

1961

**Surface Water Records
of
Hawaii and other
Pacific Areas**



**UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Prepared in cooperation with the State of Hawaii and other agencies

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

SURFACE WATER RECORDS
OF HAWAII AND OTHER PACIFIC AREAS

1961

Prepared under the direction of H. S. Leak, District Engineer,
Surface Water Branch, in cooperation with the State of
Hawaii and other agencies

Copies of this report may be obtained from
District Engineer, Surface Water Branch
U. S. Geological Survey
Room 330, 1100 Ward St.
Honolulu 14, Hawaii

CALENDAR FOR FISCAL YEAR 1961

JULY 1960

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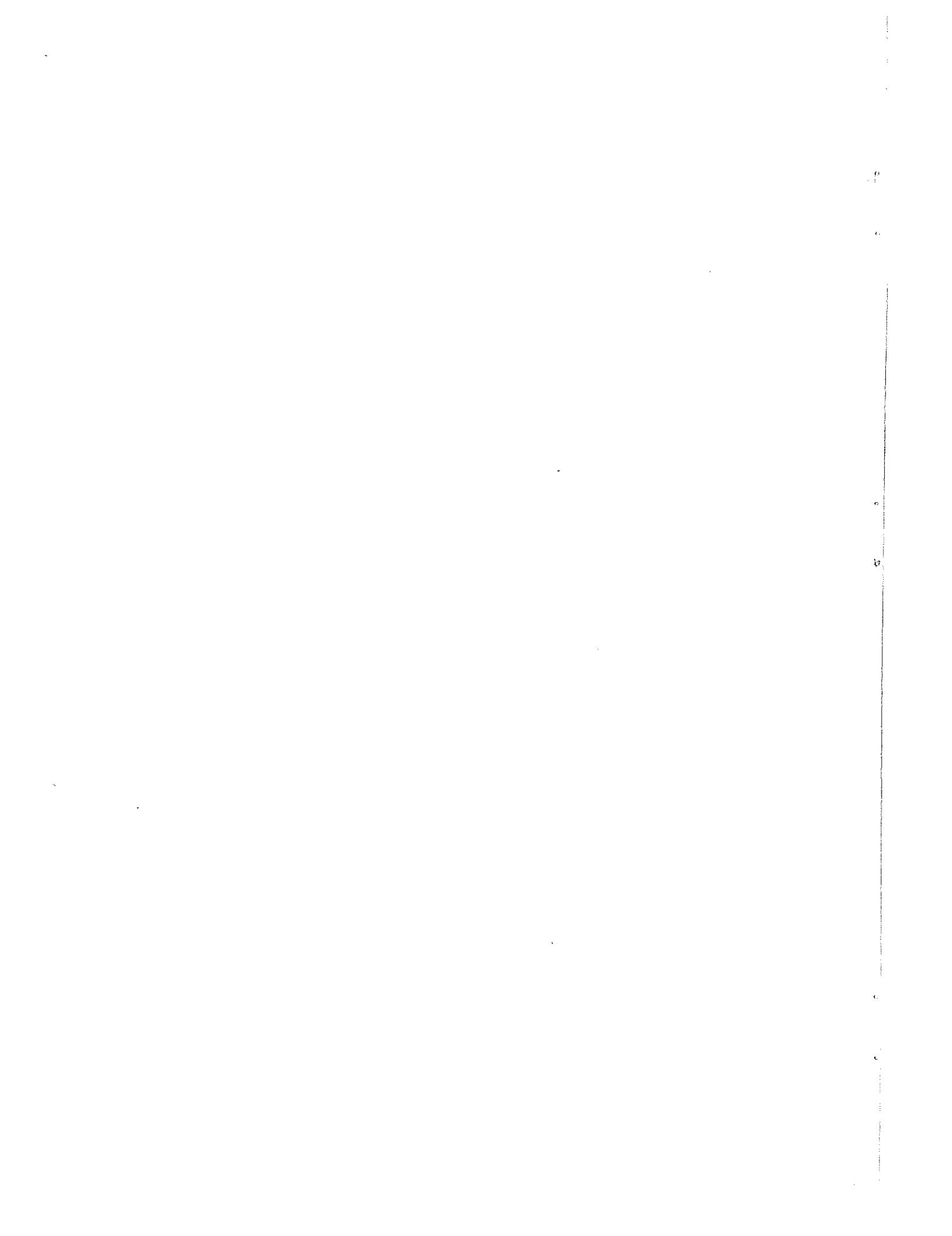
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SURFACE WATER RECORDS OF HAWAII AND OTHER PACIFIC AREAS

INTRODUCTION

The surface-water records for the 1961 fiscal 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 Howard S. Leak, district engineer, Surface Water Branch.

This report marks the beginning of a new method of presenting, annually, basic data on surface-water records by States. Through June 30, 1960, 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 are contained in the above series as "Surface Water Supply of Hawaii." Records for other Pacific Areas are contained in a volume entitled "Surface Water Supply of Mariana, Caroline, and Samoa Islands."

Beginning with the 1961 fiscal year, streamflow records and related data will be released by the Geological Survey in annual reports on a State-boundary basis, except Hawaii, which includes other Pacific Areas. Distribution of these basic data reports will be limited and primarily for local needs. The records later will be published in Geological Survey water-supply papers at 5-year intervals. These 5-year water-supply papers will show daily discharge and will be compiled on the same geographical areas previously used for the annual series; however, some of the 14 parts of conterminous United States will be further subdivided.

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, and with the Territory of American Samoa in 1957. 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.

City and County of Honolulu, Division of Engineering.

Government of Guam.

Government of American Samoa.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army, in collecting records for five gaging stations published in this report.

The following organizations aided in collecting records:

Boards of Water Supply of the City and County of Honolulu, Maui County and County of Hawaii; Lihue Plantation Co., Ltd.; McBryde Sugar Co., Ltd.; Kilauea Sugar Co., Ltd.; Kekaha Sugar Co., Ltd.; Waialua Agricultural Co., Ltd.; East Kauai Water Co., Ltd.; Waiahole Water Co., Ltd.; East Maui Irrigation Co., Ltd.; State of Hawaii Board of Agriculture and Forestry; Kohala Ditch Co., Ltd.; Parker Ranch; and James Campbell Estate.

DEFINITION OF TERMS AND ABBREVIATIONS

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.

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

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.

Million gallons per day (mgd) is the rate of discharge of a stream measured in millions of gallons per day.

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.

Content 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 indentation in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indentation 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.

DOWNSTREAM ORDER AND STATION NUMBERS

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 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 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 number for each station, such as 40-2290.00, includes the district number "40" and a six digit station number. In this report, only the essential digits of the station number are shown. For example, the complete number 40-2290.00 would appear as 2290. 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. The records of stage are obtained either from a water-stage recorder that gives a continuous record of fluctuations or from direct readings on a nonrecording gage. 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 of 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 relations 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, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the fiscal year which begins on July 1 and ends on June 30. A calendar for the 1961 fiscal 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, average discharge, 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. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is a little or no regulation; and the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height if it is significant. In the first paragraph, the data given are for the complete current fiscal 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 are 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, a crest-stage indicator, or a non-recording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is

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EXPLANATION OF DATA

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."

Skeleton rating tables are published for all stations except those for which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables generally are not published for canals, ditches, or springs.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such a fluctuation, the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, which is an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-day for the month for Guam and million gallons for Hawaii and Samoa. The line headed "Mean" gives the average flow in millions of gallons per day and cubic feet per second during the month. Discharge for the month may be 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.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record, or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated. The following footnotes and their corresponding symbols have been standardized for use throughout this report. The method used in computing data for such footnoted periods have been explained in preceding paragraphs.

* Discharge measurement made on this day. Used to indicate days on which discharge measurements were made at a gaging station unless they were made at frequent regular intervals, two or more times monthly, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

** Field estimate made on this day. Used to indicate days on which an estimate of the flow was made at the gaging station.

A, a No gage-height record. Used to indicate periods when there was no gage-height record or the available record was such that it could not be used to compute the daily discharge. No mention is made of periods of no gage-height record if they are few and of short duration, no more than 4 days in succession and not more than 12 days distributed throughout the fiscal year, and if the degree of accuracy of records for those days is not changed.

C Backwater from aquatic growth (or debris or other conditions). Used only when records for the periods affected are rated down in accuracy.

e Shifting-control method used. Used only when records for the period affected are rated down in accuracy.

f Fragmentary gage-height record; discharge computed on basis of partly estimated gage heights.

g Computed from once-daily (twice-daily, etc.) staff (or chain, wire-weight, etc.) gage readings. Used only for recording stations for periods when the water-stage recorder graph was not used but readings of a nonrecording gage were used. The symbol is not used for periods of short duration if the degree of accuracy of records for the periods involved are not changed.

k Computed by using rate of change in stage as a factor. Used only when records for the periods involved are rated down in accuracy.

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 states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

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. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversion, for changes in contents of reservoir, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents unless it is so stated. Even at those stations where adjustments are made, the large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

SUPPLEMENTAL DATA

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. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are given in special tables after the list of measurements at miscellaneous sites.

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 number of consecutive days in each year; and (3) the highest mean discharge for selected number of consecutive days in each year. Information on the availability of electronic computer analyses and unpublished data may generally be obtained from the district office.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The following table lists the gaging stations in the State of Hawaii at which records of discharge were collected during the fiscal year 1960 to June 1961 by agencies other than the Geological Survey. The records for these stations are not contained in the publications of the Geological Survey, and, except as indicated, have not been published elsewhere.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Operated by
<u>ISLAND OF KAUAI</u>			
Hanamaulu ditch	Lat 22°01'38", long 159°25'25", 3,500 ft below intake and 4.5 miles northwest of Lihue, at altitude 450 ft.	1927-60	Lihue Plantation Co.
Kealia ditch	Lat 22°07'48", long 159°22'24", 500 ft west of Kaneha Reservoir, 4,000 ft below intake, and 4.7 miles northwest of Kealia, at altitude 800 ft.	1940-60	Do
Kealia River	Lat 22°07'37", long 159°22'52", 2,000 ft west of Kaneha Reservoir and 5.3 miles northwest of Kealia, at altitude 800 ft.	1936-60	Do
Koloa ditch	Lat 21°58'32", long 159°28'25", 3 miles below intake and 6.4 miles west of Lihue, at altitude 700 ft.	1927-60	Do
Lower Lihue ditch	Lat 22°01'20", long 159°25'18", 2,000 ft below 2,000 ft below Upper Lihue ditch and 4 miles northwest of Lihue, at altitude 500 ft.	1927-60	Do
Upper Lihue ditch	Lat 22°01'30", long 159°25'24", 1.7 miles below intake and 4.3 miles northwest of Lihue, at altitude 525 ft.	1927-60	Do
Waimea Valley ditch	Lat 22°02'33", long 159°38'32", 6.2 miles northwest of Kekaha, at altitude 525 ft.	1903-60	Kekaha Sugar Co., Ltd.
<u>ISLAND OF OAHU</u>			
Alewa Heights Springs	Lat 21°21'05", long 157°49'33", 3.8 miles northeast of Honolulu Post Office and 4.4 miles east of Tripler Hospital, at altitude 680 ft.	1932-60a	Board of Water Supply, City and County of Honolulu.
Booth Springs	Lat 21°20'10", long 157°49'42", 2.4 miles north of University of Hawaii and 2.9 miles northeast of Honolulu Post Office, at altitude 685 ft.	1929-60a	Do
Haiku tunnel	Lat 21°24'39", long 157°50'08", 2.0 miles southwest of St. Ann's School and 2.6 miles west of Castle High School, at altitude 550 ft.	1941-60	Do
Hering Springs	Lat 21°19'36", long 157°49'18", in Makiki valley, 2.9 miles northeast of Honolulu Post Office, at altitude 970 ft.	1947-60a	Do
Kahaluu tunnel	Lat 21°26'18", long 157°51'32", 2.3 miles southwest of Kahaluu and 3.3 miles south of Waiahole School, at altitude 585 ft.	1947-60	Do
Kahana development tunnel	Lat 21°31'05", long 157°54'22", 6.3 miles south of Haulea School and 7.1 miles east of Leilehua High School, at altitude 800 ft.	1931-60	Waiahole Water Co., Ltd.
Kahuawai Springs	Lat 21°20'05", long 157°49'18", 2.8 miles northeast of Honolulu Post Office, at altitude 618 ft.	1925-60a	Board of Water Supply, City and County of Honolulu.
Kalihi tunnels	Lat 21°22'20", long 157°50'03", 3.9 miles east of Tripler Hospital and 4.7 miles northeast of Honolulu Post Office at altitude 650 ft.	1926-60a	Do
Kipapa ditch	Lat 21°25'15", long 158°00'50", 2.2 miles north of Waipahu Post Office and 3.0 miles southeast of Kipapa School, at altitude 370 ft.	1918-60	Waiahole Water Co., Ltd.
Kuou Springs	Lat 21°23'30", long 157°48'47", 1.5 miles southwest of Castle High School and 2.4 miles south of St. Ann's School, at altitude 230 ft.	1955-60	Board of Water Supply, City and County of Honolulu.
Luluku tunnels	Lat 21°23'40", long 157°49'17", 1.9 miles southwest of Castle High School and 2.3 miles southwest of St. Ann's School, at altitude 570 ft.	1927-60	Do
Makiki Springs	Lat 21°19'15", long 157°49'48", 2.3 miles northeast of Honolulu Post Office, at altitude 350 ft.	1926-60a	Do
Manoa tunnels	Lat 21°19'59", long 157°47'33", 4.9 miles northeast of Honolulu Post Office, at altitude 800 ft.	1925-60a	Do

^a Published in biennial reports of Honolulu Sewer and Water Commission and of Honolulu Board of Water Supply.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Operated by
<u>ISLAND OF OAHU--Continued</u>			
McCandless ditch	Lat 21°24'07", long 157°55'43", 1.4 miles north of Aiea Post Office and 5 miles east of August Ahrens School, at altitude 550 ft.	1949-60	Waiahole Water Co., Ltd.
Nuuanu tunnels	Lat 21°21'06", 157°49'10", 3.5 miles north of University of Hawaii and 4.1 miles northeast of Honolulu Post Office, at altitude 780 ft.	1926-60a	Board of Water Supply, City and County of Honolulu.
Nuuanu tunnels No. 3	Lat 21°21'16", long 157°49'14", 2.7 miles north of University of Hawaii and 4.2 miles northeast of Honolulu Post Office, at altitude 830 ft.	1931-60a	Do
Palolo tunnel	Lat 21°19'38", long 157°46'27", 3.1 miles northwest of Aina Haina School and 3.7 miles southwest of Waimanalo village, at altitude 1,000.	1926-60a	Do
Uwau development tunnel	Lat 21°29'29", long 157°53'16", 2.2 miles west of Waiahole School and 3.6 miles northwest of Kahaluu, at altitude 840 ft.	1934-60	Waiahole Water Co., Ltd.
Waianae tunnel	Lat 21°28'27", long 158°09'21", 2.6 miles northeast of Waianae School and 3.7 miles northeast of Maile.	1951-60	Board of Water Supply, City and County of Honolulu.
Waiawa ditch	Lat 21°26'55", long 157°57'30", 3.9 miles southeast of Kipapa School and 5.2 miles northeast of Waipahu Post Office, at altitude 680 ft.	1918-60	Waiahole Water Co., Ltd.
Waiawa Intake	Lat 21°27'45", long 157°55'29", 5.9 miles east of Kipapa School and 7.4 miles northeast of Waipahu Post Office, at altitude 750 ft.	1918-60	Do
Waihee tunnel	Lat 21°26'59", long 157°52'42", 1.6 miles south of Waiahole School and 3.7 miles northwest of St. Anna School, at altitude 218 ft.	1956-60	Board of Water Supply, City and County of Honolulu.
Waikakalaua ditch	Lat 21°27'15", long 158°01'45", 2.5 miles east of Kunia School and 3.1 miles south of Wahiawa Post Office, at altitude 760 ft.	1918-60	Waiahole Water Co., Ltd.
Waikane No. 1 development tunnel	Lat 21°30'16", long 157°53'25", 4.2 miles southwest of Kaewa School, at altitude 780 ft.	1928-60	Do
Waikane No. 2 development tunnel	Lat 21°29'50", long 157°53'13", 2.1 miles west of Waikane and 2.2 miles northwest of Waiahole School, at altitude 780 ft.	1928-60	Do
Waimanalo tunnel	Lat 21°20'13", long 157°45'01", 2.1 miles southwest of Waimanalo village and 3.8 miles north of Aina Haina, at altitude 462 ft.	1940-60	Board of Water Supply, City and County of Honolulu.
<u>ISLAND OF MAUI</u>			
Everett ditch	Lat 20°51'35", long 156°31'43", below intake, 2.6 miles southwest of Wailuku Post Office, at altitude 880 ft.	1935-60	Wailuku Sugar Co.
Haiku ditch	Lat 20°55'46", long 156°20'38", at Hamakupoko, 0.9 mile north of Maui High School and 2.3 miles northeast of Paia School, at altitude 250 ft.	1924-60	East Maui Irrigation Co.
Honoluia ditch	Lat 20°57'10", long 156°39'29", at Mahinahina weir, 2.1 miles east of Honokowai and 4.06 miles north of Lahainaluna High School, at altitude 710 ft.	1912-60	Baldwin Packers, Ltd.
Iao-Waikapu ditch	Lat 20°52'58", long 156°31'06", at tunnel outlet, 1 mile southwest of Wailuku Post Office and 2 miles northwest of Waikapu, at altitude 780 ft.	1923-60	Wailuku Sugar Co.
Kahoma tunnel	Lat 20°54'20", long 156°38'06", 2,000 ft above outlet and 2.0 miles northeast of Lahainaluna High School, at altitude 2,000 ft.	1920-60	Pioneer Mill Co.
Kaluanui ditch	Lat 20°53'30", long 156°18'20", at Ohia-Kuiaha Gulch, 0.6 mile northwest of Kaupakulua School and 2.8 miles southeast of Haiku School, at altitude 960 ft.	1954-60	East Maui Irrigation Co.
Kanaha ditch	Lat 20°53'45", long 156°39'37", at intake, 0.2 mile northeast of Lahainaluna High School, at altitude 520 ft.	1921-60	Pioneer Mill Co.
Kauaula tunnel	Lat 20°52'40", long 156°38'44", at outlet 1.5 miles southeast of Lahainaluna School and 2.9 miles east of Lahaina, at altitude 940 ft.	1920-60	Do
Kauhikoa ditch	Lat 20°53'35", long 156°20'12", 0.45 mile northeast of Maunalolu College and 2.0 miles southeast of Paia School, at altitude 890 ft.	1928-60	East Maui Irrigation Co.
Launiupoko ditch	Lat 20°51'42", long 156°38'30", at outlet, 1.25 miles east of Launiupoko, at altitude 980 ft.	1921-60	Pioneer Mill Co.
Lowrie ditch	Lat 20°54'57", long 156°20'15", at Hamakuapoko, 0.9 mile east of Maui High and 1.8 miles north of Maunalolu College, at altitude 520 ft.	1949-60	East Maui Irrigation Co.
Mailepae Stream	Lat 20°58'02", long 156°39'00", 2.1 miles southeast of Kahana Church and 2.7 miles south of Honokuhua School, at altitude 760 ft.	1912-60	Baldwin Packers, Ltd.

a Published in biennial reports of Honolulu Sewer and Water Commission and of Honolulu Board of Water Supply.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Operated by
<u>ISLAND OF MAUI</u>			
Maniania ditch	Lat 20°53'09", long 156°32'30", below intake, 2.4 miles southwest of Wailuku Post Office and 3 miles northwest of Waikapu at altitude 800 ft.	1923-60	Wailuku Sugar Co..
North Waiehu Stream	Lat 20°54'44", long 156°31'24", 1.8 miles northwest of Wailuku Post Office and 2.7 miles northwest of KMWI Radio Station, at altitude 540 ft.	1922-60	Do
Old Kaluanui ditch	Lat 20°53'32", long 156°19'59", at Hamskua-poko, 2.2 miles west of Kapukulua School and 2.8 miles south of Haiku School, at altitude 980 ft.	1924-60	East Maui Irrigation Co.
South Waikapu ditch	Lat 20°51'28", long 156°31'35", 1.4 miles west of Waikapu and 2.6 miles southwest of Wailuku Post Office, at altitude 1,100 ft.	1933-60	Wailuku Sugar Co..
Spreckels ditch	Lat 20°56'41", long 156°32'39", 1,000 ft below intake, 2 miles west of Walhee, and 5.0 miles northwest of Wailuku Post Office, at altitude 460 ft.	1931-60	Do
Do	Lat 20°52'56", long 156°30'05", at Waiale, 0.6 mile southeast of Wailuku Post Office, at altitude 240 ft.	1929-60	East Maui Irrigation Co.
Ukumehame ditch	Lat 20°48'56", long 156°35'24", 2.3 miles east of Olovalu, at altitude 200 ft.	1931-60	Pioneer Mill Co..
Waihee ditch	Lat 20°56'20", long 156°32'58", below intake, 4.35 miles northwest of Wailuku Post Office, at altitude 600 ft.	1931-60	Wailuku Sugar Co..
Wailoa ditch	Lat 20°52'56", long 156°19'56", at Kamaole, 1.7 miles northwest of Kokomo and 3.4 miles south of Haiku School, at altitude 1,160 ft.	1924-60	East Maui Irrigation Co.
<u>ISLAND OF HAWAII</u>			
Alili flume	Lat 19°13'43", long 155°30'56", 1.5 mile northwest of Pahala and 4.9 miles northeast of Honuapo, at altitude 2,680 ft.	1943-60	Hawaiian Agricultural Co..
Avini weir	Lat 20°08'21", long 155°43'55", at east branch Honokane Nui Stream, 6.0 miles south of Niulii, at altitude 1,840 ft.	1927-60	Kohala Sugar Co..
Keaiwa Reservoir	Lat 19°15'13", long 155°30'06", 2.1 miles northwest of Pahala and 5.8 miles northeast of Honuepo, at altitude 3,060 ft.	1943-60	Hawaiian Agricultural Co..
Kohala ditch	Lat 20°11'50", long 155°45'10", at main weir, 1.75 miles south of Makapala village, at altitude 980 ft.	1942-60	Kohala Sugar Co..
Lower Hamakua ditch	Lat 20°07'10", long 155°34'50", at weir No. 1, 0.8 mile southwest of Kukuihaele and 8.1 miles from intake at Kavainui at altitude 980 ft.	1910-60	Hawaiian Irrigation Co..
Do	Lat 20°05'06", long 155°28'35", at weir No. 2. 0.8 mile southwest of Haina and 1.0 mile northwest of Honokaa High School, at altitude 960 ft.	1910-60	Do
Do	Lat 20°04'44", long 155°27'18", at weir No. 3, 0.8 mile east of Honokaa High School and 1.7 miles southeast of Haina, at altitude 910 ft.	1958-60	Do
Lower Lyman Springs	Lat 19°42'10", long 155°10'20", 2.0 miles northwest of Kaumana and 5.7 miles southwest of Hilo, at altitude 1,662 ft, near Papaihou.	1951-60	Board of Water Supply, County of Hawaii
Pahoehoe Springs	Lat 19°46'36", long 155°06'40", 1.2 miles southwest of Papaihou and 3.8 miles northwest of Hilo, at altitude 480 ft.	1953-60	Do
Puukumau Inlet	Lat 20°11'47", long 155°49'47", at southeast corner of Puukumau Reservoir, 3.25 miles south of Havi, at altitude 1,820 ft.	1958-60	Kohala Sugar Co..
Puukumau Outlet	Lat 20°11'50", long 155°50'22", at southwest corner of Puukumau Reservoir, 3 miles south of Havi, at altitude 1,800 ft.	1942-60	Do

ISLAND OF KAUAI

13

100. Kawaikoi Stream near Waimea

Location--Lat 22°08'00", long 159°37'15", on left bank at old trail crossing, 12.5 miles northeast of Waimea.Drainage area--4.1 sq mi.Records available--April 1909 to December 1916, July 1919 to June 1961. 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, 1919, staff gage at site 300 ft downstream at different datum.Average discharge--45 years (1911-18, 1913-15, 1919-61), 22.0 mgd (34.0 cfs).Extremes--Maximum discharge during year, 1,100 mgd (1,700 cfs) Mar. 20 (gage height, 7.33 ft), from rating curve extended above 300 mgd as explained below; minimum, 2.27 mgd (3.51 cfs) Aug. 17.

1909-16, 1919-61: Maximum discharge, 6,900 mgd (10,700 cfs) Dec. 18, 1916 (gage height, 15.2 ft), from rating curve extended above 300 mgd on basis of slope-area measurement at gage heights 12.12 and 13.43 ft; minimum, 0.74 mgd (1.15 cfs) Sept. 21, 22, 1953.

Remarks--Records good.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.37	5.83	6.73	10.9	3.27	7.76	21.2	7.94	7.39	115	57.3	8.67
2	22.5	5.21	6.21	89.4	3.39	6.17	10.5	6.65	7.57	84.7	12.4	6.49
3	30.2	4.76	3.77	13.2	3.27	5.37	8.74	6.01	17.2	29.0	8.74	5.69
4	15.5	11.2	3.15	11.4	3.04	189	6.01	5.53	13.8	15.8	7.39	28.2
5	8.87	12.4	2.92	7.20	2.80	22.9	4.76	5.05	8.74	12.6	6.65	19.5
6	8.03	9.18	*3.58	6.59	2.68	11.8	6.96	4.90	7.02	10.9	6.33	9.16
7	5.85	4.90	7.08	15.2	2.56	8.13	7.81	4.90	76.6	9.70	6.01	88.3
8	4.76	3.91	7.63	11.4	2.45	6.83	4.90	6.95	17.9	23.3	5.69	114
9	4.19	3.51	4.06	14.2	2.45	8.43	4.19	6.82	8.98	13.3	5.53	33.6
10	3.63	3.27	3.27	13.7	2.76	8.71	53.4	82.6	7.02	81.2	5.05	14.1
11	3.51	3.91	4.55	*6.65	82.5	6.49	11.5	25.2	6.33	72.3	4.90	19.4
12	22.1	3.15	4.52	5.85	35.4	31.9	11.8	10.4	5.85	*25.3	4.90	14.2
13	14.3	2.80	7.51	13.1	10.4	12.3	6.53	32.2	*5.69	16.8	4.62	9.46
14	7.58	2.56	4.58	7.14	5.85	11.7	4.90	18.6	5.53	13.2	5.94	7.57
15	4.90	2.45	3.39	5.21	*4.48	11.4	4.62	14.5	5.21	12.4	*5.90	6.49
16	4.05	2.36	3.15	4.48	4.34	6.65	4.62	7.94	5.21	11.5	4.62	6.17
17	3.51	2.36	2.80	10.3	10.3	5.37	35.2	35.9	5.05	10.2	13.9	6.81
18	3.27	2.56	3.13	5.69	6.47	15.4	12.3	17.7	4.76	9.22	15.5	7.39
19	3.04	3.39	5.53	4.76	5.37	*13.0	6.65	9.94	4.48	8.50	10.3	*19.8
20	3.04	7.71	3.63	10.9	34.6	6.83	6.65	20.5	60.1	8.13	36.6	102
21	3.04	4.07	11.8	9.19	27.3	5.69	5.37	28.7	341	7.76	122	21.2
22	3.04	2.92	23.8	5.45	28.6	7.58	4.90	36.6	101	7.57	123	9.46
23	2.80	2.96	36.4	4.34	23.2	7.39	*23.9	134	22.6	7.39	18.4	7.76
24	2.80	5.09	12.9	3.77	8.47	6.33	17.9	40.2	15.5	7.02	9.94	6.65
25	*2.80	3.77	5.96	3.65	6.01	5.21	202	20.5	12.4	18.2	7.94	7.39
26	7.87	3.04	4.19	10.3	5.05	4.62	17.0	11.8	10.9	59.2	26.6	19.0
27	7.89	25.9	9.61	8.73	4.48	4.34	11.8	9.22	10.7	108	11.7	13.1
28	4.76	25.1	64.9	5.08	35.8	4.05	9.46	7.94	24.0	72.6	7.76	30.9
29	6.96	6.79	20.4	3.77	27.6	6.67	7.94	-----	52.9	17.3	6.65	27.7
30	10.2	4.48	22.2	3.51	7.76	15.1	11.8	-----	10.2	11.8	6.17	61.5
31	22.1	4.43	-----	3.27	-----	36.3	15.6	-----	51.0	-----	7.48	-----
TOTAL	255.46	185.97	303.35	328.33	427.49	499.42	560.91	680.57	932.63	899.89	575.91	731.66
MEAN	8.24	6.00	10.1	10.6	14.2	16.1	18.1	24.3	30.1	30.0	18.6	24.4
MGD	12.7	9.28	15.6	16.4	22.0	24.9	28.0	37.6	46.5	46.4	28.7	37.7
CFS	784	571	931	1,010	1,310	1,530	1,720	2,090	2,860	2,760	1,770	2,250
CALENDAR YEAR 1960 MAX 250 MIN 2.36 MEAN MGD 16.8 MEAN CFS 26.0 AC-FT 18,870	FISCAL YEAR 1960-61 MAX 341 MIN 2.36 MEAN MGD 17.5 MEAN CFS 27.0 AC-FT 19,590											

Peak discharge (base, 1,300 mgd)...No peak above base.

* Discharge measurement made on this day.

ISLAND OF KAUAI

130. Mohihhi Stream at altitude 3,500 ft, near Waimea

Location.--Lat 22°07'05", long 159°36'15", on left bank at upper trail crossing, 3.8 miles northeast of confluence of Waiahulu and Poipau Stream, and 12 miles northeast of Waimea.

Drainage area.--1.6 sq mi.

Records available.--June 1920 to October 1926, October 1936 to June 1961. April 1909 to December 1911 (fragmentary), July 1947 to June 1952, published as Mohihhi Stream near Waimea; records 1909-11 at site 2 miles downstream not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (from topographic map).

Average discharge.--30 years (1920-26, 1937-61), 5.18 mgd (8.01 cfs).

Extremes.--Maximum discharge during year, 291 mgd (450 cfs) Dec. 4 (gage height, 4.56 ft), from rating curve extended above 50 mgd; minimum, 0.60 mgd (0.93 cfs) Sept. 5, 6.

1920-26, 1936-61: Maximum discharge, 1,250 mgd (1,930 cfs) Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 50 mgd; minimum, 0.08 mgd (0.12 cfs) September 21, 1953.

Remarks.--Records good, except those above 50 mgd, which are poor.

Rating tables, fiscal year 1960-61 (gage height, in feet, and discharge in million gallons a day)

	July 1 to Oct. 2					Oct. 3 to June 30				
0.8	0.43	1.6	5.20			1.0	0.96	2.0	12.8	
.9	.55	1.8	8.39			1.2	1.37	2.5	31.5	
1.0	.74	2.0	12.8			1.4	3.40	3.0	62.5	
1.1	1.07	2.5	31.5			1.6	5.50	3.5	112	
1.4	3.04	3.0	62.5			1.8	8.25			
1.6	5.20	3.5	112							

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	
1	2.05	1.80	1.11	4.15	1.62	2.43	7.83	2.90	2.08	11.2	22.4	1.47	
2	2.35	1.36	1.16	36.0	1.62	2.50	5.77	2.29	2.01	15.5	6.41	1.37	
3	4.51	1.26	.99	6.70	1.57	2.57	3.40	1.88	2.70	7.23	4.16	1.28	
4	4.09	2.27	.76	3.90	1.52	69.6	2.43	1.67	3.23	3.48	2.90	1.24	
5	2.30	3.25	.61	2.81	1.42	11.0	2.01	1.47	2.57	2.57	2.43	1.85	
6	1.62	2.38	*.61	2.36	1.32	5.50	1.77	1.32	2.08	2.15	2.15	1.96	
7	1.36	1.52	.74	3.51	1.24	3.90	1.72	1.24	9.41	1.88	1.82	9.26	
8	1.11	1.16	1.35	4.87	1.20	3.15	1.62	*1.24	5.67	2.09	1.72	20.1	
9	.99	1.03	1.03	8.31	1.16	2.90	1.47	6.71	2.86	2.29	1.57	10.4	
10	.88	.99	.85	6.96	1.47	2.81	5.85	17.2	2.01	25.8	1.47	4.79	
11	.79	.95	1.16	*3.70	44.0	2.50	3.82	7.27	1.72	23.6	1.42	2.65	
12	1.22	.82	.99	3.23	35.1	5.89	2.81	2.90	1.57	*8.37	1.37	2.50	
13	3.64	.76	1.65	5.12	8.85	4.87	2.22	14.4	*1.47	4.62	1.32	2.08	
14	2.66	.79	1.46	3.34	4.20	3.15	1.77	12.0	1.37	3.50	1.37	1.67	
15	1.46	.68	1.11	2.43	*2.90	2.98	1.62	7.32	1.32	3.50	*1.67	1.47	
16	1.07	.64	.92	2.08	2.43	2.43	1.62	3.60	1.37	3.15	1.32	1.37	
17	.88	.63	.92	2.77	2.50	2.08	8.17	3.70	1.32	2.65	2.14	1.28	
18	.79	.63	.79	2.36	2.73	5.30	5.61	4.30	1.24	2.29	3.06	1.24	
19	.71	.68	1.29	5.94	2.57	*5.64	2.73	2.98	1.16	2.15	2.50	*1.24	
20	.68	.87	1.07	7.99	4.01	3.15	2.22	2.57	3.30	1.94	2.27	13.6	
21	.71	1.07	.88	4.49	10.6	2.65	1.77	5.18	68.0	1.88	21.2	5.40	
22	.68	.82	4.19	2.78	6.15	2.43	1.67	4.51	23.7	1.72	24.3	2.37	
23	.64	.79	6.61	2.22	6.41	2.36	*3.24	17.6	6.20	1.67	6.80	1.88	
24	.64	.99	4.72	1.88	3.90	2.08	2.87	10.0	3.90	1.62	3.31	1.72	
25	*.64	1.07	1.90	1.72	2.73	1.88	76.1	5.89	2.98	2.12	2.36	1.42	
26	.64	.95	1.31	2.33	2.36	1.77	8.48	3.80	2.50	7.93	3.12	1.87	
27	.76	2.45	1.03	2.81	2.01	1.67	4.51	2.90	2.81	10.5	3.21	2.98	
28	1.03	6.30	9.24	2.22	4.53	1.62	2.90	2.36	4.15	14.4	2.22	4.35	
29	2.64	2.49	4.29	1.77	10.1	1.57	2.50	-----	4.76	4.28	1.77	8.37	
30	1.57	1.57	4.69	1.62	3.15	2.34	5.64	-----	2.65	2.83	1.62	13.8	
31	3.36	1.21	-----	1.57	-----	2.72	6.41	-----	2.15	-----	1.47	-----	
TOTAL	48.47	44.18	59.43	143.94	175.37	167.44	183.15	151.20	174.26	178.91	136.85	126.98	
MEAN	MGD	1.66	1.43	1.98	4.64	5.85	5.40	5.91	5.40	5.62	5.96	4.41	4.23
	CFS	2.42	2.20	3.06	7.18	9.04	8.36	9.14	8.35	8.70	9.23	6.83	6.55
	AC-FT	149	136	182	442	538	514	562	464	535	549	420	390

CALENDAR YEAR 1960 MAX 86.1 MIN 0.61 MEAN MGD 4.79 MEAN CFS 7.41 AC-FT 5,380
FISCAL YEAR 1960-61 MAX 76.7 MIN 0.61 MEAN MGD 4.36 MEAN CFS 6.74 AC-FT 4,880

Peak discharge (base, 200 mgd).--Dec. 4 (12:30 p.m.) 291 mgd (450 cfs), 4.56 ft; Jan. 25 (2:30 a.m.) 200 mgd (309 cfs), 4.10 ft.

*Discharge measurement made on this day.

ISLAND OF KAUAI

15

140. 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 June 1961.Gage.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (by barometer).Average discharge.--3½ years (1927-61), 15.9 mgd (24.6 cfs).Extremes.--1926-61: Maximum daily discharge, 68 mgd (105 cfs) Dec. 2, 1929, Mar. 4, 1933; no flow occasionally.Remarks.--Records good. Kokee ditch diverts water at altitude 3,400 ft from all streams tributary to Waimea River west of Mobihi Stream for irrigation near Kehama. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.6	8.91	7.18	16.6	3.34	10.4	34.9	17.5	12.6	47.2	34.2	12.6
2	17.5	7.00	7.78	25.7	3.46	8.76	21.2	14.8	12.4	43.0	22.2	9.84
3	27.2	6.49	5.08	18.7	3.34	7.70	15.8	13.5	19.5	32.4	17.3	8.76
4	23.4	10.9	4.24	14.8	3.10	29.4	11.1	12.6	19.0	21.9	15.0	9.92
5	13.3	14.3	3.70	9.84	2.99	31.9	8.80	11.7	14.2	18.5	13.7	21.6
6	12.0	12.8	3.98	8.22	2.87	22.0	8.08	11.1	11.3	16.1	12.6	13.1
7	9.18	7.36	6.89	15.9	2.75	15.1	13.7	10.4	33.1	14.6	11.7	29.0
8	7.90	5.64	* 8.81	13.9	2.75	12.0	8.44	10.6	25.5	23.0	11.3	4.22
9	7.00	5.02	5.05	10.6	2.63	12.4	7.36	4.00	14.8	17.8	10.6	32.4
10	6.32	4.74	4.24	21.2	8.39	14.0	24.0	4.22	11.7	33.9	10.2	20.8
11	5.98	5.16	5.37	9.30	38.4	10.3	19.5	32.3	10.4	41.2	9.84	19.5
12	18.7	4.60	4.41	7.35	32.4	29.4	19.2	19.5	9.66	* 20.0	9.48	20.4
13	19.5	4.18	8.58	13.8	17.4	20.1	11.1	30.2	9.30	* 9.42	9.12	13.9
14	15.9	3.90	5.61	* 9.30	9.50	13.6	8.62	25.1	8.94	17.8	9.78	11.7
15	8.26	3.78	4.24	6.49	7.00	18.3	7.90	23.4	* 8.40	21.9	10.9	10.2
16	6.83	3.54	3.84	5.37	6.17	10.5	7.54	15.3	8.40	20.0	8.94	9.30
17	6.15	3.42	3.46	10.2	* 12.0	8.44	22.7	22.0	8.22	17.8	* 15.8	9.48
18	5.64	3.54	3.58	6.65	9.30	15.2	24.8	25.9	7.88	16.1	18.5	10.6
19	5.30	4.18	5.81	5.21	7.52	23.3	13.3	16.6	7.35	15.0	16.2	12.9
20	5.16	8.08	4.51	11.5	16.8	12.6	13.0	22.7	14.2	14.4	18.6	38.4
21	5.16	5.28	8.05	11.9	28.6	* 9.94	10.1	29.9	46.4	13.5	38.5	* 25.2
22	5.02	4.04	22.7	6.49	26.0	11.4	9.56	24.7	43.6	12.6	42.2	13.9
23	4.60	3.78	26.1	4.92	28.1	12.0	29.2	43.3	26.0	12.2	26.6	11.3
24	4.60	5.47	19.0	4.24	14.8	10.1	16.9	38.4	19.0	11.5	17.0	9.84
25	4.60	4.88	8.42	3.97	9.12	8.44	48.2	27.8	15.7	14.3	13.5	9.84
26	* 6.67	4.04	5.85	8.83	7.35	7.54	32.7	19.7	13.7	36.3	23.6	19.0
27	10.9	13.4	4.51	9.66	6.33	7.00	24.9	13.3	13.3	40.5	18.8	17.9
28	6.66	25.4	30.8	5.61	9.64	5.49	20.0	13.7	22.7	40.0	12.8	20.1
29	8.44	9.88	24.1	4.24	26.1	6.49	17.3	-----	23.4	22.2	10.9	29.6
30	7.48	6.49	26.4	3.70	12.2	19.6	* 20.7	-----	14.2	16.6	9.84	27.2
31	22.8	5.37	-----	3.34	-----	20.8	29.2	-----	16.4	-----	10.4	-----
Total	320.75	215.57	282.29	307.53	360.35	445.20	559.80	628.2	521.25	681.72	510.10	540.48
Mean		6.95										
Mgd	10.3		9.41	9.92	12.0	14.4	18.1	22.4	16.8	22.7	16.5	18.0
Cfs	15.9	10.8	14.6	15.3	18.6	22.3	28.0	34.7	26.0	35.1	25.5	27.9
Ac-ft	984	662	866	944	1110	1370	1720	1930	1600	2090	1570	1660
Calendar Year	1960		Max	45.1	Min	2.63	Mean mgd	14.3	Mean cfs	22.1	Ac-ft	16,080
Fiscal Year	1960-61		Max	48.2	Min	2.63	Mean mgd	14.7	Mean cfs	22.7	Ac-ft	16,510

* Discharge measurement made on this day.

ISLAND OF KAUAI

160. Waimea River at altitude 890 ft, near Waimea

Location.--Lat $22^{\circ}04'45''$, long $159^{\circ}39'15''$, on right bank in Waimea Canyon, 0.5 mile upstream from confluence with Koae 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 June 1961. Prior to July 1, 1952, published as Waialuku Stream near Waimea.

Gage.--Water-stage recorder. Altitude of gage is 890 ft (by barometer). Prior to May 25, 1925, at datum 1.55 ft lower.

Average discharge.--33 years (1925-48, 1951-61), 31.7 mgd (49.0 cfs).

Extremes.--Maximum discharge during year 1,220 mgd (1,890 cfs) Dec. 4 (gage height, 6.33 ft), from rating curve extended above 70 mgd on basis of slope-area measurements at gage height 11.45 ft; minimum, 7.20 mgd (11.1 cfs) Jan. 9, 10.

1916, 1917-18, 1925-61: Maximum discharge, 18,100 mgd (28,000 cfs) Aug. 17, 1950 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 320 mgd; minimum, 5.2 mgd (8.0 cfs) Nov. 4, 1927.

Remarks.--Records good except those for period of no gage-height record, which are fair. Kokee ditch diverts water above station for irrigation near Kekaha (see p.15).

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	10.5	10	10+3	19.7	8.80	9.75	26.2	16.4	9.75	127	F71+8	9+50
2	11.4	9.8	10+3	<u>195</u>	8.60	9.25	15.2	13.0	9.50	88.9	19.3	9+50
3	<u>20.3</u>	9.6	10+3	36.9	8.60	9.50	9.75	12.7	10.0	29.6	13.8	9+50
4	<u>18.9</u>	10	10+0	14.4	8.60	<u>332</u>	8.60	12.7	11.8	13.0	11.3	9+50
5	11.8	11	9.75	11+8	8.60	57.9	8.00	12.7	10.5	10.8	10.5	10+8
6	10.8	9.8	<u>9.50</u>	10.3	<u>8.40</u>	17.6	7.80	12.7	9.75	10.0	10.3	10+3
7	10.0	9.6	<u>9.50</u>	10.5	<u>8.40</u>	*13.5	7.60	12.7	57.2	9.75	10+0	55+2
8	9.75	9.4	<u>9.75</u>	12.7	8.40	12.1	<u>7.40</u>	12.7	23.4	11.0	*9.75	<u>126</u>
9	9.25	9.2	10+3	23.0	8.40	11.8	7.40	47.2	11.3	10.8	9.75	31.0
10	9.0	9.0	10+3	31.8	8.40	12.1	34.6	82.7	10.0	149	9.75	16.4
11	8.8	9.2	10.3	13.8	<u>107</u>	12.1	*15.6	31.8	9.50	<u>180</u>	9.75	11.5
12	12	9.0	10+3	12.1	<u>74.3</u>	14.1	10.3	13.8	9.50	45.0	9.75	12.7
13	11	8.8	10+3	11.8	21.2	12.9	9.75	28.4	9.25	19.7	9.75	*10.3
14	10	8.8	10.8	12.1	12.7	9.25	9.50	22.8	9.25	14.4	14.3	10.3
15	9.6	<u>8.6</u>	10+3	10.3	10.3	9.00	9.25	23.5	9.25	17.4	10.3	10.0
16	9.4	8.6	10.3	10.0	9.50	8.40	9.50	*12.7	9.25	16.1	9.75	10.0
17	9.2	8.6	10.0	<u>9.25</u>	9.00	8.00	45.4	22.8	9.25	13.0	10.0	9.75
18	9.0	9.0	10.0	10.0	9.50	17.5	35.2	21.0	9.00	11.5	11.0	9.75
19	8.8	9.25	10.0	10.4	9.50	25.1	14.7	11.3	<u>8.80</u>	10.8	11.3	10.0
20	8.8	9.25	10+5	17.5	10.6	11.0	12.1	12.1	43.2	10.3	19.4	85.6
21	8.8	9.50	10+3	13.2	36.8	9.00	10.8	17.9	<u>430</u>	10.0	119	24.4
22	8.8	9.50	*13.4	10.8	15.1	9.00	10.8	15.4	<u>139</u>	9.75	<u>156</u>	11.8
23	8.6	9.25	25.9	9.75	21.8	8.80	17.8	<u>139</u>	21.6	<u>9.50</u>	23.8	10.8
24	8.6	9.00	20.6	9.50	13.2	8.40	14.7	45.4	12.7	9.50	12.4	10.3
25	8.6	9.25	12.1	9.00	10.0	8.00	<u>406</u>	19.4	10.8	9.50	10.3	10.0
26	10	9.25	10+8	9.00	9.50	8.00	42.4	12.4	10.3	29.7	13.9	10.0
27	11	14.8	10.3	*9.75	9.00	7.60	20.2	12.2	*9.75	76.2	13.2	12.1
28	9.6	<u>21.8</u>	<u>52.1</u>	9.75	12.4	<u>7.40</u>	15.1	<u>10.3</u>	16.4	85.1	10.3	16.6
29	9.8	13.0	17.4	9.25	44.1	7.60	13.5	-----	17.5	14.9	10.0	26.4
30	10	11.0	31.1	9.00	12.1	10.2	25.3	-----	10.8	11.3	9.75	49.2
31	14	10.5	-----	<u>8.80</u>	-----	13.7	30.3	-----	27.0	-----	<u>9.50</u>	-----
TOTAL	326.10	313.35	406.80	591.15	542.80	710.55	910.75	707.7	995.30	1,063.50	679.70	649.20
MEAN												
MGD	10.8	10.1	13.6	19.1	18.1	22.9	29.4	25.3	32.1	35.5	21.9	21.6
CFS	16.7	15.6	21.0	29.5	28.0	35.5	45.4	39.1	49.7	54.8	33.9	33.5
AC-FT	1,030	962	1,250	1,810	1,670	2,180	2,800	2,170	3,050	3,260	2,090	1,990

CALENDAR YEAR 1960 MAX 450 MIN 7.40 MEAN MOD 24.5 MEAN CFS 37.9 AC-FT 27,500
FISCAL YEAR 1960-61 MAX 430 MIN 7.40 MEAN MOD 21.6 MEAN CFS 33.4 AC-FT 24,260

Peak discharge (base, 1,220 mgd).--Dec. 4 (2 p.m.) 1,220 mgd (1,890 cfs), 6.33 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 10 to Aug. 18; discharge estimated on recorded range in stage and records for nearby stations.

f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

ISLAND OF KAUAI

17

170. Komic Stream at altitude 3,700 ft, near Waimea

Location.--Lat 22°06'40", long 159°34'00", on left bank 3 miles upstream from left branch, 6.5 miles east of Kokes 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 June 30, 1961.

Gage.--Water-stage recorder. Altitude of gage is 3,700 ft (from topographic map).

Average discharge.--20 years (1919-32, 1954-61), 17.3 mgd (26.8 cfs).

Extremes.--Maximum discharge during fiscal year, 1,060 mgd (1,640 cfs) Dec. 4 (gage height, 2.85 ft), from rating curve extended above 350 mgd; minimum, 0.80 mgd (1.24 cfs) July 26.

1919-32, 1954-61: Maximum discharge, 4,210 mgd (6,510 cfs) Oct. 23, 1956 (gage height, 5.88 ft), from rating curve extended above 350 mgd; minimum, 0.6 mgd (0.9 cfs) May 21, 22, 1929.

Remarks.--Records fair except those for periods of no gage-height record and those above 400 mgd, which are poor.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18	5.30	9.20	16.8	8.98	7.50	19.8	4.58	4.22	16.4	69.5	2.82
2	26	4.22	7.09	120	9.98	12.7	18.4	3.31	11.2	27.7	7.50	2.82
3	43	4.22	3.60	14.0	10.2	8.00	9.20	2.59	37.2	11.3	4.58	2.59
4	34	39.0	2.36	9.85	4.94	291	5.70	2.36	22.4	4.58	3.60	2.82
5	20	17.4	2.00	7.00	3.31	14.4	4.22	2.17	7.50	3.31	2.82	3.60
6	15	8.43	*8.54	6.10	2.82	7.00	3.05	2.00	5.70	2.59	2.59	3.60
7	11	3.91	9.35	8.27	2.36	4.94	2.82	1.69	26.7	2.36	2.36	39.9
8	8	3.60	8.28	24.4	2.17	3.91	2.82	2.00	17.0	2.82	2.17	41.5
9	7	14.6	3.91	13.1	2.17	4.22	2.36	13.1	6.55	2.17	2.00	35.2
10	6	8.32	3.60	8.58	13.9	4.22	7.05	4.11	4.58	96.1	2.00	10.7
11	5	3.31	3.60	23.2	267	4.92	6.10	13.5	3.60	*74.4	2.36	9.80
12	25	2.36	24.1	10.5	166	22.1	7.50	6.55	2.82	10.5	3.31	9.35
13	30	2.17	30.7	*20.7	32.5	12.8	4.94	211	*2.59	5.30	2.59	5.30
14	20	1.69	7.00	8.60	7.50	16.9	3.60	9.88	2.59	3.91	15.8	4.22
15	10	1.56	4.94	6.55	5.70	11.8	2.59	17.4	2.36	3.91	6.16	3.60
16	8	1.19	13.2	5.30	7.50	4.94	2.83	9.20	2.36	5.30	*3.91	4.58
17	6	327	5.30	6.10	8.60	3.91	28.7	7.00	2.17	3.91	17.6	7.00
18	5	3.31	4.22	4.58	12.8	16.3	9.31	5.70	2.00	3.05	12.7	6.55
19	4	3.60	7.50	13.0	8.00	9.06	3.91	4.22	183	3.91	7.99	6.52
20	*3	9.35	3.91	11.9	24.7	5.30	3.05	4.22	17.3	3.60	7.50	*50.2
21	4	3.60	12.3	8.00	25.2	4.94	2.36	28.2	236	2.82	44.9	13.9
22	3	2.36	46.5	5.30	16.5	4.58	2.17	20.0	67.0	2.36	60.4	6.10
23	3	8.46	37.8	3.91	22.9	4.94	4.35	35.5	9.70	5.70	21.6	5.30
24	3	8.00	16.3	3.31	7.50	3.91	9.92	25.1	6.55	4.68	6.10	5.30
25	3	4.94	7.00	3.31	5.70	3.05	*195	31.3	4.94	12.8	4.22	4.22
26	1.19	4.12	4.22	20.3	5.30	2.82	9.10	9.85	11.8	68.8	14.4	9.99
27	15.7	20.5	4.54	15.2	3.91	2.59	4.94	7.50	15.3	40.2	7.15	19.2
28	44.8	23.9	51.8	6.55	25.2	236	3.60	4.94	13.6	42.6	4.58	25.0
29	12.2	12.0	10.5	4.94	24.9	2.59	3.05	-----	7.10	7.98	3.60	22.9
30	22.7	14.9	36.5	4.94	5.70	4.22	13.2	-----	3.91	4.58	3.31	51.3
31	29.4	19.3	-----	5.70	-----	6.25	10.6	-----	3.05	-----	3.05	-----
Total	4 45.99	262.89	389.86	419.99	743.94	508.17	406.24	614.88	561.62	4 79.64	352.35	415.88
Mean												
Mgd	14.4	8.48	13.0	13.5	24.8	16.4	13.1	22.0	18.1	16.0	11.4	13.9
Cfs	22.3	13.1	20.1	20.9	38.4	25.4	20.3	34.0	28.0	24.8	17.6	21.5
Ac-ft	1370	807	1200	1290	2280	1560	1250	1890	1720	1470	1080	1280

Calendar Year 1960 Max 291 Min 1.19 Mean mgd 16.5 Mean cfs 25.5 Ac-ft 18,510
Fiscal Year 1960-61 Max 291 Min 1.19 Mean mgd 15.3 Mean cfs 23.7 Ac-ft 17,200

Peak discharge (base, 900 mgd).--Dec. 4 (11:30 a.m.) 1,060 mgd (1,640 cfs), 2.85 ft; Feb. 13 (8:30 a.m.) 960 mgd (1,490 cfs), 2.72 ft;
Mar. 21 (4:30 a.m.) 1,010 mgd (1,560 cfs), 2.78 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 1-25; discharge estimated on basis of recorded range in stage and records for nearby stations.

ISLAND OF KAUAI

220. 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 1961. August 1932 to June 1933 monthly discharge only, published in WSP 1319; figures of discharge published in WSP 755 are unreliable.Gage.--Water-stage recorder. Altitude of gage is 520 ft (by barometer). Prior to July 12, 1921, staff gages at several sites within 1 mile of present site at various datums.Average discharge.--48 years (1910-15, 1916-17, 1918-24, 1925-61), 36.7 mgd (56.8 cfs) (fiscal years 1911-15, and 1917 were omitted in error in computing averages for period prior to 1960.)Extremes.--1907-61: Maximum daily discharge, 67 mgd (104 cfs) Jan. 6, Mar. 3, 6, 7, 17, 18, 24-26, 29-31, 1921; no flow at times.Remarks.--Records good. Ditch diverts water from Waimea River, 1 mile downstream from mouth of Waialae Stream. Flow regulated by headgates. Water used for irrigation in vicinity of Kekaha.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	42.2	40.0	35.6	40.0	33.5	37.8	f 35.6	40.0	35.6	40.0	40.0	29.5
2	40.0	31.5	37.8	40.0	40.0	40.0	f 35.6	40.0	40.0	42.2	40.0	29.5
3	46.6	29.5	29.5	40.0	37.8	f 35.6	40.0	44.4	48.9	40.0	40.0	27.5
4	46.6	37.8	27.5	44.4	33.5	35.6	f 35.6	37.8	40.0	44.4	40.0	27.5
5	44.4	48.9	25.5	42.2	27.5	33.5	f 35.6	35.6	40.0	35.6	37.8	31.5
6	* 37.8	46.6	29.5	35.6	27.5	24.5	33.5	33.5	40.0	33.5	37.8	29.5
7	33.5	33.5	35.6	37.8	25.5	22.6	f 31.5	33.5	44.4	31.5	35.6	37.8
8	31.5	29.5	40.0	44.4	25.5	22.9	29.5	31.5	48.9	31.5	33.5	46.6
9	29.5	35.6	31.5	44.4	24.5	37.8	29.5	44.4	44.4	33.5	* 31.5	46.6
10	27.5	40.0	31.5	35.6	25.5	37.8	37.8	44.4	37.8	37.8	31.5	46.6
11	27.5	29.5	31.5	40.0	42.2	35.6	42.2	35.6	33.5	37.8	31.5	42.2
12	29.5	27.5	31.5	37.8	37.8	44.4	* 37.8	35.6	31.5	35.6	31.5	46.6
13	48.9	27.5	46.6	40.0	40.0	f 46.6	35.6	44.4	31.5	35.6	31.5	37.8
14	46.6	25.5	40.0	35.6	44.4	44.4	31.5	42.2	29.5	35.6	35.6	* 33.5
15	33.5	25.5	31.5	35.6	44.4	48.9	29.5	35.6	29.5	35.6	44.4	29.5
16	29.5	24.5	35.4	33.5	42.2	f 37.8	29.5	40.0	29.5	35.6	35.6	29.5
17	27.5	24.5	35.6	33.5	44.4	f 33.5	44.4	* 44.4	29.5	46.6	40.0	31.5
18	25.5	* 27.5	29.5	31.5	42.2	f 35.6	44.4	35.6	29.5	44.4	44.4	33.5
19	25.5	27.5	31.5	35.6	37.8	f 44.4	44.4	37.8	27.5	42.2	42.2	31.5
20	25.5	33.5	29.5	37.8	40.0	46.6	37.8	40.0	31.5	42.2	35.6	46.6
21	25.5	31.5	27.5	35.6	46.6	42.2	33.5	44.4	46.6	35.6	40.0	46.6
22	24.5	27.5	* 46.6	35.6	46.6	40.0	31.5	48.9	46.6	33.5	46.6	37.8
23	24.5	27.5	46.6	33.5	44.4	f 42.2	40.0	48.9	46.6	35.6	46.6	31.5
24	24.5	37.8	46.6	31.5	37.8	35.6	35.6	44.4	44.4	37.8	44.4	31.5
25	24.5	33.5	40.0	29.5	37.8	33.5	37.8	40.0	40.0	42.2	37.8	29.5
26	24.5	27.5	31.5	35.6	35.6	33.5	40.0	40.0	40.0	46.6	35.6	31.5
27	27.3	33.5	29.5	* 44.4	31.5	31.5	40.0	46.6	46.6	46.6	40.0	46.6
28	46.6	46.6	44.4	37.8	31.5	29.5	40.0	42.2	* 44.4	44.4	35.6	44.4
29	46.6	46.6	46.6	31.5	46.6	31.5	39.4	-----	46.6	37.8	33.5	46.6
30	37.8	44.4	42.2	29.5	44.4	f 33.5	40.0	-----	42.2	37.8	31.5	46.6
31	48.9	46.6	-----	31.5	-----	f 33.5	40.0	-----	35.6	-----	29.5	-----
Total	1054.3	1048.9	1068.1	1141.3	1121.2	L134.6	L134.7	L127.3	L198.1	L168.0	L161.1	L107.4
Mean	34.0	33.8	35.6	36.8	37.4	36.6	36.6	40.3	38.6	38.9	37.5	36.9
Mgd	52.6	52.3	55.1	56.9	57.9	56.6	56.6	62.4	59.7	60.2	58.0	57.1
Cfs	3.240	3.220	3.280	3.500	3.440	3.480	3.480	3.460	3.680	3.580	3.560	3.400

Calendar Year 1960 Max 48.9 Min 0.98 Mean mgd 35.9 Mean cfs 55.5 Ac-ft 40390
Fiscal Year 1960-61 Max 48.9 Min 22.6 Mean mgd 36.9 Mean cfs 57.1 Ac-ft 41320

* Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage height.

ISLAND OF KAUAI

19

291. Waimea ditch below wastewater, near Waimea

Location.--Lat 21°59'05", long 159°39'55", on left bank, at tunnel No. 4 outlet, below wastewater 1.3 miles below intake and 2 miles north of Waimea.

Records available.--February 1960 to June 1961.

Gage.--Water-stage recorder and Parshall flume.

Extremes.--1960-61: Maximum daily discharge, 8.50 mgd (13.2 cfs) Nov. 12, 13, 1960 and Jan. 26, 1961; no flow Mar. 16-21, 1960.

Remarks.--Records good. Flow can be regulated by means of two wastewater gates between station and intake. Water used for irrigation of sugar cane.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.90	6.15	5.30	5.35	3.33	5.06	0.47	0.63	3.96	2.88	1.44	2.38
2	3.67	4.18	4.88	3.23	4.80	5.22	0.56	0.59	3.61	3.26	0.69	2.32
3	2.91	3.47	3.89	0.88	4.82	5.03	4.90	0.69	5.38	5.46	0.59	2.19
4	2.63	3.68	2.98	0.38	4.98	0.96	6.80	1.00	6.69	5.97	0.53	2.13
5	5.13	6.79	2.57	0.22	3.26	0.92	4.98	0.96	6.51	4.18	0.47	*2.19
6	*5.46	6.42	2.32	0.13	2.70	0.92	3.96	2.65	4.98	3.33	0.38	2.32
7	4.50	5.06	3.68	0.73	2.57	0.85	3.54	3.26	4.98	2.98	0.38	2.36
8	4.10	3.75	4.42	1.29	2.44	0.69	3.40	3.05	6.98	2.77	1.87	7.03
9	3.75	3.40	*4.10	1.00	2.38	2.71	3.26	4.19	6.06	2.98	3.05	7.93
10	2.98	4.74	3.40	5.55	2.32	3.19	3.97	4.47	3.81	2.75	2.98	6.41
11	2.77	*4.18	4.18	6.88	6.45	2.25	6.69	2.98	1.80	1.89	2.98	2.09
12	2.63	3.26	3.33	6.84	8.50	2.44	*4.90	2.63	1.73	1.04	2.98	2.19
13	4.95	3.05	6.13	6.69	8.50	5.92	4.98	3.00	2.77	.88	2.98	3.67
14	6.69	2.91	5.88	5.40	*8.02	6.79	4.10	3.92	2.63	.81	4.12	3.40
15	4.98	2.77	4.26	2.91	6.88	4.22	3.47	4.92	2.77	.77	6.88	2.84
16	3.61	2.63	3.61	2.13	5.62	1.26	3.47	7.17	2.91	.43	4.50	2.44
17	3.05	2.63	5.06	*2.97	5.79	1.12	5.90	*4.89	2.84	4.33	3.50	2.44
18	2.84	2.98	3.75	3.47	6.06	1.17	8.21	1.21	2.77	6.33	6.60	3.05
19	2.70	3.12	3.26	3.44	6.98	2.67	7.17	1.04	2.51	5.22	6.15	3.05
20	2.57	3.40	3.54	7.74	5.79	3.82	5.46	3.12	2.57	4.98	4.90	5.31
21	2.51	4.34	2.98	6.08	8.02	2.91	4.26	5.19	6.95	4.26	6.73	7.55
22	*2.44	3.40	4.63	3.26	7.74	2.84	2.45	7.17	7.55	4.34	8.21	5.79
23	2.32	2.91	6.98	2.38	4.92	3.82	3.19	7.26	7.45	3.54	8.21	3.68
24	2.25	4.03	7.26	2.89	4.77	3.54	5.38	5.86	6.79	4.18	7.26	2.91
25	2.25	4.58	5.30	2.91	0.50	2.77	7.95	3.26	3.67	*3.96	4.98	2.57
26	2.44	3.68	3.30	2.91	2.90	1.32	8.50	2.98	.58	6.79	3.61	2.38
27	2.77	3.47	3.19	6.76	2.95	2.21	8.12	4.79	4.96	5.07	7.08	4.89
28	4.94	6.24	5.58	5.70	2.22	2.84	5.40	5.38	5.62	3.40	4.98	5.97
29	6.69	6.24	7.07	4.10	7.19	2.70	2.57	-----	*6.60	2.98	3.47	7.17
30	4.98	5.62	7.17	3.33	6.79	1.96	2.82	-----	3.84	2.38	2.70	7.55
31	6.42	6.15	-----	3.05	-----	0.30	1.82	-----	1.64	-----	2.38	-----
TOTAL	116.83	129.23	133.70	110.60	145.49	84.42	142.45	98.23	133.91	104.34	117.55	119.20
MEAN												
MGD	3.77	4.17	4.46	3.57	4.85	2.72	4.60	3.51	4.32	3.48	3.79	3.97
CFS	5.83	6.45	6.89	5.52	7.50	4.21	7.11	5.43	6.68	5.38	5.87	6.15
AC-FT	359	397	410	339	446	259	437	301	411	320	361	366

CALENDAR YEAR 1960 MAX - MIN - MEAN MGD - MEAN CFS - AC-FT
FISCAL YEAR 1960-61 MAX 8.50 MIN 0.13 MEAN MGD 3.93 MEAN CFS 6.08 AC-FT 4,410

* Discharge measurement made on this day.

