.1	.89	.18	.36	.57	.14
15	1.2	1.1	5.6	2.5	1.5	2.4	1.1	.79	.10	.26	.79	.13
16	1.2	1.1	5.0	7.4	1.4	2.5	2.2	.79	.13	.18	.79	.13
17	1.2	1.1	9.4	3.8	1.3	23	1.7	.69	.13	.88	.69	.13
18	1.4	1.1	5.8	2.8	1.2	4.2	1.2	.69	.13	.89	.69	.12
19	2.0	1.1	4.8	2.5	1.2	3.0	1.4	.57	.26	.57	.69	.18
20	2.4	1.1	4.2	2.4	1.2	2.7	22	.69	.26	.46	.69	.13
21	1.6	1.1	3.8	2.3	2.0	2.4	3.8	.57	.36	.46	.69	.12
22	1.4	1.1	3.7	2.3	1.2	2.2	11	.57	.26	.18	.69	.12
23	1.3	2.2	11	2.2	1.2	2.2	3.7	.46	.36	1.0	.69	.13
24	1.2	18	6.1	2.0	1.1	2.1	2.8	.46	.57	1.0	.57	.15
25	1.2	6.0	4.9	2.0	1.1	2.7	2.4	.36	.46	.69	.46	.13
26	1.2	15	4.3	1.9	1.0	2.2	2.2	.26	.57	.69	.79	.10
27	1.2	12	3.9	4.7	1.0	2.0	2.1	.26	.57	.57	.57	.12
28	1.2	9.8	4.5	3.6	.89	1.9	2.0	.26	.57	.57	.46	.09
29	1.2	6.9	4.5	2.5	.89	1.9	1.8	.26	.69	.57	.46	.10
30	1.4	8.2	3.4	2.3	------	2.0	1.8	.18	1.6	.57	.46	.09
31	1.2	------	3.9	2.2	------	1.9	------	.18	------	1.1	.46	------
TOTAL	40.59	104.4	256.3	96.8	46.58	78.65	82.8	27.63	8.70	18.37	21.00	13.20
MEAN	1.31	3.48	8.27	3.12	1.61	2.54	2.76	0.891	0.290	0.593	0.677	0.440
MAX	2.4	18	45	7.4	3.4	23	22	2.0	1.6	1.1	1.4	7.0
MIN	0.69	1.1	3.4	1.9	0.89	0.57	1.1	0.18	0.10	0.18	0.46	0.09
AC-FT	81	207	508	192	92	156	164	55	17	36	42	26

CAL YR 1967: TOTAL 1,235.73 MEAN 3.39 MAX 45 MIN 0.57 AC-FT 2,450
WAT YR 1968: TOTAL 795.02 MEAN 2.17 MAX 45 MIN 0.09 AC-FT 1,580

Peak discharge (base, 140 cfs).--Apr. 20 (0130) 178 cfs (4.30 ft).

Note.--No gage-height record Oct. 5 to Nov. 22.

16-0770. Makaleha ditch near Kealia

Location.--Lat 22°07'00", long 159°22'04", 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.

Records available.--December 1936 to September 1968.

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

Extremes.--1936-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	12	1.2	0.42	1.4	7.6	0.16	0.21	8.0	14	22	10
2	19	22	.93	.38	2.2	7.5	2.2	.17	7.4	9.7	16	7.9
3	12	15	.93	.33	1.9	7.8	6.5	.14	7.4	8.3	11	7.5
4	15	11	.74	.28	1.8	9.6	7.5	.14	7.4	10	10	11
5	11	10	.74	.71	.74	13	11	.17	7.4	8.6	9.7	7.5
6	10	12	.69	.74	.42	16	7.1	.11	7.5	7.5	9.3	7.4
7	14	9.8	.58	.47	.28	9.6	7.0	2.5	7.8	7.4	8.6	7.4
8	16	11	5.9	.33	.21	8.6	7.0	9.6	12	7.4	9.5	8.0
9	15	9.3	19	.28	.17	8.4	11	13	8.3	6.9	17	18
10	16	15	14	.24	.14	11	9.5	8.6	8.7	6.8	15	7.8
11	13	13	5.8	.21	.11	17	6.4	5.4	12	13	11	12
12	11	13	2.6	1.3	3.4	18	.33	5.3	15	13	10	11
13	11	9.6	1.3	2.6	4.1	17	.21	6.4	11	13	14	14
14	9.8	8.9	.74	2.5	3.1	7.7	.14	10	12	9.7	9.7	9.8
15	9.8	8.7	.52	2.4	7.6	.69	4.4	9.0	8.3	8.0	13	7.6
16	9.1	8.7	.38	1.4	7.9	.63	18	8.9	11	7.8	10	7.5
17	8.7	8.9	1.0	.52	7.9	8.3	17	8.4	11	14	13	7.8
18	9.1	11	.93	.33	7.8	2.3	13	8.2	9.7	10	10	8.6
19	17	9.3	.69	.21	7.9	1.1	9.7	8.0	11	9.9	8.7	11
20	20	7.1	.47	.17	8.0	.52	6.0	10	8.3	17	8.6	9.1
21	13	.14	.38	.14	4.4	.28	2.9	10	8.7	9.1	11	9.8
22	11	.11	.28	.14	.06	.21	4.2	9.4	8.3	10	14	9.0
23	9.7	.33	1.8	.11	2.4	.17	1.9	8.9	7.9	21	11	10
24	9.7	2.7	1.3	1.7	4.3	.17	1.1	8.4	10	18	9.4	17
25	8.9	1.9	.93	3.3	2.0	.24	.69	8.2	7.8	11	16	12
26	8.6	4.8	.58	1.9	.02	.17	.47	8.0	7.6	11	13	16
27	11	3.4	.42	.81	.02	.17	.42	6.8	7.6	9.1	11	13
28	15	3.0	.71	.69	2.3	.14	.33	6.9	8.0	8.2	9.0	9.4
29	14	1.7	.63	.35	7.3	.14	.24	7.8	7.4	8.3	8.3	8.7
30	21	1.5	.42	1.3	------	.17	.24	8.4	18	7.8	7.9	8.3
31	13	------	.58	1.7	------	.17	------	8.3	------	21	7.6	------
TOTAL	390.7	244.88	67.17	27.96	89.87	174.37	156.63	205.34	282.5	336.5	354.3	304.1
MEAN	12.6	8.16	2.17	0.902	3.10	5.62	5.22	6.62	9.42	10.9	11.4	10.1
MAX	21	22	19	3.3	8.0	18	18	13	18	21	22	18
MIN	8.6	0.11	0.28	0.11	0.02	0.14	0.14	0.11	7.4	6.8	7.6	7.4
AC-FT	775	486	133	55	178	346	311	407	560	667	703	603

CAL YR 1967: TOTAL 2,231.26 MEAN 6.11 MAX 24 MIN 0.04 AC-FT 4,430
WAT YR 1968: TOTAL 2,634.32 MEAN 7.20 MAX 22 MIN 0.02 AC-FT 5,230

16-0790. Kapahi ditch near Kealia

Location.--Lat 22°06'09", long 159°22'28", on right bank 500 ft downstream from intake and 4.0 miles west of Kealia.

Records available.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to September 1968. 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.

Extremes.--1909-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	4.7	0.19	0.38	0.19	0.38	0.03	0.25	4.9	10	9.0	3.5
2	8.2	8.2	.19	.51	.19	.31	.48	.25	5.4	4.7	8.6	3.0
3	5.2	5.2	.19	.66	.53	.14	.25	.19	5.4	4.1	5.6	2.9
4	5.0	.25	1.2	.74	.31	.10	8.5	.19	5.2	4.9	3.2	5.0
5	4.4	.14	1.6	.82	.25	.46	7.3	.19	5.2	4.1	1.7	2.9
6	4.2	2.8	1.4	.66	.25	.10	.25	.19	5.0	3.9	3.4	2.9
7	4.7	4.2	1.4	.74	.25	.10	.19	.19	5.2	3.6	3.8	2.9
8	5.9	4.2	2.2	.90	.25	.06	5.6	6.6	6.7	3.5	3.9	3.0
9	8.1	4.1	3.2	.90	1.9	.06	12	5.4	5.9	3.6	7.0	11
10	8.4	5.4	1.8	2.5	.51	.06	3.8	.25	5.2	3.6	6.0	4.3
11	5.7	4.9	.31	.82	.45	.10	.10	.25	5.4	7.0	4.4	7.0
12	4.4	5.6	.19	.66	.58	.91	.19	.25	7.7	9.1	3.9	5.6
13	3.2	4.1	.10	.45	.58	.56	.25	2.9	4.4	8.5	5.8	6.1
14	.31	4.1	.10	.38	.25	.36	.25	7.2	5.0	4.2	4.1	5.2
15	.25	4.1	.14	.38	.19	.10	.25	7.0	3.8	3.9	5.2	5.4
16	3.4	3.9	.14	.52	.19	.21	.82	6.6	5.2	3.6	4.1	5.2
17	3.8	3.0	.25	.31	.19	1.4	.06	4.5	4.4	14	5.5	5.2
18	4.1	1.9	.14	.31	.19	.19	.06	.25	4.1	5.4	4.1	4.9
19	8.0	1.9	.19	.45	.19	.14	.19	.19	4.9	4.2	3.6	4.4
20	8.2	1.9	.31	.45	.25	.10	.75	4.2	3.8	9.8	3.6	4.1
21	.58	.75	.31	.45	.86	.10	.39	6.2	3.6	4.9	4.2	4.1
22	.31	.58	.31	.45	.31	.10	.55	6.2	3.6	5.6	8.0	4.4
23	3.0	1.2	.31	.45	.51	.10	.10	5.7	3.5	29	3.5	4.4
24	4.1	2.3	.14	.45	.25	.10	.10	5.4	3.7	15	3.0	13
25	3.8	1.2	.14	.45	.25	.14	.10	5.4	3.5	5.7	6.8	7.9
26	3.6	2.0	.14	.51	.55	.06	.49	5.6	3.3	5.6	5.3	13
27	2.5	.74	.14	.67	.88	.06	.31	6.6	3.3	4.9	3.8	10
28	.38	.51	.25	.31	.38	.06	.31	6.4	3.3	4.2	3.2	5.4
29	.10	.19	.25	.25	.38	.06	.25	6.1	3.3	4.1	3.3	4.7
30	1.9	.19	.25	.19	------	.06	.25	4.9	19	3.9	3.2	4.2
31	4.7	------	.31	.19	------	.03	------	4.7	------	11	3.3	------
TOTAL	126.13	84.25	17.79	17.91	12.06	6.71	44.17	110.24	152.9	209.6	144.1	165.6
MEAN	4.07	2.81	0.574	0.578	0.416	0.216	1.47	3.56	5.10	6.76	4.65	5.52
MAX	8.4	8.2	3.2	2.5	1.9	1.4	12	7.2	19	29	9.0	13
MIN	0.10	0.14	0.10	0.19	0.19	0.03	0.03	0.19	3.3	3.5	1.7	2.9
AC-FT	250	167	35	36	24	13	88	219	303	416	286	328

CAL YR 1967: TOTAL 1,251.15 MEAN 3.43 MAX 20 MIN 0.10 AC-FT 2,480
WAT YR 1968: TOTAL 1,091.46 MEAN 2.98 MAX 29 MIN 0.03 AC-FT 2,160

16-0800. Kapaa Stream at Kapahi ditch intake, near Kapaa

Location.--Lat 22°06'15", long 159°22'29", 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.

Records available.--July 1936 to September 1968. 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.

Extremes.--Maximum discharge during year, 2,550 cfs Dec. 9 (gage height, 3.37 ft); no flow for many days.
1936-68: Maximum discharge, 7,670 cfs Jan. 25, 1956 (gage height, 5.41 ft, present datum), from rating curve extended above 2,800 cfs by logarithmic plotting; 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. no. 790).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.06	0	50	32	17	5.6	19	34	0	0	9.6	0
2	14	12	55	38	14	5.6	15	28	0	0	.58	0
3	.76	3.3	54	38	73	5.6	11	20	0	0	0	0
4	0	5.1	38	36	31	5.6	5.2	48	0	0	1.0	0
5	0	4.5	48	90	21	11	16	36	0	0	2.2	0
6	0	1.9	38	42	19	9.9	9.1	21	0	0	.69	0
7	6.8	0	40	28	18	5.6	6.9	16	0	0	0	0
8	2.4	0	337	24	18	5.6	2.0	3.7	0	0	0	0
9	.13	0	637	21	15	5.1	14	6.7	0	0	.04	146
10	.05	.05	456	18	17	5.6	68	18	0	0	0	21
11	0	0	92	19	17	34	17	20	0	0	0	0
12	0	.03	50	17	12	86	18	13	0	.15	0	0
13	1.5	0	40	16	9.1	83	25	7.4	0	0	0	0
14	5.1	0	37	16	13	125	18	0	0	0	0	0
15	5.1	0	30	23	7.6	48	17	0	0	0	0	0
16	.75	0	31	112	6.9	75	80	0	0	0	0	0
17	0	.96	129	34	6.2	326	23	2.3	0	4.8	0	0
18	0	4.0	46	23	6.2	42	11	7.6	0	0	0	0
19	1.7	2.2	31	21	6.2	50	60	6.9	0	0	0	0
20	7.8	4.0	25	20	6.9	25	218	2.3	0	0	0	0
21	7.6	7.6	24	20	30	19	102	0	0	0	1.4	0
22	6.2	14	32	20	17	18	171	0	0	0	.21	0
23	1.9	71	128	19	12	36	50	0	0	13	0	0
24	0	275	66	16	9.9	57	34	0	0	0	0	.40
25	0	100	36	13	13	72	31	0	0	0	0	0
26	0	247	28	14	13	32	29	0	0	0	0	.02
27	1.9	117	24	107	13	34	28	0	0	0	0	0
28	19	127	44	36	11	20	34	0	0	0	0	0
29	9.1	66	34	21	5.6	38	27	0	0	0	0	0
30	26	72	25	18	------	48	34	0	23	0	0	0
31	1.3	------	52	17	------	27	------	0	------	2.1	0	------
TOTAL	119.15	1,134.64	2757	969	458.6	1360.2	1193.2	290.9	23	20.05	15.72	167.42
MEAN	3.84	37.8	88.9	31.3	15.8	43.9	39.8	9.38	0.8	0.647	0.507	5.58
MAX	26	275	637	112	73	326	218	48	23	13	9.6	146
MIN	0	0	24	13	5.6	5.1	2.0	0	0	0	0	0
AC-FT	236	2,250	5470	1920	910	2700	2370	577	46	40	31	332

CAL YR 1967: TOTAL 13,293.34 MEAN 36.4 MAX 637 MIN 0 AC-FT 26,370
WAT YR 1968: TOTAL 8,508.88 MEAN 23.2 MAX 637 MIN 0 AC-FT 16,880

Peak discharge (base, 1,900 cfs).--Dec. 9 (0900) 2,550 cfs (3.37 ft).

16-0870. Anahola ditch wasteway near Kealia

Location.--Lat 22°08'16", long 159°22'28", 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.

Records available.--July 1936 to September 1968.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 825 ft above mean sea Level (by stadia survey).

Extremes.--1936-68: Maximum daily discharge, 84 cfs Nov. 12, 1955; no flow at times.

Remarks.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 miles below gaging station 890 on Anahola Stream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.02	0.02	18	9.2	4.3	0.18	8.2	16	0.70	0.37	0.84	0.37
2	.02	.18	20	16	3.6	.18	6.7	14	.70	.18	.70	.56
3	.02	.07	17	14	12	.18	6.1	8.2	.70	.37	.07	.37
4	.02	.02	13	8.9	6.4	.18	6.1	18	.84	.37	.07	.37
5	.02	.02	16	24	4.5	.70	16	16	.84	.56	.18	.37
6	.07	.07	14	15	4.0	.37	6.4	9.2	.84	.56	.18	.37
7	.07	.02	13	9.2	3.8	.18	5.2	7.6	.84	.56	.37	.37
8	.07	.02	30	7.6	3.8	.18	4.8	7.0	.99	.56	.37	.37
9	.02	.02	53	7.0	3.6	.18	12	10	.84	.56	.56	.99
10	.07	.18	33	6.4	3.6	.37	13	13	.99	.56	.56	.70
11	.02	.18	25	5.8	3.6	.99	7.6	13	.70	.56	.56	.07
12	.07	.07	19	5.2	3.3	.99	6.1	7.3	.84	.99	.18	.18
13	.07	.02	14	5.0	3.3	.84	9.5	6.4	.18	.56	.70	.70
14	.07	.02	14	4.5	3.3	10	7.6	5.1	.56	.37	.18	.18
15	.07	.02	11	6.3	3.3	17	8.4	.99	.18	.56	.18	.07
16	.07	.02	14	21	2.3	22	21	.99	.56	.56	.07	.18
17	.07	.18	24	8.5	.99	37	11	.84	.07	.70	.07	.18
18	.07	.18	16	5.8	.99	19	7.6	.84	.07	.37	.37	.07
19	.56	.02	11	5.0	.99	19	19	.70	.18	.37	.37	.37
20	.18	.37	8.9	4.5	.84	11	22	.70	.18	.70	.37	.02
21	.02	.02	7.6	4.5	.60	7.9	19	.84	.18	.18	.56	.02
22	.02	.18	8.7	4.3	.02	7.0	14	.84	.18	.37	.37	.02
23	.07	.70	23	4.0	.02	14	12	.70	.18	.44	.07	.18
24	.02	18	17	3.8	.02	22	8.2	.70	.37	.18	.18	.99
25	.02	26	10	3.6	.07	24	7.0	.70	.37	.02	.56	.18
26	.02	30	7.9	3.6	.07	17	7.3	.70	.37	.02	.23	.70
27	.18	24	6.4	20	.07	17	8.5	.70	.37	.02	.07	.56
28	.37	23	10	8.2	.18	10	12	.70	.56	.02	.18	.18
29	.07	22	8.2	5.5	.18	15	10	.70	.37	.04	.07	.18
30	.37	22	5.5	4.3	------	19	15	.70	.70	.07	.07	.56
31	.07	------	17	5.0	------	11	------	.56	------	.84	.07	------
TOTAL	2.88	167.60	505.2	255.7	73.74	304.42	317.3	163.70	15.45	12.59	9.38	10.43
MEAN	0.093	5.59	16.3	8.25	2.54	9.82	10.6	5.28	0.515	0.406	0.303	0.348
MAX	0.56	30	53	24	12	24	22	18	0.99	0.99	0.84	0.99
MIN	0.02	0.02	5.5	3.6	0.02	0.18	4.8	0.56	0.07	0.02	0.07	0.02
AC-FT	5.7	332	1000	507	146	604	629	325	31	25	19	21

CAL YR 1967: TOTAL 2,391.09 MEAN 6.55 MAX 53 MIN 0.02 AC-FT 4,740
WAT YR 1968: TOTAL 1,838.39 MEAN 5.02 MAX 53 MIN 0.02 AC-FT 3,650

16-0880. Anahola ditch above Kaneha Reservoir, near Kealia

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

Records available.--December 1921 to September 1968. Records for May 1915 to December 1921 at site 520 ft upstream not equivalent owing to 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.

Extremes.--1921-68: Maximum daily discharge, 62 cfs Nov. 12, 1947; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta. no. 870).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	4.5	0.09	0.04	0.02	1.7	0.02	5.8	2.7	5.2	17	2.4
2	10	13	.09	.06	.02	1.7	.02	5.3	2.7	2.6	8.9	2.1
3	3.7	8.0	.09	.06	.09	1.7	.02	3.1	2.7	2.0	4.7	2.1
4	4.2	3.9	.06	.04	.02	1.7	.02	.02	2.7	1.9	3.7	2.0
5	3.0	3.4	.09	.19	.02	4.1	.04	.16	2.7	1.9	3.6	1.8
6	2.5	6.1	.09	.06	0	5.6	0	.02	2.7	1.8	3.3	1.8
7	4.8	3.4	.09	.04	0	2.1	.13	.02	2.7	1.7	3.0	1.8
8	5.1	3.0	.63	.04	0	1.5	.82	.02	15	1.7	2.9	1.9
9	3.0	2.9	1.3	.04	0	1.4	4.4	.02	4.0	1.5	4.2	19
10	4.9	6.9	.34	.04	0	2.1	3.7	.10	15	1.5	4.2	9.8
11	4.2	9.0	.17	.02	0	16	1.9	.10	4.5	4.1	5.0	3.7
12	3.1	6.2	.13	.02	0	22	1.3	.02	8.0	9.8	3.1	2.9
13	3.6	3.1	.13	.02	0	19	2.6	.02	3.0	5.7	6.7	5.8
14	3.4	2.6	.13	.02	0	18	2.0	4.5	7.4	2.2	2.9	3.3
15	2.4	2.5	.09	.04	0	.09	2.2	3.3	3.0	2.0	6.9	2.5
16	2.1	2.4	.13	.13	.60	.09	6.3	3.0	7.4	1.8	3.1	2.2
17	2.1	2.8	.29	.04	1.4	.77	4.0	2.8	3.7	9.2	2.8	2.1
18	2.1	7.0	.09	.02	1.5	.06	2.5	2.7	3.7	3.9	2.4	3.0
19	11	2.8	.06	.02	1.5	.06	7.5	2.7	3.0	3.1	2.2	7.2
20	9.1	8.0	.06	0	1.5	.04	7.0	2.7	3.0	9.9	2.1	2.6
21	6.0	3.1	.06	0	9.2	.04	7.3	2.7	3.0	3.4	3.7	3.0
22	3.1	4.2	.04	.02	2.1	.04	7.3	2.7	2.7	3.6	7.6	2.4
23	8.9	17	.30	.02	1.9	.04	5.5	2.7	2.4	10	2.9	5.9
24	4.5	11	.09	.02	1.8	.06	3.6	2.7	2.2	8.1	2.5	13
25	2.6	.09	.06	.02	1.8	.09	2.9	2.7	1.8	3.6	8.5	5.2
26	2.5	.17	.04	.02	1.7	.06	2.8	2.7	1.5	3.1	5.2	7.4
27	5.8	.06	.04	.13	1.7	.04	3.4	2.7	1.4	2.8	3.3	6.2
28	6.4	.07	.09	.04	1.5	.02	4.7	2.7	1.5	2.4	2.6	3.1
29	7.3	.09	.04	.02	1.7	.04	4.1	2.7	1.4	2.1	2.6	2.9
30	15	.06	.04	.02	------	.06	5.4	2.7	11	2.1	2.1	4.8
31	6.0	------	.09	.02	------	.02	------	2.1	------	12	2.1	------
TOTAL	155.5	137.34	5.04	1.27	30.07	100.22	93.47	65.50	128.5	126.7	135.8	133.9
MEAN	5.02	4.58	0.162	0.041	1.04	3.23	3.12	2.11	4.28	4.09	4.38	4.46
MAX	15	17	1.3	0.19	9.2	22	7.5	5.8	15	12	17	19
MIN	2.1	0.06	0.04	0	0	0.02	0	0.02	1.4	1.5	2.1	1.8
AC-FT	308	272	10	2.5	59	199	185	130	255	251	269	266

CAL YR 1967: TOTAL 1,264.31 MEAN 3.46 MAX 24 MIN 0 AC-FT 2,510
WAT YR 1968: TOTAL 1,113.31 MEAN 3.04 MAX 22 MIN 0 AC-FT 2,210

Note.--No gage-height record Apr. 29 to June 24.

16-0890. Anahola Stream near Kealia

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

Drainage area.--5.5 sq mi, approximately.

Records available.--August to December 1910, January 1913 to November 1918, January 1919, March 1919 to September 1968. 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. See also Note below.

Gage.--Water-stage recorder and concrete dam-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.

Extremes.--Maximum discharge during year, 3,650 cfs Dec. 9 (gage height, 6.50 ft), from rating curve extended above 1,800 cfs on basis of slope-area measurement at gage height 10.6 ft; minimum, 2.6 cfs Sept. 30.
1910, 1913-68: 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. no. 910). Anahola ditch (see sta. no. 880) diverts 3 miles above station for irrigation in vicinity of Kealia.

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	4.4	24	16	15	5.1	15	31	7.0	9.8	80	5.8
2	6.8	4.2	23	20	20	5.8	14	29	6.2	6.6	7.7	3.6
3	4.7	6.2	16	26	38	5.4	13	18	7.4	5.4	4.7	3.3
4	5.1	4.2	7.4	14	45	6.6	12	47	6.2	5.8	5.1	3.3
5	4.7	4.4	12	72	20	5.8	27	54	7.0	6.2	4.7	3.3
6	5.8	5.1	6.2	40	15	6.2	13	21	6.6	6.2	4.2	3.3
7	5.2	5.1	9.0	13	12	5.1	10	18	7.0	5.8	5.1	3.6
8	6.2	4.4	415	10	10	5.4	13	22	7.8	4.7	4.4	4.4
9	4.7	4.2	1,380	8.0	8.8	4.7	33	28	5.8	5.4	4.2	108
10	4.7	5.1	446	8.0	7.8	5.8	59	99	7.4	5.4	4.7	14
11	5.1	5.1	69	8.0	7.0	20	22	37	6.6	5.2	4.7	6.3
12	6.2	5.1	45	8.0	6.6	90	18	19	8.8	6.4	5.1	6.2
13	5.1	5.1	30	8.0	6.2	140	45	16	7.4	8.9	4.2	5.8
14	6.2	4.7	23	7.0	5.8	259	20	16	6.2	5.1	4.2	5.4
15	5.1	4.4	18	7.0	5.8	38	48	14	7.4	4.7	6.0	6.2
16	6.2	4.7	15	75	5.4	41	194	13	14	4.7	4.7	5.1
17	6.2	4.6	110	18	5.4	409	35	12	5.8	35	4.2	5.4
18	4.7	5.8	45	12	6.2	6.2	21	11	5.1	6.5	3.8	6.2
19	7.3	4.2	27	8.0	5.8	5.4	318	10	6.2	5.1	4.2	7.0
20	6.2	4.2	18	7.0	5.8	5.4	196	9.8	5.1	6.3	4.2	6.2
21	6.2	4.4	13	6.9	8.8	4.2	192	9.8	5.1	5.1	3.8	7.0
22	5.8	4.2	10	6.4	5.4	4.2	95	8.8	4.7	4.7	5.9	6.2
23	9.1	28	80	5.8	7.0	3.8	60	8.8	4.7	30	4.4	5.8
24	5.1	351	35	5.2	6.2	6.7	49	7.8	5.4	10	3.8	11
25	3.8	104	21	5.0	6.2	55	35	6.2	4.7	6.2	4.7	6.2
26	4.7	485	16	5.0	5.8	22	31	5.8	5.4	5.4	5.1	4.6
27	4.3	87	12	80	5.4	26	35	7.4	5.4	5.1	4.0	4.7
28	5.1	112	14	37	5.1	18	30	7.0	5.8	5.1	3.1	4.2
29	6.0	55	25	17	5.4	19	24	8.8	5.4	5.1	2.8	3.3
30	16	49	10	13	------	36	32	7.8	53	5.1	3.1	3.3
31	4.7	------	27	12	------	19	------	7.4	------	5.9	3.3	------
TOTAL	182.1	1,374.8	3,001.6	578.3	306.9	1,283.8	1,709	610.4	240.6	236.9	214.1	268.7
MEAN	5.87	45.8	96.8	18.7	10.6	41.4	57.0	19.7	8.02	7.64	6.91	8.96
MAX	16	485	1,380	80	45	409	318	99	53	35	80	108
MIN	3.8	4.2	6.2	5.0	5.1	3.8	10	6.2	4.7	4.7	2.8	3.3
AC-FT	361	2,730	5,950	1,150	609	2,550	3,390	1,210	477	470	425	533

CAL YR 1967: TOTAL 17,349.2 MEAN 47.5 MAX 1,380 MIN 3.1 AC-FT 34,410
WAT YR 1968: TOTAL 10,007.2 MEAN 27.3 MAX 1,380 MIN 2.8 AC-FT 19,850

PEAK DISCHARGE (BASE, 1,700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1630	5.79	2,940	3-17	0300	5.42	2,570
12- 9	1100	6.50	3,650	4-16	1800	5.49	2,640
12-17	0730	4.56	1,750	4-19	2300	6.45	3,600
3-13	2300	4.69	1,870	8- 1	1100	4.72	1,900

Note.--No gage-height record Dec. 12 to Feb. 7.

16-0910. Lower Anahola ditch near Kealia

Location.--Lat 22°08'13", long 159°19'31", 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.

Records available.--December 1936 to September 1968.

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

Extremes.--1936-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	4.2	0	0	0	0	0	0	7.0	6.4	7.2	2.9
2	4.8	4.7	0	0	0	0	0	0	6.7	6.3	8.5	2.6
3	5.3	5.4	0	0	.01	0	0	0	6.4	4.2	5.3	2.6
4	4.5	4.0	0	0	0	0	0	0	6.4	3.8	4.3	2.5
5	4.0	3.6	0	0	0	0	0	0	6.4	3.8	4.2	2.3
6	4.0	4.0	0	0	0	0	0	0	6.2	3.5	3.8	2.2
7	4.1	3.5	0	0	0	0	0	0	6.2	3.3	3.6	2.2
8	5.4	3.2	.04	0	0	0	0	0	6.9	3.2	3.8	2.5
9	4.4	3.1	.04	0	0	1.6	0	0	6.3	3.1	3.7	10
10	4.4	3.8	.01	0	0	4.8	0	0	6.3	3.0	3.6	7.0
11	4.6	3.8	0	0	0	5.8	0	0	6.7	3.6	2.9	5.0
12	4.0	4.1	0	0	0	8.9	0	0	7.4	4.5	3.4	4.8
13	4.2	3.9	0	0	0	3.3	0	0	7.6	5.6	4.2	4.9
14	3.8	3.5	0	0	0	.02	0	0	2.3	3.8	4.0	4.6
15	3.6	3.2	0	0	0	0	0	0	.09	3.5	4.8	3.7
16	3.7	3.3	0	.02	0	0	0	0	.06	3.4	4.4	4.0
17	3.6	2.1	.01	0	0	0	0	0	.04	6.2	3.8	3.3
18	3.5	0	0	0	0	0	0	0	.02	7.5	3.6	3.8
19	3.6	0	0	0	0	0	0	0	0	5.3	3.3	3.7
20	4.4	0	0	0	0	0	.08	0	0	5.9	3.3	3.7
21	4.2	0	0	0	0	0	0	0	0	5.3	3.1	3.0
22	3.8	0	0	0	0	0	0	0	2.6	1.7	4.8	2.9
23	3.6	0	0	0	0	0	0	0	4.5	.01	4.4	3.7
24	4.0	.06	0	0	0	0	0	0	4.7	0	3.5	4.7
25	3.6	.02	0	0	0	0	0	0	4.3	0	4.3	5.7
26	3.5	0	0	0	0	0	0	0	3.8	0	4.3	4.2
27	3.6	0	0	0	0	0	0	0	3.5	0	3.9	4.8
28	3.7	0	0	0	0	0	0	5.7	3.5	0	3.0	3.6
29	4.7	0	0	0	0	0	0	8.1	3.3	3.3	2.8	3.0
30	5.4	0	0	0	------	0	0	7.6	6.5	3.5	2.6	2.8
31	5.0	------	0	0	------	0	------	7.2	------	4.5	2.5	------
TOTAL	128.8	63.48	0.10	0.02	0.01	24.42	0.08	28.6	125.71	108.21	124.9	116.7
MEAN	4.15	2.12	0.003	0.001	0.0003	0.788	0.003	0.92	4.19	3.49	4.03	3.89
MAX	5.4	5.4	0.04	0.02	0.01	8.9	0.08	8.1	7.6	7.5	8.5	10
MIN	3.5	0	0	0	0	0	0	0	0	0	2.5	2.2
AC-FT	255	126	0.2	0.04	0.02	48	0.2	57	249	215	248	231

CAL YR 1967: TOTAL 623.23 MEAN 1.71 MAX 11 MIN 0 AC-FT 1,240
WAT YR 1968: TOTAL 721.03 MEAN 1.97 MAX 10 MIN 0 AC-FT 1,430

16-0932. Anahola Stream at Anahola

Location.--Lat 22°08'42", long 159°18'59", 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.

Records available.--Water years 1962-65 (annual maximums), November 1964 to September 1968.

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.

Extremes.--Maximum discharge during year, 4,690 cfs Apr. 20 (gage height, 12.17 ft); minimum, 3.8 cfs Aug. 21, Sept. 7.
1961-68: Maximum discharge, 13,000 cfs May 15, 1965 (gage height, 16.0 ft), from rating curve extended above 2,100 cfs on basis of contracted-opening measurement of peak flow.
1964-68: Minimum discharge, 3.8 cfs Aug. 21, Sept. 7, 1968.

Remarks.--Records good. Anahola and Lower Anahola ditches (see sta. nos. 880 and 910) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	4.8	66	20	22	13	33	42	9.1	12	55	5.0
2	8.4	5.5	67	23	24	13	30	45	9.1	7.8	9.3	4.0
3	7.2	12	59	26	52	13	28	32	9.1	6.7	4.6	4.0
4	5.7	5.7	45	18	54	13	28	51	8.6	6.5	4.2	4.0
5	5.3	4.4	51	88	28	13	44	59	8.0	7.0	4.2	4.0
6	5.2	5.3	42	53	24	14	30	35	8.0	7.0	4.4	3.9
7	5.0	4.8	42	20	22	13	26	30	8.3	7.2	4.4	3.8
8	5.0	4.6	357	16	21	13	26	31	9.6	7.4	4.4	4.2
9	5.3	5.0	1,260	14	21	12	47	39	8.3	7.2	4.8	91
10	5.0	5.3	540	12	21	12	70	83	8.3	7.4	5.1	15
11	5.0	5.9	226	12	19	16	35	68	8.6	8.6	5.1	8.6
12	5.3	5.9	82	11	18	72	28	34	11	9.6	5.1	6.3
13	5.0	5.0	46	11	18	55	44	30	10	13	5.3	6.3
14	4.8	4.4	33	9.4	18	257	34	29	12	7.8	5.0	6.1
15	4.6	4.4	25	9.4	18	69	43	25	13	7.6	8.9	5.8
16	4.8	4.6	23	96	17	64	193	23	22	7.6	5.0	6.1
17	5.0	5.2	158	24	16	490	90	22	15	24	4.6	5.8
18	5.0	7.3	64	13	15	80	41	20	13	11	4.8	6.3
19	5.7	5.3	35	11	15	59	166	20	12	7.0	4.8	6.1
20	7.5	5.0	25	9.9	15	46	576	20	12	8.5	4.6	6.1
21	6.6	5.0	18	9.4	20	38	203	20	12	7.4	4.2	5.8
22	5.5	5.0	16	8.8	15	34	168	18	10	9.5	6.4	6.3
23	5.9	19	111	8.6	14	39	66	18	7.2	25	4.4	6.5
24	7.9	231	50	8.0	14	62	51	18	7.2	23	4.2	6.5
25	4.8	125	28	7.6	14	117	42	18	7.2	15	5.5	6.5
26	4.6	322	20	7.4	13	54	41	18	7.2	13	5.3	6.5
27	5.0	126	18	112	13	49	41	18	7.2	13	5.1	6.3
28	5.5	129	20	51	13	36	41	14	7.2	11	5.1	6.3
29	8.1	87	30	26	14	36	38	10	7.0	8.7	4.8	6.1
30	15	92	16	23	------	56	44	10	40	7.0	4.4	5.8
31	6.7	------	35	21	------	40	------	9.6	------	8.6	4.4	------
TOTAL	186.3	1,251.4	3,608	779.5	588	1,898	2,347	909.6	327.2	322.1	207.4	265.0
MEAN	6.01	41.7	116	25.1	20.3	61.2	78.2	29.3	10.9	10.4	6.69	8.83
MAX	15	322	1,260	112	54	490	576	83	40	25	55	91
MIN	4.6	4.4	16	7.4	13	12	26	9.6	7.0	6.5	4.2	3.8
AC-FT	370	2,480	7,160	1,550	1,170	3,760	4,660	1,800	649	639	411	526

CAL YR 1967: TOTAL 20,131.8 MEAN 55.2 MAX 1,260 MIN 4.4 AC-FT 39,930
WAT YR 1968: TOTAL 12,689.5 MEAN 34.7 MAX 1,260 MIN 3.8 AC-FT 25,170

PEAK DISCHARGE (BASE, 2,200 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1700	11.65	3,900	4-20	0030	12.17	4,690
3-17	0200	11.20	3,340				

16-0942. Ka Loko ditch near Kilauea

Location.--Lat 22°10'43", long 159°22'59", on left bank 35 ft downstream from Moloaa ditch, 400 ft upstream from Ka Loko Reservoir, and 3.5 miles southeast of Kilauea.

Records available.--August 1932 to September 1968 (discontinued).

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 754 ft above mean sea level (by stadia survey).

Extremes.--1932-68: Maximum daily discharge, 98 cfs Dec. 10, 1935; minimum daily, 0.08 cfs Apr. 30, May 1, 3, 1965.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts from Moloaa and Puu Ka Ele Streams at points 0.5 mile southeast and 1.5 miles southwest of station, respectively, for irrigation in vicinity of Kilauea.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	1.9	13	4.4	3.0	2.2	4.8	7.5	2.7	5.0	7.3	2.3
2	5.1	2.4	13	6.1	2.6	2.1	4.2	7.1	2.7	2.3	3.9	1.6
3	4.6	3.1	11	6.6	3.8	1.9	4.0	5.3	2.6	1.9	2.3	1.5
4	3.3	1.8	9.0	6.4	3.4	2.1	4.0	8.1	2.6	1.8	1.8	1.4
5	2.4	1.6	12	9.5	2.6	3.1	6.4	9.0	2.4	1.7	1.9	1.3
6	2.2	2.4	8.1	8.1	2.3	4.9	4.0	5.8	2.4	1.6	1.7	1.3
7	2.7	1.7	7.3	4.9	2.2	2.7	3.6	4.9	2.4	1.6	1.6	1.3
8	3.4	1.6	40	3.9	2.7	2.0	3.5	5.5	3.0	1.5	1.5	1.2
9	2.6	1.5	52	6.3	3.3	2.0	5.6	5.3	2.6	1.5	1.8	9.0
10	2.8	1.9	24	6.8	3.1	2.5	6.0	11	2.4	1.4	1.8	3.5
11	2.7	2.4	23	6.6	3.0	6.0	4.0	13	2.6	1.9	1.8	1.7
12	2.2	2.6	8.9	7.0	3.0	15	3.7	6.8	4.8	1.9	1.7	1.5
13	2.3	1.7	1.5	7.3	3.0	15	5.2	5.6	3.1	2.6	2.3	2.2
14	2.3	1.5	3.3	5.6	2.9	32	3.6	5.5	2.7	1.7	1.7	1.7
15	1.9	1.5	2.9	6.4	2.7	10	4.5	5.1	2.3	1.5	2.9	1.4
16	1.8	1.4	2.6	7.3	2.1	20	14	4.8	3.6	1.4	1.8	1.4
17	1.9	1.6	1.1	.39	1.9	37	8.0	4.6	2.7	5.5	1.7	1.3
18	2.2	2.9	2.7	3.1	1.8	.26	5.0	4.3	2.4	2.8	1.7	1.6
19	4.3	1.6	7.1	5.3	1.9	6.0	14	4.3	2.1	1.8	1.5	2.2
20	3.8	1.7	6.2	5.5	2.4	13	23	4.3	1.9	2.6	1.5	1.6
21	3.1	1.5	6.8	5.3	5.1	8.0	10	4.1	2.1	1.8	1.5	1.4
22	2.3	1.9	7.7	4.9	2.7	6.2	18	3.8	1.9	1.8	2.3	1.3
23	2.4	6.6	21	4.8	2.3	5.2	7.1	3.6	1.8	4.1	1.8	1.6
24	2.2	33	14	4.4	2.3	7.0	5.6	3.4	1.9	3.8	1.7	3.3
25	1.9	23	10	4.4	2.3	13	4.8	3.4	1.7	2.2	2.4	2.3
26	1.8	50	6.8	4.3	2.3	8.0	3.9	3.6	1.7	1.7	1.9	3.0
27	1.9	23	4.4	6.3	2.2	6.0	3.8	3.3	1.7	1.6	1.8	3.0
28	2.2	26	7.2	.32	2.2	4.0	3.6	3.1	1.7	1.5	1.5	1.7
29	2.9	20	8.8	1.5	2.4	4.0	3.8	3.1	1.6	1.4	1.6	1.6
30	4.7	21	6.6	2.7	------	7.0	5.3	2.9	7.6	1.6	1.5	1.4
31	2.3	------	7.9	3.1	------	6.0	------	2.9	------	3.8	1.4	------
TOTAL	84.9	244.8	349.9	159.51	77.5	254.16	197.0	165.0	77.7	69.3	63.6	61.6
MEAN	2.74	8.16	11.3	5.15	2.67	8.20	6.57	5.32	2.59	2.24	2.05	2.05
MAX	5.1	50	52	9.5	5.1	37	23	13	7.6	5.5	7.3	9.0
MIN	1.8	1.4	1.1	0.32	1.8	0.26	3.5	2.9	1.6	1.4	1.4	1.2
AC-FT	168	486	694	316	154	504	391	327	154	137	126	122

CAL YR 1967: TOTAL 2,155.61 MEAN 5.91 MAX 52 MIN 0.39 AC-FT 4,280
WAT YR 1968: TOTAL 1,804.97 MEAN 4.93 MAX 52 MIN 0.26 AC-FT 3,580

Note.--No gage-height record Mar. 8 to Apr. 23.

16-0959. Kalihiwai ditch above wasteway, near Kilauea

Location.--Lat 22°10'42", long 159°25'43", on left bank 1,800 ft upstream from wasteway gate, 0.7 mile upstream from Kalihiwai Reservoir, and 2.5 miles southwest of Kilauea.

Records available.--April 1960 to September 1968 (discontinued).

Gage.--Digital water-stage recorder and Parshall flume. Datum of gage is 413.4 ft above mean sea level (by stadia survey). Prior to July 5, 1967, graphic water-stage recorder at same site and datum.

Extremes.--1960-68: Maximum daily discharge, 55 cfs May 21, 1967; minimum daily, 1.4 cfs Feb. 7, 1961.

Remarks.--Records good. Ditch diverts from Pohakuhonu Stream for domestic use and irrigation of sugarcane in vicinity of Kilauea.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.7	15	6.7	4.4	2.7	5.8	17	3.2	6.0	15	3.6
2	5.7	6.1	15	7.2	4.3	2.7	5.5	12	3.1	3.0	6.6	2.6
3	5.2	5.9	13	7.3	4.1	2.6	5.1	9.3	3.0	2.6	4.8	2.5
4	5.4	4.7	12	7.2	4.0	2.7	5.0	12	3.0	2.4	4.5	2.4
5	4.7	4.6	14	22	3.8	2.7	6.3	13	2.9	2.5	4.3	2.3
6	4.6	5.2	10	10	3.8	2.7	5.0	8.9	2.8	2.3	3.7	2.2
7	5.4	4.4	9.3	6.8	3.6	2.6	4.6	8.1	2.8	2.3	3.4	2.2
8	5.6	4.4	23	6.1	3.6	2.6	4.5	7.5	3.1	2.2	3.4	2.2
9	4.7	4.1	50	5.6	3.5	2.5	6.4	7.3	2.8	2.1	3.9	7.8
10	4.7	4.7	30	5.2	3.4	2.9	7.4	14	2.8	2.1	3.5	7.1
11	4.7	7.3	18	5.0	3.4	6.6	5.2	10	3.1	3.0	4.2	3.5
12	4.7	5.9	13	4.9	3.3	18	4.7	6.6	4.1	3.0	3.8	3.1
13	4.7	4.7	10	4.7	3.3	18	5.5	6.0	3.3	3.4	4.9	3.1
14	4.6	4.3	9.9	4.4	3.1	35	4.8	5.9	3.8	2.4	3.7	2.6
15	4.4	4.1	8.4	4.3	3.1	12	5.3	5.4	2.8	2.2	3.9	2.4
16	4.1	4.0	8.4	11	3.1	22	16	5.2	3.9	2.1	3.3	2.3
17	4.1	4.1	21	5.9	3.0	41	9.0	5.0	3.3	8.3	3.1	2.3
18	4.3	5.7	10	4.7	3.0	13	6.6	4.8	3.4	4.0	2.9	2.4
19	7.1	4.3	8.2	4.3	3.0	9.2	15	4.7	3.1	3.1	2.7	3.0
20	8.5	4.4	7.4	4.1	2.9	7.6	26	4.7	2.7	4.8	2.7	2.3
21	6.6	4.1	6.8	4.0	4.6	6.6	12	4.6	2.6	3.5	2.9	2.2
22	5.6	4.6	6.4	3.8	3.0	6.2	22	4.2	2.5	3.4	4.5	2.1
23	5.2	17	7.5	3.6	2.9	7.2	12	4.1	2.5	6.6	3.1	2.2
24	5.0	50	6.6	3.5	2.9	8.0	10	3.9	2.4	6.5	2.8	6.0
25	4.6	24	6.3	3.4	2.9	14	9.5	3.8	2.3	4.0	5.4	3.6
26	4.4	46	5.7	3.3	2.7	8.9	9.3	3.8	2.3	3.4	3.8	6.3
27	4.7	22	5.4	13	2.7	8.0	11	3.6	2.2	3.0	3.9	4.7
28	4.6	22	5.7	7.1	2.7	6.7	17	3.5	2.3	2.8	3.1	3.2
29	5.0	20	5.6	5.2	2.9	6.7	10	3.4	2.2	2.7	2.9	2.8
30	7.1	18	5.0	4.7	------	8.3	11	3.3	4.2	3.1	2.7	2.6
31	5.2	------	14	4.6	------	6.7	------	3.2	------	14	2.6	------
TOTAL	159.6	325.3	380.6	193.6	97.0	296.4	277.5	208.8	88.5	116.8	126.0	97.6
MEAN	5.15	10.8	12.3	6.25	3.34	9.56	9.25	6.74	2.95	3.77	4.06	3.25
MAX	8.5	50	50	22	4.6	41	26	17	4.2	14	15	7.8
MIN	4.1	4.0	5.0	3.3	2.7	2.5	4.5	3.2	2.2	2.1	2.6	2.1
AC-FT	317	645	755	384	192	588	550	414	176	232	250	194

CAL YR 1967: TOTAL 2,824.2 MEAN 7.74 MAX 55 MIN 2.0 AC-FT 5,600
WAT YR 1968: TOTAL 2,367.7 MEAN 6.47 MAX 50 MIN 2.1 AC-FT 4,700

16-0970. Pohakuhonu Stream near Kilauea

Location.--Lat 22°10'52", long 159°25'40", 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.

Records available.--October 1957 to September 1968.

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

Extremes.--Maximum discharge during year, 1,530 cfs Mar. 17 (gage height, 5.40 ft), from rating curve extended above 640 cfs as explained below; minimum, 1.1 cfs Mar. 3, 4.

1957-68: 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, 1.1 cfs on several days in 1967, Mar. 3, 4, 1968.

Maximum stage known, 11.0 ft Jan. 24, 1956, from floodmark (discharge, 5,600 cfs, from slope-area measurement of peak flow).

Remarks.--Records good. Kalihiwai ditch (see sta. no. 959) diverts about 0.5 mile above station for domestic supply and irrigation of sugarcane. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.9	23	5.2	2.6	1.3	3.7	18	2.4	6.6	33	4.0
2	1.9	2.6	21	6.1	2.4	1.3	3.2	8.2	2.4	3.0	7.9	3.0
3	1.9	2.8	19	6.1	2.4	1.3	2.8	5.8	2.4	2.6	5.0	3.0
4	2.1	1.9	16	7.2	2.1	1.4	2.6	9.3	2.4	2.6	4.7	2.8
5	1.6	1.9	20	37	2.1	1.4	3.7	10	2.4	2.6	4.5	2.8
6	1.4	2.3	14	12	1.9	1.4	2.6	5.0	2.4	2.4	4.0	2.6
7	1.9	1.9	12	6.4	1.8	1.4	2.3	4.0	2.4	2.4	3.7	2.4
8	1.9	1.9	58	5.0	1.8	1.4	2.3	3.5	2.6	2.4	3.7	2.4
9	1.6	1.8	326	4.5	1.8	1.4	4.0	3.2	2.4	2.4	4.2	9.8
10	1.6	1.9	46	4.0	1.8	1.6	5.5	20	2.4	2.4	3.7	7.3
11	1.6	3.9	20	3.7	1.6	5.6	3.0	10	2.6	2.8	4.2	3.5
12	1.6	2.6	11	3.5	1.6	30	2.6	6.1	3.5	3.0	3.7	3.2
13	1.8	1.9	8.6	3.5	1.6	46	3.7	5.5	2.8	3.2	4.7	3.2
14	1.4	1.8	8.2	2.8	1.6	115	2.8	5.2	3.2	2.6	3.7	3.0
15	1.4	1.8	6.4	2.6	1.6	13	5.8	4.7	2.6	2.6	4.0	2.8
16	1.3	1.8	6.7	17	1.4	30	35	4.2	3.2	2.4	3.5	2.8
17	1.3	1.8	51	5.0	1.4	196	7.6	4.0	2.8	10	3.5	2.6
18	1.4	2.8	9.3	3.5	1.4	12	5.2	3.7	3.0	2.6	3.2	2.6
19	2.8	1.9	6.7	3.0	1.3	7.9	28	3.5	2.8	2.3	3.2	3.2
20	4.5	1.9	5.2	2.8	1.3	6.1	78	3.5	2.6	3.7	3.0	2.6
21	2.8	1.8	4.7	2.6	2.3	4.5	9.8	3.7	2.6	2.4	3.2	2.6
22	2.1	1.9	4.2	2.6	1.4	4.2	34	3.5	2.4	2.4	4.5	2.6
23	1.9	21	5.8	2.4	1.3	5.0	8.6	3.2	2.4	7.1	3.2	2.6
24	1.9	157	4.5	2.4	1.4	6.4	6.7	3.0	2.4	5.2	3.0	6.9
25	1.8	37	4.2	2.3	1.4	17	5.8	3.0	2.4	3.0	5.2	4.0
26	1.8	169	3.7	2.3	1.4	7.6	6.1	3.0	2.4	2.6	3.5	8.8
27	1.9	43	3.5	26	1.3	6.4	9.6	2.8	2.4	2.4	3.7	5.5
28	1.9	41	3.7	6.4	1.3	4.7	17	2.8	2.4	2.3	3.2	3.7
29	2.3	35	3.5	3.5	1.4	4.7	6.7	2.8	2.4	2.1	3.0	3.5
30	3.5	32	3.0	2.8	------	7.0	7.3	2.6	4.0	2.4	2.8	3.2
31	2.3	------	15	2.8	------	4.7	------	2.6	------	16	2.8	------
TOTAL	60.6	581.8	743.9	197.0	48.7	547.7	316.0	170.4	79.1	112.5	149.2	113.0
MEAN	1.95	19.4	24.0	6.35	1.68	17.7	10.5	5.50	2.64	3.63	4.81	3.77
MAX	4.5	169	326	37	2.6	196	78	20	4.0	16	33	9.8
MIN	1.3	1.8	3.0	2.3	1.3	1.3	2.3	2.6	2.4	2.1	2.8	2.4
AC-FT	120	1,150	1,480	391	97	1,090	627	338	157	223	296	224

CAL YR 1967: TOTAL 4,292.0 MEAN 11.8 MAX 351 MIN 1.1 AC-FT 8,510
WAT YR 1968: TOTAL 3,119.9 MEAN 8.52 MAX 326 MIN 1.3 AC-FT 6,190

PEAK DISCHARGES (BASE, 780 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0300	4.93	1,300	3-17	0230	5.40	1,530
12- 9	1630	5.00	1,330	4-20	0030	4.77	1,220
3-14	0930	3.92	828				

16-0975. Halaulani Stream at altitude 400 ft, near Kilauea

Location.--Lat 22°10'54", long 159°25'17", 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.

Records available.--November 1957 to September 1968.

Gage.--Digital water-stage recorder. Datum of gage is 391.8 ft above mean sea level (by stadia survey). Prior to July 5, 1967, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 1,270 cfs Mar. 17 (gage height, 6.55 ft), from rating curve extended above 190 cfs as explained below; minimum, 1.8 cfs Sept. 6-8.
1957-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.9	27	12	7.4	4.8	9.0	30	4.7	11	53	5.3
2	6.6	6.2	25	14	7.0	4.7	8.0	17	4.7	5.0	39	3.9
3	6.2	5.9	22	14	7.7	4.7	7.0	13	4.7	4.8	8.4	3.4
4	6.2	4.8	17	18	6.9	5.0	7.0	18	4.7	4.5	6.4	2.0
5	4.9	4.6	24	48	6.6	5.4	8.8	20	4.7	4.6	6.6	1.9
6	4.8	5.7	15	19	6.4	5.5	7.0	12	4.5	4.1	5.5	1.9
7	6.2	4.6	14	13	6.2	4.8	6.4	10	4.5	4.1	5.1	1.9
8	5.9	4.4	62	12	6.3	4.7	6.2	9.2	4.7	4.1	5.1	1.9
9	4.9	4.2	223	10	5.9	4.7	8.0	8.4	4.6	4.1	5.9	18
10	5.1	5.3	61	9.2	5.9	5.5	12	30	4.5	4.1	5.1	7.4
11	5.3	8.1	31	9.0	5.7	17	7.4	17	5.0	5.2	5.9	3.4
12	4.9	6.2	18	9.0	5.7	45	5.6	12	6.6	5.4	5.3	3.1
13	5.1	4.6	14	8.6	5.6	56	7.4	9.4	5.6	5.7	7.1	3.6
14	4.8	4.2	13	8.0	5.5	68	5.8	8.8	6.0	4.4	5.1	2.9
15	4.6	4.1	10	7.6	5.5	27	8.0	8.2	4.8	4.2	7.1	2.6
16	4.4	4.1	13	22	5.4	42	36	7.8	6.3	4.2	4.9	2.5
17	4.4	4.2	54	10	5.3	155	14	7.5	5.6	14	4.6	2.4
18	4.4	5.3	20	8.5	5.2	21	11	7.2	5.8	6.2	4.4	2.6
19	8.7	4.2	14	7.8	5.2	13	32	7.0	5.2	5.3	4.2	3.3
20	9.9	4.4	11	7.3	5.1	9.0	60	6.8	4.9	9.0	4.1	2.5
21	7.1	4.2	10	7.2	8.1	7.3	17	7.2	4.6	5.7	4.6	2.3
22	5.5	4.6	9.5	7.0	5.4	6.6	50	6.4	4.4	5.9	6.4	2.2
23	6.8	21	15	6.8	5.1	8.7	20	6.0	4.3	13	4.8	2.4
24	5.5	100	11	6.6	5.0	12	15	5.6	3.8	9.9	4.2	8.1
25	4.6	52	9.8	6.5	5.0	25	13	5.4	3.9	6.2	7.1	3.7
26	4.4	127	8.5	6.4	4.9	12	13	5.4	4.1	5.5	5.1	11
27	4.9	42	8.0	46	4.9	10	16	5.2	3.9	5.1	4.8	5.3
28	5.5	46	9.6	15	5.1	7.5	29	5.2	4.0	4.9	4.2	3.4
29	6.6	40	8.8	9.1	5.1	9.0	14	5.2	4.1	4.8	4.1	3.0
30	9.3	36	7.6	8.0	------	14	15	5.0	6.6	5.5	3.9	3.5
31	5.7	------	23	8.1	------	11	------	4.8	------	18	3.9	------
TOTAL	177.6	572.8	808.8	393.7	169.1	625.9	468.6	320.7	145.8	198.5	245.9	121.4
MEAN	5.73	19.1	26.1	12.7	5.83	20.2	15.6	10.3	4.86	6.40	7.93	4.05
MAX	9.9	127	223	48	8.1	155	60	30	6.6	18	53	18
MIN	4.4	4.1	7.6	6.4	4.9	4.7	5.6	4.8	3.8	4.1	3.9	1.9
AC-FT	352	1,140	1,600	781	335	1,240	929	636	289	394	488	241

CAL YR 1967: TOTAL 5,774.4 MEAN 15.8 MAX 256 MIN 4.1 AC-FT 11,450
WAT YR 1968: TOTAL 4,248.8 MEAN 11.6 MAX 223 MIN 1.9 AC-FT 8,430

Note.--No gage-height record Mar. 30 to July 12.

PEAK DISCHARGE (BASE, 580 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT	DISCHARGE
11-26	0215	5.84	1,000	3-17	0100	6.55	1,270
12- 9	1600	5.41	854				

16-1000. Hanalei tunnel outlet near Lihue

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

Records available.--July 1932 to September 1968.

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

Extremes.--1932-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	39	60	38	29	25	18	21	25	31	48	34
2	45	54	63	42	27	24	17	17	24	27	40	31
3	35	45	58	38	29	24	17	15	24	27	30	30
4	38	39	57	42	28	25	17	20	31	23	29	28
5	31	39	56	48	27	30	19	16	26	26	29	27
6	29	40	57	38	27	29	17	15	29	23	29	24
7	37	36	55	35	26	25	17	14	26	23	28	20
8	38	42	68	32	26	24	17	15	29	22	28	19
9	39	36	70	32	26	24	22	14	29	22	30	36
10	38	44	78	31	26	31	24	15	26	23	35	35
11	35	45	63	31	26	33	12	13	29	32	30	31
12	35	42	52	30	27	53	12	12	32	33	32	29
13	32	36	52	29	26	45	12	12	35	31	36	32
14	31	35	46	29	26	47	12	12	36	29	31	24
15	32	34	40	33	36	39	21	12	27	26	32	26
16	31	33	60	52	27	64	21	16	29	24	27	25
17	30	32	64	35	26	38	19	24	29	37	32	25
18	33	33	49	31	26	22	19	24	28	31	29	24
19	54	38	40	29	27	21	29	24	30	31	27	26
20	53	54	37	29	36	19	27	26	26	28	28	24
21	47	42	36	40	44	19	23	27	29	24	39	21
22	41	47	40	37	28	19	21	28	28	23	34	24
23	40	65	67	32	27	24	21	25	29	38	30	25
24	37	69	64	29	26	26	31	24	28	32	28	32
25	35	68	46	28	28	32	28	23	24	31	32	28
26	34	76	39	28	26	21	26	23	24	28	33	36
27	45	68	36	53	26	19	24	23	24	26	30	33
28	44	66	37	36	25	19	23	31	29	26	27	30
29	40	62	36	31	25	22	20	26	23	28	27	28
30	50	62	33	29	------	22	19	24	40	29	27	27
31	40	------	48	30	------	19	------	24	------	52	19	------
TOTAL	1178	1421	1607	1077	809	884	605	615	848	886	956	834
MEAN	38.0	47.4	51.8	34.7	27.9	28.5	20.2	19.8	28.3	28.6	30.8	27.8
MAX	54	76	78	53	44	64	31	31	40	52	48	36
MIN	29	32	33	28	25	19	12	12	23	22	19	19
AC-FT	2340	2820	3190	2140	1600	1750	1200	1220	1680	1760	1900	1650

CAL YR 1967: TOTAL 12,563.47 MEAN 34.4 MAX 78 MIN 0 AC-FT 24,920
WAT YR 1968: TOTAL 11,720 MEAN 32.0 MAX 78 MIN 12 AC-FT 23,250

16-1030. Hanalei River near Hanalei

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

Drainage area.--19.1 sq mi.

Records available.--January 1912 to November 1919, water years 1962-63 (annual maximums), December 1962 to September 1968.

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

Extremes.--Maximum discharge during year, 21,200 cfs Dec. 8 (gage height, 11.20 ft), from rating curve extended above 2,700 cfs as explained below; minimum, 51 cfs Sept. 7.
1912-19, 1961-68: Maximum discharge, 44,900 cfs Nov. 13, 1965 (gage height, 14.23 ft), from rating curve extended above 2,700 cfs by logarithmic plotting.
1912-19, 1962-68: Minimum discharge, 39 cfs Mar. 4, 1963.

Remarks.--Records good except those above 6,000 cfs, which are fair, and those for periods of no gage-height record, which are poor. Since 1925, Hanalei tunnel (see sta. no. 1000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	92	570	167	107	80	150	360	68	130	439	77
2	162	170	787	254	107	76	120	290	68	90	174	100
3	91	257	415	210	107	74	100	194	68	76	117	67
4	98	92	306	211	114	72	90	320	90	76	99	56
5	84	80	290	705	110	80	270	293	76	83	94	53
6	73	106	279	283	100	74	80	181	86	68	85	52
7	115	77	192	166	100	72	70	160	80	65	79	56
8	123	87	2,050	137	100	70	84	148	120	63	77	58
9	99	73	4,790	120	100	70	330	139	100	61	104	420
10	92	98	2,750	109	100	150	400	209	90	63	98	154
11	98	86	480	103	100	170	170	204	110	140	94	74
12	91	76	204	102	150	750	130	139	130	250	80	65
13	87	70	142	95	63	300	160	126	160	160	121	81
14	82	64	132	89	63	350	120	120	180	140	75	65
15	76	60	96	95	104	230	200	114	80	90	82	60
16	73	56	238	591	62	3,400	168	112	100	82	70	59
17	70	64	1,230	169	58	600	130	99	76	450	71	57
18	71	60	300	108	58	200	109	95	80	150	72	56
19	257	150	194	96	58	170	592	91	84	100	62	79
20	313	200	156	90	250	150	565	91	75	150	60	56
21	179	100	137	102	760	130	258	95	100	106	93	58
22	112	160	125	124	200	150	338	89	90	99	132	53
23	199	500	748	90	100	450	262	86	100	534	65	57
24	112	900	582	80	80	600	406	83	90	249	60	162
25	75	1,700	243	78	90	840	466	82	70	135	105	98
26	69	3,120	152	75	86	250	344	82	76	106	79	228
27	71	1,280	132	1,120	80	180	354	80	90	90	77	130
28	76	1,150	140	224	82	150	388	84	150	82	64	72
29	91	582	152	128	84	300	291	85	80	79	60	65
30	261	567	112	109	------	400	322	76	400	79	59	60
31	114	------	360	104	------	200	------	71	------	432	59	------
TOTAL	3,593	12,077	18,484	6,134	3,573	10,788	7,467	4,398	3,167	4,478	3,006	2,728
MEAN	116	403	596	198	123	348	249	142	106	144	97.0	90.9
MAX	313	3,120	4,790	1,120	760	3,400	592	360	400	534	439	420
MIN	69	56	96	75	58	70	70	71	68	61	59	52
AC-FT	7,130	23,950	36,660	12,170	7,090	21,400	14,810	8,720	6,280	8,880	5,960	5,410

CAL YR 1967: TOTAL 108,486 MEAN 297 MAX 8,340 MIN 53 AC-FT 215,200
WAT YR 1968: TOTAL 79,893 MEAN 218 MAX 4,790 MIN 52 AC-FT 158,500

PEAK DISCHARGE (BASE, 5,600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	about 0800	10.58	17,900	12-17	0600	9.66	13,600
12- 8	1200	11.20	21,200	3-16	about 2300	10.21	16,000

16-2118. Kaupuni Stream at altitude 374 ft, near Waianae

Location.--Lat 21°28'20", long 158°09'26", 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.

Records available.--May 1960 to September 1968.

Gage.--Digital water-stage recorder and concrete-masonry control. Datum of gage is 374 ft above mean sea level (by stadia survey). Prior to July 23, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 202 cfs Dec. 10 (gage height, 3.12 ft); minimum, 0.05 cfs Nov. 18, 19, 24.

1960-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.14	0.14	0.12	0.42	0.94	1.6	1.3	1.3	0.42	0.42	0.34	0.23
2	.14	.17	.12	.38	.87	1.4	1.2	1.2	.42	.38	.34	.23
3	.14	.17	.17	.34	.94	1.2	1.6	1.1	.42	.42	.34	.23
4	.14	.20	.12	.38	1.2	1.0	1.3	.94	.42	.38	.34	.20
5	.14	.20	.12	.62	.87	.94	2.2	.87	.38	.42	.34	.20
6	.14	.23	.12	.42	.80	.87	1.7	.87	.42	.42	.30	.20
7	.14	.26	.12	.42	.74	.87	1.2	.87	.51	.42	.30	.23
8	.14	.17	.20	.38	.68	.80	1.1	.87	.51	.42	.30	.23
9	.14	.20	19	.38	.62	.74	6.2	.94	.51	.38	.30	.26
10	.14	.20	41	.38	.62	.68	9.2	1.4	.46	.38	.30	.26
11	.14	.12	12	.38	.62	.74	4.4	1.1	.42	.38	.26	.26
12	.14	.12	6.4	.38	.74	.80	6.4	1.0	.42	.38	.30	.26
13	.14	.12	4.8	.38	.68	.87	4.8	.94	.42	.38	.30	.26
14	.14	.12	3.4	.38	.68	2.5	3.1	.87	.42	.34	.26	.26
15	.14	.12	1.4	.34	1.6	1.2	2.5	.80	.42	.34	.26	.26
16	.14	.10	.87	27	2.0	5.0	3.9	.74	.42	.34	.26	.23
17	.14	.10	2.9	6.2	1.6	3.6	3.7	.74	.42	.38	.26	.23
18	.12	.10	41	2.4	1.1	2.1	2.6	.74	.42	.38	.26	.23
19	.12	.10	8.6	1.5	4.1	2.6	3.2	.74	.42	.34	.26	.23
20	.12	.08	5.5	1.0	4.3	1.9	2.9	.68	.42	.34	.23	.23
21	.12	.08	2.9	.80	8.9	1.5	2.4	.68	.42	.34	.23	.23
22	.14	.08	1.9	.74	3.9	1.3	3.7	.68	.42	.34	.23	.23
23	.14	.10	1.6	2.2	2.5	1.5	2.9	.68	.42	.42	.23	.23
24	.14	.10	1.9	1.4	2.0	2.6	2.2	.68	.38	.38	.23	.23
25	.14	.10	1.9	.94	8.9	2.2	2.0	.68	.42	.38	.23	.23
26	.14	.10	1.0	.80	3.7	1.6	1.8	.62	.38	.38	.23	.23
27	.14	.12	.80	3.9	2.5	1.5	1.6	.62	.42	.38	.20	.23
28	.14	.20	.62	5.5	2.0	2.5	1.5	.51	.38	.34	.20	.23
29	.14	.17	.56	2.5	1.8	2.0	1.4	.51	.42	.34	.23	.23
30	.17	.23	.46	1.6	------	1.8	1.3	.42	.42	.34	.20	.23
31	.17	------	.46	1.2	------	1.6	------	.46	------	.34	.20	------
TOTAL	4.32	4.30	162.06	65.66	61.90	51.51	85.3	25.25	12.75	11.62	8.26	7.02
MEAN	0.139	0.143	5.23	2.12	2.13	1.66	2.84	0.815	0.425	0.375	0.266	0.234
MAX	0.17	0.26	41	27	8.9	5.0	9.2	1.4	0.51	0.42	0.34	0.26
MIN	0.12	0.08	0.12	0.34	0.62	0.68	1.1	0.42	0.38	0.34	0.20	0.20
AC-FT	8.6	8.5	321	130	123	102	169	50	25	23	16	14

CAL YR 1967: TOTAL 407.47 MEAN 1.12 MAX 41 MIN 0 AC-FT 808
WAT YR 1968: TOTAL 499.95 MEAN 1.37 MAX 41 MIN 0.08 AC-FT 992

PEAK DISCHARGE (BASE, 31 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-10	0430	3.12	202	1-16	1245	2.97	158
12-11	1730	2.39	49	2-25	0815	2.34	44
12-18	0200	2.89	138				

16-2128. Kipapa Stream near Wahiawa

Location.--Lat 21°28'15", long 157°57'50", 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.

Records available.--January 1957 to September 1968.

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

Extremes.--Maximum discharge during year, 2,560 cfs Mar. 16 (gage height, 9.64 ft), from rating curve extended above 300 cfs as explained below; no flow for several days.
1957-68: 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. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	16	35	3.5	2.2	0.76	4.5	17	0.50	0.35	15	1.7
2	13	12	25	19	1.7	.82	3.5	6.8	.38	.29	2.3	2.9
3	5.3	4.9	13	5.5	1.7	.82	5.1	3.7	.32	.17	.65	.42
4	5.0	2.1	8.9	29	2.5	.88	4.1	3.0	.38	.12	.50	.15
5	4.3	1.3	9.3	225	1.6	25	35	2.6	.38	.09	1.6	.06
6	1.2	.94	5.8	35	1.3	3.8	7.7	2.2	.29	.07	.65	.01
7	.82	.88	4.5	12	1.1	1.2	4.5	2.1	.38	.06	.29	0
8	44	.94	115	7.4	1.0	.76	3.2	2.1	.07	.02	.15	2.1
9	6.0	1.4	69	5.5	.94	.60	2.9	1.8	1.8	0	.09	30
10	2.2	1.8	61	4.3	.88	.55	21	17	.76	0	.09	2.5
11	2.7	2.3	17	3.5	.88	12	4.7	4.7	.70	.08	.13	.65
12	3.9	6.9	15	3.0	1.1	91	4.7	2.1	.88	.32	.10	.26
13	10	1.5	7.4	2.7	1.2	105	4.0	1.5	1.7	.19	.15	.55
14	3.2	.82	6.2	2.2	.88	171	2.2	1.3	2.6	.17	.19	1.0
15	1.6	.60	4.9	2.1	1.3	103	26	1.1	.88	.17	.10	.70
16	1.0	.82	4.3	58	2.9	411	43	1.0	.55	.13	.02	.21
17	.88	.82	3.9	15	1.5	130	56	1.0	.42	.13	0	.12
18	29	.55	102	7.1	.82	29	16	.94	.35	.23	0	.26
19	55	.55	34	5.8	10	26	117	.76	.35	.21	0	.70
20	27	1.1	24	3.5	18	14	188	.70	.29	.10	0	.29
21	11	1.3	8.9	2.7	3.7	8.3	26	.65	.32	.06	0	.46
22	5.8	2.9	6.2	2.3	2.1	6.5	19	.60	.29	0	0	.38
23	3.7	29	4.9	2.2	1.2	15	14	.55	.21	4.7	0	.19
24	4.9	118	9.1	1.8	.94	49	13	.55	.17	2.1	0	.21
25	3.3	35	18	1.6	5.3	22	16	.50	.17	.50	0	.38
26	2.7	57	4.7	1.4	3.2	12	9.9	.55	.29	.23	0	13
27	1.8	51	3.5	47	1.2	13	7.1	.94	.76	.15	0	5.3
28	1.5	32	2.9	29	1.0	6.5	5.1	.65	.38	.10	.77	.94
29	7.0	19	2.7	9.6	.82	13	4.3	2.5	.19	.08	.29	.46
30	8.5	30	2.3	4.7	------	12	9.6	2.0	.17	.07	.10	6.1
31	4.9	------	4.9	2.9	------	6.5	------	1.1	------	3.7	.05	------
TOTAL	273.40	433.42	633.3	554.3	72.96	1290.99	677.1	83.99	16.93	14.59	23.22	72.00
MEAN	8.82	14.4	20.4	17.9	2.52	41.6	22.6	2.71	0.564	0.471	0.749	2.40
MAX	55	118	115	225	18	411	188	17	2.6	4.7	15	30
MIN	0.82	0.55	2.3	1.4	0.82	0.55	2.2	0.50	0.07	0	0	0
AC-FT	542	860	1,260	1,100	145	2,560	1,340	167	34	29	46	143

CAL YR 1967: TOTAL 4,982.95 MEAN 13.7 MAX 223 MIN 0.46 AC-FT 9,880
WAT YR 1968: TOTAL 4,146.20 MEAN 11.3 MAX 411 MIN 0 AC-FT 8,220

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1- 5	0330	8.12	1,520	4-19	2100	7.77	1,340
3-16	0300	9.64	2,560				

16-2129. Kipapa Stream near Waipahu

Location.--Lat 21°24'33", long 158°01'14", on left bank 350 ft upstream from mouth and 1.5 miles northwest of Waipahu Post Office.

Drainage area.--13.8 sq mi.

Records available.--December 1966 to September 1968 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 7,300 cfs Jan. 5 (gage height, 14.34 ft), from rating curve extended above 200 cfs on basis of slope-area measurement of peak flow; no flow for many days.
1966-68: Maximum discharge, that of Jan. 5, 1968; no flow at times each year.

Remarks.--Records good. Several diversions above station for irrigation of truck farms and sugarcane. Sediment samples were collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.34	1.8	38	7.2	5.7	0.53	7.7	14	0.62		2.5	0
2	6.8	8.5	32	15	4.6	.37	6.0	10	.31		2.4	0
3	5.4	1.1	17	11	4.4	.28	5.3	5.7	.19		.19	0
4	3.1	3.0	12	69	4.2	.22	7.5	3.9	.11		.01	0
5	3.8	1.3	10	911	4.1	11	19	3.1	.07		0	0
6	1.5	.62	7.9	67	3.1	6.8	17	2.7	.03		0	0
7	.57	.41	6.0	21	2.4	2.3	6.6	2.5	.01		0	0
8	37	.34	114	13	2.3	.94	5.1	2.1	0		0	0
9	7.2	.28	115	10	1.9	.62	3.9	2.1	.74		0	11
10	3.0	.67	80	8.0	1.3	.37	17	11	.62		0	3.5
11	1.3	.94	26	5.6	1.0	.25	8.1	7.4	.19		0	.19
12	1.9	4.1	21	5.6	1.3	77	5.9	30	.05		0	.01
13	6.7	3.1	12	4.8	1.4	79	6.0	1.9	.03		0	0
14	4.2	.87	9.2	4.1	1.3	225	4.2	2.9	.11		0	0
15	2.1	.49	7.9	3.4	1.5	94	14	.87	.87		0	0
16	.74	.34	7.0	98	2.7	598	46	.62	.49		0	0
17	.37	1.4	6.6	24	4.1	242	81	.57	.09		0	0
18	23	4.3	186	9.2	2.6	41	21	.53	.03		0	0
19	62	.87	85	8.1	2.9	26	51	.53	.02		0	0
20	32	.31	61	5.5	24	16	169	.34	.01		0	0
21	16	.37	19	3.9	6.6	10	31	.19	0		0	0
22	7.4	.90	14	3.1	3.6	7.9	35	.13	0		0	0
23	4.6	25	11	3.0	2.3	12	17	.07	0		0	0
24	4.1	162	13	2.5	1.4	51	17	.05	0		0	0
25	4.1	54	23	2.7	2.0	39	20	.05	0		0	0
26	2.5	72	10	2.5	5.5	17	14	.16	0		0	0
27	1.9	75	7.7	60	2.4	18	11	.09	0		0	2.8
28	.45	43	6.6	43	1.2	11	7.8	.05	0		0	.37
29	.87	23	6.0	20	.74	14	4.1	.03	0		0	.05
30	.49	40	5.1	10	------	18	3.3	.92	0		0	.13
31	3.3	------	5.9	7.2	------	11	------	.80	------		0	------
TOTAL	248.73	530.01	974.9	1459.4	102.54	1630.58	661.5	78.30	4.59	0	5.10	18.05
MEAN	8.02	17.7	31.4	47.1	3.54	52.6	22.0	2.53	0.153	0	0.165	0.602
MAX	62	162	186	911	24	598	169	14	0.87	0	2.5	11
MIN	0.34	0.28	5.1	2.5	0.74	0.22	3.3	0.03	0	0	0	0
AC-FT	493	1,050	1,930	2890	203	3,230	1,310	155	9.1	0	10	36

CAL YR 1967: TOTAL 5,943.49 MEAN 16.3 MAX 319 MIN 0 AC-FT 11,790
WAT YR 1968: TOTAL 5,713.70 MEAN 15.6 MAX 911 MIN 0 AC-FT 11,330

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1830	9.15	1,050	3-16	0430	11.13	2,730
1- 5	0430	14.34	7,300	4-20	0230	9.64	1,370

16-2130. Waikele Stream at Waipahu

Location.--Lat 21°23'09", long 158°00'48", 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.

Records available.--June to October 1951, December 1951 to October 1959, July 1960 to September 1968.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level, datum of 1929. Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.

Extremes.--Maximum discharge during year, 7,350 cfs Jan. 5 (gage height, 9.72 ft), from rating curve extended above 2,200 cfs on basis of slope-area measurement at gage height 9.65 ft; minimum, 14 cfs Sept. 13-16.
1951-68: 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. Diversions above station for irrigation of sugarcane in vicinity of Waipahu. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	23	85	43	48	40	43	54	30	20	18	22
2	20	39	76	48	46	42	45	54	30	18	20	26
3	22	25	60	49	44	40	41	43	24	17	18	23
4	19	24	48	42	46	40	44	42	24	20	17	20
5	20	21	50	1,150	43	49	68	41	28	30	17	16
6	18	20	39	153	42	47	66	41	22	36	16	15
7	20	20	28	72	37	42	46	37	21	22	17	16
8	59	20	248	58	36	36	47	30	21	19	18	15
9	33	19	263	50	36	38	38	35	22	20	18	25
10	22	18	164	47	36	36	60	60	23	22	16	22
11	19	20	81	44	36	33	49	52	21	22	17	17
12	18	27	66	43	37	147	49	40	22	20	16	15
13	22	25	50	40	39	157	47	35	20	20	16	15
14	20	21	45	39	36	421	43	34	19	18	16	15
15	18	20	43	38	47	190	53	30	20	18	17	15
16	17	20	42	415	47	1,020	236	27	23	19	16	15
17	16	18	41	98	45	515	150	26	20	20	16	16
18	33	30	424	65	45	118	81	28	20	19	16	15
19	96	24	163	60	50	84	145	31	20	20	17	17
20	72	23	152	49	77	70	504	28	20	18	16	16
21	46	22	66	45	60	48	120	28	18	18	16	17
22	32	24	55	45	49	50	134	26	20	18	16	20
23	26	61	49	49	47	61	75	27	20	19	15	16
24	26	234	53	44	43	156	70	28	18	18	16	16
25	23	224	73	43	63	125	69	35	18	19	16	18
26	23	125	49	42	55	60	66	30	18	18	15	22
27	22	144	43	217	48	70	58	29	18	22	16	26
28	20	86	40	123	45	52	52	29	19	20	16	19
29	19	66	43	78	42	52	43	24	18	18	24	17
30	20	93	40	58	------	70	37	24	18	18	26	16
31	26	------	42	52	------	55	------	28	------	18	22	------
TOTAL	862	1,536	2,721	3,399	1,325	3,964	2,579	1,076	635	624	536	544
MEAN	27.8	51.2	87.8	110	45.7	128	86.0	34.7	21.2	20.1	17.3	18.1
MAX	96	234	424	1,150	77	1,020	504	60	30	36	26	26
MIN	15	18	28	38	36	33	37	24	18	17	15	15
AC-FT	1,710	3,050	5,400	6,740	2,630	7,860	5,120	2,130	1,260	1,240	1,060	1,080

CAL YR 1967: TOTAL 18,551 MEAN 50.8 MAX 563 MIN 15 AC-FT 36,800
WAT YR 1968: TOTAL 19,801 MEAN 54.1 MAX 1,150 MIN 15 AC-FT 39,270

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1930	4.63	1,200	3-16	0500	6.29	2,790
12-18	0700	4.78	1,330	4-16	1730	5.09	1,610
1- 5	0500	9.72	7,350	4-20	0130	5.14	1,660
1-16	1230	5.32	1,820				

16-2160. Waiawa Stream near Pearl City

Location.--Lat 21°23'55", long 157°58'50", 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.

Records available.--June 1952 to September 1968.

Gage.--Graphic water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level, datum of 1929. Prior to July 24, 1964, graphic and July 24, 1964, to Aug. 8, 1966, digital water-stage recorders at same site and datum.

Extremes.--Maximum discharge during year, 23,400 cfs Jan. 5 (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, 4.6 cfs Oct. 1-3.
1952-68: Maximum discharge, that of Jan. 5, 1968; minimum, 2.0 cfs June 11, 12, 1965.

Remarks.--Records good. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversions and return flows above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	24	59	13	14	7.3	13	18	8.5	9.9	9.9	8.2
2	5.0	34	50	34	12	7.0	11	18	7.8	12	10	7.8
3	5.1	15	36	20	11	7.0	9.6	11	9.3	12	8.2	7.3
4	5.1	11	32	119	10	6.8	10	9.6	8.0	11	7.8	7.5
5	7.0	7.3	22	3,220	9.3	29	20	8.7	7.5	8.2	7.3	8.0
6	6.1	6.8	16	180	8.5	17	18	8.7	7.5	8.0	7.5	7.0
7	5.5	6.3	12	81	8.5	9.6	12	8.2	7.5	8.0	8.0	7.3
8	62	6.3	76	37	8.0	8.0	10	9.6	7.3	12	7.8	7.3
9	15	6.1	232	21	7.8	7.3	8.7	9.3	7.5	10	8.2	19
10	9.3	6.3	113	18	7.8	6.8	13	31	8.7	9.9	7.5	11
11	6.8	7.5	44	16	7.8	6.6	14	21	9.6	12	7.3	7.8
12	6.1	8.7	32	13	9.3	260	12	12	9.6	10	8.2	7.0
13	12	8.5	18	11	8.5	214	10	9.6	9.3	9.0	7.8	7.0
14	9.3	6.6	16	11	7.8	1,080	8.7	8.0	10	8.7	7.3	7.0
15	6.3	6.1	13	9.6	8.0	487	35	8.2	11	10	6.8	6.6
16	6.3	6.1	11	169	8.0	2,040	72	7.8	9.0	10	7.3	6.6
17	6.1	5.9	9.9	64	7.5	722	120	8.2	8.7	11	7.8	6.6
18	53	6.1	649	28	7.3	97	39	8.0	11	12	7.8	7.0
19	132	6.1	65	22	12	60	343	7.3	8.2	11	8.5	7.3
20	54	5.9	68	17	17	36	1,170	7.3	9.0	9.0	8.7	8.0
21	28	5.5	29	14	12	24	99	7.3	8.5	8.2	7.5	8.0
22	15	6.1	21	12	9.9	18	75	7.0	8.2	8.7	7.0	7.5
23	12	30	18	11	8.5	23	34	7.0	8.2	9.9	6.6	8.0
24	13	587	22	9.9	7.8	77	34	7.0	8.7	9.9	7.0	7.3
25	9.3	166	42	8.7	12	54	34	7.8	8.0	10	8.0	7.3
26	7.8	153	20	8.2	12	26	28	8.2	8.5	9.9	8.5	8.2
27	7.5	127	14	246	8.7	21	18	7.0	9.6	8.5	8.2	6.3
28	7.3	70	12	112	7.8	20	15	6.6	9.9	7.3	8.2	6.8
29	7.3	39	11	42	7.3	23	12	6.8	9.6	7.3	8.2	7.8
30	8.0	60	9.6	23	------	23	12	7.0	9.3	8.2	7.3	9.6
31	12	------	12	17	------	17	------	8.2	------	9.0	7.5	------
TOTAL	544.2	1,434.2	1,784.5	4,607.4	276.1	5,434.4	2,310.0	309.4	263.5	300.6	243.7	238.1
MEAN	17.6	47.8	57.6	149	9.52	175	77.0	9.98	8.78	9.70	7.86	7.94
MAX	132	587	649	3,220	17	2,040	1,170	31	11	12	10	19
MIN	5.0	5.5	9.6	8.2	7.3	6.6	8.7	6.6	7.3	7.3	6.6	6.3
AC-FT	1,080	2,840	3,540	9,140	548	10,780	4,580	614	523	596	483	472

CAL YR 1967: TOTAL 13,185.2 MEAN 36.1 MAX 1,620 MIN 4.6 AC-FT 26,150
WAT YR 1968: TOTAL 17,746.1 MEAN 48.5 MAX 3,220 MIN 5.0 AC-FT 35,200

PEAK DISCHARGE (BASE, 2,300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1830	10.69	4,390	3-16	0300	15.18	9,870
12-18	0600	10.98	4,680	3-17	0300	9.70	3,510
1-5	0500	20.56	23,400	4-20	0130	12.84	6,610
3-14	0300	10.90	4,600				

16-2230. Waimalu Stream near Aiea

Location.--Lat 21°23'34", long 157°57'03", 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.

Records available.--January 1952 to June 1962, July 1963 to September 1968.

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

Extremes.--Maximum discharge during year, 8,020 cfs Jan. 5 (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; minimum, 0.10 cfs Aug. 29. 1952-68: Maximum discharge, that of Jan. 5, 1968; no flow Sept. 25, Sept. 28 to Oct. 1, 1958. Maximum discharge of flood of May 14, 1963, was 5,320 cfs, from slope-area measurement of peak flow.

Remarks.--Records good. Occasional small diversions for irrigation of truck farms above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	24	19	2.2	1.6	0.38	4.4	9.1	1.6	0.60	0.32	0.35
2	1.7	13	17	4.8	1.1	.38	3.0	6.6	2.3	.60	.30	.29
3	1.6	6.0	9.3	3.2	.94	.35	5.8	2.8	1.6	.60	.28	.38
4	2.0	3.4	6.9	94	.78	.35	3.8	1.8	.94	.64	.26	.35
5	2.2	2.9	4.8	235	.64	24	21	1.4	.58	.58	.24	.20
6	1.8	2.4	3.4	33	.52	5.8	8.5	1.1	.46	.46	.22	.26
7	1.7	1.7	2.0	11	.46	1.8	4.8	.86	.42	.52	.21	.29
8	14	1.5	11	6.0	.46	.94	4.4	.94	.35	.46	.20	34
9	8.8	1.4	90	3.6	.42	.46	2.9	.64	.42	.46	.20	20
10	2.8	1.6	72	2.8	.38	.32	3.8	12	.71	.38	.20	2.8
11	2.0	1.8	19	2.0	.38	19	3.4	5.2	.64	.38	.20	.46
12	1.7	3.0	10	1.4	.46	128	2.6	4.0	.58	.38	.20	.24
13	5.6	2.5	4.8	1.3	.35	120	2.9	2.5	.58	.46	.20	.26
14	2.1	1.7	5.0	.86	.42	348	1.5	2.2	.58	.71	.20	.22
15	1.9	1.8	3.0	.71	.42	137	5.2	2.1	.64	.71	.20	.22
16	1.7	1.6	2.1	58	.38	476	14	2.0	1.3	.42	.20	.26
17	1.2	1.5	1.6	41	.35	140	19	1.8	1.2	.52	.20	.24
18	16	1.3	186	11	.32	32	10	1.6	.78	.64	.20	.22
19	31	2.4	35	7.2	.46	38	186	1.6	.86	.58	.20	.22
20	22	2.3	24	4.0	.35	16	342	1.6	.71	.64	.20	.22
21	9.9	1.4	8.5	2.8	.38	8.0	25	1.6	.64	.64	.22	.24
22	4.1	1.6	5.2	2.0	.35	5.2	18	1.6	.78	.78	.22	.24
23	24	2.9	3.6	2.0	.52	7.7	6.6	1.3	.80	.94	.26	.24
24	14	162	5.4	1.4	.35	40	5.0	1.3	.80	1.0	.29	.22
25	5.4	90	16	.94	2.3	25	6.6	1.5	1.0	.71	.26	.24
26	5.4	60	4.1	.64	3.2	9.3	5.2	2.2	.80	.58	.24	.58
27	4.0	35	2.6	75	.86	7.7	3.4	2.6	.80	.38	.20	.29
28	3.2	21	1.7	16	.46	5.8	2.5	2.1	.80	.38	.22	.24
29	3.4	8.8	1.5	7.2	.38	4.4	1.7	2.0	.80	.42	.18	.58
30	5.6	14	1.0	3.8	------	6.4	1.7	1.8	.80	.38	.24	8.5
31	5.0	------	1.9	2.4	------	7.7	------	1.3	------	.35	.24	------
TOTAL	207.1	474.5	577.4	637.25	19.99	1615.98	724.7	81.14	25.27	17.30	7.00	72.85
MEAN	6.68	15.8	18.6	20.6	0.689	52.1	24.2	2.62	0.842	0.558	0.226	2.43
MAX	31	162	186	235	3.2	476	342	12	2.3	1.0	0.32	34
MIN	1.2	1.3	1.0	0.64	0.32	0.32	1.5	0.64	0.35	0.35	0.18	0.20
AC-FT	411	941	1150	1260	40	3210	1440	161	50	34	14	144

CAL YR 1967: TOTAL 3,798.67 MEAN 10.4 MAX 186 MIN 0.22 AC-FT 7,530
WAT YR 1968: TOTAL 4,460.48 MEAN 12.2 MAX 476 MIN 0.18 AC-FT 8,850

PEAK DISCHARGE (BASE, 550 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1700	3.06	1,040	3-14	0300	3.39	1,490
12-18	0530	2.93	876	3-16	0300	4.25	2,910
1- 5	0400	6.82	8,020	4-20	0145	4.20	2,820

16-2245. Kalauao Stream at Moanalua Road, at Aiea

Location.--Lat 21°23'07", long 157°56'22", 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.

Records available.--July 1957 to September 1968.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 12.75 ft above mean sea level, datum of 1929. Prior to Apr. 28, 1964, graphic water-stage recorder at same site and datum. Apr. 28, 1964, to Nov. 14, 1965, digital water-stage recorder at same site and datum and Nov. 15, 1965, to June 16, 1966, at datum 1.00 ft lower.

Extremes.--Maximum discharge during year, 800 cfs Jan. 5 (gage height, 3.56 ft); minimum, not determined; minimum daily, 0.04 cfs Sept. 6, 7, 27.
1957-68: 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; minimum, 0.02 cfs Sept. 13, 1966.

Remarks.--Records good except those for period of no gage-height record, which are poor. Some return of irrigation water above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.09	3.0	6.6	0.88	0.44	0.25	0.70	1.3	0.21	0.17	0.15	0.06
2	.09	1.1	4.7	.75	.31	.25	.36	1.3	.19	.17	.13	.06
3	.08	.31	2.4	.95	.36	.25	1.8	.44	.17	.17	.13	.06
4	.09	.23	1.5	29	.29	.31	.81	.29	.19	.19	.13	.05
5	.08	.21	.75	123	.27	4.7	3.7	.27	.21	.15	.13	.05
6	.08	.16	.48	8.6	.25	1.6	1.5	.25	.19	.13	.13	.04
7	.12	.12	.27	2.6	.25	1.0	.70	.23	.19	.15	.12	.04
8	.19	.11	8.3	1.3	.27	.48	.55	.23	.19	.19	.12	8.0
9	2.2	.11	58	.70	.25	.36	.40	.23	.21	.19	.11	4.0
10	.13	.10	27	.44	.25	.25	.50	8.9	.19	.25	.12	1.0
11	.11	.12	6.1	.31	.23	4.1	.40	3.0	.19	.11	.12	.50
12	.10	.11	3.2	.25	.27	40	.35	.65	.19	.12	.12	.20
13	.11	.10	1.3	.25	.23	49	.40	.33	.21	.15	.12	.15
14	.10	.10	1.1	.23	.23	144	.30	.29	.19	.12	.11	.13
15	.09	.10	.60	.21	.27	51	.80	.27	.19	.12	.11	.11
16	.09	.11	.36	40	.25	185	2.5	.25	.19	.12	.11	.11
17	.09	.09	.40	14	.23	61	3.5	.25	.17	.13	.11	.09
18	1.5	.09	61	4.5	.23	8.9	2.0	.23	.15	.13	.11	.10
19	16	.10	9.5	3.7	.31	15	40	.23	.17	.13	.11	.09
20	6.6	.09	9.2	1.6	.40	4.7	97	.23	.17	.13	.12	.08
21	2.5	.09	2.6	1.0	1.4	2.2	5.4	.23	.17	.13	.11	.08
22	.65	.11	1.5	.65	1.0	1.4	5.1	.23	.17	.13	.10	.07
23	9.9	.36	.95	.60	.40	6.1	1.0	.23	.17	.15	.11	.07
24	4.9	54	2.6	.44	.29	13	.65	.21	.17	.13	.09	.06
25	.88	31	4.1	.33	3.1	6.6	1.0	.21	.19	.15	.09	.05
26	.44	17	1.1	.29	1.5	2.5	.88	.23	.17	.15	.08	.06
27	.27	12	.56	49	.48	2.4	.44	.21	.17	.15	.08	.04
28	.17	6.4	.36	6.8	.31	1.2	.36	.23	.19	.15	.08	.06
29	.15	2.8	.36	2.8	.27	.75	.29	.23	.19	.15	.07	.06
30	.21	4.1	.29	1.3	------	1.1	.27	.23	.19	.17	.07	2.0
31	.81	------	.52	.65	------	2.6	------	.23	------	.15	.07	------
TOTAL	48.82	134.32	217.70	297.13	14.34	612.00	173.66	21.64	5.54	4.63	3.36	17.47
MEAN	1.57	4.48	7.02	9.58	0.494	19.7	5.79	0.698	0.185	0.149	0.108	0.582
MAX	16	54	61	123	3.1	185	97	8.9	0.21	0.25	0.15	8.0
MIN	0.08	0.09	0.27	0.21	0.23	0.25	0.27	0.21	0.15	0.11	0.07	0.04
AC-FT	97	266	432	589	28	1,210	344	43	11	9.2	6.7	35

CAL YR 1967: TOTAL 1,195.63 MEAN 3.28 MAX 110 MIN 0.08 AC-FT 2,370
WAT YR 1968: TOTAL 1,550.61 MEAN 4.24 MAX 185 MIN 0.04 AC-FT 3,080

PEAK DISCHARGE (BASE, 240 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1630	2.67	372	1-27	0730	2.41	259
12-18	0530	3.20	620	3-16	0245	3.20	620
1- 5	0345	3.56	800	4-20	0130	3.45	745
1-16	1215	2.37	244				

Note.--No gage-height record Aug. 24 to Sept. 30.

16-2260. North Halawa Stream near Aiea

Location.--Lat 21°23'45", long 157°53'37", 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.

Records available.--August 1929 to June 1933, July 1953 to September 1968. Monthly discharge only May, June 1931, published in WSP 1319.

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

Extremes.--Maximum discharge during year, 1,690 cfs Apr. 20 (gage height, 11.33 ft), from rating curve extended above 55 cfs on basis of slope-area measurements at gage heights 10.3, 13.04 and 13.46 ft; no flow for many days.
1929-33, 1953-68: 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. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	11	13	0.88	1.2	0.09	4.1	3.1	0.10			0
2	2.4	4.8	11	2.1	.88	.04	3.0	3.2	.05			0
3	.50	2.3	7.3	1.2	.70	.02	9.1	1.5	.03			0
4	.52	.82	4.6	72	.60	.01	4.1	.94	.01			0
5	.33	.45	3.0	139	.50	11	11	.65	0			0
6	.19	.30	2.8	20	.37	2.5	5.6	.50	0			0
7	.07	.11	1.8	7.3	.24	.82	3.4	.45	0			0
8	8.8	.08	25	4.1	.15	.37	2.3	.41	0			0
9	4.5	.04	151	2.7	.10	.21	1.8	.37	0			0
10	.70	.01	69	2.0	.07	.11	3.3	21	0			0
11	.37	.01	20	1.6	.04	20	2.2	9.2	0			0
12	.21	.01	9.4	1.2	.04	89	3.3	3.3	0			0
13	1.2	.01	5.1	1.1	.04	107	2.4	1.7	0			0
14	.41	0	4.1	.88	.02	267	1.6	1.2	0			0
15	.21	0	2.8	.82	.01	86	5.3	.88	0			0
16	.08	0	2.2	49	0	278	6.1	.76	0			0
17	.04	0	1.7	22	0	109	16	.70	0			0
18	5.0	0	180	11	0	24	7.6	.60	0			0
19	32	0	21	9.1	0	45	90	.50	0			0
20	15	0	14	4.4	1.2	16	181	.41	0			0
21	5.3	0	4.8	3.4	1.6	7.6	20	.33	0			0
22	2.0	0	2.5	2.2	1.2	6.0	10	.30	0			0
23	12	4.6	1.8	1.6	.55	18	3.9	.24	0			0
24	6.6	90	7.1	1.2	.37	22	2.7	.17	0			0
25	2.0	83	4.8	1.0	5.1	17	3.8	.13	0			0
26	1.3	38	1.7	.76	1.8	9.1	2.8	.11	0			0
27	.82	28	.94	50	.70	11	2.0	.10	0			0
28	.60	15	.55	15	.41	5.6	1.6	.08	0			0
29	.41	7.6	.45	6.6	.21	6.8	1.1	.19	0			.90
30	15	11	.33	3.1	------	5.8	1.2	.37	0			1.2
31	1.6	------	1.7	1.8	------	7.3	------	.24	------			------
TOTAL	120.16	297.14	575.47	439.04	18.10	1,172.37	412.3	53.63	0.19	0	0	2.10
MEAN	3.88	9.90	18.6	14.2	0.624	37.8	13.7	1.73	0.006	0	0	0.070
MAX	32	90	180	139	5.1	278	181	21	0.10	0	0	1.2
MIN	0	0	0.33	0.76	0	0.01	1.1	0.08	0	0	0	0
AC-FT	238	589	1,140	871	36	2,330	818	106	0.4	0	0	4.2

CAL YR 1967: TOTAL 2,866.35 MEAN 7.85 MAX 235 MIN 0 AC-FT 5,690
WAT YR 1968: TOTAL 3,090.50 MEAN 8.44 MAX 278 MIN 0 AC-FT 6,130

PEAK DISCHARGE (BASE, 470 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1600	9.18	718	3-14	0300	10.50	1,250
12- 9	1300	9.17	714	3-16	0130	10.49	1,240
12-18	0400	10.01	1,020	4-20	0030	11.33	1,690
1- 4	2230	10.40	1,200				

16-1080. Wainiha River near Hanalei

Location.--Lat 22°08'10", long 159°33'40", 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.

Records available.--August 1952 to February 1956, October 1957 to September 1968.

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

Extremes.--Maximum discharge during year, 5,560 cfs Mar. 16 (gage height, 5.86 ft), from rating curve extended above 1,100 cfs as explained below; minimum, 39 cfs Sept. 20.
1952-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	90	429	131	60	58	92	240	52	86	138	126
2	275	284	629	164	60	56	76	142	52	64	66	68
3	78	141	289	127	60	55	68	86	51	57	53	64
4	96	100	205	175	68	59	72	180	71	61	49	49
5	66	90	162	231	60	63	231	142	56	63	49	44
6	55	112	191	115	56	61	64	87	67	54	49	41
7	88	78	111	106	56	55	57	75	59	53	49	42
8	72	80	846	100	55	54	72	69	98	52	48	43
9	73	72	1,260	87	55	53	282	66	78	52	84	102
10	75	90	1,990	75	54	100	342	69	68	53	75	102
11	62	80	449	69	54	110	99	74	100	126	73	51
12	68	76	180	66	162	620	77	61	103	193	70	45
13	56	68	198	64	58	254	86	58	125	120	112	87
14	53	63	175	62	60	283	69	56	138	110	55	52
15	50	56	108	106	208	174	98	56	63	69	66	49
16	51	52	301	406	73	2,110	69	56	95	59	49	44
17	49	61	707	132	76	524	60	56	81	358	59	43
18	72	56	192	114	67	137	63	55	77	77	49	41
19	220	132	119	108	76	137	285	54	80	71	45	46
20	228	186	106	100	215	99	312	56	59	115	46	41
21	130	90	99	140	640	78	119	66	93	73	129	46
22	82	121	141	189	96	86	96	72	78	72	79	42
23	81	473	1,040	119	76	295	150	64	88	447	52	51
24	63	814	879	110	66	481	891	56	77	143	44	110
25	56	1,010	180	106	73	718	467	53	56	83	68	56
26	52	2,380	116	99	61	160	379	53	58	66	73	185
27	94	1,160	108	214	58	99	170	53	63	59	66	72
28	63	870	124	90	58	83	182	57	120	55	49	50
29	55	432	115	64	60	279	124	56	61	59	45	46
30	122	461	102	62	------	337	150	52	314	66	44	53
31	82	------	354	60	------	130	------	52	------	323	43	------
TOTAL	2,734	9,778	11,905	3,791	2,821	7,808	5,302	2,372	2,581	3,339	1,976	1,891
MEAN	88.2	326	384	122	97.3	252	177	76.5	86.0	108	63.7	63.0
MAX	275	2,380	1,990	406	640	2,110	891	240	314	447	138	185
MIN	49	52	99	60	54	53	57	52	51	52	43	41
AC-FT	5,420	19,390	23,610	7,520	5,600	15,490	10,520	4,700	5,120	6,620	3,920	3,750

CAL YR 1967: TOTAL 69,898 MEAN 192 MAX 2,690 MIN 44 AC-FT 138,600
WAT YR 1968: TOTAL 56,298 MEAN 154 MAX 2,380 MIN 41 AC-FT 111,700

PEAK DISCHARGE (BASE, 3,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0330	5.67	4,900	3-16	2200	5.86	5,560
12-17	0500	5.56	4,530				

16-1300. Nahomalu Valley near Mana

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

Drainage area.--3.77 sq mi.

Records available.--Water years 1962-63 (annual maximums), July 1963 to September 1968.

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.

Extremes.--Maximum discharge during year, 146 cfs Feb. 21 (gage height, 2.90 ft), from rating curve extended above 23 cfs as explained below; no flow most of the time.
1961-68: 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.
1963-68: No flow most of the time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0.02	1.3	0.80	0.58	0	0.11		0		
2	0	0	0	.98	.65	.58	0	.09		0		
3	0	0	0	.65	.58	.46	0	.03		0		
4	0	0	0	.46	.52	.36	0	0		0		
5	0	0	0	.36	.40	.31	0	0		0		
6	0	0	0	.31	.36	.27	0	0		0		
7	0	0	0	.20	.27	.14	0	0		0		
8	0	0	1.8	.11	.23	.09	.61	0		0		
9	0	0	1.9	.09	.20	.04	.27	0		0		
10	0	0	.72	.06	.14	.03	.52	0		0		
11	0	0	.04	.06	.14	.02	.40	0		0		
12	0	0	.01	.04	.20	0	.27	0		0		
13	0	0	.03	.01	.20	0	.14	0		0		
14	0	0	.01	0	.14	0	.11	0		0		
15	0	0	.02	0	.74	.03	.04	0		0		
16	0	0	.06	5.7	.40	0	0	0		0		
17	0	0	17	1.4	.25	.03	0	0		.01		
18	0	0	8.6	1.3	.17	.06	0	0		0		
19	0	0	4.6	.80	.85	0	.51	0		0		
20	0	0	2.5	.58	3.9	0	.65	0		0		
21	0	0	1.6	.40	33	0	.52	0		0		
22	0	0	1.2	.36	7.5	0	.36	0		0		
23	.19	0	13	.27	4.1	0	.27	0		0		
24	.01	0	14	.20	2.3	0	.20	0		0		
25	0	0	7.2	.16	2.5	0	.20	0		0		
26	0	.01	4.1	.11	1.8	0	.33	0		0		
27	0	.07	2.3	13	1.2	0	.46	0		0		
28	0	.06	3.8	6.2	.89	0	.27	0		0		
29	0	.04	5.1	2.6	.72	0	.20	0		0		
30	0	.07	2.3	1.6	------	0	.14	0		0		
31	.05	------	1.9	1.1	------	0	------	0	------	0		------
TOTAL	0.25	0.25	93.81	40.41	65.15	3.00	6.47	0.23	0	0.01	0	0
MEAN	0.008	0.008	3.03	1.30	2.25	0.097	0.216	0.007	0	0.0003	0	0
MAX	0.19	0.07	17	13	33	0.58	0.61	0.11	0	0.01	0	0
MIN	0	0	0	0	0.14	0	0	0	0	0	0	0
AC-FT	0.5	0.5	186	80	129	6.0	13	0.5	0	0.02	0	0

CAL YR 1967: TOTAL 155.90 MEAN 0.427 MAX 17 MIN 0 AC-FT 309
WAT YR 1968: TOTAL 209.58 MEAN 0.573 MAX 33 MIN 0 AC-FT 416

Peak discharge (base, 93 cfs).--Dec. 17 (0630) 102 cfs (2.64 ft); Feb. 21 (0530) 146 cfs (2.90 ft).

16-2000. North Fork Kaukonahua Stream above Right Branch, near Wahiawa

Location.--Lat 21°31'09", long 157°56'53", 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.

Records available.--May 1913 to July 1953, April 1960 to September 1968. 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).

Extremes.--Maximum discharge during year, 4,540 cfs Mar. 16 (gage height, 11.73 ft), from rating curve extended above 82 cfs on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.54 cfs Mar. 3, 4.
1913-53, 1960-68: Maximum discharge, 5,490 cfs Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 68 cfs by test on 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. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	22	58	4.6	2.8	0.58	6.0	42	2.0	3.1	33	26
2	27	8.6	24	13	2.6	.58	5.6	12	1.6	1.5	6.7	3.7
3	8.1	5.3	21	4.4	2.3	.54	17	8.4	1.4	1.2	4.6	2.1
4	12	3.7	18	74	2.4	11	9.1	7.5	1.5	1.1	7.8	1.9
5	4.4	3.1	24	98	2.1	48	26	6.7	1.4	1.0	4.4	1.5
6	3.2	3.0	18	18	2.0	3.0	7.0	5.8	1.1	.93	3.1	1.4
7	4.1	2.7	36	8.7	1.8	1.5	11	5.4	7.9	.93	2.7	4.0
8	24	4.6	134	6.7	1.7	1.1	5.6	5.4	18	.93	3.1	102
9	7.0	6.5	47	5.8	1.7	.66	5.6	4.8	5.0	.86	5.0	44
10	3.4	3.1	39	5.0	1.6	.80	28	13	6.2	1.2	2.7	6.4
11	3.6	4.8	20	4.8	1.5	38	6.0	5.0	3.6	5.2	2.3	4.4
12	5.3	5.7	14	4.2	1.6	125	5.6	3.8	2.3	1.7	8.4	4.6
13	13	2.6	12	3.8	1.6	159	4.2	3.4	14	5.8	4.8	5.8
14	5.4	2.3	10	3.4	1.4	135	3.7	3.4	13	20	2.3	5.5
15	2.8	2.1	8.7	3.2	2.4	131	15	3.1	2.3	2.4	1.9	6.9
16	2.6	5.9	7.8	54	2.8	827	35	3.0	2.8	12	1.7	3.2
17	2.3	2.2	7.8	7.5	2.2	108	22	3.4	4.4	14	1.6	2.4
18	26	1.9	73	5.0	1.4	24	9.3	2.8	8.7	3.1	1.7	4.2
19	43	3.1	26	4.0	1.4	31	155	2.4	8.7	5.0	5.4	3.7
20	23	26	11	3.4	5.7	15	91	2.3	3.4	6.0	2.7	5.0
21	9.7	14	8.1	3.1	1.8	11	14	2.4	3.8	2.7	30	3.7
22	15	23	7.5	2.8	1.2	9.3	11	2.2	2.3	2.0	4.2	2.7
23	7.2	42	6.7	3.0	1.0	29	22	2.0	2.2	41	2.2	5.6
24	6.4	152	7.2	2.8	.86	71	21	1.9	3.4	4.6	2.7	6.2
25	5.8	109	8.7	2.4	1.8	18	29	1.7	1.7	2.8	3.3	7.3
26	4.6	91	5.6	2.3	1.3	15	20	5.3	3.1	7.8	4.1	55
27	4.4	33	5.0	27	.80	15	33	3.9	1.9	2.8	10	8.7
28	3.8	46	4.6	19	.68	8.7	19	3.1	1.6	2.4	3.4	4.4
29	3.6	31	4.4	4.0	.63	15	9.0	6.7	1.3	3.0	2.4	3.6
30	11	24	4.2	3.0	------	23	43	4.6	6.2	13	2.0	3.2
31	5.2	------	18	2.7	------	7.5	------	5.5	------	50	1.9	------
TOTAL	300.7	684.2	689.3	403.6	53.07	1883.46	688.7	182.9	136.8	220.05	172.1	339.1
MEAN	9.70	22.8	22.2	13.0	1.83	60.8	23.0	5.90	4.56	7.10	5.55	11.3
MAX	43	152	134	98	5.7	827	155	42	18	50	33	102
MIN	2.3	1.9	4.2	2.3	0.63	0.54	3.7	1.7	1.1	0.86	1.6	1.4
AC-FT	596	1360	1370	801	105	3,740	1370	363	271	436	341	673

CAL YR 1967: TOTAL 6,427.6 MEAN 17.6 MAX 252 MIN 1.1 AC-FT 12,750
WAT YR 1968: TOTAL 5,753.98 MEAN 15.7 MAX 827 MIN 0.54 AC-FT 11,410

PEAK DISCHARGE (BASE, 1,300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1730	6.39	1,380	3-16	0230	11.73	4,540
11-25	1430	6.36	1,360				

16-2030. Mauka ditch near Wahiawa

Location.--Lat 21°30'45", long 157°59'20", on left bank 0.7 mile northwest of Ku Tree Reservoir and 2.9 miles east of Wahiawa Post Office.

Records available.--March 1947 to September 1968 (discontinued). Prior to July 1958, published as Kaukonahua ditch near Wahiawa.

Gage.--Digital water-stage recorder and Parshall flume. Altitude of gage is 1,140 ft (from topographic map). Prior to Apr. 9, 1964, graphic water-stage recorder at same site and datum.

Extremes.--1947-68: Maximum daily discharge, 15.6 cfs Jan. 27, 1948; no flow at times.

Remarks.--Records poor. Ditch diverts from North Fork Kaukonahua Stream at Right Branch and returns to the same stream at Wahiawa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.16	0.11	1.4	0.17	0.23	0.13	0.44	0.29	0.18	0.15	0.37	0.40
2	.30	.14	.47	.25	.27	.19	.44	.28	.17	.15	.50	.15
3	.14	.16	.36	.24	.27	.44	.44	.27	.16	.13	.67	.10
4	.14	.17	.28	.39	.27	.52	.44	.25	.16	.14	.11	.07
5	.13	.17	.24	4.9	.29	.41	.44	.25	.16	.14	.11	.06
6	.13	.13	.22	.32	.26	.13	.40	.25	.16	.13	.11	.05
7	.12	.13	.21	.27	.25	.17	.30	.25	.15	.13	.09	.05
8	.11	.21	.56	.27	.24	.13	.25	.25	.19	.13	.10	.50
9	.13	.22	1.1	.25	.23	.13	.22	.26	.19	.14	.11	.20
10	.11	.14	.51	.25	.23	.13	.35	.37	.27	.15	.09	.10
11	.09	.12	.31	.25	.23	.13	.21	.25	.21	.38	.08	.05
12	.21	.14	.27	.25	.22	.26	.28	.22	.15	.15	.11	.05
13	.23	.13	.23	.25	.22	.41	.23	.20	.20	.15	.16	.05
14	.26	.11	.21	.25	.21	.85	.22	.20	.28	.15	.11	.05
15	.30	.11	.20	.25	.23	1.5	.25	.19	.16	.15	.10	.05
16	.32	.11	.20	3.5	.20	14	.52	.18	.19	.16	.07	.06
17	.35	.11	.20	.30	.25	2.7	.23	.18	.19	.19	.07	.07
18	.27	.14	1.7	.26	.31	.45	.19	.17	.28	.20	.05	.08
19	.64	.16	.90	.26	.15	.35	.52	.17	.20	.21	.05	.10
20	.41	.19	.42	.25	.15	.34	3.9	.16	.16	.22	.05	.09
21	.19	.37	.27	.25	.18	.35	.28	.16	.14	.22	.07	.07
22	.18	.41	.30	.23	.15	.40	.25	.16	.13	.21	.08	.05
23	.18	1.1	.24	.23	.15	.50	.61	.16	.13	.85	.12	.05
24	.14	2.0	.26	.23	.15	.81	.36	.16	.12	.19	.16	.10
25	.14	1.3	.25	.23	.20	.47	.32	.16	.12	.14	.11	.20
26	.12	1.2	.20	.23	.15	.39	.28	.16	.13	.13	.14	.45
27	.11	.69	.19	1.3	.13	.40	.35	.20	.14	.10	.34	.15
28	.09	.69	.17	.69	.13	.41	.36	.13	.13	.11	.15	.10
29	.09	.39	.20	.35	.13	.41	.27	.15	.12	.11	.11	.08
30	.09	.42	.18	.23	------	.53	.28	.15	.15	.15	.09	.07
31	.09	------	.34	.23	------	.44	------	.20	------	.53	.08	------
TOTAL	5.97	11.47	12.59	17.33	6.08	28.48	13.63	6.43	5.12	6.09	4.56	3.65
MEAN	0.193	0.382	0.406	0.559	0.210	0.919	0.454	0.207	0.171	0.196	0.147	0.122
MAX	0.64	2.0	1.7	4.9	0.31	14	3.9	0.37	0.28	0.85	0.67	0.50
MIN	0.09	0.11	0.17	0.17	0.13	0.13	0.19	0.13	0.12	0.10	0.05	0.05
AC-FT	12	23	25	34	12	56	27	13	10	12	9.0	7.2

CAL YR 1967: TOTAL 173.20 MEAN 0.488 MAX 4.6 MIN 0.09 AC-FT 344
WAT YR 1968: TOTAL 121.40 MEAN 0.332 MAX 14 MIN 0.05 AC-FT 241

16-2040. North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'54", long 157°59'19", on left bank 1.0 mile downstream from Poamoho tunnel inflow and 3.1 miles northeast of Wahiawa Post Office.

Drainage area.--4.86 sq mi.

Records available.--September 1946 to September 1968 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 930 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,430 cfs Mar. 16 (gage height, 19.90 ft), from rating curve extended above 280 cfs as explained below; minimum, 2.2 cfs Mar. 3, 4.
1946-68: Maximum discharge, 4,660 cfs Apr. 15, 1963 (gage height, 20.95 ft), from rating curve extended above 290 cfs on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; no flow at times in 1953.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Mauka ditch (see sta. no. 2030) diverts 2.6 miles above station and entire flow returns to stream 1.7 miles below station. Poamoho tunnel (see sta. no. 2109) diverts from Poamoho Stream into North Fork Kaukonahua Stream 1.0 mile above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	49	186	23	14	2.5	22	160	78	10	135	90
2	62	24	73	37	12	2.4	20	45	6.3	6.0	24	80
3	18	16	59	22	12	2.3	37	37	5.6	4.5	15	60
4	20	9.6	47	163	15	9.3	26	35	13	4.2	16	50
5	12	7.6	54	442	10	104	64	28	78	4.0	14	4.5
6	7.3	6.8	46	78	90	11	23	22	5.2	3.4	10	4.3
7	6.3	5.8	41	36	8.3	50	25	21	38	3.0	90	90
8	44	11	308	30	7.8	3.4	20	20	50	2.8	8.0	250
9	35	15	176	26	7.6	2.9	20	18	24	2.6	15	120
10	80	9.6	142	24	7.0	2.6	70	40	18	3.4	8.0	18
11	7.0	10	66	23	6.6	54	23	20	22	19	7.0	12
12	90	23	51	20	7.3	280	21	17	10	7.0	21	13
13	37	6.8	38	20	8.3	264	17	14	62	92	13	16
14	10	5.0	34	17	7.0	345	16	12	58	47	7.0	15
15	6.6	4.6	31	16	9.3	299	28	11	10	11	6.0	20
16	5.2	14	28	198	14	1,720	90	10	6.0	4.8	5.0	9.0
17	4.6	7.3	28	36	10	447	50	9.8	8.0	74	4.5	7.0
18	48	5.2	267	22	7.0	101	25	12	27	16	5.0	8.6
19	114	23	131	20	6.0	96	400	9.5	25	15	16	7.8
20	64	62	54	16	10	52	250	9.2	9.0	20	7.0	14
21	26	44	32	15	9.3	42	40	10	10	10	76	13
22	27	60	29	14	6.8	34	35	9.0	5.8	5.8	13	12
23	29	124	28	16	4.6	65	50	8.0	5.6	111	6.8	14
24	14	428	35	15	3.6	201	45	7.3	9.0	20	8.2	16
25	19	274	34	12	5.8	64	80	7.0	5.0	10	9.4	20
26	15	447	22	11	5.6	41	50	27	80	18	12	140
27	12	174	20	114	3.5	43	90	18	4.1	9.6	25	15
28	11	165	18	62	3.0	31	50	14	3.7	6.8	10	12
29	9.6	83	20	20	2.8	36	30	26	3.4	7.3	7.0	10
30	21	86	18	14	------	69	170	14	15	58	5.8	9.0
31	14	------	86	12	------	28	------	13	------	114	5.5	------
TOTAL	730.6	2200.3	2202	1574	233.4	4457.4	1987	7038	482.3	637.4	524.2	899.2
MEAN	23.6	73.3	71.0	50.8	8.05	144	62.9	22.7	16.1	20.6	16.9	30.0
MAX	114	447	308	442	15	1,720	400	160	62	114	135	250
MIN	4.6	4.6	18	11	2.8	2.3	16	7.0	3.4	2.6	4.5	4.3
AC-FT	1450	4360	4370	3120	463	8840	3740	1400	957	1260	1040	1780

CAL YR 1967: TOTAL 18,180.7 MEAN 49.8 MAX 632 MIN 4.6 AC-FT 36,060
WAT YR 1968: TOTAL 16,531.6 MEAN 45.2 MAX 1,720 MIN 2.3 AC-FT 32,790

Note.--No gage-height record Apr. 4 to May 21, Aug. 7 to Sept. 30.

16-2080. South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa

Location.--Lat 21°29'32", long 157°59'55", 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.

Records available.--July 1957 to June 1963, water years 1963-64 (annual maximums), July 1964 to September 1968.

Gage.--Graphic water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level, datum of 1929. Prior to July 1, 1963, graphic water-stage recorder, July 1, 1963, to June 30, 1964, crest-stage gage, and July 1, 1964, to July 7, 1966, digital water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 3,260 cfs Mar. 16 (gage height, 8.42 ft), from rating curve extended above 1,100 cfs as explained below; minimum, 1.0 cfs on several days.
1957-68: 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. Koolau ditch diverts water into Koolau Reservoir (capacity, 132 acre-ft) and Ku Tree Reservoir (capacity, 899 acre-ft) located on tributaries above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	23	100	8.6	5.0	2.4	11	47	3.8	4.4	31	22
2	20	12	53	13	4.6	2.2	9.2	19	2.7	2.2	6.0	9.7
3	9.6	6.8	37	11	4.6	2.1	20	12	2.4	1.6	3.2	2.7
4	9.6	4.8	31	44	4.6	9.6	12	11	2.4	1.3	3.0	1.7
5	6.5	4.0	27	307	4.2	28	31	9.6	2.4	1.2	4.8	1.3
6	4.6	3.6	19	73	3.8	6.5	12	8.2	2.1	1.1	2.5	1.1
7	4.0	3.4	16	18	3.6	3.4	9.2	7.9	2.2	1.0	1.7	1.1
8	23	4.8	161	14	3.6	2.7	8.6	7.9	3.8	1.0	1.5	60
9	14	4.6	103	12	3.8	2.4	7.9	7.9	5.5	1.0	2.2	47
10	5.0	5.3	69	11	3.6	2.1	32	22	3.6	1.1	2.2	68
11	4.6	14	35	10	3.8	38	10	8.9	7.0	4.0	2.0	3.4
12	7.9	18	27	9.2	4.0	159	10	6.8	4.4	3.2	1.6	2.5
13	11	5.3	18	9.6	4.2	140	8.2	5.7	3.4	3.6	9.2	11
14	7.9	3.4	16	8.6	3.8	220	6.5	5.3	6.5	5.7	3.0	6.5
15	4.4	2.9	14	7.6	4.8	177	19	5.0	3.8	4.2	1.8	3.6
16	3.4	2.7	14	118	7.0	817	48	4.8	3.8	1.7	1.4	2.4
17	3.0	2.9	12	22	5.5	138	41	4.8	6.0	1.3	1.2	1.8
18	30	2.7	154	12	3.8	44	21	4.6	6.8	1.4	1.1	1.7
19	82	2.7	59	11	3.6	42	86	4.4	4.8	1.2	1.0	3.8
20	41	4.4	42	8.6	20	24	267	4.0	3.0	1.2	1.2	2.9
21	15	9.1	20	7.6	5.7	17	27	4.0	2.5	1.4	1.2	2.2
22	11	62	16	7.0	4.2	15	28	3.8	2.1	1.2	3.0	1.5
23	14	70	15	7.3	3.2	42	27	3.6	1.7	37	2.0	1.6
24	8.6	226	15	7.0	2.9	103	19	3.2	1.7	8.6	1.8	5.1
25	9.2	158	17	6.2	4.8	40	17	3.0	1.7	2.9	2.1	21
26	6.2	91	12	5.7	5.0	19	14	3.0	2.2	1.8	8.3	45
27	5.5	53	10	59	3.0	21	18	3.4	4.0	2.0	8.8	13
28	4.8	52	9.2	38	2.7	15	28	3.2	2.2	2.0	4.2	5.0
29	5.0	46	9.6	8.9	2.4	19	12	3.2	1.7	4.8	2.4	3.8
30	12	64	8.2	6.8	------	36	45	5.3	1.8	2.5	1.5	2.4
31	7.6	------	12	5.7	------	15	------	6.0	------	24	1.2	------
TOTAL	398.6	962.4	1,151.0	887.4	135.8	2202.4	904.6	248.5	102.0	131.6	117.8	293.6
MEAN	12.9	32.1	37.1	28.6	4.68	71.0	30.2	8.02	3.40	4.25	3.80	9.79
MAX	82	226	161	307	20	817	267	47	7.0	37	31	60
MIN	3.0	2.7	8.2	5.7	2.4	2.1	6.5	3.0	1.7	1.0	1.0	1.1
AC-FT	791	1,910	2280	1,760	269	4,370	1,790	493	202	261	234	582

CAL YR 1967: TOTAL 9,014.0 MEAN 24.7 MAX 349 MIN 2.4 AC-FT 17,880
WAT YR 1968: TOTAL 7,535.7 MEAN 20.6 MAX 817 MIN 1.0 AC-FT 14,950

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1630	5.07	1,070	3-14	0230	4.68	870
12- 8	0800	4.58	820	3-16	0400	8.42	3,260
1- 5	0430	6.44	1,890	4-20	0200	5.78	1,500
1-16	1300	4.34	700				

16-2085. Right Branch of South Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°29'58", long 157°59'07", 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.

Records available.--August 1957 to September 1968.

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

Extremes.--Maximum discharge during year, 3,160 cfs Jan. 5 (gage height, 7.68 ft), from rating curve extended above 170 cfs; minimum, 0.02 cfs Sept. 24, 25.
1957-68: Maximum discharge, that of Jan. 5, 1968; no flow at times.

Remarks.--Records fair. Diversion from South Fork Kaukonahua Stream into Ku Tree Reservoir (capacity, 899 acre-ft) above station, then to Schofield Barracks for domestic use. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	0.39	28	2.6	1.4	0.66	1.6	3.0	0.57	0.51	5.1	3.5
2	4.7	.33	8.5	5.0	1.2	.60	1.4	2.1	.41	.23	1.0	1.4
3	2.1	.54	8.4	2.9	1.2	.60	1.6	1.6	.51	.19	.51	.85
4	1.6	.29	6.0	7.0	1.2	3.0	1.4	1.1	.63	.17	.23	.51
5	.89	.21	3.6	216	1.2	8.0	1.5	1.3	.75	.21	.21	.16
6	.60	.09	3.1	5.5	1.1	1.5	1.3	1.1	.51	.17	.19	.14
7	.75	.11	2.4	3.8	1.0	1.0	1.2	1.0	.60	.11	.07	.11
8	1.6	1.6	11	3.3	1.0	.70	1.0	1.2	1.4	.12	.12	.16
9	.97	1.8	25	2.9	1.1	.54	2.0	1.5	1.2	.09	.25	.21
10	.57	.93	11	2.8	1.0	.69	4.9	4.8	3.3	.33	.23	.19
11	.57	1.8	5.7	2.7	1.0	.66	1.8	1.4	2.7	5.1	.33	.11
12	.69	2.2	4.8	2.2	1.1	4.8	2.7	1.1	1.4	1.2	.46	.09
13	.37	.54	3.6	2.6	1.1	8.2	1.6	1.1	1.0	1.1	1.6	.11
14	.43	.25	3.1	2.2	1.0	15	1.2	.89	2.7	.63	.33	.10
15	.27	.16	2.8	2.1	2.6	20	1.2	.78	.93	.39	.21	.08
16	.21	.19	3.1	33	2.5	200	6.2	.85	2.5	.16	.06	.07
17	.23	.21	3.3	4.9	1.5	24	5.7	.75	2.3	.19	.04	.08
18	.29	.66	38	4.1	1.1	5.3	2.7	.78	2.7	.21	.04	.09
19	11	.57	22	3.0	1.4	3.4	7.7	.72	1.3	.23	.04	.10
20	9.7	81	9.3	2.5	1.4	2.3	58	.60	.69	.21	.04	.09
21	2.9	3.4	4.8	2.2	1.6	2.1	3.4	.81	.72	.21	.04	.07
22	2.2	14	4.1	1.9	1.0	1.7	2.1	.75	.57	.12	.05	.08
23	1.6	27	4.0	2.0	.93	3.4	4.6	.46	.33	12	.09	.10
24	1.2	44	4.9	1.9	81	13	3.4	.51	.54	1.6	.17	.05
25	1.0	22	4.5	1.8	2.7	4.9	3.1	.60	.39	.54	.69	.03
26	.75	21	3.1	1.5	1.0	2.4	2.1	.78	.66	.25	2.6	.05
27	.60	12	2.8	15	.75	2.4	3.2	.81	.66	.17	6.4	.04
28	.48	9.5	2.7	10	.66	2.0	4.5	.66	.43	.35	1.5	.04
29	.31	9.5	3.8	3.0	.66	1.8	1.7	.78	.33	.72	.69	.03
30	.48	10	2.8	2.0	------	4.5	2.2	.69	.54	1.0	.27	.03
31	.54	------	4.9	1.6	------	2.1	------	.75	------	9.7	.11	------
TOTAL	51.20	18608	245.1	354.0	36.21	341.25	137.0	35.27	33.27	38.21	23.67	8.67
MEAN	1.65	6.20	7.91	11.4	1.25	11.0	4.57	1.14	1.11	1.23	0.764	0.289
MAX	11	44	38	216	2.7	200	58	4.8	3.3	12	6.4	3.5
MIN	0.21	0.09	2.4	1.5	0.66	0.54	1.0	0.46	0.33	0.09	0.04	0.03
AC-FT	102	369	486	702	72	677	272	70	66	76	47	17

CAL YR 1967: TOTAL 1,269.40 MEAN 3.48 MAX 76 MIN 0.04 AC-FT 2,520
WAT YR 1968: TOTAL 1,489.93 MEAN 4.07 MAX 216 MIN 0.03 AC-FT 2,960

16-2109. Poamoho tunnel near Wahiawa

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

Records available.--July 1958 to September 1968.

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

Extremes.--1958-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.03	9.8	24	5.1	2.9	0.04	5.0	13	1.4	1.9	17	17
2	3.4	3.6	12	5.9	2.6	.04	4.4	7.3	1.3	1.1	3.5	2.8
3	.02	2.1	8.6	4.2	3.0	.05	7.0	5.6	1.2	.93	2.4	1.4
4	.02	.70	6.9	33	4.1	.06	4.4	5.0	5.1	.78	2.3	.93
5	.02	.28	6.2	71	2.1	2.3	8.9	4.5	2.0	.74	2.4	.70
6	.02	.17	6.4	16	1.8	.04	4.4	4.3	1.3	.70	1.7	.54
7	.03	.11	6.7	7.5	1.7	.05	7.6	3.9	14	.66	1.4	.90
8	8.7	.28	57	6.1	1.6	.04	4.0	3.9	9.5	.58	1.3	8.0
9	3.5	.79	41	5.3	1.4	.04	3.1	3.5	4.4	.58	1.3	11
10	.04	.41	37	4.7	1.4	.04	7.1	9.2	2.3	.66	1.1	2.2
11	.03	1.6	14	4.5	1.3	1.8	.06	4.3	1.9	1.3	.98	1.4
12	.03	4.7	11	4.0	1.6	15	.05	3.3	1.5	.88	1.0	1.0
13	8.3	.41	7.8	3.9	2.4	18	.05	3.0	23	.88	1.1	1.4
14	.05	.10	6.1	3.5	1.8	47	.05	2.8	25	9.0	.88	1.0
15	.02	.08	5.6	3.0	2.6	36	.06	2.6	4.2	2.0	.74	1.0
16	.03	2.0	5.3	40	3.2	265	3.2	2.4	3.0	.93	.62	.88
17	.03	.78	5.1	9.0	2.4	120	.03	2.6	2.4	17	.58	.62
18	9.8	.20	54	5.5	1.6	26	.02	2.7	2.6	3.6	.54	.74
19	21	9.6	34	4.5	1.3	24	53	2.2	2.8	2.3	.54	.93
20	9.0	6.6	24	4.1	1.4	13	77	2.0	2.3	2.6	2.0	.93
21	1.4	4.6	7.1	4.0	2.2	10	11	2.2	2.3	1.3	3.2	1.2
22	1.8	7.4	6.1	3.7	1.6	8.9	9.5	1.9	2.0	.93	1.9	.93
23	2.4	19	5.8	3.7	.51	12	23	1.8	1.8	11	.93	1.1
24	.32	66	9.1	3.3	.06	40	45	1.8	1.7	3.0	.78	1.7
25	1.4	61	8.2	2.6	.05	14	50	1.6	1.3	2.2	.88	1.1
26	3.2	118	4.5	2.4	.05	9.1	24	7.1	1.3	2.9	.88	12
27	1.0	43	4.0	22	.05	9.2	14	3.6	1.4	1.5	1.4	4.0
28	.70	30	3.9	12	.04	7.1	10	2.7	1.1	.98	1.1	1.2
29	.54	13	4.3	3.9	.04	6.6	7.7	7.3	.98	.93	.83	1.1
30	3.6	15	3.8	2.9	------	14	8.7	2.7	1.7	15	.74	1.0
31	1.8	------	29	2.4	------	6.6	------	1.8	------	11	.58	------
TOTAL	82.23	421.31	458.5	303.7	46.80	706.00	392.32	122.6	126.78	99.86	56.60	80.70
MEAN	2.65	14.0	14.8	9.80	1.61	22.8	13.1	3.95	4.23	3.22	1.83	2.69
MAX	21	118	57	71	4.1	265	77	13	25	17	17	17
MIN	0.02	0.08	3.8	2.4	0.04	0.04	0.02	1.6	0.98	0.58	0.54	0.54
AC-FT	163	836	909	602	93	1400	778	243	251	198	112	160

CAL YR 1967: TOTAL 2,736.70 MEAN 7.50 MAX 118 MIN 0.02 AC-FT 5,430
WAT YR 1968: TOTAL 2,897.40 MEAN 7.92 MAX 265 MIN 0.02 AC-FT 5,750

16-2110. Poamoho Stream near Wahiawa

Location.--Lat 21°31'24", long 157°58'55", 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.

Records available.--January 1947 to September 1968.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 1,150 ft (from topographic map). Prior to July 13, 1966, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 3,630 cfs Mar. 16 (gage height, 10.32 ft), from rating curve extended above 75 cfs on basis of slope-area measurement at gage height 7.26 ft; minimum, 0.02 cfs on several days. 1947-68: Maximum discharge, that of Mar. 16, 1968; no flow at times.

Remarks.--Records good. Poamoho tunnel (see sta. no. 2109) diverts 180 ft above station to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	1.4	0.19	0.10	0.16	0.86	0.05	0.14	0.06	0.06	11	12
2	5.3	1.3	.19	.10	.16	.86	.04	.04	.05	.06	.36	1.4
3	2.2	1.2	.22	.10	.12	.80	.14	.04	.05	.06	.04	.12
4	2.0	1.1	.28	16	.16	2.0	.04	.03	.16	.05	.12	.04
5	1.6	1.1	.28	69	.16	22	.07	.05	.05	.06	.05	.03
6	1.1	1.1	.32	.10	.16	3.0	.05	.05	.06	.05	.05	.04
7	.98	1.0	.36	.08	.16	1.4	.08	.06	4.0	.06	.04	.32
8	6.0	1.0	1.4	.07	.19	1.1	.07	.06	.28	.06	.05	4.3
9	5.1	1.1	.19	.08	.19	.98	2.0	.06	.06	.07	.04	8.4
10	1.7	1.1	.68	.10	.22	.86	19	.16	.04	.07	.05	.92
11	1.4	1.1	.14	.08	.22	14	5.5	.04	.04	.08	.06	.07
12	1.4	1.1	.14	.08	.25	45	6.0	.05	.04	.06	.07	.04
13	4.2	1.0	.14	.08	.36	38	3.6	.06	11	.06	.08	.28
14	2.4	.98	.12	.08	.44	51	3.0	.06	7.0	4.3	.08	.05
15	1.4	.86	.12	.08	.48	34	7.3	.05	.05	.06	.10	.04
16	1.1	.98	.12	.08	.14	540	18	.07	.05	.05	.06	.05
17	.98	.92	.14	.12	.19	42	9.6	.07	.04	10	.06	.04
18	2.5	.92	20	.12	.16	.07	4.9	.08	.05	.10	.07	.05
19	3.5	1.3	1.8	.10	.19	.07	38	.06	.05	.08	.08	.07
20	2.9	1.5	.16	.10	.25	.06	16	.06	.05	.06	1.2	.06
21	2.3	1.9	.14	.10	.16	.06	.06	.10	.05	.08	3.0	.40
22	1.9	5.0	.12	.10	.06	.06	.06	.10	.05	.10	.68	.07
23	1.7	3.0	.12	.10	.74	.08	1.4	.12	.05	8.4	.05	.22
24	1.5	45	.12	.10	1.0	.19	8.1	.14	.05	.19	.05	.86
25	1.5	1.7	.10	.10	2.8	.08	9.9	.14	.05	.48	.05	.14
26	1.5	.40	.10	.10	1.8	.08	1.4	.22	.05	.10	.05	8.1
27	1.4	.25	.10	5.1	1.0	.10	.12	.04	.05	.04	.52	1.4
28	1.4	.16	.10	.14	.92	.12	.04	.04	.05	.04	.14	.12
29	1.3	.14	.12	.16	.86	.14	.06	.44	.05	.04	.05	.03
30	1.4	.14	.16	.16	------	.16	.08	.07	.05	10	.05	.04
31	1.4	------	.52	.16	------	.05	------	.05	------	10	.05	------
TOTAL	67.56	79.75	28.69	92.97	13.70	799.18	154.66	2.75	23.68	44.92	18.35	39.70
MEAN	2.18	2.66	0.925	3.00	0.472	25.8	5.16	0.089	0.789	1.45	0.592	1.32
MAX	6.0	45	20	69	2.8	540	38	0.44	11	10	11	12
MIN	0.98	0.14	0.10	0.07	0.06	0.05	0.04	0.03	0.04	0.04	0.04	0.03
AC-FT	134	158	57	184	27	1,590	307	5.5	47	89	36	79

CAL YR 1967: TOTAL 1,174.89 MEAN 3.22 MAX 70 MIN 0.08 AC-FT 2,330
WAT YR 1968: TOTAL 1,365.91 MEAN 3.73 MAX 540 MIN 0.03 AC-FT 2,710

16-2116. Makaha Stream near Makaha

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

Drainage area.--2.31 sq mi.

Records available.--July 1959 to September 1968.

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

Extremes.--Maximum discharge during year, 404 cfs Dec. 10 (gage height, 4.08 ft), from rating curve extended above 51 cfs as explained below; minimum, 0.08 cfs Sept. 24, 25.
1959-68: 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. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.17	1.0	1.2	1.5	1.8	1.9	2.6	1.5	0.69	0.42	0.23	0.14
2	.17	.62	.82	1.6	1.6	1.8	2.4	1.7	.63	.42	.23	.14
3	.17	.96	.56	1.5	1.7	2.2	6.0	1.6	.63	.42	.23	.17
4	.20	.45	.62	1.4	2.6	1.7	3.8	1.4	.63	.38	.26	.14
5	.23	.31	.40	4.2	1.6	1.6	11	1.3	.63	.38	.23	.14
6	.24	.27	.35	1.5	1.4	1.3	4.0	1.2	.63	.38	.20	.14
7	.23	.23	.27	1.3	1.2	1.1	3.0	1.1	.57	.52	.20	.17
8	.56	.31	4.9	1.2	1.2	1.0	2.6	1.1	.57	.42	.17	.23
9	1.6	.35	62	1.1	1.1	1.0	14	1.1	.57	.38	.14	.73
10	.50	.27	56	.95	1.0	1.0	12	1.8	.52	.38	.14	.38
11	.27	.31	21	.88	.95	1.7	8.1	1.5	.52	.38	.14	.26
12	.23	.69	10	.81	2.2	2.7	11	1.2	.52	.38	.14	.26
13	.20	.31	7.8	.75	1.6	4.3	6.8	1.0	.52	.34	.12	.23
14	.17	.23	6.0	.69	1.2	20	4.8	.90	.47	.34	.12	.20
15	.20	.20	4.2	.69	4.4	5.7	4.0	.81	.47	.30	.10	.17
16	.17	.17	3.7	15	2.7	12	8.0	.75	.38	.30	.10	.17
17	.17	.17	11	6.0	3.3	7.6	4.6	.95	.38	.30	.17	.17
18	.17	.35	27	3.5	1.9	5.7	3.5	1.0	.42	.30	.17	.12
19	.14	.23	14	2.7	6.5	12	3.7	.81	.38	.30	.17	.12
20	.14	.20	10	2.2	4.2	6.0	3.8	.75	.38	.26	.17	.12
21	.14	.17	6.5	2.4	8.3	4.2	6.1	.69	.38	.23	.17	.12
22	.12	.17	4.6	2.6	3.2	3.5	4.2	.63	.30	.23	.14	.12
23	.31	.94	5.3	6.3	2.3	6.8	2.7	.69	.30	.42	.14	.10
24	.23	1.0	6.2	2.7	2.2	12	2.4	.69	.30	.42	.14	.10
25	.20	1.5	4.4	2.2	9.9	7.6	2.3	.69	.30	.38	.14	.10
26	.17	1.9	2.6	1.9	3.8	5.7	2.0	.69	.34	.34	.14	.14
27	.17	2.5	2.2	3.8	2.7	6.3	1.8	.69	.34	.34	.14	.14
28	.14	1.0	1.9	4.8	2.3	4.6	1.7	.69	.34	.30	.14	.12
29	.17	1.4	2.0	2.8	2.0	3.8	1.6	.69	.38	.26	.12	.10
30	1.6	1.6	1.6	2.6	------	4.0	1.5	.69	.42	.23	.12	.12
31	.96	------	1.9	2.2	------	3.3	------	.69	------	.23	.12	------
TOTAL	10.14	19.81	281.02	83.77	80.85	154.1	146.0	31.00	13.91	10.68	4.94	5.36
MEAN	0.327	0.660	9.07	2.70	2.79	4.97	4.87	1.00	0.464	0.345	0.159	0.179
MAX	1.6	2.5	62	15	9.9	20	14	1.8	0.69	0.52	0.26	0.73
MIN	0.12	0.17	0.27	0.69	0.95	1.0	1.5	0.63	0.30	0.23	0.10	0.10
AC-FT	20	39	557	166	160	306	290	61	28	21	9.8	11

CAL YR 1967: TOTAL 919.69 MEAN 2.52 MAX 62 MIN 0.12 AC-FT 1,820
WAT YR 1968: TOTAL 841.58 MEAN 2.30 MAX 62 MIN 0.10 AC-FT 1,670

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-10	0400	4.08	404	1-16	1000	3.33	186
12-17	2230	3.96	340	4-21	1930	3.20	160

16-2280. Moanalua Stream near Honolulu

Location.--Lat 21°22'53", long 157°52'22", 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.

Records available.--June 1926 to September 1968.

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.

Extremes.--Maximum discharge during year, 1,800 cfs Dec. 9 (gage height, 9.21 ft), from rating curve extended above 120 cfs on basis of slope-area measurement at gage height 11.82 ft; no flow for many days.
1926-68: Maximum discharge, 4,580 cfs Nov. 18, 1930 (gage height, 12.58 ft, present datum), from rating curve extended above 110 cfs by test on model of station site; no flow at times each year.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	9.3	0.71	0.37	0	0.89	2.9				
2	0	0	6.9	.93	.22	0	.54	1.5				
3	0	0	4.0	.71	.16	0	1.5	.49				
4	0	0	2.2	56	.12	0	.65	.16				
5	0	0	1.1	60	.10	.03	1.0	.06				
6	0	0	.59	12	.08	.02	.96	.04				
7	0	0	.25	4.8	.07	0	.45	.03				
8	0	0	13	2.7	.04	0	.16	.02				
9	0	0	165	1.6	.02	0	.07	.02				
10	0	0	45	.96	.01	0	.14	.26				
11	0	0	17	.65	0	5.4	.12	.45				
12	0	0	8.4	.37	0	51	.12	.08				
13	0	0	4.4	.16	0	98	.07	.04				
14	0	0	3.0	.10	0	223	.03	.03				
15	0	0	1.7	.06	0	62	2.1	.02				
16	0	0	1.2	22	0	277	3.8	.02				
17	0	0	.71	9.1	0	86	12	.01				
18	0	0	128	4.2	0	21	3.8	.01				
19	7.2	0	17	3.1	0	24	48	0				
20	4.1	0	11	1.6	0	10	147	0				
21	1.7	0	4.8	1.0	0	5.7	15	0				
22	.33	0	3.4	.54	0	3.8	7.3	0				
23	.10	0	2.3	.29	0	13	3.2	0				
24	.10	47	6.1	.16	0	11	2.3	0				
25	.06	52	5.8	.10	0	7.9	3.6	0				
26	.04	26	2.3	.07	0	4.4	2.4	0				
27	.02	17	1.1	26	0	6.1	1.5	0				
28	.01	6.7	.71	7.4	0	4.1	.96	0				
29	0	3.2	.83	3.5	0	3.1	.45	0				
30	0	6.8	.41	1.5	------	2.4	.49	0				
31	0	------	1.6	.71	------	1.5	------	0	------			------
TOTAL	13.66	158.7	470.10	223.02	1.19	921.45	260.60	6.14	0	0	0	0
MEAN	0.441	5.29	15.2	7.19	0.041	29.7	8.69	0.198	0	0	0	0
MAX	7.2	52	166	60	0.37	277	147	2.9	0	0	0	0
MIN	0	0	0.25	0.06	0	0	0.03	0	0	0	0	0
AC-FT	27	315	932	442	2.4	1,830	517	12	0	0	0	0

CAL YR 1967: TOTAL 1,615.19 MEAN 4.43 MAX 166 MIN 0 AC-FT 3,200
WAT YR 1968: TOTAL 2,054.86 MEAN 5.61 MAX 277 MIN 0 AC-FT 4,080

PEAK DISCHARGE (BASE, 240 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1300	5.05	376	3-14	0200	7.95	1,240
12- 9	1330	9.21	1,800	3-16	0200	8.10	1,300
12-18	0500	7.52	1,080	4-20	0030	8.59	1,500
1- 4	2230	7.63	1,110				

16-2289. Kalihi Stream near Kaneohe

Location.--Lat 21°22'35", long 157°49'32", 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.

Records available.--November 1966 to September 1968.

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

Extremes.--Maximum discharge during year, 1,230 cfs Mar. 14 (gage height, 4.96 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.
1966-68: Maximum discharge, that of Mar. 14, 1968; minimum, 0.07 cfs on several days in 1968.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.32	0.91	1.6	0.95	0.61	0.32	1.3	2.6	0.23	0.08	0.21	0.12
2	.34	.66	1.3	1.1	.58	.28	1.2	1.4	.20	.08	.10	.08
3	.28	.46	1.1	.89	.55	.26	1.9	1.1	.20	.08	.10	.10
4	.30	.38	.93	11	.55	.43	1.2	.98	.20	.10	.28	.10
5	.30	.36	.95	4.1	.49	2.0	2.5	.87	.20	.10	.14	.10
6	.26	.34	.86	1.6	.43	.58	1.5	.79	.18	.10	.10	.12
7	.28	.32	.79	1.2	.43	.38	1.5	.72	.23	.10	.10	.17
8	8.7	.32	11	1.0	.40	.38	1.2	.76	.20	.08	.10	.08
9	1.4	.32	28	.92	.38	.36	1.2	.72	.16	.07	.10	.10
10	.67	.31	13	.86	.34	.38	1.2	1.2	.16	.07	.10	.08
11	.46	.40	4.2	.79	.34	3.5	.98	.83	.14	.08	.10	.08
12	.40	.32	3.1	.73	.36	10	1.4	.65	.16	.07	.12	.10
13	.43	.30	2.6	.67	.32	60	.98	.55	.32	.08	.10	.10
14	.36	.30	2.4	.64	.32	92	1.6	.58	.16	.10	.10	.08
15	.34	.32	2.3	.61	.36	22	2.8	.49	.12	.08	.10	.08
16	.32	.34	2.6	9.0	.32	53	2.3	.46	.12	.08	.10	.08
17	.32	.30	2.3	1.3	.30	17	5.4	.62	.10	.12	.10	.08
18	.53	.30	54	.95	.30	5.2	2.3	.43	.14	.10	.10	.10
19	.61	.32	3.7	.79	.58	8.0	14	.34	.12	.10	.10	.12
20	.55	.34	2.6	.95	.38	3.5	21	.37	.10	.10	.12	.12
21	.38	.30	2.2	.76	.61	2.6	7.4	.31	.10	.10	.20	.12
22	.38	.34	1.8	.67	.34	2.2	2.8	.31	.08	.10	.08	.08
23	.61	.39	2.0	.67	.32	4.2	2.6	.31	.08	.14	.08	.08
24	.55	7.0	3.2	.58	.33	4.6	1.9	.28	.08	.10	.10	.10
25	.43	16	2.3	.52	1.5	2.6	1.6	.28	.08	.12	.08	.14
26	.43	2.4	1.5	.52	.40	2.3	1.8	.32	.14	.14	.07	.41
27	.38	1.7	1.3	10	.32	3.3	1.4	.28	.10	.12	.08	.10
28	.40	1.2	1.1	1.4	.31	2.6	1.5	.31	.08	.12	.07	.08
29	.46	.95	1.3	.95	.30	2.5	1.2	.31	.08	.12	.07	.14
30	.54	1.1	1.0	.82	------	2.3	2.2	.23	.08	.18	.08	.08
31	.32	------	1.3	.70	------	1.6	------	.23	------	.12	.08	------
TOTAL	22.05	39.00	158.33	57.64	12.77	310.37	91.86	19.63	4.34	3.13	3.36	3.32
MEAN	0.711	1.30	5.10	1.86	0.440	10.0	3.06	0.633	0.145	0.101	0.108	0.111
MAX	8.7	16	54	11	1.5	92	21	2.6	0.32	0.18	0.28	0.41
MIN	0.26	0.30	0.79	0.52	0.30	0.26	0.98	0.23	0.08	0.07	0.07	0.08
AC-FT	44	77	314	114	25	616	182	39	8.6	6.2	6.7	6.6

CAL YR 1967: TOTAL 582.12 MEAN 1.59 MAX 54 MIN 0.26 AC-FT 1,150
WAT YR 1968: TOTAL 725.80 MEAN 1.98 MAX 92 MIN 0.07 AC-FT 1,440

PEAK DISCHARGE (BASE, 200 CFS, REVISED)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1430	3.30	390	1-27	0700	2.95	285
12-18	0500	3.46	444	3-14	0100	4.96	1,230
1-4	2100	3.14	342	3-16	0130	4.56	986
1-16	1230	3.88	630	4-20	0100	3.44	436

16-2290. Kalihi Stream near Honolulu

Location.--Lat 21°21'59", long 157°50'49", 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.

Records available.--September 1913 to April 1914, July 1914 to September 1968. 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, datum of 1929. Prior to Oct. 12, 1923, at datum 2.00 ft lower.

Extremes.--Maximum discharge during year, 2,380 cfs Dec. 18 (gage height, 9.99 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 not determined; minimum daily, 0.40 cfs Sept. 14-16, 23.
1913-68: 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 and 11.27 ft; minimum, 0.09 cfs Oct. 22, 1933, July 29, 1966.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	3.0	15	5.4	4.4	2.3	5.0	12	1.5	1.2	2.0	1.2
2	2.3	3.0	12	6.2	4.2	2.3	4.5	7.7	1.4	1.1	1.2	.64
3	1.7	2.5	10	5.1	4.2	2.0	7.0	5.9	1.4	1.1	1.1	.74
4	1.8	1.7	7.0	117	4.0	3.6	4.5	5.1	1.5	1.1	1.3	.45
5	1.3	1.5	6.0	42	3.6	10	7.0	4.6	1.5	.90	1.0	.43
6	1.5	1.5	5.1	12	3.6	4.5	4.5	4.4	1.4	.95	.80	.43
7	1.5	1.2	4.4	8.4	3.6	3.3	5.0	4.4	2.0	.90	.80	2.0
8	20	2.0	39	7.1	3.6	2.2	3.8	4.4	1.8	.80	.80	.80
9	5.0	1.5	89	6.8	3.6	2.1	3.8	4.4	1.5	.80	.80	.60
10	2.5	1.2	43	6.2	3.4	2.0	4.2	4.4	1.2	.80	.70	.50
11	2.0	5.0	16	5.6	3.2	12	3.5	4.4	1.3	1.3	.60	.43
12	1.8	2.5	12	5.1	3.0	35	4.5	4.2	1.3	1.0	.74	.43
13	1.6	2.0	11	4.9	2.6	100	3.5	4.2	3.1	1.0	.70	.45
14	1.5	1.5	10	4.4	2.4	76	3.0	3.8	3.0	1.0	.62	.40
15	1.2	1.5	8.7	4.4	2.7	60	8.0	3.2	2.0	.90	.62	.40
16	1.2	2.0	8.4	45	2.5	200	7.0	3.0	1.6	.80	.70	.40
17	1.1	1.5	5.9	15	2.4	60	17	3.4	1.6	1.1	.70	.54
18	4.5	1.5	216	10	2.3	14	7.0	3.0	1.5	1.1	.74	.47
19	10	2.0	23	8.0	2.8	15	60	2.6	1.4	1.1	.70	.45
20	6.0	2.0	15	10	2.5	9.6	70	2.4	1.3	1.0	.74	.60
21	4.0	1.5	11	8.0	3.0	9.0	11	2.3	1.2	1.0	.80	.54
22	2.3	3.0	9.1	6.0	2.7	10	8.0	2.2	1.2	1.0	.56	.43
23	2.5	10	9.1	5.8	2.5	12	9.0	2.2	1.2	3.0	.56	.40
24	2.5	70	14	5.4	2.3	17	8.0	2.4	1.2	1.0	.56	.43
25	2.0	80	11	4.0	8.0	8.4	10	2.4	1.2	.95	.56	.70
26	1.7	27	8.4	3.8	2.5	7.4	7.0	2.3	2.0	.90	.56	1.7
27	1.6	30	7.1	60	1.9	8.4	7.1	2.2	1.5	.90	.48	.60
28	1.5	10	6.5	15	1.6	7.4	6.2	1.9	1.2	.86	.48	.45
29	1.5	7.0	8.0	7.0	1.6	7.0	5.4	1.8	1.2	.80	.48	.42
30	2.0	8.0	6.2	5.0	------	9.0	11	1.8	1.2	1.3	.48	.45
31	2.0	------	6.5	4.9	------	4.0	------	1.5	------	1.0	.60	------
TOTAL	943	287.1	653.4	453.5	90.7	715.5	315.5	114.5	46.4	32.66	23.48	18.48
MEAN	3.04	9.57	21.1	14.6	3.13	23.1	10.5	3.69	1.55	1.05	0.757	0.616
MAX	20	80	216	117	8.0	200	70	12	3.1	3.0	2.0	2.0
MIN	1.1	1.2	4.4	3.8	1.6	2.0	3.0	1.5	1.2	0.80	0.48	0.40
AC-FT	187	569	1300	900	180	1420	626	227	92	65	47	37

CAL YR 1967: TOTAL 3,092.0 MEAN 8.47 MAX 216 MIN 1.1 AC-FT 6,130
WAT YR 1968: TOTAL 2,845.52 MEAN 7.77 MAX 216 MIN 0.40 AC-FT 5,640

PEAK DISCHARGE (BASE, 390 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	about 1500	9.09	1,610	1- 4	2200	-	about 1,500
12- 9	1330	6.88	554	3-14	0100	-	about 1,400
12-18	0400	9.99	2,380	3-16	2200	8.77	1,400

Note.--No gage-height record Oct. 2 to Dec. 5, Mar. 5 to Apr. 26, July 5 to Sept. 30.

16-2293. Kalihi Stream at Kalihi

Location.--Lat 21°20'29", long 157°52'36", 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.

Records available.--Water year 1962 (annual maximum), July 1962 to September 1968.

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.

Extremes.--Maximum discharge during year, 5,270 cfs Dec. 18 (gage height, 7.54 ft), from rating curve extended above 780 cfs on basis of slope-area measurements at gage heights 8.0 and 8.24 ft; minimum, 0.51 cfs Sept. 6, 7.
1961-68: Maximum discharge, about 7,000 cfs Nov. 14, 1965.
1962-68: Minimum discharge, 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. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	5.2	29	6.9	5.5	3.0	14	30	2.3	1.6	4.2	3.6
2	4.2	5.2	21	10	4.8	2.4	13	14	2.3	1.5	1.7	1.2
3	3.1	4.2	18	6.9	4.7	2.3	19	9.1	2.3	1.4	1.3	2.1
4	3.4	2.8	12	173	4.5	4.6	13	6.4	2.4	1.2	2.2	.75
5	2.4	2.6	9.6	113	4.3	21	19	5.6	2.3	1.1	1.8	.67
6	2.6	2.6	8.2	19	4.2	6.4	13	5.6	2.3	1.2	1.2	.67
7	2.6	2.1	8.2	14	4.2	4.2	15	5.3	3.3	1.1	1.0	6.0
8	34	3.4	49	11	4.2	3.3	11	5.2	2.8	1.0	1.0	2.0
9	9.6	2.8	212	9.1	4.2	2.8	11	5.1	2.3	1.0	1.0	1.2
10	4.5	2.1	66	8.2	3.9	2.8	12	5.1	2.3	1.0	.93	.84
11	3.6	8.2	26	6.8	3.8	28	9.6	5.1	2.3	2.0	.75	.75
12	3.1	4.2	17	6.4	3.8	107	13	5.1	2.2	1.2	1.2	.75
13	2.8	2.8	13	6.0	2.9	185	9.6	5.0	7.8	1.2	1.1	.93
14	2.4	2.6	11	5.6	2.8	444	8.6	4.5	5.6	1.2	.93	.67
15	2.1	2.6	9.6	5.2	3.2	174	22	4.0	2.6	1.0	.93	.67
16	2.1	3.6	9.6	121	2.8	718	19	3.8	2.3	.93	1.3	.75
17	1.9	2.6	9.1	18	2.7	178	47	4.9	2.2	1.4	1.3	2.5
18	7.7	2.6	614	13	2.6	44	19	4.0	2.3	1.4	1.4	1.4
19	18	3.4	34	8.6	3.5	46	93	3.7	1.7	1.3	1.3	1.1
20	11	3.4	22	12	3.0	25	95	3.3	2.0	1.3	1.4	2.3
21	6.1	2.8	16	9.6	4.0	18	32	2.8	1.6	1.1	1.8	2.1
22	3.9	6.3	14	7.2	3.8	15	15	2.7	1.6	1.1	1.2	.84
23	4.3	17	15	6.8	2.9	36	18	2.6	1.6	6.8	1.2	.75
24	4.2	134	23	6.0	2.6	50	18	2.6	1.5	1.3	1.2	.93
25	3.4	141	17	5.2	15	26	23	2.6	1.7	1.1	1.2	.84
26	2.8	48	12	4.9	3.0	21	13	2.8	3.3	1.2	1.2	5.2
27	2.6	54	9.8	102	2.6	24	9.2	2.7	1.8	1.1	1.0	2.2
28	2.4	17	8.2	19	2.4	17	8.2	2.6	1.6	1.1	.67	1.2
29	2.4	12	14	10	2.3	19	7.1	3.0	1.5	1.0	.75	1.0
30	3.4	13	8.2	6.6	------	25	19	2.4	1.7	3.0	.75	1.3
31	3.4	------	11	5.8	------	16	------	2.3	------	2.2	.84	------
TOTAL	162.6	514.1	1346.5	756.8	114.2	2268.8	638.3	163.9	73.5	46.03	39.75	47.21
MEAN	5.25	17.1	43.4	24.4	3.94	73.2	21.3	5.29	2.45	1.48	1.28	1.57
MAX	34	141	614	173	15	718	95	30	7.8	6.8	4.2	6.0
MIN	1.9	2.1	8.2	4.9	2.3	2.3	7.1	2.3	1.5	0.93	0.67	0.67
AC-FT	323	1020	2670	1500	227	4500	1270	325	146	91	79	94

CAL YR 1967: TOTAL 5,359.6 MEAN 14.7 MAX 614 MIN 1.0 AC-FT 10,630
WAT YR 1968: TOTAL 6,171.69 MEAN 16.9 MAX 718 MIN 0.67 AC-FT 12,240

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1600	5.95	2,790	1-16	1330	5.00	1,750
12- 9	1330	5.62	2,390	3-14	0130	6.56	3,580
12-18	0430	7.54	5,270	3-16	2200	7.08	4,440
1- 4	2200	6.62	3,670	4-20	0130	4.79	1,560

Note.--No gage-height record Apr. 22 to May 27.

16-2320. Nuuanu Stream below reservoir 2 wasteway, near Honolulu

Location.--Lat 21°20'55", long 157°49'40", 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.

Records available.--October 1913 to January 1921, September 1921 to September 1968.

Gage.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1915, staff gage at same site at datum 0.03 ft lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

Extremes.--Maximum discharge during year, 1,580 cfs Mar. 16 (gage height, 5.88 ft), from rating curve extended above 420 cfs on basis of slope-area measurement at gage height 6.69 ft; minimum, 1.0 cfs Sept. 6, 22, 29, 30.
1913-68: Maximum discharge, 6,990 cfs Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 420 cfs by test on model of station site; minimum, 0.09 cfs Sept. 10, 11, 1925.

Remarks.--Records fair. 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	5.4	8.8	6.2	6.6	4.0	12	11	3.9	2.7	2.4	1.9
2	4.0	4.0	8.2	7.4	6.3	3.9	12	7.9	3.9	2.6	1.7	1.7
3	3.5	3.7	7.3	6.6	6.2	3.8	15	7.1	3.8	2.8	1.6	1.5
4	3.7	3.3	6.3	53	6.0	4.3	11	6.8	3.9	2.6	1.8	1.2
5	3.4	3.1	5.9	37	5.8	12	14	6.3	3.7	2.5	1.7	1.1
6	3.3	3.1	5.6	13	5.6	4.6	11	6.3	3.6	2.5	1.6	1.2
7	3.4	3.0	5.2	9.9	5.5	4.2	12	6.3	4.3	2.4	1.4	2.5
8	11	3.2	18	9.3	5.3	4.0	10	6.3	3.8	2.5	1.4	1.8
9	4.4	3.1	67	9.0	5.1	3.8	10	6.2	3.6	2.4	1.4	1.6
10	3.6	2.8	31	8.5	5.0	4.0	10	7.0	3.7	2.4	1.4	1.4
11	3.5	3.1	14	8.2	5.0	20	9.9	6.0	3.5	2.6	1.3	1.3
12	3.5	2.9	11	7.9	5.3	38	11	5.8	3.5	2.4	1.5	1.3
13	3.4	2.8	9.9	7.6	5.0	58	9.9	5.0	4.8	2.5	1.4	1.3
14	3.3	2.7	9.0	7.3	5.0	216	9.6	5.2	4.5	2.4	1.4	1.3
15	3.2	2.6	8.5	7.1	5.1	143	16	5.3	3.7	2.2	1.4	1.4
16	3.1	2.9	9.6	20	5.0	355	14	5.2	3.5	2.3	1.3	1.4
17	3.1	2.6	15	8.5	4.5	170	53	5.2	3.2	2.4	1.4	1.4
18	5.6	2.6	213	7.9	4.3	104	46	5.0	3.3	2.3	1.5	1.3
19	5.1	3.2	102	7.4	4.9	106	36	4.9	3.2	2.4	1.5	1.2
20	5.0	3.7	93	7.6	4.6	94	30	4.5	3.3	2.2	1.5	1.3
21	4.0	2.9	86	7.1	4.9	64	15	4.6	3.2	2.1	1.5	1.2
22	3.5	4.1	41	6.8	4.4	26	12	4.6	3.1	2.2	1.5	1.0
23	4.1	8.7	7.9	6.6	4.3	28	11	4.6	3.0	3.2	1.4	1.2
24	3.6	28	9.3	6.5	4.2	33	10	4.3	3.0	2.4	1.4	1.4
25	3.2	63	7.6	6.3	8.2	25	12	4.2	3.0	2.3	1.4	1.2
26	3.4	15	6.6	6.0	4.5	21	9.6	4.5	3.2	2.2	1.4	1.7
27	3.3	13	6.6	32	4.3	16	8.5	4.3	3.0	2.1	1.5	1.4
28	3.2	7.4	6.6	8.8	4.0	16	7.9	4.1	2.9	2.1	1.4	1.2
29	3.2	6.8	6.5	7.0	4.0	15	7.1	4.8	2.8	2.0	1.3	1.0
30	4.0	8.2	6.3	6.8	------	17	7.6	4.2	2.8	2.5	1.2	1.0
31	3.4	------	6.3	6.6	------	14	------	4.0	------	2.2	1.2	------
TOTAL	121.6	220.9	839.0	349.9	148.9	1627.6	453.1	171.5	104.7	74.4	45.8	41.4
MEAN	3.92	7.36	27.1	11.3	5.13	52.5	15.1	5.53	3.49	2.40	1.48	1.38
MAX	11	63	213	53	8.2	355	53	11	4.8	3.2	2.4	2.5
MIN	3.1	2.6	5.2	6.0	4.0	3.8	7.1	4.0	2.8	2.0	1.2	1.0
AC-FT	241	438	1660	694	295	3230	899	340	208	148	91	82

CAL YR 1967: TOTAL 2,935.9 MEAN 8.04 MAX 213 MIN 2.6 AC-FT 5,820
WAT YR 1968: TOTAL 4,198.8 MEAN 11.5 MAX 355 MIN 1.0 AC-FT 8,330

PEAK DISCHARGE (BASE, 240 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1600	5.17	896	3-14	0200	5.15	880
12- 9	1430	4.61	550	3-16	2230	5.88	1,580
12-18	0230	5.60	1,270	4-17	1400	3.82	284
1- 4	2230	4.40	450				

16-2385. Waihi Stream at Honolulu

Location (revised).--Lat 21°19'54", long 157°48'13", 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.

Records available.--May 1913 to January 1921, August 1925 to September 1968. Prior to July 1960, published as West Branch Manoa Stream near Honolulu.

Gage.--Digital 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, staff gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, graphic water-stage recorder at site 150 ft upstream at different datum. Aug. 4, 1925, to Mar. 15, 1928, graphic water-stage recorder at present site at datum 3.35 ft lower and Mar. 16, 1928, to July 2, 1963, at present site and datum.

Extremes.--Maximum discharge during year, 956 cfs Dec. 18 (gage height, 4.71 ft), from rating curve extended above 120 cfs by test on model of station site; minimum, 0.18 cfs Aug. 16, 17, 29-31.
1913-21, 1925-68: 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. Occasional small diversion for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.76	3.2	9.3	1.6	1.0	0.55	2.4	13	0.76	0.48	1.6	2.3
2	2.6	1.5	9.6	3.0	1.0	.48	2.3	4.5	.69	.42	.69	1.0
3	1.1	1.3	6.4	1.9	1.0	.42	6.2	3.1	.69	.42	.55	.30
4	1.5	.76	4.5	41	.90	3.0	2.5	2.5	.62	.36	.84	.26
5	.84	.69	4.0	16	.90	9.0	3.8	2.3	.62	.30	.84	.26
6	.69	.69	3.1	3.9	.90	1.9	2.4	2.1	.62	.30	.62	.30
7	.62	.62	2.7	2.7	.90	1.3	2.8	2.0	1.7	.30	.48	9.6
8	15	.76	20	2.5	.85	.92	2.0	2.0	.92	.30	.48	2.2
9	2.7	.76	48	2.1	.84	.76	2.1	2.1	.69	.30	.42	1.8
10	1.5	.62	16	2.0	.84	.84	2.1	3.8	.69	.30	.36	1.1
11	1.3	5.4	4.5	1.8	.76	15	1.9	1.9	.76	.55	.36	.69
12	1.2	1.5	3.6	1.6	1.1	38	2.4	1.7	1.1	.36	.36	.76
13	1.0	.84	3.1	1.6	.92	70	1.7	1.5	1.9	.48	.42	.92
14	.84	.76	2.7	1.5	.76	67	1.6	1.5	1.6	.42	.36	.55
15	.69	.62	2.4	1.5	1.2	45	10	1.4	.92	.30	.30	.42
16	.62	1.8	3.9	10	.84	97	2.8	1.3	.92	.30	.26	.48
17	.55	.76	2.2	2.7	.62	30	14	1.6	.84	.92	.26	.36
18	5.0	.62	110	2.1	.55	11	3.4	1.3	1.2	.55	.26	.48
19	6.8	1.6	8.7	1.7	1.4	10	22	1.2	.76	.48	.30	.42
20	5.0	3.5	5.6	1.7	1.1	6.6	7.8	1.2	1.0	.36	.26	.62
21	2.4	2.0	4.2	1.6	1.6	5.4	3.3	1.0	.69	.30	.62	1.1
22	1.6	8.0	3.8	1.4	.84	4.7	2.3	.92	.62	.30	.36	.48
23	3.3	16	3.5	1.3	.69	7.4	2.3	.92	.55	2.6	.26	.62
24	1.4	25	4.9	1.2	.62	12	2.3	.84	.55	.76	.22	.84
25	1.1	37	3.3	1.1	4.5	5.2	5.9	.92	.48	.84	.26	.92
26	1.2	10	2.7	1.0	1.1	4.0	3.3	1.5	2.7	1.0	.26	3.9
27	.92	7.0	2.4	16	.76	3.5	2.2	1.1	.76	.55	.36	1.6
28	.84	4.0	2.2	2.0	.69	3.3	1.8	1.1	.55	.62	.48	1.1
29	.92	4.1	2.1	1.5	.62	2.8	1.7	4.9	.48	.69	.26	.92
30	2.0	5.4	2.0	1.2	------	3.4	5.6	1.2	.84	.55	.22	.84
31	1.1	------	2.0	1.0	------	2.8	------	.84	------	.92	.26	------
TOTAL	67.09	146.80	303.4	132.2	29.80	463.27	126.9	67.24	27.22	17.33	13.58	37.14
MEAN	2.16	4.89	9.79	4.26	1.03	14.9	4.23	2.17	0.907	0.559	0.438	1.24
MAX	15	37	110	41	4.5	97	22	13	2.7	2.6	1.6	9.6
MIN	0.55	0.62	2.0	1.0	0.55	0.42	1.6	0.84	0.48	0.30	0.22	0.26
AC-FT	133	291	602	262	59	919	252	133	54	34	27	74

CAL YR 1967: TOTAL 1,644.92 MEAN 4.51 MAX 110 MIN 0.36 AC-FT 3,260
WAT YR 1968: TOTAL 1,431.97 MEAN 3.91 MAX 110 MIN 0.22 AC-FT 2,840

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1500	4.26	720	1- 4	2115	3.51	428
12- 9	1400	3.98	593	3-13	2315	3.27	346
12-18	0415	4.71	956	3-16	2100	4.20	690

16-2405. Waiakeakua Stream at Honolulu

Location (revised).--Lat 21°19'52", long 157°48'08", 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.

Records available.--May 1913 to January 1921, August 1925 to September 1968. 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, staff 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.

Extremes.--Maximum discharge during year, 1,180 cfs Dec. 18 (gage height, 4.78 ft), from rating curve extended above 110 cfs on basis of slope-area measurement at gage height 5.28 ft; minimum, 2.2 cfs Aug. 17.
1913-21, 1925-68: 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 except those for period of no gage-height record, which are fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	9.3	10	4.7	4.3	3.7	6.0	14	4.3	4.0	4.2	3.5
2	4.9	5.0	9.9	6.1	4.3	3.4	6.1	7.2	4.3	3.8	3.6	4.0
3	3.8	4.7	6.8	5.0	4.3	3.3	12	6.3	4.3	3.7	3.4	4.5
4	4.1	3.8	5.7	32	4.3	6.9	6.4	6.0	4.3	3.7	4.3	4.0
5	3.7	3.7	5.7	13	4.0	15	13	5.7	4.2	3.7	4.1	3.5
6	3.6	3.7	4.7	6.4	4.0	4.7	6.9	5.6	4.2	3.7	3.6	15
7	3.7	3.6	11	5.4	4.0	4.1	6.9	5.4	5.8	3.7	3.4	50
8	20	3.7	19	5.2	3.8	3.8	5.9	5.6	4.6	3.7	3.4	30
9	5.4	3.7	42	5.0	3.7	3.7	6.2	6.2	4.3	3.6	3.4	15
10	4.2	3.6	21	5.0	3.7	4.1	6.3	7.8	4.3	3.6	3.4	9.0
11	4.1	6.5	8.0	4.7	3.6	28	6.0	5.7	4.5	3.6	3.4	6.0
12	3.8	4.1	6.3	4.5	4.1	43	6.5	5.4	4.6	3.6	3.4	5.0
13	3.6	3.6	5.6	4.3	3.7	59	5.7	5.3	5.9	3.8	3.3	4.5
14	3.3	3.4	5.3	4.2	3.6	82	6.1	5.3	5.4	3.7	3.2	4.5
15	3.3	3.4	5.0	4.2	4.1	32	15	5.0	4.5	3.6	3.1	4.0
16	5.6	4.2	7.8	13.0	3.7	103	7.0	5.0	4.5	3.6	3.1	4.0
17	8.8	3.4	26	6.2	3.3	39	13	5.7	4.5	4.0	2.7	3.5
18	5.7	3.3	108	5.2	3.3	13	7.4	5.2	4.5	3.7	3.0	3.5
19	4.3	4.1	9.7	4.7	4.4	17	23	4.7	4.1	3.7	3.2	3.8
20	4.0	4.5	8.0	4.9	4.0	10	10	4.6	4.1	3.6	3.3	4.0
21	5.7	4.3	6.9	4.7	4.6	7.4	7.0	4.6	4.0	3.6	5.0	6.0
22	4.1	6.9	6.4	4.5	3.7	6.4	6.4	4.6	4.0	3.4	3.0	4.0
23	3.8	9.7	6.6	4.3	3.4	12	6.9	4.6	4.0	5.9	3.5	4.0
24	4.0	14	7.2	4.3	3.3	23	6.5	4.5	4.0	3.8	3.0	5.0
25	3.8	16	5.9	4.1	7.5	8.9	8.2	4.6	4.0	4.0	3.5	15
26	3.8	8.9	5.3	4.0	4.0	7.5	6.8	4.7	6.9	3.8	3.5	40
27	3.7	6.2	5.0	16	3.7	7.4	6.3	4.5	4.2	3.6	5.0	25
28	3.7	4.9	4.9	6.2	3.7	7.2	6.0	4.3	4.0	3.7	6.0	15
29	3.6	5.0	4.9	5.2	3.7	6.9	6.0	8.4	4.0	3.4	4.0	8.0
30	6.5	5.8	5.0	4.6	------	8.2	8.4	5.3	4.2	3.4	3.5	6.0
31	4.1	------	5.0	4.5	------	6.6	------	4.5	------	3.8	3.0	------
TOTAL	150.0	167.0	388.6	206.1	115.8	580.2	243.9	176.3	134.5	116.5	111.5	309.3
MEAN	4.84	5.57	12.5	6.65	3.99	18.7	8.13	5.69	4.48	3.76	3.60	10.3
MAX	20	16	108	32	7.5	103	23	14	6.9	5.9	6.0	50
MIN	3.3	3.3	4.7	4.0	3.3	3.3	5.7	4.3	4.0	3.4	2.7	3.5
AC-FT	298	331	771	409	230	1,150	484	350	267	231	221	613

CAL YR 1967: TOTAL 2,323.8 MEAN 6.37 MAX 108 MIN 2.3 AC-FT 4,610
WAT YR 1968: TOTAL 2,699.7 MEAN 7.38 MAX 108 MIN 2.7 AC-FT 5,350

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1100	4.00	630	3-14	0030	3.57	420
12-18	0730	4.78	1,180	3-16	2300	4.36	852
1- 4	2130	3.90	570	4-15	1500	3.35	345
1-16	1200	3.54	409				

Note.--No gage-height record Aug. 18 to Sept. 30.

16-2440. Pukele Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'30", 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.

Records available.--June 1926 to September 1968.

Gage.--Digital 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). Prior to July 3, 1963, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 1,000 cfs Dec. 18 (gage height, 5.94 ft), from rating curve extended above 96 cfs on basis of slope-area measurement at gage height 6.13 ft; minimum, 0.18 cfs Aug. 31, Sept. 1. 1926-68: Maximum discharge, 2,600 cfs Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 71 cfs by test on model of station site; minimum, 0.08 cfs Oct. 31, 1929.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.56	2.1	4.1	1.0	0.90	0.65	1.8	1.9	0.65	0.44	0.39	0.20
2	.60	.97	6.9	1.2	.90	.65	1.6	1.6	.65	.41	.36	.22
3	.56	.76	3.5	1.0	1.5	.60	7.0	1.5	.65	.41	.35	.25
4	.56	.70	2.2	40	1.0	.88	2.0	1.4	.65	.41	.42	.30
5	.52	.76	1.4	5.0	.90	11	10	1.4	.60	.41	.38	.28
6	.52	.76	1.3	2.0	.85	1.4	6.0	1.3	.60	.41	.35	.28
7	.52	.70	1.3	1.4	.80	.88	4.0	1.2	.60	.41	.33	3.5
8	5.8	.70	6.9	1.3	.75	.82	2.5	1.2	.56	.38	.31	1.0
9	.65	.70	49	1.2	.70	.76	2.0	1.1	.56	.38	.29	.70
10	.56	.65	22	1.1	.70	.88	2.2	1.5	.56	.35	.27	.50
11	.60	1.5	6.5	1.0	.70	18	2.0	.88	.56	.35	.26	.40
12	.65	.70	3.4	.92	.90	38	2.0	.88	.56	.35	.25	.35
13	.65	.60	2.3	.86	.80	32	2.0	.82	1.7	.35	.24	.32
14	.65	.60	2.5	.84	.70	63	1.9	.82	.97	.38	.24	.30
15	.65	.60	2.1	1.0	.70	27	6.9	.76	.48	.35	.24	.30
16	.60	.60	4.6	30	.65	42	2.5	.76	.48	.35	.24	.29
17	.60	.60	2.3	5.0	.60	20	12	.82	.44	.35	.26	.28
18	.76	.56	120	2.0	.60	8.0	4.3	.88	.48	.35	.26	.28
19	2.9	.56	20	1.0	.80	10	14	.82	.44	.35	.28	.28
20	1.3	.60	5.0	1.1	.56	5.0	5.8	.82	.41	.35	.30	.29
21	.65	.56	2.0	1.0	.70	3.0	2.6	.76	.41	.32	.35	.35
22	.60	.65	1.3	1.0	.56	2.5	2.0	.76	.41	.32	.30	.32
23	.97	1.5	1.2	1.5	.56	4.6	3.0	.76	.41	.32	.31	.30
24	.70	8.6	1.6	1.2	.60	13	2.0	.76	.38	.32	.30	.42
25	.65	4.4	1.2	1.1	2.5	5.2	2.2	.76	.41	.32	.27	1.5
26	.65	3.4	1.1	1.1	.65	3.4	2.0	.70	1.1	.40	.30	2.5
27	.60	1.5	1.0	50	.65	2.7	1.9	.65	.48	.35	.26	.80
28	.60	.82	.93	4.0	.65	2.3	1.9	.65	.41	.37	.25	.60
29	.56	.82	.88	2.0	.65	2.0	1.7	.60	.41	.35	.23	.50
30	1.2	1.4	.82	1.5	------	2.3	1.7	.82	.44	.35	.21	.45
31	.56	------	1.1	1.0	------	2.0	------	.60	------	.35	.20	------
TOTAL	27.95	39.37	280.43	164.32	23.53	324.52	113.5	30.18	17.46	11.31	9.00	18.06
MEAN	0.902	1.31	9.05	5.30	0.811	10.5	3.78	0.974	0.582	0.365	0.290	0.602
MAX	5.8	8.6	120	50	2.5	63	14	1.9	1.7	0.44	0.42	3.5
MIN	0.52	0.56	0.82	0.84	0.56	0.60	1.6	0.60	0.38	0.32	0.20	0.20
AC-FT	55	78	556	326	47	644	225	60	35	22	18	36

CAL YR 1967: TOTAL 1,107.63 MEAN 3.03 MAX 120 MIN 0.35 AC-FT 2,200
WAT YR 1968: TOTAL 1,059.63 MEAN 2.90 MAX 120 MIN 0.20 AC-FT 2,100

PEAK DISCHARGE (BASE, 140 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1415	4.84	496	3-14	0500	3.82	225
12-18	0430	5.94	1,000	3-16	2400	4.53	402
1-27	0815	3.77	214				

Note.--No gage-height record Dec. 18 to Feb. 19, Aug. 19 to Sept. 30.

16-2460. Waiomao Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'10", 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.

Records available.--April to December 1911, May to December 1912, June 1926 to September 1968. 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, staff gage at site 0.5 mile downstream at different datum.

Extremes.--Maximum discharge during year, 765 cfs Dec. 18 (gage height, 5.39 ft), from rating curve extended above 140 cfs on basis of slope-area measurement at gage height 4.74 ft; no flow for several days.
1911-12, 1926-68: Maximum discharge, 1,550 cfs Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 98 cfs by test on model of station site; no flow at times.

Remarks.--Records fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.32	1.2	2.9	0.54	0.50	0.29	1.1	1.2	0.35	0.17	0.32	0
2	1.2	.60	6.1	.78	.50	.26	1.5	.94	.35	.13	.15	0
3	.58	.50	2.8	.63	.40	.29	9.5	.68	.46	.11	.13	.10
4	.42	.30	1.9	10	.40	1.1	3.6	.54	.42	.09	.26	.09
5	.38	.25	1.2	5.0	.40	10	6.6	.50	.42	.07	.29	.05
6	.32	.25	.94	3.9	.40	1.4	2.3	.46	.29	.07	.26	.03
7	.26	.25	.73	1.5	.40	.73	2.2	.38	.29	.06	.15	3.9
8	8.7	.30	15	.94	.35	.46	1.4	.38	.32	.05	.11	.88
9	1.8	.30	50	.73	.35	.38	2.1	.83	.32	.05	.07	.68
10	.78	.25	20	.58	.32	.44	1.8	1.9	.32	.03	.04	.38
11	.50	2.0	6.5	.58	.32	26	1.4	1.4	.29	.04	.06	.23
12	.46	.60	3.3	.50	.57	45	1.1	.63	.35	.06	.06	.15
13	.94	.30	1.7	.46	.38	47	.78	.42	2.9	.05	.03	.15
14	.50	.25	1.7	.42	.29	102	.63	.38	2.3	.09	.01	.09
15	.38	.25	1.1	.38	.73	25	7.0	.35	.46	.05	.01	.07
16	.32	.70	3.5	10	.58	53	3.0	.32	.38	.03	.01	.06
17	.26	.30	1.6	3.2	.35	23	12	.88	.29	.07	.01	.05
18	.86	.25	120	2.0	.29	5.1	4.8	.63	.23	.15	.01	.05
19	2.7	.50	10	1.4	.89	10	12	.38	.20	.09	0	.05
20	2.4	1.3	4.4	1.1	1.0	3.8	4.5	.38	.20	.06	0	.06
21	1.0	.80	2.7	1.1	1.4	1.9	2.1	.38	.17	.04	.01	.20
22	.50	3.0	2.0	.78	.68	1.4	1.4	.35	.13	.04	0	.07
23	1.3	5.0	1.4	1.2	.42	2.8	2.9	.35	.13	.38	0	.05
24	1.7	8.7	1.1	1.1	.35	9.6	1.4	.32	.15	.23	.01	.15
25	.54	4.3	.92	.83	3.8	3.3	1.2	.29	.15	.20	.01	1.1
26	.42	3.5	.88	.68	1.0	2.1	1.1	.35	3.9	.50	.01	2.0
27	.38	2.7	.80	17	.50	1.8	.88	.26	.68	.32	.01	1.0
28	.32	1.6	.73	10	.38	1.4	.83	.23	.32	.17	0	.42
29	.32	1.6	1.2	1.5	.32	1.9	.68	.97	.23	.20	0	.26
30	.80	2.0	.68	.80	------	4.3	.82	3.2	.20	.15	0	.17
31	.50	------	.68	.60	------	1.7	------	.58	------	.26	0	------
TOTAL	31.86	43.85	268.46	80.23	18.27	387.45	92.62	20.86	17.20	4.01	2.03	12.49
MEAN	1.03	1.46	8.66	2.59	0.630	12.5	3.09	0.673	0.573	0.129	0.065	0.416
MAX	8.7	8.7	120	17	3.8	102	12	3.2	3.9	0.50	0.32	3.9
MIN	0.26	0.25	0.68	0.38	0.29	0.26	0.63	0.23	0.13	0.03	0	0
AC-FT	63	87	532	159	36	768	184	41	34	8.0	4.0	25

CAL YR 1967: TOTAL 927.09 MEAN 2.54 MAX 120 MIN 0.01 AC-FT 1,840
WAT YR 1968: TOTAL 979.33 MEAN 2.68 MAX 120 MIN 0 AC-FT 1,940

PEAK DISCHARGE (BASE, 110 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1430	4.59	427	3-14	0400	4.37	361
12-18	0430	5.39	765	3-16	2300	4.84	516
1-27	0700	3.21	113				

16-2470. Palolo Stream near Honolulu

Location.--Lat 21°17'35", long 157°48'25", 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.

Records available.--April 1952 to September 1968.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 95 ft (from topographic map). Prior to Apr. 28, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 4,270 cfs Dec. 18 (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, 0.40 cfs Aug. 24, 28-31, Sept. 1.
1952-68: Maximum discharge, that of Dec. 18, 1967; 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	8.2	9.8	3.5	3.2	2.3	4.4	4.5	1.1	0.80	1.1	0.47
2	2.7	5.2	16	4.5	3.2	2.3	4.7	3.5	1.1	.68	.58	.49
3	1.5	3.8	6.1	3.5	9.3	2.3	29	3.0	1.1	.73	.53	.55
4	1.5	2.6	5.2	70	6.2	6.2	10	2.5	1.1	.72	.70	.67
5	1.3	2.8	3.3	15	3.9	26	22	2.2	1.1	.71	.70	.54
6	1.2	2.5	3.0	10	3.6	5.0	7.8	2.0	1.1	.69	.58	.70
7	1.4	2.5	2.8	8.0	3.9	3.3	6.0	1.8	1.2	.68	.53	6.8
8	26	2.8	16	6.0	3.6	2.7	4.0	1.7	1.3	.68	.58	1.2
9	2.5	2.6	196	5.0	3.2	2.1	7.2	2.0	1.2	.66	.48	.93
10	1.4	2.5	63	4.5	2.9	4.1	5.0	10	1.2	.64	.48	1.1
11	1.3	8.0	11	4.0	2.7	71	4.0	4.0	1.3	.83	.48	.70
12	1.3	3.9	6.6	3.8	6.8	132	3.5	2.5	1.5	.58	.77	.70
13	1.9	2.1	3.3	3.6	2.5	106	3.2	2.0	5.8	.63	.58	.63
14	1.4	2.1	3.2	3.5	2.0	169	3.0	1.7	4.0	.77	.53	.58
15	1.3	2.1	2.5	5.0	6.2	57	24	1.5	1.5	.63	.50	.58
16	1.3	2.6	19	50	2.5	101	8.9	1.4	1.3	.58	.51	.58
17	1.3	2.6	7.4	6.0	2.0	68	44	3.0	1.2	.77	.52	.53
18	2.7	2.4	300	3.9	1.9	9.0	12	2.0	1.1	.70	.52	.77
19	8.7	2.7	50	3.0	8.0	15	32	1.7	1.1	.70	.50	.58
20	5.0	3.1	15	3.6	3.6	6.7	12	1.4	1.0	.58	.50	2.7
21	2.5	2.6	10	2.4	8.0	5.1	7.0	1.4	.95	.63	.55	1.0
22	1.9	3.9	8.0	1.9	2.3	4.6	5.0	1.3	.90	.63	.51	.70
23	5.6	4.9	6.0	3.9	1.9	10	15	1.3	.90	1.2	.58	.85
24	3.6	47	5.0	2.2	2.9	32	5.0	1.2	.85	.71	.88	.93
25	2.0	18	4.5	2.0	9.3	13	4.5	1.2	.90	.63	.57	1.7
26	2.0	12	4.0	1.8	3.6	8.4	4.0	1.2	7.0	.93	.62	1.4
27	1.7	8.3	3.6	126	2.7	6.9	3.5	1.1	1.8	.93	.56	1.1
28	1.7	5.7	3.3	9.9	2.3	5.8	3.3	1.1	1.4	1.0	.50	.77
29	1.8	5.6	3.1	4.3	2.3	5.8	3.0	1.4	1.1	.63	.46	.70
30	8.1	6.6	3.0	5.0	------	14	3.5	3.9	1.0	.63	.46	.63
31	3.0	------	5.0	3.9	------	5.9	------	1.2	------	.85	.46	------
TOTAL	100.8	181.7	794.7	379.7	116.5	902.5	300.5	70.7	48.10	22.53	17.82	31.58
MEAN	3.25	6.06	25.6	12.2	4.02	29.3	10.0	2.28	1.60	0.727	0.575	1.05
MAX	26	47	300	126	9.3	169	44	10	7.0	1.2	1.1	6.8
MIN	1.2	2.1	2.5	1.8	1.9	2.1	3.0	1.1	0.85	0.58	0.46	0.47
AC-FT	200	360	1580	753	231	1790	596	140	95	45	35	63

CAL YR 1967: TOTAL 3,215.1 MEAN 8.81 MAX 300 MIN 1.1 AC-FT 6,380
WAT YR 1968: TOTAL 2,967.13 MEAN 8.11 MAX 300 MIN 0.46 AC-FT 5,890

PEAK DISCHARGE (BASE, 340 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1430	4.20	1,770	3-14	0445	2.72	439
12-18	0430	5.98	4,270	3-16	2400	2.96	618
1-16	1215	2.75	460	4-17	1400	2.76	467
1-27	0730	3.82	1,360				

Note.--No gage-height record Apr. 20 to May 20.

16-2490. Waimanalo Stream at Waimanalo

Location.--Lat 21°21'12", long 157°43'52", on right bank 40 ft upstream from Highway 72 and 2.3 miles northwest of Waimanalo Post Office.

Drainage area.--2.16 sq mi.

Records available.--January 1967 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 18.89 ft above mean sea level.

Extremes.--Maximum discharge during year, 3,810 cfs Dec. 18 (gage height, 9.54 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, 0.35 cfs Aug. 29, 30, Sept. 11, 12.
1967-68: Maximum discharge, that of Dec. 18, 1967; minimum, that of Aug. 29, 30, Sept. 11, 12, 1968.

Remarks.--Records fair. 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. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.6	1.7	4.2	2.6	1.8	6.5	3.0	1.6	2.0	1.0	0.65
2	1.4	1.8	2.5	3.9	2.6	1.8	5.4	2.8	2.5	1.4	.95	.65
3	1.2	1.4	2.6	3.0	3.8	1.9	8.5	2.8	2.0	1.4	1.0	.60
4	1.2	1.2	2.5	16	4.0	1.8	16	3.0	1.9	1.4	1.2	.60
5	1.2	1.2	1.7	7.6	3.0	1.8	15	3.8	1.9	1.6	1.6	.55
6	1.2	1.4	1.6	5.4	2.8	1.8	12	3.0	1.9	1.4	1.2	.55
7	1.0	1.2	1.4	4.0	3.0	1.8	12	2.6	2.0	1.6	1.0	.60
8	5.2	1.4	11	3.8	2.6	1.9	8.1	3.0	1.9	1.8	1.2	.60
9	2.8	1.4	239	3.2	2.5	1.9	16	11	3.6	1.2	1.0	.60
10	1.2	1.4	115	2.3	2.3	2.0	16	5.6	2.0	1.4	1.0	.55
11	1.4	1.4	48	2.2	2.5	2.5	11	4.4	1.9	1.4	.80	.55
12	1.4	1.4	29	2.0	3.2	3.4	12	4.0	2.0	1.2	.70	.55
13	1.6	1.4	18	2.3	2.8	35	11	2.8	1.4	1.2	.70	.60
14	1.0	1.2	11	3.2	2.6	119	12	1.9	1.6	1.2	.60	.60
15	1.7	1.2	12	2.6	6.1	24	14	1.9	1.4	1.0	.65	.60
16	1.4	1.2	34	66	2.8	10	45	2.0	1.4	1.2	.55	.60
17	1.0	1.2	24	6.8	2.6	8.3	20	2.2	1.6	1.2	.60	.65
18	1.0	1.2	434	5.4	3.4	4.9	5.4	2.6	1.4	1.2	.60	.65
19	1.4	1.6	20	4.2	7.8	8.3	7.4	2.6	1.4	1.2	.60	.65
20	1.2	1.8	12	4.6	4.4	5.2	12	2.0	1.4	1.2	.60	.70
21	1.0	1.4	9.7	4.2	4.6	4.0	4.0	2.2	1.4	2.2	.60	.75
22	1.2	1.7	6.2	4.2	2.8	3.6	3.8	2.0	1.4	1.8	.55	.75
23	2.9	1.8	5.2	4.9	3.0	3.6	3.8	1.8	1.7	1.4	.60	.75
24	2.0	2.5	5.6	4.4	2.8	3.6	3.6	2.0	1.9	1.7	.65	.80
25	1.4	3.4	5.2	4.4	24	3.6	3.4	1.7	1.4	1.2	.60	.85
26	1.4	4.9	4.6	4.2	3.2	3.6	3.0	2.8	1.9	1.4	.60	.95
27	1.8	3.4	4.6	37	2.3	18	3.0	2.0	1.4	1.2	.65	.85
28	1.0	2.3	4.6	11	2.0	37	2.8	1.6	1.9	1.4	.60	1.2
29	1.0	1.8	5.6	4.6	1.9	12	3.0	1.6	1.4	1.7	.55	1.6
30	1.4	1.8	4.6	3.6	------	13	3.0	1.6	2.5	1.0	.55	1.8
31	1.2	------	4.2	3.0	------	8.1	------	1.6	------	1.0	.60	------
TOTAL	47.5	52.6	1081.1	238.2	114.0	349.2	298.7	87.9	53.7	43.2	24.10	22.40
MEAN	1.53	1.75	34.9	7.68	3.93	11.3	9.96	2.84	1.79	1.39	0.777	0.747
MAX	5.2	4.9	434	66	24	119	45	11	3.6	2.2	1.6	1.8
MIN	1.0	1.2	1.4	2.0	1.9	1.8	2.8	1.6	1.4	1.0	0.55	0.55
AC-FT	94	104	2140	472	226	693	592	174	107	86	48	44

CAL YR 1967:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-
WAT YR 1968:	TOTAL	2,412.60	MEAN	6.59	MAX	434	MIN	0.55	AC-FT	4,790

PEAK DISCHARGE (BASE, 450 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1400	7.18	1,640	3-14	0430	4.69	617
12-18	0500	9.54	3,810	3-28	0330	4.97	701
1-16	1230	6.42	1,240				

16-2500. Maunawili ditch near Waimanalo

Location.--Lat 21°20'45", long 157°45'10", on left bank 80 ft downstream from Aniani Nui Ridge tunnel and 3.5 miles west of Waimanalo Post Office.

Records available.--March 1954 to September 1968 (discontinued).

Gage.--Digital water-stage recorder and sharp-crested weir. Altitude of gage is 390 ft (from topographic map). Prior to Aug. 11, 1964, graphic water-stage recorder at same site and datum.

Extremes.--1954-68: Maximum daily discharge, 10.8 cfs Mar. 5, 1958; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.7	0.50			0	0	5.0	2.5	2.7	2.3	0
2	2.2	1.5	.20			0	0	4.0	2.5	2.6	2.3	0
3	2.2	1.5	.10			0	3.1	3.2	2.5	2.5	2.3	0
4	2.1	1.5	0			0	2.9	3.0	2.4	2.5	2.6	0
5	2.0	1.5	0			0	3.1	3.0	2.4	2.6	2.5	0
6	2.0	1.4	0			0	2.5	2.9	2.4	2.7	2.3	0
7	2.0	1.4	0			0	.09	2.9	2.8	2.7	2.3	0
8	2.7	1.5	0			0	0	3.2	2.4	2.6	2.3	0
9	2.2	1.4	0			0	0	4.6	2.4	2.5	2.3	0
10	2.1	1.4	0			0	0	5.6	2.4	2.4	2.3	0
11	2.1	1.5	0			0	0	4.0	2.4	2.4	2.2	0
12	2.1	1.3	0			0	0	3.5	2.4	2.4	2.2	0
13	2.0	1.4	0			0	0	3.3	2.4	2.3	2.2	0
14	1.8	1.4	0			2.9	0	3.2	2.4	2.3	2.2	0
15	1.7	1.6	0			.06	0	3.1	3.0	2.3	2.2	0
16	1.8	2.1	0			0	0	3.0	3.5	2.2	2.2	0
17	1.8	2.4	0			0	9.0	3.5	3.0	2.3	2.2	0
18	1.8	2.4	0			0	6.0	2.9	2.8	2.3	2.2	0
19	2.0	2.5	0			0	10	2.8	2.7	2.2	2.2	0
20	1.8	2.1	0			0	8.4	2.7	2.7	2.2	1.6	1.5
21	1.8	2.6	0			0	6.2	2.7	2.7	2.1	2.0	1.6
22	1.8	2.6	0			0	5.6	2.7	2.7	2.4	1.5	1.5
23	2.1	2.6	0			0	5.6	2.7	2.6	3.0	1.5	1.5
24	1.7	2.4	0			0	4.8	2.5	2.6	2.7	.74	2.0
25	1.6	2.9	0			0	4.8	2.6	2.7	2.7	0	1.9
26	1.6	2.8	0			0	4.8	2.8	3.0	2.7	0	1.8
27	1.3	1.7	0			0	5.0	2.6	2.7	2.5	0	1.8
28	1.4	1.5	0			.06	5.0	2.6	2.7	2.4	0	1.7
29	1.5	2.0	0			0	4.5	2.6	2.6	2.3	0	1.4
30	1.5	1.5	0		------	0	3.7	2.5	2.7	2.3	0	1.5
31	1.4	------	0		------	0	------	2.5	------	2.3	0	------
TOTAL	58.3	56.1	0.80	0	0	3.02	95.09	98.2	79.0	76.1	50.64	18.2
MEAN	1.88	1.87	0.026	0	0	0.097	3.17	3.17	2.63	2.45	1.63	0.61
MAX	2.7	2.9	0.50	0	0	2.9	10	5.6	3.5	3.0	2.6	2.0
MIN	1.3	1.3	0	0	0	0	0	2.5	2.4	2.1	0	0
AC-FT	116	111	1.6	0	0	6.0	189	195	157	151	100	36

CAL YR 1967: TOTAL 744.60 MEAN 2.04 MAX 5.4 MIN 0 AC-FT 1,480
WAT YR 1968: TOTAL 535.45 MEAN 1.46 MAX 10 MIN 0 AC-FT 1,060

Note.--No gage-height record Dec. 1 to Feb. 7, Apr. 16 to May 23, May 27 to July 23.

16-2540. Makawao Stream near Kailua

Location.--Lat 21°21'49", long 157°46'02", 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.

Records available.--November 1912 to June 1916, January 1958 to September 1968.

Gage.--Graphic water-stage recorder and concrete control. Altitude of gage is 80 ft (from topographic map). Prior to Jan. 1, 1958, staff gage at sites about 200 ft upstream at different datums. Jan. 1, 1958, to Feb. 3, 1964, graphic and Feb. 4, 1964, to Aug. 28, 1966, digital water-stage recorders at present site and datum.

Extremes.--Maximum discharge during year, 2,490 cfs Dec. 18 (gage height, 9.30 ft), from rating curve extended above 470 cfs as explained below; minimum, 2.0 cfs Sept. 19, 20, 22, 23.
1912-16, 1958-68: 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 (see sta. no. 2500) diverts 1.5 miles above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	7.1	5.0	9.1	9.1	7.8	10	9.6	4.0	3.3	2.4	2.5
2	4.3	5.6	4.7	9.3	9.1	7.6	8.1	8.1	3.9	3.2	2.4	3.7
3	4.0	4.8	4.2	9.1	9.8	7.3	11	6.3	3.9	3.0	2.4	2.2
4	4.0	4.3	4.5	32	8.8	8.1	8.7	5.8	3.7	3.0	2.7	2.2
5	3.9	4.2	5.2	12	8.3	8.8	9.8	5.8	3.7	3.2	2.6	2.1
6	3.9	4.2	5.2	9.8	8.1	7.6	7.1	5.6	3.7	3.3	2.4	2.1
7	3.9	4.0	4.5	8.6	7.8	7.3	6.7	5.6	4.2	3.3	2.4	2.4
8	13	4.0	18	8.3	7.6	7.3	7.6	6.3	3.9	3.2	2.4	2.5
9	6.3	4.0	128	8.1	7.5	7.1	16	9.0	3.7	2.9	2.4	2.2
10	4.8	4.0	40	7.8	7.5	6.9	12	11	3.7	2.8	2.4	2.2
11	4.8	4.2	20	7.6	7.5	10	7.1	8.1	3.7	2.8	2.2	2.1
12	4.5	4.0	14	7.1	8.0	16	8.8	6.9	3.7	2.8	2.2	2.1
13	4.7	3.9	11	6.9	7.5	117	6.7	6.1	3.7	2.7	2.2	2.1
14	4.5	3.9	11	6.7	7.6	161	6.1	5.8	3.7	2.7	2.2	2.1
15	4.3	3.7	12	6.9	11	38	13	5.6	4.2	2.6	2.2	2.4
16	4.2	3.7	20	60	7.8	36	62	5.4	4.8	2.6	2.2	2.2
17	4.2	3.7	18	12	7.3	27	23	6.9	4.2	2.7	2.2	2.2
18	4.2	3.6	328	12	7.1	16	12	5.6	3.4	2.7	2.2	2.2
19	5.2	3.7	27	11	9.9	23	24	5.2	3.3	2.6	2.2	2.1
20	4.5	4.0	18	11	8.1	13	23	5.0	3.3	2.6	2.2	2.1
21	4.2	3.7	17	9.8	10	11	13	5.0	3.3	2.4	2.4	2.1
22	4.0	3.9	13	9.6	7.6	11	11	5.0	3.3	2.6	2.2	2.1
23	11	4.8	14	10	7.1	11	11	4.8	3.2	2.8	2.2	2.1
24	6.1	7.1	16	9.3	6.7	12	9.8	4.8	3.2	2.6	2.2	2.2
25	4.3	7.2	11	9.1	26	9.6	9.6	4.8	3.0	2.4	2.2	2.1
26	4.2	5.2	9.8	8.8	9.3	9.3	9.6	4.8	3.7	2.8	2.2	2.2
27	4.0	5.6	9.8	38	8.6	17	9.8	4.7	3.3	2.7	2.2	2.2
28	4.0	5.4	9.6	14	8.1	31	9.8	4.5	3.3	2.6	2.2	2.1
29	3.9	4.5	11	11	7.8	12	8.6	4.5	3.2	2.4	2.2	2.1
30	4.3	4.7	10	10	------	13	7.3	4.3	3.3	2.4	2.2	2.1
31	3.9	------	9.3	9.3	------	11	------	4.2	------	2.4	2.2	------
TOTAL	151.3	136.7	828.8	394.2	256.6	680.7	382.2	185.1	109.2	86.1	70.9	67.0
MEAN	4.88	4.56	26.7	12.7	8.85	22.0	12.7	5.97	3.64	2.78	2.29	2.23
MAX	13	7.2	328	60	26	161	62	11	4.8	3.3	2.7	3.7
MIN	3.9	3.6	4.2	6.7	6.7	6.9	6.1	4.2	3.0	2.4	2.2	2.1
AC-FT	300	271	1640	782	509	1350	758	367	217	171	141	133

CAL YR 1967: TOTAL 2,815.1 MEAN 7.71 MAX 328 MIN 2.9 AC-FT 5,580
WAT YR 1968: TOTAL 3,348.8 MEAN 9.15 MAX 328 MIN 2.1 AC-FT 6,640

PEAK DISCHARGE (BASE, 390 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1400	7.52	1,360	3-13	2400	7.93	1,610
12-18	0400	9.30	2,490	3-28	0200	5.24	470
1- 4	2100	6.24	796	4-16	1530	7.93	1,610
1-16	1200	7.39	1,300				

16-2605. Maunawili Stream at Highway 61, near Kailua

Location.--Lat 21°22'51", long 157°45'48", 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.

Records available.--Annual maximum, water years 1958-67 and occasional low-flow measurements, water years 1922, 1956-62, 1965-67. January 1967 to September 1968.

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.--Maximum discharge during year, 3,720 cfs Dec. 18 (gage height, 11.91 ft), from rating curve extended above 1,500 cfs on basis of contracted-opening measurement at gage height 16.66 ft; minimum, 3.4 cfs Sept. 24.
1957-68: 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.
1967-68: Minimum discharge, 3.4 cfs Sept. 24, 1968.
A discharge of 1.97 cfs was measured on June 8, 1959.
Revisions.--The maximum discharge for the water year 1967 has been revised to 1,750 cfs Sept. 16, 1967 (gage height, 9.33 ft), superseding figure published in Water Resources Data for Hawaii and other Pacific Areas, Part 1, for 1967.

Remarks.--Records fair. Maunawili ditch (see sta. no. 2500) diverts above station for irrigation in vicinity of Waimanalo. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	18	13	23	20	17	31	25	10	9.0	5.6	10
2	12	13	11	25	19	17	29	22	10	9.0	5.2	15
3	11	11	10	22	21	17	47	16	11	8.8	5.2	4.6
4	11	10	10	85	20	17	38	15	9.9	8.8	6.2	4.6
5	11	10	11	43	18	17	45	15	9.9	8.8	5.8	4.6
6	11	10	11	30	17	16	36	14	9.9	8.6	5.6	5.2
7	11	10	19	25	17	17	35	14	11	8.6	5.4	5.6
8	43	10	79	23	17	17	48	15	10	8.8	5.4	5.8
9	14	10	407	22	17	17	39	20	9.9	8.3	5.4	4.4
10	13	10	153	22	17	17	40	25	9.9	8.6	5.4	4.1
11	14	10	67	21	16	19	28	20	10	7.6	5.2	4.1
12	14	10	45	20	18	29	31	18	9.9	7.3	5.6	4.1
13	13	10	38	20	17	205	26	15	9.9	7.8	5.4	4.1
14	13	10	35	20	16	597	24	15	10	7.8	5.2	4.1
15	13	10	32	19	22	148	52	14	10	7.6	5.2	4.3
16	12	10	51	155	16	177	146	15	12	6.8	5.4	4.8
17	12	10	36	29	16	180	58	17	10	6.4	5.2	3.9
18	12	10	875	26	16	75	39	15	9.3	6.2	5.4	4.3
19	12	10	88	22	21	80	72	13	9.3	6.0	5.4	4.1
20	12	10	58	22	18	54	71	13	9.9	5.8	5.0	3.9
21	12	10	47	20	23	45	40	13	9.3	5.6	5.4	4.1
22	12	10	40	19	17	40	35	13	9.0	5.6	5.2	3.9
23	38	14	39	19	17	39	30	13	9.0	6.6	4.8	4.3
24	14	19	49	18	17	45	27	13	9.0	5.6	4.8	4.1
25	11	28	34	17	57	35	26	13	9.0	6.0	4.8	3.9
26	11	19	30	17	17	33	25	12	11	6.4	4.6	4.6
27	11	15	28	85	17	66	24	12	9.3	6.0	4.8	4.1
28	10	13	27	32	17	115	24	12	9.6	5.8	4.8	3.9
29	10	11	30	24	17	39	22	11	9.0	5.6	5.0	3.9
30	11	12	27	22	------	38	21	10	9.3	5.4	5.2	3.9
31	11	------	25	21	------	33	------	10	------	5.6	7.6	------
TOTAL	427	363	2425	968	558	2261	1209	468	295.3	220.8	165.2	146.3
MEAN	13.8	12.1	78.2	31.2	19.2	72.9	40.3	15.1	9.84	7.12	5.33	4.88
MAX	43	28	875	155	57	597	146	25	12	9.0	7.6	15
MIN	10	10	10	17	16	16	21	10	9.0	5.4	4.6	3.9
AC-FT	847	720	4810	1920	1110	4480	2400	928	586	458	328	290

CAL YR 1967: TOTAL 7,714.2 MEAN 21.1 MAX 875 MIN 8.1 AC-FT 15,300
WAT YR 1968: TOTAL 9,506.6 MEAN 26.0 MAX 875 MIN 3.9 AC-FT 18,860

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1500	10.97	2,880	3-14	0100	10.42	2,440
12-18	0500	11.91	3,720	3-17	0100	7.32	836
1- 4	2130	7.83	992	3-28	0330	7.65	940
1-16	1330	9.78	2,020	4-16	1430	8.85	1,480

16-2705. Kamooalii Stream below Kuou Stream, near Kaneohe

Location.--Lat 21°23'42", long 157°48'26", 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.

Records available.--March 1967 to September 1968.

Gage.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 118 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,820 cfs Mar. 14 (gage height, 8.82 ft); minimum, 5.5 cfs Sept. 23. 1967-68: Maximum discharge, that of Mar. 14, 1968; minimum, that of Sept. 23, 1968.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	12	11	18	16	14	19	31	15	10	8.0	7.7
2	10	11	10	18	16	14	19	22	14	10	7.8	9.0
3	9.4	9.9	9.9	17	16	14	21	21	14	10	7.8	7.8
4	9.2	9.4	9.6	72	16	14	18	21	14	10	8.0	7.0
5	9.2	9.2	9.4	24	15	15	23	20	14	10	7.6	7.0
6	9.2	9.0	9.2	19	15	14	19	20	14	9.9	7.4	7.0
7	9.4	9.2	9.4	18	15	13	18	20	14	9.6	7.4	7.4
8	59	9.0	40	17	15	13	18	20	13	9.6	7.4	6.7
9	15	9.0	193	17	14	13	19	20	13	9.6	7.2	6.3
10	12	8.7	65	16	14	13	24	31	13	9.2	7.2	6.3
11	12	9.0	26	16	14	14	19	19	13	9.4	7.0	6.3
12	11	8.7	20	16	15	20	21	18	13	9.2	6.7	6.3
13	12	8.5	17	15	16	168	17	17	13	9.2	7.0	6.1
14	11	8.5	16	15	14	465	17	17	12	9.2	7.2	5.9
15	11	8.3	16	15	15	87	39	17	12	9.0	7.0	5.9
16	10	8.5	22	95	14	146	62	17	12	9.0	6.7	5.9
17	10	8.5	15	21	14	128	26	18	12	9.0	6.7	5.9
18	11	8.3	432	18	14	29	19	16	12	9.0	6.7	5.7
19	13	8.3	35	18	19	32	85	16	13	9.0	6.7	5.9
20	13	8.3	25	20	20	26	81	16	12	8.7	6.7	5.7
21	11	8.0	23	17	22	24	66	16	12	8.7	7.0	5.9
22	11	8.0	20	16	16	23	29	16	12	8.5	6.7	5.7
23	42	9.0	25	16	15	32	23	15	12	8.7	6.7	5.5
24	13	16	34	16	15	28	22	15	12	8.5	6.7	5.7
25	11	63	25	15	44	23	21	15	11	8.5	6.5	5.9
26	11	15	20	14	16	22	21	15	11	8.3	6.5	6.5
27	10	12	19	110	15	25	21	15	11	8.3	6.5	6.1
28	9.9	10	19	21	15	28	21	15	10	8.0	6.3	6.1
29	9.6	9.9	21	18	14	23	21	15	10	8.0	6.3	6.3
30	9.4	10	18	18	------	23	29	15	10	8.0	6.3	6.3
31	9.4	------	20	17	------	20	------	15	------	8.0	6.5	------
TOTAL	413.6	342.2	1234.5	763	479	1523	858	564	373	2801	216.2	191.8
MEAN	13.3	11.4	39.8	24.6	16.5	49.1	28.6	18.2	12.4	9.04	6.97	6.39
MAX	59	63	432	110	44	465	85	31	15	10	8.0	9.0
MIN	9.2	8.0	9.2	14	14	13	17	15	10	8.0	6.3	5.5
AC-FT	820	679	2450	1510	950	3020	1700	1120	740	556	429	380

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 7,238.4 MEAN 19.8 MAX 465 MIN 5.5 AC-FT 14,360

PEAK DISCHARGE (BASE, 900 CFS, REVISED)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1600	6.64	930	1-27	0700	6.94	1,080
12- 9	1500	7.25	1,280	3-14	0100	8.82	2,820
12-18	0500	8.55	2,500	3-16	0200	7.17	1,220
1- 4	2130	6.59	905	3-17	0130	6.82	1,020
1-16	1230	7.80	1,720				

16-2709. Luluku Stream at altitude 220 ft, near Kaneohe

Location.--Lat 21°23'42", long 157°48'46", 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.
Records available.--Occasional low-flow measurements, water years 1960-63, 1965-67, July 1967 to September 1968.
Gage.--Water-stage recorder and concrete control. Altitude of gage is 220 ft (from topographic map).
Extremes.--1967: Maximum discharge during period July to September, 209 cfs Aug. 9 (gage height, 4.38 ft), from rating curve extended above 10 cfs as explained below; minimum, 0.83 cfs July 28.
1967-68: Maximum discharge during water year, 296 cfs Jan. 16 (gage height, 4.85 ft), from rating curve extended above 10 cfs on basis of slope-area measurement at gage height 6.09 ft for peak of Feb. 1, 1969; minimum, 0.71 cfs Aug. 19-21.
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.

DISCHARGE, IN CUBIC FEET PER SECOND, JULY TO SEPTEMBER 1967

DAY	JUL	AUG	SEP	DAY	JUL	AUG	SEP	DAY	JUL	AUG	SEP	DAY	JUL	AUG	SEP	DAY	JUL	AUG	SEP
1	1.7	1.0	1.2	7	1.6	1.1	1.0	13	.96	1.8	1.3	19	1.1	1.6	1.6	25	1.0	1.4	1.2
2	1.0	1.0	1.2	8	1.2	3.3	1.2	14	1.1	1.8	1.5	20	1.8	1.8	1.4	26	1.0	1.4	1.2
3	.96	1.5	1.2	9	1.0	9.2	1.1	15	1.1	1.6	1.4	21	1.2	1.6	1.3	27	.96	1.4	1.2
4	1.0	1.6	1.3	10	1.0	2.6	1.1	16	1.0	1.6	3.7	22	1.1	1.6	1.4	28	.90	1.3	1.1
5	.96	1.3	1.6	11	.96	2.2	1.1	17	1.3	2.1	1.6	23	1.0	1.6	1.3	29	1.0	1.2	1.2
6	.96	1.2	1.1	12	.96	1.9	1.2	18	.96	1.6	1.6	24	1.0	1.5	1.2	30	1.0	1.3	1.2
																31	1.0	1.2	
Total																	33.78	57.3	40.7
Mean																	1.09	1.85	1.36
Max																	1.8	9.2	3.7
Min																	0.90	1.0	1.0
Runoff in acre-feet																	67	114	81

Peak discharge (base, 180 cfs).--Aug. 9 (1000) 209 cfs (4.38 ft).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.5	1.4	1.6	1.6	1.4	2.0	2.1	1.8	1.3	0.96	0.92
2	1.1	1.2	1.3	1.7	1.5	1.5	2.0	2.0	1.8	1.3	.89	1.0
3	1.1	1.0	1.3	1.6	1.6	1.4	2.1	1.8	1.7	1.3	.92	1.1
4	1.2	1.0	1.2	3.0	1.6	1.5	2.0	1.9	1.6	1.3	.96	.96
5	1.1	1.0	1.2	1.9	1.5	1.8	2.1	1.9	1.6	1.3	.92	.86
6	1.1	.96	1.2	1.6	1.4	1.5	2.0	1.8	1.6	1.2	.89	1.0
7	1.0	1.0	1.5	1.5	1.4	1.4	1.8	1.8	1.6	1.1	.83	1.1
8	4.6	1.0	10	1.5	1.4	1.4	1.8	1.9	1.6	1.1	.89	.92
9	1.8	.96	18	1.5	1.4	1.4	1.9	1.9	1.6	1.1	.83	.83
10	1.6	.96	4.0	1.5	1.4	1.4	2.0	3.4	1.5	1.1	.80	.89
11	1.3	.86	1.8	1.4	1.4	1.7	1.6	2.1	1.6	1.1	.77	.86
12	1.2	.89	1.6	1.4	1.4	4.0	1.6	2.0	1.5	1.1	.77	.80
13	1.2	.80	1.5	1.4	1.4	10	1.5	2.0	1.6	1.2	.80	.80
14	1.2	.77	1.4	1.3	1.2	28	1.5	1.9	1.6	1.1	.77	.80
15	1.1	.92	1.4	1.3	1.3	8.0	5.0	1.8	1.5	1.0	.77	.77
16	1.1	1.0	1.5	7.0	1.4	10	8.0	1.7	1.4	1.0	.77	.77
17	1.1	1.3	2.5	2.0	1.2	8.0	3.0	2.4	1.4	1.0	.96	.80
18	1.3	1.3	24	1.7	1.1	3.0	1.8	1.9	1.4	1.1	1.0	.80
19	1.6	1.3	3.0	1.6	1.6	2.7	12	1.8	1.4	1.1	.86	.89
20	1.5	1.4	2.7	1.8	1.5	2.4	10	1.8	1.4	1.1	.74	.89
21	1.3	1.3	2.1	1.5	1.6	1.8	5.0	1.9	1.4	1.1	.74	.92
22	1.3	1.3	1.8	1.4	1.4	1.7	3.4	1.9	1.4	1.0	.78	1.0
23	1.8	1.3	2.1	1.5	1.4	3.0	2.2	1.8	1.4	1.1	.80	.92
24	1.4	3.6	3.2	1.4	1.4	2.5	2.1	1.8	1.4	1.1	.83	1.1
25	1.2	5.3	2.1	1.4	2.6	2.3	2.1	1.8	1.4	1.1	.80	.96
26	1.2	1.6	1.7	1.4	1.6	2.1	2.1	2.1	1.4	1.0	.77	1.2
27	1.2	1.4	1.7	10	1.5	2.2	2.1	1.9	1.4	1.0	.83	1.2
28	1.1	1.4	1.6	2.5	1.4	2.3	2.1	1.9	1.4	1.0	.80	.96
29	1.0	1.3	1.9	1.8	1.4	2.5	2.0	1.9	1.4	.96	.80	.96
30	.96	1.4	1.7	1.6	------	2.3	2.1	2.9	1.5	.96	.86	.92
31	1.1	------	1.8	1.6	------	2.1	------	1.8	------	1.0	.89	------
TOTAL	41.86	41.02	104.2	64.4	42.6	117.3	90.9	61.6	45.3	34.22	26.00	27.90
MEAN	1.35	1.37	3.36	2.08	1.47	3.78	3.03	1.99	1.51	1.10	0.839	0.930
MAX	4.6	5.3	24	10	2.6	28	12	3.4	1.8	1.3	1.0	1.2
MIN	0.96	0.77	1.2	1.3	1.1	1.4	1.5	1.7	1.4	0.96	0.74	0.77
AC-FT	83	81	207	128	84	233	180	122	90	68	52	55

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 697.30 MEAN 1.91 MAX 28 MIN 0.74 AC-FT 1,380

PEAK DISCHARGE (BASE, 180 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1200	4.57	243	3-14	about 0100	4.40	212
12-18	0400	4.45	221	3-16	0130	4.55	239
1-16	1300	4.85	296	3-17	0130	4.25	188

Note.--No gage-height record Dec. 22 to Feb. 5.

16-2739. Kamooalii Stream at Kaneohe

Location.--Lat 21°24'51", long 157°48'12", 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.

Records available.--January 1959 to October 1963, October 1965 to September 1968.

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.

Extremes.--Maximum discharge during year, about 2,900 cfs Mar. 14; minimum, 6.4 cfs Sept. 25.
1959-63, 1965-68: Maximum discharge, 5,180 cfs Nov. 14, 1965 (gage height, 7.14 ft), from rating curve extended above 380 cfs on basis of slope-area measurements at gage heights 5.26, 7.14 and 7.47 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. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	16	16	22	20	16	28	35	19	14	12	17
2	14	14	15	23	19	14	27	27	18	14	11	13
3	14	12	14	22	20	14	28	26	17	14	11	9.8
4	14	12	14	80	20	15	25	25	17	14	14	7.7
5	14	12	14	28	19	18	30	24	17	14	11	7.3
6	14	12	15	23	18	15	23	24	16	14	10	8.1
7	13	12	15	21	18	14	22	24	16	14	9.8	9.8
8	69	13	54	20	18	14	22	25	16	14	10	8.1
9	17	13	220	20	18	14	23	26	16	14	10	7.3
10	16	13	69	20	17	14	26	42	16	13	9.4	7.0
11	14	13	29	19	17	16	21	27	16	14	9.0	7.0
12	14	12	24	19	18	25	24	24	16	12	9.0	7.0
13	17	12	22	19	17	184	20	23	16	13	9.4	7.0
14	14	12	20	18	17	500	20	23	16	14	9.0	6.8
15	13	12	20	18	19	95	45	22	16	12	8.6	6.8
16	13	12	27	100	18	160	67	22	16	12	8.6	6.8
17	13	11	21	24	18	135	37	24	16	13	9.0	6.8
18	14	11	490	22	16	39	23	22	16	12	9.0	7.0
19	16	11	42	20	25	41	90	21	16	12	8.6	7.0
20	16	11	30	23	26	35	85	21	16	12	8.1	6.8
21	14	12	28	20	32	32	70	22	16	12	9.0	7.3
22	14	13	25	19	16	31	38	22	16	12	8.6	7.0
23	55	14	30	20	16	46	29	21	15	14	9.0	6.8
24	16	25	44	19	16	40	27	21	15	12	9.0	7.0
25	14	74	30	19	45	32	26	21	15	12	9.0	7.3
26	14	20	24	19	16	30	25	22	16	12	9.0	9.0
27	13	16	24	115	16	38	26	21	15	12	9.0	8.1
28	13	14	23	26	15	44	27	20	14	11	8.6	7.7
29	12	15	27	21	14	39	26	20	15	11	9.0	11
30	12	15	24	20	------	33	30	20	16	11	8.6	8.6
31	13	------	26	20	------	29	------	20	------	12	8.6	------
TOTAL	532	464	1476	879	564	1772	1010	737	481	396	293.9	243.9
MEAN	17.2	15.5	47.6	28.4	19.4	57.2	33.7	23.8	16.0	12.8	9.48	8.13
MAX	69	74	490	115	45	500	90	42	19	14	14	17
MIN	12	11	14	18	14	14	20	20	14	11	8.1	6.8
AC-FT	1060	920	2930	1740	1120	3510	2000	1460	954	785	583	484

CAL YR 1967: TOTAL 7,165.9 MEAN 19.6 MAX 490 MIN 7.7 AC-FT 14,210
WAT YR 1968: TOTAL 8,848.8 MEAN 24.2 MAX 500 MIN 6.8 AC-FT 17,550

PEAK DISCHARGE (BASE, 950 CFS, REVISED)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	1600	-	about 1,000	1-27	0730	-	about 1,100
12- 9	1500	-	about 1,300	3-14	0100	-	about 2,900
12-18	0500	5.26	2,320	3-16	0200	-	about 1,300
1- 4	2130	-	about 950	3-17	0130	-	about 1,100
1-16	1230	-	about 1,800				

16-2750. Haiku Stream near Heeia

Location.--Lat 21°24'45", long 157°49'35", on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heeia.

Drainage area.--0.97 sq mi.

Records available.--January 1914 to October 1919, July 1939 to September 1968.

Gage.--Digital 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, staff gage and Apr. 28, 1914, to Oct. 25, 1919, graphic water-stage recorder, at same site at different datums. July 1, 1939, to July 7, 1963, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 1,070 cfs Mar. 13 (gage height, 3.78 ft), from rating curve extended above 57 cfs as explained below; minimum, 1.3 cfs on many days.
1914-19, 1939-68: 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 fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.8	1.8	1.7	2.2	1.7	2.5	2.2	1.8	1.4	1.4	1.4
2	1.5	1.9	1.8	1.8	2.2	1.7	2.4	2.1	1.8	1.4	1.5	1.4
3	1.4	1.7	1.7	1.6	2.5	1.8	2.5	2.1	1.8	1.4	1.5	1.3
4	1.4	1.6	1.7	5.7	3.0	1.8	2.4	2.1	1.7	1.4	1.7	1.3
5	1.4	1.5	1.7	4.7	2.0	2.0	2.4	2.0	1.6	1.4	1.6	1.3
6	1.3	1.5	1.7	2.8	1.9	2.0	2.3	2.0	1.6	1.5	1.5	1.3
7	1.3	1.5	1.7	2.1	1.9	1.9	2.2	2.0	1.6	1.5	1.5	1.4
8	2.1	1.5	17	2	1.9	1.8	2.4	2.0	1.6	1.5	1.5	1.4
9	2.1	1.5	51	1.9	1.9	1.8	2.7	2.0	1.6	1.5	1.5	1.4
10	1.7	1.5	14	1.8	1.8	1.8	2.9	3.0	1.6	1.5	1.5	1.3
11	1.6	1.5	6.2	1.7	1.8	2.9	2.7	2.5	1.6	1.5	1.5	1.3
12	1.6	1.4	3.8	1.7	1.9	13	2.7	2.1	1.6	1.5	1.5	1.3
13	1.7	1.4	2.9	1.6	1.8	56	2.6	1.9	1.6	1.5	1.5	1.3
14	1.6	1.4	2.6	1.6	1.8	119	2.6	1.9	1.6	1.6	1.5	1.3
15	1.6	1.4	2.4	1.6	1.9	14	3.1	1.8	1.6	1.5	1.4	1.3
16	1.6	1.4	2.4	5.9	1.8	39	3.5	1.8	1.6	1.5	1.4	1.3
17	1.6	1.4	2.3	3.4	1.8	19	3.1	1.8	1.6	1.5	1.4	1.3
18	2.0	1.4	47	2.8	1.8	5.7	2.9	1.8	1.6	1.5	1.4	1.3
19	3.6	1.4	5.7	2.4	2.0	8.4	30	1.8	1.6	1.5	1.4	1.3
20	2.2	1.4	3.7	2.3	1.9	4.6	21	1.8	1.6	1.4	1.4	1.3
21	1.8	1.4	2.8	2.1	2.0	3.4	14	1.7	1.6	1.4	1.4	1.3
22	1.7	1.5	2.3	2.0	1.8	2.9	4.4	1.7	1.6	1.4	1.4	1.3
23	2.4	1.6	2.2	2.0	1.8	5.4	3.2	1.6	1.6	1.5	1.4	1.3
24	1.8	5.2	3.6	2.0	1.7	3.3	2.7	1.6	1.6	1.4	1.4	1.3
25	1.6	12	2.9	2.0	3.6	3.0	2.5	1.6	1.5	1.4	1.4	1.3
26	1.6	4.4	2.1	1.9	2.1	2.7	2.4	1.6	1.6	1.4	1.4	1.3
27	1.6	2.3	2.0	18	1.8	4.0	2.4	1.6	1.4	1.4	1.4	1.3
28	1.5	1.9	1.9	3.6	1.7	3.2	2.3	1.7	1.4	1.3	1.4	1.3
29	1.5	1.8	2.0	2.3	1.7	3.5	2.2	1.7	1.4	1.3	1.4	2.2
30	1.5	1.8	1.8	2.2	------	2.9	2.2	1.7	1.4	1.3	1.4	1.4
31	1.5	------	1.8	2.3	------	2.6	------	1.7	------	1.4	1.3	------
TOTAL	53.2	64.0	198.5	91.5	58.0	336.8	137.2	58.9	47.8	44.7	44.9	40.5
MEAN	1.72	2.13	6.40	2.95	2.00	10.9	4.57	1.90	1.59	1.44	1.45	1.35
MAX	3.6	12	51	18	3.6	119	30	3.0	1.8	1.6	1.7	2.2
MIN	1.3	1.4	1.7	1.6	1.7	1.7	2.2	1.6	1.4	1.3	1.3	1.3
AC-FT	106	127	394	181	115	668	272	117	95	89	89	80

CAL YR 1967: TOTAL 967.9 MEAN 2.65 MAX 51 MIN 1.3 AC-FT 1,920
WAT YR 1968: TOTAL 1,176.0 MEAN 3.21 MAX 119 MIN 1.3 AC-FT 2,330

PEAK DISCHARGE (BASE, 340 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 9	1245	3.42	630	3-16	0300	3.40	610
12-18	0415	3.54	754	4-19	2245	3.36	574
1-27	0645	3.15	405	4-21	1815	3.31	529
3-13	2400	3.78	1,070				

16-2780. Iolekaa Stream mauka near Heeia

Location.--Lat 21°25'15", long 157°49'50", 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.

Records available.--March 1940 to September 1968.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 320 ft above mean sea level (transit levels by U.S. Navy). Prior to Apr. 30, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 104 cfs Mar. 13 (gage height, 2.38 ft), from rating curve extended above 3.3 cfs as explained below; minimum, 0.17 cfs Feb. 5, 6,
1940-68: Maximum discharge, 797 cfs May 2, 1965 (gage height, 5.6 ft), from rating curve extended above 3.3 cfs by test on model of station site; minimum, 0.06 cfs Feb. 12, 1967.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Diversion 400 ft above station for irrigation and domestic use since July 1966.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.28	0.38	0.54	0.42	0.28	0.25	0.63	0.84	0.63	0.69	0.57	0.51
2	.31	.36	.54	.44	.28	.24	.63	.84	.63	.69	.57	.48
3	.29	.34	.54	.42	.29	.24	.63	.84	.63	.69	.57	.48
4	.28	.34	.52	1.9	.29	.25	.60	.84	.63	.69	.60	.48
5	.26	.34	.52	1.6	.25	.41	.63	.84	.63	.69	.57	.48
6	.26	.34	.50	.80	.18	.26	.60	.84	.63	.69	.57	.44
7	.26	.33	.50	.45	.18	.26	.60	.84	.63	.66	.57	.44
8	.38	.33	4.0	.32	.19	.28	.60	.84	.63	.63	.57	.44
9	.32	.32	7.5	.26	.19	.28	.60	.84	.63	.63	.60	.44
10	.26	.32	3.8	.25	.19	.27	.63	1.0	.63	.63	.60	.44
11	.26	.34	1.7	.26	.20	.35	.60	.76	.63	.63	.60	.44
12	.26	.42	.90	.26	.20	.80	.60	.72	.63	.63	.60	.44
13	.27	.34	.68	.26	.20	7.3	.60	.69	.63	.63	.60	.44
14	.26	.35	.54	.26	.21	23	.63	.66	.63	.60	.60	.44
15	.27	.36	.50	.26	.21	6.2	.69	.66	.63	.60	.60	.44
16	.28	.36	.50	1.1	.21	8.4	.63	.65	.66	.57	.60	.44
17	.28	.37	.48	.57	.21	4.3	.66	.65	.66	.60	.60	.44
18	.40	.37	8.0	.35	.21	1.4	.66	.64	.66	.60	.60	.44
19	.58	.38	1.9	.28	.42	2.0	4.3	.80	.66	.60	.60	.44
20	.26	.37	1.2	.26	.26	1.0	4.0	.70	.63	.60	.60	.44
21	.26	.38	.85	.26	.25	.88	4.8	.68	.63	.60	.57	.44
22	.25	.38	.68	.28	.23	.84	2.2	.68	.66	.57	.57	.44
23	.38	.38	.55	.27	.22	.93	1.2	.66	.66	.57	.57	.46
24	.26	1.4	.95	.26	.22	.69	1.0	.66	.66	.57	.57	.44
25	.26	3.2	.80	.26	.88	.66	.98	.66	.63	.54	.57	.44
26	.26	1.1	.52	.26	.32	.66	.93	.65	.63	.57	.57	.46
27	.26	.72	.48	1.9	.28	.66	.88	.65	.63	.57	.57	.44
28	.24	.57	.44	.76	.26	.66	.88	.65	.66	.57	.57	.44
29	.24	.54	.48	.42	.25	.80	.84	.64	.66	.57	.54	.98
30	.24	.54	.42	.32	------	.66	.84	.64	.69	.57	.54	.25
31	.24	------	.44	.29	------	.66	------	.64	------	.57	.51	------
TOTAL	8.91	16.27	41.97	16.00	7.56	65.59	34.07	22.70	19.23	19.02	17.94	13.82
MEAN	0.287	0.542	1.35	0.516	0.261	2.12	1.14	0.732	0.641	0.614	0.579	0.461
MAX	0.58	3.2	8.0	1.9	0.88	23	4.8	1.0	0.69	0.69	0.60	0.98
MIN	0.24	0.32	0.42	0.25	0.18	0.24	0.60	0.64	0.63	0.54	0.51	0.25
AC-FT	18	32	83	32	15	130	68	45	38	38	36	27

CAL YR 1967: TOTAL 233.05 MEAN 0.638 MAX 16 MIN 0.09 AC-FT 462
WAT YR 1968: TOTAL 283.08 MEAN 0.773 MAX 23 MIN 0.18 AC-FT 561

Note.--No gage-height record Dec. 4 to Jan. 8.

16-2830. Kahaluu Stream near Heeia

Location.--Lat 21°26'20", long 157°51'20", 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.

Records available.--October 1935 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 357.52 ft above mean sea level (levels by Wright, Harvey & Wright).

Extremes.--Maximum discharge during year, 127 cfs Mar. 13 (gage height, 3.49 ft), from rating curve extended above 16 cfs as explained below; minimum, 0.21 cfs on many days.
1935-68: Maximum discharge, 1,730 cfs Feb. 4, 1965 (gage height, 8.46 ft, from floodmarks), from rating curve extended above 16 cfs by test on model of station site; minimum, 0.05 cfs at times in 1958, 1962 and 1963.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.26	0.40	0.45	0.26	0.26	0.26	0.53	0.77	0.53	0.32	0.38	0.26
2	.26	.37	.45	.45	.38	.26	.53	.69	.45	.32	.32	.21
3	.21	.36	.38	.32	.45	.21	.69	.61	.45	.32	.32	.21
4	.21	.35	.32	1.8	.53	.26	.69	.61	.45	.32	.38	.21
5	.26	.35	.32	3.6	.45	.77	1.1	.53	.38	.32	.38	.21
6	.26	.34	.32	.69	.38	.45	.77	.45	.32	.32	.32	.26
7	.38	.34	.38	.38	.45	.32	.69	.45	.32	.32	.32	.32
8	1.1	.34	2.8	.26	.45	.26	.61	.45	.32	.32	.32	1.1
9	.32	.34	5.4	.26	.45	.26	.69	.53	.32	.32	.32	.85
10	.32	.33	4.6	.26	.45	.26	.94	1.6	.32	.32	.26	.32
11	.21	.33	.94	.26	.38	.38	.61	.94	.32	.38	.26	.26
12	.21	.33	.53	.21	.38	1.9	.69	.69	.32	.32	.26	.26
13	.32	.33	.38	.21	.32	11	.53	.61	.32	.32	.26	.21
14	.21	.33	.38	.21	.26	19	.66	.61	.32	.32	.26	.21
15	.21	.33	.26	.21	.32	7.1	1.3	.53	.32	.32	.26	.21
16	.21	.32	.26	2.2	.32	8.0	2.0	.53	.32	.32	.26	.21
17	.26	.32	.26	1.7	.26	2.0	1.2	.61	.32	.32	.32	.21
18	11	.32	8.9	.53	.26	.69	.85	.61	.32	.32	.32	.21
19	.69	.32	1.4	.38	.38	1.4	10	.53	.32	.32	.26	.21
20	.45	.32	.77	.32	.38	.69	7.2	.45	.32	.26	.26	.21
21	.40	.32	.32	.26	.38	.45	1.4	.53	.32	.26	.26	.21
22	.35	.32	.26	.26	.32	.45	1.1	.69	.32	.21	.26	.21
23	2.5	.32	.32	.26	.26	.45	.94	.69	.32	.32	.21	.21
24	.90	3.0	.81	.26	.21	13	.85	.77	.32	.26	.26	.21
25	.50	6.0	.45	.21	1.0	.69	1.0	.85	.32	.21	.21	.21
26	.40	1.3	.26	.21	.45	.53	1.5	.85	.38	.21	.21	.26
27	.37	.61	.26	2.6	.32	.53	.94	.94	.32	.26	.21	.21
28	.35	.45	.26	.53	.26	12	.77	.94	.32	.26	.21	.21
29	.34	.38	.26	.38	.26	.69	.69	.69	.32	.26	.21	1.8
30	.33	.38	.26	.38	------	.61	.69	.61	.32	.26	.21	.94
31	.32	------	.32	.38	------	.53	------	.53	------	.26	.21	------
TOTAL	24.11	19.85	33.28	20.24	10.97	62.90	42.16	20.89	10.32	9.17	8.50	10.62
MEAN	0.778	0.662	1.07	0.653	0.378	2.03	1.41	0.674	0.344	0.296	0.274	0.354
MAX	11	6.0	8.9	3.6	1.0	19	10	1.6	0.53	0.38	0.38	1.8
MIN	0.21	0.32	0.26	0.21	0.21	0.21	0.53	0.45	0.32	0.21	0.21	0.21
AC-FT	48	39	66	40	22	125	84	41	20	18	17	21

CAL YR 1967: TOTAL 216.45 MEAN 0.593 MAX 11 MIN 0.13 AC-FT 429
WAT YR 1968: TOTAL 273.01 MEAN 0.746 MAX 19 MIN 0.21 AC-FT 542

PEAK DISCHARGE (BASE, 47 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-18	1100	2.66	74	1-27	0730	2.32	56
11-24	1530	3.07	98	3-13	2330	3.49	127
12-10	0500	2.40	60	3-16	0200	2.74	78
12-18	0400	3.25	110	4-20	0030	2.82	83
1- 5	0230	2.75	79				

Note.--No gage-height record Oct. 20 to Nov. 24.

16-2835. Kahaluu Stream at Kahaluu

Location.--Lat 21°27'23", long 157°50'15", 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.

Records available.--Water years 1960-62, 1965 (annual maximum gage height only), February 1967 to September 1968.

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 year, 2,950 cfs Mar. 14 (gage height, 15.06 ft), from rating curve extended above 240 cfs on basis of slope-area measurement at gage height 14.55 ft; minimum, 2.6 cfs Aug. 27, 28, Sept. 20.
1959-62, 1964-65, 1967-68: Maximum gage height, 17.71 ft May 2, 1965 (discharge not determined); maximum discharge determined, that of Mar. 14, 1968.
1967-68: Minimum discharge, 2.6 cfs Aug. 27, 28, Sept. 20, 1968.

Remarks.--Records poor. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area. Effluent of about 0.2 cfs from sewage treatment plant enters Ahuimanu Stream above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	6.5	5.7	14	11	6.3	11	12	8.0	5.4	7.4	4.6
2	6.5	6.3	5.7	15	11	6.0	11	12	8.0	5.0	5.4	5.9
3	6.7	6.1	5.5	13	11	5.7	12	11	8.0	5.0	5.9	3.8
4	6.5	6.0	5.4	29	10	5.7	11	11	8.0	5.0	6.9	3.5
5	6.2	5.9	5.4	36	10	6.6	13	11	7.5	4.6	4.5	3.2
6	6.1	5.7	5.3	15	10	6.3	11	11	7.5	4.6	4.0	3.5
7	6.2	5.6	6.2	13	10	5.7	10	11	7.5	4.2	3.5	4.2
8	7.9	5.7	18	11	9.8	5.7	9.8	11	7.5	4.6	3.4	6.8
9	6.5	5.6	36	11	9.8	5.7	10	11	7.0	4.6	3.2	6.4
10	6.1	5.5	17	11	9.8	5.7	13	30	7.0	4.6	3.1	3.8
11	6.1	5.6	7.8	10	9.8	5.7	9.8	14	7.0	5.9	3.1	3.5
12	5.6	5.5	6.5	10	10	9.8	10	11	7.0	5.0	3.0	3.5
13	6.8	5.5	5.9	10	9.4	108	12	10	6.5	5.0	3.0	3.5
14	6.1	5.5	5.6	10	9.4	492	9.8	10	6.5	4.6	3.0	3.2
15	5.9	5.4	5.3	10	13	90	13	10	6.5	5.0	2.9	3.2
16	5.7	5.4	5.3	53	9.4	77	28	9.7	6.5	4.6	2.9	3.2
17	5.7	5.3	5.4	25	8.4	59	14	9.7	6.5	5.0	2.8	3.2
18	14	5.3	236	13	7.8	25	12	9.7	5.9	5.0	2.8	3.2
19	9.2	5.3	38	12	12	27	81	9.4	5.9	4.6	2.8	2.8
20	7.8	5.4	22	12	11	19	89	9.4	5.9	4.6	2.8	2.8
21	6.8	5.3	19	12	12	17	106	9.4	5.9	4.6	2.8	3.8
22	6.3	5.4	17	12	8.1	16	23	9.4	5.9	4.6	2.8	3.2
23	54	5.6	17	11	7.5	18	17	9.1	5.9	6.9	2.8	3.8
24	7.8	18	28	11	7.2	24	16	9.1	5.9	5.0	2.8	3.8
25	6.7	19	19	11	21	16	15	9.1	5.4	4.6	2.8	4.2
26	6.5	7.8	15	11	8.1	15	14	9.1	7.4	4.6	2.8	5.0
27	6.3	6.1	14	105	6.9	15	14	8.7	5.9	4.6	2.8	4.2
28	6.2	5.6	14	17	6.3	59	13	8.7	5.4	4.2	2.8	4.2
29	6.1	5.6	15	14	6.0	14	13	8.7	5.4	4.6	3.2	24
30	6.2	5.6	14	12	------	14	12	8.6	5.4	5.0	2.8	14
31	6.1	------	14	11	------	13	------	8.6	------	5.4	3.2	------
TOTAL	256.8	197.1	634.0	560	285.7	1192.9	633.4	332.4	198.7	151.0	108.0	148.0
MEAN	8.28	6.57	20.5	18.1	9.85	38.5	21.1	10.7	6.62	4.87	3.48	4.93
MAX	54	19	236	105	21	492	106	30	8.0	6.9	7.4	24
MIN	5.6	5.3	5.3	10	6.0	5.7	9.8	8.6	5.4	4.2	2.8	2.8
AC-FT	509	391	1260	1110	567	2370	1260	659	394	300	214	294

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 4,698.0 MEAN 12.8 MAX 492 MIN 2.8 AC-FT 9,320

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-23	1530	14.19	1,190	3-15	2300	11.00	740
12-18	0430	14.55	2,570	3-17	0200	10.73	640
1-16	1400	11.00	740	4-20	0130	11.48	932
1-27	0800	13.50	1,940	4-21	1900	12.83	1,560
3-14	0030	15.06	2,950				

Note.--No gage-height record Apr. 26 to June 17.

16-2836. South Fork Waihee Stream near Heeia

Location.--Lat 21°26'42", long 157°52'10", 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.

Records available.--September 1962 to September 1968.

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).

Extremes.--Maximum discharge during year, 154 cfs Apr. 20 (gage height, 3.19 ft), from rating curve extended above 3.9 cfs as explained below; minimum, 2.0 cfs Oct. 1, 2, 4-6.
1962-68: Maximum discharge, 279 cfs May 2, 1965 (gage height, 3.96 ft), from rating curve extended above 3.9 cfs by logarithmic plotting; minimum, 1.4 cfs on many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.7	2.3	2.2	2.3	2.3	2.5	2.6	2.6	2.6	2.6	2.4
2	2.0	2.6	2.3	2.3	2.3	2.3	2.5	2.5	2.6	2.6	2.6	2.4
3	2.1	2.3	2.3	2.2	2.3	2.3	2.6	2.5	2.6	2.6	2.6	2.4
4	2.0	2.3	2.3	2.8	2.3	2.3	2.5	2.5	2.6	2.6	2.6	2.4
5	2.0	2.3	2.3	3.1	2.3	2.6	3.1	2.5	2.6	2.6	2.6	2.4
6	2.0	2.3	2.3	2.5	2.3	2.4	2.4	2.5	2.6	2.6	2.5	2.4
7	2.1	2.3	2.3	2.4	2.3	2.4	2.4	2.5	2.6	2.6	2.5	2.4
8	2.3	2.3	2.7	2.4	2.3	2.4	2.4	2.5	2.6	2.6	2.5	2.4
9	2.1	2.3	2.9	2.4	2.3	2.4	2.4	2.5	2.6	2.6	2.5	2.8
10	2.1	2.3	3.2	2.3	2.3	2.4	2.5	2.6	2.6	2.6	2.5	2.6
11	2.1	2.3	2.3	2.3	2.3	2.6	2.4	2.6	2.6	2.6	2.5	2.5
12	2.1	2.2	2.3	2.3	2.3	2.9	2.5	2.6	2.6	2.6	2.5	2.5
13	2.2	2.2	2.3	2.3	2.3	5.4	2.4	2.6	2.6	2.6	2.5	2.5
14	2.1	2.2	2.3	2.3	2.3	8.1	2.5	2.6	2.6	2.6	2.5	2.5
15	2.1	2.2	2.3	2.3	2.4	5.3	2.8	2.6	2.6	2.6	2.5	2.5
16	2.1	2.2	2.3	3.0	2.3	5.4	2.8	2.6	2.6	2.6	2.5	2.5
17	2.1	2.2	2.3	2.6	2.3	2.8	2.7	2.6	2.6	2.6	2.5	2.5
18	3.5	2.2	4.3	2.3	2.3	2.5	2.6	2.6	2.6	2.6	2.5	2.5
19	2.3	2.2	2.5	2.3	2.4	2.6	6.0	2.6	2.6	2.6	2.5	2.5
20	2.2	2.2	2.3	2.3	2.4	2.5	5.2	2.6	2.6	2.6	2.5	2.5
21	2.2	2.3	2.3	2.3	2.5	2.5	3.1	2.6	2.6	2.6	2.5	2.5
22	2.2	2.3	2.3	2.3	2.3	2.5	2.6	2.6	2.6	2.6	2.5	2.4
23	2.2	2.3	2.3	2.3	2.3	2.5	2.6	2.6	2.6	2.6	2.5	2.4
24	2.2	3.3	2.4	2.3	2.3	2.8	2.6	2.6	2.6	2.6	2.5	2.4
25	2.2	3.2	2.3	2.3	2.6	2.5	2.6	2.6	2.6	2.6	2.5	2.4
26	2.2	2.5	2.3	2.2	2.3	2.5	2.6	2.6	2.6	2.6	2.4	2.5
27	2.2	2.3	2.3	2.7	2.3	2.6	2.6	2.6	2.6	2.6	2.4	2.4
28	2.2	2.3	2.3	2.3	2.3	2.6	2.6	2.6	2.6	2.6	2.4	2.4
29	2.2	2.3	2.3	2.3	2.3	2.5	2.6	2.6	2.6	2.5	2.4	2.7
30	2.6	2.3	2.3	2.3	------	2.5	2.6	2.6	2.6	2.5	2.4	2.4
31	2.4	------	2.2	2.3	------	2.5	------	2.6	------	2.5	2.4	------
TOTAL	68.3	70.9	75.4	74.2	67.5	91.9	83.7	79.8	78.0	80.3	77.4	74.1
MEAN	2.20	2.36	2.43	2.39	2.33	2.96	2.79	2.57	2.60	2.59	2.50	2.47
MAX	3.5	3.3	4.3	3.1	2.6	8.1	6.0	2.6	2.6	2.6	2.6	2.8
MIN	2.0	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.5	2.4	2.4
AC-FT	135	141	150	147	134	182	166	158	155	159	154	147

CAL YR 1967: TOTAL 771.4 MEAN 2.11 MAX 5.8 MIN 1.8 AC-FT 1,530
WAT YR 1968: TOTAL 921.5 MEAN 2.52 MAX 8.1 MIN 2.0 AC-FT 1,830

PEAK DISCHARGE (BASE, 31 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-18	1000	2.04	41	3-14	0030	2.48	72
12-10	0530	1.84	31	3-16	0130	2.33	60
12-18	0430	1.90	34	4-20	0100	3.19	154
1- 5	0230	2.09	44	4-21	1800	1.96	37

Note.--No gage-height record Oct. 20 to Nov. 20, Aug. 8 to Sept. 30.

16-2837. North Fork Waihee Stream near Heeia

Location.--Lat 21°26'46", long 157°52'18", 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.

Records available.--September 1962 to September 1968.