ISLAND OF KAUAI

310. Waimea River near Waimea

Location.--Lat $21^{\circ}58'55''$, long $159^{\circ}39'50''$, on right bank 1.2 miles upstream from confluence with Makaweli River and 1.8 miles north of Waimea.

Drainage area.--57.8 sq mi.

Records available.--July 1910 to October 1919, November 1943 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from estuary at confluence with Makaweli River). Prior to Oct. 5, 1911, staff gage at site 1 mile downstream at different datum. Oct. 5, 1911 to June 30, 1918, staff gage at present site at different datum.

Average discharge.--24 years (1911-18, 1944-61), 84.7 mgd (131 cfs) (fiscal years 1912-18 were omitted in error in computing averages for period prior to 1960).

Extremes.--Maximum discharge during year, 5,240 mgd (8,110 cfs) Dec. 4 (gage height, 10.21 ft), from rating curve extended above 3,800 mgd as explained below; minimum, 0.32 mgd (0.50 cfs) Sept. 6.

1910-19, 1943-61: Maximum discharge, 24,000 mgd (37,100 cfs) Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 3,800 mgd on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; no flow when all water was being diverted.

Remarks.--Records good. Several ditches divert most of flow for irrigation of sugar cane.

Rating table (gage height, in feet, and discharge in million gallons a day)

2.9	0.18	4.5	70.0
3.0	.45	5.0	180
3.2	1.90	5.5	365
3.4	4.10	6.0	640
3.6	8.00	7.0	1,400
4.0	22.2	8.0	2,380

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	220	8.54	5.04	45.8	0.92	3.62	21.1	33.2	2.15	95.0	286	0.80
2	8.04	1.18	2.19	674	1.79	3.14	41.1	18.4	1.40	106	53.5	.68
3	56.5	1.07	2.35	90.8	2.40	12.4	15.7	12.1	12.0	49.8	23.1	.58
4	26.1	8.52	1.50	22.2	1.78	1440	5.93	9.00	33.7	9.28	11.4	.63
5	10.9	29.5	1.15	11.2	.74	*195	2.40	7.16	18.9	1.98	7.50	* .68
6	* 4.43	10.7	.68	6.74	.63	69.4	1.70	4.02	4.01	.86	5.18	.68
7	2.82	3.12	1.09	4.82	* 58	46.2	1.50	2.70	31.2	.54	4.10	.71
8	2.40	1.07	2.57	19.5	.63	36.5	1.30	2.50	50.4	.38	2.51	201
9	2.85	.86	* 2.86	16.7	.58	10.2	1.22	15.9	10.4	.38	1.40	55.1
10	1.50	2.24	1.92	43.2	.58	7.79	9.91	107	3.34	366	1.15	37.5
11	1.30	* 1.73	3.90	17.4	56.4	6.95	10.7	66.2	3.50	567	.86	8.22
12	1.30	.92	1.37	21.0	585	7.77	* 208	20.0	2.90	135	.68	7.96
13	1.13	.86	35.5	13.3	114	26.3	1.80	279	1.15	* 512	.50	3.99
14	22.8	.86	9.37	14.2	* 21.9	7.85	1.30	220	.92	27.4	116	1.07
15	3.55	.86	2.00	8.06	6.55	16.8	.99	99.4	.80	4.27	11.5	.80
16	1.30	.80	1.30	4.70	2.46	9.42	.99	21.9	* .68	48.8	1.68	.68
17	.86	.86	3.56	* 2.24	2.20	6.11	47.4	* 104	.74	20.1	.86	.63
18	.74	.99	1.70	2.84	2.70	35.1	63.0	31.5	.63	7.59	9.07	.80
19	.58	1.15	1.30	5.21	11.0	58.4	8.16	11.6	.58	3.98	4.51	.86
20	.54	1.22	1.30	41.4	3.41	14.4	4.45	4.72	.63	3.14	2.66	55.0
21	* .68	2.63	1.15	23.3	75.0	8.75	1.50	16.1	904	2.50	136	53.3
22	.68	1.70	16.7	11.7	18.5	* 582	2.40	47.5	348	2.10	276	6.04
23	.63	1.22	43.3	5.92	4.56	632	2.16	122	46.8	1.50	61.8	1.48
24	.68	2.81	49.4	2.84	29.1	5.94	3.20	79.4	12.6	1.80	12.6	.80
25	.74	3.20	6.45	1.80	11.4	4.46	1040	54.6	9.57	* 130	2.42	.68
26	.74	2.12	2.55	1.32	5.20	4.46	97.3	24.7	13.8	102	.86	.86
27	.86	2.10	.92	15.1	3.34	3.24	31.5	8.23	28.8	103	135	8.34
28	7.00	312	* 60.2	4.56	3.66	2.30	18.0	4.42	6.07	193	2.74	7.40
29	31.0	13.7	20.8	1.22	78.7	2.20	12.4	-----	* 29.5	382	1.22	38.30
30	3.07	6.25	51.4	.86	13.3	3.78	4.62	-----	7.62	12.6	1.07	29.20
31	33.5	12.5	-----	.74	-----	9.26	* 86.1	-----	5.00	-----	.99	-----
Total	241.59	156.48	335.52	1134.67	1607.65	2069.88	1583.49	1333.65	1591.79	1995.13	948.96	524.77
Mean	7.79	5.05	11.2	36.6	53.6	66.8	51.1	47.6	51.3	66.5	30.6	17.5
Mgd	12.1	7.81	17.3	56.6	82.9	103	79.1	73.6	79.4	101	47.3	27.1
Cfs	741	480	1030	3480	4930	6350	4860	4090	4890	6120	2910	1610
Ac-ft												
Calendar Year	1960	Max	1440	Min	0.54	Mean mgd	46.4	Mean cfs	71.8	Ac-ft	52070	
Fiscal Year	1960-61	Max	1440	Min	0.38	Mean mgd	37.1	Mean cfs	57.4	Ac-ft	41490	

Peak discharge (base, 5,600 mgd).--No peak above base.

* Discharge measurement made on this day.

ISLAND OF KAUAI

21

360. Makaweli River near Waimea

Location--Lat 21°58'15", long 159°38'55", on left bank 0.7 mile upstream from mouth and 1.9 miles northeast of Waimea.Drainage area--25.0 sq mi.Records available--July 1943 to June 1961.Gage--Water-stage recorder. Altitude of gage is 29 ft (by hand levels from estuary at confluence with Waimea River). July 27, 1943 to June 15, 1959, at datum 1.0 ft higher.Average discharge--17 years (1944-61), 50.6 mgd (78.3 cfs) (averages prior to 1959 include the period 1911-17 at site 0.2 mile downstream which has been found to be nonequivalent).Extremes--Maximum discharge during year, 3,200 mgd (4,950 cfs) Dec. 4 (gage height, 7.42 ft), from rating curve extended above 730 mgd on basis of slope-area measurement of peak flow; minimum daily, 4.7 mgd (7.3 cfs) July 24-26.

1943-61: Maximum discharge, 8,800 mgd (13,600 cfs) Jan. 19, 1952 (gage height, 11.19 ft), from rating curve extended above 1,300 mgd on basis of slope-area measurement at gage height 9.46 ft; minimum recorded, 2.05 mgd (3.15 cfs) July 19, 1951.

Remarks--Records fair. Olokele ditch diverts all low water from Olokele Stream 9 miles above station for irrigation near Makaweli.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.7	13.1	20.6	62.7	10.1	14.8	54.3	27.4	12.7	10.1	29.5	6.75
2	88.5	13.3	13.9	75.7	12.6	23.2	57.7	16.1	37.9	8.83	83.0	6.42
3	30.4	8.60	7.12	82.6	45.3	15.0	26.0	13.2	*50.7	9.26	51.0	6.09
4	18.1	99.7	5.80	34.5	8.40	8.78	17.0	9.69	59.3	7.41	59.3	5.76
5	13.7	86.3	5.06	17.5	7.08	128	13.2	7.41	20.4	7.74	37.8	*6.42
6	*10.9	19.5	36.4	13.2	6.75	53.9	11.8	7.41	15.1	7.08	17.0	5.76
7	10.9	8.60	12.2	13.7	*6.42	40.4	11.0	7.08	16.8	6.42	15.1	28.2
8	9.70	17.7	16.3	70.7	6.42	33.1	10.1	7.08	31.2	6.75	14.6	53.5
9	8.05	29.5	*7.12	16.1	6.09	*30.8	9.69	7.74	17.5	6.42	*13.7	*68.3
10	7.12	15.7	6.66	14.6	6.09	28.7	9.26	13.4	14.1	266	11.8	16.5
11	6.66	*7.12	6.20	76.8	70.3	22.2	9.69	8.83	12.7	328	11.8	17.6
12	21.0	5.80	35.2	17.9	84.6	18.1	9.69	5.75	12.3	62.4	11.0	17.0
13	48.6	6.20	78.1	39.0	229	41.4	*9.69	397	11.4	*26.7	10.6	7.41
14	20.5	5.80	12.0	13.7	*51.9	78.1	8.83	191	11.0	19.9	92.1	6.75
15	10.3	7.12	8.60	12.3	23.4	33.6	8.83	84.7	11.4	41.5	17.4	6.75
16	8.05	5.06	50.2	10.1	27.0	16.5	8.83	46.1	14.1	32.3	9.26	7.41
17	7.12	18.3	11.5	*9.26	23.6	14.6	60.3	222	8.40	22.2	354	11.4
18	6.20	10.6	8.05	8.40	24.6	146	303	17.5	8.83	21.6	16.5	7.41
19	6.20	5.42	8.60	34.7	26.6	59.9	13.7	14.1	7.74	23.2	13.0	5.76
20	6.66	8.41	5.80	18.9	26.9	30.8	11.0	*11.0	152	22.7	7.08	24.2
21	6.20	6.20	20.5	10.6	45.6	24.1	9.69	38.8	150	13.7	384	11.3
22	*5.80	5.42	5.91	8.40	14.6	*21.6	9.69	43.1	163	12.7	127	6.42
23	5.06	22.3	58.0	7.74	38.7	28.7	9.26	21.7	24.7	27.4	64.9	10.0
24	4.71	10.3	28.0	7.08	14.6	18.7	24.4	26.7	*15.1	20.3	13.2	7.56
25	4.71	7.58	12.0	6.75	12.7	15.1	326	77.7	10.6	*18.5	9.26	5.76
26	4.71	9.40	8.60	41.3	10.6	13.7	32.6	18.7	26.4	167	32.1	6.42
27	121	20.6	7.12	36.0	8.83	11.0	16.1	25.0	373	120	11.7	23.7
28	2.87	23.0	*25.1	9.69	29.0	9.69	12.7	13.7	12.7	103	7.41	14.6
29	57.9	24.9	11.5	7.41	42.9	9.26	11.4	-----	17.1	27.3	9.86	18.5
30	35.8	76.8	121	7.08	10.6	140	8.21	-----	11.0	19.0	6.75	36.2
31	81.7	57.0	-----	8.40	-----	11.0	*54.6	-----	8.83	-----	6.42	-----
Total	967.95	655.33	706.33	1474.11	2324.38	1883.95	979.45	1181.09	875.50	1465.41	1149.44	455.85
Mean	Med	21.1	23.5	47.6	77.5	60.8	31.6	42.2	28.2	48.8	37.1	15.2
	Cfs	48.3	32.6	36.4	73.6	120	94.1	48.9	65.3	43.6	75.5	57.4
	Ac-ft	2.970	2010	2.170	4.520	7.130	5.780	3.010	3.620	2.690	4.500	3.530
Calendar Year	1960	Max	878	Min	4.71	Mean mgd	48.3	Mean cfs	74.7	Ac-ft	54240	
Fiscal Year	1960-61	Max	878	Min	4.71	Mean mgd	38.7	Mean cfs	59.9	Ac-ft	43330	

Peak discharge (base, 1,300 mgd)--Oct. 2 (11 a.m.) 1,580 mgd (2,440 cfs), 5.21 ft; Nov. 11 (10:30 a.m.) 1,560 mgd (2,410 cfs), 5.17 ft; Dec. 4 (9 a.m.) 3,200 mgd (4,950 cfs), 7.42 ft; May 1 (7:30 a.m.) 1,340 mgd (2,070 cfs), 5.15 ft.

* Discharge measurement made on this day.

ISLAND OF KAUAI

490. Hanapepe River below Manushi Stream, near Eelele

Location.--Lat 21°57'20", long 159°33'15", on left bank just downstream from Manushi Stream, and 4 miles northeast of Eelele.Drainage area.--18.8 sq mi.Records available.--May 1917 to January 1921, December 1926 to June 1961. Prior to July 1952, published as "at Koula, near Eelele." August 1910 to December 1916 at site half a mile upstream; records not equivalent due to inflow.Gage.--Water-stage recorder. Altitude of gage is 150 ft (by barometer). Prior to Dec. 15, 1926, staff gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.Average discharge.--37 years (1912-20, 1927-61), 53.3 mgd (82.5 cfs).Extremes.--Maximum discharge during year, 4,570 mgd (7,070 cfs) Dec. 4 (gage height, 8.70 ft), from rating curve extended above 2,400 mgd as explained below; minimum, 6.40 mgd (9.90 cfs) Nov. 9.

1910-21, 1926-61: Maximum discharge, 15,820 mgd (24,430 cfs) Dec. 17, 1949 (gage height, 11.74 ft), from rating curve extended above 6,300 mgd on basis of slope-area measurements at gage heights 9.1 and 8.5 ft; minimum, 3.3 mgd (5.1 cfs) May 21, 1954.

Remarks.--Records good except those for periods of no gage-height records, which are poor. Hanapepe ditch diverts water from river 3 miles above station for irrigation in vicinity of Makaweli.Note.--The figures of maximum discharge for fiscal years 1918-21, 1927-60 have been revised. These records are on file in the district office and will be published in the next water-supply paper.

Rating tables (gage height, in feet, and discharge,
in million gallons a day)

July 1 to Dec. 4

Dec. 5 to June 30

0.7	6.4	2.5	172	0.7	6.4	1.7	62.5
.9	12.2	3.0	310	.9	12.2	2.0	99
1.1	20.5	3.5	485	1.1	20.5	2.5	189
1.4	37.5	4.0	710	1.4	37.5	3.0	315
1.7	59.0	4.5	960				
2.0	87.0						

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.7	14.3	35.5	70.2	12.4	18.8	39.8	15	8.74	10.6	24.6	9.36
2	85.9	12.7	18.2	588	13.4	29.4	22.4	12	24.8	10.3	33.8	8.22
3	37.0	11.6	11.6	64.6	51.7	16.6	14.5	10	45.0	9.64	19.2	7.96
4	19.3	70.3	10.6	43.1	8.22	805	11.6	9.0	41.5	9.32	27.4	7.96
5	12.6	134	9.96	16.9	7.44	110	10.6	8.5	14.9	9.32	15.2	8.22
6	11.9	31.1	32.7	13.3	6.92	74.3	9.96	8.5	11.9	9.64	13.3	* 7.96
7	10.9	12.8	16.8	21.5	6.92	58.9	9.96	8.2	14.2	9.64	12.2	31.0
8	9.96	23.9	14.0	28.4	6.66	53.5	9.64	8.2	14.8	9.64	12.2	41.5
9	9.00	47.4	* 9.96	16.2	6.66	* 60.7	9.32	8.5	11.2	9.64	11.6	154
10	8.74	16.2	9.64	11.4	24.7	61.7	9.00	9.0	9.32	79.2	11.2	24.7
11	8.74	9.96	9.00	57.2	367	47.2	9.00	8.5	8.74	53.8	11.9	51.1
12	13.6	9.89	29.6	16.2	489	51.7	9.64	8.0	8.74	19.2	11.2	21.7
13	25.7	9.96	9.25	29.6	179	111	* 9.00	160	114	13.3	10.9	11.6
14	11.2	12.1	13.8	16.4	53.4	265	8.74	80	10.8	12.6	158	9.96
15	9.64	10.6	10.9	10.6	30.5	88.8	8.74	35	9.54	48.7	17.2	8.74
16	9.00	11.1	64.8	8.74	31.6	59.8	9.32	20	9.32	22.0	12.0	10.7
17	8.74	20.2	13.9	8.48	23.3	52.6	26.5	14	8.74	15.2	22.3	17.4
18	8.48	12.3	15.9	8.22	28.4	220	13.5	11	8.48	18.9	11.5	9.00
19	8.74	9.64	10.6	* 9.10	27.0	60.2	9.96	10	8.48	20.4	9.15	9.66
20	8.74	10.8	9.64	11.6	23.1	30.9	9.00	* 8.5	17.9	21.8	8.48	21.8
21	8.22	8.74	15.2	8.74	* 33.4	22.0	9.00	203	47.9	13.3	43.2	8.48
22	8.22	8.74	44.6	8.22	25.0	18.7	9.00	18.7	108	11.9	107	7.96
23	8.22	19.2	50.4	7.70	31.7	16.4	8.74	11.8	15.2	8.11	37.5	20.3
24	8.22	13.6	25.1	7.18	16.0	14.1	8.32	21.2	* 11.6	16.9	11.9	8.74
25	8.22	11.0	13.3	7.44	15.8	13.3	60.6	55.1	10.3	* 38.8	9.64	8.48
26	8.22	12.0	10.6	44.7	13.3	13.7	12.0	122	94.8	126	37.4	11.1
27	* 71.0	23.4	9.96	19.1	12.6	11.9	9.32	17.6	27.0	139	11.8	12.8
28	266	15.6	15.8	12.3	33.3	11.2	8.5	9.32	11.6	119	8.74	18.3
29	44.8	24.7	9.32	8.22	23.1	10.9	8.0	-----	10.6	32.6	8.74	12.1
30	40.4	78.8	118	8.83	12.6	10.9	50	-----	10.3	24.9	8.22	54.3
31	77.6	64.2	-----	8.74	12.1	30	9.96	-----	9.41	-----	-----	-----
Total	880.70	770.83	751.88	1,190.91	1,614.12	2,431.3	473.66	618.12	655.76	1,016.34	968.28	635.10
Mean	28.4	24.9	25.1	38.4	53.8	78.4	15.3	22.1	21.2	33.9	31.2	21.2
Mgd	43.9	38.5	38.8	59.4	83.2	121	23.7	34.2	32.8	52.5	48.3	32.8
Cfs	2,700	2,370	2,310	3,650	4,950	7,460	1,450	1,900	2,010	3,120	2,970	1,950
Ac-ft												

Calendar Year 1960
Fiscal Year 1960-61 Max 805 Min 6.66 Mean mgd 40.8 Mean cfs 63.1 Ac-ft 45,850

Max 805 Min 6.66 Mean mgd 32.9 Mean cfs 50.9 Ac-ft 36,840

Peak discharge (base, 2,300 mgd).--Dec. 4 (7 a.m.) 4,570 mgd (7,070 cfs), 8.70 ft.

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 28 to Feb. 20; discharge estimated on basis of recorded range in stage and records for nearby stations.

600, South Fork Wailua River near Lihue

Location.--Lat 22°02'10", long 159°22'55", on right bank 0.3 mile upstream from Wailua Falls and 5 miles north of Lihue.

Drainage area.--22.4 sq mi.

Records available.--December 1911 to June 1961. Published as "South Fork Wailua River above Waiehu Falls" 1912-13. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 230 ft (by barometer). Prior to Nov. 18, 1918, at site 0.3 mile upstream at different datum. Nov. 18, 1918 to June 23, 1958 at site 10 ft downstream from present site at datum 2.48 ft higher.

Average discharge.--45 years (1912-18, 1919-20, 1921-24, 1925-57, 1958-61), 73.5 mgd (114 cfs).

Extremes.--Maximum discharge during year, 6,520 mgd (10,100 cfs) Dec. 4 (gage height, 15.87 ft); minimum, 2.05 mgd (3.17 cfs) July 27.

1911-61: Maximum discharge, 30,200 mgd (46,700 cfs) Nov. 12, 1955 (gage height, 11.52 ft), from rating curve extended above 4,200 mgd by logarithmic plotting; minimum, 1.09 mgd (1.69 cfs) Sept. 21, 1953.

Remarks.--Records good except those for period of no gage-height record, which are fair. Several ditches divert about 20 mgd for irrigation of cane lands above station.

Note.--The figures of maximum discharge for fiscal years 1959 and 1960 have been revised. These records are on file in the district office and will be published in the next water-supply paper.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.6	1.50	4.0	135
1.7	3.50	5.0	252
1.8	7.40	6.0	400
2.2	14.8	7.0	570
2.5	27.0	8.0	770
3.0	55.0	9.0	1,015
3.5	92.0	10.0	1,265

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	13.2	17.7	19.4	144	47.2	4.10	A40.0	*3.20	3.90	4.65	*600	*5.25
2	50.3	64.0	5.45	1,040	49.0	6.84	A62.0	3.50	7.78	4.85	143	5.25
3	45.3	5.95	3.90	167	52.5	9.08	A38.8	2.70	*41.2	4.25	82.0	4.65
4	38.8	35.4	4.31	106	34.0	9.86	A34.0	2.48	58.4	*3.70	55.6	4.25
5	18.1	273	10.1	62.0	34.0	139	29.0	2.48	35.5	3.50	50.2	4.45
6	4.65	129	18.1	44.8	37.0	73.2	26.0	2.48	10.7	3.50	53.2	3.50
7	3.70	57.2	4.85	66.9	25.1	49.0	27.0	2.48	7.20	3.20	50.8	4.65
8	3.70	24.0	3.70	95.9	13.1	36.0	24.1	2.25	8.45	3.50	44.8	32.2
9	3.10	7.82	3.10	71.1	10.5	43.3	*17.5	2.25	*4.45	3.50	17.5	360
10	3.10	6.80	3.10	72.5	6.40	66.6	12.8	3.30	3.50	51.1	6.80	94.5
11	3.94	5.95	2.70	128	279	35.0	11.4	3.10	3.30	85.2	6.80	115
12	4.10	5.25	3.30	54.4	248	33.0	11.9	2.90	4.10	34.0	5.71	42.1
13	6.74	5.25	71.0	62.0	186	11.7	536	5.44	22.7	5.25	15.1	
14	6.74	5.25	6.53	89.0	87.2	559	11.2	114	8.16	16.8	128	15.8
15	4.45	7.61	4.65	57.6	38.2	144	11.2	59.2	4.10	85.9	47.4	12.5
16	3.50	5.71	23.1	48.4	11.4	84.0	9.29	6.40	4.25	48.2	22.9	7.40
17	3.50	13.1	5.45	85.7	8.45	61.3	36.9	5.45	3.70	7.00	23.4	17.8
18	3.30	18.4	8.55	304	9.74	197	25.2	4.25	3.30	4.25	7.20	27.1
19	*3.10	6.20	12.8	293	30.2	90.3	4.10	5.95	3.50	3.70	5.95	12.2
20	3.90	6.20	4.45	219	36.0	68.3	3.10	4.17	136	5.05	5.45	39.0
21	3.50	5.45	4.45	104	39.6	52.6	3.10	3.90	318	9.63	40.7	12.2
22	3.30	4.45	5.05	64.1	8.24	40.2	2.90	4.45	261	18.6	112	7.00
23	2.48	5.64	7.60	54.4	22.7	57.1	2.70	4.85	76.3	83.7	*60.4	12.7
24	2.48	6.14	11.9	44.8	28.5	48.4	2.70	12.5	62.7	26.0	9.29	13.5
25	2.48	*5.25	25.1	35.5	22.7	35.0	225	112	44.2	40.6	5.45	13.1
26	2.48	4.85	8.45	128	19.8	A28.0	7.20	36.0	84.6	133	28.6	10.7
27	42.0	5.05	3.70	110	16.5	A25.1	4.25	23.7	61.1	170	30.0	4.85
28	160	11.1	*64.7	77.6	29.3	A21.8	4.10	4.85	6.80	239	24.6	4.25
29	16.1	40.2	14.8	56.4	42.7	A25.1	4.10	-----	5.45	90.4	16.2	4.10
30	5.88	73.9	248	55.0	5.25	A28.0	4.25	-----	4.45	59.9	5.95	44.5
31	119	49.7	-----	44.2	-----	A32.0	3.30	-----	4.45	-----	5.25	-----
TOTAL	586.92	853.92	612.29	3,985.3	1,472.28	3,361.32	710.79	970.79	1,285.98	1,269.48	1,700.40	949.60
MEAN												
MGD	18.9	27.5	20.4	129	49.1	108	22.9	34.7	41.5	42.3	54.9	31.7
CFS	29.3	42.6	31.6	199	75.9	168	35.5	53.6	64.2	65.5	84.9	49.0
AC-FT	1,800	2,620	1,880	12,230	4,520	10,320	2,180	2,980	3,950	3,900	5,220	2,910
CALENDAR YEAR	1960	MAX	1,040	MIN	2.43	MEAN MGD	61.8	MEAN CFS	93.6	AC-FT	69,450	
FISCAL YEAR 1960-61	MAX	1,040	MIN	2.25	MEAN MGD	48.7	MEAN CFS	75.6	AC-FT	54,510		

Peak discharge (base, 3,700 mgd).--Dec. 4 (8 a.m.) 6,520 mgd (10,100 cfs), 15.87 ft.

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby stations.

ISLAND OF KAUAI

610. North Wailua ditch near Libue

Location.--Lat 22°03'40", long 159°27'55", on left bank 300 ft downstream from intake diversion dam on North Fork Wailua River, 8

miles west of Wailua, and 8.5 miles northwest of Libue.

Records available.--July 1932 to June 1961 in reports of Geological Survey. October 1925 to June 1932 in files of Libue Plantation

Co.

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

Average discharge.--29 years (1932-61), 12.1 mgd (18.7 cfs).

Extremes.--1932-61: Maximum daily discharge, 38 mgd (59 cfs) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

Remarks.--Records good. Water used for power and irrigation in vicinity of Libue.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.2	12.5	13.4	14.7	13.1	13.4	12.1	*11.5	12.8	13.4	12.4	*12.8
2	14.0	12.8	12.8	16.8	13.8	14.1	12.4	11.5	*14.7	15.4	*11.5	12.4
3	12.8	13.1	12.4	13.8	14.4	12.8	*11.8	11.5	15.1	*13.1	11.5	11.8
4	12.8	12.4	12.8	13.1	12.4	16.4	11.2	11.2	15.1	12.4	12.4	12.4
5	*12.2	10.7	12.4	12.4	12.1	13.4	10.9	11.2	13.4	12.4	12.1	12.1
6	12.2	9.60	13.8	12.4	12.1	12.8	11.5	10.9	13.1	12.1	11.2	12.4
7	11.9	9.30	13.1	13.4	12.1	12.1	11.2	10.9	13.4	*11.8	11.2	15.4
8	11.9	9.90	12.1	13.4	11.8	12.1	10.6	11.2	13.1	11.5	11.8	14.7
9	11.6	9.90	12.1	13.4	11.8	13.8	10.6	12.4	12.4	12.4	12.1	17.2
10	11.6	10.5	12.1	13.1	12.8	12.8	11.5	12.8	11.5	11.8	12.1	14.1
11	11.6	12.4	11.8	14.7	16.4	12.8	11.2	11.5	11.2	10.6	12.4	15.8
12	13.1	12.1	14.1	14.1	16.8	14.4	11.5	13.4	10.9	11.6	11.8	14.1
13	13.1	12.1	13.8	13.4	15.1	16.4	10.9	13.7	12.4	12.4	11.2	13.1
14	12.8	13.1	12.1	14.1	14.1	16.8	11.2	11.8	11.2	12.4	*15.8	15.8
15	11.9	12.4	12.4	12.8	13.1	*13.4	11.2	10.9	12.4	13.1	12.8	14.4
16	11.9	*13.4	13.4	13.1	13.4	12.4	11.8	11.2	12.1	12.4	13.8	13.8
17	11.6	13.4	12.4	13.1	13.1	12.1	13.4	10.6	12.1	11.8	11.4	13.8
18	11.6	12.8	12.8	13.4	13.1	13.4	11.5	10.6	11.8	12.8	10.0	12.8
19	12.5	12.4	*12.1	14.0	13.1	12.1	11.2	10.6	11.5	13.1	9.40	14.1
20	11.6	12.8	12.1	13.4	13.4	12.4	10.9	10.6	12.1	12.8	9.40	16.1
21	11.3	12.1	12.8	12.4	13.4	11.8	10.9	13.6	11.5	12.8	10.3	13.8
22	11.3	12.4	12.8	12.1	13.1	12.4	10.9	12.4	10.3	12.1	10.9	12.8
23	11.3	13.8	13.1	12.1	13.1	12.4	10.9	13.1	10.6	13.1	10.0	13.8
24	11.3	13.1	12.4	*11.8	12.4	11.8	12.9	14.4	11.8	12.8	12.4	12.4
25	11.0	12.8	12.1	12.1	12.8	11.5	16.0	14.7	11.2	13.4	13.1	12.4
26	11.0	13.1	11.8	15.1	12.4	11.5	12.4	13.8	13.4	15.4	14.7	13.8
27	13.7	13.1	13.2	14.1	12.1	11.2	12.1	13.4	12.8	13.7	12.8	13.1
28	13.3	12.8	14.1	13.1	*13.4	11.2	11.8	12.1	12.4	11.8	12.4	14.1
29	11.9	13.4	12.4	12.1	12.4	11.5	11.5	-----	12.1	10.3	13.8	12.8
30	14.3	15.4	14.4	12.1	12.4	11.5	13.1	-----	12.4	11.5	12.1	14.7
31	14.0	14.4	-----	12.1	-----	11.2	11.8	-----	12.8	-----	13.8	-----
Total	379.3	384.00	383.1	411.7	395.5	397.9	362.9	337.5	383.6	376.1	372.60	412.8
Mean												
Mgd	12.2	12.4	12.8	13.3	13.2	12.8	11.7	12.1	12.4	12.5	12.0	13.8
Cfs	18.9	19.2	19.8	20.6	20.4	19.8	18.1	18.7	19.2	19.3	18.6	21.4
Ac-ft	1150	1180	1180	1260	1210	1220	1110	1040	1180	1150	1140	1270
Calendar Year 1960				Max 16.8	Min 8.00		Mean mgd 12.3		Mean cfs 19.0		Ac-ft 13800	
Fiscal Year 1960-61				Max 17.2	Min 9.30		Mean mgd 12.6		Mean cfs 19.5		Ac-ft 14100	

* Discharge measurement made on this day.

ISLAND OF KAUAI

25

620. Stable storm ditch near Lihue

Location.--Lat 22°04'00", long 159°26'45", 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 June 1961.

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

Average discharge.--24 years (1937-61), 7.39 mgd (11.4 cfs).

Extremes.--1936-61: Maximum daily discharge, 46 mgd (71 cfs) Apr. 3, 1948; no flow at times each year.

Remarks.--Records good. Ditch diverts water from North Fork Wailua River for irrigation of sugar cane in vicinity of Lihue. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.07	0.07	0.26	0.12	0	0	0.01	0.19	a 17	0	0.32	* 11.7
2	.07	.07	.26	.26	0	0	.01	13.7	*a 30	0	.19	6.51
3	.07	.02	.19	.19	0	0	0	19.4	10.2	*14.7	.19	.26
4	.12	.02	.19	.12	0	.23	0	19.0	.43	17.2	.12	.26
5	.07	.02	.19	.07	0	.19	0	18.7	.43	15.0	.12	8.31
6	.07	.02	.19	.07	0	0	.19	18.4	.43	13.9	.07	11.7
7	.07	.02	.12	.07	0	0	.19	18.1	.34	12.7	.02	25.2
8	15.6	.02	.12	.02	0	0	.12	20.4	.34	12.4	.02	9.80
9	20.4	0	.12	0	0	0	.07	28.9	.26	15.5	.02	0
10	20.0	0	.12	0	0	0	.04	0	30.8	12.8	.01	0
11	19.4	0	.12	0	.05	0	0	23.7	17.8	.26	.07	0
12	27.2	19.8	24.2	0	0	0	0	30.0	16.8	.19	.02	0
13	28.2	28.9	29.1	0	0	0	.02	15.5	21.1	.19	0	0
14	8.50	30.8	27.2	0	0	0	.07	14.5	18.1	.19	.06	0
15	.12	30.8	30.8	.05	0	0	.07	0	.19	16.8	.19	0
16	.12	* 32.6	10.4	.07	0	0	.07	0	.19	14.7	.19	0
17	.12	34.5	43	.02	0	0	.07	0	.12	13.9	.19	0
18	124	30.8	.43	.12	0	0	.02	5.23	.12	13.0	.19	0
19	23.7	30.8	.43	.19	0	0	.02	10.1	.07	11.7	18.3	0
20	20.0	9.92	20.6	.12	0	0	.02	9.62	14.8	9.38	25.4	0
21	18.7	.34	30.8	.07	0	0	9.14	27.2	.21	25.4	0	0
22	16.8	.34	16.9	.07	0	0	.02	8.66	23.7	.12	18.7	0
23	20.7	.26	.34	.07	0	0	.02	8.42	28.9	.12	24.6	0
24	21.0	22.1	.34	.02	0	0	0	16.7	30.8	.12	23.7	0
25	20.0	30.8	.34	0	0	0	0	13.6	a 7.8	.07	27.7	0
26	21.0	30.8	.26	.01	0	0	.19	a .3	.07	11.6	.12	0
27	31.3	30.8	.34	0	0	0	.19	a .3	.02	.34	.12	12.7
28	9.81	30.8	.19	0	0	0	.19	a .3	0	.26	.07	21.7
29	.12	32.6	.07	0	0	0	.19	-----	0	.26	.12	18.4
30	.12	17.6	.10	0	0	0	.19	-----	0	.26	.07	25.1
31	.07	.43	-----	0	-----	0	.19	-----	0	-----	.07	-----
Total	355.92	446.05	195.15	1.73	0.05	143	82.63	393.03	226.24	295.01	212	151.64
Mean	11.5	14.4	6.50	0.056	0.002	0.046	2.67	14.0	7.30	9.83	0.058	5.05
Mgd	17.8	22.3	10.1	0.087	0.003	0.071	4.13	21.7	11.3	15.2	0.105	7.81
Cfs	1.090	1.370	599	5.3	0.2	4.4	254	1210	694	905	6.5	465
Ac-ft												
Calendar Year	1960	Max	35.0	Min	0	Mean mgd	6.77	Mean cfs	10.5	Ac-ft	7.610	
Fiscal Year	1960-61	Max	34.5	Min	0	Mean mgd	5.89	Mean cfs	9.11	Ac-ft	6.600	

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, ditch man readings and records for nearby stations.

ISLAND OF KAUAI

630. North Fork Wailua River at altitude 650 ft near Lihue

Location.--Lat 22°03'50", long 159°26'20", on right bank 0.5 mile downstream from intake of Stable storm ditch and 7.8 miles north-west of Lihue.

Drainage area.--6.6 sq mi.Records available.--September 1914 to June 1961. Monthly discharge only for some periods published in WSP 1319.Gage.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map). Prior to Sept. 9, 1944 at datum 2.0 ft higher.Average discharge.--45 years (1915-18, 1919-60), 46.7 mgd (72.3 cfs) (fiscal years 1916-18 were completed by compilation).Extremes.--Maximum discharge during year, 1,860 mgd (2,880 cfs) Feb. 13 (gage height, 7.82 ft), from rating curve extended above 470 mgd on basis of slope area measurement of peak flow; minimum daily, 0.62 mgd (0.96 cfs) June 6.

1914-61: Maximum discharge, 8,550 mgd (13,200 cfs) Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 470 mgd as explained above; minimum, 0.22 mgd (0.34 cfs) Oct. 27, 1953.

Remarks.--Records good. Since 1925 Hanalei tunnel (See p. 46) has discharged its water into river, and North Wailua and Stable storm ditches have diverted water above station for irrigation in vicinity of Lihue.

Rating table, fiscal year 1960-61 (gage height in feet, and discharge, in million gallons a day)

1.0	0.42	2.0	17.7
1.1	.81	2.4	28.0
1.2	1.32	2.9	79.0
1.3	2.07	3.6	173
1.5	4.37	4.5	360
1.7	8.00		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24.0	33.2	55.2	99.2	21.1	23.5	22.9	* 21.6	10.5	37.9	* 176	* 7.41
2	77.8	36.4	41.9	317	27.8	29.4	28.1	810	19.6	49.2	39.3	6.10
3	36.3	37.2	35.6	59.1	67.6	16.8	19.0	1.17	4.28	9.79	27.5	9.75
4	33.8	85.6	38.5	46.4	16.2	244	* 15.8	1.12	4.88	* 1.06	49.4	12.1
5	25.9	136	33.3	30.3	133	35.8	13.6	1.12	25.9	.86	33.2	4.45
6	27.0	56.0	58.0	26.4	11.9	24.5	14.5	1.12	24.8	.81	25.0	.62
7	21.6	46.8	40.4	43.8	10.2	20.4	13.6	1.06	26.6	.77	22.6	14.8
8	7.60	64.8	34.4	46.7	9.50	18.9	12.2	1.21	26.4	.77	20.8	14.8
9	1.06	66.7	29.2	41.1	8.75	29.3	11.6	5.24	* 25.1	1.49	18.9	110
10	.91	45.2	30.3	34.6	15.0	24.4	17.8	10.1	7.52	1.39	17.3	25.9
11	.86	36.2	26.4	75.0	111	20.0	12.6	1.40	1.27	141	20.0	49.2
12	5.68	13.0	39.6	36.5	132	34.6	14.0	1.43	1.17	36.1	16.2	27.0
13	16.4	177	38.8	34.1	63.4	133	11.6	352	4.22	24.0	14.7	19.6
14	21.6	10.3	5.92	50.8	37.2	228	11.9	95.3	1.22	22.6	96.9	41.7
15	21.2	*3.82	3.24	25.9	24.0	51.4	12.3	4.27	1.06	37.2	15.5	22.8
16	18.5	18.7	4.56	24.5	26.4	33.2	13.0	59.1	1.01	21.2	20.6	21.6
17	17.7	18.2	31.4	29.3	24.7	27.5	29.2	27.0	.96	16.6	40.8	22.0
18	7.29	5.68	40.3	67.6	24.2	34.5	9.14	21.6	.91	26.2	36.2	15.5
19	26.0	28.5	*32.0	124	27.4	24.0	.86	20.0	.86	20.2	21.7	27.9
20	1.12	28.9	131	53.6	26.3	23.4	.77	6.86	146	4.97	17.5	61.6
21	.96	31.4	7.99	34.4	32.6	20.0	.73	7.14	248	4.61	38.5	21.8
22	.96	33.2	24.2	28.1	22.1	23.5	.86	23.9	117	1.27	70.4	15.8
23	1.32	60.7	43.6	23.6	22.6	24.7	1.06	7.07	45.8	10.6	*50.3	22.3
24	1.47	21.2	31.4	19.6	16.2	20.4	56.1	23.6	37.7	3.05	22.1	14.7
25	1.32	9.96	26.4	*19.3	17.8	17.7	154	6.49	27.0	6.29	17.9	14.0
26	1.12	12.2	24.5	67.2	14.4	17.0	32.6	33.2	97.5	104	33.1	19.1
27	4.66	12.3	61.8	42.3	12.2	15.5	27.0	36.1	354	97.0	14.4	7.89
28	169	10.6	74.7	27.8	*34.0	144	24.0	23.0	226	111	122	241
29	473	16.5	32.0	18.9	15.1	23.0	-----	19.6	39.3	222	14.0	32.0
30	57.6	85.3	76.2	16.6	13.3	16.8	30.5	-----	17.3	57.3	133	-----
31	67.4	82.2	-----	17.0	-----	19.6	24.0	-----	17.2	-----	24.6	-----
Total	763.97	1228.88	1075.95	1580.6	904.05	12813	6583.2	889.50	1101.90	1026.14	1049.1	6662.3
Mean	24.6	36.2	35.9	51.0	30.1	41.3	21.2	31.8	35.5	34.2	33.8	22.2
Mgd	38.1	56.0	55.5	78.9	46.6	63.9	32.8	49.2	54.9	52.9	52.3	34.3
Cfs	2340	3450	3300	4850	2770	3930	2020	2730	3380	3150	3220	2040
Ac-ft												
Calendar Year 1960		Max	338	Min	0.58	Mean mgd	41.6	Mean cfs	64.4	Ac-ft	46.760	
Fiscal Year 1960-61		Max	352	Min	0.62	Mean mgd	33.2	Mean cfs	51.4	Ac-ft	37.180	

Peak discharge (base, 1,200 mgd).--Dec. 4 (7 a.m.) 1,620 mgd (2,510 cfs), 7.48 ft; Feb. 13 (1:30 p.m.) 1,860 mgd (2,880 cfs), 7.82 ft; May 1 (4 a.m.) 1,660 mgd (2,570 cfs), 7.54 ft.

* Discharge measurement made on this day.

680. East Branch of North Fork Wailua River near Lihue

Location.--Lat $22^{\circ}04'10''$, long $159^{\circ}25'05''$, on right bank 1,200 ft upstream from mouth and 7.5 miles northwest of Lihue.

Drainage area.--6.2 sq mi.

Records available.--July 1912 to June 1961. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (by barometer). Prior to Oct. 1, 1914, staff gage at site 725 ft downstream at different datum. Oct. 1, 1914, to May 10, 1934, water-stage recorder located 75 ft upstream at same datum.

Average discharge.--46 years (1913-14, 1915-18, 1919-61), 30.7 mgd (47.5 cfs) (fiscal years 1916, 1917 and 1920 completed by compilation).

Extremes.--Maximum discharge during year, 2,350 mgd (3,640 cfs) Oct. 19 (gage height, 7.43 ft), from rating curve extended above 600 mgd; minimum, 9.8 mgd (15.2 cfs) Jan. 20, 21, 22, 24.

1912-61: Maximum gage height, 14.7 ft, from floodmarks, Nov. 12, 1955 (discharge not determined); minimum discharge, 4.4 mgd (6.8 cfs) July 3, 13, 1926.

Remarks.--Records good except those above 600 mgd, which are fair, and those for period of no gage-height record, which are poor.

Rating tables, fiscal year 1960-61 (gage height, in feet, and discharge, in million gallons a day)

July 1, 1960 to Oct. 19, 1960

Oct. 19, 1960 to June 30, 1961

1.2	8.10	2.5	136								
1.3	11.0	3.0	220								
1.5	20.0	4.0	469								
1.7	33.0	4.5	768								
2.0	66.0						2.0	60.0			
							2.5	138			
							3.0	277			

Note.--Same as preceding table below
1.8 ft.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19.3	* 18.0	26.7	65	20.0	16.5	19.0	11.0	* 18.0	* 40.8	* 120	* 17.0
2	45.7	18.5	21.2	430	19.0	17.3	22.5	10.7	23.7	51.3	33.0	16.0
3	27.8	17.5	18.5	65	18.5	14.6	* 17.5	10.7	26.9	27.0	26.7	14.2
4	25.1	30.5	17.5	* 40	17.0	* 121	15.5	10.7	24.8	20.6	30.3	15.0
5	21.8	57.2	16.5	33.0	16.0	29.8	14.2	10.4	19.0	19.0	23.6	15.0
6	30.6	26.7	20.9	28.8	15.5	21.2	14.2	10.4	17.5	18.0	21.8	14.2
7	21.0	21.8	20.0	46.9	15.0	18.0	14.2	10.4	20.4	17.0	20.6	34.8
8	17.0	25.6	17.5	37.5	14.2	16.5	13.0	10.8	18.5	22.8	19.5	30.6
9	15.0	26.7	15.5	28.8	138	20.4	12.6	21.2	17.0	17.0	18.5	81.2
10	14.6	20.6	16.0	27.2	16.0	20.0	16.8	36.9	15.5	90.5	17.5	28.8
11	13.8	18.5	14.6	48.4	69.8	16.7	12.6	15.0	14.6	107	17.5	42.0
12	19.0	17.0	23.2	30.2	33.5	25.6	12.6	15.0	14.2	32.3	16.5	28.1
13	25.4	16.5	38.6	33.7	24.2	11.2	11.8	* 157	21.6	26.0	15.0	25.0
14	24.7	17.5	18.5	51.1	23.4	190	12.1	41.5	16.2	24.2	21.3	23.0
15	17.0	* 16.5	16.5	30.2	18.0	53.0	11.4	25.4	14.6	40.2	16.0	21.2
16	14.6	16.0	21.8	28.1	18.0	33.8	11.0	28.5	14.2	23.6	24.7	21.2
17	14.2	19.8	16.0	39.4	18.0	28.1	* 11.0	21.2	13.4	20.0	29.6	21.2
18	13.8	18.0	19.9	78.7	16.5	25.4	10.7	17.5	13.0	21.0	27.7	19.0
19	20.7	17.0	* 21.3	237	19.1	23.0	10.1	16.5	12.6	21.6	19.0	26.0
20	16.5	19.0	15	63.6	18.6	20.6	10.1	15.0	155	22.5	19.0	47.0
21	15.0	16.0	15	* 42.0	28.0	19.5	98.4	17.5	214	29.7	25.6	23.0
22	14.2	16.0	20	32.3	19.0	20.3	98.4	19.0	99.0	19.5	46.3	19.0
23	14.2	28.9	25	28.1	18.0	23.1	11.5	24.8	43.8	20.6	* 31.8	19.8
24	14.2	24.4	19	24.8	15.0	19.9	22.2	36.5	34.6	19.3	20.6	16.5
25	13.8	21.4	15	23.6	16.6	17.0	85.9	43.8	30.2	25.2	20.0	15.5
26	13.8	19.0	15	41.0	14.6	16.5	16.5	22.4	32.8	46.1	36.4	16.0
27	51.0	22.6	17	37.7	13.8	15.5	138	20.0	27.9	58.9	30.0	16.0
28	74.4	23.9	50	26.0	23.2	15.0	12.6	18.5	23.6	83.4	17.5	17.1
29	27.0	26.3	22	22.4	21.2	15.0	11.8	-----	21.8	32.3	17.5	17.0
30	21.2	26.7	60	20.6	* 14.6	15.5	11.8	-----	20.0	27.4	16.0	39.5
31	27.0	40.2	-----	* 20.0	-----	27.8	11.4	-----	19.7	-----	17.8	-----
Total	703.4	704.3	683.7	1,761.1	608.1	1,028.6	4,900.8	698.3	1,058.1	1,024.8	807.1	737.9
Mean												
Mgd	22.7	22.7	21.8	56.8	20.3	33.2	15.8	24.9	34.1	34.2	26.0	24.6
Cfs	35.1	35.1	33.7	87.9	31.4	51.4	24.4	38.5	52.8	52.9	40.2	38.1
Ac-ft	2160	2160	2010	5,400	1,870	3,150	1,500	2,140	3,250	3,140	2,480	2,260
Calendar Year 1960:				Max 430		Min 9.55	Mean mgd 30.4	Mean cfs 47.0				
Fiscal Year 1960-61:				Max 430		Min 9.84	Mean mgd 28.2	Mean cfs 43.6				

Peak discharge (base, 1,000 mgd).--Oct. 2 (Time unknown) 1,680 mgd (2,600 cfs), 6.54 ft (from floodmark in well); Oct. 19 (1:30 p.m.) 2,350 mgd (3,640 cfs), 7.43 ft; Mar. 20 (11 p.m.) 1,320 mgd (2,040 cfs), 5.61 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 20 to Oct. 4; discharge estimated on basis of recorded range in stage and records for nearby stations.

ISLAND OF KAUAI

690. Wailua ditch near Kapaa

Location.--Lat 22°04'25", long 159°24'05", 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 June 1961 in reports of Geological Survey. April 1932 to November 1936 in files of East Kauai Water Co.

Gage.--Water-stage recorder. Altitude of gage is 462 ft (by estimating slope of 2,000-ft length of ditch on basis of levels by Lihue Plantation Co.).

Average discharge.--2½ years (1937-61), 10.5 mgd (16.2 cfs).

Extremes.--1936-61: Maximum daily discharge, 41 mgd (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 sugar cane. Flow regulated by gates at reservoir.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	8.30	4.05	9.30	0.72	0.56	8.30	0.51	2.59	8.80	7.80	2.98	*24.4	
2	8.30	4.05	8.30	.86	3.72	8.80	.51	*2.59	*8.80	a 7.3	30	24.4	
3	8.30	8.66	8.30	.67	5.59	8.80	.51	2.59	8.80	a 7.2	25	24.4	
4	8.30	*6.07	7.80	.67	5.59	9.30	.56	2.52	3.81	*a 7.2	30	25.8	
5	*8.30	4.0	8.30	4.85	5.59	4.03	.56	2.59	1.31	7.30	.35	25.8	
6	8.30	4.0	8.30	18.8	5.98	25	.51	2.59	4.84	7.80	.40	25.8	
7	8.30	4.0	8.80	12.5	3.46	21	2.92	8.99	9.30	7.80	.35	18.4	
8	8.30	4.0	11.0	9.30	21.0	21	4.20	16.8	8.80	7.80	4.96	15.4	
9	8.30	12.9	13.5	9.30	2.03	21	4.12	18.8	9.30	7.30	6.80	12.6	
10	8.30	24.4	15.4	9.80	1.96	21	4.50	11.2	9.30	4.27	*13.6	10.4	
11	8.30	24.4	15.4	9.30	1.96	21	4.81	7.30	12.7	.40	*18.1	10.4	
12	8.30	15.7	15.4	9.80	1.76	21	4.73	7.30	14.8	.25	18.1	10.4	
13	8.30	9.80	15.4	8.80	1.49	3.48	4.73	7.30	14.8	.25	11.0	17.1	
14	8.30	9.80	15.4	8.80	1.31	3.42	4.73	3.04	14.8	.25	7.30	20.2	
15	8.30	9.80	11.0	8.80	1.06	1.00	4.42	.78	11.8	.25	11.7	20.2	
16	8.30	9.80	8.80	8.80	6.07	1.00	4.65	.67	11.0	4.68	*18.1	20.2	
17	8.30	9.80	8.80	7.42	9.30	1.00	4.65	7.32	11.0	11.6	18.1	12.7	
18	8.30	9.80	8.80	1.86	9.80	1.06	4.50	11.0	13.8	12.8	18.1	9.30	
19	8.30	9.80	8.80	1.10	9.30	1.12	4.42	11.0	14.8	5.77	13.2	9.30	
20	8.30	9.80	9.30	*.67	9.30	1.18	*4.42	11.0	15.4	.40	5.59	9.30	
21	10.1	9.80	8.80	.56	9.30	1.12	4.65	11.6	9.69	2.61	5.59	*9.30	
22	12.2	*9.80	*8.80	.35	8.80	1.00	4.81	8.80	5.98	6.80	14.3	9.30	
23	14.2	9.30	9.80	.45	*8.80	.83	5.04	*3.70	5.98	6.80	20.2	9.30	
24	14.2	9.30	11.6	.40	8.80	.78	5.20	1.00	4.09	16.0	20.2	9.30	
25	14.2	9.30	11.6	.35	8.80	.78	5.20	.89	1.43	2.30	18.8	9.30	
26	14.2	9.30	14.2	.35	8.80	.72	4.97	.89	1.49	23.0	14.8	16.1	
27	7.61	9.30	15.4	.35	8.30	.72	3.61	4.27	9.00	15.4	9.30	20.2	
28	4.12	9.30	15.4	.40	8.30	*.72	2.87	8.80	14.2	7.30	9.30	20.2	
29	4.05	9.30	15.4	.45	8.30	.67	2.66	-----	15.4	7.30	9.30	20.2	
30	3.90	9.30	6.39	.45	8.30	.67	2.59	-----	*11.8	7.30	12.8	20.2	
31	4.05	9.30	-----	.45	-----	.67	2.59	-----	7.80	-----	21.6	-----	
Total	268.83	283.53	333.49	136.38	174.43	62.68	109.15	177.92	294.82	223.93	325.77	489.90	
Mean	Mgd	8.67	9.15	11.1	4.40	5.81	2.02	3.52	6.35	9.51	7.46	10.5	16.3
	Cfa	1.34	1.42	1.72	6.81	8.99	3.13	5.45	9.83	14.7	11.5	16.2	25.2
	Ac-ft	825	870	1020	419	535	192	335	546	905	687	1000	1500
Calendar Year	1960	Max	27.2	Min	0.13	Mean mfd	7.57	Mean cfs	11.7	Ac-ft	8.500		
Fiscal Year 1960- 61	Max	25.8	Min	0.21	Mean mfd	7.89	Mean cfs	12.2	Ac-ft	8.830			

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage.

710. North Fork Wailua River near Kapaa

Location--Lat 22°02'55", long 159°22'25", on right bank 1.1 miles upstream from confluence with South Fork 4.0 miles southwest of Kapaa and 5.0 miles north of Lihue.

Drainage area--18.7 sq mi.

Records available--July 1952 to June 1961.

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

Average discharge--8 years (1952-61), 73.5 mgd (114 cfs).

Extremes--Maximum discharge during year, 3,650 mgd (5,650 cfs) Oct. 19 (gage height, 7.95 ft), from rating curve extended above 2,400 mgd as explained below; minimum, 3.09 mgd (4.78 cfs) June 6.

1952-61: Maximum discharge, 34,400 mgd (53,200 cfs) Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft from flood-marks), from rating curve extended above 930 mgd on basis of slope-area measurement of peak flow; minimum, 1.37 mgd (2.12 cfs) Oct. 29, 1953.

Remarks--Records good except those for periods of no gage-height records, which are fair. Wailua ditch diverts water between this station and station at altitude 650 ft.

Rating tables (gage height, in feet, and discharge in million gallons a day)

July 1 to Mar. 20

Mar. 21 to June 30

1.2	2.95	3.0	185	1.2	2.02	2.5	103
1.3	4.95	3.5	310	1.3	4.00	3.0	195
1.5	11.5	4.0	480	1.5	11.4	3.5	328
1.8	26.0	5.0	1,000	1.8	29.3	4.0	500
2.1	48.0	6.0	1,730	2.1	54.5	4.5	730
2.5	94.0						

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	43.5	* 61.0	109	192	55.0	40.6	53.4	35.5	20.6	89.5	47.5	13.3
2	110	62.0	94.0	1020	55.0	48.2	63.0	30.3	35.8	117	191	3.75
3	71.7	57.0	63.0	194	96.0	30.4	44.4	15.1	71.3	61.5	147	5.58
4	61.6	122	55.8	131	34.8	39.0	34.1	14.6	87.5	21.7	162	3.30
5	53.0	204	48.0	91.2	30.8	89.4	31.4	16.0	58.0	6.85	114	3.30
6	58.6	99.0	74.1	63.0	28.4	61	30.8	11.5	50.0	5.46	103	3.09
7	50.1	80.0	56.9	74.8	26.6	48	32.0	3.75	53.0	12.2	93.2	19.8
8	a 20	99.1	54.5	101	25.5	42.6	27.8	3.35	48.0	26.8	79.9	31.3
9	a 14	109	45.3	70.1	25.0	51.8	20.3	5.60	40.1	24.5	69.4	213
10	a 13	58.4	45.3	65.0	26.6	64.7	12.5	29.7	24.5	24.2	* 36.3	73.8
11	a 12	30.2	36.9	161	190	45.3	12.4	13.4	7.87	3.34	26.9	98.5
12	a 25	20.3	52.3	71.6	196	70.2	27.2	6.69	4.15	97.4	21.8	* 64.5
13	a 54	8.51	93.6	80.9	125	231	22.4	549	5.85	76.0	23.8	39.3
14	a 52	20.6	26.4	102	75.4	49.4	20.3	173	8.94	64.0	120	51.8
15	a 22	25.1	16.5	67.2	54.0	141	22.4	97.3	6.17	101	39.1	34.8
16	a 14	18.4	60.5	54.0	43.8	80.0	22.9	103	3.55	64.0	42.1	35.4
17	a 13	37.0	51.0	79.8	33.4	61.0	41.4	62.0	3.75	34.7	61.8	32.0
18	a 12	30.6	62.5	209	37.9	68.5	* 29.7	4.44	3.75	11.5	49.4	23.8
19	* 24	18.9	63.2	534	48.7	59.0	12.8	37.6	3.35	25.6	36.6	39.8
20	18.9	37.4	35.5	226	44.7	51.0	10.6	24.8	299	50.8	42.1	120
21	13.8	42.6	274	* 145	71.1	45.3	41.5	6.63	605	56.9	73.2	49.8
22	10.4	44.4	384	102	43.5	47.1	3.75	13.6	302	33.9	123	33.1
23	6.91	92.8	65.4	80.0	* 46.2	55.2	355	* 33.0	125	44.9	90.9	40.1
24	7.19	51.3	50.2	69.2	33.4	49.9	212	82.3	103	23.3	40.0	29.3
25	6.91	* 314	37.6	63.0	36.0	38.3	392	135	79.9	18.0	33.5	26.5
26	6.63	28.0	34.1	123.0	30.2	35.5	67.8	58.0	139	156	70.7	28.6
27	70.3	33.5	41.4	112.0	272	354	48.0	59.3	75.5	196	45.6	18.5
28	2.30	31.6	* 135	76.4	46.7	* 32.0	45.3	34.4	30.1	273	38.6	4.25
29	112	45.9	49.7	59.0	56.8	31.4	39.0	-----	23.8	118	36.1	4.00
30	87.5	94.6	163	53.0	29.0	33.4	42.0	-----	* 31.8	121	14.2	41.1
31	127	141	-----	52.0	49.6	42.1	-----	48.2	-----	17.0	-----	-----
Total	4210.4	1825.61	1786.5	4532.2	1672.7	2618.8	1280.65	1698.82	2398.48	2509.51	2517.2	1185.37
Mean	45.8	58.9	59.6	146	55.8	84.5	41.3	60.7	77.4	83.7	81.2	39.5
Mgd	70.9	91.1	92.2	226	86.3	131	63.9	93.9	120	130	126	61.1
Cfs	4360	5600	5480	13880	5130	8040	3930	5210	7360	7700	7720	3640
Ac-ft												
Calendar Year	1960	Max	1020	Min	3.35	Mean zgd	811	Mean cfs	125	Ac-ft	91140	
Fiscal Year	1960-61	Max	1020	Min	3.09	Mean mgd	69.7	Mean cfs	108	Ac-ft	78050	

Peak discharge (base, 2,300 mgd)--Oct. 2 (11 a.m.) 3,430 mgd (5,310 cfs), 7.73 ft; Oct. 19 (2 p.m.) 3,650 mgd (5,650 cfs), 7.95 ft; Dec. 4 (7:30 a.m.) 2,590 mgd (4,010 cfs), 6.89 ft; Mar. 20 (11 p.m.) 2,620 (4,050 cfs), 6.92 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby stations.

715. Left Branch Opaeka Stream near Kapaa

Location.--Lat 22°04'25", long 159°23'55", on left bank, 0.1 mile upstream from confluence with Right Branch and 5 miles west of Kapaa.

Drainage area.--0.7 sq mi.

Records available.--May 1960 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 400 ft (from topographic map).

Extremes.--1961: Maximum discharge, 201 mgd (311 cfs) Oct. 2 (gage height, 4.72 ft); minimum, 0.65 mgd (1.01 cfs) Sept. 9-12, 16-18, July 24-27.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge in million gallons a day)

0.8	0.56
.9	1.10
1.0	1.97
1.1	3.10
1.3	6.3
1.5	10.7
1.8	19
2.2	33
2.5	46

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.83	0.83	1.02	4.70	2.42	1.36	1.54	1.02	1.36	1.80	9.47	1.27
2	1.71	.83	.91	* 4.47	2.31	1.27	1.54	.96	1.36	2.06	2.65	1.27
3	1.71	.76	.63	6.00	2.31	1.27	1.27	.96	1.45	1.80	2.31	1.19
4	1.19	* .96	.83	* 3.94	2.20	5.47	1.19	.96	1.45	1.62	2.20	1.19
5	* 1.02	1.75	.76	3.24	2.08	2.20	1.19	.96	1.27	1.54	1.97	1.10
6	.96	1.36	.83	2.87	1.88	1.71	1.19	.96	1.27	* 1.54	1.88	1.10
7	.91	1.10	.70	2.76	1.80	1.62	1.19	.96	1.27	1.54	1.80	1.27
8	.83	1.10	.70	2.76	1.80	1.54	1.19	.91	1.27	1.62	1.71	1.36
9	.83	1.02	.70	2.42	1.71	1.62	1.10	.96	1.19	1.54	1.62	3.51
10	.76	.96	.70	2.31	1.80	1.62	1.10	.96	1.19	2.81	* 1.62	1.80
11	.83	.91	.70	2.54	2.50	1.45	1.10	.91	1.10	2.99	1.62	1.80
12	.83	.91	.76	2.31	1.88	1.45	1.10	.91	1.10	2.20	1.62	* 1.62
13	.96	.91	.96	2.20	1.71	1.62	1.02	3.77	1.10	1.88	1.62	1.36
14	.96	.96	.76	2.08	1.71	3.00	1.10	1.85	1.10	1.88	1.62	1.36
15	.91	.91	.70	1.97	1.54	2.42	1.02	1.36	1.02	2.08	1.54	1.27
16	.83	.91	.70	1.97	1.54	1.88	.96	1.54	.96	1.80	1.54	1.27
17	.83	.91	.65	4.85	1.54	1.80	.96	1.45	.96	1.71	1.54	1.19
18	.76	.96	.76	1.30	1.45	1.71	.96	1.27	.91	1.62	1.45	1.19
19	.96	.91	.83	17.7	1.54	1.71	.96	1.19	.91	1.62	1.36	1.19
20	.91	.96	.83	* 6.72	1.45	1.54	* .91	1.19	9.42	1.62	1.27	1.54
21	.76	.83	.83	4.86	1.45	1.45	.83	1.19	9.98	1.71	1.54	1.19
22	.70	* .83	* .76	3.94	1.45	1.45	.83	1.27	5.61	1.45	1.88	1.10
23	.70	1.02	.76	3.66	* 1.36	1.54	.83	* 1.27	3.38	1.45	2.08	1.10
24	.70	.96	.76	3.24	1.36	1.45	.94	1.45	2.76	1.54	1.62	1.02
25	.65	.91	.76	3.10	1.36	1.36	4.10	2.21	2.42	1.54	1.54	.96
26	.65	.83	.76	3.24	1.36	1.36	1.36	1.62	2.20	1.71	1.62	.96
27	1.18	.83	.83	3.10	1.36	1.27	1.10	1.45	2.08	2.08	1.36	.96
28	1.19	.83	1.19	2.76	1.45	* 1.27	1.10	1.45	1.97	3.33	1.36	.96
29	.91	.91	.91	2.65	1.45	1.27	1.10	-----	1.88	2.08	1.36	.96
30	.83	.83	* 2.63	2.54	1.36	1.27	1.10	-----	* 1.80	1.80	1.27	1.34
31	.96	.96	-----	2.54	-----	1.70	1.02	-----	1.71	-----	1.27	-----
Total	28.76	29.66	25.82	166.67	51.13	53.65	36.90	36.96	67.45	55.96	59.31	39.40
Mean												
Mgd	0.928	0.957	0.861	5.38	1.70	1.73	1.19	1.32	2.18	1.87	1.91	1.31
Cfs	1.44	1.48	1.33	8.32	2.63	2.68	1.84	2.04	3.37	2.89	2.96	2.03
Ac-ft	88	91	79	511	157	165	113	113	207	172	162	121

Calendar Year 1960 Max 44.7 Min 0.65 Mean mgd 36.96 Mean cfs 1.79 Mean ac-ft 2.77
Fiscal Year 1960-61 Max 44.7 Min 0.65 Mean mgd 36.96 Mean cfs 1.79 Mean ac-ft 2.000

Peak discharge (base, 90 mgd).--Oct. 2 (11 a.m.) 201 mgd (311 cfs), 4.72 ft; Oct. 19 (2:30 p.m.) 197 mgd (305 cfs), 4.68 ft.