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

Extremes.--Maximum discharge during year, 141 cfs Apr. 20 (gage height, 2.48 ft), from rating curve extended above 19 cfs as explained below; minimum, 1.8 cfs Nov. 13-22.
1962-68: Maximum discharge, 376 cfs Feb. 4, 1965 (gage height, 3.38 ft), from rating curve extended above 19 cfs by logarithmic plotting; minimum, 1.3 cfs on many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	2.2	1.9	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2
2	2.0	2.0	1.9	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2
3	2.0	1.9	1.9	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2
4	2.0	1.9	1.9	2.5	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2
5	2.0	1.9	1.9	3.0	2.1	2.3	3.0	2.3	2.3	2.3	2.3	2.2
6	2.0	1.9	1.9	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.2
7	2.0	1.9	1.9	2.1	2.1	2.2	2.3	2.4	2.3	2.3	2.3	2.2
8	2.3	1.9	2.3	2.1	2.1	2.2	2.3	2.4	2.3	2.3	2.4	2.2
9	2.0	1.9	2.7	2.1	2.1	2.2	2.3	2.4	2.3	2.3	2.4	2.4
10	2.0	1.9	3.1	2.1	2.1	2.2	2.3	2.6	2.3	2.3	2.4	2.2
11	2.0	1.9	1.9	2.1	2.1	2.3	2.3	2.4	2.3	2.3	2.4	2.2
12	2.0	1.9	1.9	2.1	2.1	2.7	2.3	2.4	2.3	2.3	2.4	2.2
13	2.0	1.8	1.9	2.1	2.1	6.0	2.3	2.4	2.3	2.3	2.4	2.2
14	2.0	1.8	1.9	2.1	2.1	6.7	2.3	2.3	2.3	2.3	2.3	2.2
15	2.0	1.8	1.9	2.1	2.3	5.0	2.3	2.3	2.3	2.3	2.3	2.2
16	2.0	1.8	1.9	2.7	2.1	5.2	2.6	2.3	2.3	2.3	2.3	2.2
17	2.0	1.8	1.9	2.3	2.1	2.7	2.6	2.3	2.3	2.3	2.3	2.2
18	3.1	1.8	4.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.2
19	2.2	1.8	2.1	2.1	2.1	2.4	6.9	2.3	2.3	2.3	2.3	2.2
20	2.0	1.8	2.0	2.1	2.1	2.3	5.5	2.3	2.3	2.3	2.3	2.2
21	2.0	1.8	2.0	2.1	2.3	2.2	2.9	2.3	2.3	2.3	2.3	2.2
22	2.0	1.8	2.0	2.1	2.1	2.2	2.5	2.3	2.3	2.3	2.3	2.1
23	2.0	1.9	2.0	2.1	2.1	2.2	2.4	2.3	2.3	2.4	2.3	2.1
24	1.9	3.3	2.1	2.1	2.1	2.7	2.4	2.3	2.3	2.3	2.3	2.1
25	1.9	2.6	2.0	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1
26	1.9	2.0	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2	2.2
27	1.9	1.9	2.0	2.7	2.1	2.3	2.3	2.3	2.3	2.3	2.2	2.1
28	1.9	1.9	2.0	2.1	2.1	2.4	2.3	2.3	2.3	2.3	2.2	2.1
29	1.9	1.9	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2	2.3
30	2.1	1.9	2.0	2.1	------	2.3	2.3	2.3	2.3	2.3	2.2	2.1
31	1.9	------	2.0	2.1	------	2.3	------	2.3	------	2.3	2.2	------
TOTAL	62.9	58.6	64.9	67.5	61.5	84.8	79.1	72.2	69.0	71.4	71.3	65.6
MEAN	2.03	1.95	2.09	2.18	2.12	2.74	2.64	2.35	2.30	2.30	2.30	2.19
MAX	3.1	3.3	4.0	3.0	2.3	6.7	6.9	2.6	2.3	2.4	2.4	2.4
MIN	1.9	1.8	1.9	2.0	2.1	2.1	2.3	2.3	2.3	2.3	2.2	2.1
AC-FT	125	116	129	134	122	168	157	143	137	137	141	130

CAL YR 1967: TOTAL 690.1 MEAN 1.89 MAX 5.0 MIN 1.6 AC-FT 1,370
WAT YR 1968: TOTAL 828.8 MEAN 2.26 MAX 6.9 MIN 1.8 AC-FT 1,640

PEAK DISCHARGE (BASE, 31 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-18	1030	1.59	34	3-16	0130	2.02	73
1- 5	0230	1.77	48	4-20	0030	2.48	141
3-13	2400	1.97	68				

Note.--No gage-height record Dec. 5 to Jan. 31, Feb. 3 to Mar. 7.

16-2840. Waihee Stream near Heeia

Location.--Lat 21°27'00", long 157°51'40", 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.

Records available.--December 1935 to September 1968.

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).

Extremes.--Maximum discharge during year, 272 cfs Mar. 16 (gage height, 4.51 ft), from rating curve extended above 77 cfs as explained below; minimum, 5.0 cfs Aug. 28-31.
1935-68: 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.
Revisions.--The maximum discharge for the water year 1967 has been revised to 354 cfs Aug. 9, 1967 (gage height, 4.74 ft), superseding figure published in Water Resources Data for Hawaii and other Pacific Areas, Part 1, for 1967.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	9.9	7.4	7.9	7.9	8.1	7.0	8.1	7.0	6.6	6.0	5.3
2	6.8	9.9	7.4	8.7	7.6	8.1	7.0	8.1	7.0	6.4	5.8	5.1
3	6.8	8.5	7.4	7.9	7.6	8.1	7.0	7.9	7.0	6.4	5.8	5.1
4	6.8	7.9	7.2	12	7.6	8.1	6.8	7.9	7.0	6.4	6.4	5.3
5	6.8	7.4	7.2	14	7.6	9.0	11	7.9	7.0	6.4	6.4	5.1
6	6.8	7.4	7.0	9.9	7.6	8.1	7.4	7.6	7.0	6.2	6.2	5.3
7	7.0	7.2	7.7	9.0	7.6	7.6	7.0	7.6	7.2	6.2	6.2	5.3
8	8.9	7.4	17	8.5	7.9	7.6	6.6	7.6	7.2	6.2	6.2	5.7
9	7.2	7.2	19	8.3	7.6	7.6	6.6	7.6	7.0	6.2	6.2	6.2
10	7.2	7.4	24	8.1	7.6	7.4	7.2	9.4	7.2	6.2	6.2	5.5
11	7.0	7.2	12	8.1	7.6	7.9	7.0	8.5	7.2	6.2	6.0	5.3
12	7.0	7.2	9.6	8.1	7.9	11	7.2	8.1	7.2	6.2	6.0	5.3
13	7.2	7.2	9.0	8.1	7.9	29	7.0	8.1	7.2	6.2	5.8	5.3
14	7.0	7.2	8.5	8.1	8.1	66	7.6	8.1	7.2	6.2	5.8	5.3
15	7.0	7.2	8.1	8.1	8.3	37	10	7.9	7.0	6.0	5.8	5.3
16	7.0	7.0	7.9	13	8.3	37	12	7.6	7.0	5.8	5.8	5.3
17	6.8	6.8	8.1	12	8.1	16	11	7.6	6.8	6.0	5.7	5.5
18	16	6.6	31	9.4	8.1	11	9.2	7.6	6.8	5.8	5.7	5.5
19	11	6.6	12	9.0	8.7	9.6	33	7.4	6.6	5.8	5.5	5.5
20	8.7	6.4	9.6	8.7	8.7	8.3	35	7.4	6.8	5.8	5.5	5.7
21	8.1	6.4	8.7	8.5	9.0	7.9	17	7.4	6.8	5.8	5.5	5.7
22	7.9	6.6	8.5	8.5	8.3	7.6	11	7.0	6.8	6.0	5.5	5.5
23	8.1	6.8	8.1	8.5	8.1	7.4	9.2	7.0	6.6	6.4	5.5	5.7
24	7.9	16	9.2	8.3	8.1	9.9	8.7	7.0	6.6	6.4	5.5	5.7
25	7.6	18	9.0	8.1	10	8.1	8.3	7.2	6.6	6.2	5.3	5.7
26	7.6	11	8.3	7.9	8.3	7.4	8.1	7.0	6.6	6.4	5.3	6.2
27	7.6	8.5	7.9	12	8.1	7.9	8.1	6.8	6.6	6.4	5.3	5.8
28	7.9	7.6	7.9	9.0	8.1	8.8	8.1	7.0	6.6	6.2	5.1	5.7
29	7.4	7.6	7.9	8.1	8.1	7.9	8.1	7.0	6.6	6.0	5.1	7.1
30	7.9	7.9	7.9	7.9	------	7.9	8.1	7.0	6.6	6.0	5.1	6.2
31	7.4	------	7.9	7.9	------	7.2	------	7.0	------	6.0	5.1	------
TOTAL	240.8	246.0	318.4	281.6	234.4	400.5	307.3	235.4	206.8	191.0	177.3	167.2
MEAN	7.77	8.20	10.3	9.08	8.08	12.9	10.2	7.59	6.89	6.16	5.72	5.57
MAX	16	18	31	14	10	66	35	9.4	7.2	6.6	6.4	7.1
MIN	6.4	6.4	7.0	7.9	7.6	7.2	6.6	6.8	6.6	5.8	5.1	5.1
AC-FT	478	488	632	559	465	794	610	467	410	379	352	332

CAL YR 1967: TOTAL 2,567.6 MEAN 7.03 MAX 58 MIN 4.1 AC-FT 5,090
WAT YR 1968: TOTAL 3,006.7 MEAN 8.22 MAX 66 MIN 5.1 AC-FT 5,960

PEAK DISCHARGE (BASE, 140 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-18	0400	4.23	233	3-16	0200	4.51	272
3-14	0100	4.36	249	4-20	0130	4.41	256

16-2845. Waihee Stream at Kahaluu

Location.--Lat 21°27'31", long 157°50'26", 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.

Records available.--Occasional low-flow measurements, water years 1958, 1960-63, 1965-66, October 1966 to September 1968.

Gage.--Water-stage recorder. Datum of gage is at mean sea level.

Extremes.--Maximum discharge during year, 1,760 cfs Mar. 14 (gage height, 9.19 ft), from rating curve extended above 260 cfs; minimum, 7.3 cfs Aug. 31.
1966-68: Maximum discharge, that of Mar. 14, 1968; minimum, that of Aug. 31, 1968.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Diversions above station for irrigation of taro and other crops. Honolulu Board of Water Supply diverts ground water from tunnel and well in drainage area. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	20	13	18	16	17	17	18	12	10	12	8.8
2	15	19	13	21	16	17	17	17	13	10	11	10
3	15	16	12	18	17	17	18	16	12	10	11	8.8
4	15	15	11	29	17	18	16	16	12	10	13	8.8
5	15	14	11	30	16	19	26	15	12	10	14	8.8
6	14	14	11	21	16	18	18	14	12	9.6	12	8.8
7	14	14	12	19	16	17	16	14	12	9.6	11	9.6
8	19	14	36	18	16	17	14	17	12	9.6	11	9.6
9	15	14	42	17	16	18	15	16	11	9.6	10	12
10	15	14	24	17	16	17	18	26	11	9.6	10	9.6
11	15	14	17	17	16	18	14	19	11	12	10	8.8
12	14	13	16	17	16	21	15	17	11	12	10	8.8
13	15	13	15	17	16	60	15	16	11	12	11	8.8
14	14	13	15	16	16	277	15	16	12	12	11	8.8
15	13	13	14	16	19	96	24	15	12	11	11	8.0
16	13	13	15	37	17	85	37	15	12	11	11	8.0
17	13	13	16	29	16	51	26	15	12	12	11	8.0
18	35	12	130	21	16	33	23	14	12	12	11	8.0
19	22	11	34	18	17	32	89	14	12	12	10	8.0
20	18	12	23	18	17	26	97	13	12	12	10	8.0
21	16	12	22	18	21	23	65	13	12	12	10	8.8
22	14	12	21	17	17	20	32	13	11	13	10	8.8
23	35	14	21	17	16	21	27	12	11	15	10	9.6
24	19	35	28	17	16	31	24	12	11	13	10	9.6
25	16	32	22	17	23	20	21	13	11	13	10	9.6
26	16	20	20	16	18	18	20	13	15	14	10	11
27	16	16	19	39	18	22	19	13	12	12	9.6	10
28	16	14	19	19	17	41	17	13	11	12	8.8	9.6
29	16	14	18	17	17	24	16	12	11	11	8.8	19
30	16	14	18	16	------	23	18	12	11	11	8.0	16
31	16	------	18	16	------	19	------	12	------	12	8.0	------
TOTAL	519	464	706	623	491	1136	789	461	352	354.0	324.2	290.0
MEAN	16.7	15.5	22.8	20.1	16.9	36.6	26.3	14.9	11.7	11.4	10.5	9.67
MAX	35	35	130	39	23	277	97	26	15	15	14	19
MIN	13	11	11	16	16	17	14	12	11	9.6	8.0	8.0
AC-FT	1030	920	1400	1240	974	2250	1560	914	698	702	643	575

CAL YR 1967: TOTAL 6,017 MEAN 16.5 MAX 150 MIN 10 AC-FT 11,930
WAT YR 1968: TOTAL 6,509.2 MEAN 17.8 MAX 277 MIN 8.0 AC-FT 12,910

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-18	1200	4.63	306	3-16	0230	5.47	493
12-18	0530	6.85	875	4-20	0100	7.43	1,050
3-14	0100	9.19	1,760	4-21	1800	7.12	956

Note.--No gage-height record May 3 to June 2.

16-2850. Waiahole tunnel at Waianu, near Waiahole

Location.--Lat 21°29'05", long 157°53'15", on left bank in Waiahole tunnel at Waianu Stream intake and 2.1 miles west of Waiahole School.

Records available.--December 1950 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 785.5 ft above mean sea level (levels by Waiahole Water Co.).

Extremes.--1950-68: Maximum daily discharge, 114 cfs July 28, 1954; minimum daily, 24.8 cfs Jan. 24-29, 1952.

Remarks.--Records good. Tunnel diverts from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in vicinity of Waipahu. Occasional releases at various intakes above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	64	49	45	46	42	46	53	45	43	41	39
2	48	50	46	46	44	42	46	48	45	43	40	37
3	45	46	45	46	44	42	47	47	45	42	39	37
4	46	45	45	61	44	42	47	47	45	42	42	37
5	45	45	46	63	43	54	55	47	45	42	40	36
6	45	45	45	50	43	42	47	47	44	42	39	36
7	46	44	52	46	43	42	46	47	45	42	39	37
8	58	44	90	46	43	42	46	47	45	42	39	42
9	47	44	61	46	43	42	46	47	44	41	39	54
10	45	44	56	45	43	42	56	53	44	41	39	38
11	45	44	51	45	43	62	46	48	44	41	39	37
12	45	44	48	45	43	84	46	47	44	41	39	37
13	58	44	47	45	43	82	46	47	44	41	38	37
14	53	44	46	45	43	81	46	47	45	43	38	37
15	46	44	46	45	43	70	61	46	44	40	38	36
16	45	44	46	57	43	78	64	46	44	41	38	36
17	45	43	46	48	43	58	62	46	44	41	38	36
18	57	43	70	46	43	48	50	46	44	40	38	37
19	58	43	51	45	45	54	73	46	43	40	38	36
20	50	45	47	45	46	48	67	46	43	40	38	36
21	47	44	46	45	43	46	56	46	43	40	39	36
22	46	44	46	44	43	46	52	46	43	40	38	36
23	52	47	45	44	43	55	52	46	43	41	38	36
24	49	58	47	44	43	65	50	46	43	40	37	36
25	46	54	47	44	44	50	49	45	43	40	37	37
26	45	51	45	44	43	48	48	46	43	44	37	46
27	45	46	45	54	42	58	48	45	43	40	37	37
28	46	47	45	51	42	48	48	45	43	39	37	36
29	46	47	45	45	42	47	47	49	43	39	37	38
30	53	47	45	44	------	49	52	48	43	39	37	37
31	46	------	46	44	------	46	------	46	------	42	37	------
TOTAL	1492	1394	1535	1463	1256	1655	1545	1456	1316	1272	1190	1133
MEAN	48.1	46.5	49.5	47.2	43.3	53.4	51.5	47.0	43.9	41.0	38.4	37.8
MAX	58	64	90	63	46	84	73	53	45	44	42	54
MIN	44	43	45	44	42	42	46	45	43	39	37	36
AC-FT	2960	2760	3040	2900	2490	3280	3060	2890	2610	2520	2360	2250

CAL YR 1967: TOTAL 16,684 MEAN 45.7 MAX 94 MIN 35 AC-FT 33,090
WAT YR 1968: TOTAL 16,707 MEAN 45.6 MAX 90 MIN 36 AC-FT 33,140

16-2860. Waiahole tunnel wasteway at intake 31, near Waiahole

Location.--Lat 21°28'30", long 157°53'15", on left bank 150 ft downstream from wasteway gates at Waiahole tunnel intake No. 31 and 2.2 miles west of Waiahole School.

Records available.--January 1951 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 742.7 ft above mean sea level (levels by Waiahole Water Co.).

Extremes.--1951-68: Maximum daily discharge, 99 cfs Nov. 12, 1965; no flow most of the time each year.

Remarks.--Records good. Station measures releases from Waiahole tunnel to Waiahole Stream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	19	40	41	40	0	0.58				
2	0	0	41	42	36	40	0	0				
3	0	0	40	39	32	40	0	0				
4	0	0	26	53	32	18	0	0				
5	0	0	0	58	32	21	.01	0				
6	0	0	0	46	31	2.6	0	0				
7	0	0	0	41	38	0	0	0				
8	.01	0	19	40	42	0	0	0				
9	0	0	51	40	42	0	0	0				
10	0	0	46	40	42	0	1.0	.01				
11	0	0	42	40	42	.01	0	0				
12	0	0	39	40	42	6.8	0	0				
13	.01	0	39	40	42	18	0	0				
14	0	0	39	39	42	18	.06	0				
15	0	0	39	39	42	8.4	.59	0				
16	0	0	40	52	42	11	.08	0				
17	0	0	41	43	41	2.3	.28	0				
18	1.0	0	58	41	41	0	0	0				
19	.49	0	46	40	43	.30	10	0				
20	.01	.01	39	40	44	0	5.0	0				
21	0	0	40	40	42	0	2.3	0				
22	0	0	40	39	41	0	.01	0				
23	.33	.01	40	40	41	1.3	.01	0				
24	0	11	40	39	40	4.1	0	0				
25	0	19	40	39	43	0	0	0				
26	0	15	40	39	40	0	0	0				
27	0	13	40	49	40	.85	0	0				
28	.21	21	40	46	40	0	0	0				
29	0	13	40	40	40	0	0	0				
30	.29	0	40	39	------	0	.62	0				
31	0	------	40	39	------	0	------	0	------			------
TOTAL	2.35	92.02	1104	1302	1156	232.66	19.96	0.59	0	0	0	0
MEAN	0.076	3.07	35.6	42.0	39.9	7.51	0.665	0.019	0	0	0	0
MAX	1.0	21	58	58	44	40	10	0.58	0	0	0	0
MIN	0	0	0	39	31	0	0	0	0	0	0	0
AC-FT	4.7	183	2190	2580	2290	461	40	1.2	0	0	0	0

CAL YR 1967: TOTAL 1,422.01 MEAN 3.88 MAX 58 MIN 0 AC-FT 2,820
WAT YR 1968: TOTAL 3,909.58 MEAN 10.7 MAX 58 MIN 0 AC-FT 7,750

16-2870. Waiahole tunnel at north portal, near Waiahole

Location.--Lat 21°28'15", long 157°53'30", on right bank in Waiahole tunnel directly below crest of Koolau Range and 2.6 miles southwest of Waiahole School.

Records available.--January 1951 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 752.5 ft above mean sea level (levels by Waiahole Water Co.).

Extremes.--1951-68: Maximum daily discharge, 125 cfs July 28, 1954; minimum daily, 2.29 cfs Dec. 9, 1956.

Remarks.--Records excellent. Tunnel diverts from headwaters of nearly all streams from Kahana Valley to Waiahole Valley for irrigation in vicinity of Waipahu. Occasional releases at numerous intakes above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	72	34	7.6	7.0	3.0	49	55	51	48	48	44
2	55	58	9.0	8.0	9.6	3.1	49	52	51	48	45	41
3	50	53	8.8	7.4	13	3.1	50	51	51	47	45	41
4	50	51	22	8.5	14	25	49	51	51	47	47	42
5	50	51	47	8.8	14	36	57	51	51	48	45	42
6	49	50	46	7.6	14	41	50	51	51	47	45	42
7	50	51	52	7.0	8.3	43	49	52	51	45	45	42
8	66	50	75	7.0	3.5	43	49	53	51	46	45	47
9	52	49	12	6.8	3.4	43	51	53	51	47	44	60
10	51	49	11	6.8	3.4	43	60	59	50	47	44	43
11	50	50	9.8	6.8	3.2	62	51	52	50	47	44	42
12	50	50	9.6	6.8	3.2	82	51	51	50	47	44	42
13	60	50	9.4	6.8	3.1	65	51	52	51	47	44	42
14	60	49	9.2	6.8	3.1	69	52	53	52	49	43	42
15	51	49	9.2	6.8	3.1	67	69	53	50	47	44	41
16	49	50	9.0	8.0	3.1	73	79	51	50	47	43	41
17	50	48	9.0	7.2	3.1	60	67	52	50	48	43	41
18	64	47	11	6.8	3.1	51	55	52	49	47	43	41
19	65	46	8.8	6.8	2.8	56	76	52	49	47	43	41
20	56	50	8.4	6.8	2.8	50	66	52	48	47	43	41
21	52	49	8.0	6.7	2.8	49	57	52	48	46	44	41
22	51	48	8.0	6.7	2.8	49	55	52	48	46	43	40
23	57	49	8.0	6.7	2.8	55	55	52	47	48	43	41
24	54	55	8.2	6.7	2.8	64	53	52	48	46	43	41
25	52	39	8.0	6.5	2.8	54	52	52	48	47	43	41
26	51	39	8.0	6.5	2.7	52	51	52	49	51	43	50
27	51	35	7.8	7.6	2.7	60	51	52	48	46	43	42
28	53	30	7.8	7.4	2.7	52	51	52	48	46	42	41
29	52	37	7.8	7.0	2.7	52	51	54	48	45	42	44
30	59	50	7.6	6.8	------	52	54	55	47	44	42	42
31	52	------	7.8	6.8	------	50	------	52	------	47	42	------
TOTAL	1662	1454	497.2	220.5	145.6	1507.2	1660	1625	1487	1455	1357	1281
MEAN	53.6	48.5	16.0	7.11	5.02	48.6	55.3	52.4	49.6	46.9	43.8	42.7
MAX	66	72	75	8.8	14	82	79	59	52	51	48	60
MIN	49	30	7.6	6.5	2.7	3.0	49	51	47	44	42	40
AC-FT	3300	2880	986	437	289	2990	3290	3220	2950	2890	2690	2540

CAL YR 1967:	TOTAL	16,938.8	MEAN	46.4	MAX	104	MIN	3.1	AC-FT	33,600
WAT YR 1968:	TOTAL	14,351.5	MEAN	39.2	MAX	82	MIN	2.7	AC-FT	28,470

16-2872. Waiahole tunnel at adit 8, near Waipahu

Location.--Lat 21°27'00", long 157°57'30", on left bank at adit 8, 2,700 ft downstream from Ewa Forest Reserve, and 5.2 miles northeast of Waipahu Post Office.

Records available.--August 1956 to September 1968.

Gage.--Water-stage recorder and concrete control. Datum of gage is 709.0 ft above mean sea level (levels by Waiahole Water Co.).

Extremes.--1956-68: Maximum daily discharge, 151 cfs Oct. 23, 1958; minimum daily, 9.3 cfs Dec. 9, 1956.

Remarks.--Records excellent. Records represent entire flow of Waiahole water-development tunnel; water is used for irrigation of sugarcane in vicinity of Waipahu.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	80	48	17	17	13	56	64	60	57	56	52
2	62	68	21	17	18	12	56	60	60	56	54	50
3	58	62	19	17	22	12	57	59	60	56	54	49
4	58	61	30	17	23	29	57	59	60	56	56	49
5	58	60	56	20	23	40	64	58	60	56	54	49
6	58	60	56	18	23	46	58	59	60	56	54	48
7	58	60	57	17	19	49	57	60	60	54	54	49
8	72	60	92	17	14	49	57	62	60	54	54	52
9	62	59	25	17	13	49	58	62	60	55	53	66
10	59	59	23	17	13	49	67	67	60	56	52	51
11	58	60	22	17	13	63	58	62	60	56	52	50
12	58	60	22	17	13	86	58	60	60	56	52	49
13	64	60	21	16	13	68	58	60	60	56	52	49
14	72	60	21	16	13	76	58	60	60	57	52	49
15	60	59	21	16	13	72	75	60	60	56	52	48
16	58	59	21	18	13	79	85	60	59	55	52	48
17	59	58	20	18	13	67	74	61	58	56	52	48
18	72	56	22	17	13	58	64	61	58	56	52	48
19	74	56	20	17	13	63	80	61	58	56	52	48
20	65	59	19	17	14	58	76	60	58	56	52	48
21	62	58	19	16	13	56	64	60	58	55	52	47
22	61	58	19	16	13	56	66	60	58	55	51	47
23	67	59	18	16	13	61	64	60	56	56	51	47
24	64	64	18	16	13	68	61	60	58	55	51	47
25	62	49	18	16	13	60	60	60	58	55	51	47
26	60	50	18	16	13	58	60	60	58	59	51	56
27	60	46	18	19	13	65	59	60	58	55	51	48
28	62	41	17	19	13	58	59	60	57	54	50	46
29	62	45	17	18	13	58	58	63	57	54	50	48
30	68	60	17	17	------	58	60	63	56	52	50	47
31	62	------	17	17	------	56	------	60	------	55	50	------
TOTAL	1,933	1,746	832	529	433	1,692	1,884	1,881	1,765	1,721	1,619	1,480
MEAN	62.4	58.2	26.8	17.1	14.9	54.6	62.8	60.7	58.8	55.5	52.2	49.3
MAX	74	80	92	20	23	86	85	67	60	59	56	66
MIN	58	41	17	16	13	12	56	58	56	52	50	46
AC-FT	3,830	3,460	1,650	1,050	859	3,360	3,740	3,730	3,500	3,410	3,210	2,940

CAL YR 1967: TOTAL 19,693 MEAN 54.0 MAX 103 MIN 14 AC-FT 39,060
WAT YR 1968: TOTAL 17,515 MEAN 47.9 MAX 92 MIN 12 AC-FT 34,740

16-2910. Waiahole Stream at altitude 250 ft, near Waiahole

Location.--Lat 21°28'35", long 157°52'30", on left bank 1.5 miles southwest of Waiahole School and 2.7 miles northwest of Kahaluu.

Drainage area.--0.99 sq mi.

Records available.--July 1955 to September 1968 (discontinued as a continuous-record station; converted to a crest-stage and low-flow partial-record station).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 250 ft (from topographic map).

Extremes.--Maximum discharge during year, 755 cfs Mar. 13 (gage height, 3.95 ft, from floodmark in well), from rating curve extended above 29 cfs on basis of field estimate at gage height 4.23 ft and slope-area measurement at gage height 4.80 ft; minimum, not determined; minimum daily, 4.0 cfs Sept. 5, 18-25.
1955-68: Maximum discharge, 2,230 cfs Apr. 15, 1963, May 2, 1965 (gage height, 4.80 ft), from rating curve extended above 120 cfs on basis of field estimate at gage height 4.23 ft and slope-area measurement of peak flow; minimum, 2.3 cfs Oct. 7-13, 1962.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Water was released from Waiahole tunnel at times throughout the year which increased flow at this station and augmented some of the peaks. During the water year, an average of 1.5 cfs was diverted above station by pumping into Waiahole tunnel for irrigation in central Oahu. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	6.6	30	49	60	54	9.2	11	5.6	5.0	5.6	5.4
2	5.0	7.0	55	54	55	54	8.8	10	5.6	5.0	5.0	4.5
3	4.7	5.3	54	50	54	53	8.8	9.6	5.6	6.0	5.0	4.3
4	4.7	4.7	37	73	54	33	9.2	9.6	5.6	6.0	5.3	4.2
5	4.4	4.4	7.4	90	53	36	10	9.6	5.6	5.6	5.0	4.0
6	4.1	5.0	7.0	69	52	16	9.2	9.6	5.6	5.6	5.0	4.1
7	4.1	4.4	8.4	60	61	15	8.8	7.7	6.0	7.0	5.0	4.2
8	13	4.4	63	59	68	14	7.7	7.4	6.0	6.3	4.7	4.8
9	5.0	5.0	83	58	68	13	7.4	7.0	5.6	6.0	4.7	13
10	4.1	5.0	77	58	68	12	11	11	5.6	5.3	4.7	6.0
11	4.4	4.4	62	57	68	13	6.3	11	5.6	5.3	5.0	5.0
12	4.4	4.1	57	57	66	20	6.0	10	5.6	5.3	5.0	4.5
13	5.0	4.1	54	57	65	55	6.0	8.0	5.6	5.3	4.7	5.1
14	4.4	4.1	52	58	64	130	8.6	7.0	5.6	5.3	5.0	5.1
15	4.1	4.1	52	57	63	58	16	7.0	5.6	5.3	4.7	4.2
16	4.7	4.1	52	81	63	35	34	7.7	5.6	5.0	4.4	4.2
17	4.1	5.3	52	68	62	20	11	7.4	5.6	5.0	4.4	4.1
18	16	7.0	91	62	62	12	9.6	6.3	5.6	5.0	4.4	4.0
19	19	7.0	56	59	64	11	57	6.3	5.6	5.0	4.4	4.0
20	7.4	5.6	54	58	68	10	36	6.3	6.0	5.0	4.4	4.0
21	5.6	4.1	50	57	62	10	29	6.3	6.0	5.0	4.4	4.0
22	4.7	6.0	50	58	61	9.6	15	6.3	6.0	5.0	4.4	4.0
23	9.6	7.4	51	57	61	12	12	6.3	7.4	5.0	4.4	4.0
24	5.0	34	55	57	60	16	11	6.3	6.0	5.0	4.4	4.0
25	4.7	35	54	57	66	11	11	6.3	6.0	5.0	4.4	4.0
26	4.4	27	52	57	59	10	11	6.3	5.6	5.0	4.4	5.0
27	4.1	23	51	72	57	15	11	6.3	5.6	5.0	4.5	4.5
28	5.6	31	51	69	55	10	10	6.3	5.6	5.0	4.4	4.4
29	5.0	21	50	59	54	11	9.6	6.3	5.6	5.0	4.3	7.0
30	6.8	7.7	50	57	------	10	10	6.0	6.6	6.3	4.1	5.0
31	5.0	------	51	57	------	9.6	------	6.0	------	6.3	4.1	------
TOTAL	187.2	297.8	1,568.8	1,891	1,773	788.2	410.2	238.2	173.6	166.9	144.2	144.6
MEAN	6.04	9.93	50.6	61.0	61.1	25.4	13.7	7.68	5.79	5.38	4.65	4.82
MAX	19	35	91	90	68	130	57	11	7.4	7.0	5.6	13
MIN	4.1	4.1	7.0	49	52	9.6	6.0	6.0	5.6	5.0	4.1	4.0
AC-FT	371	591	3,110	3,750	3,520	1,560	814	472	344	331	286	287

CAL YR 1967: TOTAL 4,286.0 MEAN 11.7 MAX 91 MIN 3.4 AC-FT 8,500
WAT YR 1968: TOTAL 7,783.7 MEAN 21.3 MAX 130 MIN 4.0 AC-FT 15,440

PEAK DISCHARGE (BASE, 190 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-18	1100	2.75	295	3-13	about 2400	3.95	755
12- 8	0230	2.33	195				
12-18	0430	2.31	190	4-16	0730	2.41	212
1- 4	2100	3.17	421	4-19	2030	2.46	223
				4-21	2000	3.27	454

Note.--No gage-height record Feb. 12 to Mar. 18, Aug. 27 to Sept. 30.

16-2949. Waikane Stream at altitude 75 ft, at Waikane

Location.--Lat 21°30'00", long 157°51'54", 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.

Records available.--December 1959 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,660 cfs Oct. 13 (gage height, 6.54 ft), from rating curve extended above 120 cfs as explained below; minimum, 2.1 cfs Sept. 5, 6.
1959-68: 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. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	19	11	7.0	13	4.4	8.7	9.1	4.0	3.2	2.8	4.2
2	5.8	14	7.6	7.0	7.0	4.2	8.3	8.0	4.0	3.0	2.6	3.2
3	4.2	9.9	6.4	6.4	7.2	4.2	8.7	7.3	3.8	3.0	2.4	2.6
4	4.7	8.3	6.1	17	6.7	4.4	8.7	7.0	3.8	3.0	3.6	2.4
5	4.2	7.6	5.8	34	6.4	7.0	16	6.7	3.8	3.0	3.0	2.2
6	4.0	7.3	5.5	18	6.1	4.4	9.1	6.4	3.8	2.8	2.6	2.4
7	4.0	7.0	4.9	9.5	6.1	4.2	7.6	6.4	4.0	2.6	2.4	3.2
8	14	6.7	153	8.3	5.8	4.2	7.6	7.0	4.2	2.6	2.4	3.5
9	5.8	6.4	112	8.0	5.5	4.2	8.0	6.7	3.6	2.6	2.4	30
10	4.4	6.4	84	7.6	5.2	4.2	14	15	3.6	3.0	2.4	4.2
11	4.2	6.1	34	7.3	4.9	14	7.6	8.7	3.4	3.2	2.4	3.0
12	4.2	5.8	22	7.0	5.2	31	7.0	7.0	3.6	3.0	2.6	2.6
13	52	5.5	17	6.7	4.9	98	8.3	6.1	3.4	3.2	2.8	3.2
14	18	5.5	14	6.4	4.7	179	7.0	6.4	3.6	3.4	2.4	3.2
15	7.0	5.5	12	6.1	5.8	80	17	5.8	3.4	2.8	2.4	2.4
16	5.5	5.8	11	36	5.5	57	33	5.5	3.4	2.8	2.4	2.4
17	4.9	5.5	9.9	15	4.7	36	24	5.8	3.4	3.0	2.4	2.4
18	17	4.9	49	8.7	4.4	22	20	5.2	3.4	3.0	2.6	2.4
19	16	4.9	21	8.0	7.8	26	50	4.9	3.4	3.0	2.6	2.4
20	11	4.7	15	7.3	7.3	18	60	4.9	3.4	3.0	2.6	2.2
21	8.0	4.7	12	6.7	5.5	14	35	4.9	3.2	2.8	2.8	2.6
22	7.3	4.9	11	6.4	4.7	12	23	4.9	3.2	3.0	2.8	2.2
23	60	5.2	10	6.4	4.4	15	20	4.7	3.2	3.6	2.6	2.2
24	17	20	16	6.1	4.4	25	15	4.7	3.2	3.0	2.6	2.4
25	11	11	15	5.8	8.0	16	14	4.7	3.0	3.0	2.6	2.4
26	9.5	14	10	5.5	4.9	13	12	4.9	3.6	3.6	2.6	4.4
27	8.7	7.3	8.7	26	4.7	25	11	4.7	3.2	3.2	2.8	3.4
28	10	6.4	8.0	14	4.4	16	9.9	4.2	3.2	2.8	2.6	2.6
29	9.9	6.4	8.0	8.0	4.4	12	9.1	4.2	3.2	2.6	2.6	7.8
30	9.9	7.0	7.6	7.0	------	11	9.5	4.2	3.4	2.6	2.4	5.8
31	8.3	------	7.6	6.7	------	9.5	------	4.2	------	3.0	2.6	------
TOTAL	354.7	233.7	715.1	329.9	169.6	774.9	489.1	190.2	105.4	92.4	80.8	119.9
MEAN	11.4	7.79	23.1	10.6	5.85	25.0	16.3	6.14	3.51	2.98	2.61	4.00
MAX	60	20	153	36	13	179	60	15	4.2	3.6	3.6	30
MIN	4.0	4.7	4.9	5.5	4.4	4.2	7.0	4.2	3.0	2.6	2.4	2.2
AC-FT	704	464	1420	654	336	1540	970	377	209	183	160	238

CAL YR 1967: TOTAL 4,727.1 MEAN 13.0 MAX 197 MIN 3.2 AC-FT 9,380
WAT YR 1968: TOTAL 3,655.7 MEAN 9.99 MAX 179 MIN 2.2 AC-FT 7,260

PEAK DISCHARGE (BASE, 700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-13	2200	6.54	1,660	12- 8	0300	5.84	1,200
10-23	1600	5.48	1,000	3-13	2400	5.22	870

16-2965. Kahana Stream at altitude 30 ft, near Kahana

Location.--Lat 21°32'38", long 157°53'07", 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.

Records available.--December 1958 to September 1968.

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

Extremes.--Maximum discharge during year, 4,110 cfs Dec. 8 (gage height, 7.16 ft), from rating curve extended above 530 cfs as explained below; minimum, 13 cfs Aug. 28-30.
1958-68: 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 except those for period of no gage-height record, which are poor. Approximately 9 cfs is diverted by Waiahole Water Co. at 800-ft elevation, 2.3 miles above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	63	40	25	47	18	31	45	21	18	17	22
2	31	39	31	27	27	18	29	31	20	17	16	15
3	22	35	28	25	28	18	31	28	20	17	18	14
4	22	28	27	102	28	20	30	27	20	17	22	14
5	21	27	29	106	25	57	39	26	20	16	20	14
6	20	26	26	49	24	22	30	25	19	16	16	15
7	21	24	83	34	24	20	29	25	22	17	15	17
8	65	24	1,280	30	23	19	28	30	22	17	15	66
9	30	24	229	29	23	19	35	26	20	16	15	117
10	29	23	216	28	22	18	133	44	20	17	15	21
11	21	23	95	28	21	51	30	30	20	18	15	18
12	21	23	61	27	21	150	28	26	19	17	16	19
13	157	21	47	26	22	288	29	25	19	18	17	18
14	53	20	41	25	21	407	28	25	22	24	15	17
15	25	20	38	24	22	215	86	24	19	17	15	16
16	21	22	36	103	22	337	242	24	19	16	15	16
17	21	20	33	39	21	203	80	24	19	20	15	16
18	56	19	168	30	21	61	47	23	19	18	16	17
19	51	19	57	28	22	59	203	23	19	18	15	16
20	34	21	41	27	26	44	190	23	18	17	15	17
21	28	19	37	26	22	37	126	22	19	16	16	17
22	26	22	34	25	21	37	61	21	18	17	16	16
23	66	29	32	25	20	58	51	21	18	21	15	17
24	38	146	35	24	20	77	42	21	18	18	15	17
25	31	161	35	24	23	42	40	20	18	19	15	20
26	29	96	29	23	20	40	36	24	18	33	14	42
27	27	40	28	127	19	58	35	21	17	19	15	22
28	33	39	28	76	19	39	33	21	17	17	14	20
29	32	37	27	31	18	36	29	40	17	16	14	60
30	35	37	26	28	------	39	38	38	18	16	13	50
31	31	------	30	27	------	33	------	23	------	17	14	------
TOTAL	1,119	1,147	2,947	1,248	672	2,540	1,869	826	575	560	484	766
MEAN	36.1	38.2	95.1	40.3	23.2	81.9	62.3	26.6	19.2	18.1	15.6	25.5
MAX	157	161	1,280	127	47	407	242	45	22	33	22	117
MIN	20	19	26	23	18	18	28	20	17	16	13	14
AC-FT	2,220	2,280	5,850	2,480	1,330	5,040	3,710	1,640	1,140	1,110	960	1,520

CAL YR 1967: TOTAL 16,997 MEAN 46.6 MAX 1,280 MIN 17 AC-FT 33,710
WAT YR 1968: TOTAL 14,753 MEAN 40.3 MAX 1,280 MIN 13 AC-FT 29,260

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-13	2230	5.02	1,810	3-14	0030	4.88	1,680
11-24	1700	4.99	1,780	3-16	0230	4.88	1,680
12- 8	0300	7.16	4,110				

Note.--No gage-height record July 28 to Aug. 28.

16-3020. Punaluu ditch near Punaluu

Location.--Lat 21°33'41", long 157°54'11", on right bank 1,000 ft downstream from intake, 1.5 miles west of Kahana, and 1.7 miles southwest of Punaluu.

Records available.--May 1953 to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to Apr. 30, 1964, graphic water-stage recorder at same site and datum.

Extremes.--1953-68: Maximum daily discharge, 54 cfs Oct. 31, 1964; no flow Dec. 7-11, 1963, Jan. 20-22, 25, 1966.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Ditch diverts from Punaluu Stream for irrigation of sugarcane in vicinity of Punaluu.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	15	4.5	0.07	0.07	14	13	14	13	14	17	15
2	17	15	4.5	.06	.09	14	13	16	13	14	17	13
3	16	18	5.0	.05	.12	14	13	16	12	14	17	13
4	16	18	5.0	.07	.13	13	13	16	12	14	15	13
5	16	18	5.3	.03	.06	13	13	15	12	14	15	13
6	15	18	5.3	.04	.06	12	13	15	12	14	15	12
7	16	18	6.0	.04	.05	13	13	15	13	16	15	11
8	17	17	6.8	.04	.05	12	14	15	12	16	15	11
9	17	15	.20	.04	.04	12	16	15	12	16	15	11
10	18	15	.36	.04	.03	14	17	15	11	16	17	12
11	18	15	.10	.05	.03	16	14	15	14	16	17	12
12	20	15	.07	.05	.05	8.2	14	15	14	18	17	12
13	16	18	.07	.05	.05	8.3	14	15	14	18	17	13
14	16	18	.06	.06	4.8	22	14	15	14	16	17	14
15	14	18	.05	.10	10	19	17	15	14	14	17	14
16	15	18	.05	.16	11	24	17	15	15	14	17	14
17	15	17	.05	.06	10	19	17	15	15	14	17	14
18	16	13	.25	.09	10	15	15	15	15	14	17	14
19	15	13	.09	.13	10	16	17	14	15	14	17	14
20	15	13	.10	.15	4.5	14	17	14	15	13	17	14
21	14	14	.10	.10	1.3	13	17	14	15	13	17	17
22	15	14	.10	.05	2.6	13	16	14	15	15	17	17
23	17	12	.12	.08	2.5	13	14	14	15	15	17	17
24	17	8.0	.17	.11	2.5	13	14	14	15	16	17	17
25	17	5.0	.21	.12	2.5	13	14	14	15	16	17	17
26	18	5.0	.16	.12	2.3	13	14	14	15	16	17	15
27	18	5.0	.07	.17	2.2	15	15	14	14	16	16	15
28	18	5.0	.05	.05	11	13	14	14	14	16	15	16
29	18	5.0	.07	.06	14	13	14	15	14	16	14	16
30	18	5.0	.08	.05	------	14	14	14	14	16	14	16
31	16	------	.08	.05	------	13	------	14	------	15	14	------
TOTAL	509	403.0	45.06	2.34	102.03	438.5	440	455	413	469	503	422
MEAN	16.4	13.4	1.45	0.075	3.52	14.1	14.7	14.7	13.8	15.1	16.2	14.1
MAX	20	18	6.8	0.17	14	24	17	16	15	18	17	17
MIN	14	5.0	0.05	0.03	0.03	8.2	13	14	11	13	14	11
AC-FT	1,010	799	89	4.6	202	870	873	902	819	930	998	837

CAL YR 1967: TOTAL 4,026.63 MEAN 11.0 MAX 30 MIN 0.05 AC-FT 7,990
WAT YR 1968: TOTAL 4,201.93 MEAN 11.5 MAX 24 MIN 0.03 AC-FT 8,330

Note.--No gage-height record Oct 24 to Dec. 4, Mar. 23 to May 2, June 11 to July 18, July 23 to Aug. 29.

16-3030. Punaluu Stream near Punaluu

Location.--Lat 21°33'33", long 157°54'06", 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.

Records available.--May 1953 to September 1968.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 212 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,200 cfs Dec. 8 (gage height, 4.98 ft), from rating curve extended above 170 cfs as explained below; minimum, 1.8 cfs Aug. 30, 31.
1953-68: Maximum discharge, 2,970 cfs Nov. 1, 1961, and Feb. 4, 1965 (gage height, 6.06 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 except those for period of no gage-height record, which are poor. Records do not include flow of Punaluu ditch (see sta. no. 3020). Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	19	18	27	30	6.0	10	20	14	8.3	7.5	4.6
2	5.6	14	21	27	24	6.0	7.0	18	12	8.3	4.8	3.6
3	5.0	10	19	27	26	6.3	25	15	12	8.3	4.6	3.2
4	6.0	9.1	19	56	25	7.9	20	15	13	8.3	5.0	3.2
5	5.0	8.7	18	49	23	17	50	15	13	7.9	5.3	3.2
6	4.8	8.3	18	32	22	9.9	30	15	13	7.9	5.0	3.6
7	5.6	8.3	147	28	22	8.7	12	15	15	7.5	5.0	5.0
8	17	8.7	594	27	22	8.7	12	15	14	6.3	5.0	5.9
9	9.5	9.5	134	27	22	8.7	50	15	13	6.0	5.3	29
10	7.2	9.5	127	26	22	9.9	70	21	13	6.3	4.3	6.3
11	6.9	9.9	69	26	21	29	25	17	9.9	7.5	3.2	5.3
12	7.2	9.9	45	26	22	54	22	16	7.2	6.6	3.2	5.0
13	25	9.5	38	26	21	105	15	16	7.9	6.0	3.2	5.0
14	11	9.1	35	26	17	206	10	16	10	7.2	3.2	4.6
15	9.9	8.7	33	26	14	76	40	16	9.5	5.3	3.2	4.8
16	7.2	9.9	31	63	13	122	50	16	8.7	5.1	3.0	4.6
17	6.9	9.5	31	31	13	79	40	16	6.6	6.9	2.8	4.6
18	15	7.5	104	27	13	36	20	15	7.5	5.6	2.8	4.8
19	16	6.9	53	26	13	38	100	14	6.6	6.3	3.0	4.8
20	14	6.9	38	26	17	28	150	13	6.3	6.0	3.2	5.0
21	11	6.0	35	26	21	25	35	13	6.9	5.3	3.0	3.8
22	9.9	6.0	33	25	18	22	30	14	7.2	5.0	2.8	2.2
23	17	9.0	31	26	18	25	25	13	8.3	7.2	2.8	2.6
24	14	34	32	25	18	35	40	13	9.9	5.0	3.0	2.6
25	15	56	31	24	20	25	30	14	11	4.6	3.0	2.8
26	11	28	30	24	18	24	35	16	8.3	4.8	2.6	9.5
27	5.8	16	30	63	18	50	20	14	8.7	4.6	2.8	4.3
28	6.0	15	28	35	8.7	25	17	14	11	4.3	3.0	2.8
29	5.8	13	27	26	5.6	16	17	21	11	4.3	2.3	2.3
30	11	13	27	24	------	40	18	17	9.9	5.0	2.0	2.0
31	11	------	28	24	------	15	------	16	------	7.5	2.2	------
TOTAL	308.1	388.9	1,924	951	547.3	1,164.1	1,025.0	484	304.4	195.2	112.1	151.0
MEAN	9.94	13.0	62.1	30.7	18.9	37.6	34.2	15.6	10.1	6.30	3.62	5.03
MAX	25	56	594	63	30	206	150	21	15	8.3	7.5	29
MIN	4.8	6.0	18	24	5.6	6.0	7.0	13	6.3	4.3	2.0	2.0
AC-FT	611	771	3,820	1,890	1,090	2,310	2,030	960	604	387	222	300

CAL YR 1967: TOTAL 7,167.6 MEAN 19.6 MAX 594 MIN 3.3 AC-FT 14,220
WAT YR 1968: TOTAL 7,555.1 MEAN 20.6 MAX 594 MIN 2.0 AC-FT 14,990

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 8	0230	4.98	2,200	3-14	0100	3.58	1,220
12-10	0400	3.40	1,090	4-20	about 0400	3.34	1,050
12-18	0430	3.15	930				

Note.--No gage-height record Mar. 27 to Apr. 28.

16-3042. Kaluanui Stream near Punaluu

Location.--Lat 21°35'22", long 157°54'38", 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.

Records available.--April 1967 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

Extremes.--Maximum discharge during year, 915 cfs Mar. 13 (gage height, 8.85 ft), from rating curve extended above 14 cfs as explained below; minimum, 0.17 cfs Mar. 14.
1967-68: Maximum discharge, 1,260 cfs Aug. 9, 1967 (gage height, 9.29 ft), from rating curve extended above 14 cfs on basis of slope-area measurements at gage heights 8.85 and 10.0 ft for peaks of Mar. 13, 1968, and Feb. 1, 1969, respectively; minimum, 0.10 cfs June 25, 1967.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	21	9.3	1.4	12	0.21	1.8	6.2	0.40	1.0	3.5	3.1
2	5.1	16	7.4	2.8	1.3	.20	1.4	2.0	.34	.60	1.0	1.2
3	1.1	2.7	4.1	1.4	4.8	.18	5.8	1.2	.28	.48	.66	.44
4	3.2	1.4	3.7	21	2.8	6.9	4.8	.95	.28	.40	3.7	.32
5	1.5	1.0	4.4	14	.81	16	11	.85	.36	.38	2.6	.27
6	.80	.85	3.8	4.5	.57	1.7	2.3	.73	.28	.34	.73	.23
7	.64	.73	36	2.0	.48	.77	2.2	.69	.92	.28	.57	2.7
8	2.5	.63	86	1.5	.44	.60	2.1	1.2	2.9	.26	.54	11
9	4.4	.77	57	1.2	.38	.48	13	.90	1.2	.25	.77	34
10	1.0	.73	39	1.0	.32	.42	14	7.9	.85	.22	.73	1.8
11	.80	3.0	15	.85	.30	22	3.8	3.2	1.4	.27	.77	.95
12	.72	2.2	6.6	.81	.27	30	2.1	1.0	1.2	.30	1.2	.73
13	9.0	.66	4.4	.73	.48	97	1.4	.69	1.0	1.2	1.2	2.6
14	5.2	.51	3.2	.66	.46	88	1.3	2.5	2.9	4.2	.60	.77
15	1.1	.44	2.6	.63	2.9	33	9.1	.81	.60	.81	.46	.73
16	.91	.88	2.2	16	1.3	43	8.6	.60	1.3	.48	.42	.57
17	.80	.77	2.2	4.1	1.4	16	8.9	.90	.73	1.8	.36	.46
18	2.0	.44	41	1.4	.77	8.2	4.0	.85	.51	.90	.32	.44
19	7.7	.40	17	1.0	.48	21	40	.60	1.1	.73	.36	.57
20	3.9	1.0	4.7	.73	.54	4.0	32	.48	.77	.95	.34	.57
21	1.7	1.4	2.6	.66	1.7	2.6	9.9	.54	1.1	.48	.88	.95
22	.81	2.1	2.1	.57	.66	2.1	4.3	.48	.69	.38	.63	.57
23	17	9.3	1.8	1.8	.40	7.1	6.9	.46	.81	4.6	.36	.42
24	2.6	18	23	.85	.34	8.2	4.3	.38	1.0	1.2	.28	1.5
25	4.2	29	5.5	.51	1.8	4.4	3.4	.36	.60	.66	.26	1.0
26	2.6	26	2.2	.48	.66	5.8	4.8	2.1	1.4	1.4	.42	12
27	2.4	4.8	1.6	21	.38	28	3.2	.60	.77	.63	1.9	1.8
28	1.0	10	1.3	3.9	.28	5.5	2.9	1.1	.54	.48	.85	.81
29	.85	7.1	1.5	1.1	.25	3.7	1.5	3.3	.48	.42	.54	.63
30	10	6.9	1.0	.73	------	9.0	2.6	.81	2.9	1.6	.44	.51
31	5.6	------	5.7	.57	------	2.7	------	.54	------	3.7	.32	------
TOTAL	102.63	170.71	397.9	109.88	39.27	468.76	213.4	44.92	29.61	31.40	27.71	83.64
MEAN	3.31	5.69	12.8	3.54	1.35	15.1	7.11	1.45	0.987	1.01	0.894	2.79
MAX	17	29	86	21	12	97	40	7.9	2.9	4.6	3.7	34
MIN	0.64	0.40	1.0	0.48	0.25	0.18	1.3	0.36	0.28	0.22	0.26	0.23
AC-FT	204	339	789	218	78	930	423	89	59	62	55	166

CAL YR 1967:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-
WAT YR 1968:	TOTAL	1,719.83	MEAN	4.70	MAX	97	MIN	0.18	AC-FT	3,410

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	2300	8.52	707	1-27	0800	8.40	640
12- 7	2230	8.43	656	3-13	2400	8.85	915
1-16	1130	8.26	570	9- 8	2300	8.20	540

16-3089.9. Malaekahana Stream near Laie

Location.--Lat 21°38'09", long 157°57'54", on left bank 2.3 miles southwest of Laie Temple and 3.0 miles south of Kahuku School.

Drainage area.--0.64 sq mi.

Records available.--July 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

Extremes.--Maximum discharge during year, 470 cfs Apr. 17 (gage height, 5.44 ft), from rating curve extended above 6.6 cfs as explained below; no flow Aug. 19-21.
1963-68: 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.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.47	6.6	2.8	0.90	6.2	0.15	0.51	0.80	0.17	0.47	1.0	3.4
2	1.8	2.9	2.3	1.6	.67	.13	.44	.67	.17	.41	.60	.67
3	.35	1.0	1.5	.90	1.4	.13	1.7	.55	.15	.10	.35	.19
4	.97	.32	1.3	9.0	2.1	.81	.75	.47	.15	.08	1.5	.09
5	.51	.21	1.6	5.0	.59	13	1.9	.44	.15	.06	.30	.05
6	.25	.17	1.4	3.0	.38	.63	.75	.41	.13	.05	.20	.04
7	.19	.13	10	1.2	.29	.29	.38	.38	.13	.04	.10	.05
8	.74	.11	30	.70	.29	.21	.32	.47	.27	.04	.07	1.7
9	1.4	.16	60	.50	.27	.17	2.9	.38	.32	.03	.05	14
10	.29	.12	25	.40	.25	.15	13	.75	.19	.03	.04	.63
11	.23	.30	10	.35	.23	3.5	6.0	2.0	.17	.10	.03	.27
12	.19	1.7	4.0	.30	.23	14	1.3	.63	.15	.44	.02	.10
13	3.4	.80	1.5	.27	.23	46	1.2	.41	.15	1.2	.02	.09
14	1.7	.40	1.1	.23	.21	75	.75	.38	.21	3.0	.04	.07
15	.35	.13	.90	.23	.27	17	4.7	.35	.29	.35	.05	.05
16	.25	.30	1.5	15	.41	57	6.0	.32	.21	.19	.03	.05
17	.19	.40	2.5	1.2	.38	15	24	.32	.17	.11	.02	.05
18	1.4	.12	14	.51	.35	2.1	2.7	.41	.19	.10	.01	.08
19	2.9	.11	7.0	.32	.27	11	8.8	.32	.32	.10	0	.06
20	3.9	.11	3.5	.29	1.3	1.6	32	.29	.29	.09	0	.05
21	.47	1.3	1.5	.27	1.4	1.0	9.8	.27	.17	.06	0	.32
22	.27	2.3	1.2	.23	.44	.80	4.4	.23	.29	.05	.16	.29
23	2.6	6.0	1.0	.33	.25	.85	1.8	.23	.17	2.9	.10	.11
24	.85	7.0	4.0	.47	.19	4.7	1.4	.21	.19	.59	.06	.08
25	.48	13	10	.29	.41	2.0	1.4	.21	.19	.23	.05	.05
26	.80	35	1.7	.25	.41	.80	1.1	.23	.13	.20	.05	5.3
27	.44	5.0	1.2	19	.23	3.4	.75	.21	.10	.32	.03	.35
28	.29	3.0	1.0	4.4	.19	1.1	.81	.23	.09	.22	.10	.24
29	.21	2.2	1.2	.75	.17	.67	2.0	.19	.08	.10	.10	.14
30	.62	2.1	.70	.47	------	.76	1.1	.21	.27	.08	.06	.12
31	.47	------	3.0	.35	------	.75	------	.19	------	.10	.05	------
TOTAL	28.98	92.99	208.40	68.71	20.01	274.70	134.66	13.16	5.66	11.84	5.19	28.69
MEAN	0.935	3.10	6.72	2.22	0.690	8.86	4.49	0.425	0.189	0.382	0.167	0.956
MAX	3.9	35	60	19	6.2	75	32	2.0	0.32	3.0	1.5	14
MIN	0.19	0.11	0.70	0.23	0.17	0.13	0.32	0.19	0.08	0.03	0	0.04
AC-FT	57	184	413	136	40	545	267	26	11	23	10	57

CAL YR 1967: TOTAL 829.85 MEAN 2.27 MAX 60 MIN 0.05 AC-FT 1,650
WAT YR 1968: TOTAL 892.99 MEAN 2.44 MAX 75 MIN 0 AC-FT 1,770

PEAK DISCHARGE (BASE, 190 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	about 2100	4.42	224	3-14	0030	5.22	406
				3-16	0230	5.30	428
12- 9	about 1400	5.26	417	4-17	1500	5.44	470
				4-20	0100	4.36	212
1-27	0700	4.38	216				

Note.--No gage-height record Nov. 9 to Jan. 12.

16-3250. Kamananui Stream at Pupukea Military Road, near Maunawai

Location.--Lat 21°37'25", long 158°01'04", on right bank 75 ft upstream from Pupukea Military Road and 3.5 miles southeast of Maunawai.

Drainage area.--3.13 sq mi.

Records available.--Occasional low-flow measurements, water years 1961, 1963. June 1963 to September 1968.

Gage.--Water-stage recorder and culvert control. Altitude of gage is 590 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,720 cfs Apr. 20 (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, 0.08 cfs Sept. 7, 8.
1963-68: Maximum discharge, that of Apr. 20, 1968; minimum, 0.02 cfs May 26-28, 1966.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	32	21	5.0	10	1.2	7.4	16	2.2	3.4	4.1	0.81
2	5.1	21	31	4.4	5.1	1.1	6.6	12	2.1	1.5	2.2	3.7
3	2.9	8.2	14	4.8	7.5	1.1	17	7.4	2.1	1.1	.98	1.2
4	5.1	3.7	9.9	56	15	15	9.7	6.3	2.2	.74	21	.82
5	3.7	2.6	10	43	4.5	57	16	5.7	2.1	.61	5.4	.33
6	1.8	2.2	8.6	14	3.6	6.8	7.8	5.3	1.9	.55	2.6	.16
7	1.4	2.0	6.5	6.8	3.1	3.2	6.3	5.0	2.0	.55	1.4	.11
8	5.5	1.7	17	5.6	2.9	2.4	5.7	4.8	2.9	.50	.98	.11
9	4.4	1.7	233	4.8	2.7	2.0	13	4.8	3.2	.55	.82	45
10	2.1	1.8	210	4.5	2.4	1.8	61	8.6	2.5	.74	.67	3.4
11	1.5	2.5	65	4.4	2.3	88	22	8.0	2.1	1.1	.55	1.3
12	1.3	6.6	39	4.0	2.3	198	9.5	4.8	2.0	1.4	.55	.67
13	5.4	2.3	24	4.0	2.3	124	7.0	4.0	2.2	2.7	.74	.55
14	2.4	1.6	18	3.6	2.1	475	5.9	3.7	2.6	4.7	.74	.98
15	1.4	1.3	15	3.4	2.4	126	9.0	3.6	2.5	2.9	.50	.67
16	1.1	1.6	12	72	4.1	555	21	3.5	1.9	1.2	.37	.43
17	.82	1.9	11	11	3.0	366	89	4.0	1.7	.90	.24	.30
18	.90	1.2	68	5.6	2.8	40	15	4.0	1.7	1.1	.18	.41
19	8.5	1.1	20	4.4	2.3	106	50	3.4	2.7	1.1	.18	.27
20	17	1.4	22	3.8	4.7	28	250	3.0	2.2	.82	.22	.33
21	4.1	1.4	11	3.6	6.1	22	29	2.9	1.9	.67	.41	.74
22	2.3	5.2	10	3.2	3.6	19	17	2.8	2.2	.74	.90	1.5
23	9.1	5.6	8.6	6.3	2.1	18	14	2.8	1.6	10	1.1	.90
24	6.5	11	7.4	5.6	1.7	34	13	2.8	1.6	3.7	.74	.55
25	2.5	136	18	3.4	2.2	23	17	2.8	1.5	1.6	.45	1.80
26	4.1	189	7.5	3.0	2.7	16	15	2.8	1.5	.98	.41	8.0
27	4.0	23	5.4	40	1.7	29	10	2.8	1.3	.61	.67	4.0
28	2.2	38	5.0	16	1.6	11	9.3	2.6	1.0	.61	.98	1.4
29	1.6	14	5.3	5.7	1.3	9.3	7.6	5.1	1.0	.45	.61	.67
30	6.6	25	4.8	4.4	------	9.7	9.3	3.5	3.5	.37	.45	.45
31	5.4	------	7.0	3.7	------	8.8	------	2.5	------	3.8	.33	------
TOTAL	123.52	546.6	945.0	360.0	108.1	2397.4	770.1	151.3	61.9	51.69	51.47	81.56
MEAN	3.98	18.2	30.5	11.6	3.73	77.3	25.7	4.88	2.06	1.67	1.66	2.72
MAX	17	189	233	72	15	555	250	16	3.5	10	21	45
MIN	0.82	1.1	4.8	3.0	1.3	1.1	5.7	2.5	1.0	0.37	0.18	0.11
AC-FT	245	1080	1870	714	214	4760	1530	300	123	103	102	162

CAL YR 1967: TOTAL 4,879.20 MEAN 13.4 MAX 233 MIN 0.82 AC-FT 9,680
WAT YR 1968: TOTAL 5,648.64 MEAN 15.4 MAX 555 MIN 0.11 AC-FT 11,200

PEAK DISCHARGE (BASE, 650 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-25	2300	8.49	1,420	3-16	0330	8.85	1,580
12- 9	1630	6.79	817	4-17	1430	6.80	820
3-14	0030	8.25	1,320	4-20	0030	9.13	1,720

16-3290. Kaiwikoele Stream tributary near Maunawai

Location.--Lat 21°36'49", long 158°01'23", 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.

Records available.--November 1967 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 730 ft (from topographic map).

Extremes.--Maximum discharge during period, 822 cfs Mar. 16 (gage height, 8.34 ft), from rating curve extended above 24 cfs on basis of slope-area measurement of peak flow; no flow most of time.

Remarks.--Records fair. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, NOVEMBER 1967 to SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	0	0	0	0	0					
2		0	0	0	0	0	0					
3		0	0	0	.11	0	0					
4		0	0	0	.12	0	0					
5		0	0	3.9	0	0	0					
6		0	0	.09	0	0	0					
7		0	0	0	0	0	0					
8		0	0	0	0	0	0					
9		0	4.8	0	0	0	0					
10		0	5.9	0	0	0	0					
11		0	.08	0	0	0	0					
12		0	.04	0	0	.36	0					
13		0	0	0	0	2.0	0					
14		0	0	0	0	48	0					
15		0	0	0	0	6.2	0					
16		0	0	3.4	0	223	2.4					
17		0	0	.33	0	25	.32					
18		0	0	0	0	7.0	0					
19		0	0	0	0	3.8	9.5					
20		0	0	0	0	1.8	67					
21		0	0	0	0	.73	8.2					
22		0	0	0	0	.40	3.0					
23		0	0	0	0	.28	1.1					
24		0	0	0	0	.84	.73					
25		0	0	0	0	.84	.84					
26		11	0	0	0	.14	.14					
27		0	0	0	0	.18	0					
28		0	0	0	0	.24	0					
29		0	0	0	0	0	0					
30		0	0	0	------	0	0					
31		------	0	0	------	0	------		------			------
TOTAL		11	10.82	7.72	0.23	320.81	93.23	0	0	0	0	0
MEAN		0.4	0.349	0.249	0.008	10.3	3.11	0	0	0	0	0
MAX		11	5.9	3.9	0.12	223	67	0	0	0	0	0
MIN		0	0	0	0	0	0	0	0	0	0	0
AC-FT		22	21	15	0.5	636	185	0	0	0	0	0

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-14	0200	7.13	185	4-20	0430	7.70	410
3-16	0400	8.34	822				

16-3300. Kamananui Stream at Maunawai

Location.--Lat 21°38'20", long 158°03'27", 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.

Records available.--February 1958 to September 1968.

Gage.--Graphic water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to May 13, 1964, graphic and May 13, 1964, to May 12, 1965, digital water-stage recorders at same site at datum 2.00 ft higher. May 13, 1965, to May 17, 1966, graphic water-stage recorder at same site at datum 1.00 ft higher than present datum.

Extremes.--Maximum discharge during year, 5,270 cfs Mar. 16 (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; minimum, 0.01 cfs Aug. 27, 28.
1958-68: Maximum discharge, that of Mar. 16, 1968; no flow at times.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	28	21	8.5	12	1.2	9.4	18	1.9	5.2	4.8	0.02
2	5.6	32	27	6.2	8.5	1.1	7.4	18	1.7	1.8	4.2	7.5
3	4.9	10	18	6.2	9.8	.95	19	14	1.6	.88	1.4	2.3
4	4.4	5.4	12	43	30	8.5	14	10	1.6	.57	15	1.1
5	6.4	3.2	9.4	106	8.0	77	20	7.5	1.6	.40	8.1	.57
6	2.8	2.5	8.0	24	5.2	14	12	6.2	1.4	.30	4.2	.22
7	1.9	2.1	6.2	12	4.2	5.6	6.7	5.6	1.3	.20	1.8	.09
8	5.1	1.8	6.9	8.8	3.7	3.4	5.6	5.2	1.7	.20	.88	.03
9	6.2	1.6	260	7.4	3.3	2.5	15	5.0	3.1	.20	.57	43
10	3.7	1.6	241	6.4	3.1	2.2	88	8.0	2.5	.20	.34	7.5
11	2.0	1.8	69	5.8	2.8	45	42	11	1.9	.20	.25	2.6
12	1.5	7.2	52	5.2	2.6	264	18	5.4	1.6	.28	.14	1.2
13	4.4	3.7	27	4.9	2.7	131	10	4.5	1.8	2.3	.09	.68
14	5.1	2.0	21	4.5	2.5	876	7.8	4.0	2.0	4.4	.08	.38
15	2.5	1.4	18	4.0	2.7	169	11	3.7	2.3	5.5	.12	.62
16	1.4	1.3	15	106	4.5	1220	43	3.7	1.9	1.9	.10	.34
17	.88	2.0	14	25	4.2	342	110	4.2	1.5	.88	.04	.19
18	.63	1.6	98	11	3.6	112	29	4.2	1.4	.52	.02	.14
19	7.4	1.1	22	7.8	3.0	163	52	3.7	1.6	.62	.02	.10
20	19	1.0	25	6.0	5.2	67	531	3.2	2.2	.52	.01	.12
21	6.4	1.3	15	4.9	11	39	69	3.0	1.6	.31	.02	.12
22	3.1	2.9	12	4.2	7.6	31	71	2.9	1.6	.19	.02	.09
23	5.9	8.3	11	6.9	3.3	26	33	2.8	1.4	6.3	.02	.62
24	11	8.8	11	11	2.3	55	26	2.7	1.2	7.5	.02	.34
25	3.7	110	22	5.2	3.0	42	29	2.6	1.1	2.4	.02	.14
26	3.6	341	11	4.0	3.7	24	26	2.5	.88	1.1	.02	6.8
27	5.2	35	8.5	45	2.6	43	20	2.6	1.0	.62	.02	7.8
28	3.0	39	7.1	29	1.9	22	16	2.5	.71	.38	.01	2.4
29	2.0	18	7.4	11	1.6	14	15	4.1	.60	.25	.08	1.1
30	2.6	25	6.9	6.9	------	14	14	4.7	.60	.19	.12	.52
31	6.9	------	10	5.2	------	13	------	2.4	------	.28	.04	------
TOTAL	141.81	700.6	1092.4	542.0	158.6	3828.45	1369.9	177.9	47.29	46.59	42.55	88.63
MEAN	4.57	23.4	35.2	17.5	5.47	123	45.7	5.74	1.58	1.50	1.37	2.95
MAX	19	341	260	106	30	1220	531	18	3.1	7.5	15	43
MIN	0.63	1.0	6.2	4.0	1.6	0.95	5.6	2.4	0.60	0.19	0.01	0.02
AC-FT	281	1390	2170	1080	315	7590	2720	353	94	92	84	176

CAL YR 1967: TOTAL 5,988.84 MEAN 16.4 MAX 341 MIN 0.40 AC-FT 11,880
WAT YR 1968: TOTAL 8,236.72 MEAN 22.5 MAX 1,220 MIN 0.01 AC-FT 16,340

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0030	7.46	1,930	3-16	0400	10.14	5,270
3-14	0130	8.90	3,050	4-20	0100	8.75	2,900

16-3430. Helemano Stream at Haleiwa

Location.--Lat 21°34'40", long 158°06'12", on left bank at upstream side of private road bridge, 0.3 mile east of Keeu Circle, and 1.1 miles southeast of Waialua School at Haleiwa.

Drainage area.--14.2 sq mi.

Records available.--November 1967 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 1.57 ft above mean sea level.

Extremes.--Maximum discharge during period, 7,390 cfs Mar. 16 (gage height, 15.34 ft), 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 (for peak of Feb. 1, 1969); minimum, 0.02 cfs July 28-30.

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. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

Discharge measurement made prior to beginning of continuous discharge record

Aug. 9, 1967..... /5,940 cfs

/Slope-area measurement of peak flow.

DISCHARGE, IN CUBIC FEET PER SECOND, NOVEMBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		1.4	11	11	1.4	0.83	8.7	1.7	0.05	0.04	5.2	0.03
2		.88	25	4.4	.83	1.4	5.2	4.4	.05	.04	3.0	.03
3		1.2	17	2.6	.59	1.0	4.6	2.1	.06	.06	.16	.03
4		.73	5.4	2.4	1.8	1.3	10	1.0	.05	.04	.05	.04
5		.51	3.0	4 35	3.0	.51	5.4	.59	.05	.05	.04	.04
6		.47	2.0	44	1.2	.47	16	.73	.05	.05	.03	.04
7		.88	1.3	16	.88	1.0	5.4	.40	.07	.04	.03	.05
8		.43	124	7.8	.59	.43	3.1	.28	.08	.04	.04	.05
9		.43	133	5.2	.73	.22	3.2	.18	.04	.03	.03	.30
10		.51	163	3.1	.40	.18	41	.28	.07	.04	.04	6.7
11		.83	43	2.4	.22	.15	13	1.5	.05	.04	.04	.90
12		.88	35	2.0	.18	86	5.2	.73	.05	.05	.04	.13
13		.78	14	2.4	.16	82	3.8	.43	.05	.06	.03	.15
14		1.1	7.2	1.7	.34	295	2.2	.15	3.1	.04	.03	.12
15		.94	4.4	1.5	.47	71	1.8	.08	1.4	.04	.03	.12
16		.51	5.6	98	.51	3,090	20	.13	.15	.06	.04	.10
17		.47	5.0	45	.34	736	40	.07	.05	.06	.27	.10
18		.51	170	9.6	.28	75	11	.04	.05	.04	.03	.10
19		.31	30	4.0	.31	47	43	.04	.05	.04	.03	.20
20		.26	77	2.7	.88	33	972	.04	.05	.04	.03	1.6
21		.26	13	1.7	1.1	16	31	.05	.10	.03	.03	.06
22		.26	6.2	1.2	.55	11	16	.06	.04	.03	.03	.07
23		.28	5.0	2.4	.40	8.7	7.0	.06	.04	.07	.03	.15
24		.28	4.6	6.3	.37	43	18	.08	.04	.05	.04	.35
25	/0.75	133	31	1.3	.51	44	30	.08	.04	.07	.03	.20
26		508	9.9	.83	.59	14	19	.07	.09	.04	.17	.26
27		98	4.4	40	.73	12	14	.07	.03	.03	.03	.37
28		29	3.0	23	.94	20	3.8	.10	.03	.02	.03	.37
29		16	2.6	8.7	1.1	9.3	3.0	.05	.03	.04	.20	.34
30		23	2.3	3.2	------	7.8	1.9	.07	.04	.02	.04	.43
31		------	5.0	2.2	------	19	------	.08	------	5.3	.04	------
TOTAL		822.11	962.9	791.63	21.40	4,727.29	1358.3	15.64	6.05	6.60	9.86	13.43
MEAN		27.4	31.1	25.5	0.738	152	45.3	0.504	0.202	0.213	0.318	0.448
MAX		508	170	435	3.0	3,090	972	4.4	3.1	5.3	5.2	6.7
MIN		0.26	1.3	0.83	0.16	0.15	1.8	0.04	0.03	0.02	0.03	0.03
AC-FT		1630	1910	1570	42	9,380	2690	31	12	13	20	27

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 1,200 CFS)

/Result of discharge measurement.

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0730	8.59	1,400	3-16	0830	15.34	7,390
1- 5	0600	10.54	2,490	4-20	0300	14.58	6,400
3-14	0530	8.44	1,320				

16-3450. Opaeula Stream near Wahiawa

Location.--Lat 21°33'55", long 158°00'10", 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.

Records available.--August 1959 to September 1968.

Gage.--Graphic water-stage recorder and concrete control. Altitude of gage is 1,120 ft (from topographic map). Prior to May 13, 1964, graphic and May 13, 1964, to July 12, 1966, digital water-stage recorders at same site and datum.

Extremes.--Maximum discharge during year, 2,740 cfs Mar. 16 (gage height, 8.68 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 6.74 and 10.12 ft; minimum, 0.17 cfs Aug. 21, 22.
1959-68: Maximum discharge, 2,800 cfs Dec. 15, 1964 (gage height, 8.82 ft), from rating curve extended above 110 cfs on basis of slope-area measurement at gage height 6.74 ft; minimum, 0.11 cfs June 2-4, 1966.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	57	32	7.4	3.6	0.64	5.8	19	1.7	2.5	12	5.0
2	6.5	27	27	4.1	5.2	.57	4.7	10	1.1	1.8	4.6	7.0
3	6.2	12	14	6.8	3.1	.54	18	4.4	.88	1.2	2.0	3.1
4	16	4.9	11	36	12	13	9.9	3.7	.84	.76	3.9	2.0
5	6.0	3.2	13	101	3.3	52	38	3.5	1.2	.54	6.2	.76
6	2.3	2.4	9.9	21	1.9	7.9	10	3.1	1.5	.42	3.7	.48
7	1.5	2.1	7.1	7.9	1.6	2.8	5.2	2.7	1.0	.33	1.7	.36
8	34	1.9	131	5.1	1.4	1.7	5.2	2.6	8.3	.29	1.1	1.2
9	25	1.9	86	4.2	1.2	1.2	17	2.9	4.4	.25	.93	59
10	3.8	3.7	111	3.6	1.2	.93	63	11	2.8	.23	1.0	6.0
11	2.2	3.2	28	3.6	1.1	63	12	5.8	3.1	.25	1.5	2.3
12	2.6	16	21	3.3	1.1	166	8.7	3.5	3.5	.27	1.3	1.4
13	34	4.1	13	4.6	1.3	119	5.6	2.3	2.8	.39	1.5	2.7
14	4.6	2.0	9.2	3.1	1.9	211	4.0	1.9	6.2	4.8	1.7	3.3
15	2.2	1.5	7.1	2.3	2.6	102	14	3.3	3.3	4.6	1.2	1.5
16	1.6	1.4	6.2	60	7.9	653	23	2.2	1.9	1.7	.68	.98
17	1.3	3.0	6.0	16	4.6	104	15	2.0	2.9	1.0	.48	1.2
18	4.2	2.2	100	5.6	3.6	20	9.9	2.5	1.7	5.1	.36	.80
19	17	1.4	33	4.3	2.1	63	136	2.2	1.2	2.2	.27	.72
20	29	6.5	22	3.1	1.6	14	265	1.5	2.0	1.3	.23	.80
21	9.5	4.7	7.4	2.5	3.4	8.7	14	1.4	1.5	2.0	.19	.88
22	5.6	10	5.8	2.2	4.9	6.6	10	1.4	1.6	1.0	.19	1.3
23	5.2	34	5.2	2.7	1.9	17	9.5	1.4	1.3	14	1.4	1.3
24	6.3	80	27	5.4	1.2	50	19	1.2	.98	6.8	.76	1.5
25	3.4	90	26	2.7	1.1	18	15	1.0	1.0	2.3	.51	3.2
26	7.3	173	6.4	1.9	4.7	14	17	.98	1.5	2.5	.48	15
27	4.4	28	4.6	49	1.9	32	8.7	3.2	2.3	2.1	.57	10
28	4.1	35	4.1	13	1.1	12	7.6	2.3	1.6	1.2	3.5	2.8
29	2.2	16	4.7	5.1	.76	8.9	4.9	6.3	.98	.88	1.7	1.3
30	17	35	4.4	3.0	------	27	4.3	4.2	1.0	.68	1.3	.88
31	10	------	13	2.2	------	10	------	2.5	------	19	.68	------
TOTAL	281.2	663.1	796.1	392.7	83.26	1,800.48	780.0	115.98	66.08	82.39	57.63	138.76
MEAN	9.07	22.1	25.7	12.7	2.87	58.1	26.0	3.74	2.20	2.66	1.86	4.63
MAX	34	173	131	101	12	653	265	19	8.3	19	12	59
MIN	1.3	1.4	4.1	1.9	0.76	0.54	4.0	0.98	0.84	0.23	0.19	0.36
AC-FT	558	1320	1580	779	165	3,570	1550	230	131	163	114	275

CAL YR 1967: TOTAL 6,286.32 MEAN 17.2 MAX 209 MIN 0.68 AC-FT 12,470
WAT YR 1968: TOTAL 5,257.68 MEAN 14.4 MAX 653 MIN 0.19 AC-FT 10,430

Peak discharge (base, 1,200 cfs).--Mar. 16 (0530) 2,740 cfs (8.68 ft); Apr. 20 (0030) 1,850 cfs (7.43 ft).

16-4000. Halawa Stream near Halawa

Location.--Lat 21°09'31", long 156°45'53", on right bank 600 ft downstream from Hipuapua Stream and 1.5 miles west of Halawa.

Drainage area.--4.62 sq mi.

Records available.--July 1917 to July 1932, November 1937 to September 1968.

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, Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft higher than present datum.

Extremes.--Maximum discharge during year, 2,570 cfs Mar. 14 (gage height, 9.36 ft), from rating curve extended above 29 cfs on basis of slope-area measurement at gage height 19.91 ft; minimum, 2.1 cfs July 10.
1917-32, 1937-68: Maximum discharge, 26,900 cfs Feb. 4, 1965 (gage height, 19.91 ft, from floodmarks), from rating curve extended above 51 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	103	39	10	17	3.2	18	38	3.6	3.5	29	70
2	10	75	28	19	12	6.7	35	18	3.2	2.9	8.3	152
3	5.6	34	25	12	6.1	118	56	12	3.1	2.6	6.4	24
4	5.5	18	33	45	5.5	53	46	10	3.2	11	80	10
5	4.7	12	37	95	5.3	81	53	10	3.1	8.3	25	6.6
6	3.6	9.8	16	53	4.9	11	21	8.6	2.9	3.3	9.2	12
7	2.9	8.6	21	15	40	7.3	17	7.7	15	2.5	6.6	54
8	12	8.8	22	11	16	8.5	16	10	13	2.3	6.1	13
9	4.7	17	52	9.0	29	7.9	156	8.1	5.7	2.2	8.4	10
10	3.2	9.4	293	8.1	7.5	17	49	21	3.7	2.2	10	7.0
11	3.6	31	59	7.5	6.1	110	21	16	3.2	11	8.2	5.9
12	5.0	20	41	7.0	5.6	88	40	8.8	8.6	7.3	14	5.8
13	16	9.0	44	9.7	5.8	157	18	7.3	6.9	4.6	10	7.5
14	8.7	7.3	28	12	7.5	538	45	6.4	9.5	21	6.6	5.0
15	4.4	6.6	22	16	14	119	248	6.1	4.9	6.0	5.0	4.3
16	3.4	7.7	18	125	13	147	75	5.8	5.6	3.5	3.8	5.0
17	2.9	19	15	45	11	52	61	24	15	3.8	3.2	4.4
18	4.1	10	163	11	6.3	28	72	7.7	13	4.7	3.3	3.6
19	22	20	47	9.2	4.9	135	186	5.9	8.8	11	4.2	4.5
20	17	37	174	198	4.4	41	70	5.3	7.0	9.6	3.8	4.6
21	7.2	11	25	19	159	20	60	5.2	5.8	5.1	4.3	14
22	7.5	18	17	11	14	16	28	5.0	5.0	3.5	5.5	7.5
23	32	53	15	9.0	7.0	53	49	4.6	6.0	10	5.6	15
24	28	61	12	8.8	5.5	111	22	4.3	8.9	5.6	4.2	60
25	7.0	170	11	7.0	11	33	22	4.1	4.9	25	3.0	49
26	15	98	9.6	6.4	13	65	18	8.8	37	30	2.9	109
27	7.3	39	8.8	32	4.9	81	17	7.5	7.5	6.8	6.5	18
28	12	32	8.6	31	3.9	324	13	6.8	5.5	6.3	5.3	9.6
29	12	18	18	16	3.5	53	23	4.7	4.4	7.8	19	12
30	49	54	16	8.1	------	61	36	4.1	3.7	15	7.9	13
31	49	------	23	7.0	------	30	------	3.8	------	33	10	------
TOTAL	369.7	1017.2	1341.0	872.8	443.7	2575.6	1591	295.6	227.7	271.4	325.3	716.3
MEAN	11.9	33.9	43.3	28.2	15.3	83.1	53.0	9.54	7.59	8.75	10.5	23.9
MAX	49	170	293	198	159	538	248	38	37	33	80	152
MIN	2.9	6.6	8.6	6.4	3.5	3.2	13	3.8	3.1	2.2	2.9	3.6
AC-FT	733	2020	2660	1730	880	5110	3160	586	452	538	645	1420

CAL YR 1967: TOTAL 9,593.7 MEAN 26.3 MAX 357 MIN 2.2 AC-FT 19,030
WAT YR 1968: TOTAL 10,047.3 MEAN 27.5 MAX 538 MIN 2.2 AC-FT 19,930

PEAK DISCHARGE (BASE, 1,900 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-20	0100	8.90	2,190	3-14	1400	9.36	2,570
1-16	1730	8.86	2,160	3-28	0400	8.70	2,040

16-4051. Molokai tunnel at east portal

Location.--Lat 21°08'38", long 156°55'16", on left bank 100 ft downstream from the east portal, 5.3 miles southeast of Kalaupapa, and 7.5 miles northeast of Kaunakakai.

Records available.--July 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (from tunnel plans).

Extremes.--1966-68: Maximum daily discharge, 13 cfs Apr. 10; no flow for many days each year.

Remarks.--Records good. Tunnel diverts from Waikolu Stream and a tributary; diversion is augmented by water pumped from two wells in Waikolu Valley near the east portal and one well in the tunnel slightly below the station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	7.2	1.4	0.01	0.01	0.02	0.01	1.9	2.2	2.6	4.2	3.4
2	1.4	9.5	1.5	.12	.01	.02	.01	1.1	2.0	2.2	2.5	2.0
3	1.3	5.2	1.3	.20	.01	.01	.01	.74	2.2	2.0	2.4	1.9
4	1.1	2.0	.99	.31	.01	.03	.01	.60	3.2	3.0	8.5	1.5
5	.99	1.1	.74	.36	.11	.01	.01	.54	2.0	2.5	3.8	1.4
6	.99	1.5	.54	.31	.01	.02	.01	.54	2.0	2.2	2.4	1.4
7	.99	1.6	.31	.31	.01	.01	.01	.48	2.5	1.9	1.9	1.4
8	1.4	1.6	.23	.46	.01	0	.02	.67	4.8	2.4	1.8	1.4
9	1.2	4.5	1.2	.17	.01	0	8.2	.14	3.0	1.8	1.6	1.6
10	1.1	1.1	.48	0	.01	0	13	.67	2.5	1.8	1.6	1.4
11	.99	3.4	.30	0	.01	.02	3.6	1.4	2.4	1.8	1.5	1.3
12	.99	2.1	.28	0	.01	.01	.48	.36	2.5	1.8	1.8	1.5
13	.99	1.8	.04	0	.01	.01	.48	.23	5.5	1.8	2.4	1.3
14	.99	1.8	.02	0	0	.01	.48	.17	6.3	1.8	1.9	1.3
15	.90	1.4	.02	0	0	.01	.54	.14	3.0	1.9	1.8	1.3
16	2.2	1.3	.01	.01	0	.01	.48	.17	3.4	1.6	1.6	1.5
17	3.0	.59	.01	.02	0	.01	1.4	1.2	5.1	1.6	1.6	1.3
18	2.8	.31	.16	.02	0	.02	2.2	.36	4.0	1.6	1.5	1.6
19	3.6	1.3	.01	.01	.01	.01	2.4	.20	5.2	1.6	1.8	1.3
20	3.8	.99	0	.01	0	0	2.4	.17	3.2	1.6	1.5	1.6
21	2.8	1.3	.35	.01	0	0	2.0	.12	3.0	1.6	1.5	1.3
22	2.0	2.1	.67	.21	0	0	1.8	.74	2.5	1.8	1.5	1.3
23	1.4	2.9	.36	.01	0	0	1.4	2.2	2.4	1.9	1.4	1.5
24	1.4	2.4	.36	.01	0	0	2.4	2.2	2.6	1.9	1.4	1.5
25	1.2	2.2	.49	.01	0	.01	2.2	2.4	5.2	1.9	1.4	2.6
26	1.9	2.8	.31	.01	.01	.01	1.6	2.4	9.0	2.0	1.6	7.5
27	1.5	1.7	.31	.01	.01	.01	1.6	2.4	3.4	1.8	1.4	2.5
28	1.2	2.0	.31	.01	.01	.01	1.1	2.4	2.6	1.8	1.4	1.8
29	1.1	1.0	.14	.06	.01	0	.59	2.2	2.5	1.9	1.4	1.6
30	3.4	1.5	.01	.01	------	0	1.1	2.2	2.4	3.4	1.4	1.8
31	7.0	------	.01	.01	------	0	------	2.2	------	4.8	1.5	------
TOTAL	57.23	70.19	12.86	2.68	0.28	0.27	51.94	33.24	101.6	64.3	64.0	54.8
MEAN	1.85	2.34	0.415	0.086	0.010	0.009	1.73	1.07	3.39	2.07	2.06	1.83
MAX	7.0	9.5	1.5	0.46	0.11	0.03	13	2.4	9.0	4.8	8.5	7.5
MIN	0.90	0.31	0	0	0	0	0.01	0.12	2.0	1.6	1.4	1.3
AC-FT	114	139	26	5.3	0.6	0.5	103	66	202	128	127	109

CAL YR 1967: TOTAL 484.09 MEAN 1.33 MAX 9.5 MIN 0 AC-FT 960
WAT YR 1968: TOTAL 513.39 MEAN 1.40 MAX 13 MIN 0 AC-FT 1,020

16-4053. Molokai tunnel at west portal

Location.--Lat 21°07'27", long 156°59'50", on left bank 50 ft upstream from west portal, 2.5 miles northeast of Kaunakakai, and 4.7 miles south of Kalaupapa.

Records available.--July 1965 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from tunnel plans).

Extremes.--1965-68: Maximum daily discharge, 16 cfs Apr. 10, 1968; minimum daily, 1.8 cfs Oct. 15, 1967.

Remarks.--Records excellent. Tunnel diverts from Waikolu Stream and a tributary, and diversion is augmented by water pumped from two wells in Waikolu Valley near east portal and one well in the tunnel below east portal. Water is used for irrigation in west-central Molokai.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	9.9	3.9	2.6	2.6	2.4	3.1	5.0	4.8	5.6	8.0	6.8
2	3.5	13	4.1	2.8	2.6	2.6	3.1	4.6	4.8	5.0	6.3	5.3
3	4.3	8.7	4.1	3.0	2.6	2.6	3.1	4.1	5.0	5.0	5.6	5.3
4	4.1	4.8	3.9	3.0	2.6	3.0	3.1	3.9	4.8	5.8	11	4.8
5	4.1	4.1	3.5	3.1	2.8	2.4	3.1	3.9	4.8	5.6	8.0	4.6
6	4.1	3.9	3.3	3.1	2.6	2.8	3.1	3.9	4.8	5.0	6.1	4.6
7	4.1	4.1	3.1	3.0	2.6	2.4	3.1	3.7	5.0	5.0	5.6	4.6
8	4.3	3.9	3.0	3.1	2.6	2.4	3.3	4.3	8.0	5.6	5.3	4.6
9	4.1	7.1	3.1	3.0	2.6	2.2	9.4	3.3	6.1	4.8	5.0	5.0
10	4.1	3.7	3.1	2.8	2.6	2.2	16	3.9	5.7	4.8	5.0	4.6
11	4.1	6.1	2.8	2.8	2.6	2.4	7.4	4.3	5.6	4.8	4.8	4.6
12	4.1	5.3	2.8	2.8	2.4	2.4	3.5	3.5	5.8	5.0	5.0	5.0
13	3.9	4.3	2.6	2.8	2.4	2.4	3.5	3.3	9.1	5.0	5.6	4.6
14	3.9	4.3	2.6	2.8	2.4	2.4	3.5	3.0	11	5.0	5.3	4.6
15	1.8	4.1	2.4	2.8	2.4	2.2	3.7	3.0	6.3	5.3	5.0	4.6
16	3.1	3.9	2.6	3.0	2.4	2.2	3.5	3.0	6.6	5.0	4.8	5.0
17	4.3	3.3	2.6	3.0	2.4	2.4	4.3	3.9	8.5	5.0	4.8	4.6
18	4.6	2.8	2.8	3.0	2.4	2.8	5.0	3.1	7.2	4.8	4.6	5.0
19	5.3	3.5	2.8	3.0	2.6	2.8	5.0	3.0	8.2	4.8	5.0	4.6
20	6.1	3.5	2.6	2.8	2.4	2.8	5.3	3.3	6.6	4.8	4.8	5.0
21	5.6	3.5	3.0	2.8	2.4	3.0	4.8	3.1	6.3	4.8	4.8	4.6
22	4.8	4.3	3.5	3.0	2.4	3.0	4.8	3.9	5.6	5.0	4.8	4.6
23	4.3	4.8	3.1	2.8	2.4	3.0	4.1	5.0	5.6	4.8	5.0	5.0
24	4.3	4.8	3.1	2.8	2.4	3.0	4.3	5.0	6.1	5.0	4.6	4.6
25	4.1	4.6	3.1	2.8	2.4	3.1	4.8	5.3	7.3	5.0	4.6	5.6
26	4.8	5.6	3.0	2.8	3.0	3.0	4.6	5.3	12	5.3	5.3	11
27	4.3	4.3	3.0	2.8	2.6	3.0	4.3	5.3	6.9	5.0	4.8	6.1
28	3.9	4.6	3.0	2.8	2.6	3.0	4.1	5.3	5.8	5.0	4.8	5.0
29	3.7	3.7	2.8	3.0	2.6	3.0	3.9	5.0	5.6	5.3	4.8	4.8
30	5.4	4.1	2.6	2.8	------	3.0	4.1	5.0	5.3	6.2	4.8	5.3
31	11	------	2.6	2.8	------	3.0	------	4.8	------	8.5	4.8	------
TOTAL	138.2	148.6	94.5	89.5	73.4	82.9	138.9	127.0	195.2	161.6	168.7	154.4
MEAN	4.46	4.95	3.05	2.89	2.53	2.67	4.63	4.10	6.51	5.21	5.44	5.15
MAX	11	13	4.1	3.1	3.0	3.1	16	5.3	12	8.5	11	11
MIN	1.8	2.8	2.4	2.6	2.4	2.2	3.1	3.0	4.8	4.8	4.6	4.6
AC-FT	274	295	187	178	146	164	276	252	387	321	335	306

CAL YR 1967: TOTAL 1,475.8 MEAN 4.04 MAX 13 MIN 1.8 AC-FT 2,930
WAT YR 1968: TOTAL 1,572.9 MEAN 4.30 MAX 16 MIN 1.8 AC-FT 3,120

16-4055. Waikolu Stream at altitude 900 ft, near Kalaupapa

Location.--Lat 21°08'43", long 156°55'18", 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.

Records available.--May 1956 to October 1961, July 1962 to September 1968.

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.

Extremes.--Maximum discharge during year, 3,010 cfs Jan. 16 (gage height, 6.10 ft), from rating curve extended above 21 cfs as explained below; minimum, 0.34 cfs Oct. 20.

1956-61, 1962-68: Maximum discharge, 3,030 cfs Apr. 13, 1965 (gage height, 6.12 ft), from rating curve extended above 21 cfs on basis of approximate gage height for flood of Oct. 31, 1961; 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 of peak flow).

Remarks.--Records good except those above 50 cfs, which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.60	30	19	4.5	3.2	1.6	38	7.2	1.3	1.3	1.2	1.3
2	.70	48	8.2	6.2	2.9	4.2	42	4.9	1.2	1.3	1.2	1.3
3	.84	49	4.9	4.9	2.3	76	57	4.2	1.2	1.3	1.3	1.3
4	.84	4.2	11	48	2.3	29	34	3.8	1.2	2.6	16	1.3
5	.84	3.2	3.2	55	2.3	15	16	3.8	1.2	1.3	1.2	1.3
6	.84	1.3	2.6	6.7	2.3	3.5	5.3	3.8	1.2	1.3	1.2	1.2
7	.84	.84	2.3	3.8	2.9	2.6	3.8	3.5	1.2	1.3	1.2	1.2
8	.84	.84	2.0	2.6	2.6	2.0	7.7	3.2	1.2	1.3	1.3	1.2
9	.84	16	34	2.6	3.2	1.8	45	4.5	1.2	1.3	1.3	1.2
10	.70	2.9	316	2.3	2.3	7.7	39	8.2	1.2	1.3	1.3	1.2
11	.70	61	64	2.3	2.3	132	6.7	9.4	1.2	1.3	1.3	1.2
12	.59	10	26	2.0	2.6	56	22	4.5	1.2	1.3	1.3	1.2
13	.48	1.2	41	2.6	4.9	34	9.4	4.2	2.7	1.3	1.3	1.2
14	.59	.59	15	2.3	4.5	84	4.2	3.8	2.7	1.3	1.3	1.2
15	.70	.59	7.2	2.0	40	36	15	3.8	1.3	1.3	1.3	1.2
16	.59	.59	4.2	100	50	29	6.7	4.5	1.3	1.3	1.3	1.2
17	.48	1.8	4.2	69	44	7.7	9.1	4.9	1.3	1.3	1.3	1.2
18	.48	2.0	108	9.4	7.7	4.9	6.7	3.8	1.3	1.3	1.3	1.2
19	.40	2.9	24	22	3.8	40	76	3.8	1.3	1.3	1.3	1.2
20	.34	3.2	85	176	2.9	14	49	3.5	1.3	1.3	1.3	1.2
21	.40	1.3	5.3	7.7	139	4.5	16	3.5	1.3	1.3	1.3	1.2
22	.48	1.3	3.2	3.8	6.2	3.5	6.7	2.3	1.3	1.2	1.3	1.2
23	.59	11	3.2	4.5	2.9	4.5	7.4	1.3	1.3	1.2	1.3	1.2
24	.59	5.7	4.5	4.5	2.3	26	18	1.3	1.3	1.2	1.3	1.2
25	.59	5.3	26	3.2	52	14	12	1.3	6.4	1.2	1.3	1.2
26	.59	39	3.8	2.9	6.7	20	5.7	1.3	5.2	1.2	1.3	9.4
27	.59	10	2.6	11	2.6	7.7	6.7	1.3	1.3	1.2	1.3	.98
28	.70	7.2	2.9	11	2.0	3.8	4.9	1.3	1.3	1.2	1.3	.98
29	.70	3.8	6.2	5.3	1.8	3.8	4.5	1.3	1.3	1.2	1.3	.98
30	54	28	10	4.5	------	21	5.3	1.3	1.3	1.8	1.3	.98
31	19	------	26	4.2	------	9.4	------	1.3	------	1.3	1.3	------
TOTAL	91.46	352.75	875.5	586.8	404.5	699.2	545.6	110.8	49.7	41.3	54.5	43.82
MEAN	2.95	11.8	28.2	18.9	13.9	22.6	18.2	3.57	1.66	1.33	1.76	1.46
MAX	54	61	316	176	139	132	76	9.4	6.4	2.6	16	9.4
MIN	0.34	0.59	2.0	2.0	1.8	1.6	3.8	1.3	1.2	1.2	1.2	0.98
AC-FT	181	700	1,740	1,160	802	1,390	1,080	220	99	82	108	87

CAL YR 1967: TOTAL 4,047.98 MEAN 11.1 MAX 316 MIN 0.34 AC-FT 8,030
WAT YR 1968: TOTAL 3,855.93 MEAN 10.5 MAX 316 MIN 0.34 AC-FT 7,650

PEAK DISCHARGE (BASE, 570 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-10	1400	4.61	1,370	1-20	0800	5.10	1,830
12-20	0100	3.72	732	2-21	1030	4.17	1,020
1-16	1530	6.10	3,010	4-19	1530	3.77	762

16-4080. Waikolu Stream below pipeline crossing, near Kalaupapa

Location.--Lat 21°09'45", long 156°55'54", on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Kalaupapa Lighthouse.

Drainage area.--3.68 sq mi.

Records available.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to September 1968. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

Gage (revised).--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, than present datum.

Extremes.--Maximum discharge during year, 760 cfs Jan. 16 (gage height, 4.65 ft), from rating curve extended above 35 cfs on basis of slope-area measurement at gage height 13.75 ft; minimum, 6.0 cfs on several days in October.

1919-32, 1937-68: 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. Since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	43	24	10	11	9.6	19	21	13	11	10	9.3
2	6.4	48	16	12	10	14	57	19	13	11	9.8	9.1
3	6.4	48	12	10	9.5	107	75	18	13	11	11	9.1
4	6.2	12	18	42	9.0	61	54	17	13	21	26	9.1
5	6.2	9.8	9.8	52	9.0	32	42	17	13	13	11	9.1
6	6.2	8.2	9.3	13	9.0	15	24	16	13	12	10	9.1
7	6.2	7.6	8.9	10	10	12	21	16	13	11	10	9.1
8	6.5	7.5	8.2	8.7	9.0	11	24	16	13	11	9.8	8.9
9	6.2	18	32	8.5	11	10	67	18	12	11	9.8	8.7
10	6.4	9.6	212	8.3	9.0	14	74	21	12	11	9.8	8.7
11	6.4	56	61	8.3	9.0	161	26	21	12	11	9.6	8.7
12	6.2	17	31	8.2	10	91	38	18	12	11	9.8	8.7
13	6.2	8.9	40	9.2	14	54	28	17	13	11	9.6	8.5
14	6.2	7.8	20	8.5	12	126	21	16	14	11	9.6	8.5
15	6.2	7.6	12	8.2	40	74	31	16	12	11	9.6	8.5
16	6.2	7.6	9.6	62	58	86	24	17	12	11	9.6	8.5
17	6.0	8.3	8.7	49	53	28	26	18	12	10	9.6	8.5
18	6.2	8.9	88	12	16	24	23	16	12	10	9.6	8.7
19	6.2	9.3	29	17	11	84	80	16	12	10	9.3	8.5
20	6.0	9.8	69	120	10	35	63	16	12	10	9.3	8.5
21	6.0	8.0	13	20	120	23	30	16	12	10	9.3	8.5
22	6.2	7.8	9.8	13	17	20	22	15	12	10	9.3	8.5
23	6.2	15	9.6	14	11	22	21	14	12	11	9.3	8.7
24	6.0	12	10	13	10	49	30	13	12	10	9.3	8.7
25	6.0	11	28	12	55	33	25	13	15	10	9.3	10
26	6.2	34	9.8	11	17	59	20	13	16	10	9.1	15
27	6.0	16	8.7	18	11	27	21	13	12	10	9.1	8.5
28	6.0	13	8.7	18	9.8	22	19	13	11	10	9.3	8.5
29	6.0	9.8	12	14	9.6	21	18	13	11	9.8	9.3	8.5
30	45	27	14	13	------	37	19	13	11	13	9.1	8.3
31	24	------	29	12	------	26	------	13	------	10	9.8	------
TOTAL	248.3	506.5	871.1	634.9	589.9	1387.6	1,042	499	375	342.8	315.0	269.0
MEAN	8.01	16.9	28.1	20.5	20.3	44.8	34.7	16.1	12.5	11.1	10.2	8.97
MAX	45	56	212	120	120	161	80	21	16	21	26	15
MIN	6.0	7.5	8.2	8.2	9.0	9.6	18	13	11	9.8	9.1	8.3
AC-FT	492	1,000	1,730	1,260	1,170	2750	2070	990	744	680	625	534

CAL YR 1967: TOTAL 5,858.3 MEAN 16.1 MAX 212 MIN 6.0 AC-FT 11,620
WAT YR 1968: TOTAL 7,081.1 MEAN 19.3 MAX 212 MIN 6.0 AC-FT 14,050

Peak discharge (base, 700 cfs).--Jan. 16 (1530) 760 cfs (4.65 ft).

16-4114. Kakaako Gulch near Mauna Loa

Location.--Lat 21°10'39", long 157°12'31", 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.

Records available.--July 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 867 cfs Jan. 16 (gage height, 3.62 ft), from rating curve based on slope-area measurements at gage heights 0.72, 1.43 and 6.28 ft; no flow most of the time.
1963-68: 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 the time each year.

Remarks.--Records poor. No diversion above staion. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			0	0	0	0	0	0				
2			0	0	0	0	0	0				
3			0	0	0	0	0	0				
4			0	0	0	0	0	0				
5			0	1.1	0	0	0	0				
6			0	5.5	0	0	.50	0				
7			0	0	0	0	0	0				
8			0	0	0	0	0	0				
9			.55	0	0	0	0	1.3				
10			1.0	0	0	0	3.4	0				
11			4.4	0	0	0	0	0				
12			0	0	0	0	0	0				
13			0	0	0	0	0	0				
14			0	0	0	34	0	0				
15			0	0	0	0	0	0				
16			0	37	0	0	0	0				
17			0	0	0	0	.61	0				
18			3.5	0	0	0	0	0				
19			2.6	0	0	0	45	0				
20			5.4	0	0	0	0	0				
21			0	0	37	0	14	0				
22			0	0	0	0	0	0				
23			0	0	0	0	0	0				
24			0	0	0	0	0	0				
25			0	0	0	0	0	0				
26			0	0	0	0	0	0				
27			0	0	0	0	0	0				
28			2.5	0	0	0	0	0				
29			1.8	0	0	0	0	0				
30			0	0	------	0	0	0				
31		------	0	0	------	0	------	0	------			------
TOTAL	0	0	21.75	43.6	37	34	63.51	1.3	0	0	0	0
MEAN	0	0	0.702	1.41	1.3	1.1	2.12	0.04	0	0	0	0
MAX	0	0	5.4	37	37	34	45	1.3	0	0	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	43	86	73	67	126	2.6	0	0	0	0

CAL YR 1967: TOTAL 221.51 MEAN 0.607 MAX 45 MIN 0 AC-FT 440
WAT YR 1968: TOTAL 201.16 MEAN 0.550 MAX 45 MIN 0 AC-FT 398

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-16	1530	3.62	867	4-19	1600	3.36	776
2-21	0330	3.57	850	4-21	0300	2.35	445
3-14	1230	3.42	797				

16-4140. Kaunakakai Gulch at Kaunakakai

Location.--Lat 21°06'21", long 157°00'34", 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.

Records available.--December 1949 to September 1968. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,220 cfs Jan. 20 (gage height, 6.89 ft), from rating curve extended above 76 cfs on basis of slope-area measurement at gage height 9.30 ft; no flow for many days.
1949-68: 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 fair. No diversion above station. Diversion from Molokai tunnel, which entered gulch above station May 20, 1965, to Dec. 19, 1966, now enters below station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		0	0	0	0	0	0		0		0	
2		0	0	0	0	0	0		0		0	
3		3.1	0	0	0	2.1	4.0		0		0	
4		.01	0	0	0	2.2	2.3		0		4.3	
5		0	0	1.9	0	.80	.56		0		3.7	
6		0	0	0	0	.10	0		0		0	
7		0	0	0	0	0	0		0		0	
8		0	0	0	0	0	0		0		0	
9		0	0	0	0	0	6.8		0		0	
10		0	63	0	0	0	27		0		0	
11		0	14	0	0	2.1	6.0		0		0	
12		.74	15	0	0	23	2.0		0		0	
13		0	13	0	0	2.0	7.7		0		0	
14		0	1.3	0	0	34	.16		5.6		0	
15		0	1.4	0	.76	9.8	0		0		0	
16		0	0	57	16	7.5	0		0		0	
17		0	0	26	17	.62	0		0		0	
18		0	35	1.2	1.6	.05	0		0		0	
19		0	6.6	.02	.12	0	45		0		0	
20		0	63	128	0	0	25		0		0	
21		0	1.4	8.0	89	0	1.4		0		0	
22		0	.04	1.2	6.9	0	1.5		0		0	
23		0	0	.20	.62	0	0		0		0	
24		0	0	0	.07	0	0		0		0	
25		0	.32	0	22	0	0		0		0	
26		0	.01	0	4.0	0	0		3.2		0	
27		0	0	0	.24	0	0		0		0	
28		0	0	0	0	0	0		0		0	
29		0	0	0	0	0	0		0		0	
30		0	0	0	------	0	0		0		0	
31		------	0	0	------	0	------		------		0	------
TOTAL	0	3.85	214.07	223.52	158.31	84.27	129.42	0	8.8	0	8.0	0
MEAN	0	0.128	6.91	7.21	5.46	2.72	4.31	0	0.29	0	0.26	0
MAX	0	3.1	63	128	89	34	45	0	5.6	0	4.3	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	7.6	425	443	314	167	257	0	17	0	16	0

CAL YR 1967: TOTAL 636.33 MEAN 1.74 MAX 80 MIN 0 AC-FT 1,260
WAT YR 1968: TOTAL 830.24 MEAN 2.27 MAX 128 MIN 0 AC-FT 1,650

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-10	1500	4.75	273	1-20	0900	6.89	1,220
12-18	1700	4.24	162	2-21	1030	5.82	654
12-20	0200	5.20	415	2-25	1500	4.29	172
1-16	1700	6.70	1,110	4-19	1700	5.37	474

16-4150. East Fork Kawela Gulch near Kamalo

Location.--Lat 21°06'46", long 156°54'23", 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.

Records available.--September 1946 to September 1968. 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).

Extremes.--Maximum discharge during year, 307 cfs Jan. 16 (gage height, 4.79 ft), from rating curve extended above 6.6 cfs as explained below; no flow for many days.
1946-68: 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 fair. Molokai Ranch diverts from gage pool.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	7.4	6.2	1.1	0.03	0.17	0.50	3.5	0	0	1.8	2.4
2	.35	8.2	4.1	3.6	0	.22	6.0	1.5	0	0	.10	.09
3	.04	5.6	3.6	1.5	0	9.0	13	.43	0	0	0	0
4	0	2.0	5.1	12	0	9.2	6.8	.02	0	0	2.4	0
5	0	1.2	1.4	12	0	5.7	2.7	0	0	0	.57	0
6	0	.29	.74	2.8	0	.97	.64	0	0	0	0	0
7	0	.06	.11	1.2	.04	.43	.17	0	.30	0	0	0
8	0	1.2	.40	.74	.02	.26	.07	0	3.5	0	0	0
9	0	11	14	.20	0	.17	5.9	0	.76	0	0	0
10	0	1.4	30	0	0	.69	14	2.0	.06	0	0	0
11	0	12	13	0	0	15	3.9	1.7	.11	0	0	0
12	0	2.9	10	0	.01	17	11	.11	1.8	0	1.5	0
13	0	.55	12	0	.26	16	3.0	0	4.7	0	.91	0
14	0	0	4.8	0	.18	20	.94	0	3.1	.10	.01	0
15	0	0	2.1	0	16	7.8	4.1	0	.26	.01	0	0
16	0	0	1.1	15	13	5.1	4.0	0	2.5	0	0	0
17	0	1.6	1.8	15	9.9	1.9	4.9	0	2.8	.06	0	0
18	0	.35	29	.91	1.9	.59	3.6	0	1.9	0	0	0
19	.05	1.6	8.3	4.0	.51	8.9	20	0	2.4	0	0	0
20	1.8	2.6	21	36	.23	4.0	9.4	0	.59	0	0	0
21	1.7	.91	1.9	3.1	38	1.0	6.5	0	.03	0	0	0
22	.74	1.9	.85	1.4	1.7	.24	1.7	0	0	0	0	0
23	.07	5.8	1.2	.57	.35	1.1	3.7	0	.03	1.4	0	0
24	0	3.9	3.0	.69	.02	6.9	6.0	0	.55	.28	0	.83
25	0	1.7	10	.11	22	3.1	3.9	0	5.9	.43	0	.62
26	0	13	.91	0	1.8	9.5	1.6	0	50	.10	0	3.8
27	0	4.3	.26	2.6	.64	2.0	2.2	0	.59	0	0	.32
28	0	3.9	.66	4.0	.43	.47	1.0	0	.26	0	0	0
29	.22	3.7	2.3	1.6	.29	.32	.64	0	0	0	.30	0
30	9.4	11	2.5	.51	------	13	2.5	0	0	.43	.03	0
31	6.3	------	8.4	.47	------	3.1	------	0	------	1.8	.01	------
TOTAL	21.67	110.06	200.73	121.50	107.31	163.83	144.36	9.26	37.14	4.61	7.63	8.06
MEAN	0.699	3.67	6.48	3.92	3.70	5.28	4.81	0.299	1.24	0.149	0.246	0.269
MAX	9.4	13	30	36	38	20	20	3.5	5.9	1.8	2.4	3.8
MIN	0	0	0.11	0	0	0.17	0.07	0	0	0	0	0
AC-FT	43	218	398	241	213	325	286	18	74	9.1	15	16

CAL YR 1967: TOTAL 1,003.09 MEAN 2.75 MAX 34 MIN 0 AC-FT 1,990
WAT YR 1968: TOTAL 936.16 MEAN 2.56 MAX 38 MIN 0 AC-FT 1,860

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-20	0030	4.32	185	1-20	0800	4.34	190
1-16	1600	4.79	307	2-21	0400	4.33	188

16-4160. Punaula Gulch near Pukoo

Location.--Lat 21°05'50", long 156°48'48", on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

Drainage area.--0.24 sq mi.

Records available.--March 1947 to September 1968. Prior to July 1958, published as Punaula Stream near Pukoo.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

Extremes.--Maximum discharge during year, 397 cfs Mar. 28 (gage height, 5.17 ft), from rating curve extended above 14 cfs as explained below; minimum, 0.03 cfs Aug. 31.
1947-68: Maximum discharge, 569 cfs Feb. 4, 1965 (gage height, 7.17 ft), from rating curve extended above 14 cfs by test on model of station site; minimum, 0.02 cfs Mar. 13, 1947, Feb. 19, 1954.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.09	3.5	2.5	0.30	0.54	0.09	0.48	1.8	0.06	0.07	1.3	3.4
2	.11	5.2	1.4	.91	.56	.09	3.3	.60	.06	.05	.18	4.3
3	.09	2.1	7.4	.33	.18	3.0	4.1	.33	.06	.04	.09	.48
4	.06	.48	1.1	9.2	.53	2.7	3.0	.26	.06	.65	3.2	.14
5	.05	.22	1.4	7.7	.28	3.4	1.2	.28	.04	.22	.48	.06
6	.05	.14	.48	1.8	.14	.28	.48	.22	.04	.08	.16	.29
7	.04	.11	2.0	.33	5.0	.16	.56	.18	.49	.05	.10	1.5
8	.21	.11	1.0	.22	.36	.16	.36	.20	.26	.06	.07	.45
9	.06	.28	5.6	.18	.20	.16	2.9	.69	.11	.06	.08	.12
10	.04	.12	10	.16	.12	.48	2.2	2.2	.07	.04	.06	.11
11	.04	1.5	2.1	.12	.10	8.8	.70	.60	.06	.18	.13	.09
12	.05	.66	3.0	.12	.11	6.5	1.5	.26	.18	.11	.51	06
13	.06	.22	2.0	.30	.14	11	.60	.20	.26	.08	.38	.06
14	.24	.12	2.6	.49	.16	8.7	2.2	.14	.28	1.5	.09	.04
15	.07	.10	7.9	.51	4.4	5.6	7.9	.12	.10	.16	.05	.04
16	.04	.10	.73	11	1.3	4.1	2.6	.11	.69	.07	.04	.06
17	.04	.28	.44	3.4	1.0	1.3	8.4	.87	.70	.06	.04	.05
18	.04	.18	18	.30	.26	.52	5.6	.20	.24	.05	.04	.04
19	.30	1.4	1.4	.22	.14	2.3	11	.12	.40	.42	.04	.26
20	1.2	3.1	7.3	13	.11	1.3	1.8	.10	.20	.18	.04	.07
21	.18	.48	.82	.60	19	.48	.82	.09	.11	.10	.04	1.5
22	.12	1.8	.44	.28	.52	.33	.91	.09	.09	.08	.06	.20
23	1.3	3.9	.36	1.6	.24	4.2	1.5	.08	.11	.30	.04	.20
24	1.3	5.0	.28	.44	.16	5.9	.56	.08	.30	.12	.04	4.4
25	.20	5.3	.33	.22	3.9	2.0	1.0	.08	.95	.58	.04	2.3
26	.26	2.5	.22	.16	.48	3.3	.48	.11	2.4	.56	.04	6.5
27	.16	2.1	.20	2.6	.20	6.3	.48	.10	.24	.11	04	.36
28	.11	.82	.18	1.8	.14	32	.36	.10	.12	.08	.04	.20
29	.78	.59	.33	.48	.11	3.2	.48	.07	.09	.06	.13	.30
30	2.0	3.1	2.4	.26	------	4.0	.91	.06	.08	.20	.06	.40
31	1.8	------	.88	.20	------	1.0	------	.06	------	.30	07	------
TOTAL	11.09	45.51	84.79	59.23	40.38	123.35	68.38	10.40	8.85	6.62	7.68	27.98
MEAN	0.358	1.52	2.74	1.91	1.39	3.98	2.28	0.335	0.295	0.214	0.248	0.933
MAX	2.0	5.3	18	13	19	32	11	2.2	2.4	1.5	3.2	6.5
MIN	0.04	0.10	0.18	0.12	0.10	0.09	0.36	0.06	0.04	0.04	0.04	0.04
AC-FT	22	90	168	117	80	245	136	21	18	13	15	55

CAL YR 1967: TOTAL 507.41 MEAN 1.39 MAX 26 MIN 0.04 AC-FT 1,010
WAT YR 1968: TOTAL 494.26 MEAN 1.35 MAX 32 MIN 0.04 AC-FT 980

PEAK DISCHARGE (BASE, 140 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-18	0830	4.49	311	1-20	0900	3.63	188
1- 4	2400	4.18	267	2-21	1030	3.56	179
1-16	1630	5.05	384	3-28	0300	5.17	397

16-4195. Papio Gulch at Halawa

Location.--Lat 21°08'55", long 156°44'16", 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.

Records available.--July 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 640 ft (from topographic map).

Extremes.--Maximum discharge during year, 566 cfs Mar. 14 (gage height, 5.62 ft), from rating curve extended above 17 cfs as explained below; minimum, 0.03 cfs Oct. 17.
1963-68: 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. Diversion above station for domestic use at Puu O Hoku Ranch.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.14	1.5	0.18	0.49	18	1.2	2.7	2.1	1.0	0.72	0.61	0.37
2	.16	1.0	.18	.46	3.5	1.3	2.5	2.0	1.0	.68	.58	1.9
3	.14	.64	.16	.46	1.5	3.0	2.5	1.9	1.0	.69	.55	.55
4	.16	.40	.18	.55	1.2	1.7	2.7	1.9	1.0	.75	2.4	.43
5	.16	.24	.20	3.2	1.2	3.5	2.5	1.9	.96	.72	1.1	.37
6	.12	.18	.24	5.3	1.0	1.4	2.3	1.7	.96	.64	.68	.28
7	.10	.16	.18	1.2	9.7	1.1	2.1	1.6	1.0	.61	.64	.55
8	.46	.14	.16	.75	1.9	.75	2.0	1.9	1.0	.61	.64	.40
9	.16	.12	.51	.64	2.2	.68	7.3	1.9	.92	.58	.64	.30
10	.07	.09	9.6	.61	1.3	.84	5.0	2.8	.92	.61	.61	.20
11	.08	.10	3.4	.55	1.1	3.0	2.4	2.0	.88	.68	.61	.20
12	.12	.14	1.2	.52	1.0	4.8	2.9	1.6	.96	.61	.61	.20
13	.14	.12	.92	.49	1.0	6.0	2.0	1.5	.92	.58	.58	.20
14	.09	.08	.75	.49	1.1	63	3.1	1.4	.88	.61	.52	.20
15	.09	.07	.64	.37	1.6	14	21	1.4	.88	.58	.49	.20
16	.08	.07	.49	18	1.4	13	3.5	1.4	.92	.55	.49	.20
17	.07	.08	.40	6.8	1.1	7.2	6.0	1.7	.92	.58	.49	.20
18	.09	.09	6.9	1.4	.96	4.2	4.0	1.4	.92	.55	.49	.20
19	.10	.14	2.7	1.0	.92	7.8	9.0	1.3	.88	.61	.49	.30
20	.10	.09	10	19	.88	4.3	5.8	1.3	.84	.58	.46	.20
21	.08	.07	1.5	2.7	29	2.9	4.0	1.2	.84	.52	.46	2.0
22	.09	.07	1.1	1.6	3.0	2.6	3.0	1.2	.81	.52	.49	.50
23	.63	.12	.88	1.4	1.9	2.5	3.4	1.2	.81	.58	.49	.40
24	.64	1.0	.75	1.2	1.6	7.4	2.7	1.2	.78	.58	.46	2.0
25	.31	3.9	.61	1.1	1.7	3.0	2.5	1.2	.81	.64	.40	1.0
26	.31	5.1	.58	1.1	1.6	2.9	2.4	1.2	.92	.68	.31	5.0
27	.43	.84	.52	3.2	1.4	10	2.3	1.2	.81	.61	.24	1.0
28	.26	.58	.52	2.4	1.3	13	2.2	1.2	.75	.61	.22	.30
29	1.8	.22	.72	1.8	1.3	4.0	2.2	1.1	.72	.58	.28	.40
30	.29	.16	.58	1.2	------	4.8	2.1	1.1	.72	.61	.24	.50
31	1.6	------	.52	1.0	------	3.1	------	1.1	------	.75	.31	------
TOTAL	9.07	17.51	47.27	80.98	95.36	198.97	118.1	47.6	26.73	19.21	17.58	20.55
MEAN	0.293	0.584	1.52	2.61	3.29	6.42	3.94	1.54	0.891	0.620	0.567	0.685
MAX	1.8	5.1	10	19	29	63	21	2.8	1.0	0.75	2.4	5.0
MIN	0.07	0.07	0.16	0.37	0.88	0.68	2.0	1.1	0.72	0.52	0.22	0.20
AC-FT	18	35	94	161	189	395	234	94	53	38	35	41

CAL YR 1967: TOTAL 318.22 MEAN 0.872 MAX 29 MIN 0.07 AC-FT 631
WAT YR 1968: TOTAL 698.93 MEAN 1.91 MAX 63 MIN 0.07 AC-FT 1,390

PEAK DISCHARGE (BASE, 210 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-16	1630	4.75	330	2-21	1030	4.26	233
2- 1	1930	5.16	430	3-14	1500	5.62	566

16-5001. Kepuni Gulch near Kahikinui House

Location.--Lat 20°37'21", long 156°15'16", on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 miles east of Kahikinui House, and 8.5 miles west of Kaupo.

Drainage area.--1.91 sq mi.

Records available.--May 1963 to September 1968.

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.

Extremes.--Maximum discharge during year, 964 cfs Jan. 17 (gage height, 8.23 ft), from rating curve defined only by computations of peak flow over dam at gage heights 4.80, 6.38 and 7.95 ft; no flow most of the time.
1963-68: Maximum discharge, that of Jan. 17, 1968; no flow most of the time each year.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0			0	0		0					
2	0			0	0		0					
3	0			0	0		0					
4	0			0	0		0					
5												
6	0			0	0		0					
7	0			0	0		0					
8	0			0	0		0					
9	0			0	0		0					
10	0											
11	0			0	0		0					
12	0			0	0		0					
13	0			0	0		0					
14	0			0	0		0					
15	0											
16	0			4.2	0		19					
17	0			43	53		.45					
18	0			0	0		0					
19	0			0	0		0					
20	0			0	0		22					
21	0			0	10		0					
22	0			0	0		0					
23	.70			0	0		0					
24	0			0	0		0					
25	0			0	0		0					
26	0			0	0		0					
27	0			0	0		0					
28	0			0	0		0					
29	0			0	0		0					
30	0			0	------		0		------			------
31	0	------		0	------		------					
TOTAL	0.70	0	0	47.2	63	0	41.45	0	0	0	0	0
MEAN	0.023	0	0	1.52	2.2	0	1.38	0	0	0	0	0
MAX	0.70	0	0	43	53	0	22	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	1.4	0	0	94	125	0	82	0	0	0	0	0

CAL YR 1967: TOTAL 48.39 MEAN 0.133 MAX 25 MIN 0 AC-FT 96
WAT YR 1968: TOTAL 152.35 MEAN 0.416 MAX 53 MIN 0 AC-FT 302

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-17	0430	8.23	964	4-16	1800	4.52	198
2-17	0230	4.74	228	4-20	0300	6.52	543
2-21	1100	3.53	87				

16-5008. Kukuiula Gulch near Kipahulu

Location.--Lat 20°39'15", long 156°04'42", on right bank on downstream side of Highway 31, 1.3 miles west of Kipahulu, and 3.2 miles east of Kaupo.

Drainage area.--0.76 sq mi.

Records available.--May 1963 to January 1966, May 1967 to April 1968 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).