* Discharge measurement made on this day.

ISLAND OF KAUAI

31

770. Makaleha ditch near Kealia

Location.--Lat 22°06'55", long 159°22'05", 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 June 1961 in reports of Geological Survey. July 1925 to November 1936 in files of East Kauai Water Co.

Gage.--Water-stage recorder and Parshall flume. Prior to December 1936, water-stage recorder at site 150 ft downstream at different datum.

Average discharge.--24 years (1937-61), 4.40 mgd (6.81 cfs).

Extremes.--1936-61: Maximum daily discharge, 19.2 mgd (29.7 cfs) Nov. 1, 1959; no flow at times.

Remarks.--Records good. Ditch diverts water from Makaleha Stream for irrigation of sugar cane. Diversion is regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.86	6.90	11.4	0.86	0.22	8.80	0.36	1.94	8.42	7.52	3.47	7.80
2	14.0	9.80	7.35	6.34	.20	9.30	.25	.03	* 12.6	.68	* 1.10	6.90
3	11.4	7.35	6.45	1.67	.10	7.80	.17	.05	12.6	3.77	.60	5.92
4	9.80	7.30	6.45	.69	.08	13.8	.14	1.95	12.3	* 7.35	.39	7.80
5	* 7.80	8.71	5.76	.35	.06	12.0	.12	4.40	8.30	6.45	.31	7.35
6	9.02	10.4	10.4	.28	.06	7.80	3.72	4.40	7.35	6.00	.25	6.54
7	6.90	7.35	10.7	.20	.05	6.45	6.90	4.40	11.2	5.76	2.44	16.6
8	6.45	9.40	6.90	.20	.05	5.68	5.52	6.34	9.30	13.4	6.45	13.6
9	5.68	8.80	5.68	.14	.03	10.2	5.04	13.1	7.80	7.35	5.68	17.9
10	5.84	6.90	6.90	.14	.03	9.40	2.97	13.1	6.00	13.9	5.44	11.4
11	6.00	5.84	5.84	4.91	.51	6.66	.08	7.80	5.84	7.59	6.45	17.9
12	11.1	5.28	12.3	7.80	.22	12.0	.10	9.80	5.52	4.41	5.52	11.4
13	11.1	5.04	12.4	6.58	.14	14.2	.05	15.4	8.37	8.80	5.28	8.30
14	15.4	6.45	8.80	1.82	.12	8.66	.08	13.1	6.90	8.30	8.08	8.68
15	8.68	6.45	7.80	1.55	.08	.40	.06	10.4	6.45	4.96	6.90	6.90
16	6.00	6.33	11.2	1.29	.06	.20	.05	10.9	6.00	.57	14.2	7.35
17	5.84	* 10.7	6.90	2.29	.08	.14	.03	9.30	5.68	3.38	13.6	9.04
18	5.52	8.57	10.8	3.41	.06	.12	.03	6.90	5.36	7.35	12.6	7.35
19	9.55	7.35	10.3	3.82	.08	.17	1.89	7.35	5.12	7.35	7.80	11.5
20	6.90	8.30	* 9.30	2.43	.08	.10	5.04	6.00	10.1	7.80	9.30	17.9
21	6.45	6.45	9.74	1.45	.14	.08	4.88	9.71	17.9	9.80	9.88	9.80
22	5.60	6.90	7.80	.84	.08	.06	4.80	9.80	15.4	7.35	14.8	6.90
23	5.36	11.2	8.30	.53	.08	.22	6.69	13.6	10.9	8.80	12.4	7.35
24	6.00	13.1	7.35	.39	.06	.20	5.97	15.4	8.80	7.80	8.30	6.00
25	5.68	11.0	6.00	.34	.06	.10	10.9	13.1	6.90	9.87	8.58	6.00
26	6.00	9.61	6.00	* 3.76	2.95	.03	6.90	8.30	7.57	15.4	12.5	7.45
27	12.1	11.8	7.93	9.30	5.36	.02	5.76	7.80	8.51	16.6	6.90	6.90
28	13.9	11.3	16.6	7.24	8.59	.02	5.44	6.90	6.00	9.40	6.00	8.54
29	8.48	11.8	12.0	3.16	* 9.29	.02	5.20	-----	5.76	.49	6.90	9.30
30	10.1	11.4	5.95	.28	6.45	.05	5.18	-----	5.36	.36	5.92	12.1
31	12.0	16.6	-----	.22	-----	.35	5.36	-----	6.61	-----	8.59	-----
Total	263.51	274.38	261.30	74.28	35.37	135.03	99.68	231.27	260.92	218.56	216.63	288.47
Mean	8.50	8.85	8.71	2.40	1.18	4.36	3.22	8.26	8.42	7.29	6.99	9.62
Med	13.2	13.7	13.5	3.71	1.83	6.75	4.98	12.8	13.0	11.3	10.8	14.9
Cf's	809	842	802	228	109	414	306	710	801	671	665	885
Ac-ft												
Calendar Year	1960	Max	17.6	Min	0.02	Mean mgd	6.56	Mean cfs	10.1	Ac-ft	7.370	
Fiscal Year	1960-61	Max	17.9	Min	0.02	Mean mgd	6.46	Mean cfs	10.0	Ac-ft	7.240	

* Discharge measurement made on this day.

ISLAND OF KAUAI

790. Kapahi ditch near Kealia

Location.--Lat 22°06'00", long 159°22'30", on right bank 500 ft downstream from intake and 4.0 miles west of Kealia.

Records available.--April 1909 to May 1914, May 1915 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 360 ft (by barometer). Prior to Nov. 26, 1936, water-stage recorder at site 61 ft upstream at datum 2.52 ft higher.

Average discharge.--43 years (1917-20, 1921-61), 4.78 mgd (7.40 cfs).

Extremes.--1090-61: Maximum daily discharge, 89.2 mgd (138 cfs) Feb. 6, 1913; no flow at times.

Remarks.--Records good. Ditch diverts water from Kapaa River for irrigation in vicinity of Kapaa. Flow regulated by headgates.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.52	2.62	5.48	0.37	0.04	3.80	0.19	1.56	*3.98	0.16	0.60	3.70
2	3.47	3.13	3.66	0.7	0.07	4.05	0.19	*3.78	2.89	0.23	1.6	3.36
3	2.82	2.82	2.62	1.0	1.0	3.94	0.19	5.76	.19	.16	.16	2.83
4	2.82	1.93	2.72	1.3	1.0	4.48	0.16	4.29	1.6	3.45	1.6	2.92
5	*2.82	.31	2.53	1.3	1.0	2.3	0.16	2.24	1.6	4.39	1.6	3.03
6	3.38	2.3	3.74	1.0	1.0	1.6	2.96	2.24	1.3	4.04	1.3	2.60
7	3.38	.19	3.24	1.3	1.3	2.16	3.50	2.15	3.51	3.70	.13	5.77
8	3.00	.19	2.91	1.3	1.3	2.13	2.72	3.09	3.93	2.80	1.96	1.90
9	2.62	2.22	2.44	1.3	1.0	2.15	2.77	7.60	3.58	.23	4.04	.19
10	2.53	2.82	2.82	1.3	1.0	.82	1.33	2.57	3.03	.33	3.93	.66
11	2.53	2.44	2.44	1.3	.20	1.6	2.3	2.04	2.71	.23	3.82	.16
12	2.44	2.24	7.37	1.3	.13	1.6	2.3	3.40	2.60	.19	2.68	3.93
13	3.50	2.15	5.68	1.0	1.0	2.6	2.3	1.44	4.47	.19	2.04	4.62
14	5.20	2.34	3.94	1.0	.16	2.9	2.7	.23	3.48	3.54	3.58	4.04
15	3.66	2.53	2.91	1.0	5.38	1.0	1.9	2.3	2.92	1.77	3.36	3.70
16	2.62	2.80	3.52	1.0	10.7	1.0	1.59	4.23	*3.03	.23	7.90	3.36
17	2.44	*5.42	1.30	31	9.76	1.0	.27	5.06	*2.82	2.96	2.14	2.55
18	2.24	3.69	.19	35	5.49	1.0	1.9	3.66	2.71	5.13	.23	2.20
19	5.70	2.53	3.05	.69	.87	1.0	1.9	3.24	2.49	2.98	.19	3.82
20	3.10	2.82	*3.84	1.6	1.09	1.0	2.3	2.91	2.01	.54	1.9	6.33
21	2.53	2.34	3.69	1.3	1.02	1.0	1.67	2.22	.46	.19	.16	5.27
22	2.24	2.24	3.24	1.0	.90	1.0	2.34	1.3	.27	.19	7.30	3.93
23	2.15	6.53	3.00	1.0	.83	2.00	2.99	1.0	.16	.19	6.93	4.04
24	2.15	3.71	3.72	1.0	.70	2.3	2.80	1.0	.13	2.67	4.16	3.25
25	2.15	2.34	2.34	.07	.70	1.9	1.01	.50	.13	4.88	4.04	3.03
26	2.07	2.53	2.15	1.0	.64	2.3	.31	.13	.16	2.74	6.90	3.03
27	4.63	2.43	3.18	1.0	.54	2.3	.27	.13	3.29	.23	2.01	2.92
28	4.36	2.62	2.60	.07	.49	2.3	.27	2.54	4.16	.25	.19	2.92
29	3.80	2.15	.16	.07	.44	5.70	.31	-----	3.82	.13	2.51	3.36
30	3.24	2.91	.16	.04	2.26	8.80	.31	-----	1.74	.13	3.03	5.83
31	3.94	6.25	-----	.04	-----	3.04	1.85	-----	.16	4.04	-----	-----
Total	97.05	81.47	89.64	5.31	4.340	46.26	31.92	67.57	65.28	48.85	78.83	99.24
Mean												
Mgd	3.13	2.63	2.99	0.171	1.45	1.49	1.03	2.41	3.11	1.63	2.54	3.31
Cfs	4.84	4.07	4.63	0.265	2.24	2.31	1.59	3.73	3.26	2.52	3.93	5.12
Ac-ft	298	250	275	16	133	142	98	207	200	150	242	305
Calendar Year 1960		Max	13.1	Min	0.04	Mean mgd	2.49	Mean cfs	3.85	Ac-ft	2800	
Fiscal Year 1960-61		Max	10.7	Min	0.04	Mean mgd	2.07	Mean cfs	3.20	Ac-ft	2320	

* Discharge measurement made on this day.

800. Kapaa Stream at Kapahi ditch intake, near Kapaa

Location.--Lat $22^{\circ}06'05''$, long $159^{\circ}22'30''$, on right bank 4 miles northwest of Kapaa and 4.5 miles northwest of Wailua.

Drainage area.--3.3 sq mi.

Records available.--July 1936 to June 1961. Prior to July 1959 published as Kapaa River at Kapahi ditch intake, near Kapaa.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 365 ft (by barometer).

Average discharge.--25 years, 13.1 mgd (20.3 cfs).

Extremes.--Maximum discharge during year, 1,890 mgd (2,920 cfs) Oct. 2 (gage height, 3.54 ft); no flow many times.

1936-61: Maximum discharge, 4,960 mgd (7,670 cfs) Jan. 25, 1956 (gage height, 5.34 ft); no flow at times.

Remarks.--Records good.

Entire low flow is diverted into several ditches above station. Records do not include flow of Kapahi ditch (see p. 32).

Corporation.--Records for July 1 to Dec. 14, 1936, furnished by East Kauai Water Co.

Rating tables (gage height, in feet, and discharge
in million gallons a day)

July 1 to Oct. 2						Oct. 3 to June 30					
-0.03	0	0.8	54.2			-0.03	0	0.6	28.4		
0	.10	1.0	90.5			0	.10	.8	54.2		
.2	2.57	1.2	140			.2	2.53	1.0	90.5		
.4	11.5	1.5	235			.4	10.9	1.2	140		
.6	28.4	1.8	365								

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	0.29	94.7	9.40	0	12.5	3.20	0.10	34.4	96.4	0
2	19.2	0	0	*330	9.40	0	12.3	3.00	3.75	53.7	16.5	0
3	3.61	0	.30	28.8	13.2	0	10.9	1.65	7.25	*14.7	11.7	0
4	1.65	11.7	0	21.5	9.40	55.4	8.72	.97	8.43	1.57	15.5	0
5	*1.14	16.1	0	12.5	8.72	6.26	*7.50	0	4.10	0	10.1	0
6	1.79	4.44	.21	12.5	8.10	4.10	3.65	0	3.80	0	10.1	0
7	.13	3.12	0	16.7	7.50	1.64	.37	0	1.06	0	6.86	11.1
8	0	3.80	0	14.4	7.50	1.47	.63	.34	0	7.09	2.25	5.53
9	0	1.14	0	12.4	6.96	5.30	.15	7.04	0	3.80	0	3.94
10	0	0	0	13.3	12.8	4.42	10.8	20.4	0	4.66	0	5.91
11	0	0	0	8.86	54.0	3.03	8.10	1.50	0	36.4	0	15.1
12	.70	0	.69	4.10	22.1	6.31	9.40	2.56	0	12.4	.86	1.95
13	2.51	0	3.70	5.68	14.1	38.7	6.96	113	.38	5.02	1.30	0
14	1.86	0	.17	11.6	14.4	65.3	15.2	11.4	0	2.85	0	0
15	0	0	0	8.10	5.41	19.1	8.72	5.68	0	21.7	0	0
16	0	.11	.49	15.9	.05	11.7	6.63	3.93	0	12.5	1.10	0
17	0	.52	1.41	64.4	2.13	9.40	7.50	0	0	4.74	9.27	1.80
18	0	0	4.56	79.6	5.13	10.9	6.96	0	0	1.36	5.65	1.65
19	.14	0	2.38	89.8	13.2	8.72	4.74	0	0	4.93	3.80	9.26
20	0	0	*30	31.7	11.9	7.50	2.31	0	90.9	12.3	3.80	15.0
21	0	0	0	21.8	17.7	6.48	.77	1.45	103	10.2	4.70	.07
22	0	0	0	16.5	11.6	8.72	0	4.10	40.8	3.80	9.10	0
23	0	5.05	0	14.1	10.9	19.9	.37	6.58	8.72	3.80	.36	0
24	0	5.36	0	11.7	9.40	10.9	11.1	20.2	6.06	1.21	0	0
25	0	3.37	0	10.9	11.9	7.50	36.6	10.9	5.02	.04	0	0
26	0	1.47	0	*18.4	6.25	6.96	3.80	4.70	11.4	12.6	.26	0
27	7.30	2.87	29.3	12.5	3.26	6.06	3.00	4.10	2.42	16.6	1.80	0
28	5.08	2.11	25.2	6.06	10.7	6.06	2.76	1.11	0	41.9	3.00	0
29	.28	4.33	5.89	8.72	*6.43	2.80	2.53	-----	0	14.9	.82	0
30	.95	.95	22.2	10.1	1.31	1.35	2.53	-----	1.87	11.7	0	14.4
31	1.18	11.2	-----	9.40	23.7	.93	-----	5.67	-----	0	-----	-----
Total	47.52	77.64	97.09	1,016.92	324.85	359.68	208.43	227.81	304.73	392.81	215.23	121.17
Mean	1.53	2.50	3.24	32.8	10.8	11.6	6.72	8.14	9.83	13.1	6.94	4.04
Mgd	2.37	3.87	5.01	50.7	16.7	17.9	10.4	12.6	15.2	20.3	10.7	6.25
Cfs	146	238	298	3,120	997	1,100	640	699	935	1,210	661	372
Ac-ft												
Calendar Year	1960	Max	330	Min	0	Mean mgd	10.3	Mean cfs	15.9	Ac-ft	11520	
Fiscal Year	1960-61	Max	330	Min	0	Mean mgd	9.30	Mean cfs	14.4	Ac-ft	10,420	

Peak discharge (base, 1,400 mgd).--Oct. 2 (11 a.m.) 1,890 mgd (2,920 cfs), 3.54 ft.

*Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

ISLAND OF KAUAI

870. Anahola ditch wasteway near Kealia

Location.--Lat 22°08'10", long 159°22'30", 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 June 1961.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 820 ft above mean sea level (by hand levels from East Kauai Water Co. benchmark).

Average discharge.--25 years (1936-61), 3.29 mgd (5.09 cfs).

Extremes.--1936-61: Maximum daily discharge, 54 mgd (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 the Anahola Stream station.

Cooperation.--Records for July to November 1936 furnished by East Kauai Water Co.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.11	<u>0.11</u>	0.11	3.51	0.46	0.38	0.30	0.38	1.56	11.5	<u>16.7</u>	0.39
2	.17	.11	.11	<u>10.1</u>	.46	.30	.30	.38	.23	<u>17.0</u>	*6.72	.39
3	.17	.11	.11	2.78	.46	.30	.30	.38	.17	*8.42	4.57	.31
4	.17	.11	.11	2.16	.46	<u>1.21</u>	.30	.38	.17	5.25	5.69	.39
5	.11	.17	.11	1.69	.46	.38	.30	.30	.17	4.65	4.25	.39
6	.11	.11	.11	1.54	.56	.38	.30	.30	.17	*3.65	3.85	.31
7	.07	.11	.17	1.69	.56	.38	.30	.30	2.77	2.19	3.65	.39
8	.07	.11	.11	1.25	.56	.38	.30	2.08	4.73	9.26	1.51	.39
9	.07	.11	.11	1.12	.56	.38	.30	6.73	3.97	8.31	.39	5.75
10	.07	.11	.11	1.12	.56	<u>.23</u>	.46	7.72	2.94	13.5	.39	6.94
11	.07	.11	.11	1.12	.66	.23	.30	2.86	2.62	<u>13.4</u>	.39	<u>12.5</u>
12	.11	.11	<u>.17</u>	.87	.46	.23	.23	2.66	2.47	6.94	.39	<u>3.22</u>
13	.11	.11	.17	.87	<u>.38</u>	.47	.23	<u>11.8</u>	4.96	5.25	.39	.31
14	.11	.11	.11	.76	.38	.46	.30	10.7	3.55	5.18	.47	.31
15	.07	.17	.11	.66	.38	.30	.30	6.32	2.16	8.79	.39	.31
16	.07	.17	.11	.76	.38	.23	.30	7.92	.80	4.65	.47	.31
17	.07	<u>.23</u>	.07	3.42	.38	.23	.30	5.52	.30	3.65	2.29	.31
18	.07	<u>.23</u>	.11	4.11	.38	.23	.38	3.97	.30	1.78	6.41	.39
19	.17	.17	.11	5.89	.38	.30	.89	3.40	.23	.39	3.26	.47
20	.11	.17	.11	2.16	.38	.23	.86	2.94	.30	.47	3.60	6.74
21	.07	.11	.07	1.25	.46	.23	.17	3.10	7.03	.39	5.33	5.45
22	.07	.11	.07	.99	.38	.30	.17	4.27	<u>14.6</u>	.39	6.82	3.48
23	.07	.17	.11	.87	.38	.46	.17	12.0	7.40	.39	2.27	3.32
24	.07	.17	.11	.87	.38	.30	1.84	<u>13.6</u>	6.53	.39	<u>.31</u>	2.82
25	.07	.17	.11	.76	.38	.23	<u>7.30</u>	10.1	4.45	.39	<u>.31</u>	2.50
26	.07	.11	.11	.76	.38	.23	*2.78	4.92	5.19	8.46	.39	2.99
27	.11	.17	.11	.76	.38	.23	2.16	4.16	4.29	15.2	.31	1.75
28	.11	.17	.17	.56	.46	.23	1.85	3.59	.55	14.3	.31	.39
29	.07	.17	.11	<u>.46</u>	.46	.30	1.39	-----	.47	6.94	.31	.39
30	.11	.17	.11	.46	.38	.38	.56	-----	.55	5.65	.31	.39
31	.11	.17	-----	.46	-----	.64	.46	-----	.55	-----	.39	-----
Total	3.01	4.43	3.42	55.78	13.30	10.76	26.10	132.78	86.18	186.73	82.84	64.00
Mean												
Mgd	0.097	0.143	0.114	1.80	0.443	0.347	0.842	4.74	2.78	6.22	2.67	2.13
Cfs	0.150	0.221	0.176	2.79	0.685	0.537	1.30	7.33	4.30	9.62	4.13	3.30
Ac-ft	9.2	14	10	171	41	33	80	407	264	573	254	196
Calendar Year	1960		Max	26.1	Min	0.07	Mean mgd	0.755	Mean cfs	1.17	Ac-ft	849
Fiscal Year	1960-61		Max	17.0	Min	0.07	Mean mgd	1.83	Mean cfs	2.83	Ac-ft	2.050

* Discharge measurement made on this day.

ISLAND OF KAUAI

35

880. Anahola ditch above Kaneha Reservoir, near Kealia

Location--Lat 22°08'00", long 159°22'30", on left bank at point of discharge into Kaneha Reservoir, 500 ft below wastewater gates and 5 miles northwest of Kealia.

Records available--December 1921 to June 1961. May 1915 to December 1921 at site 0.3 mile upstream; records 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 benchmark). Dec. 9, 1921 to June 2, 1933, at site 480 ft upstream at different datum.

Average discharge--37 years (1922-55, 1927-61), 2.98 mgd (4.61 cfs).

Extremes--1921-61: Maximum daily discharge, 40 mgd (62 cfs) Nov. 12, 1947; no flow at times.

Remarks--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted by Anahola ditch wastewater (see p. 34).

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	2.89	3.44	5.79	4.28	0.02	0	0	1.34	* 2.33	6.79	0.17	4.51	
2	7.57	4.03	3.55	.45	.02	0	0	* 1.26	7.18	.12	.04	* 4.07	
3	7.14	3.55	2.78	.02	.01	0	0	1.26	6.71	.04	.04	3.11	
4	7.41	5.91	2.56	.04	.01	.04	0	1.18	8.32	.02	.76	4.36	
5	4.88	6.73	2.27	.04	.01	0	0	1.11	4.39	.02	.04	6.38	
6	5.31	4.03	3.33	.04	.01	0	0	1.11	4.75	* .08	.04	2.67	
7	3.33	3.11	4.64	.02	.01	0	0	1.11	4.97	1.32	.04	13.8	
8	2.78	3.98	3.11	.02	.0	0	0	2.31	.16	5.25	1.62	14.0	
9	2.27	4.03	2.18	.02	.0	0	0	6.00	.12	.06	2.45	10.2	
10	2.27	3.79	3.25	.02	0	0	0	6.51	.12	.12	2.36	.16	
11	2.79	2.56	2.18	.02	0	0	0	2.89	.12	.09	2.18	.20	
12	8.18	2.36	4.66	.02	0	0	0	2.47	.12	.04	2.09	4.74	
13	6.42	2.27	6.30	.02	0	0	0	4.63	.16	.04	2.00	5.01	
14	* 7.31	2.67	2.56	.02	0	0	0	.24	.12	.04	3.80	4.39	
15	3.33	3.22	3.73	.02	0	0	0	.20	.52	.06	2.78	3.79	
16	2.56	2.18	6.82	.02	0	0	0	.24	1.90	.04	6.51	4.15	
17	2.36	4.22	2.78	.13	0	0	0	.16	2.18	.02	9.46	4.03	
18	2.18	3.83	6.98	.13	0	0	0	.16	2.09	2.02	3.22	3.33	
19	5.10	* 2.97	6.78	.18	0	0	0	.16	2.00	4.58	1.11	7.26	
20	3.00	5.16	3.91	.09	0	0	98	.12	6.84	6.37	1.34	9.27	
21	2.56	2.18	* 4.54	.06	0	0	0	1.64	.12	8.86	5.87	2.61	
22	2.09	2.27	3.44	.06	0	0	0	1.64	.16	.09	3.22	4.84	
23	2.00	5.46	5.50	.06	0	0	0	8.60	.33	.06	6.47	5.01	
24	2.36	6.06	3.11	.04	0	0	0	2.12	.38	.06	5.97	3.79	
25	2.09	3.22	2.45	.04	0	0	0	.16	.24	.04	8.84	3.33	
26	2.09	2.76	2.18	.04	0	0	0	.09	.16	.04	6.60	.84	
27	7.79	4.75	3.59	.06	0	0	0	.09	.16	1.36	.09	3.33	
28	9.31	6.72	9.86	.04	0	0	0	.09	.12	4.94	.06	2.56	
29	5.41	5.46	8.10	.02	0	0	0	.35	-----	3.40	.04	3.79	
30	5.31	6.08	6.71	.02	0	0	0	1.34	-----	2.45	.04	2.45	
31	6.75	9.36	-----	.02	-----	0	0	1.42	-----	4.37	-----	3.33	
Total	136.84	128.36	129.64	6.06	0.09	0.04	18.52	36.13	80.77	64.52	85.63	132.15	
Mean	Mgd	4.41	4.14	4.32	0.195	0.003	0.001	0.597	1.29	2.61	2.15	2.76	4.40
	Ofs	6.82	6.41	6.68	0.302	0.005	0.002	0.924	2.00	4.04	3.33	4.27	6.81
	Ac-ft	420	394	398	19	0.3	0.1	57	111	248	198	263	406
Calendar Year	1960:	Max	13.2	Min	0	Mean mgd	2.43	Mean cfs	3.76	Ac-ft	2.730		
Fiscal Year	1960-61:	Max	14.0	Min	0	Mean mgd	2.24	Mean ofs	3.47	Ac-ft	2510		

* Discharge measurement made on this day.

ISLAND OF KAUAI

890. Anahola Stream near Kealia

Location.--Lat 22°08'55", long 159°21'20", on right bank just upstream from intake of Lower Anahola ditch and 4.5 miles northwest of Kealia.

Drainage area.--5.5 sq mi.

Records available.--August to November 1910, December 1910 to November 1912 (fragmentary), December 1912 to June 1961. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1958 published as Anahola River near Kealia.

Gage.--Water-stage recorder and concrete dam and orifice control. Datum of gage is 295.11 ft above mean sea level (Highway Department benchmark). Aug. 22 to Nov. 2, 1910, water-stage recorder, Dec. 15, 1910 to Dec. 29, 1912, staff gage and Dec. 30, 1912 to May 3, 1934, water-stage recorder at site one-eighth of a mile upstream at different datum.

Average discharge.--47 years (1913-18, 1919-61), 14.0 mgd (21.7 cfs).

Extremes.--Maximum discharge during year, 1,450 mgd (2,240 cfs) Oct. 17 (gage height, 5.53 ft), from rating curve extended above 430 mgd; minimum, 2.97 mgd (4.60 cfs) Feb. 8.

1910, 1912-61: Maximum discharge, about 12,700 mgd (19,600 cfs) Jan. 25, 1956 (gage height, 14.6 ft from floodmark), from rating curve extended above 380 mgd; minimum, 1.28 mgd (1.98 cfs) Oct. 27, 1953.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Anahola ditch diverts water 3 miles above station for irrigation in vicinity of Kealia (see p. 35).

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.04	4.37	4.81	67.9	15.0	5.19	11.7	3.78	* 5.62	106	147	6.31
2	20.9	4.32	4.04	262	13.5	5.72	12.3	* 3.58	6.51	44.6	* 19.8	* 6.31
3	6.29	4.00	3.59	30.8	14.0	9.40	8.97	3.48	6.31	* 12.4	14.0	5.32
4	5.45	9.60	3.37	18.5	12.2	6.84	* 6.31	3.37	8.06	7.84	13.1	5.72
5	4.85	5.66	3.30	9.19	11.3	27.8	5.91	3.27	5.52	7.11	10.4	6.51
6	5.06	4.74	3.37	6.71	10.4	13.5	7.51	3.17	5.52	6.51	9.19	5.05
7	4.60	4.17	4.31	15.9	9.73	9.73	7.93	3.17	6.31	6.31	8.65	30.7
8	* 4.27	4.31	3.85	8.84	8.92	8.65	5.91	12.0	5.52	86.1	7.84	14.1
9	4.05	4.17	3.37	5.19	8.38	12.2	5.52	31.0	5.19	14.4	7.30	54.0
10	4.00	3.88	3.73	5.32	12.1	13.0	35.2	49.3	4.78	72.1	7.30	8.65
11	4.11	3.59	3.37	8.18	54.8	8.38	8.11	6.31	4.52	40.4	7.11	35.2
12	8.36	3.37	3.95	4.92	29.8	11.3	6.90	5.19	4.25	14.4	6.90	12.6
13	5.86	3.30	5.87	9.28	12.6	20.0	6.11	* 116	5.82	11.3	6.71	7.30
14	6.22	3.30	3.65	4.92	13.8	6.62	12.7	22.8	5.52	9.73	6.51	6.71
15	4.45	3.37	3.76	3.98	9.73	16.8	7.11	12.6	4.38	13.5	6.71	6.11
16	4.00	3.23	4.94	7.06	7.84	10.4	* 6.48	24.5	4.38	8.65	9.19	5.91
17	3.76	3.43	3.80	119	8.11	8.38	6.31	10.9	3.98	7.11	20.8	5.91
18	3.65	3.65	4.22	167	* 7.30	9.15	6.11	8.11	3.78	6.90	8.92	8.72
19	4.97	* 3.45	6.29	196	10.0	9.52	5.72	7.30	* 368	6.90	6.51	12.2
20	4.33	4.50	4.22	71.6	12.0	7.11	4.25	6.71	31.5	7.30	6.11	32.2
21	3.94	3.52	* 3.98	41.0	20.4	6.90	3.88	6.51	* 53.1	7.84	7.98	7.84
22	3.71	3.30	3.83	228	12.2	10.7	3.78	6.71	56.2	6.31	22.0	6.11
23	3.59	6.27	4.19	15.0	10.9	34.1	33.7	20.0	9.73	7.75	10.5	6.51
24	3.65	6.11	3.89	11.3	7.11	12.5	5.32	31.7	8.24	6.71	6.51	6.31
25	3.52	4.36	3.30	10.0	a 8.0	7.57	19.9	15.4	6.31	7.30	5.91	6.11
26	3.52	3.65	3.09	* 28.4	a 7.0	6.51	* 5.72	6.71	8.35	28.3	9.78	6.11
27	16.8	4.05	5.23	35.0	a 6.3	5.91	* 4.92	6.11	7.27	42.0	6.31	5.52
28	23.3	5.90	* 33.1	21.5	a 30	5.52	4.52	5.91	5.85	46.2	5.91	5.32
29	5.92	4.73	25.9	19.0	* 11	9.31	4.11	-----	5.52	118	5.72	5.19
30	4.79	4.10	13.2	18.2	5.52	10.7	4.25	-----	4.92	8.92	5.52	20.2
31	6.54	7.10	-----	16.2	-----	34.4	4.52	-----	16.2	-----	6.11	-----
Total	192.50	137.52	181.52	1260.69	399.94	484.95	271.68	435.59	312.84	662.69	422.30	347.75
Mean	6.21	4.44	6.05	40.7	13.3	15.6	8.76	15.6	10.1	22.1	13.6	11.6
Mgd	9.61	6.87	9.36	63.0	20.6	24.1	13.6	24.1	15.6	34.2	21.0	17.9
Cfs	591	422	557	3870	1230	1490	834	1340	960	2030	1300	1070
Ac-ft												
Calendar Year 1960:			Max	696	Min	3.09	Mean mgd	18.4	Mean cfs	28.5	Ac-ft	20640
Fiscal Year 1960-61:			Max	262	Min	3.09	Mean mgd	14.0	Mean cfs	21.7	Ac-ft	15690

Peak discharge (base, 900 mgd).--Oct. 2 (10:30 a.m.) 1,030 mgd (1,590 cfs), 4.91 ft; Oct. 17 (11:30 p.m.) 1,450 mgd (2,240 cfs), 5.53 ft; May 1 (6 a.m.) 1,180 mgd (1,830 cfs), 5.15 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorder range in stage and records for nearby stations.

ISLAND OF KAUAI

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910. Lower Anahola ditch near Kealia

Location.--Lat 22°08'00", long 159°19'30", on left bank 100 ft downstream from last wastewater, 1.3 miles southwest of mouth of Anahola Stream, and 2.5 miles northwest of Kealia.

Records available.--December 1936 to June 1961 in reports of Geological Survey. July 1925 to December 1936 in files of East Kauai Water Co.

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

Average discharge.--24 years (1937-61), 2.28 mgd (3.53 cfs).

Extremes.--1936-61: Maximum daily discharge 12.0 mgd (18.6 cfs) June 1, 1938; no flow at times.

Remarks.--Records good. Ditch diverts water from Anahola Stream for irrigation of sugar cane. Flow regulated by spillways and gates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	<u>0.02</u>	4.27	4.75	<u>0.04</u>	0	<u>5.38</u>	0.03	3.54	<u>0.01</u>	2.40	0.04	3.40	
2	.02	2.96	2.41	<u>0.04</u>	0	4.64	.03	*3.47	.01	2.66	.01	*3.33	
3	.02	<u>.04</u>	<u>.04</u>	0	0	.04	.03	4.88	1.50	*2.60	.01	3.26	
4	.02	<u>.04</u>	1.60	0	0	.04	.03	3.33	4.35	2.66	.01	3.19	
5	.02	.50	2.79	0	0	.04	.03	3.05	5.64	4.93	.01	3.19	
6	.02	2.72	2.72	0	0	.03	.03	3.05	2.18	<u>6.15</u>	.01	3.19	
7	<u>1.39</u>	4.15	3.18	0	.68	.03	.03	2.92	.03	3.62	.01	3.54	
8	2.22	4.00	3.40	0	3.74	.03	.03	1.82	.03	.06	2.93	3.61	
9	2.49	3.92	2.85	0	3.00	.03	.03	2.23	.03	.06	<u>4.14</u>	2.27	
10	3.05	3.62	2.99	0	0	<u>.01</u>	.03	6.15	3.14	.06	<u>1.47</u>	<u>.03</u>	
11	2.88	3.32	2.92	0	0	.01	.03	6.15	5.38	.04	1.30	.03	
12	4.15	3.54	3.12	0	0	.01	.03	6.06	5.47	.04	1.20	.03	
13	5.08	3.05	3.78	0	0	.01	.03	3.62	5.56	.04	1.12	.03	
14	1.75	3.05	3.40	0	0	.04	<u>.01</u>	.04	5.90	.04	1.37	.03	
15	.02	3.26	3.18	0	.01	.04	.01	.04	3.48	.04	1.98	.03	
16	.02	3.34	4.00	0	2.86	.04	.01	.06	.04	.04	3.49	.03	
17	.02	*3.05	3.40	0	5.06	.04	2.30	.06	1.20	.04	4.14	.04	
18	.02	3.25	.85	0	4.98	.04	3.68	2.08	3.05	.04	1.12	.04	
19	1.60	3.12	.04	<u>.01</u>	5.14	.04	3.68	6.60	2.98	.04	1.12	.04	
20	4.00	3.85	.04	0	5.14	.04	2.89	4.04	3.19	.04	.98	.04	
21	3.55	3.32	1.11	0	5.56	.04	.04	.06	3.19	.04	.98	.04	
22	3.28	2.99	3.48	0	5.22	.04	.04	.03	.03	.04	1.02	.04	
23	2.38	4.00	3.87	0	3.49	.04	.04	.03	.03	.03	.85	.07	
24	2.99	4.60	3.40	0	.76	.04	1.54	.03	.03	.03	.34	.06	
25	2.92	<u>4.75</u>	2.85	0	.69	.03	3.34	.03	.03	.03	.26	.04	
26	2.79	3.92	2.66	0	.73	.03	.06	.03	.01	.01	.26	.04	
27	4.00	5.62	1.99	0	.73	.03	1.13	<u>.01</u>	.01	.29	.23	.04	
28	5.39	4.22	2.83	0	1.10	.03	2.79	<u>.01</u>	2.32	.50	.31	2.66	
29	5.42	4.52	4.91	0	*2.90	.03	2.66	-----	3.61	.47	.40	<u>3.92</u>	
30	3.31	4.22	1.98	0	5.47	.03	2.28	-----	2.32	.32	1.47	2.51	
31	4.99	4.08	-----	0	-----	.03	3.38	-----	.69	-----	3.47	-----	
Total	69.83	103.29	80.54	0.09	57.26	10.95	30.27	63.42	65.44	27.36	36.05	38.77	
Mean	Mgd	2.25	3.33	2.68	0.003	1.91	0.353	0.976	2.26	2.11	0.912	1.16	1.29
	Cfs	3.48	5.15	4.15	0.005	2.96	0.546	1.51	3.50	3.26	1.41	1.79	2.00
	Ac-ft	214	317	247	0.3	176	34	93	195	201	84	111	119
Calendar Year	1960	Max	5.56	Min	0	Mean mgd	1.72	Mean cfs	2.66	Ac-ft	1940		
Fiscal Year	1960-61	Max	6.60	Min	0	Mean mgd	1.60	Mean cfs	2.48	Ac-ft	1790		

* Discharge measurement made on this day.

ISLAND OF KAUAI

942. Ka Loko ditch near Kilauea

Location.--Lat 22°10'35", long 159°23'00", on left bank 35 ft downstream from Moloa ditch, 400 ft upstream from Ka Loko Reservoir, and 3.5 miles southeast of Kilauea.

Records available.--August 1932 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 750 ft (from topographic map).

Average discharge.--28 years (1933-61), 3.38 mgd (5.23 cfs). (Incomplete fiscal year 1933 was included in error, in computing averages for period 1950-59).

Extremes.--1932-61: Maximum daily discharge, 63 mgd (98 cfs) Dec. 10, 1935; minimum daily, 0.11 mgd (0.17 cfs) Nov. 3, 4, 1959.

Remarks.--Records good. Ditch diverts water from Moloa and Puu Ka Ele Streams, 0.5 mile southeast and 1.5 miles southwest of station, respectively. Water used for irrigation in vicinity of Kilauea. Flow regulated by wastewater gates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.23	2.60	2.94	13.0	1.37	1.06	1.60	1.52	2.14	19.7	6.82	2.59
2	8.22	2.83	2.32	4.26	*1.29	1.13	1.77	1.45	2.98	8.58	3.75	3.18
3	4.01	2.23	2.05	11.2	1.21	1.13	1.52	1.45	3.12	3.46	4.56	2.14
4	3.06	5.74	2.05	9.16	1.86	4.55	1.37	1.37	3.12	2.72	5.15	2.42
5	3.31	5.52	1.86	6.50	2.14	2.60	1.29	1.29	2.23	2.51	4.31	3.05
6	2.42	3.40	2.42	5.75	2.05	*1.86	1.29	1.29	2.23	2.32	3.75	2.14
7	2.14	2.60	3.75	8.48	2.05	1.60	1.29	1.13	2.60	2.23	3.52	7.40
8	2.23	3.44	2.23	5.75	1.96	1.37	1.21	3.29	2.23	2.72	3.40	4.91
9	1.96	2.72	1.86	4.59	1.86	1.68	1.13	6.29	2.05	6.58	3.18	10.4
10	1.86	2.42	2.48	4.67	2.14	1.77	1.99	9.66	1.86	19.9	3.18	3.73
11	1.96	2.14	1.77	6.64	3.20	1.45	*1.37	2.50	1.77	12.0	3.06	10.0
12	*5.63	2.05	3.23	4.89	2.83	1.45	1.60	2.00	1.68	6.20	2.83	5.54
13	3.30	2.05	3.36	5.26	2.14	1.86	2.05	25.8	2.14	4.87	2.83	3.52
14	5.35	2.05	2.05	3.75	2.05	3.41	2.05	6.50	2.05	4.21	2.83	3.40
15	2.51	2.05	2.14	3.40	1.77	2.07	1.96	*4.73	1.68	5.72	2.72	3.06
16	2.14	1.96	4.35	3.74	1.68	1.77	1.86	7.00	1.68	4.03	4.33	3.40
17	2.05	2.42	2.14	21.7	1.60	1.52	1.96	3.80	1.52	3.52	6.07	3.06
18	1.86	2.23	3.74	24.2	1.60	1.45	1.86	2.72	1.37	3.29	5.39	2.72
19	3.15	2.14	3.31	24.8	1.60	1.37	1.77	2.42	1.37	3.29	2.94	4.63
20	2.14	3.38	2.23	14.4	1.96	1.29	1.68	2.14	*6.12	3.38	2.72	7.60
21	1.86	2.05	2.50	10.1	2.28	1.29	1.60	2.14	10.2	3.00	3.42	3.40
22	1.68	1.77	2.05	7.70	1.77	1.77	1.52	2.51	15.6	2.83	7.43	2.60
23	1.68	4.44	2.86	6.80	1.60	3.32	6.93	3.67	4.09	3.23	4.94	2.60
24	1.86	*5.11	2.05	3.36	1.45	2.36	2.22	6.60	3.39	*3.79	2.83	2.32
25	1.68	3.00	1.77	2.05	1.37	1.68	4.52	5.75	2.32	3.67	2.51	2.23
26	1.68	2.42	1.68	2.32	1.29	1.52	2.05	2.72	2.23	10.8	*4.75	2.23
27	5.37	2.84	*3.61	2.23	1.21	1.37	1.77	2.32	2.28	11.4	2.42	*2.14
28	12.0	2.93	1.21	1.86	1.45	1.37	1.68	2.23	2.28	12.3	2.23	2.32
29	3.98	2.94	1.26	1.60	1.29	1.64	1.60	-----	2.05	4.73	2.32	2.23
30	4.27	2.72	7.57	1.68	1.13	1.59	1.68	-----	1.86	4.59	*2.14	4.44
31	4.71	4.57	-----	1.52	-----	1.60	2.06	-----	3.86	-----	2.88	-----
Total	102.30	90.76	101.07	265.70	53.20	55.90	60.25	116.29	96.10	206.05	115.21	115.40
Mean	3.30	2.93	3.37	8.57	1.77	1.80	1.94	4.15	3.10	6.87	3.72	3.85
Mgd	5.11	4.53	5.21	13.3	2.74	2.79	3.00	6.42	4.80	10.6	5.76	5.96
Cfs	314	278	310	815	163	171	185	357	295	632	354	354
Ac-ft	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Calendar Year 1960	Max	4.26	Min	0.11	Mean mgd	3.66	Mean cfs	5.66	Ac-ft	4.100		
Fiscal Year 1960-61	Max	4.26	Min	1.06	Mean mgd	3.78	Mean cfs	5.85	Ac-ft	4.230		

* Discharge measurement made on this day.

ISLAND OF KAUAI

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950. Puu Ka Ele ditch near Kilauea

Location.--Lat 22°11'05", long 159°24'20", on left bank 200 ft upstream from Puu Ka Ele Reservoir and 2 miles south of Kalauea.Records available.--August 1932 to June 1961.Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 430 ft (by barometer).Average discharge.--28 years (1933-61), 2.58 mgd (3.99 cfs). (Incomplete fiscal year 1933 was included in error in computing averages for period 1944-59).Extremes.--1932-61: Maximum daily discharge, 21 mgd (32 cfs) Sept. 2, 1943; no flow at times each year.Remarks.--Records good. Ditch diverts water from Puu Ka Ele Stream 0.8 mile south of station. Water used for irrigation of sugar cane in vicinity of Kilauea. Flow regulated by wastewater gates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.58	3.25	3.36	7.21	0	0	0	1.62	1.42	10.3	1.64	2.68
2	5.68	3.16	2.78	11.0	0	0	0	1.54	2.58	4.01	0	2.87
3	3.71	2.78	2.58	3.86	0	0	0	1.54	2.58	1.47	0	2.49
4	3.06	4.45	2.49	7.70	0	.18	0	1.54	2.68	1.09	0	2.58
5	2.87	6.25	2.40	5.74	0	0	0	1.47	2.30	1.95	0	2.58
6	2.40	4.02	2.78	2.98	0	0	0	1.39	2.30	2.07	0	2.30
7	2.22	3.47	3.32	0	1.54	0	0	1.39	2.40	2.00	0	4.92
8	2.15	4.02	2.49	0	3.58	0	0	2.32	2.15	4.58	0	3.74
9	2.07	3.47	2.22	0	3.47	0	0	3.39	2.00	.05	2.09	6.80
10	2.00	2.96	2.73	0	4.08	0	0	5.80	1.84	.59	3.06	3.69
11	* 1.92	2.68	2.15	0	3.04	0	1.50	2.15	1.77	2.66	2.96	6.90
12	3.42	2.49	3.78	0	0	0	3.12	1.96	1.69	5.10	2.78	4.72
13	3.31	2.40	3.68	1.55	0	0	2.07	8.02	1.84	4.13	2.78	3.58
14	5.81	2.30	2.40	.38	0	.12	2.07	0	1.77	4.02	3.27	3.47
15	2.96	2.22	2.49	0	0	0	2.00	0	1.69	3.10	2.87	3.16
16	2.40	2.30	3.12	0	0	0	2.00	0	1.69	1.23	6.25	2.96
17	2.22	2.40	2.40	1.27	0	0	1.92	0	1.69	1.09	7.03	2.87
18	2.15	2.22	2.87	2.90	0	0	1.92	0	1.62	1.93	4.46	2.68
19	2.69	2.15	2.87	1.39	0	0	1.84	0	1.54	2.15	3.16	3.50
20	2.22	2.96	2.40	.30	0	0	1.84	0	* 2.51	2.07	3.06	4.90
21	2.07	2.30	2.58	0	0	0	1.84	0	3.99	2.07	3.16	3.80
22	2.00	2.07	2.40	0	0	0	1.77	0	5.71	2.03	5.03	2.96
23	2.00	3.62	2.58	0	0	.10	4.99	0	1.49	2.47	4.85	2.87
24	2.07	* 4.72	2.40	0	0	0	2.00	0	1.24	* 2.07	3.47	2.68
25	2.00	2.96	2.22	0	0	0	2.30	0	.95	2.07	3.06	2.49
26	1.92	2.78	2.15	.03	0	0	1.92	0	.81	5.80	* 3.95	2.49
27	6.31	2.58	* 2.97	.03	0	0	1.84	0	.81	3.72	2.87	* 2.40
28	10.4	2.68	6.76	0	0	0	1.77	0	1.74	.23	2.78	2.68
29	4.50	3.24	8.51	0	0	0	1.69	-----	2.07	0	2.96	2.40
30	4.28	3.89	4.73	0	0	0	1.77	-----	1.92	0	2.58	3.73
31	4.61	4.13	-----	0	-----	.03	1.77	-----	2.68	-----	2.87	-----
Total	100.00	96.92	92.61	46.34	15.71	0.42	43.94	34.13	63.47	76.05	82.99	101.89
Mean												
Mgd	3.23	3.13	3.09	1.49	0.524	0.014	1.42	1.22	2.05	2.54	2.68	3.40
Cfs	5.00	4.84	4.78	2.31	0.811	0.022	2.20	1.89	3.17	3.93	4.15	5.26
Ac-ft	307	297	284	142	48	13	135	105	195	233	255	313
Calendar Year 1960		Max	14.5	Min	0		Mean mgd	2.61	Mean cfs	4.04	Ac-ft	2.930
Fiscal Year 1960-61		Max	11.0	Min	0		Mean mgd	2.07	Mean cfs	3.20	Ac-ft	2.320

* Discharge measurement made on this day.

ISLAND OF KAUAI

952. Ross ditch near Kilauea

Location.--Lat 22°11'10", long 159°24'35", on left bank, 1,000 ft downstream from intake on Puu Ka Ele Stream and 1.7 miles south of Kilauea.

Records available.--October 1956 to June 1961.

Gage.--Water-stage recorder and Parshall flume.

Extremes.--1956-61: Maximum daily discharge, 10.6 mgd (16.4 cfs) Jan. 18, 1957; no flow Jan. 26, 31 to Feb. 3, Feb. 7-8, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Puu Ka Ele Stream for irrigation in vicinity of Kilauea. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.87	2.46	2.52	2.60	5.80	4.3	5.40	1.06	3.06	5.00	6.42	1.92
2	3.80	2.52	2.40	5.66	* 5.80	4.3	5.00	1.06	2.59	5.00	5.00	1.98
3	2.40	2.26	2.20	4.02	5.80	5.4	5.00	1.02	2.59	4.52	4.92	1.65
4	2.09	3.18	2.14	2.85	5.80	5.8	4.76	.98	2.52	3.99	4.92	1.76
5	1.98	3.44	1.98	2.72	5.40	5.4	4.68	.98	2.14	2.92	4.92	1.70
6	1.76	3.04	2.33	2.72	5.40	* 5.0	4.60	1.02	2.04	2.26	5.00	1.50
7	1.60	2.78	2.33	3.04	4.02	4.76	4.60	1.02	2.20	2.14	4.92	3.39
8	1.55	3.11	2.04	2.92	1.55	4.68	4.44	1.35	1.92	6.56	4.92	3.59
9	1.45	3.11	1.87	2.92	1.45	4.84	4.20	2.12	1.76	5.40	3.16	4.76
10	1.40	2.66	2.26	2.85	1.76	4.84	* 4.76	2.95	1.65	5.80	1.92	3.57
11	* 1.40	2.40	1.92	2.92	4.88	4.60	3.50	1.60	1.60	5.00	1.92	4.68
12	2.66	2.20	2.33	2.92	5.40	4.60	1.76	1.50	1.55	3.64	1.70	4.28
13	2.97	2.09	2.40	2.85	5.00	4.68	1.45	4.88	1.70	3.04	1.70	3.18
14	4.13	2.09	1.98	2.85	4.92	5.40	1.35	4.60	1.60	2.92	2.34	3.18
15	2.46	2.04	1.98	2.78	4.84	5.40	1.30	* 4.36	1.50	3.78	1.70	2.78
16	1.92	2.09	2.40	2.78	4.76	5.00	1.25	4.36	1.45	4.44	3.67	2.82
17	1.76	2.26	2.09	3.85	4.68	4.92	1.30	4.28	1.40	4.36	4.28	2.46
18	1.70	2.09	2.14	7.55	4.7	4.84	1.25	4.13	1.30	3.30	3.50	2.20
19	2.09	2.04	2.14	6.70	4.8	4.84	1.20	4.06	1.25	2.85	2.46	2.90
20	1.76	2.40	1.87	6.70	5.0	4.76	1.20	3.92	1.80	2.78	2.20	4.28
21	1.65	2.09	1.92	6.20	5.0	4.68	1.15	3.92	4.26	2.78	2.46	3.85
22	1.55	1.87	1.87	6.20	4.6	5.00	1.15	3.99	5.00	2.83	4.20	2.59
23	1.50	2.53	2.04	5.80	4.6	5.40	2.93	3.92	4.36	3.71	4.13	2.66
24	1.55	* 2.72	1.83	5.80	4.6	5.40	1.50	4.20	4.06	* 2.72	2.72	2.20
25	1.50	2.46	1.65	6.20	4.6	5.00	1.40	4.28	3.44	2.66	2.33	2.09
26	1.40	2.33	1.60	6.20	4.4	5.00	1.25	4.20	3.18	4.60	* 3.28	2.09
27	3.53	2.20	* 1.87	6.70	4.3	4.92	1.20	4.20	3.11	5.40	2.20	* 1.92
28	4.20	2.26	2.46	5.80	4.3	4.84	1.15	4.13	2.09	5.80	1.87	2.32
29	3.50	2.53	2.78	5.80	4.3	4.92	1.11	-----	1.76	4.84	2.41	1.92
30	3.18	2.59	2.72	5.80	4.3	5.00	1.11	-----	1.65	4.84	1.82	2.83
31	3.30	2.59	-----	5.80	-----	5.40	1.15	-----	2.21	-----	2.20	-----
Total	69.31	76.48	64.05	140.50	136.76	153.92	78.10	84.09	72.74	119.88	101.19	82.75
Mean												
Mgd	2.24	2.47	2.14	4.53	4.56	4.97	2.52	3.00	2.35	4.00	3.26	2.76
Cfs	3.47	3.82	3.31	7.01	7.06	7.69	3.90	4.64	3.64	6.19	5.04	4.27
Ac-ft	213	235	197	431	420	472	240	258	223	368	311	254
Calendar Year 1960	Max	8.25	Min	0.02	Mean mgd	3.00	Mean cfs	4.64	Ac-ft	3370		
Fiscal Year 1960-61	Max	7.55	Min	0.98	Mean mgd	3.23	Mean cfs	5.00	Ac-ft	3620		

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 18 to Dec. 6; discharge estimated on basis of recorded range in stage, ditchman's readings and records for nearby stations.

ISLAND OF KAUAI

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959. Kalihiwai ditch above wastewater near Kilauea.

Location.--Lat 22°10'40", long 159°25'45", on left bank, 0.7 mile upstream from Kalihiwai reservoir and 2.5 miles southwest of Kilauea.

Records available.--April 1960 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 400 ft above mean sea level (from topographic map).

Extremes.--1960-61: Maximum daily discharge, 18.5 mgd (28.6 cfs) Oct. 2, 1960; minimum daily, 0.87 mgd (1.35 cfs) Feb. 7, 1961.

Remarks.--Records good except those for period of no gage-height record which are fair. Flow can be regulated above station by Kilauea Sugar Co. Water passing station is used for domestic water supply and irrigation of sugar cane.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	3.21	3.66	5.28	5.55	* 2.36	1.59	3.64	1.26	3.79	15.4	13.0	2.44	
2	5.49	3.43	4.16	18.5	2.36	1.59	2.90	1.19	4.16	10.5	4.28	2.44	
3	3.79	3.21	3.66	6.18	2.10	1.93	2.63	1.13	4.41	6.18	3.54	2.18	
4	3.79	5.21	3.32	4.91	2.02	6.51	2.02	1.13	4.28	5.03	3.54	2.27	
5	3.32	* 10.6	3.21	4.16	1.93	* 2.99	1.84	1.00	3.54	4.53	2.99	2.36	
6	3.10	5.91	3.43	3.79	1.84	2.18	1.76	.93	3.43	4.04	2.77	2.10	
7	2.77	5.28	4.28	5.95	1.76	1.93	1.76	.87	4.16	3.79	2.66	5.51	
8	2.77	6.18	3.10	4.53	1.76	1.76	1.59	1.39	3.54	17.3	2.55	5.30	
9	2.44	5.66	2.88	3.66	1.68	2.18	* 1.59	2.84	a 3.0	6.86	2.44	9.07	
10	2.44	4.66	2.99	3.79	2.40	2.10	4.58	6.29	a 2.8	14.0	2.36	3.91	
11	2.44	4.16	2.66	5.09	5.78	1.76	2.27	2.27	a 2.6	7.13	2.27	8.59	
12	4.16	3.66	6.90	4.41	3.88	1.84	2.36	2.01	a 2.5	4.91	2.18	4.53	
13	4.57	3.43	6.22	4.66	2.44	2.10	1.93	16.3	a 2.7	5.16	2.10	3.43	
14	* 4.94	3.32	3.79	3.79	2.18	4.94	3.15	* 5.28	a 2.4	4.78	2.36	2.99	
15	2.99	3.10	3.82	3.43	1.93	2.84	2.10	3.54	a 2.1	4.91	2.27	2.77	
16	2.66	3.21	5.91	3.82	1.93	2.10	1.93	3.43	a 2.0	4.28	3.95	2.66	
17	2.44	3.21	3.79	4.88	1.93	1.93	1.84	3.10	a 1.9	3.91	7.35	2.66	
18	2.36	3.10	4.66	10.9	1.84	1.84	1.68	2.44	a 1.8	3.79	4.93	2.44	
19	2.36	3.10	4.53	6.18	1.84	1.76	1.59	2.18	a 1.8	3.66	2.99	3.70	
20	2.27	3.66	3.54	6.74	3.19	1.59	1.59	2.02	* a 8.9	3.10	2.77	6.51	
21	2.27	2.88	4.85	4.56	2.74	1.59	1.52	1.84	9.29	2.36	3.84	4.82	
22	2.18	2.66	4.78	2.77	2.18	1.76	1.52	2.36	15.0	2.36	8.09	2.99	
23	2.18	* 4.49	6.32	2.55	2.18	2.43	4.69	3.50	5.79	2.44	5.50	2.77	
24	2.27	4.89	4.53	2.36	1.93	1.84	1.84	6.28	4.78	* 3.13	3.32	2.44	
25	2.18	3.43	3.91	2.36	1.84	1.59	1.76	5.03	3.91	2.87	* 2.88	2.36	
26	2.10	3.66	3.43	4.11	1.68	1.59	1.59	3.43	4.03	11.6	4.36	2.44	
27	* 10.3	4.53	* 4.48	3.82	1.59	1.52	1.52	3.10	3.66	10.4	2.99	* 2.27	
28	1.15	4.78	7.54	2.55	1.95	1.46	1.46	3.32	5.50	10.7	2.66	2.36	
29	5.62	6.00	11.3	2.36	1.93	2.03	1.39	-----	4.16	4.66	2.66	2.18	
30	4.90	7.13	6.63	2.92	1.59	1.84	1.39	-----	3.32	3.66	2.44	4.02	
31	5.90	6.86	-----	2.81	-----	2.40	1.33	4.08	-----	2.44	-----	-----	
Total	115.71	139.06	139.80	140.09	66.76	67.51	64.76	89.46	129.33	187.44	114.48	106.51	
Mean	Mgd	3.73	4.49	4.66	4.78	2.23	2.18	2.09	3.20	4.17	6.25	3.69	3.55
	Cfs	5.77	6.95	7.21	7.40	3.45	3.37	3.23	4.95	6.45	9.67	5.71	5.49
	Ac-ft	355	427	429	454	205	207	199	275	397	575	351	327
Calendar Year	1960	Max	-	Min	Max	Mean	Mean mgd	Mean	Mean cfs	Mean	Mean	Mean	Mean
Fiscal Year	1960-61	Max	16.5	Min	0.87	Mean	Mean mgd	3.75	Mean cfs	5.80	Ac-ft	4200	Ac-ft

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for station on Kalihiwai ditch near Kilauea.

ISLAND OF KAUAI

960. Kalihiwai ditch near Kilauea

Location--Lat 22°10'55", long 159°25'55", on right bank 0.1 mile upstream from Kalihiwai Reservoir, and 2.4 miles southwest of Kilauea.

Records available--June 1934 to June 1961.

Gage--Water-stage recorder and Parshall flume. Altitude of gage is 410 ft (by barometer).

Average discharge--27 years (1934-61), 2.45 mgd (3.79 cfs). (Fiscal year 1943 was completed in WSP 1319 changing averages for period 1944-59.)

Extremes--1934-61: Maximum daily discharge, 29.5 mgd (45.6 cfs) July 16, 1937; no flow at times.

Remarks--Records good. Ditch diverts low-water flow from most branches of Pohakubon Stream at intakes, about 1 mile south of station. Diversion of flow to Kahililolo Stream, 0.1 mile above station, regulated by gates. Water discharges into Kalihiwai Reservoir, where it is stored for irrigation in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.52	2.34	3.58	0.47	0.11	a 0.06	0.10	1.23	2.44	10.2	0.55	0.11
2	.58	2.24	2.95	.98	a .06	a .06	.14	1.16	2.97	2.85	.33	.08
3	.47	2.05	2.54	.58	a .06	a .06	.11	1.16	3.94	.76	.29	.08
4	.47	3.41	2.24	.52	a .06	a .06	.38	a .06	4.04	.70	.25	.08
5	.47	7.49	2.05	.47	a .06	a .06	.42	a .06	1.09	3.46	1.56	.25
6	.47	4.04	2.34	.42	a .06	a .06	.29	a .06	.95	3.25	2.64	.25
7	.42	3.35	3.29	.42	a .06	a .06	.25	a .06	.82	3.71	2.34	.25
8	.37	3.86	2.34	.37	1.03	a .06	.25	a .06	1.36	3.35	5.20	.21
9	.37	3.70	1.96	.33	1.30	a .06	.21	a .06	2.54	2.95	.64	.21
10	.33	3.05	2.34	1.19	1.71	a .06	.14	a .09	6.07	2.74	.90	.17
11	* 33	2.64	1.96	2.22	2.64	a .06	1.1	a .06	1.96	2.54	.64	.17
12	.37	2.34	5.33	.76	.52	a .06	.11	a .06	1.74	2.44	3.08	.17
13	.29	2.34	5.40	.70	.42	a .06	.08	a .06	1.73	2.61	4.89	.17
14	.25	2.24	2.95	.64	.33	a .06	.15	a .06	* 1.68	2.34	4.50	.21
15	.21	2.05	2.77	.52	.29	a .06	.21	a .06	.52	2.05	3.65	.21
16	.21	2.14	5.28	.52	.25	a .06	.17	.53	.47	1.96	2.54	.25
17	.17	2.14	3.15	.42	.21	a .06	.21	1.16	.47	1.87	2.34	.25
18	.14	2.05	3.94	.65	.21	a .06	.21	1.16	.42	1.78	1.96	.25
19	.14	2.05	3.84	.42	.21	a .06	.17	1.16	.42	1.78	1.70	.25
20	1.07	2.44	2.95	.37	.17	a .06	.08	1.09	.37	* 8.88	1.46	.21
21	1.38	1.96	4.01	.33	.17	a .06	1.09	.33	9.66	1.23	.21	.25
22	1.38	1.78	4.20	.25	.17	a .06	1.09	.25	14.3	1.23	.29	.25
23	1.38	* 3.03	5.63	.21	.17	a .06	2.92	.25	1.70	1.30	.21	.21
24	1.46	3.37	4.04	.17	.14	a .06	1.38	.37	1.54	* 1.38	.21	.17
25	1.38	2.44	3.46	.17	.14	a .06	1.38	.42	1.46	1.38	.17	.17
26	1.30	2.53	2.95	.14	.21	a .06	1.30	.37	1.46	3.08	.21	.17
27	6.76	3.07	* 4.19	.14	.17	a .06	1.38	.93	1.38	1.94	.14	.17
28	7.96	3.27	7.68	.14	.14	a .06	1.30	2.05	1.71	.70	.14	.17
29	3.53	3.86	1.17	.11	.08	a .06	1.16	-----	1.54	.47	.14	.17
30	3.14	5.28	2.00	.11	a .06	a .06	1.23	-----	2.10	.37	.11	.17
31	3.83	4.63	-----	.11	a .06	a .06	1.30	-----	3.17	-----	.11	-----
Total	41.15	93.18	113.06	14.85	11.21	4.28	21.73	47.79	101.12	67.63	6.88	5.67
Mean												
Mgd	1.33	3.01	3.77	0.479	0.374	0.138	0.701	1.71	3.26	2.25	0.222	0.189
Cfs	2.06	4.66	5.83	0.741	0.579	0.214	1.08	2.65	5.04	3.48	0.343	0.292
Ac-ft	126	286	347	46	34	13	67	147	310	208	21	17
Calendar Year 1960:		Max	17.0		Min	0.06	Mean mgd	1.71	Mean cfs	2.65	Ac-ft	1.920
Fiscal Year 1960-61:		Max	17.3		Min	0.06	Mean mgd	1.45	Mean cfs	2.24	Ac-ft	1.620

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of several observations of normal gate leakage.

970. Pohakuhonu Stream near Kilauea

Location.--Lat 22°10'35", long 159°25'35", on left bank 0.75 mile upstream from confluence with Halawani Stream, 1.25 miles above Stone Dam, and 2.5 miles southwest of Kilauea.

Drainage area.--1.8 sq mi.

Records available.--October 1957 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 577 mgd (893 cfs) Oct. 2 (gage height, 4.04 ft), from rating curve extended above 410 mgd on basis of slope-area measurement at gage height 11.0 ft; minimum, 1.19 mgd (1.84 cfs) Mar. 18-20.

1957-60: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 6, 1959 (gage height, 7.23 ft from floodmarks in well), from rating curve extended above 410 mgd as explained above; minimum, 0.80 mgd (1.24 cfs) June 27-28, 1959.

Maximum stage known, 11.0 ft on Jan. 24, 1956, from floodmark (discharge 3,620 mgd (5,600 cfs), from rating curve extended above 200 mgd from slope-area measurement at peak flow).

Remarks.--Records good. Malihiwai ditch diverts an average of about 3 mgd about 0.5 mile above station for domestic water supply and irrigation of sugarcane.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	0.88	1.6	68.0
.5	3.20	2.0	117
.7	8.20	2.5	199
.9	15.5	3.0	300
1.1	26.2	3.5	420
1.3	40.0	4.1	595

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	2.78	3.41	2.64	7.75	* 3.83	2.36	6.49	1.94	1.94	21.2	47.7	2.78	
2	5.95	3.06	2.08	6.74	3.62	2.50	4.88	1.94	2.22	9.15	5.09	2.64	
3	3.62	2.78	1.94	6.73	3.20	3.30	4.23	1.80	2.64	3.48	4.04	2.36	
4	3.62	4.68	1.80	4.88	3.06	1.30	3.06	1.69	2.36	2.50	3.83	2.50	
5	3.06	10.5	1.69	3.62	2.78	* 5.02	2.78	1.69	1.94	2.08	3.20	2.64	
6	2.64	3.30	1.80	3.20	2.64	3.41	2.78	1.69	1.94	1.94	3.06	2.22	
7	2.36	2.78	2.08	5.96	2.50	2.92	2.64	1.69	2.36	1.80	2.92	7.11	
8	2.22	3.51	1.69	4.04	2.50	2.78	2.36	3.37	1.94	41.5	2.78	6.35	
9	1.94	2.92	1.48	2.92	2.36	3.19	2.22	5.24	1.80	4.95	2.50	1.58	
10	* 1.80	2.22	1.69	2.86	2.54	3.39	* 7.97	13.3	1.69	23.0	2.36	4.96	
11	1.80	2.08	1.48	4.65	7.56	2.64	3.62	3.83	1.58	6.32	2.36	14.3	
12	4.53	1.69	3.52	3.62	6.56	2.92	3.83	3.46	1.48	4.30	2.08	5.88	
13	5.34	1.58	3.33	4.04	3.62	3.62	2.92	4.95	1.48	2.64	1.94	4.25	
14	6.66	1.58	1.80	2.78	3.41	1.26	6.03	* 9.53	1.48	2.36	2.36	3.62	
15	3.41	1.48	1.86	2.50	2.78	5.13	3.41	6.10	1.38	2.36	2.30	3.20	
16	2.64	1.48	3.15	2.92	2.64	3.41	2.92	6.06	1.38	1.94	5.27	3.06	
17	2.36	1.58	1.94	4.19	2.64	2.92	2.78	5.09	1.28	1.80	10.6	3.06	
18	2.22	1.48	2.22	3.25	2.64	2.92	2.64	3.83	1.28	1.80	6.04	2.78	
19	2.22	1.48	2.08	6.20	2.78	2.78	2.50	3.41	1.19	1.80	3.41	4.17	
20	2.08	1.69	1.80	7.15	5.63	2.50	2.36	3.06	* 24.9	2.22	3.06	7.97	
21	1.94	1.38	2.22	5.30	4.84	2.36	2.22	3.41	9.57	2.64	4.25	5.78	
22	1.69	1.28	2.08	4.67	3.41	2.78	2.08	4.53	25.7	2.76	10.8	3.41	
23	1.69	* 2.45	2.76	4.25	3.41	4.32	9.01	4.67	32.3	2.92	6.64	3.06	
24	1.69	2.85	2.08	3.62	2.92	2.92	2.78	7.76	2.50	* 327	3.83	2.64	
25	1.58	1.80	1.80	3.83	2.78	2.50	2.64	6.15	1.94	2.08	* 320	2.50	
26	1.48	2.13	1.80	7.29	2.64	2.36	2.36	3.83	1.96	20.1	5.08	2.64	
27	1.83	2.08	* 2.37	6.93	2.36	2.22	2.22	3.20	1.80	15.2	3.20	* 2.22	
28	1.82	2.36	4.37	4.04	3.31	2.08	2.22	2.64	4.60	18.7	2.92	2.50	
29	6.23	3.55	11.6	3.83	3.06	3.31	2.08	-----	1.80	5.59	3.06	2.22	
30	5.01	5.21	5.48	4.62	2.50	2.92	2.22	-----	1.58	4.46	2.64	4.95	
31	6.87	4.04	-----	4.84	-----	4.32	2.22	-----	2.21	-----	2.92	-----	
Total	127.93	84.41	78.63	233.13	100.52	115.40	104.47	164.41	115.15	216.86	165.44	133.57	
Mean	Mgd	4.13	2.72	2.62	7.52	3.35	3.72	3.37	5.87	3.71	7.23	5.34	4.45
	Cfs	6.39	4.21	4.05	11.6	5.18	5.76	5.21	9.08	5.74	11.2	8.26	6.89
	Ac-ft	393	259	241	715	308	354	321	505	353	666	508	410
Calendar Year	1960	Max	267	Min	1.19	Mean mgd	5.87	Mean cfs	9.08	Ac-ft	6.600		
Fiscal Year	1960-61	Max	67.4	Min	1.19	Mean mgd	4.49	Mean cfs	6.95	Ac-ft	5.030		

Peak discharge (base, 225 mgd).--Oct. 2 (11 a.m.) 577 mgd (893 cfs), 4.04 ft; Oct. 18 (12:30 a.m.) 422 mgd (653 cfs), 3.51 ft; Mar. 20 (10:30 p.m.) 311 mgd (481 cfs), 3.05 ft; Apr. 8 (8:30 a.m.) 228 mgd (353 cfs), 2.65 ft; May 1 (6 a.m.) 420 mgd (662 cfs), 3.53 ft.

* Discharge measurement made on this day.

ISLAND OF KAUAI

975. Halaulani Stream at altitude 400 ft, near Kilauea

Location.--Lat 22°10'35", long 159°25'15", on left bank 0.5 mile upstream from confluence with Pohakubonu, 1 mile above Stone Dam, and 2.5 miles southwest of Kilauea.

Drainage area.--1.1 sq mi.

Records available.--November 1957 to June 1961.

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

Extremes.--Maximum discharge during fiscal year, 607 mgd (939 cfs) Oct. 18 (gage height, 5.55 ft), from rating curve extended above 130 mgd on basis of slope-area measurement; minimum, 3.05 mgd (4.72 cfs) Feb. 6-8, Mar. 19, 20.

1957-61: Maximum discharge 1,340 mgd (2,070 cfs) Aug. 6, 1959 (gage height, 8.30 ft), from rating curve extended above 130 mgd on basis of slope-area measurement as explained above; minimum, 2.35 mgd (3.64 cfs) June 28, 1959.

Remarks.--Records good except those for periods of fragmentary or no gage-height record, which are fair.

Rating table (gage height, in feet), and discharge, in million gallons a day

0.9	3.05	1.6	18.5
1.0	4.30	1.8	26.0
1.1	5.80	2.1	44.0
1.2	7.70	2.5	77.0
1.4	12.2		

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	5.20	5.65	6.89	16.7	5.05	3.42	9.10	3.30	4.75	28.6	50.0	4.60	
2	10.2	5.35	5.50	6.30	* 4.60	4.01	7.32	3.30	5.35	14.3	8.33	5.01	
3	6.75	4.90	4.75	11.8	4.30	5.42	6.37	3.30	5.72	7.51	6.56	4.18	
4	6.18	8.71	4.5	8.68	4.05	* 18.6	5.20	3.30	5.65	5.65	6.56	4.60	
5	5.50	13.9	4.3	6.37	3.80	8.55	4.75	3.18	4.75	5.05	5.50	5.30	
6	5.05	7.13	4.6	5.65	3.68	5.99	4.90	3.18	4.60	4.60	5.05	4.05	
7	4.45	6.18	5.8	10.5	3.55	5.05	4.75	3.05	5.60	4.30	4.90	12.0	
8	4.60	7.46	4.2	6.70	3.42	4.60	4.30	6.31	4.75	4.8	4.60	10.4	
9	4.05	6.18	4.0	5.35	3.30	5.90	4.18	9.23	4.30	11	4.30	19.1	
10	3.92	5.35	4.1	5.38	4.14	5.80	10.6	18.9	4.05	29	4.30	7.70	
11	* 3.80	4.75	3.8	7.90	11.2	4.60	* 5.35	5.96	3.80	12	4.30	18.4	
12	9.06	4.45	9.8	6.18	8.20	5.05	5.44	5.63	3.68	7.2	4.05	9.45	
13	8.20	4.18	8.0	6.51	4.75	5.99	4.60	3.91	4.05	6.0	3.92	6.75	
14	10.0	4.05	4.7	5.05	4.75	19.6	6.17	124	3.80	5.4	4.32	5.99	
15	5.65	3.92	5.0	4.60	3.92	8.37	4.60	* 8.12	3.55	5.6	4.27	5.35	
16	4.90	3.92	7.6	6.02	3.80	5.99	4.30	8.90	3.42	5.0	8.17	5.05	
17	4.30	4.30	5.0	15.4	3.80	5.05	4.18	6.56	3.30	4.9	13.2	5.20	
18	4.18	3.92	6.4	4.27	3.68	4.75	4.05	5.35	3.18	4.9	10.2	4.60	
19	4.45	4.05	6.0	12.8	4.16	4.75	3.92	4.90	3.05	4.8	5.76	7.68	
20	4.05	4.96	4.6	12.2	7.46	4.30	3.80	4.45	* 17.2	4.8	5.65	13.3	
21	3.80	3.92	6.6	8.33	6.62	4.18	3.68	4.60	15.9	* 4.75	7.03	8.38	
22	3.55	3.55	6.4	6.18	5.01	5.05	3.68	5.50	24.6	* 5.80	16.2	5.50	
23	3.55	6.96	7.6	5.35	4.60	10.5	124	7.03	7.40	* 5.20	10.6	5.35	
24	3.68	* 7.18	6.0	4.90	3.92	5.99	4.45	11.3	5.99	* 6.85	6.75	4.75	
25	3.42	5.05	5.0	4.96	3.80	4.90	4.60	9.16	4.75	6.31	5.65	4.45	
26	3.42	5.35	4.5	10.0	3.55	4.45	4.05	5.80	4.60	21.5	* 8.34	4.60	
27	16.9	5.90	* 6.4	8.39	3.42	4.18	3.92	5.05	4.30	20.4	5.35	* 4.30	
28	19.1	6.14	11.6	5.20	5.11	4.18	3.80	4.75	6.84	20.9	4.75	4.75	
29	8.35	7.53	18.0	5.05	4.61	6.33	3.55	-----	4.45	8.75	5.20	4.45	
30	8.11	9.59	9.78	6.13	3.68	5.45	3.68	-----	3.80	7.13	4.30	8.85	
31	8.75	10.3	-----	6.17	-----	8.62	3.80	-----	6.34	-----	5.05	-----	
Total	197.12	184.78	191.42	3 301.5	1 399.93	199.62	159.49	211.61	187.52	3 262.20	243.16	214.09	
Mean	Mgd	5.36	5.96	6.38	10.6	4.66	6.44	5.14	7.56	6.05	10.9	7.84	7.14
	Cfs	9.84	9.22	9.87	16.4	7.21	9.96	7.95	11.7	9.36	16.9	12.1	11.0
	Ac-ft	605	567	587	1010	429	613	489	649	575	1000	746	657

Calendar Year 1960 Max 201 Min 2.54 Mean mgd 7.81 Mean cfs 12.1 Ac-ft 8.770
Fiscal Year 1960-61 Max 63.0 Min 3.05 Mean mgd 7.08 Mean cfs 11.0 Ac-ft 7.930

Peak discharge (base, 145 mgd).--Oct. 2 (11 a.m.) 396 mgd (613 cfs), 4.53 ft; Oct. 18 (12:30 a.m.) 607 mgd (939 cfs), 5.55 ft; Mar. 20 (10 p.m.) 165 mgd (255 cfs), 3.22 ft; Apr. 8 (time unknown) about 180 mgd (279 cfs); May 1 (5 a.m.) 378 mgd (585 cfs), 4.44 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 4-27 and Apr. 8-20; discharge estimated on basis of records for nearby stations.

f Fragmentary gage-height record; discharge computed from partly estimated gage-height.

ISLAND OF KAUAI

45

995. Hanalei ditch near Kilauea

Location.--Lat 22°11'10", long 159°26'10", on right bank 205 ft upstream from Kalihiwai Reservoir, 215 ft downstream from inverted siphon across Kalihiwai River, and 2.4 miles southwest of Kilauea.

Records available.--July 1956 to June 1961 in reports of Geological Survey. July 1951 to June 1956 in files of Kilauea Sugar Co.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 390 ft (from topographic map). Prior to Mar. 5, 1959 at site 150 ft downstream and at datum 0.25 ft higher.

Average discharge.--5 years (1956-61), 2.06 mgd (3.22 cfs).

Extremes.--1956-61: Maximum daily discharge, 19.3 mgd (29.9 cfs) Sept. 17, 1956; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Kalihiwai River, 2.2 miles southwest of station. Water used for irrigation of sugar cane in vicinity of Kilauea.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.60	4.63	0					0	0	0.04	0	7.85
2	5.52	4.63	0					5.57	0	.04	0	3.83
3	0	4.50	0					6.31	0	0	0	0
4	3.58	5.01	0					4.50	0	0	0	4.25
5	8.60	1.75	0					3.94	0	0	0	7.70
6	8.60	0	0					5.27	0	0	0	7.40
7	8.60	1.89	0					5.65	0	0	0	5.40
8	8.30	2.81	0					6.04	0	0	3.86	.48
9	5.19	0	2.71					7.55	0	0	7.85	.02
10	3.21	0	6.70					11.9	0	0	7.85	0
11	*8.30	0	6.84					10.2	0	0	7.85	0
12	8.75	2.36	7.40					8.30	0	0	6.87	0
13	8.75	6.04	1.42					1.95	0	0	0	0
14	7.85	6.18	0					0	0	0	4.47	3.88
15	4.59	6.04	3.02					0	5.60	0	6.44	1.70
16	0	6.04	7.55					0	6.70	0	5.08	0
17	3.65	6.31	4.09					0	6.31	2.7	.55	0
18	8.75	6.31	0					0	6.97	4.4	0	1.48
19	8.75	6.31	0					0	7.25	7.2	0	4.06
20	8.75	6.84	0					3.06	*7.70	8.6	0	2.35
21	8.60	7.25	0					7.10	4.76	8.6	0	0
22	8.60	7.25	0					6.97	.21	8.6	.04	2.13
23	8.60	*7.55	0					7.10	0	8.6	0	1.50
24	8.75	7.70	0					3.83	0	*8.6	0	0
25	8.30	7.40	0					0	0	8.60	0	0
26	8.15	7.25	0					0	.03	3.84	0	5.18
27	5.31	4.52	0					.15	0	0	0	*5.77
28	.01	3.31	0					0	0	0	0	7.70
29	0	7.55	.02					-----	0	0	3.99	7.70
30	0	6.18	0					-----	0	0	7.45	7.85
31	2.08	.64	-----					-----	.01	-----	7.85	-----
Total	186.74	144.45	39.75	0	0	0	0	105.39	45.54	69.82	70.15	88.23
Mean												
Mgd	6.02	4.66	1.32	0	0	0	0	3.76	1.47	2.33	2.26	2.94
Cfs	9.31	7.21	2.04	0	0	0	0	5.82	2.27	3.61	3.50	4.55
Ac-ft	573	443	122	0	0	0	0	323	140	214	215	271
Calendar Year	1960		Max	8.75	Min	0	Mean mgd	1.82	Mean cfs	2.82	Ac-ft	2040
Fiscal Year	1960-61		Max	11.9	Min	0	Mean mgd	2.05	Mean cfs	3.17	Ac-ft	2300

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 4-24; discharge estimated on basis of recorded range in stage, once daily staff gage readings and ditchman's report of gate openings.

ISLAND OF KAUAI

1000. Hanalei tunnel outlet near Lihue

Location.--Lat 22°05'00", long 159°28'15", on right bank at end of Hanalei tunnel, 2.2 miles downstream from intake on Kaapoko Stream and 9.8 miles northwest of Lihue.

Records available.--July 1932 to June 1961 in reports of Geological Survey. October 1925 to June 1932 in files of Lihue Plantation Co.

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

Average discharge.--29 years (1932-61), 18.6 mgd (28.8 cfs).

Extremes.--1932-61: Maximum daily discharge, 64 mgd (99 cfs) April 11, 25, 26, 1942; no flow occasionally when water is shut out of ditch.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Tunnel diverts water from Kaapoko Stream and Hanalei River and empties into north branch of North Fork Wailua River, from which it is later diverted and used for irrigation in vicinity of Lihue and Kapaa. Flow regulated by spillway and headgates.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.0	19.3	21.7	23.2	26.9	4.8	5.6	*152	8.50	13.3	<u>15.1</u>	14.02
2	17.0	19.8	19.8	23.2	32.9	*4.8	5.2	152	*13.3	14.0	<u>5.40</u>	3.78
3	14.3	19.3	18.8	11.7	4.95	4.5	*3.8	152	14.5	*6.03	3.78	<u>3.33</u>
4	15.6	23.2	19.8	9.92	2.90	8.0	3.55	152	14.2	4.02	8.28	4.02
5	*13.4	<u>25.1</u>	18.8	8.60	2.69	*5.0	3.33	14.8	8.28	3.33	5.11	3.55
6	13.4	21.2	22.2	8.60	2.69	4.5	3.55	14.3	7.64	2.69	3.55	3.33
7	12.1	19.8	21.2	11.1	2.69	4.0	3.11	14.3	9.26	*2.49	3.33	10.5
8	12.1	21.7	18.8	11.2	2.69	4.0	3.11	15.6	8.99	2.90	2.90	9.37
9	12.1	23.6	17.9	10.4	2.69	5.0	*2.90	18.4	8.17	3.73	3.43	<u>184</u>
10	12.1	20.3	18.8	10.6	3.55	4.5	3.96	20.3	6.04	<u>21.8</u>	3.00	7.32
11	12.1	18.8	<u>17.4</u>	8.77	8.65	4.5	3.11	16.5	5.72	17.4	3.26	12.0
12	14.3	18.4	22.2	5.11	<u>10.1</u>	5.4	3.33	19.8	5.40	5.72	2.69	7.32
13	15.2	17.9	22.7	5.11	6.20	6.4	3.11	<u>27.1</u>	6.01	4.28	2.10	5.72
14	13.4	19.8	19.3	4.83	5.34	7.4	3.11	19.3	5.11	4.28	<u>15.4</u>	10.8
15	12.1	18.8	19.3	4.28	4.02	5.11	3.11	8.54	4.83	4.57	4.94	6.59
16	11.7	*20.8	22.2	4.55	4.02	4.28	3.33	9.00	4.55	3.11	5.00	6.88
17	11.7	21.2	18.8	5.01	3.78	3.78	3.98	6.04	4.55	2.90	8.38	6.31
18	11.7	19.8	21.2	5.45	3.78	4.02	3.11	<u>5.11</u>	4.28	6.82	8.44	4.83
19	12.1	19.8	*19.8	7.30	4.00	3.78	3.11	<u>5.11</u>	3.94	7.64	4.55	6.52
20	11.7	19.8	16.8	5.11	4.06	3.78	2.90	5.11	11.3	5.82	5.69	15.6
21	11.7	17.9	20.8	4.55	4.36	3.55	2.90	9.93	27.0	4.88	11.6	6.68
22	<u>11.1</u>	18.8	21.2	4.02	3.78	3.8	2.90	7.32	<u>19.3</u>	3.65	14.6	5.11
23	16.5	21.7	21.7	3.78	3.6	3.8	2.93	133	10.3	6.62	10.2	7.78
24	17.4	21.2	19.8	*3.78	3.6	3.5	14.2	15.0	8.88	5.37	5.40	5.11
25	16.5	19.8	18.8	4.02	3.8	3.5	27.5	16.0	7.00	7.44	5.11	5.11
26	16.5	19.8	18.4	6.26	3.6	3.5	17.4	10.2	14.7	17.5	9.14	6.54
27	21.2	22.2	20.3	5.22	3.6	3.5	16.1	9.83	8.87	14.9	4.55	6.04
28	<u>26.5</u>	21.2	22.7	4.02	*6.0	3.5	15.6	7.64	6.68	16.5	4.28	6.04
29	20.8	20.8	19.3	3.55	4.0	3.6	15.2	-----	6.04	6.04	5.21	6.36
30	22.7	24.6	22.7	2.69	4.0	3.8	16.1	-----	5.72	10.8	3.55	11.3
31	22.2	24.1	-----	2.69	-----	4.0	15.6	-----	6.75	-----	6.48	-----
Total	464.2	640.5	605.2	228.62	125.12	137.60	216.74	369.33	275.81	230.53	195.45	216.26
Mean												
Mgd	15.0	20.7	20.2	7.37	4.17	4.44	6.99	132	8.90	7.68	6.30	7.21
Cfs	23.2	32.0	31.3	11.4	6.45	6.87	10.8	20.4	13.8	11.9	9.75	11.2
Ac-ft	1420	1970	1860	702	384	422	665	1130	846	707	600	664
Calendar Year	1960		Max	42.0		Min	0.94	Mean mgd	13.8	Mean cfs	21.4	Ac-ft
Fiscal Year	1960-61		Max	27.5		Min	2.10	Mean mgd	10.2	Mean cfs	15.8	Ac-ft
												15490
												11370

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 23 to Dec. 14 and Dec. 22 to Jan. 3; discharge estimated on basis of recorded range in stage, 3 discharge measurements, and records for nearby stations.

ISLAND OF KAUAI

47

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 power plant intake, and 6.0 miles southwest of Hanalei.

Drainage area.--10.2 sq mi.

Records available.--August 1952 to February 1956, October 1957 to June 1961. Gage-height records collected in this vicinity from April 1923 to December 1940 are contained in files of McBryde Sugar Co.

Average discharge.--5 years (1953-55, 1958-61), 83.6 mgd (129 cfs).

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

Extremes.--Maximum discharge during year, 3,480 mgd (5,380 cfs) Feb. 13 (gage height, 5.79 ft), from rating curve extended above 650 mgd on basis of slope-area measurement at gage height, 7.72 ft; minimum, 27.5 mgd (42.5 cfs) Mar. 20.

1952-56, 1957-61: Maximum discharge recorded, 13,000 mgd (20,100 cfs) Aug. 6, 1959 (gage height, 8.19 ft), from rating curve extended above 650 mgd on basis of slope-area measurement at gage height, 7.72 ft; minimum, 22.5 mgd (34.8 cfs) Feb. 12, 1954.

Flood of Feb. 17, 1956, which destroyed the station, reached a stage of about 14.1 ft (discharge not determined).

Remarks.--Records good. Water passing station is used for power by McBryde Sugar Co.

Rating tables (gage height, in feet, and discharge
in million gallons a day)

July 1 to Sept. 30, May 2 to June 30

Oct. 1 to May 1

1.2	28.0	2.0	84.0	1.2	25.0	2.5	165
1.4	38.3	2.5	165	1.4	34.2	3.0	300
1.6	50.0	3.0	300	1.6	48.0	3.5	530
1.8	65.0			1.8	65.0	4.0	850

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	53.5	48.5	73.5	91.9	68.4	75.4	10.9	32.7	69.4	129	200	44.6
2	168	62.8	49.0	248	78.5	92.9	94.4	31.1	99.8	151	61.0	38.9
3	84.0	55.3	41.2	66.0	121	46.4	64.4	30.6	128	82.8	48.2	35.1
4	82.5	158	41.6	68.9	37.2	431	46.4	29.6	111	56.5	63.4	44.1
5	52.1	152	38.9	43.3	33.7	93.2	39.0	29.1	62.6	44.1	47.0	44.7
6	44.6	57.8	96.9	43.2	31.6	59.0	43.1	29.1	53.9	37.8	41.2	39.1
7	40.0	49.5	80.3	85.4	31.1	46.4	39.2	29.1	104	34.2	42.4	156
8	40.4	75.2	50.2	99.5	30.1	39.6	33.2	32.8	83.5	39.0	41.5	160
9	36.2	125	*412	61.7	30.1	52.6	31.6	87.7	55.6	37.2	44.5	204
10	35.6	52.7	42.6	56.8	78.2	45.4	61.6	161	39.0	392	42.1	76.3
11	35.6	41.2	38.3	128	575	43.6	51.4	85.8	34.8	218	49.4	104
12	81.6	37.8	118	70.3	619	121	58.0	119	32.7	63.0	41.6	61.0
13	95.2	36.2	118	83.3	171	110	41.0	727	32.7	47.2	35.6	47.6
14	58.8	47.1	54.7	61.8	87.6	167	36.0	283	32.2	*44.1	146	63.7
15	40.6	43.6	56.2	41.8	60.5	61.9	33.2	110	30.6	45.8	46.2	46.2
16	36.7	65.3	102	45.2	75.9	45.7	39.9	88.4	29.6	39.0	45.8	63.7
17	35.6	71.5	46.7	48.3	70.0	39.0	76.2	71.3	29.1	33.2	92.7	61.6
18	34.1	50.7	65.6	*38.4	72.2	58.9	40.8	69.5	28.7	513	88.1	43.8
19	36.2	55.4	53.0	63.3	71.8	41.8	34.2	63.3	27.9	46.4	*50.2	60.9
20	36.7	62.9	45.1	61.3	98.3	39.0	*33.2	55.5	80.0	44.2	60.5	189
21	37.2	40.6	75.6	46.4	99.3	34.8	31.1	135	672	38.3	171	74.4
22	34.1	46.7	129	37.8	92.4	40.3	30.6	87.5	308	321	202	52.8
23	34.1	84.1	128	34.8	90.2	38.4	38.7	168	81.0	729	103	72.6
24	37.8	63.5	72.6	33.2	55.8	33.7	66.4	158	68.9	53.3	55.6	45.2
25	34.1	51.5	53.5	47.6	61.4	32.2	293	165	47.2	76.0	49.2	43.4
26	35.6	61.8	45.2	139	44.1	31.6	67.4	91.2	93.4	209	96.5	69.1
27	135	93.2	77.3	83.4	35.4	*30.6	45.7	81.2	55.0	167	50.7	59.6
28	294	87.6	176	55.8	126	30.1	36.6	58.2	50.6	187	47.0	70.9
29	682	708	663	39.6	88.9	38.7	33.7	-----	45.7	64.2	55.1	74.5
30	121	163	131	43.8	53.1	46.4	50.8	-----	39.0	66.2	38.9	187
31	108	108	-----	46.6	-----	58.1	40.8	-----	37.2	-----	43.0	-----
Total	2,067.1	2,219.3	2,207.5	2,114.4	3,187.8	2,124.7	1,740.6	3,109.7	2,663.1	2,601.8	2,199.4	23,338.8
Mean	66.7	71.6	73.6	68.2	106	68.5	56.1	111	85.9	86.7	70.9	77.8
Mgd	103	111	114	106	164	106	86.8	172	133	134	110	120
Cfs	6,340	6,810	6,770	6,490	9,780	6,520	5,340	9,540	8,170	7,980	6,750	7,160
Ac-ft	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Calendar Year	1960	Max	619	Min	30.1	Mean mgd	85.3	Mean cfs	132	Ac-ft	95,770	
Fiscal Year	1960-61	Max	727	Min	27.9	Mean mgd	78.3	Mean cfs	121	Ac-ft	87,650	

Peak discharge (base, 2,000 mgd).--Feb. 13 (1:30 p.m.) 3,480 mgd (5,380 cfs), 5.79 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2000. Left Branch of North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°31'09", long 157°56'53", on left bank 140 ft upstream from intake of Wahiawa Water Co.'s tunnel and the confluence of Right and Left Branches of North Fork Kaukonahua Stream, and 4.5 miles northeast of Wahiawa.

Drainage area.--1.38 sq mi.

Records available.--May 1913 to July 1953, April 1960 to June 1961. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--39 years (1913-24, 1926-53, 1960-61), 10.6 mgd (16.4 cfs).

Extremes.--Maximum discharge during year, 904 mgd (1,400 cfs) Feb. 13 (gage height, 6.36 ft), from rating curve extended above 43 mgd by test on model of station site; minimum 0.78 mgd (1.21 cfs) Feb. 8.

1913-53, 1960-61: Maximum discharge, 3,550 mgd (5,490 cfs) Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 15 mgd by test on model of station site; minimum, 0.08 mgd (0.12 cfs) Mar. 2, 13, 1941.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.6	0.56	2.5	13.4
1.7	.93	2.8	27.5
1.8	1.45	3.1	52.0
2.1	4.30	3.5	100
2.3	7.90	4.0	185

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YFAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	5.58	2.91	7.50	4.30	15.0	2.81	20.8	1.39	3.82	5.21	3.22	12.8
2	13.1	4.88	5.10	3.94	4.46	8.36	1.24	6.29	29.2	2.24	8.86	
3	10.6	3.84	4.53	3.58	2.81	4.06	1.13	11.6	7.48	2.08	5.10	
4	16.5	37.4	7.32	4.62	2.34	22.8	3.34	1.03	5.10	2.91	7.09	3.94
5	16.13	36.4	12.9	3.10	2.08	4.45	4.18	.93	3.70	2.15	2.34	11.0
6	5.54	6.90	14.9	4.03	1.94	2.62	3.22	.89	4.78	2.01	2.08	3.82
7	4.78	5.10	15.9	16.9	1.80	2.34	3.22	.85	*14.2	1.80	2.15	3.10
8	4.06	33.8	8.90	16.4	1.80	2.08	2.43	.81	17.2	1.66	1.80	9.46
9	3.46	5.74	5.42	5.90	1.94	2.54	1.45	15.8	9.45	1.52	1.87	8.64
10	3.34	4.18	14.0	28.2	17.3	2.70	13.0	39.5	4.30	1.39	2.24	6.02
11	3.10	3.46	4.62	13.5	28.7	1.87	13.1	6.30	3.70	1.29	2.01	16.9
12	4.90	*3.00	40.2	11.8	18.9	30.0	4.27	48.1	3.22	1.45	1.66	4.62
13	4.91	2.81	6.70	6.66	7.50	53.4	*2.62	114	2.91	2.54	4.27	16.6
14	5.63	5.76	4.94	8.65	4.30	58.6	9.64	22.9	2.72	*4.29	3.68	9.52
15	2.91	3.10	18.4	4.30	5.42	9.15	2.72	8.15	2.53	1.59	10.7	4.46
16	2.43	3.34	20.4	3.58	5.47	5.0	2.15	6.10	2.34	1.08	10.9	3.94
17	2.34	9.50	7.16	14.4	3.70	4.62	2.34	9.22	2.15	.93	15.4	7.63
18	2.08	3.34	10.3	8.89	*9.60	4.78	2.24	5.10	2.08	4.31	3.82	5.74
19	3.33	2.53	7.50	23.2	13.5	4.06	1.80	4.30	1.94	7.06	2.53	3.34
20	2.01	3.10	18.0	5.42	16.1	3.34	1.66	4.30	1.87	41.9	2.81	3.70
21	1.94	2.15	11.5	4.46	5.90	2.91	1.59	8.03	9.46	12.9	8.55	2.81
22	1.73	2.01	15.3	3.34	8.80	2.91	1.45	5.72	6.39	5.61	6.77	3.22
23	1.52	4.18	9.65	3.00	6.30	3.10	1.34	19.5	3.82	4.12	3.76	3.58
24	1.52	14.2	6.50	2.72	15.4	2.34	1.29	10.1	2.62	7.23	*2.62	3.63
25	1.39	5.28	7.10	2.81	4.30	2.15	29.0	6.42	2.01	3.00	2.24	2.43
26	40.2	3.94	4.78	8.65	3.70	2.15	3.92	5.67	5.48	8.00	9.99	3.22
27	23.9	5.62	20.8	3.10	3.22	1.94	2.01	4.30	2.08	4.62	2.72	2.34
28	3.70	18.9	9.80	3.46	5.02	4.75	1.66	5.10	1.66	3.22	6.01	6.91
29	2.24	20.7	7.22	2.43	4.41	43.9	1.45	-----	1.66	2.24	17.7	5.64
30	19.3	50.2	5.10	5.89	2.62	23.7	1.45	-----	1.94	13.1	4.78	13.9
31	8.58	9.90	-----	6.06	-----	6.50	5.12	-----	1.52	-----	7.81	-----
TOTAL	212.75	318.17	332.44	237.29	223.81	321.68	156.88	356.88	144.54	185.81	157.84	196.87
MEAN	6.86	10.3	11.1	7.65	7.46	10.4	5.06	12.7	4.66	6.19	5.09	6.56
MGD	10.6	15.9	17.1	11.8	11.5	16.1	7.83	19.7	7.21	9.58	7.88	10.2
CFS	653	976	1,020	728	687	987	481	1,100	444	570	484	604
AC-FT												

CALENDAR YEAR 1960 MAX MIN MEAN MGD
FISCAL YEAR 1960-61 MAX MIN MEAN CFS
114 0.81 321.68 156.88 144.54 185.81 157.84 196.87
7.79

Peak discharge (base, 700 mgd).--July 26 (11 p.m.) 833 mgd (1,290 cfs), 6.18 ft; Feb. 13 (4 a.m.) 904 mgd (1,400 cfs), 6.36 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

49

2030. Mauka ditch near Wahiawa

Location.--Lat 21°30'45", long 157°59'20", on left bank 3 miles northeast of Wahiawa.

Records available.--March 1947 to June 1961. Prior to July 1959, published as Kaukonahua ditch near Wahiawa.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,100 ft (from topographic map).

Average discharge.--14 years, 3.21 mgd (4,97 cfs).

Extremes.--1947-61: Maximum daily discharge, 10.1 mgd (15.6 cfs) Jan. 27, 1948; no flow at times.

Remarks.--Records good, except those for periods of no gage-height record, which are poor. Ditch diverts water from North Fork Kaukonahua Stream for domestic use.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.8	4.5	5.22	4.46	5.35	3.50	7.27	1.63	1.51	3.14	4.10	4.58
2	5.4	4.8	4.96	4.34	4.46	4.10	6.39	2.39	2.42	5.22	3.50	4.34
3	5.2	4.7	4.70	4.22	4.22	3.62	5.0	2.12	4.46	4.22	3.19	3.86
4	5.6	6.0	5.22	4.46	3.74	4.54	4.0	1.77	3.98	3.50	4.34	3.74
5	5.0	5.8	5.09	4.10	3.50	3.05	4.5	1.53	3.62	3.19	3.50	4.70
6	4.6	5.4	5.87	4.22	3.40	.04	2.5	1.46	3.98	*2.99	3.30	3.74
7	4.4	5.0	6.00	5.22	3.30	.04	2.5	1.46	4.22	2.89	3.19	3.50
8	4.3	6.0	5.22	5.35	3.19	1.10	1.1	1.46	4.46	2.79	2.89	4.34
9	4.1	5.4	4.96	4.70	1.15	.16	.20	3.87	4.46	2.79	2.99	4.46
10	4.0	5.0	5.35	4.85	2.43	3.10	6.0	6.13	3.86	2.48	3.30	3.86
11	4.0	4.5	4.70	5.35	7.04	2.03	5.8	4.83	3.62	2.30	3.30	5.09
12	4.3	* 4.3	6.58	4.83	6.39	.02	5.0	5.87	3.50	2.30	2.79	3.98
13	4.5	4.10	5.09	4.70	5.35	.04	3.86	6.65	3.40	2.48	2.92	4.58
14	5.0	4.70	4.83	4.70	4.58	2.00	5.11	6.00	3.40	3.30	4.22	4.70
15	4.2	4.34	5.35	4.22	3.41	5.48	3.98	5.22	3.19	2.68	5.25	3.98
16	3.8	4.58	6.00	4.10	.04	5.22	1.27	4.96	3.09	2.03	4.70	3.86
17	3.7	4.96	5.09	1.77	.08	4.83	.03	5.22	2.99	1.69	5.09	4.46
18	3.5	4.46	5.35	1.20	1.56	4.96	1.34	4.58	2.99	2.73	*4.10	3.86
19	3.9	3.98	5.22	5.52	5.09	1.69	3.09	4.34	2.89	3.40	3.62	3.40
20	3.4	4.22	5.61	4.46	5.61	.02	2.89	4.22	2.68	4.96	3.74	3.50
21	2.3	3.62	5.48	4.46	4.83	1.33	2.68	4.96	4.33	5.09	4.70	3.40
22	1.7	3.40	5.74	3.98	*5.09	3.98	2.68	4.58	4.10	4.34	4.46	3.40
23	1.2	4.34	5.61	3.86	4.96	4.22	.14	5.35	3.62	4.34	3.86	3.50
24	.10	5.61	5.22	3.62	5.09	4.22	.90	*4.70	3.40	4.70	3.50	3.74
25	3.5	4.70	5.35	3.86	4.83	4.83	5.53	4.58	2.89	3.86	3.19	3.19
26	6.4	4.46	4.96	1.78	3.98	4.83	4.22	4.22	4.24	4.70	4.58	3.74
27	5.8	4.70	5.74	.04	3.86	1.39	3.40	4.10	3.30	4.34	3.40	*3.30
28	4.6	6.26	5.61	1.49	1.19	.02	2.99	4.22	2.89	4.10	3.62	4.22
29	3.7	6.13	*5.09	3.74	1.09	3.65	2.89	-----	2.79	3.50	4.58	4.46
30	5.6	6.65	4.12	4.58	3.50	7.69	2.41	-----	2.89	4.46	3.86	5.22
31	5.0	5.48	-----	4.46	-----	6.26	1.69	-----	2.48	-----	4.22	-----
TOTAL	127.60	132.09	159.33	122.64	112.31	92.36	101.36	112.42	105.65	104.51	118.00	120.70
MEAN												
MGD	4.12	4.91	5.31	3.96	3.74	2.98	3.27	4.02	3.41	3.48	3.81	4.02
CFS	6.37	7.60	8.22	6.12	5.79	4.61	5.06	6.21	5.27	5.39	5.89	6.22
AC-FT	392	467	489	376	345	283	311	345	324	321	362	370

Calendar Year 1960: Max 7.69 Min 0.02 Mean mgd 4.57 Mean cfs 7.07 Ac-ft 5,130
 Fiscal Year 1960-61: Max 7.69 Min 0.02 Mean mgd 3.91 Mean cfs 6.03 Mean ofs 6.03 Ac-ft 4,390

* Discharge measurement made on this day.

Note.--No gage-height record July 1 to Aug. 12, Jan. 3-12; discharge estimated on basis of records for nearby stations.

ISLAND OF OAHU

2040. North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'55", long 157°59'20", on left bank 3 miles northeast of Wahiawa and 8.6 miles north of Pearl City.Drainage area.--4.86 sq mi.Records available.--September 1946 to June 1961.Gage.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from topographic map).Average discharge.--14 years (1947-61), 20.8 mgd (32.2 cfs).Extremes (unadjusted for diversions).--Maximum discharge during year, 1,120 mgd (1,730 cfs) Feb. 13 (gage height, 8.40 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; minimum, 1.06 mgd (1.64 cfs) Apr. 17.

1946-61: Maximum discharge, 2,200 mgd (3,400 cfs) Nov. 28, 1954 (gage height, 15.55 ft), from rating curve extended above 190 mgd as explained above; minimum, no flow several days in 1953.

Remarks.--Records good. Poamoho tunnel diverts water from Poamoho Stream into North Fork Kaukonahua Stream about a mile above station Maika ditch diverts water 2.6 miles above station for domestic use in Wahiawa (see p. 49).

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 - 26

July 27 to June 30

0.4	0.80	1.6	37.5		0.4	1.06					
.5	1.45	2.0	75.0		.5	1.80					
.6	2.35	2.4	131		.6	2.75					
.8	5.00	3.0	245		.8	5.40					
1.0	9.10	4.0	424								
1.3	20.0										

Note.--Same as preceding table at and above 1.0 ft.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	10.3	5.12	14.3	6.08	30.0	4.82	38.7	4.85	9.10	1.89	6.63	17.5
2	19.2	6.08	8.70	5.11	9.12	8.20	16.0	2.56	10.5	57.9	3.86	12.1
3	14.1	5.51	6.59	4.53	6.03	6.21	6.59	2.46	17.6	17.9	1.99	5.91
4	31.3	83.1	18.3	5.49	3.71	75.9	4.67	2.08	8.70	4.53	8.74	4.53
5	10.1	75.0	7.30	*4.15	3.11	14.9	4.82	1.65	6.42	2.99	2.88	18.5
6	8.41	13.3	38.1	3.59	2.75	8.70	5.52	1.65	9.87	*2.18	2.37	7.35
7	7.26	7.50	31.4	28.8	2.46	7.70	4.24	1.65	21.1	1.80	1.80	3.35
8	5.54	64.3	13.8	31.0	2.27	6.08	3.71	1.65	22.2	1.65	1.65	13.3
9	4.55	14.3	10.9	9.76	4.05	4.24	5.21	25.4	33.6	2.25	1.28	19.4
10	3.95	6.76	26.4	71.2	46.2	5.06	21.3	97.6	7.10	1.72	1.65	6.93
11	3.80	4.96	7.10	61.6	158	4.01	26.5	13.5	5.40	1.35	3.73	30.1
12	8.44	3.95	88.4	15.1	72.9	59.6	11.6	98.8	4.53	1.28	1.65	6.93
13	16.1	3.35	13.5	13.4	31.6	119	3.95	27.3	3.95	1.35	22.2	17.9
14	9.79	6.05	7.70	13.3	13.2	124	28.5	66.7	3.59	3.41	15.3	29.2
15	4.24	7.13	14.3	7.24	11.5	19.3	5.38	19.3	3.23	3.66	*18.9	6.25
16	2.58	6.53	74.1	5.11	18.5	10.6	*5.52	12.8	2.99	1.57	.19.7	4.82
17	2.35	11.4	11.2	13.7	*12.1	7.70	6.59	18.8	2.75	1.20	26.4	9.24
18	2.17	7.68	15.9	42.0	22.3	7.62	5.39	8.70	2.46	12.0	5.91	8.10
19	2.56	3.35	12.0	121	23.8	10.3	2.56	7.50	2.27	12.3	3.47	4.67
20	2.35	5.20	28.1	20.6	36.6	9.70	2.27	6.59	2.08	59.9	2.99	3.95
21	1.90	3.35	22.4	13.9	16.0	7.19	1.99	*12.1	17.2	37.2	14.9	3.23
22	1.63	2.27	24.9	7.50	13.6	4.24	1.72	10.7	11.9	6.23	10.1	2.65
23	1.38	4.87	17.7	5.91	15.0	5.57	3.31	43.9	6.76	10.4	4.53	3.83
24	1.45	60.6	13.6	4.96	29.2	3.95	3.06	11.6	4.24	9.96	3.47	4.53
25	1.32	11.8	14.5	4.38	8.50	3.23	88.2	14.9	2.75	3.95	2.18	2.75
26	34.2	5.91	7.70	20.6	6.76	3.11	10.6	6.76	20.4	12.1	12.8	6.33
27	124	6.85	28.4	8.50	5.91	4.98	3.83	8.72	4.93	6.15	3.83	*3.71
28	7.64	43.4	26.1	11.2	8.87	5.91	2.56	6.86	2.51	5.74	2.83	9.46
29	3.47	42.4	13.8	3.71	15.7	92.2	3.29	-----	2.08	2.75	28.1	12.0
30	32.0	180	11.2	11.1	4.96	51.7	4.34	-----	2.19	21.5	5.25	30.9
31	20.6	24.2	-----	10.3	-----	11.9	14.1	-----	1.99	-----	10.9	-----
TOTAL	398.68	726.22	628.39	584.82	634.70	707.62	346.22	782.78	255.39	310.81	251.99	309.42
MEAN	12.9	23.4	20.9	18.9	21.2	22.8	11.2	28.0	8.84	10.0	8.13	10.3
HGD	19.6	36.2	32.4	29.2	32.8	35.3	17.3	43.3	12.7	15.5	12.6	16.0
CFS	14220	21230	16930	16790	1,950	2,170	1,060	2,400	784	954	773	950

Calendar Year	1960	Max	497	Min	0.34	Mean mgd	26.5	Mean cfs	37.9	Ac-ft	27,350
Fiscal Year	1960-61	Max	873	Min	1.80	Mean mgd	16.3	Mean cfs	89.8	Ac-ft	18,810

Discharge measurement made on this day.

ISLAND OF OAHU

51

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

Location.--Lat 21°29'32", long 157°59'55", on right bank of South Fork Kaukonahua Stream at dam on East Pump Reservoir about 7.5 miles north of Waipahu, and 2 miles southeast of Wahiawa Post Office.

Drainage area.--4.04 sq mi.

Records available.--July 1957 to June 1961.

Gage.--Water-stage recorder and Ogee-type dam control with modified crest. Datum of gage is 860.35 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 488 mgd (755 cfs) Feb. 13 (gage height, 4.43 ft); no flow Dec. 24, 25, 27, 28.

1957-61: Maximum discharge, 1,270 mgd (1,960 cfs) Feb. 21, 1959 (gage height, 6.40 ft); no flow Dec. 24, 25, 27, 28, 1960.

Flood of Feb. 25, 1956 is the highest known since 1946 and reached a stage 8.85 ft and was affected by backwater from Wahiawa Reservoir.

Remarks.--Records fair. Koolau ditch diverts water into Koolau Reservoir (capacity 43 million gallons), and Ki Tree Reservoir (capacity 293 million gallons) located on tributary.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.12	0	2.0	16.0
1.3	0.80	2.3	39.0
1.5	2.75	2.6	74.0
1.7	6.20	3.0	136

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NDV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.87	3.95	8.16	5.61	9.73	5.22	46.9	3.80	7.14	2.40	5.81	8.87
2	12.6	3.35	5.61	5.22	5.42	5.61	12.6	3.20	6.00	28.0	3.20	21.9
3	51.4	3.95	4.44	5.42	4.10	6.00	6.90	2.75	11.6	15.4	2.06	7.84
4	35.1	23.0	3.95	10.2	3.35	42.4	2.54	2.52	6.43	3.95	1.94	5.81
5	14.3	21.1	3.80	5.42	3.20	14.4	.51	2.52	5.22	2.63	2.06	14.5
6	10.2	7.61	28.7	4.64	2.75	5.81	1.04	2.40	5.42	2.06	1.60	6.20
7	12.4	3.20	35.5	28.3	2.63	5.03	.42	2.29	27.9	*2.17	1.44	3.95
8	7.37	9.26	18.5	8.55	2.63	4.64	.15	2.17	12.2	2.29	1.52	16.9
9	6.43	5.42	14.8	5.61	2.75	4.10	2.30	19.6	12.9	2.63	1.83	11.4
10	7.99	3.65	16.0	9.88	47.8	3.95	7.85	73.0	5.61	2.52	2.06	4.83
11	6.20	3.05	6.67	12.4	55.5	3.95	29.1	17.1	5.03	2.06	2.17	12.6
12	12.6	3.20	47.3	21.6	23.8	46.2	*12.6	12.6	4.64	2.06	1.60	5.22
13	8.08	3.65	9.85	17.3	12.1	49.7	4.83	115	4.25	2.52	1.20	11.8
14	8.48	2.75	7.84	9.85	6.90	68.9	15.9	19.2	4.10	3.05	1.20	7.84
15	5.81	2.63	8.08	6.67	6.00	14.1	5.81	13.0	3.95	4.10	7.93	4.25
16	4.83	2.52	20.7	5.22	9.20	4.02	4.10	9.52	3.80	2.75	12.2	3.80
17	4.25	6.87	10.7	8.69	*6.67	1.20	4.44	20.9	3.50	2.17	20.0	10.8
18	3.95	6.34	30.2	18.2	8.87	2.86	4.83	9.20	3.35	2.29	*4.64	16.2
19	3.95	*2.75	10.8	29.7	20.0	5.94	3.80	7.84	3.20	3.50	2.75	5.03
20	3.80	2.52	14.3	9.52	33.5	4.10	3.35	8.08	3.20	16.1	3.20	4.10
21	3.65	2.52	35.9	7.61	16.0	2.52	3.20	9.52	10.3	22.0	10.5	3.65
22	3.20	2.06	23.1	5.22	23.7	.56	3.05	8.55	14.0	3.50	11.8	4.10
23	3.05	2.63	18.7	4.83	19.1	.17	2.75	51.1	4.64	2.75	4.44	6.20
24	3.05	3.65	11.8	4.25	28.1	0	2.52	16.5	3.80	3.50	3.80	5.03
25	2.75	4.64	9.85	4.25	9.85	0	66.8	13.9	3.20	3.95	2.52	5.03
26	2.52	2.75	8.08	11.8	7.84	.26	12.6	8.08	2.90	3.65	2.19	4.64
27	5.16	9.52	8.63	4.83	6.90	0	5.22	*7.61	2.63	6.06	4.83	4.44
28	5.03	56.8	*16.6	4.25	6.67	0	3.95	6.67	2.52	6.56	3.35	11.1
29	3.80	46.7	8.08	4.10	13.6	42.2	3.35	-----	2.63	2.52	17.0	17.1
30	8.43	37.9	7.84	5.81	5.81	45.5	3.50	-----	2.63	8.38	3.95	37.2
31	7.14	11.2	-----	5.42	-----	9.17	9.20	-----	2.52	-----	5.81	-----
TOTAL	322.83	301.14	454.48	290.37	404.47	398.51	286.11	468.62	191.21	167.52	170.31	282.33
MEAN												
MGD	10.4	9.71	15.1	9.37	13.5	12.9	9.23	16.7	6.17	5.58	5.49	9.41
CFS	16.1	15.0	23.4	14.5	20.9	19.9	14.3	25.9	9.54	8.64	8.50	14.6
AC-FT	991	924	1,390	891	1,240	1,220	878	1,440	587	514	523	866

CALENDAR YEAR 1960 MAX 116 MIN 0 MEAN MOD 13.0 MEAN CFS 20.1 AC-FT 15,150
FISCAL YEAR 1960-61 MAX 115 MIN 0 MEAN MGD 10.2 MEAN CFS 15.8 AC-FT 11,460

Peak discharge (base, 450 mgd)--Feb. 13 (7 a.m.) 488 mgd (755 cfs), 4.43 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2085. Right Branch of South Fork Kaukonahua Stream, near Wahiawa

Location.--Lat 21°30'00", long 157°59'06", on left bank 500 ft below spillway of Ku Tree Reservoir, 1 mile above confluence with South Fork Kaukonahua Stream, and 3 miles east of Wahiawa Post Office.

Drainage area.--0.86 sq mi.Records available.--August 1957 to June 1961.Gage.--Water-stage recorder and masonry control. Altitude of gage is 980 ft (from topographic map).Extremes.--Maximum discharge during year 100 mgd (155 cfs) Oct. 19 (gage height, 3.62 ft); minimum 0.01 mgd (0.02 cfs) May 24.

1957-61: Maximum discharge, 498 mgd (771 cfs) Mar. 5, 1958 (gage height, 5.34 ft), from rating curve extended above 110 mgd by logarithmic plotting; no flow at times.

Remarks.--Records fair.

Rating table (gage height, in feet, and discharge,
in million gallons a day)

0.02	0	0.9	1.85
.1	.02	1.2	3.00
.2	.09	1.5	6.60
.3	.20	1.7	9.15
.5	.51	1.9	12.5
.7	1.00	2.2	19.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.35	0.13	0.15	0.31	2.07	0.97	2.87	0.45	1.40	0.44	0.21	0.85
2	2.67	.12	.15	.28	.82	1.26	2.03	.32	1.22	.59	.49	.12
3	1.74	.12	.14	.40	.51	.88	.84	.31	3.65	.29	.13	.06
4	1.94	.12	.13	.32	.46	8.41	.49	.27	1.32	.06	.13	.05
5	.88	.12	.27	.20	.29	2.75	.54	.28	.77	.05	.06	.21
6	.93	.12	4.68	.24	.14	1.15	.56	.20	1.03	.04	.07	.17
7	.80	.12	8.12	.24	.16	.91	.39	.17	5.23	.04	.10	.04
8	.59	.12	1.20	.29	.17	.83	.39	.23	1.92	.04	.10	.08
9	.64	.12	.96	.29	.31	.86	.35	.83	1.16	.17	.12	.04
10	.78	.11	.35	.16	17.4	.77	.48	5.60	.72	.29	.12	.04
11	.61	.10	.26	.38	18.4	.74	*4.83	2.04	.61	*.12	.12	.05
12	3.94	.10	1.84	.79	6.99	3.01	6.49	.97	.55	.12	.13	.04
13	2.42	.09	.68	2.39	3.04	1.68	.48	4.89	.53	.16	.10	.04
14	.77	.07	.38	2.03	1.19	1.97	.83	2.25	.51	.07	.07	.04
15	.53	.07	.29	.42	1.58	1.19	.47	1.05	.47	.07	.06	.05
16	.45	.07	1.04	.34	3.28	.77	.37	1.11	.44	.07	.04	.06
17	.51	.10	.38	.22	*2.66	.69	.66	2.89	.32	.10	*.01	.23
18	.41	.10	.27	2.21	4.27	1.30	.47	.79	.34	.10	.02	.54
19	.33	.06	.15	1.19	6.56	1.00	.37	.74	.31	.16	.01	.28
20	.25	.04	.12	2.50	7.93	.91	.25	.94	.43	.13	.04	.14
21	.16	.04	.96	1.44	3.05	.69	.22	3.58	3.07	.20	.07	.06
22	.15	.04	2.31	.61	6.20	.65	.20	1.96	2.15	.07	.03	.07
23	.15	.05	3.46	.46	5.32	.61	.39	5.92	1.07	.05	.02	.06
24	.14	.04	1.66	.33	4.20	.53	.10	*4.34	.88	.04	.02	.10
25	.14	.03	1.05	.38	1.79	.49	11.4	2.11	.44	.04	.03	.27
26	.14	.03	.41	1.66	1.37	.72	2.21	1.11	.4	.08	3.58	.84
27	.14	.04	.18	.53	1.19	.59	.68	.68	.25	.84	.81	*1.28
28	.13	.17	.98	.41	1.63	.49	.45	.94	.22	1.49	.33	5.20
29	.13	1.67	1.09	.36	1.66	1.29	.42	-----	.69	.33	.26	2.44
30	.13	.65	.53	1.20	.99	2.31	.55	-----	.42	.09	.17	4.81
31	.13	.22	-----	.71	-----	.85	2.55	-----	.31	-----	.10	-----
TOTAL	24.08	4.98	34.19	34.00	105.63	41.27	43.33	50.98	32.86	6.34	7.55	18.26
MEAN												
MGD	0.777	0.161	1.14	1.10	3.52	1.33	1.40	1.82	1.06	0.211	0.244	0.609
CFS	1.20	0.248	1.76	1.70	5.45	2.06	2.16	2.82	1.64	0.327	0.377	0.942
AC-FT	74.0	15.0	105	104	324	127	133	156	101	19.0	23.0	56.0

Calendar Year 1960 Max 18.4 Min 0 Mean mgd 0.776 Mean cfs 1.20 Ac-ft 872
 Fiscal Year 1960-61 Max 18.4 Min 0.01 Mean mgd 1.11 Mean cfs 1.72 Ac-ft 1,240

Peak discharge (base, 200 mgd).--No peak above base.

* Discharge measurement made on this day.

ISLAND OF OAHU

2109. Poamoho tunnel near Wahiawa

53

Location.--Lat 21°31'10", long 157°58'50", on left bank about 5 ft downstream from tunnel outlet, and 3.5 miles northeast of Wahiawa Post Office.

Records available.--July 1958 to June 1961.

Gage.--Water-stage recorder and 7-ft concrete flume. Altitude of gage is 1120 ft (from topographic map).

Extremes.--1958-61: Maximum daily discharge, 116 mgd (179 cfs) Aug. 8, 1958; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water from Poamoho Stream basin is diverted by Poamoho tunnel to Maukonahua Stream basin.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.06	0.50	0.91	A 0.44	0.07	0.03	1.84	0.03	0.19	0.04	0.24	1.07
2	.06	.40	.22	A .34	.03	.03	.61	.03	.18	14.8	.04	.65
3	.27	.30	.03	A .25	.03	.04	.03	.03	.18	1.34	.04	.22
4	.42	13.5	3.37	.18	.02	14.8	.03	.03	.17	.08	.05	.03
5	.05	8.78	.38	.08	.02	.04	.03	.02	.17	.08	.05	1.66
6	.05	1.60	1.78	.07	.02	.03	.03	0	.17	.07	.05	.69
7	.05	.65	2.53	3.66	.02	.03	A .03	0	1.07	.07	.05	.03
8	.05	9.60	.60	2.29	.01	.03	A .02	.01	.80	.06	.05	2.69
9	.05	2.16	1.08	.65	.01	.04	A .01	3.23	4.04	.07	.05	3.15
10	.05	.77	3.72	9.55	5.45	.03	A .82	16.0	.15	.08	.05	.91
11	.06	.44	.28	8.23	33.8	.03	A 5.3	5.90	.13	.08	.05	2.52
12	.05	.32	12.6	.32	2.01	5.80	A 1.20	18.4	.13	.09	.05	.03
13	1.29	.28	.90	.20	.06	14.2	A .03	46.3	.14	.09	.09	1.11
14	.05	.30	.09	.03	.04	10.3	A 11.0	10.1	.13	.07	.14	5.88
15	.05	.90	.64	.03	.04	.03	A .91	.12	.13	.06	.91	.24
16	.05	2.14	10.3	.03	.04	.03	A .03	.04	.12	.06	.90	.02
17	.05	1.13	.30	1.22	.04	.03	A .02	1.51	.09	.06	3.85	.02
18	.05	1.49	.71	6.11	.04	.03	A .02	.34	.09	2.93	*.18	.01
19	.04	.44	.65	26.9	.04	.03	.02	.32	.09	3.80	.03	0
20	.04	.77	3.07	4.05	.54	.03	.02	.28	.11	10.1	.03	0
21	.04	.53	1.75	2.78	.03	.04	.02	.25	1.41	.62	1.24	0
22	.04	.28	2.02	.82	.04	.04	.03	.25	.18	1.00	.59	0
23	.03	1.04	1.67	.47	.04	.04	.03	4.15	.16	.17	.12	0
24	.03	14.1	1.63	.28	.04	.04	.03	.23	.09	.06	.02	0
25	.03	1.86	A .77	.12	.04	.04	14.6	.22	.09	.06	.01	0
26	3.45	.40	A .36	.03	.04	.04	.03	.22	4.77	.07	.31	.01
27	12.1	.53	A .05	.03	.04	.04	.03	.22	.07	.06	.04	.01
28	.53	9.80	A 2.75	.04	.04	.03	.03	.21	.06	.06	.01	.01
29	.07	5.10	A 1.60	.04	.03	8.22	.03	-----	.06	.06	3.13	.03
30	4.89	42.3	A .59	.04	.03	2.37	.03	-----	.05	2.09	.11	1.19
31	3.78	3.81	-----	.04	-----	.03	.03	-----	.04	-----	1.41	-----
TOTAL	27.03	126.22	57.37	69.32	42.70	56.54	36.89	108.44	15.26	38.28	13.89	22.18
MEAN												
MGD	0.898	4.07	1.91	2.24	1.42	1.82	1.19	3.87	0.492	1.28	0.448	0.739
CFS	1.39	6.30	2.96	3.47	2.20	2.82	1.84	5.99	0.762	1.97	0.693	1.14
AC-FT	85.0	387	176	213	131	174	113	333	47.0	117	43.0	68.0
Calendar Year	1960	Max	100	Min	0.01		Mean mgd	3.79		Mean cfs	3.86	k,260
Fiscal Year	1960-61	Max	46.3	Min	0		Mean mgd	1.68		Mean cfs	2.60	Ac-ft 1,890

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of records for nearby stations.

ISLAND OF OAHU

54

2110. Poamoho Stream near Wahiawa

Location.--Lat 21°31'25", long 157°58'55", on left bank just below concrete diversion dam, 3.5 miles northeast of Wahiawa and 9.5 miles north of Waipahu.

Drainage area.--1.79 sq. mi.

Records available.--January 1947 to June 1961.

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

Average discharge.--14 years, 2.57 mgd (3.98 cfs).

Extremes. (unadjusted for diversions).--Maximum discharge during year, 680 mgd (1,050 cfs) Oct. 19 (gage height, 4.55 ft), from rating curve extended above 48 mgd by test on model of station site; minimum, 0.02 mgd (0.03 cfs) Feb. 17.

1947-61: Maximum discharge, 1,000 mgd (1,550 cfs) Oct. 23, 1958 (gage height, 6.06 ft), from rating curve extended above 48 mgd as explained above; no flow at times.