Gage.--Water-stage recorder and concrete-masonry control. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during period October 1967 to April 1968, 816 cfs Jan. 17 (gage height, 4.37 ft), from rating curve extended above 5.0 cfs as explained below; no flow for several days.
1963-68: Maximum discharge, 1,560 cfs Jan. 23, 1965 (gage height, 5.11 ft), from rating curve extended above 5.0 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1967 to APRIL 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.19	0	7.3	0.86	1.6	2.0	0.77					
2	.73	0	4.2	2.3	1.5	1.7	.69					
3	.19	0	7.0	7.5	2.8	1.5	.62					
4	.07	0	5.7	11	2.4	1.6	.50					
5	.01	0	5.4	9.6	2.3	2.2	-					
6	0	0	4.2	3.2	1.0	1.4	-					
7	0	.01	9.1	2.3	1.2	1.3	-					
8	0	1.6	12	2.0	.95	.95	-					
9	0	4.7	10	1.7	.69	.86	-					
10	0	.55	12	1.4	.62	1.3	-					
11	0	3.4	8.3	1.3	.56	.86	-					
12	0	2.3	4.8	1.2	.50	1.7	-					
13	1.2	.40	3.7	1.0	7.5	3.6	-					
14	.17	.16	3.0	1.2	1.6	5.7	-					
15	0	.11	2.6	1.4	11	6.8	-					
16	0	.34	2.2	1.2	10	5.6	-					
17	0	1.0	1.8	27	52	3.5	-					
18	0	3.7	2.0	9.1	6.6	2.9	-					
19	1.0	1.1	1.8	9.4	4.4	2.6	-					
20	3.9	1.4	2.1	8.4	2.9	2.5	-					
21	2.6	.27	1.4	4.4	18	2.3	-					
22	.19	2.4	1.0	3.7	6.7	3.2	-					
23	2.2	5.4	.95	3.2	4.2	10	-					
24	.35	16	1.5	2.8	3.5	7.0	-					
25	.05	10	4.8	2.5	5.2	1.8	-					
26	.86	11	.86	2.2	4.6	1.5	-					
27	.23	5.2	.77	6.7	28	1.4	-					
28	.16	7.9	.62	6.2	2.5	8.4	-					
29	.31	4.0	1.6	2.6	2.2	1.3	-					
30	0	11	.77	2.1	------	1.6	-					
31	0	------	3.4	1.7	------	.95	------		------			------
TOTAL	14.41	93.94	126.87	141.16	161.82	90.02	-					
MEAN	0.465	3.13	4.09	4.55	5.58	2.90	-					
MAX	3.9	16	12	27	52	10	-					
MIN	0	0	0.62	0.86	0.50	0.86	-					
AC-FT	29	186	252	280	321	179	-					

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 470 cfs).--Jan. 17 (0600) 816 cfs (4.37 ft).

16-5010. Palikea Stream below diversion dam, near Kipahulu

Location.--Lat 20°41'05", long 156°04'10", 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.

Records available.--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 September 1968. 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.

Extremes.--Maximum discharge during year, 5,230 cfs Apr. 16 (gage height, 9.69 ft), from rating curve extended above 3,300 cfs as explained below; minimum, 0.01 cfs on several days.
1927-29, 1931-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.08	28	283	21	0.27	0.08	1.1	90	0.02	0.03	61	89
2	.13	135	48	110	.27	.04	.50	30	.01	.02	1.3	27
3	.10	122	265	225	132	.03	.37	6.5	.01	.02	.23	42
4	.05	11	112	508	12	.19	.19	1.9	.02	.02	.13	3.0
5	.03	.91	106	306	2.8	45	.13	1.4	.02	.02	5.2	1.0
6	.02	.16	53	42	.37	.36	.13	.85	.02	.02	.36	1.2
7	.02	.19	261	5.3	.23	.06	29	.56	45	.01	.10	130
8	.01	198	255	1.4	.16	.04	12	1.2	81	.02	.08	138
9	.01	327	48	.85	.08	.03	.23	.70	43	.01	.60	12
10	.01	29	67	.50	.04	.20	6.2	135	46	.01	12	21
11	.02	214	46	.32	.03	.23	2.0	165	12	.02	36	24
12	.02	57	6.6	.19	.02	26	.23	2.5	41	.06	119	2.3
13	34	4.1	2.2	.10	21	166	.13	1.1	168	.04	16	1.0
14	.42	1.1	1.4	.43	2.4	117	11	.63	58	186	3.2	.70
15	.06	.50	.93	.83	5.9	261	250	.43	5.6	4.5	.43	18
16	.04	.77	.63	465	28	127	2210	.23	64	.08	.19	18
17	.03	19	.43	743	711	14	300	.16	55	54	.10	.78
18	.04	171	1.0	20	11	1.7	458	.10	53	.98	7.8	.19
19	2.7	96	.85	100	2.3	.70	423	.06	92	21	28	13
20	133	71	3.3	90	1.2	.50	566	.04	16	53	9.8	30
21	69	24	.75	5.3	187	.32	30	.05	1.9	4.0	17	8.7
22	4.0	156	.16	1.4	10	4.0	6.4	.05	18	.19	2.6	1.0
23	11	255	.08	.93	1.5	165	572	.03	8.7	117	.56	.85
24	.43	258	80	.63	.85	184	654	.02	1.5	4.1	.27	149
25	.23	383	98	.43	.77	10	531	.02	.13	41	20	32
26	14	1.000	.62	.27	4.5	1.3	857	.02	16	16	10	262
27	1.5	278	.23	3.4	.77	.63	684	19	2.4	.70	1.8	13
28	2.0	322	.16	18	.32	72	142	1.1	8.7	19	.32	2.2
29	2.1	66	.43	1.4	.16	26	122	.13	.16	7.7	78	9.8
30	.95	372	.19	.50	------	145	77	.06	.05	33	8.1	1.6
31	13	------	198	.27	------	15	------	.03	------	37	48	------
TOTAL	289.00	4,599.73	1,939.96	2,672.45	1,136.94	1,383.41	7,945.61	458.87	837.24	599.55	488.17	1,052.32
MEAN	9.32	153	62.6	86.2	39.2	44.6	265	14.8	27.9	19.3	15.7	35.1
MAX	133	1.000	283	743	711	261	2.210	165	168	186	119	262
MIN	0.01	0.16	0.08	0.10	0.02	0.03	0.13	0.02	0.01	0.01	0.08	0.19
AC-FT	573	9.120	3,850	5.300	2260	2740	15.760	910	1.660	1.190	968	2090

CAL YR 1967: TOTAL 24,178.71 MEAN 66.2 MAX 1,050 MIN 0.01 AC-FT 47,960
WAT YR 1968: TOTAL 23,403.25 MEAN 63.9 MAX 2,210 MIN 0.01 AC-FT 46,420

PEAK DISCHARGE (BASE, 2,800 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12-24	2300	9.65	4,950	2- 3	1630	9.33	3,460
1- 4	2200	9.28	3,370	2-17	0400	9.53	4,180
1-17	0100	9.66	5,020	4-16	0500	9.69	5,230

16-5020. Hahalawe Gulch near Kipahulu

Location.--Lat 20°40'54", long 156°02'50", on left bank at old ditch intake, 0.7 mile upstream from mouth, and 1.8 miles northeast of Kipahulu Church.

Drainage area.--0.43 sq mi.

Records available.--February 1927 to March 1935, May 1935 to April 1937, May 1938 to September 1968. Monthly discharge only May, June 1938, published in WSP 1319. Published as Right Branch Kahalawe Stream near Kipahulu 1927-56 and as Right Branch Hahalawe Stream near Kipahulu 1956-60.

Gage.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to May 1, 1938, at datum 8.0 ft lower.

Extremes.--Maximum discharge during year, 1,530 cfs Apr. 16 (gage height, 4.88 ft), from rating curve extended above 39 cfs as explained below; minimum, 0.51 cfs June 6.
1927-68: Maximum discharge, 3,560 cfs Apr. 29, 1937 (gage height, 15.74 ft, datum then in use), from rating curve extended above 83 cfs on basis of slope-area measurement at gage height 4.80 and by test on model of station site; minimum, 0.23 cfs Dec. 18, 1929.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	72	11	30	12	1.1	22	5.7	0.92	0.92	5.8	5.1
2	2.0	15	5.6	3.5	1.2	.99	1.9	4.0	.76	.81	2.4	7.7
3	1.5	15	8.0	5.4	3.6	.99	2.2	3.3	67	.71	1.9	9.8
4	1.4	4.1	6.0	16	1.8	4.0	1.8	3.0	.76	.76	1.6	3.0
5	1.1	2.8	4.8	7.0	1.7	5.1	1.5	3.0	.63	.67	2.6	2.2
6	.99	2.0	4.0	3.5	1.3	1.6	1.4	2.6	.56	.63	1.9	3.3
7	.94	1.8	7.2	2.5	1.1	1.3	3.6	2.4	3.6	.59	1.6	16
8	86	4.9	6.2	2.0	.99	1.1	3.2	4.0	2.4	.63	1.9	7.5
9	82	9.6	5.0	1.7	.90	.94	1.8	3.2	3.7	.80	3.3	3.7
10	82	3.1	5.8	1.5	86	2.9	4.7	21	4.2	10	3.7	7.7
11	.78	98	5.4	1.3	.73	2.6	2.3	13	3.2	2.8	7.6	6.2
12	.80	5.2	4.0	1.3	.74	4.7	1.6	3.2	3.8	2.2	10	3.4
13	5.1	2.5	2.7	1.2	16	10	1.4	2.4	8.0	1.7	3.6	2.6
14	1.5	1.9	2.3	1.3	1.8	10	6.6	2.3	3.9	8.8	3.7	2.3
15	1.1	1.6	2.0	1.8	6.6	8.2	43	2.0	2.3	3.1	2.3	2.6
16	.94	1.6	1.7	1.6	13	5.2	354	1.9	3.6	2.0	1.7	3.3
17	.90	3.0	1.6	40	68	3.0	16	1.7	4.7	5.6	1.4	2.4
18	1.2	7.4	1.8	8.6	3.6	2.0	36	1.6	3.8	2.2	4.8	2.0
19	9.7	3.8	1.7	6.9	2.1	1.5	19	1.4	4.4	2.8	5.5	5.4
20	12	9.6	2.0	5.1	1.6	1.3	25	1.4	2.4	3.8	3.7	5.5
21	4.0	3.2	1.7	2.6	15	1.3	5.4	1.4	2.0	2.1	3.9	5.5
22	2.5	9.5	1.5	1.9	3.6	5.1	3.7	1.2	1.6	1.6	2.6	2.8
23	24	16	1.4	1.5	2.0	21	7.4	10	2.1	6.6	2.3	3.1
24	4.9	46	1.9	1.4	1.6	18	13	.98	2.1	1.8	2.0	16
25	2.9	25	2.9	1.3	1.7	3.8	12	.98	1.8	6.3	2.7	6.1
26	9.5	21	2.1	1.2	3.4	2.3	50	1.4	4.2	9.9	3.3	32
27	3.2	8.3	1.7	5.0	1.4	1.9	20	4.0	1.8	1.9	2.4	4.4
28	2.8	7.5	1.5	4.4	1.3	34	6.6	1.9	1.4	3.7	2.0	3.2
29	4.5	5.6	1.7	1.9	1.1	4.3	7.4	1.9	1.2	3.0	6.3	10
30	2.8	9.0	1.6	1.4	------	9.1	6.4	1.4	1.1	4.2	2.4	3.2
31	2.8	------	5.0	1.3	------	3.4	------	10	------	5.9	4.3	------
TOTAL	109.85	263.0	111.8	139.1	159.97	172.72	661.1	100.26	77.60	89.52	105.6	188.0
MEAN	3.54	8.77	3.61	4.49	5.52	5.57	22.0	3.23	2.59	2.89	3.41	6.27
MAX	24	46	11	40	68	34	354	21	8.0	9.9	10	32
MIN	0.78	1.6	1.4	1.2	0.74	0.94	1.4	0.98	0.56	0.59	1.4	2.0
AC-FT	218	522	222	276	317	343	1,310	199	154	178	209	373

CAL YR 1967: TOTAL 2,093.43 MEAN 5.74 MAX 64 MIN 0.78 AC-FT 4,150
WAT YR 1968: TOTAL 2,178.52 MEAN 5.95 MAX 354 MIN 0.56 AC-FT 4,320

PEAK DISCHARGE (BASE, 360 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-17	0700	4.04	898	4-16	0430	4.88	1,530
2-17	0400	3.14	373	5-10	2300	3.11	360
3-28	0100	3.47	535				

Note.--No gage-height record Nov. 28 to Jan. 9.

16-5080. Hanawi Stream near Nahiku

Location.--Lat 20°48'35", long 156°07'00", 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.

Records available.--January 1914 to January 1916, November 1921 to September 1968. Monthly discharge only April to June 1915, published in WSP 1319.

Gage.--Digital water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, graphic water-stage recorder at site 50 ft downstream at datum 0.12 ft lower and Nov. 1, 1921, to July 18, 1967, at present site and datum.

Extremes.--Maximum discharge during year, 2,960 cfs Jan. 4 (gage height, 8.65 ft), from rating curve extended above 410 cfs as explained below; minimum, 2.0 cfs Oct. 15-18.
1914-16, 1921-68: 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 on model of station site; minimum, 1.6 cfs Nov. 14, 19, 20, 1962, Feb. 10, 11, 16, 17, 1963.

Remarks.--Records good except those above 900 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	133	221	7.0	3.2	2.2	10	22	4.2	3.9	7.9	6.5
2	2.7	310	63	11	3.1	2.2	29	23	4.1	3.7	5.2	4.0
3	2.9	256	151	103	3.0	69	92	15	4.0	3.5	15	3.5
4	2.6	68	66	251	3.0	44	39	12	3.9	3.4	9.8	3.3
5	2.5	18	25	132	2.9	18	11	15	3.8	3.3	5.4	3.1
6	2.4	10	18	14	2.9	5.7	9.1	11	3.7	3.2	4.2	3.1
7	2.4	9.4	15	8.4	2.9	4.3	12	9.9	3.9	3.1	3.8	4.0
8	2.3	49	13	6.5	4.2	3.7	22	9.4	4.3	3.0	3.9	3.6
9	2.3	104	18	5.7	3.8	3.4	15	9.1	5.7	3.0	3.8	3.0
10	2.2	32	27	5.1	3.0	3.3	11	39	5.2	3.0	8.8	3.0
11	2.2	148	53	4.8	2.9	6.3	8.4	12	4.7	3.2	15	2.9
12	2.2	33	21	4.5	2.8	11	7.4	20	5.5	3.3	33	2.7
13	2.2	9.0	25	4.4	2.8	13	6.8	14	6.5	3.2	9.7	2.7
14	2.1	6.4	15	4.2	2.7	217	7.3	10	7.9	10	8.8	2.7
15	2.1	5.4	11	4.0	2.6	249	25	8.4	4.3	4.8	5.4	4.9
16	2.0	5.3	10	117	2.6	574	438	8.6	11	3.4	4.7	4.0
17	2.0	5.2	9.3	47	12	20	63	7.4	17	3.1	4.1	2.9
18	2.0	5.2	8.7	4.8	3.3	17	111	7.4	11	2.9	3.8	2.8
19	3.7	30	8.0	17	2.6	94	152	12	20	3.5	3.6	3.0
20	16	12	7.4	15	2.5	34	172	10	7.5	3.8	3.5	2.9
21	7.9	9.2	6.9	4.1	23	11	20	9.9	5.4	3.8	3.5	2.7
22	4.4	53	6.5	3.6	3.4	8.5	13	6.8	5.2	4.8	3.3	2.6
23	14	83	6.2	3.5	2.6	157	184	6.2	4.7	44	3.3	2.9
24	6.0	78	5.9	3.4	2.5	104	135	5.7	4.9	5.8	3.4	141
25	3.6	54	6.3	3.3	2.4	21	77	5.3	4.6	4.4	5.4	18
26	20	323	5.5	3.3	2.4	13	91	5.1	18	3.6	4.6	14
27	5.0	128	5.1	6.2	2.3	21	126	9.0	17	3.4	3.9	5.9
28	3.8	127	5.0	8.6	2.3	14	134	5.5	8.5	4.0	3.7	4.4
29	3.1	59	4.9	3.7	2.2	175	85	4.8	4.9	3.8	7.1	3.9
30	9.0	133	8.4	3.4	------	147	41	4.5	4.3	46	4.2	3.5
31	118	------	76	3.3	------	24	------	4.4	------	11	7.8	------
TOTAL	256.6	2296.1	922.1	812.8	111.9	2086.6	2147.0	342.4	215.7	208.9	209.6	267.5
MEAN	8.28	76.5	29.7	26.2	3.86	67.3	71.6	11.0	7.19	6.74	6.76	8.92
MAX	118	323	221	251	23	574	438	39	20	46	33	141
MIN	2.0	5.2	4.9	3.3	2.2	2.2	6.8	4.4	3.7	2.9	3.3	2.6
AC-FT	509	4550	1830	1610	222	4140	4260	679	428	414	416	531

CAL YR 1967: TOTAL 9,885.7 MEAN 27.1 MAX 478 MIN 2.0 AC-FT 19,610
WAT YR 1968: TOTAL 9,877.2 MEAN 27.0 MAX 574 MIN 2.0 AC-FT 19,590

PEAK DISCHARGE (BASE, 1,600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-4	2245	8.65	2,960	3-16	0545	8.38	2,780
3-14	1300	6.37	1,690	4-16	1530	8.17	2,640

16-5120. Koolau ditch at Nahiku weir, near Nahiku

Location.--Lat 20°48'55", long 156°07'15", on right bank between Kapaula and Waiohue Gulches, 1.8 miles southwest of Nahiku, and 3.8 miles southeast of Keanae.

Records available.--February 1919 to September 1968.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level, datum of 1929. Prior to Apr. 28, 1922, staff gage at same site and datum.

Extremes.--1919-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	68	96	31	13	7.4	52	72	18	20	34	27
2	12	96	95	36	12	7.0	54	68	17	19	26	19
3	13	96	96	84	12	73	88	53	17	18	38	17
4	12	94	94	94	12	90	72	44	16	17	39	15
5	11	76	90	78	12	62	47	49	16	16	27	15
6	11	50	76	35	11	28	41	40	15	15	22	14
7	11	48	68	28	11	21	45	37	16	15	20	19
8	10	72	58	28	16	17	72	36	17	15	20	18
9	10	54	62	25	16	15	60	35	22	14	19	15
10	10	67	80	22	12	15	49	62	21	14	30	15
11	10	94	82	22	12	21	37	41	19	14	44	14
12	10	81	76	23	11	36	33	50	21	14	69	13
13	10	48	80	22	10	49	30	51	25	14	41	13
14	9.6	37	60	21	10	66	32	39	28	34	37	13
15	9.6	33	50	20	10	93	66	33	19	21	28	19
16	9.2	29	45	41	9.6	69	84	34	35	16	24	17
17	9.2	27	41	59	18	32	77	31	49	15	22	14
18	8.8	25	39	22	15	45	84	29	41	14	20	13
19	17	54	36	35	9.2	60	85	44	53	15	19	14
20	36	45	34	35	8.8	38	85	40	34	16	17	14
21	37	37	32	19	23	50	66	37	26	16	17	12
22	20	81	30	17	12	46	52	29	24	17	16	12
23	30	92	28	16	9.2	76	78	26	23	68	16	13
24	23	95	26	15	8.8	96	83	24	23	27	16	76
25	17	89	26	15	8.4	75	84	23	23	21	22	58
26	50	96	23	15	8.0	54	84	22	48	19	21	47
27	25	95	22	20	8.0	56	84	36	47	17	18	27
28	19	94	21	27	7.8	68	84	24	33	19	16	23
29	16	92	21	16	7.8	85	83	21	24	18	25	20
30	17	95	26	14	------	91	81	20	22	50	19	18
31	84	------	77	14	------	72	------	19	------	42	29	------
TOTAL	580.4	2060	1690	949	333.6	1613.4	1972	1169	792	650	811	624
MEAN	18.7	68.7	54.5	30.6	11.5	52.0	65.7	37.7	26.4	21.0	26.2	20.8
MAX	84	96	96	94	23	96	88	72	53	68	69	76
MIN	8.8	25	21	14	7.8	7.0	30	19	15	14	16	12
AC-FT	1,150	4,090	3,350	1,880	662	3,200	3,910	2320	1,570	1,290	1,610	1,240

CAL YR 1967: TOTAL 15,012.4 MEAN 41.1 MAX 96 MIN 8.8 AC-FT 29,780
WAT YR 1968: TOTAL 13,244.4 MEAN 36.2 MAX 96 MIN 7.0 AC-FT 26,270

16-5180. West Wailuaiki Stream near Keanae

Location.--Lat 20°49'15", long 156°08'37", 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.

Records available.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to September 1968. Monthly discharge only for some periods, published in WSP 1319. See also Note below.

Gage.--Water-stage recorder. Datum of gage is 1,343.6 ft above mean sea level (by vertical angles).

Extremes.--Maximum discharge during year, 4,120 cfs Jan. 4 (gage height, 9.63 ft), from rating curve extended above 650 cfs as explained below; minimum, 1.7 cfs Oct. 16-19.
1914-17, 1921-68: Maximum discharge, 9,900 cfs (revised) Jan. 14, 1923 (gage height, 13.5 ft, from floodmarks), from rating curve extended above 650 cfs by logarithmic plotting; 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.

Note.--All past published peak discharges 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	244	294	10	4.3	2.5	18	26	5.0	5.3	10	9.0
2	3.2	477	87	13	4.1	2.4	80	25	4.7	4.8	7.7	5.8
3	3.2	490	191	139	3.9	133	170	17	4.4	4.6	48	5.0
4	2.8	121	93	238	4.1	70	64	13	4.3	7.5	17	4.1
5	2.5	32	29	252	5.2	27	16	20	4.2	5.3	8.5	3.7
6	2.4	25	20	20	3.7	8.3	13	12	3.9	4.3	6.7	3.5
7	2.3	23	16	12	3.8	6.3	18	10	4.3	4.0	5.9	3.9
8	2.1	92	13	9.8	8.6	5.3	28	11	5.1	3.7	5.6	4.2
9	1.9	143	34	8.2	12	4.8	70	10	6.4	3.6	5.3	3.3
10	2.1	49	46	7.2	6.1	8.3	33	29	6.4	3.7	15	3.4
11	3.7	244	27	6.7	5.1	16	13	13	5.5	8.0	22	3.2
12	2.5	70	25	6.2	3.9	24	11	22	6.0	8.8	59	3.0
13	2.2	20	38	5.9	3.6	19	10	18	6.1	5.2	15	2.8
14	2.0	13	22	5.9	3.4	267	9.4	13	8.4	13	12	3.2
15	1.8	11	13	5.3	3.2	413	30	10	5.3	6.2	8.0	7.1
16	1.7	9.3	11	36	3.0	570	372	11	28	4.3	7.0	4.5
17	1.7	8.8	9.8	27	8.8	35	83	10	31	3.9	6.0	3.0
18	1.7	8.5	9.1	8.0	5.2	24	151	9.6	17	3.6	5.5	2.8
19	4.0	44	9.3	12	3.5	150	247	23	25	4.7	5.0	3.2
20	32	19	8.2	12	3.2	70	135	17	9.3	5.2	4.6	3.2
21	18	12	8.0	7.2	15	17	26	12	6.7	5.3	4.6	2.7
22	11	73	7.7	5.5	6.9	11	22	8.7	6.2	10	4.4	2.5
23	36	94	6.7	4.8	4.4	200	129	7.7	5.5	76	4.2	5.4
24	9.4	98	6.2	4.6	3.7	111	92	6.8	5.6	7.6	5.4	182
25	5.3	63	5.9	4.8	3.2	28	54	6.6	7.3	5.5	15	22
26	42	289	5.6	5.1	3.3	19	76	6.2	43	4.6	9.6	21
27	8.8	118	5.3	13	3.0	30	109	12	23	4.4	6.3	9.1
28	5.9	113	5.0	18	2.7	17	165	6.4	10	6.2	5.8	6.3
29	4.8	82	6.4	6.3	2.6	140	114	58	6.7	6.3	11	5.3
30	24	147	8.8	5.3	------	270	52	5.4	6.0	103	5.4	4.8
31	136	------	60	5.0	------	80	------	5.2	------	18	16	------
TOTAL	381.4	3,232.6	1,121.0	913.8	143.5	2,778.9	2,410.4	402.4	310.3	356.6	361.5	343.0
MEAN	12.3	108	36.2	29.5	4.95	89.6	80.3	13.0	10.3	11.5	11.7	11.4
MAX	136	490	294	252	15	570	372	26	43	103	59	182
MIN	1.7	8.5	5.0	4.6	2.6	2.4	9.4	5.2	3.9	3.6	4.2	2.5
AC-FT	757	6,410	2,220	1,810	285	5,510	4,780	798	615	707	717	680

CAL YR 1967: TOTAL 13,379.6 MEAN 36.7 MAX 564 MIN 1.7 AC-FT 26,540
WAT YR 1968: TOTAL 12,755.4 MEAN 34.8 MAX 570 MIN 1.7 AC-FT 25,300

PEAK DISCHARGE (BASE, 1,900 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-4	2330	9.63	4,120	4-16	1600	8.07	2,590
3-16	1000	8.47	2,940				

16-5220. Taro patch feeder ditch at Keanae

Location.--Lat 20°51'40", long 156°09'00", on left bank at Keanae, 80 ft downstream from intake on Palauhulu Stream, 500 ft downstream from highway bridge, 4.2 miles northwest of Nahiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 51 ft (from topographic map).

Extremes.--1934-68: Maximum daily discharge, 12.2 cfs June 30, 1941, Feb. 10, 1955; no flow Nov. 15 to Dec. 12, 1965.

Remarks.--Records excellent. Ditch diverts from Palauhulu Stream for irrigation of taro at Keanae.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	5.7	7.8	2.9	2.2	2.8	3.6	4.4	3.2	2.9	3.2	2.6
2	3.0	8.6	4.8	2.8	2.2	2.8	4.0	4.4	3.0	2.7	3.0	2.4
3	2.9	8.2	6.6	4.6	2.6	5.4	6.5	4.1	3.0	2.6	3.7	2.4
4	2.9	4.6	5.2	5.5	2.9	5.0	4.8	3.9	2.9	2.6	3.6	2.4
5	2.9	3.2	4.2	3.0	2.9	4.2	3.8	4.1	2.9	2.6	3.0	2.4
6	2.9	3.1	4.0	1.9	2.8	3.1	3.5	3.7	2.9	2.6	2.8	2.4
7	2.9	3.0	4.0	2.6	2.8	2.9	3.6	3.6	2.8	2.6	2.7	2.4
8	2.9	3.2	3.9	2.6	2.9	2.8	3.6	3.5	2.8	2.6	2.7	2.4
9	2.9	5.4	4.1	2.5	3.0	2.8	4.1	3.4	2.8	2.6	2.6	2.4
10	2.8	3.4	4.3	2.4	2.8	2.8	3.9	3.6	2.8	2.6	2.7	2.4
11	2.8	5.6	3.8	2.5	2.8	3.0	3.3	3.2	2.8	2.6	3.0	2.4
12	2.8	3.9	3.7	2.6	2.8	3.6	3.2	3.3	2.7	2.6	4.0	2.4
13	2.8	3.2	3.6	2.6	2.8	3.3	3.2	3.6	2.6	2.6	3.2	2.4
14	2.8	3.1	3.6	2.6	2.8	7.0	3.2	3.2	3.1	2.8	3.1	2.4
15	2.8	3.1	3.5	2.5	2.9	8.8	3.8	3.1	2.9	2.6	2.9	2.4
16	2.7	3.0	3.4	2.5	2.9	8.7	6.8	3.0	3.6	2.6	2.8	2.4
17	2.7	2.9	3.3	2.5	3.0	3.6	4.4	2.9	4.1	2.6	2.7	2.4
18	2.7	2.9	3.2	2.4	3.0	3.5	5.9	2.9	3.6	2.6	2.6	2.4
19	2.8	3.7	3.2	2.4	3.0	6.5	6.5	3.5	3.8	2.6	2.6	2.4
20	3.1	3.2	3.1	2.4	2.9	4.5	5.4	3.2	3.2	2.6	2.6	2.4
21	2.9	3.1	3.1	2.4	3.0	3.6	4.0	3.2	3.0	2.5	2.6	2.4
22	2.7	4.2	3.0	2.3	3.0	3.6	3.8	2.9	2.9	2.5	2.5	2.3
23	2.7	4.5	2.9	2.3	2.9	5.9	5.7	2.9	2.9	4.0	2.5	2.4
24	2.8	4.7	2.9	2.3	2.9	5.5	5.0	2.8	2.9	2.9	2.4	4.9
25	2.7	4.2	2.9	2.4	2.9	4.0	4.6	3.0	2.9	2.6	2.6	3.4
26	3.2	7.4	2.9	2.4	2.8	3.6	5.3	3.3	4.1	2.5	2.5	3.4
27	2.7	5.2	2.8	2.4	2.8	3.9	5.9	3.5	3.9	2.5	2.4	2.6
28	2.7	5.0	2.8	2.4	2.8	4.2	7.0	3.4	3.2	2.5	2.4	2.4
29	2.6	4.2	2.8	2.3	2.8	7.7	5.8	3.2	3.0	2.5	2.5	2.3
30	2.6	5.5	2.8	2.2	------	5.6	5.0	3.2	2.9	4.8	2.4	2.3
31	5.0	------	3.2	2.2	------	4.0	------	3.2	------	4.0	2.5	------
TOTAL	89.7	131.0	115.4	81.4	81.9	138.7	139.2	105.2	93.2	85.9	86.8	76.6
MEAN	2.89	4.37	3.72	2.63	2.82	4.47	4.64	3.39	3.11	2.80	2.80	2.55
MAX	5.0	8.6	7.8	5.5	3.0	8.8	7.0	4.4	4.1	4.8	4.0	4.9
MIN	2.6	2.9	2.8	1.9	2.2	2.8	3.2	2.8	2.6	2.5	2.4	2.3
AC-FT	178	260	229	161	162	275	276	209	185	170	172	152

CAL YR 1967: TOTAL 1,251.3 MEAN 3.43 MAX 8.6 MIN 2.0 AC-FT 2,480
WAT YR 1968: TOTAL 1,225.0 MEAN 3.35 MAX 8.8 MIN 1.9 AC-FT 2,430

16-5230. Koolau ditch near Keanae

Location.--Lat 20°49'53", long 156°10'30", on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office, and 5.1 miles southeast of Kailua.

Records available.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to September 1968.

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, staff gage at same site and datum.

Extremes.--1910-12, 1917-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	177	214	94	39	25	160	219	50	54	115	99
2	33	206	226	123	38	24	156	202	47	50	77	59
3	35	213	223	221	36	209	224	168	45	48	98	49
4	32	224	226	227	36	220	216	133	44	51	142	48
5	30	211	221	198	40	174	172	162	43	47	83	44
6	28	162	197	91	34	78	146	113	40	42	65	43
7	28	165	173	77	36	57	142	102	43	40	59	52
8	27	219	141	85	58	49	200	100	51	39	59	52
9	26	227	150	75	86	44	190	96	71	38	56	43
10	28	216	217	68	46	55	186	177	74	38	123	43
11	34	227	204	63	39	108	120	123	64	57	156	40
12	29	224	198	60	35	152	99	131	66	61	211	38
13	28	162	217	59	33	168	91	152	62	42	140	37
14	26	114	181	59	32	168	87	121	93	125	128	38
15	25	95	131	53	31	212	190	94	55	68	82	75
16	24	82	111	90	30	168	211	102	137	45	73	58
17	24	76	99	174	57	82	223	91	173	41	64	40
18	24	72	95	71	38	120	226	88	141	38	59	37
19	59	155	91	105	31	225	227	158	155	49	54	40
20	173	165	83	122	29	220	225	135	96	54	51	40
21	141	118	67	66	86	169	210	123	70	54	51	36
22	78	211	76	51	49	143	172	81	66	49	48	34
23	103	223	71	46	34	196	220	73	60	204	47	54
24	76	226	66	44	31	224	223	66	64	79	56	204
25	49	223	66	43	29	218	222	63	67	62	122	191
26	176	215	60	43	29	169	224	59	154	50	88	185
27	76	227	57	74	27	166	225	118	149	47	63	84
28	53	225	55	121	26	192	226	68	99	65	58	65
29	44	225	62	51	26	226	225	57	67	58	110	56
30	66	226	85	45	------	226	223	54	60	150	58	52
31	224	------	204	42	------	220	------	51	------	166	128	------
TOTAL	1,842	5,511	4,267	2,741	1,141	4,707	5,661	3,480	2,406	2,011	2,724	1,936
MEAN	59.4	184	138	88.4	39.3	152	189	112	80.2	64.9	87.9	64.5
MAX	224	227	226	227	86	226	227	219	173	204	211	204
MIN	24	72	55	42	26	24	87	51	40	38	47	34
AC-FT	3,650	10,930	8,460	5,440	2,260	9,340	11,230	6,900	4,770	3,990	5,400	3,840

CAL YR 1967: TOTAL 42,297 MEAN 116 MAX 227 MIN 24 AC-FT 83,890
WAT YR 1968: TOTAL 38,427 MEAN 105 MAX 227 MIN 24 AC-FT 76,220

16-5240. Honomanu Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'19", long 156°12'15", on left bank at Haiku-uka trail crossing, 4.5 miles southwest of Keanae, 4.8 miles southeast of Kailiili, and 5 miles south of Kailua.

Drainage area.--2.54 sq mi.

Records available.--October 1919 to February 1927, July 1932 to December 1934, June 1962 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,140 cfs Mar. 16 (gage height, 7.05 ft), from rating curve extended above 120 cfs; minimum, 0.18 cfs Mar. 2.
1919-27, 1932-34, 1962-68: Maximum discharge, 2,000 cfs Jan. 14, 1923 (gage height, 9.93 ft), from rating curve extended above 120 cfs; minimum, 0.09 cfs Nov. 20, 1962.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.64	82	111	1.2	0.36	0.19	1.7	3.4	0.39	0.68	2.2	2.6
2	.39	164	23	1.7	.36	.18	21	3.1	.36	.60	1.5	1.4
3	.33	174	67	71	.33	37	80	1.7	.36	.56	11	1.0
4	.28	64	38	49	.33	8.4	19	1.2	.33	.52	5.6	.73
5	.23	9.2	4.1	51	.33	5.5	3.3	3.1	.33	.48	2.3	.60
6	.23	6.8	2.4	2.4	.30	1.1	1.7	1.3	.30	.45	1.3	.52
7	.23	6.5	1.8	1.5	.80	.64	2.2	1.0	.39	.39	.99	27
8	.21	23	1.6	1.1	.64	.68	4.8	.99	.52	.39	.83	1.6
9	.21	62	9.3	.83	.88	.75	33	1.3	.72	.36	.73	.73
10	.30	16	21	.68	.60	4.9	48	6.3	1.1	.41	2.5	.56
11	.36	130	3.8	.60	.56	5.3	1.8	1.5	1.2	3.7	3.0	.52
12	1.1	22	7.3	.56	.36	6.2	1.2	1.5	.99	2.0	13	.52
13	2.3	2.2	29	.52	.30	4.9	.93	2.2	3.6	.78	2.8	.45
14	.90	1.5	12	.52	.23	49	.83	1.9	2.5	1.5	2.0	.51
15	.28	1.2	1.9	.52	.21	167	5.8	1.2	3.7	.93	1.7	1.2
16	.21	.93	1.4	.45	1.9	100	114	1.3	13	.48	1.3	.68
17	.19	2.0	1.2	1.1	64	2.9	11	1.2	12	.45	.99	.45
18	.19	1.2	1.3	.60	2.2	1.8	80	1.1	3.5	.39	.83	.39
19	.23	5.6	1.4	1.3	.56	44	131	6.3	4.2	.62	.68	.39
20	11	5.0	1.0	1.1	.33	19	25	2.2	1.6	.80	.60	.48
21	3.9	1.7	1.2	.60	21	2.3	7.4	1.4	.99	.83	.60	.42
22	2.5	22	1.2	.48	1.4	1.6	4.9	.93	.73	1.5	.56	.33
23	.64	19	.83	.42	.60	74	40	.73	.64	26	.52	1.4
24	1.2	39	.73	.42	.42	42	24	.60	.64	1.6	1.2	67
25	.48	16	.64	.42	.30	2.5	4.2	.60	8.3	2.7	2.5	4.8
26	14	106	.56	.36	.28	2.4	17	.56	20	1.5	1.7	3.1
27	1.2	25	.52	.90	.23	5.7	27	1.5	3.7	.78	.99	1.3
28	.64	24	.54	2.9	.21	1.5	50	.68	1.6	1.7	.83	.88
29	.48	29	2.0	.64	.19	37	32	.56	1.0	1.5	1.5	1.5
30	7.5	58	1.1	.42	------	90	14	.45	.88	47	.78	.88
31	36	------	4.8	.36	------	7.9	------	.42	------	2.4	5.1	------
TOTAL	88.35	1,118.83	353.62	195.60	100.21	726.34	806.76	52.22	89.57	104.00	72.13	123.94
MEAN	2.85	37.3	11.4	6.31	3.46	23.4	26.9	1.68	2.99	3.35	2.33	4.13
MAX	36	174	111	71	64	167	131	6.3	20	47	13	67
MIN	0.19	0.93	0.52	0.36	0.19	0.18	0.83	0.42	0.30	0.36	0.52	0.33
AC-FT	175	2220	701	388	199	1440	1600	104	178	206	143	246

CAL YR 1967: TOTAL 4,393.12 MEAN 12.0 MAX 207 MIN 0.19 AC-FT 8,710
WAT YR 1968: TOTAL 3,831.57 MEAN 10.5 MAX 174 MIN 0.18 AC-FT 7,600

Peak discharge (base, 700 cfs).--Mar. 16 (0500) 1,140 cfs (7.05 ft); Apr. 16 (1730) 715 cfs (5.60 ft).

16-5310. Kula diversion from Haipuaena Stream near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank of Haipuaena Stream, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

Records available.--July 1945 to September 1968.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

Extremes.--1945-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.08	1.5	1.3	0.66	0.12	0.06	0.79	1.4	0.05	0.14	0.64	0.85
2	.07	.15	.73	.40	.10	.04	.81	.97	.04	.10	.38	.49
3	.06	.05	.73	.93	.09	1.2	1.2	.59	.04	.08	.66	.30
4	.05	.03	1.4	.28	.08	1.2	.94	.40	.04	.07	1.3	.21
5	.04	.03	1.2	1.1	.07	1.1	1.1	.49	.03	.08	.79	.14
6	.04	.76	.76	1.1	.06	.40	1.1	.38	.03	.08	.40	.67
7	.03	1.5	.59	.57	.06	.21	.91	.28	.03	.06	.25	.97
8	.02	1.5	.47	.38	.09	.17	1.0	.23	.03	.05	.17	.28
9	.02	1.1	.87	.28	.11	.15	1.7	.23	.03	.04	.14	.43
10	.02	.79	1.8	.21	.08	.62	.93	1.8	.04	.04	.17	.38
11	.02	.66	1.2	.18	.07	1.2	.76	.71	.12	.86	.46	.30
12	.33	.23	1.4	.15	.06	1.4	.57	.40	.18	.86	1.9	.25
13	.66	.54	1.6	.12	.05	.94	.43	.40	.28	.36	.76	.21
14	.52	.52	1.4	.10	.04	1.2	.36	.32	.80	.26	.40	.15
15	.28	.38	.94	.09	.04	.61	1.3	.25	.66	.30	.25	.17
16	.15	.30	.59	.08	.96	.05	1.3	.21	1.8	.19	.19	.17
17	.10	.30	.45	.37	1.0	.02	.83	.21	1.7	.18	.14	.12
18	.08	.25	.39	.28	.43	.39	2.4	.18	1.3	.14	.10	.09
19	.06	.87	.69	1.0	.43	1.7	.12	.65	1.1	.10	.08	.09
20	.79	1.2	.47	.62	.28	1.4	.10	.73	.70	.08	.07	.11
21	1.0	.59	.45	.34	.74	.98	.10	.32	.34	.08	.06	.19
22	.76	1.6	.54	.21	.80	.62	.80	.19	.21	.10	.07	.17
23	.55	1.6	.36	.15	.45	1.4	1.8	.14	.15	1.1	.06	.22
24	.74	1.4	.26	.12	.26	.80	1.8	.10	.12	.54	.07	1.8
25	.36	.91	.21	.10	.18	.64	1.3	.08	.37	.82	.30	1.6
26	.92	.94	.17	.08	.18	.64	1.5	.07	1.6	.68	.32	1.6
27	.57	1.4	.14	.12	.14	.64	1.6	.07	.70	.26	.23	.70
28	.40	1.8	.12	1.2	.09	.57	1.7	.08	.49	.33	.15	.36
29	.26	1.4	.52	.41	.07	1.5	1.6	.07	.28	.49	.14	.26
30	.22	1.1	.34	.21	------	1.9	1.8	.07	.19	1.1	.12	.21
31	1.8	------	1.2	.15	------	1.0	------	.06	------	.82	.83	------
TOTAL	11.00	25.40	23.29	11.99	7.13	24.75	32.65	12.08	13.45	10.39	11.60	13.49
MEAN	0.355	0.847	0.751	0.387	0.246	0.798	1.09	0.390	0.448	0.335	0.374	0.450
MAX	1.8	1.8	1.8	1.2	1.0	1.9	2.4	1.8	1.8	1.1	1.9	1.8
MIN	0.02	0.03	0.12	0.08	0.04	0.02	0.10	0.06	0.03	0.04	0.06	0.09
AC-FT	22	50	46	24	14	49	65	24	27	21	23	27

CAL YR 1967: TOTAL 206.73 MEAN 0.566 MAX 2.4 MIN 0.02 AC-FT 410
WAT YR 1968: TOTAL 197.22 MEAN 0.539 MAX 2.4 MIN 0.02 AC-FT 391

16-5311. Haipuaena Stream at Kula pipeline intake, near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank at Kula pipeline intake, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

Drainage area.--0.27 sq mi.

Records available.--January to April 1946 (fragmentary), May 1946 to September 1968 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,320 ft (from topographic map).

Extremes.--Maximum discharge during year, 52 cfs Apr. 18 (gage height, 2.93 ft), from rating curve extended above 13 cfs by logarithmic plotting; no flow for many days.
1946-68: Maximum discharge, 141 cfs Nov. 14, 1965 (gage height, 3.76 ft), from rating curve extended above 1.9 cfs by differential-curve method; no flow at times each year.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts all water from Haipuaena Stream at low flow.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	9.2	12	0	0	0	0.08	0.03	0	0	0	0
2	0	19	3.4	0	0	0	2.0	0	0	0	0	0
3	0	21	7.8	11	0	4.7	9.4	0	0	0	.08	0
4	0	10	5.5	5.2	0	.44	1.9	0	0	0	.02	0
5	0	2.6	.01	5.9	0	0	.18	0	0	0	0	0
6	0	.83	0	0	0	0	0	0	0	0	0	.48
7	0	.61	0	0	0	0	0	0	0	0	0	5.4
8	0	4.5	0	0	0	0	.14	0	0	0	0	1.0
9	0	10	2.6	0	0	0	7.0	0	0	0	0	.17
10	0	3.7	4.9	0	0	.35	8.5	1.7	0	0	0	0
11	0	21	.81	0	0	.22	.20	0	0	.08	0	0
12	.57	3.7	3.0	0	0	.89	0	0	0	0	.62	0
13	2.2	.31	7.9	0	0	.71	0	0	.75	0	0	0
14	.28	0	3.6	0	0	6.8	0	0	.26	0	0	0
15	0	0	.09	0	0	17	2.2	0	0	0	0	0
16	0	0	0	0	.80	7.3	13	0	1.8	0	0	0
17	0	0	0	0	15	1.0	1.0	0	1.4	0	0	0
18	0	0	0	0	1.0	.24	11	0	.24	0	0	0
19	0	.12	0	.49	.09	5.0	13	.14	.02	0	0	0
20	1.5	.20	0	0	0	2.0	3.2	0	0	0	0	0
21	.98	0	0	0	4.7	.15	2.6	0	0	0	0	0
22	1.0	4.2	0	0	.24	0	.53	0	0	0	0	0
23	.02	3.2	0	0	0	9.0	4.0	0	0	1.7	0	0
24	0	5.5	0	0	0	5.6	2.9	0	0	0	0	7.9
25	0	2.3	0	0	0	.82	.18	0	1.4	.11	0	.28
26	3.4	15	0	0	0	1.2	2.6	0	3.3	0	0	.06
27	.24	3.0	0	0	0	2.1	3.0	0	0	0	0	0
28	0	2.3	0	.10	0	.54	4.4	0	0	0	0	0
29	0	5.8	0	0	0	3.5	3.6	0	0	0	0	0
30	1.2	9.5	0	0	------	13	.97	0	0	3.9	0	0
31	5.3	------	.60	0	------	.95	------	0	------	.11	.18	------
TOTAL	16.69	157.57	52.21	22.69	21.83	83.51	97.58	1.87	9.17	5.90	0.90	15.29
MEAN	0.538	5.25	1.68	0.732	0.753	2.69	3.25	0.060	0.306	0.190	0.029	0.510
MAX	5.3	21	12	11	15	17	13	1.7	3.3	3.9	0.62	7.9
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	33	313	104	45	43	166	194	3.7	18	12	1.8	30

CAL YR 1967: TOTAL 591.57 MEAN 1.62 MAX 26 MIN 0 AC-FT 1,170
WAT YR 1968: TOTAL 485.21 MEAN 1.33 MAX 21 MIN 0 AC-FT 962

Peak discharge (base, 69 cfs).--No peak above base.

16-5380. Spreckels ditch at Haipuaena weir, near Huelo

Location.--Lat 20°51'15", long 156°11'25", 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.

Records available.--April 1922 to September 1968. 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.

Extremes.--1922-68: Maximum daily discharge, 150 cfs Feb. 10, 1955, Feb. 18, 1956; no flow at times.

Remarks.--Records good. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	78	113	16	5.9	4.5	30	48	9.1	10	33	25
2	6.7	126	67	22	5.9	4.3	64	43	8.8	9.4	21	14
3	6.4	122	59	99	5.6	110	114	28	8.2	8.8	51	11
4	5.6	103	67	106	5.9	107	80	24	7.9	8.5	50	9.4
5	5.2	52	36	84	5.6	60	37	47	7.9	8.2	26	8.5
6	4.7	39	25	27	5.2	18	27	21	7.3	7.6	17	8.5
7	4.5	40	25	18	10	13	45	19	8.2	7.3	14	31
8	4.3	70	24	15	18	11	47	18	10	7.0	13	14
9	4.1	105	46	14	14	12	78	20	18	6.7	12	8.8
10	4.7	50	74	12	7.9	25	78	47	24	7.3	38	8.5
11	7.3	118	38	11	8.2	49	27	25	17	22	51	7.3
12	5.2	71	43	10	5.9	55	20	24	17	18	84	7.0
13	13	30	76	11	5.6	64	17	30	14	9.1	40	6.7
14	9.7	21	57	12	5.2	81	17	27	29	35	40	7.4
15	4.9	18	24	10	4.9	118	61	19	23	13	23	23
16	4.1	15	20	9.1	11	87	99	25	66	8.5	20	14
17	3.7	19	17	13	75	44	66	19	72	7.3	15	7.3
18	3.7	15	18	9.8	21	37	114	17	44	6.4	14	6.7
19	4.1	50	18	11	7.6	118	114	57	48	14	12	7.3
20	71	49	17	11	5.9	88	95	39	22	14	11	8.5
21	36	28	16	8.5	38	34	46	28	16	13	10	6.4
22	24	96	16	7.6	14	29	44	17	13	13	9.8	5.9
23	12	85	13	7.3	7.6	77	94	14	12	74	9.8	11
24	12	103	12	7.3	6.7	92	91	13	13	17	11	94
25	8.5	82	11	7.0	5.9	43	76	12	22	16	32	55
26	63	121	10	6.7	5.6	33	98	11	56	13	23	41
27	16	98	9.8	9.6	5.4	46	107	39	42	10	13	17
28	10	96	9.4	24	4.9	48	114	14	22	18	12	12
29	8.5	83	17	8.5	4.7	106	108	11	14	14	27	13
30	22	113	22	7.0	------	114	84	10	12	71	12	11
31	96	------	49	6.4	------	58	------	9.8	------	54	38	------
TOTAL	491.9	2096	1049.2	620.8	327.1	1785.8	2092	775.8	683.4	541.1	782.6	500.2
MEAN	15.9	69.9	33.8	20.0	11.3	57.6	69.7	25.0	22.8	17.5	25.2	16.7
MAX	96	126	113	106	75	118	114	57	72	74	84	94
MIN	3.7	15	9.4	6.4	4.7	4.3	17	9.8	7.3	6.4	9.8	5.9
AC-FT	976	4160	2080	1230	649	3540	4150	1540	1360	1070	1550	992

CAL YR 1967: TOTAL 12,424.3 MEAN 34.0 MAX 126 MIN 3.7 AC-FT 24,640
WAT YR 1968: TOTAL 11,745.9 MEAN 32.1 MAX 126 MIN 3.7 AC-FT 23,300

16-5410. Koolau ditch at Haipuaena, near Huelo

Location.--Lat 20°51'17", long 156°11'19", 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.

Records available.--April 1932 to September 1968.

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.

Extremes.--1932-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	199	268	91	38	24	162	226	51	53	117	107
2	32	264	234	115	37	23	173	206	48	50	78	60
3	33	276	251	240	35	254	262	166	46	47	118	49
4	30	243	237	255	35	258	235	135	45	51	126	48
5	27	210	222	229	39	186	172	168	44	46	86	44
6	26	161	194	91	33	81	146	114	42	41	66	44
7	25	164	166	73	35	59	138	103	45	39	60	52
8	25	226	137	84	56	50	203	102	52	38	60	55
9	25	246	149	73	87	44	210	97	73	38	56	42
10	25	214	223	66	46	55	202	176	73	38	121	43
11	31	255	200	62	38	109	124	125	58	58	156	40
12	27	233	196	62	34	156	101	129	66	60	226	38
13	26	160	217	60	32	177	93	152	66	42	138	36
14	25	112	178	60	30	202	88	120	88	129	128	38
15	24	93	127	54	29	277	202	96	56	67	83	74
16	23	81	108	90	29	221	244	103	142	44	72	58
17	23	74	97	172	63	94	244	93	182	40	63	39
18	22	70	92	70	40	135	269	89	139	37	59	37
19	57	163	89	88	30	271	266	173	154	48	54	40
20	175	160	81	114	28	235	260	136	94	56	52	41
21	135	114	64	60	82	168	222	125	68	53	52	35
22	76	229	72	48	50	144	176	82	65	58	48	32
23	100	237	66	46	33	218	253	74	60	217	48	54
24	75	255	62	44	30	242	248	68	61	74	54	230
25	48	238	62	43	28	223	240	64	67	60	122	199
26	181	275	57	42	28	168	258	62	160	50	88	184
27	74	249	54	70	26	172	260	123	147	47	64	87
28	52	244	52	118	25	200	267	69	96	65	60	64
29	43	234	58	52	25	262	260	60	64	57	105	58
30	68	247	80	44	------	262	240	56	59	178	59	52
31	248	------	202	42	------	230	------	52	------	168	118	------
TOTAL	1823	5926	4295	2758	1121	5200	6218	3544	2411	2049	2737	1980
MEAN	58.8	198	139	90.0	38.7	168	207	114	80.4	66.1	88.3	66.0
MAX	248	276	268	255	87	277	269	226	182	217	226	230
MIN	22	70	52	42	25	23	88	52	42	37	48	32
AC-FT	3620	11750	8520	5470	2220	10310	12330	7030	4780	4060	5430	3930

CAL YR 1967: TOTAL 43,708 MEAN 120 MAX 283 MIN 22 AC-FT 86,690
WAT YR 1968: TOTAL 40,062 MEAN 109 MAX 277 MIN 22 AC-FT 79,460

16-5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo

Location.--Lat 20°51'48", long 156°11'00", 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.

Records available.--December 1917 to November 1924, January 1925 to September 1968.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

Extremes.--1917-68: Maximum daily discharge, 142 cfs Jan. 3, 1927; no flow at times.

Remarks.--Records fair. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.36	80	81	1.1	0.45	0.13	3.8	4.1	0.36	0.43	3.6	1.1
2	.30	44	16	.92	.45	.13	14	2.9	.36	.36	1.4	.36
3	.30	40	44	32	.35	63	28	2.4	.30	.36	9.4	.30
4	.30	33	22	42	.40	35	10	1.9	.30	.30	2.9	.30
5	.24	16	5.8	50	.30	17	2.6	3.2	.30	.30	1.0	.24
6	.24	10	4.0	6.4	.28	3.2	2.0	1.5	.24	.24	.83	.36
7	.24	13	3.8	3.6	.90	1.9	2.1	1.3	.43	.24	.83	1.6
8	.24	26	2.6	2.6	20	1.4	2.3	1.2	.43	.24	.83	.36
9	.24	38	4.3	2.0	1.5	1.1	17	1.3	.36	.24	.74	.24
10	.24	15	9.4	1.5	.80	1.1	12	2.1	.50	.24	1.8	.30
11	.24	42	4.5	1.3	.70	2.3	2.2	1.6	.66	.50	3.8	.30
12	.24	28	3.4	1.1	.50	4.9	1.9	1.4	.74	.36	12	.24
13	.18	9.0	4.2	1.1	.35	8.6	1.5	1.5	.50	.50	1.6	.24
14	.13	4.5	2.9	1.1	.30	47	1.9	1.2	1.1	4.4	1.5	.24
15	.13	3.6	2.1	.92	.24	96	13	1.0	.43	.83	1.0	.43
16	.13	3.0	1.8	.83	.24	86	39	.92	2.5	.43	.92	.50
17	.13	4.2	1.5	1.0	5.7	12	11	.83	4.6	.43	.83	.24
18	.13	3.0	1.5	.74	.50	11	48	.74	1.9	.30	.74	.18
19	.13	11	1.4	15	.18	67	51	5.4	2.8	.50	.66	.24
20	4.5	14	1.2	7.6	.13	16	39	1.6	.92	.50	.58	.18
21	2.3	7.0	1.1	6.3	1.7	6.0	8.4	1.3	.58	.43	.74	.13
22	1.5	27	1.0	3.8	.43	5.3	5.4	.74	.50	.43	.58	.13
23	.80	18	.92	.50	.18	32	29	.66	.58	26	.58	.24
24	.60	35	.83	.43	.13	23	14	.58	.58	1.1	.50	41
25	.40	16	.74	.43	.13	8.1	9.1	.50	.79	.92	.89	6.1
26	4.0	40	.66	.43	.13	4.8	19	.43	8.6	.74	.50	4.2
27	1.3	20	.66	.50	.13	11	31	3.9	1.3	.58	.36	1.1
28	.52	14	.66	1.6	.13	19	42	.66	.83	.58	.30	.83
29	.40	90	.66	1.0	.13	39	16	.50	.58	.66	.43	.66
30	1.4	22	.92	.70	------	37	6.8	.43	.50	33	.36	.58
31	19	------	6.4	.40	------	6.3	------	.43	------	6.9	2.4	------
TOTAL	40.86	573.3	231.95	188.90	19.36	666.26	483.0	48.22	34.57	83.04	54.60	62.92
MEAN	1.31	19.1	7.48	6.09	0.668	21.5	16.1	1.56	1.15	2.68	1.76	2.10
MAX	19	44	81	50	5.7	96	51	5.4	8.6	33	12	41
MIN	0.13	3.0	0.66	0.40	0.13	0.13	1.5	0.43	0.24	0.24	0.30	0.13
AC-FT	81	1,140	460	375	38	1,320	958	96	69	165	108	125

CAL YR 1967: TOTAL 2,802.96 MEAN 7.68 MAX 94 MIN 0.13 AC-FT 5,560
WAT YR 1968: TOTAL 2,486.98 MEAN 6.80 MAX 96 MIN 0.13 AC-FT 4,930

Note.--No gage-height record Oct. 15 to Nov. 29.

16-5430. Middle Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'42", long 156°12'50", on left bank 200 ft downstream from Haiku-uka trail crossing, 4.0 miles east of Kailiili, and 4.5 miles south of Kailua.

Drainage area.--0.48 sq mi.

Records available.--March 1919 to February 1927, July 1932 to June 1934, June 1962 to September 1968.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 2,900 ft (from topographic map). Prior to June 12, 1962, at site 200 ft upstream at different datum.

Extremes.--Maximum discharge during year, 420 cfs Mar. 16 (gage height, 4.85 ft), from rating curve extended above 14 cfs as explained below; minimum, 0.07 cfs on several days in October.
1962-68: Maximum discharge, 469 cfs Nov. 14, 1965 (gage height, 5.09 ft), from rating curve extended above 14 cfs on basis of slope-conveyance study; minimum, 0.06 cfs Nov. 12, 16-20, 1962, Jan. 20, 1965.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.18	21	34	1.1	0.12	0.10	3.9	5.3	0.34	1.1	1.7	2.6
2	.16	36	9.3	4.0	.12	.10	9.3	4.3	.23	.43	1.1	1.0
3	.16	35	25	15	.12	14	23	3.2	.23	.26	5.0	.42
4	.14	15	11	5.6	.10	4.8	11	2.8	.20	.34	4.6	.18
5	.12	4.7	3.9	11	.10	3.4	5.0	3.9	.20	.26	2.0	.18
6	.10	3.7	2.3	2.3	.10	.90	3.9	2.6	.20	.23	1.0	.26
7	.08	3.8	1.8	1.5	.24	.74	4.1	2.3	.26	.23	.67	5.5
8	.08	9.2	1.3	1.2	.19	.67	4.3	2.1	.34	.23	.54	2.0
9	.07	19	7.0	1.0	.43	.60	12	2.3	.68	.23	.38	.82
10	.10	5.4	10	.82	.14	1.8	11	5.6	1.2	.26	1.4	.43
11	.14	26	3	.67	.10	2.6	3.2	2.4	1.5	3.2	1.7	.30
12	.36	7.7	7	.60	.10	3.7	2.6	2.3	1.1	2.4	8.9	.30
13	1.7	2.4	13	.54	.10	2.6	2.3	2.4	1.5	.99	2.3	.23
14	.24	1.7	5.2	.48	.10	12	2.1	2.4	3.2	1.6	1.5	.21
15	.08	1.2	1.8	.38	.10	44	4.5	2.0	2.8	1.4	1.0	1.0
16	.08	1.0	1.3	.30	1.2	37	22	2.1	8.3	.34	.82	.54
17	.07	1.2	1.1	.54	14	5.0	6.3	2.0	8.6	.23	.54	.20
18	.07	.82	1.2	.48	1.8	3.6	23	2.0	4.3	.23	.43	.16
19	.08	2.9	1.4	1.1	1.0	16	23	4.4	4.2	.34	.38	.16
20	4.7	2.8	.90	.74	.48	8.9	9.2	3.1	2.3	.38	.30	.26
21	1.8	1.0	1.1	.54	4.1	3.7	5.8	2.4	1.7	.30	.26	.16
22	.72	9.2	.92	.30	1.3	2.8	5.2	2.0	1.5	.74	.20	.14
23	.14	7.7	.70	.23	.90	17	14	1.7	1.4	11	.20	.60
24	.14	13	.56	.23	.34	11	10	1.3	1.3	1.8	.23	20
25	.14	6.9	.45	.18	.12	4.6	5.3	1.4	4.2	2.1	1.3	4.8
26	4.6	31	.36	.14	.10	4.1	8.7	1.4	7.9	1.2	.67	3.3
27	.43	9.7	.31	.26	.10	5.3	12	2.1	3.3	.18	.23	1.4
28	.18	12	.45	1.2	.10	3.4	18	1.3	2.3	.68	.20	.82
29	.12	9.8	2.0	.38	.10	12	13	.90	1.8	.50	.54	.82
30	2.2	19	1.0	.18	------	20	8.9	.74	1.7	16	.20	.67
31	13	------	9.4	.12	------	6.6	------	.54	------	2.8	2.9	------
TOTAL	32.18	319.82	158.75	53.11	27.80	253.01	286.6	75.28	68.78	51.98	43.19	49.46
MEAN	1.04	10.7	5.12	1.71	0.959	8.16	9.55	2.43	2.29	1.68	1.39	1.65
MAX	13	36	34	15	14	44	23	5.6	8.6	16	8.9	20
MIN	0.07	0.82	0.31	0.12	0.10	0.10	2.1	0.54	0.20	0.18	0.20	0.14
AC-FT	64	634	315	105	55	502	568	149	136	103	86	98

CAL YR 1967: TOTAL 1,317.63 MEAN 3.61 MAX 41 MIN 0.07 AC-FT 2,610
WAT YR 1968: TOTAL 1,419.96 MEAN 3.88 MAX 44 MIN 0.07 AC-FT 2,820

PEAK DISCHARGE (BASE, 140 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1600	3.45	188	3-16	0530	4.85	420
1-4	2300	3.06	142				

16-5450. Puohokamoa Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'21", long 156°11'29", 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.

Records available.--June 1913 to September 1968. 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. See also Note below.

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.

Extremes.--Maximum discharge during year, 3,400 cfs Mar. 16 (gage height, 7.15 ft), from rating curve extended above 920 cfs by logarithmic plotting; minimum, 1.2 cfs Oct. 17, 18.
1913-68: Maximum discharge, 3,650 cfs Apr. 16, 1960 (gage height, 9.31 ft), from rating curve extended above 630 cfs by logarithmic plotting; minimum, 0.6 cfs Oct. 26, 1917.
Revisions.--Figures of maximum discharge for the water years 1966 and 1967 have been revised to 3,580 cfs Nov. 14, 1965 (gage height, 7.32 ft) and 2,520 cfs Aug. 9, 1967 (gage height, 6.29 ft), superseding those published in Water Resources Data for Hawaii and other Pacific Areas, Part 1, for the years indicated.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use.

Revisions.--Some figures of peak discharge for water years 1966 and 1967 have been revised as shown in the following table. They supersede figures published in Water Resources Data for Hawaii and other Pacific Areas, Part 1, for those years.
Revised peak discharge.--1965: Nov. 12 (1500) 1,620 cfs (5.22 ft); Nov. 14 (1600) 3,580 cfs (7.32 ft); Nov. 20 (0700) 1,600 cfs (5.20 ft).
1967: Aug. 3 (0200) 2,130 cfs (5.86 ft); Aug. 9 (0400) 2,520 cfs (6.29 ft).

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	240	340	9.4	2.6	1.8	23	40	4.2	6.7	20	18
2	4.0	335	81	10	2.6	1.8	66	35	4.0	5.7	12	9.8
3	3.8	260	191	118	2.4	150	137	25	3.7	5.1	49	6.0
4	3.5	80	98	117	2.4	82	76	20	3.5	4.5	30	4.5
5	3.2	32	38	220	2.4	39	26	33	3.2	4.2	16	4.0
6	3.0	24	27	22	2.2	11	20	17	2.8	3.7	10	4.0
7	2.8	23	22	15	4.0	7.8	31	14	3.5	3.7	8.2	18
8	2.6	53	18	11	8.9	6.4	31	12	4.5	3.5	7.4	9.0
9	2.4	130	27	9.0	6.8	5.7	75	14	7.6	3.2	6.4	5.1
10	2.6	37	52	7.8	3.0	11	63	31	14	3.5	21	4.5
11	3.2	144	30	6.7	2.6	26	20	18	9.4	11	25	3.7
12	2.6	48	30	6.4	2.2	33	15	14	8.6	11	63	3.5
13	7.5	21	42	6.0	2.0	37	12	17	5.4	6.0	22	2.8
14	4.7	15	32	6.7	2.0	152	12	15	20	19	22	3.0
15	1.7	12	17	6.0	2.0	408	41	12	13	8.6	12	11
16	1.4	10	14	5.1	4.8	646	169	14	43	4.8	10	7.0
17	1.4	11	12	6.4	63	36	47	10	48	3.7	7.8	3.2
18	1.2	9.4	11	5.1	11	31	155	10	66	3.2	7.4	2.8
19	1.5	38	12	6.9	4.5	170	165	36	29	7.5	6.0	2.8
20	43	26	10	6.0	3.5	60	88	22	15	8.1	5.4	3.5
21	17	10	9.8	4.5	22	27	33	17	10	6.7	5.1	2.6
22	10	87	9.4	4.0	8.0	22	34	10	8.6	7.5	4.5	2.2
23	4.5	61	8.6	3.7	4.2	108	110	8.6	7.8	115	4.5	3.0
24	3.2	119	7.8	3.5	3.5	80	69	7.4	7.8	12	4.8	119
25	3.0	64	7.0	3.5	2.8	31	48	7.0	14	9.4	15	36
26	38	248	6.4	3.0	2.6	24	76	6.7	48	8.6	11	26
27	7.3	92	6.0	3.7	2.4	36	119	22	28	5.4	6.4	10
28	4.2	82	5.7	10	2.0	28	168	8.2	15	8.5	5.4	7.4
29	3.5	61	8.2	4.2	1.8	113	98	6.0	9.4	7.8	13	6.4
30	17	120	9.0	3.0	------	119	61	5.4	8.2	147	5.7	5.4
31	115	------	29	2.8	------	37	------	4.8	------	34	20	------
TOTAL	325.2	2492.4	1210.9	646.4	184.2	2540.5	2088	512.1	465.2	488.6	456.0	344.2
MEAN	10.5	83.1	39.1	20.9	6.35	82.0	69.6	16.5	15.5	15.8	14.7	11.5
MAX	115	335	340	220	63	646	169	40	66	147	63	119
MIN	1.2	9.4	5.7	2.8	1.8	1.8	12	4.8	2.8	3.2	4.5	2.2
AC-FT	645	4940	2400	1280	365	5040	4140	1020	923	969	904	683

CAL YR 1967: TOTAL 12,133.9 MEAN 33.2 MAX 402 MIN 1.2 AC-FT 24,070
WAT YR 1968: TOTAL 11,753.7 MEAN 32.1 MAX 646 MIN 1.2 AC-FT 23,310

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 1	1100	5.08	1,520	3-16	0600	7.15	3,400
1- 5	0100	6.07	2,320	4-18	2330	4.77	1,300

16-5528. Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda

Location.--Lat 20°48'27", long 156°14'02", on left bank 1,000 ft upstream from Kula pipeline intake and 3.3 miles east of Olinda Prison Camp.

Drainage area.--2.50 sq mi.

Records available.--July 1953 to September 1968 (discontinued). Prior to July 1956, published as Waiakamoi Stream above reservoir at Kula pipeline intake, near Olinda.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,487 ft above mean sea level (levels by Maui County Waterworks).

Extremes.--Maximum discharge during year, 292 cfs Feb. 17 (gage height, 3.23 ft), from rating curve extended above 9.9 cfs as explained below; minimum, 0.01 cfs on several days.
1953-68: Maximum discharge, 2,600 cfs Dec. 10, 1954 (gage height, 8.16 ft), from rating curve extended above 9.9 cfs on basis of computation of flow over dam; no flow at times.

Remarks.--Records good except those above 20 cfs, which are fair. Diversion above station for livestock.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.04	8.0	10	0.14	0.04	0.03	0.51	0.88	0.02	0.05	0.18	0.35
2	.03	18	3.1	.09	.03	.02	.93	.48	.02	.04	.11	.18
3	.03	25	5.9	7.8	.02	2.0	6.6	.21	.02	.03	.19	.09
4	.02	8.9	5.4	6.0	.02	.86	1.9	.10	.02	.03	.33	.06
5	.02	1.9	.78	6.6	.02	.32	.60	.11	.02	.04	.20	.04
6	.01	.85	.35	.68	.02	.10	.45	.08	.02	.03	.10	.22
7	.01	1.2	.18	.23	.03	.05	.35	.06	.03	.03	.06	7.0
8	.01	3.2	.10	.10	.04	.05	.23	.05	.04	.03	.05	.78
9	.01	8.1	1.2	.06	.03	.05	6.1	.06	.03	.03	.05	.23
10	.02	2.7	4.6	.05	.02	.21	18	1.4	.05	.03	.06	.11
11	.03	19	1.4	.05	.02	.30	.88	.36	.04	.26	.09	.09
12	.28	4.3	3.0	.04	.02	.64	.31	.11	.05	.23	.66	.07
13	.82	.68	7.7	.03	.01	.46	.12	.08	.23	.10	.23	.06
14	.20	.25	3.8	.03	.01	5.2	.09	.06	.34	.08	.11	.05
15	.07	.11	.69	.03	.01	18	1.4	.05	.18	.08	.08	.05
16	.05	.08	.25	.03	.56	7.5	30	.04	.86	.06	.06	.05
17	.03	.06	.12	.08	65	.92	3.4	.03	.88	.06	.05	.04
18	.03	.06	.10	.06	3.4	.37	16	.03	.60	.05	.05	.04
19	.03	.25	.12	.48	.32	3.3	24	.10	.36	.05	.04	.06
20	.73	.39	.10	.14	.06	2.0	3.8	.10	.20	.05	.04	.07
21	.72	.15	.09	.08	18	.62	2.6	.05	.10	.05	.04	.05
22	.80	2.7	.08	.06	1.5	.18	1.2	.03	.06	.05	.05	.05
23	.40	2.6	.06	.05	.22	6.8	3.3	.02	.05	1.1	.05	.07
24	.48	3.2	.05	.05	.05	5.0	3.2	.02	.05	.18	.06	5.6
25	.23	2.2	.05	.05	.04	.90	.96	.02	.39	.20	.11	.74
26	2.3	13	.05	.05	.05	.81	2.2	.02	2.0	.18	.09	.59
27	.63	3.4	.05	.05	.05	2.0	2.8	.03	.25	.08	.06	.21
28	.25	2.4	.03	.24	.03	.81	2.9	.03	.14	.16	.05	.10
29	.16	4.3	.10	.07	.03	1.9	2.8	.02	.08	.31	.05	.06
30	.57	8.1	.06	.05	------	13	1.8	.02	.06	2.6	.04	.05
31	4.7	------	.35	.04	------	1.8	------	.02	------	.38	.34	------
TOTAL	13.71	145.08	49.86	23.51	89.65	76.20	139.43	4.67	7.19	6.65	3.68	17.16
MEAN	0.442	4.84	1.61	0.758	3.09	2.46	4.65	0.151	0.240	0.215	0.119	0.572
MAX	4.7	25	10	7.8	65	18	30	1.4	2.0	2.6	0.66	7.0
MIN	0.01	0.06	0.03	0.03	0.01	0.02	0.09	0.02	0.02	0.03	0.04	0.04
AC-FT	27	288	99	47	178	151	277	9.3	14	13	7.3	34

CAL YR 1967: TOTAL 795.11 MEAN 2.18 MAX 152 MIN 0.01 AC-FT 1,580
WAT YR 1968: TOTAL 576.79 MEAN 1.58 MAX 65 MIN 0.01 AC-FT 1,140

Peak discharge (base, 210 cfs).--Feb. 17 (1000) 292 cfs (3.23 ft); Apr. 16 (1630) 281 cfs (3.18 ft).

16-5700. Nailiilihaele Stream near Huelo

Location.--Lat 20°52'28", long 156°13'06", 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.--3.58 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August to October 1919, December 1919 to June 1924, January 1925 to September 1968. 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, staff 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.

Extremes.--Maximum discharge during year, 2,400 cfs Mar. 16 (gage height, 7.82 ft), from rating curve extended above 600 cfs as explained below; minimum, 2.9 cfs Oct. 9, 10, 17-19.
1910-11, 1913-68: Maximum discharge, 6,410 cfs Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 600 cfs by logarithmic plotting; minimum, 0.70 cfs July 14, 1920.

Remarks.--Records good except those above 1,500 cfs, which are fair. No diversion above station since 1922. All low flow diverted into Wailoa ditch (see sta. no. 5880) 200 ft below station for domestic supply, power, and irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	319	397	12	4.5	3.8	23	48	8.0	9.8	28	18
2	4.8	318	90	14	4.5	4.0	55	42	7.6	8.6	16	11
3	4.8	216	216	112	4.3	270	127	29	7.2	8.3	51	8.6
4	4.0	70	102	323	4.3	142	72	25	6.9	8.0	30	8.0
5	3.8	29	49	130	4.5	65	24	48	6.6	7.6	17	7.2
6	3.6	22	34	30	4.0	16	19	20	6.2	6.9	13	10
7	3.3	22	28	19	6.9	12	25	18	7.2	6.6	12	13
8	3.3	50	22	15	14	10	27	16	8.3	6.2	11	9.8
9	3.1	138	31	14	12	9.0	86	18	11	6.0	9.8	7.2
10	3.3	33	71	12	5.1	11	70	43	18	7.2	26	6.9
11	4.0	93	38	10	4.3	34	19	26	13	12	27	6.2
12	3.3	44	32	9.4	3.8	41	16	18	12	11	85	6.0
13	9.9	22	32	9.4	3.8	60	14	19	10	8.6	26	5.6
14	6.8	18	29	11	3.6	227	14	16	19	40	28	5.6
15	3.8	16	20	9.4	3.3	410	83	14	11	11	16	14
16	3.3	14	18	8.0	3.8	562	178	16	30	7.2	14	11
17	3.1	15	15	8.6	52	39	46	13	47	6.6	12	6.2
18	2.9	12	15	7.2	11	35	164	12	26	6.0	11	5.6
19	3.1	54	15	7.6	5.6	238	145	54	35	10	10	5.6
20	50	32	14	6.9	4.8	67	164	26	17	11	9.4	6.2
21	22	20	12	6.2	24	29	58	24	13	11	9.4	5.4
22	12	127	11	6.0	9.0	22	47	14	12	11	8.3	4.8
23	7.6	64	10	5.6	6.0	85	138	12	11	147	8.0	7.6
24	5.6	178	9.4	5.6	5.4	67	88	11	11	14	7.6	110
25	5.1	76	9.0	5.4	4.8	29	78	10	15	11	16	30
26	44	294	8.3	5.4	4.5	20	113	9.8	43	9.4	13	34
27	11	107	8.0	6.0	4.3	43	167	36	36	8.6	8.6	12
28	6.9	90	8.0	11	4.0	47	176	12	19	9.8	8.3	9.4
29	6.6	52	9.4	5.6	4.0	164	112	9.4	12	11	17	8.3
30	33	122	15	5.1	------	109	76	8.6	11	162	9.0	8.0
31	148	------	47	4.8	------	37	------	8.3	------	47	25	------
TOTAL	433.6	2667	1415.1	835.2	226.1	2907.8	2424	676.1	490.0	640.4	582.4	401.2
MEAN	14.0	88.9	45.6	26.9	7.79	93.8	80.8	21.8	16.3	20.7	18.8	13.4
MAX	148	319	397	323	52	562	178	54	47	162	85	110
MIN	2.9	12	8.0	4.8	3.3	3.8	14	8.3	6.2	6.0	7.6	4.8
AC-FT	860	5290	2810	1660	448	5770	4810	1340	972	1270	1160	796

CAL YR 1967: TOTAL 14,651.7 MEAN 40.1 MAX 487 MIN 2.9 AC-FT 29,060
WAT YR 1968: TOTAL 13,698.9 MEAN 37.4 MAX 562 MIN 2.9 AC-FT 27,170

PEAK DISCHARGE (BASE, 1,200 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 1	2130	6.12	1,230	1- 4	2300	7.51	2,160
12- 1	1000	7.70	2,300	3-16	0700	7.82	2,400

16-5745. Kailua Stream near Kailiili

Location.--Lat 20°50'28", long 156°14'24", 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.--1.01 sq mi.

Records available.--June 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 2,840 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,290 cfs Mar. 16 (gage height, 9.41 ft), from rating curve extended above 39 cfs as explained below; minimum, 0.04 cfs Oct. 8-10.
1963-68: Maximum discharge, 1,780 cfs Feb. 3, 1965 (gage height, 10.51 ft), from rating curve extended above 39 cfs by logarithmic plotting; minimum, 0.03 cfs June 17, 18, 1966.

Remarks.--Records good except those above 80 cfs and those for period of no gage-height record, which are fair. Diversion above station at altitude 4,250 ft by Maui County Board of Water Supply for irrigation and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.07	31	85	0.98	0.22	0.12	2.3	3.7	0.20	0.42	1.7	1.5
2	.06	86	12	.78	.20	.09	8.5	3.0	.18	.33	.94	.90
3	.05	94	43	31	.18	24	38	2.1	.16	.28	1.8	.56
4	.05	27	24	24	.15	7.0	15	1.7	.15	.43	2.9	.42
5	.05	6.6	4.6	30	.13	4.4	3.1	2.1	.13	.59	2.0	.31
6	.05	3.2	3.0	2.6	.12	1.2	2.0	1.4	.12	.33	1.2	.28
7	.05	4.1	2.3	1.6	.12	.67	2.4	1.2	.10	.28	.90	1.5
8	.04	11	1.9	1.2	.13	.53	2.3	1.0	.10	.26	.70	.82
9	.04	46	2.2	.86	.22	.45	23	1.3	.13	.22	.56	.50
10	.04	9.7	17	.67	.24	.81	24	5.7	.53	.20	2.0	.36
11	.05	73	7.5	.56	.24	1.9	2.7	2.9	.42	.26	3.5	.31
12	.05	15	10	.48	.20	3.2	1.9	1.5	.31	.90	6.0	.26
13	.41	3.1	15	.42	.15	2.3	1.4	1.4	.28	.50	2.5	.24
14	.80	2.0	11	.36	.12	17	1.2	1.0	2.3	.81	1.6	.28
15	.24	1.6	2.9	.31	.12	103	4.3	.82	1.4	.48	1.2	.90
16	.18	1.3	2.0	.28	.32	67	56	.86	5.7	.28	1.0	.56
17	.13	1.2	1.6	.36	71	4.0	7.1	.70	8.5	.24	.74	.31
18	.08	.90	1.3	.33	6.4	2.3	43	.59	4.3	.20	.59	.26
19	.06	3.0	1.5	1.2	1.4	23	65	1.3	2.9	.22	.45	.22
20	2.3	2.5	1.3	.98	.67	9.6	25	1.6	1.7	.26	.36	.28
21	3.0	1.6	1.1	.50	11	3.4	12	.94	.86	.28	.33	.24
22	1.5	10	.94	.31	2.8	1.9	7.3	.56	.59	.36	.31	.20
23	.63	11	.88	.26	.94	17	24	.48	.48	14	.28	.80
24	.31	10	.80	.24	.56	17	14	.36	.39	1.8	.50	38
25	.24	8.6	.74	.22	.39	3.0	4.7	.31	.48	.82	1.0	4.0
26	4.5	66	.70	.20	.24	2.4	6.8	.28	7.7	.74	.78	2.6
27	1.6	18	.64	.20	.20	3.0	14	.50	3.1	.50	.59	1.1
28	.59	15	.58	1.0	.18	2.2	15	.39	1.6	.48	.45	.67
29	.33	15	.67	.63	.16	7.8	11	.26	.82	.53	.78	.48
30	3.6	34	.59	.31	------	33	6.8	.24	.56	21	.42	.36
31	26	------	2.0	.24	------	5.0	------	.22	------	3.2	2.0	------
TOTAL	47.10	611.40	258.74	103.08	98.80	368.27	443.8	40.41	46.19	51.20	40.08	59.22
MEAN	1.52	20.4	8.35	3.33	3.41	11.9	14.8	1.30	1.54	1.65	1.29	1.97
MAX	26	94	85	31	71	103	65	5.7	8.5	21	6.0	38
MIN	0.04	0.90	0.58	0.20	0.12	0.09	1.2	0.22	0.10	0.20	0.28	0.20
AC-FT	93	1,210	513	204	196	730	880	80	92	102	79	117

CAL YR 1967: TOTAL 2,358.12 MEAN 6.46 MAX 108 MIN 0.04 AC-FT 4,680
WAT YR 1968: TOTAL 2,168.29 MEAN 5.92 MAX 103 MIN 0.04 AC-FT 4,300

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-4	2330	6.35	410	4-18	2300	6.92	524
3-16	0600	9.41	1,290	4-20	1500	5.83	314
4-16	1700	6.73	486				

Note.--No gage-height record Aug. 4 to Sept. 24.

16-5850. Hoolawanui Stream near Huelo

Location.--Lat 20°53'15", long 156°14'55", 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.

Records available.--December 1910 to September 1968. 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, staff 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.

Extremes.--Maximum discharge during year, 1,600 cfs Mar. 16 (gage height, 5.45 ft), from rating curve extended above 140 cfs by logarithmic plotting; minimum, 0.73 cfs Oct. 19, 20.
1910-68: Maximum discharge, 5,010 cfs Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 150 cfs by logarithmic plotting; 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. no. 5880) 250 ft below station for domestic supply, power, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	67	145	3.8	1.7	1.1	13	20	2.4	2.0	5.2	3.8
2	1.1	57	45	4.0	1.6	1.2	19	17	2.3	1.9	3.3	2.3
3	1.2	50	66	20	1.5	65	39	14	2.2	1.8	8.5	1.8
4	1.1	18	48	76	1.5	34	30	12	2.2	1.7	6.9	1.6
5	1.1	10	29	42	1.6	19	16	16	2.0	1.6	3.5	1.5
6	1.0	7.2	18	14	1.4	7.8	12	9.9	1.9	1.5	2.9	2.0
7	1.0	6.6	15	10	2.0	5.9	11	8.6	2.0	1.5	2.6	2.5
8	.94	11	12	8.2	2.1	5.2	11	7.8	2.2	1.4	2.4	2.1
9	.94	31	13	7.0	2.0	4.6	22	7.8	2.3	1.4	2.3	1.6
10	1.0	12	30	6.2	1.4	4.6	27	13	2.4	1.5	4.5	1.5
11	1.1	20	19	5.6	1.4	8.9	11	10	2.4	2.2	3.1	1.4
12	.94	16	16	5.2	1.3	11	10	7.4	2.4	1.8	13	1.3
13	1.2	10	15	4.9	1.4	15	8.2	7.4	2.3	1.6	4.9	1.2
14	1.1	6.9	13	4.6	1.3	77	7.8	6.2	3.5	5.0	4.9	1.2
15	.88	5.7	11	4.0	1.2	126	22	5.6	1.9	1.9	3.3	1.8
16	.83	5.0	9.0	3.8	1.2	229	45	5.6	2.9	1.4	2.9	1.5
17	.83	4.5	7.8	4.0	10	33	17	4.9	6.2	1.4	2.6	1.2
18	.80	4.1	7.8	3.3	3.1	21	27	4.6	4.6	1.3	2.6	1.2
19	.80	7.6	7.0	3.1	1.5	65	42	12	6.0	1.4	2.4	1.2
20	4.0	5.5	6.6	2.9	1.3	30	64	7.4	3.3	1.4	2.3	1.3
21	2.5	4.7	5.9	2.8	5.9	18	30	7.0	2.4	1.4	2.2	1.2
22	1.4	24	5.2	2.6	2.2	15	22	4.3	2.3	1.4	2.0	1.2
23	1.1	12	4.6	2.4	1.5	20	40	4.0	2.2	24	2.0	1.4
24	.88	44	4.3	2.4	1.4	24	31	3.8	2.2	2.6	1.9	11
25	.83	28	4.0	2.3	1.3	14	28	3.5	2.6	2.0	2.4	4.1
26	3.9	103	3.5	2.2	1.2	11	30	3.3	6.6	1.8	2.0	5.6
27	1.4	40	3.3	2.4	1.2	12	44	6.8	8.3	1.7	1.9	1.8
28	1.0	28	3.1	2.8	1.2	12	46	3.3	4.3	1.7	1.9	1.4
29	1.0	22	3.8	2.0	1.2	41	32	2.9	2.6	1.8	3.1	1.4
30	1.2	34	4.7	1.8	------	30	26	2.8	2.3	38	1.8	1.3
31	18	------	11	1.8	------	16	------	2.6	------	9.0	4.5	------
TOTAL	56.47	694.8	586.6	258.1	57.6	977.3	783.0	241.5	93.2	121.1	109.8	64.4
MEAN	1.82	23.2	18.9	8.33	1.99	31.5	26.1	7.79	3.11	3.91	3.54	2.15
MAX	18	103	145	76	10	229	64	20	8.3	38	13	11
MIN	0.80	4.1	3.1	1.8	1.2	1.1	7.8	2.6	1.9	1.3	1.8	1.2
AC-FT	112	1,380	1,160	512	114	1,940	1,550	479	185	240	218	128

CAL YR 1967: TOTAL 4,196.37 MEAN 11.5 MAX 187 MIN 0.80 AC-FT 8,320
WAT YR 1968: TOTAL 4,043.87 MEAN 11.0 MAX 229 MIN 0.80 AC-FT 8,020

PEAK DISCHARGE (BASE, 620 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 1	1030	4.03	835	3-16	0800	5.45	1,600
3-15	1630	3.50	620				

16-5870. Honopou Stream near Huelo

Location.--Lat 20°53'20", long 156°15'20", 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.

Records available.--December 1910 to September 1968. 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, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 408 cfs Jan. 4 (gage height, 3.31 ft), from rating curve extended above 110 cfs as explained below; minimum, 0.35 cfs Oct. 15-19, 25.
1910-68: Maximum discharge, 5,710 cfs Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 110 cfs by test on model of station site; minimum, 0.02 cfs on several days in 1933, 1934.

Remarks.--Records excellent. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.63	18	48	2.0	1.0	0.55	6.4	9.2	1.4	0.81	2.4	1.6
2	.63	16	20	1.9	.91	.63	8.0	8.2	1.2	.81	1.8	.91
3	.55	13	19	5.8	.91	28	9.3	7.1	1.2	.72	2.2	.81
4	.47	6.2	19	46	.81	15	7.3	6.4	1.1	.72	2.0	.72
5	.47	4.2	13	18	.81	8.5	6.2	6.7	1.1	.72	1.6	.72
6	.47	3.6	10	7.5	.72	4.6	5.4	5.0	1.0	.72	1.5	1.0
7	.47	3.2	8.8	5.7	1.0	3.8	5.2	4.6	1.1	.72	1.5	.91
8	.47	5.0	7.5	5.0	.81	3.2	5.0	4.0	1.1	.72	1.4	.81
9	.41	9.0	7.1	4.2	.81	2.9	7.7	4.0	1.1	.72	1.2	.72
10	.41	4.6	11	3.8	.72	2.9	10	5.0	1.1	.72	1.9	.72
11	.55	5.2	8.8	3.4	.63	4.4	4.8	4.2	1.1	1.0	1.5	.63
12	.47	5.2	7.1	3.2	.55	4.0	4.4	3.4	1.1	.91	3.8	.63
13	.55	4.0	6.4	3.0	.63	6.7	4.2	3.2	1.0	.91	1.9	.55
14	.47	3.6	5.7	2.9	.63	34	4.0	2.9	1.2	2.0	1.6	.55
15	.35	3.2	5.0	2.5	.55	40	9.0	2.7	.91	.91	1.4	.81
16	.35	3.0	4.4	2.4	.55	86	11	2.5	1.4	.72	1.2	.63
17	.35	2.7	4.0	2.2	1.9	20	6.4	2.4	1.6	.72	1.2	.55
18	.35	2.5	3.8	2.0	.81	14	8.5	2.2	1.5	.63	1.2	.55
19	.35	3.9	3.4	1.9	.63	23	10	4.4	1.6	.72	1.1	.55
20	1.5	3.0	3.2	1.8	.55	15	32	2.9	1.1	.72	1.1	.55
21	1.0	2.7	2.9	1.6	1.6	11	11	2.7	.91	.72	1.1	.55
22	.63	9.8	2.7	1.5	.81	9.2	9.4	2.0	.91	.72	1.0	.55
23	.47	4.8	2.5	1.5	.63	9.4	14	1.9	.91	6.6	1.0	.63
24	.41	20	2.4	1.5	.55	9.7	12	1.9	.91	1.1	1.0	2.9
25	.35	11	2.2	1.4	.55	7.3	12	1.8	1.1	1.0	1.1	1.2
26	1.2	39	2.0	1.2	.55	6.2	13	1.6	1.4	.81	1.0	1.4
27	.55	20	1.9	1.6	.55	6.5	16	3.7	1.6	.81	1.0	.72
28	.41	14	1.8	1.6	.55	6.4	14	1.8	1.2	.81	.91	.63
29	.41	12	2.0	1.2	.55	16	13	1.6	.91	.91	1.2	.55
30	.52	15	2.4	1.1	------	9.9	11	1.5	.91	6.8	.91	.55
31	5.1	------	4.7	1.0	------	7.5	------	1.4	------	3.6	1.8	------
TOTAL	21.32	267.4	242.7	140.4	22.27	416.28	290.2	112.9	34.67	40.50	45.52	24.60
MEAN	0.688	8.91	7.83	4.53	0.768	13.4	9.67	3.64	1.16	1.31	1.47	0.820
MAX	5.1	39	48	46	1.9	86	32	9.2	1.6	6.8	3.8	2.9
MIN	0.35	2.5	1.8	1.0	0.55	0.55	4.0	1.4	0.91	0.63	0.91	0.55
AC-FT	42	530	481	278	44	826	576	224	69	80	90	49

CAL YR 1967: TOTAL 1,756.55 MEAN 4.81 MAX 65 MIN 0.35 AC-FT 3,480
WAT YR 1968: TOTAL 1,658.76 MEAN 4.53 MAX 86 MIN 0.35 AC-FT 3,290

PEAK DISCHARGE (BASE, 170 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 1	1100	3.14	307	3-14	1900	3.18	329
1- 4	1930	3.31	408	4-20	0430	2.89	200

16-5880. Wailoa ditch at Honopou, near Huelo

Location.--Lat 20°53'20", long 156°15'19", on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, and 2.2 miles southwest of Huelo.

Records available.--November 1922 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

Extremes.--1922-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	286	259	169	26	8.5	299	264	92	101	198	184
2	60	319	259	186	26	12	289	264	86	92	170	124
3	62	315	259	193	26	15	314	262	82	87	177	96
4	56	300	259	270	24	35	314	253	80	88	270	88
5	51	294	259	207	24	24	308	262	78	83	189	80
6	48	273	258	215	21	15	270	232	73	75	137	88
7	47	280	256	187	20	13	260	205	81	71	120	114
8	45	279	250	176	20	12	304	194	94	68	118	129
9	44	271	244	153	87	80	307	186	126	66	109	82
10	45	248	272	138	76	132	311	262	150	70	174	80
11	59	264	282	125	67	228	251	247	127	130	198	72
12	48	267	264	120	58	266	201	219	132	125	269	67
13	75	259	262	117	56	232	178	241	105	86	247	64
14	69	223	261	123	55	233	167	221	154	213	212	63
15	45	187	239	110	56	192	281	178	126	134	170	143
16	42	163	201	124	64	159	284	200	183	84	148	116
17	40	159	180	165	222	182	283	166	246	74	124	69
18	40	145	176	45	142	242	286	160	278	67	117	64
19	71	228	172	49	51	256	287	170	262	99	104	67
20	242	251	148	144	25	247	287	227	194	111	98	73
21	237	233	104	94	36	309	285	225	137	107	100	61
22	157	265	125	45	65	279	283	161	124	90	90	55
23	138	232	120	61	53	308	287	141	115	252	90	90
24	111	233	118	78	45	312	298	128	118	160	94	260
25	78	275	114	75	42	309	292	103	137	125	177	292
26	266	277	106	72	32	299	287	80	259	107	164	287
27	144	274	102	99	27	288	278	112	260	90	112	156
28	94	232	98	196	26	308	280	126	202	119	104	112
29	80	198	120	75	17	315	281	109	129	116	169	102
30	97	252	143	32	------	315	270	102	115	230	106	92
31	308	------	254	26	------	312	------	96	------	266	162	------
TOTAL	2986	7482	6164	3869	1489	5937.5	8322	5796	4345	3586	4717	3370
MEAN	96.3	249	199	125	51.3	192	277	187	145	116	152	112
MAX	308	319	282	270	222	315	314	264	278	266	270	292
MIN	40	145	98	26	17	8.5	167	80	73	66	90	55
AC-FT	5920	14840	12230	7670	2950	11780	16510	11500	8620	7110	9360	6680

CAL YR 1967: TOTAL 67,349 MEAN 185 MAX 326 MIN 40 AC-FT 133,600
WAT YR 1968: TOTAL 58,063.5 MEAN 159 MAX 319 MIN 8.5 AC-FT 115,200

16-5890. New Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'28", long 156°15'22", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, and 2.1 miles southwest of Huelo.

Records available.--January 1918 to September 1968.

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.

Extremes.--1918-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.34	99	92	0.15	38	15	46	0.77	0.53	0.58	84	42
2	.30	182	74	.12	34	26	50	.15	.48	.48	1.8	.83
3	.26	178	74	.12	36	167	58	.12	.43	.38	32	.53
4	.22	156	73	.26	38	172	.05	.12	.38	.38	59	.38
5	.18	123	74	.06	42	171	.05	.09	.34	.34	1.4	.30
6	.15	15	74	.05	36	138	.05	.09	.30	.30	1.1	.34
7	.12	61	63	.05	50	118	.05	.09	.34	.26	.96	30
8	.12	113	16	5.8	73	105	.05	.09	.34	.26	.89	7.8
9	.09	145	21	4.7	43	30	.05	.09	.34	.18	.82	.38
10	.09	142	75	3.8	.70	1.8	.05	.09	13	.26	67	.38
11	.07	158	76	3.2	.48	40	.05	.09	.64	.43	82	.30
12	.12	156	46	2.8	.38	94	.05	.09	.82	.48	143	.26
13	.09	67	.06	2.5	.34	116	.05	.09	1.0	.43	41	.22
14	.09	2.8	.06	2.5	.30	127	.05	.09	48	56	71	.18
15	.07	2.0	.06	1.9	.22	92	.04	.09	2.8	2.1	1.2	3.5
16	.07	1.8	.05	1.9	.18	105	.04	.09	82	.53	.96	.82
17	.07	1.6	.05	59	62	66	.03	.09	112	.38	.76	.30
18	.07	1.4	.05	61	17	37	.02	.09	47	.30	.64	.18
19	.06	76	.05	50	16	94	.02	.09	51	.34	.58	.15
20	82	67	.05	17	32	130	.05	.09	5.7	.38	.48	.15
21	52	15	.04	4.9	19	83	.01	.09	.89	.38	.53	.12
22	.53	128	.04	39	.12	21	.01	.09	.76	.30	.48	.09
23	.26	162	.04	22	.09	91	.03	.09	.70	143	.38	.18
24	.18	168	.04	1.9	.09	150	26	.07	.70	13	.38	122
25	.12	162	.04	2.2	5.1	133	.22	14	.64	.89	34	65
26	76	154	1.8	2.1	6.9	44	.18	23	66	.70	.91	74
27	2.7	151	1.3	2.4	5.8	56	.18	86	51	.58	.48	1.5
28	.34	174	1.2	2.9	5.2	104	.15	14	7.4	.64	.43	.76
29	.18	174	1.3	16	11	153	.15	1.4	.82	.76	22	.64
30	2.0	148	3.5	43	------	152	10	.66	.70	95	.58	.53
31	146	------	7.2	43	------	144	------	.58	------	130	68	------
TOTAL	364.89	3183.6	774.93	396.31	572.90	2975.8	191.68	142.58	497.05	450.04	718.76	353.82
MEAN	11.8	106	25.0	12.8	19.8	96.0	6.39	4.60	16.6	14.5	23.2	11.8
MAX	146	182	92	61	73	172	58	86	112	143	143	122
MIN	0.06	1.4	0.04	0.05	0.09	1.8	0.01	0.07	0.30	0.18	0.38	0.09
AC-FT	724	6310	1540	786	1,140	5,900	380	283	986	893	1,430	702

CAL YR 1967: TOTAL 12,336.88 MEAN 33.8 MAX 182 MIN 0.04 AC-FT 24,470
WAT YR 1968: TOTAL 10,622.36 MEAN 29.0 MAX 182 MIN 0.01 AC-FT 21,070

16-5920. Lowrie ditch at Honopou Gulch, near Huelo

Location.--Lat 20°54'57", long 156°15'07", 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.

Records available.--January 1910 to March 1927, February 1930 to September 1968. 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, datum of 1929. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Extremes.--1910-27, 1930-68: Maximum daily discharge, 116 cfs Oct. 31, 1921; no flow at times.

Remarks.--Records excellent. Lowrie ditch receives water from Center ditch at Waiiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	54	54	18	9.9	16	2.1	75	13	14	52	13
2	6.1	104	3.5	15	16	12	38	72	7.7	11	39	7.6
3	6.1	91	3.1	26	8.5	67	87	60	12	9.9	36	11
4	5.7	72	3.0	16	8.2	67	87	34	13	5.9	39	7.7
5	5.0	42	2.6	3.4	9.1	78	45	62	7.9	9.3	28	5.4
6	4.8	18	2.5	1.8	7.7	61	48	31	6.8	8.2	34	5.2
7	4.6	42	2.5	1.4	9.9	52	41	29	8.2	5.0	20	16
8	4.4	53	2.4	1.3	14	18	70	27	7.7	5.4	19	13
9	4.2	110	22	17	33	13	84	29	6.4	6.8	9.9	5.7
10	4.2	51	54	34	13	22	67	99	6.4	8.2	16	5.7
11	4.4	72	11	26	7.1	49	26	64	9.3	8.5	16	5.2
12	4.2	63	2.5	23	6.8	62	30	28	11	7.4	75	4.8
13	5.2	12	2.1	23	9.6	66	27	53	8.5	6.6	21	4.4
14	4.0	4.6	1.9	27	7.4	79	26	26	22	26	27	4.2
15	3.6	4.2	1.8	29	6.1	40	68	36	6.8	9.6	30	6.4
16	3.3	4.0	1.7	28	5.9	38	77	35	22	11	22	7.7
17	3.3	4.7	1.6	23	46	37	77	26	52	9.9	15	5.0
18	3.5	12	1.7	33	22	39	78	22	34	7.4	11	4.4
19	4.4	46	1.6	42	11	69	78	54	35	9.1	12	4.6
20	35	14	1.7	26	15	12	86	56	28	8.8	10	4.8
21	37	4.6	1.6	28	28	3.1	78	45	27	5.4	8.2	4.2
22	6.4	41	1.4	32	19	37	77	36	21	8.2	7.1	3.8
23	5.0	52	1.3	17	2.6	57	78	26	9.6	64	7.1	5.4
24	5.4	81	1.3	15	2.4	60	78	30	17	16	6.8	62
25	5.2	48	1.2	11	1.8	24	78	22	11	13	8.5	50
26	47	88	6.0	11	1.1	3.0	78	9.6	43	12	7.4	61
27	14	75	12	12	1.0	3.2	78	52	21	9.9	6.6	31
28	16	68	13	13	3.0	3.1	78	18	22	11	6.6	17
29	14	83	14	12	8.7	2.5	78	28	15	16	7.9	16
30	11	71	14	11	------	2.4	77	27	7.9	66	6.6	15
31	81	------	27	10	------	2.2	------	16	------	74	18	------
TOTAL	364.1	1485.1	270.0	585.9	333.8	1094.5	1920.1	1227.6	512.2	483.5	622.7	407.2
MEAN	11.7	49.5	8.71	18.9	11.5	35.3	64.0	39.6	17.1	15.6	20.1	13.6
MAX	81	110	54	42	46	79	87	99	52	74	52	62
MIN	3.3	4.0	1.2	1.3	1.0	2.2	2.1	9.6	6.4	5.0	6.6	3.8
AC-FT	722	2950	536	1160	662	2170	3810	2430	1020	959	1240	808

CAL YR 1967: TOTAL 8,079.03 MEAN 22.1 MAX 110 MIN 0 AC-FT 16,020
WAT YR 1968: TOTAL 9,306.7 MEAN 25.4 MAX 110 MIN 1.0 AC-FT 18,460

16-5940. Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", 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.

Records available.--January 1910 to December 1928, February 1930 to September 1968. 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, datum of 1929. 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.

Extremes.--1910-28, 1930-68: 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 except those for period of no gage-height record, which are good. Ditch diverts from all streams between Naililihaele Stream and Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	39	27	0.88	2.8	1.6	57	94	1.5	0.82	2.3	1.1
2	1.5	97	.34	.40	2.7	1.6	40	93	1.5	.82	1.2	.82
3	1.4	99	.34	29	2.7	81	95	68	1.3	.82	5.6	.70
4	1.5	49	5.8	8.7	2.6	98	100	25	1.2	.82	21	.65
5	1.2	15	16	.46	2.6	87	52	68	1.1	.76	1.3	.65
6	1.2	2.4	65	.25	2.7	14	20	10	1.2	.76	1.1	.60
7	1.1	9.1	39	.22	2.4	3.4	23	3.8	1.4	.76	1.0	3.9
8	1.1	8.0	28	19	3.1	2.6	52	3.5	1.3	.82	1.0	1.8
9	1.1	96	20	24	7.6	2.2	78	3.5	1.2	.76	1.1	.82
10	1.2	10	1.8	11	21	2.5	94	69	1.2	.88	1.4	.70
11	1.1	61	.88	8.7	4.1	3.5	27	15	1.2	.94	1.2	.76
12	1.1	51	2.7	7.8	2.3	31	14	3.4	1.4	.88	47	.70
13	1.1	14	.70	7.2	2.3	36	13	28	1.2	.82	2.5	.65
14	1.1	50	.65	7.0	2.1	44	12	6.0	1.5	1.1	1.5	.65
15	1.1	27	.60	6.1	1.9	35	82	1.1	1.4	.88	1.1	.70
16	1.1	14	.55	5.5	1.9	76	97	.05	1.7	.76	1.1	.70
17	1.1	11	9.2	9.0	23	66	97	.62	14	.70	1.0	.76
18	1.1	2.1	15	5.7	6.6	24	97	2.1	19	.65	.94	.70
19	1.1	27	11	4.9	1.7	63	97	40	8.1	.76	.88	.70
20	11	23	29	4.6	1.8	86	99	37	2.1	.70	.88	.76
21	7.0	32	33	4.3	8.7	87	94	18	1.2	.70	.94	.70
22	.94	87	23	4.1	12	37	92	1.5	1.1	.70	.88	.70
23	1.1	70	20	4.0	6.8	38	97	1.6	1.0	48	.88	.88
24	1.2	72	19	3.8	8.7	42	26	1.8	.94	2.2	1.0	54
25	1.1	46	17	3.7	6.6	79	47	1.8	.94	1.1	1.0	3.4
26	13	59	12	3.5	5.5	72	97	1.7	16	.94	.88	21
27	2.0	59	4.6	3.3	5.2	74	98	33	1.1	.88	.82	1.3
28	1.4	71	4.6	2.3	3.4	56	98	2.3	.94	1.0	.82	1.0
29	1.2	96	5.1	2.4	18	86	100	1.7	.88	1.1	.82	.94
30	1.1	96	4.9	3.1	------	99	101	1.6	.88	50	.76	.88
31	56	------	4.5	2.8	------	89	------	1.6	------	46	.94	------
TOTAL	119.64	1392.6	421.26	197.71	156.6	1517.4	2096	637.67	89.48	168.83	104.84	103.62
MEAN	3.86	46.4	13.6	6.38	5.40	48.9	69.9	20.6	2.98	5.45	3.38	3.45
MAX	56	99	65	29	23	99	101	94	19	50	47	54
MIN	0.94	2.1	0.34	0.22	1.7	1.6	12	0.05	0.88	0.65	0.76	0.60
AC-FT	237	2760	836	392	311	3010	4160	1260	177	335	208	206

CAL YR 1967: TOTAL 6,804.05 MEAN 18.6 MAX 100 MIN 0.55 AC-FT 13,500
WAT YR 1968: TOTAL 7,005.65 MEAN 19.1 MAX 101 MIN 0.05 AC-FT 13,900

Note.--No gage-height record Jan. 23 to Feb. 25.

16-5962. Halehaku Gulch near Kailiili

Location.--Lat 20°50'53", long 156°15'13", 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.

Records available.--March 1965 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,610 ft (from topographic map).

Extremes.--Maximum discharge during year, 28 cfs Mar. 16 (gage height, 2.09 ft), from rating curve extended above 2.3 cfs as explained below; minimum, 0.04 cfs Oct. 19, 20.
1965-68: Maximum discharge, 36 cfs May 2, 1965 (gage height, 2.31 ft), from rating curve extended above 2.3 cfs by logarithmic plotting; minimum, 0.04 cfs Oct. 19, 20, 1967.

Remarks.--Records good except those above 5 cfs, which are fair. No diversion above station. Continuous records of rainfall are obtained st station.

DISCHAROE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.10	1.6	7.4	0.42	0.17	0.20	1.5	1.8	0.29	0.26	0.42	0.56
2	.09	4.6	4.8	.42	.17	.20	1.6	1.6	.29	.23	.37	.29
3	.08	6.7	5.1	1.1	.17	1.7	4.4	1.4	.26	.23	.46	.23
4	.08	3.0	5.5	1.7	.17	1.4	3.8	1.2	.23	.23	.46	.20
5	.08	1.8	3.0	2.9	.17	1.1	2.1	1.1	.23	.23	.42	.20
6	.08	1.2	2.2	1.4	.14	.68	1.6	1.0	.23	.20	.37	.17
7	.08	1.0	1.7	1.1	.14	.56	1.3	.93	.20	.20	.33	.49
8	.06	1.2	1.5	.86	.14	.46	1.2	.80	.20	.17	.29	.33
9	.06	4.0	1.3	.74	.14	.42	1.8	.74	.20	.17	.26	.26
10	.05	2.1	1.8	.68	.14	.37	2.6	.93	.20	.17	.26	.26
11	.05	4.0	2.0	.62	.14	.42	1.7	.86	.17	.17	.26	.23
12	.05	3.3	2.1	.56	.14	.46	1.4	.80	.17	.17	.37	.23
13	.06	1.8	2.0	.51	.14	.46	1.1	.74	.20	.17	.29	.23
14	.08	1.3	2.1	.46	.14	1.3	1.0	.68	.20	.17	.29	.20
15	.06	1.1	1.8	.42	.12	6.0	.93	.62	.17	.17	.29	.20
16	.05	.86	1.5	.37	.12	7.4	2.4	.56	.26	.14	.26	.20
17	.05	.74	1.3	.33	1.0	2.4	2.1	.51	.42	.14	.26	.17
18	.05	.74	1.1	.29	.46	1.6	2.4	.46	.42	.14	.23	.17
19	.04	.74	1.0	.29	.29	3.4	4.2	.46	.33	.14	.23	.17
20	.12	.68	.93	.26	.26	2.7	3.3	.42	.29	.12	.23	.14
21	.12	.62	.86	.26	.44	1.9	2.8	.42	.26	.12	.20	.12
22	.12	1.1	.80	.26	.37	1.4	2.3	.37	.23	.12	.20	.12
23	.09	1.4	.74	.26	.33	1.5	3.0	.37	.23	.58	.17	.12
24	.08	1.4	.68	.23	.29	2.3	3.0	.37	.20	.26	.17	.42
25	.06	1.7	.62	.23	.26	1.6	2.2	.37	.20	.23	.17	.29
26	.17	5.1	.56	.23	.26	1.4	1.8	.37	.33	.20	.17	.29
27	.12	4.2	.51	.23	.23	1.2	2.3	.33	.33	.17	.17	.20
28	.10	3.0	.46	.23	.23	1.1	2.5	.33	.33	.17	.14	.20
29	.10	3.0	.46	.20	.23	1.6	2.5	.33	.29	.17	.14	.17
30	.12	3.6	.42	.20	------	2.4	2.2	.33	.26	1.5	.14	.17
31	1.0	------	.46	.20	------	1.9	------	.33	------	.68	.17	------
TOTAL	3.45	67.58	56.70	17.96	7.00	51.53	67.03	21.53	7.62	7.82	8.19	7.03
MEAN	0.111	2.25	1.83	0.579	0.241	1.66	2.23	0.694	0.254	0.252	0.264	0.234
MAX	1.0	6.7	7.4	2.9	1.0	7.4	4.4	1.8	0.42	1.5	.46	0.56
MIN	0.04	0.62	0.42	0.20	0.12	0.20	0.93	0.33	0.17	0.12	0.14	0.12
AC-FT	6.8	134	112	36	14	102	133	43	15	16	16	14

CAL YR 1967: TOTAL 367.69 MEAN 1.01 MAX 7.5 MIN 0.04 AC-FT 729
WAT YR 1968: TOTAL 323.44 MEAN 0.884 MAX 7.4 MIN 0.04 AC-FT 642

Peak discharge (base, 13 cfs).--Dec. 1 (1030) 17 cfs (1.72 ft); Mar. 16 (0600) 28 cfs (2.09 ft).

16-5995. Opana tunnel at Kailiili

Location.--Lat 20°51'04", long 156°16'17", on left bank at tunnel outlet, 0.3 mile north of Kailiili, and 2.7 miles east of Makawao.

Records available.--May 1965 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (from topographic map).

Extremes.--1965-68: Maximum daily discharge, 11 cfs for many days 1966-68; minimum daily, 0.23 cfs Oct. 5, 6, 1965.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	6.8	11	3.3	1.4	1.0	7.5	7.6	1.6	0.94	2.8	4.1
2	1.5	10	10	3.1	1.4	1.0	9.5	7.0	1.6	.86	2.0	3.4
3	1.3	11	10	7.3	1.3	9.0	11	6.5	1.4	.79	2.5	1.8
4	1.1	9.6	10	9.2	1.4	8.1	11	6.0	1.4	1.0	3.0	1.4
5	.94	8.8	9.2	9.6	1.4	6.2	9.6	5.7	1.4	1.3	2.2	1.2
6	.80	6.8	8.8	7.3	1.2	3.7	8.8	5.4	1.3	.86	1.8	1.4
7	.58	6.0	8.2	5.5	1.4	2.9	8.4	5.2	1.3	.72	1.6	4.6
8	.42	7.2	8.1	4.5	1.4	2.4	9.0	4.9	1.3	.65	1.4	5.1
9	.37	8.8	7.9	3.9	1.8	2.2	11	4.5	1.4	.58	1.4	2.6
10	.47	10	9.6	3.7	1.4	2.3	11	6.4	1.3	.52	1.6	1.8
11	.52	11	9.2	3.3	1.1	2.9	9.6	5.6	1.2	.86	1.4	1.6
12	.42	11	9.4	3.1	1.0	3.2	8.8	5.0	1.1	1.0	2.2	1.4
13	1.2	10	9.8	3.0	1.0	3.0	7.7	4.5	1.2	.72	2.0	1.4
14	1.4	8.2	9.6	2.9	.94	5.8	7.0	4.2	1.8	.86	1.8	1.3
15	.72	6.2	8.4	2.6	.94	11	6.6	3.9	1.4	.65	1.4	1.4
16	.42	5.2	7.9	2.6	2.2	11	9.0	3.8	2.4	.58	1.4	1.3
17	.42	4.4	7.2	2.9	11	8.6	10	3.6	3.8	.52	1.4	1.2
18	.42	3.9	6.5	2.6	7.9	7.5	11	3.3	3.7	.79	1.4	1.2
19	.37	4.6	6.5	4.3	3.8	9.2	11	3.6	2.4	1.4	1.3	1.1
20	1.3	4.2	5.8	3.3	2.4	8.8	11	3.4	2.0	1.6	1.3	1.2
21	1.5	3.6	5.2	2.4	6.1	7.9	10	3.0	1.4	1.6	1.2	1.2
22	1.5	7.1	4.9	2.2	5.7	7.2	9.0	2.8	1.2	1.6	1.1	1.2
23	1.1	8.1	4.5	2.0	3.0	7.5	10	2.5	1.0	4.8	1.0	1.2
24	.80	7.9	4.1	2.0	2.2	9.0	9.6	2.3	.94	2.9	1.0	5.4
25	.72	8.2	3.9	1.8	1.8	7.5	9.0	2.2	1.1	2.0	1.4	3.6
26	2.4	11	3.7	1.8	1.6	7.2	8.6	2.0	4.4	1.8	1.3	2.9
27	1.9	9.8	3.4	2.0	1.4	7.0	9.0	2.2	2.6	1.6	1.2	1.8
28	1.4	9.2	3.2	3.2	1.2	6.8	9.4	2.0	1.8	1.4	1.1	1.6
29	1.1	9.6	3.9	2.2	1.1	8.2	9.0	2.0	1.3	1.6	1.3	1.4
30	1.5	11	3.3	1.8	------	11	8.4	1.8	1.0	5.6	1.0	1.4
31	6.0	------	4.0	1.6	------	9.8	------	1.8	------	4.6	1.0	------
TOTAL	36.19	239.2	217.2	111.0	70.48	198.9	280.5	124.7	51.74	46.70	48.5	62.2
MEAN	1.17	7.97	7.01	3.58	2.43	6.42	9.35	4.02	1.72	1.51	1.56	2.07
MAX	6.0	11	11	9.6	11	11	11	7.6	4.4	5.6	3.0	5.4
MIN	0.37	3.6	3.2	1.6	0.94	1.0	6.6	1.8	0.94	0.52	1.0	1.1
AC-FT	72	474	431	220	140	395	556	247	103	93	96	123

CAL YR 1967: TOTAL 1,445.04 MEAN 3.96 MAX 11 MIN 0.37 AC-FT 2,870
WAT YR 1968: TOTAL 1,487.31 MEAN 4.06 MAX 11 MIN 0.37 AC-FT 2,950

Note.--No gage-height record Oct. 18 to Nov. 17, Mar. 26 to May 15.

16-6024. Awalau Gulch at Kaililli

Location.--Lat 20°51'11", long 156°16'25", on left bank 150 ft downstream from Left Fork, 0.4 mile north of Kaililli, and 2.6 miles east of Makawao.

Drainage area.--0.23 sq mi.

Records available.--February 1965 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,260 ft (from topographic map).

Extremes.--Maximum discharge during year, 116 cfs Mar. 16 (gage height, 1.48 ft), from rating curve extended above 26 cfs on basis of slope-area measurement at gage height 3.00 ft made in November 1968; minimum, 0.08 cfs on several days.
1965-68: Maximum discharge, 253 cfs Apr. 5, 1965 (gage height, 2.34 ft), from rating curve extended above 26 cfs as explained above; minimum, 0.07 cfs Dec. 4-6, 1966.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.94	5.0	8.4	3.6	1.4	0.44	7.4	6.0	1.5	0.34	2.3	3.3
2	.65	9.6	8.4	3.6	1.3	.49	9.6	6.6	1.4	.31	1.4	2.5
3	.53	9.6	6.6	7.4	1.2	6.9	11	6.6	1.3	.28	2.1	1.1
4	.30	8.4	7.4	14	1.2	8.4	11	6.0	1.2	1.0	2.7	.56
5	.10	8.4	7.4	12	1.2	6.0	9.6	6.0	1.1	.76	1.9	.37
6	.13	6.0	7.4	9.6	.94	3.9	9.6	5.5	1.0	.51	1.3	.81
7	.21	6.0	7.4	6.0	1.2	2.9	9.6	5.5	1.0	.31	.88	5.4
8	.14	7.4	8.4	3.9	1.2	2.5	9.6	5.5	1.1	.50	.82	5.5
9	.16	8.4	9.6	3.6	1.8	1.9	11	5.5	1.1	.36	.76	2.3
10	.13	9.6	13	3.6	.94	2.2	8.4	6.6	1.2	.42	1.0	1.3
11	.28	9.6	14	3.9	.82	2.9	7.4	6.0	.88	.58	.82	.94
12	.21	9.6	13	3.6	.61	3.6	7.4	5.5	.82	.56	1.9	.70
13	.99	9.6	13	3.4	.60	3.4	7.4	5.5	.72	.33	1.5	.54
14	.82	6.6	13	3.1	.60	6.0	7.4	5.0	1.9	.55	1.1	.54
15	.39	5.5	11	2.9	.60	12	7.4	4.6	1.3	.41	.75	.82
16	.08	5.0	9.6	2.9	2.0	16	9.6	4.3	2.3	.26	.59	.57
17	.08	5.0	6.6	3.4	7.4	8.4	7.4	3.9	3.9	.26	.52	.49
18	.08	3.9	6.0	2.9	8.4	9.6	6.6	3.6	3.6	.28	.62	.40
19	.18	4.3	6.6	3.9	3.9	11	7.4	4.3	2.0	1.2	.56	.36
20	1.3	3.9	6.0	3.1	2.2	9.6	7.4	3.9	1.6	1.2	.46	.35
21	1.5	3.6	5.5	2.7	3.6	9.6	6.6	3.6	.88	1.2	.43	.34
22	1.5	5.5	5.0	2.0	5.5	9.6	6.0	3.1	.56	1.1	.25	.30
23	.88	6.0	4.3	2.0	3.1	9.6	6.6	2.9	.40	4.3	.25	.39
24	.56	6.0	3.9	1.9	2.0	9.6	6.0	2.7	.48	2.3	.30	4.4
25	.48	6.0	3.6	1.9	1.8	9.6	6.0	2.5	.44	1.4	.65	3.1
26	2.2	7.4	3.4	1.6	1.3	9.6	6.0	2.3	4.0	1.2	.51	2.5
27	1.7	6.0	3.4	2.0	1.0	8.4	6.6	2.5	2.7	1.0	.32	1.2
28	.31	6.0	3.4	3.6	.76	8.4	6.6	2.0	1.3	.82	.35	.65
29	.10	6.0	3.6	2.2	.56	9.6	6.6	1.9	.69	.82	.44	.58
30	.19	6.6	3.4	1.8	------	11	6.0	1.8	.56	7.7	.41	.45
31	9.0	------	3.6	1.5	------	9.6	------	1.6	------	4.6	.75	------
TOTAL	26.12	200.5	225.9	123.6	59.13	222.73	235.2	133.3	42.93	36.86	28.64	42.76
MEAN	0.843	6.68	7.29	3.99	2.04	7.18	7.84	4.30	1.43	1.19	0.924	1.43
MAX	9.0	9.6	14	14	8.4	16	11	6.6	4.0	7.7	2.7	5.5
MIN	0.08	3.6	3.4	1.5	0.56	0.44	6.0	1.6	0.40	0.26	0.25	0.30
AC-FT	52	398	448	245	117	442	467	264	85	73	57	85

CAL YR 1967: TOTAL 1,316.39 MEAN 3.61 MAX 17 MIN 0.08 AC-FT 2,610
WAT YR 1968: TOTAL 1,377.67 MEAN 3.76 MAX 16 MIN 0.08 AC-FT 2,730

PEAK DISCHARGE (BASE, 34 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
12- 1	1030	1.07	46	4-16	1630	1.10	51
3-16	0700	1.48	116				

16-6180. Kahakuloa Stream near Honokohau

Location.--Lat 20°58'54", long 156°33'26", 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.

Records available.--July 1939 to August 1943, September 1947 to September 1968. 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).

Extremes.--Maximum discharge during year, 1,350 cfs Mar. 27 (gage height, 6.34 ft), from rating curve extended above 510 cfs on basis of slope-area measurements at gage heights 6.70 and 8.48 ft; minimum, 5.3 cfs Oct. 17-19.

1939-43, 1947-68: 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 on model of station site; minimum, 3.02 cfs Feb. 9-11, 1954.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	136	52	6.9	6.2	5.9	13	13	7.7	7.3	11	11
2	7.1	134	22	6.9	6.2	5.9	35	11	7.7	7.1	7.7	7.8
3	6.2	42	21	27	6.0	104	42	10	7.7	6.9	9.2	6.2
4	6.0	12	29	22	5.9	82	20	9.8	7.5	7.1	22	5.9
5	5.8	8.4	33	18	5.9	56	19	10	7.5	6.9	8.4	5.9
6	5.8	7.3	10	10	5.9	10	13	9.2	7.5	6.6	7.3	10
7	5.8	6.9	10	7.5	6.0	8.0	14	9.0	7.3	6.6	6.9	8.2
8	5.8	7.3	8.0	6.9	6.2	7.3	26	9.0	7.5	6.6	6.6	6.0
9	5.7	11	11	6.6	5.9	7.1	22	9.2	7.3	6.4	6.4	5.9
10	5.7	7.3	138	6.2	5.9	23	43	21	7.3	6.6	6.4	5.7
11	5.8	11	32	6.2	5.7	74	14	13	7.5	7.1	9.8	5.5
12	5.8	9.2	17	6.0	5.7	45	11	9.8	8.0	6.6	20	5.5
13	6.9	7.7	28	5.9	5.7	93	21	13	7.5	6.4	8.7	5.7
14	5.8	6.4	20	5.9	5.7	107	18	10	7.7	8.2	11	5.5
15	5.7	6.0	12	5.9	7.3	74	108	9.2	7.5	7.5	7.3	5.5
16	5.5	8.6	9.2	13	25	215	22	9.5	9.0	6.4	6.9	5.5
17	5.3	8.0	8.2	19	71	29	89	11	11	7.7	6.6	5.4
18	5.3	6.4	9.2	7.3	12	16	48	9.0	11	6.9	6.4	5.4
19	5.5	6.2	9.8	9.1	7.1	120	86	9.0	23	6.2	6.2	5.4
20	6.0	10	18	14	6.4	44	38	9.2	9.2	6.2	6.2	5.4
21	5.7	6.6	11	7.5	74	15	39	9.0	7.7	6.2	6.4	5.4
22	6.8	15	8.2	6.4	11	42	17	8.4	7.5	6.2	6.2	5.4
23	7.4	9.7	7.5	6.2	7.5	84	15	8.2	8.0	42	6.0	5.9
24	33	69	7.3	6.2	6.9	71	15	8.2	7.7	8.2	5.9	20
25	6.4	31	9.0	6.0	7.7	49	12	11	7.3	24	5.9	9.9
26	6.8	34	7.1	6.0	8.0	27	23	10	21	11	5.9	9.0
27	5.8	13	6.9	24	6.4	127	16	18	8.2	7.3	5.9	6.2
28	5.8	12	6.6	11	6.0	73	15	9.8	7.7	6.9	5.9	5.7
29	5.7	9.0	8.7	7.1	5.9	52	26	8.4	7.3	6.9	7.8	7.3
30	8.7	13	7.1	6.4	------	55	17	8.0	7.5	37	6.6	6.0
31	36	------	7.1	6.2	------	19	------	8.0	------	15	14	------
TOTAL	245.8	664.0	583.9	303.3	345.1	1740.2	897	320.9	266.3	308.0	257.5	208.2
MEAN	7.93	22.1	18.8	9.78	11.9	56.1	29.9	10.4	8.88	9.94	8.31	6.94
MAX	36	136	138	27	74	215	108	21	23	42	22	20
MIN	5.3	6.0	6.6	5.9	5.7	5.9	11	8.0	7.3	6.2	5.9	5.4
AC-FT	488	1320	1160	602	684	3450	1780	636	528	611	511	413

CAL YR 1967: TOTAL 5,933.1 MEAN 16.3 MAX 206 MIN 5.3 AC-FT 11,770
WAT YR 1968: TOTAL 6,140.2 MEAN 16.8 MAX 215 MIN 5.3 AC-FT 12,180

PEAK DISCHARGE (BASE, 500 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 1	1800	5.39	614	3-27	2100	6.34	1,350
3-16	0600	5.99	1,060	4-17	1430	5.23	522

16-6200. Honokohau Stream near Honokohau

Location.--Lat 20°57'48", long 156°35'22", 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.