Remarks.--Records good. Poamoho tunnel diverts water into North Fork Kaukonahua Stream about 175 ft above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.0	0.20	1.0	10.0
.4	.99	1.2	16.2
.6	2.83	1.4	25.5
.8	5.75	1.6	39.5

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.15	1.11	2.46	1.50	5.22	1.60	8.64	1.18	1.77	1.39	3.08	1.11
2	3.09	.99	2.25	1.41	2.80	4.69	6.38	.99	1.85	6.45	1.96	1.04
3	3.44	.88	1.97	1.33	2.71	2.84	2.83	.94	2.39	5.32	.99	.99
4	6.38	1.33	2.46	*1.25	1.25	7.68	2.15	.83	1.97	2.80	2.00	.94
5	2.25	1.33	2.15	<u>1.18</u>	.99	5.27	2.05	.79	3.13	1.60	1.18	.94
6	1.97	1.11	2.25	1.18	.88	2.35	2.25	.74	3.21	1.68	1.11	.94
7	1.68	.99	2.25	1.68	.83	1.85	2.25	.74	4.39	*1.04	.83	.88
8	1.68	1.11	2.15	1.77	.79	1.60	1.68	.74	3.76	.99	.74	.94
9	1.33	.99	2.15	1.68	.83	1.50	1.41	4.69	4.45	1.23	.64	.99
10	1.18	.94	2.25	13.3	8.14	1.60	5.22	9.45	2.25	.88	.88	.88
11	1.18	.99	1.97	4.73	<u>16.2</u>	1.33	6.80	5.64	1.68	.79	1.25	2.04
12	1.97	.94	<u>2.96</u>	3.30	12.5	11.6	3.76	7.18	1.41	.69	.69	1.85
13	4.80	.83	2.46	2.96	7.02	<u>14.8</u>	1.85	<u>11.1</u>	1.25	.79	1.56	2.26
14	1.60	.79	2.15	2.25	3.55	13.4	10.1	9.00	1.18	.83	<u>3.50</u>	2.58
15	1.18	.79	2.05	1.97	2.72	5.74	2.72	6.38	1.11	1.18	3.18	2.08
16	.99	.74	2.83	1.97	2.96	3.55	1.85	4.90	1.04	.79	2.72	1.60
17	.94	.69	2.25	1.52	2.05	2.83	*2.05	5.33	1.04	.64	2.05	2.05
18	.88	.69	2.15	3.70	2.35	2.96	2.05	3.30	.99	2.91	*1.77	3.76
19	.79	.64	2.15	<u>31.6</u>	3.48	2.72	1.41	2.83	.99	4.15	1.18	1.60
20	.79	.64	2.35	1.85	7.56	2.35	1.33	2.60	.94	6.10	.99	1.50
21	.79	.60	2.25	1.68	5.30	2.05	1.11	*3.19	3.31	4.31	1.25	1.11
22	.69	.60	2.05	1.33	*3.41	1.85	1.04	2.60	3.33	2.97	1.33	.94
23	<u>.64</u>	.60	1.97	1.25	3.57	2.90	.99	6.32	2.59	3.07	1.25	1.11
24	.69	1.21	1.85	1.18	5.14	1.77	.99	2.83	1.60	2.25	.99	1.11
25	.64	1.25	1.77	1.34	2.60	1.50	<u>10.5</u>	2.03	1.04	1.33	.79	.88
26	<u>9.04</u>	1.04	1.50	1.85	2.15	1.50	4.15	2.15	4.05	2.64	1.04	<u>5.09</u>
27	4.54	.99	1.60	1.33	1.85	1.50	1.85	2.53	2.12	1.77	.94	1.33
28	1.68	1.33	2.15	3.82	2.04	<u>1.33</u>	1.33	2.05	1.11	1.60	.74	1.18
29	1.33	1.33	1.85	1.25	3.61	<u>11.8</u>	1.11	-----	.94	1.04	1.11	6.11
30	1.33	<u>6.84</u>	1.77	3.79	1.68	10.6	1.18	-----	1.11	3.00	1.04	<u>10.4</u>
31	1.25	2.83	-----	2.56	-----	4.85	3.89	-----	.94	-----	1.11	-----
TOTAL	62.89	37.14	64.42	103.51	116.18	133.91	96.92	103.85	62.94	66.23	43.89	60.23
MEAN												
MGD	2.03	1.20	2.15	3.34	3.87	4.32	3.13	3.71	2.03	2.21	1.42	2.01
CFS	3.14	1.85	3.32	5.17	5.99	6.68	4.84	5.74	3.14	3.42	2.19	3.11
AC-FT	193	114	198	318	357	411	297	319	193	203	135	185

Calendar Year 1960 Max 31.6 Min 0 Mean mgd 2.32 Mean cfs 3.59 Ac-ft 2,600
Fiscal Year 1960-61 Max 31.6 Min 0.60 Mean mgd 2.61 Mean cfs 4.04 Ac-ft 2,920

* Discharge measurement made on this day.

ISLAND OF OAHU

55

2116, Makaha Stream near Makaha

Location.--Lat 21°30'18", long 158°10'48", on right bank 1.5 miles northeast of Kaneaki Heiau and 3.4 miles northeast of Makaha.Drainage area.--2.13 sq mi.Records available.--July 1959 to June 1961.Gage.--Water-stage recorder and concrete-masonry control. Datum of gage is 938.64 ft above mean sea level (from Waianae Plantation Benchmark).Extremes.--Maximum discharge during year, 1kl mgd (218 cfs) Dec. 29 (gage height, 3.38 ft), from rating curve extended above 32 mgd by logarithmic plotting; no flow Sept. 25.

1959-61: Maximum discharge same as above; no flow Sept. 25, 1959.

Remarks.--Records good. A 1½-inch pipe 1,200 ft above station occasionally diverts water for use in siphoning water from a well. Continuous rainfall record collected at this site.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.04	0	1.60	2.25
1.10	.01	1.80	5.30
1.20	.08	2.90	10.4
1.40	.67	2.10	14.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.18	<u>0.04</u>	0.02	<u>0.37</u>	<u>0.01</u>	<u>0.04</u>	3.53	2.82	0.44	<u>10.8</u>	<u>7.33</u>	0.18
2	.14	.03	.03	.25	.01	.05	1.46	2.03	.44	<u>9.28</u>	<u>2.03</u>	.16
3	.17	.03	.03	.16	.01	.05	.96	1.73	.62	<u>3.80</u>	<u>1.38</u>	.16
4	.44	.03	.03	.12	.01	2.35	.72	1.31	.53	<u>2.13</u>	<u>1.09</u>	.18
5	.40	.03	.03	.08	.01	1.20	.53	1.09	.44	<u>*1.46</u>	<u>.82</u>	.22
6	<u>.86</u>	.03	.02	.05	.01	.77	.44	.96	<u>*.37</u>	1.09	.72	.31
7	.57	.03	.01	.04	.01	.34	.44	.82	.34	.88	.62	.22
8	.34	.03	.02	.04	.01	.28	.37	.72	.44	1.15	.53	.22
9	.22	.03	.03	.04	.01	.20	<u>.31</u>	<u>6.76</u>	.37	.82	.44	.37
10	.16	.03	.02	.04	.11	.16	3.51	<u>8.46</u>	.31	.67	.40	.28
11	.14	.03	.02	.03	.53	.12	1.93	4.32	.25	1.22	.34	.22
12	.14	.03	.03	<u>*.03</u>	.44	1.76	1.31	2.82	.22	1.15	.31	.22
13	.11	.03	.01	.03	.28	.82	.88	4.90	.20	.77	.31	.20
14	.11	.03	.01	.03	.20	1.90	.72	3.76	.20	.77	.37	.16
15	.09	.03	.01	.03	.14	.88	.62	2.58	.20	2.74	.31	.16
16	.09	.03	.01	.03	.18	.48	.53	2.03	.16	1.46	.25	.14
17	.08	.03	.01	.03	.14	.31	2.77	1.73	.16	1.09	.22	.18
18	.07	.03	.01	.03	.14	.81	1.46	1.55	.16	.82	.22	.28
19	.06	.02	.01	.03	.16	.82	.88	1.46	.14	.77	*.22	.31
20	.05	.02	.01	.04	<u>.63</u>	3.85	1.02	1.09	.12	.67	.25	.22
21	.05	.02	.01	.04	.53	4.23	.67	1.02	<u>.98</u>	.67	.22	.20
22	.04	<u>.01</u>	.01	.04	.34	1.43	.53	.96	.57	.53	.20	.16
23	.04	.01	.01	.06	.25	1.02	<u>*3.11</u>	1.46	.31	.48	.20	.12
24	.03	.01	.01	.05	.18	.57	.96	1.09	.20	.44	.20	.12
25	.03	.01	<u>0</u>	.04	.12	.44	12.7	1.02	.16	.37	.20	.11
26	.04	.01	.01	.04	.09	.37	<u>*5.75</u>	.67	.14	.37	.18	.09
27	.04	.01	.03	.03	.08	.31	2.82	.57	.12	.37	.16	.08
28	.04	.01	.49	.03	.06	.37	1.93	<u>.48</u>	.12	.31	.16	.07
29	.04	.01	.68	.02	<u>*.05</u>	<u>6.74</u>	1.55	-----	.12	.31	.16	.11
30	.04	.01	<u>1.11</u>	.01	.04	2.91	4.86	-----	.12	.28	.16	*.53
31	.04	.01	-----	.01	-----	1.46	<u>13.6</u>	-----	.34	-----	.16	-----
TOTAL	4.85	0.71	2.73	1.87	4.78	36.04	72.87	60.21	9.29	47.67	20.16	5.98
MEAN												
MGD	0.156	0.023	0.091	0.060	0.159	1.16	2.35	2.15	0.300	1.59	0.650	0.199
CFS	0.4242	0.035	0.141	0.093	0.246	1.80	3.64	3.33	0.464	2.46	1.01	0.30
AC-FT	15.0	2.20	8.40	5.70	15.0	111	224	185	29.0	146	62.0	18.0

CALENDAR YEAR	1960	MAX	15.6	MIN	0	MEAN	MGD	0.702	MEAN	CFS	1.09	AC-FT
FISCAL YEAR 1960-61	MAX	13.6	MIN	0	MEAN	MGD	0.732	MEAN CFS	1.13	AC-FT	789	821

Peak discharge (base, 100 mgd).--Dec. 29 (5 p.m.) 1kl mgd (218 cfs), 3.38 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2118. Kaupuni Stream at altitude 360 ft, near Waianae

Location.--Lat 21°28'20", long 158°09'26", on right bank of 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.--3.27 sq mi.Records available.--May 1960 to June 1961.Gage.--Water-stage recorder and concrete and masonry control. Altitude of gage is 360 ft (from topographic map).Extremes.--1960: Maximum discharge during period May to June, 0.87 mgd (1.35 cfs) June 6 (gage height, 1.16 ft); no flow most of period.

1960-61: Maximum discharge during year, 10.8 mgd (16.7 cfs) Jan. 31 (gage height, 2.34 ft) from rating curve extended above 0.60 mgd by logarithmic plotting; no flow several times during year.

Remarks.--Records good. A 12' pipe on right side takes water from pool for irrigation by Capital Investment Co. development tunnels above station which may affect flow passing the station.

Discharge, in million gallons a day, 1961

Day	May	June	Day	May	June	Day	May	June	Day	May	June	Day	May	June
1	-	0	7	-	0	13	-	0	19	-	0	25	-	0
2	-	0	8	-	0	14	-	0	20	-	0	26	-	0
3	-	0	9	-	0	15	-	0	21	-	0	27	-	0
4	-	0	10	-	0	16	-	0	22	-	0	28	0.25	0
5	-	0	11	-	0	17	-	0	23	-	0	29	.26	0
6	-	0	12	-	0	18	-	0	24	-	0	30	.24	0
		<u>0.11</u>									0			--
Total														0.11
Mean in million gallons a day														0.004
Mean in cubic feet per second														0.006
Runoff in acre-feet														0.3

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0			0	0.09	0	0.60	0.91	0.03	0	0	0.13
2	0			0	.04	0	.55	.57	.27	0	.07	.24
3	0			0	0	0	.55	.38	*.10	0	.55	.30
4	0			0	0	0	*.50	.42	.02	0	.48	.40
5	0			0	0	.18	.48	.50	.03	0	.38	.27
6	0			0	.01	.55	.52	.47	.07	0	.07	.20
7	0			0	0	.38	.50	.32	.05	0	.01	.15
8	.11			0	0	.42	.52	.38	.06	0	.28	.26
9	.17			0	.01	.48	.47	.42	.01	0	.33	.44
10	.18			0	.03	.50	.47	.50	0	0	.34	.32
11	.14			0	.26	.57	.42	.51	0	0	.30	.27
12	0			0	.30	.48	.38	.60	0	0	.25	.21
13	0		*	0	.26	.28	.38	.99	0	0	.32	.17
14	0		0	.20	.40	.31	1.25	0	0	0	.33	.22
15	0		.01	.04	.50	.30	.94	0	0	.01	.38	.19
16	0			.06	.06	.48	.30	.74	0	.29	*.35	.18
17	0			.01	.06	.47	.62	.78	0	.29	.33	.16
18	0			.01	.09	.55	.54	.81	0	.22	.26	.12
19	0			.24	0	.55	.52	.81	0	.27	.24	.15
20	0			.48	0	.48	.59	.78	0	.20	.25	.12
21	0			*.76	.11	.40	.59	.96	0	.26	.26	.15
22	0			1.05	.16	.57	.67	.92	0	.01	.25	.13
23	0			.52	*.16	.55	.41	1.02	.01	.04	.21	.05
24	0			.12	.14	.35	.14	.96	0	0	.18	.09
25	0			.12	.13	.54	.92	.89	0	0	.17	.10
26	0			.11	.03	.52	*.81	.59	0	0	.19	.08
27	0			.09	.04	.55	.57	.49	0	.14	.24	.07
28	0			.06	.02	.50	.09	.44	0	.73	.35	.07
29	0			.09	.07	.52	.02	-----	0	.16	.17	.06
30	0			.10	.01	.59	.04	-----	0	.0	.14	.07
31	0			.06	-----	.55	2.94	-----	0	-----	.15	-----
Total	0.60	0	0	3.89	2.32	12.91	16.72	19.35	0.65	2.62	7.83	5.37
Mean	0.019	0	0	0.125	0.077	0.416	0.539	0.691	0.021	0.087	0.253	0.179
Mgd	0.029	0	0	0.193	0.119	0.644	0.834	1.07	0.032	0.138	0.391	0.277
Cfs	1.8	0	0	12	7.1	40	51	59	2.0	8.0	24	16
Ac-ft												

Calendar Year 1960	Max Max	2.94	Min Min	0	Mean mgd Mean mgd	1.98	Mean of's Mean of's	3.06	Ac-ft Ac-ft	221
Fiscal Year 1960-61										

Peak discharge (base, 160 mgd).--No peak above base.

* Discharge measurement made on this day.

ISLAND OF OAHU

57

2118.50 Pua maula ditch near Waianae

Location.--Lat 21°28'12", long 158°09'43" on left bank of ditch 2.5 miles northeast of junction at Farrington Highway and Waianae Valley Road.

Records available.--June 1960 to June 1961.

Gage.--Water-stage recorder and 2-ft Parshall flume.

Extremes.--1960-61: Maximum daily discharge during period June 1960 to June 1961, 1.40 mgd (2.17 cfs) Oct. 22, 1960; minimum daily, 0.18 mgd (0.28 cfs) Nov. 3-4, 6-7, 20, 1960, Apr. 6, 12, 1961.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Pumps upstream of gage used by farmers for irrigation purposes.

Discharge, in million gallons a day, 1960

Day	June										
1	-	6	-	11	0.43	16	0.47	21	0.51	26	0.47
2	-	7	-	12	.39	17	.47	22	.51	27	.51
3	-	8	-	13	.40	18	.47	23	.47	28	.47
4	-	9	-	14	.43	19	.51	24	.47	29	.51
5	-	10	0.43	15	.47	20	.51	25	.51	30	*.43

* Discharge measurement made on this day

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.39	0.42	0.32	0.43	0.26	0.32	0.81	0.47	0.29	0.26	0.23	0.39
2	.47	.43	.32	.43	.20	.32	.67	.72	.29	.23	.23	.47
3	.47	.43	.32	.39	.18	.39	.67	.59	*.29	.23	.57	.51
4	.51	.43	.32	.39	.18	.32	*.54	.59	.29	.23	.72	.51
5	.51	.38	.32	.43	.20	.43	.72	.67	.26	*.22	.55	.51
6	.59	.36	.36	.39	.18	.81	.72	.63	.26	.18	.32	.39
7	.59	.32	.32	.39	.18	.59	.72	.59	.26	.23	.32	.36
8	.59	.32	.36	.39	.20	.67	.63	.59	.26	.26	.51	.43
9	.63	.29	.32	.39	.23	.72	.63	.59	.26	.26	.51	.59
10	.63	.29	.32	.39	.26	.76	.67	.51	.26	.26	.31	.51
11	.59	.32	.32	.36	.36	.72	.59	.47	.26	.26	.51	.47
12	.51	.29	.36	.32	.39	.72	.59	.43	.26	.18	.39	.39
13	.47	.32	.32	.39	.36	.55	.51	.63	.26	.23	.47	.39
14	.51	.32	.32	.32	.26	.51	.47	.59	.26	.29	.43	.43
15	.51	.32	.36	.36	.20	.72	.47	.63	.29	.29	.47	.39
16	.47	.32	.32	.38	.23	.72	.47	.59	.29	.32	*.51	.39
17	.51	.32	.36	.32	.39	.67	.63	.51	.26	.32	.39	.43
18	.51	.36	.39	.36	.28	.72	.63	.55	.29	.32	.36	.32
19	.47	.36	.39	.36	.20	.81	.67	.59	.26	.29	.29	.32
20	.51	.39	.32	.32	.67	.63	.67	.50	.29	.32	.39	.29
21	.47	.39	.32	1.0	.23	.55	.76	.47	.29	.32	*.51	.39
22	.47	.36	.39	1.4	.23	.72	.76	.39	.23	.29	.32	.29
23	.51	.36	.32	.60	*.39	.72	.59	.43	.23	.23	.32	.23
24	.47	.39	.32	.43	.43	.59	.43	.32	.26	.23	.36	.32
25	.47	.32	.36	.43	.43	.72	1.37	.29	.26	.23	.39	.32
26	.47	.36	.36	.36	.36	.63	.89	.32	.23	.23	.36	.29
27	.47	.36	.43	.89	.36	.67	.72	.32	.23	.23	.39	.26
28	.47	.39	.51	.26	.32	.72	.43	.32	.23	.29	.47	.29
29	.47	.32	.59	.23	.32	.72	.32	----	.23	.32	.39	.27
30	.47	.32	.55	.23	.32	.72	.36	----	.23	.32	.39	.27
31	.47	.29	-----	.23	-----	.72	1.03	-----	.26	-----	.39	-----
TOTAL	15.65	10.86	10.89	12.92	7.85	19.58	20.14	14.30	8.09	7.75	12.92	11.49
MEAN	0.505	0.350	0.363	0.417	0.862	0.632	0.650	0.511	0.261	0.258	0.417	0.383
MGD	0.781	0.542	0.562	0.643	0.805	0.977	1.01	0.790	0.404	0.400	0.645	0.593
CFS	48.0	33.0	33.0	40.0	94.0	60.0	62.0	44.0	25.0	24.0	40.0	39.0
AC-FT												

Calendar Year 1960 Max Min Mean mgd - Mean cfs - Mean ac-ft -
Fiscal Year 1960-61 Max 1.40 Min 0.18 Mean mgd 0.418 Mean cfs 0.647 Mean ac-ft 468

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 25 to Oct. 12, Oct. 21 to Nov. 29; discharge estimated on basis of records for nearby streams.

ISLAND OF OAHU

2128. Kipapa Stream near Wahiawa

Location.--Lat 21°28'15", long 157°57'50", on left bank 1,700 ft below 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 June 1961.

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

Extremes.--Maximum discharge during year, 793 mgd (1,230 cfs) Feb. 12 (gage height, 7.56 ft), from rating curve extended above 190 mgd on basis of slope-area measurement at gage height 7.96 ft; minimum, 0.14 mgd (0.22 cfs) May 13.

1957-61: Maximum discharge, 1,520 mgd (2,350 cfs) Dec. 6, 1957 (gage height, 9.57 ft), from rating curve extended above 190 mgd as explained above; no flow on many days.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(shifting-control method used June 29, 30)

2.1	0.08	3.2	18.4
2.2	.17	3.6	42.0
2.4	.87	4.0	76.0
2.6	2.55	4.1	86.0
2.8	5.70	4.5	135
3.0	10.8		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.83	1.65	3.81	1.07	1.34	0.93	33.5	1.85	2.15	0.82	2.78	2.54
2	6.06	1.07	2.35	.78	2.05	*1.00	12.0	1.21	2.35	24.8	.87	5.28
3	7.77	1.00	1.75	*.73	.87	1.85	3.25	.93	3.95	*13.7	.51	1.82
4	12.6	18.5	1.41	1.00	.55	32.0	2.05	.82	2.45	2.83	.46	.69
5	9.25	15.7	1.34	1.07	.42	7.06	4.62	.73	1.65	1.55	.64	4.51
6	2.35	3.81	2.83	.73	.37	2.05	3.24	.64	1.75	.87	.34	2.32
7	2.45	2.45	8.36	4.09	*.34	1.34	1.75	.64	3.42	.73	.29	.69
8	2.35	5.17	3.95	2.97	.34	1.00	1.75	.60	5.72	.64	.24	6.44
9	1.34	2.69	*3.25	1.34	.37	.82	1.14	11.3	*5.87	.69	.22	7.96
10	1.07	1.41	3.53	*8.84	4.23	.78	5.66	26.2	2.69	.60	.24	1.34
11	.87	1.00	1.55	6.71	27.5	.64	6.99	5.00	1.85	.51	.19	6.77
12	1.07	7.15	<u>16.8</u>	2.25	21.1	9.75	3.80	30.3	1.34	.46	.19	1.69
13	1.95	3.95	3.26	3.11	6.15	52.9	1.34	120	1.27	.39	.16	11.9
14	1.07	1.41	1.65	1.65	2.83	*68.2	27.8	30.5	1.07	.39	.34	3.11
15	.73	1.41	<u>1.32</u>	1.27	2.05	11.0	2.35	13.1	1.00	.42	.46	.93
16	.55	1.21	4.78	1.00	2.45	5.35	1.65	8.56	.93	.51	.87	.46
17	.55	2.76	1.95	5.08	1.55	3.25	3.84	19.4	.82	.37	*.51	.87
18	.51	3.05	6.21	7.62	1.75	2.69	3.71	7.08	.78	.37	.39	2.35
19	.42	1.00	3.53	2.49	2.69	2.83	1.48	4.82	.73	.60	.22	.93
20	.46	.87	6.42	4.55	12.2	2.05	*1.07	3.95	.73	9.81	.24	.37
21	.39	.69	3.67	3.81	6.78	1.55	.87	5.70	2.01	6.03	.99	.46
22	.37	.55	6.08	2.45	3.67	1.41	.82	5.00	1.27	1.41	.29	
23	.34	.69	3.95	1.14	7.54	2.05	.73	14.3	1.55	.82	.93	.22
24	.29	4.06	2.35	.82	13.4	1.21	.64	5.70	1.00	.60	.87	.24
25	.29	2.42	1.75	.78	3.11	1.00	20.3	5.00	.78	.51	.39	.19
26	11.9	1.07	1.41	6.13	2.05	1.07	8.06	3.25	.78	.60	.73	.36
27	<u>29.1</u>	1.52	3.00	1.65	1.48	.87	2.97	3.39	.69	.78	.51	.60
28	2.35	20.5	6.19	1.34	1.41	.73	1.75	2.45	.60	.55	.24	.44
29	1.41	11.0	1.85	.82	2.69	10.0	1.34	-----	.87	.37	5.40	#15.5
30	4.06	<u>42.1</u>	2.35	.73	1.27	19.7	1.27	-----	1.00	11.7	.82	20.9
31	4.53	6.83	-----	.64	6.39	7.79	-----	-----	.78	-----	.46	-----
TOTAL	105.28	168.69	112.65	78.66	134.55	253.47	169.53	332.42	57.58	84.29	22.91	102.17
MEAN												
MGD	3.40	5.44	3.76	2.54	4.49	8.18	5.47	11.9	1.86	2.81	0.739	3.41
CFS	5.25	8.42	5.81	3.93	6.94	12.6	8.46	18.4	2.87	4.35	1.14	5.27
AC-FT	323	518	346	241	413	778	520	1,020	177	259	70.0	314

Calendar Year 1960 Max 103 Min 0.16 Mean mgd 6.53 Mean cfs 4.44 Mean ac-ft 7,340
Fiscal Year 1960-61 Max 180 Min 0.16 Mean mgd 4.44 Mean cfs 6.07 Mean ac-ft 4,980

Peak discharge (base, 200 mgd)--July 26 (12 p.m.) 276 mgd (427 cfs), 5.41 ft; Aug. 30 (11:30 a.m.) 227 mgd (351 cfs), 5.11 ft;
Nov. 4 (5 p.m.) 364 mgd (563 cfs), 5.87 ft; Dec. 14 (12 m.) 220 mgd (340 cfs), 5.07 ft; Jan. 1 (7 a.m.) 216 mgd (334 cfs), 5.04 ft;
Feb. 13 (4 a.m.) 793 mgd (1,230 cfs), 7.56 ft.

* Discharge measurement made on this day.

2130. Waikale Stream at Waipahu

Location.--Lat 21°23'09", long 158°00'48", on left bank, 300 ft upstream from bridge on Farrington Highway, 0.3 mile south of Waipahu and 2.5 miles west of Pearl City.

Drainage area.--44.9 sq mi.

Records available.--June 1951 to March 1952 (fragmentary), April 1952 to Oct. 1959, July 1960 to June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level. Prior to Oct. 1959 at site 300 ft downstream at different datum.

Average discharge.--8 years (1952-59, 1960-61), 24.1 mgd (37.3 cfs).

Extremes.--1959-60: Maximum discharge during the period July to Oct., 515 mgd (797 cfs) Aug. 6 (gage height, 4.45 ft), from rating curve extended above 470 mgd on basis of slope-area measurement at gage height 14.82 ft; minimum, 7.58 mgd (11.7 cfs) Sept. 21, 25.

1960-61: Maximum discharge during fiscal year, 301 mgd (466 cfs) Feb. 13 (gage height, 4.07 ft), from rating curve extended above 45 mgd on basis of logarithmic plotting; minimum, 7.44 mgd (11.5 cfs) Sept. 15.

1951-61: Maximum discharge, 8,790 mgd (13,600 cfs) Nov. 28, 1954 (gage height, 14.82 ft), from rating curve extended above 470 mgd on basis of slope-area measurement at gage height 14.82 ft; minimum recorded, 6.4 mgd (9.9 cfs) Sept. 28-30, 1953.

Remarks.--Records good except those for periods of no or faulty gage-height record, which are poor. Flow is regulated by plantation operation.

Rating table (gage height in feet, and discharge, in million gallons a day)

1.8	6.60	2.4	28.0
1.9	8.70	2.8	58.0
2.0	11.3	3.2	105
2.2	18.5		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10	11.9	7.86	11.6	7.65	9.48	46.9	17.7	14.9	14.9	17	8.70
2	11	11.9	7.23	11.9	7.65	10.3	39.6	17.3	*14.9	15.3	15	9.74
3	12	11.6	7.86	8.70	7.65	12.3	23.0	17.3	15.3	14.5	13	12.6
4	13	12.3	8.96	7.65	8.07	17.4	16.5	16.9	15.3	13.5	12	11.6
5	11	11.3	10.0	7.65	11.0	30.8	*15.7	16.9	16.5	11.3	13	11.9
6	*12	12.3	8.49	9.0	10.8	14.5	14.9	16.9	16.1	9.48	11	10.5
7	14.2	14.2	7.86	13	7.65	12.9	15.7	16.9	14.9	9.74	10	9.48
8	12.9	10.0	7.65	12.5	7.44	12.6	15.7	16.5	13.5	14.2	9.0	9.74
9	12.9	9.74	7.65	11	7.86	11.9	14.2	16.1	10.8	14.5	8.6	9.74
10	12.9	10.3	9.74	14	8.07	12.9	14.2	25.1	10.3	11.3	8.0	11.9
11	12.3	10.8	11.0	12	10.3	14.2	15.3	23.0	15.7	10.8	7.4	14.2
12	12.9	10.8	9.22	12	18.2	15.3	14.2	20.3	15.7	10.0	*7.2	10.5
13	12.6	10.8	8.07	9.0	13.2	31.4	14.5	98.8	11.3	10.0	7.0	11.3
14	12.9	10.8	7.65	8.49	8.07	47.7	21.8	49.6	10.5	10.0	8.0	10.0
15	12.9	12.9	7.65	11.3	*8.07	25.5	18.1	32.9	9.74	13.9	9.0	9.22
16	12.9	15.7	7.65	12.3	7.86	16.1	13.9	20.8	9.48	15.7	10	8.96
17	13.2	14.2	10.0	8.96	8.49	14.9	14.5	21.6	9.48	10.0	9.0	10.8
18	11.9	12.3	11.3	8.96	8.96	14.9	14.9	23.0	15.3	10	8.6	11.9
19	12.3	10.5	10.0	8.70	12.3	15.3	14.9	20.8	15.7	13	8.0	9.74
20	11.9	9.48	8.28	14.2	12.6	14.9	14.2	18.1	11.9	18	8.0	8.96
21	11.6	9.74	7.86	*11.3	8.07	14.9	15.3	16.5	12.9	15	9.0	*9.74
22	11.6	9.74	7.86	13.2	9.22	14.5	15.7	16.5	13.2	12	12	8.96
23	13.5	*8.28	7.86	10.8	10.8	14.2	13.9	17.7	11.0	9.0	11	9.74
24	14.9	7.86	10.0	8.70	11.9	13.9	13.9	19.4	10.8	8.4	9.48	14.5
25	11.6	7.86	12.3	8.07	13.9	13.9	31.1	16.9	14.2	8.0	9.48	14.5
26	11.9	7.86	10.0	7.65	12.6	14.5	*32.8	16.5	17.3	9.0	9.48	11.0
27	23.5	9.48	*7.65	7.65	12.6	14.5	20.3	16.1	11.3	10	11.9	10.3
28	11.9	10.5	7.86	8.07	10.8	14.5	16.9	14.5	12.6	9.0	11.0	9.48
29	11.9	9.48	8.07	11.0	10.0	13.5	16.5	-----	12.6	8.0	14.2	9.74
30	12.9	17.8	8.49	13.2	9.74	16.1	16.5	-----	*12.6	20	10.0	16.1
31	13.9	10.3	-----	7.65	-----	19.4	22.0	-----	15.3	-----	8.49	-----
Total	396.9	342.72	262.07	319.70	301.52	519.18	587.6	640.6	411.10	358.52	314.83	325.54
Mean												
Mgd	12.8	11.1	8.74	10.3	10.1	16.7	19.0	22.9	13.3	12.0	10.2	10.9
Cfs	19.8	17.2	13.5	15.9	15.6	25.8	29.4	35.4	20.6	18.6	15.8	16.9
Ac-ft	1220	1050	804	981	925	1590	1800	1970	1260	1100	966	999

Calendar Year	1960	Max	-	Min	-	Mean mgd	-	Mean cfs	-	Ac-ft	-
Fiscal Year	1960-61	Max	98.8	Min	7.0	Mean mgd	13.1	Mean cfs	20.3	Ac-ft	14,660

Peak discharge (base, 700 mgd).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record July 1-6, Oct. 6-13, Apr. 18 to May 23; discharge estimated on basis of records of nearby station.

ISLAND OF OAHU

60

2140. Pearl Harbor Springs at Waiawa, near Pearl City

Location.--Lat 21°23'35", long 157°59'10", on right bank at rear of Oahu Sugar Co.'s pumping plant 9, 0.7 mile west of Pearl City and 9.8 miles northwest of Honolulu.

Records available.--March 1931 to June 1934, July 1937 to June 1961.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 0.73 ft below mean sea level, datum of 1929.

Average discharge.--27 years (1931-34, 1937-61), 11.8 mgd (18.3 cfs), unadjusted for pumping.

Extremes.--1931-34, 1937-61: Maximum daily discharge, 18.7 mgd (28.9 cfs) Feb. 27, 1949; minimum daily, 5.48 mgd (8.48 cfs) on several days in 1950.

Remarks.--Records good. Oahu Sugar Co.'s pump 9 diverts about 3 mgd at times when water is needed for irrigation of sugarcane. Surface runoff from floods not included in figures of discharge given below.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	7.33	6.68	5.75	9.13	5.75	5.75	10.0	9.71	10.6	9.13	9.42	7.27
2	9.71	6.02	6.57	9.13	5.75	7.72	10.0	9.71	10.6	9.13	9.42	7.14
3	9.71	6.02	8.55	6.31	5.75	8.84	10.0	9.71	10.6	6.74	9.42	8.55
4	10.0	6.02	8.55	6.10	6.65	9.13	10.0	10.0	10.6	7.33	9.42	8.55
5	6.72	6.76	8.55	8.14	9.13	10.0	10.0	10.9	7.20	9.42	7.68	
6	7.09	9.13	6.60	9.13	9.13	10.0	10.0	10.9	7.07	9.42	7.55	
7	10.0	9.13	5.75	7.81	8.79	8.64	10.0	8.71	7.68	7.07	9.42	7.27
8	9.71	6.31	5.75	8.84	8.00	8.84	10.0	8.53	7.39	9.42	9.42	6.25
9	9.71	5.75	5.75	9.13	7.72	9.13	10.0	8.14	7.10	9.42	9.71	6.89
10	9.71	5.48	6.78	6.31	7.86	9.13	*10.0	8.43	6.95	8.51	9.71	8.55
11	9.71	5.48	8.84	5.98	7.44	9.42	10.0	9.71	8.64	9.42	8.55	
12	8.14	6.17	6.31	5.48	9.13	9.42	10.0	10.0	9.71	8.38	*8.25	6.89
13	7.87	8.26	5.75	5.48	9.13	9.42	10.0	10.0	7.61	8.77	7.83	7.53
14	7.48	8.55	5.75	5.98	6.40	9.42	10.0	10.0	6.79	9.42	9.13	6.60
15	6.56	6.22	5.75	8.55	*5.75	9.42	10.0	7.51	9.42	6.81	7.53	
16	7.04	5.48	6.65	8.84	6.91	9.42	10.0	10.0	7.63	9.42	6.45	8.04
17	9.42	5.48	8.84	6.31	7.68	9.42	9.71	10.0	7.75	9.71	7.42	8.55
18	6.86	5.48	8.84	5.75	7.68	9.42	8.38	10.3	9.71	9.71	7.81	8.55
19	6.29	5.48	6.24	5.75	8.84	9.42	8.38	10.6	10.0	9.42	7.68	8.55
20	6.29	5.99	5.48	6.39	9.13	9.42	10.0	7.22	9.71	8.84	7.38	
21	6.29	8.55	5.48	7.68	7.81	8.38	9.42	10.6	7.33	9.71	9.13	8.55
22	6.02	5.86	5.48	8.84	7.62	8.25	9.42	10.6	9.42	9.71	8.14	6.89
23	6.49	*5.48	5.48	8.84	7.62	8.18	9.42	10.6	9.42	9.71	7.58	6.38
24	9.42	5.48	6.22	7.30	8.55	9.42	9.42	10.6	9.42	10.0	7.67	8.55
25	6.45	5.48	8.55	8.55	8.84	9.42	9.42	10.9	9.42	9.71	6.68	8.55
26	6.29	5.48	6.27	8.55	9.13	9.71	9.42	10.9	9.42	10.0	7.27	*8.14
27	6.29	6.12	*5.75	8.71	9.13	9.71	9.42	10.9	8.64	9.71	8.55	8.84
28	6.29	8.84	5.75	8.07	7.19	10.0	9.42	*10.6	9.42	9.71	8.55	7.50
29	6.45	6.60	5.75	8.84	6.02	10.0	9.71	-----	7.32	9.71	7.02	5.98
30	9.42	5.75	6.65	9.13	5.75	10.0	9.71	-----	*6.91	9.71	7.14	8.13
31	9.42	5.75	-----	6.36	-----	9.71	9.71	-----	8.84	-----	7.27	-----
TOTAL MEAN	244.18	199.28	198.43	235.41	230.28	282.62	300.38	279.85	272.52	271.30	259.42	231.38
MGD	7.88	6.43	6.61	7.59	7.68	9.12	9.69	9.99	8.79	9.04	8.37	7.71
CFS	12.2	9.94	10.2	11.7	11.9	14.1	15.0	15.5	13.6	14.0	12.9	11.9
AC-FT	749	612	609	722	707	867	922	859	836	833	796	710

CALENDAR YEAR 1960 MAX 10.9 MIN 5.48 MEAN MGD 8.14 MEAN CFS 12.6 AC-FE 9,140
FISCAL YEAR 1960-61 MAX 10.9 MIN 5.48 MEAN MGD 8.23 MEAN CFS 12.7 AC-FI 9,220

* Discharge measurement made on this day.

ISLAND OF OAHU

61

2160, Waiawa Stream near Pearl City

Location.--Lat 21°23'55", long 157°58'50", on left bank 100 ft upstream from bridge on Farrington Highway, 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 June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level, datum of 1929.

Average discharge.--9 years, 15.2 mgd (23.5 cfs).

Extremes.--Maximum discharge during year, 2,080 mgd (3,220 cfs) Feb. 13 (gage height, 9.47 ft), from rating curve extended above 700 mgd on basis of slope-area measurement at gage height 17.1 ft; minimum, 2.20 mgd (3.40 cfs) May 11.

1952-61: Maximum discharge 10,900 mgd (16,900 cfs) Nov. 28, 1954 (gage height, 19.27 ft), from rating curve extended above 700 mgd as explained above; minimum 1.67 mgd (2.58 cfs) June 8, 1957.

Remarks.--Records good except those for period of no gage-height record, which are poor. Small quantity of water diverted occasionally for irrigation.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.5	1.92	2.5	30.3
1.6	2.90	3.0	75.0
1.8	5.50	3.5	151
2.0	9.27	4.0	263
2.2	15.2	5.0	493

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.53	3.45	6.96	5.67	4.74	6.53	51.3	5.67	4.78	2.90	13.0	2.70
2	6.09	4.09	5.21	4.35	6.01	6.36	32.5	4.20	4.49	13.7	8.0	3.10
3	12.1	4.78	3.93	4.65	6.36	5.21	12.8	3.57	3.45	24.2	4.5	2.90
4	34.9	7.80	3.57	5.82	7.70	79.3	7.42	3.30	3.80	8.24	6.0	2.70
5	11.9	9.90	3.33	6.01	5.67	41.8	5.36	3.20	4.49	5.21	6.4	2.70
6	9.13	7.07	3.74	6.01	4.64	11.6	7.42	2.90	3.80	3.69	5.4	5.21
7	7.63	4.20	3.51	5.50	4.81	6.87	5.21	2.90	2.90	3.84	4.0	3.30
8	5.84	3.69	7.89	4.64	6.56	5.21	4.20	2.90	8.58	3.30	3.3	3.10
9	4.35	4.35	9.70	3.93	9.52	4.35	3.69	3.44	12.6	3.10	2.8	11.0
10	3.69	4.78	8.24	10.1	8.86	3.93	*4.40	42.3	5.84	2.90	2.4	5.50
11	3.22	5.67	7.22	17.4	59.8	3.69	26.1	20.5	4.35	2.80	*8.2	5.36
12	4.58	6.36	27.0	6.87	25.4	10.9	8.24	28.0	3.57	2.70	2.40	4.78
13	4.35	5.00	12.7	6.27	13.1	94.9	5.50	331	3.20	2.70	2.50	5.50
14	5.15	4.92	8.45	5.84	7.83	149	46.4	63.4	3.30	2.60	2.30	8.86
15	5.36	4.78	7.42	4.64	6.53	51.4	10.1	37.9	3.30	2.50	2.30	4.78
16	5.84	4.64	6.67	3.80	*6.36	35.5	5.21	18.9	3.30	2.40	2.30	3.20
17	4.49	5.21	5.50	4.06	4.78	15.7	4.92	26.8	3.57	2.40	2.40	3.00
18	3.93	5.21	4.78	7.98	5.51	9.52	8.37	15.7	3.20	2.40	2.40	2.80
19	4.06	5.21	4.64	5.07	5.64	8.24	5.50	10.3	3.91	2.50	2.40	3.10
20	4.31	5.21	5.67	4.35	21.4	6.36	4.06	8.04	5.84	2.90	2.60	3.00
21	4.01	4.49	5.07	4.64	26.0	4.78	3.69	7.83	25.7	2.70	2.60	2.90
22	3.80	4.35	4.49	4.49	13.8	3.93	3.69	8.65	12.8	2.50	2.60	3.00
23	4.13	4.20	4.72	4.06	11.8	3.57	3.10	53.5	6.87	2.30	2.60	2.80
24	3.45	4.64	4.14	4.06	19.3	3.20	2.90	24.1	4.78	2.70	2.60	2.90
25	3.45	5.01	4.06	4.20	11.2	3.10	9.04	18.7	3.80	3.50	2.60	2.90
26	3.93	5.03	3.69	4.06	6.70	3.10	22.0	9.77	3.30	4.00	2.60	*2.70
27	42.9	5.03	*4.06	5.84	5.21	3.00	9.27	6.70	3.10	3.50	2.60	2.60
28	6.89	4.35	10.7	4.64	5.44	2.90	5.84	*5.36	2.90	4.50	2.60	2.60
29	4.64	4.35	6.52	3.80	6.57	30.4	4.49	-----	2.80	6.00	2.60	3.58
30	3.80	37.5	11.6	3.57	6.36	95.9	3.93	-----	2.80	9.00	2.90	30.0
31	3.45	16.1	-----	3.45	-----	17.5	6.31	-----	2.90	-----	2.70	-----
TOTAL	233.95	201.37	205.18	169.77	333.60	727.75	332.96	769.53	164.02	137.68	108.60	142.57
MEAN												
MGD	7.55	6.50	6.84	5.48	11.1	23.5	10.7	27.5	5.29	4.59	3.50	4.75
CFS	11.7	10.0	10.6	8.47	17.2	36.3	16.6	42.5	8.19	7.10	5.48	7.35
AC-FT	718	618	630	521	1,020	2,230	1,020	2,360	503	483	333	438

Calendar Year 1960 Max 668 Min 2.90 Mean mgd 15.1 Mean cfs 93.4 Ac-ft 16,080
Fiscal Year 1960-61 Max 331 Min 8.2 Mean mgd 9.66 Mean cfs 14.9 Ac-ft 10,080

Peak discharge (base, 800 mgd).--Dec. 4 (8 p.m.) 879 mgd (1,360 cfs), 6.53 ft; Feb. 13 (5 a.m.) 2,069 mgd (3,220 cfs), 9.47 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 11 to May 11, June 30; discharge estimated on basis of records for nearby stations.

ISLAND OF OAHU

2190. Hawaiian Electric Co. tunnel at Waianae, near Pearl City

Location.--Lat 21°23'30", long 157°57'55", on right bank of ditch at Hawaiian Electric Co.'s Waianae powerplant, 0.6 mile east of Pearl City, and 8.8 miles northwest of Honolulu.

Records available.--October 1939 to December 1945, July 1952 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 2.91 ft above mean sea level, datum of 1929. Prior to July 1, 1952, water-stage recorder at site 120 ft downstream at datum 2.27 ft lower.

Average discharge.--11 years (1940-41, 1944-45, 1952-61), 10.4 mgd (16.1 cfs).

Extremes.--1939-45, 1952-61: Maximum daily discharge, 17.3 mgd (26.8 cfs) Mar. 26, 27, 1940; minimum daily, 6.0 mgd (9.3 cfs) Aug. 3, 1941.

Remarks.--Records good. Flow regulated by valves. Water used for cooling condensers of powerplant, and afterwards for irrigation of sugarcane.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	9.35	9.68	9.35	9.57	9.68	10.1	10.7	10.7	10.9	10.5	10.2	10.0
2	9.57	9.68	9.35	9.57	9.68	10.1	10.0	10.7	10.8	10.5	10.2	10.1
3	9.57	9.68	9.35	9.57	9.79	9.90	10.7	10.8	10.8	10.8	10.1	10.1
4	9.57	9.68	9.46	9.57	9.79	10.2	10.5	10.9	10.8	*10.8	10.2	9.90
5	9.57	9.35	9.57	9.57	9.68	10.1	10.5	10.9	10.8	10.7	10.1	10.0
6	9.57	9.46	9.46	9.57	9.79	10.1	10.7	11.2	10.8	10.5	10.3	10.0
7	9.68	9.57	9.46	9.57	9.90	10.1	10.6	11.4	10.8	10.3	10.2	10.0
8	9.57	9.68	9.35	9.57	9.79	10.1	10.6	10.9	10.8	10.2	10.2	10.0
9	9.57	9.68	9.35	9.57	9.57	10.1	10.7	10.9	10.8	10.3	10.2	10.0
10	9.57	9.57	9.46	9.46	9.79	9.46	10.1	10.7	10.8	10.2	10.2	9.90
11	9.68	9.68	9.57	9.79	9.90	10.1	*10.5	10.7	10.6	10.2	10.2	9.90
12	9.57	9.79	9.46	9.79	9.90	10.2	10.3	10.8	10.7	10.3	10.2	9.79
13	9.57	9.57	9.35	9.79	9.90	10.2	10.3	10.9	10.7	10.2	10.2	10.0
14	9.57	9.57	9.35	9.68	*9.79	10.2	10.5	10.9	10.7	10.2	10.2	9.90
15	9.57	9.68	9.35	9.46	9.79	10.1	10.6	10.7	10.7	10.3	10.1	9.90
16	9.57	9.68	9.35	9.46	10.1	10.1	10.6	10.9	10.7	10.3	10.2	9.90
17	9.57	9.68	9.35	9.68	9.79	10.2	10.6	10.7	10.7	10.2	10.2	9.68
18	9.68	9.68	9.35	9.68	9.79	10.3	10.5	10.8	10.5	10.2	10.1	9.79
19	9.46	9.68	9.35	9.68	9.90	10.2	10.5	10.8	10.5	10.5	10.1	9.90
20	9.35	9.35	9.35	9.68	9.90	10.2	10.7	10.9	10.7	10.2	10.1	9.90
21	9.35	9.35	9.35	9.68	10.1	10.2	10.5	10.9	10.7	10.2	10.1	10.0
22	9.35	9.68	9.46	9.68	10.1	10.2	10.6	10.8	10.7	10.2	10.1	10.1
23	9.46	9.68	9.35	9.68	10.0	10.2	10.5	10.7	10.7	10.2	10.1	10.0
24	9.46	9.68	9.35	9.79	9.90	10.2	10.3	10.7	10.7	10.2	10.1	9.79
25	9.68	9.57	9.46	9.68	9.90	10.3	10.6	10.8	10.6	10.2	10.1	9.90
26	9.57	9.35	*9.46	9.68	10.0	10.3	10.6	10.8	10.6	10.1	10.1	10.0
27	9.57	9.35	9.57	9.68	10.1	10.7	10.6	10.7	10.7	10.1	10.1	10.1
28	9.57	9.46	9.68	9.68	10.1	10.7	10.7	*10.8	10.7	10.1	9.90	10.3
29	9.57	9.35	9.68	9.57	10.1	10.7	10.7	-----	10.7	10.2	10.1	10.3
30	9.57	9.35	9.57	9.68	10.1	10.3	10.7	-----	10.7	10.2	9.90	10.5
31	9.57	9.35	-----	9.68	-----	10.5	10.7	-----	10.8	-----	9.90	-----
TOTAL	295.90	296.56	282.92	299.09	296.29	317.00	327.3	303.5	332.2	309.1	314.00	299.65
MEAN												
MGD	9.55	9.57	9.43	9.65	9.88	10.2	10.6	10.8	10.7	10.3	10.1	9.99
CFS	14.8	14.8	14.6	14.9	15.3	15.8	16.3	16.8	16.6	15.9	15.7	15.5
AC-FT	908	910	868	918	909	973	1,000	931	1,020	949	964	920

CALENDAR YEAR 1960 MAX 10.7 MIN 9.35 MEAN MGD 9.81 MEAN CFS 15.2 AC-FT 11,020
FISCAL YEAR 1960-61 MAX 11.4 MIN 9.35 MEAN MGD 10.1 MEAN CFS 15.6 AC-FT 11,270

* Discharge measurement made on this day.

2230. Waimalu Stream near Aiea

Location.--Lat $21^{\circ}23'35''$, long $157^{\circ}57'02''$, on right bank 350 ft downstream from bridge on Moanalua Highway, 1.5 miles northwest of Aiea, and 1.6 miles east of Pearl City.

Drainage area.--6.07 sq mi.

Records available.--January 1952 to June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1.84 ft above mean sea level datum of 1927. Prior to Dec. 16, 1960, at site 350 ft upstream at different datum.

Average discharge.--9 years, 4.47 mgd (6.92 cfs).

Extremes.--Maximum discharge during year, 392 mgd (607 cfs) Dec. 4 (gage height, 4.57 ft), from rating curve extended above 380 mgd on basis of slope-area measurement of peak flow; minimum daily, 0.12 mgd (0.19 cfs) Aug. 24.

1952-61: Maximum discharge, 2,790 mgd (4,320 cfs) May 14, 1960 (gage-height, 9.49 ft, from floodmark in well), from rating curve extended above 380 mgd as explained above; no flow Sept. 25, 28-30, Oct. 1, 1958.

Remarks.--Records fair for period July 1 to Dec. 15 except those for periods of no gage-height record, which are poor. For the period Feb. 21 to June 30, records good. Small quantities of water diverted for irrigation.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.31	0.77	*1.27	1.10	*0.51	*0.82	1.5	0.70	0.93	0.46	0.68	0.31
2	1.31	.75	1.14	.75	.84	.57	8.0	.56	.93	1.14	.42	.53
3	2.49	.48	1.46	.63	1.14	.53	*3.0	.45	.49	1.14	.31	.53
4	6.53	2.78	1.18	.51	1.23	27.0	1.5	.40	.49	*3.48	.47	.38
5	2.55	1.80	.80	.49	.94	7.33	.90	.35	.46	1.72	.49	.53
6	1.68	.77	.58	.31	.77	2.75	1.3	.32	.46	.93	.38	.53
7	2.35	.26	1.52	.16	.72	1.68	.80	*.28	.57	.68	.34	.53
8	1.12	.15	1.96	.21	.60	1.03	.60	.28	.82	.65	.34	.49
9	.59	.18	*2.07	.16	.48	.75	.45	.50	.68	.98	.29	.57
10	.44	.21	2.96	.21	*.80	.70	.70	6.0	.68	.57	.29	.53
11	.58	.25	1.38	.22	20.0	.84	4.5	3.5	.49	.53	.25	.49
12	1.07	.30	7.91	.22	4.96	6.77	1.5	9.0	.46	.42	*.27	.42
13	.80	.23	2.61	.27	2.43	28.4	1.0	.50	.38	.36	.31	.38
14	.63	.21	1.25	*.44	*1.27	27.7	8.0	.15	.36	.34	.36	.36
15	.55	.20	.34	.31	.77	*8.72	2.0	7.0	.36	.31	.31	.49
16	.46	.20	*.26	.42	.60	5.0	.90	2.0	.65	.31	.27	.61
17	.39	.25	.16	1.12	.53	2.5	.80	5.0	.65	.29	.27	.53
18	.28	.25	.17	3.67	.47	1.5	1.4	3.4	.57	.29	.25	.46
19	.47	.25	.17	1.38	.43	1.1	.90	2.5	.46	.31	.49	.57
20	.35	.25	.20	1.07	5.59	.80	.60	1.4	.42	.36	.53	.65
21	*.28	.16	.27	*.77	5.12	.64	.45	.82	16.6	.31	.38	.65
22	.20	.14	.23	.80	2.41	.50	.43	.72	4.21	.29	.34	.61
23	.19	.13	.30	.53	1.58	*.41	.40	17.6	1.40	.25	.34	.68
24	.34	.12	.28	.42	4.14	.37	.38	5.20	.76	.29	.29	.68
25	.51	.19	.42	.42	1.91	.35	1.4	3.40	.61	.29	.29	.61
26	.63	*.40	*.53	.42	.67	.34	4.0	1.72	.46	.34	.31	*.57
27	31.1	.42	4.67	*.39	.35	.33	1.5	1.32	.36	.27	.38	.53
28	2.32	2.77	4.40	.34	.51	.33	.80	*.76	.38	.29	.38	.49
29	1.18	6.81	8.56	.31	.63	6.0	.60	-----	.49	.38	.36	.65
30	.87	9.81	2.98	.42	.48	26	.54	-----	.38	.46	.34	15.6
31	.94	3.80	-----	.44	-----	5.0	.80	-----	.42	-----	.31	-----
Total	64.51	35.29	52.03	18.91	62.88	166.86	65.15	140.18	37.38	38.96	11.04	30.96
Mean												
Mgd	2.08	1.14	1.73	0.610	2.10	5.38	2.10	5.01	1.21	1.30	0.356	1.03
Cfs	3.22	1.76	2.68	0.944	3.25	8.32	3.25	7.75	1.87	2.01	0.551	1.59
Ac-ft	198	108	160	58	193	512	200	430	115	120	34	95
Calendar Year 1960		Max	336	Min	0.12	Mean mgd	4.69	Mean cfs	7.25	Ac-ft	5.280	
Fiscal Year 1960-61		Max	50	Min	0.12	Mean mgd	1.98	Mean cfs	3.06	Ac-ft	2.220	

Peak discharge (base, 250 mgd).--July 27 (12 a.m.) 347 mgd (537 cfs), 4.22 ft; Dec. 4 (7:30 p.m.) 392 mgd (607 cfs), 4.57 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 8 to Aug. 23, Dec. 16 to Feb. 20; discharge estimated on basis of records for nearby streams.

ISLAND OF OAHU

2240. Pearl Harbor Springs at Kalauao, near Aiea

Location--Lat $21^{\circ}23'05''$, long $157^{\circ}56'45''$, on left bank 900 ft downstream from Oahu Sugar Co.'s pump 6, 1.1 miles west of Aiea and 7.16 miles northwest of Honolulu.

Records available--March 1931 to June 1961.

Gage--Water-stage recorder and sharp-crested weir. Datum of gage is 1.38 ft below mean sea level, datum of 1929.

Average discharge--30 years, 15.8 mgd (24.4 cfs), unadjusted for pumping.

Extremes--1931-61: Maximum daily discharge, 25 mgd (39 cfs) Feb. 17-26, 1938; Feb. 23, 24, 1955; minimum daily, 7.06 mgd (10.9 cfs) Aug. 10, 1960.

Remarks--Records good except those for period of no gage-height record, which are fair. When water is needed for irrigation of sugar cane, Oahu Sugar Co.'s pump 6 diverts about 7 mgd as a high-lift pump or 9 mgd as a low-lift pump. Surface runoff from floods not included in figures of discharge given below.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	14.6	14.6	13.8	13.8	11.2	11.7	15.9	*16.7	14.0	15.9	15.4	14.6
2	14.6	14.2	9.89	13.8	11.1	10.3	15.9	16.7	*14.0	15.9	15.4	11.1
3	14.6	11.9	14.2	10.3	10.8	14.6	15.9	16.7	14.1	15.4	15.4	14.6
4	14.6	10.5	14.2	11.0	14.6	15.0	16.3	16.7	17.6	15.4	11.7	14.6
5	14.6	12.7	14.2	10.6	14.6	14.6	16.3	16.7	17.6	12.0	11.7	10.2
6	10.9	14.6	8.63	10.9	14.0	14.6	16.3	11.8	15.8	11.9	11.8	11.1
7	14.6	14.2	8.00	10.8	9.89	12.3	16.7	13.4	16.7	12.2	15.4	11.1
8	14.6	12.1	8.63	14.2	9.89	12.9	16.7	13.8	16.7	15.0	11.5	10.8
9	14.6	11.5	10.3	9.14	12.0	14.6	*16.7	14.3	16.7	15.0	10.1	12.8
10	14.6	7.06	14.6	7.69	9.89	14.6	16.7	16.7	16.7	12.0	14.6	14.6
11	8.29	14.6	14.6	9.66	10.2	14.6	16.7	16.7	12.3	11.8	14.6	
12	10.2	A14.6	10.1	10.7	14.6	14.6	16.7	16.7	12.4	15.0	10.7	
13	12.7	A14.6	11.6	10.0	14.6	14.6	16.7	16.7	15.0	15.0	14.6	
14	14.6	A14.6	11.5	10.6	14.6	15.0	16.7	16.7	15.0	15.0	14.6	
15	14.6	A14.6	11.6	13.8	14.6	15.0	16.7	16.7	15.4	15.0	14.6	
16	14.6	A14.6	14.6	13.3	14.6	14.6	16.7	16.7	13.5	15.4	*15.0	14.6
17	14.6	A13.0	14.6	10.6	14.6	14.6	16.7	16.7	14.1	15.4	A14.6	14.6
18	14.6	A13.8	14.6	11.5	14.6	14.6	16.7	16.7	11.5	A14.6	14.6	
19	12.3	A13.8	13.7	11.0	15.0	14.6	16.7	16.7	12.1	A11.1	10.5	
20	14.6	A13.8	8.00	11.5	15.0	14.6	16.7	16.7	11.8	A14.6	10.8	
21	14.6	A13.8	9.89	14.2	15.0	14.6	16.7	16.7	12.9	A14.6	11.1	
22	13.4	A13.8	11.8	13.8	15.0	14.6	16.3	16.7	13.8	A10.2	8.32	
23	14.6	A13.8	11.8	9.59	15.0	14.6	12.8	16.7	13.2	15.0	A10.8	13.7
24	14.6	13.8	10.8	9.59	15.0	14.6	11.6	16.7	13.8	12.1	10.7	14.6
25	14.6	9.87	10.2	9.59	15.0	14.6	16.7	16.7	15.9	12.1	10.8	14.6
26	13.2	8.62	9.89	10.0	14.6	14.6	16.7	16.7	15.9	13.8	12.8	11.8
27	12.9	9.59	10.2	12.1	14.6	15.0	16.7	13.7	15.9	15.4	13.7	*14.6
28	12.2	11.3	11.5	10.3	12.2	15.0	16.7	13.7	15.4	15.4	14.6	14.6
29	14.6	11.5	12.0	14.2	11.3	10.8	16.7	-----	15.4	15.4	11.1	14.6
30	14.6	11.5	11.6	14.6	11.7	15.4	16.7	-----	15.4	15.4	14.6	14.6
31	14.6	14.2	-----	11.2	-----	15.4	17.2	-----	15.4	-----	14.6	-----
TOTAL	427.29	397.14	351.03	354.06	399.77	441.2	505.2	448.1	480.9	418.4	413.2	392.22
MEAN												
MGD	13.8	12.8	11.7	11.4	13.3	14.2	16.3	16.0	15.5	13.9	13.3	13.1
CFS	21.3	19.8	18.1	17.7	20.6	22.0	25.2	24.8	24.0	21.6	20.6	20.2
AC-FT	1,310	1,220	1,080	1,090	1,230	1,350	1,550	1,380	1,480	1,280	1,270	1,200

Calendar Year 1960 Max 16.7 Min 7.06 Mean mgd 13.4 Mean cfs 20.7 Ac-ft 15,070
Fiscal Year 1960-61 Max 17.6 Min 7.06 Mean mgd 13.8 Mean cfs 21.4 Ac-ft 15,440

* Discharge measurement made on this day.

Note--No gage-height record Aug. 12-23, Dec. 2 to Jan. 9, Apr. 8 to May 23; discharge computed on basis of pumping record.

ISLAND OF OAHU

65

2245, Kalauao Stream at Moanalua Road at Aiea

Location.--Lat 21°23'07", long 157°56'22", on left bank of stream at 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 June 1961.

Gage.--Water stage recorder and concrete control. Datum of gage is 12.75 ft above mean sea level, datum of 1929. July 22, 1953 to June 19, 1957, at site 0.1 mile downstream. Records not equivalent due to spring inflow.

Extremes.--Maximum discharge during year, 116 mgd (179 cfs) Sept. 29 (gage height, 3.73 ft), from rating curve extended above 60 mgd on basis of slope-area measurement at peak; minimum daily, 0.02 mgd (0.03 cfs) Aug. 23-28, Sept. 24-25.

1953-61: Maximum discharge, 1,160 mgd (1,790 cfs) May 14, 1960.

1957-61: Minimum daily discharge, Sept. 28, 1959, Aug. 23-28, Sept. 24-25.

Remarks.--Records good. Some return of irrigation water.

Rating table (gage height, in feet and discharge, in million gallons a day)

0.4	0.02	0.9	3.09
.5	.25	1.1	6.10
.6	.62	1.4	11.8
.7	1.14	1.8	21.5
.8	1.96		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.12	0.06	0.06	0.17	0.19	0.12	8.79	0.50	0.19	0.12	0.22	0.14
2	.10	.10	.06	.10	.12	.12	5.78	.19	.19	5.15	.14	.12
3	.32	.04	.08	.08	.12	.10	1.66	.17	.17	5.31	.14	.12
4	1.48	.17	.08	.06	.19	6.46	.71	.17	.14	1.33	.14	.14
5	.54	.08	.19	.06	.12	4.88	.35	.14	.14	*.46	.14	.14
6	.14	.08	.54	.06	.10	.66	.50	.14	.14	.25	.14	.12
7	1.22	.06	.38	.06	.10	.22	.25	.14	.12	.22	.14	.17
8	.19	*.06	.08	.08	.10	.17	.22	.14	.12	.19	*.14	.17
9	.12	.04	.08	.08	.10	.17	.22	2.15	.12	.19	.12	.17
10	.10	.04	.04	.08	.95	.14	3.58	9.15	.12	.17	.14	.12
11	.10	.04	.06	.08	8.72	.14	3.20	2.72	.12	.17	.17	.14
12	.10	.04	1.15	.08	2.37	4.01	.71	4.46	.12	.17	.12	.14
13	.10	.04	.12	.08	.71	1.21	.25	16.6	.12	.17	.12	.12
14	.10	.04	.04	.08	*.19	11.6	1.90	5.42	.12	.17	.12	.12
15	.10	.04	.04	.08	.12	4.14	.50	3.45	.12	.17	.12	.12
16	.08	.04	.04	.08	.14	2.96	.19	2.37	.12	.17	.12	.12
17	.08	.04	.04	2.70	.17	1.02	.19	6.82	.12	.14	.12	.12
18	.08	.06	.04	.91	.10	.50	.17	2.60	.12	.14	.12	.12
19	.08	.08	.06	.35	.10	1.57	.17	.91	.12	.17	.14	.12
20	.06	.10	.06	.12	4.32	.58	.14	.46	.12	.17	.17	*.10
21	.08	.08	.06	8.79	1.96	.25	.14	.28	4.33	.17	.12	.10
22	.10	.06	.06	.56	.62	.19	.12	.25	1.48	.17	.12	.12
23	.08	.02	.06	.12	.25	.19	.10	6.98	.42	.17	.12	.17
24	.06	.02	.02	.12	1.31	.19	.10	2.26	.17	.17	.12	.22
25	.06	.02	.02	.12	.54	.17	.23	1.48	.12	.17	.12	.25
26	.06	.02	*.04	.19	.19	.17	3.71	.62	.12	.17	.12	.19
27	.17	.02	2.09	.17	.14	.22	.81	.28	.12	.17	.12	.12
28	.08	.02	2.56	.19	.14	.28	.22	*.17	.10	.17	.12	.17
29	.06	.95	6.84	.12	.12	13.4	.17	-----	.10	.17	.17	.22
30	.06	2.52	1.33	.12	.12	15.3	.14	-----	.10	1.77	.14	3.50
31	.06	.42	-----	.12	-----	5.50	2.95	-----	.10	-----	.14	-----
TOTAL	6.08	5.40	16.02	7.99	24.42	87.62	38.17	71.02	9.81	18.33	4.19	7.69
MEAN												
MGD	0.196	0.174	0.534	0.258	0.814	2.82	1.23	2.54	0.316	0.611	0.135	0.256
CFS	0.304	0.269	0.826	0.399	1.26	4.37	1.90	3.92	0.490	0.945	0.209	0.397
AC-FT	19.0	17.0	49.0	25.0	75.0	269	117	218	30.0	56.0	13.0	24.0

CALENDAR YEAR 1960 MAX 95.5 MIN 0.02 MEAN MGD 1.32 MEAN CFS 2.04 AC-FT 1,490
FISCAL YEAR 1960-61 MAX 16.6 MIN 0.02 MEAN MGD 0.813 MEAN CFS 1.26 MEAN CFS 1.26 AC-FT 912

Peak discharge (base, 150 mgd)...No peak above base.