Records available.--September, November and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to September 1968. 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, staff gage at site just below Honokohau ditch intake at different datum.

Extremes.--Maximum discharge during year, 3,550 cfs Mar. 16 (gage height, 8.23 ft), from rating curve extended above 180 cfs as explained below; minimum, 12 cfs on several days in September.
1911, 1913-20, 1922-68: Maximum discharge, 3,740 cfs Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft), from rating curve extended above 180 cfs by logarithmic plotting; minimum, 8.4 cfs May 1, 1945, Jan. 5, 1946.

Remarks.--Records good except those for period of no gage-height record and those above 400 cfs, which are fair. No diversion above station. All medium and low flow, together with the inflow from 2 development tunnels below station, is diverted into Honokohau ditch.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	169	201	17	14	13	19	38	21	18	62	21
2	16	171	47	19	14	13	39	33	20	17	18	13
3	15	100	100	80	13	118	115	27	20	17	19	13
4	14	28	83	119	13	160	44	25	20	17	25	13
5	14	17	59	43	13	91	28	30	20	17	20	12
6	14	15	22	18	13	18	71	24	20	17	17	52
7	14	15	31	16	18	16	59	24	21	17	16	24
8	13	19	17	15	15	15	48	24	25	17	15	44
9	13	34	22	14	13	14	32	24	22	17	15	17
10	13	20	124	14	13	52	59	47	24	17	21	15
11	15	47	34	14	13	119	35	27	28	23	33	13
12	36	29	25	14	13	98	20	24	22	19	75	13
13	18	18	42	14	13	248	19	24	67	19	22	13
14	14	14	46	14	13	126	20	23	26	33	29	12
15	13	13	20	13	37	133	180	22	21	20	16	13
16	13	14	17	23	52	420	40	23	27	17	14	13
17	13	14	16	51	126	65	56	24	36	29	14	13
18	16	26	23	21	23	24	125	22	30	18	30	12
19	15	21	25	29	15	65	224	22	41	18	16	13
20	28	49	38	53	14	63	41	22	22	18	22	15
21	22	20	18	17	166	22	42	25	19	18	22	14
22	27	32	16	15	19	25	28	22	20	17	15	12
23	16	22	15	15	16	115	56	22	25	85	14	15
24	28	155	20	15	14	134	69	21	22	18	13	43
25	14	36	33	14	42	80	68	29	30	35	14	33
26	22	43	16	14	18	31	109	24	70	19	13	22
27	14	38	15	33	14	35	58	38	20	16	13	13
28	14	33	15	22	13	54	86	23	19	18	13	12
29	13	25	18	16	13	155	81	22	18	20	21	12
30	25	44	15	14	------	99	73	21	18	89	15	12
31	46	------	28	14	------	28	------	21	------	92	37	------
TOTAL	564	1281	1201	790	773	2649	1944	797	794	812	689	542
MEAN	18.1	42.7	38.7	25.5	26.7	85.5	64.8	25.7	26.5	26.2	22.2	18.1
MAX	46	171	201	119	166	420	224	47	70	92	75	52
MIN	13	13	15	13	13	13	19	21	18	16	13	12
AC-FT	1120	2540	2380	1570	1530	5250	3860	1580	1570	1610	1370	1080

CAL YR 1967: TOTAL 12,879 MEAN 35.3 MAX 303 MIN 12 AC-FT 25,550
WAT YR 1968: TOTAL 12,836 MEAN 35.2 MAX 420 MIN 12 AC-FT 25,460

PEAK DISCHARGE (BASE, 1,100 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1930	6.43	1,820	3-16	0530	8.23	3,550
2-21	0800	5.47	1,150				

Note.--No gage-height record Mar. 17 to Apr. 16.

16-6385. Kahoma Stream at Lahaina

Location.--Lat 20°53'10", long 156°40'36", 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.
Records available.--October 1962 to September 1968. See also Note below.
Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).
Extremes.--Maximum discharge during year, 1,180 cfs Mar. 16 (gage height, 8.07 ft), from rating curve extended above 21 cfs as explained below; no flow most of the time.

1962-68: 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 most of the time each year.

Maximum discharge known, 7,750 cfs May 13, 1960, from slope-area measurement of peak flow at site 0.5 mile upstream.

Revisions.--Figures of maximum discharge for the water years 1966 and 1967 have been revised to 621 cfs Jan. 19, 1966 (gage height, 6.56 ft), and 1,100 cfs Mar. 17, 1967 (gage height, 7.87 ft), superseding those published in Water Resources Data for Hawaii and other Paeific Areas, Part I, for the years indicated.
Remarks.--Records fair. 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. Continuous records of rainfall are obtained at station.
Revisions.--Some figures of peak discharge for water years 1966 and 1967 have been revised as shown in the following table. They supersede figures published in Water Resources Data for Hawaii and other Pacific Areas, Part 1, for those years.

Revised peak discharge.--1965-66: Nov. 20 (0900) 476 cfs (6.12 ft); Dec. 6 (2130) 470 cfs (6.10 ft); Jan. 19 (2200) 621 cfs (6.56 ft).

1966-67: Oct. 16 (1400) 405 cfs (5.90 ft); Nov. 4 (1700) 390 cfs (5.85 ft); Jan. 12 (0100) 476 cfs (6.12 ft); Feb. 10 (1430) 666 cfs (6.69 ft); Mar. 17 (1630) 1,100 cfs (7.87 ft); Mar. 24 (0130) 694 cfs (6.77 ft); Apr. 5 (1030) 435 cfs (6.00 ft); Apr. 24 (1700) 491 cfs (6.17 ft); July 7 (2030) 360 cfs (5.75 ft); July 21 (2330) 363 cfs (5.76 ft).

Note.--Published records for 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	34	0	0	0	0		0	0	1.2	0.02
2	0	.92	7.5	0	0	0	0		0	0	0	0
3	0	5.2	65	9.9	0	0	.41		0	0	0	0
4	0	1.4	48	52	0	2.7	1.6		0	0	0	0
5	0	.02	.25	6.3	0	.15	0		.56	.06	0	0
6	0	.04	.07	.02	.07	0	72		0	0	0	0
7	0	.22	.05	0	0	.08	16		0	0	0	0
8	0	0	.09	0	0	0	1.1		1.1	0	0	0
9	.01	3.7	0	0	0	0	0		.53	1.1	0	0
10	0	5.0	13	0	0	0	1.6		1.8	0	0	0
11	0	79	1.6	0	0	0	1.3		0	0	0	0
12	0	4.0	.07	0	0	4.7	0		0	0	.02	0
13	0	.10	0	0	0	.69	0		0	0	0	0
14	0	.06	0	0	0	6.3	0		1.1	0	0	0
15	0	.05	0	0	0	23	0		0	0	0	0
16	0	.19	0	0	10	124	0		0	.17	0	0
17	0	.03	0	6.0	37	16	0		0	0	0	0
18	0	0	0	.16	.59	.36	4.5		0	0	0	0
19	0	0	0	1.2	0	.01	64		.02	0	0	0
20	0	0	5.9	18	0	0	2.1		0	0	0	0
21	0	.48	.09	.14	77	0	1.5		0	0	0	0
22	0	.33	0	0	2.4	0	.54		0	0	0	0
23	.22	.68	0	0	.03	0	42		0	4.1	0	0
24	0	31	0	0	0	0	5.8		0	0	0	0
25	0	2.2	.09	0	15	0	6.5		0	0	0	.06
26	0	1.7	0	0	.92	0	.43		.50	0	0	.05
27	0	1.7	0	0	.24	.22	110		0	0	0	0
28	0	1.1	0	0	.95	0	9.0		0	0	0	0
29	0	1.2	0	0	2.0	.20	1.2		0	0	0	0
30	0	1.2	0	0	------	26	.10		0	10	0	0
31	0	------	3.5	0	------	2.4	------		------	39	0	------
TOTAL	0.23	141.52	179.21	93.72	146.20	206.81	341.68	0	5.61	54.43	1.22	0.13
MEAN	0.007	4.72	5.78	3.02	5.04	6.67	11.4	0	0.187	1.76	0.039	0.004
MAX	0.22	79	65	52	77	124	110	0	1.8	39	1.2	0.06
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0.5	281	355	186	290	410	678	0	11	108	2.4	0.3

CAL YR 1967: TOTAL 1,443.09 MEAN 3.95 MAX 134 MIN 0 AC-FT 2,860
WAT YR 1968: TOTAL 1,170.76 MEAN 3.20 MAX 124 MIN 0 AC-FT 2,320

PEAK DISCHARGE (BASE, 390 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	2000	6.26	521	3-16	0700	8.07	1,180
1- 4	1900	6.06	456	4- 6	1800	6.53	610
2-21	0830	7.17	834	4-19	1500	6.63	646

16-6462. Olowalu Stream at Olowalu

Location.--Lat 20°49'23", long 156°37'15", 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.

Records available.--May 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 790 cfs Feb. 21 (gage height, 4.48 ft), from rating curve extended above 66 cfs as explained below; no flow most of the time.
1963-68: 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 the time each year.
Discharge for flood of Nov. 2, 1961, was 743 cfs, from slope-area measurement of peak flow.

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. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		6.9	10	0	0	0.10	1.7	0.05		0		
2		20	6.0	0	0	0	0	0		0		
3		28	8.0	1.8	0	0	3.5	0		0		
4		.40	15	10	0	9.3	.52	0		0		
5		0	2.8	10	0	14	0	0		0		
6		0	0	.61	0	1.1	9.9	0		0		
7		0	0	0	4.9	0	5.6	0		0		
8		0	0	0	.30	0	1.7	0		0		
9		0	16	0	0	0	0	0		0		
10		0	31	0	0	0	12	1.6		0		
11		0	13	0	0	3.3	13	.70		0		
12		0	3.0	0	0	15	11	0		0		
13		0	.45	0	0	18	5.0	0		0		
14		0	2.6	0	0	27	1.4	0		0		
15		0	.08	0	.33	18	.24	0		0		
16		0	0	0	10	64	0	0		0		
17		0	0	19	31	28	.32	0		0		
18		0	4.5	6.9	15	8.1	2.3	0		0		
19		0	7.6	13	3.5	2.0	42	0		0		
20		0	62	50	.45	.34	17	0		0		
21		0	21	16	135	0	7.6	0		0		
22		0	5.1	6.3	31	0	1.2	0		0		
23		0	1.4	3.8	12	3.3	0	0		0		
24		24	.16	4.0	6.6	9.4	.06	0		0		
25		16	9.3	3.0	37	5.6	.27	0		0		
26		.41	.83	2.2	21	1.0	1.5	0		0		
27		0	0	7.2	8.6	0	3.4	0		0		
28		0	0	8.3	4.0	0	7.9	0		0		
29		0	0	5.8	1.4	8.9	3.0	0		0		
30		0	0	4.0	------	18	1.8	0		.50		
31		------	0	.92	------	10	------	0	------	0		------
TOTAL	0	95.71	219.82	172.83	322.08	264.44	153.91	2.35	0	0.50	0	0
MEAN	0	3.19	7.09	5.58	11.1	8.53	5.13	0.076	0	0.016	0	0
MAX	0	28	62	50	135	64	42	1.6	0	0.50	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	190	436	343	639	525	305	4.7	0	1.0	0	0

CAL YR 1967: TOTAL 1,973.27 MEAN 5.41 MAX 248 MIN 0 AC-FT 3,910
WAT YR 1968: TOTAL 1,231.64 MEAN 3.37 MAX 135 MIN 0 AC-FT 2,440

PEAK DISCHARGE (BASE, 340 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-24	1900	3.57	410	4-19	1430	3.49	382
2-21	0830	4.48	790				

16-6600. Kulanihakoi Gulch near Kihei

Location.--Lat 20°46'06", long 156°27'03", 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.

Records available.--October 1962 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

Extremes.--Maximum discharge during year, 592 cfs Jan. 28 (gage height, 2.40 ft), from rating curve extended above 150 cfs as explained below; no flow most of the time.
1962-68: 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 the time each year.

Remarks.--Records poor. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

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	0							
12				0	0							
13				0	0							
14				0	0							
15				0	0							
16				0	0							
17				4.7	49							
18				0	.04							
19				0	0							
20				0	0							
21				0	21							
22				0	0							
23				0	0							
24				0	0							
25				0	0							
26				0	0							
27				0	0							
28				24	0							
29				.72	0							
30				0	------							
31		------		0	------		------		------			------
TOTAL	0	0	0	29.42	70.04	0	0	0	0	0	0	0
MEAN	0	0	0	0.949	2.42	0	0	0	0	0	0	0
MAX	0	0	0	24	49	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	58	139	0	0	0	0	0	0	0

CAL YR 1967: TOTAL 525.6 MEAN 1.44 MAX 408 MIN 0 AC-FT 1,040
WAT YR 1968: TOTAL 99.46 MEAN 0.272 MAX 49 MIN 0 AC-FT 197

PEAK DISCHARGE (BASE, 62 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
1-17	0700	1.40	200	2-17	1300	1.53	246
1-28	2200	2.40	592	2-21	1600	1.52	242

16-7000. Waiakea Stream near Mountain View

Location.--Lat 19°38'30", long 155°10'28", 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.

Records available.--September 1930 to September 1968. 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.

Extremes.--Maximum discharge during year, 265 cfs Nov. 26 (gage height, 3.95 ft); minimum, 0.65 cfs Mar. 14.
1930-68: Maximum discharge, 565 cfs Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 160 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	5.1	55	6.0	3.7	1.2	16	46	7.8	9.0	11	7.5
2	3.0	19	65	5.0	3.4	1.1	17	38	7.2	8.3	9.9	7.3
3	3.3	32	58	10	16	1.2	21	31	6.7	8.1	9.4	7.0
4	2.8	22	55	30	9.3	2.0	19	28	6.3	7.7	9.3	6.5
5	2.5	19	48	20	7.0	1.3	17	25	6.0	7.3	9.0	6.1
6	2.4	20	45	18	6.0	1.0	16	22	5.6	7.1	8.5	5.8
7	2.3	20	84	17	5.4	1.0	18	19	5.7	6.9	8.9	14
8	2.2	18	61	16	5.0	.95	19	18	6.8	6.6	9.3	14
9	2.0	18	53	15	4.6	.90	17	16	6.9	6.4	9.4	12
10	2.0	20	44	14	4.4	.90	17	15	7.2	6.2	12	11
11	2.0	19	37	13	4.1	.80	16	14	6.6	6.0	13	11
12	2.8	19	31	13	3.9	.75	15	13	6.3	5.6	14	10
13	4.5	19	27	12	3.6	.70	14	12	6.2	5.7	14	9.4
14	2.5	18	23	12	3.3	.70	13	11	14	20	14	8.8
15	2.1	18	20	12	3.2	13	18	10	12	18	13	8.9
16	2.0	17	18	11	3.1	7.3	23	9.4	11	16	13	8.2
17	2.1	14	16	11	3.0	5.2	21	8.9	12	17	12	7.6
18	2.2	13	15	11	2.8	4.6	22	10	12	17	12	7.1
19	1.9	12	13	10	2.6	4.7	21	16	13	17	11	8.0
20	2.5	13	12	10	2.4	5.2	20	19	13	17	10	8.8
21	3.4	14	11	9.0	2.3	4.2	19	17	13	17	9.8	9.2
22	3.6	16	9.7	9.0	2.2	4.4	18	16	14	17	9.4	8.9
23	5.2	15	8.9	8.0	2.0	7.2	21	16	13	16	9.4	8.4
24	3.5	14	8.3	8.0	1.9	9.1	30	15	13	16	8.7	8.4
25	3.0	15	7.5	7.0	1.8	8.8	35	13	12	15	8.8	8.1
26	2.8	61	6.9	7.0	1.7	21	45	12	11	14	8.9	7.9
27	2.5	64	6.4	6.0	1.6	16	56	12	11	13	8.2	7.6
28	2.4	68	5.9	6.0	1.4	16	62	11	11	13	7.7	8.2
29	2.3	62	5.6	5.0	1.3	15	63	9.9	10	12	7.3	8.9
30	2.1	56	5.6	4.1	------	19	54	9.2	9.6	12	7.5	8.4
31	4.3	------	6.3	3.9	------	17	------	8.3	------	11	6.9	------
TOTAL	85.5	740.1	862.1	339.0	113.0	192.20	763	520.7	289.9	368.9	315.3	263.0
MEAN	2.76	24.7	27.8	10.9	3.90	6.20	25.4	16.8	9.66	11.9	10.2	8.77
MAX	5.2	68	84	30	16	21	63	46	14	20	14	14
MIN	1.9	5.1	5.6	3.9	1.3	0.70	13	8.3	5.6	5.6	6.9	5.8
AC-FT	170	1470	1710	672	224	381	1510	1030	575	732	625	522

CAL YR 1967: TOTAL 5,881.2 MEAN 16.1 MAX 84 MIN 1.9 AC-FT 11,670
WAT YR 1968: TOTAL 4,852.70 MEAN 13.3 MAX 84 MIN 0.70 AC-FT 9,630

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	1800	3.95	265	12- 6	0330	3.88	232
12- 2	0430	3.53	116	3-26	1630	3.93	255

16-7017.5. Wailuku River near Humuula

Location.--Lat 19°42'55", long 155°18'36", 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.

Records available.--February 1965 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,360 cfs Nov. 26 (gage height, 8.40 ft), from rating curve extended above 18 cfs as explained below; minimum, 0.01 cfs Oct. 8-11.
1965-68: Maximum discharge, 2,600 cfs Aug. 8, 1967 (gage height, 10.27 ft), from rating curve extended above 18 cfs by logarithmic plotting; no flow Oct. 4-6, Nov. 2, 1965.

Remarks.--Records good except those above 40 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.06	0.07	13	0.46	0.07	0.06	0.16	4.8	0.13	0.07	0.18	0.10
2	.03	.64	26	.36	.09	.05	.15	3.8	.12	.07	.12	.10
3	.03	.51	15	1.9	3.9	.06	.33	2.9	.12	.09	.09	.07
4	.02	.20	10	9.6	.76	.09	.30	1.8	.12	.10	.12	.05
5	.02	.11	7.3	3.3	.18	.09	.12	1.1	.10	.09	.24	.04
6	.03	.15	5.1	2.1	.13	.05	.16	.76	.09	.06	.13	.04
7	.02	1.8	46	.52	.09	.04	.22	.70	.15	.05	.15	.18
8	.01	.56	9.3	.30	.07	.04	.22	.64	.24	.05	.12	.33
9	.01	1.0	6.6	.24	.07	.04	.15	.58	.18	.05	.12	.16
10	.01	1.0	8.5	.22	.06	.07	.27	.46	.20	.05	.13	.13
11	.01	.38	4.8	.20	.06	.07	.36	.40	.18	.05	.18	.09
12	.02	.22	3.3	.20	.05	.05	.20	.52	.16	.06	.30	.06
13	.20	.15	2.3	.18	.05	.05	.15	.46	.20	.09	.20	.05
14	.08	.12	1.7	.16	.05	.05	.13	.40	18	14	.58	.05
15	.05	.09	1.1	.15	.05	.61	1.1	.33	1.7	1.3	.18	.13
16	.04	.08	.76	.15	.06	.18	2.1	.30	.33	.30	.12	.16
17	.04	.10	.64	.16	.06	.13	1.3	.27	.40	.22	.09	.06
18	.08	.08	.58	.16	.07	.13	.70	.27	.82	.27	.10	.05
19	.05	.08	.46	.16	.09	.09	.64	.46	.58	.27	.07	.05
20	.07	.56	.40	.15	.07	.07	.27	4.6	.46	.40	.07	1.1
21	.41	.60	.40	.13	.09	.06	.20	.64	.22	.24	.06	.88
22	.20	2.6	.36	.12	.09	.05	.18	.30	.24	.18	.07	.16
23	.16	.64	.33	.12	.07	.76	6.5	.24	.18	.15	.13	.09
24	.18	.24	.30	.12	.07	.70	71	.22	.15	.12	.07	.12
25	.10	.18	.27	.15	.06	1.3	30	.22	.12	.10	.09	.29
26	.07	479	.24	.13	.06	1.0	14	.20	.12	.10	.09	.30
27	.06	58	.24	.15	.06	.27	16	.18	.15	.09	.07	.18
28	.05	36	.24	.22	.06	.27	15	.16	.13	.13	.06	.13
29	.04	27	.27	.13	.06	.27	13	.15	.10	.15	.07	.22
30	.03	15	.99	.10	------	.30	6.6	.15	.09	.22	.15	1.6
31	.03	------	1.8	.09	------	.22	------	.15	------	.40	.12	------
TOTAL	2.21	627.16	168.28	22.13	6.65	7.22	181.51	28.16	25.78	19.52	4.27	6.97
MEAN	0.071	20.9	5.43	0.714	0.229	0.233	6.05	0.908	0.859	0.630	0.138	0.232
MAX	0.41	479	46	9.6	3.9	1.3	71	4.8	18	14	0.58	1.6
MIN	0.01	0.07	0.24	0.09	0.05	0.04	0.12	0.15	0.09	0.05	0.06	0.04
AC-FT	4.4	1240	334	44	13	14	360	56	51	39	8.5	14

CAL YR 1967: TOTAL 2,016.39 MEAN 5.52 MAX 479 MIN 0.01 AC-FT 4,000
WAT YR 1968: TOTAL 1,099.86 MEAN 3.00 MAX 479 MIN 0.01 AC-FT 2,180

Peak discharge (base, 310 cfs).--Nov. 26 (1900) 1,360 cfs (8.40 ft).

16-7018. Wailuku River near Kaumana

Location.--Lat 19°43'15", long 155°16'08", on right bank 0.2 mile upstream from Waipahochoe Gulch and 8.4 miles west of Kaumana.

Drainage area.--43.4 sq mi.

Records available.--October 1966 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 3,520 ft (from topographic map).

Extremes.--Maximum discharge during year, 7,320 cfs Nov. 26 (gage height, 11.85 ft), from rating curve extended above 2,200 cfs as explained below; minimum, 0.24 cfs Oct. 10.
1966-68: Maximum discharge, 9,580 cfs Aug. 8, 1967 (gage height, 13.35 ft), from rating curve extended above 2,200 cfs by logarithmic plotting; minimum, 0.24 cfs Oct. 10, 1967.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.87	0.93	124	6.3	0.87	0.45	1.7	28	1.1	1.3	3.0	1.3
2	.57	13	289	4.0	.99	.42	2.2	23	1.0	1.1	2.0	1.7
3	.45	8.4	150	19	92	.48	8.6	19	.99	1.5	1.6	1.3
4	.39	2.3	102	120	11	.90	2.2	14	.93	1.4	2.2	1.0
5	.33	1.3	48	24	2.8	.87	1.4	12	.84	1.3	5.2	.90
6	.33	2.2	34	17	1.9	.60	6.8	9.2	.75	1.0	2.2	.90
7	.33	19	490	8.8	1.4	.42	9.2	7.4	1.4	.96	4.3	3.4
8	.30	5.5	70	6.6	1.3	.45	5.2	7.4	4.9	.90	2.1	3.5
9	.26	12	40	5.5	1.2	.42	2.2	5.4	2.5	.84	2.0	1.4
10	.24	13	70	4.6	1.1	.69	6.7	4.7	3.8	.84	3.1	1.4
11	.26	5.5	28	3.8	1.0	.57	5.5	4.0	2.4	.99	3.8	1.1
12	.39	4.1	19	3.3	.96	.45	2.3	4.0	1.5	.90	6.3	1.1
13	2.6	2.8	15	2.7	.90	.42	1.6	4.1	2.2	1.1	4.0	.90
14	.78	2.5	12	2.3	.90	.42	1.5	2.8	223	317	11	.81
15	.48	2.0	9.7	2.1	.84	19	30	2.6	15	19	4.7	1.7
16	.36	1.9	7.8	1.7	.75	2.6	31	2.1	6.6	7.4	2.7	2.2
17	.45	1.9	6.5	1.7	.75	1.3	15	1.8	11	5.5	2.5	.99
18	1.3	1.5	5.4	1.6	.78	2.2	9.9	1.6	15	8.5	3.1	.78
19	.63	1.4	4.9	1.5	.93	1.1	9.9	5.9	13	6.1	2.2	.78
20	.63	8.8	4.1	1.3	.72	.84	7.6	61	9.2	8.8	1.6	8.5
21	5.5	11	3.7	1.1	.81	.69	4.4	7.2	5.5	5.4	1.5	10
22	2.5	28	3.0	1.0	1.1	.66	4.6	4.1	6.3	4.0	1.7	1.6
23	1.7	8.3	2.5	.99	.87	13	85	3.1	4.4	3.4	5.4	1.1
24	1.0	5.1	2.1	.96	.75	12	569	2.5	4.1	2.7	1.7	1.6
25	.72	4.1	1.7	1.4	.63	18	320	2.7	3.1	2.5	1.8	3.3
26	.57	2.7	90	1.6	1.2	.60	12	149	3.5	2.7	2.2	1.5	3.8
27	.54	5	38	1.4	1.1	.60	4.1	166	2.1	3.3	1.7	1.3	1.7
28	.54	3	12	1.4	2.8	.54	3.3	164	1.7	2.4	3.3	1.1	1.9
29	.54	2	41	1.6	1.3	.51	2.5	138	1.6	1.7	3.1	1.2	8.5
30	.48	1	16	20	.93	------	4.9	47	1.4	1.4	9.8	2.6	31
31	.60	------		33	.78	------	3.0	------	1.3	------	9.6	1.6	------
TOTAL	26.64	4	163.53	1601.4	251.36	129.50	108.75	1807.5	251.2	352.01	434.13	91.0	100.16
MEAN	0.859		139	51.7	8.11	4.47	3.51	60.2	8.10	11.7	14.0	2.94	3.34
MAX	5.5	2	790	490	120	92	19	569	61	223	317	11	31
MIN	0.24		0.93	1.4	0.78	0.51	0.42	1.4	1.3	0.75	0.84	1.1	0.78
AC-FT	53	8	260	3180	499	257	216	3590	498	698	861	180	199

CAL YR 1967: TOTAL 13,867.43 MEAN 38.0 MAX 2,790 MIN 0.24 AC-FT 27,510
WAT YR 1968: TOTAL 9,317.18 MEAN 25.5 MAX 2,790 MIN 0.24 AC-FT 18,480

Peak discharge (base, 1,500 cfs).--Nov. 26 (1930) 7,320 cfs (11.85 ft); Apr. 24 (1300) 1,680 cfs (6.51 ft).

16-7040. Wailuku River at Piihonua

Location.--Lat 19°42'58", long 155°09'13", 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.

Records available.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to September 1968. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

Gage.--Digital water-stage recorder. Altitude of gage is 1,070 ft (from topographic map). Prior to Apr. 28, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 37,200 cfs Nov. 26 (gage height, 21.95 ft), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 5.4 cfs Oct. 7.
1928-68: 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	53	1,140	146	13	9.4	121	539	27	48	74	180
2	18	594	2,850	99	26	9.2	98	482	24	41	53	107
3	13	850	1,620	519	1,150	9.0	388	364	23	164	44	76
4	11	348	1,120	1,290	239	18	157	265	22	69	50	53
5	9.5	186	685	594	109	17	104	201	19	47	132	42
6	8.5	209	750	360	70	11	192	163	17	36	62	36
7	7.0	600	5,520	214	53	9.4	211	134	20	31	176	100
8	6.3	200	1,240	152	40	9.3	213	115	54	28	86	80
9	5.9	300	709	117	33	9.1	111	97	80	26	105	51
10	5.6	400	726	94	28	10	151	85	111	24	152	47
11	5.6	200	488	77	25	11	148	73	76	26	164	43
12	8.1	170	353	65	22	9.3	89	65	42	25	205	52
13	167	140	262	56	20	9.1	68	64	70	25	158	36
14	33	120	207	52	17	9.0	60	53	1,290	2,880	345	32
15	20	100	172	45	16	676	618	46	272	569	148	62
16	15	90	144	38	15	102	997	42	138	267	104	55
17	14	114	120	34	14	56	479	37	180	197	90	33
18	31	83	103	32	13	50	597	37	313	193	118	28
19	19	61	95	30	14	42	380	133	345	164	90	28
20	21	220	82	27	13	36	222	864	222	208	69	79
21	85	345	71	24	12	27	151	200	133	156	57	116
22	64	821	62	23	13	23	130	124	160	124	72	41
23	209	330	54	21	13	223	846	90	109	103	284	32
24	82	750	48	19	19	263	4,200	70	105	80	90	54
25	43	351	43	19	13	211	2,600	58	80	69	102	54
26	31	14,500	38	22	11	415	1,890	56	68	63	79	79
27	26	3,980	34	20	10	206	1,770	49	106	52	61	57
28	24	2,460	32	32	10	283	1,810	43	138	57	49	86
29	25	1,980	31	25	9.8	150	1,720	36	74	77	45	122
30	20	1,090	96	18	------	272	781	33	57	111	87	269
31	22	------	427	15	------	178	------	30	------	178	59	------
TOTAL	1,077.5	31,645	19,322	4,279	2,040.8	3,362.8	21,302	4,648	4,375	6,138	3,410	2,130
MEAN	34.8	1,055	623	138	70.4	108	710	150	146	198	110	71.0
MAX	209	14,500	5,520	1,290	1,150	676	4,200	864	1,290	2,880	345	269
MIN	5.6	53	31	15	9.8	9.0	60	30	17	24	44	28
AC-FT	2,140	62,770	38,320	8,490	4,050	6,670	42,250	9,220	8,680	12,170	6,760	4,220

CAL YR 1967 TOTAL 138,624.5 MEAN 380 MAX 14,500 MIN 5.6 AC-FT 275,000
WTR YR 1968 TOTAL 103,730.1 MEAN 283 MAX 14,500 MIN 5.6 AC-FT 205,700

PEAK DISCHARGE (BASE, 8,700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	1945	21.95	37,200	4-24	1300	16.52	13,300
12- 7	0415	16.15	12,200				

16-7170. Honolii Stream near Papaikou

(Hydrologic bench-mark station)

Location.--Lat 19°46'00", long 155°09'16", 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.

Records available.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 1,540 ft (from topographic map). Prior to Aug. 27, 1911, staff gage and Aug. 27, 1911, to Mar. 24, 1913, graphic water-stage recorder, at site 0.5 mile upstream at different datum.

Extremes.--Maximum discharge during year, 7,070 cfs Nov. 26 (gage height, 14.57 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum, 6.5 cfs Mar. 2, 3.
1911-13, 1967-68: Maximum discharge, 9,450 cfs Aug. 3, 1967 (gage height, 16.95 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	73	424	68	10	7.2	56	108	16	23	34	129
2	16	737	1,270	69	15	6.9	59	131	15	20	30	54
3	13	722	445	370	200	11	213	91	14	29	26	51
4	11	181	353	565	50	48	82	59	14	28	31	33
5	9.9	74	137	187	30	27	44	48	13	21	75	27
6	9.1	131	260	73	25	18	97	42	12	18	36	24
7	8.4	276	1,830	43	22	13	121	36	13	16	88	98
8	8.2	103	190	34	20	11	100	34	33	15	40	50
9	7.9	188	82	29	18	11	50	30	77	14	42	33
10	7.3	344	128	26	17	22	61	28	80	14	96	31
11	7.6	133	89	23	16	16	60	27	48	14	95	30
12	9.7	105	64	21	15	12	38	24	32	14	112	34
13	69	57	47	19	14	10	31	24	49	15	168	24
14	24	43	39	18	13	27	37	23	710	1,290	196	23
15	16	35	35	22	12	641	398	21	100	168	60	34
16	12	31	31	17	12	64	687	20	47	49	42	34
17	12	79	28	16	11	67	184	18	102	51	49	22
18	29	40	28	15	11	50	352	21	106	69	73	19
19	18	30	31	15	12	54	104	144	180	55	41	28
20	40	114	26	15	11	52	58	480	71	75	33	58
21	133	232	25	13	10	38	47	67	42	50	29	46
22	60	330	22	12	10	31	40	37	62	46	47	28
23	119	79	19	12	15	232	572	29	39	42	146	22
24	46	205	18	11	22	245	2,610	26	44	32	38	42
25	25	156	17	11	15	142	1,240	23	33	29	52	28
26	19	4,010	16	12	11	362	625	24	30	29	39	28
27	16	857	15	11	9.7	95	620	25	50	23	31	27
28	15	867	14	20	8.8	100	658	24	65	31	26	63
29	14	529	14	15	7.9	58	647	19	32	43	24	65
30	13	220	63	12	------	268	163	18	26	89	42	80
31	38	------	197	11	------	98	------	17	------	60	39	------
TOTAL	855.1	10,981	5,957	1,785	643.4	2,837.1	10,054	1,718	2,155	2,472	1,880	1,265
MEAN	27.6	366	192	57.6	22.2	91.5	335	55.4	71.8	79.7	60.6	42.2
MAX	133	4,010	1,830	565	200	641	2,610	480	710	1,290	196	129
MIN	7.3	30	14	11	7.9	6.9	31	17	12	14	24	19
AC-FT	1,700	21,780	11,820	3,540	1,280	5,630	19,940	3,410	4,270	4,900	3,730	2,510

CAL YR 1967 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1968 TOTAL 42,602.6 MEAN 116 MAX 4,010 MIN 6.9 AC-FT 84,500

PEAK DISCHARGE (BASE, 4,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	1015	14.57	7,070	4-24	1200	14.16	6,660
12- 7	0345	12.50	5,050				

16-7176. Alia Stream near Hilo

Location.--Lat 19°50'38", long 155°06'21", 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.

Records available.--April 1962 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 489 ft above mean sea level (by stadia survey).

Extremes.--Maximum discharge during year, 282 cfs Nov. 26 (gage height, 3.77 ft); minimum, 4.7 cfs Dec. 30, 1962-68: Maximum discharge, 393 cfs Nov. 8, 1964 (gage height, 4.12 ft); minimum, 1.1 cfs sometime during period Jan. 24 to Feb. 12, 1963.

Remarks.--Records good. No diversion above station. Spring water not used by sugar mills enters stream above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	18	42	5.6	5.8	7.2	15	21	8.7	9.4	10	24
2	7.7	28	46	5.8	19	7.0	19	18	8.5	9.0	11	11
3	6.4	17	23	10	72	7.7	18	17	8.3	8.5	9.6	10
4	6.2	18	26	18	20	14	16	15	8.1	8.1	8.1	9.6
5	6.0	13	20	18	16	13	15	14	7.9	8.1	10	9.2
6	6.2	12	30	16	14	9.4	17	13	7.4	7.7	9.6	9.0
7	6.0	13	42	15	14	7.7	16	13	7.9	7.2	11	9.0
8	6.2	12	24	14	15	7.0	15	12	9.2	7.0	11	9.4
9	5.8	15	18	13	13	6.8	14	12	11	6.8	11	8.7
10	5.6	17	16	12	11	9.4	14	11	13	6.8	12	9.0
11	5.6	15	15	12	9.4	8.1	14	11	12	6.8	13	9.0
12	6.0	14	13	11	8.3	6.8	13	10	10	6.6	13	9.6
13	13	13	12	11	7.6	6.2	13	10	11	6.8	14	8.3
14	8.5	12	11	10	7.9	7.5	12	9.6	15	26	22	7.4
15	6.0	11	9.9	10	8.1	16	18	9.4	12	13	12	9.6
16	5.6	9.9	9.2	9.6	7.7	11	30	9.2	11	12	12	11
17	5.6	18	8.5	9.4	7.0	10	20	8.7	12	12	14	7.7
18	6.8	12	8.7	8.7	8.6	9.4	28	8.5	12	13	13	7.0
19	7.0	9.9	8.1	8.5	11	15	19	10	12	13	12	7.7
20	7.7	11	7.7	8.3	7.2	17	17	12	11	13	11	12
21	16	11	7.4	7.7	7.2	13	15	9.2	11	13	9.9	11
22	16	11	7.2	7.4	7.7	12	15	9.2	13	14	9.4	8.7
23	11	11	7.0	7.2	9.2	15	35	9.6	12	13	11	7.7
24	9.6	11	6.0	7.0	16	16	46	9.4	12	12	11	11
25	7.9	17	5.5	7.2	13	15	28	9.2	12	11	11	10
26	6.0	100	5.2	7.2	12	16	32	9.0	10	10	13	12
27	6.6	22	5.0	7.4	9.2	14	27	8.7	13	9.0	11	11
28	6.0	23	4.9	10	8.1	17	29	8.5	13	9.0	9.0	13
29	5.4	17	4.9	8.3	7.4	15	29	9.2	12	11	8.5	14
30	5.3	17	4.9	7.0	------	19	23	9.2	11	11	9.2	13
31	16	------	5.8	6.2	------	16	------	9.0	------	11	9.6	------
TOTAL	244.7	528.8	453.9	308.5	372.4	364.2	622	344.6	327.0	324.8	351.9	309.6
MEAN	7.89	17.6	14.6	9.95	12.8	11.7	20.7	11.1	10.9	10.5	11.4	10.3
MAX	16	100	46	18	72	19	46	21	15	26	22	24
MIN	5.3	9.9	4.9	5.6	5.8	6.2	12	8.5	7.4	6.6	8.1	7.0
AC-FT	485	1,050	900	612	739	722	1,230	684	649	644	698	614

CAL YR 1967: TOTAL 5,342.4 MEAN 14.6 MAX 100 MIN 4.9 AC-FT 10,600
WAT YR 1968: TOTAL 4,552.4 MEAN 12.4 MAX 100 MIN 4.9 AC-FT 9,030

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-17	1800	3.23	161	12- 6	2300	3.27	169
11-26	1000	3.77	282	2- 3	1500	3.44	203
12- 1	2200	3.52	220	9- 1	0045	3.31	177

16-7178. Pohakupuka Stream near Papaaloa

Location.--Lat 19°57'20", long 155°11'20", 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.

Records available.--April 1962 to September 1968.

Gage.--Digital water-stage recorder. Datum of gage is 250 ft above mean sea level (by stadia survey). Prior to Feb. 10, 1967, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 5,340 cfs Nov. 26 (gage height, 13.37 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum, 1.2 cfs Oct. 28-31.
1962-68: Maximum discharge, that of Nov. 26, 1967; 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	76	116	9.8	4.2	3.0	22	29	6.9	4.7	3.7	24
2	2.3	305	286	20	4.2	3.0	48	32	6.5	4.2	4.1	4.5
3	2.4	295	111	101	162	49	173	42	6.5	4.2	4.4	3.7
4	2.3	102	87	122	19	55	56	21	6.2	4.0	3.5	3.4
5	2.3	35	34	94	8.0	7.0	14	20	6.1	3.7	3.0	3.0
6	2.2	52	48	18	6.5	4.7	11	16	5.8	3.7	3.4	3.1
7	2.1	60	270	11	5.9	3.8	30	13	5.7	3.5	9.6	3.0
8	2.1	21	36	9.5	5.5	3.5	28	12	5.6	3.4	5.0	4.5
9	1.9	30	25	8.5	5.6	3.2	51	22	5.6	3.3	3.9	4.1
10	1.9	67	28	7.9	5.1	3.7	25	17	8.2	3.2	16	3.7
11	1.9	45	30	7.5	4.8	3.5	18	11	8.2	3.1	23	3.1
12	1.9	35	27	7.1	4.4	3.0	11	37	6.0	3.1	19	3.1
13	1.9	13	22	6.9	4.2	2.8	9.7	25	5.9	3.1	68	3.0
14	2.0	9.1	17	6.6	4.8	10	9.8	24	137	185	86	3.0
15	1.9	7.6	15	6.5	4.5	274	71	13	11	19	13	3.0
16	1.9	6.7	13	6.2	4.2	9.5	136	15	7.6	7.0	7.5	3.3
17	1.9	7.6	13	5.9	3.8	9.3	57	11	18	5.7	18	3.1
18	1.9	6.8	12	5.5	4.3	10	134	66	18	7.5	11	2.9
19	1.8	5.6	12	5.8	4.5	181	36	175	33	7.2	5.5	2.8
20	1.9	17	11	5.5	3.8	115	22	148	12	7.2	4.8	4.5
21	4.9	24	11	5.3	3.7	23	15	20	7.0	5.5	4.2	3.4
22	5.4	64	11	5.0	3.7	14	18	13	8.3	6.5	4.1	2.8
23	2.6	14	9.9	5.0	3.5	40	135	11	6.4	8.6	10	2.7
24	2.3	72	9.5	5.8	3.4	42	251	10	6.4	4.8	5.0	6.4
25	2.1	16	9.0	8.5	3.4	19	188	9.2	6.0	4.0	5.1	3.9
26	1.9	1,120	8.8	10	6.5	67	92	8.7	5.3	3.7	5.0	4.2
27	1.5	128	8.5	9.4	3.7	35	61	8.7	40	3.5	4.2	4.3
28	1.3	155	8.1	6.9	3.2	37	175	8.1	14	3.4	3.7	9.6
29	1.3	111	7.8	6.0	3.1	64	154	7.7	6.2	5.1	3.3	8.6
30	1.3	44	8.0	5.0	------	172	38	7.3	5.1	4.1	3.2	6.5
31	138	------	13	4.6	------	64	------	7.1	------	5.0	3.9	------
TOTAL	203.4	2,944.4	1,317.6	536.7	303.5	1,331.0	2,089.5	859.8	424.5	340.0	364.1	141.2
MEAN	6.56	98.1	42.5	17.3	10.5	42.9	69.7	27.7	14.2	11.0	11.7	4.71
MAX	138	1,120	286	122	162	274	251	175	137	185	86	24
MIN	1.3	5.6	7.8	4.6	3.1	2.8	9.7	7.1	5.1	3.1	3.0	2.7
AC-FT	403	5,840	2,610	1,060	602	2,640	4,140	1,710	842	674	722	280

CAL YR 1967 TOTAL 11,188.1 MEAN 30.7 MAX 1,120 MIN 1.3 AC-FT 22,190
WTR YR 1968 TOTAL 10,855.7 MEAN 29.7 MAX 1,120 MIN 1.3 AC-FT 21,530

PEAK DISCHARGE (BASE, 930 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	1000	13.37	5,340	12- 7	0430	8.08	1,610
12- 1	2045	6.60	940	7-14	0815	6.76	1,000

16-7178.2. Manowaiopae Stream near Laupahoehoe

Location.--Lat 19°58'35", long 155°14'45", 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.

Records available.--August 1965 to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to Feb. 21, 1967, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 1,890 cfs Nov. 26 (gage height, 5.43 ft), from rating curve extended above 150 cfs by logarithmic plotting; minimum, 0.44 cfs Oct. 30.
1965-68: Maximum discharge, that of Nov. 26, 1968; minimum, 0.11 cfs Oct. 13, 15, 16, 1965.

Remarks.--Records good except those above 300 cfs, which are fair. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	3.6	25	4.7	1.9	1.1	8.0	15	6.9	2.6	2.3	1.6
2	1.4	30	61	5.7	1.9	1.1	18	15	6.7	2.7	2.4	1.2
3	1.2	54	27	12	9.6	7.3	41	17	6.3	2.4	1.5	1.3
4	1.3	20	21	13	2.1	7.5	15	13	6.1	2.3	1.5	1.3
5	1.3	3.5	16	19	1.9	1.2	8.0	12	5.9	2.3	1.5	1.3
6	1.3	5.6	16	4.5	1.8	1.1	7.4	11	5.6	2.3	1.5	1.5
7	1.3	5.8	55	4.0	1.8	1.1	7.6	11	5.5	2.2	1.7	1.5
8	1.3	2.0	17	3.9	1.7	1.0	7.5	9.8	5.2	2.2	1.6	1.5
9	1.2	2.0	16	3.8	1.7	1.0	20	9.3	5.0	2.1	1.5	1.6
10	1.2	3.9	15	3.7	1.7	1.0	11	8.8	4.9	2.1	1.7	1.6
11	1.2	4.0	16	3.6	1.6	.97	8.6	8.2	4.7	2.2	1.6	1.2
12	1.2	4.0	14	3.4	1.6	.95	7.8	17	4.5	2.0	1.9	1.3
13	1.1	2.8	13	3.2	1.6	.94	7.5	9.9	4.6	2.1	14	1.4
14	1.1	2.7	12	3.1	1.5	1.3	7.6	9.1	9.7	25	11	1.5
15	1.1	2.6	11	3.0	1.5	27	9.4	7.6	4.1	2.2	1.5	1.6
16	1.1	2.7	10	3.0	1.5	1.5	15	7.3	3.9	2.0	1.3	1.5
17	1.1	2.7	9.3	3.0	1.5	1.4	15	7.1	4.1	2.2	1.3	1.4
18	1.1	2.8	8.7	2.9	1.5	1.3	35	30	3.8	2.4	1.4	1.4
19	1.0	2.8	8.1	2.8	1.4	66	13	98	3.9	2.3	1.3	1.3
20	1.0	2.9	7.7	2.7	1.4	28	10	36	3.6	2.6	1.3	.99
21	1.5	2.9	7.3	2.6	1.4	5.8	9.6	12	3.5	1.6	1.3	.98
22	2.0	3.8	6.9	2.5	1.3	4.0	10	11	3.4	1.8	1.3	.98
23	1.5	2.9	6.6	2.5	1.3	4.2	22	11	3.1	1.8	1.4	.98
24	1.2	12	6.2	2.4	1.3	7.4	29	10	3.0	1.8	1.2	1.0
25	1.0	3.5	6.0	2.3	1.3	4.3	27	10	2.9	1.9	1.2	.94
26	.80	333	5.7	2.3	1.5	16	17	9.4	2.8	1.9	1.3	.93
27	.55	24	5.3	2.4	1.2	5.2	13	8.9	3.3	1.8	1.3	.91
28	.50	21	5.0	2.2	1.2	7.0	56	8.4	3.0	2.0	1.3	.98
29	.49	20	4.9	2.1	1.1	15	38	7.8	2.7	1.9	1.5	.89
30	.48	12	4.7	2.0	------	24	17	7.5	2.6	2.2	1.5	.89
31	16	------	4.6	2.0	------	12	------	7.1	------	2.1	1.6	------
TOTAL	49.92	595.5	442.0	130.3	52.8	257.66	511.0	455.2	135.3	89.0	68.7	37.47
MEAN	1.61	19.9	14.3	4.20	1.82	8.31	17.0	14.7	4.51	2.87	2.22	1.25
MAX	16	333	61	19	9.6	66	56	98	9.7	25	14	1.6
MIN	.48	2.0	4.6	2.0	1.1	.94	7.4	7.1	2.6	1.6	1.2	.89
AC-FT	99	1,180	877	258	105	511	1,010	903	268	177	136	74

CAL YR 1967 TOTAL 2,867.92 MEAN 7.86 MAX 333 MIN .48 AC-FT 5,690
WTR YR 1968 TOTAL 2,824.85 MEAN 7.72 MAX 333 MIN .48 AC-FT 5,600

Peak discharge (base, 470 cfs).--Nov. 26 (1000) 1,890 cfs (5.43 ft); May 19 (0015) 981 cfs (4.33 ft).

16-7200. Kawainui Stream near Kamuela

Location.--Lat 20°05'18", long 155°40'58", on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 miles north of Kamuela.

Drainage area.--1.58 sq mi.

Records available.--January 1964 to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,300 cfs Apr. 20 (gage height, 7.33 ft), from rating curve extended above 53 cfs as explained below; minimum, 0.16 cfs on several days.
1964-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	36	17	0.90	0.90	0.54	11	13	0.48	1.6	2.7	3.7
2	2.2	163	62	12	.74	.26	34	14	.38	1.1	3.8	2.8
3	1.2	136	31	45	3.1	99	95	29	.32	.82	7.4	1.9
4	.90	47	53	33	2.0	78	27	6.3	3.8	.74	6.7	1.1
5	.60	34	29	7.9	1.2	15	6.5	7.0	5.5	.54	10	.74
6	.54	43	43	4.7	.82	3.0	83	2.8	3.3	.43	4.0	.60
7	.43	51	39	2.3	.65	1.9	26	1.5	1.6	.38	8.1	.60
8	.33	88	5.1	1.4	.99	1.2	15	1.1	2.8	.32	2.7	.48
9	.26	12	18	.99	.90	.90	19	.74	4.0	.32	1.4	.43
10	.16	53	44	.74	.65	.65	260	.60	15	.26	22	.33
11	.26	53	5.9	.54	.48	.54	84	.54	5.9	.32	22	.54
12	.48	17	70	.43	.38	.38	14	.74	2.4	.32	2.2	.82
13	1.6	8.1	13	.38	.32	1.1	4.3	3.1	1.6	1.9	8.6	.43
14	.90	3.3	44	.32	.43	1.3	2.8	4.9	13	40	33	.33
15	.54	2.0	5.3	.26	.32	100	15	2.3	4.3	29	5.1	20
16	.38	1.4	2.5	.21	9.9	33	13	4.3	4.3	4.3	2.5	9.0
17	.26	1.2	1.6	62	205	11	7.9	1.4	16	16	1.6	2.2
18	.38	.99	1.2	9.6	44	2.7	72	4.2	15	14	1.3	1.1
19	.43	.82	.99	43	38	70	17	120	32	13	.99	.82
20	.43	8.1	.99	4.2	1.4	50	146	87	7.2	8.3	.74	5.7
21	.54	8.3	1.1	1.8	18	15	13	7.2	4.0	6.3	.60	4.0
22	13	33	1.2	1.2	8.1	8.8	2.4	1.9	20	16	.90	1.6
23	5.5	7.6	.99	.82	2.2	36	1.9	1.2	13	12	5.9	2.2
24	1.8	3.6	.74	.60	1.1	77	22	82	17	70	2.0	12
25	1.3	2.0	.99	.99	.60	14	27	.60	12	38	1.9	8.0
26	1.3	34	1.2	42	3.5	70	16	.54	18	18	2.0	12
27	1.4	16	.82	9.9	1.5	28	12	1.2	17	1.8	1.5	4.2
28	1.2	8.1	.60	15	1.9	1.4	65	.90	19	9.3	.99	8.7
29	.99	26	1.9	5.3	.99	33	46	.65	5.7	14	2.3	19
30	.74	3.6	.82	2.0	------	116	18	.65	2.7	8.3	2.2	6.1
31	75	------	.65	1.2	------	54	------	.60	------	3.6	16	------
TOTAL	123.84	821.91	434.59	310.68	315.87	835.47	1,175.8	320.78	266.28	217.55	202.92	136.57
MEAN	3.99	27.4	14.0	10.0	10.9	27.0	39.2	10.3	8.89	7.02	6.55	4.55
MAX	75	163	62	62	205	116	260	120	32	40	33	20
MIN	0.16	0.82	0.60	0.21	0.32	0.26	1.9	0.54	0.32	0.26	0.60	0.38
AC-FT	246	1,630	862	616	627	1,660	2,330	636	528	432	402	271

CAL YR 1967: TOTAL 4,459.38 MEAN 12.2 MAX 244 MIN 0.16 AC-FT 8,850
WAT YR 1968: TOTAL 5,162.26 MEAN 14.1 MAX 260 MIN 0.16 AC-FT 10,240

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	0330	4.78	385	4- 6	1330	6.75	1,020
1-17	1330	5.16	480	4-10	1900	6.80	1,040
1-19	0545	4.82	395	4-20	1830	7.33	1,300
1-26	0400	4.79	388	5-19	2215	4.84	400
2-17	1600	6.75	1,020				

16-7203. Kawaiki Stream near Kamuela

Location.--Lat 20°05'13", long 155°40'59", 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.

Records available.--June to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 4,090 ft (from topographic map).

Extremes.--Maximum discharge during period, 38 cfs Sept. 15 (gage height, 1.91 ft); minimum, 0.08 cfs July 9-11, 13, Sept. 10.

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

DISCHARGE, IN CUBIC FEET PER SECOND, JUNE TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									0.28	0.42	0.85	1.9
2									.24	.28	1.5	1.0
3									.24	.24	2.7	.68
4									3.1	.21	2.9	.32
5									2.7	.18	3.5	.21
6									1.2	.12	1.2	.18
7									.48	.10	2.7	.15
8									1.0	.10	.68	.12
9									3.1	.08	.48	.10
10									6.1	.08	7.5	.10
11									1.5	.12	7.8	.21
12									.61	.12	5.3	.54
13									.42	2.9	2.9	.18
14									5.3	14	9.4	.15
15									1.2	7.8	1.5	7.2
16									2.1	1.0	.76	2.1
17									6.7	5.0	.54	.48
18									5.0	4.1	.48	.24
19									9.7	3.7	.36	.24
20									1.3	2.7	.28	2.4
21									1.0	2.1	.24	1.3
22									4.7	3.7	.54	.42
23									3.5	2.7	1.9	.68
24									4.5	2.2	.48	3.1
25									3.7	1.3	.68	2.7
26									4.5	.54	.54	3.9
27									4.1	.68	.32	.95
28								≠ 0.24	4.3	3.5	.21	2.9
29									1.3	4.1	2.1	5.3
30					------				.61	2.5	.95	1.5
31		------			------		------		------	1.0	5.8	------
TOTAL									84.48	67.57	67.09	41.25
MEAN									2.82	2.18	2.16	1.38
MAX									9.7	14	9.4	7.2
MIN									0.24	0.08	0.21	0.10
AC-FT									168	134	133	82

CAL YR 1967:	TOTAL	MEAN	MAX	MIN	AC-FT
WAT YR 1968:	TOTAL -	MEAN -	MAX -	MIN -	AC-FT -

Peak discharge (base, 90 cfs).--No peak above base.
≠ Result of discharge measurement.

16-7205. Upper Hamakua ditch below Kawaiki Stream, near Kamuela

Location.--Lat 20°05'15", long 155°40'42", on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 miles north of Kamuela.

Records available.--January 1964 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (from topographic map).

Extremes.--1964-68: Maximum daily discharge, 49 cfs Nov. 2, 1967; minimum daily, 0.05 cfs Oct. 4-6, 1965.

Remarks.--Records fair. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	43	18	0.98	0.98	0.20	13	3.9	0.62	2.3	3.9	12
2	2.4	49	39	7.9	.86	.14	15	4.0	.56	1.4	5.6	4.1
3	1.3	48	32	34	3.9	18	27	4.1	.45	1.1	11	2.6
4	.86	41	39	30	2.5	25	24	3.5	7.5	.94	11	1.5
5	.68	39	35	13	1.4	2.9	8.8	3.5	8.4	.84	14	.94
6	.56	40	38	5.8	.92	1.5	13	2.7	4.4	.67	5.4	.78
7	.46	39	31	2.8	.74	2.1	20	2.1	2.1	.62	12	.72
8	.36	12	6.0	1.7	1.1	1.6	14	1.7	3.5	.56	3.5	.62
9	.31	16	11	1.2	.86	1.1	13	1.4	7.1	.45	2.1	.56
10	.27	42	31	.86	.62	.89	20	1.2	17	.45	23	.45
11	.31	42	7.0	.74	.46	.78	11	.94	8.0	.56	23	.72
12	.68	23	9.9	.62	.36	.67	2.9	1.2	3.1	.50	24	1.4
13	2.4	12	20	.46	.31	1.0	1.2	3.4	1.9	7.4	11	.72
14	1.1	4.0	30	.41	.41	1.9	.94	3.8	16	25	24	.62
15	.62	2.6	6.6	.36	.27	28	6.4	2.7	5.8	21	7.2	8.9
16	.46	2.0	3.0	.31	15	27	4.3	3.2	6.3	6.2	3.5	13
17	.36	1.6	2.2	19	14	14	2.1	2.0	15	13	2.3	2.9
18	.46	1.3	1.6	16	9.5	3.8	7.1	2.1	19	21	1.8	1.4
19	.56	1.1	1.3	22	.89	23	3.2	5.4	23	19	1.3	1.1
20	.56	14	1.3	5.1	.45	27	4.7	3.0	12	13	.94	8.6
21	.68	15	1.5	2.3	5.5	18	2.7	1.7	5.6	9.9	.84	5.9
22	15	34	1.7	1.4	1.5	11	1.3	1.9	22	10	1.4	2.3
23	6.9	11	1.1	.98	.62	27	1.4	1.8	17	17	8.4	3.0
24	2.2	4.6	.92	.74	.38	27	3.0	1.4	20	11	2.6	16
25	1.9	2.7	1.2	1.5	.28	18	3.9	1.1	15	5.8	2.5	11
26	1.9	25	1.3	22	.89	9.8	3.8	1.0	23	2.6	2.4	15
27	2.0	23	.92	13	.34	4.1	3.0	2.4	20	2.6	1.8	5.6
28	1.5	11	.74	22	.45	2.5	4.8	1.6	24	11	1.2	12
29	1.1	27	2.1	7.0	.24	20	4.4	1.1	7.7	18	5.9	19
30	.86	4.6	.92	2.5	------	28	3.9	1.2	3.6	13	3.1	8.7
31	39	------	.74	1.5	------	27	------	.84	------	5.3	14	------
TOTAL	98.75	630.5	376.04	238.16	65.73	372.98	243.84	71.88	319.63	242.19	234.68	162.13
MEAN	3.19	21.0	12.1	7.68	2.27	12.0	8.13	2.32	10.7	7.81	7.57	5.40
MAX	39	49	39	34	15	28	27	5.4	24	25	24	19
MIN	0.27	1.1	0.74	0.31	0.24	0.14	0.94	0.84	0.45	0.45	0.84	0.45
AC-FT	196	1.250	746	472	130	740	484	143	634	480	465	322

CAL YR 1967: TOTAL 3,857.70 MEAN 10.6 MAX 49 MIN 0.19 AC-FT 7,650
WAT YR 1968: TOTAL 3,056.51 MEAN 8.35 MAX 49 MIN 0.14 AC-FT 6,060

16-7248. Upper Hamakua ditch above Alakahi Stream, near Kamuela

Location.--Lat 20°04'31", long 155°40'26", on right bank 0.1 mile upstream from Alakahi Stream and 3.6 miles north of Kamuela.

Records available.--March to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 3,890 ft (from topographic map). Prior to May 21, graphic water-stage recorder at same site and datum.

Extremes.--Maximum daily discharge during period, 29 cfs Apr. 3; minimum daily, 0.02 cfs Sept. 10.

Remarks.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-	12	4.7	0.63	1.7	2.6	98
2						-	13	4.7	.54	1.1	4.1	3.1
3						-	29	5.9	.47	.78	8.0	1.9
4						-	23	3.5	5.1	.60	7.7	.89
5						-	7.4	3.6	7.1	.45	11	.50
6						2.4	12	2.6	4.1	.33	4.2	.34
7						1.5	19	1.8	1.7	.22	88	.27
8						1.1	12	1.4	2.8	.18	2.7	.16
9						.78	12	1.1	5.4	.09	1.3	.08
10						.49	22	.96	14	.05	19	.02
11						.37	12	.72	7.0	.09	20	.13
12						.22	2.8	.78	2.6	.07	21	.71
13						.45	1.1	2.6	1.6	5.6	88	.19
14						1.0	84	3.1	13	23	22	.04
15						26	5.4	2.0	4.7	20	6.2	6.0
16						24	3.5	2.6	4.7	4.8	2.8	12
17						11	2.0	1.5	12	10	1.7	2.1
18						2.8	8.3	1.9	15	17	1.4	.87
19						21	3.5	12	21	14	.85	.56
20						25	6.9	6.3	8.7	9.7	.57	5.3
21						16	3.5	2.3	4.2	8.0	.43	5.2
22						8.3	1.6	2.0	18	8.7	.75	1.5
23						25	1.6	2.0	14	14	5.4	1.4
24						27	3.2	1.5	17	8.7	1.6	12
25						17	4.1	1.7	12	4.7	1.4	8.7
26						9.5	3.8	1.1	21	1.9	1.3	12
27						3.8	3.0	2.2	17	1.8	.97	4.7
28						2.0	8.0	1.6	21	7.0	.55	8.3
29						18	5.4	1.1	6.8	14	3.9	15
30					------	28	5.0	1.1	3.0	9.4	2.2	8.3
31		------			------	27	------	87	------	4.0	9.7	------
TOTAL						-	246.94	81.23	266.14	191.96	182.92	122.06
MEAN						-	8.23	2.62	8.87	6.19	5.90	4.07
MAX						-	29	12	21	23	22	15
MIN						-	0.84	0.72	0.47	0.05	0.43	0.02
AC-FT						-	490	161	528	381	363	242

CAL YR 1967:	TOTAL		MEAN		MAX		MIN		AC-FT	
WAT YR 1968:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

16-7250. Alakahi Stream near Kamuela

Location.--Lat 20°04'27", long 155°40'25", on right bank 25 ft upstream from Upper Hamakua ditch intake and 3.5 miles north of Kamuela.

Drainage area.--0.87 sq mi.

Records available.--January 1964 to September 1968.

Gage.--Digital water-stage recorder. Altitude of gage is 3,900 ft (from topographic map).

Extremes.--Maximum discharge during year, 692 cfs Apr. 20 (gage height, 7.13 ft), from rating curve extended above 28 cfs as explained below; minimum, 0.21 cfs Oct. 10-12.
1964-68: 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 fair. 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	16	9.9	0.42	0.75	0.56	6.8	8.9	1.1	1.6	1.8	6.2
2	1.0	85	29	2.5	.53	.53	15	9.4	1.0	1.2	2.6	2.6
3	.70	65	13	2.2	1.2	33	42	18	.90	.95	5.2	2.5
4	.60	20	25	16	1.6	38	13	4.8	3.7	.75	5.2	1.2
5	.50	15	16	5.4	.95	8.2	4.7	5.2	4.8	.60	8.0	.80
6	.50	18	26	3.3	.53	3.0	19	3.5	3.1	.56	30	80
7	.42	25	20	2.0	.46	1.6	19	2.4	1.9	.53	4.6	.70
8	.39	4.0	3.3	1.4	.42	1.2	9.6	2.0	1.7	.53	2.5	.65
9	.25	6.0	7.6	1.1	.35	.95	8.4	1.7	4.0	.53	2.0	.50
10	.23	23	20	.85	.31	.75	61	1.6	8.0	.53	15	.39
11	.23	23	3.6	.65	.29	.65	32	1.4	3.8	.53	15	.58
12	.28	8.6	4.3	.53	.25	.56	7.9	1.4	2.1	.50	15	1.2
13	.53	3.8	9.6	.46	.31	.70	3.3	4.0	1.6	4.4	6.3	.57
14	.53	2.5	18	.42	.39	1.2	2.5	6.1	7.7	22	23	.53
15	.46	1.9	3.2	.39	.36	44	12	3.4	2.6	16	6.6	9.1
16	.39	1.4	2.0	.39	3.8	18	6.6	4.1	2.5	3.3	4.3	5.4
17	.28	1.2	1.5	18	49	6.3	4.4	2.3	8.4	7.7	3.9	1.7
18	.28	.95	1.2	4.4	22	2.7	23	2.9	6.4	8.0	5.5	.85
19	.32	.85	1.0	17	3.6	27	8.9	48	15	6.1	5.0	.65
20	.28	2.8	.95	3.0	2.0	28	50	37	4.4	4.6	4.9	2.6
21	.28	3.4	.95	1.8	10	8.8	11	5.2	2.4	4.4	4.9	3.1
22	6.5	17	.95	1.2	5.4	5.9	3.7	2.9	7.0	5.6	5.0	1.2
23	3.8	4.1	.75	.90	2.2	23	3.1	2.2	6.6	5.4	7.9	1.0
24	1.7	2.4	.65	.70	1.3	34	9.2	1.7	9.2	4.8	7.2	5.8
25	1.2	1.7	.65	.95	.90	8.2	10	1.7	5.6	3.2	6.5	7.1
26	.90	13	.70	15	1.7	6.4	7.1	1.7	80	1.8	1.0	8.4
27	.95	7.3	.56	6.8	1.0	3.6	7.0	2.0	6.5	1.4	.85	3.2
28	.65	3.2	.53	8.9	1.0	2.2	32	2.0	7.7	3.6	.70	4.7
29	.75	7.2	.53	4.0	.80	19	24	1.5	3.5	5.4	1.9	11
30	.60	2.4	.50	1.9	------	46	13	1.5	2.2	4.3	2.4	4.8
31	40	------	.46	1.2	------	29	------	1.4	------	2.6	8.1	------
TOTAL	68.50	385.70	222.38	123.76	113.40	403.00	469.2	191.9	143.40	123.41	185.85	89.82
MEAN	2.21	12.9	7.17	3.99	3.91	13.0	15.6	6.19	4.78	3.98	6.00	2.99
MAX	40	85	29	18	49	46	61	48	15	22	23	11
MIN	0.23	0.85	0.46	0.39	0.25	0.53	2.5	1.4	0.90	0.60	0.70	0.39
AC-FT	136	765	441	245	225	799	931	381	284	245	369	178

CAL YR 1967: TOTAL 2,411.08 MEAN 6.61 MAX 106 MIN 0.23 AC-FT 4,780
WAT YR 1968: TOTAL 2,520.32 MEAN 6.89 MAX 85 MIN 0.23 AC-FT 5,000

PEAK DISCHARGE (BASE, 93 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	about 0400	4.38	117	4-10	1915	5.80	202
1-19	0430	4.21	103	4-18	1900	4.77	159
2-17	1600	5.20	220	4-20	1915	7.13	692
4- 6	1430	4.62	142	5-19	2330	4.22	104

16-7322. Wailoa Stream near Waipio

Location.--Lat 20°05'28", long 155°37'01", on right bank 1.0 mile downstream from confluence of Waipio and Waima Streams, 1.8 miles southwest of Waipio and 3.3 miles southwest of Kukuihaele.

Drainage area.--14.3 sq mi.

Records available.--August 1901 to January 1902 (prior to any upstream diversions), July 1911 to December 1912 (gage heights only), February 1964 to September 1968. Published as Waipio River at elevation 360 ft, near Waipio 1901-2 and as Waipio River below Waima Stream, near Waipio 1911-12.

Gage.--Digital water-stage recorder. Altitude of gage is 150 ft (from topographic map). Aug. 15, 1901, to Jan. 22, 1902, and July 20, 1911, to Dec. 31, 1912, staff gage at site 1.0 mile upstream (400 ft below Waima Stream) at different datums. Feb. 19, 1964, to June 2, 1965, graphic water-stage recorder at present site and datum.

Extremes.--Maximum discharge during year, 3,860 cfs Apr. 20 (gage height, 5.48 ft), from rating curve extended above 1,200 cfs as explained below; minimum, 40 cfs on several days.

1901-2, 1964-68: Maximum discharge, 8,500 cfs Jan. 11, 1967 (gage height, 7.8 ft, from floodmarks), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 36 cfs July 21, 1967.

Flood of Nov. 8, 1963, reached a stage of 8.2 ft, from floodmarks (discharge, 6,130 cfs, from slope-area measurement of peak flow).

Remarks.--Records fair prior to Apr. 21, poor thereafter. Upper and Lower Hamakua ditches divert water out of basin from upstream tributaries for irrigation in vicinity of Kamuela and for mill and domestic use, power generation, and irrigation on Hamakua coast. Parker Ranch pipeline diverts from Alakahi Stream for ranch use in Kamuela area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	149	57	53	50	51	104	77	45	48	41	50
2	47	844	266	57	47	51	210	77	40	48	41	45
3	47	744	169	143	47	543	676	111	40	48	43	45
4	47	250	176	152	47	522	194	66	50	48	44	44
5	47	143	112	67	47	116	94	66	55	48	45	44
6	47	146	190	62	47	59	242	59	53	48	41	44
7	47	202	193	56	47	56	129	57	53	48	41	43
8	47	60	54	53	47	56	96	56	53	47	41	43
9	47	54	67	53	47	54	70	56	53	45	42	42
10	47	152	194	53	47	54	652	56	57	45	50	42
11	47	155	54	53	47	54	279	57	53	45	52	42
12	47	89	57	53	47	54	87	58	52	44	51	42
13	47	47	85	53	48	56	62	59	51	50	45	43
14	47	43	176	53	48	65	63	65	62	80	65	43
15	47	42	62	53	50	620	98	55	52	77	45	52
16	47	42	56	53	59	194	76	58	51	45	44	48
17	47	40	56	162	468	94	68	54	56	53	44	41
18	45	40	54	65	222	63	279	69	56	49	44	41
19	45	40	54	126	48	628	92	310	69	45	43	41
20	45	44	54	54	48	365	489	326	48	45	41	41
21	45	40	53	50	83	109	97	76	47	45	41	42
22	98	109	53	50	60	70	59	56	50	46	41	41
23	65	50	53	50	50	180	60	54	49	47	41	41
24	51	44	53	48	50	404	72	50	56	45	41	41
25	50	44	54	48	50	102	72	45	48	43	41	48
26	48	94	56	116	50	89	65	40	54	42	41	46
27	47	81	56	62	51	68	59	55	49	42	41	41
28	47	47	54	70	51	62	165	50	52	43	41	42
29	47	72	53	56	51	250	141	47	48	43	42	47
30	47	47	53	51	------	578	93	47	48	43	42	43
31	432	------	53	47	------	345	------	45	------	42	53	------
TOTAL	1,911	3,954	2,777	2,122	2,054	6,012	4,943	2,357	1,550	1,487	1,368	1,308
MEAN	61.6	132	89.6	68.5	70.8	194	165	76.0	51.7	48.0	44.1	43.6
MAX	432	844	266	162	468	628	676	326	69	80	65	52
MIN	45	40	53	47	47	51	59	40	40	42	41	41
AC-FT	3,790	7,840	5,510	4,210	4,070	11,920	9,800	4,680	3,070	2,950	2,710	2,590

CAL YR 1967 TOTAL 30,245 MEAN 82.9 MAX 890 MIN 38 AC-FT 59,990
WTR YR 1968 TOTAL 31,843 MEAN 87.0 MAX 844 MIN 40 AC-FT 63,160

PEAK DISCHARGE (BASE, 1,300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	0400	4.38	1,310	4-10	1945	4.87	1,910
2-17	1745	4.79	1,810	4-20	2015	5.48	3,860
4- 6	1500	4.58	1,550				

16-7330. Lower Hamakua ditch wasteway near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 50 ft downstream from Lower Hamakua ditch, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to September 1968.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 980 ft (from topographic map). Prior to Apr. 22, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-68: Maximum daily discharge, 19 cfs Dec. 30, 1965, Jan. 2, 1966; no flow most of the time each year.

Remarks.--Records good. The wasteway diverts excess water from Lower Hamakua ditch (see sta. no. 7331).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	8.7	0	0	1.4	0	9.4	8.9	0	0	0	9.0
2	0	8.3	.59	0	.11	0	7.7	8.9	0	0	0	0
3	0	9.5	0	2.3	0	5.3	13	11	0	0	0	0
4	0	14	8.7	8.7	0	8.2	12	10	0	0	0	0
5	0	11	13	1.1	0	3.1	8.0	8.4	1.6	0	5.5	0
6	0	11	10	0	0	0	8.4	5.7	0	0	1.1	0
7	0	12	14	0	0	0	7.0	.18	0	0	2.6	0
8	0	4.0	2.6	0	0	0	11	0	0	0	0	0
9	0	0	0	0	0	0	6.8	0	0	0	0	0
10	0	9.2	11	0	0	0	13	0	0	0	5.0	0
11	0	13	3.1	0	0	0	4.2	0	0	0	7.0	0
12	0	12	0	0	0	0	4.2	0	0	0	7.9	0
13	0	6.5	.02	0	0	0	0	4.6	0	0	.59	0
14	0	.06	3.8	0	0	0	0	10	6.0	10	8.8	0
15	0	0	.01	0	0	12	3.9	4.5	0	14	2.6	0
16	0	0	0	0	0	5.6	8.7	.05	0	1.3	.01	2.5
17	0	0	0	1.5	0	2.0	8.9	0	0	2.2	0	0
18	0	0	0	1.4	0	0	4.4	0	2.9	8.1	0	0
19	0	0	0	3.6	0	5.0	6.4	11	5.4	4.2	0	0
20	0	4.0	0	1.8	0	13	2.9	7.8	4.4	.83	0	0
21	0	2.7	0	0	.26	4.5	3.6	.02	0	0	0	0
22	0	5.6	0	0	3.7	0	6.2	0	3.0	0	0	0
23	0	9.6	0	0	0	8.8	1.1	0	.01	3.6	0	0
24	0	.96	0	0	0	13	2.5	0	6.2	3.6	0	0
25	0	0	0	0	0	12	8.2	0	0	0	0	0
26	0	2.4	0	2.6	0	8.4	7.3	0	4.9	0	0	4.4
27	0	9.5	0	0	0	4.4	7.3	0	2.3	0	0	3.0
28	0	1.7	0	3.4	0	0	10	0	6.5	0	0	.48
29	0	5.8	0	0	0	4.5	13	0	2.0	4.6	0	2.2
30	0	.02	0	0	------	12	9.9	0	0	.02	0	2.7
31	5.4	------	0	0	------	12	------	0	------	0	1.4	------
TOTAL	5.4	161.54	66.82	26.4	5.47	133.8	209.0	91.05	45.21	52.45	42.50	24.28
MEAN	0.17	5.38	2.16	0.85	0.189	4.32	6.97	2.94	1.51	1.69	1.37	0.809
MAX	5.4	14	14	8.7	3.7	13	13	11	6.5	14	8.8	9.0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	11	320	133	52	11	265	415	181	90	104	84	48

CAL YR 1967: TOTAL 797.13 MEAN 2.18 MAX 16 MIN 0 AC-FT 1,580
WAT YR 1968: TOTAL 863.92 MEAN 2.36 MAX 14 MIN 0 AC-FT 1,710

16-7331. Lower Hamakua ditch below main weir, near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 30 ft upstream from main weir, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to September 1968.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 990 ft (from topographic map). Prior to Apr. 22, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-68: 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. no. 7330) to prevent flume damage downstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	57	48	37	41	33	53	56	46	44	50	50
2	40	54	31	39	39	33	56	57	46	42	50	47
3	39	50	14	54	41	45	54	58	46	41	54	47
4	37	50	56	51	39	48	53	54	50	41	57	44
5	37	51	53	45	38	50	54	57	56	39	53	42
6	38	52	56	42	37	50	47	54	52	38	46	42
7	37	52	54	38	37	42	36	52	45	38	50	44
8	37	52	53	37	37	40	50	51	44	39	44	42
9	37	53	52	36	36	39	51	48	47	40	39	41
10	37	59	57	35	36	38	50	48	53	42	46	41
11	38	54	48	35	35	37	48	47	52	41	53	42
12	38	52	46	34	35	36	52	48	44	41	53	44
13	41	51	52	34	34	38	47	57	42	45	46	38
14	38	51	52	34	34	40	46	56	52	53	54	38
15	37	47	47	34	33	36	54	52	46	48	50	46
16	37	45	43	34	36	17	54	59	44	44	44	54
17	37	44	41	44	34	18	51	52	51	44	42	44
18	36	44	41	41	29	44	52	53	56	50	42	42
19	36	42	41	44	42	50	56	62	59	47	43	42
20	36	52	40	36	36	48	57	54	54	43	46	45
21	36	46	40	36	41	57	24	56	47	44	46	51
22	40	52	40	36	46	61	56	63	54	44	46	43
23	40	42	40	36	39	57	54	59	54	53	50	42
24	37	43	40	36	36	52	57	57	61	54	47	51
25	37	41	39	37	35	51	54	56	56	52	46	54
26	38	50	39	47	36	52	54	53	58	44	46	58
27	38	47	39	43	36	53	53	54	56	42	46	51
28	37	44	38	48	35	51	57	52	57	46	45	51
29	37	50	38	41	34	54	56	51	50	52	50	57
30	36	45	38	37	------	53	54	48	45	50	53	56
31	52	------	37	37	------	52	------	47	------	48	51	------
TOTAL	1185	1472	1353	1218	1067	1375	1540	1671	1523	1389	1488	1389
MEAN	38.2	49.1	43.6	39.3	36.8	44.4	51.3	53.9	50.8	44.8	48.0	46.3
MAX	52	59	57	54	46	61	57	63	61	54	57	58
MIN	36	41	14	34	29	17	24	47	42	38	39	38
AC-FT	2350	2920	2680	2420	2120	2730	3050	3310	3020	2760	2950	2760

CAL YR 1967: TOTAL 16,704.3 MEAN 45.8 MAX 62 MIN 8.3 AC-FT 33,130
WAT YR 1968: TOTAL 16,670 MEAN 45.5 MAX 63 MIN 14 AC-FT 33,060

16-7332. Honokaa diversion at Honokaa

Location.--Lat 20°05'12", long 155°28'36", on left bank 50 ft downstream from Lower Hamakua ditch and 0.5 mile northwest of Honokaa Hospital.

Records available.--March 1964 to September 1968.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 950 ft (from topographic map). Prior to Apr. 17, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-68: 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. no. 7333) for use in Honokaa Sugar Co. mill.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	16	17	15	16	13	18	19	18	13	14	16
2	11	16	12	15	16	13	19	19	18	13	14	16
3	11	16	.90	16	16	15	20	19	16	14	15	15
4	11	16	17	16	16	18	20	18	15	14	15	15
5	11	16	18	16	14	18	20	19	16	14	16	14
6	11	16	17	16	15	19	19	19	16	14	16	13
7	11	16	17	14	15	16	13	19	15	14	16	13
8	12	16	18	16	15	16	17	17	16	14	16	13
9	12	16	17	16	15	16	20	16	16	14	15	13
10	12	16	18	16	15	16	20	16	16	14	15	14
11	12	16	18	16	15	14	17	16	16	14	16	14
12	13	16	18	15	15	13	19	16	15	14	16	14
13	13	18	18	14	15	13	19	16	14	14	16	14
14	13	18	18	14	14	15	19	16	16	16	16	13
15	13	17	18	14	14	18	19	16	15	16	18	14
16	13	17	18	13	15	3.0	19	16	14	16	17	14
17	13	17	17	13	15	2.8	19	16	14	14	16	14
18	13	17	17	14	14	17	19	16	16	15	16	14
19	13	17	16	16	16	15	20	17	17	16	15	14
20	13	17	16	16	15	12	20	19	16	16	14	14
21	12	17	16	16	14	16	10	18	15	16	15	15
22	11	17	16	14	17	18	18	18	15	14	14	14
23	15	17	16	13	16	19	19	18	15	15	15	14
24	13	17	16	14	16	19	19	18	16	16	14	15
25	12	17	16	14	15	19	19	18	17	16	14	16
26	12	17	16	16	16	18	19	18	18	15	15	17
27	12	18	16	16	14	19	19	18	16	16	15	16
28	11	17	15	16	13	18	19	18	15	15	14	16
29	11	18	15	16	14	19	19	18	15	14	15	16
30	11	18	15	16	------	19	19	18	15	15	15	16
31	14	------	15	15	------	18	------	18	------	13	15	------
TOTAL	377	503	497.90	467	436	484.8	556	543	472	454	473	436
MEAN	12.2	16.8	16.1	15.1	15.0	15.6	18.5	17.5	15.7	14.6	15.3	14.5
MAX	15	18	18	16	17	19	20	19	18	16	18	17
MIN	11	16	0.90	13	13	2.8	10	16	14	13	14	13
AC-FT	748	998	988	926	865	962	1,100	1,080	936	900	938	865

CAL YR 1967: TOTAL 5,778.78 MEAN 15.8 MAX 22 MIN 0.68 AC-FT 11,460
WAT YR 1968: TOTAL 5,699.70 MEAN 15.6 MAX 20 MIN 0.90 AC-FT 11,310

16-7333. Lower Hamakua ditch below Honokaa diversion, at Honokaa

Location.--Lat 20°05'12", long 155°28'34", on right bank 50 ft downstream from tunnel, 100 ft downstream from Honokaa diversion, and 0.5 mile northwest of Honokaa Hospital.

Records available.--February 1964 to September 1968.

Gage.--Graphic water-stage recorder and Parshall flume. Altitude of gage is 950 ft (from topographic map). Prior to Apr. 17, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-68: 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. no. 7330) and water for Honokaa Sugar Co. mill is diverted 100 ft above station (see sta. no. 7332).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	34	23	16	18	16	31	33	24	20	25	32
2	21	33	22	16	18	15	33	33	24	20	26	28
3	20	31	.34	28	18	21	34	33	24	18	29	25
4	18	28	26	30	18	26	31	31	25	21	31	22
5	18	29	30	25	17	25	32	32	32	22	31	21
6	18	28	30	23	16	26	31	31	29	18	27	21
7	18	30	30	21	16	21	22	29	25	18	30	24
8	18	28	29	18	15	20	32	29	26	18	25	24
9	18	30	26	17	15	18	31	29	27	20	23	22
10	18	34	32	16	15	18	31	29	29	22	25	23
11	18	33	26	15	15	18	31	28	29	21	30	23
12	18	31	24	16	14	18	33	28	22	22	32	25
13	19	28	26	16	14	18	29	33	22	22	30	21
14	19	28	28	16	14	21	27	34	28	32	31	20
15	18	26	24	16	14	34	31	31	24	28	31	23
16	18	24	21	16	16	.59	33	34	22	26	27	32
17	18	23	19	20	15	2.3	30	31	24	25	24	26
18	17	22	18	25	10	21	30	28	26	29	25	24
19	17	22	19	23	23	29	33	40	30	26	22	22
20	17	24	18	18	18	20	34	34	27	25	25	23
21	16	23	18	16	19	25	13	32	22	25	25	29
22	24	30	18	17	26	26	36	38	24	24	24	23
23	20	22	18	18	20	36	32	35	26	32	26	22
24	18	24	18	16	17	32	34	33	33	31	27	25
25	17	22	18	16	17	29	33	32	30	31	26	29
26	18	26	18	23	16	31	33	31	30	24	25	34
27	18	27	17	22	18	31	32	30	30	22	25	28
28	17	24	17	26	17	30	34	30	28	23	24	26
29	17	26	17	21	16	32	34	28	25	31	23	32
30	17	24	17	18	------	33	32	26	21	28	29	32
31	26	------	16	17	------	32	------	25	------	25	25	------
TOTAL	576	814	663.34	601	485	724.89	932	970	788	749	828	761
MEAN	18.6	27.1	21.4	19.4	16.7	23.4	31.1	31.3	26.3	24.2	26.7	25.4
MAX	26	34	32	30	26	36	36	40	33	32	32	34
MIN	16	22	0.34	15	10	0.59	13	25	21	18	22	20
AC-FT	1,140	1,610	1,320	1,190	962	1,440	1,850	1,920	1,560	1,490	1,640	1,510

CAL YR 1967: TOTAL 8,168.34 MEAN 22.4 MAX 34 MIN 0 AC-FT 16,200
WAT YR 1968: TOTAL 8,892.23 MEAN 24.3 MAX 40 MIN 0.34 AC-FT 17,640

16-7430. Awini ditch at East Honokane Iki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'10", at upper end of flume across East Honokane Iki Gulch and 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1938, September 1938 to June 1949, July 1950 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

Extremes.--1927-68: Maximum daily discharge, 58 cfs Nov. 2, 1967; no flow at times.

Remarks.--Records good. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	40	24	4.9	14	2.9	14	12	4.9	8.5	9.7	23
2	6.9	58	45	7.6	14	2.7	25	11	4.7	6.8	9.1	11
3	4.2	57	38	29	14	33	43	19	4.6	6.3	13	11
4	3.2	43	47	31	10	45	24	9.1	7.2	10	13	7.0
5	2.8	33	34	20	6.2	24	14	10	9.2	5.6	16	5.0
6	6.7	23	41	16	4.6	13	22	7.8	9.2	4.6	11	4.2
7	3.1	37	42	11	3.8	10	15	6.7	9.4	4.3	18	3.9
8	2.2	22	26	7.4	3.3	9.5	14	6.2	7.8	6.5	11	3.5
9	1.8	17	26	5.6	9.9	8.0	12	5.9	8.0	4.2	7.0	3.0
10	1.7	35	43	4.5	5.0	7.0	25	5.8	19	3.8	21	2.7
11	1.7	43	26	3.9	3.3	6.0	28	5.6	15	3.5	23	2.7
12	1.6	31	20	3.3	2.6	5.5	11	11	9.1	3.5	26	3.8
13	4.2	26	25	2.9	2.2	10	8.8	15	7.4	12	18	2.8
14	3.2	17	29	2.6	2.5	22	8.0	14	20	42	39	4.5
15	2.2	14	21	2.4	2.0	51	13	7.4	10	34	19	11
16	1.7	12	16	2.2	5.1	44	9.4	12	8.0	17	12	19
17	1.9	12	13	19	20	17	12	6.2	11	24	8.4	7.4
18	1.3	10	11	16	23	9.9	24	14	20	27	7.0	4.1
19	1.6	9.1	10	22	9.9	47	15	46	34	20	5.7	3.3
20	1.8	25	9.4	12	6.4	41	17	32	19	16	4.8	6.1
21	1.6	29	9.1	6.4	12	18	14	10	12	16	4.4	14
22	2.1	38	9.7	4.5	15	14	8.8	7.2	20	16	4.2	6.5
23	5.9	28	8.3	3.6	9.2	25	9.0	6.5	20	27	15	5.4
24	3.2	19	7.3	3.1	6.2	46	12	6.4	30	23	8.8	20
25	2.4	21	7.0	3.4	4.9	24	27	6.8	19	18	5.9	26
26	2.1	38	6.5	28	4.3	17	16	6.8	20	11	5.8	26
27	2.4	34	6.0	24	3.8	12	9.7	7.6	26	7.7	9.7	17
28	2.4	25	5.7	25	3.7	10	37	6.2	38	7.7	5.8	12
29	1.7	38	5.7	13	3.2	35	30	5.6	19	16	4.2	15
30	1.3	21	5.2	7.7	------	39	16	5.2	12	19	4.0	12
31	40	------	4.9	5.7	------	31	------	5.1	------	14	19	------
TOTAL	132.9	855.1	621.8	347.7	224.1	679.5	533.7	330.1	453.5	435.0	378.5	292.9
MEAN	4.29	28.5	20.0	11.2	7.73	21.9	17.8	10.6	15.1	14.0	12.2	9.76
MAX	40	58	47	31	23	51	43	46	34	42	39	26
MIN	1.3	9.1	4.9	2.2	2.0	2.7	8.0	5.1	4.6	3.5	4.0	2.7
AC-FT	264	1,700	1,230	690	444	1,350	1,060	655	900	863	751	581

CAL YR 1967: TOTAL 5,637.3 MEAN 15.4 MAX 58 MIN 1.3 AC-FT 11,180
WAT YR 1968: TOTAL 5,284.8 MEAN 14.4 MAX 58 MIN 1.3 AC-FT 10,480

16-7440. East Honokane Iki intake to Awini ditch near Niulii

Location.--Lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokane Iki Gulch to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

Records available.--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 September 1968. 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).

Extremes.--1927-49, 1951-68: Maximum daily discharge, 13.0 cfs Aug. 6, 1957; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Records are of diversion from East Honokane Iki Gulch to Awini ditch (see sta. no. 7430) for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.70	5.2	3.6	0.16	1.2	0.10	1.1	0.80	0.15	0.28	0.28	1.9
2	.20	8.2	7.5	.53	1.2	.09	1.8	.70	.15	.20	.20	.52
3	.10	2.2	4.9	2.5	1.2	3.0	2.8	1.5	.15	.16	.24	.52
4	.07	1.4	6.2	2.3	.81	5.0	1.4	.50	.40	.16	.28	.20
5	.07	1.1	4.1	1.7	.52	2.0	2.5	.60	1.0	.13	.52	.10
6	.07	4.1	6.3	.99	.42	.90	5.9	.45	1.0	.10	.33	.05
7	.05	7.3	6.8	.56	.33	.60	3.8	.35	.42	.10	.75	.05
8	.03	2.7	2.1	.37	.33	.50	2.9	.30	.28	.13	.28	.03
9	.03	1.8	3.0	.28	1.0	.40	2.7	.30	.24	.10	.13	.01
10	.03	6.2	5.3	.20	.56	.30	3.0	.30	1.0	.07	2.0	.01
11	.03	8.2	2.8	.16	.33	.20	2.0	.25	.75	.05	1.2	.01
12	.01	4.0	1.7	.13	.24	.15	1.3	.70	.33	.05	2.0	.01
13	.01	3.1	2.3	.10	.20	.60	1.6	1.0	.20	1.7	.81	.01
14	.01	1.5	2.4	.07	.24	2.7	1.4	.90	1.2	5.5	4.6	.07
15	.01	1.0	1.3	.05	.20	.47	2.8	.40	.47	3.4	.81	.98
16	.01	.87	.87	.05	.75	.24	1.6	.80	.28	.81	.37	1.5
17	.01	.81	.70	2.3	1.4	.05	1.4	.30	.56	1.9	.20	.28
18	.01	.70	.61	1.4	1.8	.07	3.8	1.0	.93	2.1	.16	.07
19	.01	.61	.56	4.0	.70	.20	.07	3.5	3.8	.93	.07	.07
20	.01	2.3	.52	.81	.40	.05	.42	2.5	1.4	.61	.07	.07
21	.01	2.6	.61	.37	.80	.03	.24	.60	.47	.70	.07	.28
22	.01	4.7	.99	.24	1.0	1.6	.16	.35	1.8	1.3	.05	.13
23	.47	2.3	.47	.16	.60	5.5	.16	.30	1.1	2.1	.88	.07
24	.13	1.0	.33	.16	.40	5.2	1.0	.30	2.7	.93	.28	1.1
25	.07	.81	.28	.27	.20	1.4	2.0	.35	.75	.61	.10	3.4
26	.05	6.0	.33	2.7	.17	.99	1.0	.35	.93	.33	.13	2.2
27	.03	2.9	.28	1.6	.15	.81	.60	.40	2.5	.20	.61	.81
28	.03	1.9	.20	1.4	.13	1.3	2.5	.30	5.7	.24	.24	.52
29	.03	4.0	.28	1.0	.11	3.4	2.0	.25	.93	.81	.10	.56
30	.03	1.3	.20	.61	------	1.9	1.0	.20	.42	.99	.07	.42
31	4.3	------	.16	.47	------	1.6	------	.20	------	.52	2.3	------
TOTAL	6.63	90.80	67.69	27.64	17.39	41.35	54.95	20.75	32.01	27.21	20.13	15.95
MEAN	0.214	3.03	2.18	0.892	0.600	1.33	1.83	0.669	1.07	0.878	0.649	0.532
MAX	4.3	8.2	7.5	4.0	1.8	5.5	5.9	3.5	5.7	5.5	4.6	3.4
MIN	0.01	0.61	0.16	0.05	0.11	0.03	0.07	0.20	0.15	0.05	0.05	0.01
AC-FT	13	180	134	55	34	82	109	41	63	54	40	32

CAL YR 1967: TOTAL 538.95 MEAN 1.48 MAX 9.5 MIN 0 AC-FT 1,070
WAT YR 1968: TOTAL 422.50 MEAN 1.15 MAX 8.2 MIN 0.01 AC-FT 838

Note.--No gage-height record Apr. 25 to June 5.

16-7455. Awini ditch at Awini weir, near Kohala

Location.--Lat 20°08'20", long 155°43'55", on right bank at Awini weir, 6 miles south of Niulii, and 8 miles southeast of Kohala.

Records available.--July 1907 to June 1917 (published as Kohala ditch at Awini weir, near Kohala), May 1963 to September 1968.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 1,840 ft (from topographic map). July 1, 1907, to June 30, 1917, staff gage at same site at different datum and May 16, 1963, to Jan. 12, 1965, digital water-stage recorder at same site and datum.

Extremes.--1907-17, 1963-68: 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 Waikaloa and the Honokane and empties into Kohala ditch (see sta. no. 7509) for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	43	27	5.5	12	3.5	19	19	6.4	8.6	9.8	30
2	5.5	55	48	6.9	18	3.0	25	16	6.1	6.7	9.8	12
3	3.0	55	42	31	13	37	46	28	5.8	5.5	14	13
4	2.0	45	50	35	12	47	32	13	8.6	11	15	8.3
5	1.5	36	38	26	7.4	27	19	14	14	5.2	18	4.9
6	5.0	26	44	20	5.2	15	31	11	12	3.8	11	3.5
7	2.0	40	45	13	4.4	12	24	9.4	11	4.1	20	3.0
8	1.0	25	30	8.3	3.8	11	23	8.3	8.0	6.1	12	3.0
9	.50	20	30	6.4	11	9.0	16	8.0	8.0	3.4	7.0	2.5
10	.50	40	45	4.9	6.4	7.7	29	8.0	22	2.7	23	1.4
11	.50	45	30	4.1	4.1	6.7	37	7.4	20	2.5	28	1.2
12	.50	35	24	3.5	3.0	6.1	18	12	11	2.2	34	2.5
13	3.0	30	30	3.0	2.5	13	12	21	7.4	12	21	1.6
14	2.0	20	36	2.5	2.5	25	11	20	24	45	43	2.7
15	1.0	12	28	1.8	2.0	50	20	10	12	41	24	8.0
16	.50	11	21	.93	5.5	46	13	18	8.3	21	14	25
17	.50	10	16	20	18	21	15	8.6	11	25	9.8	7.7
18	.50	9.6	13	20	27	8.0	32	15	25	34	8.0	3.5
19	.50	9.4	11	27	12	43	19	52	37	25	6.1	2.2
20	.50	25	9.8	13	6.1	43	20	42	26	19	4.4	4.1
21	.50	32	9.8	7.0	11	22	18	15	13	19	3.8	15
22	1.0	42	11	4.7	19	18	11	11	23	17	3.3	7.4
23	4.5	32	10	3.5	11	30	11	9.8	24	32	14	4.9
24	2.0	22	8.6	3.5	7.4	49	16	9.4	34	27	9.0	21
25	1.2	24	8.0	3.5	5.5	30	35	9.4	23	23	6.4	27
26	1.0	42	8.0	31	4.9	23	25	10	24	12	6.4	31
27	1.2	38	7.0	24	4.4	15	14	11	34	9.0	9.8	20
28	1.2	29	6.4	32	4.1	13	46	9.0	44	8.3	5.5	12
29	1.0	42	6.4	16	3.8	40	41	7.7	25	19	3.5	18
30	1.5	24	6.1	9.0	------	44	24	7.0	14	22	3.5	13
31	43	------	5.5	6.4	------	38	------	6.7	------	15	18	------
TOTAL	100.60	919.0	704.6	393.43	247.0	756.0	702	446.7	541.6	487.1	415.1	309.4
MEAN	3.25	30.6	22.7	12.7	8.52	24.4	23.4	14.4	18.0	15.7	13.4	10.3
MAX	43	55	50	35	27	50	46	52	44	45	43	31
MIN	0.50	9.4	5.5	0.93	2.0	3.0	11	6.7	5.8	2.2	3.3	1.2
AC-FT	200	1820	1400	780	490	1500	1390	886	1070	966	823	614

CAL YR 1967: TOTAL 6,431.95 MEAN 17.6 MAX 55 MIN 0.39 AC-FT 12,760
WAT YR 1968: TOTAL 6,022.53 MEAN 16.5 MAX 55 MIN 0.50 AC-FT 11,950

Note.--No gage-height record Oct. 2 to Dec. 13.

16-7475. East Branch Honokane Nui Stream near Niulii

Location.--Lat 20°08'18", long 155°44'00", on left bank 500 ft upstream from Awini falls, 1.2 miles upstream from confluence with West Branch, and 6.0 miles south of Niulii.

Drainage area.--4.96 sq mi.

Records available.--May 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 1,080 ft (from topographic map). Prior to Dec. 13, 1964, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, not determined; maximum daily, 110 cfs Nov. 2, 3; minimum, not determined; minimum daily, 15 cfs for many days.
1963-68: Maximum discharge, not determined; maximum daily, 150 cfs Jan. 11, 1967; minimum, not determined; minimum daily, 14 cfs Sept. 14-23, 1965.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	70	20	16	15	18	35	35	16	20	20	35
2	19	110	100	17	15	17	35	35	15	20	18	17
3	18	110	90	70	16	70	95	45	16	20	16	16
4	17	70	95	75	16	100	75	24	16	18	16	16
5	17	40	80	30	17	45	35	21	16	20	20	17
6	16	35	70	17	17	18	45	19	17	20	20	18
7	17	90	90	17	18	18	20	19	17	17	20	18
8	16	35	35	18	19	17	35	18	20	18	20	18
9	17	19	35	18	16	17	25	18	19	20	20	20
10	17	75	95	19	16	18	75	18	20	20	25	20
11	17	90	35	17	17	19	60	19	17	20	35	20
12	17	60	35	18	17	17	19	18	17	20	45	20
13	16	35	35	17	18	15	15	18	20	19	25	18
14	16	16	70	18	18	20	17	17	19	60	60	18
15	16	20	20	17	17	100	20	19	20	70	30	17
16	17	18	15	18	22	75	26	16	20	20	15	19
17	17	20	15	28	30	35	22	20	25	20	16	20
18	16	20	16	19	25	23	15	17	40	40	16	20
19	15	19	17	45	15	100	25	90	40	30	18	20
20	15	17	20	17	15	95	15	80	25	25	20	19
21	15	35	20	17	15	35	20	25	20	20	20	18
22	23	70	19	15	15	30	20	19	30	20	20	18
23	23	40	15	15	20	60	20	20	20	40	20	18
24	19	17	17	15	18	95	25	18	35	30	18	30
25	18	15	16	15	18	60	70	18	25	20	18	30
26	17	60	17	20	25	35	60	17	45	17	16	45
27	17	60	15	24	19	19	25	17	45	17	20	25
28	17	35	15	32	17	18	80	17	70	18	20	20
29	17	70	15	15	20	75	75	19	30	30	20	20
30	16	25	15	15	------	100	35	17	20	25	20	19
31	60	------	16	15	------	90	------	19	------	25	18	------
TOTAL	578	1396	1168	709	526	1454	1139	772	755	779	685	629
MEAN	18.6	46.5	37.7	22.9	18.1	46.9	38.0	24.9	25.2	25.1	22.1	21.0
MAX	60	110	100	75	30	100	95	90	70	70	60	45
MIN	15	15	15	15	15	15	15	16	15	17	15	16
AC-FT	1150	2770	2320	1410	1040	2880	2260	1530	1500	1550	1360	1250

CAL YR 1967: TOTAL 9,894 MEAN 27.1 MAX 150 MIN 15 AC-FT 19,620
WAT YR 1968: TOTAL 10,590 MEAN 28.9 MAX 110 MIN 15 AC-FT 21,000

Note.--No gage-height record for entire year.

16-7509. Kohala ditch at Honokane, near Niulii

Location.--Lat 20°09'50", long 155°43'50", on land of Honokane, on Honokane trail at tunnel adit, 28 ft from right side of tunnel, and 4.4 miles south of Niulii.

Records available.--May 1963 to September 1968.

Gage.--Graphic water-stage recorder. Altitude of gage is 960 ft (from topographic map). Prior to Apr. 20, 1965, digital water-stage recorder at same site and datum.

Extremes.--1963-68: Maximum daily discharge, 96 cfs May 24, 1964; no flow at times each year.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	63	39	22	25	21	46	43	24	28	30	48
2	26	87	80	24	29	20	48	42	23	26	28	29
3	23	87	74	64	29	60	77	51	23	25	31	29
4	22	60	77	67	28	83	66	37	25	29	31	24
5	21	48	68	42	24	50	44	35	31	24	37	23
6	24	46	65	37	22	33	50	30	29	23	32	22
7	22	74	74	30	22	30	36	28	28	21	39	22
8	20	44	45	26	21	28	45	26	28	24	32	21
9	20	39	43	24	27	26	41	26	27	23	26	20
10	20	66	78	22	22	24	65	26	37	22	42	21
11	20	75	48	21	21	24	59	26	37	22	47	21
12	20	59	44	20	20	23	37	30	28	22	54	22
13	21	44	44	20	20	27	25	39	27	27	43	21
14	21	38	63	20	20	38	28	37	43	58	58	22
15	20	34	39	20	19	82	40	29	33	60	42	25
16	20	31	33	21	37	68	39	34	29	37	28	44
17	20	32	31	48	43	46	37	27	34	38	26	27
18	18	31	31	39	39	31	47	32	50	50	24	23
19	17	29	30	52	22	84	13	78	59	43	24	22
20	17	43	30	30	17	74	33	73	44	36	24	23
21	17	47	30	24	26	49	21	40	32	34	23	33
22	26	64	32	13	34	40	31	30	48	34	23	25
23	29	49	27	0	31	57	31	28	46	52	35	22
24	23	39	26	0	25	78	41	27	54	42	28	44
25	21	38	26	0	23	54	61	27	44	37	24	44
26	20	54	27	2.8	28	43	54	27	50	29	22	51
27	20	59	24	0	23	34	39	28	57	26	28	41
28	20	43	23	0	21	31	69	26	60	26	25	32
29	19	64	23	11	22	67	66	25	43	43	23	37
30	17	41	22	24	------	81	48	24	33	43	22	32
31	57	------	22	21	------	72	------	24	------	37	33	------
TOTAL	696	1528	1318	744.8	740	1478	1337	1055	1126	1041	984	870
MEAN	22.5	50.9	42.5	24.0	25.5	47.7	44.6	34.0	37.5	33.6	31.7	29.0
MAX	57	87	80	67	43	84	77	78	60	60	58	51
MIN	17	29	22	0	17	20	13	24	23	21	22	20
AC-FT	1380	3030	2610	1480	1470	2930	2650	2090	2230	2060	1950	1730

CAL YR 1967: TOTAL 12,471 MEAN 34.2 MAX 88 MIN 0 AC-FT 24,740
WAT YR 1968: TOTAL 12,917.8 MEAN 35.3 MAX 87 MIN 0 AC-FT 25,620

Note.--No gage-height record Oct. 1-31, Jan. 31 to Mar. 12.

16-7510. Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'19", long 155°44'20", 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.

Records available.--August 1927 to June 1938, September 1938 to September 1968.

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

Extremes.--1927-68: 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	67	42	24	27	22	52	46	25	30	30	50
2	28	83	76	24	31	21	53	45	25	28	28	30
3	24	83	72	68	31	64	74	56	25	27	30	30
4	23	64	75	69	30	79	66	38	27	31	31	25
5	22	52	68	46	25	54	48	36	32	26	37	23
6	26	49	65	40	24	36	54	32	31	25	32	23
7	23	75	72	32	23	32	38	29	30	23	39	23
8	21	49	49	28	22	30	49	28	29	26	32	21
9	21	42	47	25	29	28	45	28	28	25	27	21
10	21	67	76	23	24	26	65	28	39	24	44	21
11	21	76	52	22	22	25	61	28	39	24	49	21
12	21	62	46	21	21	24	39	32	30	24	56	22
13	22	48	49	21	21	30	27	42	28	29	44	21
14	22	40	65	21	21	44	30	40	45	60	62	23
15	21	36	43	21	20	73	43	31	34	62	42	26
16	21	34	36	22	39	70	42	37	30	40	31	45
17	21	34	34	48	45	51	40	29	36	41	26	28
18	19	33	34	42	42	34	49	34	52	52	24	23
19	18	31	33	22	23	75	15	74	60	45	24	22
20	18	45	33	0	18	71	35	70	46	39	24	23
21	18	50	32	0	28	55	23	43	33	36	24	32
22	28	67	34	0	36	44	34	33	51	36	23	25
23	31	53	30	0	33	62	34	30	48	54	35	23
24	24	42	27	0	27	72	43	29	57	42	29	45
25	22	41	42	0	24	60	64	29	45	37	24	45
26	21	53	32	0	30	49	58	29	52	29	23	52
27	21	64	26	0	25	37	42	30	60	26	28	40
28	21	45	25	0	26	34	67	28	62	26	25	32
29	20	68	25	10	24	64	67	27	46	42	24	38
30	18	44	24	25	------	72	52	26	35	44	22	33
31	61	------	24	23	------	70	------	26	------	37	35	------
TOTAL	735	1,597	1,388	677	791	1,508	1,409	1,113	1,180	1,090	1,004	886
MEAN	23.7	53.2	44.8	21.8	27.3	48.6	47.0	35.9	39.3	35.2	32.4	29.5
MAX	61	83	76	69	45	79	74	74	62	62	62	52
MIN	18	31	24	0	18	21	15	26	25	23	22	21
AC-FT	1,460	3,170	2,750	1,340	1,570	2,990	2,790	2,210	2,340	2,160	1,990	1,760

CAL YR 1967: TOTAL 13,338.80 MEAN 36.5 MAX 84 MIN 0 AC-FT 26,460
WAT YR 1968: TOTAL 13,378 MEAN 36.6 MAX 83 MIN 0 AC-FT 26,530

16-7560. Kohakohau Stream near Kamuela

Location.--Lat 20°02'38", long 155°41'10", on left bank 0.6 mile upstream from Oolamakapehu Gulch and 1.7 miles northwest of Kamuela.

Drainage area.--2.51 sq mi.

Records available.--March 1956 to September 1968.

Gage.--Digital 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 Oct. 28, 1966, graphic water-stage recorder and Oct. 28, 1966, to Jan. 10, 1967, digital water-stage recorder at site 0.5 mile upstream at different datums.

Extremes.--Maximum discharge during year, 2,220 cfs Apr. 20 (gage height, 6.21 ft), from rating curve extended above 46 cfs on basis of computation of flow over dam at gage height 6.20 ft; minimum, 0.02 cfs Oct. 21, 22. 1956-68: 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 on model of station site; minimum, 0.02 cfs Oct. 6, 7, 1965, Oct. 21, 22, 1967.

Remarks.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	005	23	3.1	0.52	10	1.0	11	12	1.0	1.6	1.3	2.3
2	.15	100	38	1.2	.90	.88	10	12	.95	1.2	1.4	1.0
3	.25	83	23	19	1.1	43	54	24	.74	1.0	2.3	.85
4	.20	33	18	25	1.2	57	22	7.0	1.2	.89	2.1	.64
5	.10	22	15	4.0	.90	16	5.4	5.0	2.3	.73	3.2	.52
6	08	21	20	2.6	80	3.1	49	3.5	1.7	.62	1.9	.44
7	.06	35	30	1.7	.70	1.9	23	2.5	1.1	.58	1.9	.35
8	.05	5.2	4.5	1.2	.74	1.6	16	2.0	.95	.56	1.3	.25
9	.04	3.0	11	1.0	.60	1.3	17	1.8	.95	.51	.92	.20
10	.03	25	43	.88	.52	1.1	175	1.7	2.6	.47	7.5	.16
11	.03	30	5.4	.67	.47	.95	68	1.5	2.3	.44	11	.16
12	.04	16	12	.56	.47	.81	18	1.8	1.5	.41	13	.25
13	1.7	3.5	16	.52	.47	.81	5.2	2.3	1.2	.49	4.4	.14
14	.95	2.2	34	.45	.52	.81	3.5	4.4	5.9	16	23	.11
15	.39	1.7	5.2	.40	.35	50	10	2.2	2.2	24	4.4	.86
16	.22	1.5	2.6	.35	7.0	24	9.0	2.2	1.6	3.2	2.2	2.2
17	.12	1.2	1.9	27	149	8.2	5.0	1.5	2.8	3.0	1.6	1.1
18	.10	1.1	1.7	8.0	50	2.7	40	1.3	5.6	5.9	1.4	.72
19	.09	.95	1.5	33	4.4	22	19	59	18	5.0	1.0	.51
20	.05	1.0	1.6	3.5	2.0	35	155	79	5.5	3.9	.84	.42
21	.03	.95	1.4	1.5	19	13	23	9.2	2.2	2.6	.72	.58
22	1.0	16	1.4	1.2	9.2	3.8	4.9	3.1	7.3	2.8	.64	.35
23	3.5	4.0	1.1	1.0	2.5	25	3.5	2.2	5.7	5.7	.69	.31
24	1.1	1.9	.95	.90	1.7	52	11	2.0	11	3.9	.57	1.0
25	.67	1.5	1.1	.80	1.4	13	19	1.8	5.2	2.6	.53	3.3
26	.47	9.8	.95	30	2.8	4.4	13	1.7	10	1.5	.47	4.4
27	.35	12	.81	3.5	1.7	2.5	70	1.6	4.7	1.2	.41	2.2
28	.26	2.2	.74	9.0	1.8	3.2	45	1.4	9.7	1.4	.37	2.1
29	.39	7.3	.74	4.0	1.2	15	42	1.3	3.4	2.3	.35	14
30	.67	1.8	.60	1.5	------	82	17	1.5	2.0	2.2	.39	6.2
31	31	------	.56	1.2	------	44	------	1.2	------	1.8	.79	------
TOTAL	44.13	466.80	297.85	186.15	264.44	530.06	900.5	253.7	121.29	98.50	92.59	47.62
MEAN	1.42	15.6	9.61	6.00	9.12	17.1	30.0	8.18	4.04	3.18	2.99	1.59
MAX	31	100	43	33	149	82	175	79	18	24	23	14
MIN	0.03	0.95	0.56	0.35	0.35	0.81	3.5	1.2	0.74	0.41	0.35	0.11
AC-FT	88	926	591	369	525	1,050	1,790	503	241	195	184	94

CAL YR 1967: TOTAL 3,642.82 MEAN 9.98 MAX 600 MIN 0.03 AC-FT 7,230
WAT YR 1968: TOTAL 3,303.63 MEAN 9.03 MAX 175 MIN 0.03 AC-FT 6,550

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
2-17	1615	5.07	716	4-18	2000	4.71	466
4-6	1430	5.10	740	4-20	1915	6.21	2,220
4-10	2000	5.00	660				

16-7565. Keanuiomano Stream near Kamuela

Location.--Lat 20°01'48", long 155°42'05", on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 miles west of Kamuela.

Drainage area.--4.30 sq mi.

Records available.--November 1963 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,410 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,540 cfs Apr. 20 (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 Oct. 5-13, 17-21, Sept. 15.
1963-68: Maximum discharge, that of Apr. 20, 1968; no flow at times in 1965-68.

Remarks.--Records good. Two Parker Ranch pipeline diversions above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	22	1.2	0.24	0.73	0.63	13	10	0.66	1.2	0.94	1.0
2	.02	189	36	.23	.61	.55	6.5	10	.61	1.0	.85	.55
3	.03	150	26	12	.82	64	83	22	.57	.88	1.6	.50
4	.02	37	20	27	.85	84	25	7.1	.55	.79	1.4	.36
5	0	19	17	3.9	.61	17	5.8	4.8	1.8	.66	2.4	.19
6	0	14	23	2.3	.52	2.9	60	3.6	1.3	.52	1.5	.15
7	0	42	33	1.3	.46	1.6	20	2.5	.91	.45	1.3	.12
8	0	4.9	4.3	.94	.55	1.2	16	1.9	.70	.43	1.1	.08
9	0	2.1	11	.70	.45	1.0	16	1.7	.63	.34	.70	.05
10	0	18	71	.57	.33	.82	311	1.5	1.2	.28	4.0	.04
11	0	28	5.5	.45	.28	.66	112	1.3	2.3	.07	6.8	.02
12	0	18	10	.36	.24	.55	20	2.0	1.2	.10	11	.02
13	0	3.1	15	.28	.23	.50	6.2	1.8	.73	.08	4.2	.02
14	.81	1.7	43	.23	.28	.59	4.3	3.5	3.8	7.9	18	.01
15	.13	1.2	5.3	.21	.22	65	9.8	2.0	1.9	28	4.5	0
16	.02	.97	2.5	.16	4.2	23	9.2	1.8	1.2	3.1	2.0	.96
17	0	.79	1.6	30	220	7.8	5.4	1.3	1.2	1.6	1.3	.52
18	0	.68	1.2	7.4	92	2.5	71	1.0	4.6	6.5	1.2	.27
19	0	.55	1.1	36	4.5	18	21	73	14	5.5	.85	.15
20	0	.55	1.1	3.4	1.8	36	259	111	5.7	3.0	.66	.08
21	0	.52	1.2	1.3	25	13	31	9.9	1.8	1.5	.55	.08
22	1.2	9.8	1.1	.94	10	3.5	6.8	3.3	4.5	2.0	.46	.08
23	3.1	3.5	.82	.70	2.4	22	4.8	2.0	4.3	4.6	.48	.07
24	.61	1.5	.66	.57	1.3	75	10	1.6	9.8	3.0	.43	.05
25	.30	.97	.66	.57	1.1	13	16	1.3	4.5	2.0	.36	.58
26	.13	4.8	.70	34	1.9	4.6	12	1.2	8.8	1.2	.30	2.7
27	.05	13	.52	3.4	1.4	2.3	6.8	1.1	4.2	.88	.23	1.5
28	.02	2.0	.45	8.5	1.2	3.7	52	1.0	7.1	.73	.18	.66
29	.05	4.5	.45	3.6	.85	14	62	.88	3.4	1.7	.05	8.1
30	.31	1.6	.34	1.3	------	154	14	.97	1.7	1.5	.02	6.3
31	26	------	.27	.91	------	53	------	.88	------	1.5	.01	------
TOTAL	32.80	595.73	335.97	183.46	374.83	686.40	1289.6	287.93	95.66	83.01	69.37	25.21
MEAN	1.06	19.9	10.8	5.92	12.9	22.1	43.0	9.29	3.19	2.68	2.24	0.840
MAX	26	189	71	36	220	154	311	111	14	28	18	8.1
MIN	0	0.52	0.27	0.16	0.22	0.50	4.3	0.88	0.55	0.07	0.01	0
AC-FT	65	1,180	666	364	743	1,360	2,560	571	190	165	138	50

CAL YR 1967: TOTAL 3,753.88 MEAN 10.3 MAX 786 MIN 0 AC-FT 7,450
WAT YR 1968: TOTAL 4,059.97 MEAN 11.1 MAX 311 MIN 0 AC-FT 8,050

PEAK DISCHARGE (BASE, 550 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
2-17	1745	6.08	1,030	4-10	2000	6.12	1,050
4-6	1500	5.76	840	4-20	1900	10.02	3,540

16-7570. Waikoloa Stream near Kamuela

Location.--Lat 20°03'17", long 155°40'01", on left bank 0.2 mile south of Puu Iki and 2.2 miles north of Kamuela.

Drainage area.--0.78 sq mi.

Records available.--May 1947 to September 1968. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,570 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,510 cfs Apr. 20 (gage height, 6.05 ft), from rating curve extended above 95 cfs as explained below; minimum, 1.2 cfs Oct. 8-12.
1947-68: Maximum discharge, 1,930 cfs Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 95 cfs by logarithmic plotting; minimum, 0.74 cfs Sept. 28 to Oct. 7, 1965.

Remarks.--Records good except those above 200 cfs, which are fair. No diversion above station.

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	20	5.7	2.2	1.9	1.7	8.0	8.3	2.4	2.3	2.4	5.2
2	1.5	80	19	4.4	1.8	1.7	14	7.2	2.3	2.2	3.0	3.0
3	1.5	60	8.9	12	2.2	41	45	15	2.3	2.1	4.8	2.6
4	1.5	25	15	9.1	2.2	32	16	6.3	3.7	2.1	5.6	2.2
5	1.4	15	9.4	4.6	1.9	7.0	6.1	6.7	4.8	1.9	5.0	1.8
6	1.4	15	21	3.6	1.7	2.8	25	4.8	4.0	1.9	3.2	1.8
7	1.3	15	16	2.8	1.7	2.1	12	3.7	2.8	1.8	3.2	1.7
8	1.3	4.6	4.4	2.4	1.7	1.8	10	3.2	2.6	1.8	2.6	1.7
9	1.3	4.0	8.0	2.3	1.6	1.7	8.0	3.0	3.0	1.8	2.2	1.6
10	1.3	10	17	2.2	1.6	1.6	69	2.8	4.6	1.8	6.5	1.6
11	1.3	12	4.6	2.1	1.6	1.5	24	2.7	4.0	1.8	9.1	1.7
12	1.4	6.7	7.5	1.9	1.5	1.4	8.6	3.2	2.8	1.8	5.9	1.9
13	2.7	4.2	11	1.9	1.6	1.6	5.0	7.2	2.6	2.7	4.8	1.6
14	2.2	3.4	16	1.8	1.6	1.7	4.3	9.8	8.0	16	14	1.4
15	1.4	2.8	4.6	1.8	1.5	36	12	4.6	3.4	13	4.3	3.2
16	1.3	2.7	3.4	1.8	2.2	12	7.5	5.2	2.8	3.7	3.1	3.8
17	1.3	2.6	3.0	13	52	4.4	5.4	3.4	4.2	4.6	3.0	1.9
18	1.3	2.4	2.8	4.8	11	2.7	24	5.5	4.8	6.5	2.8	1.6
19	1.3	2.3	2.8	13	3.2	25	11	63	9.1	4.3	2.4	1.4
20	1.3	2.6	3.0	3.6	2.4	23	91	47	4.2	3.4	2.3	1.7
21	1.3	2.6	3.0	2.6	13	7.2	11	6.7	2.8	3.2	2.2	2.1
22	8.0	8.0	3.0	2.2	4.6	4.6	5.2	4.3	3.6	3.4	2.3	1.6
23	4.0	4.2	2.6	2.1	2.8	15	4.3	3.6	4.8	4.4	2.4	1.6
24	2.2	3.1	2.4	1.9	2.3	26	6.5	3.1	7.8	5.6	2.3	3.1
25	1.7	2.6	2.7	2.2	2.1	7.8	6.5	3.0	5.0	3.7	2.2	5.2
26	1.5	8.6	2.4	9.4	2.2	4.3	5.2	2.8	7.2	2.6	2.2	4.8
27	1.4	5.6	2.4	4.0	1.9	3.0	5.0	3.0	4.6	2.3	2.1	3.1
28	1.4	3.4	2.3	5.9	2.2	3.2	24	2.8	4.4	2.7	1.9	3.4
29	1.4	4.0	2.3	3.4	1.8	26	20	2.7	3.4	3.6	2.1	14
30	1.6	3.0	2.3	2.4	------	53	9.8	2.7	2.7	3.6	1.9	4.6
31	30	------	2.2	2.1	------	27	------	2.4	------	2.8	4.3	------
TOTAL	84.2	335.4	210.7	129.5	129.8	379.8	503.4	249.7	124.7	115.4	116.1	86.9
MEAN	2.72	11.2	6.80	4.18	4.48	12.3	16.8	8.05	4.16	3.72	3.75	2.90
MAX	30	80	21	13	52	53	91	63	9.1	16	14	14
MIN	1.3	2.3	2.2	1.8	1.5	1.4	4.3	2.4	2.3	1.8	1.9	1.4
AC-FT	167	665	418	257	257	753	998	495	247	229	230	172

CAL YR 1967: TOTAL 2,285.6 MEAN 6.26 MAX 115 MIN 1.3 AC-FT 4,530
WAT YR 1968: TOTAL 2,465.6 MEAN 6.74 MAX 91 MIN 1.3 AC-FT 4,890

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	about 0300	3.39	214	4- 6	1430	3.66	285
				4-10	1445	3.34	202
2-17	1830	3.33	200	4-20	1930	6.05	1,510

16-7580. Waikoloa Stream at Marine Dam, near Kamuela

Location.--Lat 20°02'48", long 155°39'58", 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.

Records available.--May 1947 to September 1968. See also Note below.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 3,460 ft (from topographic map). Prior to Apr. 20, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 2,100 cfs Apr. 20 (gage height, 5.96 ft), from rating curve extended above 120 cfs as explained below; minimum, 1.1 cfs Oct. 21.
1947-68: 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.

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	24	5.3	2.0	1.9	1.7	13	11	2.6	2.5	2.6	6.2
2	1.6	111	23	3.6	1.8	1.6	23	9.2	2.5	2.4	3.2	3.0
3	1.5	89	13	12	2.3	50	62	20	2.5	2.2	5.3	2.5
4	1.5	28	19	9.2	2.3	48	23	8.6	4.8	2.2	6.4	2.2
5	1.5	17	13	4.8	1.9	12	8.6	8.4	5.8	2.0	6.0	1.9
6	1.4	19	26	4.0	1.8	3.8	29	6.0	4.1	1.9	3.6	1.9
7	1.4	19	22	2.9	1.7	2.9	17	4.4	2.9	1.9	3.5	1.8
8	1.4	5.5	5.5	2.5	1.8	2.5	14	3.8	2.5	1.9	2.8	1.8
9	1.3	4.3	8.4	2.3	1.7	2.3	13	3.5	3.0	1.8	2.4	1.7
10	1.3	13	26	2.2	1.6	2.2	97	3.3	5.1	1.8	7.5	1.8
11	1.3	14	5.8	2.0	1.6	2.0	37	3.0	4.3	1.8	11	1.8
12	1.4	9.2	9.2	2.0	1.5	2.0	12	3.8	2.8	1.7	7.5	2.2
13	2.8	4.8	15	1.9	1.6	2.2	6.9	8.9	2.4	2.9	4.6	1.8
14	2.3	3.5	24	1.9	1.5	2.3	5.5	13	10	22	18	1.7
15	1.6	3.0	6.0	1.7	1.5	51	14	6.0	3.6	19	5.3	4.3
16	1.4	2.6	4.0	1.6	2.3	18	11	6.7	2.9	4.3	3.5	4.8
17	1.4	2.5	3.3	13	54	7.2	7.5	4.1	4.6	5.3	3.2	2.4
18	1.4	2.4	3.0	5.1	27	3.6	27	5.8	5.3	7.5	3.2	1.9
19	1.3	2.3	2.9	16	4.0	37	15	87	13	5.1	2.6	1.8
20	1.2	2.5	3.2	3.8	2.6	35	161	70	5.5	3.8	2.4	2.0
21	1.2	2.5	3.0	2.6	15	12	17	9.2	3.2	3.5	2.3	2.5
22	12	9.8	3.0	2.3	6.9	6.0	6.7	5.1	4.3	3.6	2.3	1.9
23	5.3	4.6	2.6	2.0	3.0	23	5.5	4.1	6.7	5.1	2.4	1.8
24	2.5	3.2	2.5	1.9	2.3	40	8.6	3.5	11	6.9	2.2	3.6
25	1.9	2.6	2.6	2.2	2.0	12	8.9	3.3	6.0	4.6	2.2	7.2
26	1.7	8.9	2.4	11	2.3	6.2	6.7	3.2	9.5	2.9	2.0	7.5
27	1.6	7.8	2.3	4.3	1.9	4.1	6.4	3.2	5.5	2.5	1.9	3.8
28	1.5	3.6	2.2	6.7	2.3	4.1	25	3.0	5.1	2.9	1.9	4.8
29	1.6	4.1	2.3	3.6	1.9	30	30	2.9	3.8	4.1	1.9	20
30	1.8	3.0	2.2	2.4	------	74	14	3.0	2.9	4.0	1.8	8.1
31	43	------	2.0	2.0	------	41	------	2.8	------	3.2	5.3	------
TOTAL	104.9	426.7	264.7	136.5	154.0	539.7	725.3	329.8	148.2	137.3	130.8	110.7
MEAN	3.38	14.2	8.54	4.37	5.31	17.4	24.2	10.6	4.94	4.43	4.22	3.69
MAX	43	111	26	16	54	74	161	87	13	27	18	20
MIN	1.2	2.3	2.0	1.6	1.5	1.6	5.5	2.8	2.4	1.7	1.8	1.7
AC-FT	208	846	525	269	305	1,070	1,440	654	294	272	259	220

CAL YR 1967 TOTAL 2,822.7 MEAN 7.73 MAX 133 MIN 1.2 AC-FT 5,600
WTR YR 1968 TOTAL 3,207.6 MEAN 8.76 MAX 161 MIN 1.2 AC-FT 6,360

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	0400	3.50	231	4-10	1515	3.59	257
2-17	1900	3.50	231	4-20	2000	5.96	2,100
3-30	1315	3.27	172	5-19	2400	3.31	182
4- 6	1500	3.56	248				

16-7590. Hauani Gulch near Kamuela

Location.--Lat 20°02'28", long 155°39'05", on left bank 800 ft downstream from small tributary and 1.8 miles northeast of Kamuela.

Drainage area.--0.47 sq mi.

Records available.--March 1956 to September 1968. Prior to July 1960, published as Hauani Stream near Kamuela.

Gage.--Digital water-stage recorder and, since Feb. 27, 1963, concrete control. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark). Prior to Apr. 21, 1964, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 400 cfs Apr. 20 (gage height, 3.80 ft), from rating curve extended above 37 cfs by logarithmic plotting; minimum, 0.03 cfs Oct. 8, 9, 17, 20, 21, 22, 28.
1956-68: Maximum discharge, 503 cfs Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 11 cfs by 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.12	3.7	0.82	0.17	0.13	0.10	1.4	1.6	0.34	0.31	0.23	0.62
2	.09	29	4.6	.37	.12	.10	6.2	1.6	.34	.28	.23	.21
3	.07	23	2.4	1.1	.18	15	16	4.2	.31	.25	.33	.17
4	.07	6.0	3.3	1.8	.18	10	3.9	1.3	.84	.24	.73	.14
5	.07	2.2	1.7	.61	.13	2.0	1.3	1.1	.62	.22	.59	.13
6	.07	3.0	4.3	.38	.10	.50	1.1	.83	.40	.21	.32	.12
7	.06	3.3	4.2	.25	.09	.30	1.9	.67	.32	.21	.31	.11
8	.05	.99	.91	.20	.10	.28	1.8	.59	.29	.22	.23	.10
9	.04	.71	1.9	.17	.08	.24	2.3	.54	.34	.20	.19	.10
10	.05	2.5	6.2	.16	.07	.22	23	.49	.82	.18	.74	.10
11	.06	2.2	.96	.14	.06	.19	7.6	.44	.52	.21	1.3	.11
12	.07	1.3	1.3	.13	.06	.18	1.9	.53	.33	.19	.77	.13
13	.22	.73	2.5	.12	.06	.20	.94	1.1	.29	.33	.43	.10
14	.13	.49	6.1	.10	.07	.26	.77	1.3	1.7	3.9	1.9	.09
15	.08	.38	.99	.10	.05	12	2.1	.73	.40	3.4	.60	.83
16	.06	.33	.64	.09	.25	2.5	1.3	.89	.35	.53	.35	.46
17	.05	.30	.49	1.5	7.4	1.0	.56	.50	.69	10	.29	.17
18	.07	.26	.39	.50	4.4	.47	3.8	1.1	.63	.87	.28	.13
19	.07	.24	.36	1.9	.40	19	1.9	32	1.4	.51	.22	.11
20	.06	.27	.35	.30	.22	10	27	28	.62	.37	.20	.10
21	.06	.24	.33	.25	1.9	2.0	3.5	1.9	.37	.35	.18	.12
22	3.3	.97	.32	.20	.81	1.6	.94	.89	.72	.38	.19	.10
23	.57	.47	.27	.15	.30	3.4	.78	.72	1.4	.51	.20	.09
24	.19	.29	.24	.13	.20	10	1.0	.62	1.8	.89	.17	.12
25	.15	.24	.24	.20	.16	1.8	.84	.50	1.1	.53	.16	.28
26	.12	1.1	.22	1.5	.20	1.0	.78	.45	1.2	.28	.15	.60
27	.08	.85	.20	.40	.16	.66	.76	.45	.62	.23	.14	.28
28	.05	.38	.18	.90	.20	.55	5.7	.41	.50	.44	.13	.66
29	.07	.52	.20	.30	.15	3.6	5.2	.41	.45	.70	.13	1.9
30	.09	.32	.18	.20	------	18	2.4	.37	.34	.40	.12	.78
31	12	------	.18	.15	------	10	------	.34	------	.30	.72	------
TOTAL	18.24	86.28	46.97	14.47	18.23	127.15	129.07	86.57	20.05	18.64	12.53	8.96
MEAN	0.588	2.88	1.52	0.467	0.629	4.10	4.30	2.79	0.668	0.601	0.404	0.299
MAX	12	29	6.2	1.9	7.4	19	27	32	1.8	3.9	1.9	1.9
MIN	0.04	0.24	0.18	0.09	0.05	0.10	0.76	0.34	0.29	0.18	0.12	0.09
AC-FT	36	171	93	29	36	252	256	172	40	37	25	18

CAL YR 1967: TOTAL 523.65 MEAN 1.43 MAX 37 MIN 0.04 AC-FT 1,040
WAT YR 1968: TOTAL 587.16 MEAN 1.60 MAX 32 MIN 0.04 AC-FT 1,160

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 2	0915	2.73	100	4-20	1930	3.80	400
4-10	1715	2.58	79	5-19	1715	2.61	82

16-7592. Right Branch Waiaha Stream near Holualoa

Location.--Lat 19°38'41", long 155°54'55", 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.

Records available.--April 1960 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (from topographic map).

Extremes.--Maximum discharge during year, 395 cfs Sept. 29 (gage height, 4.73 ft), from rating curve extended above 9.1 cfs as explained below; no flow for several days.
1960-68: Maximum discharge, 416 cfs Aug. 14, 1965 (gage height, 5.16 ft), from rating curve extended above 1.3 cfs on basis of slope-area measurement at gage height 4.07 ft; no flow at times each year.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.03	1.8	0.01	0.05	0.30	0.05	0.10	0.23	0.02	0.01	0.11	0.02
2	.02	.48	.01	.06	.17	.04	.07	.13	.02	.01	.09	.02
3	1.1	.72	.01	.04	1.7	.04	.14	.11	.02	0	.05	.01
4	.10	.21	.01	.04	.27	.03	.12	.09	.01	.01	.04	.01
5	.05	.10	.01	2.2	.14	.03	.07	.07	.01	.47	.04	.01
6	.02	.07	0	.25	.10	.03	.05	.05	.01	.23	.04	.01
7	.02	.05	0	.09	.09	.03	.77	.03	.01	.08	.67	.01
8	.02	.04	0	.06	.09	.02	6.1	.03	.01	.07	.19	.06
9	.01	.04	.73	.05	.07	.02	2.4	.03	.03	.04	.09	.05
10	.01	.03	2.4	.03	.05	.02	40	.08	.01	.02	.07	.11
11	.01	.03	1.0	.02	.04	.02	13	.08	.01	.02	.07	.07
12	.01	.02	.48	.02	.03	.02	.79	.11	.01	.02	.16	.04
13	11	.02	.16	.01	.06	.02	.21	.07	0	.01	.64	.03
14	.39	.02	.08	.01	.05	.02	.12	1.6	.01	.01	.23	.02
15	.16	.01	.05	.01	.03	.06	.09	.21	.01	.01	.10	.02
16	.09	.02	.04	.01	.47	.08	.08	.09	.02	.61	.09	.02
17	.06	.01	.03	4.6	14	.07	11	.06	.05	14	.07	.02
18	.05	.01	.02	.25	2.6	.03	.55	.04	.04	2.3	.07	.02
19	.04	.01	.02	5.9	.21	.02	.17	.05	.03	.63	.63	.02
20	.03	.01	.05	.17	.10	.02	1.1	.08	.04	.27	.46	1.7
21	.02	.01	.78	.09	1.50	.02	.27	.11	.01	1.2	.33	.39
22	.02	.01	.36	.06	.36	.06	.11	.07	.01	.39	.14	.23
23	.01	.01	.09	.05	.16	.36	.12	.05	.01	.25	.09	.11
24	3.2	.01	.21	.04	.11	2.0	.39	.04	.01	.23	.07	.12
25	.17	.01	1.4	.08	.09	.27	.59	.04	.01	.11	.06	.61
26	.09	.02	.23	7.1	.08	.10	.23	.04	.01	.07	.06	4.7
27	.08	.02	.11	1.2	.07	.10	15	.05	.01	.07	.05	.63
28	.35	.02	.07	1.3	.07	.16	2.3	.04	0	2.0	.04	4.0
29	1.4	.01	.07	.30	.06	.46	.45	.04	.01	.27	.02	27
30	.23	.01	.05	.14	------	.27	.59	.03	.01	.14	.02	.86
31	.33	------	.04	1.3	------	.16	------	.03	------	.10	.03	------
TOTAL	19.12	3.83	8.52	25.53	23.07	4.63	96.98	3.78	0.46	23.65	4.82	40.92
MEAN	0.617	0.128	0.275	0.824	0.796	0.149	3.23	0.122	0.015	0.763	0.155	1.36
MAX	11	1.8	2.4	7.1	14	2.0	40	1.6	0.05	14	0.67	27
MIN	0.01	0.01	0	0.01	0.03	0.02	0.05	0.03	0	0	0.02	0.01
AC-FT	38	7.6	17	51	46	9.2	192	7.5	0.9	47	9.6	81

CAL YR 1967: TOTAL 183.74 MEAN 0.503 MAX 25 MIN 0 AC-FT 364
WAT YR 1968: TOTAL 255.31 MEAN 0.698 MAX 40 MIN 0 AC-FT 506

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-13	1800	4.06	178	4-27	1430	4.54	306
2-17	1730	3.71	125	7-17	1415	4.46	278
4-10	1630	4.26	220	9-26	1700	3.38	85
4-17	1715	3.90	152	9-29	1800	4.73	395

16-7593. Waiaha Stream at Luawai, near Holualoa

Location.--Lat 19°38'12", long 155°55'45", 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.

Records available.--April 1960 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

Extremes.--Maximum discharge during year, 780 cfs Sept. 29 (gage height, 5.28 ft), from rating curve extended above 33 cfs as explained below; no flow for many days.
1960-68: Maximum discharge, 1,700 cfs Aug. 14, 1965 (gage height, 6.37 ft), from rating curve extended above 30 cfs on basis of slope-area measurements at gage heights 4.34 and 4.51 ft; no flow at times each year.

Remarks.--Records good. Huehue Ranch diverts entire low flow of a tributary above station for domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.02	1.2	0	0	0.03	0.02	0.06	0.48	0.01	0	0.06	0.01
2	.01	.60	0	0	.02	.02	.02	.20	.01	0	.06	0
3	.51	1.0	0	0	1.9	.02	.01	.12	0	0	.01	.01
4	.01	.30	0	0	.25	.02	.01	.08	0	0	.01	.06
5	0	.14	0	1.4	.06	.02	.02	.04	0	1.9	0	.17
6	0	.05	.01	.04	.02	.01	.01	.01	0	.48	0	.06
7	0	.02	.01	0	.02	.01	.06	.01	0	.07	6.9	.01
8	0	.02	0	0	.04	.01	8.6	.01	0	.04	2.5	.36
9	0	.02	.78	0	.02	.02	3.7	.01	.48	.02	.35	.11
10	0	.01	2.8	0	.01	.02	84	.01	.02	.02	.12	.22
11	0	.01	.36	0	.01	.01	37	.01	.01	.01	.06	.09
12	0	.03	.22	0	0	.01	1.4	.02	0	.01	.11	.20
13	18	.02	.02	0	.01	.01	.30	.01	0	0	.11	.07
14	.52	.01	.01	0	.01	0	.22	2.4	0	0	.08	.03
15	.20	.01	0	0	.01	0	.12	.12	0	0	.02	.02
16	.11	.02	0	0	.24	.01	.09	.02	0	.21	0	.02
17	.04	.01	0	6.5	29	.01	32	.01	0	30	0	.06
18	.03	.01	0	.20	9.5	0	.94	0	0	10	0	.05
19	.02	.01	0	11	.28	0	.22	0	0	.80	.75	.02
20	.02	.01	0	.14	.09	0	3.7	0	0	.32	.32	6.9
21	.01	0	.17	.03	2.7	0	.52	0	0	3.0	.35	.56
22	.01	0	.07	.02	.56	.05	.12	0	0	.48	.12	.25
23	.01	0	.01	.02	.25	.15	.06	0	0	.44	.04	.12
24	2.0	0	.01	.01	.11	4.1	.14	0	0	.30	.02	.12
25	.11	.01	.44	.05	.07	.30	.69	0	0	.09	.01	.30
26	.05	.01	.04	14	.04	.06	.30	0	0	.05	.01	4.6
27	.02	.01	.01	1.1	.02	.05	45	.01	0	.04	.01	.22
28	.63	.01	0	1.4	.02	.08	6.4	.02	0	4.9	0	4.6
29	2.0	.02	0	.30	.02	2.0	1.2	.01	0	.38	0	50
30	.20	.01	0	.08	------	.52	2.0	.01	0	.15	.13	2.9
31	.35	------	0	.03	------	.20	------	.01	------	.08	.04	------
TOTAL	24.88	3.57	4.96	36.32	45.31	7.73	228.91	3.62	0.53	53.79	12.19	72.14
MEAN	0.803	0.119	0.160	1.17	1.56	0.249	7.63	0.117	0.018	1.74	0.393	2.40
MAX	18	1.2	2.8	14	29	4.1	84	2.4	0.48	30	6.9	50
MIN	0	0	0	0	0	0	0.01	0	0	0	0	0
AC-FT	49	7.1	9.8	72	90	15	454	7.2	1.1	107	24	143

CAL YR 1967: TOTAL 338.14 MEAN 0.926 MAX 43 MIN 0 AC-FT 671
WAT YR 1968: TOTAL 493.95 MEAN 1.35 MAX 84 MIN 0 AC-FT 980

PEAK DISCHARGE (BASE, 140 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
2-17	1800	3.80	225	4-27	1545	4.42	408
4-10	1645	4.30	370	7-17	1400	4.09	307
4-17	1815	4.16	328	9-29	1800	5.28	780

16-7595. Waiaha Stream near Holualoa

Location.--Lat 19°38'12", long 155°56'40", on left bank 0.5 mile upstream from Highway 18, 1.2 miles north of Holualoa School, and 3.2 miles east of Kailua.

Drainage area.--9.35 sq mi.

Records available.--December 1957 to September 1968 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,910 ft (from topographic map).

Extremes.--Maximum discharge during year, about 1,100 cfs Sept. 29: no flow for many days.
1957-68: Maximum discharge, 2,410 cfs Jan. 18, 1959 (gage height, 4.76 ft), from rating curve extended above 240 cfs on basis of 2 slope-area measurements at gage height 3.80 ft; no flow for many days each year.
Maximum discharge of flood of Oct. 3, 1968, which destroyed the station, was about 3,300 cfs, from unit-discharge study.

Remarks.--Records good except those for period of no gage-height record, which are fair. Diversions by Huehue Ranch from Right Branch Waiaha Stream for domestic use and from Waiaha Stream 1 mile above station to off-stream reservoir for stock water. Diversion by Hawaii County Board of Water Supply from pool about 0.3 mile above station for domestic use in Kailua and Holualoa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0.03	0	0.01	0	0	0	0.28	0	0	0.01	0
2	0	.03	0	.01	0	0	0	.03	0	0	.01	0
3	0	.04	0	0	.17	0	0	.01	0	0	0	0
4	0	.02	0	0	.01	0	0	0	0	0	0	.01
5	0	.02	0	0	0	0	0	0	0	3.7	0	.03
6	0	.01	0	0	0	0	0	0	0	.40	0	.01
7	0	.01	0	0	0	0	.06	0	0	.01	20	0
8	0	0	0	0	0	0	9.2	0	0	.01	1.5	.25
9	0	0	0	0	0	0	3.9	0	.43	0	.25	.02
10	0	0	1.0	0	0	0	131	0	.01	.01	.02	.05
11	0	0	.02	0	0	0	42	0	0	0	.01	.01
12	0	0	0	0	0	0	.51	0	0	0	.02	.05
13	17	0	0	0	0	0	.03	0	0	0	.02	.01
14	.35	0	0	0	0	0	.09	.27	0	0	.01	0
15	.05	0	0	0	0	0	.05	0	0	.01	0	0
16	.02	0	0	0	0	0	.03	0	0	7.1	0	0
17	.01	0	0	.19	44	0	55	0	0	67	0	.01
18	.01	0	0	.01	.86	0	.40	0	0	6.9	0	.01
19	0	0	0	9.2	.02	0	.02	0	0	.11	.50	0
20	0	0	0	.01	.01	0	4.0	0	0	.04	.20	7.5
21	0	0	0	0	1.4	0	.09	0	0	1.7	.25	.40
22	0	0	.01	0	.09	0	.02	0	0	.06	.02	.10
23	0	0	.01	0	.02	0	.01	0	0	.02	.01	.03
24	0	0	.01	0	.01	6.8	.01	0	0	.01	0	.03
25	.01	0	.01	0	0	.06	.03	0	0	.01	0	.10
26	.01	0	.02	15	0	.01	.03	0	0	.02	0	5.0
27	.01	0	.02	.06	0	0	86	0	0	.06	0	.05
28	.26	0	.01	.22	0	.01	5.9	0	0	2.9	0	5.0
29	1.1	0	.01	.01	0	1.4	2.3	0	0	.08	0	90
30	.03	0	.01	0	------	.02	4.8	0	0	.02	.02	3.5
31	.02	------	0	0	------	.01	------	0	------	.01	.01	------
TOTAL	18.88	0.16	1.13	24.72	46.59	8.31	345.48	0.59	0.44	90.18	22.86	112.17
MEAN	0.609	0.005	0.036	0.797	1.61	0.268	11.5	0.019	0.015	2.91	0.737	3.74
MAX	17	0.04	1.0	15	44	6.8	131	0.28	0.43	67	20	90
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	37	0.3	2.2	49	92	16	685	1.2	0.9	179	45	222

CAL YR 1967: TOTAL 421.48 MEAN 1.15 MAX 72 MIN 0 AC-FT 836
WAT YR 1968: TOTAL 671.51 MEAN 1.83 MAX 131 MIN 0 AC-FT 1,330

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-13	1815	2.22	168	7-17	1530	3.64	940
2-17	1745	2.72	340	8- 7	about 1700	2.55	270
4-10	1730	3.45	770				
4-17	1800	3.30	660	9-29	about 1815	-	about 1,100
4-27	1545	3.53	837				

Note.--No gage-height record Aug. 1 to Sept. 30.

16-7598. Kiilae Stream near Honaunau

Location.--Lat 19°24'52", long 155°50'56", on right bank 2.4 miles northeast of Kealia and 3.0 miles southeast of Honaunau Post Office.

Drainage area.--0.67 sq mi.

Records available.--April 1958 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

Extremes.--Maximum discharge during year, 45 cfs July 17 (gage height, 1.76 ft), from rating curve extended above 18 cfs by logarithmic plotting; no flow for many days.
1958-68: Maximum discharge, 104 cfs Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 5.7 cfs by logarithmic plotting; 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. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0.12	0.03	0	0.22	0	0.11	0.37	0.11	0	0	0
2	0	1.1	.01	0	.10	0	.04	.18	.04	0	0	.65
3	.01	.28	0	0	.26	0	.01	.07	.01	0	0	.93
4	.01	2.2	0	0	.08	0	.36	.03	0	.07	0	.14
5	.01	.26	0	0	.03	0	.70	.01	.02	1.1	0	.04
6	0	.05	0	.01	.03	0	.11	0	0	.20	0	0
7	0	.04	0	0	.10	0	2.0	0	0	.02	.24	.08
8	0	.02	.01	0	.51	0	1.5	0	.71	0	.20	2.2
9	0	0	.70	0	.10	0	.48	0	.36	.03	.08	.52
10	0	0	1.6	0	.03	0	5.0	.06	.04	0	.02	.16
11	.03	0	2.1	0	.02	0	4.5	.21	.06	0	.50	.04
12	.03	.05	.18	0	0	0	.16	.52	.04	0	.74	.04
13	1.4	.15	.04	0	.70	0	.26	.06	.02	0	.10	.27
14	.11	.04	.01	0	.16	.59	.10	.03	.25	0	.01	.10
15	.03	.01	.01	0	.06	.05	.14	.02	.06	0	0	0
16	.01	.10	.02	0	.08	.02	.94	0	.33	.08	0	0
17	.01	.04	0	1.9	.20	.02	1.6	0	.73	2.7	0	.04
18	0	.01	0	.13	.78	0	.40	0	.22	.94	0	.57
19	0	0	.09	1.1	.03	.01	.16	0	.28	1.9	0	.07
20	.26	.26	.07	.06	0	0	.06	.20	.26	.22	0	.04
21	.07	.14	.11	.02	.37	0	.03	.20	.07	.50	.2	.07
22	.40	.05	.10	0	.17	0	.01	.20	.05	1.1	.04	.04
23	.89	0	.02	0	.04	.34	0	.07	0	.09	.04	.01
24	.14	0	.03	0	.01	.06	0	.01	0	.02	.01	.53
25	.05	0	1.1	.05	0	0	.98	.02	.15	0	0	.89
26	.01	.34	.10	1.9	0	.05	.14	.02	.46	.02	.02	.71
27	.03	.07	.08	.22	0	.28	.72	.01	.06	.04	0	.11
28	.04	.02	.02	1.7	0	1.0	3.1	.02	.01	.40	.11	.90
29	.12	.48	.04	.26	0	.13	1.1	.02	0	.06	.02	.62
30	.05	.10	.01	.06	------	.13	.80	.10	0	0	0	.10
31	.31	------	0	.25	------	.60	------	.08	------	0	0	------
TOTAL	4.02	5.93	6.48	7.66	4.08	3.28	25.51	2.51	4.34	9.49	2.33	9.87
MEAN	0.130	0.198	0.209	0.247	0.141	0.106	0.850	0.081	0.145	0.306	0.075	0.329
MAX	1.4	2.2	2.1	1.9	0.78	1.0	5.0	0.52	0.73	2.7	0.74	2.2
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	8.0	12	13	15	8.1	6.5	51	5.0	8.6	19	4.6	20

CAL YR 1967: TOTAL 130.61 MEAN 0.358 MAX 3.4 MIN 0 AC-FT 259
WAT YR 1968: TOTAL 85.50 MEAN 0.234 MAX 5.0 MIN 0 AC-FT 170

PEAK DISCHARGE (BASE, 25 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-13	1700	1.62	29	4- 8	1730	1.61	28
1-26	1900	1.58	25	7-17	1400	1.76	45

16-7640. Hilea Gulch tributary near Honuapo

Location.--Lat 19°10'27", long 155°35'58", 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.

Records available.--February 1966 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 2,940 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,110 cfs Jan. 27 (gage height, 6.14 ft), from rating curve extended above 75 cfs by logarithmic plotting; no flow for many days.
1966-68: Maximum discharge, 1,220 cfs Dec. 30, 1966 (gage height, 6.35 ft), from rating curve extended above 75 cfs by logarithmic plotting; no flow at times each year.

Remarks.--Records good except those above 150 cfs, which are fair. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	23	0.87	4.0	0.26	0.02	0.61	15	0.97	008	30	0.56
2	.28	33	1.0	8.3	2.0	0	.19	4.0	2.1	.07	3.8	4.5
3	16	2.2	.21	.83	63	0	.11	.69	2.2	.77	18	1.2
4	1.0	.32	.18	7.7	8.0	0	.07	.48	1.4	2.9	59	1.8
5	.15	.12	14	2.5	2.8	0	04	1.5	.45	.26	7.3	.52
6	.28	.07	13	1.3	1.3	0	24	.65	.26	.72	1.3	22
7	.23	.03	63	.16	.38	0	68	.24	15	1.2	19	81
8	.11	.03	5.3	.10	.26	0	45	.17	89	.52	40	28
9	.13	.02	18	.06	.18	.67	3.5	.13	17	6.7	32	30
10	.12	0	18	.04	.10	13	.51	.11	29	1.2	3.2	6.7
11	.36	0	8.3	.03	.06	1.1	.24	.09	35	.95	21	7.6
12	10	0	.54	.02	.03	.20	.12	12	29	.38	43	8.9
13	23	0	1.1	.02	.02	.07	.09	1.2	5.1	.11	3.9	1.9
14	4.2	0	.66	.01	.02	.09	.93	.18	45	73	5.2	.60
15	1.5	0	.26	0	.02	.15	1.8	.11	11	7.4	1.2	2.1
16	.52	2.1	.22	0	.01	.22	1.5	.10	2.3	7.0	.38	1.1
17	.68	.56	1.1	0	0	.52	1.7	.07	15	21	4.8	.60
18	.40	.04	8.7	.01	0	.83	.36	.05	4.8	48	19	21
19	11	5.7	1.7	5.6	0	1.6	.14	49	36	20	2.3	4.5
20	.64	25	.55	.07	0	.14	.08	34	3.9	8.1	2.8	28
21	.26	4.9	.25	.02	0	.06	.05	2.0	.58	1.4	15	37
22	.30	3.1	.21	0	0	.03	.04	.32	14	.44	53	6.5
23	1.1	.52	.13	0	0	1.1	23	.96	7.4	.26	5.4	1.5
24	14	1.3	.86	.18	0	11	103	.49	2.7	1.1	.80	43
25	.60	50	3.7	4.7	0	.37	29	4.2	.58	9.5	23	5.5
26	4.7	332	3.5	16	0	.29	8.4	9.1	.33	2.4	3.3	38
27	.38	31	.59	96	0	10	38	35	.24	.80	1.0	9.3
28	.18	6.5	.33	39	0	18	40	3.7	.17	18	.40	38
29	.28	1.1	.64	2.8	.04	1.5	17	1.7	.13	5.0	8.4	23
30	.20	.33	25	.48	------	5.1	23	.46	.10	29	3.2	3.7
31	1.4	------	7.2	.23	------	2.3	------	.39	------	5.3	.40	------
TOTAL	95.70	522.94	199.10	190.16	78.48	68.36	430.48	178.09	370.71	273.56	431.09	458.08
MEAN	3.09	17.4	6.42	6.13	2.71	2.21	14.3	5.74	12.4	8.82	13.9	15.3
MAX	23	332	63	96	63	18	103	49	89	73	59	81
MIN	0.11	0	0.13	0	0	0	0.04	005	0.10	0.07	0.38	0.52
AC-FT	190	1040	395	377	155	136	854	353	735	543	855	906

CAL YR 1967: TOTAL 3,899.80 MEAN 10.7 MAX 332 MIN 0 AC-FT 7,740
WAT YR 1968: TOTAL 3,296.74 MEAN 9.01 MAX 332 MIN 0 AC-FT 6,540

PEAK DISCHARGE (BASE, 600 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0500	6.10	1,090	6- 8	1700	5.72	900
1-27	2200	6.14	1,110	9- 7	1530	5.75	915

16-7650. Hilea Gulch tributary No. 2 near Honuapo

Location.--Lat 19°10'17", long 155°36'05", 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.

Records available.--February 1966 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 2,880 ft (from topographic map).

Extremes.--Maximum discharge during year, 410 cfs Nov. 26 (gage height, 6.55 ft), from rating curve extended above 41 cfs as explained below; no flow for many days.
1966-68: Maximum discharge, 523 cfs Dec. 30, 1966 (gage height, 7.16 ft), from rating curve extended above 41 cfs by logarithmic plotting; no flow for many days each year.

Remarks.--Records good except those above 90 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.58	12	0.04	0	0	0	0	3.4	0	0	9.5	0
2	0	32	.16	.30	.01	0	0	.65	0	0	.64	.96
3	17	.98	0	0	15	0	0	0	0	0	5.7	.02
4	.86	0	0	.40	.01	0	0	0	0	0	11	0
5	0	0	2.2	0	0	0	0	0	0	0	1.8	0
6	0	0	3.2	0	0	0	11	0	0	0	.03	1.1
7	0	0	28	0	0	0	37	0	2.6	0	5.8	37
8	0	0	1.4	0	0	0	20	0	46	0	13	2.4
9	0	0	5.4	0	0	0	.57	0	8.2	.74	13	2.8
10	0	0	11	0	0	1.3	0	0	10	.13	.66	0
11	0	0	2.0	0	0	.03	0	0	13	0	5.8	.01
12	2.4	0	0	0	0	0	0	2.5	10	0	20	.01
13	6.3	0	0	0	0	0	0	.06	1.2	0	.76	0
14	.39	0	0	0	0	0	0	0	20	34	1.3	0
15	.05	0	0	0	0	0	.08	0	3.9	2.0	.17	0
16	0	.12	0	0	0	0	0	0	.40	1.1	0	0
17	0	.04	0	0	0	0	0	0	7.9	6.5	.72	0
18	0	0	1.2	0	0	0	0	0	1.3	26	4.3	6.2
19	1.9	.68	.06	.22	0	0	0	16	13	11	.23	.01
20	.03	7.2	0	0	0	0	0	13	.83	2.2	.05	2.1
21	0	1.9	0	0	0	0	0	.20	0	.14	2.9	2.7
22	.34	1.1	0	0	0	0	0	0	5.1	0	23	.01
23	.86	.06	0	0	0	0	11	0	.60	0	1.1	0
24	7.8	0	0	0	0	2.1	54	0	.35	0	0	11
25	.17	22	.58	.17	0	.01	11	.72	0	.82	7.5	0
26	1.1	191	.04	1.6	0	0	1.1	1.8	0	.52	.21	6.9
27	0	20	0	20	0	.95	16	9.3	0	0	0	.12
28	0	2.2	0	5.3	0	2.8	18	.40	0	11	0	9.0
29	0	.09	0	0	0	.06	3.0	.01	0	1.1	1.4	.30
30	0	0	7.2	0	------	0	7.3	0	0	13	.61	0
31	0	------	.10	0	------	0	------	0	------	1.4	0	------
TOTAL	39.78	291.37	62.58	27.99	15.02	7.25	190.05	48.04	144.38	111.65	131.18	82.64
MEAN	1.28	9.71	2.02	0.903	0.518	0.234	6.34	1.55	4.81	3.60	4.23	2.75
MAX	17	191	28	20	15	2.8	54	16	46	34	23	37
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	79	578	124	56	30	14	377	95	286	221	260	164

CAL YR 1967: TOTAL 1,649.55 MEAN 4.52 MAX 191 MIN 0 AC-FT 3,270
WAT YR 1968: TOTAL 1,151.93 MEAN 3.15 MAX 191 MIN 0 AC-FT 2,280

PEAK DISCHARGE (BASE, 310 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	2115	6.55	410	9- 7	1515	6.10	335
6- 8	1745	6.05	327				

16-7670. Ninole Gulch near Punaluu

Location.--Lat 19°10'44", long 155°33'46", 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.

Records available.--February 1966 to September 1968.

Gage.--Digital water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (from topographic map). Prior to Aug. 31, 1967, graphic water-stage recorder at same site and datum.

Extremes.--Maximum discharge during year, 1,330 cfs Sept. 7 (gage height, 5.88 ft), from rating curve extended above 30 cfs; no flow for many days.
1966-68: Maximum discharge, that of Sept. 7, 1968; no flow for many days each year.

Remarks.--Records good except those above 60 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	7.8	0	0	.03	0	.05	3.6	0	0	21	0
2	0	23	0	0	.22	0	0	.42	0	0	.54	.60
3	13	2.8	0	0	86	0	0	0	0	0	16	0
4	.36	.09	0	0	2.4	0	0	0	0	0	7.2	0
5	0	0	.19	.01	.96	0	0	0	0	0	.48	0
6	.05	0	.03	0	.54	0	6.9	0	0	0	0	48
7	.02	0	27	0	.07	0	130	0	0	0	11	101
8	0	0	.11	0	.09	0	42	0	25	0	23	8.4
9	0	0	5.6	0	.03	0	1.1	0	.36	0	20	7.0
10	0	0	10	0	0	.16	.02	0	7.6	0	.36	.20
11	0	0	3.0	0	0	.02	0	0	18	0	6.6	.25
12	0	0	.01	0	0	0	.09	11	5.0	0	17	.40
13	3.5	0	.05	0	0	0	.11	.42	.30	0	.22	0
14	.02	0	.01	0	0	0	.11	0	21	26	2.6	0
15	.01	0	0	0	0	0	.09	0	2.9	.48	0	0
16	0	0	0	0	0	0	.02	0	.07	.05	0	0
17	0	0	0	0	0	0	.66	0	3.3	1.2	5.5	0
18	0	0	.54	.02	0	.02	.22	0	.16	26	11	5.0
19	14	.02	.05	.16	0	.01	0	13	8.7	3.9	.09	.10
20	.11	5.0	0	0	0	0	0	2.9	.19	.07	0	6.5
21	0	.16	0	0	0	0	0	.03	0	0	1.1	7.0
22	.22	0	0	0	0	0	0	0	0	0	18	.20
23	10	0	0	0	0	0	9.9	.02	0	0	.36	0
24	14	.01	0	.01	0	2.0	67	0	0	0	0	18
25	.26	53	0	.05	0	.10	6.3	0	0	2.3	2.6	.10
26	0	432	9.2	.96	0	0	.36	.02	0	.19	.02	8.0
27	0	26	.13	75	0	.78	7.2	5.5	0	0	0	.40
28	0	.05	0	48	0	7.9	17	.11	0	3.9	0	8.0
29	0	0	0	.42	0	.16	3.5	0	0	.03	0	6.0
30	0	0	10	.01	------	0	6.9	0	0	10	0	.10
31	0	------	.66	0	------	.84	------	0	------	.60	0	------
TOTAL	55.55	549.93	66.58	124.64	90.34	11.99	299.53	37.02	92.58	74.72	164.67	225.25
MEAN	1.79	18.3	2.15	4.02	3.12	.387	9.98	1.19	3.09	2.41	5.31	7.51
MAX	14	432	27	75	86	7.9	130	13	25	26	23	101
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	110	1,090	132	247	179	24	594	73	184	148	327	447

CAL YR 1967 TOTAL 2,333.33 MEAN 6.39 MAX 432 MIN 0 AC-FT 4,630
WTR YR 1968 TOTAL 1,792.80 MEAN 4.90 MAX 432 MIN 0 AC-FT 3,560

PEAK DISCHARGE (BASE, 1,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0530	5.70	1,140	4- 7	1345	5.84	1,280
1-27	2245	5.63	1,080	9- 7	1515	5.88	1,330

16-7705. Paauau Gulch at Pahala

Location.--Lat 19°12'39", long 155°28'48", 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.

Records available.--May 1962 to September 1968.

Gage.--Water-stage recorder. Datum of gage is 972 ft above mean sea level (by stadia survey).

Extremes.--Maximum discharge during year, 2,360 cfs Jan. 27 (gage height, 5.48 ft), from rating curve extended above 360 cfs on basis of slope-area measurement at gage height 4.40 ft; no flow most of the time.
1962-68: Maximum discharge, that of Jan. 27, 1968; no flow most of the time each year.

Remarks.--Records good except those above 1,500 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0.19	0	0.09	0	0	0	0	0	1.1	0
2	0	0	.05	0	.58	0	0	0	0	0	.01	0
3	0	0	.15	0	55	0	0	0	0	0	0	0
4	0	0	.09	0	1.5	0	0	0	0	0	0	0
5	0	0	.03	0	.55	0	0	0	0	0	0	0
6	0	.14	.09	.49	.15	0	0	0	0	0	0	1.1
7	0	.54	2.7	.25	0	0	.77	0	0	0	0	4.5
8	0	0	.11	0	7.0	0	12	0	0	0	0	.25
9	0	0	.08	0	.01	0	.45	0	0	0	0	0
10	0	0	.16	0	0	0	.01	0	0	0	.03	0
11	0	0	.03	0	0	0	0	0	0	0	.08	0
12	0	0	0	0	0	0	0	5.8	0	0	.15	0
13	0	0	.01	0	0	0	0	.30	0	0	0	0
14	0	0	0	0	0	0	0	0	2.4	7.6	0	0
15	0	0	0	0	0	0	0	0	.01	0	0	0
16	0	0	0	0	0	0	.02	0	0	0	0	0
17	0	0	0	0	0	0	14	0	0	0	0	0
18	0	0	.41	0	0	.08	1.5	0	0	0	0	0
19	0	0	.16	.10	0	.01	.02	0	0	0	0	0
20	0	0	.01	0	0	0	0	.06	0	0	.08	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	1.8	0	0	0	0	0
23	.05	0	0	0	.53	0	8.4	0	0	0	0	0
24	0	0	4.9	0	.01	.38	16	0	0	0	0	0
25	0	.40	.01	.72	0	.41	.35	0	0	0	0	0
26	0	88	0	23	.10	0	.03	0	0	0	0	0
27	0	6.4	0	104	.01	0	.19	0	0	0	0	0
28	.01	.06	0	22	20	.84	.05	0	0	0	0	0
29	0	0	0	.16	.52	.02	0	0	0	0	0	.51
30	0	.04	0	.04	------	0	0	0	0	0	0	.04
31	0	------	0	.05	------	0	------	0	------	0	0	------
TOTAL	0.06	95.58	9.19	150.81	86.05	1.74	55.59	6.16	2.41	7.6	1.45	6.40
MEAN	0.002	3.19	0.296	4.86	2.97	0.056	1.85	0.199	0.080	0.25	0.047	0.213
MAX	0.05	88	4.9	104	55	0.84	16	5.8	2.4	7.6	1.1	4.5
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0.1	190	18	299	171	3.5	110	12	4.8	15	2.9	13

CAL YR 1967: TOTAL 208.04 MEAN 0.570 MAX 88 MIN 0 AC-FT 413
WAT YR 1968: TOTAL 423.04 MEAN 1.16 MAX 104 MIN 0 AC-FT 839

PEAK DISCHARGE (BASE, 160 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-26	0415	4.19	512	4-17	2015	3.91	316
1-27	2200	5.48	2,360	4-23	2100	3.66	182
2- 3	0900	4.15	480	5-12	1930	3.65	178
2-28	2000	3.89	304	7-14	0200	3.65	178
4- 8	1700	3.88	298				

16-8000. Denni Spring
(Formerly published as Donni Spring near Garapan)

Location (revised).--Lat 15°11'57" N., long 145°46'05" E., 2.8 miles southeast of Tanapag, 3.1 miles east of Garapan, and 5.6 miles northeast of Chalan Kanoa.

Records available.--August 1952 to June 1954, February to April 1968 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 261 ft (from U.S. Navy).

Extremes.--1952-54, 1968: Maximum daily discharge, 1.84 cfs, Nov. 3, 4, 11, 12, 1952; minimum daily, 0.05 cfs, June 12-21, 1954.

Remarks.--Records fair.

DISCHARGE, IN CUBIC FEET PER SECOND, FEBRUARY TO APRIL 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					-	0.32	0.26					
2					-	.32	.26					
3					-	.30	.26	✗0.42				
4					-	.30	.24					
5					-	.30	.24					
6					-	.30	.24					
7					-	.30	.24					
8					-	.30	.24					
9					-	.30	.24					
10					-	.30	.24					
11					-	.30	.24					
12					-	.30	-					
13					.36	.30	-					
14					.36	.30	-					
15					.36	.30	-					
16					.36	.30	-					
17					.36	.30	-					
18					.36	.28	-					
19					.36	.28	-					
20					.34	.28	-					
21					.34	.28	-					
22					.34	.28	-					
23					.34	.28	-					
24					.34	.28	-			✗2.97		
25					.34	.28	-					
26					.34	.26	-					
27					.34	.26	-					
28					.32	.26	-					
29					.32	.26	-					
30					------	.26	-				✗1.40	
31		------			------	.26	------	✗.48	------			------
TOTAL					-	8.94	-					
MEAN					-	0.288	-					
MAX					-	0.32	-					
MIN					-	0.26	-					
AC-FT					-	18	-					

CAL YR 1967:	TOTAL		MEAN		MAX		MIN		AC-FT
WAT YR 1968:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT -

✗ Result of discharge measurement.

16-8015. Middle Fork Talofofo Stream

Location.--Lat 15°13'05" N., long 145°46'36" E., 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.

Records available.--February to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map).

Extremes.--Maximum discharge during period, 1,430 cfs June 28 (gage height, 4.64 ft), from rating curve extended above 5.0 cfs by logarithmic plotting; minimum, 0.15 cfs Apr. 6.

Remarks.--Records fair except those above 10 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, FEBRUARY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					-	0.27	0.19	0.31	0.23	0.33	0.89	0.78
2					-	.27	.19	.31	.23	.50	.83	41
3					-	.27	.19	.31	.31	.53	1.2	38
4					-	.27	.18	.31	.23	.41	1.1	26
5					-	.31	.18	.31	.29	.36	1.3	6.2
6					-	.26	.17	.31	.29	.33	.89	4.8
7					-	.26	.18	.29	.26	.33	.78	3.7
8					-	.24	.18	.29	.24	.31	.73	2.8
9					-	.24	.17	.27	.24	.31	.69	2.3
10					-	.23	.18	.29	.24	1.2	.69	6.2
11					-	.24	14	.27	.24	1.3	.65	25
12					.33	.24	28	.27	.24	.53	.65	22
13					.33	.26	.83	.27	.24	.44	.65	4.8
14					.33	.24	.50	.29	.24	.36	2.7	3.7
15					.33	.23	.38	.31	.27	.36	3.1	2.6
16					.33	.23	.36	.31	.33	.41	.78	2.1
17					.36	.23	.33	9.4	.31	.33	3.0	3.7
18					.33	.23	.38	.47	.27	.31	1.3	1.6
19					.33	.21	.41	.33	.26	.84	.78	2.1
20					.33	.20	.38	.27	.24	.50	.73	1.7
21					.33	.21	.38	.26	.26	25	.96	1.5
22					.31	.19	.38	.24	.26	5.0	.83	1.4
23					.29	.20	.41	.24	.24	2.0	.89	1.3
24					.31	.21	.44	.24	.24	10	.73	1.3
25					.33	.19	.50	.23	.36	2.0	.65	1.2
26					.31	.18	.36	.23	.23	3.8	.69	1.1
27					.33	.18	.33	.23	.20	1.8	.69	1.0
28					.29	.19	.33	.23	26	1.6	1.6	.96
29					.27	.20	.33	.23	.73	1.2	1.3	.96
30					------	.20	.31	.23	.44	1.0	3.4	1.3
31		------			------	.19	------	.23	------	1.1	.78	------
TOTAL					-	7.07	51.15	17.78	34.16	64.49	35.96	213.10
MEAN					-	0.228	1.70	0.574	1.14	2.08	1.16	7.10
MAX					-	0.31	28	9.4	26	25	3.4	41
MIN					-	0.18	0.17	0.23	0.20	0.31	0.65	0.78
AC-FT					-	14	101	35	68	128	71	423

CAL YR 1967:	TOTAL	MEAN	MAX	MIN	AC-FT
WAT YR 1968:	TOTAL -	MEAN -	MAX -	MIN -	AC-FT -

PEAK DISCHARGE (BASE, 300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
4-12	0130	3.23	352	9- 2	2200	4.07	876
6-28	0730	4.64	1,430	9-12	1300	3.11	304
7-21	-	3.12	308				

16-8083. Finile River at Agat

Location.--Lat 13°22'41" N., long 144°39'26" E., on right bank 0.4 mile upstream from estuary and 0.4 mile southeast of Agat School.

Drainage area.--0.26 sq mi.

Records available.--April 1960 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Extremes.--Maximum discharge during year, 145 cfs Nov. 14 (gage height, 2.45 ft), from rating curve extended above 30 cfs as explained below; minimum, 0.39 cfs on several days in May and June.
1960-68: Maximum discharge, 318 cfs Sept. 25, 1967 (gage height, 3.80 ft), 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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	3.3	2.4	1.2	0.95	1.4	0.62	0.44	0.39	0.50	0.70	0.86
2	3.8	2.7	2.2	1.2	.95	1.2	.62	.44	.39	.56	.70	.86
3	3.6	2.7	2.8	1.2	.95	3.5	.70	.44	.44	.56	.70	3.2
4	3.3	2.6	2.0	1.2	.95	2.8	.62	.44	.70	.56	.78	2.6
5	3.1	4.5	1.9	1.2	.95	1.8	.62	.44	2.1	.62	.62	1.4
6	3.3	3.1	1.8	1.2	.95	1.5	.62	.44	.86	1.2	4.2	1.2
7	2.9	2.7	1.8	1.0	.95	1.2	.62	.44	.56	2.2	.78	1.0
8	3.6	2.7	1.8	1.0	.95	1.2	.62	.44	.50	.78	.78	1.0
9	3.1	2.7	2.0	1.2	.95	1.2	.62	.44	.50	.62	.62	.95
10	3.1	2.6	1.8	1.0	.95	1.0	.62	.44	.50	.62	.56	1.2
11	3.3	2.6	1.6	1.4	.95	.95	.62	.44	.50	.62	.62	1.4
12	2.7	2.9	1.6	1.5	1.0	1.0	.70	.44	.56	.62	1.0	7.7
13	8.0	16	1.6	1.9	1.2	.95	.62	.44	.50	.56	3.3	3.1
14	3.3	10	1.9	1.4	.86	.95	.62	.44	.44	.56	1.0	1.8
15	3.1	3.8	1.6	1.2	.78	.95	.56	.44	.44	1.3	.86	1.5
16	3.3	4.0	1.6	1.2	.78	.86	.56	.44	.56	.70	.95	1.4
17	4.0	3.3	1.5	1.0	.78	.86	.56	.62	.50	3.4	1.0	1.4
18	6.8	3.1	1.5	1.0	.78	.86	.56	.50	.50	1.2	1.9	1.2
19	14	3.1	2.2	1.0	.78	.86	.56	.44	.44	1.4	1.4	1.6
20	12	3.6	1.5	1.0	1.2	.86	.56	.44	.44	.95	1.0	1.2
21	5.0	4.0	1.5	.95	1.2	.86	.50	.39	.56	.78	1.0	1.0
22	4.2	3.1	1.4	1.0	1.0	.86	.50	.39	.84	3.2	1.0	1.5
23	3.8	2.7	1.4	1.0	.86	.78	.50	.39	.82	4.6	.86	2.2
24	3.8	2.7	1.4	2.0	.86	.78	.50	.39	.56	7.2	4.0	1.2
25	3.6	2.6	1.6	1.4	7.2	.78	.50	.39	.99	2.0	4.5	1.2
26	3.3	2.6	1.4	1.2	8.9	.78	.50	.39	.62	1.5	1.5	2.2
27	3.1	2.4	1.5	1.2	7.0	.78	.50	.39	.56	1.0	1.2	1.2
28	4.1	2.4	1.4	1.0	1.8	.78	.50	.39	.56	.87	1.0	1.2
29	3.1	2.3	1.2	1.0	1.6	1.0	.44	.44	.56	.70	1.0	2.2
30	3.1	2.7	1.2	.95	------	.78	.44	.62	.50	.70	.95	2.5
31	3.6	------	1.2	.95	------	.70	------	.44	------	.70	.86	------
TOTAL	135.5	109.5	52.3	36.65	49.03	34.78	17.08	13.66	18.39	42.78	41.34	52.97
MEAN	4.37	3.65	1.69	1.18	1.69	1.12	0.569	0.441	0.613	1.38	1.33	1.77
MAX	14	16	2.8	2.0	8.9	3.5	0.70	0.62	2.1	7.2	4.5	7.7
MIN	2.7	2.3	1.2	0.95	0.78	0.70	0.44	0.39	0.39	0.50	0.56	0.86
AC-FT	269	217	104	73	97	69	34	27	36	85	82	105

CAL YR 1967: TOTAL 896.22 MEAN 2.46 MAX 35 MIN 0.44 AC-FT 1,780
WAT YR 1968: TOTAL 603.98 MEAN 1.65 MAX 16 MIN 0.39 AC-FT 1,200

Peak discharge (base, 170 cfs).--No peak above base.

16-8160. Umatac River at Umatac

Location.--Lat 13°17'45" N., long 144°39'50" E., 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.

Records available.--September 1952 to September 1968.

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.

Extremes.--Maximum discharge during year, 1,950 cfs Sept. 25 (gage height, 3.92 ft), from rating curve extended above 320 cfs as explained below; minimum, 0.74 cfs on several days in May and June.
1952-68: 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 fair. Upstream diversion at Piga Spring for domestic use at Umatac. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	9.0	4.6	2.6	2.4	7.6	1.5	0.84	0.84	1.3	1.6	3.8
2	12	7.0	4.3	2.8	2.4	6.4	1.5	.84	.74	1.8	14	18
3	10	6.0	5.0	2.6	2.2	6.8	1.5	.84	.74	1.5	4.0	18
4	9.0	6.0	4.3	3.0	2.2	6.0	1.3	.84	2.8	1.5	3.0	20
5	8.5	11	4.0	2.4	2.0	5.0	1.3	.84	2.0	1.6	2.4	12
6	8.0	10	4.0	2.2	2.2	4.0	1.3	.84	1.3	2.0	3.5	8.0
7	7.5	9.0	4.0	2.2	2.0	3.8	1.2	.84	1.1	9.2	2.6	6.0
8	7.0	7.6	3.8	2.2	2.0	3.5	1.2	.84	1.6	2.0	2.0	5.0
9	7.0	5.3	9.6	2.2	2.0	3.2	1.2	.74	1.2	1.5	2.0	4.6
10	8.0	4.6	4.6	2.4	2.2	3.2	1.2	.74	.94	1.6	1.8	16
11	7.0	4.3	7.0	3.7	2.0	3.0	1.5	.74	1.1	2.2	2.4	16
12	8.0	8.2	4.0	11	6.7	3.0	1.5	.74	2.0	2.4	11	47
13	10	106	3.8	32	13	3.0	2.0	.74	1.8	2.0	35	19
14	9.0	62	4.3	5.3	4.0	2.8	1.5	.74	1.2	1.6	9.0	9.0
15	8.0	13	4.3	3.2	3.0	2.8	1.2	.74	1.1	1.5	7.3	6.8
16	7.0	10	3.2	2.8	2.8	2.4	1.1	.74	4.5	1.3	23	5.6
17	10	8.0	3.2	2.8	2.6	2.4	1.2	.94	2.0	2.0	18	5.0
18	20	7.2	3.0	2.8	2.6	2.4	1.2	.84	1.3	3.2	14	4.3
19	60	6.8	7.2	2.8	2.8	2.2	1.1	.84	1.2	3.2	8.5	4.3
20	50	6.8	3.8	2.4	5.6	2.2	1.1	.84	1.2	2.6	6.0	17
21	15	43	3.2	2.2	4.6	2.2	.94	.84	1.2	2.0	5.3	5.0
22	13	12	3.0	2.2	5.0	2.2	.94	.84	1.3	5.6	4.6	5.0
23	10	7.6	3.2	2.2	3.5	2.2	.94	.84	1.2	29	4.3	6.4
24	9.0	53	3.0	7.0	3.0	2.2	.94	1.3	1.3	19	3.8	4.3
25	8.0	9.0	3.5	6.4	38	2.0	.94	.94	2.6	8.0	93	97
26	8.0	7.2	3.0	3.0	53	1.8	.94	.94	1.8	4.3	28	46
27	9.0	6.0	3.0	3.0	64	2.0	.84	.74	1.3	3.0	8.5	13
28	11	5.6	2.8	2.8	15	1.8	.84	.74	1.8	3.0	6.4	10
29	9.0	5.3	2.8	2.6	10	2.0	.84	.84	1.3	2.6	5.6	9.5
30	7.0	6.0	2.6	2.6	------	2.0	.84	1.5	1.2	2.0	4.3	6.8
31	8.0	------	2.6	2.4	------	1.6	------	1.1	------	1.8	5.6	------
TOTAL	388.0	462.5	124.7	129.8	262.8	97.7	35.60	26.72	45.66	126.3	340.5	448.4
MEAN	12.5	15.4	4.02	4.19	9.06	3.15	1.19	0.862	1.52	4.07	11.0	14.9
MAX	60	106	9.6	32	64	7.6	2.0	1.5	4.5	29	93	97
MIN	7.0	4.3	2.6	2.2	2.0	1.6	0.84	0.74	0.74	1.3	1.6	3.8
AC-FT	770	917	247	257	521	194	71	53	91	251	675	889

CAL YR 1967: TOTAL 4,717.8 MEAN 12.9 MAX 129 MIN 2.0 AC-FT 9,360
WAT YR 1968: TOTAL 2,488.68 MEAN 6.80 MAX 106 MIN 0.74 AC-FT 4,940

Peak discharge (base, 1,200 cfs).--Aug. 25 (1500) 1,850 cfs (3.84 ft); Sept. 25 (1230) 1,950 cfs (3.92 ft).

Note.--No gage-height record Oct. 1 to Nov. 7.

16-8210. Geus River near Merizo

Location.--Lat 13°16'15" N., long 144°40'40" E., 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.

Records available.--April 1953 to September 1968.

Gage.--Water-stage recorder and broad-crested weir. Altitude of gage is 60 ft (from topographic map).

Extremes.--Maximum discharge during year, 586 cfs Sept. 25 (gage height, 3.02 ft), from rating curve extended above 66 cfs as explained below; minimum, 0.10 cfs Apr. 22.
1953-68: 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 for many days in 1966.

Remarks.--Records good. Water is diverted half a mile upstream for domestic use and at station for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	5.0	1.6	0.93	0.55	1.5	0.25	0.28	0.25	0.55	0.51	1.6
2	2.3	3.8	1.5	.93	.55	1.2	.25	.28	.23	.93	1.0	2.2
3	2.1	2.0	1.8	.87	.55	1.2	.28	.28	.25	.77	.93	6.7
4	2.0	3.0	1.5	.93	.55	1.1	.23	.28	.87	.77	.63	9.1
5	1.9	4.0	1.4	.82	.55	.93	.25	.28	1.1	1.2	.51	4.2
6	1.8	5.8	1.4	.77	.55	.82	.25	.28	.55	1.0	.77	2.6
7	1.8	3.1	1.3	.72	.51	.77	.25	.31	.28	1.8	.68	1.8
8	1.9	3.9	1.3	.77	.51	.82	.25	.28	.20	.93	.51	1.4
9	1.9	2.2	2.4	.82	.63	.72	.23	.28	.20	.63	.43	1.3
10	2.0	1.7	1.5	.87	.47	.72	.25	.28	.18	.55	.40	11
11	2.1	1.6	1.4	1.0	.51	.63	.31	.28	.18	.82	.51	11
12	2.2	2.5	1.2	3.2	2.6	.68	.31	.25	.31	1.2	5.8	30
13	2.1	60	1.2	7.8	5.1	.59	.55	.28	.63	.82	30	7.2
14	2.1	32	1.3	2.0	1.3	.59	.37	.28	.28	.51	5.6	3.6
15	1.7	5.4	1.2	1.2	.77	.59	.28	.28	.23	.34	2.4	2.3
16	1.9	5.2	1.1	.93	.68	.51	.18	.28	2.3	1.1	5.3	1.7
17	1.6	3.1	1.2	.87	.55	.59	.25	.37	.82	1.4	14	1.5
18	12	2.6	1.1	.82	.51	.55	.23	.31	.43	1.3	7.6	1.4
19	40	2.2	1.3	.87	.63	.55	.20	.28	.31	2.4	4.2	1.2
20	35	2.2	1.2	.68	2.8	.47	.18	.28	.31	1.6	2.1	1.4
21	8.0	13	1.1	.68	3.4	.40	.16	.28	.34	.87	1.4	1.2
22	5.0	8.1	1.2	.68	2.5	.40	.16	.25	.37	.98	1.4	1.6
23	4.0	3.6	1.4	.63	1.2	.37	.16	.28	.28	13	1.2	3.2
24	3.5	16	1.1	1.0	.72	.43	.20	.60	.25	6.5	1.0	2.2
25	3.0	4.2	1.3	.77	22	.40	.23	.40	.51	3.4	24	58
26	2.5	2.8	1.1	.72	35	.37	.28	.34	.43	1.5	17	12
27	3.5	2.3	1.2	.68	35	.43	.28	.31	.31	.98	3.3	4.6
28	4.6	1.9	1.0	.72	4.2	.37	.25	.20	2.3	.72	1.6	2.3
29	3.2	1.7	1.0	.63	2.2	.37	.25	.20	.82	.77	1.4	1.6
30	2.7	1.9	.98	.59	------	.40	.28	.34	.43	.63	1.2	1.5
31	2.2	------	.87	.59	------	.34	------	.25	------	.55	1.6	------
TOTAL	163.2	206.8	40.15	35.49	127.09	19.81	7.60	9.17	15.95	50.52	138.98	191.4
MEAN	5.26	6.89	1.30	1.14	4.38	0.639	0.253	0.296	0.532	1.63	4.48	6.38
MAX	40	60	2.4	7.8	35	1.5	0.55	0.60	2.3	13	30	58
MIN	1.6	1.6	0.87	0.59	0.47	0.34	0.16	0.20	0.18	0.34	0.40	1.2
AC-FT	324	410	80	70	252	39	15	18	32	100	276	380

CAL YR 1967: TOTAL 1,564.59 MEAN 4.29 MAX 60 MIN 0.25 AC-FT 3,100
WAT YR 1968: TOTAL 1,006.16 MEAN 2.75 MAX 60 MIN 0.16 AC-FT 2,000

Peak discharge (base, 350 cfs).--Sept. 25 (1200) 586 cfs (3.02 ft).

16-8350. Inarajan River near Inarajan

Location.--Lat 13°16'40" N., long 144°44'15" E., on right bank 0.6 mile northwest of Inarajan and 4.9 miles east of Merizo.

Drainage area.--4.49 sq mi.

Records available.--September 1952 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum gage height during year, 12.05 ft Aug. 25 (discharge not determined); minimum discharge, 1.6 cfs June 2.
1952-68: Maximum gage height, 12.90 ft Oct. 11, 1963 (discharge not determined); minimum discharge, 0.99 cfs July 14, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. 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.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	30	12	7.2	3.2	10	3.6	2.3	2.0	2.9	5.2	14
2	47	19	11	7.2	3.2	7.0	3.4	2.3	1.9	3.2	5.0	52
3	36	17	15	6.9	3.0	5.0	3.4	2.3	2.2	2.9	4.6	42
4	30	15	12	7.5	3.0	8.0	3.2	2.3	6.7	3.0	4.4	40
5	26	40	11	6.3	2.9	18	3.2	2.3	4.0	2.9	4.2	22
6	22	35	11	6.3	2.8	10	3.4	2.3	2.9	3.4	13	18
7	20	23	11	6.0	2.8	9.0	3.6	2.2	2.2	4.0	4.8	18
8	20	24	11	6.0	2.8	8.2	3.2	2.2	2.0	3.0	4.0	14
9	20	18	19	6.3	3.0	7.8	3.2	2.2	1.9	2.4	3.6	15
10	25	17	13	6.3	3.0	7.2	3.2	2.3	1.9	2.4	4.6	49
11	27	16	15	7.2	3.0	6.8	4.0	2.3	1.8	2.9	4.8	36
12	28	20	12	16	9.0	6.4	4.0	2.2	3.0	3.2	93	159
13	38	406	12	20	15	6.4	5.0	2.0	4.2	2.8	74	43
14	20	115	12	8.4	5.0	6.2	4.2	2.0	2.2	2.4	11	28
15	22	26	11	7.2	4.0	5.8	3.2	2.0	1.9	2.3	37	22
16	20	25	10	6.6	3.5	5.5	3.0	2.0	7.8	29	24	20
17	16	19	10	6.2	3.0	5.2	3.2	2.3	3.2	5.2	23	19
18	99	19	9.1	5.8	2.8	5.2	3.2	2.0	2.3	7.0	17	19
19	306	16	11	5.4	2.6	5.0	2.9	2.0	2.0	24	12	17
20	284	19	9.4	5.0	2.5	4.6	2.8	1.9	2.3	7.8	9.1	16
21	25	72	9.1	4.7	5.0	4.4	2.8	1.8	2.4	4.6	9.1	16
22	30	23	8.8	4.5	4.0	4.2	2.6	1.8	3.0	6.1	9.1	16
23	26	19	11	4.2	3.5	4.4	2.6	1.9	2.2	89	13	46
24	20	85	8.8	4.0	3.0	4.6	2.6	5.4	1.9	27	9.1	19
25	18	19	9.4	3.9	2.8	4.2	2.4	3.2	4.0	13	270	47
26	17	15	8.4	3.8	20	4.2	2.4	2.4	2.4	8.1	137	37
27	21	15	8.4	3.8	150	4.6	2.3	2.3	2.2	6.6	23	19
28	28	15	8.1	3.8	30	4.2	2.4	2.3	10	6.3	16	17
29	21	14	8.1	3.8	17	4.0	2.3	2.3	4.2	6.0	19	16
30	18	15	7.8	3.6	------	4.6	2.3	5.2	2.9	6.6	15	17
31	16	------	7.2	3.6	------	4.0	------	2.4	------	5.5	17	------
TOTAL	1414	1211	332.6	197.5	315.4	194.7	93.6	74.4	93.6	295.5	895.6	913
MEAN	45.6	40.4	10.7	6.37	10.9	6.28	3.12	2.40	3.12	9.53	28.9	30.4
MAX	306	406	19	20	150	18	5.0	5.4	10	89	270	159
MIN	16	14	7.2	3.6	2.5	4.0	2.3	1.8	1.8	2.3	3.6	14
AC-FT	2800	2400	660	392	626	386	186	148	186	586	1780	1810

CAL YR 1967: TOTAL 10,229.6 MEAN 28.0 MAX 406 MIN 3.8 AC-FT 20,290
WAT YR 1968: TOTAL 6,030.9 MEAN 16.5 MAX 406 MIN 1.8 AC-FT 11,960

Peak discharge (base, 1,700 cfs).--Aug. 25 (1530) discharge not determined (12.05 ft).

Note.--No gage-height record Feb. 13 to Mar. 14.

16-8400. Paulilue River near Inarajan

Location.--Lat 13°17'05" N., long 144°45'00" E., 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.

Records available.--October 1952 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during year, about 500 cfs Aug. 25; minimum, 0.23 cfs May 28, 29.
1952-68: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended above 210 cfs by logarithmic plotting; minimum, 0.15 cfs May 16, 21-23, 29, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	6.1	4.3	2.6	1.3	2.9	1.2	0.47	0.78	0.83	1.4	4.1
2	5.8	4.7	4.3	2.8	1.2	2.6	1.2	.47	.54	.74	1.3	19
3	5.5	4.1	5.2	2.8	1.2	2.5	1.0	.44	.54	.74	1.2	14
4	4.7	3.9	4.9	2.8	1.2	3.7	.99	.44	.88	.70	1.2	11
5	4.7	8.9	4.7	2.8	1.1	6.7	.93	.47	.78	.70	1.2	6.1
6	4.7	10	4.7	2.8	1.0	2.9	.93	.47	.66	.83	6.0	4.9
7	4.5	5.8	4.3	2.5	1.0	2.5	.93	.44	.54	1.2	2.9	5.8
8	5.2	6.1	3.9	2.4	.99	2.4	.93	.41	.50	.93	1.6	4.1
9	4.7	4.5	4.7	2.4	.99	2.0	.88	.41	.47	.74	1.4	4.3
10	5.5	4.3	4.5	2.2	.93	2.0	.83	.41	.44	.66	1.3	17
11	5.5	4.1	3.9	2.5	.93	1.9	.97	.44	.47	.66	1.4	12
12	4.7	7.4	3.9	6.1	2.1	1.9	1.0	.47	.70	.62	39	80
13	12	130	3.7	9.3	4.1	1.8	1.3	.47	.78	.58	14	14
14	5.2	42	3.7	4.3	2.0	1.7	1.6	.50	.66	.50	4.1	7.3
15	5.7	9.7	4.1	3.0	1.4	1.7	1.3	.74	.58	.50	6.8	5.8
16	4.9	7.7	3.7	2.8	1.3	1.6	1.2	.74	.83	1.5	16	4.9
17	4.3	6.7	3.5	2.5	1.3	1.6	1.1	.74	.93	1.5	6.4	4.9
18	26	6.7	3.5	2.5	1.2	1.5	.99	.58	.78	2.1	5.5	4.7
19	91	6.1	5.7	2.5	1.2	1.5	.99	.38	.62	26	4.9	4.5
20	93	9.7	4.1	2.4	1.7	1.4	.83	.41	.58	3.7	3.4	3.9
21	17	14	3.4	2.4	2.1	1.4	.74	.44	.54	1.8	3.4	3.7
22	11	11	3.2	2.1	1.8	1.4	.70	.32	.58	2.2	3.9	3.7
23	8.1	6.7	3.2	2.0	1.5	1.3	.66	.38	.54	24	5.8	11
24	6.7	31	3.0	1.9	1.4	1.3	.66	.29	.50	8.5	3.5	4.5
25	6.1	7.0	3.0	1.8	13	1.3	.62	.29	1.0	4.3	85	5.2
26	6.4	6.1	3.0	1.7	21	1.2	.62	.29	.99	2.8	42	5.5
27	5.2	5.5	2.9	1.6	48	1.2	.54	.27	.74	2.0	6.1	4.7
28	9.1	4.9	2.9	1.4	4.7	1.2	.54	.27	.93	1.7	4.5	4.1
29	11	4.5	2.8	1.4	4.1	1.2	.50	.25	1.2	1.6	4.9	3.7
30	4.9	4.7	2.6	1.4	------	1.3	.47	1.1	.88	1.5	4.5	5.5
31	4.9	------	2.6	1.4	------	1.2	------	1.2	------	1.4	4.1	------
TOTAL	395.7	383.9	117.9	83.1	125.74	60.8	27.15	15.00	20.96	97.53	288.7	283.9
MEAN	12.8	12.8	3.80	2.68	4.34	1.96	0.905	0.484	0.699	3.15	9.31	9.46
MAX	93	130	5.7	9.3	48	6.7	1.6	1.2	1.2	26	85	80
MIN	4.3	3.9	2.6	1.4	0.93	1.2	0.47	0.25	0.44	0.50	1.2	3.7
AC-FT	785	761	234	165	249	121	54	30	42	193	573	563

CAL YR 1967: TOTAL 3,128.7 MEAN 8.55 MAX 134 MIN 1.2 AC-FT 6,210
WAT YR 1968: TOTAL 1,900.38 MEAN 5.19 MAX 130 MIN 0.25 AC-FT 3,770

Peak discharge (base, 400 cfs).--Aug. 25 (1500) about 500 cfs (gage height unknown).

16-8470. Imong River near Agat

Location.--Lat 13°20'14" N., long 144°41'55" E., 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.

Records available.--March 1960 to September 1968.

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

Extremes.--Maximum discharge during year, 1,220 cfs Sept. 25 (gage height, 5.46 ft), from rating curve extended above 110 cfs as explained below; minimum, 2.0 cfs on several days.
1960-68: 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 good except those for periods of no gage-height record, which are poor. No diversion above station. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	7.0	6.3	4.0	2.8	6.0	2.8	2.2	2.6	2.4	4.2	5.6
2	11	6.0	5.9	4.3	2.8	5.6	2.8	2.2	2.2	2.8	4.0	8.6
3	10	6.0	9.3	4.0	2.8	5.0	2.8	2.2	2.4	2.2	3.9	22
4	9.0	8.0	6.3	4.3	2.8	6.0	2.6	2.2	6.2	2.4	3.9	29
5	8.0	11	5.9	3.8	2.6	8.0	2.6	2.2	7.9	2.4	3.8	14
6	7.0	8.0	5.6	3.8	2.6	5.9	2.6	2.4	3.8	3.0	8.0	10
7	7.0	7.0	5.9	3.5	2.6	5.2	2.6	2.2	2.6	5.9	6.0	9.5
8	7.0	6.0	5.6	3.5	2.6	4.9	2.6	2.2	2.4	3.2	4.0	7.5
9	8.0	5.6	15	3.8	2.6	4.6	2.8	2.0	2.4	2.6	3.5	10
10	10	5.4	6.3	3.8	2.8	4.3	2.8	2.4	2.2	2.8	4.0	22
11	12	5.0	5.9	7.6	2.6	4.0	3.0	2.2	2.2	2.8	4.5	18
12	15	6.0	5.6	15	5.2	4.0	3.5	2.0	2.8	2.8	60	53
13	30	200	7.1	27	11	3.8	3.5	2.0	3.5	2.5	10	26
14	10	20	6.9	5.9	4.0	3.8	2.8	2.4	2.4	2.4	6.0	14
15	11	10	6.7	4.6	3.0	3.8	2.8	2.2	2.4	2.4	28	10
16	9.0	8.0	5.6	4.6	3.0	3.8	2.8	2.0	4.6	12	15	9.0
17	12	7.0	5.9	5.2	2.8	3.5	3.0	2.6	2.8	4.0	11	9.0
18	46	6.0	5.6	4.6	2.8	3.5	2.8	2.2	2.6	5.0	20	12
19	144	7.0	12	4.0	3.2	3.5	2.6	2.2	2.4	10	13	10
20	87	30	5.6	3.8	5.9	3.2	2.6	2.8	2.4	5.0	7.1	17
21	8.0	10	5.9	3.8	4.3	3.5	2.6	2.0	2.4	4.0	5.9	10
22	10	8.0	5.9	4.0	4.0	3.5	2.6	2.2	2.6	5.0	6.3	11
23	8.0	7.0	7.5	3.5	3.2	3.2	2.4	2.2	2.8	50	5.6	17
24	7.0	40	5.6	8.1	3.0	3.5	2.4	4.2	2.6	15	5.6	13
25	6.0	10	6.7	4.9	25	3.0	2.6	2.6	4.9	9.0	20	76
26	7.0	8.0	5.6	3.8	45	3.0	2.4	2.4	3.5	6.0	25	50
27	6.0	7.1	5.6	3.8	10	3.0	2.4	2.2	2.6	5.0	9.0	14
28	6.0	6.7	4.9	3.2	9.0	3.0	2.4	2.2	12	4.5	6.7	51
29	10	6.3	4.9	3.2	7.0	3.5	2.2	2.4	4.3	4.3	9.0	35
30	7.0	8.0	4.3	3.0	------	3.8	2.4	5.0	2.6	5.0	6.3	18
31	6.0	------	4.3	2.8	------	3.0	------	2.6	------	4.5	6.3	------
TOTAL	548.0	480.1	200.2	165.2	181.0	128.4	80.8	74.8	103.1	190.9	325.6	611.2
MEAN	17.7	16.0	6.46	5.33	6.24	4.14	2.69	2.41	3.44	6.16	10.5	20.4
MAX	144	200	15	27	45	8.0	3.5	5.0	12	50	60	76
MIN	6.0	5.0	4.3	2.8	2.6	3.0	2.2	2.0	2.2	2.2	3.5	5.6
AC-FT	1,100	952	397	328	359	255	160	148	204	379	646	1,210

CAL YR 1967: TOTAL 7,270.5 MEAN 19.9 MAX 406 MIN 3.0 AC-FT 14,420
WAT YR 1968: TOTAL 3,089.3 MEAN 8.44 MAX 200 MIN 2.0 AC-FT 6,130

Peak discharge (base, 1,400 cfs).--No peak above base.

Note.--No gage-height record Oct. 21 to Nov. 26, July 12 to Aug. 19.

16-8480. Almagosa Springs near Agat

Location.--Lat 13°20'45" N., long 144°40'45" E., on left bank 3.5 miles southeast of Agat and 3.5 miles northeast of Umatac.

Drainage area.--0.74 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--September 1951 to January 1968 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 640 ft (from topographic map).

Extremes.--Maximum discharge during period, 122 cfs Nov. 14 (gage height, 2.70 ft), from rating curve extended above 53 cfs as explained below; minimum, 0.02 cfs Dec. 24, 27-31.
1951-68: Maximum discharge, 770 cfs Oct. 15, 1953 (gage height, 5.02 ft), from rating curve extended above 53 cfs by test on model of station site; no flow at times.

Remarks.--Records good. Up to 3.9 cfs diverted above station for municipal use.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1967 to JANUARY 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	4.6	2.4	0.05								
2	16	4.0	2.0	.09								
3	12	3.7	2.3	.10								
4	11	3.5	1.8	.20								
5	9.6	5.0	1.5	.20								
6	8.2	4.0	1.3	.23								
7	7.6	3.8	1.1	.23								
8	7.3	3.4	.92	.20								
9	7.3	2.8	1.2	.23								
10	6.4	2.7	.79	.18								
11	5.9	2.3	.67	.46								
12	5.6	3.3	.57	2.0								
13	10	50	.67	4.3								
14	8.8	52	.57	1.4								
15	6.4	19	.62	.67								
16	6.7	12	.32	-								
17	6.7	9.4	.26	-								
18	22	7.6	.16	-								
19	56	5.9	.88	-								
20	65	5.6	.32	-								
21	28	6.4	.14	-								
22	20	7.0	.04	-								
23	13	5.6	.12	-								
24	11	7.9	.02	-								
25	9.4	5.3	.07	-								
26	8.5	4.4	.03	-								
27	7.0	3.8	.02	-								
28	7.0	3.1	.02	-								
29	5.0	2.9	.02	-								
30	5.1	2.8	.02	-	------		------		------			------
31	5.6	------	.02	-	------							
TOTAL	422.1	253.8	20.87	-								
MEAN	13.6	8.46	0.673	-								
MAX	65	52	2.4	-								
MIN	5.0	2.3	0.02	-								
AC-FT	837	503	41	-								

CAL YR 1967: TOTAL 2,209.83 MEAN 6.05 MAX 65 MIN 0.01 AC-FT 4,380
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 80 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-19	2330	2.30	94	11-14	0700	2.70	122
11-13	1500	2.68	121				

16-8490. Fena Dam spillway near Agat

Location.--Lat 13°21'30" N., long 144°42'10" E., on left bank 4.0 miles southeast of Agat and 5.5 miles southwest of Yona.

Drainage area.--5.81 sq mi.

Records available.--September 1951 to July 1952, November 1952 to September 1968.

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).

Extremes.--Maximum discharge during year, 793 cfs Nov. 13 (gage height, 1.30 ft), from rating curve extended above 130 cfs on basis of broad-crested weir formula; no flow for many days.
1951-68: 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. About 10 cfs is diverted from Fena Valley Reservoir and tributary springs for military and civilian use. Records represent only flow over spillway. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	20	6.0	0							0	136
2	52	17	6.0	0							0	130
3	34	12	14	0							0	122
4	34	12	9.9	0							0	350
5	34	34	6.0	0							0	200
6	31	28	4.3	0							0	160
7	31	17	4.3	0							0	140
8	34	9.9	4.3	0							0	122
9	34	4.3	14	0							0	200
10	31	6.0	9.9	0							0	250
11	34	4.3	6.0	0							0	150
12	28	14	4.3	20							0	400
13	113	430	4.3	44							55	79
14	48	268	6.0	9.9							168	38
15	25	48	9.9	1.5							162	25
16	28	31	6.0	.54							184	17
17	38	20	2.8	0							189	14
18	143	17	2.8	0							213	22
19	335	14	9.9	0							207	17
20	370	20	9.9	0							178	20
21	94	31	2.8	0							162	17
22	89	31	0	0							162	25
23	48	17	4.3	0							147	63
24	28	34	2.8	0							152	31
25	28	14	2.8	0							218	150
26	31	9.9	4.3	0							248	120
27	25	7.9	1.5	0							184	48
28	59	6.0	.54	0							168	129
29	22	6.0	.54	0							152	132
30	20	7.9	0	0	------						127	94
31	34	------	0	0	------		------		------		136	------
TOTAL	2049	1191.2	160.18	75.94	0	0	0	0	0	0	3212	3401
MEAN	66.1	39.7	5.17	2.45	0	0	0	0	0	0	104	113
MAX	370	430	14	44	0	0	0	0	0	0	248	400
MIN	20	4.3	0	0	0	0	0	0	0	0	0	14
AC-FT	4060	2360	318	151	0	0	0	0	0	0	6370	6750

CAL YR 1967: TOTAL 14,565.82 MEAN 39.9 MAX 641 MIN 0 AC-FT 28,890
WAT YR 1968: TOTAL 10,089.32 MEAN 27.6 MAX 430 MIN 0 AC-FT 20,010

16-8550. Ugum River near Talofofo

Location.--Lat 13°20'00" N., long 144°44'55" E., 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.

Records available.--June 1952 to September 1968.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level.

Extremes.--Maximum discharge during year, 1,090 cfs Feb. 27 (gage height, 8.51 ft); minimum, 5.1 cfs May 28.
1952-68: 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 good. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	48	24	14	12	22	9.2	6.6	6.2	7.0	13	18
2	75	37	23	15	11	17	9.2	6.6	5.6	8.8	13	64
3	63	32	31	14	11	19	9.2	6.6	5.6	8.0	13	65
4	55	32	25	15	11	25	8.8	6.6	15	7.6	12	48
5	49	63	23	13	10	29	8.4	6.2	11	7.3	12	41
6	44	53	23	13	10	16	8.4	6.2	10	7.0	23	32
7	43	48	22	13	9.6	15	8.4	6.2	7.0	18	15	26
8	42	42	21	13	9.6	14	8.0	6.2	6.2	11	13	23
9	40	31	57	14	10	14	8.0	6.2	5.9	7.6	12	24
10	39	27	24	14	12	13	7.6	7.0	5.9	7.3	11	52
11	43	26	25	18	12	13	9.2	7.0	5.6	8.0	13	41
12	37	40	21	52	19	13	9.6	6.2	8.0	7.6	16	157
13	92	409	23	90	32	13	12	6.2	8.4	7.0	76	61
14	41	174	21	25	15	12	10	6.2	6.2	7.3	28	36
15	36	56	24	18	12	13	8.4	5.9	5.9	6.2	26	30
16	35	50	19	17	11	12	8.0	6.2	21	23	42	26
17	34	40	19	16	10	12	8.8	6.2	14	14	37	27
18	131	38	18	16	9.6	12	9.6	5.9	8.0	19	34	29
19	353	36	33	15	12	12	8.4	5.6	6.6	55	28	29
20	302	45	20	14	17	11	8.0	5.9	6.2	21	19	49
21	81	77	18	13	14	11	8.0	5.3	6.6	14	18	30
22	69	55	18	13	13	11	8.0	5.3	7.0	31	18	30
23	53	34	19	13	12	10	7.6	6.2	6.6	137	23	52
24	45	110	18	13	9.6	11	7.6	13	6.6	67	18	31
25	43	35	19	14	74	10	7.6	9.6	12	43	146	113
26	44	31	18	13	160	10	7.6	6.2	8.8	25	128	92
27	46	27	17	12	188	9.6	7.3	5.6	6.6	19	32	41
28	60	26	16	12	34	9.6	7.0	5.3	21	18	25	40
29	44	25	15	12	24	10	7.0	5.3	13	16	23	33
30	36	30	14	12	------	13	7.0	12	8.4	14	20	31
31	41	------	14	12	------	10	------	8.0	------	13	24	------
TOTAL	2201	1777	682	558	784.4	422.2	251.9	207.5	264.9	654.7	931	1371
MEAN	71.0	59.2	22.0	18.0	27.0	13.6	8.40	6.69	8.83	21.1	30.0	45.7
MAX	353	409	57	90	188	29	12	13	21	137	146	157
MIN	34	25	14	12	9.6	9.6	7.0	5.3	5.6	6.2	11	18
AC-FT	4370	3520	1350	1110	1560	837	500	412	525	1300	1850	2720

CAL YR 1967: TOTAL 17,208 MEAN 47.1 MAX 505 MIN 10 AC-FT 34,130
WAT YR 1968: TOTAL 10,105.6 MEAN 27.6 MAX 409 MIN 5.3 AC-FT 20,040

Peak discharge (base, 1,100 cfs).--No peak above base.

16-8580. Ylig River near Yona

Location.--Lat 13°23'20" N., long 144°45'00" E., 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.

Records available.--June 1952 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,880 cfs Nov. 13 (gage height, 14.08 ft), from rating curve extended above 620 cfs as explained below; minimum, 1.3 cfs May 29.
1952-68: 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. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	24	17	7.0	3.7	30	5.5	2.5	1.9	6.0	15	19
2	34	24	15	6.8	3.6	20	5.3	2.4	1.6	5.8	13	23
3	32	20	16	6.8	3.6	25	4.9	2.4	1.6	5.5	12	113
4	31	19	16	6.5	3.4	27	4.7	2.2	2.6	7.0	31	121
5	26	49	14	6.5	3.2	30	4.7	2.1	4.4	12	18	42
6	33	30	14	6.2	3.1	22	4.5	2.1	4.9	10	173	33
7	26	20	13	6.0	3.1	19	4.7	2.1	2.7	28	32	32
8	68	18	12	6.0	2.9	17	4.5	2.0	2.9	11	23	25
9	33	18	17	6.0	3.4	16	4.3	2.0	3.6	11	17	23
10	27	16	11	6.0	3.7	14	4.3	1.9	2.1	9.9	15	45
11	26	14	11	7.0	3.6	13	4.9	2.1	1.8	9.9	17	133
12	24	26	11	10	4.3	15	6.0	2.1	2.4	18	24	473
13	57	788	11	20	18	11	4.9	3.6	2.6	11	133	91
14	26	266	10	10	6.0	9.9	4.7	3.7	1.8	9.3	27	50
15	21	58	18	8.0	3.9	11	4.3	5.1	1.6	7.8	24	38
16	25	43	11	7.0	3.6	9.3	3.9	2.5	5.1	13	47	32
17	50	37	9.9	6.0	3.4	8.3	3.7	3.7	3.4	62	40	30
18	180	33	9.6	6.0	3.1	8.0	9.7	3.2	2.2	43	57	37
19	361	29	18	5.5	4.1	8.0	7.0	2.4	2.1	24	39	34
20	379	115	12	5.0	15	7.8	4.5	2.0	1.8	16	26	23
21	85	72	9.9	5.0	8.3	7.5	3.7	1.9	1.9	17	24	20
22	56	46	9.0	6.2	12	7.0	3.6	1.7	3.6	109	30	35
23	42	32	8.6	7.0	6.2	6.8	3.2	1.8	4.0	145	24	121
24	35	39	8.6	6.0	4.9	6.8	3.2	1.7	4.9	152	31	29
25	32	26	8.6	7.0	50	6.8	3.2	1.6	6.6	69	162	41
26	32	24	9.0	6.0	173	6.2	3.4	1.5	5.8	40	38	80
27	26	20	8.6	5.0	342	5.8	2.9	1.5	3.6	29	26	30
28	89	19	8.6	4.5	64	5.5	2.8	1.4	80	24	32	24
29	45	19	8.0	4.5	45	8.5	2.6	1.5	13	23	32	26
30	27	19	7.5	3.9	------	15	2.6	3.4	7.0	19	26	234
31	37	------	7.0	3.7	------	6.2	------	3.2	------	16	22	------
TOTAL	2,008	1,963	359.9	207.1	804.1	403.4	132.2	73.3	183.5	963.2	1,230	2,057
MEAN	64.8	65.4	11.6	6.68	27.7	13.0	4.41	2.36	6.12	31.1	39.7	68.6
MAX	379	788	18	20	342	30	9.7	5.1	80	152	173	473
MIN	21	14	7.0	3.7	2.9	5.5	2.6	1.4	1.6	5.5	12	19
AC-FT	3,980	3,890	714	411	1,590	800	262	145	364	1,910	2,440	4,080

CAL YR 1967: TOTAL 18,962.1 MEAN 52.0 MAX 1,080 MIN 4.1 AC-FT 37,610
WAT YR 1968: TOTAL 10,384.7 MEAN 28.4 MAX 788 MIN 1.4 AC-FT 20,600

PEAK DISCHARGE (BASE, 2,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-13	1430	14.08	2,880	9-12	0600	12.45	2,380
2-27	0500	12.20	2,300				

16-8650. Pago River near Ordot

Location.--Lat 13°26'10" N., long 144°45'15" E., 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.

Records available.--September 1951 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,760 cfs Sept. 12 (gage height, 15.20 ft), from rating curve extended above 320 cfs as explained below; minimum, 1.2 cfs on May 10.
1951-68: 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 June 5-7, 10-23, 1959, Apr. 29 to June 13, June 17-19, July 4, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	20	11	3.6	2.1	28	11	1.5	2.3	5.0	13	18
2	36	19	11	4.3	2.1	16	10	1.3	1.9	4.6	12	17
3	30	18	11	4.0	2.1	20	9.0	1.5	6.1	4.4	11	78
4	27	17	11	4.0	1.9	25	7.5	1.5	10	5.0	19	98
5	25	44	10	3.3	1.7	28	3.1	1.5	4.9	6.0	17	40
6	31	26	9.4	3.3	1.7	25	3.1	1.5	4.6	9.0	150	30
7	24	18	8.9	3.1	1.7	22	3.3	1.4	37	23	25	28
8	52	14	8.9	3.1	1.7	20	3.3	1.4	3.5	13	21	23
9	33	13	9.4	3.1	2.3	18	2.8	1.4	3.9	10	17	19
10	25	12	7.9	3.1	2.6	15	2.8	1.3	2.2	9.6	14	32
11	22	12	7.9	3.3	2.3	14	3.6	1.7	1.7	9.2	16	125
12	20	17	7.4	4.9	2.6	13	4.0	1.3	2.1	10	17	866
13	38	700	7.0	21	18	12	4.0	2.1	2.8	9.2	130	100
14	20	250	7.0	6.1	4.3	12	4.0	4.5	2.2	8.0	30	62
15	18	70	8.4	4.3	2.8	13	3.6	4.0	1.6	7.0	20	40
16	21	36	6.6	4.0	2.3	12	3.6	2.6	6.2	15	34	25
17	30	30	6.6	3.6	2.3	12	3.3	6.7	4.6	50	30	24
18	40	26	6.1	3.6	2.1	11	4.9	8.4	3.4	35	45	31
19	400	24	7.9	3.3	2.1	10	4.0	3.6	2.6	21	29	25
20	420	104	6.1	3.1	6.6	9.8	2.8	2.3	1.8	18	22	21
21	50	60	5.3	2.8	6.1	9.4	2.3	1.9	1.9	18	19	18
22	40	40	4.9	4.3	8.4	8.6	2.1	1.7	2.0	60	18	35
23	35	30	4.9	4.6	7.0	8.1	2.1	1.5	2.3	180	14	70
24	30	22	4.6	3.6	4.3	7.8	2.1	1.5	3.5	110	14	26
25	27	18	5.3	4.6	80	7.4	1.9	1.5	7.0	50	92	60
26	25	15	4.6	3.1	240	7.2	2.1	1.5	6.4	29	28	92
27	24	13	4.6	2.6	370	7.0	1.7	1.5	8.0	25	19	29
28	60	12	4.3	2.8	36	9.0	1.5	1.3	86	21	57	21
29	35	12	4.3	2.6	32	12	1.7	1.5	25	18	33	25
30	23	12	4.0	2.6	------	15	1.5	9.2	14	16	24	140
31	30	------	4.3	2.1	------	13	------	4.0	------	15	24	------
TOTAL	1731	1704	220.6	127.8	849.1	440.3	112.7	78.6	261.5	814.0	1014	2218
MEAN	55.8	56.8	7.12	4.12	29.3	14.2	3.76	2.54	8.72	26.3	32.7	73.9
MAX	420	700	11	21	370	28	11	9.2	86	180	150	866
MIN	18	12	4.0	2.1	1.7	7.0	1.5	1.3	1.6	4.4	11	17
AC-FT	3430	3380	438	253	1680	873	224	156	519	1610	2010	4400

CAL YR 1967: TOTAL 17,072.2 MEAN 46.8 MAX 750 MIN 3.1 AC-FT 33,860
WAT YR 1968: TOTAL 9,571.6 MEAN 26.2 MAX 866 MIN 1.3 AC-FT 18,980

PEAK DISCHARGE (BASE, 2,700 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11-13	about 1430	-	about 4,500	9-12	0630	15.20	4,760
2-27	about 0500	-	about 3,200				

Note.--No gage-height record Oct. 1 to Nov. 6, Feb. 25 to Apr. 4, June 7 to Aug. 21.

16-8752. Benoki-gawa at Benoki

Location.--Lat 26°47'06" N., long 128°14'59" E., on left bank 0.9 mile southeast of Benoki and 1.6 miles east of Sate.

Drainage area.--3.8 sq mi, approximately.

Records available.--December 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 220 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,420 cfs June 20 (gage height, 8.50 ft); minimum, 2.5 cfs Oct. 15, 16.
1963-68: Maximum discharge, 6,700 cfs May 12, 1966 (gage height, 10.45 ft), from rating curve extended above 2,400 cfs by logarithmic plotting; minimum, 2.5 cfs Oct. 14, 16, 1967.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	8.9	7.4	7.1	6.3	35	23	8.8	34	17	6.3	17
2	3.3	8.0	8.8	6.9	20	13	21	8.5	25	16	7.5	15
3	3.0	7.5	32	6.8	14	15	19	8.2	14	16	9.3	14
4	5.7	7.0	14	6.5	28	12	18	8.0	13	15	10	14
5	4.6	6.9	29	6.4	50	11	16	7.9	12	14	7.4	13
6	3.7	7.1	59	7.1	28	10	15	7.7	11	29	6.6	12
7	2.9	6.0	18	11	32	9.7	14	12	10	38	6.0	11
8	2.7	5.7	15	7.0	35	9.7	14	7.9	9.7	14	5.7	10
9	2.7	5.4	13	6.8	23	8.9	13	7.4	10	13	5.8	10
10	3.9	6.0	12	6.4	19	8.6	12	7.1	15	12	5.8	9.5
11	3.8	8.3	12	7.0	17	8.6	12	7.0	9.9	12	5.4	9.5
12	2.9	20	10	6.0	16	8.8	12	6.9	9.6	11	5.2	8.9
13	2.8	8.2	9.9	7.0	14	8.1	11	7.1	9.2	12	7.6	8.6
14	2.9	6.8	14	6.8	14	7.9	10	6.5	8.8	10	5.8	8.4
15	2.8	6.2	12	5.8	66	8.9	10	6.2	8.2	9.9	121	8.1
16	2.9	5.8	9.9	5.7	18	8.4	13	6.2	14	9.5	16	7.9
17	14	5.7	9.3	5.7	16	7.4	10	6.2	13	8.9	21	7.6
18	133	10	14	5.6	15	7.2	9.7	9.1	65	10	12	7.9
19	84	8.9	10	6.4	14	7.1	9.2	7.9	60	9.2	9.7	7.7
20	17	6.8	9.3	6.7	13	13	8.8	8.1	331	9.3	8.8	7.4
21	10	7.2	9.3	5.6	12	13	54	40	112	12	8.2	6.9
22	7.9	6.9	8.4	5.3	12	11	21	15	54	8.9	25	6.9
23	6.9	5.8	8.1	5.2	11	34	13	9.9	39	8.1	11	8.5
24	10	5.6	8.0	5.3	11	14	11	10	69	8.0	15	10
25	23	5.2	7.7	8.8	11	13	10	150	27	7.6	12	6.8
26	34	5.1	7.5	7.1	10	12	9.9	18	24	7.2	12	6.4
27	131	5.0	15	5.7	9.5	14	9.6	15	22	7.5	12	6.4
28	19	4.9	9.6	5.4	9.6	12	14	12	20	7.0	17	6.9
29	14	9.0	8.4	5.6	9.3	350	9.9	11	20	6.8	15	6.6
30	12	7.6	7.7	9.8	------	62	9.0	10	18	6.6	30	6.4
31	10	------	7.4	6.3	------	30	------	9.5	------	6.4	22	------
TOTAL	580.3	217.5	415.7	204.8	553.7	783.3	432.1	455.1	1087.4	371.9	462.1	279.3
MEAN	18.7	7.25	13.4	6.61	19.1	25.3	14.4	14.7	36.2	12.0	14.9	9.31
MAX	133	20	59	11	66	350	54	150	331	38	121	17
MIN	2.7	4.9	7.4	5.2	6.3	7.1	8.8	6.2	8.2	6.4	5.2	6.4
AC-FT	1,150	431	825	406	1,100	1,550	857	903	2,160	738	917	554

CAL YR 1967: TOTAL 6,472.8 MEAN 17.7 MAX 511 MIN 2.7 AC-FT 12,840
WAT YR 1968: TOTAL 5,843.2 MEAN 16.0 MAX 350 MIN 2.7 AC-FT 11,590

PEAK DISCHARGE (BASE, 1,300 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
3-29	1600	8.08	2,920	6-20	1730	8.50	3,420
5-25	0800	7.00	1,820				

16-8755. Yona-gawa at Yona

Location.--Lat 26°45'10" N., long 128°13'18" E., on left bank 0.9 mile southeast of Yona and 2.7 miles east of Hentona School.

Drainage area.--1.7 sq mi, approximately.

Records available.--December 1963 to September 1968.

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

Extremes.--Maximum discharge during year, 1,060 cfs June 20 (gage height, 4.48 ft), from rating curve extended above 350 cfs; minimum, 1.4 cfs Oct. 15, 16.
1963-68: 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.

Remarks.--Records good except those above 700 cfs, which are fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	6.2	3.8	3.0	3.2	13	14	4.1	7.4	5.9	3.4	16
2	2.1	5.6	3.4	2.8	6.5	5.4	12	3.8	7.4	5.6	6.8	13
3	1.7	5.1	10	2.8	4.8	6.2	12	3.8	4.6	5.8	3.4	10
4	5.5	4.6	6.8	2.6	6.8	4.8	9.5	3.6	4.4	5.4	5.0	13
5	2.8	4.4	4.4	2.6	16	4.6	8.3	3.6	4.1	4.8	5.4	10
6	2.2	4.4	6.8	3.0	10	4.1	7.2	3.6	3.6	7.8	3.8	9.1
7	1.7	4.1	5.4	5.4	12	3.8	6.8	5.2	3.6	18	3.4	8.3
8	1.7	3.8	4.6	3.0	18	4.1	6.2	3.6	3.4	6.2	3.4	7.2
9	1.7	3.6	3.8	2.6	12	3.6	5.9	3.4	3.8	5.4	3.2	7.2
10	1.6	3.6	3.4	2.6	9.1	3.8	5.6	3.4	5.2	4.8	3.2	6.5
11	3.4	3.8	3.6	3.0	7.6	4.1	5.4	3.4	3.6	4.6	3.0	6.2
12	1.9	3.6	3.2	2.6	6.5	4.1	5.4	3.4	3.4	4.8	3.0	5.6
13	1.6	3.2	3.0	3.3	5.9	3.6	4.8	3.4	3.4	13	3.8	5.4
14	1.6	3.0	4.8	3.0	5.9	3.6	4.6	3.0	3.2	5.6	3.2	5.4
15	1.6	3.0	4.1	2.6	22	4.1	4.4	3.0	3.0	5.1	59	5.1
16	1.6	3.0	3.6	2.4	7.6	3.8	5.6	2.8	5.4	4.6	11	4.8
17	10	3.0	3.4	2.4	6.8	3.2	4.4	3.0	4.5	4.4	7.6	4.6
18	21	4.0	4.4	2.4	6.2	3.2	4.4	5.9	32	4.1	5.9	5.1
19	18	4.1	3.4	3.0	6.2	3.2	4.1	4.1	29	4.1	5.1	5.1
20	6.8	3.0	3.2	2.9	5.4	7.3	3.8	5.4	94	4.1	4.6	4.4
21	4.4	3.0	3.0	2.4	5.1	7.6	25	8.7	32	8.0	5.3	4.1
22	3.4	3.0	2.8	2.2	4.8	4.8	11	5.6	17	4.8	5.9	4.1
23	3.2	2.8	2.8	2.2	4.6	13	6.5	4.6	13	4.1	4.8	5.1
24	12	2.6	2.8	2.2	4.4	6.5	5.6	5.1	21	4.1	9.4	5.9
25	39	2.4	2.8	3.8	4.4	5.6	5.4	24	13	3.6	6.8	4.1
26	35	2.4	2.6	3.0	4.1	5.4	5.1	6.8	10	3.4	6.2	3.8
27	85	2.2	8.3	2.4	3.8	6.5	4.8	5.6	9.1	3.4	6.8	3.6
28	19	2.2	3.8	2.4	4.1	5.4	4.8	4.6	7.6	3.2	10	3.8
29	12	3.6	3.2	3.0	3.8	130	4.6	4.1	7.2	3.8	18	3.6
30	9.1	3.8	3.2	7.5	------	36	4.4	3.8	6.5	3.4	27	3.8
31	7.6	------	3.0	3.4	------	20	------	3.6	------	3.0	24	------
TOTAL	321.0	107.1	127.4	92.5	217.6	334.4	211.6	152.0	365.4	168.9	271.4	193.9
MEAN	10.4	3.57	4.11	2.98	7.50	10.8	7.05	4.90	12.2	5.45	8.75	6.46
MAX	85	6.2	10	7.5	22	130	25	24	94	18	59	16
MIN	1.6	2.2	2.6	2.2	3.2	3.2	3.8	2.8	3.0	3.0	3.0	3.6
AC-FT	637	212	253	183	432	663	420	301	725	335	538	385

CAL YR 1967: TOTAL 2,729.3 MEAN 7.48 MAX 161 MIN 1.6 AC-FT 5,410
WAT YR 1968: TOTAL 2,563.2 MEAN 7.00 MAX 130 MIN 1.6 AC-FT 5,080

Peak discharge (base, 700 cfs).--Mar. 29 (1530) 1,020 cfs (4.41 ft); June 20 (1630) 1,060 cfs (4.48 ft).

16-8762. Takazato-gawa near Hama

Location.--Lat 26°41'10" N., long 128°10'48" E., on right bank 2.3 miles southeast of Hama and 3.0 miles south of Okuma.

Drainage area.--0.9 sq mi, approximately.

Records available.--December 1963 to September 1968.

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

Extremes.--Maximum discharge during year, 355 cfs June 20 (gage height, 3.90 ft), from rating curve extended above 40 cfs as explained below; minimum, 0.82 cfs Oct. 8-16.
1963-68: Maximum discharge, 1,150 cfs June 16, 1964 (gage height, 6.10 ft), from rating curve extended above 44 cfs on basis of slope-area measurement at gage height 5.45 ft; minimum, 0.76 cfs Dec. 2, 4-8, 1964.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	3.8	1.3	1.3	1.6	5.1	8.4	2.1	2.7	4.6	2.1	9.6
2	.94	3.5	1.3	1.3	2.7	2.4	7.2	2.1	2.7	4.2	3.7	8.0
3	.94	3.1	4.2	1.3	2.1	3.9	6.4	1.8	1.8	4.2	1.8	6.8
4	1.6	3.1	2.4	1.3	2.4	2.4	5.6	1.8	1.8	3.5	2.1	8.1
5	1.3	2.7	1.8	1.3	4.6	2.1	4.9	1.8	1.8	3.5	1.8	6.0
6	1.1	2.7	2.7	2.3	3.5	1.8	4.6	1.8	1.6	5.1	1.8	5.3
7	.94	2.4	2.7	3.1	4.6	1.8	4.2	2.7	1.3	5.4	1.8	4.9
8	.82	2.4	2.1	1.8	6.0	2.1	3.8	1.8	1.3	3.5	1.8	4.6
9	.82	2.1	1.8	1.6	4.6	1.8	3.8	1.8	1.8	3.1	1.8	4.6
10	.82	2.4	1.8	1.7	3.8	1.8	3.5	1.8	2.8	2.4	1.8	4.2
11	.82	2.1	1.8	1.6	3.8	2.1	3.1	1.8	1.6	2.4	1.8	3.8
12	.82	2.7	1.8	1.1	3.1	2.1	3.1	1.8	1.6	3.0	1.6	3.5
13	.82	2.1	1.6	1.6	2.7	1.8	2.7	1.8	1.6	3.5	4.4	3.5
14	.82	1.8	3.1	1.3	2.4	1.8	2.7	1.6	1.6	2.4	2.1	2.7
15	.82	1.6	2.1	1.1	5.9	2.4	2.7	1.3	1.3	2.2	19	2.7
16	.94	1.6	1.6	1.1	3.1	2.1	3.5	1.3	1.3	2.1	8.0	2.4
17	4.4	1.6	1.6	1.1	2.7	1.8	2.7	1.6	2.1	2.0	6.0	2.4
18	5.2	3.3	1.6	1.1	2.4	1.8	2.7	2.7	6.4	1.9	4.6	2.4
19	3.0	1.8	1.3	1.3	2.4	1.8	2.4	1.8	7.4	1.8	3.8	2.7
20	1.8	1.6	1.3	1.3	2.1	4.8	2.4	3.1	25	1.8	3.5	2.1
21	1.4	1.6	1.3	1.3	2.1	6.8	9.4	2.7	15	3.0	3.5	2.1
22	1.3	1.6	1.3	1.1	2.1	3.5	5.3	1.8	11	2.4	9.2	2.1
23	1.3	1.6	1.3	1.1	2.1	7.0	3.8	1.8	9.2	2.2	5.6	2.5
24	4.8	1.6	1.3	1.3	1.8	4.6	3.1	2.4	12	2.0	10	2.7
25	15	1.3	1.3	2.1	1.8	4.2	2.7	4.3	9.2	1.9	7.6	2.1
26	13	1.3	1.3	1.6	1.8	3.8	2.4	2.4	7.2	1.8	6.0	1.8
27	29	1.3	3.1	1.3	1.6	4.6	2.4	1.8	6.0	1.8	6.8	1.8
28	9.6	1.1	2.1	1.1	1.8	3.8	2.4	1.8	5.6	1.8	14	2.1
29	6.8	1.8	1.8	1.6	1.6	28	2.1	1.6	5.3	1.8	10	2.1
30	5.3	2.1	1.6	2.2	------	16	2.1	1.6	4.6	1.6	13	2.4
31	4.6	------	1.3	1.6	------	11	------	1.3	------	1.6	12	------
TOTAL	122.22	63.7	57.6	45.9	83.2	141.0	116.1	61.8	154.6	84.5	173.0	112.0
MEAN	3.94	2.12	1.86	1.48	2.87	4.55	3.87	1.99	5.15	2.73	5.58	3.73
MAX	29	3.8	4.2	3.1	6.0	28	9.4	4.3	25	5.4	19	9.6
MIN	0.82	1.1	1.3	1.1	1.6	1.8	2.1	1.3	1.3	1.6	1.6	1.8
AC-FT	242	126	114	91	165	280	230	123	307	168	343	222

CAL YR 1967: TOTAL 1,158.66 MEAN 3.17 MAX 49 MIN 0.82 AC-FT 2,300
WAT YR 1968: TOTAL 1,215.62 MEAN 3.32 MAX 29 MIN 0.82 AC-FT 2,410

Peak discharge (base, 300 cfs).--June 20 (1600) 355 cfs (3.90 ft).

16-8770. Right Branch of South Fork Henan-gawa near Tsuha

Location.--Lat 26°37'42" N., long 128°05'52" E., 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.

Records available.--November 1963 to September 1968.

Gage.--Water-stage recorder and, since May 14, 1965, concrete control. Altitude of gage is 50 ft (from topographic map).

Extremes.--Maximum discharge during year, 471 cfs Mar. 29 (gage height, 3.59 ft), from rating curve extended above 150 cfs on basis of slope-area measurement of gage height 5.46 ft; minimum, 0.33 cfs Oct. 15, 16.
1963-68: Maximum discharge, 1,600 cfs June 16, 1964 (gage height, 6.47 ft), from rating curve extended above 38 cfs; minimum, 0.33 cfs Sept. 23-26, Oct. 15, 16, 1967.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.56	0.64	0.54	0.49	0.54	3.8	2.8	1.0	1.8	1.7	0.81	3.5
2	.48	.59	.54	.49	1.3	1.1	2.6	1.0	2.0	1.7	1.5	2.6
3	.44	.64	2.0	.44	.88	.88	2.7	.94	1.2	1.7	.69	2.1
4	.72	.59	.88	.44	.81	.75	2.2	.94	1.1	1.6	.69	2.1
5	.56	.64	.81	.44	1.5	.75	1.9	.94	1.0	1.5	1.3	1.9
6	.44	.69	2.7	.59	1.4	.69	1.7	1.0	.94	2.5	.81	1.7
7	.40	.64	.94	1.5	1.8	.69	1.5	1.1	.94	3.9	.69	1.6
8	.40	.59	.69	.64	2.6	.75	1.4	.94	.94	1.5	.64	1.5
9	.40	.59	.64	.49	1.4	.69	1.4	.90	1.1	1.4	.75	1.5
10	.40	.64	.64	.49	1.1	.64	1.4	.84	2.2	1.4	.75	1.4
11	.40	.64	.54	.59	.75	.69	1.3	.80	1.1	1.3	1.1	1.4
12	.36	1.5	.54	.49	.81	.69	1.4	.78	1.0	1.5	.75	1.3
13	.36	.69	.49	.54	.81	.64	1.1	.74	.94	1.3	1.7	1.3
14	.36	.59	.75	.54	.81	.64	1.1	.72	.88	1.2	1.1	1.2
15	.36	.54	.64	.49	3.6	.80	1.1	.70	.81	1.1	4.1	1.1
16	.33	.54	.59	.49	1.1	.75	1.4	.70	.88	1.1	1.4	1.1
17	.88	.54	.59	.49	1.0	.59	1.1	.76	.91	1.0	1.2	1.1
18	1.4	.78	.69	.49	.94	.59	1.1	1.3	3.0	1.0	1.0	1.1
19	.65	.75	.60	.57	.94	.59	1.1	1.1	6.7	.94	.88	1.1
20	.44	.59	.54	.59	.81	1.5	1.0	1.7	22	1.0	.81	1.1
21	.40	.54	.54	.49	.75	1.7	8.1	3.0	6.3	1.0	.94	1.0
22	.36	.49	.54	.49	.75	.94	2.8	1.3	3.7	1.0	1.0	1.0
23	.36	.49	.54	.49	.81	3.4	1.4	1.0	2.8	.88	.88	1.4
24	.56	.49	.54	.49	.75	1.4	1.3	1.5	5.4	.81	6.4	1.3
25	3.0	.49	.54	.88	.69	1.1	1.2	12	2.9	.81	2.4	1.0
26	3.6	.49	.54	.64	.69	1.1	1.1	2.0	2.6	.75	1.6	.94
27	17	.49	1.5	.54	.69	1.4	1.1	1.5	2.2	.75	1.4	.94
28	1.2	.49	.75	.49	.69	1.1	1.1	1.3	2.0	.75	12	.94
29	.81	.85	.59	.64	.69	42	1.1	1.1	1.9	.69	2.3	.94
30	.69	.64	.54	1.3	------	7.4	1.0	1.0	1.8	.75	11	.88
31	.64	------	.49	.59	------	4.0	------	.94	------	.69	13	------
TOTAL	38.96	18.87	23.46	18.33	31.41	83.76	51.5	45.54	83.04	39.22	75.59	42.04
MEAN	1.26	0.629	0.757	0.591	1.08	2.70	1.72	1.47	2.77	1.27	2.44	1.40
MAX	17	1.5	2.7	1.5	3.6	42	8.1	12	22	3.9	13	3.5
MIN	0.33	0.49	0.49	0.44	0.54	0.59	1.0	0.70	0.81	0.69	0.64	0.88
AC-FT	77	37	47	36	62	166	102	90	165	78	150	83

CAL YR 1967: TOTAL 748.96 MEAN 2.05 MAX 46 MIN 0.33 AC-FT 1,490
WAT YR 1968: TOTAL 551.72 MEAN 1.51 MAX 42 MIN 0.33 AC-FT 1,090

Peak discharge (base, 300 cfs).--Mar. 29 (1530) 471 cfs (3.59 ft).

16-8782. Hanechi-okawa at Kawakami

Location.--Lat 26°36'28" N., long 128°01'16" E., 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.

Records available.--November 1963 to September 1968.

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.

Extremes.--Maximum discharge during year, 1,210 cfs Mar. 29 (gage height, 3.14 ft); minimum, 0.88 cfs Oct. 15, 16, 1963-68: Maximum discharge, 7,840 cfs June 16, 1964 (gage height, 6.03 ft, present datum), from rating curve extended above 950 cfs; minimum, 0.88 cfs Oct. 15, 16, 1967.
Minimum discharge known, 0.40 cfs Oct. 21, 1963, result of discharge measurement.

Remarks.--Records good. No diversion above station. Records include small diversion from gage pool for irrigation below station. Daily sediment samples and continuous records of rainfall are obtained at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	6.5	5.3	4.7	5.1	20	22	5.8	7.8	10	11	35
2	2.3	5.8	5.7	4.6	12	11	20	5.8	10	10	8.6	25
3	1.9	6.5	22	4.4	11	9.7	22	5.6	6.3	10	5.2	17
4	3.1	5.1	12	4.3	9.7	7.6	18	5.4	6.0	9.4	4.8	14
5	3.1	4.7	9.3	4.3	16	6.7	15	5.2	5.4	8.4	4.4	12
6	2.4	6.5	14	4.8	14	6.2	14	5.1	4.8	8.5	4.1	11
7	1.6	5.1	13	11	31	5.8	12	6.7	4.6	22	3.7	10
8	1.4	4.7	10	5.8	33	5.7	12	5.0	4.3	10	3.8	9.2
9	1.4	4.7	8.2	5.1	22	5.4	11	4.6	5.1	9.0	4.4	8.4
10	1.4	4.7	7.6	4.7	14	5.0	11	4.3	12	8.4	4.0	8.2
11	1.4	4.7	7.1	4.6	12	5.0	11	4.3	6.0	7.8	3.6	7.8
12	1.4	19	6.5	4.1	9.7	5.0	11	4.2	5.8	9.5	3.4	7.6
13	1.3	8.7	6.0	3.8	8.2	5.0	10	4.2	5.6	9.2	6.8	7.1
14	1.4	6.5	8.0	3.5	7.6	5.0	9.2	3.8	5.4	7.2	5.8	6.7
15	1.2	5.8	6.9	3.3	16	5.0	8.2	3.7	4.8	6.0	21	6.7
16	1.1	5.1	6.0	3.3	10	5.1	12	3.6	4.8	5.6	11	6.3
17	7.9	5.1	5.7	3.1	8.7	4.7	8.4	3.6	5.0	5.2	7.8	6.2
18	15	16	6.5	3.1	8.0	4.6	7.4	6.4	34	5.1	5.8	6.2
19	9.8	15	5.7	3.6	7.6	4.4	7.2	6.0	68	4.8	4.3	6.7
20	4.0	10	5.2	4.6	6.9	6.7	6.7	12	116	4.6	4.2	5.7
21	2.9	8.2	5.2	3.6	6.3	9.0	38	16	66	5.7	5.7	5.2
22	2.2	6.9	4.8	3.1	6.2	6.7	25	7.2	35	5.1	5.8	4.4
23	2.0	6.0	4.7	3.1	6.2	14	12	7.0	25	4.4	5.0	7.0
24	4.1	5.0	4.6	3.5	5.7	11	10	9.7	40	4.3	10	8.9
25	43	4.2	4.6	6.4	5.6	8.0	8.4	13	22	4.1	9.7	5.1
26	57	3.7	4.6	4.4	5.4	7.2	7.6	9.0	16	3.8	10	4.6
27	159	3.3	11	3.6	5.4	9.7	7.4	7.8	14	4.1	8.4	4.4
28	20	3.0	6.9	3.4	5.4	8.7	7.1	6.2	13	4.2	55	4.3
29	12	7.4	5.7	4.5	5.7	185	6.5	5.2	12	4.2	35	4.3
30	9.7	6.0	5.1	11	------	65	6.0	4.7	11	4.2	68	4.3
31	8.7	------	5.0	5.7	------	40	------	4.4	------	3.8	59	------
TOTAL	387.9	203.9	232.9	143.0	314.4	497.9	376.1	195.5	575.7	218.6	399.3	269.3
MEAN	12.5	6.80	7.51	4.61	10.8	16.1	12.5	6.31	19.2	7.05	12.9	8.98
MAX	159	19	22	11	33	185	38	16	116	22	68	35
MIN	1.1	3.0	4.6	3.1	5.1	4.4	6.0	3.6	4.3	3.8	3.4	4.3
AC-FT	769	404	462	284	624	988	746	388	1140	434	792	534

CAL YR 1967: TOTAL 5,555.7 MEAN 15.2 MAX 311 MIN 1.1 AC-FT 11,020
WAT YR 1968: TOTAL 3,814.5 MEAN 10.4 MAX 185 MIN 1.1 AC-FT 7,570

Peak discharge (base, 900 cfs).--Mar. 29 (1630) 1,210 cfs (3.14 ft).

16-8785, Oi-kawa at Jingusuku

Location.--Lat 26°39'07" N., long 127°57'24" E., on left bank 0.1 mile west of Jingusuku, 0.8 mile west of Gogayama, and 2.5 miles east of Manna.

Drainage area.--3.1 sq mi, approximately.

Records available.--March 1964 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,920 cfs June 20 (gage height, 7.75 ft), from rating curve extended above 160 cfs as explained below; no flow for many days.
1964-68: Maximum discharge, 2,480 cfs May 7, 1966 (gage height, 10.30 ft), from rating curve extended above 160 cfs on basis of slope-area measurements at gage heights 7.40 and 8.50 ft; no flow at times each year.

Remarks.--Records good. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	1.9	0.62	0.22	0.26	13	6.1	0.62	4.1	3.4	0.56	7.2
2	0	1.4	.62	.15	1.4	3.2	5.5	.56	4.2	3.0	2.7	5.5
3	0	.92	9.0	.12	1.4	2.0	5.8	.50	1.4	3.0	.50	4.2
4	0	.69	4.9	.12	3.1	1.5	4.4	.44	1.0	2.6	.39	4.0
5	0	.56	3.0	.10	9.8	1.2	3.8	.44	.76	2.4	.34	3.2
6	0	.50	3.6	.26	11	1.0	3.2	.44	.69	6.3	.30	3.3
7	0	.39	1.7	.76	11	.92	2.8	.78	.62	8.6	.26	3.0
8	0	.30	1.6	.39	7.9	.84	2.3	.44	.50	3.0	.22	2.4
9	0	.26	1.4	.26	4.9	.69	2.0	.39	.66	2.4	.22	2.3
10	0	.18	1.3	.22	3.8	.62	1.7	.34	.73	2.3	.20	2.1
11	0	.15	1.1	.22	2.8	.62	1.5	.30	.39	2.0	.15	2.0
12	0	.34	.84	.15	2.3	.56	1.5	.26	.34	1.9	.12	1.9
13	0	.18	.84	.22	1.9	.39	1.3	.22	.30	1.9	2.3	1.7
14	0	.08	2.0	.12	1.6	.39	1.3	.18	.26	1.7	1.4	1.6
15	0	.06	1.4	.06	12	.52	1.1	.15	.22	1.5	34	1.6
16	0	.08	1.1	.03	3.4	.44	1.3	.12	.40	1.4	24	1.5
17	.89	.03	.84	0	2.4	.30	1.1	.10	.66	1.3	9.7	1.4
18	11	1.5	.76	0	2.1	.26	1.0	.18	16	1.2	4.9	1.3
19	2.3	.76	.62	.06	1.6	.26	1.1	.15	19	1.1	3.4	1.2
20	.39	.30	.50	.06	1.4	1.7	1.1	.18	251	1.1	2.6	1.2
21	.10	.22	.39	0	1.2	5.1	11	1.4	33	1.1	7.2	1.0
22	.02	.18	.34	0	1.0	1.7	4.7	.76	16	1.1	6.7	.84
23	0	.10	.30	0	.92	6.8	2.1	.44	12	.92	4.4	17
24	.90	.08	.26	0	.76	3.0	1.5	.39	17	.84	2.6	14
25	12	.04	.26	0	.69	2.0	1.2	5.6	9.0	.76	2.1	3.4
26	13	0	.26	0	.62	1.9	1.0	1.5	6.5	.76	1.9	1.9
27	44	0	1.7	0	.56	2.3	.92	1.0	5.2	.69	1.7	1.4
28	6.8	0	.69	0	.50	1.7	.84	.69	4.2	.69	7.7	1.3
29	4.0	6.3	.56	.51	.48	32	.69	.56	3.8	.62	16	1.2
30	3.2	1.2	.39	.64	------	13	.62	.44	3.6	.62	9.6	1.2
31	2.4	------	.30	.30	------	8.3	------	.39	------	.62	10	------
TOTAL	101.00	18.70	43.19	4.97	92.79	108.21	74.47	19.96	413.53	60.82	158.16	95.84
MEAN	3.26	0.623	1.39	0.160	3.20	3.49	2.48	0.644	13.8	1.96	5.10	3.19
MAX	44	6.3	9.0	0.76	12	32	11	5.6	251	8.6	34	17
MIN	0	0	0.26	0	0.26	0.26	0.62	0.10	0.22	0.62	0.12	0.84
AC-FT	200	37	86	9.9	184	215	148	40	820	121	314	190

CAL YR 1967: TOTAL 1,678.32 MEAN 4.60 MAX 228 MIN 0 AC-FT 3,330
WAT YR 1968: TOTAL 1,191.64 MEAN 3.26 MAX 251 MIN 0 AC-FT 2,360

Peak discharge (base, 750 cfs).--June 20 (1430) 1,920 cfs (7.75 ft).

16-8799. Yonabaru-gawa below Zukeyama Dam

Location.--Lat 26°23'00" N., long 127°48'25" E., 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.

Records available.--October 1966 to September 1968.

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

Extremes.--Maximum discharge during year, 89 cfs Dec. 26 (gage height, 2.42 ft), from rating curve extended above 38 cfs; minimum, 0.16 cfs Nov. 22-26.
1966-68: Maximum discharge, 588 cfs June 16, 1967 (gage height, 6.40 ft), from rating curve extended above 38 cfs; minimum, 0.16 cfs Nov. 22-26, 1967.

Remarks.--Records good except those above 80 cfs, which are fair. Flow regulated by Zukeyama Reservoir (capacity, 2,070 acre-ft). No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	0.22	0.20	1.4	0.18	0.55	0.37	0.24	0.72	3.1	10	0.68
2	14	.20	.20	3.0	.18	.29	.31	2.3	.52	2.9	11	1.4
3	14	.20	.31	4.4	.18	.29	.42	4.1	.37	2.4	5.4	1.4
4	8.3	.20	.22	4.4	.18	.27	.34	4.1	.34	2.8	3.2	1.9
5	2.4	.20	.22	4.4	.24	.24	.34	3.8	.29	2.2	7.5	2.1
6	7.1	.22	.20	3.8	.28	.24	.29	3.9	.29	3.9	5.1	4.8
7	2.9	.20	.20	.72	.27	.22	.29	3.9	.27	4.1	7.0	2.5
8	8.1	.20	.20	.22	.34	.22	.27	4.1	.27	2.4	7.5	2.6
9	5.8	.20	.18	.20	.27	.22	.27	4.1	.29	1.9	7.5	1.8
10	5.8	.20	.18	.45	.24	.20	.24	3.9	.38	1.6	6.5	1.2
11	3.9	.20	.18	.20	.22	.20	.24	4.1	.31	1.3	4.5	1.1
12	5.5	.22	.18	.73	.22	.20	.24	4.4	.31	1.8	6.2	1.2
13	6.7	.20	.18	1.9	.20	.22	.24	5.3	.29	6.4	6.2	1.2
14	6.5	.20	.22	2.0	.18	.24	.24	7.5	.27	3.7	3.9	1.2
15	6.2	.20	.20	3.1	.24	.29	.22	9.8	.27	4.8	2.3	.86
16	6.2	.20	.18	3.4	.20	.27	.24	12	.27	5.5	1.2	1.1
17	.89	.20	.18	3.6	.20	.24	.24	13	.34	6.5	.66	1.0
18	.85	.20	.18	4.1	.20	.27	.22	13	1.1	6.5	.34	.81
19	.36	.18	.18	5.0	.20	.27	.27	7.3	2.3	6.5	.31	.81
20	.24	.18	.18	5.8	.18	.27	.24	8.1	1.5	6.7	.29	.81
21	.20	.18	.18	6.2	.18	.27	.83	.46	.81	5.2	.40	.81
22	.18	.16	.18	7.9	.18	.27	.43	.48	.56	6.7	.40	.81
23	.18	.16	.18	9.5	.18	.24	.31	.62	.40	7.0	.31	4.2
24	.20	.16	.18	10	.18	.27	.29	.46	5.5	7.2	.40	7.2
25	.38	.16	.63	9.2	.18	.24	.29	.56	7.2	7.2	.37	2.5
26	.69	.38	14	9.5	.18	.24	.27	.40	5.5	7.2	.34	1.2
27	1.2	.64	15	9.5	1.2	.24	.29	.37	4.8	7.9	.37	1.0
28	.34	.74	.24	9.5	4.4	.27	.29	.37	3.9	8.2	.92	1.0
29	.27	.55	.22	9.8	.29	2.5	.27	.34	3.4	8.5	.46	1.5
30	.24	.20	.22	3.0	------	1.0	.24	.29	3.2	9.2	2.3	1.7
31	.24	------	.22	.20	------	.52	------	.29	------	9.5	.76	------
TOTAL	122.86	7.35	35.22	137.12	11.37	11.27	9.04	123.58	45.97	160.8	103.63	52.39
MEAN	3.96	0.245	1.14	4.42	0.392	0.364	0.301	3.99	1.53	5.19	3.34	1.75
MAX	14	0.74	15	10	4.4	2.5	0.83	13	7.2	9.5	11	7.2
MIN	0.18	0.16	0.18	0.20	0.18	0.20	0.22	0.24	0.27	1.3	0.29	0.68
AC-FT	244	15	70	272	23	22	18	245	91	319	206	104

CAL YR 1967: TOTAL: 2,323.55 MEAN 6.37 MAX 140 MIN 0.16 AC-FT 4,610
WAT YR 1968: TOTAL: 820.60 MEAN 2.24 MAX 15 MIN 0.16 AC-FT 1,630

16-8803. Bishi-gawa at Kadena

Location.--Lat 26°21'54" N., long 127°45'59" E., 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.