* Discharge measurement made on this day.

ISLAND OF OAHU

2260. North Kalawa Stream near Aiea

Location.--Lat $21^{\circ}23'45''$, long $157^{\circ}53'35''$, on left bank 2.7 miles above confluence with South Kalawa Stream, and 2.7 miles northeast of with South Kalawa 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 June 1961. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--11 years (1930-33, 1953-61), 4.31 mgd (6.67 cfs).

Extremes.--Maximum discharge during year, 667 mgd (1,030 cfs) Dec. 30 (gage height, 10.16 ft), from rating curve extended above 60 mgd on basis of slope-area measurements at gage heights 10.3 and 13.04 ft; no flow at times.

1929-33, 1953-61: Maximum discharge, 4,300 mgd (6,650 cfs) Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 270 mgd; no flow several times each year.

Remarks.--Records good. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge,
in million gallons a day)
(Shifting-control method used June 4-20)

4.08	0	4.9	4.19
4.09	.01	5.2	9.40
4.1	.01	5.5	17.5
4.2	.06	6.0	38.5
4.4	.43	6.5	71.0
4.6	1.35		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.16	0.12	0.53	0.93	0.01	0.03	1.62	1.39	0.30	0.38	0.57	0.55
2	1.20	.05	.21	.37	.0	.02	1.36	.72	.46	2.66	.18	.35
3	3.18	.02	.12	.23	.0	.01	4.65	.56	.81	13.1	.09	.93
4	5.63	4.19	.04	.09	0	11.9	2.45	.37	.64	3.57	.04	.43
5	3.09	1.17	.01	.05	0	3.93	1.85	.21	.37	1.68	.02	1.89
6	9.96	.40	.01	.02	0	.92	1.47	.13	.35	.90	.01	1.23
7	5.21	.19	Q	.01	0	.37	1.00	.09	.46	.53	0	.35
8	1.91	.23	.07	.02	0	.23	.76	.07	1.10	.37	*0	1.33
9	1.00	.32	.68	.09	0	.12	.68	7.51	1.14	.27	0	3.49
10	.64	.16	1.18	.95	3.47	.05	10.9	21.6	.46	.19	0	1.35
11	.43	.06	.35	.71	10.8	.03	5.87	7.20	.32	.10	0	2.25
12	1.20	.02	7.18	.16	4.61	.76	2.11	14.7	.21	.05	0	.95
13	.85	.01	1.14	.08	1.66	25.6	1.22	46.2	.10	.03	0	2.66
14	.46	.01	.35	.05	.65	31.2	6.52	14.4	.05	.02	0	1.91
15	.37	Q	.21	.02	.35	8.62	1.29	9.68	.03	.01	0	.64
16	.19	0	.12	.01	.19	4.26	.72	*5.15	.02	.01	0	.40
17	.09	0	.03	2.53	.09	1.85	.72	13.9	.01	.01	.98	.25
18	.05	0	.01	1.89	.05	1.93	1.13	6.01	0	0	.08	1.11
19	.03	0	.03	.57	.03	2.14	.56	3.03	0	0	.06	.32
20	.02	0	*.35	.25	7.39	*1.16	.40	1.91	0	0	.05	*.19
21	.01	0	.42	2.93	3.22	.72	.25	1.61	*4.06	.20	.03	.05
22	.01	0	.30	.75	1.47	.49	.14	1.61	2.00	.07	.02	.02
23	Q	0	.13	.21	.72	.46	.09	16.0	1.05	.05	.01	.01
24	0	0	.06	.09	5.33	.37	.06	5.06	.60	.03	.01	0
25	.01	0	.02	.04	1.39	.30	3.45	3.37	.37	.02	0	0
26	.09	0	.01	1.08	.56	.21	9.87	1.85	.25	.01	0	0
27	2.61	0	14.1	.19	.35	.18	2.58	1.22	*1.13	.01	0	.01
28	.16	6.19	4.68	.09	.23	6.37	1.10	.81	.07	0	0	.02
29	.10	4.91	11.4	.04	.12	31.7	.68	-----	.04	0	1.45	.04
30	.49	6.78	3.46	.02	.05	41.2	.56	-----	.03	5.48	.09	7.00
31	.27	1.60	-----	.01	-----	11.8	6.73	-----	.02	-----	.07	-----
TOTAL	40.42	26.43	47.20	14.48	42.74	196.93	100.31	186.36	16.45	53.69	3.76	29.73
MEAN												
MGD	1.30	0.853	1.57	0.467	1.42	6.35	3.24	6.66	0.531	1.79	0.121	0.991
CFS	2.02	1.32	2.43	0.723	2.20	9.83	5.01	10.3	0.821	2.77	0.188	1.53
AC-FT	124	81.0	145	44.0	131	604	308	572	50.0	165	12.0	91.0

CALENDAR YEAR	1960	MAX	226	MIN	0	MEAN MOD	4.02	MEAN CFS	6.22	AC-FT	4,510
FISCAL YEAR 1960-61	MAX	46.2	MIN	0	MEAN MGD	2.08	MEAN CFS	3.28	AC-FT	2,330	

Peak discharge (base, 300 mgd).--Dec. 30 (5 a.m.) 667 mgd (1,030 cfs), 10.16 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

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2270. Halawa Stream near Aiea

Location.--Lat $21^{\circ}22'25''$, long $157^{\circ}55'40''$, on right bank 0.7 mile southeast of Aiea Post Office, and 6.2 miles northwest of Honolulu Post Office.

Drainage area.--8.78 sq mi.

Records available.--April 1953 to June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 16.52 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 7.09 mgd (11.0 cfs).

Extremes.--Maximum discharge during year, 753 mgd (1,170 cfs) Dec. 30 (gage height, 6.53 ft); minimum, 0.02 mgd (0.03 cfs) Sept. 25.

1953-61: Maximum discharge, 2,400 mgd (3,710 cfs) May 14, 1960 (gage height, 10.8 ft); no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. At times, the Oahu Sugar Co. installs flashboards on the control diverting the entire flow for irrigation.

Rating tables (gage height, in feet, and discharge,
in million gallons a day)

July 1 to Dec. 28

Dec. 29 to June 30

1.1	0.02	1.9	15.3	1.2	0.30	1.9	15.3
1.2	.20	2.2	29.0	1.3	1.10		
1.4	2.03	2.5	47.5	1.4	2.55		
1.6	5.97	3.0	89.0	1.6	6.20		

Note.--Same as
preceding table
above 1.9 ft.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.03	0.90	0.72	1.60	0.50	0.90	28.5	3.00	2.05	15	2.80	2.0
2	2.03	1.00	.38	.90	.72	.64	23.7	1.90	2.05	70	2.20	1.8
3	2.49	1.22	.24	.64	.68	.57	8.12	1.47	1.60	40	1.75	2.5
4	7.81	2.84	.18	.81	.57	20.3	4.36	1.21	1.47	20	1.75	2.2
5	5.70	1.88	.12	.72	.57	19.0	3.00	1.35	1.4	11	1.75	3.4
6	14.9	1.60	.12	.57	1.82	2.35	2.20	.80	1.5	8.0	1.47	2.8
7	12.7	1.22	.08	.57	2.93	1.34	1.75	.80	2.0	5.0	1.60	2.3
8	3.80	1.00	.08	.44	4.87	1.10	1.35	.72	2.5	2.55	1.35	3.5
9	2.50	1.00	.06	.33	.90	.81	1.10	3.33	3.5	f 4.04	1.35	5.0
10	1.73	.57	.04	.50	.90	.64	9.14	28.5	3.2	2.65	*1.35	3.2
11	1.73	.44	.04	.64	14.6	.50	7.92	10.8	3.0	3.00	1.75	3.6
12	1.60	.50	3.21	.44	6.23	4.78	2.80	11.9	2.9	2.35	1.75	3.2
13	2.50	.38	1.10	.44	3.21	37.9	1.60	78.3	2.8	2.35	2.05	4.0
14	2.18	.33	.38	.64	1.73	6.84	6.84	25.0	2.7	2.20	2.20	3.7
15	1.88	.24	.24	.72	1.10	17.8	2.20	17.0	2.6	2.55	2.05	3.3
16	1.47	.20	.18	.72	.81	8.34	1.35	8.60	2.55	f 4.85	2.20	3.0
17	1.00	.20	.12	.85	.72	4.00	1.00	20.9	2.65	3.00	2.20	2.7
18	.81	.20	.10	2.68	.64	2.50	.80	11.8	2.20	2.05	2.05	2.9
19	.81	.18	.08	1.88	.57	4.40	.80	6.44	1.75	2.35	1.75	2.8
20	1.10	.20	*.06	1.47	4.85	2.68	.72	4.15	1.60	1.90	1.90	2.7
21	.90	.14	.04	2.03	4.80	2.03	.64	3.15	6.54	2.05	1.75	2.6
22	.90	.12	.08	2.18	2.18	1.34	.56	2.80	3.80	1.90	1.75	* 2.5
23	.81	.12	.06	1.22	1.34	* 1.00	.72	24.3	2.20	1.47	2.05	2.35
24	.72	.10	.04	.81	4.90	.72	.80	10.2	2.05	1.60	2.20	2.20
25	.72	.08	.04	.64	2.68	.57	1.61	7.40	1.75	1.90	2.3	2.05
26	1.60	.08	.10	.50	1.34	.64	20.1	4.56	1.35	2.20	2.4	1.90
27	2.50	.08	9.79	.44	1.00	.44	6.20	3.00	* 1.10	1.75	2.6	2.35
28	2.50	1.13	8.35	.44	.81	.38	2.80	2.35	1.35	1.47	2.8	3.00
29	2.03	7.76	13.6	.44	.90	36.1	1.90	-----	1.47	1.47	3.0	2.05
30	1.60	9.87	5.46	.33	.90	80.6	1.47	-----	1.60	f 5.57	1.7	f 6.98
31	1.10	2.03	-----	.33	-----	21.0	7.20	-----	5.0	-----	1.1	-----
Total	87.15	37.61	45.09	26.92	69.77	343.77	153.25	295.73	74.23	226.22	60.92	88.58
Mean												
Mgd	2.81	1.21	1.50	0.868	2.33	11.1	4.94	10.6	2.39	7.54	1.97	2.95
Cfs	4.35	1.87	2.32	1.34	3.61	17.2	7.64	16.4	3.70	11.7	3.05	4.56
Ac-ft	267	115	138	83	214	1050	470	908	228	694	187	272

Calendar Year	1960	Max	516	Min	0.04	Mean mgd	7.25	Mean cfs	11.2	Ac-ft	8,140
Fiscal Year	1960-61	Max	80.6	Min	0.04	Mean mgd	4.13	Mean cfs	6.39	Ac-ft	4,630

Peak discharge (base, 300 mgd)...Dec. 30 (5:30 a.m.) 753 mgd (1,170 cfs), 6.53 ft.

* Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage-heights.

Note.--No gage-height record Mar. 5 to 15, Mar. 31 to Apr. 7, May 25 to June 22; discharge estimated on basis of records for nearby station.

ISLAND OF OAHU

2280. Moanalua Stream near Honolulu

Location.--Lat 21°22'50", long 157°52'20", on left bank 5 miles upstream from mouth, and 5 miles north of Honolulu Post Office.

Drainage area.--2.73 sq mi.

Records available.--June 1926 to June 1961.

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 1.0 ft higher.

Average discharge.--35 years, 2.03 mgd (3.14 cfs).

Extremes.--Maximum discharge during year, 778 mgd (1,200 cfs) Dec. 30 (gage height, 7.94 ft), from rating curve extended above 71 mgd by test on model of station site and on basis of culvert computation at 8.8 ft gage height; no flow for many days.

1926-61: Maximum discharge, 2,960 mgd (4,580 cfs) Nov. 18, 1930 (gage height, 11.58 ft), from rating curve extended above 80 mgd by test on model of station site; no flow at times each year.

Remarks.--Records fair. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0	1.8	5.70
1.0	.03	2.1	13.0
1.2	.30	2.5	27.1
1.4	1.13	3.0	55.0
1.6	2.85		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.06											
2	.04											
3	.04											
4	.44											
5	.30											
6	2.79											
7	.75											
8	.08											
9	.03											
10	.02											
11	.01											
12	0											
13	0											
14	0											
15	0											
16	0											
17	0											
18	0											
19	0											
20	0											
21	0											
22	0											
23	0											
24	0											
25	0											
26	0											
27	0											
28	0											
29	0											
30	0											
31	0											
TOTAL	4.56	0	3.29	0.01	4.30	114.64	38.06	102.05	0.39	11.51	0	0
MEAN												
MGD	0.147	0	0.110	0	0.143	3.70	1.23	3.64	0.013	0.384	0	0
CFS	0.227	0	0.170	0.001	0.222	5.72	1.90	5.64	0.019	0.594	0	0
AC-FT	14.0	0	10.0	0.03	13.0	352	117	313	1.20	35.0	0	0

CALENDAR YEAR	1960	MAX	191	MIN	0	MEAN MGD	8.10	MEAN CFS	3.85	AC-FT	8,360
PICAL YEAR 1960-61	MAX	41.6	MIN	0		MEAN MGD	0.764	MEAN CFS	1.18	AC-FT	855

Peak discharge (base, 150 mgd).--Dec. 30 (4:30 a.m.) 778 mgd (1,200 cfs), 7.94 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

69

2290. Kalibhi Stream near Honolulu

Location.--Lat 21°22'00", long 157°50'50", on right bank at Kioi Pool, 0.4 mile upstream from Catholic Orphanage, and 4.1 miles north of Honolulu Post Office.

Drainage area.--2.61 sq mi.

Records available.--September 1913 to June 1961. 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, water-stage recorder at same site at datum 2.00 ft lower.

Average discharge.--47 years (1914-61), 4.59 mgd (7.10 cfs).

Extremes.--Maximum discharge during year, 950 mgd (1,470 cfs) Dec. 30 (gage height, 8.90 ft), from rating curve extended above 200 mgd on basis of indirect measurements at gage heights 8.9 ft and 11.27 ft; minimum, 0.45 mgd (0.70 cfs) Nov. 8, 9.

1913-61: Maximum discharge, about 8,000 mgd (about 12,400 cfs) Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 200 mgd on basis of indirect measurements at gage heights 8.9 ft and 11.27 ft; minimum, 0.06 mgd (0.09 cfs) Oct. 22, 1933.

Remarks.--Records fair. Water for domestic use diverted from stream above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.1	0.45	2.7	10.4
2.2	1.28	3.0	19.2
2.3	2.38	3.5	38.0
2.5	5.80	4.0	62.0

DISCHARGE, IN MILLION GALLONS A DAY: FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DÉC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.80	0.91	0.82	1.38	0.91	0.91	11.4	2.52	*2.94	2.83	*0.91	1.38
2	2.55	.91	.66	1.18	.82	1.18	13.7	2.26	2.94	10.4	.82	*1.09
3	2.14	.66	.59	1.09	.74	1.00	*5.20	1.91	3.40	*4.44	.91	1.18
4	2.14	3.91	.66	1.09	.66	9.63	4.43	1.80	2.80	2.80	1.00	1.09
5	1.58	1.38	.66	1.09	.59	3.08	4.65	1.69	2.52	2.14	.82	9.30
6	1.89	.91	.91	1.18	.82	1.69	3.40	1.58	2.85	1.91	.74	2.02
7	1.48	.74	1.98	1.91	.59	1.28	3.40	1.48	3.09	1.80	.82	1.38
8	1.28	2.24	1.71	1.80	.59	1.09	2.94	1.48	3.58	1.69	.74	4.74
9	1.18	1.38	4.36	1.28	*.66	1.38	2.80	5.53	*2.94	1.58	.66	5.03
10	1.18	.82	1.58	1.38	.26	1.18	7.19	10.9	2.38	1.58	.66	2.66
11	1.09	.66	1.34	1.30	4.43	.82	4.25	3.96	2.26	1.58	.66	3.07
12	1.38	.66	6.53	1.69	3.90	16.7	2.94	20.3	2.14	1.48	.59	1.91
13	1.28	.66	1.91	1.58	2.02	21.5	2.66	45.1	2.02	1.38	1.14	2.92
14	1.09	.92	1.38	1.26	1.48	30.7	6.44	12.0	1.80	1.38	1.00	2.46
15	1.00	.82	1.38	1.09	1.48	7.72	2.66	6.68	1.80	1.58	1.58	1.69
16	1.19	.82	1.38	1.00	1.69	4.61	2.38	5.20	1.69	1.28	1.00	1.38
17	2.14	.74	1.00	1.38	1.00	3.56	2.66	17.1	1.58	1.28	1.60	1.58
18	1.71	.59	1.28	1.48	1.28	4.20	2.38	5.40	1.58	1.58	.91	2.02
19	1.34	.59	1.18	1.09	2.08	3.40	2.02	4.43	1.48	1.58	.74	1.38
20	*.86	.59	1.72	1.38	6.06	2.80	1.80	4.43	1.38	1.58	1.19	1.38
21	*.91	.52	1.38	3.88	2.38	2.52	1.80	3.90	2.23	1.48	.91	1.09
22	.82	*.52	1.28	1.69	1.80	2.80	1.69	4.07	1.58	1.18	1.23	1.00
23	.74	.82	*1.09	1.18	1.67	2.38	1.80	22.2	1.58	1.09	.82	.91
24	1.31	.66	.82	1.00	4.77	2.02	1.58	7.59	1.38	1.18	.74	.91
25	2.50	1.09	.82	1.38	1.80	1.91	15.6	4.80	1.28	1.09	.66	.82
26	2.10	1.33	.74	1.58	1.48	2.14	18.2	4.07	1.48	1.09	1.19	.82
27	2.02	.74	6.40	1.14	1.18	1.80	3.40	3.56	1.18	1.09	.66	1.00
28	1.18	2.51	3.69	1.66	1.28	5.83	2.66	3.40	1.18	1.18	1.01	1.18
29	1.35	1.91	2.53	1	1.18	27.9	2.26	-----	1.28	.91	4.39	2.19
30	2.71	3.03	1.80	1	,00	*54.8	2.26	-----	1.28	1.28	1.18	.124
31	1.96	1.28	-----	-----	-----	8.85	8.34	-----	1.09	1.09	-----	-----
TOTAL	48.90	35.32	5	43.05	55.70	231.38	148.89	208.94	62.71	57.44	32.37	71.98
MEAN												
MGD	1.58	1.14	1.79	1.39	1.86	7.46	4.80	7.46	2.02	1.91	1.04	2.40
CFS	2.44	1.76	2.76	2.15	2.87	11.5	7.43	11.5	3.13	2.96	1.62	3.71
AC-FT	150	108	164	132	171	710	457	641	192	176	99.0	221
CALENDAR YEAR	1960	MAX	125	MIN	0.52	MEAN MOD	4.04	MEAN CFS	6.25	AC FT	4,540	
FISCAL YEAR 1960-61	MAX	54.8	HIN	0.32	MEAN MGD	2.88	MEAN CFS	4.46	AC-FT	3,220		

Peak discharge (base, 400 mgd).--Dec. 30 (4:30 a.m.) 950 mgd (1,470 cfs), 8.90 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2320. Huuau Stream below reservoir 2 wastewater, near Honolulu

Location.--Lat $21^{\circ}20'55''$, long $157^{\circ}49'40''$, on right bank near Pali Road in upper Huuau Valley, 0.2 miles downstream from reservoir 2 wastewater, and 3.5 miles northeast of Honolulu Post Office.

Drainage area.--3.35 sq mi.

Records available.--October 1913 to June 1961.

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. Sept. 7, 1915, to Apr. 4, 1918, staff gage at same site and datum.

Average discharge.--44 years (1914-16, 1917-20, 1922-61) 4.88 mgd (7.55 cfs). Prior to this year, average for period 1914-16 was not included.

Extremes.--Maximum discharge during year, 828 mgd (1,280 cfs) Dec. 30 (gage height, 5.59 ft), from rating curve extended above 300 mgd on basis of slope-area measurement of peak flow; minimum, 0.9 mgd (estimated) (1.39 cfs) Nov. 6.

1913-61: Maximum discharge, 4,520 mgd (6,990 cfs) Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 300 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Sept. 10, 11, 1925.

Remarks.--Records fair, except those for periods of no gage-height and faulty record, which are poor. Reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively) regulate flow. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Rating table (gage height, in feet, and discharge, in million gallons a day)
Shifting control method used Nov. 15 to Dec. 29, 1960,
Feb. 18-22, Mar. 10 to Apr. 1, 1961)

0.3	0.71	1.0	4.20
.4	1.08	1.5	16.2
.6	1.95	2.0	37.4
.8	2.97	2.5	64.0

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.50	1.92	1.33	1.5	1.4	1.08	14	8.78	5.32	3.57	1.72	1.7
2	2.61	2.23	1.24	1.4	1.3	1.24	13	8.24	5.20	5.54	1.63	1.3
3	2.66	2.05	1.20	1.3	1.1	1.12	9.6	8.24	5.32	3.38	1.58	1.4
4	2.55	4.30	1.66	1.3	1.0	5.10	9.04	7.98	5.08	2.81	1.58	1.3
5	2.45	1.63	1.67	1.3	.94	2.10	9.57	7.98	4.45	2.61	1.49	5.0
6	2.40	1.54	1.67	1.5	.90	1.58	8.78	7.98	3.73	2.50	1.45	3.2
7	2.30	1.61	2.22	2.2	1.0	1.58	8.78	7.98	4.31	2.40	1.54	2.0
8	2.25	2.05	2.27	2.5	1.0	1.54	8.51	7.98	5.02	2.35	1.45	4.0
9	2.25	1.72	4.19	2.0	*9.4	1.49	7.98	16	3.93	2.35	1.41	5.0
10	2.15	1.49	1.86	2.2	5.0	1.54	10.9	24	3.64	2.30	*1.4	3.5
11	2.20	1.37	1.64	2.0	4.0	1.45	9.57	10	3.57	2.25	1.4	3.6
12	2.70	1.37	4.26	2.4	3.5	9.95	8.78	26	3.45	2.20	1.3	3.0
13	2.70	1.37	1.86	1.7	2.5	14.4	8.51	50	3.45	2.20	1.6	3.3
14	2.25	1.37	1.54	1.5	1.4	16.4	9.57	20	3.29	2.20	1.3	3.1
15	2.05	1.28	1.71	1.4	1.28	4.64	8.24	11	3.29	2.25	2.0	2.5
16	2.05	1.33	1.67	1.4	1.20	3.08	7.98	10	3.24	2.10	1.5	2.1
17	2.00	1.37	1.54	1.5	1.24	2.76	8.24	*20	3.24	1.76	1.7	2.3
18	1.95	1.24	1.74	3.0	1.58	3.39	7.98	7.72	3.18	2.10	1.3	2.5
19	2.00	1.2	1.54	1.6	2.04	2.52	7.72	6.65	3.08	2.15	1.2	2.0
20	1.90	1.2	1.63	2.0	5.36	2.50	7.45	6.45	3.02	2.20	1.5	1.9
21	1.86	1.1	1.67	4.0	1.70	2.40	7.45	6.65	3.24	2.00	1.3	*1.7
22	1.81	*1.1	1.80	2.5	1.56	*2.61	7.45	7.05	3.13	1.95	1.5	1.5
23	1.77	1.37	1.28	2.0	1.66	2.45	7.98	10.3	2.97	1.86	1.3	1.3
24	1.72	1.28	1.49	1.5	2.74	2.30	7.45	7.05	2.87	1.86	1.1	1.3
25	1.58	1.16	1.45	1.7	1.58	2.25	28.8	6.05	2.81	1.86	1.0	1.2
26	1.77	1.16	1.37	2.2	1.45	2.30	26.0	5.85	2.92	1.81	1.4	1.3
27	2.18	1.28	5.0	1.7	1.41	2.15	9.84	5.65	2.76	2.01	1.0	1.4
28	1.72	2.26	3.0	2.4	1.41	3.87	9.04	5.65	*2.61	1.86	1.3	1.6
29	1.67	3.23	2.5	1.6	1.37	29.3	8.51	-----	2.67	1.72	3.5	3.0
30	1.95	4.45	2.0	1.6	*1.08	60	8.51	-----	2.61	1.72	1.3	6.0
31	1.86	1.49	-----	1.4	-----	20	12.2	-----	2.50	-----	1.3	-----
Total	65.81	53.52	60.00	71.8	54.64	209.09	31743	327.23	109.90	69.87	46.05	75.0
Mean												
Mgd	2.12	1.73	2.00	2.32	1.82	6.74	10.2	11.7	3.55	2.33	1.54	2.50
Cfs	3.28	2.68	3.09	3.59	2.82	10.4	15.8	18.1	5.49	3.61	2.38	3.87
Ac-ft	202	164	184	220	168	642	974	1000	337	214	141	230

Calendar Year 1960 Max 100 Min 0.89 Mean mgd 4.09 Mean cfs 6.33 Ac-ft 4,590
Fiscal Year 1960-61 Max 60 Min 0.90 Mean mgd 4.00 Mean cfs 6.19 Ac-ft 4,480

Peak discharge (base, 150 mgd)...Dec. 30 (4:30 a.m.) 828 mgd (1,280 cfs), 5.59 ft; Jan. 26 (8 a.m.) 204 mgd (316 cfs), 4.05 ft; Feb. 13 (Unknown) 157 mgd (243 cfs), 3.73 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 19-22, Sept. 27-Nov. 14, Dec. 30 to Jan. 3, Feb. 9-17, May 10 to June 30; discharge estimated on basis of recorded range in stage and records for nearby streams.

2390. East Branch Manoa Stream near Honolulu

Location--Lat 21°19'50", long 157°48'10", on right bank just downstream from highway bridge, 400 ft upstream from confluence with West Branch and 4.2 miles northeast of Honolulu Post Office.

Drainage area--1.06 sq mi.

Records available--May 1913 to January 1921, August 1923 to June 1961.

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 beach 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 50 ft upstream at different datum. Aug. 18, 1925, to Oct. 18, 1933, water-stage recorder at present site at datum 0.41 ft higher.

Average discharge--42 years (1913-20, 1926-61), 3.17 mgd (4.90 cfs).

Extremes--Maximum discharge during year, 905 mgd (1,400 cfs) Dec. 30 (gage height, 5.24 ft), from rating curve extended above 90 mgd by test on model of station site; minimum, 1.36 mgd (2.10 cfs) Dec. 11, Apr. 23, May 6-14.

1913-21, 1926-61: Maximum gage height, 10.4 ft, Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,000 mgd or 3,090 cfs, estimated from rating curve extended above 90 mgd); minimum discharge, 0.4 mgd (0.6 cfs) June 7, 8, 1926.

Remarks--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnels in drainage area.

Rating table (gage height, in feet, and discharge in million gallons a day)

0.3	1.15	1.2	11.5
.4	1.85	1.4	18.3
.6	3.50	1.6	26.5
.8	5.60	2.0	47.0
1.0	7.90		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.25	1.57	1.78	1.93	2.71	1.64	8.73	2.82	2.73	3.03	2.09	2.79
2	2.98	2.09	1.71	1.86	2.01	1.64	4.20	2.65	2.82	7.84	2.01	2.57
3	3.74	1.50	1.64	2.01	1.71	1.57	3.33	2.49	3.42	4.10	2.09	2.82
4	3.50	2.21	1.64	2.09	1.64	5.21	2.90	2.49	2.82	2.65	2.09	2.57
5	2.79	2.25	1.85	1.85	1.64	2.18	4.43	2.41	2.73	2.33	1.93	6.60
6	2.98	1.71	1.93	2.01	1.64	1.64	2.73	2.41	2.73	2.17	1.85	2.90
7	2.33	1.64	2.73	2.98	1.64	1.50	2.41	2.41	4.17	2.17	1.85	2.41
8	2.17	2.74	3.04	2.73	1.64	1.43	2.33	2.33	5.28	2.09	1.85	10.2
9	2.09	1.71	4.99	2.49	1.85	1.83	2.25	6.14	3.70	2.09	1.78	4.39
10	2.25	1.64	2.33	2.25	*4.48	1.50	9.75	11.5	3.07	2.09	1.78	3.33
11	2.01	*1.64	2.86	2.01	3.23	1.43	6.19	4.10	2.82	2.01	1.78	4.08
12	2.70	1.50	4.29	2.59	2.62	21.9	2.73	10.1	2.73	2.01	1.78	2.73
13	2.89	1.50	2.25	2.09	1.93	17.4	*2.41	27.8	2.65	2.09	1.78	4.17
14	2.25	1.64	1.78	2.01	1.78	21.5	2.69	6.73	2.57	2.09	2.01	3.40
15	2.09	1.57	2.33	1.85	1.71	5.71	2.33	4.10	2.57	2.17	2.09	2.49
16	2.01	1.64	1.85	1.91	1.64	3.80	2.25	4.86	2.49	2.01	2.49	2.49
17	1.93	2.13	1.71	13.3	1.64	2.99	2.73	16.7	2.49	1.85	2.05	3.07
18	1.85	1.71	3.42	3.76	1.85	3.76	2.17	4.61	2.41	2.25	2.01	4.34
19	2.01	1.64	2.25	2.09	3.05	2.65	2.09	4.10	2.49	2.01	1.93	*2.49
20	2.33	1.64	2.25	2.29	5.38	2.57	2.01	*4.20	2.09	2.36	1.93	
21	2.01	1.50	*2.77	3.95	2.25	*2.25	1.93	3.80	2.57	2.01	3.29	1.78
22	1.93	1.50	2.46	2.09	1.93	3.18	1.85	4.66	2.65	2.01	2.33	2.31
23	1.85	1.71	2.25	1.85	1.90	2.65	2.09	9.56	2.57	2.01	2.33	1.93
24	1.85	1.57	2.01	1.85	2.80	2.25	1.85	4.50	2.49	2.01	2.09	1.93
25	1.85	1.57	1.93	3.86	1.85	2.17	16.2	3.60	2.41	2.17	1.71	
26	1.85	1.50	1.93	2.92	1.71	2.17	8.26	3.24	2.41	*2.09	3.56	1.71
27	1.93	1.71	8.91	2.09	1.64	2.09	2.90	2.99	2.41	2.52	2.25	1.78
28	1.57	6.63	3.10	2.09	2.88	6.04	2.41	2.90	*2.33	2.65	5.05	1.78
29	1.57	3.36	2.49	2.01	2.01	25.7	2.25	-----	2.49	2.17	7.66	4.33
30	1.93	3.97	2.09	2.01	1.64	45.4	2.31	-----	2.33	2.33	2.49	7.60
31	1.64	2.01	-----	2.09	-----	6.05	7.78	-----	2.33	2.33	2.33	-----
TOTAL	69.13	65.70	78.17	82.90	66.40	203.80	120.49	160.20	86.25	73.11	75.95	98.63
MEAN												
MGD	2.23	2.12	2.61	2.67	2.21	6.57	3.89	5.72	2.78	2.44	2.45	3.29
CFS	3.45	3.28	4.03	4.14	3.42	10.2	6.01	8.85	4.30	3.78	3.79	5.09
AC-FT	212	202	240	254	204	625	370	492	265	224	233	303

Calendar Year 1960 Max 53.2 Min 0.98 Mean mgd 3.23 Mean cfs 5.00 Ac-ft 3,620
Fiscal Year 1960-61 Max 45.4 Min 1.43 Mean mgd 3.23 Mean cfs 5.00 Ac-ft 3,620

Peak discharge (base, 200 mgd).--Dec. 30 (5 a.m.) 905 mgd (1,400 cfs), 5.24 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2400. West Branch Manoa Stream near Honolulu

Location.--Lat 21°19'55", long 157°48'10", on left bank 100 ft upstream from highway bridge 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 June 1961.

Gage.--Water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 290.84 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, staff gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft upstream at different datum. Aug. 4, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 3.40 ft lower.

Average discharge.--2 years (1913-20, 1926-61), 2.45 mgd (3.79 cfs).

Extremes.--Maximum discharge during year, 1,850 mgd (2,860 cfs) Dec. 30 (gage height, 616 ft), from rating curve extended above 73 mgd by test on model of station site; minimum, 0.13 mgd (0.20 cfs) April 12.

1913-21, 1925-61: Maximum gage height, 10.4 ft, Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,100 mgd or 3,250 cfs, estimated from rating curve extended above 40 mgd); minimum discharge, about 0.05 mgd (0.08 cfs) Mar. 16, 22, 1926.

Remarks.--Records good. Small quantity of water is diverted above station occasionally for irrigation.

Rating table (gage height, in feet, and discharge,
in million gallons a day)
(Shifting-control method used July 2-10, May 15 to June 11)

	0	0.8	6.20
.1	.32	1.0	10.6
.2	.82	1.3	20.7
.3	1.42	1.6	36.0
.5	2.85	2.0	65.0
.7	4.90		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.11	0.32	0.99	0.87	1.51	0.82	6.55	1.23	1.29	1.25	0.32	2.32
2	2.22	1.17	.76	.82	.87	3.01	.99	1.42	4.36	.32	1.95	
3	2.51	.41	.66	.82	.66	.76	2.25	.87	2.45	2.34	.28	1.82
4	3.25	3.89	.76	.99	.60	5.09	1.82	.82	1.17	.93	.36	1.62
5	2.47	1.17	1.05	.71	.55	1.23	2.12	.82	1.05	.60	.23	3.32
6	2.91	.76	1.32	.71	.50	.76	2.02	.71	1.23	.50	.19	2.10
7	2.25	.60	2.60	1.82	.50	.66	1.42	.66	4.04	.46	.23	1.75
8	1.89	1.66	2.89	1.81	.50	.60	1.29	.66	5.74	.41	.19	3.93
9	1.82	.66	8.26	1.34	.73	.94	1.17	3.48	2.28	.32	.19	2.85
10	2.03	.50	1.75	1.58	*3.74	.66	4.20	7.48	1.49	.19	.19	2.47
11	1.75	*.41	1.96	1.02	2.54	.95	3.21	2.17	1.17	.16	.19	2.98
12	3.05	.46	4.76	2.61	2.26	14.6	1.49	10.8	1.05	.13	.19	1.89
13	2.50	.46	1.62	1.36	1.23	15.7	1.23	24.1	.87	.32	.19	3.21
14	1.49	.66	1.17	1.11	.87	17.4	1.76	7.78	.76	.46	.31	2.55
15	1.11	.50	1.78	.82	.82	4.95	1.11	3.57	.71	.36	.46	1.62
16	.93	.50	1.37	.86	.76	3.17	.99	5.81	.66	.36	1.23	1.65
17	.87	1.23	.99	1.42	.66	2.32	1.55	14.3	.66	.28	1.75	2.25
18	.76	.60	2.11	2.55	1.03	2.76	1.05	3.09	.60	.66	1.05	3.43
19	.82	.50	1.11	1.23	2.93	1.89	.99	2.32	.55	.50	.99	*1.89
20	.99	.50	1.41	1.31	7.50	1.75	.82	*1.95	.55	.93	1.23	1.55
21	.87	.50	2.44	2.28	1.75	*1.49	.82	1.82	.55	.55	2.10	1.29
22	.60	.50	2.32	.93	1.36	1.55	.76	3.01	.60	.36	1.49	1.76
23	.46	.82	1.55	.76	1.11	1.49	.88	7.78	.60	.32	1.49	1.29
24	.41	.50	*1.29	.71	3.04	1.17	.66	3.84	.50	.32	1.23	1.33
25	.46	.32	1.05	1.83	.99	1.11	22.9	2.40	.41	.36	1.17	1.05
26	.41	.28	.99	1.63	.82	1.11	11.0	2.02	.46	*.32	2.35	.93
27	1.12	.36	4.25	.76	.82	.93	2.02	1.55	.41	.68	1.49	.93
28	.36	5.47	1.60	.93	1.59	2.47	1.36	1.55	*.41	.81	2.47	1.05
29	.32	3.48	1.29	.66	1.07	24.7	1.11	-----	.46	.36	4.10	4.86
30	.60	4.56	1.05	.66	.76	*59.6	1.11	-----	.41	.46	1.95	9.59
31	.36	1.49	-----	.92	-----	4.91	6.31	-----	.41	-----	1.95	-----
TOTAL	42.70	35.24	57.15	50.61	44.02	178.01	88.98	117.58	34.96	20.06	31.88	71.23
MEAN	1.38	1.14	1.91	1.63	1.47	5.74	2.87	4.20	1.13	0.669	1.03	2.37
MGD	2.13	1.76	2.95	2.53	2.27	8.88	4.44	6.50	1.74	1.03	1.59	3.67
CFS	131	108	175	155	135	546	273	361	107	62.0	98.0	219

CALENDAR YEAR	1960	MAX	61.3	MIN	0.28	MEAN MGD	2.47	MAX CFS	3.82	AC-FT	2,770
FISCAL YEAR 1960-61	MAX	59.6	MIN	0.13	MEAN MGD	2.12	MEAN CFS	3.88	AC-FT	2,370	

Peak discharge (base, 200 mgd).--Oct. 17 (9 p.m.) 295 mgd (456 cfs), 3.56 ft; Dec. 30 (5 a.m.) 1,850 mgd (2,860 cfs), 6.16 ft; Jan. 26 (7:30 a.m.) 358 mgd (554 cfs), 3.84 ft; Feb. 17 (12:30 a.m.) 254 mgd (393 cfs), 3.42 ft.

* Discharge measurement made on this day.

2440. Pukela Stream near Honolulu

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

Drainage area.--1.18 sq mi.

Records available.--June 1926 to June 1961. Records for April to December 1912, published in WSP 336 have been found to be unreliable and should not be used.

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

Average discharge.--35 years, 1.25 mgd (1.93 cfs);

Extremes.--Maximum discharge during year, 711 mgd (1,100 cfs) Dec. 30 (gage height, 6.13 ft), from rating curve extended above 30 mgd on basis of slope-area measurement at gage height 6.13 ft; minimum, 0.20 mgd (0.31 cfs) many days in May.

1926-61: Maximum discharge, 1,680 mgd (2,600 cfs) Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 62 mgd by test on model of station site; minimum (corrected), 0.05 mgd (0.08 cfs) Oct. 30, 1929.

Remarks.--Records fair, except those for periods of no gage-height record, which are poor. A 2-inch pipe diverts water from stream above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.9	0.18	1.6	6.20
1.0	.43	1.8	10.2
1.1	.87	2.0	15.2
1.2	1.50	2.3	25.6
1.4	3.39	2.6	40.5

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	
1	0.47	0.35	<u>0.30</u>	0.38	0.51	0.38	5.90	1.31	<u>1.50</u>	0.50	0.33	<u>0.28</u>	
2	.51	.35	.30	.40	.43	.35	2.10	1.12	1.43	.80	.33	.28	
3	<u>.83</u>	.33	.33	.40	.43	.35	1.31	1.05	1.37	<u>1.5</u>	.33	.30	
4	.60	.35	.33	.40	.40	1.11	1.18	1.05	1.31	.90	.30	.30	
5	.56	.35	.35	.38	.43	.54	1.62	.99	1.24	.70	.30	1.53	
6	.56	.35	.33	.38	<u>.38</u>	.35	1.18	.99	1.31	.60	.30	.35	
7	.56	.35	.33	.38	.38	.35	1.18	.99	1.31	.50	.30	.35	
8	.56	.35	.35	.38	*.38	<u>.33</u>	1.18	.99	1.18	.45	.25	<u>3.11</u>	
9	.56	.35	.35	.35	.40	.33	1.12	4.39	1.12	.43	.25	1.43	
10	.56	.30	.33	.35	.60	.33	6.20	8.17	1.05	.60	.25	.65	
11	.56	.30	.33	.35	.38	.33	3.40	2.63	1.05	.35	.25	.73	
12	.51	.30	.33	.40	.38	8.61	1.37	5.57	1.05	.37	.23	.65	
13	.60	.30	.33	.38	.38	8.03	1.05	<u>18.4</u>	1.05	.36	.20	.65	
14	.47	.30	.30	.35	.38	9.62	1.05	5.15	1.05	.37	.20	.69	
15	.43	*.30	.30	.33	.40	*2.92	.99	2.67	.82	.35	*.20	.65	
16	.43	.28	.30	.33	.40	1.46	.99	2.27	.78	.36	.23	.65	
17	.43	.28	.30	<u>5.17</u>	.40	.93	7.60	.73	.35	.25	.23	.65	
18	.43	.28	.35	1.57	.40	1.42	.87	2.95	.65	.35	.23	.73	
19	.43	.28	.33	.35	.40	1.05	.82	1.91	.65	.35	.23	.60	
20	.40	.30	.30	.43	<u>1.13</u>	.93	.78	1.91	.65	.37	.23	.56	
21	.40	.30	*.30	.65	.40	.93	.78	*1.50	.65	.35	.23	.51	
22	.38	.30	.30	.40	.38	*1.23	.73	1.50	.65	.35	.20	.51	
23	.38	.30	.33	.40	.38	1.05	.78	5.20	.65	.35	.20	.51	
24	.38	.30	.30	.43	.43	.87	.78	2.16	.56	.35	.20	.56	
25	.38	.30	.30	.59	.40	.87	6.75	1.91	.56	.35	.20	.47	
26	<u>.35</u>	.28	.33	.51	.40	.82	7.77	1.66	.51	*.35	.23	.47	
27	.35	.28	<u>1.25</u>	.51	.40	.82	1.45	1.58	.47	.35	.23	.43	
28	.35	<u>1.52</u>	.57	.51	.54	2.48	.82	1.50	.43	.35	.67	.40	
29	.35	.30	.63	.51	.40	8.22	.82	-----	*.43	.33	1.97	.68	
30	.35	.38	.35	.47	.38	29.42	.93	-----	.40	.33	.25	3.10	
31	.35	.30	-----	.47	-----	*5.49	6.75	-----	.40	-----	.25	-----	
TOTAL	14.48	10.91	11.13	18.91	13.10	91.70	63.58	89.12	27.01	14.03	9.82	22.78	
MEAN	MGD	0.467	0.352	0.371	0.610	0.437	2.96	2.05	3.18	0.871	0.468	0.317	0.759
	CFS	0.723	0.545	0.574	0.944	0.676	4.58	3.17	4.92	1.35	0.724	0.490	1.17
	AC-FT	44.0	33.0	34.0	58.0	40.0	281	195	274	63.0	43.0	30.0	70.0

Calendar Year 1960 Max 59.8 Min 0.22 Mean mgd 1.22 Mean cfs 1.89 Ac-ft 1,370
Fiscal Year 1960-61 Max 29.2 Min 0.80 Mean mgd 1.06 Mean cfs 1.64 Ac-ft 1,190

Peak discharge (base, 90 mgd).--Dec. 30 (4:30 p.m.) 711 mgd (1,100 cfs), 6.13 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 21-24, Mar. 29 to Apr. 26; discharge estimated on basis of record for nearby streams.

ISLAND OF OAHU

2460. Waiowao Stream above Pukele 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 1911 to December 1912, June 1926 to June 1961.

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.

Average discharge.--35 years (1926-61), 1.16 mgd (1.79 cfs).

Extremea.--Maximum discharge during year, 304 mgd (470 cfs) Dec. 30 (gage height, 4.72 ft), from rating curve extended above 58 mgd on basis of slope-area measurement at gage height, 4.74 ft; no flow May 12-14.

1911-12, 1926-61: Maximum discharge 1,000 mgd (1,550 cfs) Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 58 mgd as explained above; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 7				Nov. 8 to June 30			
0.74	0	1.3	1.76	0.74	0	1.7	6.60
.8	.02	1.5	3.70	.8	.03	1.9	10.5
.9	.10			.9	.16	2.1	15.5
1.1	.62	Note.—See as following table		1.1	.75	2.3	22.0
		above 1.5 ft.		1.3	1.86	2.6	34.5
				1.5	3.70		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.19	0.07	0.23	0.3	0.5	0.12	7.51	0.79	0.37	0.53	0.07	0.43
2	.43	.07	.14	.2	.3	.12	2.36	.46	.31	9.58	.06	.55
3	1.15	.05	.10	.3	.2	.11	1.20	.34	.45	4.23	.05	.40
4	1.00	.82	.08	.3	.1	1.21	.79	.26	.31	2.02	.06	.37
5	.33	.60	.07	.2	.1	1.27	1.24	.22	.24	.83	.06	3.20
6	.19	.19	.19	.3	.1	.31	.67	.18	.34	.49	.04	.84
7	.12	.10	.19	.6	.1	.18	.43	.16	.81	.34	.02	.37
8	.10	.28	.25	.4	*.07	.14	.34	.14	.79	.24	.02	5.03
9	.07	.19	.55	.3	.06	.14	.28	3.84	.61	.20	.02	2.01
10	.06	.10	.28	.2	1.28	.20	6.83	9.18	.31	.22	.01	.99
11	.06	.06	.27	.2	.75	.14	2.92	1.93	.24	.26	.01	1.60
12	.08	.05	1.35	.5	.71	12.3	1.04	3.74	.18	.20	0	.63
13	.29	.05	.42	.3	.28	*10.1	.75	25.3	.16	.16	0	1.31
14	.12	.04	.17	.2	.18	12.3	.52	3.70	.12	.18	0	1.04
15	.06	*.04	.19	.2	.16	*3.71	.34	1.90	.11	.40	*.01	.46
16	.04	.05	.15	2.0	.11	2.06	.26	1.63	.11	.28	.07	.34
17	.04	.22	.12	10	.11	.84	.37	6.02	.09	.16	.28	.84
18	.04	.15	.47	1.0	*.20	1.45	.43	1.94	.08	.22	.11	1.44
19	.05	.08	1.28	.5	.41	1.06	.26	.99	.07	.20	.08	.75
20	.03	.08	.62	.3	1.83	.55	.20	.99	.06	.16	.06	.40
21	.03	.06	.6	.9	*.64	.37	.16	*.71	.09	.22	.52	.31
22	.03	.04	.6	.5	.28	*1.34	.16	.82	.08	.12	.24	.28
23	.02	.05	.5	.3	.20	1.02	.42	4.44	.04	.12	.20	.31
24	.02	.07	.4	.3	.46	.40	.18	1.38	.04	.14	.16	.31
25	.01	.03	.3	.9	.24	.31	7.47	1.04	.04	.12	.11	.22
26	.01	.02	.8	.6	.16	.24	9.78	.59	.03	.11	.58	.16
27	.02	.05	4.0	.4	.14	.20	1.54	.46	.02	.12	.20	.16
28	.02	3.29	.1	.3	.37	2.20	.67	.43	.02	.16	.58	.20
29	.02	1.27	.5	.2	.42	7.51	.40	-----	.02	.11	4.02	1.50
30	.02	1.65	.4	.1	*.16	*.28.1	.37	-----	*.04	.08	.63	4.54
31	.08	.48	-----	.2	-----	3.87	7.88	-----	.05	-----	.46	-----
TOTAL	4.73	10.30	19.18	23.2	10.62	93.87	57.77	73.58	6.23	22.20	9.03	30.99
MEAN												
MGD	0.153	0.332	0.506	0.748	0.354	3.03	1.86	2.63	0.201	0.740	0.291	1.03
CFS	0.236	0.514	0.783	1.16	0.588	4.68	2.88	4.07	0.311	1.14	0.451	1.60
AC-FT	15.0	32.0	47.0	71.0	33.0	288	177	226	19.0	68.0	28.0	95.0

Fiscal Year 1960-61 Max 29.1 Min 0 Mean segd 0.980 Mean obs 1.32 Ac-ft 1,100

* Discharge measurement made on this day.

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 June 1961.

Gage.--Water-stage recorder and steel plate in concrete-lined channel. Altitude of gage is 95 ft (from topographic map).

Average discharge.--9 years, 3.41 mgd (5.28 cfs).

Extremes.--Maximum discharge during year, 1,150 mgd (1,780 cfs) Dec. 30 (gage height, 3.92 ft), from rating curve extended above 450 mgd as explained below; minimum, 0.17 mgd (0.26 cfs) Aug. 11, 12.

1952-60: Maximum discharge, 2,100 mgd (3,250 cfs) Mar. 5, 1958 (gage height, 5.33 ft), from rating curve extended above 450 mgd by test on model of station site; minimum daily, 0.03 mgd (0.05 cfs) June 23-25, 1958.

Remarks.--Records good except those for periods of no gage-height record and those below 5.0 mgd, which are poor.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.69	0.25	1.29	1.04	1.00	0.92	*19.3	1.85	1.29	1.0	0.36	0.70
2	.78	.27	1.24	1.00	.89	.92	5.50	1.54	1.34	1.4	.35	.84
3	1.62	.27	1.24	.92	.78	.96	2.90	1.19	1.70	8.0	.35	.78
4	1.54	1.04	1.19	1.00	.75	6.98	1.77	.96	1.29	6.0	.35	.70
5	.92	.78	1.24	.89	.72	2.43	2.70	.75	1.00	3.5	.35	.52
6	.75	.43	1.34	.89	.69	1.34	1.77	.69	1.16	1.9	.33	1.5
7	.75	.24	1.34	1.29	.69	1.04	1.40	.55	1.56	1.1	.30	.70
8	.72	.41	1.40	1.24	.60	1.00	1.24	.50	1.29	.70	.25	1.0
9	.78	.41	1.62	1.04	.93	.96	1.04	10.1	1.24	.45	.25	.35
10	.69	.25	1.34	1.00	5.10	.96	12.6	32.8	.72	.52	.24	1.7
11	.72	.21	1.29	.78	1.54	.92	7.10	7.10	.66	.60	.21	2.4
12	.60	.21	5.10	1.16	1.34	43.2	2.40	10.9	.62	.50	.20	1.3
13	1.04	.25	1.62	1.34	1.19	28.0	1.62	57.9	.58	.40	.20	2.2
14	.78	.25	.75	.75	.92	28.7	1.24	10.4	.54	.45	.20	1.7
15	.72	.25	.60	.69	.96	4.80	1.04	4.80	.52	1.0	.20	1.2
16	.58	.41	.69	.60	.96	3.20	.96	4.45	.49	.70	.37	.80
17	.41	.75	.72	1.80	.89	2.05	1.12	18.0	.47	.45	.64	1.5
18	.39	.75	1.23	4.77	1.19	5.20	1.04	5.90	.46	.50	.50	2.5
19	.53	.69	1.54	1.24	1.62	3.60	.72	3.40	.45	.45	.38	1.6
20	.41	.72	1.19	3.33	3.78	2.43	.55	3.20	.45	.42	.30	.94
21	.39	.58	.92	3.20	1.34	*1.77	.42	*2.60	.54	.56	.90	.86
22	.37	.53	.69	1.40	1.00	3.16	.37	2.60	.46	.54	.66	.80
23	.37	.58	1.02	1.00	.96	2.60	1.07	5.10	.39	.52	.43	.80
24	.37	.58	.60	.92	1.34	1.54	.41	4.50	.34	.52	.35	.88
25	.37	.55	.58	1.75	.96	1.40	22.7	3.60	.34	.50	.30	.70
26	.34	*.58	.55	1.54	.92	1.29	29.2	2.90	.34	.50	.90	.52
27	.34	.72	4.76	.96	.83	1.29	4.20	2.20	.32	.52	.40	.52
28	.25	8.81	4.73	.92	2.32	6.43	1.70	1.85	.30	.54	1.7	.52
29	.25	4.50	4.10	.92	1.34	23.0	1.40	-----	*3.0	.45	.70	2.5
30	.34	3.20	1.54	.92	.89	74.2	1.35	-----	.33	.37	1.8	9.0
31	.25	1.54	-----	.89	-----	8.79	18.8	-----	.35	-----	.70	-----
Total	19.06	31.01	47.46	41.19	38.44	265.08	149.63	202.33	21.84	35.06	21.47	58.86
Mean												
Mgd	0.615	1.00	1.58	1.33	1.28	8.55	4.83	7.23	0.705	1.17	0.693	1.96
Cfs	0.952	1.55	2.44	2.06	1.98	13.2	7.47	11.2	1.09	1.81	1.07	3.03
Ac-ft	58	95	146	126	118	813	459	621	67	108	66	181

Calendar Year	1960	Max	74.2	Min	0.21	Mean mgd	3.30	Mean cfs	5.11	Ac-ft	3,700
Fiscal Year	1960-61	Max	74.2	Min	0.20	Mean mgd	2.55	Mean cfs	3.95	Ac-ft	2,860

Peak discharge (base, 220 mgd).--Oct. 17 (9 p.m.) 220 mgd (340 cfs), 2.51 ft; Dec. 30 (5 a.m.) 1,150 mgd (1,780 cfs), 3.92 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 11 to June 30; discharge estimated on basis of records for nearby streams.

ISLAND OF OAHU

2500. Maunavili ditch near Waimanalo.

Location.--Lat 21°20'45", long 157°45'10", on left bank 80 ft downstream from Aniani Mai Ridge tunnel, and 2.1 miles west of Waimanalo.

Records available.--March 1954 to June 1961.

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

Average discharge.--7 years (1954-61), 1.93 mgd (2.99 cfs).

Extremes.--1954-61: Maximum daily discharge, 7.0 mgd (10.8 cfs) Mar. 5, 1958; no flow at times.

Remarks.--Records good except those for period of no gage-height record which are fair. Ditch diverts water from headwaters of Maunavili Stream for irrigation in vicinity of Waimanalo.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.45	2.37	2.00	1.94	2.06	1.82	2.43	1.25	0.37	2.18	1.88	1.88
2	2.37	2.37	2.00	1.88	2.00	1.82	1.82	1.05	.33	2.45	1.88	1.88
3	2.24	2.24	2.00	1.88	2.00	1.92	1.58	1.00	.33	2.30	1.88	1.88
4	2.24	2.45	1.94	1.82	2.00	2.20	1.35	.95	.33	2.37	1.88	1.82
5	2.18	2.26	1.94	1.88	2.06	1.80	1.40	.90	.20	2.18	1.88	1.84
6	2.37	2.24	1.94	1.88	1.94	2.00	1.20	.95	.30	2.18	1.88	1.88
7	2.52	2.18	2.00	1.94	1.94	1.15	1.80	.80	.30	2.12	1.88	1.88
8	2.06	*2.18	2.00	1.88	1.94	1.94	1.10	.80	.30	2.06	1.82	2.18
9	2.06	2.18	2.12	1.88	1.94	1.09	.65	.98	2.00	1.82	2.00	
10	2.06	2.18	2.06	1.94	2.06	1.88	1.71	.80	2.00	2.06	1.82	1.94
11	2.00	2.18	2.12	1.88	2.00	1.88	1.98	.60	2.00	.68	1.82	1.88
12	1.94	2.18	2.12	1.94	1.88	*2.24	1.35	.80	2.00	0	1.82	1.88
13	2.06	2.12	2.00	1.94	1.88	2.10	1.25	1.05	2.00	0	1.82	2.06
14	2.06	2.12	1.94	2.00	1.88	2.82	1.15	1.00	1.94	.84	1.82	1.94
15	1.70	2.12	2.00	2.06	1.88	2.24	1.10	.90	1.88	2.12	1.82	1.88
16	1.70	2.12	2.00	2.00	1.82	1.48	1.05	.85	1.88	2.00	1.88	*1.88
17	1.82	2.18	1.94	2.52	1.82	1.82	1.30	1.00	1.88	.67	1.88	1.88
18	2.00	2.12	2.06	*3.13	1.82	1.88	1.25	.95	1.88	0	1.88	1.88
19	2.06	2.06	2.06	*1.94	1.88	1.76	1.15	.90	1.88	0	1.88	1.88
20	2.06	2.06	*2.00	2.52	2.06	1.88	1.09	.85	1.88	0	1.94	1.88
21	2.12	2.06	2.00	2.60	1.88	2.18	1.05	.80	1.82	.81	2.00	1.82
22	2.24	2.06	1.94	2.67	1.82	2.24	1.00	.60	1.82	1.94	1.88	1.88
23	2.24	2.06	1.94	2.52	1.82	2.24	1.05	.72	1.82	1.94	1.88	1.88
24	2.06	2.06	1.94	2.30	1.82	2.18	1.00	.47	1.82	1.94	1.71	1.88
25	1.88	2.00	1.88	*2.37	1.76	2.12	2.60	.40	1.82	1.94	1.50	1.82
26	2.18	2.00	1.88	.68	1.76	2.06	2.60	.40	1.82	1.94	1.82	
27	2.18	2.00	2.12	0	1.76	2.00	1.82	.37	1.82	2.00	1.88	1.88
28	2.12	2.18	2.12	.86	1.76	2.18	1.58	.37	*1.76	1.94	1.94	1.88
29	2.37	2.06	2.12	2.00	1.76	2.90	1.40	-----	1.82	1.88	2.00	1.94
30	2.45	2.12	2.00	2.06	1.82	2.75	1.52	-----	1.94	1.94	1.88	2.12
31	2.37	2.06	-----	2.00	-----	1.82	2.20	-----	2.00	-----	1.82	-----
TOTAL	66.16	66.55	60.18	61.04	56.70	64.67	44.84	22.68	45.00	46.48	57.67	57.36
MEAN												
MGD	2.13	2.15	2.01	1.97	1.89	2.09	1.45	0.810	1.45	1.55	1.86	1.91
CFS	3.30	3.32	3.10	3.05	2.92	3.23	2.24	1.25	2.25	2.40	2.68	2.96
AC-FT	203	204	185	187	174	198	138	70.0	138	143	177	176
CALENDAR YEAR	1960	MAX	3.77	MIN	0	MEAN MGD	1.75	MEAN CFS	2.71	AC-FT	1,960	
FISCAL YEAR 1960-61	MAX	3.13	MIN	0	MEAN MGD	1.78	MEAN CFS	2.75	AC-FT	1,990		

* Discharge measurement made on this day.

A Discharge for period of no gage-height record was estimated on basis of records for Makua Stream.

ISLAND OF OAHU

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2540. Makavao Stream near Kailua

Location.--Lat 21°21'50", long 157°46'05", on left bank 650 ft above confluence with Maunawili Stream, 2.7 miles southwest of Kailua and 4.3 miles southeast of Kaneohe Courthouse.

Drainage area.--2.44 sq mi.

Records available.--November 1912 to June 1916, January 1958 to June 1961.

Gage.--Water-stage recorder. November 1912 to June 1916 at site approximately 200 ft upstream at different datum.

Average discharge.--6 years (1913-16, 1958-61), 3.11 mgd (4.81 cfs).

Extremes.--Maximum discharge during year, 323 mgd (500 cfs) Jan. 26 (gage height, 5.33 ft) from rating curve extended above 300 mgd by logarithmic plotting; minimum 0.62 mgd (0.96 cfs) Oct. 15.

1958-61: Maximum discharge, 1,380 mgd (2,140 cfs) Mar. 5, 1960 (gage height, 9.08 ft), from rating curve as explained above; minimum, 0.62 mgd (0.96 cfs) July 22, 23, Aug. 1, 1959, Oct. 15, 1960.

Remarks.--Records good. Maunawili ditch diverts water from headwaters of Maunawili and Makavao streams for irrigation in vicinity of Waianae. Intake to the irrigation ditch about 100 ft above present site and below former site is no longer used.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.28	1.6	2.05	2.1	10.5
1.4	.72	1.7	2.98	2.3	16.5
1.5	1.30	1.9	5.97	2.5	24.0

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.30	1.05	0.83	0.99	0.93	0.83	13.4	4.23	4.08	1.87	1.24	1.17
2	1.50	.99	.83	.99	.93	.83	4.50	4.40	4.08	2.12	1.17	1.17
3	1.80	.99	.83	.93	.93	.88	3.19	3.91	4.08	1.87	1.17	1.17
4	1.64	1.30	.83	.93	.93	2.73	2.77	3.67	5.91	2.48	1.24	1.17
5	1.64	1.10	.78	.88	.93	1.30	2.88	3.95	3.91	1.80	1.17	1.00
6	1.80	1.10	.83	.88	.93	.99	2.48	3.19	3.79	1.71	1.10	1.05
7	1.43	1.10	.83	.88	.93	.99	2.38	3.30	3.91	1.71	1.03	1.05
8	1.30	*1.10	.88	.88	.93	.88	2.28	3.19	3.79	1.64	*1.05	1.16
9	1.30	.99	.99	.83	.99	.99	2.20	3.43	3.08	1.80	1.05	1.17
10	1.30	.99	.88	.83	1.10	.88	6.27	3.30	1.87	1.95	1.10	.98
11	1.30	.99	.88	.78	1.10	.88	3.86	2.98	1.80	2.77	1.10	1.10
12	1.57	.99	1.05	.78	.99	*1.61	2.68	2.57	1.80	*1.43	1.10	.99
13	1.60	.99	.93	.72	.99	1.64	2.48	3.60	1.80	3.30	1.10	1.10
14	1.50	1.05	.83	.72	.99	2.13	2.38	3.43	1.80	2.57	1.17	.99
15	1.50	.99	.83	.78	.99	1.50	2.28	3.08	1.71	1.66	1.17	1.05
16	1.36	.99	.78	.72	.93	1.30	2.20	3.43	1.71	1.57	1.24	*1.08
17	1.24	1.05	.78	4.56	.93	1.24	3.28	4.92	1.64	1.50	1.24	.98
18	1.17	.99	.88	3.99	.93	1.61	2.38	4.40	1.64	1.64	1.24	.93
19	1.17	.93	.83	1.64	.99	1.36	2.20	4.67	1.64	1.57	1.17	.88
20	1.17	.93	.83	.78	.99	1.17	2.12	4.40	1.64	2.48	1.24	.98
21	1.17	.93	.88	1.57	.99	1.17	2.05	4.23	1.64	2.28	1.36	.88
22	1.10	.93	.93	1.36	.99	1.36	1.93	4.23	1.57	1.50	1.24	.88
23	1.10	.99	*.78	1.17	.99	1.24	2.20	4.97	1.57	1.43	1.17	.88
24	1.17	.83	.78	1.05	.99	1.17	1.95	4.67	1.57	1.43	1.17	.83
25	1.17	.83	.78	1.10	.99	1.17	2.12	4.50	1.50	1.43	1.17	.88
26	1.17	.83	.78	1.80	.93	1.17	20.9	4.40	1.20	1.43	1.17	.88
27	1.17	.83	.99	2.48	.93	1.10	5.35	4.23	1.50	1.57	1.10	.88
28	1.17	1.05	.93	1.87	.93	1.43	4.23	4.23	*1.50	1.30	1.30	.88
29	1.10	.88	1.10	1.05	.93	5.00	4.40	-----	1.50	1.24	1.43	.93
30	1.05	.88	.99	.99	.88	11.6	4.23	-----	1.57	1.24	1.17	1.17
31	1.05	.83	-----	.93	-----	3.79	19.9	-----	1.57	-----	1.10	-----
TOTAL	40.91	30.42	26.23	40.58	29.28	55.95	156.85	111.39	70.67	56.27	36.49	30.27
MEAN	1.32	0.981	0.874	1.31	0.976	1.80	5.06	3.98	2.28	1.88	1.18	1.01
MGD	2.04	1.52	1.35	2.03	1.51	2.79	7.83	6.15	5.53	2.90	1.82	1.56
CFS	126	93.0	80.0	125	90.0	172	481	342	217	173	112	93.0
AC-FT												
CALENDAR YEAR	1960	MAX	103	MIN	0.72	MEAN	MGD	8.49	MEAN CFS	3.85	AC-FT	2,790
FISCAL YEAR 1960-61	MAX	21.5	MIN	0.72	MEAN MGD	1.88	MEAN CFS	2.91	AC-FT	2,100		
Peak discharge (base, 70 mgd).--Jan. 26 (7 a.m.) 323 mgd (500 cfs), 5.33 ft; Jan. 31 (2:30 a.m.) 85.2 mgd (132 cfs), 3.48 ft.												

* Discharge measurement made on this day.

ISLAND OF OAHU

2739. Kameoalii Stream at Kaneohe

Location.--Lat $21^{\circ}24'50''$, long $157^{\circ}48'13''$, on right bank at dam 450 ft above Kamehameha Highway Bridge and 0.22 miles south of Parker School at Kaneohe.

Drainage area.--4.34 sq mi.

Records available.--January 1959 to June 1961.

Gage.--Water-stage recorder and masonry diversion dam and ditch culvert act as control. Datum of gage is 37.82 ft above mean sea level (levels by City and County of Honolulu).

Extremes.--Maximum discharge during year, 818 mgd (1,270 cfs) Dec. 30 (gage height, 5.69 ft), from rating curve extended as explained below; minimum, 3.32 mgd (5.14 cfs) Sept. 17.

1959-61: Maximum discharge, 1,230 mgd (1,900 cfs) May 13, 1960 (gage height, 6.16 ft), from rating curve extended above 82 mgd on basis of slope-area measurement at gage height, 5.69 ft and logarithmic plotting above; minimum, 3.30 mgd (5.11 cfs) July 8, 9, 1959.

Flood of Oct. 23, 1958, reached a stage of 8.3 ft (discharge about 4,270 mgd (6,610 cfs), from rating curve extended above 82 mgd as explained above).

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Many diversions upstream used for irrigation.

Continuous rainfall record collected at this site.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1-6

July 7 to June 30

3.6	3.05	3.6	2.56
3.7	6.40	3.7	5.90
3.8	12.5	3.8	12.5
3.9	23.2		
4.0	37.0		
4.1	54.3		
4.2	75.5		

Note.--Same as preceding table above 3.8 ft.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	7.35	6.40	5.90	7.0	5.2	6.40	29.8	7.0	8.10	7.50	5.05	6.40
2	8.35	6.40	5.90	7.0	5.2	6.40	13.3	7.2	8.10	8.70	5.47	6.95
3	7.80	*6.40	5.90	6.6	5.2	6.95	8.70	6.8	8.10	6.40	5.05	7.50
4	7.80	8.10	5.90	6.6	5.2	17.0	7.0	6.4	8.10	6.40	5.05	7.50
5	7.35	6.95	5.90	6.6	5.2	9.40	8.0	6.0	8.10	6.40	4.65	9.82
6	7.80	6.40	5.90	6.0	5.2	6.95	7.0	5.6	8.10	5.47	4.65	5.90
7	8.10	5.47	6.95	6.0	5.2	5.20	6.5	6.0	8.10	5.90	4.28	5.05
8	6.95	5.47	6.40	6.0	5.2	5.90	6.0	5.6	8.10	5.47	4.65	5.47
9	6.95	5.47	6.95	5.6	5.47	6.40	5.6	6.2	7.50	5.47	*4.65	6.40
10	6.95	5.47	6.40	5.6	8.10	6.40	20	6.0	7.50	5.90	5.05	5.47
11	6.40	5.47	6.40	5.4	7.50	5.90	17	5.6	6.95	5.47	5.05	5.05
12	6.95	5.90	8.70	5.4	6.40	7.50	15	5.2	6.95	5.47	5.47	5.47
13	6.95	5.47	6.40	5.0	5.90	8.70	14	5.2	6.95	5.47	5.90	5.90
14	6.40	5.47	6.40	5.0	5.90	13.5	13.2	*10.1	6.95	6.40	5.90	5.47
15	6.40	5.05	5.90	5.4	6.95	8.70	8.70	9.40	6.95	5.90	6.40	5.90
16	6.40	5.47	5.90	5.2	6.95	7.50	8.70	9.40	6.95	5.47	5.90	*4.65
17	5.90	5.05	5.40	8.0	6.95	8.10	10.8	20.9	6.95	5.47	5.90	4.65
18	5.90	5.47	5.90	9.0	6.95	10.1	*9.40	10.1	6.95	5.90	5.05	
19	6.40	5.05	5.05	7.0	6.95	9.40	8.70	8.70	6.40	5.47	4.65	
20	6.40	5.05	*5.90	6.0	8.10	8.10	7.77	8.70	6.40	6.40	5.05	
21	6.40	5.05	5.6	6.6	6.95	6.95	7.0	8.10	8.10	5.90	5.05	
22	6.40	5.05	5.8	6.0	6.95	6.40	6.0	8.70	6.40	5.47	5.90	5.05
23	5.90	5.47	5.2	5.6	6.95	*5.90	7.0	19.6	6.40	5.47	5.47	5.05
24	6.40	5.90	5.2	5.2	7.50	5.90	6.0	10.1	6.40	5.47	7.50	5.47
25	6.40	5.90	5.2	6.0	6.95	6.40	25.7	8.10	6.40	5.47	8.10	5.05
26	6.40	5.90	5.2	7.0	6.95	6.95	39.9	8.10	6.40	5.90	6.95	5.05
27	5.90	6.40	6.4	12	6.40	6.95	10.8	7.50	6.40	5.90	4.28	5.90
28	5.90	7.50	6.0	7.0	6.95	7.50	8.70	8.10	6.40	6.95	4.28	5.90
29	5.90	7.50	8.0	6.0	6.95	15.4	8.10	-----	*6.95	6.95	5.47	5.90
30	6.95	6.95	7.0	5.6	6.95	71.1	6.40	-----	6.95	9.85	5.05	6.95
31	6.40	6.40	-----	5.2	-----	12.5	26.3	-----	6.95	-----	5.90	-----
TOTAL	208.45	184.00	184.15	208.6	193.22	317.15	377.27	249.20	221.95	184.79	171.64	173.67
MEAN	6.72	5.94	6.14	6.73	6.44	10.2	18.2	8.90	7.16	6.16	5.54	5.79
MGM	10.4	9.18	9.50	10.4	9.96	15.8	18.9	13.8	11.1	9.53	8.57	8.96
CFS	640	565	565	640	593	973	1,160	765	681	567	527	533

Calendar Year	1960	Max	153	Min	3.90	Mean mgd	8.55	Mean cfs	13.2	Ac-ft	9,600
Fiscal Year	1960-61	Max	71.1	Min	4.28	Mean mgd	7.33	Mean cfs	11.3	Ac-ft	8,210

Peak discharge (base, 500 mgd).--Dec. 30 (5:30 a.m.) 818 mgd (1,270 cfs), 5.69 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 21 to Oct. 31, Nov. 1-8, Jan. 4-13, 21-24, Feb. 1-13; discharge estimated on basis of records for nearby streams.

ISLAND OF OAHU

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2750. Haiku Stream near Hesia

Location--Lat $21^{\circ}24'45''$, long $157^{\circ}49'35''$, on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heiau.Drainage area--0.97 sq mi.Records available--January 1914 to October 1919, July 1939 to June 1961.Gage--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by City and County of Honolulu). Prior to Apr. 28, 1914, staff gage and Apr. 29, 1914 to October 25, 1919, Water-stage recorder at same site at different datum.Average discharge--18 years (1943-61), 1.27 mgd (1.96 cfs) (unadjusted for diversions).Extremes--Maximum discharge during year, 649 mgd (1,000 cfs) Dec. 30 (gage height, 3.87 ft), from rating curve extended above 37 mgd as explained below; minimum daily, 0.22 mgd (0.34 cfs) June 25-26.

1914-19, 1939-61: Maximum discharge, 2,730 mgd (4,220 cfs) Mar. 26, 1951 (gage height, 5.39 ft), from rating curve extended above 37 mgd on the basis of slope-area measurement at gage height 3.87 ft; minimum daily, 0.19 mgd (0.29 cfs) July 13, Oct. 17, 19-21, 23-26, 1945, Sept. 18-20, 1946.

Remarks--Records good except those for periods of no gage-height record, which are fair. Board of Water Supply diverts ground water from tunnel in drainage area.

Rating table (gage height, in feet, and discharge, in million gallons a day)

	0.9	0.21
1.0	.46	
1.2	1.52	
1.5	5.0	
1.8	11.3	
2.0	21	

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.56	0.40	0.53	0.60	0.43	0.34	3.53	1.30	0.99	0.53	0.40	A0.40
2	.60	.37	.73	.46	.43	.37	1.99	1.17	.99	1.61	.29	A.34
3	.60	.37	.73	.43	.43	.37	1.52	1.11	.99	.99	.29	A.40
4	.60	.46	.73	.40	.43	2.23	1.30	1.11	.99	.68	.29	A.34
5	.56	*.37	.68	.37	.43	1.26	1.23	1.11	.99	.56	.31	A.34
6	2.05	.34	.68	.46	.40	.64	.99	1.11	.99	.53	.31	A.34
7	1.23	.34	.73	.56	.37	.53	.73	1.05	.99	.49	.31	A.34
8	.68	.34	.73	.37	.37	.46	.73	1.05	.99	.46	.31	A.34
9	.37	.29	.73	.34	.37	.46	.68	1.05	.99	.46	.31	A.37
10	.34	*.27	.77	.43	.51	.46	1.02	1.05	.99	.46	.31	A.34
11	.27	.27	.82	.40	.87	.43	.99	1.05	.99	.49	.31	A.40
12	.27	.27	1.47	.37	.64	.46	.82	1.22	.99	.46	*.29	A.31
13	.31	.27	.99	.43	.49	.91	.73	2.55	.99	.49	.31	A.64
14	.29	.27	.82	.37	.43	*4.49	2.36	1.45	.99	.46	.31	A.43
15	.27	.29	.77	.43	.43	2.18	1.45	*1.23	1.05	.43	*.37	*A.53
16	.27	.34	.53	.37	.40	1.30	1.05	1.17	1.05	.43	.34	.31
17	.27	.34	.31	.40	.37	.88	.88	1.37	1.05	.40	.37	.31
18	.27	.46	.34	.46	.34	.93	.82	1.23	1.05	.40	.34	.34
19	.31	.64	.31	.53	.37	.93	.88	1.17	1.05	.40	.31	.31
20	.34	.64	.40	.64	.46	.82	1.17	1.11	1.11	.43	.37	.29
21	.31	.64	.37	1.70	.49	.73	1.17	1.05	1.45	.37	.31	.29
22	.29	.64	.37	*1.30	.46	.73	1.17	.99	.99	.37	.31	.27
23	.27	.49	*.31	.99	.43	.73	.99	1.17	.93	.37	.31	.27
24	.31	.29	.31	.82	.46	.73	.64	1.11	.82	.37	.34	.24
25	.31	.29	.29	.60	.43	.68	2.00	1.05	.82	.37	.34	.24
26	.40	.27	.29	.64	.43	.68	3.42	.99	.77	.37	.40	.37
27	.40	.27	2.53	.60	.40	.68	1.30	.99	.60	.37	A.34	.64
28	.34	.61	1.47	.60	.37	1.03	.77	.99	.43	.37	A.34	.60
29	.34	.49	1.67	.56	.37	4.28	.73	-----	*.49	.31	A.34	.64
30	.43	.56	1.23	.53	.34	*16.9	.88	-----	.49	.73	A.31	.73
31	.40	.53	-----	*.49	-----	1.99	2.62	-----	.46	-----	A.34	-----
TOTAL	14.26	12.42	22.64	17.65	13.15	49.61	40.56	34.00	28.47	15.16	10.13	11.71
MEAN	0.460	0.401	0.755	0.569	0.438	1.60	1.31	1.21	0.918	0.505	0.327	0.390
MGD	0.460	0.401	0.755	0.569	0.438	1.60	1.31	1.21	0.918	0.505	0.327	0.390
CFS	0.712	0.620	1.17	0.881	0.678	2.48	2.02	1.88	1.42	0.782	0.505	0.604
AC-FT	44.0	38.0	69.0	54.0	40.0	152	124	104	87.0	47.0	31.0	36.0

CALENDAR YEAR	1960	MAX	22.8	MIN	0.27	MEAN MOD	1.05	MEAN CFS	1.62	AC-FT	1,170
FISCAL YEAR 1960-61	MAX	16.9	MIN	0.24	MEAN MGD	0.739	MEAN CFS	1.14	AC-FT	826	

Peak discharge (base, 100 mgd).--Dec. 30 (5 a.m.) 649 mgd (1,000 cfs), 3.87 ft.

* Discharge measurement made on this day.
A No gage-height record May 27 to June 15; discharge estimated on basis of records for stations on nearby streams.

ISLAND OF OAHU

2780. Iolekua Stream mouth near Heiau

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 Heiau, and 1.8 miles west of Kaneohe Post Office.

Drainage area.--0.28 sq mi.

Records available.--March 1940 to June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 320 ft above mean sea level (transit levels by U. S. Navy).

Average discharge.--20 years (1940-42, 1943-61), 0.396 mgd (0.613 cfs).

Extremes.--Maximum discharge during year, 24.6 mgd (38.1 cfs) Dec. 30 (gage height, 1.77 ft), from rating curve extended above 4.0 mgd by rating for Columbus-type control and test on model of station site; minimum, 0.23 mgd (0.36 cfs) June 19-29.

1940-61: Maximum discharge, 71.4 mgd (110 cfs) Oct. 23, 1958 (gage height, 2.43 ft); minimum daily, 0.10 mgd (0.16 cfs) Oct. 31 to Nov. 9, Nov. 24, 27, 1946.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0.20
.6	.36
.7	.64
.8	1.06
.9	1.75
1.0	2.70

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.26	0.32	0.26	0.34	0.32	0.32	1.24	0.43	0.32	0.44	0.26	0.30
2	0.30	0.30	0.26	0.32	0.32	0.32	0.64	0.38	0.32	0.87	0.25	0.28
3	0.30	0.32	0.26	0.32	0.32	0.32	0.43	0.34	0.32	0.28	0.25	0.32
4	0.30	0.42	0.26	0.32	0.32	0.32	1.46	0.38	0.32	0.28	0.25	0.26
5	0.30	0.30	0.28	0.32	0.32	0.64	0.36	0.32	0.32	0.26	0.26	0.28
6	0.76	0.28	0.28	0.32	0.32	0.43	0.34	0.32	0.32	0.26	0.25	0.26
7	0.36	0.28	0.28	0.32	0.32	0.36	0.34	0.32	0.32	0.26	0.26	0.28
8	0.32	0.28	0.28	0.32	0.32	0.34	0.32	0.32	0.32	0.28	0.26	0.32
9	0.32	0.26	0.26	0.32	0.32	0.32	0.32	0.32	0.32	0.28	0.26	0.34
10	0.32	0.26	0.28	0.44	0.60	0.32	0.67	0.32	0.32	0.28	0.23	0.30
11	0.32	0.26	0.28	0.32	0.56	0.32	0.38	0.30	0.32	0.26	0.25	0.36
12	0.32	0.26	0.41	0.32	0.36	0.32	0.34	0.42	0.32	0.28	0.25	0.30
13	0.32	0.26	0.26	0.32	0.34	0.79	0.34	1.02	0.32	0.28	0.25	0.54
14	0.32	0.28	0.26	0.32	0.32	1.45	0.67	0.43	0.32	0.28	0.25	0.36
15	0.32	0.28	0.26	0.32	0.32	0.64	0.38	0.38	0.32	0.28	0.25	0.28
16	0.32	0.28	0.26	0.32	0.32	0.49	0.36	0.34	0.32	0.28	0.25	0.28
17	0.32	0.30	0.26	0.36	0.32	0.41	0.49	0.48	0.32	0.28	0.26	0.28
18	0.32	0.30	0.26	0.32	0.32	0.48	0.41	0.36	0.30	0.28	0.25	0.28
19	0.34	0.30	0.28	0.32	0.32	0.41	0.38	0.34	0.30	0.28	0.25	0.25
20	0.32	0.30	0.12	0.38	0.61	0.38	0.36	0.32	0.30	0.26	0.26	0.25
21	0.32	0.28	0.28	0.55	0.41	0.38	0.34	0.32	0.62	0.26	0.26	0.23
22	0.32	0.28	0.28	0.34	0.36	0.38	0.32	0.32	0.30	0.26	0.26	0.25
23	0.32	0.28	0.28	0.32	0.34	0.36	0.34	0.48	0.28	0.26	0.26	0.23
24	0.32	0.30	0.30	0.32	0.41	0.36	0.32	0.32	0.26	0.26	0.26	0.23
25	0.32	0.30	0.30	0.32	0.34	0.38	1.11	0.32	0.26	0.26	0.26	0.23
26	0.32	0.30	0.30	0.36	0.36	0.38	0.94	0.32	0.26	0.26	0.26	0.23
27	0.32	0.30	0.72	0.32	0.36	0.34	0.49	0.32	0.26	0.26	0.26	0.23
28	0.32	0.53	0.44	0.32	0.34	0.72	0.41	0.32	0.26	0.26	0.26	0.25
29	0.32	0.39	0.91	0.32	0.32	0.97	0.36	-----	*.28	0.26	0.30	0.25
30	0.34	0.36	0.43	0.32	0.32	2.33	0.36	-----	*.28	0.26	0.28	0.35
31	0.32	0.26	-----	0.32	0.32	0.64	1.10	-----	*.28	-----	0.26	-----
TOTAL	10.30	9.42	9.79	10.45	10.79	17.76	15.44	10.50	9.68	9.17	8.01	8.62
MEAN	0.332	0.304	0.326	0.337	0.360	0.573	0.498	0.375	0.312	0.306	0.258	0.287
MGD	0.332	0.304	0.326	0.337	0.360	0.573	0.498	0.375	0.312	0.306	0.258	0.287
CFS	0.514	0.470	0.505	0.522	0.556	0.886	0.771	0.580	0.483	0.473	0.400	0.445
AC-FT	32.0	29.0	30.0	32.0	33.0	55.0	47.0	32.0	30.0	28.0	25.0	26.0

CALENDAR YEAR	1960	MAX	5.63	MIN	0.22	MEAN MGD	0.433	MEAN CFS	0.670	AC-FT	486
FISCAL YEAR 1960-61	MAX	2.33	MIN	0.23	MEAN MGD	0.356	MEAN CFS	0.551	AC-FT	399	

Peak discharge (base, 15 mgd).--Dec. 4 (4 p.m.) 16.6 mgd (25.7 cfs), 1.59 ft; Dec. 30 (4:30 a.m.) 24.6 mgd (38.1 cfs), 1.77 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

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2830. Kahaluu Stream near Hesia

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 Hesia.

Drainage area.--0.28 sq mi.

Records available.--October 1935 to June 1961.

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, 47.7 mgd (73.8 cfs) Dec. 30 (gage height, 2.62 ft), from rating curve extended above 9 mgd by test on model of station site; minimum, 0.07 mgd (0.11 cfs) Many days.

1935-61: Maximum discharge, 290 mgd (449 cfs) Sept. 27, 1937 (gage height, 5.47 ft, control then in use), from rating curve computed from 11 to 240 mgd by Parshall flume formula and extended above; minimum daily, 0.03 mgd (0.05 cfs) June 25, 1958.

Remarks.--Records good. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.06	0.04
.1	.17
.2	.53
.3	.98
.5	2.36

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	
1	0.07	0.17	0.17	0.17	0.10	0.17	1.27	0.24	0.13	0.13	0.20	0.13	
2	0.07	0.17	0.13	0.10	0.10	0.17	0.35	0.20	0.13	0.24	0.17	0.13	
3	0.13	0.17	0.13	0.07	0.10	0.17	0.20	0.17	0.13	0.24	0.17	0.13	
4	0.17	0.24	0.13	0.07	0.10	1.26	0.17	0.17	0.13	0.36	0.17	0.13	
5	0.13	0.17	0.13	0.07	0.10	0.31	0.24	0.17	0.13	0.20	0.17	0.10	
6	0.13	0.17	0.13	0.10	0.10	0.17	0.20	*0.13	0.13	0.17	0.17	0.07	
7	0.13	0.17	0.17	0.13	0.10	0.17	0.17	0.13	0.13	0.20	0.17	0.07	
8	0.13	0.13	0.13	0.13	0.10	0.13	0.20	0.13	0.13	0.20	0.17	0.10	
9	0.13	0.13	0.13	0.13	0.13	0.13	0.20	0.13	0.13	0.20	0.17	0.10	
10	0.13	0.13	0.13	0.20	0.43	0.13	0.98	0.17	0.13	0.20	0.13	0.07	
11	0.13	0.13	0.10	0.17	0.52	0.13	0.45	0.17	0.13	0.20	0.13	0.10	
12	0.13	0.13	0.38	0.13	0.24	0.13	0.24	0.25	0.13	0.20	0.13	0.10	
13	0.13	0.13	0.20	0.17	0.13	0.78	0.20	1.62	0.13	0.17	0.10	0.17	
14	0.17	0.13	0.13	0.17	0.10	1.12	1.23	0.40	0.13	0.17	0.10	0.24	
15	0.17	0.17	0.10	0.20	0.10	0.27	0.27	0.35	0.13	0.20	0.13	0.17	
16	0.17	0.17	0.10	0.20	0.13	0.20	0.24	0.27	0.13	0.17	0.13	0.17	
17	0.20	0.17	0.10	0.24	0.17	0.27	0.31	0.13	0.13	0.17	0.17	0.17	
18	0.20	0.13	0.10	0.24	0.17	0.20	0.24	0.24	0.13	0.17	0.13	0.20	
19	0.20	0.13	0.10	0.20	0.17	0.20	0.20	0.20	0.13	0.13	0.10	0.17	
20	0.20	0.13	0.17	0.24	0.27	0.17	0.17	0.20	0.13	0.17	0.10	0.20	
21	0.20	0.13	0.10	0.48	0.24	0.17	0.17	0.13	0.93	0.17	0.10	0.17	
22	0.17	0.13	0.17	0.31	0.17	0.17	0.17	0.13	0.27	0.13	0.10	0.17	
23	0.17	0.13	0.10	0.20	0.17	0.17	0.17	0.33	0.13	0.13	0.10	0.20	
24	0.17	0.13	0.10	0.13	0.20	0.17	0.17	0.20	0.10	0.17	0.10	0.17	
25	0.17	0.13	0.13	0.17	0.17	0.17	0.69	0.20	0.10	0.13	0.10	0.17	
26	0.31	0.13	0.13	0.20	0.17	0.17	0.45	0.17	0.10	0.17	0.10	0.17	
27	0.57	0.13	0.82	0.17	0.17	0.17	0.24	0.13	0.10	0.17	0.10	0.17	
28	0.27	0.20	0.42	0.13	0.17	0.65	0.20	0.13	0.10	0.17	0.10	0.17	
29	0.20	0.24	1.54	0.13	0.17	1.25	0.17	---	0.13	0.17	0.10	0.17	
30	0.17	0.38	0.27	0.13	0.17	1.79	0.17	---	0.10	0.20	0.10	0.22	
31	0.17	0.27	---	0.13	0.27	0.55	0.55	0.10	0.10	0.10	0.10	---	
TOTAL	5.49	5.07	6.64	5.31	5.16	11.53	10.64	7.07	4.76	5.46	4.01	4.55	
MEAN	MGD	0.177	0.166	0.221	0.171	0.172	0.372	0.343	0.253	0.154	0.162	0.129	0.138
	CFS	0.274	0.253	0.342	0.265	0.266	0.575	0.531	0.391	0.237	0.262	0.200	0.235
	AC-F1	17.0	16.0	20.0	16.0	16.0	35.0	33.0	22.0	15.0	17.0	12.0	14.0

CALENDAR YEAR	1960	MAX	7.02	MIN	0.06	MEAN MOD	0.251	MEAN CFS	0.368	AC-F1	268
FISCAL YEAR 1960-61	MAX	1.79	MIN	0.07	MEAN MOD	0.207	MEAN CFS	0.388	AC-F1	833	

Peak discharge (base, 30 mgd).--Sept. 29 (2:30 p.m.) 43.9 mgd (67.9 cfs); 2.51 ft; Dec. 30 (h a.m.) 47.7 mgd (73.8 cfs), 2.62 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

2840. Waimea 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 4.4 miles northwest of Kaneohe.

Drainage area.--0.93 sq mi.

Records available.--December 1935 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 191.66 ft above mean sea level (levels by Austin and Towill).

Average discharge.--25 years (1936-61), 6.38 mgd (9.87 cfs).

Extremes.--Maximum discharge during year, 97.8 mgd (151 cfs) Dec. 30 (gage height, 3.38 ft), from rating curve extended above 50 mgd by logarithmic plotting; minimum, 3.80 mgd (5.88 cfs) on June 29-30.

1935-61: Maximum discharge, 466 mgd (721 cfs) Oct. 23, 1958 (gage height, 5.69 ft), from rating curve extended above 50 mgd as explained above; minimum, 2.75 mgd (4.25 cfs) Sept. 6, Oct. 31 to Nov. 2, 1955.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.7	3.80
.8	5.00
1.0	8.00
1.2	11.6
1.4	16.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	5.42	4.88	5.28	5.42	5.42	5.00	9.40	5.70	5.70	5.42	5.00	4.28
2	5.56	4.64	5.28	5.28	5.00	6.72	5.70	5.7	5.70	5.26	5.14	4.28
3	5.84	4.64	5.28	5.28	5.00	6.12	5.70	5.70	5.84	5.14	4.28	
4	6.26	5.47	4.88	5.28	5.28	10.3	10.98	5.70	5.70	6.26	5.00	4.28
5	5.70	4.56	4.64	5.14	5.28	9.98	10.40	5.56	5.70	5.70	4.88	4.28
6	5.56	5.42	4.64	5.14	5.28	5.28	10.98	5.56	5.70	5.70	5.00	4.16
7	5.56	5.42	4.64	5.14	5.28	5.00	10.56	5.56	5.70	5.70	5.14	4.16
8	5.56	5.42	4.76	5.14	5.28	5.00	10.26	5.56	5.70	5.70	4.88	4.40
9	5.56	5.42	4.88	5.28	5.28	5.00	10.84	5.56	5.56	5.56	4.76	4.28
10	5.56	5.28	5.28	5.61	6.32	4.88	10.00	5.70	5.56	5.56	4.76	4.16
11	5.42	*5.00	5.14	5.28	6.42	4.88	10.04	5.56	5.56	5.56	4.76	4.28
12	5.42	5.00	6.75	4.88	5.56	5.14	10.40	6.38	5.56	5.56	4.76	4.16
13	5.42	4.88	5.42	4.76	5.42	8.75	10.98	*13.6	5.56	5.56	4.76	4.90
14	5.42	4.88	5.28	5.00	5.42	12.4	11.60	6.88	5.56	5.70	4.76	4.40
15	5.28	4.76	5.28	5.00	5.42	7.36	10.08	6.56	5.42	5.56	4.76	4.16
16	5.42	4.76	5.28	5.00	5.42	6.40	10.04	6.12	5.28	5.42	4.76	4.16
17	5.42	5.00	5.28	5.42	5.42	5.98	10.72	6.40	5.42	5.42	4.88	4.16
18	5.28	5.14	5.14	5.28	5.42	5.84	10.40	5.98	5.42	5.42	4.64	4.16
19	5.14	5.28	4.88	5.28	5.42	*5.76	10.98	5.84	5.28	5.42	4.52	4.04
20	5.00	4.88	5.22	5.56	5.70	10.84	10.84	5.70	5.14	5.56	4.52	4.04
21	5.14	4.76	5.14	5.98	5.42	10.84	10.84	5.70	10.4	5.42	4.52	4.04
22	5.14	4.76	*5.28	5.42	5.42	10.84	10.84	6.12	5.42	5.42	4.40	4.04
23	5.42	4.76	5.28	5.28	5.42	10.84	10.84	6.80	5.70	5.28	4.40	4.04
24	5.42	5.00	5.28	5.28	5.42	10.84	10.84	5.98	5.56	5.14	4.28	4.04
25	5.28	4.64	5.28	5.42	5.28	10.84	10.84	5.84	5.56	5.28	4.28	4.04
26	6.92	4.64	5.28	5.98	5.14	10.84	10.84	5.70	5.42	5.42	4.52	4.04
27	6.80	4.64	8.39	5.42	5.14	10.56	10.56	5.28	5.28	4.16	3.92	
28	5.00	4.88	6.40	5.28	5.28	10.04	10.98	5.84	5.00	5.00	4.16	4.04
29	4.88	5.28	7.90	5.28	5.14	10.08	10.84	5.84	5.14	5.00	4.28	4.04
30	5.14	6.97	5.98	5.28	5.00	11.5	10.04	-----	4.88	5.14	4.16	4.28
31	5.14	5.56	-----	*5.28	-----	6.56	10.08	-----	5.14	4.16	-----	-----
TOTAL MEAN MGD CFS AC-FT	170.08	157.62	163.44	164.07	161.98	199.57	216.90	172.58	175.12	165.26	144.14	125.54
CALENDAR YEAR 1960 MAX MIN MEAN MOD 5.81 MEAN CFS 8.99 AC-FT 6,530	27.1	4.48	5.45	5.29	5.40	6.44	7.00	6.16	5.65	5.51	4.65	4.18
FISCAL YEAR 1960-61 MAX MIN MEAN MGD 5.52 MEAN CFS 8.54 AC-FT 6,190	16.0	3.92	8.43	8.19	8.35	9.96	10.8	9.54	8.74	8.52	7.19	6.47

Peak discharge (base, 90 mgd).--Dec. 30 (4:30 a.m.) 97.8 mgd (151 cfs), 3.38 ft.

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of records for nearby streams.

2850. Waiahole tunnel at Waianae, near Waiahole

Location--Lat 21°29'05", long 157°53'15", on left bank in Waiahole tunnel at intake No. 29, 2.1 miles southwest of Waiahole.

Records available--December 1950 to June 1961 in reports of Geological Survey. June 1916 to November 1950 in files of Waiahole Water Co.

Gage--Water-stage recorder and Parshall flume.

Average discharge--10 years (1941-61), 24.4 mgd (37.8 cfs).

Extremes--1950-61: Maximum daily discharge, 74.0 mgd (114 cfs) July 28, 1954; minimum daily, 16.0 mgd (24.8 cfs) Jan. 24-29, 1952.

Remarks--Records excellent except those for period of fragmentary gage-height record which are good. Tunnel diverts water from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Water may be diverted at various intakes above station.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	24.6	23.7	24.2	23.5	*24.7	21.8	37.7	22.6	23.1	24.4	22.2	22.0
2	26.0	23.5	23.7	23.3	22.6	22.0	27.1	22.6	23.3	39.2	21.8	25.6
3	26.7	23.7	24.2	23.3	22.6	22.0	23.7	22.4	23.7	29.4	21.8	24.0
4	27.9	32.4	24.2	23.3	22.4	29.1	23.1	22.4	23.5	24.4	22.2	22.0
5	24.9	37.1	24.0	23.1	22.4	29.3	24.0	22.2	23.5	23.3	21.8	22.6
6	29.4	25.3	F24.4	23.1	22.4	22.4	23.1	22.2	23.5	23.1	21.8	21.6
7	25.6	24.4	F25.6	26.7	22.6	22.2	22.9	22.2	24.4	22.9	21.8	21.6
8	24.9	28.9	F25.1	23.7	22.6	22.2	22.9	22.2	26.7	22.9	21.8	23.3
9	24.4	24.4	F23.7	23.1	22.6	22.2	22.6	31.0	25.6	22.9	21.8	23.3
10	24.2	24.0	29.0	26.0	24.2	22.2	29.5	32.7	24.4	22.9	21.6	22.2
11	24.0	23.7	24.4	24.0	26.5	22.0	26.2	24.0	23.5	22.9	21.6	23.5
12	24.4	29.2	33.5	23.7	23.5	26.7	23.5	38.7	23.3	22.6	21.6	21.6
13	24.6	26.0	24.4	22.9	22.9	53.9	22.9	52.2	23.3	22.4	22.0	27.6
14	25.1	24.9	24.0	24.9	22.6	56.0	27.2	27.2	23.3	23.1	21.8	24.4
15	24.0	24.0	25.6	22.6	22.6	26.7	23.1	24.9	23.3	22.4	21.6	22.0
16	23.7	23.7	25.6	22.2	22.6	24.2	22.9	24.4	23.3	22.4	22.2	21.6
17	23.7	24.9	26.7	29.3	22.4	23.5	23.1	26.2	23.3	22.2	22.6	21.8
18	23.7	24.0	28.5	23.3	22.4	23.3	22.9	24.2	23.1	22.4	21.6	21.8
19	23.5	23.5	24.9	26.7	23.3	22.9	22.6	23.7	23.1	23.1	21.4	21.2
20	23.5	23.3	27.8	23.3	26.5	22.6	22.6	23.3	23.1	38.3	21.4	21.2
21	23.5	23.3	25.1	23.3	23.1	22.6	22.6	23.3	24.0	27.2	22.0	20.9
22	23.7	23.3	26.2	22.6	22.9	22.4	22.6	23.3	23.7	22.9	21.8	20.9
23	23.5	23.3	24.6	22.2	22.4	22.4	22.4	27.8	23.1	22.4	21.8	20.9
24	23.5	25.6	23.7	22.0	23.5	22.2	22.4	24.0	22.9	22.2	21.4	20.7
25	23.5	23.5	23.3	22.0	22.2	22.2	42.1	23.5	22.9	22.2	21.4	20.7
26	24.9	23.3	23.3	23.1	22.2	22.2	25.1	23.5	22.9	22.2	21.4	20.7
27	35.2	23.7	32.7	22.0	22.0	22.0	23.1	23.1	22.9	22.2	21.2	20.5
28	24.0	27.4	27.2	22.0	22.0	24.1	22.9	22.9	22.9	22.0	22.4	20.5
29	23.5	27.8	25.1	21.8	22.0	39.0	22.6	-----	22.9	22.0	23.1	21.4
30	26.2	40.5	24.0	22.6	22.0	39.9	22.6	-----	22.6	27.7	21.4	25.1
31	24.6	26.0	-----	22.0	-----	26.0	24.4	-----	22.6	-----	21.8	-----
TOTAL	774.9	802.3	768.7	727.6	688.7	816.0	766.4	722.7	727.7	730.4	676.1	669.4
MEAN												
MGD	25.0	25.9	25.6	23.5	23.0	26.3	24.7	25.8	23.5	24.3	21.8	22.3
CFS	38.7	40.0	39.6	36.3	35.5	40.7	38.2	39.9	36.3	37.7	33.7	34.5
AC-FT	2,380	2,460	2,360	2,230	2,110	2,500	2,350	2,220	2,230	2,240	2,070	2,050

CALENDAR YEAR 1960 MAX 60.8 MIN 17.8 MEAN MOD 24.5 MEAN CFS 37.9 AC-FT 27,520
FISCAL YEAR 1960-61 MAX 56.0 MIN 20.5 MEAN MGD 24.3 MEAN CFS 37.6 AC-FT 27,200

* Discharge measurement made on this day.

F Fragmentary gage-height record; discharge computed from partly estimated gage heights.

ISLAND OF OAHU

2860. Waiahole tunnel wastewater at intake 31, near Waiahole

Location.--Lat 21°28'30", long 157°53'15", on left bank 150 ft below wastewater gates of intake No. 31 of Waiahole tunnel and 2.2 miles southwest of Waiahole.

Records available.--January 1951 to June 1961.

Gage.--Water-stage recorder and Parshall flume.

Average discharge.--10 years, 0.812 mgd (1.26 cfs).

Extremes.--1951-61: Maximum daily discharge, 62.1 mgd (96.1 cfs) Dec. 1, 1957; no flow most of time.

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

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
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												
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0
MEAN												
MGD	0	0	0	0	0	0	0	0	0	0	0	0
CFS	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	0	0	0	0	0	0	0	0	0
CALENDAR YEAR 1960 MAX	4.03	MIN	0	MEAN MGD	0.027	MEAN CFS	0.042	AC-FT	31			
FISCAL YEAR 1960-61 MAX	0	MIN	0	MEAN MGD	0	MEAN CFS	0	AC-FT	0			

2870. Waiahole tunnel at north portal, near Waiahole

Location.--Lat 21°28'15", long 157°53'30", on right bank in Waiahole tunnel at the boundary of Stage and private lands and 2.6 miles southwest of Waiahole.

Records available.--January 1951 to June 1961 in reports of Geological Survey. May 1916 to December 1950 in files of Waiahole Water Co.

Gage.--Water-stage recorder and Parshall flume.

Average discharge.--10 years (1951-61), 26.2 mgd (40.5 cfs).

Extremes.--1951-61: Maximum daily discharge, 81.0 mgd (125 cfs) July 28, 1954; minimum daily, 1.48 mgd (2.29 cfs) Dec. 9, 1956.

Remarks.--Records excellent. Tunnel diverts water from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Numerous intakes can divert water above station.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	29.8	28.5	29.0	27.8	28.9	25.5	41.2	24.8	27.0	27.3	25.8	26.3
2	29.5	28.3	27.5	27.5	26.5	25.5	29.6	24.5	27.0	42.7	25.8	29.3
3	32.5	28.3	27.5	27.3	26.3	25.3	27.0	24.5	27.3	33.0	25.8	27.8
4	33.3	36.7	28.8	27.0	26.3	34.0	27.0	24.5	26.8	28.3	26.0	25.8
5	30.0	41.3	28.0	27.0	26.3	26.8	27.3	24.5	26.8	27.0	25.5	26.5
6	34.0	30.0	28.5	27.0	26.3	25.8	26.5	24.8	26.8	26.8	25.5	25.5
7	30.8	29.0	28.8	31.3	25.8	25.5	26.3	25.5	27.3	26.5	25.5	25.3
8	30.0	34.5	28.5	27.8	25.5	25.3	26.3	25.8	29.5	26.3	25.5	29.5
9	29.5	29.3	27.8	27.0	24.5	25.3	26.0	34.5	28.8	26.3	25.5	27.3
10	29.5	28.8	32.2	32.0	27.5	24.8	34.3	35.8	28.0	26.3	25.5	26.0
11	29.3	28.5	28.0	28.0	31.0	24.3	30.5	26.3	27.0	25.8	25.3	27.3
12	29.5	34.3	38.6	27.5	27.3	29.9	27.3	39.7	26.8	26.0	25.3	25.5
13	29.3	31.3	28.8	27.3	26.5	60.8	26.3	58.6	26.5	26.0	25.8	32.3
14	30.0	29.3	28.0	29.5	26.3	63.7	33.3	30.5	26.5	26.5	25.0	28.8
15	29.0	28.8	29.5	27.5	26.3	30.5	26.8	28.0	26.5	25.5	25.3	25.8
16	29.0	28.5	29.5	27.0	26.0	27.8	26.5	27.0	26.3	26.3	25.8	25.3
17	28.5	29.5	31.0	34.1	26.0	27.0	27.8	29.5	26.3	25.5	26.5	25.3
18	28.3	28.8	32.3	28.0	25.8	26.3	27.3	26.8	26.3	26.3	25.3	25.3
19	28.8	28.3	29.0	30.3	26.8	26.3	26.8	26.3	26.3	26.5	24.8	24.8
20	28.8	28.0	31.8	28.5	31.0	26.0	26.8	26.0	26.3	40.7	24.5	24.8
21	28.5	27.8	29.3	28.8	27.0	26.0	26.5	25.8	28.3	31.6	25.3	24.5
22	28.5	27.8	30.0	26.3	26.5	26.0	26.4	25.8	27.0	26.3	24.8	24.3
23	28.3	27.8	28.8	25.5	26.0	26.0	26.3	31.9	26.3	26.0	25.0	24.5
24	28.3	30.0	28.0	26.8	27.3	25.8	26.3	28.3	26.3	25.8	24.5	24.3
25	28.3	28.3	27.8	26.8	25.8	25.5	46.8	28.0	26.0	25.8	24.5	24.0
26	29.5	27.8	27.5	28.8	25.5	25.5	28.8	27.5	26.0	25.8	24.8	24.3
27	38.0	28.3	37.0	26.8	25.5	25.5	25.8	27.0	26.0	25.8	24.5	24.0
28	28.8	32.0	31.8	26.8	25.5	28.3	25.0	27.0	25.8	25.5	26.0	24.0
29	28.3	32.3	30.0	26.5	25.8	42.5	25.0	-----	25.8	25.3	26.5	24.8
30	30.5	47.1	28.5	27.3	25.8	44.8	25.0	-----	25.8	31.2	25.0	30.3
31	29.5	30.8	-----	26.5	-----	28.3	28.0	-----	25.8	-----	25.5	-----
TOTAL	925.9	950.0	891.8	866.3	797.6	930.6	880.9	809.2	829.2	834.7	786.4	783.5
MEAN	29.9	30.6	29.7	27.9	26.6	30.0	28.4	28.9	26.7	27.8	25.4	26.1
MGD	29.9	30.6	29.7	27.9	26.6	30.0	28.4	28.9	26.7	27.8	25.4	26.1
CFS	46.2	47.4	46.0	43.2	41.1	46.4	44.0	44.7	41.4	43.0	39.2	40.4
AC-FT	2,840	2,920	2,740	2,660	2,450	2,860	2,700	2,480	2,540	2,560	2,410	2,400

CALENDAR YEAR 1960 MAX 66.6 MIN 19.9 MEAN MOD 28.5 MEAN MGD 28.2 MEAN CFS 44.1 AC-FT 32,040
FISCAL YEAR 1960-61 MAX 63.7 MIN 24.0 MEAN MGD 28.2 MEAN CFS 43.6 AC-FT 31,560

* Discharge measurement made on this day.

ISLAND OF OAHU

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 eastern boundary of Ewa Forest Reserve and 5.2 miles northeast of Waipahu Post Office.

Records available.--August 1956 to June 1961 in reports of Geological Survey. May 1916 to July 1956 in files of Waiahole Water Co.

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

Extremes.--1956-61: Maximum daily discharge, 97.4 mgd (151 cfs) Oct. 23, 1958; minimum daily, 6.0 mgd (9.3 cfs) Dec. 9, 1956.

Remarks.--Records good.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	*35.7	*34.1	*34.5	32.5	*34.0	*30.9	45.6	28.9	*31.2	32.1	30.5	*30.2
2	37.3	34.1	33.1	32.1	31.5	30.9	34.0	29.3	31.2	47.4	30.5	33.4
3	39.0	34.1	32.1	*32.1	31.5	30.9	*31.8	29.3	31.5	*37.7	30.5	32.1
4	41.3	43.2	34.1	32.1	31.5	38.6	31.5	29.3	31.5	32.8	30.5	30.2
5	36.4	47.7	33.1	31.8	31.5	32.8	31.8	29.3	31.2	31.5	30.5	31.2
6	40.6	36.4	38.1	31.8	31.5	31.8	31.2	29.6	31.2	31.2	30.5	30.2
7	37.3	35.4	35.4	35.7	30.9	31.5	30.5	30.5	32.1	31.2	30.5	29.9
8	36.4	39.0	34.4	33.1	30.5	31.2	30.5	30.5	34.7	30.9	30.5	34.1
9	35.7	35.0	33.1	32.1	29.9	31.2	30.2	38.1	33.4	30.9	30.2	32.1
10	35.4	34.7	37.5	37.3	32.8	30.5	37.7	39.7	33.4	30.9	29.9	30.2
11	35.4	34.7	33.1	34.1	32.8	*30.2	35.0	31.2	31.8	30.5	29.9	31.8
12	35.4	38.5	44.7	32.8	33.7	34.7	31.8	43.8	31.8	30.5	29.9	30.2
13	35.4	37.3	34.1	32.5	31.8	65.5	30.5	70.5	31.5	30.5	30.2	36.7
14	38.4	34.7	33.4	34.7	31.5	73.2	38.0	37.0	31.5	31.2	29.9	33.4
15	35.0	34.1	33.7	32.5	31.5	37.3	31.5	32.8	31.5	29.9	29.9	30.2
16	34.7	34.1	36.0	32.1	31.5	34.4	30.9	31.8	31.2	29.3	30.5	29.9
17	34.1	34.7	35.7	35.0	31.5	32.5	32.5	34.4	31.2	29.6	30.9	29.9
18	33.7	34.1	37.7	34.1	31.2	32.5	31.5	31.5	31.2	30.5	29.9	29.6
19	34.4	33.7	33.7	35.4	32.1	32.1	30.9	30.9	31.2	30.9	29.6	29.3
20	34.4	33.7	36.8	33.4	35.6	32.1	30.5	30.9	31.2	43.1	29.6	29.3
21	38.1	33.1	34.1	33.7	32.1	31.5	30.5	30.5	33.1	36.8	29.9	28.9
22	34.1	33.1	35.4	31.5	31.8	31.2	30.5	30.2	32.1	31.2	29.9	28.9
23	33.7	33.1	33.7	30.9	31.2	31.2	30.5	36.5	31.2	30.9	29.9	28.6
24	33.7	34.7	32.8	31.2	33.1	31.2	30.5	32.5	31.2	30.5	29.3	28.6
25	33.4	33.7	32.5	31.8	30.9	31.2	49.7	32.5	30.5	30.5	28.9	28.6
26	35.0	33.1	32.1	34.1	30.9	30.5	33.4	31.8	30.9	30.5	29.3	28.6
27	44.7	33.7	41.1	31.8	30.9	30.2	30.2	31.2	30.9	30.5	28.9	28.6
28	34.7	37.7	37.5	31.8	30.9	31.2	29.6	31.5	30.9	30.2	29.3	28.3
29	34.1	38.0	34.7	31.5	31.2	46.9	29.6	-----	30.9	30.2	32.5	29.9
30	36.7	53.3	33.1	32.1	31.2	49.0	29.3	-----	30.9	35.7	29.6	34.7
31	35.0	37.0	-----	31.5	-----	33.1	32.5	-----	30.9	-----	29.9	-----
TOTAL MEAN	1,112.2	1,123.8	1,047.3	1,023.1	958.5	1,102.6	1,014.2	946.0	979.4	969.6	931.8	917.6
MEAN MGD	35.9	36.3	34.9	33.0	32.0	35.6	32.7	33.8	31.6	32.3	30.1	30.6
CFS	55.5	56.1	54.0	51.1	49.4	55.0	50.6	52.3	48.9	50.0	46.5	47.3
AC-FT	3,410	3,450	3,210	3,140	2,940	3,380	3,110	2,900	3,010	2,980	2,860	2,820

CALENDAR YEAR 1960 MAX 75.2 MIN 24.2 MEAN MGD 33.4 MEAN CFS 51.7 AC-FT 37,470	FISCAL YEAR 1960-61 MAX 73.2 MIN 28.3 MEAN MGD 33.2 MEAN CFS 51.4 AC-FT 37,210
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* Discharge measurement made on this day.

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 June 1961.

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

Average discharge.--6 years (1955-61), 4.89 mgd (7.57 cfs).

Extremes.--Maximum discharge during year, 140 mgd (217 cfs) Feb. 13 (gage height, 2.67 ft), from rating curve extended above 75 mgd on basis of field estimate of flow at gage height 4.23 ft; minimum, 1.90 mgd (2.94 cfs) Nov. 30.

1955-61: Maximum discharge, 625 mgd (967 cfs) Apr. 16, 1960 (gage height, 4.32 ft); minimum, 1.71 mgd (2.65 cfs) Sept. 9, 10, 16, 1957.

Remarks.--Records fair except those for period of no gage-height record which are poor. Approximately 1.7 million gallons a day are pumped upstream from station into Waiahole tunnel for irrigation in Central Oahu. Pumps are turned off at times.

Rating table (gage height, in feet, and discharge in million gallons a day)

0.5	1.72
.6	2.73
.7	4.00
.9	7.50
1.1	12.5
1.2	15.5

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.85	2.62	2.40	2.97	2.51	2.20	6.49	4.16	3.09	2.85	2.73	2.30
2	2.85	2.51	2.73	2.85	*2.51	2.20	5.12	4.00	2.97	3.74	2.30	2.40
3	3.52	2.51	2.97	2.73	2.40	2.20	3.35	4.00	2.97	3.61	2.30	2.30
4	4.00	*3.20	2.20	2.73	2.51	7.34	2.85	4.00	2.97	3.22	*2.20	2.30
5	*3.22	2.51	2.20	2.73	2.40	3.74	2.97	4.00	2.97	*2.85	2.30	2.30
6	2.97	2.40	2.30	2.85	2.40	2.73	2.85	3.35	2.97	2.85	2.30	*2.20
7	3.09	2.20	2.40	2.73	2.51	3.09	2.73	3.22	2.85	2.30	2.20	2.20
8	2.97	2.30	2.40	2.73	3.22	2.51	2.85	2.73	2.85	2.85	2.30	2.30
9	2.85	2.20	2.40	2.73	3.74	2.40	2.97	*2.62	2.85	2.97	2.30	2.40
10	2.73	2.10	2.40	3.65	3.35	2.40	3.71	3.09	2.85	2.85	*2.20	2.20
11	2.73	2.10	2.40	2.97	3.71	2.97	3.48	3.87	2.73	2.85	2.20	2.30
12	2.73	2.40	3.75	2.62	2.85	2.73	3.09	4.32	2.73	2.85	2.30	2.20
13	2.97	2.20	2.73	2.51	2.62	5.00	3.22	12.19	2.73	2.85	2.40	*2.85
14	2.85	2.40	2.51	2.51	2.51	10.8	11.0	3.44	2.73	2.97	2.62	2.65
15	2.73	2.40	2.40	2.51	2.51	4.00	3.61	5.28	2.73	3.35	2.51	2.62
16	2.73	2.30	2.30	2.40	2.51	*2.97	3.95	5.12	2.73	*2.87	2.51	2.51
17	3.09	2.40	2.30	2.51	2.51	2.62	3.35	4.96	2.73	2.97	2.62	2.40
18	3.22	2.30	2.40	3.09	2.62	2.97	3.09	4.64	2.73	2.73	2.51	2.40
19	2.85	2.20	2.40	3.09	2.85	2.73	2.85	4.48	2.73	2.85	2.40	2.40
20	2.85	2.20	2.97	3.09	2.73	2.62	2.73	4.32	2.73	3.36	2.40	2.40
21	2.73	2.10	*2.62	3.48	2.73	2.51	1.73	4.32	*2.97	2.85	2.62	2.40
22	2.73	2.20	2.51	4.00	2.62	2.51	2.73	4.32	3.35	*2.73	*2.85	A2.40
23	2.85	2.30	2.40	4.00	2.62	2.51	2.73	4.16	2.97	*2.51	2.62	A2.51
24	2.85	2.30	2.40	3.09	2.97	2.51	2.73	3.48	2.85	2.51	2.40	A2.30
25	2.85	2.20	2.40	2.51	2.85	2.51	5.48	3.09	2.85	2.62	2.40	A2.30
26	2.85	2.20	2.40	2.73	2.73	2.51	4.80	3.09	2.73	2.62	2.51	A2.40
27	2.85	2.30	3.82	2.62	2.73	2.51	4.32	3.35	*2.62	2.62	2.40	A2.40
28	2.85	2.40	3.61	2.51	2.85	2.62	4.16	3.09	2.62	2.51	2.51	A2.51
29	2.85	2.40	3.85	2.51	2.40	3.09	4.00	-----	2.73	2.62	2.40	A2.73
30	2.85	4.63	3.22	2.51	2.30	10.6	4.16	-----	2.62	2.73	2.30	A3.48
31	2.73	2.97	-----	2.51	-----	4.80	4.48	-----	2.62	-----	2.30	-----
TOTAL	90.79	75.45	79.79	88.47	81.99	108.32	110.34	118.91	88.94	87.61	75.01	73.26
MEAN												
MGD	2.93	2.43	2.66	2.85	2.73	3.49	3.82	4.25	2.87	2.92	2.42	2.44
CFS	4.53	3.77	4.11	4.41	4.23	5.41	5.91	6.57	4.84	4.82	3.74	3.70
AC-FT	279	232	245	272	252	332	363	365	273	269	230	225

Calendar Year	1960	Max	25.6	Min	2.10	Mean mgd	3.38	Mean cfs	5.26	Ac-ft	3,800
Fiscal Year	1960-61	Max	12.9	Min	2.10	Mean mgd	2.98	Mean cfs	4.61	Ac-ft	3,340

Peak discharge (base, 100 mgd).--Dec. 29 (12 p.m.) 105 mgd (162 cfs), 2.43 ft; Feb. 13 (3 a.m.) 140 mgd (217 cfs), 2.67 ft.

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of records for nearby streams.

ISLAND OF OAHU

2949. Waikane Stream at elevation 75 ft, at Waikane

Location.--Lat 21°30'00", long 157°51'54", on right bank 1/4 mile below confluence with Waimee Stream and 400 ft above ditch on left bank and 0.7 mile west of Waikane cemetery.

Drainage area.--2.25 sq mi.

Records available.--December 1959 to June 1961.

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

Extremes.--Maximum discharge during year, 233 mgd (361 cfs) Feb. 13 (gage height, 3.81 ft), from rating curve extended above 74 mgd by logarithmic plotting; minimum, 1.25 mgd (1.93 cfs) Aug. 11.

1959-61: Maximum discharge, 1,530 mgd (2,370 cfs) May 12 (gage height, 7.42 ft), from rating curve extended above 74 mgd as explained above; minimum, 1.15 mgd (1.78 cfs) Dec. 23, 1959.

Remarks.--Records good except those for period of no gage-height record, which are fair. Continuous records of rainfall are obtained at station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	1.07	2.0	18.0
1.5	2.13	2.2	30.0
1.6	3.70	2.4	45.5
1.8	9.10		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.13	1.43	2.00	3.02	1.87	A1.64	2.21	3.36	3.19	3.65	2.00	1.54
2	2.56	1.33	1.75	2.56	1.87	A1.54	9.01	3.19	3.02	2.40	1.87	2.71
3	2.71	1.33	1.64	2.42	1.75	A1.54	6.31	3.02	3.02	11.8	1.87	2.00
4	3.53	*3.16	1.54	2.42	1.75	A4.39	5.31	2.85	2.85	6.51	2.00	1.75
5	*2.71	3.42	1.54	2.28	1.64	A2.13	5.31	2.71	2.71	*4.62	1.87	1.87
6	3.00	2.13	1.54	2.28	1.64	A2.00	4.39	2.56	2.56	4.16	1.75	1.64
7	3.36	1.75	1.75	2.56	1.64	A2.00	4.39	2.56	3.56	3.70	1.75	1.64
8	2.68	1.64	1.75	2.28	1.64	A2.00	4.16	2.56	2.71	3.53	1.75	2.65
9	2.28	1.54	1.64	2.13	1.64	A1.87	3.70	*6.05	5.88	3.36	*1.64	2.85
10	2.13	1.43	4.13	2.00	1.75	A2.13	8.07	5.99	5.54	3.19	1.94	1.87
11	2.00	1.33	2.00	2.28	A2.85	A2.42	5.54	3.93	3.19	3.02	1.54	2.28
12	2.13	7.68	4.65	1.87	A2.13	A3.02	4.39	6.44	2.71	2.71	1.43	1.75
13	1.87	2.96	2.42	1.87	A1.67	A5.08	3.93	37.6	2.56	2.56	1.54	4.49
14	2.00	1.87	2.00	2.13	A1.75	*A30.0	4.16	6.93	2.56	3.19	1.54	*3.02
15	1.75	1.75	1.87	2.00	A1.75	6.34	3.53	5.54	2.42	2.71	1.64	2.00
16	1.75	1.64	1.87	2.00	A1.75	4.39	4.16	5.31	2.42	2.56	1.64	1.75
17	1.75	1.75	1.75	2.28	A1.64	3.36	4.16	6.93	2.28	2.42	1.64	1.75
18	1.64	1.64	2.99	2.42	A1.87	3.36	3.53	9.31	2.28	2.42	1.64	1.75
19	1.64	1.54	2.28	3.13	A2.13	3.19	3.36	4.62	2.13	2.42	1.43	1.54
20	1.64	1.54	2.56	2.85	A2.00	A3.02	3.19	4.16	2.13	2.42	1.54	1.64
21	1.54	1.43	*2.28	4.15	A1.87	A2.85	3.02	4.16	3.91	2.42	1.75	1.72
22	1.54	1.43	2.42	3.02	A1.75	A2.85	3.93	2.85	2.28	1.75	1.43	
23	1.54	1.54	2.42	2.28	A1.75	A2.71	3.02	5.34	2.13	2.28	1.75	1.64
24	1.54	1.54	2.00	2.13	A2.42	2.56	2.71	4.16	2.00	2.13	1.64	1.43
25	1.54	1.54	1.87	1.87	A2.13	2.42	15.6	3.70	1.87	2.13	1.54	1.43
26	1.54	1.33	1.87	2.42	A2.13	2.42	6.78	3.53	1.87	2.00	1.54	1.54
27	1.54	1.64	3.04	2.00	A2.13	2.28	4.39	3.36	1.87	2.00	1.43	1.43
28	1.43	2.42	10.1	*1.75	A2.28	2.87	3.70	3.19	1.87	1.87	1.64	1.64
29	1.33	2.85	4.02	1.75	A2.00	7.16	3.36	-----	2.00	1.87	1.75	1.75
30	1.75	5.63	4.16	1.75	A1.75	19.8	3.53	-----	1.87	2.00	1.33	4.15
31	1.64	2.85	-----	1.75	-----	7.36	4.87	-----	2.00	-----	1.43	-----
TOTAL	62.19	67.06	77.85	71.65	57.14	140.70	166.63	152.99	82.86	115.93	51.17	60.96
MEAN												
MGD	2.01	2.16	2.60	2.31	1.90	4.54	5.38	5.46	2.68	3.86	1.69	2.01
CFS	3.10	3.35	4.01	3.58	2.95	7.02	8.32	8.45	4.14	5.98	2.85	3.11
AC-FT	191	206	239	220	175	432	511	470	255	356	157	185

CALENDAR YEAR 1960 MAX 146 MIN 1.25 MEAN MGD 5.21 MEAN CFS 8.06 AC-FT 5,850
FISCAL YEAR 1960-61 MAX 37.6 MIN 1.33 MEAN MGD 3.03 MEAN CFS 4.69 AC-FT 3,400

Peak discharge (base, 300 mgd).--No peak above base.

* Discharge measurement made on this day.
A No gage-height record; discharge estimated on basis of records for nearby streams.

2965. Kahana Stream at altitude 30 ft, near Kahana

Location.--Lat 21°32'138", long 157°53'10", on right bank 600 ft above confluence with East Branch Kahana Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Kauai Post Office.

Drainage area.--3.74 sq mi.

Records available.--Dec. 1958 to June 1961.

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

Extremes.--Maximum discharge during year, 3,480 mgd (5,380 cfs) Oct. 17 (gage height, 5.04 ft), from rating curve extended above 340 mgd by logarithmic plotting; minimum daily, 9.65 mgd (14.9 cfs) July 25, Aug. 22, June 27.

1958-61: Maximum discharge, that of Oct. 17, 1960; minimum, 7.15 mgd (11.1 cfs) Feb. 8, 1960.

Remarks.--Records good except those for periods of shifting-control, which are fair. Approximately 6 million gallons are diverted daily by Waiahole Water Co. at 800 ft elevation, 2.3 miles above station.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	14.6	14.6	17.4	15.1	16.9	10.5	77.4	13.1	14.1	12.2	18.0	*15.9
2	14.3	13.6	15.1	14.6	*14.1	10.8	32.0	13.1	14.1	30.1	14.6	18.5
3	17.9	*13.1	15.1	13.6	12.6	10.5	22.9	12.6	14.6	18.5	14.1	15.1
4	20.7	33.9	16.2	14.1	12.1	41.2	20.2	12.1	14.1	14.6	15.1	13.1
5	15.1	44.4	14.1	12.1	12.6	16.2	19.7	12.6	13.1	12.1	14.1	14.1
6	18.5	21.5	14.6	12.6	12.1	12.6	18.5	12.1	13.1	11.6	13.6	13.1
7	20.0	18.0	14.6	18.6	11.6	11.2	18.5	11.6	15.0	10.8	13.1	12.6
8	18.4	23.0	13.6	14.6	11.6	10.8	16.2	*10.8	20.2	10.8	13.1	*16.1
9	15.1	16.8	12.1	12.6	11.2	11.2	15.1	19.1	16.2	10.8	12.6	16.2
10	15.1	15.7	22.6	18.9	16.5	11.2	29.0	19.7	15.7	11.2	12.1	14.6
11	14.1	14.6	14.1	17.4	22.3	10.5	20.2	14.1	13.6	11.2	12.1	19.6
12	15.7	17.7	27.4	15.1	15.7	14.4	16.2	54.3	13.1	10.8	12.1	*15.1
13	15.1	14.6	15.7	13.6	13.1	*80.7	15.7	20.3	12.1	10.5	13.1	21.1
14	16.8	15.7	14.6	16.1	12.1	86.9	76.6	25.7	12.1	11.2	13.1	21.9
15	14.1	13.1	15.5	13.1	12.6	27.1	19.1	21.5	11.6	10.8	12.1	15.1
16	13.6	14.1	18.0	12.1	12.6	21.5	16.8	20.2	11.2	10.5	15.1	14.1
17	13.1	15.1	16.2	13.9	12.1	19.1	16.8	20.2	10.8	10.0	16.2	14.3
18	12.6	12.1	21.5	30.2	12.6	18.5	15.7	18.0	11.2	10.8	13.1	13.6
19	12.1	12.1	*16.2	31.2	13.6	16.2	15.1	16.2	10.8	11.2	12.6	12.1
20	12.6	12.1	19.9	23.6	19.4	15.1	14.6	15.7	11.2	7.8.4	12.6	13.1
21	11.6	10.8	17.4	22.2	15.1	15.1	13.6	15.7	13.8	34.1	13.6	*11.6
22	11.2	9.65	19.8	19.7	14.1	15.1	13.1	15.7	11.6	18.5	13.6	11.2
23	10.5	10.5	18.5	18.0	13.1	15.1	13.6	23.5	10.8	16.0	13.1	12.1
24	10.5	14.0	15.1	16.8	15.7	13.6	12.1	16.2	11.2	16.2	12.1	11.2
25	9.65	12.1	14.6	16.2	12.6	13.6	64.0	15.7	10.8	15.1	12.1	10.0
26	10.8	10.8	13.6	18.0	12.6	12.6	19.1	15.7	11.2	15.1	12.6	11.6
27	85.9	12.1	21.9	15.7	12.1	12.1	15.7	15.1	11.2	14.6	11.2	9.65
28	18.5	17.7	20.8	13.1	12.1	22.4	14.1	14.6	10.8	13.6	12.1	10.5
29	14.6	19.7	18.5	14.6	11.6	54.3	14.1	-----	11.2	13.6	17.2	*11.2
30	18.2	70.1	16.2	15.1	10.8	71.9	13.6	-----	*10.8	29.9	13.1	16.5
31	17.4	22.2	-----	14.6	-----	22.9	15.7	-----	10.8	-----	14.6	-----
TOTAL	528.35	565.45	510.9	644.2	407.2	724.9	705.0	677.9	391.3	505.6	417.8	424.85
MEAN												
MGD	17.0	18.2	17.0	20.8	13.6	23.4	22.7	24.2	12.6	16.9	13.5	14.2
CFS	26.4	28.2	26.3	32.1	21.0	36.2	35.2	37.5	19.5	26.1	20.8	21.9
AC-FT	1,620	1,740	1,570	1,980	1,250	2,220	2,160	2,080	1,200	1,550	1,280	1,300

Calendar Year 1960 Max 390 Min 7.45 Mean mgd 22.4 Mean cfs 34.7 Ac-ft 25,160
Fiscal Year 1960-61 Max 203 Min 9.65 Mean mgd 17.8 Mean cfs 27.5 Ac-ft 19,950

Peak discharge (base, 800 mgd).--July 27 (11 a.m.) 950 mgd (1,470 cfs), 3.83 ft; Oct. 17 (6:30 p.m.) 3,480 mgd (5,380 cfs), 5.04 ft;
Dec. 4 (4:30 p.m.) 950 mgd (1,470 cfs), 3.83 ft; Jan. 1 (7 a.m.) 950 mgd (1,470 cfs), 3.83 ft; Jan. 14 (7 a.m.) 926 mgd (1,430 cfs),
3.81 ft; Feb. 13 (2:30 a.m.) 1,840 mgd (2,850 cfs), 4.40 ft.