Records available.--July 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,440 cfs Mar. 29 (gage height, 6.00 ft), from rating curve extended above 44 cfs as explained below; no flow for many days.
1966-68: Maximum discharge, 2,280 cfs Sept. 23, 1966 (gage height, 8.10 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. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.31	0.06	0	0	0	111	19	0	73	6.0	0.02	66
2	.19	0	0	0	0	20	8.3	0	96	3.0	.70	19
3	.22	0	27	0	0	9.8	33	.10	18	2.8	97	14
4	77	.01	5.2	0	1.4	8.1	7.6	.25	6.6	70	.73	7.4
5	6.9	1.6	.69	0	27	3.0	3.3	.20	7.4	1.2	13	5.9
6	.75	.40	0	0	24	.05	.90	.09	.70	18	14	12
7	0	0	0	23	34	0	.23	4.4	.18	10	0	4.5
8	0	0	0	5.0	26	0	.10	.54	.11	3.2	0	7.9
9	0	0	0	.08	8.7	0	.23	.18	3.4	1.2	0	3.9
10	0	0	0	0	.94	0	.03	.08	25	0	1.6	01
11	5.8	0	0	.20	.22	0	.08	0	4.9	0	.07	.12
12	0	.82	0	0	0	0	.05	.08	2.1	0	0	.23
13	0	0	0	0	0	0	.03	.63	.11	19	0	.45
14	0	0	6.8	0	0	0	0	0	.75	10	0	.12
15	0	0	1.7	.03	30	0	0	.06	0	2.4	78	1.1
16	0	0	.29	0	5.0	4.6	0	0	2.9	1.6	178	.20
17	26	0	0	0	.75	0	.02	.75	3.4	0	123	.12
18	138	0	.55	0	2.8	0	3.2	6.9	200	0	9.0	.05
19	55	0	.05	0	4.0	0	9.6	12	350	0	3.9	2.6
20	11	0	0	.82	.81	0	.96	80	240	0	.27	1.1
21	.11	0	0	0	0	35	127	39	170	3.0	14	.10
22	.11	0	.03	0	.61	8.4	60	7.7	76	0	8.2	.10
23	0	0	0	.80	0	16	13	34	57	0	1.0	13
24	3.1	0	0	0	0	11	5.9	31	220	0	8.5	14
25	36	0	0	.02	0	.96	2.8	62	50	.08	11	1.7
26	111	.23	0	.07	0	2.2	.70	17	27	.05	3.3	.46
27	277	0	19	0	0	23	.27	22	21	.11	1.1	.03
28	30	0	4.5	0	1.5	8.2	.14	12	15	.20	71	.18
29	7.2	14	.11	.03	2.7	487	0	1.6	11	0	9.8	0
30	.30	.12	0	8.2	------	186	0	.08	9.0	0	89	0
31	.98	------	0	0	------	39	------	0	------	.07	56	------
TOTAL	786.97	17.24	65.92	38.25	170.43	973.31	296.44	332.64	1690.55	88.91	792.19	176.27
MEAN	25.4	0.575	2.13	1.23	5.88	31.4	9.88	10.7	56.4	2.87	25.6	5.88
MAX	277	14	27	23	34	487	127	80	350	19	178	66
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	1560	34	131	76	338	1930	588	660	3350	176	1570	350

CAL YR 1967: TOTAL 9,282.47 MEAN 25.4 MAX 1,030 MIN 0 AC-FT 18,410
WAT YR 1968: TOTAL 5,429.12 MEAN 14.8 MAX 487 MIN 0 AC-FT 10,770

Peak discharge (base, 1,900 cfs).--No peak above base.

16-8805. Nagata-gawa at Kadena

Location.--Lat 26°22'23" N., long 127°45'50" E., on left bank 1.0 mile northeast of Kadena Circle and 3.4 miles northwest of Chibana.

Drainage area.--4.0 sq mi, approximately.

Records available.--September 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during year, 906 cfs Mar. 29 (gage height, 8.00 ft), from rating curve extended above 54 cfs; minimum, 1.3 cfs Oct. 1-4.
1966-68: Maximum discharge, 1,600 cfs Sept. 23, 1966 (gage height, 11.50 ft), from rating curve extended above 54 cfs; minimum, 0.95 cfs Aug. 26, 27, 1967.

Remarks.--Records good except those above 150 cfs, which are fair. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	3.1	3.1	2.0	2.0	25	7.4	2.6	14	4.8	4.1	11
2	1.3	2.9	2.8	1.9	2.8	8.8	6.1	2.6	19	4.8	4.7	6.6
3	1.3	2.8	10	1.9	2.8	6.9	11	2.6	6.1	4.8	3.1	5.0
4	18	2.6	5.9	1.8	3.3	4.5	6.9	2.8	5.4	5.2	2.8	4.5
5	11	2.6	3.4	1.8	7.7	3.4	5.0	2.8	5.2	4.8	4.3	4.1
6	5.0	2.8	3.1	2.0	7.4	2.9	4.1	2.8	4.8	7.2	3.3	5.2
7	3.1	2.8	4.3	6.1	10	2.6	3.5	3.2	4.5	6.6	2.9	3.5
8	2.5	2.5	3.7	3.4	11	2.6	3.4	2.8	4.1	4.8	2.6	3.2
9	2.3	2.5	2.9	2.4	6.6	2.5	3.2	2.5	4.3	4.8	2.5	2.9
10	2.1	2.4	2.5	2.1	4.1	2.3	3.1	2.3	9.2	4.8	2.5	2.8
11	2.0	2.9	2.4	2.8	3.2	2.6	3.1	2.1	5.0	4.8	2.3	2.8
12	2.7	4.5	2.3	2.3	2.8	3.9	3.5	2.3	5.4	4.5	2.1	2.6
13	3.2	3.1	2.1	2.1	2.5	3.2	3.2	2.3	4.5	21	2.5	2.5
14	2.5	2.5	4.7	2.1	2.4	2.3	2.9	2.1	3.9	7.9	2.9	2.4
15	2.0	2.3	4.1	1.9	10	5.0	2.8	2.0	3.5	5.6	32	2.3
16	1.8	2.3	2.8	1.8	4.8	3.0	3.2	1.8	3.2	4.8	21	2.3
17	8.1	2.4	2.5	1.8	3.1	2.7	3.1	1.8	3.6	4.1	20	2.3
18	24	2.4	3.2	1.8	3.4	2.5	4.1	3.0	17	3.6	8.1	1.8
19	21	2.5	2.9	1.8	3.7	2.3	4.8	4.2	105	3.3	4.5	1.8
20	6.6	2.4	2.5	1.9	28	2.1	3.2	11	58	3.2	3.5	2.0
21	4.1	2.3	2.4	1.8	2.5	4.5	36	13	30	5.0	22	2.0
22	3.5	2.0	2.1	1.7	2.3	3.1	18	7.1	14	4.5	9.2	2.3
23	2.8	1.9	2.0	1.7	2.5	6.6	5.9	13	13	3.5	5.7	14
24	2.9	1.9	2.0	1.7	2.3	3.9	4.1	11	27	3.2	4.8	19
25	11	1.8	2.1	2.5	2.1	2.9	3.5	16	10	3.0	4.3	3.7
26	24	1.9	2.0	2.5	2.0	3.1	3.2	6.9	8.0	3.1	3.9	2.8
27	70	1.8	6.5	2.1	2.0	7.4	3.1	8.3	6.9	2.9	3.4	1.5
28	12	1.8	3.9	1.9	2.7	3.9	3.1	5.0	6.1	3.1	16	3.2
29	5.9	7.8	2.8	1.9	3.4	248	2.8	3.9	5.7	4.1	14	3.7
30	4.1	4.8	2.4	2.8	------	35	2.5	3.2	5.2	4.2	21	3.7
31	3.5	------	2.1	2.4	------	13	------	3.1	------	4.5	19	------
TOTAL	265.6	82.3	101.5	68.7	118.2	422.5	169.8	150.1	411.6	156.5	255.0	127.5
MEAN	8.57	2.74	3.27	2.22	4.08	13.6	5.66	4.84	13.7	5.05	8.23	4.25
MAX	70	7.8	10	6.1	11	248	36	16	105	21	32	19
MIN	1.3	1.8	2.0	1.7	2.0	2.1	2.5	1.8	3.2	2.9	2.1	1.5
AC-FT	527	163	201	136	234	838	337	298	816	310	506	253

CAL YR 1967: TOTAL 3,812.6 MEAN 10.4 MAX 377 MIN 1.0 AC-FT 7,560
WAT YR 1968: TOTAL 2,329.3 MEAN 6.36 MAX 248 MIN 1.3 AC-FT 4,620

Peak discharge (base, 1,200 cfs).--No peak above base.

16-8806. Hiza-gawa at Kadena

Location.--Lat 26°21'49" N., long 127°45'23" E., 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.

Records available.--July 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 12 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,530 cfs Mar. 29 (gage height, 4.73 ft), from rating curve extended above 240 cfs as explained below; no flow for many days.
1966-68: Maximum discharge, 3,980 cfs Sept. 23, 1966 (gage height, 6.02 ft), from rating curve extended above 240 cfs on basis of theoretical rating for the artificial control; no flow for many days in 1967-68.

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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	1.8	18	0	0.21	170	26	0	102	15	0.07	106
2	0	.87	0	0	0	41	18	0	141	9.8	2.4	49
3	0	.55	42	0	0	26	85	0	30	3.9	109	32
4	100	.32	13	0	.30	20	44	0	15	12	4.6	28
5	22	2.2	3.9	0	39	5.9	20	0	13	3.1	19	24
6	3.9	1.8	1.8	0	31	.87	11	0	4.8	27	19	24
7	.55	.55	2.4	39	50	.01	5.9	0	1.8	20	.87	11
8	.01	.32	2.4	9.8	44	0	3.1	0	1.3	4.8	.32	13
9	0	.07	1.3	.24	20	0	7.0	0	4.8	3.1	.55	5.9
10	0	0	.32	0	4.8	0	.32	0	56	2.4	3.0	3.9
11	4.1	0	0	0	2.4	0	0	0	11	3.1	.55	2.4
12	0	2.4	0	0	.16	0	0	0	8.3	1.8	.02	5.9
13	.07	1.8	0	0	.01	0	0	0	2.4	45	.05	2.4
14	0	.87	8.0	0	0	0	0	0	4.8	19	.87	1.8
15	0	0	3.9	0	73	0	0	0	.87	3.1	124	1.8
16	0	0	1.8	0	11	5.2	0	0	4.8	3.9	242	1.8
17	41	0	.04	0	1.8	.01	0	0	5.7	3.9	179	1.8
18	192	0	2.5	0	3.2	0	0	.94	250	2.4	34	.16
19	85	0	.55	0	4.8	0	17	13	539	1.8	11	4.1
20	18	0	0	0	.32	0	3.1	106	381	1.8	3.9	3.1
21	3.1	0	0	0	0	55	182	84	191	13	40	.32
22	1.3	0	0	0	.01	11	119	14	85	8.3	39	2.4
23	.87	0	0	0	.01	41	28	60	71	1.3	7.0	34
24	3.1	0	0	0	0	13	13	50	285	.16	19	39
25	76	0	0	0	0	1.2	7.0	85	62	.87	22	5.9
26	158	0	0	0	0	0	.07	20	36	.16	6.8	1.8
27	383	0	33	0	0	32	0	32	30	.32	3.9	.62
28	56	0	13	0	0	13	0	17	22	.16	126	.51
29	16	25	.87	0	.72	745	0	5.9	18	.16	41	2.4
30	4.8	4.5	0	.60	------	237	0	1.8	18	.07	137	1.8
31	1.3	------	0	.32	------	59	------	.16	------	.16	115	------
TOTAL	1170.10	43.05	132.58	49.96	286.74	1476.19	589.49	489.80	2395.57	211.56	1310.90	410.81
MEAN	37.7	1.44	4.28	1.61	9.89	47.6	19.6	15.8	79.9	6.82	42.3	13.7
MAX	383	25	42	39	73	745	182	106	539	45	242	106
MIN	0	0	0	0	0	0	0	0	0.87	0.07	0.02	0.16
AC-FT	2320	85	263	99	569	2930	1170	972	4750	420	2600	815

CAL YR 1967: TOTAL 14,696.06 MEAN 40.3 MAX 1,520 MIN 0 AC-FT 29,150
WAT YR 1968: TOTAL 8,566.75 MEAN 23.4 MAX 745 MIN 0 AC-FT 16,990

Peak discharge (base, 3,000 cfs).--No peak above base.

16-8809. Machinato-gawa near Ojana

Location.--Lat 26°14'43" N., long 127°44'16" E., on right bank on 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.

Records available.--April 1965 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during year, 831 cfs Mar. 29 (gage height, 7.53 ft); no flow for many days. 1965-68: Maximum discharge, 2,040 cfs Aug. 5, 1965 (gage height, 12.90 ft), from rating curve extended above 550 cfs by logarithmic plotting; no flow for many days each year.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0.83	1.8	0.61	0.68	23	5.3	0.50	3.1	0.45	0	26
2	0	.55	1.1	.55	1.0	7.1	4.2	.45	7.8	.33	0	8.2
3	0	.41	4.5	.45	1.0	3.8	16	.37	3.4	.21	.25	3.8
4	1.0	.33	3.4	.37	2.8	2.4	8.5	.30	2.3	.21	.12	2.1
5	.55	.30	2.0	.33	12	1.7	4.5	.30	2.3	.12	.07	1.3
6	.18	.37	1.4	1.0	8.8	1.3	3.0	.27	1.4	.04	0	.83
7	.09	.33	1.3	14	10	1.0	2.1	2.2	.92	0	0	.55
8	.06	.24	1.2	4.0	12	.92	1.6	1.1	.68	0	0	.27
9	.03	.18	1.0	2.3	7.1	.83	1.3	.83	.79	0	0	.12
10	0	.14	.83	1.4	4.0	.68	1.0	.68	17	0	0	.02
11	0	.30	.68	1.2	2.6	.61	.83	.50	4.8	0	0	0
12	0	3.3	.50	.92	1.8	.54	.92	.37	4.0	0	0	0
13	0	1.8	.45	.75	1.3	.41	.61	.30	2.8	0	0	0
14	0	.83	2.4	.83	1.2	.39	.55	.21	2.3	0	0	0
15	0	.50	2.3	.55	11	.45	.45	.16	1.4	0	.55	0
16	0	.37	1.3	.45	3.2	1.2	.50	.10	1.1	0	1.3	0
17	1.1	.37	.92	.41	2.1	.61	.45	.07	1.4	0	1.2	0
18	26	.33	.83	.37	2.0	.50	.41	.07	24	0	.61	0
19	12	.30	.68	.37	2.1	.41	.92	.10	107	0	.16	0
20	3.2	.24	.50	.33	1.4	.41	.61	5.6	49	0	.02	0
21	1.4	.18	.45	.27	1.1	6.6	42	8.6	41	0	1.7	0
22	.83	.12	.50	.21	1.0	3.0	17	7.8	14	0	1.1	0
23	.50	.09	.37	.24	1.0	9.1	5.0	16	11	0	.37	.11
24	4.0	.07	.37	.24	.92	5.0	2.8	10	22	0	.44	.01
25	33	.06	.37	.33	.75	3.0	1.8	4.8	6.5	0	.41	0
26	58	.05	.33	.41	.69	4.7	1.3	3.2	3.6	0	.50	0
27	60	.02	5.3	.30	.55	15	1.1	3.2	2.1	0	1.7	0
28	7.1	0	3.0	.21	.68	5.9	1.3	2.6	1.4	0	34	0
29	3.4	8.5	1.7	.20	1.2	148	.83	1.6	.92	0	6.2	0
30	2.0	3.4	1.1	2.0	------	20	.61	1.0	.61	0	22	0
31	1.3	------	.83	1.1	------	8.9	------	.68	------	0	18	------
TOTAL	215.74	24.51	43.41	36.70	95.96	277.46	127.49	73.96	340.62	1.36	90.70	43.31
MEAN	6.96	0.817	1.40	1.18	3.31	8.95	4.25	2.39	11.4	0.044	2.93	1.44
MAX	60	8.5	5.3	14	12	148	42	16	107	0.45	34	26
MIN	0	0	0.33	0.20	0.55	0.39	0.41	0.07	0.61	0	0	0
AC-FT	428	49	86	73	190	550	253	147	676	2.7	180	86

CAL YR 1967: TOTAL 1,533.15 MEAN 4.20 MAX 228 MIN 0 AC-FT 3,040
WAT YR 1968: TOTAL 1,371.22 MEAN 3.75 MAX 148 MIN 0 AC-FT 2,720

Peak discharge (base, 650 cfs).--Mar. 29 (1530) 831 cfs (7.53 ft).

16-8820.5. Tengan Reservoir at Yamashiro

Location.--Lat 26°24'23" N., long 127°48'46" E., 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.

Records available.--September 1967 to September 1968.

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.--Maximum contents during year, 222 acre-ft Aug. 30 (gage height, 162.54 ft); no usable contents for several days during the period Nov. 22 to Feb. 15.

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. no. 16-8820.7) bypasses station below dam (see sta. no. 16-8821). 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.

MONTHEND GAGE HEIGHT AND USABLE CONTENTS AT 2400, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

Date	Gage-height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	148.90	98	-
Oct. 31	144.64	73	-25
Nov. 30	-	a15	-58
Dec. 31	-	a10	-5
Calendar year 1967	-	-	-
Jan. 31	-	a10	0
Feb. 29	141.00	51	+41
Mar. 31	157.21	166	+115
Apr. 30	159.35	188	+22
May 31	157.54	169	-19
June 30	160.83	203	+34
July 31	158.85	182	-21
Aug. 31	157.73	171	-11
Sept. 30	157.85	172	+1
Water year 1967-68	-	-	+74

a No gage-height record below 140.00 ft; contents estimated.

RYUKYU ISLANDS, ISLAND OF OKINAWA

16-8820.7. Tengan Dam spillway at Yamashiro

Location.--Lat 26°24'23" N., long 127°48'46" E., 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.

Records available.--October 1967 to September 1968.

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).

Remarks.--No flow since completion of Tengan Dam and establishment of station. Spillway flow begins at gage height 199.72 ft, bypasses station below dam (see sta. no. 16-8821), 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.

16-8821. Tengan-gawa below Tengan Dam

Location.--Lat 26°24'21" N., long 127°48'58" E., 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.

Records available.--May 1967 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--1967 (corrected): Maximum discharge during period May to September, 225 cfs June 5 (gage height, 5.15 ft), from rating curve extended above 99 cfs; minimum daily, 0.37 cfs July 9, 10, 29, Aug. 6, Sept. 27. 1967-68: Maximum discharge during water year, 52 cfs June 20 (gage height, 2.96 ft); minimum daily, 0.09 cfs Dec. 5.

Remarks.--Records fair. Flow regulated by Tengan Reservoir (capacity, 988 acre-ft). Diversion from reservoir of about 0.5 cfs for local irrigation and domestic use and any flow over reservoir spillway (see sta. no. 8820.7) will by-pass station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.0	2.2	1.6	0.73	0.63	1.3	2.2	0.86	3.6	0.96	3.0
2	1.4	1.0	2.7	1.4	.73	.42	1.1	2.2	.75	5.6	.96	1.5
3	1.8	1.0	.37	1.2	.64	.42	1.1	2.0	1.7	4.3	1.0	1.3
4	2.6	1.0	.11	1.1	.56	.42	1.2	2.4	.54	3.3	.96	1.2
5	.56	1.0	.09	.82	.20	.45	1.1	3.0	.60	3.2	1.0	2.5
6	.64	1.0	.11	.64	.40	.45	1.1	3.4	.60	3.0	1.0	1.6
7	1.2	.99	.11	.50	.35	.45	1.0	3.0	.60	2.5	1.0	1.3
8	.70	.92	.17	.40	.30	.42	1.0	2.7	.60	.81	.96	1.2
9	.66	.92	.25	.32	.28	.42	1.0	2.8	.63	.84	1.1	1.1
10	.64	1.6	.21	.27	.28	1.1	.96	2.8	.95	1.8	1.6	1.0
11	.64	1.8	.31	.23	.30	2.4	.92	3.0	.72	1.4	1.0	1.0
12	.64	1.8	.96	.21	.30	3.2	.92	3.1	1.6	4.1	1.4	1.0
13	.62	1.7	1.7	.20	.28	3.1	.88	3.2	1.2	1.3	1.5	1.0
14	.62	1.6	.91	.21	.28	3.0	.88	3.3	.60	2.9	1.4	1.0
15	.60	1.5	.37	.40	.60	2.8	2.0	3.4	.54	1.2	3.9	1.0
16	.60	1.5	.31	.70	.32	2.8	2.4	3.8	.69	1.5	3.8	1.0
17	.90	1.5	.31	.90	.30	2.5	2.5	3.6	.60	.96	3.9	1.0
18	1.5	1.5	.42	.80	.32	2.2	2.2	3.6	.96	.96	2.8	1.0
19	.66	1.5	.60	.74	.32	1.8	1.1	1.2	13	.96	1.1	1.0
20	.62	1.4	2.0	.70	.32	1.6	1.2	1.6	34	1.9	.77	1.0
21	.60	1.3	2.9	.70	.34	.80	1.6	1.4	9.8	2.1	.84	1.0
22	.56	1.7	2.8	.70	.30	.42	1.4	.84	7.4	.92	.73	1.0
23	.56	2.2	2.2	.70	.32	.40	1.4	.92	4.7	.92	.63	4.2
24	1.5	2.8	1.1	.70	.32	.37	1.4	.96	6.3	.96	.63	3.4
25	3.9	2.7	.82	.70	.32	.37	1.4	.63	8.2	1.0	.66	.92
26	11	2.5	.11	.72	.32	.40	1.5	.54	5.4	.96	.69	.96
27	33	2.4	.21	.72	1.3	.48	2.2	.60	2.3	.96	.69	.96
28	8.7	2.2	.17	.64	1.4	.45	2.0	.60	2.3	.96	5.2	.96
29	.92	2.2	.13	.73	1.2	3.2	1.6	.54	2.3	.96	3.7	1.0
30	.92	2.2	.13	.73	------	13	2.2	.54	2.4	1.0	23	1.0
31	.92	------	1.2	.82	------	1.4	------	.66	------	1.0	23	------
TOTAL	81.68	48.43	25.98	21.20	13.63	51.87	42.56	64.53	112.84	57.87	91.88	41.10
MEAN	2.63	1.61	0.838	0.684	0.470	1.67	1.42	2.08	3.76	1.87	2.96	1.37
MAX	33	2.8	2.9	1.6	1.4	13	2.5	3.8	34	5.6	23	4.2
MIN	0.56	0.92	0.09	0.20	0.20	0.37	0.88	0.54	0.54	0.81	0.63	0.92
AC-FT	162	96	52	42	27	103	84	128	224	115	182	82

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 653.57 MEAN 1.79 MAX 34 MIN 0.09 AC-FT 1,300

16-8824. Tengan-gawa at Tengan

Location.--Lat 26°22'54" N., long 127°51'39" E., 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.

Records available.--August 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,440 cfs Mar. 29 (gage height, 6.58 ft); no flow for part of each day Jan. 15, 21, Feb. 1.
1966-68: Maximum discharge, 3,430 cfs Jan. 1, 1967 (gage height, 12.77 ft), from rating curve extended above 1,200 cfs; no flow for part of each day Jan. 15, 21, Feb. 1, 1968.

Remarks.--Records good. Slight regulation by Tengan Reservoir (capacity, 988 acre-ft). Upstream pumping stations divert water for domestic use. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.8	1.4	0.50	0.05	54	10	2.7	57	14	3.6	31
2	1.6	2.3	2.2	.35	.51	12	6.6	2.2	53	16	4.2	24
3	1.6	2.6	12	.30	.33	6.9	18	1.8	12	15	8.0	15
4	13	2.3	4.6	.30	.35	3.7	9.1	2.6	9.1	16	7.4	13
5	5.6	2.3	3.1	.20	7.5	1.4	6.2	2.3	6.0	11	4.6	13
6	1.8	2.8	1.8	.25	6.4	2.0	3.8	2.7	4.6	21	3.7	13
7	1.5	3.0	1.3	3.8	13	1.0	3.2	2.9	3.7	17	3.7	11
8	1.3	2.0	1.8	.50	9.7	.75	2.8	2.1	3.1	11	4.0	8.6
9	1.5	1.8	1.2	.30	5.2	.49	2.3	1.8	3.1	9.2	3.7	8.1
10	1.2	2.2	.90	.35	2.1	.25	1.6	1.8	16	9.4	4.3	7.6
11	2.3	2.3	.90	.50	1.5	.46	1.5	1.6	5.5	9.4	3.1	7.3
12	1.0	2.1	.70	.30	1.0	.50	2.4	1.3	9.5	11	28	6.4
13	1.7	2.2	.90	.20	.60	.30	2.3	2.0	7.6	12	4.9	6.5
14	1.2	2.0	2.9	.60	.40	.49	2.0	.90	4.4	12	3.7	5.2
15	1.5	1.8	2.3	.25	11	.47	2.8	1.0	2.4	8.9	23	5.0
16	1.3	1.9	1.0	.30	3.6	2.5	3.6	1.1	2.3	7.9	33	4.5
17	5.2	1.8	.80	.15	2.0	.20	4.0	.94	4.6	6.7	50	3.9
18	69	2.2	1.3	.34	1.2	.67	4.4	2.9	85	7.3	19	3.8
19	28	1.9	.90	.58	1.0	.71	3.6	4.3	235	9.2	9.9	3.7
20	4.9	2.0	.80	.41	.55	.30	1.8	28	219	7.4	7.8	3.2
21	2.6	1.5	1.2	.10	.81	4.3	56	33	85	7.6	19	3.2
22	1.8	1.7	.60	.15	.44	1.0	32	12	36	5.6	22	3.2
23	2.7	1.8	.50	.36	.47	6.4	7.7	27	33	5.3	9.2	6.8
24	3.6	1.8	.40	.36	.39	1.5	4.9	28	134	5.3	16	12
25	13	1.6	.35	.70	.25	.89	4.4	38	34	4.4	16	3.7
26	37	1.5	.35	.55	.38	1.5	3.2	16	26	3.6	11	3.1
27	206	1.6	2.8	.39	.24	5.7	2.4	17	20	3.4	11	3.2
28	31	1.5	1.3	.25	.87	2.9	2.5	10	17	3.4	57	2.8
29	9.7	3.8	.80	.70	1.1	308	2.0	6.6	15	3.6	25	3.4
30	5.2	2.1	.30	.75	------	92	1.3	4.2	13	4.2	118	3.6
31	4.9	------	.35	.30	------	27	------	2.4	------	4.0	78	------
TOTAL	464.3	63.2	51.75	15.09	72.94	540.28	208.4	261.14	1155.9	281.8	586.6	238.8
MEAN	15.0	2.11	1.67	0.49	2.52	17.4	6.95	8.42	38.5	9.09	18.9	7.96
MAX	206	3.8	12	3.8	13	308	56	38	235	21	118	31
MIN	1.0	1.5	0.30	0.10	0.05	0.20	1.3	0.90	2.3	3.4	2.8	2.8
AC-FT	921	125	103	30	145	1070	413	518	2290	559	1160	474

CAL YR 1967: TOTAL 8,237.05 MEAN 22.6 MAX 932 MIN 0.30 AC-FT 16,340
WAT YR 1968: TOTAL 3,940.20 MEAN 10.8 MAX 308 MIN 0.05 AC-FT 7,820

Peak discharge (base, 2,500 cfs).-- No peak above base.

16-8826. Okukubi-gawa at Kin, Okinawa

Location.--Lat 26°27'40" N., long 127°56'03" E., 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.

Records available.--October 1967 to September 1968.

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.--Maximum discharge during year, 820 cfs Mar. 29 (gage height, 4.30 ft), from rating curve extended above 120 cfs; minimum daily, 0.10 cfs Mar. 17-20.

Remarks.--Records fair. Flow regulated by Hansen Reservoir (capacity, 421 acre-ft). Diversion from Hansen Reservoir for irrigation and domestic use. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.30	0.29	0.20	0.29	0.20	0.34	4.0	0.29	2.2	0.84	0.64	17
2	.30	.29	.24	.29	.20	.20	30	.29	18	.84	.64	8.2
3	.25	.29	.29	.34	.24	.20	5.6	.29	1.2	.93	.34	6.2
4	.25	.29	.24	.29	.24	.20	3.1	.29	.45	.93	.34	5.9
5	.25	.29	.24	.29	.29	.16	.24	.24	.45	.93	.34	4.3
6	.30	.34	.20	.24	.29	.16	.20	.20	.45	.93	.34	4.0
7	.30	.34	.24	.52	.24	.16	.20	.20	.45	.93	.34	1.2
8	.25	.29	.24	.24	.24	.20	.20	.20	.45	.84	.34	.45
9	.25	.34	.24	.24	.20	.16	.20	.16	.59	.84	.34	.45
10	.24	.34	.24	.24	.20	.16	.20	.16	.67	.84	.34	.52
11	.34	.34	.24	.20	.20	.16	.24	.16	.52	.84	.34	.52
12	.24	.34	.24	.29	.20	.16	.24	.16	.52	.75	.34	.52
13	.29	.34	.24	.59	.20	.13	.29	.16	.59	.75	.39	.59
14	.24	.34	.34	.59	.24	.13	.29	.16	.59	.75	.39	.52
15	.20	.34	.29	.59	.29	.13	.29	.16	.59	.75	33	.52
16	.20	.34	.29	.52	.20	.13	.29	.16	.59	.75	15	.52
17	.24	.34	.29	.20	.20	.10	.29	.16	.59	.67	22	.45
18	.41	.34	.29	.20	.20	.10	.34	.29	22	.67	15	.45
19	.29	.39	.29	.24	.20	.10	.39	.29	92	.67	1.5	.45
20	.20	.34	.34	.24	.20	.10	.39	.45	94	.67	.45	.45
21	.16	.34	.34	.20	.20	.13	1.3	.29	38	.75	.45	.45
22	.16	.34	.34	.20	.16	.16	18	.37	10	.75	3.3	.45
23	.16	.29	.29	.20	.16	.16	1.2	13	13	.67	6.0	.39
24	.29	.29	.29	.20	.20	.13	.29	21	28	.59	8.5	.39
25	.52	.24	.24	.24	.20	.13	.29	12	6.8	.59	5.5	.34
26	22	.24	.29	.24	.24	.16	.29	7.4	2.2	.59	3.2	.34
27	154	.24	.39	.24	.24	.16	.29	7.8	1.0	.59	2.8	.34
28	6.0	.24	.29	.24	.20	.13	.29	4.5	.93	.52	30	.39
29	.34	.24	.29	.24	.20	161	.29	1.0	.93	.45	15	.39
30	.34	.24	.29	.29	------	60	.29	.39	.84	.45	16	.39
31	.29	------	.29	.20	------	13	------	.39	------	.45	46	------
TOTAL	189.60	9.25	8.56	9.13	6.27	238.34	42.52	72.61	338.60	22.52	229.16	57.08
MEAN	6.12	0.308	0.276	0.295	0.216	7.69	1.42	2.34	11.3	0.726	7.39	1.90
MAX	154	0.39	0.39	0.59	0.29	161	18	21	94	0.93	46	17
MIN	0.16	0.24	0.20	0.20	0.16	0.10	0.20	0.16	0.45	0.45	0.34	0.34
AC-FT	376	18	17	18	12	473	84	144	672	45	455	113

CAL YR 1967: TOTAL - MEAN - MAX - MIN - AC-FT -
WAT YR 1968: TOTAL 1,223.64 MEAN 3.34 MAX 161 MIN 0.10 AC-FT 2,430

16-8828. Kanna-gawa near Kanna

Location.--Lat 26°29'20" N., long 127°56'46" E., 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.

Records available.--June 1963 to September 1968.

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.

Extremes.--Maximum discharge during year, 510 cfs Mar. 29 (gage height, 4.80 ft), from rating curve extended above 43 cfs as explained below; minimum, 0.45 cfs May 16.
1963-68: 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. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.84	1.0	0.74	0.55	0.63	5.8	1.6	0.72	4.8	1.6	1.3	3.8
2	.72	.98	.82	.55	1.1	1.3	1.4	.69	2.9	1.6	5.2	2.6
3	.70	1.1	2.4	.55	.77	.90	1.7	.66	1.4	2.5	1.3	2.3
4	1.8	.94	1.0	.52	.88	.77	1.3	.69	1.3	1.8	1.2	2.2
5	1.0	.94	.74	.52	1.5	.72	1.0	.66	1.2	1.6	1.5	2.0
6	.79	.94	.77	.81	1.8	.69	.94	.69	1.0	1.7	1.2	1.8
7	.69	.87	.77	1.9	1.7	.69	.87	1.1	.98	1.9	.98	1.5
8	.66	.87	.72	.72	1.8	.72	.84	.72	.98	1.4	.94	1.5
9	.66	.87	.60	.58	1.1	.66	.80	.66	1.2	1.4	.98	1.5
10	.74	.87	.63	.59	.84	.60	.77	.63	2.0	1.4	1.0	1.4
11	1.0	.87	.66	.69	.74	.68	.76	.60	1.1	1.3	1.1	1.4
12	.69	1.0	.55	.55	.69	.79	.80	.60	1.1	1.3	.98	1.3
13	.69	.72	.52	.58	.66	.63	.72	.58	1.2	1.3	1.2	1.3
14	.72	.69	1.2	.55	.74	.60	.69	.52	1.3	1.2	.96	1.2
15	.60	.69	.72	.50	1.9	.76	.66	.52	.94	1.2	8.0	1.2
16	.71	.69	.62	.47	.80	.79	.87	.50	.93	1.1	1.8	1.2
17	2.5	.74	.55	.50	.72	.60	.74	.52	1.0	1.1	3.2	1.2
18	5.0	.99	.94	.52	.76	.58	.81	1.5	12	1.2	1.9	1.1
19	1.6	.98	.60	.60	.74	.58	.84	1.1	15	1.2	1.3	1.3
20	1.0	.74	.55	.69	.66	.66	.69	5.6	16	1.1	1.2	1.2
21	.87	.69	.77	.60	.60	.84	9.8	3.7	6.6	1.8	2.0	1.1
22	.77	.60	.55	.58	.60	.69	2.9	3.4	3.8	1.1	4.2	1.2
23	.77	.60	.55	.60	.72	1.5	1.2	4.5	3.3	.98	1.7	2.0
24	1.3	.58	.55	.66	.60	.84	1.0	3.9	6.5	1.0	1.8	1.6
25	4.2	.58	.52	.96	.60	.74	.90	3.1	3.0	.94	1.7	1.1
26	13	.59	.55	.66	.58	.94	.84	1.8	2.5	.94	1.6	1.1
27	19	.55	2.2	.66	.58	1.6	.84	1.8	2.2	.97	1.4	1.0
28	1.8	.58	.80	.60	.93	.84	.80	1.4	2.1	.98	6.0	1.0
29	1.3	1.6	.60	.72	.77	34	.72	1.2	2.0	.90	2.4	1.7
30	1.2	.90	.58	1.1	------	5.4	.69	1.0	1.8	.84	9.0	1.5
31	1.1	------	.55	.66	------	2.5	------	.98	------	.84	20	------
TOTAL	68.42	24.76	24.32	20.74	26.51	69.41	38.49	46.04	102.13	40.19	89.04	46.3
MEAN	2.21	0.825	0.785	0.669	0.914	2.24	1.28	1.49	3.40	1.30	2.87	1.54
MAX	19	1.6	2.4	1.9	1.9	34	9.8	5.6	16	2.5	20	3.8
MIN	0.60	0.55	0.52	0.47	0.58	0.58	0.66	0.50	0.93	0.84	0.94	1.0
AC-FT	136	49	48	41	53	138	76	91	203	80	177	92

CAL YR 1967: TOTAL 1,055.55 MEAN 2.89 MAX 77 MIN 0.52 AC-FT 2,090
WAT YR 1968: TOTAL 596.35 MEAN 1.63 MAX 34 MIN 0.47 AC-FT 1,180

Peak discharge (base, 400 cfs).--Mar. 29 (1500) 510 cfs (4.80 ft).

16-8833. Left Fork O-kawa near Kushi

Location.--Lat 26°31'18" N., long 127°59'50" E., on left bank 1.1 miles northwest of Kushi and 1.1 miles north of Katabaru.

Drainage area.--0.3 sq mi, approximately.

Records available.--June 1963 to September 1968.

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.

Extremes.--Maximum discharge during year, 73 cfs Mar. 29 (gage height, 2.97 ft), from rating curve extended above 23 cfs as explained below; minimum, 0.14 cfs Jan. 1-5, 16, 17.
1963-68: 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 fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.39	0.30	0.26	0.14	0.18	0.55	0.49	0.20	0.79	0.45	0.34	0.77
2	.24	.28	.24	.14	.30	.24	.40	.20	.58	.43	.66	.51
3	.24	.30	.70	.14	.21	.20	.49	.18	.30	.57	.32	.41
4	.56	.27	.30	.14	.24	.17	.40	.20	.30	.46	.32	.39
5	.30	.25	.25	.14	.39	.17	.35	.20	.27	.40	.30	.33
6	.24	.28	.24	.21	.48	.17	.30	.20	.24	.42	.28	.33
7	.18	.24	.24	.45	.44	.16	.25	.36	.22	.50	.27	.32
8	.21	.24	.22	.20	.50	.17	.24	.22	.22	.45	.27	.28
9	.20	.25	.21	.17	.28	.16	.22	.21	.30	.41	.28	.28
10	.21	.24	.21	.16	.24	.16	.22	.20	.48	.40	.25	.27
11	.20	.24	.20	.20	.21	.18	.22	.20	.26	.38	.27	.27
12	.20	.48	.20	.17	.20	.19	.22	.18	.27	.36	.25	.25
13	.20	.25	.20	.18	.18	.16	.21	.20	.28	.34	.44	.25
14	.18	.24	.34	.16	.20	.16	.20	.17	.27	.32	.32	.25
15	.17	.24	.22	.15	.56	.21	.20	.17	.22	.30	1.7	.24
16	.18	.24	.21	.14	.21	.20	.30	.16	.24	.28	.37	.24
17	.53	.25	.20	.14	.20	.16	.22	.17	.26	.30	.46	.22
18	1.3	.52	.27	.15	.24	.15	.21	.52	3.4	.46	.33	.22
19	.36	.31	.21	.17	.21	.15	.21	.29	3.3	.33	.28	.24
20	.24	.25	.20	.20	.17	.22	.20	1.9	5.3	.32	.27	.22
21	.21	.23	.27	.17	.17	.22	2.4	.70	2.0	.44	.30	.21
22	.21	.22	.20	.16	.17	.20	.68	.44	1.1	.28	.48	.20
23	.21	.21	.20	.15	.20	.51	.32	.67	.94	.27	.32	.38
24	.40	.21	.18	.15	.17	.24	.27	.67	1.9	.27	.69	.32
25	1.1	.20	.18	.21	.17	.21	.24	.49	.88	.28	.51	.22
26	2.7	.20	.20	.18	.16	.19	.22	.36	.74	.25	.45	.21
27	9.4	.19	.50	.18	.16	.40	.22	.37	.65	.25	.39	.27
28	.60	.21	.20	.17	.21	.22	.22	.28	.58	.25	2.1	.43
29	.41	.46	.16	.31	.20	8.5	.20	.25	.53	.25	.60	.27
30	.35	.30	.15	.34	------	1.5	.20	.22	.50	.28	2.1	.27
31	.33	------	.15	.20	------	.72	------	.21	------	.28	2.7	------
TOTAL	22.25	8.10	7.51	5.77	7.25	16.84	10.52	10.79	27.32	10.98	18.62	9.07
MEAN	0.718	0.270	0.242	0.186	0.250	0.543	0.351	0.348	0.911	0.354	0.601	0.302
MAX	9.4	0.52	0.70	0.45	0.56	8.5	2.4	1.9	5.3	0.57	2.7	0.77
MIN	0.17	0.19	0.15	0.14	0.16	0.15	0.20	0.16	0.22	0.25	0.25	0.20
AC-FT	44	16	15	11	14	33	21	21	54	22	37	18

CAL YR 1967: TOTAL 256.22 MEAN 0.702 MAX 20 MIN 0.15 AC-FT 508
WAT YR 1968: TOTAL 155.02 MEAN 0.424 MAX 9.4 MIN 0.14 AC-FT 307

Peak discharge (base, 80 cfs).--No peak above base.

16-8835.5. Oura-gawa at Okawa

Location.--Lat 26°34'10" N., long 128°02'23" E., on left bank 0.4 mile north of Okawa and 1.8 miles northwest of Sedake.

Drainage area.--1.9 sq mi, approximately.

Records available.--May 1966 to September 1968.

Gage.--Water-stage recorder and, since Mar. 10, 1967, concrete control. Altitude of gage is 30 ft (from topographic map).

Extremes.--Maximum discharge during year, 462 cfs Mar. 29 (gage height, 4.22 ft), from rating curve extended above 67 cfs; no flow for many days.
1966-68: Maximum discharge, 890 cfs June 4, 1967 (gage height, 6.60 ft), from rating curve extended above 67 cfs; no flow at times in 1967-68.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	1.4	0.48	0.09	0.27	9.0	8.8	1.1	2.9	4.3	5.3	14
2	0	1.1	.23	.05	3.1	2.6	7.1	1.1	4.2	3.8	3.4	8.8
3	0	.87	3.1	.01	2.0	2.1	7.5	1.1	1.8	3.8	1.3	5.9
4	0	.62	1.8	0	1.4	1.4	5.9	.97	1.5	3.4	.87	4.8
5	0	.55	.87	0	3.6	1.1	5.0	.97	1.4	2.8	.78	3.4
6	0	.70	1.6	0	3.6	.97	4.3	.78	1.1	3.4	.62	3.2
7	0	.55	3.4	1.3	6.2	.87	3.8	1.7	.97	9.8	.36	2.6
8	0	.31	2.0	.70	9.2	.78	3.4	.97	.87	3.6	.31	2.3
9	0	.19	1.3	.31	5.3	.70	3.0	.70	.87	3.2	.31	2.0
10	0	.13	1.1	.16	3.6	.62	2.8	.48	3.6	2.8	.27	1.8
11	0	.11	.87	.13	2.8	.70	2.6	.36	1.3	2.6	.23	1.7
12	0	4.0	.62	.09	2.0	.87	3.0	.36	1.2	2.8	.19	1.5
13	0	1.3	.48	.04	1.5	.62	2.3	.36	1.1	2.6	.42	1.5
14	0	.55	1.2	.13	1.4	.48	2.1	.31	.97	2.4	.35	1.4
15	0	.31	.97	.07	5.0	.67	2.0	.23	.87	2.3	10	1.3
16	0	.16	.55	.03	2.0	1.7	3.6	.27	.66	2.1	4.0	1.2
17	.18	.11	.42	0	1.4	.62	2.3	.31	.62	2.0	2.5	1.2
18	11	2.1	.42	0	1.3	.31	2.0	2.5	12	2.6	1.6	1.2
19	2.6	2.1	.42	0	1.3	.19	1.8	1.8	20	2.6	1.1	1.2
20	.70	.87	.27	0	.97	1.6	1.5	11	41	2.0	.80	1.1
21	.23	.70	.19	0	.78	3.5	16	7.5	24	2.1	1.2	.97
22	.03	.42	.13	0	.78	1.7	9.6	2.3	14	2.0	1.2	.78
23	0	.19	.07	0	.78	8.7	4.5	2.3	11	1.1	.80	1.3
24	0	.13	.03	0	.70	2.6	3.4	3.8	18	.87	5.4	2.8
25	15	.07	.02	.04	.55	1.3	2.8	6.3	11	.78	5.0	.97
26	26	.02	0	.48	.48	1.3	2.3	3.6	9.2	.70	3.6	.62
27	56	0	1.8	.19	.42	2.0	2.1	2.8	7.5	.62	2.5	.48
28	8.2	0	.97	.04	.42	1.7	1.8	2.0	6.2	.55	27	.55
29	4.3	.28	.55	0	.48	67	1.5	1.5	5.6	.48	9.6	.55
30	2.6	.62	.36	1.0	------	21	1.3	1.2	5.0	.62	29	.55
31	2.0	------	.19	.48	------	12	------	1.1	------	1.8	37	------
TOTAL	128.84	20.46	26.41	5.34	63.33	150.70	120.1	61.77	210.43	76.52	157.01	71.67
MEAN	4.16	0.682	0.852	0.172	2.18	4.86	4.00	1.99	7.01	2.47	5.06	2.39
MAX	56	4.0	3.4	1.3	9.2	67	16	11	41	9.8	37	14
MIN	0	0	0	0	0.27	0.19	1.3	0.23	0.62	0.48	0.19	0.48
AC-FT	256	41	52	11	126	299	238	123	417	152	311	142

CAL YR 1967: TOTAL 1,750.57 MEAN 4.80 MAX 111 MIN 0 AC-FT 3,470
WAT YR 1968: TOTAL 1,092.58 MEAN 2.99 MAX 67 MIN 0 AC-FT 2,170

Peak discharge (base, 500 cfs).--No peak above base.

16-8841. Fukuji-gawa near Yubaru

Location.--Lat 26°38'32" N., long 128°13'00" E., on left bank 1.1 miles north of Yubaru and 2.4 miles northeast of Miyaji.

Drainage area.--5.8 sq mi, approximately.

Records available.--January 1964 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,330 cfs Mar. 29 (gage height, 10.00 ft), from rating curve extended above 200 cfs on basis of slope-area measurements at gage heights 10.22 and 17.20 ft; minimum, 3.0 cfs Oct. 15, 16.
1964-68: Maximum discharge, 10,400 cfs Aug. 5, 1965 (gage height, 17.20 ft), from rating curve extended above 590 cfs on basis of slope-area measurement of peak flow; minimum, 3.0 cfs Sept. 25, 26, Oct. 15, 16, 1967.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	7.8	6.8	4.7	4.3	31	22	7.6	18	17	13	30
2	4.4	6.8	5.5	4.7	6.4	11	20	7.6	30	16	21	24
3	3.8	6.4	22	4.7	6.0	25	18	7.3	11	16	9.4	21
4	10	6.4	11	4.7	6.4	11	16	7.0	9.4	15	9.4	25
5	8.3	6.0	6.8	4.7	20	7.8	13	7.3	8.7	14	9.0	21
6	4.7	6.8	18	5.1	9.8	7.3	12	7.6	8.0	16	8.7	19
7	3.8	6.0	9.8	12	17	6.8	11	13	7.6	103	8.0	18
8	3.5	5.5	8.8	6.0	15	6.8	11	8.3	7.3	21	7.6	16
9	3.2	6.0	7.3	5.1	11	6.4	11	7.6	10	16	8.0	16
10	3.2	6.8	6.8	4.7	8.8	6.0	10	7.3	36	14	8.0	14
11	12	11	8.3	6.4	7.8	6.0	9.8	7.3	11	13	7.6	16
12	4.4	10	6.8	5.1	6.8	6.0	9.8	7.0	10	15	7.6	14
13	3.5	7.3	6.4	4.7	6.4	5.5	9.4	7.6	9.8	25	18	13
14	3.2	6.0	8.8	5.5	6.0	5.1	9.0	7.0	10	13	9.4	12
15	3.2	5.5	8.3	4.7	25	20	8.7	6.3	9.4	12	191	11
16	3.0	5.1	6.8	4.3	8.3	14	11	6.3	9.0	12	30	11
17	25	5.1	6.0	4.3	7.3	6.4	8.7	6.3	9.4	11	38	11
18	73	6.8	7.3	4.3	6.8	6.0	8.7	16	133	11	17	15
19	54	8.8	6.4	5.1	6.8	5.5	9.0	11	155	11	13	13
20	14	6.0	6.0	6.8	6.4	42	8.0	33	559	14	11	11
21	7.0	5.1	6.0	5.1	6.0	64	86	30	85	23	12	10
22	5.3	5.1	5.5	4.7	6.0	23	31	11	41	14	43	9.8
23	4.7	5.1	5.5	4.7	6.0	54	12	10	30	11	17	10
24	8.7	5.1	5.5	4.3	6.0	25	11	20	94	10	63	12
25	96	4.7	5.1	5.5	6.4	14	9.4	120	43	10	22	9.6
26	79	4.7	5.1	5.5	6.0	12	9.0	20	30	9.4	18	9.2
27	268	4.7	10	4.7	5.5	15	8.7	14	25	9.0	19	9.0
28	21	4.7	6.4	4.7	6.0	11	8.3	10	22	9.4	131	9.4
29	13	9.5	5.5	4.8	6.4	460	8.0	9.4	20	9.4	218	10
30	9.8	6.8	5.1	6.8	------	106	8.0	8.7	19	9.0	46	9.4
31	8.8	------	5.1	5.1	------	38	------	8.3	------	8.7	55	------
TOTAL	766.5	191.6	238.7	163.5	246.6	1057.6	427.5	449.8	1470.6	507.9	1088.7	429.4
MEAN	24.7	6.39	7.70	5.27	8.50	34.1	14.2	14.5	49.0	16.4	35.1	14.3
MAX	268	11	22	12	25	460	86	120	559	103	218	30
MIN	3.0	4.7	5.1	4.3	4.3	5.1	8.0	6.3	7.3	8.7	7.6	9.0
AC-FT	1520	380	473	324	489	2100	848	892	2920	1010	2160	852

CAL YR 1967: TOTAL 6,957.0 MEAN 19.1 MAX 626 MIN 3.0 AC-FT 13,800
WAT YR 1968: TOTAL 7,038.4 MEAN 19.2 MAX 559 MIN 3.0 AC-FT 13,960

Peak discharge (base, 2,500 cfs).--Mar. 29 (1600) 4,330 cfs (10.00 ft); June 20 (1700) 3,530 cfs (8.81 ft).

16-8842. Fukuji-gawa at Fukuji

Location.--Lat 26°38'16" N., long 128°10'13" E., on left bank at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.

Drainage area.--12 sq mi, approximately.

Records available.--January 1964 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Mar. 7, 1967, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 8,900 cfs Mar. 29 (gage height, 11.00 ft), from rating curve extended above 940 cfs on basis of slope-area measurements at gage heights 11.00 and 12.10 ft; minimum, 5.9 cfs Oct. 16, 1964-68: Maximum discharge, 18,300 cfs Aug. 5, 1965 (gage height, 16.97 ft, present datum), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 9.37, 11.48 and 16.97 ft; minimum, 5.8 cfs Sept. 25, 26, 1967.

Flood of Oct. 14, 1959, reached a stage of 18.9 ft, present datum, from information by local residents (discharge, 23,000 cfs). Minimum discharge known, 2.57 cfs Oct. 22, 1963, result of discharge measurement.

Remarks.--Records fair. No diversion above station. Daily sediment samples are obtained at station. Records of chemical analyses, water temperatures and suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	20	15	10	8.9	54	72	15	27	35	22	76
2	9.2	18	12	10	11	26	59	15	59	34	31	61
3	7.6	17	36	10	10	48	51	14	24	33	18	52
4	19	16	24	10	10	25	44	13	20	32	18	52
5	20	15	16	9.7	34	18	38	14	18	29	19	45
6	11	17	35	10	21	16	33	15	17	31	20	44
7	8.6	14	20	27	34	15	29	25	16	179	16	41
8	7.6	12	16	13	33	14	25	16	16	35	16	35
9	6.7	12	14	10	27	13	24	15	17	30	16	37
10	6.2	14	13	10	21	12	24	14	58	27	16	30
11	24	21	15	13	16	12	23	14	20	26	16	30
12	10	20	14	10	13	12	22	13	18	29	16	28
13	8.9	15	13	11	12	11	21	15	16	42	33	25
14	7.3	12	15	12	11	11	20	13	18	25	19	24
15	6.5	11	15	10	47	28	18	12	16	24	541	24
16	5.9	9.7	13	9.7	19	31	24	12	16	23	79	23
17	38	9.7	12	9.3	16	13	18	12	16	23	84	22
18	91	14	13	9.3	15	11	16	29	140	22	42	27
19	68	17	12	9.7	15	10	18	26	404	22	29	25
20	27	12	12	12	14	65	15	40	1,530	24	24	21
21	14	10	12	9.7	13	118	163	70	216	34	24	20
22	11	9.7	11	9.3	13	38	79	28	109	23	74	19
23	10	9.7	11	8.9	12	116	30	21	80	19	41	20
24	17	9.7	11	8.5	12	46	24	41	172	18	128	23
25	163	9.3	10	10	13	33	21	252	92	18	51	19
26	102	9.3	10	11	12	30	20	45	63	17	38	18
27	792	8.9	24	9.3	11	34	18	30	54	17	40	17
28	55	8.9	15	8.5	12	28	17	25	48	17	297	19
29	32	19	12	8.9	12	1,240	16	22	42	19	480	20
30	26	18	11	12	------	311	16	20	38	19	113	18
31	23	------	10	9.3	------	125	------	18	------	18	125	------
TOTAL	1,637.5	408.9	472	331.1	497.9	2564	998	914	3,380	944	2,486	915
MEAN	52.8	13.6	15.2	10.7	17.2	82.7	33.3	29.5	113	30.5	80.2	30.5
MAX	792	21	36	27	47	1,240	163	252	1,530	179	541	76
MIN	5.9	8.9	10	8.5	8.9	10	15	12	16	17	16	17
AC-FT	3,250	811	936	657	988	5,090	1,980	1,810	6,700	1,870	4,930	1,810

CAL YR 1967: TOTAL 15,478.0 MEAN 42.4 MAX 1,750 MIN 5.9 AC-FT 30,700
WAT YR 1968: TOTAL 15,548.4 MEAN 42.5 MAX 1,530 MIN 5.9 AC-FT 30,840

PEAK DISCHARGE (BASE, 4,000 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10-27	0200	7.87	4,940	6-20	1700	10.90	8,760
3-29	1700	11.00	8,900	8-15	1330	7.41	4,390
6-18	2400	7.66	4,690				

16-8846. Aha-gawa at Aha

Location.--Lat 26°42'41" N., long 128°16'55" E., on right bank 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.

Drainage area.--9.5 sq mi, approximately.

Records available.--December 1963 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Oct. 13, 1966, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 8,390 cfs Mar. 29 (gage height, 9.64 ft), from rating curve extended above 310 cfs on basis of slope-area measurement at gage height 9.72 ft; minimum, 7.0 cfs Oct. 16.
1963-68: Maximum discharge, 12,700 cfs June 16, 1964 (gage height, 11.60 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 9.35 and 10.5 ft; minimum, 6.8 cfs Nov. 25-28, 1964, Jan. 16, 1966.
Minimum discharge known, 5.08 cfs Oct. 22, 1963, result of discharge measurement.

Remarks.--Records fair. No diversion above station. Daily sediment samples and continuous records of rainfall are obtained at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	24	19	12	13	89	95	20	53	33	22	67
2	9.8	20	15	12	29	29	77	19	72	30	49	54
3	8.3	19	54	11	25	36	78	18	23	31	19	46
4	22	17	23	10	32	25	55	18	21	30	18	54
5	15	17	14	10	82	20	45	18	18	27	16	45
6	10	17	37	13	47	18	38	17	17	39	16	40
7	8.3	15	28	33	63	18	35	26	16	116	16	36
8	7.8	14	22	15	69	18	31	18	15	28	16	34
9	7.4	14	16	13	48	16	29	16	21	25	15	33
10	7.8	16	16	12	35	15	27	16	72	24	16	30
11	52	23	18	18	29	14	25	16	20	23	15	31
12	9.3	23	15	12	23	16	25	16	19	30	14	28
13	8.3	16	13	18	20	13	23	16	18	84	26	27
14	7.8	13	22	21	19	12	21	14	18	30	17	25
15	7.4	13	18	13	92	36	20	14	16	27	272	24
16	7.4	13	15	12	32	21	26	14	17	26	60	22
17	51	12	14	11	27	14	20	14	27	25	36	21
18	158	16	19	10	25	12	18	36	226	24	27	25
19	149	24	14	14	25	11	18	25	233	22	25	22
20	87	14	13	18	21	62	16	39	876	22	24	20
21	21	15	13	11	19	79	154	74	210	36	23	19
22	16	15	12	10	18	34	87	35	68	25	29	18
23	15	13	11	9.8	18	119	38	25	55	24	21	19
24	26	12	11	9.3	17	45	32	45	184	21	71	23
25	140	11	10	17	18	34	28	230	63	21	40	19
26	127	11	9.8	15	16	32	25	40	54	20	42	17
27	433	10	40	11	15	38	25	25	48	20	46	16
28	65	10	24	9.8	17	29	24	20	42	20	87	18
29	40	22	15	11	16	853	22	17	39	20	192	20
30	30	22	13	35	------	282	21	16	36	20	87	19
31	27	------	12	15	------	140	------	15	------	20	101	------
TOTAL	1587.6	481	575.8	441.9	910	2180	1178	932	2597	943	1458	872
MEAN	51.2	16.0	18.6	14.3	31.4	70.3	39.3	30.1	86.6	30.4	47.0	29.1
MAX	433	24	54	35	92	853	154	230	876	116	272	67
MIN	7.4	10	9.8	9.3	13	11	16	14	15	20	14	16
AC-FT	3150	954	1140	876	1800	4320	2340	1850	5150	1870	2890	1730

CAL YR 1967: TOTAL 14,698.4 MEAN 40.3 MAX 970 MIN 7.4 AC-FT 29,150
WAT YR 1968: TOTAL 14,156.3 MEAN 38.7 MAX 876 MIN 7.4 AC-FT 28,080

Peak discharge (base, 4,500 cfs).--Mar. 29 (1600) 8,390 cfs (9.64 ft); June 20 (1700) 8,080 cfs (9.50 ft).

16-8848. Fun-gawa near Aha

Location.--Lat 26°44'33" N., long 128°16'53" E., 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.

Records available.--February 1964 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,080 cfs June 20 (gage height, 14.35 ft), from rating curve extended above 1,300 cfs as explained below; minimum, 2.2 cfs Oct. 15, 16.
1964-68: 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.
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 above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft).

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the water year 1968 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	7.6	6.8	5.6	5.2	38	20	7.1	36	13	6.3	16
2	3.1	7.1	7.4	5.4	20	10	18	6.8	23	12	9.6	13
3	2.8	6.6	42	5.2	11	14	18	6.8	10	12	6.4	12
4	7.0	6.1	13	4.9	29	9.9	15	6.6	9.3	12	9.0	13
5	4.7	6.1	17	4.9	51	8.8	13	6.3	8.2	10	6.3	11
6	3.5	6.1	56	5.7	31	8.5	13	6.1	7.4	20	6.3	11
7	2.8	5.4	19	9.0	33	7.9	12	9.0	7.1	42	5.6	9.3
8	2.6	5.2	14	5.6	37	8.2	11	6.3	6.8	12	5.4	9.0
9	2.6	4.9	11	5.6	21	7.4	10	5.4	8.5	10	5.4	8.8
10	3.1	6.0	11	5.2	17	7.1	9.6	5.6	12	9.6	5.9	8.2
11	3.5	7.4	10	5.6	14	7.2	9.6	5.6	7.1	9.0	5.2	8.8
12	2.6	19	8.8	4.9	13	7.1	9.3	5.6	7.1	17	4.7	7.9
13	2.4	6.8	7.9	6.3	12	6.6	8.8	5.9	7.1	19	6.1	7.6
14	2.4	5.4	12	5.6	11	6.3	8.5	5.6	6.6	9.3	5.2	7.1
15	2.4	4.9	8.8	4.7	51	7.8	8.5	5.2	6.3	8.8	118	6.8
16	3.0	4.7	7.9	4.5	14	7.1	11	5.2	11	8.5	15	6.6
17	15	4.7	7.4	4.5	12	6.1	8.5	5.4	14	7.9	16	6.6
18	150	8.3	10	4.5	12	6.1	8.2	13	123	8.2	8.8	7.4
19	76	6.6	7.9	5.1	11	5.9	7.9	7.8	74	7.6	7.6	6.6
20	14	5.2	7.4	5.2	9.9	19	7.6	12	318	7.9	7.1	6.3
21	7.9	5.6	7.1	4.3	9.3	16	56	34	57	9.7	7.1	6.1
22	6.1	5.6	6.6	4.3	9.0	10	20	14	31	7.6	13	6.1
23	5.4	4.7	6.6	4.3	8.8	48	11	9.4	25	7.1	7.4	6.9
24	8.8	4.5	6.3	4.3	8.2	13	9.6	10	79	7.1	16	8.5
25	25	4.3	6.1	6.6	8.5	12	8.8	107	25	6.6	9.0	5.9
26	43	4.1	5.9	5.2	7.9	11	8.5	14	21	6.3	11	5.4
27	135	3.9	14	4.3	7.6	13	8.5	11	18	6.3	12	5.9
28	17	3.9	7.9	4.1	7.6	11	8.2	9.0	16	6.1	26	6.1
29	12	10	6.6	4.9	7.4	324	7.6	7.9	15	6.1	43	5.2
30	9.6	7.9	6.1	9.0	------	51	7.1	7.4	14	5.9	19	6.1
31	8.5	------	5.9	5.2	------	27	------	6.8	------	5.6	19	------
TOTAL	585.5	188.6	364.4	164.5	489.4	735.0	372.8	367.8	1003.5	330.2	442.4	245.2
MEAN	18.9	6.29	11.8	5.31	16.9	23.7	12.4	11.9	33.4	10.7	14.3	8.17
MAX	150	19	56	9.0	51	324	56	107	318	42	118	16
MIN	2.4	3.9	5.9	4.1	7.4	5.9	7.1	5.2	6.3	5.6	4.7	5.2
AC-FT	1160	374	723	326	971	1460	739	730	1990	655	877	486

CAL YR 1967: TOTAL 6,114.4 MEAN 16.8 MAX 485 MIN 2.4 AC-FT 12,130
WAT YR 1968: TOTAL 5,289.3 MEAN 14.5 MAX 324 MIN 2.4 AC-FT 10,490

Peak discharge (base, 1,700 cfs).--Mar. 29 (1600) 3,050 cfs (12.11 ft); June 20 (1630) 4,080 cfs (14.35 ft).

16-8924. Aringel Stream, Yap

Location.--Lat 9°31'01" N., long 138°05'11" E., on right bank at Aringel and 0.3 mile upstream from mouth.

Drainage area.--0.24 sq mi.

Records available.--March to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 35 ft (from topographic map).

Extremes.--Maximum discharge during period, 210 cfs Sept. 22 (gage height, 5.00 ft), from rating curve extended above 20 cfs by logarithmic plotting; no flow for many days.

Remarks.--Records good except those above 40 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-		0	0	0.03	0.15	5.0
2						-		.05	0	.03	11	10
3						-		.02	0	.04	1.4	3.2
4						-		.01	0	.03	3.3	.92
5						-		0	0	8.8	3.0	2.3
6						-		0	0	.68	2.7	1.5
7						-		0	0	.16	2.9	.46
8						-		0	0	1.4	.92	.52
9	✓0.10					-		0	.02	.37	3.9	.46
10						-		0	0	1.8	.68	.37
11						-		0	0	1.2	.40	.20
12						-		0	0	.40	.40	.13
13						-		0	0	1.3	.20	.10
14						-		0	0	.60	.12	.08
15						-		0	0	.19	.08	.09
16						-		0	0	.12	.21	.07
17						-		0	0	.16	.64	.05
18						-		0	0	.16	.17	.05
19						-		0	0	.11	.13	.07
20						-		0	.02	.72	.08	1.0
21						.01		0	.06	.17	.22	4.7
22						.01		0	.92	.20	.37	13
23						.01		0	.32	.79	.68	6.7
24						.01		0	.11	.30	.22	2.0
25						0		0	.86	.52	.12	.80
26						0		0	.30	.22	.24	.34
27						0		0	.11	.15	.40	.16
28						0		0	.07	.11	.24	.11
29						0		0	.05	6.4	.15	.17
30					------	0		0	.04	.92	.09	.11
31		------			------	0	------	0	------	.30	2.7	------
TOTAL						-	0	0.08	2.88	28.38	37.81	54.66
MEAN						-	0	0.003	0.096	0.915	1.22	1.82
MAX						-	0	0.05	0.92	8.8	11	13
MIN						-	0	0	0	0.03	0.08	0.05
AC-FT						-	0	1.6	5.7	56	75	108

CAL YR 1967:	TOTAL	MEAN	MAX	MIN	AC-FT
WAT YR 1968:	TOTAL -	MEAN -	MAX -	MIN -	AC-FT -

Peak discharge (base, 200 cfs).--Sept. 22 (0630) 210 cfs (5.00 ft).

Note.--No gage-height record Apr. 26 to June 19.
✓ Result of discharge measurement.

16-8928. Dalolab Stream, Yap

Location.--Lat 9°31'04" N., long 138°06'04" E., on left bank at Talagu and 0.9 mile upstream from mouth.

Drainage area.--0.09 sq mi.

Records available.--March to September 1968.

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

Extremes.--Maximum discharge during period, 106 cfs Aug. 2 (gage height, 3.97 ft), from rating curve extended above 17 cfs by logarithmic plotting; no flow for many days.

Remarks.--Records good except those above 40 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						--			0	0	0.01	1.2
2						--			0	0	5.0	3.3
3						--			0	0	1.0	1.3
4						--			0	1.9	1.4	.26
5						--			0	.06	1.5	.82
6						--			0	.01	1.0	.46
7						--			0	.35	1.5	.06
8						--			0	.03	.22	.08
9						--			0	.63	1.2	.08
10						--			0	.46	.18	.08
11						--			0	.05	.15	.04
12						--			0	1.1	.12	.02
13						--			0	.30	.03	.02
14						--			0	.03	.02	.01
15						--			0	.02	.01	.02
16						--			0	.26	.01	.01
17						--			0	.15	.08	.01
18						--			0	.04	.02	.01
19						--			0	.35	.01	.01
20						0			0	.04	.01	.02
21						0			0	.06	.01	3.2
22						0			0	.22	.01	2.6
23						0			0	.03	.01	.35
24						0			.04	.04	0	.10
25						0			.01	.02	.02	.02
26						0			0	.01	.03	.01
27						0			0	.01	.02	.01
28						0			0	2.1	.02	.05
29					------	0			0	.30	.01	.01
30					------	0	------		------	.04	1.2	------
31		------										
TOTAL						--	0	0	0.05	8.61	14.81	14.17
MEAN						--	0	0	0.002	0.278	0.478	0.472
MAX						--	0	0	0.04	2.1	5.0	3.3
MIN						--	0	0	0	0	0	0.01
AC-FT						--	0	0	0.1	18	29	28

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 75 cfs).--Aug. 2 (1300) 106 cfs (3.97 ft).

16-8929. Pemgoy Stream, Yap

Location.--Lat 9°31'07" N., long 138°06'18" E., on right bank at Talagu, 100 ft upstream from Talagu Stream, and 0.8 mile upstream from mouth.

Drainage area.--0.17 sq mi.

Records available.--March to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map).

Extremes.--Maximum discharge during period, 66 cfs Aug. 2 (gage height, 2.94 ft), from rating curve extended above 5.0 cfs by logarithmic plotting; no flow for many days.

Remarks.--Records fair except those above 10 cfs, which are poor. No diversion above station.

Discharge measurement made prior to beginning of continuous discharge record

Sept. 23, 1965.....0.45 cfs

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-		0	0	0	0.04	1.8
2						-		.02	0	0	5.5	4.6
3						-		0	0	0	.63	2.0
4						-		0	0	0	1.0	.26
5						-		0	0	1.0	1.4	.88
6						-		0	0	.03	.63	.56
7						-		0	0	.01	1.4	.12
8						-		0	0	.05	.26	.12
9	≠ 0.10					-		0	.01	.01	.92	.16
10						-		0	0	.50	.14	.20
11						-		0	0	.25	.18	.14
12						-		0	0	.05	.16	.08
13						-		0	0	1.0	.08	.06
14						-		0	0	.25	.06	.06
15						-		0	0	.05	.04	.07
16						-		0	0	.03	.05	.05
17						-		0	0	1.7	.14	.04
18						-		0	0	.26	.05	.04
19						-		0	0	.07	.04	.04
20						-		0	0	.26	.02	.05
21						0		0	.03	.06	.02	.12
22						0		0	0	.07	.03	4.3
23						0		0	.03	.26	.04	3.9
24						0		0	.03	.07	.02	.34
25						0		0	.01	.06	0	.10
26						0		0	.16	.06	.04	.06
27						0		0	.05	.04	.09	.04
28						0		0	.01	.06	.06	.03
29						0		0	0	2.4	.05	.07
30					------	0		0	0	.18	.04	.04
31		------			------	0	------	0	------	.07	1.2	------
TOTAL						-	0	0.02	0.33	8.85	14.33	20.33
MEAN						-	0	0.001	0.011	0.285	0.462	0.678
MAX						-	0	0.02	0.16	2.4	5.5	4.6
MIN						-	0	0	0	0	0	0.03
AC-FT						-	0	0.04	0.7	18	28	40

CAL YR 1967:	TOTAL		MEAN		MAX		MIN		AC-FT	
WAT YR 1968:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

Peak discharge (base, 70 cfs).--No peak above base.

≠ Result of discharge measurement.

16-8930. Talagu Stream, Yap

Location.--Lat 9°31'08" N., long 138°06'13" E., on left bank at Talagu, 300 ft upstream from mouth, and 0.9 mile upstream from mouth of Pemgoy Stream.

Drainage area.--0.07 sq mi.

Records available.--March to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during period, 66 cfs Aug. 2 (gage height, 2.36 ft), from rating curve extended above 5.0 cfs by logarithmic plotting; no flow for many days.

Remarks.--Records fair except those above 9 cfs, which are poor. No diversion above station.

Discharge measurements made prior to beginning of continuous discharge record

Sept. 20, 1965.....0.05 cfs
23, 1965..... .19 cfs

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-		0		0	0	1.4
2						-		.01		0	4.7	3.4
3						-		0		0	1.2	1.7
4						-		0		0	1.7	.29
5						-		0		1.0	1.8	.67
6						-		0		.01	1.0	.89
7						-		0		0	1.5	.08
8						-		0		.03	.29	.06
9	≠0.08					-		0		0	1.3	.10
10						-		0		.50	.17	.10
11						-		0		.25	.17	.10
12						-		0		.05	.22	.03
13						-		0		1.0	.08	.01
14						-		0		.30	.03	.01
15						-		0		.05	.01	.01
16						-		0		.02	.01	0
17						-		0		1.5	.08	0
18						-		0		.25	.03	0
19						-		0		.05	.01	0
20						-		0		.25	0	0
21						0		0		.05	0	.02
22						0		0		.05	0	3.1
23						0		0		.25	.01	3.1
24						0		0		.05	0	.63
25						0		0		.04	0	.13
26						0		0		.01	.01	.04
27						0		0		0	.05	.01
28						0		0		0	.05	0
29						0		0		2.2	.04	.06
30					------	0		0		.29	0	.01
31		------			------	0	------	0	------	.03	1.5	------
TOTAL						-	0	0.01	0	8.23	15.96	15.95
MEAN						-	0	0.0003	0	0.265	0.515	0.532
MAX						-	0	0.01	0	2.2	4.7	3.4
MIN						-	0	0	0	0	0	0
AC-FT						-	0	0.02	0	16	32	32

CAL YR 1967:	TOTAL		MEAN		MAX		MIN		AC-FT	
WAT YR 1968:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

Peak discharge.--(base, 50 cfs).--Aug. 2 (1300) 66 cfs (2.36 ft).

≠ Result of discharge measurement.

16-8931. Burong Stream, Yap

Location.--Lat 9°31'59" N., long 138°07'05" E., on left bank at Dugor and 0.1 mile upstream from mouth.

Drainage area.--0.29 sq mi.

Records available.--March to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during period, 52 cfs Sept. 22 (gage height, 2.96 ft), from rating curve extended above 15 cfs by logarithmic plotting; no flow for many days.

Remarks.--Records good except those above 30 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-		0	0	0	0.04	2.3
2						-		.05	0	0	5.5	6.9
3						-		0	0	0	1.8	5.5
4						-		0	0	0	7.4	2.2
5						-		0	0	.11	3.4	2.4
6						-		0	0	.02	1.4	2.3
7						-		0	0	0	2.8	.63
8						-		0	0	0	.95	.38
9						-		0	0	0	1.2	.60
10						-		0	0	.23	.52	.90
11						-		0	0	.64	1.1	.60
12						-		0	0	.08	1.0	.24
13						-		0	0	.48	.42	.12
14						-		0	0	.66	.17	.06
15						-		0	0	.10	.05	.12
16						-		0	0	.41	.22	.04
17						-		0	0	2.5	.66	.01
18						-		0	0	.99	.19	0
19						-		0	0	.17	.12	.01
20						-		0	0	.70	.04	.01
21						-		0	0	.12	.08	3.1
22						0		0	0	.26	.12	7.3
23						0		0	0	1.3	.04	6.9
24						0		0	0	.24	0	1.2
25						0		0	.08	.21	0	.38
26						0		0	0	.06	.06	.19
27						0		0	0	0	.28	.08
28						0		0	0	.04	.08	.03
29						0		0	0	3.2	.02	.03
30					------	0		0	0	.60	.01	.01
31		------			------	0	------	0	------	.12	2.6	------
TOTAL						-	0	0.05	0.08	13.24	32.27	44.54
MEAN						-	0	0.002	0.003	0.427	1.04	1.48
MAX						-	0	.05	0.08	3.2	7.4	7.3
MIN						-	0	0	0	0	0	0
AC-FT						-	0	0.1	0.2	26	64	88

CAL YR 1967:	TOTAL		MEAN		MAX		MIN		AC-FT	
WAT YR 1968:	TOTAL	-	MEAN	-	MAX	-	MIN	-	AC-FT	-

Peak discharge (base, 75 cfs).--No peak above base.

16-8933. Bileiy Spring, Gagil-Tomil

Location.--Lat 9°32'19" N., long 138°10'59" E., on right bank at Binau, 200 ft downstream from main spring, and 0.6 mile upstream from mouth.

Records available.--March to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map).

Extremes.--Maximum daily discharge during period, 0.46 cfs Sept. 3; no flow for many days.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						-	0.08	0.02		0	0.05	0.19
2						-	.08	.25		0	.11	.39
3						-	.09	.10		0	.11	.46
4						-	.09	.09		0	.05	.42
5						-	.09	.08		.06	.03	.39
6						-	.08	.08		0	.05	.36
7						-	.08	.07		0	.05	.33
8						-	.08	.06		0	.05	.27
9						-	.08	.05		0	.09	.24
10	≠0.11					-	.06	.05		0	.09	.24
11						-	.06	.04		.01	.15	.21
12						-	.08	.04		.01	.15	.19
13						-	.06	.03		.01	.10	.17
14						-	.10	.03		.01	.10	.15
15						-	.08	.02		.01	.09	.15
16						-	.06	.02		0	.09	.15
17						-	.05	.01		.01	.08	.15
18						-	.04	.01		0	.08	.15
19						-	.04	.01		0	.08	.15
20						.08	.03	.01		.01	.08	.15
21						.06	.03	0		.01	.08	.13
22						.06	.03	0		.01	.08	.15
23						.06	.03	0		.01	.08	.15
24						.08	.05	0		.01	.08	.15
25						.09	.03	0		.01	.08	.13
26						.09	.03	0		.01	.08	.13
27						.09	.02	0		.01	.06	.11
28						.09	.02	0		.01	.05	.11
29						.09	.02	0		.06	.05	.11
30					------	.09	.02	0		.05	.06	.11
31		------			------	.08	------	0	------	.05	.08	------
TOTAL						-	1.69	1.07	0	0.37	2.46	6.19
MEAN						-	0.056	0.035	0	0.012	0.079	0.206
MAX						-	0.10	0.25	0	0.06	0.15	0.46
MIN						-	0.02	0	0	0	0.03	0.11
AC-FT						-	3.4	2.1	0	0.7	4.9	12

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

≠ Result of discharge measurement.
Note.--No gage-height record Apr. 11 to May 23.

16-8937. Wichen River at altitude 55 m, Moen

Location.--Lat 7°26'45" N., long 151°52'02" E., on left bank at Peniesenee, 1.0 mile upstream from mouth, and 1.6 miles west of Saint Xaviers Academy.

Drainage area.--0.23 sq mi.

Records available.--May to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during period, 82 cfs June 12 (gage height, 2.71 ft), from rating curve extended above 0.46 cfs by logarithmic plotting; minimum, 0.18 cfs Sept. 15.

Remarks.--Records poor. No diversion above station.

Discharge measurement made prior to beginning of continuous discharge record

Mar. 16, 1966.....0.04 cfs

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	1.6	0.21	1.8	0.21
2								-	.60	.25	6.4	.21
3								-	.38	.91	3.2	1.0
4								-	.33	.60	1.8	.43
5								-	.38	.48	1.2	.25
6								-	.38	.33	.75	.25
7								-	.48	1.9	.54	.25
8								-	.38	1.2	.75	.84
9								-	.33	.75	2.1	.43
10								-	2.2	.54	.67	.25
11								-	.67	2.7	.54	.25
12								-	11	1.0	.54	.25
13								-	4.1	1.4	.43	.21
14								-	2.0	.75	.33	.21
15								-	1.0	1.6	2.0	.21
16								.25	.67	.84	.94	1.5
17								.25	.48	.40	1.9	.84
18	≠0.72							3.2	.43	.70	.75	.38
19								.67	.38	1.8	.67	.25
20								.38	.33	.94	2.8	.25
21								.33	1.4	.67	1.0	.23
22								.33	1.2	.25	.67	.22
23								.54	.48	.38	.75	.25
24								.38	.33	.38	.54	.50
25								.25	.60	.33	.60	10
26								.25	.54	.29	.54	1.5
27								.29	.43	.84	.43	1.0
28								.29	.38	3.4	.33	.50
29								.21	.33	.84	.29	.40
30					------			.21	.29	4.3	.25	.30
31		------			------		------	.25	------	5.7	.25	------
TOTAL								-	34.10	36.68	35.76	23.37
MEAN								-	1.14	1.18	1.15	0.779
MAX								-	11	5.7	6.4	10
MIN								-	0.29	0.21	0.25	0.21
AC-FT								-	68	73	71	46

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 70 cfs).--June 12 (0230) 82 cfs (2.71 ft); Aug. 2 (1100) 74 cfs (2.58 ft).

≠ Result of discharge measurement.

16-8938. Wichen River at altitude 18 m, Moen
(Formerly published as 8920. Wichen River at Peniesence)

Location (revised).--Lat 7°27'05" N., long 151°52'18" E., on left bank at Peniesence and 0.5 mile upstream from mouth.

Drainage area (revised).--0.60 sq mi.

Records available.--April 1955 to March 1956 (published as "at Peniesence"), May to September 1968. 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). Apr. 1, 1955 to Mar. 31, 1956, staff gage at site 100 ft downstream at different datum.

Extremes.--Maximum discharge during period, 232 cfs June 12 (gage height, 3.59 ft), from rating curve extended above 1.0 cfs by logarithmic plotting; minimum, 0.19 cfs Sept. 15.
1955-56, 1968: Maximum discharge determined, that of June 12, 1968; minimum, not determined; minimum daily, 0.12 cfs Apr. 2, 1956.

Remarks.--Records poor. No diversion above station.

Discharge measurement made prior to beginning of continuous discharge record

Mar. 16, 1966.....0.16 cfs

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	4.0	0.30	4.0	0.30
2								-	2.1	.30	14	.28
3								-	1.1	2.6	6.0	22
4								-	.70	1.6	2.8	.88
5								-	.70	1.1	2.0	.40
6								-	.64	.52	1.3	.30
7								-	.94	5.3	1.1	.34
8								-	.46	2.9	1.2	1.8
9								-	.34	1.7	4.0	.88
10								-	4.0	.88	1.4	.40
11								.52	2.2	6.7	1.0	.30
12								.46	21	2.2	.94	.32
13								.30	9.5	2.7	.70	.26
14								.32	5.2	1.3	.58	.24
15								.38	2.5	2.1	3.7	.24
16								.46	1.5	1.7	2.6	3.7
17								.46	1.0	.64	3.0	2.1
18	✓ 2.15							6.5	.70	1.2	1.9	.82
19								1.8	.76	2.6	1.8	.40
20								.88	.71	1.3	7.3	.34
21								.70	4.9	.82	2.5	.32
22								.52	3.6	.52	1.4	.36
23								1.2	1.2	.58	1.5	.32
24								.64	.64	.46	1.0	1.0
25								.40	1.7	.40	3.1	21
26								.36	.82	.38	1.8	2.7
27								.46	.38	2.0	.82	1.5
28								.46	.46	5.1	.46	.88
29								.36	.30	1.9	.36	.58
30					------			.34	.34	8.6	.34	.58
31		------			------		------	.46	------	14	.34	------
TOTAL								-	74.39	74.40	74.94	45.74
MEAN								-	2.48	2.40	2.42	1.52
MAX								-	21	14	14	21
MIN								-	0.30	0.30	0.34	0.24
AC-FT								-	148	148	149	91

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 170 cfs).--June 12 (0300) 232 cfs (3.59 ft); Aug. 2 (1200) 200 cfs (3.45 ft).

✓ Result of discharge measurement.

16-8942. Wachiponong Stream, Moen

Location.--Lat 7°25'45" N., long 151°51'31" E., on left bank at Wichap, 300 ft downstream from dam site, and 0.2 mile upstream from mouth.

Drainage area.--0.16 sq mi.

Records available.--May to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 33 ft (from topographic map).

Extremes.--Maximum discharge during period, about 3.9 cfs Aug. 2; minimum, 0.04 cfs May 17.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	0.49	0.13	0.20	0.16
2								-	.22	.16	.55	.15
3								-	.16	.20	.34	.40
4								-	.15	.26	.27	.30
5								-	.15	.20	.23	.25
6								-	.12	.15	.20	.25
7								-	.14	.26	.18	.25
8								-	.11	.24	.17	.50
9								-	.07	.23	.23	.30
10								-	.25	.17	.15	.20
11								-	.12	.15	.14	.18
12								-	.69	.26	.19	.20
13								-	.29	.19	.17	.18
14								-	.22	.17	.15	.15
15								.11	.18	.15	.22	.15
16								.08	.16	.16	.15	.75
17								.06	.14	.14	.20	.50
18	⁄0.32							.24	.12	.14	.20	.30
19								.17	.11	.32	.12	.28
20								.10	.11	.20	.34	.26
21								.08	.30	.16	.19	.24
22								.11	.32	.13	.19	.21
23								.37	.17	.12	.20	.19
24								.19	.13	.11	.20	.27
25								.12	.30	.09	.22	1.0
26								.11	.23	.12	.20	.30
27								.11	.19	.36	.15	.20
28								.12	.16	.40	.14	.17
29								.08	.15	.19	.14	.09
30					------			.11	.15	.46	.16	.11
31		------			------		------	.11	------	.55	.16	------
TOTAL								-	6.10	6.57	6.35	8.49
MEAN								-	0.203	0.212	0.205	0.283
MAX								-	0.69	0.55	0.55	1.0
MIN								-	0.07	0.09	0.12	0.09
AC-FT								-	12	13	13	17

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 5.0 cfs).--No peak above base.

Note.--No gage-height record Aug. 2.
⁄ Result of discharge measurement.

16-8950. Echapachik Stream, Tol
(Formerly published as Echapachik Stream at Fasan)

Location.--Lat 7°20'57" N., long 151°37'26" E., on right bank 0.2 mile upstream from mouth and 0.6 mile north of Mount Tumuital.

Drainage area.--0.15 sq mi (revised).

Records available.--April 1955 to March 1957 (published as "at Fasan"), May to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Apr. 1, 1957, staff gage at same site at different datum.

Extremes.--Maximum discharge during period, 4.0 cfs July 21 (gage height, 1.80 ft), from rating curve extended above 0.22 cfs by logarithmic plotting; minimum, 0.02 cfs June 9, 11.
1955-57, 1968: Maximum discharge, not determined; maximum daily, 7.4 cfs Dec. 30, 1955; no flow Mar. 24, 25, 1957.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	0.28	0.13	0.35	0.05
2								-	.28	.13	.43	.06
3								-	.16	.12	.63	.50
4								-	.09	.12	.29	.28
5								-	.06	.09	.23	.15
6								-	.06	.08	.20	.10
7								-	.05	.17	.19	.08
8								.23	.04	.32	.16	.08
9								.23	.04	.33	.38	.12
10								.20	.04	.21	.30	.11
11								.16	.04	.16	.84	.09
12								.12	.12	.12	.95	.07
13								.09	.15	.09	.54	.06
14								.09	.18	.08	.33	.05
15								.08	.15	.11	.26	.05
16								.06	.15	.11	.22	.18
17								.06	.10	.09	.19	.28
18								.21	.10	.09	.20	.18
19								.39	.10	.10	.19	.12
20	✓0.61							.16	.10	.50	1.0	.09
21								.13	.10	.70	.50	.12
22								.13	.10	.20	.30	.11
23								.14	.10	.18	.20	.08
24								.08	.15	.11	.15	.14
25								.06	.12	.09	.15	1.1
26								.08	.08	.08	.10	.33
27								.08	.06	.18	.13	.19
28								.08	.05	.21	.08	.13
29								.05	.08	.16	.07	.09
30					------			.04	.15	.15	.06	.09
31		------			------		------	.09	------	.48	.06	------
TOTAL								-	3.28	5.69	9.68	5.08
MEAN								-	0.109	0.184	0.312	0.169
MAX								-	0.28	0.70	1.0	1.1
MIN								-	0.04	0.08	0.06	0.05
AC-FT								-	6.5	11	19	10

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

Peak discharge (base, 5.0 cfs).--No peak above base.

✓ Result of discharge measurement.

16-8968. Chun Stream, Dublon Island

Location.--Lat 7°22'36" N., long 151°52'13" E., on right bank at Chun, 0.4 mile upstream from mouth, and 1.8 miles west of Penienuk.

Drainage area.--0.09 sq mi.

Records available.--May to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

Extremes.--Maximum discharge during period, 36 cfs June 21 (gage height, 2.43 ft), from rating curve extended above 0.16 cfs by logarithmic plotting; minimum, 0.01 cfs May 16.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	0.60	0.06	0.09	0.08
2								-	.24	.14	.55	.08
3								-	.16	.12	.22	.10
4								-	.12	.12	.18	.11
5								-	.10	.11	.17	.12
6								-	.10	.10	.15	.10
7								-	.09	.22	.09	.10
8								-	.10	.16	.08	.08
9								-	.09	.14	.11	.10
10								.11	.16	.13	.13	.09
11								.08	.10	.13	.16	.08
12								.06	.09	.14	.16	.09
13								.05	.09	.14	.15	.08
14								.04	.08	.14	.14	.08
15								.03	.08	.14	.17	.08
16								.02	.07	.60	.18	.08
17								.02	.07	.17	.13	.08
18								.03	.06	.16	.16	.13
19	✓0.48							.03	.06	.36	.12	.10
20								.03	.06	.20	.18	.10
21								.02	1.4	.16	.12	.09
22								.02	.48	.14	.11	.07
23								.08	.24	.32	.10	.07
24								.06	.17	.13	.10	.10
25								.05	.16	.09	.10	.30
26								.08	.14	.10	.09	.15
27								.14	.10	.19	.08	.11
28								.11	.10	.16	.08	.08
29								.11	.10	.08	.07	.09
30					------			.10	.09	.09	.08	.11
31		------			------		------	.10	------	.14	.09	------
TOTAL								-	5.50	5.08	4.34	3.03
MEAN								-	0.183	0.164	0.140	0.101
MAX								-	1.4	0.60	0.55	0.30
MIN								-	0.06	0.06	0.07	0.07
AC-FT								-	11	10	8.6	6.0

CAL YR 1967: TOTAL MEAN MAX MIN AC-FT
WAT YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 10 CFS)

✓ Result of discharge measurement.

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
6-1	1600	2.02	11	8-2	1100	2.10	14
6-21	1900	2.43	36				

16-8972. Tumunu Stream, Dublon Island

Location.--Lat 7°22'42" N., long 151°52'51" E., on left bank at Roro, 0.1 mile upstream from mouth, and 1.1 miles west of Penienuk.

Drainage area.--0.26 sq mi.

Records available.--May to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during period, 146 cfs June 21 (gage height, 2.63 ft), from rating curve extended above 0.40 cfs by logarithmic plotting; minimum, 0.10 cfs June 20.

Remarks.--Records poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1								-	0.24	0.16	3.3	0.32
2								-	.23	.28	6.3	.30
3								-	.22	.30	3.3	.28
4								-	.22	.45	1.8	.24
5								-	.21	85	1.4	.23
6								-	.21	.50	.85	.23
7								-	.21	2.2	.71	.24
8								-	.20	1.4	.50	.35
9								-	.18	1.5	1.6	.28
10								-	.20	.92	1.1	.22
11								-	.15	1.9	3.4	.20
12								-	.20	1.3	3.4	.19
13								-	.20	.92	2.2	.19
14								-	.17	.57	1.6	.22
15								-	.14	.71	1.9	.19
16								-	.14	.92	2.0	.28
17								-	.13	.64	1.5	.38
18								-	.12	.57	2.5	.25
19	≠1.23							-	.12	2.9	1.9	.20
20								-	.12	1.3	3.6	.16
21								-	2.1	.64	2.3	.18
22								-	1.1	.38	1.8	.15
23								.25	.38	3.1	1.1	.13
24								.23	.28	1.2	.92	.18
25								.21	.25	.78	.85	2.9
26								2.1	.23	.71	.57	.35
27								.71	.22	2.3	.41	.23
28								.42	.20	2.3	.38	.19
29								.38	.19	1.5	.35	.18
30					------			.30	.18	1.4	.32	.16
31		------			------		------	.25	------	4.6	.32	------
TOTAL								-	8.74	39.20	54.18	9.60
MEAN								-	0.291	1.26	1.75	0.320
MAX								-	2.1	4.6	6.3	2.9
MIN								-	0.12	0.16	0.32	0.13
AC-FT								-	17	78	107	19

CAL YR 1967:	TOTAL	MEAN	MAX	MIN	AC-FT
WAT YR 1968:	TOTAL -	MEAN -	MAX -	MIN -	AC-FT -

Peak discharge (base, 50 cfs).--June 21 (2100) 146 cfs (2.63 ft); Aug. 2 (1200) 111 cfs (2.56 ft).

≠ Result of discharge measurement.

16-9060. Vaitolu Stream at Aoa

Location.--Lat 14°16'19" S., long 170°35'32" W., on left bank 0.5 mile upstream from mouth and 0.7 mile southwest of Aoa.

Drainage area.--0.16 sq mi.

Records available.--March 1958 to September 1968. Prior to July 1960, published as "near Aoa."

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Extremes.--Maximum discharge during year, 227 cfs Dec. 6 (gage height, 5.97 ft), from rating curve extended above 3.3 cfs as explained below; minimum, 0.01 cfs on many days.
1958-68: Maximum discharge, 238 cfs Dec. 19, 1962 (gage height, 6.16 ft), from rating curve extended above 3.3 cfs by logarithmic plotting; no flow at times in 1964-66.

Remarks.--Records poor. Small diversion above station for domestic use since Sept. 14, 1964.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.03	0.12	0.08	0.15	0.04	0.10	0.07	0.29	0.04	0.02	0.03	0.09
2	.03	.05	.05	.09	.08	.10	.08	.15	.04	.02	.02	.03
3	.03	.06	.50	.16	.04	.08	1.8	.25	.05	.02	.02	3.8
4	.18	4.9	3.5	.11	.11	.07	.99	.29	.05	.02	.02	.25
5	3.6	3.0	8.2	.07	3.0	.06	1.4	.12	.07	.01	.02	.05
6	.29	2.0	14	.15	1.0	.05	.37	.45	.18	.01	.02	1.8
7	.07	4.5	2.7	.38	.50	.05	.15	.12	.06	.01	.01	.21
8	.08	1.0	4.0	.07	5.0	.05	.15	.08	.02	.01	.06	.04
9	30	.35	.40	.04	2.0	2.4	.07	.10	.02	.01	.03	.04
10	1.4	.12	.70	.03	.50	.59	.06	.10	.02	.01	.03	.04
11	.21	.08	.30	.03	.25	5.3	.08	.08	.02	.01	.03	.04
12	.06	.06	.10	.04	1.0	1.3	1.8	.92	.03	.01	.02	.04
13	.04	.05	.07	.15	.52	.49	1.7	.12	.05	.01	.03	.05
14	.03	.08	.05	.31	.30	.25	1.3	.05	.04	.01	.02	.05
15	.04	.60	.10	.05	.15	.29	.41	.04	.08	.01	.02	.06
16	.05	.25	.25	.04	.09	.67	.21	.04	.05	.01	.02	.05
17	.05	.40	.10	.05	.07	.69	.12	.05	.02	.01	.02	.04
18	.04	.25	.07	.04	.25	.33	.15	.05	.03	.02	.02	.03
19	.05	.15	.04	.05	.50	.18	3.0	.06	.03	.09	.02	.02
20	.05	.10	.03	.05	.20	.12	.77	.06	.02	.03	.02	.03
21	.03	.08	.03	.05	.13	.12	.41	.05	.02	.03	.02	.03
22	.03	.06	.03	.04	.09	.10	.18	.04	.02	.03	.01	.03
23	.04	.05	.03	.05	.06	.08	.08	.05	.02	.02	.01	.03
24	.05	.04	.03	.06	.10	.07	.07	.06	.02	.02	.02	.03
25	.31	.04	.04	.06	.45	.50	.06	.05	.03	.02	.03	.03
26	.05	.05	.03	.06	.20	1.8	.05	.03	.02	.02	.02	.02
27	.04	.05	.03	.06	.10	.21	.05	.03	.02	.02	.01	.02
28	.03	.04	.03	.06	.10	.08	1.8	.03	.02	.02	.07	.02
29	.04	.04	.03	.04	.10	.05	.87	.04	.02	.02	.02	.02
30	1.7	.04	.04	.05	------	.06	.41	.04	.02	.02	.01	.02
31	.12	------	.03	.03	------	.05	------	.05	------	.02	.01	------
TOTAL	11.77	18.61	35.59	2.62	16.93	16.29	18.66	3.89	1.13	0.59	0.71	7.01
MEAN	0.380	0.620	1.15	0.085	0.584	0.525	0.622	0.125	0.038	0.019	0.023	0.234
MAX	3.6	4.9	14	0.38	5.0	5.3	3.0	0.92	0.18	0.09	0.07	3.8
MIN	0.03	0.04	0.03	0.03	0.04	0.05	0.05	0.03	0.02	0.01	0.01	0.02
AC-FT	23	37	71	5.2	34	32	37	7.7	2.2	1.2	1.4	14

CAL YR 1967: TOTAL 137.20 MEAN 0.376 MAX 14 MIN 0.01 AC-FT 272
WAT YR 1968: TOTAL 133.80 MEAN 0.366 MAX 14 MIN 0.01 AC-FT 265

PEAK DISCHARGE (BASE, 62 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
11- 4	2130	4.89	140	3-11	1500	4.52	114
12- 6	0630	5.97	227	4-19	1330	4.71	128
3- 9	1500	4.41	108				

Note.--No gage-height record Jan. 26 to Mar. 6.

16-9120, Pago Stream at Afono

Location.--Lat 14°16'03" S., long 170°39'02" W., on left bank 0,2 mile south of Afono and 0,3 mile upstream from mouth.

Drainage area.--0.60 sq mi.

Records available.--October 1958 to September 1968. 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).

Extremes.--Maximum discharge during year, 623 cfs Feb. 8 (gage height, 4.48 ft), from rating curve extended above 22 cfs as explained below; minimum, 0.25 cfs on several days in July and August.
1958-68: Maximum discharge, 758 cfs May 9, 1964 (gage height, 4.70 ft), from rating curve extended above 22 cfs by logarithmic plotting; minimum, 0.25 cfs at times in 1961 and 1968.

Remarks.--Records good except those above 50 cfs, which are fair. About 0.06 cfs is diverted above station for domestic use in Afono.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.87	42	8.5	1.7	0.87	2.1	1.2	2.0	0.87	0.43	0.33	2.3
2	.95	7.3	4.2	1.7	1.2	2.0	2.1	1.7	.79	.38	.29	3.2
3	5.0	5.3	5.8	2.0	.87	1.9	11	1.7	.95	.38	.29	38
4	8.4	24	30	1.7	18	1.7	12	6.3	.79	.48	.29	4.6
5	21	23	36	1.5	43	1.6	11	2.4	.79	.38	.38	2.1
6	4.4	10	158	1.5	34	1.4	4.0	2.6	.72	.38	.48	17
7	4.6	23	19	1.8	23	1.4	2.7	1.9	.72	.48	.43	4.4
8	5.6	9.9	26	1.6	70	1.4	2.6	1.7	.72	.38	1.3	2.9
9	57	6.0	8.4	1.4	35	1.5	2.1	1.5	.66	.38	.72	1.9
10	19	4.8	8.2	1.3	20	1.4	1.8	1.5	.66	.33	3.6	1.5
11	6.0	4.2	5.8	1.2	9.2	23	1.6	1.5	.66	.38	1.3	1.3
12	3.8	3.2	4.4	1.2	9.9	9.1	2.6	2.6	.66	.38	.72	1.2
13	2.9	2.7	3.6	1.2	8.0	3.8	2.9	1.9	.72	.33	.72	1.0
14	2.3	3.3	3.1	1.2	5.6	2.7	4.6	1.7	.66	.33	.48	.95
15	2.0	16	4.2	1.0	4.2	2.6	2.4	1.4	.60	.33	.43	1.0
16	1.8	6.6	5.6	1.0	3.2	3.4	1.9	1.3	.60	.33	.38	.87
17	1.7	7.0	3.8	1.0	2.6	5.3	1.6	1.2	.66	.33	.33	.79
18	1.6	4.2	2.7	1.0	3.1	3.1	1.5	1.2	.79	.54	.33	.79
19	1.6	3.2	2.3	.95	8.5	2.1	2.1	1.2	.87	.95	.33	.79
20	1.5	2.7	2.0	.95	5.6	1.9	4.6	1.2	.72	1.3	.33	.79
21	1.4	2.4	1.9	.95	3.2	1.7	6.1	1.1	.60	1.4	.33	.66
22	1.3	2.1	1.8	.95	2.4	1.7	2.6	1.1	.54	1.0	.29	.60
23	1.3	2.0	1.8	.95	2.1	1.6	2.0	1.1	.54	.66	.29	.60
24	1.8	2.0	1.8	1.0	3.1	1.5	1.7	1.4	.54	.66	.33	.60
25	1.5	2.1	1.9	1.3	8.3	1.6	1.7	2.0	.54	.54	.72	.60
26	1.4	2.1	1.9	1.1	6.4	1.6	1.5	1.4	.60	.43	.38	.54
27	4.0	2.9	1.6	1.2	3.1	1.5	1.4	1.1	.48	.38	.33	.48
28	2.4	2.1	1.5	1.1	2.6	1.3	4.8	1.0	.48	.38	.76	.48
29	1.6	2.3	1.5	.95	2.3	1.2	3.6	.95	.43	.33	.60	.43
30	17	2.0	1.7	1.0	------	1.1	3.1	.95	.43	.33	.38	.54
31	3.2	------	1.5	.95	------	1.1	------	.87	------	.33	.33	------
TOTAL	188.92	230.4	360.5	38.35	323.14	89.3	104.8	51.47	19.79	15.64	18.20	92.91
MEAN	6.09	7.68	11.6	1.24	11.1	2.88	3.49	1.66	0.660	0.505	0.587	3.10
MAX	57	42	158	2.0	70	23	12	6.3	0.95	1.4	3.6	38
MIN	0.87	2.0	1.5	0.95	0.87	1.1	1.2	0.87	0.43	0.33	0.29	0.43
AC-FT	375	457	715	76	641	177	208	102	39	31	36	184

CAL YR 1967: TOTAL 1,761.11 MEAN 4.82 MAX 158 MIN 0.65 AC-FT 3,490
WAT YR 1968: TOTAL 1,533.42 MEAN 4.19 MAX 158 MIN 0.29 AC-FT 3,040

PEAK DISCHARGE (BASE, 210 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	0800	4.13	452	2- 5	1630	4.16	464
11- 1	0530	4.12	448	2- 8	0030	4.48	623
12- 6	0630	4.46	611				

16-9175. Leele Stream at mouth, at Fagasa

Location.--Lat 14°17'28" S., long 170°43'09" W., on left bank at Fagasa and 200 ft upstream from mouth.

Drainage area.--0.23 sq mi.

Records available.--June 1966 to September 1968.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

Extremes.--Maximum discharge during year, 285 cfs Oct. 9 (gage height, 3.61 ft), from rating curve extended above 4.4 cfs on basis of slope-area measurement of peak flow; minimum, 0.11 cfs July 15.
1966-68: Maximum discharge, that of Oct. 9, 1967; minimum, that of July 15, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.34	8.5	1.4	0.57	0.28	0.90	0.46	0.75	0.32	0.15	0.17	5.5
2	.39	3.9	1.4	.69	.28	.82	1.7	.63	.32	.35	.15	19
3	1.6	6.4	3.2	.69	.25	.75	.57	3.5	.41	.30	.15	24
4	5.3	22	9.1	.51	4.6	.70	.94	7.8	.36	.17	.17	4.2
5	9.5	10	15	.46	19	.60	1.3	1.4	.36	.17	.37	1.6
6	2.2	10	13	.41	11	.56	.98	1.6	.36	.17	.63	4.8
7	5.1	10	3.3	1.0	10	.53	.69	.90	.32	.25	.58	1.8
8	4.5	12	3.3	.57	14	.59	1.1	.69	.32	.22	4.4	1.2
9	39	4.3	1.8	.46	8.2	1.4	.75	.63	.28	.22	.90	1.1
10	8.7	2.5	1.7	.41	7.3	1.9	.69	2.6	.28	.22	2.0	.75
11	2.7	1.9	1.7	.46	4.9	12	.55	1.5	.25	.25	.90	.63
12	1.6	1.4	1.5	.41	6.0	4.0	5.0	1.9	.28	.25	.57	.69
13	1.2	1.2	1.2	.46	3.7	1.5	2.2	1.2	.36	.25	.41	.57
14	.98	1.5	.98	.64	2.1	1.1	2.5	.90	.28	.22	.32	.51
15	.82	8.6	1.2	.36	3.8	1.0	.98	.76	.22	.17	.28	.46
16	.82	2.5	1.1	.51	1.6	1.2	.75	.75	.19	.15	.25	.41
17	.82	2.7	.90	.41	1.2	1.7	.57	.75	.22	.15	.25	.41
18	.75	1.4	.75	.36	1.4	1.2	.51	.75	.41	.19	.25	.36
19	.82	1.1	.63	.36	2.1	.80	1.8	.75	.46	1.2	.22	.41
20	.75	.90	.57	.36	1.7	.69	2.1	.90	.28	1.5	.22	.41
21	.69	.75	.51	.32	1.1	.63	2.4	.63	.25	1.6	.22	.36
22	.75	.69	.51	.28	.82	.69	3.9	.57	.25	1.4	.19	.28
23	.51	.63	.51	.28	.75	.75	1.6	.46	.28	.75	.19	.25
24	1.5	.63	.70	.36	1.4	.82	.98	1.1	.22	.46	.22	.36
25	.75	.75	.82	.90	3.8	1.5	.90	1.8	.19	.41	.63	.36
26	.63	.69	.82	.63	2.5	.82	.63	.63	.19	.28	.25	.25
27	1.9	1.5	.57	.51	1.6	.98	.57	.41	.19	.23	.22	.22
28	.98	.69	.51	.41	1.7	.63	1.2	.41	.25	.19	.43	.22
29	.63	.63	.51	.32	1.1	.51	2.2	.36	.19	.16	.36	.22
30	3.2	.57	.46	.36	------	.46	1.2	.36	.17	.17	.22	.22
31	1.2	------	.41	.36	------	.41	------	.32	------	.18	.19	------
TOTAL	100.63	120.33	70.06	14.83	118.18	42.14	41.72	37.71	8.46	12.38	16.31	71.55
MEAN	3.25	4.01	2.26	0.478	4.09	1.36	1.39	1.22	0.282	0.399	0.526	2.38
MAX	39	22	15	1.0	19	12	50	7.8	0.46	1.6	4.4	24
MIN	0.34	0.57	0.41	0.28	0.25	0.41	0.46	0.32	0.17	0.15	0.15	0.22
AC-FT	200	239	139	29	234	84	83	75	17	25	32	142

CAL YR 1967: TOTAL 779.87 MEAN 2.14 MAX 39 MIN 0.25 AC-FT 1,550
WAT YR 1968: TOTAL 654.30 MEAN 1.79 MAX 39 MIN 0.15 AC-FT 1,300

PEAK DISCHARGE (BASE, 78 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	1730	3.61	285	2- 6	1230	3.07	99
11- 4	1800	3.07	99	2- 7	2130	3.07	99
12- 5	1200	3.05	94	9- 3	1330	3.05	94

16-9205. Aasu Stream at Aasu

Location.--Lat 14°17'51" S., long 170°45'30" W., on right bank at Aasu and 200 ft upstream from mouth.

Drainage area.--1.03 sq mi.

Records available.--October 1958 to September 1968. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

Extremes.--Maximum discharge during year, 271 cfs Sept. 1 (gage height, 4.08 ft), from rating curve extended above 18 cfs as explained below; minimum, 0.67 cfs July 17, 18.
1958-68: Maximum discharge, 392 cfs Aug. 10, 1962 (gage height, 4.72 ft), from rating curve extended above 18 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 good except those for period of no gage-height record, which are poor. Small diversion above station for domestic use. Continuous records of rainfall are obtained at station.

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	8.3	9.9	3.5	2.5	4.0	2.5	6.0	2.0	0.84	1.1	18
2	3.5	6.7	6.4	3.1	1.4	3.8	2.7	4.0	1.8	.84	.94	36
3	5.8	7.7	7.6	2.9	1.5	4.0	2.2	9.0	1.8	.79	.89	40
4	8.4	42	23	2.6	14	3.4	5.0	60	1.6	.79	.89	23
5	20	30	33	2.2	38	3.0	5.7	8.7	2.1	.79	2.4	17
6	8.6	21	39	2.2	34	2.9	4.5	12	1.6	.74	2.6	19
7	9.7	29	23	4.3	23	3.2	3.0	6.0	1.4	.89	1.6	13
8	11	26	17	2.7	32	3.8	2.5	5.5	1.4	.74	12	10
9	73	21	14	1.8	31	5.0	2.2	5.0	1.4	.84	5.0	8.6
10	41	17	12	1.6	46	5.0	1.9	17	1.2	.74	4.0	7.3
11	24	17	11	1.5	40	31	2.6	9.3	1.2	.79	4.0	6.4
12	17	12	11	1.4	42	10	45	9.3	1.2	.79	3.1	5.8
13	13	10	9.3	1.8	27	6.0	15	8.0	1.4	.74	2.9	5.0
14	11	9.3	8.0	2.2	20	5.0	10	6.7	1.2	.70	2.6	4.2
15	9.0	17	8.3	1.5	16	4.1	6.1	5.8	1.2	.70	2.4	4.0
16	8.0	11	7.7	1.6	14	5.1	5.0	5.2	1.1	.70	2.2	3.5
17	7.0	8.0	6.7	1.5	12	9.9	3.8	5.0	1.1	.70	2.0	3.1
18	6.1	8.3	6.1	1.4	11	4.6	18	5.0	1.5	.79	1.8	2.7
19	5.8	8.3	5.2	1.2	17	4.0	15	4.5	2.6	2.4	1.6	2.6
20	5.0	7.0	4.7	1.2	13	3.7	9.0	4.2	1.5	3.1	1.6	3.1
21	4.2	6.1	4.2	1.1	10	3.3	6.0	3.5	1.2	2.7	1.5	2.6
22	4.5	5.5	4.0	1.2	8.0	3.0	8.1	3.3	1.0	3.5	1.4	2.2
23	4.6	5.0	3.8	1.1	6.1	3.0	5.0	3.1	.94	2.2	1.2	2.0
24	3.5	5.0	3.9	1.2	16	2.8	3.9	3.5	.94	1.8	1.2	2.4
25	4.0	5.0	5.2	1.4	25	3.5	4.5	3.8	.89	1.5	1.8	2.0
26	5.4	4.7	4.2	1.2	11	3.0	4.0	3.1	.89	1.2	1.5	1.6
27	10	4.5	3.3	1.1	6.0	2.5	3.4	3.1	.84	1.1	1.2	1.6
28	5.8	5.7	3.1	1.0	5.1	2.3	3.1	2.6	.89	1.1	1.8	1.5
29	5.8	5.0	2.9	.94	4.5	2.0	15	2.6	.84	1.0	1.4	1.5
30	5.2	4.5	2.7	1.4	------	1.8	9.0	2.4	.84	.94	1.1	1.4
31	4.0	------	2.6	1.2	------	1.6	------	2.2	------	.89	1.0	------
TOTAL	345.9	367.6	302.8	55.04	527.1	150.3	223.7	229.4	39.57	37.34	70.72	251.1
MEAN	11.2	12.3	9.77	1.78	18.2	4.85	7.46	7.40	1.32	1.20	2.28	8.37
MAX	73	42	39	4.3	46	31	45	60	2.6	3.5	12	40
MIN	2.0	4.5	2.6	0.94	1.4	1.6	1.9	2.2	0.84	0.70	0.89	1.4
AC-FT	686	729	601	109	1,050	298	444	455	78	74	140	498

CAL YR 1967: TOTAL 3,165.1 MEAN 8.67 MAX 73 MIN 1.5 AC-FT 6,280
WAT YR 1968: TOTAL 2,600.57 MEAN 7.11 MAX 73 MIN 0.70 AC-FT 5,160

PEAK DISCHARGE (BASE, 120 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	0830	3.67	206	2- 6	1300	3.35	158
11- 4	2130	3.51	182	2-10	1100	3.95	248
12- 3	2330	3.13	128	2-11	2200	3.42	168
12- 6	1230	3.25	144	5- 4	-	3.47	176
2- 5	0900	3.09	123	9- 1	2330	4.08	271

Note.--No gage-height record Feb. 22 to May 8.

16-9310. Atauloma Stream at Afao

Location.--Lat 14°20'10" S., long 170°48'02" W., on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

Drainage area.--0.24 sq mi.

Records available.--October 1958 to September 1968.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

Extremes.--Maximum discharge during year, 393 cfs Nov. 4 (gage height, 3.48 ft), from rating curve extended above 9.2 cfs as explained below; minimum, 0.18 cfs July 17.
1958-68: Maximum discharge, 605 cfs Aug. 10, 1967 (gage height, 3.99 ft), from rating curve extended above 9.2 cfs by logarithmic plotting; minimum, 0.06 cfs Oct. 21, 1963.

Remarks.--Records good except those above 20 cfs, which are fair. About 10,000 gal per day diverted above station for use at Atauloma School. Continuous records of rainfall are obtained at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.47	1.0	1.0	0.72	0.23	1.0	0.60	1.3	0.60	0.26	0.39	4.6
2	.69	1.1	2.0	.60	.23	.94	.65	1.0	.71	.32	.29	7.6
3	1.2	1.4	2.9	.55	.76	1.0	.55	2.2	.55	.23	.23	14
4	1.7	18	6.3	.51	1.5	.82	1.4	14	.51	.23	.23	3.3
5	3.8	7.1	21	.47	10	.88	1.4	2.1	.60	.23	1.2	1.8
6	1.6	3.4	6.3	.47	10	.88	.88	2.9	.51	.23	.51	1.5
7	1.8	3.6	3.0	.80	5.1	.82	.65	1.5	.43	.32	.35	1.1
8	4.3	3.1	2.7	.51	7.3	.94	.60	1.3	.43	.23	6.0	1.0
9	23	2.4	1.9	.43	2.7	1.2	.51	1.1	.43	.23	1.3	.94
10	6.8	1.9	1.5	.43	12	1.2	.47	6.5	.39	.23	.88	.76
11	2.7	2.6	1.4	.39	8.7	7.8	.64	2.0	.39	.29	.88	.65
12	1.8	1.6	1.8	.39	5.9	3.6	13	3.7	.43	.40	.65	.60
13	1.4	1.4	1.4	.55	2.6	1.5	3.9	2.1	.43	.29	.70	.51
14	1.2	1.4	1.3	.43	1.8	1.2	3.0	1.5	.35	.23	.51	.51
15	1.0	1.8	1.7	.35	1.4	1.0	1.5	1.3	.35	.23	.43	.47
16	.94	1.3	1.6	.35	1.2	1.8	1.2	1.1	.35	.20	.39	.43
17	.88	1.2	1.2	.39	1.0	2.5	.94	2.3	.35	.20	.39	.39
18	.88	1.0	1.0	.35	1.3	1.3	4.5	1.9	.43	.23	.35	.35
19	.88	.94	.88	.29	3.1	1.0	3.7	1.4	.65	.60	.35	.35
20	.76	.82	.82	.26	1.8	.94	2.2	1.7	.39	.60	.32	.85
21	.76	.82	.76	.29	1.2	.82	1.4	1.2	.35	.47	.32	.55
22	.70	.76	.76	.26	.94	.76	1.9	1.0	.32	.60	.29	.39
23	.77	.70	.76	.23	1.1	.76	1.3	.88	.32	.35	.29	.35
24	7.6	.76	1.0	.35	3.9	.70	1.0	.88	.32	.47	.29	.43
25	2.7	.82	1.1	.32	6.3	.76	1.3	1.0	.32	.43	.43	.35
26	1.3	.70	.82	.29	2.8	.76	.94	.76	.29	.32	.32	.32
27	1.0	.76	.70	.23	1.6	.65	.82	.70	.29	.29	.29	.32
28	.88	.70	.70	.26	1.3	.65	.82	.70	.29	.26	.75	.32
29	1.3	.60	.70	.26	1.3	.55	3.5	.65	.26	.23	.43	.32
30	1.2	.81	.60	.32	------	.77	1.7	.65	.26	.26	.29	.35
31	1.4	------	.55	.32	------	.60	------	.60	------	.26	.29	------
TOTAL	77.41	64.49	70.15	12.37	99.06	40.10	56.97	61.92	12.30	9.72	20.34	45.41
MEAN	2.50	2.15	2.26	0.399	3.42	1.29	1.90	2.00	0.410	0.314	0.656	1.51
MAX	23	18	21	0.80	12	7.8	13	14	0.71	0.60	6.0	14
MIN	0.47	0.60	0.55	0.23	0.23	0.55	0.47	0.60	0.26	0.20	0.23	0.32
AC-FT	154	128	139	25	196	80	113	123	24	19	40	90

CAL YR 1967: TOTAL 729.87 MEAN 2.00 MAX 23 MIN 0.39 AC-FT 1,450
WAT YR 1968: TOTAL 570.24 MEAN 1.56 MAX 23 MIN 0.20 AC-FT 1,130

PEAK DISCHARGE (BASE, 110 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	0900	3.29	332	12- 5	1330	3.03	257
10-24	1430	2.80	200	4-12	1530	3.08	271
11- 4	0800	3.48	393	5- 4	0100	3.12	283

16-9480. Afuelo Stream at Matuu

Location.--Lat 14°18'07" S., long 170°41'07" W., on left bank 0.2 mile northwest of Matuu and 0.3 mile upstream from mouth.

Drainage area.--0.25 sq mi.

Records available.--March 1958 to September 1968. Prior to July 1960, published as Matuu Stream at Matuu. See also Note below.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map).

Extremes.--Maximum discharge during year, 490 cfs Oct. 9 (gage height, 4.55 ft), from rating curve extended above 8.4 cfs on basis of slope-area measurement of peak flow; minimum, 0.12 cfs Aug. 23, 24.
1958-68: Maximum discharge, that of Oct. 9, 1967; minimum, 0.09 cfs Oct. 14, 15, 1965.

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

Note.--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 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.42	4.9	1.5	0.66	0.18	0.81	0.41	1.2	0.36	0.16	0.18	7.9
2	.42	2.3	1.1	.66	.16	1.1	1.8	.92	.34	.30	.18	9.1
3	1.5	4.8	2.5	.71	.14	1.0	.66	3.3	.45	.25	.16	28
4	6.1	20	6.0	.54	4.3		.71	.75	8.7	.40	.19	.16	4.0
5	12	7.2	11	.42	22		.58	4.0	2.0	.38	.17	.24	1.9
6	2.2	10	16	.39	15		.50	1.1	2.2	.37	.17	.55	8.9
7	4.3	9.8	3.2	.50	10		.42	.71	1.3	.35	.23	.27	2.2
8	3.4	6.1	3.5	.39	17		.61	2.2	1.0	.33	.21	2.6	1.5
9	48	4.2	2.1	.30	11		1.3	1.2	.86	.31	.20	.62	1.2
10	10	3.0	1.9	.27	8.5		1.9	.71	1.8	.30	.20	.76	.92
11	3.5	2.0	1.8	.24	4.5		12	.58	1.2	.29	.24	.42	.81
12	1.5	1.5	1.5	.24	6.6		4.1	4.8	2.3	.30	.25	.30	.66
13	1.2	1.3	1.3	.24	3.8		1.7	2.4	1.7	.33	.24	.30	.58
14	.95	2.0	1.1	.39	2.0		1.1	3.0	1.1	.30	.22	.21	.54
15	.80	8.0	1.2	.33	2.2		.98	1.2	.81	.25	.18	.16	.39
16	.64	2.4	1.2	.30	1.4		1.2	1.3	.71	.24	.15	.16	.39
17	.58	2.7	1.0	.33	1.1		2.0	.86	.66	.26	.16	.18	.36
18	.58	1.4	.86	.36	1.1		1.0	.71	.81	.40	.24	.14	.27
19	.62	1.0	.71	.30	1.9		.76	6.2	.58	.50	1.3	.16	.27
20	.62	.86	.62	.24	1.3		.62	2.4	1.1	.40	.58	.14	.27
21	.66	.76	.58	.21	.78		.54	2.1	.66	.30	.86	.14	.24
22	.58	.70	.54	.21	.66		.58	2.6	.58	.26	.76	.14	.21
23	.46	.68	.58	.21	.58		.62	1.6	.50	.29	.39	.14	.21
24	2.7	.70	.65	.24	1.1		.58	1.0	.98	.23	.39	.14	.24
25	1.2	.76	.81	.64	3.5		1.2	.99	1.5	.19	.42	.30	.25
26	.71	.90	1.0	.42	2.1		1.2	.76	.71	.18	.30	.21	.18
27	1.1	1.5	.54	.85	1.2		.71	.66	.54	.19	.21	.16	.18
28	.76	1.0	.46	.39	1.4		.54	4.2	.46	.22	.24	.40	.18
29	.54	.81	.50	.24	1.0		.46	2.7	.42	.20	.18	.33	.18
30	8.3	.71	.50	.48	------		.42	1.9	.46	.17	.18	.18	.16
31	1.4	------	.50	.33	------		.39	------	.39	------	.18	.16	------
TOTAL	117.74	103.98	66.75	12.03	126.50		41.63	55.50	41.45	9.09	9.75	10.19	72.19
MEAN	3.80	3.47	2.15	0.388	4.36		1.34	1.85	1.34	0.303	0.315	0.329	2.41
MAX	48	20	16	0.85	22		12	6.2	8.7	0.50	1.3	2.6	28
MIN	0.42	0.68	0.46	0.21	0.14		0.39	0.41	0.39	0.17	0.15	0.14	0.16
AC-FT	234	206	132	24	251		83	110	82	18	19	20	143

CAL YR 1967: TOTAL 691.72 MEAN 1.90 MAX 48 MIN 0.27 AC-FT 1,370
WAT YR 1968: TOTAL 666.80 MEAN 1.82 MAX 48 MIN 0.14 AC-FT 1,320

Note.--No gage-height record Nov. 14 to Dec. 14, June 2 to July 16.

PEAK DISCHARGE (BASE, 95 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	1700	4.55	490	9- 2	0030	2.60	95
12- 6	-	3.24	182	9- 3	1300	2.85	124

16-9600. Alega Stream at Alega

Location.--Lat 14°16'58" S., long 170°38'19" W., on left bank 300 ft upstream from unnamed tributary, 0.2 mile northwest of Alega, and 0.3 mile upstream from mouth.

Drainage area.--0.19 sq mi.

Records available.--March 1958 to September 1968. 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).

Extremes.--Maximum discharge during year, 108 cfs Dec. 6 (gage height, 3.41 ft), from rating curve extended above 5.3 cfs as explained below; minimum, 0.30 cfs Aug. 17.
1958-68: Maximum discharge, 132 cfs Aug. 11, 1967 (gage height, 3.65 ft), from rating curve extended above 5.3 cfs by logarithmic plotting; minimum, 0.30 cfs Aug. 17, 1968.

Remarks.--Records good except those above 15 cfs, which are fair. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.56	7.4	1.8	1.2	0.65	1.5	0.86	1.1	0.65	0.56	0.48	0.65
2	.70	2.6	1.2	1.0	.75	2.1	1.2	1.0	.65	.56	.44	.65
3	1.4	2.1	1.5	1.1	.65	1.8	5.0	.92	.70	.56	.48	8.2
4	2.5	5.5	5.5	.92	.83	1.4	3.6	1.8	.65	.56	.48	1.5
5	5.4	5.7	9.0	.86	7.4	1.2	3.4	1.1	.65	.52	.52	.80
6	1.6	4.8	26	.92	7.9	1.2	2.0	1.5	.65	.52	.52	4.4
7	2.0	7.9	6.9	1.0	5.3	1.1	1.6	1.0	.60	.56	.52	1.5
8	2.0	4.4	10	.92	14	1.1	1.9	.98	.60	.56	.65	1.0
9	12	3.3	4.9	.92	9.9	1.2	1.5	.92	.56	.56	.48	.86
10	5.6	2.6	4.7	.86	6.0	1.1	1.3	.98	.56	.56	.75	.70
11	2.9	2.1	3.6	.86	3.6	11	1.3	.92	.56	.52	.40	.65
12	2.0	1.8	2.9	.86	3.3	4.5	1.8	1.7	.56	.56	.36	.60
13	1.6	1.6	2.4	.92	3.3	2.0	1.6	1.0	.56	.56	.36	.56
14	1.4	1.9	2.2	.92	2.8	1.5	2.6	.92	.56	.52	.33	.52
15	1.2	5.6	2.4	.86	2.4	1.3	1.4	.86	.56	.52	.33	.52
16	1.1	2.9	2.8	.86	1.9	1.6	1.2	.92	.56	.52	.33	.52
17	1.0	3.0	2.1	.80	1.6	2.5	1.2	.86	.60	.48	.30	.52
18	.92	2.0	1.8	.80	1.8	1.4	1.1	.80	.70	.52	.33	.52
19	.86	1.8	1.6	.75	3.1	1.2	1.6	.80	.86	.82	.33	.52
20	.80	1.6	1.5	.75	2.3	1.0	2.3	.80	.70	.65	.33	.52
21	.75	1.5	1.4	.70	1.8	1.0	3.2	.80	.75	.65	.33	.52
22	.75	1.4	1.4	.80	1.6	1.0	1.4	.80	.70	.52	.33	.48
23	.70	1.2	1.3	.70	1.5	1.0	1.2	.80	.70	.42	.40	.48
24	.98	1.2	1.2	.70	1.9	.92	1.2	.80	.70	.44	.40	.48
25	.80	1.2	1.2	.93	3.5	.98	1.0	.80	.70	.40	.44	.48
26	.80	1.2	1.2	.80	2.4	.98	1.0	.75	.65	.40	.44	.48
27	1.7	1.4	1.1	.75	1.9	.86	.92	.75	.65	.40	.40	.44
28	.92	1.2	1.0	.70	1.6	.80	3.1	.70	.65	.40	.48	.40
29	.70	1.1	1.0	.65	1.7	.80	1.6	.70	.60	.40	.40	.40
30	5.5	1.0	1.0	.70	------	.75	1.3	.70	.60	.40	.40	.40
31	1.3	------	.98	.65	------	.80	------	.65	------	.44	.40	------
TOTAL	62.44	83.0	107.58	26.16	97.38	51.59	54.38	29.13	19.19	16.06	13.14	30.27
MEAN	2.01	2.77	3.47	0.844	3.36	1.66	1.81	0.940	0.640	0.518	0.424	1.01
MAX	12	7.9	26	1.2	14	11	5.0	1.7	0.86	0.82	0.75	8.2
MIN	0.56	1.0	0.98	0.65	0.65	0.75	0.86	0.65	0.56	0.40	0.30	0.40
AC-FT	124	165	213	52	193	102	108	58	38	32	26	60

CAL YR 1967: TOTAL 615.83 MEAN 1.69 MAX 26 MIN 0.52 AC-FT 1,220
WAT YR 1968: TOTAL 590.32 MEAN 1.61 MAX 26 MIN 0.30 AC-FT 1,170

PEAK DISCHARGE (BASE, 42 CFS)

DATE	TIME	G.HT.	DISCHARGE	DATE	TIME	G.HT.	DISCHARGE
10- 9	0730	3.10	81	2- 5	1600	2.96	71
10-30	0430	2.57	47	2- 7	2400	3.24	93
11- 1	0500	2.92	68	2- 9	1100	2.63	50
11- 4	2200	2.50	43	4- 3	1900	2.54	45
12- 6	1130	3.41	108				

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of 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 1968

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Kauai				
16-0110	Waiakoali Stream near Waimea	Lat 22°07'25", long 159°37'25", 0.3 mile above mouth and 12 miles northeast of Waimea.	1.7	1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-68	6-20-68	1.08
16-0120	Kauaikinana Stream near Waimea	Lat 22°07'45", long 159°38'05", 0.6 mile above mouth and 12 miles northeast of Waimea.	1.17	1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-68	6-20-68	.41
16-0295	Mokihana Stream near Waimea	Lat 21°59'35", long 159°40'03", 500 ft above mouth and 2.5 miles north of Waimea.	4.77	1962, 1964-68	11-14-67	1.00
		Hawaii, Island of Oahu				
16-2010	Right Branch of North Fork Kaukonahua Stream near Wahiawa	Lat 21°31'10", long 157°56'52", 200 ft above intake of Mauka Ditch tunnel and mouth of Right Branch, and 4.5 miles east of Leilehua High School in Wahiawa.	1.17	1913-53≠, 1960-62, 1966, 1968	11- 8-68 9-27-68	.56 4.28
16-2140	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'35", long 157°59'10", at rear of Oahu Sugar Co. pumping plant 9, 0.7 mile west of Pearl City, and 1.5 miles east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68	10- 5-67 do do 10-16-67 2-11-68 2-29-68 4-22-68 5-23-68 7- 4-68	10.4 9.99 12.0 11.6 15.1 14.3 13.8 12.8 12.7
16-2240	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'04", long 157°56'46", 300 ft below Highway 90, 900 ft below Oahu Sugar Co. pump 6, and 0.8 mile west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-68	10-17-67 5-24-68	31.9 26.6
16-2834.8	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mile south of Kahaluu.	2.31	1962-63, 1965, 1968	2- 6-68	5.92

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Molokai				
16-4034	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft above Kawailena Stream, 2.2 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	0.51	1968	2- 1-68	2.40
16-4035	Kawailena Stream near Pelekunu	Lat 21°07'52", long 156°53'05", 800 ft upstream from mouth, 2.2 miles south of former village of Pelekunu, and 5.5 miles north of Kamalo.	.65	1968	2- 1-68	2.97
16-4037	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'46", long 156°52'31", 400 ft above Kawaipaka Stream, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	.79	1968	2- 2-68	3.34
16-4038	Kawaipaka Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft above mouth, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo.	.26	1968	2- 2-68	.68
		Hawaii, Island of Maui				
16-5320	Haipuaena Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'28", long 156°12'28", 350 ft below Haiku-uka trail, 4.5 miles southeast of Kailiili, and 4.5 miles southwest of Keanae.	.63	1919-27≠, 1932-34≠, 1962-68	10- 5-67 11-21-67 2-14-68 6-24-68	.32 2.03 .28 .77
16-5420	East Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'36", long 156°12'39", 200 ft below Haiku-uka trail, 4.3 miles east of Kailiili, and 4.6 miles southwest of Keanae.	.14	1920-27≠, 1932-33≠, 1963-68	10- 5-67 11-21-67 1- 4-68 2-14-68 6-24-68	.11 .71 1.55 .22 .24
16-5440	West Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'51", long 156°13'03", 150 ft below Haiku-uka trail, 3.8 miles southeast of Kailiili, and 4.8 miles southwest of Keanae.	.45	1919-28≠, 1932-35≠, 1962-68	10- 5-67 11-21-67 2-14-68 6-24-68	.12 1.48 .12 .47
16-5540	Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'55", long 156°13'23", at Haiku-uka trail, 3.4 miles east of Kailiili, and 4.3 miles south of Kailua.	3.46	1918-28≠, 1932-35≠, 1963-68	10- 4-67 11-21-67 1- 4-68 2-13-68 5-13-68 6-24-68	.10 5.23 19.2 .96 5.63 2.21
16-5545	East Branch Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'53", long 156°13'21", 150 ft above Haiku-uka trail, 3.4 miles southeast of Kailiili, and 5.1 miles southwest of Keanae.	.07	1918-28≠, 1932-33≠, 1962-68	10- 4-67 11-21-67 2-13-68 5-13-68 6-24-68	.11 .68 .11 .82 .30
16-5691	Naiiliilihaele Stream near Kailiili	Lat 20°50'27", long 156°13'38", 200 ft below lower Kula pipeline, 3.0 miles east of Kailiili, and 3.7 miles south of Kailua.	.11	1963-68	10- 4-67 11-20-67 1- 3-68 3-27-68 5-13-68	0 .25 12.1 2.96 .06
16-5697	West Branch Naiiliilihaele Stream near Kailiili	Lat 20°50'27", long 156°14'00", 3 ft above lower Kula pipeline, 2.6 miles east of Kailiili, and 3.8 miles south of Kailua.	.04	1966-68	10- 4-67 11-20-67 1- 3-68 2-13-68 3-27-68 5-13-68 6-25-68	.04 .82 4.53 .05 3.26 .76 .38
16-5762	East Branch Kailua Stream near Kailiili	Lat 20°50'25", long 156°14'07", 40 ft below lower Kula pipeline, 2.5 miles east of Kailiili, and 3.9 miles south of Kailua.	.35	1963-68	10- 4-67 11-20-67 2-13-68 5-13-68	.18 1.32 .21 1.02

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Saipan				
16-8005	Hasngot Stream	Lat 15°12'44" N., long 145°46'23" E., 750 ft above unnamed tributary, 0.5 mile above mouth, and 3.4 miles east of Garapan.	0.43	1968	7-25-68 8-29-68	2.29 .73
16-8018	North Fork Talofofo Stream	Lat 15°13'07" N., long 145°46'41" E., 300 ft above confluence with South and Middle Forks and 2.3 miles southeast of Tanapag.	.45	1968	7-24-68 8- 3-68	2.11 .64
16-8020	Talofofo Stream	Lat 15°13'04" N., long 145°46'44" E., 200 ft below confluence of South, Middle and North Forks, 2.4 miles southeast of Tanapag, and 3.8 miles east of Garapan.	1.56	1968	2- 9-68 2-13-68 3-27-68 5- 3-68 5-31-68 7-24-68 8-30-68	.16 .15 .02 .11 .10 19.8 10.6
16-8025	East Achugau Spring	Lat 15°14'06" N., long 145°46'43" E., at spring 0.4 mile east of Mount Dogas and 2.0 miles east of Tanapag.	-	1965	9-15-65	.17
16-8040	West Achugau Spring	Lat 15°14'10" N., long 145°46'10" E., at spring 0.9 mile above mouth of Achugau Stream and 1.3 miles east of Tanapag.	-	1968	10- 5-67	.34
		Mariana Islands, Island of Guam				
16-8073	Fonte River at dam, near Nimitz Hill	Lat 13°27'25" N., long 144°43'34" E., at old diversion dam, 0.4 mile south of Force Headquarters building on Nimitz Hill, and 1.2 miles southeast of Asan.	.60	1961-68	4- 5-68 5-13-68	.34 .34
16-8077	Masso River at dam, near Piti	Lat 13°27'21" N., long 144°41'43" E., at end of penstocks on downstream side of dam, 0.5 mile southeast of Schroeder Junction, and 0.7 mile south of approximate center of Piti.	.74	1962, 1964-65, 1967-68	4- 5-68 5-13-68	.19 .27
16-8080	Santa Rita Spring at Santa Rita	Lat 13°23'04" N., long 144°40'23" E., 0.1 mile southeast of Santa Rita Catholic Church and 1.1 miles southeast of junction of Santa Rita Road and Marine Drive.	-	1962, 1964-66, 1968	4- 5-68 5-13-68	.08 .11
16-8082	Faata Spring near Agat	Lat 13°22'25" N., long 144°39'58" E., 0.4 mile southwest of Alifan Mountain and 1.0 mile southeast of Agat.	-	1963-68	4- 5-68 5-13-68	.35 .29
16-8085	Taleyfac River near Agat	Lat 13°21'40" N., long 144°39'00" E., 800 ft above bridge on Agat-Umatac Road and 1.7 miles southwest of Agat School.	1.77	1959-68	4- 5-68 5-13-68	.76 .46
16-8100	Right Branch Umatac River at Umatac	Lat 13°17'50" N., long 144°39'50" E., 50 ft above confluence with Left Branch and 0.3 mile southeast of Umatac Catholic Church.	.95	1960-68	4-10-68 5-14-68	.49 .50
16-8120	Left Fork of Left Branch Umatac River near Umatac	Lat 13°17'25" N., long 144°39'50" E., 0.4 mile above confluence with Right Fork and 1.2 miles southeast of Umatac Catholic Church.	.35	1960-68	4-10-68 5-14-68	.25 .32
16-8130	Piga Spring near Umatac	Lat 13°17'55" N., long 144°40'47" E., at the source of the Right Fork of Left Branch Umatac River and 1.4 miles due east of Umatac Catholic Church.	-	1955, 1961-65, 1967-68	4-10-68 5-14-68	.13 .13
16-8140	Right Fork of Left Branch Umatac River at Umatac	Lat 13°17'40" N., long 144°40'20" E., 50 ft above confluence with Left Fork and 0.9 mile southeast of Umatac Catholic Church.	.36	1960-68	4-10-68 5-14-68	.12 .08

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Guam--Continued				
16-8170	Toguan River near Umatac	Lat 13°17'05" N., long 144°39'35" E., at highway bridge on Route 4 and 1.0 mile south of Umatac Catholic Church.	0.48	1952, 1960-68	4-10-68 5-14-68	0.10 .09
16-8200	Geus River above Siligin Spring tributary, near Merizo	Lat 13°16'45" N., long 144°40'55" E., above pipeline diversion to village of Merizo and 2.0 miles northeast of Merizo School.	.50	1960-68	4-12-68 5-14-68	.12 .09
16-8205	Siligin Spring near Merizo	Lat 13°16'44" N., long 144°40'55" E., 0.2 mile above Geus River diversion dam and 1.6 miles northeast of Merizo School.	-	1954, 1961-68	4-12-68 5-14-68	.05 .04
16-8207	Geus River below Siligin Spring tributary, near Merizo	Lat 13°16'41" N., long 144°40'55" E., 1.6 miles northeast of Merizo School and 2.0 miles southeast of Umatac School.	.60	1962-68	4-12-68 5-14-68	.45 .21
16-8250	Ajayan River near Inarajan	Lat 13°15'16" N., long 144°42'56" E., 2.4 miles southwest of Inarajan School and 3.8 miles southeast of Merizo School.	1.08	1962-68	4-12-68 5-14-68	.16 .08
16-8280	Agfayan River near Inarajan	Lat 13°16'03" N., long 144°43'42" E., 1.2 miles southwest of Inarajan School and 4.5 miles east of Merizo School.	1.67	1962-65, 1967-68	5-25-67 4-12-68 5-14-68	.33 .29 .12
16-8300	Right Fork of Right Branch Inarajan River near Inarajan	Lat 13°16'59" N., long 144°43'23" E., above confluence with Left Fork and 1.6 miles northwest of Inarajan Catholic Church.	1.40	1960-68	4-12-68	1.22
16-8310	Left Fork of Right Branch Inarajan River near Inarajan	Lat 13°17'00" N., long 144°43'23" E., above confluence with Right Fork and 1.6 miles northwest of Inarajan Catholic Church.	.97	1960-68	4-12-68 5-17-68 do	.87 1.10 1.01
16-8330	Right Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'25" N., long 144°43'45" E., 1.6 miles northwest of Inarajan Catholic Church and 4.9 miles southwest of Talofofo School.	.84	1960-68	4-12-68 do 5-17-68 do	.96 .78 1.32 .16
16-8340	Left Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'10" N., long 144°44'10" E., above confluence with Right Fork and 1.0 mile northwest of Inarajan Catholic Church.	.39	1960-68	4-12-68	.10
16-8420	Asalonso River near Talofofo	Lat 13°19'41" N., long 144°45'34" E., 300 ft below highway bridge on Route 4 and 1.8 miles south of Talofofo School.	1.50	1952, 1961-68	4-12-68	.31
16-8450	Tolaeyuus River near Agat	Lat 13°21'55" N., long 144°42'40" E., 3.7 miles southeast of Agat and 4.8 miles southwest of Yona.	6.54	1951-60≠, 1961-68	5-10-68	1.89
16-8460	Tolaeyuus River at mouth, near Agat	Lat 13°21'30" N., long 144°42'30" E., above confluence with Fena River, 0.4 mile east of Fena Dam spillway, and 4.0 miles southeast of Agat School.	7.42	1962-68	5-10-68	2.27
16-8540	Left Branch Ugum River near Talofofo	Lat 13°19'08" N., long 144°43'45" E., 50 ft above confluence with Right Branch and 2.9 miles southwest of Talofofo School.	2.96	1961-68	4-10-68 5-17-68	3.48 4.12
16-8545	Right Branch Ugum River near Talofofo	Lat 13°19'06" N., long 144°43'46" E., above confluence with Left Branch and 2.9 miles southwest of Talofofo School.	2.70	1961-68	4-10-68 5-17-68	1.56 3.37

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Mariana Islands, Island of Guam--Continued				
16-8590	Left Branch Ylig River above pumping station, near Yona	Lat 13°24'05" N., long 144°45'05" E., 0.3 mile above Ylig River and 1.7 miles southwest of Yona Catholic Church.	1.98	1960-62, 1964-66, 1968	5-13-68	0.45
16-8670	Janum Spring near Yigo	Lat 13°30'56" N., long 144°54'49" E., in small cave at sea level in limestone cliff on edge of reef, 2.2 miles southeast of Yigo.	-	1953-56, 1958, 1960-62, 1964-65, 1967-68	10-27-67 4-24-68	4.56 3.96
		Ryukyu Islands, Island of Okinawa				
16-8757	Hiji-gawa at Hiji	Lat 26°43'12" N., long 128°10'40" E., at Hiji, 0.4 mile above Taihoza-gawa, and 1.1 miles east of Hama.	3.3	1964-68	10-13-67	1.92
16-8758	Taihoza-gawa at Hiji	Lat 26°43'21" N., long 128°10'55" E., 0.2 mile east of Hiji, 0.6 mile above mouth, and 1.4 miles northeast of Hama.	2.3	1964-68	10-13-67	.53
16-8765	Taiho-okawa at Taiho	Lat 26°39'01" N., long 128°08'37" E., 1.0 mile east of Taiho and 1.7 miles north of Taira.	5.2	1964-68	10- 4-67 10- 9-67 10-16-67 11-28-67 1-18-68 3-13-68	4.43 3.22 2.87 4.27 4.50 6.36
16-8772	North Fork Henan-gawa at Tsuha	Lat 26°38'28" N., long 128°05'47" E., 0.4 mile above confluence with South Fork and 0.8 mile south of Tsuha.	1.4	1964-68	10- 9-67 7-30-68 9-12-68	.56 1.39 2.00
16-8777	Genka-kawa at Genka	Lat 26°36'48" N., long 128°03'38" E., 0.9 mile southwest of Genka and 1.9 miles southeast of Nakaoshi.	5.5	1964, 1966-68	10- 5-67 3-15-68 7-30-68	4.92 6.44 7.20
16-8780	Makiya-okawa at Makiya	Lat 26°37'10" N., long 128°02'18" E., 0.3 mile south of Makiya, 0.5 mile east of Nakaoshi, and 0.6 mile above mouth.	1.7	1964-68	10- 5-67 12-13-67	1.45 2.28
16-8790	Manna-gawa at Manna	Lat 26°39'12" N., long 127°55'06" E., at Manna, 0.5 mile east of Inoha-shogakko (elementary school), and 1.4 miles above highway bridge at mouth.	2.2	1964-68	10- 4-67	2.09
16-8794	Yofuke-gawa at Yofuke	Lat 26°34'02" N., long 127°59'43" E., 0.6 mile southeast of Yofuke and 0.6 mile northeast of Sukuta.	1.2	1964-68	10- 6-67 12-13-67 8- 1-68	.52 .66 1.15
16-8795	Sukuta-kawa at Sukuta	Lat 26°33'33" N., long 127°59'23" E., 0.4 mile southeast of Sukuta, 0.6 mile above mouth, and 0.8 mile south of Yofuke.	1.1	1964-68	10- 6-67 12-13-67 8- 1-68	.22 .40 1.06
16-8796	Fukuchi-gawa at Kyoda	Lat 26°32'37" N., long 127°58'40" E., 0.7 mile northeast of Kyoda and 1.5 miles southwest of Sukuta.	1.1	1964-68	10- 6-67 12-13-67 8- 1-68	.36 .34 1.07
16-8832	O-kawa at Kushi	Lat 26°30'50" N., long 127°59'50" E., 0.7 mile north of junction of Highways 13 and 108 and 0.7 mile west of Kushi.	1.3	1964-68	11- 4-67	.73
16-8835	Suginda-gawa at Suginda	Lat 26°32'41" N., long 128°01'56" E., 0.1 mile west of Suginda and 0.4 mile south of Futami.	.9	1964-68	10- 6-67 12-12-67 1-19-68 3-19-68	.74 .74 .52 .48
16-8836	Oura-gawa at Oura	Lat 26°33'32" N., long 128°02'35" E., 0.5 mile north of Oura and 1.0 mile northwest of Sedake.	3.1	1964-68	12-12-67 1-19-68 3-19-68	3.59 2.18 2.78

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Ryukyu Islands, Island of Okinawa--Continued				
16-8838	Teema-gawa at Mihara	Lat 26°33'11" N., long 128°04'48" E., below Mihara-gawa, 0.1 mile southeast of Mihara-sho-chugakko (school), and 0.9 mile east of Teema.	3.2	1964-68	10- 6-67 12-12-67 1-19-68 3-19-68	2.91 2.92 2.48 2.40
		Caroline Islands, Yap Islands				
16-8924.5	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., 0.9 mile northwest of Lamer and 4.1 miles southwest of Colonia.	.29	1968	10- 9-67 9-25-68	.25 .58
16-8924.6	Galngun Swamp outlet, Yap	Lat 9°29'02" N., long 138°04'23" E., 0.5 mile northwest of Lamer and 3.9 miles southwest of Colonia.	.16	1968	10- 9-67 9-25-68	.23 .50
16-8925	Tamaney Stream, Yap	Lat 9°29'45" N., long 138°05'34" E., at abandoned German dam, 0.5 mile northwest of Inuf, and 2.3 miles southwest of Colonia.	.21	1968	8-22-68 9- 4-68	.97 .53
16-8926	Ripu Stream, Yap	Lat 9°30'05" N., long 138°06'02" E., 1,000 ft above mouth and 1.6 miles southwest of Colonia.	.24	1968	3- 7-68 7-29-68 8- 8-68 9- 4-68 9-17-68	.63 3.51 .88 .61 .07
16-8927	Thalomar Stream, Yap	Lat 9°30'27" N., long 138°06'05" E., 5 ft above confluence with Dinay Stream and 1.4 miles southwest of Colonia.	.14	1965, 1968	9-23-65 10-10-67 3-23-68 8- 8-68 9- 4-68	.48 .24 .04 1.02 1.23
16-8930.5	Mabu Stream, Yap	Lat 9°31'07" N., long 138°06'52" E., 500 ft above mouth and 0.4 mile northwest of Colonia.	.30	1968	9-26-68	.14
16-8933.1	Bileiy Stream, Gagil-Tomil	Lat 9°32'15" N., long 138°11'11" E., 0.3 mile below Bileiy Spring, 0.4 mile above mouth, and 0.4 mile south of Gatjapar.	.15	1968	10-10-67 3-20-68 8-19-68	.32 .12 .27
16-8933.5	Yanbilang Stream, Gagil-Tomil	Lat 9°32'45" N., long 138°11'26" E., 500 ft above mouth and 0.3 mile northeast of Gatjapar.	.03	1968	10-10-67	.04
		Caroline Islands, Truk Islands				
16-8939	Pou Stream, Moen	Lat 7°26'44" N., long 151°51'22" E., 0.5 mile north of Mount Teroken and 0.6 mile above mouth.	.07	1968	10-20-67	.10
16-8951	Afeibung Stream, Tol	Lat 7°20'55" N., long 151°37'22" E., 0.3 mile above mouth and 0.6 mile northwest of Mount Tumuital.	.08	1968	10-20-67	.55
		Samoa Islands, Island of Tutuila				
16-9025	Vaisa Stream at Onenoa	Lat 14°15'27" S., long 170°34'44" W., 30 ft below unnamed tributary, 0.1 mile southeast of Onenoa, and 0.1 mile above mouth.	.12	1964-65, 1968	5- 2-68	.37
16-9030	Afimuao Stream at Onenoa	Lat 14°15'34" S., long 170°34'53" W., 200 ft below unnamed tributary, 0.2 mile southwest of Onenoa, and 0.2 mile above mouth.	.06	1959-61, 1963-65, 1968	5- 3-68	.19
16-9040	Laoulu Stream at Aoa	Lat 14°15'54" S., long 170°34'50" W., 0.2 mile east of Aoa and 0.2 mile above mouth.	.05	1959-61, 1963-65, 1968	5-10-68	.02
16-9050	Lepa Stream at Aoa	Lat 14°16'21" S., long 170°35'17" W., 0.5 mile above mouth and 0.6 mile southwest of Aoa.	.09	1959-61, 1963-65, 1967-68	5-10-68	.20

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Samoa Islands, Island of Tutuila--Continued				
16-9070	Panota Stream at Masausi	Lat 14°15'54" S., long 170°36'09" W., 0.1 mile southeastof Masausi and 0.2 mile above mouth.	0.06	1959-60, 1962-64, 1968	5- 7-68	0.10
16-9080	Vaipito Stream at Masausi	Lat 14°16'05" S., long 170°36'18" W., 0.2 mile south of Masausi and 0.3 mile above mouth.	.08	1959-60, 1962-64, 1967-68	5- 7-68	.19
16-9095	Talaloa Stream at Masefau	Lat 14°15'51" S., long 170°38'07" W., 50 ft below unnamed tributary, 0.5 mile southwest of Masefau, and 0.5 mile above mouth.	.47	1959-60, 1962-64, 1967-68	5- 7-68	.33
16-9100	Tagau Stream at Masefau	Lat 14°15'47" S., long 170°38'20" W., 0.4 mile above mouth and 0.6 mile southwest of Masefau.	.01	1959-60, 1962-64, 1968	5- 7-68	.23
16-9160	Leua Stream at Fagasa	Lat 14°17'24" S., long 170°43'00" W., 0.2 mile northeast of Fagasa and 0.2 mile above mouth.	.14	1959-61, 1963-65, 1968	4-30-68	.38
16-9170	Leele Stream at Fagasa	Lat 14°17'32" S., long 170°43'01" W., 0.1 mile southeast of Fagasa and 0.2 mile above mouth.	.19	1959-61, 1963-65, 1968	4-30-68	1.01
16-9190	Leaveave Stream near Aasu	Lat 14°18'28" S., long 170°45'06" W., 0.6 mile above mouth and 0.9 mile southeast of Aasu.	.60	1959-60, 1962-63, 1968	5- 8-68	3.09
16-9192	Leaveave Stream tributary No. 2 near Aasu	Lat 14°18'24" S., long 170°45'03" W., 50 ft above mouth and 0.8 mile southeast of Aasu.	.16	1960, 1962-63, 1968	5- 8-68	.39
16-9194	Leaveave Stream tributary No. 1 near Aasu	Lat 14°18'21" S., long 170°45'01" W., 50 ft above mouth and 0.8 mile southeast of Aasu.	.15	1960, 1962-63, 1968	5- 8-68	.16
16-9198	Aasu Stream at Aoloaufou	Lat 14°18'54" S., long 170°46'00" W., 0.3 mile north of Aoloaufou and 1.3 miles southeast of Aoloautuai.	.24	1960-65, 1968	5- 7-68	.91
16-9200	Aasu Stream near Aasu	Lat 14°18'16" S., long 170°45'29" W., 300 ft below 100-ft waterfall, 0.5 mile south of Aasu, and 0.5 mile above mouth.	.82	1959-63, 1968	5- 8-68	5.25
16-9220	Vaisa Stream at Aoloautuai	Lat 14°18'15" S., long 170°47'00" W., 200 ft below unnamed tributary, 0.3 mile above Vailolo Stream, and 0.3 mile southwest of Aoloautuai.	.78	1959-60, 1962-63, 1965, 1968	5- 8-68	5.02
16-9230	Vailolo Stream at Aoloautuai	Lat 14°18'22" S., long 170°46'45" W., 100 ft below unnamed tributary, 0.4 mile above mouth, and 0.4 mile south of Aoloautuai.	.18	1959-60, 1962-63, 1968	5- 8-68	1.40
16-9240	Matavai Stream at Fagamalo	Lat 14°18'21" S., long 170°48'23" W., 0.2 mile southeast of Fagamalo and 0.3 mile above mouth.	.17	1959-60, 1962-63, 1968	5- 7-68	1.33
16-9250	Maloata Stream at Maloata	Lat 14°18'44" S., long 170°48'36" W., 0.4 mile southeast of Maloata and 0.4 mile above mouth.	.74	1959-60, 1962-63, 1968	5- 7-68	4.86
16-9270	Puna Stream at Amanave	Lat 14°19'39" S., long 170°49'48" W., 0.2 mile above Maululu Stream and 0.2 mile north of Amanave.	.03	1959-61, 1963-65, 1968	5- 6-68	.55
16-9280	Afutele Stream at Agugulu	Lat 14°20'05" S., long 170°49'06" W., 30 ft below unnamed tributary at Agugulu and 0.1 mile above mouth.	.17	1959-61, 1963-65, 1968	5- 6-68	1.28
16-9290	Vaialae Stream at Utumea	Lat 14°19'56" S., long 170°48'50" W., 0.1 mile north of Utumea and 0.1 mile above mouth.	.15	1959-61, 1963-65, 1968	5- 6-68	1.10

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Samoa Islands, Island of Tutuila--Continued				
16-9300	Soonapule Stream at Seetaga	Lat 14°19'42" S., long 170°48'36" W., 50 ft above Utanuatele Stream and 0.1 mile north of Seetaga.	0.16	1959-61, 1963-64, 1968	5- 6-68	1.34
16-9302	Utanuatele Stream at Seetaga	Lat 14°19'41" S., long 170°48'35" W., 200 ft above mouth and 0.2 mile north of Seetaga.	.21	1960-61, 1963-64, 1968	5- 7-68	1.86
16-9320	Asili Stream near Asili	Lat 14°19'46" S., long 170°47'42" W., 0.4 mile north of Asili and 0.5 mile above mouth.	.55	1959-61, 1963-65, 1968	5- 6-68	5.67
16-9325	Asili Stream at Asili	Lat 14°20'04" S., long 170°47'40" W., 100 ft above highway bridge at Asili and 0.1 mile above mouth.	.66	1958-59≠ 1960-61, 1963-65, 1967-68	5- 6-68	7.09
16-9355	Sigaloa Stream at Malaeloa	Lat 14°20'27" S., long 170°45'53" W., 0.1 mile above mouth and 0.3 mile northeast of Malaeloa.	.01	1959-61, 1963-65, 1968	5- 7-68	.06
16-9360	Leaveave Stream at Mapusagafou	Lat 14°19'12" S., long 170°45'00" W., 0.1 mile above Puna Stream and 0.7 mile north of Mapusagafou.	.15	1959-65, 1968	5- 7-68	.57
16-9370	Vaitele Stream at Lepine	Lat 14°18'51" S., long 170°43'35" W., 0.7 mile north of Lepine and 1.1 miles above mouth.	.18	1959-61, 1963-65, 1967-68	5- 3-68	.71
16-9380	Vaitele Stream tributary at Lepine	Lat 14°18'57" S., long 170°43'21" W., 0.2 mile above mouth and 0.7 mile northeast of Lepine.	.09	1959-61, 1963-65, 1967-68	5- 3-68	.67
16-9390	Taumata Stream near Mapusaga	Lat 14°18'23" S., long 170°44'00" W., 100 ft above unnamed tributary, 1.6 miles north of Mapusaga, and 2.2 miles above mouth.	.02	1959-61, 1963-65, 1968	5- 9-68	.19
16-9410	Mapusagatuai Stream at Mapusaga	Lat 14°19'38" S., long 170°44'48" W., 0.3 mile west of Mapusaga and 1.2 miles above mouth.	.08	1959-61, 1963-65, 1968	5- 7-68	.30
16-9420	Sauino Stream near Nuuuli	Lat 14°18'53" S., long 170°43'03" W., 0.6 mile above mouth and 1.3 miles west of Nuuuli.	.09	1959-61, 1963-65, 1968	5- 3-68	.37
16-9430	Mataalii Stream near Nuuuli	Lat 14°18'42" S., long 170°42'51" W., 0.6 mile above mouth and 1.1 miles northwest of Nuuuli.	.14	1959-61, 1963-65, 1968	5- 3-68	.73
16-9440	Papa Stream near Nuuuli	Lat 14°18'31" S., long 170°42'29" W., 0.3 mile above Tauese Stream and 0.9 mile northwest of Nuuuli.	.57	1959-61, 1963-64, 1967-68	5- 3-68 9-30-68	2.09 .06
16-9450	Amaile Stream at Nuuuli	Lat 14°18'43" S., long 170°41'48" W., 0.3 mile above mouth and 0.5 mile north of Nuuuli.	.19	1959-61, 1963-64, 1968	5- 2-68	.73
16-9460	Avau Stream at Faganeanea	Lat 14°18'34" S., long 170°41'35" W., 0.2 mile above mouth and 0.4 mile southwest of Faganeanea.	.09	1959-61, 1963-65, 1967-68	5- 2-68	.40
16-9470	Afu Stream at Faganeanea	Lat 14°18'16" S., long 170°41'25" W., 0.2 mile northwest of Faganeanea and 0.3 mile above mouth.	.22	1959-61, 1963-65, 1967-68	5- 2-68	.39
16-9490	Matafao Stream at Fagaalu	Lat 14°17'34" S., long 170°41'43" W., 100 ft above Vaitanoa Pool and 0.9 mile west of Fagaalu.	.24	1959, 1961, 1963-64, 1968	5- 2-68	.20
16-9497	Vaima Stream at Pago Pago	Lat 14°17'30" S., long 170°42'29" W., 0.4 mile above mouth and 1.0 mile southwest of Pago Pago.	.05	1959-65, 1967-68	4-30-68	.33

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1968--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Samoa Islands, Island of Tutuila--Continued				
16-9498	Utumoa Stream near Pago Pago	Lat 14°17'35" S., long 170°42'20" W., 0.6 mile above mouth and 1.1 miles south of Pago Pago.	0.07	1960-61, 1963-65, 1967-68	4-30-68	0.58
16-9505	Utumoa Stream at Pago Pago	Lat 14°17'21" S., long 170°42'21" W., 150 ft below pipeline diversion, 0.3 mile above mouth, and 0.8 mile south of Pago Pago.	.17	1957-58≠, 1960-65, 1967-68	4-30-68	.67
16-9525	Lalolamauta Stream at Aua	Lat 14°16'25" S., long 170°39'31" W., 300 ft above Amano Stream and 0.4 mile east of Aua.	.14	1959-61, 1963-65, 1968	4-30-68	.85
16-9530	Matagimalie Stream at Aua	Lat 14°16'19" S., long 170°39'50" W., 0.2 mile north of Aua and 0.2 mile above mouth.	.03	1959-61, 1963-65, 1968	4-30-68	.19
16-9550	Anasosopo Stream at Anasosopo	Lat 14°17'14" S., long 170°39'44" W., 400 ft above highway bridge at Anasosopo and 0.1 mile above mouth.	.05	1959-61, 1963-65, 1968	4-30-68	.31
16-9555	Vaisina Stream at Laullifou	Lat 14°17'34" S., long 170°39'25" W., 0.1 mile north of Laullifou and 600 ft above highway bridge.	.06	1959-61, 1963-65, 1968	4-30-68	.08
16-9560	Vaitele Stream at Laulliituai	Lat 14°17'05" S., long 170°39'07" W., 200 ft above unnamed tributary, 0.5 mile north of Laulliituai and 0.7 mile above mouth.	.19	1959-61, 1963-65, 1968	4-30-68	.70
16-9565	Maga Stream at Laulliituai	Lat 14°17'12" S., long 170°39'09" W., 0.1 mile above mouth and 0.4 mile north of Laulliituai.	.05	1959-61, 1963-65, 1968	4-30-68	.10
16-9570	Lesea Stream at Laulliituai	Lat 14°17'19" S., long 170°39'00" W., 0.1 mile above mouth and 0.3 mile northeast of Laulliituai.	.02	1959-61, 1963-65, 1968	4-30-68	.64
16-9580	Visa Stream at Alega	Lat 14°17'21" S., long 170°38'37" W., 0.2 mile above mouth and 0.5 mile southwest of Alega.	.10	1959-61, 1963-65, 1967-68	5- 2-68	.28
16-9585	Visa Stream tributary at Aumi	Lat 14°17'24" S., long 170°38'35" W., 200 ft above mouth and 0.3 mile northeast of Aumi.	.02	1959-61, 1963-65, 1967-68	5- 2-68	.20
16-9590	Visa Stream at Aumi	Lat 14°17'27" S., long 170°38'36" W., 100 ft above highway bridge and 0.2 mile east of Aumi.	.16	1957-58≠, 1963-64, 1968	5- 2-68	.56
16-9605	Alega Stream tributary at Alega	Lat 14°16'57" S., long 170°38'16" W., 300 ft above mouth and 0.2 mile north of Alega.	.04	1961, 1963-65, 1967-68	5- 2-68	.39
16-9610	Mulloleval Stream at Auto	Lat 14°16'37" S., long 170°37'54" W., 400 ft below unnamed tributary, 0.5 mile northwest of Auto, and 0.5 mile above mouth.	.22	1959-61, 1963-65, 1968	5- 2-68	.76
16-9630	Televai Stream at Amouli	Lat 14°16'25" S., long 170°34'55" W., 50 ft below unnamed tributary, 0.1 mile above Tuavaa Stream, and 0.3 mile north of Amouli.	.10	1959-61, 1963-65, 1968	5-10-68	.22
16-9640	Leafu Stream at Auasi	Lat 14°16'28" S., long 170°34'26" W., 0.1 mile north of Auasi and 0.2 mile above mouth.	.12	1959-61, 1963-65, 1968	5- 7-68	.26
16-9650	Vaialili Stream at Alao	Lat 14°16'15" S., long 170°34'08" W., 0.2 mile above Vaifusi Stream and 0.5 mile southwest of Alao.	.10	1959-61, 1963-65, 1968	5- 2-68	.20
16-9660	Vaifusi Stream at Alao	Lat 14°16'08" S., long 170°34'05" W., 400 ft above mouth and 0.3 mile west of Alao.	.02	1959-61, 1963-65, 1968	5- 2-68	.03

≠ 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 discharges 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 1968

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					
16-8808	Hiya-gawa at Ojana	Lat 26°15'35" N., long 127°44'08" E., 0.1 mile south of Ojana and 0.6 mile above mouth.	2.2	1964-68#	3-29-68	2.45	(✗)
16-8812	Kanegusuku-gawa at Kanegusuku	Lat 26°11'31" N., long 127°43'36" E., 0.2 mile northwest of Kanegusuku and 1.3 miles east of Kokubu.	3.0	1964-68#	3-29-68	6.20	(✗)
16-8815	Mukue-gawa near Itomancho	Lat 26°07'58" N., long 127°41'22" E., at highway bridge, 0.6 mile west of Yoza, and 0.9 mile northeast of Itomancho.	6.4	1964-68#	3-29-68	7.35	(✗)

✗ 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 1968

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Hawaii, Island of Kauai						
Kawaikoi Stream tributary	Kawaikoi Stream	Lat 22°08'05", long 159°37'29", at mouth, 100 ft below Kawaikoi Stream gaging station, and 12.5 miles north of Waimea.		1963, 1965-67	10-13-67 4-22-68 6-20-68 9- 4-68	0.05 2.03 .24 .33
Hawaii, Island of Oahu						
Manana Stream	Waiawa Stream	Lat 21°25'37", long 157°58'04", 300 ft above mouth and 1.4 miles north of Pearl City Highlands School.			1- 5-68	≠2,530
Waimano Stream tributary	Waimano Stream	Lat 21°25'39", long 157°57'28", at culvert crossing of Amoomoo Street near its intersection with Auhuhu Street in Pacific Palisades and 1.6 miles northeast of Pearl City Highlands School.			1- 5-68	≠480
Panakauahi Gulch	Waiawa Stream	Lat 21°26'08", long 157°59'44", 2.4 miles southeast of Kipapa School and 3.0 miles northwest of main intersection in Pearl City.			1- 5-68	≠2,420
Waimano flood channel	Pearl Harbor	Lat 21°24'01", long 157°57'57", at private road crossing 0.5 mile northeast of intersection of Highway 90 and Waimano Home Road in Pearl City.			1- 5-68	≠3,400
Waimano flood channel tributary	Waimano flood channel	Lat 21°24'25", long 157°57'59", at Hoomaemae Street crossing and 0.1 mile east of Pearl City Highlands School.			1- 5-68	≠1,210
Punanani Gulch	Waimalu Stream	Lat 21°24'05", long 157°57'05", 50 ft below left-bank tributary, 0.6 mile above Moanalua Road, and 0.8 mile northeast of Waiau.			1- 5-68	≠5,400
Kupaua Valley	Niu Stream	Lat 21°17'23", long 157°44'18", 750 ft above confluence with Pia Valley at Niu and 0.5 mile above Kalanianaole Highway.			12-18-67	≠3,440
Pia Valley	Niu Stream	Lat 21°17'37", long 157°44'32", 250 ft above entrance to lined channel at upper end of Niu Valley residential area and 0.5 mile above confluence with Kupaua Valley.			12-18-67	≠3,120
Kaalakei Valley	Maunalua Bay	Lat 21°17'41", long 157°43'13", above Kawaihae Street bridge and 0.5 mile northeast of junction of Kuliouou Road and Highway 72 at Kuliouou.			12-18-67	≠2,040
Hahaione Valley	Kuapa Pond	Lat 21°18'21", long 157°42'44", 0.3 mile above left-bank tributary and 1.5 miles northeast of junction of Kuliouou Road and Highway 72 at Kuliouou.			12-18-67	≠1,060
Kalama Valley	Pacific Ocean	Lat 21°18'41", long 157°40'31", 1.5 miles west of Makapuu Point lighthouse and 1.8 miles north of Halona Point.			12-18-67	≠1,020
Unnamed stream	Pacific Ocean	Lat 21°18'13", long 157°39'48", at Highway 72 and 0.9 mile southwest of Makapuu Point lighthouse.			12-18-67	≠377
Unnamed stream	Waimanalo Bay	Lat 21°19'58", long 157°41'40", at culvert under Highway 72 at Kaiona Beach Park and 0.4 mile southeast of Waimanalo Post Office.			12-18-67	≠516

≠ Peak flow.

Discharge measurements made at miscellaneous sites during water year 1968--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Hawaii, Island of Oahu--Continued						
Waihee Stream	Kahaluu Stream	Lat 21°27'02", long 157°51'37", 600 ft below forest-reserve boundary and 1.8 miles southwest of Kahaluu.			7-18-68 8- 8-68 9-17-68	9.67 9.75 9.87
Hawaii, Island of Maui						
Kalepa Gulch	Pacific Ocean	Lat 20°39'06", long 156°05'25", 1,000 ft above Highway 31, 0.3 mile north of Kalepa Point, and 2.4 miles east of Kaupo.			4-16-68	≠3,950
Alelele Stream	Pacific Ocean	Lat 20°39'07", long 156°05'17", 120 ft above Highway 31, 0.3 mile north of Kalepa Point, and 2.5 miles east of Kaupo.			4-16-68	≠2,280
Opelu Gulch	Pacific Ocean	Lat 20°39'23", long 156°04'31", 1,200 ft above Highway 31, 1.1 miles northeast of Kalepa Point and, 1.2 miles west of Kipahulu.			4-16-68	≠3,330
Kalena Stream	Pacific Ocean	Lat 20°39'25", long 156°03'46", 700 ft above Highway 31, 0.3 mile west of Kipahulu, and 1.4 miles southwest of Kuloa Point.			4-16-68	≠2,920
Unnamed stream	Pacific Ocean	Lat 20°40'50", long 156°02'16", 500 ft above Highway 31, 1.5 miles west of Muolea Point, and 2.0 miles northeast of Kipahulu.			4-16-68	≠569
Kapia Stream	Pacific Ocean	Lat 20°42'57", long 155°59'35", 700 ft above mouth, 800 ft below Highway 31, and 0.6 mile southwest of Hamoa.			4-16-68	≠16,900
Haneoo Gulch	Pacific Ocean	Lat 20°43'52", long 155°59'38", 1,100 ft below Highway 31, 0.6 mile northwest of Hamoa, and 2.1 miles south of Hana lighthouse.			4-16-68	≠1,170
Holoinawawae Stream tributary	Holoinawawae Stream	Lat 20°45'54", long 156°00'01", 0.2 mile southwest of Hana hospital and 1.1 miles northwest of Hana School.			4-16-68	≠476
Honomaele Gulch tributary	Honomaele Gulch	Lat 20°47'15", long 156°01'54", 400 ft below Highway 36, 1.2 miles southwest of Hana Airport, and 3.6 miles northwest of Hana School.			4-16-68	≠1,590
Honokohau Stream	Pacific Ocean	Lat 20°58'43", long 156°35'41", 3.6 miles above mouth, 4.4 miles southeast of Honokahua Post Office, and at altitude 580 ft.			8-29-68	2.78
Honokohau Stream	Pacific Ocean	Lat 20°59'08", long 156°35'51", 3.1 miles above mouth, 4.1 miles east of Honokahua Post Office, and at altitude 480 ft.			8-29-68	2.82
Honokohau Stream	Pacific Ocean	Lat 20°59'43", long 156°36'10", 2.3 miles above mouth, 3.6 miles east of Honokahua Post Office, and at altitude 300 ft.			8-29-68	2.95
Hawaii, Island of Hawaii						
Waipahoehoe Gulch	Wailuku River	Lat 19°43'34", long 155°16'18", 0.6 mile above mouth, 6.0 miles southeast of Pua Akala, and 8.7 miles west of Piihonua.		1966	10-16-67	.05
Waipahoehoe Gulch tributary	Waipahoehoe Gulch	Lat 19°43'34", long 155°16'17", 50 ft above mouth, 6.0 miles southeast of Pua Akala, and 8.7 miles west of Piihonua.		1966	10-16-67	.04

≠ Peak flow.

Discharge measurements made at miscellaneous sites during water year 1968--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		Hawaii, Island of Hawaii--Continued				
Waipahoehoe Gulch	Wailuku River	Lat 19°43'22", long 155°16'06", 0.2 mile above mouth, 6.3 miles southeast of Pua Akala, and 8.5 miles west of Piihonua.		1965-66	10-16-67	0.04
Waipahoehoe Gulch tributary No. 2	Waipahoehoe Gulch	Lat 19°43'23", long 155°16'16", 0.2 mile above mouth, 6.2 miles southeast of Pua Akala and 8.6 miles west of Piihonua.		1966	10-16-67	a.02
Waipahoehoe Gulch tributary No. 2	Waipahoehoe Gulch	Lat 19°43'22", long 155°16'07", 50 ft above mouth, 6.3 miles southeast of Pua Akala, and 8.5 miles west of Piihonua.		1966	10-16-67	.03
West Branch Honokane Iki Stream	Honokane Iki Stream	Lat 20°09'47", long 155°43'25", 30 ft below trail crossing, 1.8 miles above confluence with East Branch, and 4.5 miles south of Niulii.		1961-67	11- 1-67 12-13-67 1-24-68 3-13-68 4-24-68 6- 5-68 7-24-68 9-19-68	3.82 4.28 .14 .30 .95 .98 .74 .08
East Branch Honokane Nui Stream tributary	East Branch Honokane Nui Stream	Lat 20°06'36", long 155°42'48", 25 ft above first Kehena ditch intake, 2.8 miles east of Puu Pala, and 6.5 miles northwest of Kamuela.			2-14-68	.14
East Branch Honokane Nui Stream tributary No. 2	East Branch Honokane Nui Stream	Lat 20°06'24", long 155°43'24", between trail crossing and Kehena ditch intake, 2.1 miles east of Puu Pala, and 6.6 miles northwest of Kamuela.			2-14-68 3-11-68 7- 2-68	.53 .74 .93
East Branch Honokane Nui Stream tributary No. 3	East Branch Honokane Nui Stream	Lat 20°06'27", long 155°43'32", at trail crossing, 2.0 miles east of Puu Pala, and 6.7 miles northwest of Kamuela.			2-14-68 3-11-68 7- 2-68	.08 .02 .08
East Branch Honokane Nui Stream tributary No. 4	East Branch Honokane Nui Stream	Lat 20°06'40", long 155°43'40", at trail crossing, 1.8 miles east of Puu Pala, and 7.0 miles northwest of Kamuela.			2-14-68 3-11-68 7- 2-68	.11 .10 .09
East Branch Honokane Nui Stream	Honokane Nui Stream	Lat 20°08'58", long 155°43'59", at trail crossing, 0.2 mile above confluence with West Branch, and 5.3 miles south of Niulii.		1964-67	11- 1-67 12-12-67 1-23-68 3-12-68 4-24-68 6- 4-68 7-23-68 9-18-68	✓b350 7.93 28.8 2.39 8.19 3.57 10.6 .88
West Branch Honokane Nui Stream	Honokane Nui Stream	Lat 20°07'18", long 155°45'07", 0.9 mile north of Puu Pala and 8.5 miles northwest of Kamuela.			2-14-68	.14
West Branch Honokane Nui Stream tributary	West Branch Honokane Nui Stream	Lat 20°07'03", long 155°44'26", between trail crossing and Kehena ditch intake, 1.2 miles northeast of Puu Pala, and 7.8 miles northwest of Kamuela.			3-11-68 6- 7-68 7- 2-68	.06 .04 .06
Lanikepu Gulch	Keanuiomano Stream	Lat 20°01'58", long 155°42'14", at culvert on Highway 25, 0.2 mile northwest of Waiaka, and 2.2 miles west of Kamuela.			4-20-68	✓1,470
Waiulaula Gulch	Kawaihae Bay	Lat 20°00'49", long 155°48'58", at upstream side of new Kawaihae-Puako Road and 2.1 miles southeast of Kawaihae.		1967	4-20-68	✓4,800

✓ Peak flow.
a Estimated.
b About.

Discharge measurements made at miscellaneous sites during water year 1968--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Hawaii, Island of Hawaii--Continued						
Kamakoa Gulch tributary	Kamakoa Gulch	Lat 19°56'56", long 155°41'00", at upstream side of Highway 19, 0.8 mile northeast of Saddle Road junction, and 5.2 miles south of Kamuela.		1967	4-20-68	≠1,320
Kawa Springs	Pacific Ocean	Lat 19°06'51", long 155°31'47", 0.2 mile southwest of Keeku Heiau and 2.0 miles northeast of sugar mill at Honuapo.		1964-67	4-16-68 5-14-68 6-10-68	12.9 6.51 6.61
Ninole Springs	Pacific Ocean	Lat 19°07'57", long 155°30'54", 0.7 mile southwest of Punaluu and 3.6 miles northeast of Honuapo.		1963-67	4-16-68 5-14-68 6-10-68	33.7 29.6 29.0
Mariana Islands, Island of Saipan						
West Achugau Stream	Philippine Sea	Lat 15°14'20" N., long 145°46'06" E., 0.7 mile above mouth and 1.2 miles east of Tanapag.			8-30-68	.32
Ryukyu Islands, Island of Okinawa						
Taiho-okawa	East China Sea	Lat 26°39'10" N., long 128°08'19" E., at pumping station, 0.7 mile east of Taiho, and 2.0 miles northwest of Taira.			10-16-67	3.28
South Fork Henan-gawa	Henan-gawa	Lat 26°37'49" N., long 128°05'47" E., 15 ft below confluence of Right and Left Branches, and 1.6 miles south of Tsuha.			9-12-68	4.21
South Fork Henan-gawa	Henan-gawa	Lat 26°38'32" N., long 128°05'30" E., 60 ft above confluence with North Fork and 0.8 mile south of Tsuha.			1-24-68	1.27
North Fork Henan-gawa	Henan-gawa	Lat 26°38'32" N., long 128°05'32" E., 80 ft above confluence with South Fork and 0.8 mile south of Tsuha.			1-24-68	.83
Nagata-gawa	Hiza-gawa	Lat 26°22'46" N., long 127°46'12" E., 1.6 miles northeast of Kadena traffic circle and 3.2 miles northwest of Chibana.			11-15-67	1.46
Nagata-gawa	Hiza-gawa	Lat 26°22'31" N., long 127°46'05" E., 1.3 miles northeast of Kadena traffic circle and 3.2 miles northwest of Chibana.			11-15-67	1.49
Nagata-gawa	Hiza-gawa	Lat 26°22'26" N., long 127°45'53" E., 0.9 mile above mouth and 1.0 mile northeast of Kadena traffic circle.		1964-65, 1967	11-15-67	1.70
Nagata-gawa tributary	Nagata-gawa	Lat 26°22'26" N., long 127°45'52" E., 100 ft above mouth and 1.0 mile northeast of Kadena traffic circle.			11-15-67	.43
Miyagi-gawa	Pacific Ocean	Lat 26°37'33" N., long 128°11'08" E., 0.3 mile north of Miyagi, 0.7 mile above Highway 13, and 1.1 miles east of Kawata.			1-24-68	1.11
Ara-kawa	Pacific Ocean	Lat 26°39'43" N., long 128°15'22" E., at Arakawa, 100 ft above bridge on access road, 0.5 mile above mouth, and 4.0 miles southwest of Aha.			10-16-67 12-21-67 1-24-68	2.18 5.10 3.77
Ara-kawa tributary	Ara-kawa	Lat 26°39'43" N., long 128°15'25" E., 30 ft above mouth, 450 ft northeast of Takae-sho-chugakko, and 0.2 mile east of Arakawa.			10-16-67 12-21-67	.15 .40
Fun-gawa	Aha-gawa	Lat 26°42'51" N., long 128°17'19" E., 700 ft above mouth and 0.2 mile east of Aha School.			10-30-67	13.9

≠ Peak flow.

Discharge measurements made at miscellaneous sites during water year 1968--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Caroline Islands, Yap Islands						
Dalibaech Stream, Yap	Pacific Ocean	Lat 9°30'26" N., long 138°06'06" E., at inflow to reservoir, 20 ft below confluence of Thalomar and Dinay Streams, and 1.4 miles southwest of Colonia.			9-21-65 9-23-65	0.19 .46
Caroline Islands, Truk Islands						
Wichen River, Moen	Truk Lagoon	Lat 7°26'41" N., long 151°51'58" E., 1.1 miles above mouth and 1.7 miles west of Saint Xaviers Academy.			10-18-67	.37
Wichen River, Moen	Truk Lagoon	Lat 7°26'47" N., long 151°52'06" E., 0.9 mile above mouth and 1.6 miles west of Saint Xaviers Academy.			3-16-66 3-17-66	.08 6.36
Caroline Islands, Island of Ponape						
Unnamed stream	Pacific Ocean	Lat 6°55'44" N., long 158°11'42" E., 0.7 mile southwest of Rekisau and 3.1 miles southwest of Kolonia.			10-16-67	.42
Samoa Islands, Island of Tutuila						
Vaipito Stream	Pago Pago Harbor	Lat 14°16'48" S., long 170°42'14" W., 100 ft above pump house, 200 ft below Pago Stream, and 0.2 mile southwest of highway junction in Pago Pago.			9-26-68	.82
Vaipito Stream	Pago Pago Harbor	Lat 14°16'47" S., long 170°42'14" W., 150 ft below pump house, 450 ft below Pago Stream, and 0.2 mile southwest of highway junction in Pago Pago.			9-26-68	.40

United States Department of the Interior
Geological Survey - Water Resources Division

WATER RESOURCES DATA
FOR
HAWAII AND OTHER PACIFIC AREAS

1968

Part 2. Water Quality Records

Prepared in cooperation with

City and County of Honolulu
Corps of Engineers, U.S. Army

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Part 2. Water Quality Records

(Symbols 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, 1968

Part 2. Water Quality Records

INTRODUCTION

Water-resources investigations of the U.S. Geological Survey include the collection of water-quality data on the chemical and physical characteristics of surface- and ground-water supplies of the Nation. These data for the 1968 water year for the quality of surface waters in Hawaii and Okinawa are presented in this report. The data were collected by the Water Resources Division of the U.S. Geological Survey under the direction of Mearle M. Miller, district chief.

Water-quality information is presented for chemical quality, water temperatures, 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. 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.

The Geological Survey, from 1941 through 1965, published an annual series of water-supply papers, "Quality of Surface Waters of the United States," which contained the chemical-quality, temperature, and suspended-sediment data of the water. Each volume covered an area whose boundaries coincided with those of certain natural drainage areas. These publications are available in most public libraries. Beginning with the 1964 water year, water-quality records for surface and ground water have been released by the Geological Survey on a state boundary basis. This report is primarily for local and immediate use, and its distribution is limited. These records will be published later in Geological Survey water-supply papers.

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/1) 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, subtract 32° and divide by 1.8. (See section "Definition of Terms and Abbreviations" for further information.)

COOPERATION

Compilation of this report was done by the U.S. Geological Survey under cooperative agreement with the city and county of Honolulu and with assistance in the form of funds given by the Corps of Engineers, U.S. Army.

DEFINITION OF TERMS AND ABBREVIATIONS

A number of terms and abbreviations commonly used in relation to hydrologic data are defined in Part 1 of this report. Other terms related especially to water quality are as follows:

Color in water analysis refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. A color less than 10 units generally passes unnoticed. Some swamp waters have natural color of 200 to 300 units or more.

Discharge in its simplest concept, means outflow; therefore, the use of this term is not restricted as to course or location. In this report it represents the total fluids measured in the stream.

Mean discharge is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at time of sampling. If this discharge is reported instead of the daily mean, the heading of the discharge column is "Discharge (cfs)."

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

Hardness of water is the property of water attributable to the presence of alkaline earths and is expressed as equivalent calcium carbonate ($CaCO_3$). Hardness is a physical-chemical characteristic, not a substance.

Milligrams per liter (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 per liter may be converted to milliequivalents per liter by multiplying by the factors in table 1, page 270. Concentration of suspended sediment expressed in milligrams per liter is based on the weight of sediment in a liter of water-sediment mixture. Sediment concentrations that are expressed in parts per million may be converted to milligrams per liter by using the factors in table 2, page 270.

Particle size is the diameter, in millimeters (mm) of suspended sediment or bed material determined by sieve and sedimentation methods.

Table 1.--Factors for conversion of chemical constituents in milligrams 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

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.

Particle-size classification used in this report agrees closely with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology (Lane and others, 1947, p. 937). 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.

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.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks and 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 vary in the same source with changes in the composition of the water.

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reaction 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.

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.

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

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1968, is called the "1968 water year."

STATION NUMBERS

A station number has been assigned as an added means of identification for each stream location where regular measurements of streamflow and determinations of water quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of 2 digits followed by a hyphen and a 6-digit number. The notation to the left of the hyphen identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The number to the right of the hyphen represents the position of the location in the standard downstream order listing the stations within each of the parts. The assigned numbers are in numerical order but are not consecutive. They are so selected from the complete 6-digit-number scale that intervening

numbers will be available for future assignments to new locations. The identification number for each station in this report is printed to the left of the station name and contains only the essential digits. For example, the number is printed as 1-2345 for a station whose complete identification number is 01-2345.00.

COLLECTION AND EXAMINATION OF SAMPLES

Water samples for analyses usually are collected at or near points on streams where gaging stations are maintained by the U.S. Geological Survey for measurement of water discharge. These discharge records are published in Part 1 of this report. Some of these records are used in conjunction with the computations of the chemical constituents and sediment loads in this report.

Data on the quality of surface water were collected daily at some sites and less frequently at other sites.

Solutes

The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Rainwater and Thatcher (1960). 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 the mixing of the stream. Some streams must be sampled at several verticals across the channel to determine accurately the solute load.

Temperature

Water temperatures were measured at most of the water-quality stations. For daily stations, the water temperatures were taken at about the same time each day in order that the data would not reflect diurnal variations in water temperature. Most large streams have a small diurnal temperature change; small, shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature.

Table 3.--Temperature conversion table, degrees Fahrenheit (°F) to degrees Celsius (°C)
Report temperature to nearest °C

°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
32	0	45	7	58	14	71	22	84	29	97	36	110	43
33	1	46	8	59	15	72	22	85	29	98	37	111	44
34	1	47	8	60	16	73	23	86	30	99	37	112	44
35	2	48	9	61	16	74	23	87	31	100	38	113	45
36	2	49	9	62	17	75	24	88	31	101	38	114	46
37	3	50	10	63	17	76	24	89	32	102	39	115	46
38	3	51	11	64	18	77	25	90	32	103	39	116	47
39	4	52	11	65	18	78	26	91	33	104	40	117	47
40	4	53	12	66	19	79	26	92	33	105	41	118	48
41	5	54	12	67	19	80	27	93	34	106	41	119	48
42	6	55	13	68	20	81	27	94	34	107	42	120	49
43	6	56	13	69	21	82	28	95	35	108	42	121	49
44	7	57	14	70	21	83	28	96	36	109	43	122	50

Sediment

At some stations, suspended-sediment samples were collected daily with depth-integrating cable-suspended samplers from fixed sampling points at three or more verticals in the cross section. A hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at many verticals in the cross section to determine the ratio of the cross-sectional distribution of the concentration of suspended sediment to the daily sampling verticals.

During periods of high or rapidly changing flow, samples were taken twice or more often throughout the day at most stations. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

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MISCELLANEOUS ANALYSES OF STREAMS IN HAWAII

ISLAND OF OAHU

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(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
16-2000. NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA (LAT 21°31'09", LONG 157°56'53")																	
JAN 2, 1968	1625	19	17	14	.64	--	--	--	--	--	--	--	--	--	--	--	
16-2080. SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA (LAT 21°29'32", LONG 157°59'55")																	
JAN 3, 1968	1225	20	9.2	5	.12	--	--	--	--	--	--	--	--	--	--	--	
16-2085. RIGHT BRANCH OF SOUTH FORK KAUKONAHUA STREAM NEAR WAHIAWA (LAT 21°29'58", LONG 157°59'07")																	
JAN 3, 1968	1445	21	2.8	5	.04	--	--	--	--	--	--	--	--	--	--	--	
16-2110. POAMOHO STREAM NEAR WAHIAWA (LAT 21°31'24", LONG 157°58'55")																	
DEC 28, 1967	1025	21	.10	1	0	--	--	--	--	--	--	--	--	--	--	--	
16-2116. MAKAHA STREAM NEAR MAKAHA (LAT 21°30'16", LONG 158°10'59")																	
DEC 14, 1967	1300	18	5.2	37	.52	--	--	--	--	--	--	--	--	--	--	--	
16-2128. KIPAPA STREAM NEAR WAHIAWA (LAT 21°28'15", LONG 157°57'50")																	
JAN 4, 1968	1105	20	2.9	2	.02	--	--	--	--	--	--	--	--	--	--	--	
MAY 8.....	1400	22	2.1	1	.01	--	--	--	--	--	--	--	--	--	--	--	
16-2129. KIPAPA STREAM NEAR WAIPAHU (LAT 21°24'33", LONG 158°01'14")																	
DEC 18, 1967	1000	22	245	585	387	39	56	--	88	--	97	100	--	--	--	--	VPWC
DEC 18.....	1240	22	132	300	107	34	48	--	78	--	93	98	99	100	--	--	VPWC
DEC 19.....	1030	--	24	27	1.7	--	--	--	--	--	--	--	--	--	--	--	
MAR 25, 1968	1510	22	28	18	1.4	--	--	--	--	--	--	--	--	--	--	--	
MAY 8.....	1105	23	1.2	3	.01	--	--	--	--	--	--	--	--	--	--	--	
16-2130. WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48")																	
NOV 24, 1967	1120	18	133	193	69	--	--	--	--	--	99	100	--	--	--	--	
NOV 24.....	1400	18	106	166	48	--	--	--	--	--	--	--	--	--	--	--	S
DEC 18.....	0845	--	844	1050	2390	40	50	63	78	87	92	98	99	100	--	--	
DEC 18.....	0910	--	809	990	2160	--	--	--	--	--	--	--	--	--	--	--	VPWC
JAN 5, 1968	1030	19	655	1400	2480	39	51	64	77	86	92	95	97	99	100	--	VPWC
JAN 5.....	1100	19	606	1360	2230	--	--	--	--	--	--	--	--	--	--	--	
JAN 5.....	1115	19	535	1100	1740	--	--	--	--	--	--	--	--	--	--	--	
JAN 5.....	1145	19	515	958	1330	42	55	--	83	--	95	98	99	100	--	--	
JAN 5.....	1230	19	432	828	966	--	--	--	--	--	--	--	--	--	--	--	VPWC
JAN 16.....	1350	--	1460	3210	12700	44	54	66	80	88	93	98	99	100	--	--	VPWC
JAN 16.....	1410	--	1440	2820	11000	--	--	--	--	--	--	--	--	--	--	--	
JAN 27.....	0945	20	655	2170	3840	--	--	--	--	--	--	--	--	--	--	--	
JAN 27.....	1010	20	571	1900	2930	47	59	71	84	92	96	99	100	--	--	--	
JAN 27.....	1035	20	426	1600	1840	49	59	--	84	--	97	99	100	--	--	--	VPWC
JAN 27.....	1110	20	362	1430	1400	--	--	--	--	--	--	--	--	--	--	--	VPWC
JAN 27.....	1410	20	286	583	450	--	--	--	--	--	--	--	--	--	--	--	
JAN 27.....	1425	20	270	519	378	--	--	--	--	--	--	--	--	--	--	--	
JAN 27.....	1440	20	245	488	323	--	--	--	--	--	97	99	100	--	--	--	S
MAR 25.....	1030	21	118	53	17	--	--	--	--	--	--	--	--	--	--	--	
MAY 10.....	0855	22	83	88	20	--	--	--	--	--	98	99	100	--	--	--	S
MAY 10.....	0930	22	102	90	25	--	--	--	--	--	96	98	100	--	--	--	S
JUN 26.....	0925	24	18	6	.29	--	--	--	--	--	--	--	--	--	--	--	
AUG 6.....	0755	22	16	15	.65	--	--	--	--	--	--	--	--	--	--	--	
16-2160. WAIAWA STREAM NEAR PEARL CITY (LAT 21°23'55", LONG 157°58'50")																	
NOV 24, 1967	1210	23	165	200	89	--	--	--	--	--	91	92	94	100	--	--	V
DEC 15.....	1300	21	13	6	.21	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1000	21	418	384	433	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1035	21	330	329	293	--	--	--	--	--	--	--	--	--	--	--	
JAN 5, 1968	1345	21	505	1130	1540	56	68	76	86	95	98	99	99	100	--	--	VPWC
JAN 5.....	1450	21	418	1240	1400	--	--	--	--	--	--	--	--	--	--	--	
16-2230. WAIMALU STREAM NEAR AIEA (LAT 21°23'34", LONG 157°57'03")																	
NOV 24, 1967	1250	22	33	30	2.7	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1354	22	77	34	7.1	--	--	--	--	--	--	--	--	--	--	--	
DEC 19.....	1330	22	16	6	.26	--	--	--	--	--	--	--	--	--	--	--	
JAN 5, 1968	1225	--	112	184	56	--	--	--	--	--	88	91	92	97	100	--	S
16-2245. KALAUAO STREAM AT MOANALUA ROAD, AT AIEA (LAT 21°23'07", LONG 157°56'22")																	
DEC 18, 1967	1340	22	37	35	3.5	--	--	--	--	--	--	--	--	--	--	--	
16-2289. KALIHI STREAM NEAR KANEOHE (LAT 21°22'35", LONG 157°49'32")																	
MAR 15, 1968	1455	19	23	50	3.1	--	--	--	--	--	--	--	--	--	--	--	

ISLAND OF OAHU--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(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
16-2293. KALIHI STREAM AT KALIHI (LAT 21°20'29", LONG 157°52'36")																	
NOV 30, 1967	0820	21	11	7	.21	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1000	22	153	79	33	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1015	22	150	80	32	--	--	--	--	--	93	96	98	100	--	--	S
DEC 18.....	1150	22	118	46	15	--	--	--	--	--	--	--	--	--	--	--	
JAN 27, 1968	1000	19	125	80	27	--	--	--	--	--	94	97	99	100	--	--	S
JAN 27.....	1420	19	74	53	11	--	--	--	--	--	97	99	100	--	--	--	S
MAR 8.....	1220	22	3.3	2	.02	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	0905	19	220	68	40	--	--	--	--	--	84	89	95	100	--	--	S
MAR 28.....	1030	22	18	5	.24	--	--	--	--	--	--	--	--	--	--	--	
APR 25.....	1425	23	22	30	1.8	--	--	--	--	--	98	100	--	--	--	--	S
MAY 27.....	1300	27	2.6	13	.09	--	--	--	--	--	--	--	--	--	--	--	
JUL 8.....	1000	26	1.1	6	.02	--	--	--	--	--	--	--	--	--	--	--	
JUL 25.....	1500	28	1.2	8	.03	--	--	--	--	--	--	--	--	--	--	--	
AUG 27.....	1210	27	1.1	29	.09	--	--	--	--	--	--	--	--	--	--	--	
SEP 25.....	1200	26	.75	13	.03	--	--	--	--	--	--	--	--	--	--	--	
16-2490. WAIMANALO STREAM AT WAIMANALO (LAT 21°21'12", LONG 157°43'52")																	
JAN 27, 1968	1115	--	67	301	54	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	1345	--	80	230	50	--	--	--	--	--	--	--	--	--	--	--	
16-2540. MAKAWAO STREAM NEAR KAILUA (LAT 21°21'49", LONG 157°46'02")																	
DEC 18, 1967	1455	--	52	23	3.2	--	--	--	--	--	--	--	--	--	--	--	
MAR 13, 1968	1340	--	32	52	4.5	--	--	--	--	--	--	--	--	--	--	--	
16-2605. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48")																	
OCT 24, 1967	1400	24	14	17	.64	--	--	--	--	--	--	--	--	--	--	--	
NOV 27.....	1400	22	14	23	.87	--	--	--	--	--	--	--	--	--	--	--	
DEC 10.....	1555	--	183	263	130	--	--	--	--	--	--	--	--	--	--	--	
DEC 10.....	1625	--	151	184	75	--	--	--	--	--	--	--	--	--	--	--	
DEC 10.....	1700	--	125	135	46	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	0850	--	630	680	1160	--	--	--	--	--	77	90	100	--	--	--	V
DEC 18.....	0955	--	410	502	556	--	--	--	--	--	85	98	100	--	--	--	V
DEC 18.....	1040	--	304	420	345	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1130	--	258	320	223	--	--	--	--	--	85	98	100	--	--	--	V
JAN 3, 1968	1350	--	24	24	1.6	--	--	--	--	--	--	--	--	--	--	--	
JAN 16.....	1330	--	1550	1560	6530	32	44	57	67	75	80	87	95	100	--	--	VPWC
JAN 16.....	1410	--	515	810	1130	37	49	--	72	--	87	95	99	100	--	--	VPWC
JAN 16.....	1450	--	300	623	505	--	--	--	--	--	86	97	100	--	--	--	V
MAR 14.....	1010	--	370	260	260	--	--	--	--	--	79	93	100	--	--	--	V
APR 17.....	1000	--	38	24	2.5	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	1430	24	11	4	.12	--	--	--	--	--	--	--	--	--	--	--	
JUL 9.....	1110	24	8.6	28	.65	--	--	--	--	--	--	--	--	--	--	--	
AUG 20.....	0830	24	5.4	9	.13	--	--	--	--	--	--	--	--	--	--	--	
16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23' 42",LONG 157°48'26")																	
OCT 9, 1967	1400	23	13	7	.25	--	--	--	--	--	--	--	--	--	--	--	
NOV 21.....	0930	22	7.8	4	.08	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	0905	23	11	16	.48	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	1550	23	56	371	56	--	--	--	--	--	98	99	99	100	--	--	S
DEC 18.....	1100	21	79	118	25	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1440	22	39	85	9.0	--	--	--	--	--	--	--	--	--	--	--	
DEC 22.....	1010	22	21	26	1.5	--	--	--	--	--	--	--	--	--	--	--	
JAN 16, 1968	1435	20	211	1000	570	33	46	60	74	86	92	98	100	--	--	--	VPWC
JAN 16.....	1545	20	156	366	154	--	--	--	--	--	88	96	100	--	--	--	V
JAN 27.....	0950	19	178	455	219	--	--	--	--	--	87	95	100	--	--	--	V
JAN 27.....	1005	19	125	385	130	--	--	--	--	--	85	94	100	--	--	--	V
JAN 27.....	1035	20	81	321	70	--	--	--	--	--	86	97	100	--	--	--	V
FEB 13.....	0955	20	15	2	.08	--	--	--	--	--	--	--	--	--	--	--	
FEB 21.....	1010	22	36	152	15	--	--	--	--	--	--	--	--	--	--	--	
FEB 21.....	1045	22	30	94	7.6	--	--	--	--	--	--	--	--	--	--	--	
FEB 21.....	1115	22	25	68	4.6	--	--	--	--	--	--	--	--	--	--	--	
MAR 8.....	1415	22	13	2	.07	--	--	--	--	--	--	--	--	--	--	--	
MAR 12.....	0830	21	29	80	6.3	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	0915	19	330	256	228	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	1245	20	149	138	56	--	--	--	--	--	85	94	100	--	--	--	V
APR 10.....	0930	--	20	18	.97	--	--	--	--	--	--	--	--	--	--	--	
MAY 31.....	0910	22	15	6	.24	--	--	--	--	--	--	--	--	--	--	--	
JUL 10.....	0815	22	9.4	3	.08	--	--	--	--	--	--	--	--	--	--	--	
AUG 20.....	1315	23	6.7	2	.04	--	--	--	--	--	--	--	--	--	--	--	

MISCELLANEOUS ANALYSES OF STREAMS IN HAWAII--Continued

ISLAND OF OAHU--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
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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
16-2739. KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12")																	
OCT 10, 1967	1335	23	14	5	.19	--	--	--	--	--	--	--	--	--	--	--	
NOV 22.....	0935	22	12	13	.42	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	1030	22	12	33	1.1	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	1630	22	97	530	139	47	60	--	90	--	95	96	98	100	--	--	SPWC
DEC 18.....	0945	21	136	190	70	48	57	--	86	--	97	98	100	--	--	--	SPWC
DEC 22.....	1330	22	24	5	.32	--	--	--	--	--	--	--	--	--	--	--	
JAN 16, 1968	1330	19	980	1870	4950	30	42	55	71	86	91	97	99	100	--	--	VPWC
JAN 16.....	1400	19	376	1150	1170	34	48	62	79	92	97	99	100	--	--	--	VPWC
JAN 16.....	1605	20	93	270	68	--	--	--	--	--	--	--	--	--	--	--	
FEB 13.....	1120	22	17	2	.09	--	--	--	--	--	--	--	--	--	--	--	
MAR 12.....	1200	--	29	26	2.0	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	1110	19	208	147	83	--	--	--	--	--	93	95	96	100	--	--	S
MAR 14.....	1220	19	172	154	72	--	--	--	--	--	--	--	--	--	--	--	
MAR 14.....	1340	20	115	95	29	--	--	--	--	--	--	--	--	--	--	--	
MAR 28.....	0855	21	39	114	12	--	--	--	--	--	97	99	100	--	--	--	S
APR 23.....	0945	23	30	5	.41	--	--	--	--	--	--	--	--	--	--	--	
JUN 4.....	0930	23	18	5	.24	--	--	--	--	--	--	--	--	--	--	--	
JUL 10.....	1050	26	14	21	.79	--	--	--	--	--	--	--	--	--	--	--	
AUG 23.....	1300	--	9.0	13	.32	--	--	--	--	--	--	--	--	--	--	--	
16-2835. KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15")																	
OCT 11, 1967	1340	23	5.7	4	.06	--	--	--	--	--	--	--	--	--	--	--	
NOV 21.....	1540	23	5.3	3	.04	--	--	--	--	--	--	--	--	--	--	--	
NOV 29.....	1130	22	6.1	14	.23	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1035	22	85	65	15	--	--	--	--	--	88	93	96	100	--	--	V
DEC 18.....	1200	22	65	48	8.4	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1420	22	58	37	5.8	--	--	--	--	--	--	--	--	--	--	--	
DEC 19.....	0950	22	25	9	.61	--	--	--	--	--	--	--	--	--	--	--	
FEB 16, 1968	1300	--	14	12	.45	--	--	--	--	--	--	--	--	--	--	--	
MAR 13.....	1330	--	32	67	5.8	--	--	--	--	--	97	99	100	--	--	--	S
MAR 14.....	0910	--	200	263	142	--	--	--	--	--	69	75	81	92	100	--	V
MAR 14.....	1030	--	218	238	140	--	--	--	--	--	70	76	84	96	100	--	V
MAR 14.....	1110	--	245	302	200	22	28	--	46	--	59	64	69	81	100	--	VPWC
MAR 14.....	1135	--	252	296	201	--	--	--	--	--	68	73	79	90	100	--	V
MAR 28.....	0945	22	83	383	86	61	65	--	92	--	96	98	99	100	--	--	VPWC
APR 24.....	1400	23	15	9	.36	--	--	--	--	--	--	--	--	--	--	--	
MAY 29.....	0915	23	8.1	11	.24	--	--	--	--	--	--	--	--	--	--	--	
JUL 12.....	1015	24	5.0	9	.12	--	--	--	--	--	--	--	--	--	--	--	
AUG 28.....	0800	24	3.2	8	.07	--	--	--	--	--	--	--	--	--	--	--	
16-2845. WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'26")																	
OCT 11, 1967	1530	24	14	20	.76	--	--	--	--	--	--	--	--	--	--	--	
NOV 22.....	1110	21	12	21	.68	--	--	--	--	--	--	--	--	--	--	--	
NOV 24.....	1110	22	20	42	2.3	--	--	--	--	--	--	--	--	--	--	--	
DEC 18.....	1305	22	51	123	17	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1440	22	19	16	.82	--	--	--	--	--	--	--	--	--	--	--	
JAN 5, 1968	1305	21	23	59	3.7	--	--	--	--	--	--	--	--	--	--	--	
JAN 16.....	1500	20	92	583	145	--	--	--	--	--	--	--	--	--	--	--	
JAN 16.....	1520	20	72	389	76	--	--	--	--	--	75	80	86	97	100	--	V
MAR 14.....	1230	19	109	1440	424	40	51	63	80	91	96	98	99	100	--	--	VPWC
MAR 14.....	1415	19	90	830	202	38	48	65	84	91	96	99	99	100	--	--	VPWC
MAR 28.....	1010	21	75	322	65	--	--	--	--	--	79	87	94	98	100	--	V
APR 25.....	0815	21	22	19	1.1	--	--	--	--	--	--	--	--	--	--	--	
MAY 27.....	1310	26	13	13	.46	--	--	--	--	--	--	--	--	--	--	--	
JUL 12.....	1200	24	12	10	.32	--	--	--	--	--	--	--	--	--	--	--	
AUG 27.....	0945	24	10	13	.35	--	--	--	--	--	--	--	--	--	--	--	
16-3290. KAIWIKOELE STREAM TRIBUTARY NEAR MAUNAWAI (LAT 21°36'49", LONG 158°01'23")																	
JAN 5, 1968	1045	19	4.9	38	.50	--	--	--	--	--	--	--	--	--	--	--	
16-3300. KAMANANUI STREAM AT MAUNAWAI (LAT 21°38'20"), LONG 158°03'27")																	
DEC 26, 1967	1325	21	11	8	.24	--	--	--	--	--	--	--	--	--	--	--	
DEC 27.....	1620	21	7.8	8	.17	--	--	--	--	--	--	--	--	--	--	--	
16-3430. HELEMANO STREAM AT HALEIWA (LAT 21°34'40", LONG 158°06'12")																	
DEC 27, 1967	1010	21	3.1	10	.08	--	--	--	--	--	--	--	--	--	--	--	
16-3450. OPAEULA STREAM NEAR WAHIAWA (LAT 21°33'55", LONG 158°00'10")																	
DEC 28, 1967	1215	18	4.3	6	.07	--	--	--	--	--	--	--	--	--	--	--	

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA

LOCATION.--Lat 26°36'28" N., long 128°01'16" E., at gaging station 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.
RECORDS AVAILABLE.--Water temperatures: October 1966 to September 1968.
Sediment records: October 1966 to September 1968.
EXTREMES, 1967-68.--Water temperatures: Maximum, 34°C Aug. 6; minimum, 10°C Dec. 14.
Sediment concentrations: Maximum daily, 380 mg/l Mar. 29; minimum daily, 1 mg/l on many days.
Sediment loads: Maximum daily, 575 tons Mar. 29; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1966-68.--Water temperatures: Maximum, 34°C Aug. 6, 1968; minimum, 10°C Dec. 14, 1967.
Sediment concentrations: Maximum daily, 718 mg/l June 13, 1967; minimum daily, 1 mg/l on many days each year.
Sediment loads: Maximum daily, 1,950 tons June 4, 1967; minimum daily, less than 0.05 ton on many days each year.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	SILICA (SIO2)	DISSOLVED IRON (FE)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)
OCT. 31...	8.7	14	.10	7.6	4.2	--	--	33	0	11	24
FEB. 29...	5.7	14	.10	7.2	5.0	14	3.0	37	0	13	22

DATE	FLUORIDE (F)	NITRATE (NO3)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	DISSOLVED SOLIDS (TONS PER AC-FT)	HARDNESS (CA,MG)	NONCARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
OCT. 31...	.1	.6	100	.14	27	0	--	135	7.3	7
FEB. 29...	.1	.0	100	.14	30	0	1.0	130	7.5	5

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

MONTH	DAY 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVERAGE
OCTOBER..	23	22	22	24	23	24	23	26	24	26	23	20	21	26	24	26	24	24	24	24	23	21	--	--	22	22	21	21	23	23	24	23
NOVEMBER.	23	24	21	24	24	22	26	24	24	24	24	22	20	21	21	22	23	23	22	22	21	23	21	18	22	21	22	24	22	18	--	22
DECEMBER.	18	--	17	18	18	21	18	14	19	16	17	17	18	10	12	17	17	18	17	17	13	15	15	13	16	16	17	14	11	12	14	16
JANUARY..	13	15	--	16	14	16	19	11	11	12	14	16	17	17	13	14	16	16	16	14	14	14	13	14	13	12	18	19	18	15	14	15
FEBRUARY.	13	13	13	13	13	14	14	12	13	13	11	14	14	14	15	14	15	14	14	11	12	14	13	12	12	12	13	11	16	--	--	13
MARCH....	14	14	14	14	16	15	14	13	15	17	17	15	16	16	16	16	17	16	16	17	16	14	16	18	18	17	18	18	18	17	17	16
APRIL....	16	16	18	16	16	16	18	17	18	18	18	16	16	18	18	17	20	19	17	18	16	17	16	18	18	17	18	17	18	18	--	17
MAY.....	23	21	21	23	23	23	22	21	24	23	24	23	21	21	22	22	22	24	21	23	21	21	21	21	23	22	25	23	24	25	25	23
JUNE.....	25	24	24	21	24	25	26	27	24	21	24	26	24	26	24	25	26	25	24	24	23	23	23	24	23	24	25	24	26	26	--	24
JULY.....	25	26	--	26	26	26	26	27	27	26	27	26	24	26	26	27	27	26	27	27	27	26	26	26	27	27	27	27	27	27	27	26
AUGUST...	27	32	32	32	32	34	27	27	29	30	24	26	24	24	24	24	24	26	24	24	24	24	24	24	29	29	29	26	28	24	24	27
SEPTEMBER	24	27	29	30	30	29	28	29	29	24	26	25	24	30	29	28	31	31	31	32	24	24	26	24	28	29	29	30	29	29	--	28

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	4.2	8	0.1	6.5	2	T	5.3	3	T
2	2.3	3	T	5.8	2	T	5.7	3	T
3	1.9	2	T	6.5	3	0.1	22	26	1.5
4	3.1	8	.1	5.1	2	T	12	8	.3
5	3.1	5	T	4.7	2	T	9.3	12	.3
6	2.4	3	T	6.5	3	.1	14	10	.4
7	1.6	2	T	5.1	2	T	13	8	.3
8	1.4 C	2	T	4.7	2	T	10	5	.1
9	1.4 C	2	T	4.7	2	T	8.2	3	.1
10	1.4	2	T	4.7	2	T	7.6	3	.1
11	1.4 C	2	T	4.7	2	T	7.1	2	T
12	1.4 C	2	T	19	20 S	2.0	6.5	2	T
13	1.3 C	2	T	8.7	3	.1	6.0	2	T
14	1.4 C	2	T	6.5	2	T	8.0	12	.3
15	1.2 C	2	T	5.8	2	T	6.9	6	.1
16	1.1	4	T	5.1	1	T	6.0	3	T
17	7.9	22 S	.6	5.1	1	T	5.7	2	T
18	15	14 S	.9	16	9 S	.9	6.5	6	.1
19	9.8	10	.3	15	8	.3	5.7	3	T
20	4.0	6	.1	10	5	.1	5.2	2	T
21	2.9	3	T	8.2	4	.1	5.2	3	T
22	2.2	2	T	6.9 C	3	.1	4.8	2	T
23	2.0	2	T	6.0 C	3	T	4.7	2	T
24	4.1	9 S	.2	5.0 C	2	T	4.6	2	T
25	43	29 S	6.6	4.2 C	2	T	4.6	2	T
26	57	36 S	5.5	3.7 C	2	T	4.6	2	T
27	159	137 S	124	3.3 C	2	T	11	16	.5
28	20	6	.3	3.0 C	2	T	6.9	6	.1
29	12	3	.1	7.4	8	.2	5.7	4	.1
30	9.7	2	.1	6.0	4	.1	5.1	2	T
31	8.7	2	T	--	--	--	5.0	2	T
TOTAL	387.9	--	139.2	203.9	--	4.6	232.9	--	4.9

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	4.7 C	2	T	5.1	2	T	20	18	1.0
2	4.6 C	2	T	12	14	0.5	11	5	.1
3	4.4 C	2	T	11	4	.1	9.7	4	.1
4	4.3 C	2	T	9.7	6	.2	7.6	3	.1
5	4.3 C	2	T	16	8	.3	6.7	3	.1
6	4.8	8	0.1	14	10	.4	6.2	3	.1
7	11	12	.4	31	10	.8	5.8	2	T
8	5.8	4	.1	33	5	.4	5.7	2	T
9	5.1	3	T	22 C	3	.2	5.4	2	T
10	4.7	2	T	14 C	3	.1	5.0	1	T
11	4.6	2	T	12	3	.1	5.0	1	T
12	4.1	1	T	9.7	2	.1	5.0	1	T
13	3.8	1	T	8.2	2	T	5.0	1	T
14	3.5	1	T	7.6	5	.1	5.0	1	T
15	3.3	1	T	16	16	.7	5.0	2	T
16	3.3	1	T	10	5	.1	5.1	3	T
17	3.1 C	1	T	8.7	3	.1	4.7 C	2	T
18	3.1 C	1	T	8.0	2	T	4.6 C	2	T
19	3.6	5	T	7.6	2	T	4.4	2	T
20	4.6	4	T	6.9	2	T	6.7	12	.2
21	3.6	3	T	6.3	2	T	9.0	7	.2
22	3.1	2	T	6.2	2	T	6.7	4	.1
23	3.1	1	T	6.2	2	T	14	24	.9
24	3.5	4	T	5.7	2	T	11	6	.2
25	6.4	8	.1	5.6 C	2	T	8.0	4	.1
26	4.4	4	T	5.4 C	2	T	7.2	6	.1
27	3.6	3	T	5.4	2	T	9.7	10	.3
28	3.4	2	T	5.4	2	T	8.7	5	.1
29	4.5	10	.1	5.7	2	T	185	389 S	575
30	11	10	.3	--	--	--	65	28	4.9
31	5.7	3	T	--	--	--	40	6	.6
TOTAL	143.0	--	1.7	314.4	--	4.7	497.9	--	584.5

S Computed by subdividing day.
T Less than 0.05 ton.
C Composite period.

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	APRIL MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)	MAY MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)	JUNE MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)
1	22	C	4		0.2	5.8	C	1		T	7.8		12		0.3
2	20	C	4		.2	5.8	C	1		T	10		4		.1
3	22	C	4		.2	5.6	C	1		T	6.3		3		.1
4	18		3		.1	5.4	C	1		T	6.0		2		T
5	15	C	2		.1	5.2	C	1		T	5.4	C	2		T
6	14	C	2		.1	5.1	C	1		T	4.8	C	2		T
7	12	C	2		.1	6.7		6		0.1	4.6	C	1		T
8	12	C	1		T	5.0		3		T	4.3	C	1		T
9	11	C	1		T	4.6	C	2		T	5.1		6	S	.1
10	11	C	1		T	4.3	C	2		T	12		8		.3
11	11	C	1		T	4.3	C	2		T	6.0		3		T
12	11		3		.1	4.2	C	2		T	5.8		3		T
13	10		2		.1	4.2	C	2		T	5.6		2		T
14	9.2	C	2		T	3.8	C	2		T	5.4		2		T
15	8.2	C	2		T	3.7	C	2		T	4.8		2		T
16	12		6		.2	3.6	C	2		T	4.8		2		T
17	8.4		4		.1	3.6		2		T	5.0		4		.1
18	7.4		2		T	6.4		12	S	.2	34		49	B	12
19	7.2		3		.1	6.0		5		.1	68		52	S	18
20	6.7		2		T	12		11	S	.5	116		55	S	35
21	38		6		.6	16		8		.3	66		10		1.8
22	25		28	B	5.0	7.2		5		.1	35		8		.8
23	12		3		.1	7.0		10		.2	25		4		.3
24	10		2		.1	9.7		8		.2	40		24	S	3.0
25	8.4		2		T	13		8	S	.3	22		5		.3
26	7.6	C	1		T	9.0		3		.1	16	C	3		.1
27	7.4	C	1		T	7.8		3		.1	14	C	3		.1
28	7.1	C	1		T	6.2		3		.1	13	C	3		.1
29	6.5	C	1		T	5.2	C	2		T	12	C	2		.1
30	6.0	C	1		T	4.7	C	2		T	11	C	2		.1
31	--		--		--	4.4	C	2		T	--		--		--
TOTAL	376.1		--		7.8	195.5		--		2.7	575.7		--		73.0

DAY	JULY MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)	AUGUST MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)	SEPTEMBER MEAN DISCHARGE (CFS)		MEAN CONCENTRATION (MG/L)		LOAD (TONS)
1	10	C	2		0.1	11		32	A	1.2	35		7		0.7
2	10	C	2		.1	8.6		23	S	.6	25		6		.4
3	10		3		.1	5.2		6		.1	17		4		.2
4	9.4		2		.1	4.8	C	3		T	14		4		.2
5	8.4		2		T	4.4	C	3		T	12		3		.1
6	8.5		5		.1	4.1	C	2		T	11		2		.1
7	22		12		.7	3.7	C	2		T	10		2		.1
8	10		6		.2	3.8		3		T	9.2		2		T
9	9.0		3		.1	4.4		7		.1	8.4		2		T
10	8.4	C	2		T	4.0		4		T	8.2		2		T
11	7.8	C	2		T	3.6		3		T	7.8		2		T
12	9.5		12		.3	3.4		2		T	7.6		2		T
13	9.2		8		.2	6.8		21	S	.5	7.1		2		T
14	7.2		5		.1	5.8		5		.1	6.7		2		T
15	6.0		3		T	21		38	B	2.6	6.7		2		T
16	5.6		3		T	11		16		.5	6.3		2		T
17	5.2	C	2		T	7.8		7		.1	6.2		2		T
18	5.1	C	2		T	5.8		4		.1	6.2		2		T
19	4.8	C	2		T	4.3		2		T	6.7		2		T
20	4.6		3		T	4.2		2		T	5.7		1		T
21	5.7		6		.1	5.7		14		.2	5.2		1		T
22	5.1		4		.1	5.8		7		.1	4.4		1		T
23	4.4		2		T	5.0		5		.1	7.0		6		.1
24	4.3	C	2		T	10		20	B	.9	8.9		5		.1
25	4.1	C	2		T	9.7		10	S	.3	5.1		4		.1
26	3.8	C	2		T	10		8		.2	4.6		3		T
27	4.1	C	2		T	8.4		5		.1	4.4		2		T
28	4.2	C	2		T	55		70	B	17	4.3		2		T
29	4.2		2		T	35		15		1.4	4.3		2		T
30	4.2		2		T	68		36	S	15	4.3		2		T
31	3.8		3		T	59		26		4.6	--		--		--
TOTAL	218.6		--		2.9	399.3		--		46.1	269.3		--		2.7

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 3814.5
TOTAL LOAD FOR YEAR (TONS) 874.8

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated concentration graph.
C Composite period.

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA

LOCATION.--Lat 26°38'16" N., long 128°10'13" E., at gaging station at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.
DRAINAGE AREA.--12 sq mi, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to September 1968.
Sediment records: May 1964 to September 1968.
EXTREMES, 1967-68.--Water temperatures: Maximum, 28°C Aug. 1; minimum, 10°C Jan. 17, Feb. 27.
Sediment concentrations: Maximum daily, 1,820 mg/l June 20; minimum daily, 1 mg/l on many days.
Sediment loads: Maximum daily, 13,900 tons June 20; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1964-68.--Water temperatures: Maximum, 31°C Aug. 16, 1967; minimum, 10°C Jan. 17, Feb. 27, 1968.
Sediment concentrations: Maximum daily, 4,500 mg/l June 23, 1965; minimum daily, 1 mg/l on many days each year.
Sediment loads: Maximum daily, 64,000 tons Aug. 5, 1965; minimum daily, less than 0.05 ton on many days each year.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DIS-CHARGE (CFS)	SILICA (SIO2)	DIS-SOLVED IRON (FE)	CAL-CIUM (CA)	MAG-NE-SIUM (MG)	SODIUM (NA)	PO-TAS-SIUM (K)	BICAR-BONATE (HCO3)	CAR-BONATE (CO3)	SULFATE (SO4)	CHLO-RIDE (CL)
JAN. 24...	8.5	18	.30	5.2	3.8	20	.5	32	0	11	26

DATE	FLUO-RIDE (F)	NITRATE (NO3)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	HARD-NESS (CA,MG)	NON-CAR-BONATE HARD-NESS	SODIUM AD-SORP-TION RATIO	SPECI-FIC COND-UCTANCE (MICRO-MHOS)	PH	COLOR
JAN. 24...	.1	.0	109	.15	26	0	1.6	128	7.6	15

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

MONTH	DAY 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVER-AGE
OCTOBER..	25	24	24	24	24	23	23	21	21	22	22	22	23	22	22	22	24	23	22	22	22	22	21	22	22	22	22	20	20	17	19	22
NOVEMBER.	19	19	20	20	22	22	22	22	22	22	22	22	19	18	18	19	21	22	22	23	21	20	20	18	18	18	19	19	21	16	--	20
DECEMBER.	18	18	18	16	17	18	17	14	15	14	13	13	13	14	13	13	13	14	13	12	13	13	13	13	13	13	15	14	11	11	11	14
JANUARY..	11	11	11	12	12	13	16	14	12	11	13	13	13	13	13	11	10	12	14	14	13	14	13	12	13	12	14	11	16	16	14	13
FEBRUARY.	14	14	13	14	13	13	13	13	13	12	12	11	12	13	14	12	12	13	13	11	11	11	11	11	11	11	10	13	14	--	--	12
MARCH....	16	13	12	11	12	12	13	16	13	12	13	14	12	12	13	14	13	13	14	17	17	17	18	17	17	17	15	14	17	18	17	14
APRIL....	17	17	17	18	17	17	17	18	19	20	20	19	17	17	17	19	19	19	19	19	18	17	17	17	18	18	19	18	19	18	--	18
MAY.....	18	18	19	19	19	22	22	23	21	20	22	23	24	21	20	21	22	23	21	21	20	21	22	22	22	22	22	21	22	--	--	21
JUNE.....	--	--	--	--	--	21	21	22	22	22	21	22	24	23	24	25	25	24	22	22	21	21	21	22	22	22	24	25	26	25	--	23
JULY.....	25	26	26	26	26	26	24	26	27	27	27	27	26	26	26	26	26	26	27	27	27	27	27	27	27	27	27	27	27	27	27	26
AUGUST...	28	27	26	27	27	27	27	27	27	27	27	26	27	26	27	24	26	24	26	27	27	27	25	26	26	26	26	25	25	24	24	26
SEPTEMBER	23	23	24	26	26	26	25	25	25	24	24	23	24	23	23	24	23	24	24	25	25	25	26	26	24	24	24	24	24	25	--	24

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

	OCTOBER			NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	10	5	0.1	20	2	0.1	15 C	2	0.1
2	9.2	4	.1	18	1	T	12 C	2	.1
3	7.6	4	.1	17	1	T	36	16 S	.5
4	19	18	.9	16	1	T	24	6	.4
5	20	14	.8	15	1	T	16	4	.2
6	11	7	.2	17	2	.1	35	17 S	1.9
7	8.6	5	.1	14	1	T	20	6	.3
8	7.6	4	.1	12	1	T	16	3	.1
9	6.7	3	.1	12	1	T	14	2	.1
10	6.2	2	T	14	4	.2	13 C	1	T
11	24	16	1.0	21	12	.7	15 C	1	T
12	10	6	.2	20	8	.4	14 C	2	T
13	8.9	5	.1	15	3	.1	13 C	2	.1
14	7.3	5	.1	12	2	.1	15	6	.2
15	6.5	4	.1	11	1	T	15	4	.2
16	5.9	3	T	9.7	1	T	13 C	2	.1
17	38	106 S	15	9.7	1	T	12 C	2	.1
18	91	174 S	60	14	5	.2	13	4	.1
19	68	18	3.3	17	3	.1	12 C	2	.1
20	27	6	.4	12	2	.1	12 C	2	.1
21	14	3	.1	10	2	.1	12 C	2	.1
22	11 C	2	.1	9.7	1	T	11 C	1	T
23	10 C	2	.1	9.7 C	1	T	11 C	1	T
24	17	8 S	.4	9.7 C	1	T	11	1	T
25	163	178 A	161	9.3 C	1	T	10	1	T
26	102	59 A	22	9.3 C	1	T	10	1	T
27	792	771 S	4570	8.9 C	1	T	24	18	1.2
28	55	12	1.8	8.9 C	1	T	15	6	.2
29	32	6	.5	19	25 S	1.4	12	3	.1
30	26	3	.2	18	3	.1	11	3	.1
31	23	2	.1	--	--	--	10	2	.1
TOTAL	1637.5	--	4839.1	408.9	--	4.3	472.0	--	6.8

	JANUARY			FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	10 C	2	0.1	8.9	4	0.1	54	95 S	16
2	10 C	2	.1	11	6	.2	26	6	.4
3	10 C	1	T	10	4	.1	48	79 S	12
4	10 C	1	T	10	6	.2	25	6	.4
5	9.7 C	1	T	34	40 S	4.0	18	5	.2
6	10	4	.1	21	10	.6	16	4	.2
7	27	36 S	2.7	34	18	1.7	15	3	.1
8	13	5	.2	33	14	1.2	14	3	.1
9	10	3	.1	27	10	.7	13	2	.1
10	10	2	.1	21	6	.3	12	2	.1
11	13	5	.2	16	3	.1	12	2	.1
12	10	2	.1	13	3	.1	12	2	.1
13	11	4	.1	12	2	.1	11	1	T
14	12	6	.2	11	4	.1	11	1	T
15	10	3	.1	47	119 A	21	28	19 S	2.9
16	9.7	3	.1	19	14	.7	31	16	1.3
17	9.3 C	2	.1	16	6	.3	13	7	.2
18	9.3 C	2	.1	15	4	.2	11	4	.1
19	9.7	3	.1	15	4	.2	10	3	.1
20	12	8	.3	14 C	2	.1	65	445 S	254
21	9.7	3	.1	13 C	2	.1	118	398 S	246
22	9.3 C	2	.1	13 C	1	T	38	16	1.6
23	8.9 C	2	T	12 C	1	T	116	327 A	138
24	8.5 C	2	T	12	2	.1	46	12	1.5
25	10	6	.2	13	2	.1	33	4	.4
26	11	5	.1	12	2	.1	30	3	.2
27	9.3	2	.1	11 C	1	T	34	6	.6
28	8.5	2	T	12 C	1	T	28	4	.3
29	8.9	4	.1	12 C	1	T	1240	1280 S	9240
30	12	8	.3	--	--	--	311	179 S	195
31	9.3	5	.1	--	--	--	125	17	5.7
TOTAL	331.1	--	6.1	497.9	--	32.6	2564	--	10117.8

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.
C Composite period.

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

	APRIL				MAY				JUNE			
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)
1	72	6		1.2	15	3		0.1	27	--		1.2
2	59	4		.6	15	2	C	.1	59	--		7.3
3	51	4		.6	14	2	C	.1	24	--		.5
4	44	3		.4	13	3	C	.1	20	--		.3
5	38	3		.3	14	3	C	.1	18	--		.1
6	33	3	C	.3	15	2		.1	17	2	C	.1
7	29	3	C	.2	25	10		.7	16	2	C	.1
8	25	2		.1	16	5		.2	16	2	C	.1
9	24	2	C	.1	15	4		.2	17	6		.3
10	24	2	C	.1	14	3		.1	58	56	S	15
11	23	1	C	.1	14	3		.1	20	5		.3
12	22	1	C	.1	13	2		.1	18	3		.1
13	21	1	C	.1	15	2		.1	16	2		.1
14	20	1	C	.1	13	2	C	.1	18	3		.1
15	18	1	C	T	12	2	C	.1	16	3	C	.1
16	24	6		.4	12	1	C	T	16	3	C	.1
17	18	4		.2	12	1	C	T	16	3		.1
18	16	4		.2	29	9	S	.9	140	907	B	3400
19	18	5		.2	26	22		1.5	404	1010	B	4290
20	15	3		.1	40	36	S	13	1530	1820	S	13900
21	163	497	S	567	70	62	S	18	216	155	S	102
22	79	23		4.9	28	8		.6	109	12		3.5
23	30	8		.6	21	8		.5	80	5		1.1
24	24	6		.4	41	37	S	4.3	172	116	A	79
25	21	4	C	.2	252	793	S	1300	92	13		3.2
26	20	4	C	.2	45	20		2.4	63	5		.9
27	18	4	C	.2	30	6		.5	54	4		.6
28	17	4	C	.2	25	3		.2	48	3		.4
29	16	3	C	.1	22	2		.1	42	2		.2
30	16	3	C	.1	20	--		.1	38	2		.2
31	--	--		--	18	--		T	--	--		--
TOTAL	998	--		579.4	914	--		1344.5	3380	--		21807.0

	JULY				AUGUST				SEPTEMBER			
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)		LOAD (TONS)
1	35	1		0.1	22	12		0.7	76	6		1.2
2	34	1	C	.1	31	22	S	2.1	61	3		.5
3	33	1	C	.1	18	2		.1	52	2		.3
4	32	1	C	.1	18	2		.1	52	6		.8
5	29	1	C	.1	19	6		.3	45	3		.4
6	31	6		.5	20	6		.3	44	5		.6
7	179	679	B	1680	16	3		.1	41	3		.3
8	35	16		1.5	16	3		.1	35	2		.2
9	30	4		.3	16	2	C	.1	37	6		.6
10	27	2		.1	16	2	C	.1	30	3		.2
11	26	2		.1	16	1	C	T	30	6		.5
12	29	10		.8	16	1	C	T	28	3		.2
13	42	22	A	3.1	33	12	S	1.7	25	2	C	.1
14	25	4		.3	19	5		.3	24	2	C	.1
15	24	3		.2	541	1260	S	5460	24	1	C	.1
16	23	3		.2	79	20		4.3	23	1	C	.1
17	23	2	C	.1	84	138	S	46	22	1	C	.1
18	22	2	C	.1	42	14		1.6	27	16		1.2
19	22	2	C	.1	29	5		.4	25	6		.4
20	24	10		.6	24	3		.2	21	2	C	.1
21	34	17	S	1.7	24	5		.3	20	2	C	.1
22	23	8		.5	74	98	S	41	19	2	C	.1
23	19	2		.1	41	6		.7	20	6		.3
24	18	2	C	.1	128	295	S	305	23	8		.5
25	18	2	C	.1	51	8		1.1	19	2		.1
26	17	2	C	.1	38	4	C	.4	18	2		.1
27	17	1	C	T	40	4	C	.4	17	2		.1
28	17	1	C	T	297	367	S	432	19	3		.2
29	19	1	C	.1	480	626	S	3360	20	2		.1
30	19	1	C	.1	113	130	A	57	18	2		.1
31	18	1	C	T	125	193	S	72	--	--		--
TOTAL	944	--		1691.4	2486	--		9788.5	915	--		9.7

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 15548.4
TOTAL LOAD FOR YEAR (TONS) 50227.2

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.
C Composite period.

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(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
MAY 25, 1968	1010	23	1830	3180	15700	34	46	61	74	85	97	99	100	--	--	--	VPWC
MAY 25.....	1030	23	1920	3340	17300	27	38	50	60	70	81	96	100	--	--	--	VPWC
JUN 20.....	1455	21	2450	10900	72100	27	40	52	65	74	84	95	100	--	--	--	VPWC
JUN 20.....	1500	21	2910	11500	90400	27	39	52	64	73	82	94	100	--	--	--	VPWC

16-8846. AHA-GAWA AT AHA, OKINAWA

LOCATION.--Lat 26°42'41"N., long 128°16'55"E., at gaging station 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.
DRAINAGE AREA.--9.5 sq mi, approximately.
RECORDS AVAILABLE.--Water temperatures: March to September 1968.
Sediment records: March to September 1968.
EXTREMES, March to September 1968.--Water temperatures: Maximum, 31°C Aug. 17, minimum, 11°C Mar. 6.
Sediment concentrations: Maximum daily, 877 mg/l June 20; minimum daily, 1 mg/l on many days.
Sediment loads: Maximum daily, 5,710 tons June 20; minimum daily, less than 0.05 ton on several days.

CHEMICAL ANALYSES IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DATE	MEAN DISCHARGE (CFS)	SILICA (SIO2)	DISSOLVED IRON (FE)	CALCIUM (CA)	MAGNESIUM (MG)	SODIUM (NA)	POTASSIUM (K)	BICARBONATE (HCO3)	CARBONATE (CO3)	SULFATE (SO4)	CHLORIDE (CL)
JAN. 11...	18	16	.15	5.8	2.0	18	.8	24	0	5.5	20
APR. 17...	20	16	.10	2.4	2.9	15	1.0	22	0	5.0	21
SEPT. 27...	16	20	.30	4.8	2.4	16	--	24	0	5.0	25

DATE	FLUORIDE (F)	NITRATE (NO3)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS)	DISSOLVED SOLIDS (TONS PER AC-FT)	HARDNESS (CA,MG)	NONCARBONATE HARDNESS	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH	COLOR
JAN. 11...	.0	.0	81	.11	20	0	1.6	105	7.7	10
APR. 17...	.0	.0	77	.10	18	0	1.5	95	7.8	4
SEPT. 27...	.2	.0	83	.11	20	0	1.5	110	7.2	15

TEMPERATURE (°C) OF WATER, MARCH TO SEPTEMBER 1968

MONTH	DAY 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AVERAGE
OCTOBER..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOVEMBER.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DECEMBER.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
JANUARY..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FEBRUARY.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MARCH....	14	13	13	12	14	11	12	14	13	13	--	14	14	14	14	14	14	14	--	15	17	18	17	17	16	15	15	16	--	17	17	15
APRIL....	17	16	17	18	17	17	--	--	--	--	--	--	--	--	--	18	17	19	20	17	16	18	17	20	21	21	18	19	21	18	--	--
MAY.....	16	18	20	19	21	21	21	21	22	23	21	23	22	23	21	20	21	26	23	21	20	25	25	19	20	21	20	19	19	23	23	21
JUNE.....	19	19	19	19	21	22	22	23	22	22	21	21	22	23	22	23	26	22	21	21	21	21	20	21	24	26	25	23	23	27	--	22
JULY.....	24	26	25	26	27	26	25	24	27	27	25	26	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AUGUST...	--	--	--	--	--	--	25	28	24	24	24	24	24	25	24	24	31	24	27	27	27	25	24	25	25	24	26	24	24	23	22	25
SEPTEMBER	23	22	25	25	25	26	26	23	25	23	23	23	22	25	26	21	21	25	23	23	23	25	24	23	23	22	26	24	24	23	--	24

16-8846. AHA-GAWA AT AHA, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, MARCH TO SEPTEMBER 1968

DAY	JANUARY MEAN DISCHARGE (CFS)	JANUARY MEAN CONCEN-TRATION (MG/L)	JANUARY LOAD (TONS)	FEBRUARY MEAN DISCHARGE (CFS)	FEBRUARY MEAN CONCEN-TRATION (MG/L)	FEBRUARY LOAD (TONS)	MARCH MEAN DISCHARGE (CFS)	MARCH MEAN CONCEN-TRATION (MG/L)	MARCH LOAD (TONS)
1							89	114 A	45
2							29	3	.2
3							36	6	.6
4							25	3	.2
5							20	2	.1
6							18	2	.1
7							18	2	.1
8							18	2	.1
9							16 C	1	T
10							15 C	1	T
11							14	1	T
12							16	3	.1
13							13 C	1	T
14							12 C	1	T
15							36	57 S	10
16							21	5	.3
17							14	2	.1
18							12	1	T
19							11	1	T
20							62	32 S	8.8
21							79	59 S	23
22							34	4	.4
23							119	75 A	40
24							45	6	.7
25							34	4	.4
26							32	4	.4
27							38	5	.5
28							29	3	.2
29							853	769 B	1170
30							282	68 A	59
31							140	10	3.8
TOTAL							2180	--	1364.4

DAY	APRIL MEAN DISCHARGE (CFS)	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS)	MAY MEAN DISCHARGE (CFS)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS)	JUNE MEAN DISCHARGE (CFS)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS)
1	95	4	1.0	20 C	2	0.1	53	41 S	16
2	77	4	.8	19 C	2	.1	72	21 S	8.0
3	78	5	1.1	18 C	2	.1	23	3	.2
4	55	3	.4	18 C	1	T	21	3	.2
5	45	3	.4	18 C	1	T	18	2	.1
6	38	3	.3	17 C	1	T	17	2	.1
7	35	3	.3	26	8	.6	16 C	1	T
8	31	3	.3	18	2	.1	15 C	1	T
9	29	2	.2	16 C	2	.1	21	12 S	1.4
10	27	2	.1	16 C	2	.1	72	50 S	19
11	25	2	.1	16 C	2	.1	20	5	.3
12	24	3	.2	16 C	2	.1	19	4	.2
13	23	2	.1	16 C	2	.1	18	4	.2
14	21	2	.1	14 C	1	T	18	4	.2
15	20	2	.1	14 C	1	T	16	3	.1
16	26	5	.4	14 C	1	T	17	5	.2
17	20	3	.2	14 C	1	T	27	12 A	1.5
18	18 C	2	.2	36	39 B	6.7	226	468 A	1110
19	18 C	2	.2	25	15 S	1.5	233	163 A	196
20	16 C	2	.1	39	42 B	11	876	877 A	5710
21	154	146 B	146	74	29 S	4.6	210	9 S	6.5
22	87	19 S	5.4	35	10	.9	68	4	.7
23	38	6	.6	25	5	.3	55	4	.6
24	32	3	.3	45	20	2.4	184	136 A	160
25	28 C	2	.2	230	-- E	124	63	3	.5
26	25 C	2	.1	40	5	.5	54	2	.4
27	25 C	2	.1	25	4	.3	48	2	.3
28	24 C	2	.1	20	3	.2	42	2	.2
29	22 C	2	.1	17 C	2	.1	39	2	.2
30	21 C	2	.1	16 C	2	.1	36	2	.2
31	--	--	--	15 C	2	.1	--	--	--
TOTAL	1177	--	159.6	932	--	154.5	2597	--	7233.4

E Estimated.
S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.
C Composite period.

16-8846. AHA-GAWA AT AHA, OKINAWA--Continued

DAILY SUSPENDED SEDIMENT, MARCH TO SEPTEMBER 1968

	JULY			AUGUST			SEPTEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS)
1	33	1	0.1	22	5	0.3	67	9	1.6
2	30	1	.1	49	23 S	5.8	54	6	.9
3	31	5	.4	19 C	3	.2	46	4	.5
4	30	3	.2	18 C	3	.1	54	14	2.0
5	27	2	.1	16 C	2	.1	45	6	.7
6	39	5 S	.7	16 C	2	.1	40	3	.3
7	116	233 A	168	16	2	.1	36	3	.3
8	28	2	.2	16 C	2	.1	34 C	2	.2
9	24	2	.1	15 C	2	.1	33 C	2	.2
10	24	1	.1	16	5	.2	30 C	2	.2
11	23	1	.1	15	3	.1	31 C	3	.3
12	30	50 A	18	14	2	.1	28 C	2	.2
13	84	204 S	91	26	8	.6	27 C	2	.1
14	30	3	.2	17	5	.2	25 C	2	.1
15	27	2	.1	272	565 S	71	24 C	2	.1
16	27	2	.1	60	12	1.9	22 C	1	.1
17	25	1	.1	36	8	.8	21 C	1	.1
18	24	1	.1	27	3	.2	25	6	.4
19	22	1	.1	25	2	.1	22	6	.4
20	22	1	.1	24	2	.1	20	3	.2
21	36	8	.8	23	4	.2	19	2	.1
22	25	4	.3	29	7	.6	18	2	.1
23	24 C	3	.2	21	3	.2	19	3	.2
24	22 C	3	.2	71	120 A	61	23	6	.4
25	21 C	3	.2	40	7	.8	19	2	.1
26	20 C	3	.2	42	10	1.1	17	1	T
27	20 C	3	.2	46	8	1.0	16	1	T
28	20 C	3	.2	87	34 S	10	18	5	.2
29	20	3	.2	192	128 A	164	20	2	.1
30	20	3	.2	87	15 S	4.1	19	2	.1
31	20	3	.2	101	17 S	4.9	--	--	--
TOTAL	944	--	282.8	1458	--	330.1	872	--	10.3

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 10160
TOTAL LOAD FOR YEAR (TONS) 9535.1

S Computed by subdividing day.
T Less than 0.05 ton.

A Computed from partly estimated-concentration graph.
C Composite period.

ISLAND OF OKINAWA

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(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
16-8752. BENOKI-GAWA AT BENOKI (LAT 26°47'06"N., LONG 128°14'59"E.)																	
MAY 29, 1968	0925	20	11	2	.1	--	--	--	--	--	--	--	--	--	--	--	
AUG 29.....	1435	24	15	1	.04	--	--	--	--	--	--	--	--	--	--	--	
16-8755. YONA-GAWA AT YONA (LAT 26°45'10"N., LONG 128°13'18"E.)																	
OCT 13, 1967	0925	22	1.7	1	0	--	--	--	--	--	--	--	--	--	--	--	
OCT 18.....	1110	22	18	13	.63	--	--	--	--	--	--	--	--	--	--	--	
OCT 18.....	1330	22	16	10	.43	--	--	--	--	--	--	--	--	--	--	--	
OCT 26.....	1130	22	26	6	.42	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	0010	--	153	G 426	176	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	0030	--	358	G 1760	1700	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	1205	21	49	8	1.1	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	1305	21	47	7	.89	--	--	--	--	--	--	--	--	--	--	--	
OCT 31.....	1030	--	7.9	2	.04	--	--	--	--	--	--	--	--	--	--	--	
NOV 15.....	1330	--	2.8	1	.01	--	--	--	--	--	--	--	--	--	--	--	
NOV 21.....	0925	21	3.0	1	.01	--	--	--	--	--	--	--	--	--	--	--	
NOV 27.....	1430	21	2.4	4	.03	--	--	--	--	--	--	--	--	--	--	--	
NOV 29.....	1245	21	6.8	3	.06	--	--	--	--	--	--	--	--	--	--	--	
DEC 11.....	1320	13	3.4	1	.01	--	--	--	--	--	--	--	--	--	--	--	
DEC 14.....	1550	--	12	8	.26	--	--	--	--	--	--	--	--	--	--	--	
DEC 29.....	1410	11	3.2	2	.02	--	--	--	--	--	--	--	--	--	--	--	
JAN 11, 1968	1400	13	2.8	1	.01	--	--	--	--	--	--	--	--	--	--	--	
FEB 1.....	1115	13	3.2	2	.02	--	--	--	--	--	--	--	--	--	--	--	
FEB 29.....	1055	15	3.6	2	.02	--	--	--	--	--	--	--	--	--	--	--	
MAR 21.....	1235	18	7.9	6	.13	--	--	--	--	--	--	--	--	--	--	--	
APR 17.....	1210	20	4.6	1	.01	--	--	--	--	--	--	--	--	--	--	--	
MAY 10.....	1040	21	3.2	1	.01	--	--	--	--	--	--	--	--	--	--	--	
MAY 29.....	1055	22	4.1	2	.02	--	--	--	--	--	--	--	--	--	--	--	
JUN 13.....	1140	24	3.2	2	.02	--	--	--	--	--	--	--	--	--	--	--	
JUN 18.....	1400	--	153	G 1110	459	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1620	--	358	G 4570	4420	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1630	--	664	G 7310	13100	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1645	--	1040	G 2640	7410	--	--	--	--	--	--	--	--	--	--	--	
JUN 28.....	1055	25	7.9	5	.11	--	--	--	--	--	--	--	--	--	--	--	
AUG 7.....	0925	24	3.4	4	.04	--	--	--	--	--	--	--	--	--	--	--	
AUG 15.....	1140	--	153	G 763	315	--	--	--	--	--	--	--	--	--	--	--	
AUG 15.....	1150	--	358	G 840	812	--	--	--	--	--	--	--	--	--	--	--	
AUG 15.....	1200	--	664	G 1460	2620	--	--	--	--	--	--	--	--	--	--	--	
AUG 29.....	1600	24	16	4	.17	--	--	--	--	--	--	--	--	--	--	--	
16-8762. TAKAZATO-GAWA NEAR HAMA (LAT 26°41'10"N., Long 128°10'48"E.)																	
MAY 29, 1968	1245	23	1.6	2	.01	--	--	--	--	--	--	--	--	--	--	--	
JUN 19.....	1200	21	5.2	2	.03	--	--	--	--	--	--	--	--	--	--	--	
16-8770. RIGHT BRANCH OF SOUTH FORK HENAN-GAWA NEAR TSUHA (LAT 26°37'42"N., LONG 128°05'52"E.)																	
APR 22, 1968	1420	21	5.5	3	.04	--	--	--	--	--	--	--	--	--	--	--	
16-8785. OI-KAWA AT JINGUSUKU (LAT 26°39'07"N., LONG 127°57'24"E.)																	
MAR 18, 1968	1300	16	.26	30	.02	--	--	--	--	--	--	--	--	--	--	--	
16-8799. YONABARU-GAWA BELOW ZUKEYAMA DAM (LAT 26°23'00"N., LONG 127°48'25"E.)																	
MAR 22, 1968	1340	21	24	6	.39	--	--	--	--	--	--	--	--	--	--	--	
JUN 4.....	1515	20	.34	17	.02	--	--	--	--	--	--	--	--	--	--	--	
16-8803. BISHI-GAWA AT KADENA (LAT 26°21'54"N., LONG 127°45'59"E.)																	
JUN 4, 1968	1155	22	45	36	4.4	--	--	--	--	--	--	--	--	--	--	--	
16-8805. NAGATA-GAWA AT KADENA (LAT 26°22'23"N., LONG 127°45'50"E.)																	
OCT 4, 1967	1610	24	53	261	37	--	--	--	--	--	--	--	--	--	--	--	
OCT 4.....	1620	24	53	282	40	--	--	--	--	--	--	--	--	--	--	--	
MAR 19, 1968	0850	16	2.0	31	.17	--	--	--	--	--	--	--	--	--	--	--	
MAR 22.....	1000	18	3.2	35	.30	--	--	--	--	--	--	--	--	--	--	--	

G Samples collected with single-stage sampler.

ISLAND OF OKINAWA--Continued

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
(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
16-8809. MACHINATO-GAWA NEAR OJANA (LAT 26°14'43"N., LONG 127°44'16"E.)																	
JUN 4, 1968	0955	21	2.1	146	.83	--	--	--	--	--	--	--	--	--	--	--	
16-8824. TENGAN-GAWA AT TENGAN (LAT 26°22'54"N., LONG 127°51'39"E.)																	
OCT 27, 1967	0935	23	289	264	206	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	1030	23	257	204	142	--	--	--	--	--	--	--	--	--	--	--	
OCT 27.....	1210	23	202	174	95	--	--	--	--	--	--	--	--	--	--	--	
16-8826. OKUKUBI-GAWA AT KIN (LAT 26°27'40"N., LONG 127°56'03"E.)																	
MAY 24, 1968	1325	23	18	24	1.2	--	--	--	--	--	--	--	--	--	--	--	
MAY 24.....	1455	23	16	23	.99	--	--	--	--	--	--	--	--	--	--	--	
JUN 1.....	1400	22	.45	4	0	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1150	22	108	68	20	--	--	--	--	--	--	--	--	--	--	--	
AUG 17.....	1000	27	15	15	.61	--	--	--	--	--	--	--	--	--	--	--	
AUG 17.....	1030	27	16	29	1.3	--	--	--	--	--	--	--	--	--	--	--	
16-8828. KANNA-GAWA NEAR KANNA (LAT 26°29'20"N., LONG 127°56'46"E.)																	
MAR 16, 1968	1200	16	.70	3	.01	--	--	--	--	--	--	--	--	--	--	--	
MAR 23.....	1340	18	1.8	5	.02	--	--	--	--	--	--	--	--	--	--	--	
MAR 30.....	1410	17	7.8	4	.08	--	--	--	--	--	--	--	--	--	--	--	
JUN 1.....	1020	20	1.5	2	.01	--	--	--	--	--	--	--	--	--	--	--	
JUN 22.....	1510	22	3.2	5	.04	--	--	--	--	--	--	--	--	--	--	--	
AUG 17.....	1125	24	8.5	30	.69	--	--	--	--	--	--	--	--	--	--	--	
AUG 31.....	1415	23	18	66	3.2	--	--	--	--	--	--	--	--	--	--	--	
16-8833. LEFT FORK O-KAWA NEAR KUSHI (LAT 26°31'18"N., LONG 127°59'50"E.)																	
MAR 23, 1968	1155	18	.77	58	.12	--	--	--	--	--	--	--	--	--	--	--	
MAR 30.....	1130	18	1.3	4	.01	--	--	--	--	--	--	--	--	--	--	--	
JUN 1.....	1300	19	.51	7	.01	--	--	--	--	--	--	--	--	--	--	--	
JUN 22.....	1230	21	1.0	21	.06	--	--	--	--	--	--	--	--	--	--	--	
16-8835.5. OURA-GAWA AT OKAWA (LAT 26°34'10"N., LONG 128°02'23"E.)																	
MAR 19, 1968	1335	16	.19	2	0	--	--	--	--	--	--	--	--	--	--	--	
APR 22.....	1115	18	8.8	3	.07	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1345	--	27	9	.66	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1525	--	34	12	1.1	--	--	--	--	--	--	--	--	--	--	--	
AUG 28.....	1330	24	62	38	6.4	--	--	--	--	--	--	--	--	--	--	--	
AUG 28.....	1445	25	47	53	6.7	--	--	--	--	--	--	--	--	--	--	--	
AUG 28.....	1525	25	38	134	14	--	--	--	--	--	--	--	--	--	--	--	
16-8841. FUKUJI-GAWA NEAR YUBARU (LAT 26°38'32"N., LONG 128°13'00"E.)																	
FEB 20, 1968	1315	12	6.4	2	.03	--	--	--	--	--	--	--	--	--	--	--	
MAY 27.....	1330	22	13	6	.21	--	--	--	--	--	--	--	--	--	--	--	
JUN 19.....	1355	--	42	7	.79	--	--	--	--	--	--	--	--	--	--	--	
JUN 19.....	1450	--	40	5	.54	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1310	21	140	22	8.3	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1350	21	143	36	14	--	--	--	--	--	--	--	--	--	--	--	
JUN 20.....	1425	21	590	219	349	--	--	--	--	--	--	--	--	--	--	--	
JUN 24.....	1415	22	54	10	1.5	--	--	--	--	--	--	--	--	--	--	--	
AUG 2.....	1115	27	20	11	.59	--	--	--	--	--	--	--	--	--	--	--	
16-8848. FUN-GAWA NEAR AHA (LAT 26°44'33"N., LONG 128°16'53"E.)																	
JAN 10, 1968	1620	13	4.9	1	.01	--	--	--	--	--	--	--	--	--	--	--	
MAR 20.....	1305	16	7.9	225	4.8	--	--	--	--	--	--	--	--	--	--	--	
MAY 28.....	1155	22	8.8	2	.05	--	--	--	--	--	--	--	--	--	--	--	
AUG 29.....	1220	24	35	1	.09	--	--	--	--	--	--	--	--	--	--	--	

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