* Discharge measurement made on this day.

ISLAND OF OAHU

3020. Punaluu ditch near Punaluu

Location.--Lat $21^{\circ}33'40''$, long $157^{\circ}54'10''$, on right bank of ditch 800 ft downstream from intake, 1.7 miles southwest of highway bridge at Punaluu, and 3.3 miles southeast of Hanula Post Office.

Records available.--May 1953 to June 1961.

Gage.--Water-stage recorder. Altitude or gage, 200 ft (from topographic map).

Average discharge.--8 years, 7.37 mgd (11.4 cfs).

Extremes.--1953-61: Maximum daily discharge, 21.6 mgd (33.4 cfs) Jan. 14, 1960; minimum daily, 0.02 mgd (0.03 cfs) Jan. 9, 14, 1955, Nov. 8, 9, 1957.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Punaluu Stream for irrigation of sugar cane in the Punaluu district.

DISCHARGE, IN MILLION GALLONS A DAY; FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	12.4	12.1	13.8	13.3	6.50	6.75	7.92	4.73	2.37	13.1	13.1	11.3
2	8.63	11.7	13.3	13.3	6.50	6.50	7.78	4.73	2.37	14.0	12.4	11.1
3	4.49	11.6	13.3	13.1	*6.50	6.50	7.50	4.64	2.37	12.2	12.2	10.8
4	7.53	14.5	14.1	12.9	6.37	7.12	7.37	4.64	2.31	12.2	12.2	10.6
5	12.8	15.4	12.8	12.9	6.37	6.50	7.37	4.73	2.31	11.6	11.2	10.9
6	12.8	13.4	12.4	12.8	6.37	6.50	7.23	4.92	2.44	11.6	11.9	10.6
7	14.2	13.1	12.4	13.1	6.37	6.50	7.23	5.01	2.51	11.4	11.7	10.8
8	12.0	13.8	12.6	12.9	6.37	6.50	7.25	*5.10	2.51	11.3	11.7	11.9
9	6.81	13.1	12.4	12.6	6.37	6.37	7.12	5.51	2.51	11.1	11.7	11.4
10	12.6	12.8	14.3	14.0	6.62	6.25	7.64	5.83	2.51	11.1	A11.7	11.1
11	12.6	12.8	12.8	13.4	7.12	6.14	7.37	5.62	2.51	11.3	A11.6	11.6
12	12.6	12.8	16.0	12.6	7.12	6.14	7.25	6.04	2.44	11.3	A11.6	*10.9
13	13.1	12.4	13.4	12.4	6.87	7.25	7.25	5.23	2.47	11.4	A12.6	11.9
14	12.6	12.4	12.9	12.4	6.87	7.25	6.47	4.64	2.44	12.1	A12.1	13.3
15	10.1	12.6	12.9	12.4	6.87	*6.87	3.84	4.54	2.44	11.6	A11.7	11.6
16	9.13	12.9	13.1	12.2	6.87	6.75	2.88	4.45	5.78	11.4	11.9	11.4
17	12.4	12.4	12.4	16.2	6.67	6.62	2.65	4.36	9.74	11.4	12.4	11.4
18	12.6	12.4	13.1	15.8	6.87	6.62	2.91	4.36	11.4	11.9	11.7	11.3
19	12.4	12.2	*12.8	16.9	6.87	6.62	2.51	4.36	11.4	13.1	11.4	10.9
20	12.4	12.2	14.0	11.2	7.00	6.62	2.31	4.27	11.4	16.5	11.4	11.1
21	12.2	12.1	13.1	3.84	6.87	6.62	3.29	4.27	12.1	13.8	11.3	10.8
22	12.2	12.1	8.27	3.84	6.87	6.75	5.10	2.26	11.8	12.9	11.3	10.8
23	12.1	12.2	5.83	3.76	6.75	7.12	5.10	1.97	11.4	12.6	11.3	10.9
24	9.51	13.1	5.72	3.67	6.87	7.00	5.01	1.97	11.3	12.6	11.1	10.6
25	11.9	12.2	8.64	5.62	6.75	7.00	5.41	1.85	11.3	12.4	11.1	10.6
26	13.7	12.2	12.4	6.62	6.62	7.00	4.92	1.97	11.4	12.4	11.1	10.8
27	16.3	12.4	A19.0	6.62	6.62	6.87	4.82	2.24	11.1	12.2	10.9	10.5
28	13.5	14.0	A14.9	6.62	6.82	7.12	4.82	2.31	11.1	12.2	11.3	10.5
29	12.6	13.3	A14.3	6.62	6.75	7.92	4.73	-----	11.3	11.7	11.4	10.8
30	10.6	18.0	13.8	6.62	6.75	8.34	4.73	-----	11.1	13.3	10.9	7.82
31	9.60	14.7	-----	6.50	-----	7.50	4.82	-----	*11.3	-----	11.4	-----
TOTAL	357.80	402.7	376.76	326.73	201.14	211.61	172.24	116.54	211.13	368.5	361.3	330.02
MEAN												
HGD	11.5	13.0	12.6	10.5	6.70	6.83	5.56	4.16	6.81	12.3	11.7	11.0
CFS	17.9	20.1	19.4	16.3	10.4	10.6	8.60	6.44	10.5	19.0	18.0	17.0
AC-FT	1,100	1,240	1,160	1,000	617	649	529	358	648	1,130	1,110	1,010

CALENDAR YEAR 1960 MAX 21.6 MIN 0.07 MEAN MOD 9.58 MEAN CFS 14.8 AC-FT 10,760

FISCAL YEAR 1960-61 MAX 18.0 MIN 1.85 MEAN HGD 9.41 MEAN CFS 14.6 AC-FT 10,590

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of records for nearby stations.

3030. Punaluu Stream near Punaluu

Location.--Lat 21°33'35", long 157°54'05", on left bank at diversion dam, 1.8 miles southwest of Punaluu, and 3.5 miles southeast of Hawula.

Drainage area.--2.78 sq mi.

Records available.--May 1953 to June 1961.

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

Average discharge.--8 years, 8.39 mgd (13.0 cfs).

Extremes.--Maximum discharge during fiscal year, 990 mgd (1,530 cfs) Jan. 14 (gage height, 3.90 ft), from rating curve extended above 105 mgd; minimum, 0.01 mgd (0.02 cfs) June 25, 27.

1953-61: Maximum discharge, 1,760 mgd (2,720 cfs) Aug. 20, 1955 (gage height, 5.03 ft), from rating curve extended above 105 mgd; no flow at times.

Remarks.--Records fair except those for period of fragmentary and no gage-height record, which are poor. Records do not include flow of Punaluu ditch.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.02	0	0.8	10.2
.1	.13	1.0	21.0
.2	.55	1.2	39.0
.3	1.27	1.5	82.0
.4	2.35	2.0	195
.6	5.40		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961
(*in*)

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.61	0.67	1.27	0.94	7.0	3.90	30.1	7.90	10.2	2.50	1.48	a 0.7
2	3.76	.55	.87	.73	5.60	4.35	17.7	7.68	10.2	8.24	.87	a 1.0
3	8.38	.44	.73	.67	*5.24	4.35	10.5	7.68	10.2	1.77	.73	a .5
4	6.52	3.93	1.88	.61	5.24	23.6	8.90	7.45	10.2	1.70	.73	a .5
5	*.67	3.75	.67	.50	5.24	7.00	8.15	7.20	9.85	.94	1.01	a .7
6	.55	1.20	.67	.50	5.24	5.60	7.45	7.00	9.50	.80	.35	a .5
7	4.97	.87	.61	.73	5.24	5.24	7.20	6.60	9.85	.73	.35	a .5
8	4.90	1.80	.55	.50	5.24	4.85	6.80	*6.60	10.9	.67	.30	a 1.0
9	6.28	.80	.44	.44	5.40	4.85	6.40	12.4	10.2	.67	.30	.26
10	1.02	.67	3.45	1.0	7.48	4.68	16.7	9.93	9.50	.67	.30	.19
11	.94	.61	.80	.70	10.3	4.68	8.40	7.20	9.20	.67	.22	.50
12	.80	.86	6.26	.67	6.20	6.40	7.00	26.6	9.20	.67	.19	*1.3
13	1.16	.55	1.37	.39	5.40	32.9	6.60	75.8	8.90	.61	1.42	.74
14	.67	.61	1.02	.87	4.85	28.3	88.2	15.9	8.90	.94	.44	2.12
15	2.70	.50	1.02	.39	4.85	*12.5	15.9	15.8	8.90	.61	*.35	.35
16	2.91	.67	1.36	.50	4.68	9.50	14.2	13.0	5.78	.55	.39	.22
17	.44	.55	.73	35.0	4.68	8.15	14.2	12.1	1.98	.50	.91	.22
18	.39	.44	.94	4.0	4.68	7.90	12.5	11.3	.55	.73	.35	.22
19	.35	.35	*.87	4.0	4.85	7.20	11.7	10.5	.55	1.84	.22	.10
20	.35	.39	1.98	7.0	6.87	7.00	11.3	10.2	.50	114	.22	.10
21	.35	.30	.9	14.2	5.60	6.40	9.50	9.85	.87	2.35	a .7	.06
22	.26	.26	7.7	12.5	5.03	6.20	7.90	11.7	.55	1.37	a .7	.06
23	.26	.35	9.0	10.9	4.85	6.40	8.40	14.1	.55	1.11	a .7	.06
24	2.06	.82	8.0	10.5	5.24	5.60	7.68	11.7	.50	1.02	a .5	.04
25	.19	.35	4.4	7.90	4.35	5.60	34.7	113	.44	.87	a .5	.04
26	.48	.30	.6	7.9	4.22	5.40	11.3	11.3	.61	.87	a .5	.08
27	9.12	.39	3.0	6.6	4.22	5.03	9.20	10.5	.44	.73	a .5	.03
28	.73	2.56	2.1	6.0	4.22	13.1	8.90	10.2	.44	.73	a .7	.03
29	.50	.80	1.7	5.6	4.06	27.1	8.65	-----	.50	.61	a 1.5	.13
30	3.55	20.4	1.2	6.2	3.90	43.5	8.40	-----	.50	2.47	a 1.0	1.99
31	4.66	22.3	-----	5.8	-----	10.9	9.20	-----	*.50	-----	a 1.5	-----
Total	70.53	48.97	66.09	154.24	159.97	328.18	433.73	369.49	160.96	49.34	19.93	13.07
Mean												
Mgd	2.28	1.58	2.20	4.98	5.33	10.6	14.0	13.2	5.19	1.64	0.64	0.44
Cfs	3.52	2.44	3.40	7.71	8.25	16.4	21.6	20.4	8.03	2.54	0.99	0.68
Ac-ft	216	150	282	473	491	1010	1330	1130	494	151	61	40

Calendar Year 1960 Max 109 Min 0 Mean mgd 6.54 Mean cfs 10.1 Ac-ft 7.95 Fiscal Year 1960-61 Max 88.2 Min 0.03 Mean mgd 5.14 Mean cfs 5.0 Mean ofs 1.130 Mean ac-ft 5.830

Peak discharge (base, 500 mgd).--Jan. 14 (8 a.m.) 990 mgd (1,530 cfs), 3.90 ft; Feb. 13 (2 a.m.) 725 mgd (1,120 cfs), 3.39 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby stream.

Note.--Fragmentary gage-height record Sept. 21 to Nov. 3; discharge computed from partly estimated gage-heights.

ISLAND OF OAHU

3300. Kamananui Stream at Maunawai

Location.--Lat 21°38'20", long 158°03'27", on right bank 25 ft above confluence with Elebaha Stream at Maunawai.Drainage area.--9.79 sq mi.Records available.--February 1958 to June 1961.Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).Extremes.--Maximum discharge during fiscal year, 338 mgd (523 cfs) Feb. 13 (gage height, 5.82 ft), from rating curve extended above 180 mgd by logarithmic plotting; minimum, 0.30 mgd (0.46 cfs) July 26.

1958-61: Maximum discharge, 612 mgd (947 cfs) Oct. 23, 1958 (gage height, 7.60 ft) from rating curve extended above 180 mgd as explained above; no flow at times.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.33	2.5	28.3
1.5	1.37	3.0	62.5
1.7	3.56	3.5	100
2.0	9.40	4.0	140

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.53	2.92	5.10	2.79	1.23	1.03	31.5	3.43	3.43	10.7	*41.9	1.78
2	2.17	1.54	3.30	2.17	2.27	1.03	18.0	2.27	3.30	46.6	17.2	2.27
3	3.17	1.16	2.53	1.88	1.70	1.88	7.96	1.97	4.02	22.9	3.30	1.45
4	5.19	10.7	2.17	1.78	1.03	7.15	4.79	1.78	4.48	6.62	2.27	1.23
5	3.56	9.63	2.07	1.70	.79	13.7	3.86	1.61	3.30	4.33	2.40	1.62
6	*2.07	5.27	1.97	1.54	.69	3.04	5.48	1.45	3.04	2.53	1.61	4.23
7	1.78	2.07	2.27	2.07	.59	1.78	3.86	1.37	3.17	1.97	1.23	1.78
8	1.54	1.61	3.56	2.79	.59	1.30	3.04	1.30	5.42	1.78	1.03	4.43
9	1.37	1.88	2.53	2.07	.64	1.03	2.66	48.0	6.15	2.17	.85	5.86
10	1.09	1.23	10.5	*2.07	12.2	1.03	19.9	43.6	5.29	2.79	.79	2.92
11	1.03	.85	4.63	13.4	42.9	1.09	32.7	12.3	3.43	*1.88	.74	3.36
12	1.16	.69	15.5	3.04	29.2	1.76	13.0	31.3	2.53	5.03	.69	4.60
13	1.30	1.59	7.48	3.04	10.4	65.1	5.67	136	2.07	2.27	.59	3.17
14	1.37	.96	3.56	2.66	4.48	47.7	29.9	24.2	1.88	1.70	.55	5.48
15	1.09	1.09	2.66	1.97	2.92	15.3	10.1	29.3	1.78	1.45	.79	2.79
16	.85	.79	3.43	1.78	2.40	6.24	4.79	27.8	1.70	1.54	.74	1.54
17	.79	1.63	2.92	1.70	1.97	4.02	4.17	12.4	1.61	1.23	1.88	1.23
18	.64	1.45	2.27	3.00	1.78	3.30	*4.79	9.40	1.54	1.03	2.53	1.23
19	.59	*1.09	3.56	3.17	2.27	3.71	3.71	8.44	1.37	1.30	1.23	1.23
20	.55	.74	7.73	23.6	9.80	3.17	3.30	6.81	1.37	2.79	.96	1.09
21	.59	.64	4.33	15.3	6.83	2.66	2.79	6.62	2.78	6.16	2.69	.96
22	.59	.51	2.92	4.48	2.79	2.40	2.53	6.24	5.86	2.79	3.04	.90
23	.47	.43	4.33	2.66	3.30	3.17	2.92	14.9	3.43	1.54	*4.37	.59
24	.43	.80	3.43	2.07	3.56	3.17	3.43	8.20	1.97	2.82	1.70	.55
25	.39	4.47	2.40	1.88	2.79	2.53	6.66	6.81	1.45	2.07	1.03	.59
26	.36	1.61	1.78	1.97	1.78	1.97	13.6	5.10	1.23	1.37	.90	.55
27	7.52	1.16	2.16	2.66	1.37	1.70	15.5	*4.79	1.16	1.78	.85	.64
28	2.48	28.0	31.4	1.70	*1.30	1.54	3.30	4.02	1.03	2.07	.74	1.16
29	1.09	9.74	8.14	1.37	1.78	31.0	2.66	-----	.96	1.78	3.13	*2.94
30	8.92	62.5	4.02	1.23	1.45	44.5	2.40	-----	1.03	3.75	2.79	18.7
31	7.36	14.1	-----	1.09	-----	13.2	4.17	-----	1.09	-----	1.61	-----
TOTAL	64.04	172.85	154.65	114.63	156.80	292.20	273.14	461.41	82.87	148.74	106.13	80.87
MEAN												
MGD	2.07	5.58	5.16	3.70	5.23	9.43	8.81	16.5	2.67	4.96	3.42	2.70
CFS	3.20	8.63	7.97	5.72	8.09	14.6	13.6	25.5	4.14	7.67	5.30	4.17
AC-FT	197	530	475	352	481	897	838	1,420	254	456	326	248

CALENDARY YEAR	1960	MAX	137	MIN	0.02	MEAN MOD	8.44	MEAN CFS	13.1	AC-FT	9,480
FISCAL YEAR 1960-61	MAX	136	MIN	0.36	MEAN MGD	5.78	MEAN CFS	8.94	AC-FT	6,470	

Peak discharge, (base, 300 mgd).--Feb. 13 (4:30 a.m.) 338 mgd (523 cfs), 5.82 ft.

* Discharge measurement made on this day.

3450. Opaaua Stream near Wahiawa

Location.--Lat 21°33'55", long 158°00'10", on left bank 6.1 miles east of Waialua School and 4.3 miles northeast of Leilehua High School in Wahiawa.

Drainage area.--2.98 sq mi.

Records available.--August 1959 to June 1961.

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

Extremes.--Maximum discharge during year, 1,290 mgd (2,000 cfs) Feb. 13 (gage height, 6.25 ft), from rating curve extended above 45 mgd by logarithmic plotting; minimum, 0.55 mgd (0.85 cfs) July 26.

1959-61: Maximum discharge, 1,820 mgd (2,820 cfs) Mar. 30, 1960 (gage height, 6.82 ft), from rating curve extended above 45 mgd by logarithmic plotting; minimum, 0.24 mgd (0.37 cfs) Oct. 22, 23, 1959.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.45	2.6	21.0
1.6	1.09	3.0	46.0
1.9	3.20	3.5	100
2.2	8.10	4.0	190

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	3.98	4.15	6.39	3.03	2.07	1.24	26.0	3.03	3.11	25.0	9.23	3.20
2	2.77	1.82	3.20	2.12	4.73	1.24	17.9	1.49	3.33	95.1	7.06	4.68
3	8.53	2.20	2.35	1.82	2.52	5.65	7.53	1.24	7.60	24.7	1.90	3.85
4	20.4	28.3	2.05	1.82	1.54	35.8	4.24	1.09	6.66	9.38	2.10	2.20
5	5.01	13.7	2.94	2.60	1.09	12.6	3.46	1.02	4.24	4.84	2.77	7.88
6	*2.94	5.86	2.43	*1.67	.87	3.03	*6.40	.94	2.60	2.69	1.24	5.85
7	2.52	3.20	4.23	8.96	.76	1.82	4.75	.83	8.66	2.05	1.19	2.05
8	8.58	6.91	5.30	4.33	.72	1.29	4.45	.79	10.4	1.60	.98	8.57
9	2.86	4.84	3.72	2.94	.79	1.14	2.52	56.2	8.82	1.60	.87	14.1
10	2.12	*2.12	13.8	7.14	24.3	1.65	43.5	67.3	3.85	*1.39	.79	3.46
11	1.90	1.44	4.61	15.7	35.0	1.67	20.0	13.0	2.60	1.24	.68	6.98
12	1.76	1.24	28.3	4.67	16.3	38.6	7.53	31.4	2.05	1.09	.65	5.14
13	14.7	2.41	6.71	5.80	7.91	82.6	3.59	145	1.75	.98	.68	7.42
14	4.36	1.39	2.86	3.59	3.33	51.2	62.6	12.9	1.54	1.12	7.13	8.82
15	2.43	1.54	2.20	2.69	2.20	11.2	7.63	10.7	1.39	5.43	3.59	3.85
16	1.49	2.18	6.75	1.82	4.04	6.58	3.72	13.0	1.29	1.60	3.20	2.12
17	1.19	3.86	3.85	2.67	3.59	4.24	3.59	7.72	1.24	1.05	12.4	1.90
18	1.05	4.37	4.64	20.0	4.75	3.46	5.86	7.72	1.14	.83	4.84	6.30
19	.94	1.82	6.41	27.1	6.98	5.86	3.03	5.69	1.09	6.63	2.20	4.37
20	1.02	1.19	12.6	11.9	20.4	3.20	2.43	4.37	1.09	24.3	5.60	2.75
21	*1.02	1.05	7.72	8.56	7.72	3.03	2.05	4.37	6.83	8.82	6.03	3.03
22	.98	1.09	8.10	3.46	4.24	2.52	1.67	5.35	6.39	2.94	*6.07	1.49
23	.90	.94	6.39	2.35	4.37	7.84	1.60	*17.7	3.59	3.19	4.39	1.95
24	.68	3.25	6.03	1.67	13.5	3.85	2.69	6.96	1.90	2.12	1.90	2.35
25	.60	5.08	3.59	1.60	3.98	2.35	41.1	8.58	1.75	2.20	1.44	1.34
26	.57	1.97	2.20	4.01	2.27	2.05	*10.5	4.84	1.39	3.51	1.39	1.82
27	21.0	1.49	13.7	3.33	1.60	4.84	5.18	1.39	4.24	2.86	2.20	
28	4.22	27.9	26.7	2.12	*1.49	1.49	2.43	3.46	1.44	3.11	1.39	*1.82
29	1.44	10.3	6.77	1.60	5.84	104	1.82	-----	1.05	2.60	17.3	12.8
30	12.6	90.5	7.74	1.34	2.27	*49.6	1.49	-----	4.77	4.88	3.33	30.6
31	16.3	9.66	-----	1.82	-----	13.6	6.38	-----	2.20	-----	4.65	-----
TOTAL	150.86	247.77	214.28	164.23	191.17	466.00	317.30	441.87	107.15	250.23	119.85	164.89
MEAN												
MGD	4.87	7.99	7.14	5.30	6.37	15.0	10.2	15.8	3.46	8.34	3.87	5.50
CFS	7.53	12.4	11.0	8.20	9.86	23.3	15.8	24.4	5.35	12.9	5.98	8.50
AC-FT	463	760	658	504	587	1,430	974	1,360	329	768	368	506

CALENDAR YEAR 1960 MAX 221 MIN 0.39 MEAN MGD 9.91 MEAN CFS 15.3 AC-FT 11,140
FISCAL YEAR 1960-61 MAX 145 MIN 0.57 MEAN MGD 7.77 MEAN CFS 12.0 AC-FT 8,710

Peak discharge (base, 600 mgd).--Dec. 29 (7 p.m.) 740 mgd (1,140 cfs), 5.45 ft; Feb. 13 (4 a.m.) 1,290 mgd (2,000 cfs), 6.25 ft.

* Discharge measurement made on this day.

ISLAND OF MOLOKAI

4000. Halewa Stream near Halewa

Location.--Lat 21°09'30", long 156°45'53", on right bank 600 ft downstream from confluence of two main branches, 1.5 miles west of Halewa, and 6.0 miles northeast of Pukoo.

Drainage area.--4.62 sq mi.

Records available.--August 1917 to July 1932, November 1937 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to June 25, 1923, at site 350 ft upstream at different datum.

Average discharge.--38 years (1917-32, 1938-61), 19.2 mgd (29.7 cfs). (Fiscal year 1918 was omitted in error in computing averages prior to 1959).

Extremes.--Maximum discharge during year, 7,040 mgd (10,900 cfs) Jan. 1 (gage height, 13.6 ft), from rating curve extended above 45 mgd as explained below; minimum, 1.04 mgd (1.61 cfs) Mar. 20.

1917-32, 1937-61: Maximum discharge, that of Jan. 1, 1961, from rating curve extended above 45 mgd on basis of slope-area measurement at gage height 13.6 ft; minimum discharge, 0.7 mgd (1.1 cfs) Oct. 26, 27, 1917.

Remarks.--Records fair. A 2-inch pipeline diverts water about a quarter of a mile above station for domestic use of Halewa village.

Rating table, (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 9 to Mar. 31, May 16 to June 30)

0.72	1.00	2.0	48.0
.8	1.53	2.5	86.0
1.0	3.20	3.0	134
1.2	6.30	3.5	201
1.4	12.4	4.0	294
1.6	22.6	5.0	540
1.8	38.5	6.0	900

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.06	3.42	8.34	9.60	11.8	5.71	*425	9.11	5.34	413	19.3	48.5
2	10.8	9.56	6.52	7.52	6.52	12.9	59.9	6.10	7.20	750	5.16	64.4
3	39.4	6.10	5.71	7.00	19.3	8.34	27.3	4.66	19.3	196	4.06	45.4
4	23.7	68.9	11.7	13.4	8.01	28.5	14.2	4.06	10.2	106	5.78	14.7
5	11.4	23.8	5.90	*7.10	5.34	76.2	12.0	3.54	4.82	28.6	4.82	18.4
6	16.5	9.25	24.0	21.8	4.66	30.9	11.4	3.31	31.3	15.6	*5.16	25.6
7	13.3	12.8	36.4	21.6	4.20	11.0	10.7	2.99	33.2	10.7	5.16	7.00
8	9.25	41.7	22.5	8.34	4.50	7.78	8.90	2.61	*65.4	8.34	4.06	182
9	6.52	11.4	28.8	7.00	26.0	13.2	6.30	225	39.0	6.52	3.42	33.2
10	7.00	7.26	26.5	6.81	26.9	12.4	6.10	162	21.5	5.71	4.06	16.1
11	5.71	6.52	17.3	9.46	46.8	6.52	6.30	57.0	6.76	4.82	3.31	33.9
12	5.71	18.7	78.6	28.9	45.8	83.7	*5.71	93.3	4.35	4.35	3.66	10.7
13	5.90	8.28	18.1	15.3	12.4	79.9	4.99	91.5	3.42	3.92	3.76	96.0
14	5.71	19.8	11.4	10.3	7.78	118	35.0	99.2	2.89	5.03	12.5	71.2
15	4.66	7.94	36.5	6.30	7.52	27.3	6.76	29.3	2.45	3.66	22.3	13.8
16	4.20	50.4	16.9	19.3	9.58	20.6	4.82	18.5	2.30	3.31	123	9.95
17	4.06	48.4	29.4	59.6	16.6	12.1	43.4	105	2.07	2.89	55.2	47.1
18	3.92	23.6	40.4	20.7	23.3	9.25	37.6	34.8	1.74	4.14	11.4	88.3
19	4.06	11.4	26.9	6.62	40.1	14.2	6.30	14.2	1.53	7.35	5.16	43.8
20	5.90	7.78	24.4	82.1	17.0	10.8	6.10	26.0	1.32	4.47	5.90	12.4
21	4.66	6.10	34.0	12.9	8.34	6.76	4.20	32.2	5.00	8.28	6.30	7.78
22	3.79	5.16	18.4	8.06	18.8	6.30	*3.66	17.0	4.03	3.42	6.45	*10.1
23	7.37	12.0	14.2	6.52	13.7	5.71	50.7	23.6	13.3	2.89	6.10	7.00
24	5.34	6.52	12.4	5.52	24.5	5.34	7.11	40.2	5.26	19.5	2.99	36.6
25	3.92	4.99	11.4	10.9	8.90	4.99	5.71	20.9	2.07	10.6	2.37	8.34
26	3.54	4.35	8.90	13.4	6.52	4.66	174	7.52	1.74	5.16	24.7	5.90
27	3.66	5.80	144	6.30	5.52	8.24	46.1	5.52	18.9	5.99	3.31	4.99
28	3.31	39.8	29.1	5.34	16.4	75.0	9.95	12.9	3.58	3.31	84.0	24.2
29	3.31	27.2	24.6	4.99	19.1	36.0	6.30	-----	3.77	2.45	95.6	101
30	8.59	75.4	12.4	11.9	*6.35	49.1	4.82	-----	2.02	80.5	13.7	58.1
31	4.99	11.4	-----	14.7	-----	19.8	89.1	-----	3.51	-----	13.6	-----
TOTAL	248.24	595.73	785.67	471.28	472.24	811.20	1,140.43	1,132.02	332.15	1,766.74	566.29	1,146.46
MEAN												
MGD	8.01	19.2	26.2	15.2	15.7	26.2	36.8	41.1	10.7	58.9	18.3	38.2
CFS	12.4	29.7	40.5	23.5	24.4	40.5	56.9	63.6	16.6	91.1	28.3	59.1
AC-FT	762	1,830	2,410	1,450	1,450	2,490	3,500	3,540	1,020	5,420	1,740	3,520

Calendar Year 1960 Max 335 Min 2.37 Mean mgd 20.1 Mean cfs 31.1 Ac-ft 22,550
Fiscal Year 1960-61 Max 750 Min 1.32 Mean mgd 26.0 Mean cfs 40.2 Ac-ft 29,130

Peak discharge (base, 930 mgd).--Oct. 20 (9 a.m.) 985 mgd (1,520 cfs), 6.18 ft; Jan. 1 (10:30 a.m.) 7,040 mgd (10,900 cfs), 13.6 ft;
Apr. 1 (7:30 p.m.) 2,220 mgd (3,430 cfs), 8.48 ft; Apr. 30 (3:30 p.m.) 1,030 mgd (1,590 cfs), 6.36 ft.

* Discharge measurement made on this day.

ISLAND OF MOLOKAI

95

4055. Waikolu Stream at altitude 900 ft, near Kalauapapa

Location--Lat 21°08'43", long 156°55'17", on right bank 2.3 miles from mouth and 5.3 miles southeast of Kalauapapa Post Office.Drainage area--1.99 sq mi.Records available--May 1956 to June 1961.Gage--Water-stage recorder. Altitude of gage is 900 ft (from topographic map).Extremes--Maximum discharge during year, 390 mgd (603 cfs) Apr. 1 (gage height, 4.72 ft), from rating curve extended above 20 mgd on basis of shape of control section; minimum, 1.30 mgd (2.01 cfs) Oct. 24-29, Nov. 4-8.

1956-61: Maximum discharge, 790 mgd (1,220 cfs) Dec. 29, 1958 (gage height, 6.60 ft), from rating curve extended above 20 mgd as explained above; minimum, 1.30 mgd (2.01 cfs) Oct. 24-29, Nov. 4-8, 1960.

Remarks--Records fair except those for periods of shifting control, which are poor. Molokai Irrigation tunnel water pumped into stream above station from Nov. 16, 1960; pumpage is approximately 1.5 million gallons daily.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.64	1.68	1.94	1.52	1.64	3.10	59.6	5.33	3.97	100	3.18	4.06
2	2.71	1.80	1.68	1.38	1.44	3.10	9.18	3.88	4.51	140	3.07	4.33
3	10.0	1.89	1.52	*1.38	1.38	3.02	4.51	3.48	7.87	*37.8	3.10	4.96
4	12.4	10.0	1.48	1.38	1.30	19.0	3.48	3.32	5.12	*6.36	3.10	4.60
5	4.12	3.52	1.44	1.38	1.30	3.24	2.83	3.25	*4.34	*4.15	3.10	12.8
6	2.71	2.04	2.76	1.38	1.30	4.75	2.78	3.25	*5.95	*3.62	3.07	10.6
7	2.52	1.84	4.25	1.56	1.30	3.18	3.14	3.25	8.58	3.32	*3.18	4.45
8	2.24	1.99	2.48	1.38	1.30	2.89	*3.10	3.25	8.98	3.18	*3.32	2.21
9	2.09	1.99	4.07	1.35	2.27	2.77	3.02	4.81	6.98	3.25	3.25	6.78
10	2.04	1.89	2.24	1.35	11.5	2.71	*3.47	9.38	4.33	3.12	3.18	4.60
11	1.99	1.72	1.76	1.35	21.0	2.58	3.40	23.7	3.70	3.10	3.18	5.20
12	1.94	1.68	8.38	3.55	13.7	25.7	2.48	21.9	3.62	3.10	3.32	4.33
13	1.94	*1.60	2.39	2.74	3.91	11.9	1.98	20.1	3.48	3.04	3.18	5.86
14	1.89	1.56	1.72	1.52	1.72	9.84	1.52	16.5	3.48	3.10	3.32	6.66
15	1.89	1.56	2.39	1.38	1.52	3.56	1.52	6.55	3.40	3.07	3.55	4.51
16	1.84	1.72	2.56	1.35	5.01	2.83	2.05	5.42	3.40	3.18	8.22	4.33
17	1.84	2.96	1.68	2.57	15.9	2.28	19.3	31.6	3.40	2.80	6.09	10.4
18	1.84	4.18	1.89	2.27	1.34	3.16	9.45	7.68	3.32	2.68	3.88	15.7
19	1.80	2.57	1.90	2.15	1.21	3.71	3.83	21.6	3.32	3.18	3.62	8.49
20	1.80	1.76	1.82	1.77	3.74	2.77	5.40	18.9	3.32	3.78	3.55	3.32
21	1.80	1.60	5.83	1.60	3.02	2.52	*2.98	11.9	3.32	3.32	3.62	3.26
22	1.80	1.60	3.81	1.58	17.9	2.37	2.64	6.64	3.10	3.25	3.55	3.18
23	1.80	1.72	1.99	1.35	9.59	2.46	14.0	8.14	2.95	3.10	3.62	*3.13
24	1.80	1.84	1.72	1.30	16.6	2.46	3.24	9.50	2.95	3.24	3.40	*4.12
25	1.80	1.64	1.56	1.30	4.60	2.46	1.68	6.52	2.83	3.25	3.40	*5.19
26	1.80	1.52	1.44	1.30	2.95	2.46	88.9	4.33	2.77	3.18	6.06	3.32
27	1.72	1.52	14.5	1.50	*2.24	3.00	8.30	3.88	2.83	3.18	4.06	3.07
28	1.72	4.51	10.1	1.30	14.0	25.9	4.03	3.88	2.71	3.25	5.50	4.16
29	1.72	2.28	5.38	1.30	*9.97	20.4	3.32	-----	2.64	3.25	10.8	19.8
30	1.68	3.98	2.06	1.35	3.25	10.0	4.15	-----	2.64	3.25	4.33	7.28
31	1.68	2.46	-----	1.68	-----	3.69	109	-----	2.95	-----	3.65	-----
Total	81.56	74.62	98.74	49.87	200.85	222.97	388.28	399.65	126.76	368.10	125.45	204.59
Mean												
Mgd	2.63	2.41	3.29	1.61	6.70	7.19	12.5	14.3	4.09	12.3	4.05	6.82
Cfs	4.07	3.73	5.09	2.49	10.4	11.1	19.3	22.1	6.33	19.0	6.27	10.6
Ac-ft	250	229	303	153	616	684	1190	1230	389	1130	385	628

Calendar Year 1960	Max 78.2	Min 1.30	Mean mgd 5.93	Mean cfs 9.18	Ac-ft 6,660
Fiscal Year 1960-61	Max 140	Min 1.30	Mean mgd 6.41	Mean cfs 9.92	Ac-ft 7,190

Peak discharge (base, 250 mgd)--Jan. 1 (9:30 a.m.) 293 mgd (453 cfs), 4.12 ft; Jan. 26 (3 a.m.) 388 mgd (600 cfs), 4.17 ft; Jan. 31 (3 a.m.) 359 mgd (555 cfs), 4.53 ft; Feb. 10 (5:30 a.m.) 250 mgd (387 cfs), 3.83 ft; Apr. 1 (8 p.m.) 390 mgd (603 cfs), 4.72 ft.

* Discharge measurement made on this day.

ISLAND OF MOLOKAI

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--June 1919 to July 1932, September 1937 to June 1961. Prior to November 1930, published as Waikolu Stream at pipeline crossing.Gage--Water-stage recorder and concrete control. Datum of gage is 253 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 18, 1930, water-stage recorder at site 500 ft upstream at different datum. Sept. 20, 1937, to July 1948, water-stage recorder at present site at datum 0.49 ft higher.Average discharge--32 years (1919-30, 1938-47, 1949-61), 12.2 mgd (18.9 cfs), (fiscal year 1930 was omitted in error in computation of averages in previous years).Extremes--Maximum discharge during year, 1,120 mgd (1,730 cfs) Apr. 1 (gage height, 6.35 ft), from rating curve extended above 25 mgd as explained below; minimum, 3.70 mgd (5.72 cfs) Nov. 8.

1919-32, 1937-61: Maximum discharge, 3,700 mgd (5,720 cfs) Jan. 26, 1948 (gage height, about 10.25 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 1.3 mgd (2.0 cfs) Nov. 1, 2, 1925, June 5, 1926.

Remarks--Records fair. Kalaupapa water-supply system diverts water above station, and from Nov. 16, 1960, Molokai Irrigation Tunnel water pumped into stream above station.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.7	4.82	2.5	49.0
1.8	7.70	2.7	69.0
1.9	11.2	3.0	105
2.0	15.4	3.3	150
2.1	20.4	3.6	200
2.3	32.5	4.0	294

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.72	5.37	5.10	5.10	4.82	6.20	108	10.5	9.06	201	8.72	8.38
2	8.72	5.92	4.82	4.60	4.37	6.20	15.9	8.38	9.76	282	8.38	8.72
3	15.9	5.92	4.37	4.60	4.15	5.92	9.40	7.40	12.5	82.2	8.38	9.40
4	19.2	13.8	4.37	4.60	4.15	31.9	7.70	7.10	10.5	16.9	8.38	9.06
5	9.76	7.70	4.37	4.60	3.92	52.1	7.10	6.80	9.40	12.9	8.38	15.5
6	8.04	5.92	5.92	4.60	3.92	11.6	6.80	6.80	*10.5	10.8	8.38	17.2
7	7.70	5.65	7.10	4.82	3.92	7.40	6.80	6.50	12.5	10.1	8.38	8.72
8	7.40	5.65	5.65	4.60	3.92	6.50	6.80	6.50	13.7	9.76	*8.72	36.1
9	7.10	5.65	7.10	4.37	4.37	6.20	6.80	107	12.0	9.40	8.72	12.5
10	7.10	5.37	5.65	4.37	15.7	6.20	*6.80	195	9.06	9.40	8.38	9.06
11	6.80	5.10	5.10	4.37	23.6	5.92	6.80	47.8	8.38	9.40	8.38	9.06
12	6.80	4.82	11.7	6.20	16.4	62.2	5.65	31.3	8.04	9.40	8.38	8.38
13	6.80	*4.60	5.92	6.50	7.40	23.6	5.37	30.1	7.70	9.06	8.38	9.76
14	6.80	4.82	4.82	4.82	18.9	4.82	23.1	7.70	9.06	8.38	10.5	
15	6.50	4.82	5.65	4.60	9.40	4.60	12.5	7.70	9.06	8.72	8.38	
16	6.50	5.10	5.92	4.37	6.50	7.40	5.37	12.4	7.70	9.06	12.5	8.04
17	6.50	6.20	4.82	5.10	18.9	5.92	24.2	48.9	7.70	8.72	10.8	13.7
18	6.50	7.70	4.82	5.92	15.9	6.20	14.0	14.1	7.70	8.38	8.72	25.2
19	6.20	6.50	5.37	5.37	14.6	8.38	7.40	30.1	7.40	9.06	8.38	14.6
20	6.20	5.10	4.82	5.10	7.10	6.50	8.72	34.1	7.40	9.40	8.38	8.72
21	6.20	4.82	8.38	4.82	3.20	6.20	*6.80	19.9	7.70	9.40	8.38	8.04
22	6.20	4.82	7.10	4.37	22.4	6.50	6.20	13.3	7.70	9.06	8.38	8.04
23	5.92	4.82	5.37	4.37	13.0	6.20	22.5	14.6	7.70	9.06	8.38	7.70
24	5.92	4.82	5.10	4.15	19.4	5.92	7.10	16.4	7.70	9.06	*8.04	19.40
25	5.65	4.82	4.82	4.15	8.04	5.92	5.37	12.5	7.40	9.06	8.04	10.8
26	5.37	4.60	4.82	4.15	6.20	5.92	144	9.76	7.40	9.06	10.8	8.72
27	5.65	4.60	27.1	4.15	5.37	7.10	13.7	9.40	7.40	8.72	9.06	7.70
28	5.37	7.40	18.2	4.15	21.8	77.1	8.38	9.06	7.40	8.72	10.5	9.17
29	5.37	5.65	9.67	4.37	*21.7	57.3	7.10	-----	7.40	8.72	15.9	26.8
30	5.37	6.80	5.92	4.37	7.10	22.9	8.16	-----	7.40	8.72	9.06	12.9
31	5.37	5.65	-----	4.60	-----	10.1	168	----- *	7.70	-----	8.04	-----
TOTAL	227.63	180.51	209.87	146.26	304.27	505.80	666.34	751.30	269.30	824.64	280.42	360.25
MEAN												
MGD	7.34	5.82	7.00	4.72	10.1	16.3	21.5	26.8	8.69	27.5	9.05	12.0
CFS	11.4	9.01	10.8	7.30	15.7	25.2	33.3	41.5	13.4	42.5	14.0	18.6
AC-FT	699	554	644	449	934	1,950	2,040	2,310	826	2,530	861	1,110

CALENDAR YEAR	1960	MAX	138	MIN	3.92	MEAN MGD	12.0	MEAN CFS	18.6	AC-FT	13,420
FISCAL YEAR	1960-61	MAX	282	MIN	3.92	MEAN MGD	12.9	MEAN CFS	20.0	AC-FT	14,510

Peak discharge (base, 450 mgd)--Dec. 29 (7 p.m.) 497 mgd (769 cfs), 4.75 ft; Jan. 1 (9:30 a.m.) 510 mgd (789 cfs), 4.79 ft; Jan. 26 (2:30 a.m.) 952 mgd (1,470 cfs), 5.98 ft; Jan. 31 (2:30 a.m.) 657 mgd (1,020 cfs), 5.22 ft; Apr. 1 (7:30 p.m.) 1,120 mgd (1,730 cfs), 6.35 ft.

* Discharge measurement made on this day.

ISLAND OF MOLOKAI

97

4140. Kaunakakai Gulch at Kaunakakai

Location.--Lat $21^{\circ}06'21''$, long $157^{\circ}00'34''$, 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 June 1961.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

Average discharge.--11 years (1950-61), 0.96 mgd (1.49 cfs).

Extremes.--Maximum discharge during year, 504 mgd (780 cfs) Jan. 26 (gage height, 5.44 ft); no flow most of the time.

1949-61: Maximum discharge, 1,120 mgd (1,730 cfs) Mar. 13, 1951 (gage height, 7.10 ft), from rating curve extended above 130 mgd; no flow most of the time.

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

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.75	0	2.7	9.50
1.8	.32	3.0	18.0
1.9	.96	3.3	30.0
2.0	1.60	3.5	43.0
2.1	2.15	3.8	70.0
2.4	4.90		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						0	0	1.37		5.62		
2						0	0	0		27.4		
3						0	0	0		10.1		
4						0	0	0		.48		
5						<u>8.25</u>	0	0		0		
6						0	0	0		0		
7						0	0	0		0		
8						0	0	0		0		
9						0	0	.42		0		
10						0	0	<u>15.4</u>		0		
11						0	0	5.61		0		
12						0	0	.79		0		
13						0	0	1.41		0		
14						0	0	0		0		
15						0	0	0		0		
16						0	0	0		0		
17						0	0	2.55		0		
18						0	0	.03		0		
19						0	0	1.94		0		
20						0	0	2.33		0		
21						0	0	1.18		0		
22						0	0	0		0		
23						0	0	0		0		
24						0	0	0		0		
25						0	0	0		0		
26						0	46.7	0		0		
27						0	1.40	0		0		
28						0	0	0		0		
29						0	0	-----		0		
30						0	0	-----		0		
31						0	67.1	-----		-----		
Total	0	0	0	0	0	8.25	115.20	33.03	0	43.60	0	0
Mean												
Mgd	0	0	0	0	0	0.266	3.72	1.18	0	1.45	0	0
Cfs	0	0	0	0	0	0.412	5.75	1.83	0	2.24	0	0
Ac-ft	0	0	0	0	0	25	354	101	0	134	0	0

Calendar Year	1960	Max	35.8	Min	0	Mean mgd	0.289	Mean cfs	0.447	Ac-ft	324
Fiscal Year	1960-61	Max	67.1	Min	0	Mean mgd	0.548	Mean cfs	0.848	Ac-ft	614

Peak discharge (base, 500 mgd).--Jan. 26 (2 a.m.) 504 mgd (780 cfs), 5.44 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 9 to Jan. 9; discharge estimated on basis of weather records and records for nearby streams.

ISLAND OF MOLOKAI

4150. Right Branch of East Fork Kawela Gulch near Kamalo

Location.--Lat $21^{\circ}06'46''$, long $156^{\circ}54'23''$, on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo, and 7.6 miles east of Kaunakakai.

Drainage area.--0.45 sq mi.

Records available.--September 1946 to June 1961. Prior to July 1959, published as Right Branch of East Fork Kawela Stream near Kamalo.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

Average discharge.--14 years (1947-61), 1.53 mgd (2.37 cfs).

Extremes.--Maximum discharge during year, 1.45 mgd (224 cfs) Jan. 26 (gage height, 4.52 ft), from rating curve extended as explained below; no flow for many days.

1946-61: Maximum discharge, 882 mgd (1,360 cfs) Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended by test on model of station site; no flow for many days.

Remarks.--Records fair. Molokai Ranch diverts low flow from gage pool.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.31	0.00	3.1	5.10
2.4	.04	3.3	12.5
2.6	.46	3.5	25.5
2.8	1.43	3.7	44.0
2.9	2.15		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.32	0	0.37	0.06	0.69	0	15.1	0.69	0.46	12.4	0	1.23
2	1.33	.43	.16	0	.10	.03	1.86	.08	1.44	17.9	0	.86
3	4.21	.87	0	0	0	0	.37	0	3.73	7.60	0	.98
4	1.68	6.63	0	0	0	7.83	.08	0	1.18	1.27	0	.96
5	.59	1.86	0	0	0	12.6	0	0	.47	.43	0	4.69
6	.40	.52	2.30	0	0	.69	.01	0	1.55	.15	0	2.19
7	.21	.57	3.19	.12	0	.11	.13	0	*3.50	.04	.31	.34
8	0	.81	1.63	0	0	0	0	0	3.50	.01	.52	4.17
9	0	.36	2.66	0	1.55	0	0	14.8	1.77	.0	.05	1.12
10	0	.09	.40	0	9.17	0	0	17.5	.40	0	.08	.39
11	0	0	.13	0	9.65	0	0	6.56	.13	0	.08	2.00
12	0	0	2.70	2.87	5.92	6.35	0	9.36	.02	0	.51	.37
13	0	0	.56	1.04	1.53	6.00	0	7.60	.01	0	.08	1.82
14	0	0	.14	.14	.26	4.95	0	5.66	0	0	.19	1.59
15	0	0	1.19	.02	.13	.47	0	1.20	0	0	.35	.31
16	0	.58	1.32	0	3.33	.12	0	2.45	0	0	4.07	.26
17	0	1.48	.13	2.54	7.08	0	9.86	9.56	0	0	2.21	4.79
18	0	1.72	.26	1.36	5.13	.91	2.65	2.04	0	0	.35	4.58
19	0	.55	.26	.37	5.50	1.01	.92	8.57	0	.13	.04	2.42
20	0	.02	.04	.40	1.64	.07	1.19	7.58	0	.89	1.06	*.40
21	0	0	2.87	.40	.64	0	.04	4.03	0	.08	1.29	.03
22	0	0	2.18	.26	9.38	0	0	1.87	.01	0	.69	0
23	0	.96	.72	.17	4.04	0	1.33	2.26	.10	0	.46	0
24	0	.59	.56	.12	6.59	0	.13	3.71	.46	.19	.09	1.80
25	0	.04	.17	.15	.93	0	.23	1.53	.15	.06	0	2.78
26	0	0	.01	.43	.15	0	29.4	.46	.10	.01	3.63	.81
27	0	0	5.50	.40	0	0	1.01	.21	.04	0	.64	.34
28	0	3.55	5.58	.28	4.57	4.81	.15	.37	0	0	3.23	3.46
29	0	.91	2.78	.17	4.26	2.64	0	-----	0	0	4.60	10.4
30	0	1.80	.42	.47	.31	3.67	1.19	-----	0	0	.92	2.30
31	0	.96	-----	1.40	-----	.35	32.7	-----	.42	-----	.28	-----
TOTAL	8.74	25.30	38.23	13.17	82.55	52.61	98.35	108.09	19.44	41.16	25.73	57.39
MEAN												
MGD	0.282	0.816	1.27	0.425	2.75	1.70	3.17	3.86	0.627	1.37	0.830	1.91
CFS	0.436	1.26	1.97	0.657	4.26	2.63	4.91	5.97	0.970	2.12	1.28	2.96
AC-FT	27.0	78.0	117	40.0	253	161	302	332	60.0	126	79.0	176

CALENDAR YEAR 1960	MAX	30.2	MIN	0	MEAN MGD	1.55	MEAN CFS	2.40	AC-FT	1,740
FISCAL YEAR 1960-61	MAX	32.7	MIN	0	MEAN MGD	1.56	MEAN CFS	2.41	AC-FT	1,750

Peak discharge (base, 100 mgd).--Jan. 26 (2 a.m.) 1.45 mgd (224 cfs), 4.52 ft; Jan. 31 (2 a.m.) 109 mgd (169 cfs), 4.26 ft.

* Discharge measurement made on this day.

ISLAND OF MOLOKAI

4160, Punaula Gulch near Pakoo

Location--Lat 21°05'50", long 156°48'48", on right bank 1.8 miles northwest of Pakoo and 5.2 miles northeast of Kamalo.Drainage area--0.24 sq mi.Records available--March 1947 to June 1961.Gage--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).Average discharge--14 years, 0.813 mgd (1.26 cfs).Extremes--Maximum discharge during year, 175 mgd (271 cfs) Jan. 1 (gage height, 4.20 ft), from rating curve extended above 3.3 mgd as explained below; minimum, 0.05 mgd (0.08 cfs) May 5.

1947-61: Maximum discharge, 330 mgd (511 cfs) Apr. 2, 1948 (gage height, 6.35 ft), from rating curve extended above 3.3 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) Mar. 13, 1947, Feb. 19, 1954.

Remarks--Records good.Rating table (gage height, in feet, and discharge,
in million gallons a day)

0.45	0.03	1.2	5.80
.6	.18	1.4	9.80
.8	.81	1.6	14.7
1.0	2.60		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.27	0.09	0.25	0.19	0.16	0.18	12.5	0.35	0.21	5.40	0.06	1.55
2	+.23	+.37	+.18	+.15	+.10	+.23	+.79	+.18	+.19	10.0	+.06	1.00
3	2.04	+.27	+.16	*+.12	+.70	+.19	+.27	+.12	+.80	3.26	+.06	1.11
4	1.27	4.75	+.23	+.23	+.25	1.56	+.18	+.10	+.59	.62	+.06	.44
5	+.41	10.1	+.19	+.15	+.12	6.02	+.16	+.09	+.25	.23	+.05	1.08
6	+.23	+.27	1.66	+.23	+.09	+.50	+.15	+.08	+.46	+.15	+.08	.90
7	+.23	+.23	1.59	+.51	+.07	+.23	+.13	+.08	*1.07	+.11	+.08	.25
8	+.19	1.06	+.47	+.16	+.06	+.16	+.16	+.07	2.40	+.10	+.07	5.13
9	+.15	+.30	+.57	+.12	1.20	+.30	.10	5.69	1.49	+.09	+.06	.74
10	+.30	+.19	+.66	+.11	1.32	+.30	.10	6.97	+.66	+.10	+.07	.30
11	+.16	+.13	+.23	+.21	2.22	+.15	*.10	1.63	+.27	+.08	+.06	.41
12	+.13	+.36	2.56	1.85	1.68	4.02	.09	3.12	+.18	+.09	+.06	.31
13	+.13	+.30	+.58	+.57	+.35	4.98	.08	2.67	+.13	+.09	+.06	3.54
14	+.11	+.61	+.27	+.19	+.18	6.20	.12	3.28	+.12	+.10	+.11	2.54
15	+.10	*+.23	1.08	+.12	+.13	+.81	.09	4.65	+.11	+.08	+.52	.32
16	+.09	1.78	+.35	+.10	+.35	+.35	-.06	+.32	+.10	+.06	3.46	.23
17	+.08	3.10	+.45	1.70	+.93	+.23	5.03	3.01	+.09	+.06	2.00	2.41
18	+.07	1.10	1.71	+.65	1.40	1.00	.97	1.11	+.09	+.09	.32	3.86
19	+.08	+.35	+.71	+.19	2.00	+.50	.68	1.09	+.08	+.11	.54	1.35
20	+.09	+.19	+.49	5.27	+.78	+.21	.58	+.97	+.07	2.19	.71	.35
21	+.09	+.13	1.80	+.35	+.27	+.16	.15	.84	.26	.42	.21	.21
22	+.07	+.11	+.47	+.16	+.46	+.13	.10	.44	+.1	.15	.21	.23
23	+.10	+.36	+.27	+.11	+.46	+.12	.39	.44	.37	.10	.23	.19
24	+.11	+.21	+.19	+.09	1.28	+.12	.15	1.87	.23	.79	.13	.34
25	+.09	+.11	+.16	+.23	+.27	+.11	.09	.58	.10	.21	.09	.21
26	+.07	+.09	+.13	+.44	+.19	+.10	8.56	+.27	+.15	.19	1.00	.16
27	+.06	+.12	5.27	+.15	+.16	1.09	.38	+.19	1.35	+.10	.16	.15
28	+.06	2.43	3.46	+.10	1.30	4.11	.18	+.27	+.19	.08	2.04	1.32
29	+.06	1.37	+.86	+.08	1.21	1.31	.11	-----	+.13	.07	2.84	3.77
30	+.09	3.92	+.27	+.12	+.25	5.60	.10	-----	+.09	.06	.41	1.62
31	+.11	+.38	-----	+.46	-----	+.62	9.35	-----	+.40	-----	.25	-----
TOTAL	7.27	35.01	27.23	15.11	20.94	41.59	41.85	36.48	12.74	25.18	16.06	36.22
MEAN												
MGD	0.235	1.13	0.908	0.487	0.698	1.34	1.35	1.30	0.411	0.839	0.518	1.21
CFS	0.363	1.75	1.40	0.754	1.08	2.08	2.09	2.02	0.636	1.30	0.801	1.87
AC-FT	22.40	107	84.0	46.0	64.0	128	128	112	39.0	77.0	49.0	111

Calendar Year 1960 Max 19.0 Min 0.04 Mean mgd 0.838 Mean cfs 1.30 Ac-ft 940
Fiscal Year 1960-61 Max 12.5 Min 0.05 Mean mgd 0.865 Mean cfs 1.34 Ac-ft 967

Peak discharge (base, 70 mgd).--Oct. 20 (9:30 a.m.) 80.2 mgd (124 cfs), 3.07 ft; Dec. 30 (2 a.m.) 129 mgd (200 cfs), 3.73 ft; Jan. 1 (9:30 a.m.) 175 mgd (271 cfs), 4.20 ft; Jan. 26 (4 a.m.) 84.4 mgd (131 cfs), 3.14 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

5010. Palikea Stream below diversion dam, near Kipahulu

Location.--Lat 20°41'05", long 156°04'10", on left bank just 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 June 1961. Published as Oheo Stream at elevation 1,550 ft, near Kipahulu, 1927-29. Published as Oheo Stream below diversion dam, near Kipahulu, 1930-56.

Gage.--Water-stage recorder. Datum of gage is 1,546 ft above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft upstream at different datum.

Average discharge.--26 years (1927-29, 1932-35, 1940-61), 36.2 mgd (56.0 cfs).

Extremes.--Maximum discharge during year, 2,270 mgd (3,510 cfs) Feb. 17 (gage height, 9.70 ft), from rating curve extended above 2,100 mgd by critical-depth measurement of gage height 17.5 ft; minimum, 0.01 mgd (0.02 cfs) for many days.

1927-29, 1931-61: Maximum discharge, 9,100 mgd (14,100 cfs) Dec. 20, 1955 (gage height, 17.5 ft, from floodmark), from rating curve extended above 2,100 mgd as explained above; no flow at times.

Remarks.--Records good.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 12

Nov. 13 to June 30

0.0	0	0.6	3.00	2.5	90.0		0	0	0.7	4.8
.1	.05	.8	5.90	3.0	140		.1	.02	.9	8.2
.2	.22	1.0	10.0	4.0	275		.2	.22	1.2	15.5
.3	.57	1.3	18.5	5.0	470		.3	.64	1.4	22.0
.4	1.14	1.6	30.5	6.0	720		.4	1.30		
.5	1.95	2.0	52.0	7.0	1,050					

Note.--Same as preceding table above 1.4 ft.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.78	0.18	10.1	0.77	9.83	0.59	24.5	0.83	15.0	1.08	9.93	6.87
2	6.34	28.6	2.25	1.15	5.41	26.9	33.5	.21	28.3	169	.94	7.77
3	2.05	.81	.99	.34	17.3	24.6	17.2	.08	34.1	245	.88	1.55
4	.72	258	16.3	.37	3.96	16.1	7.37	.04	51.4	5.01	.76	1.30
5	.34	80.1	4.56	.17	.57	134	11.7	.02	25.1	.94	.64	1.46
6	.67	3.37	13.6	.13	.31	11.2	.85	.01	50.3	.59	.64	3.45
7	37.2	1.82	15.1	.11	.19	1.75	.28	.01	#38.1	.44	15.2	.54
8	2.20	25.9	2.24	.09	.22	*.94	1.10	.01	127	.36	1.76	7.08
9	3.04	29.2	9.65	.13	25.8	.70	.24	.01	36.4	.32	1.30	.79
10	16.6	5.20	.57	.37	110	.49	.15	133	28.8	.28	10.9	.59
11	1.32	5.21	.48	16.3	466	.32	.08	93.9	15.7	.24	4.84	8.15
12	.45	198	123	104	616	.44	.04	400	4.08	2.05	24.9	.49
13	8.24	10.2	*15.4	17.6	69.9	254	.04	159	1.75	1.33	61.0	*22.9
14	19.4	30.8	3.60	1.14	19.7	149	.02	206	1.15	8.58	22.6	21.1
15	.52	3.73	7.28	.53	102	49.0	.02	106	.82	1.43	88.0	1.15
16	.19	189	6.95	.28	41.0	5.57	.02	338	.64	19.2	87.7	3.97
17	.11	31.3	13.8	52.9	138	1.38	.08	735	.49	1.38	70.3	23.4
18	.09	19.6	.86	23.3	155	.88	.75	40.6	.40	11.0	4.43	9.86
19	.15	5.21	.34	1.77	294	.54	*.35	69.5	.44	35.1	4.13	1.82
20	.09	1.07	49.6	42.9	32.3	.36	.38	63.9	.32	102	53.3	.54
21	.07	.62	20.9	3.73	33.0	.21	.04	207	.32	12.5	11.7	.36
22	.05	.45	21.9	1.00	150	.18	.02	64.8	2.02	2.25	31.7	.80
23	.09	9.31	8.58	.53	219	.10	.01	14.5	141	2.28	10.1	.40
24	.28	33.8	20.2	.37	121	.15	.01	61.9	38.3	37.6	1.65	10.8
25	.79	1.54	9.90	2.06	10.9	.39	2.76	41.1	21.9	*3.72	1.30	14.6
26	.17	.57	21.2	.52	2.55	.89	114	66.0	75.6	16.6	61.1	13.3
27	2.54	7.56	126	*6.67	1.23	.15	3.94	30.4	160	37.3	38.5	.68
28	.16	59.3	5.65	1.03	1.24	2.95	.94	106	7.71	4.26	64.9	14.3
29	.06	31.2	3.32	.13	13.3	58.9	.44	-----	48.6	.94	77.1	.67.7
30	24.3	226	1.95	.19	.76	35.2	.28	-----	4.44	12.0	9.39	10.7
31	6.91	133	-----	13.1	-----	.54	1.91	-----	1.46	-----	2.25	-----
TOTAL	137.92	1,430.65	536.07	293.68	2,660.47	778.42	223.02	2,937.82	961.64	734.78	773.84	258.42
MEAN												
MGD	4.45	46.2	17.9	9.47	88.7	25.1	7.19	105	31.0	24.5	25.0	8.61
CFS	6.88	71.4	27.6	14.7	137	36.8	11.1	162	48.0	37.9	38.6	13.3
AC-FT	423	4,390	1,650	901	8,160	2,390	684	9,020	2,950	2,250	2,370	793
CALENDAR YEAR	1960	MAX	664	MIN	0.02	MEAN MGD	44.8	MEAN CFS	69.3	AC-FT	50,300	
FISCAL YEAR	1960-61	MAX	735	MIN	0.01	MEAN MGD	32.1	MEAN CFS	49.7	AC-FT	35,980	

Peak discharge (base, 1,600 mgd)...Feb. 17 (12 a.m.) 2,270 mgd (3,510 cfs), 9.70 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

101

5020. Right Branch Hahalawe Stream near Kipahulu

Location.--Lat $20^{\circ}40'54''$, long $156^{\circ}02'50''$, on left bank at old ditch intake, 0.7 mile above mouth of stream and 1.8 miles northeast of Kipahulu Church.

Drainage area.--0.43 sq mi.

Records available.--February 1927 to April 1937, April 1938 to June 1961. Prior to July 1956, published as Right Branch Kahalawe Stream near Kipahulu.

Gage.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to Apr. 21, 1938, at same site at datum 8 ft lower.

Average discharge.--31 years (1927-37, 1935-36, 1938-61), 3.51 mgd (5.43 cfs).

Extremes.--Maximum discharge during year, 508 mgd (786 cfs) Feb. 17 (gage height, 3.87 ft), from rating curve extended above 54 mgd by test on model of station site; minimum, 0.55 mgd (0.85 cfs) Jan. 23-25, Feb. 9

1927-37, 1938-61: Maximum discharge, 2,300 mgd (3,560 cfs) Apr. 29, 1937 (gage height, 15.74 ft, datum then in use), from rating curve extended above 54 mgd as explained above; minimum, 0.15 mgd (0.23 cfs) Dec. 18, 1929.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0.35	1.5	6.80
.9	.62	1.7	12.4
1.0	1.01	2.0	28.7
1.1	1.54	2.3	54.0
1.3	3.30		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.95	1.33	2.30	1.73	1.66	1.41	6.47	1.25	1.54	1.01	1.63	2.33
2	2.86	2.71	1.73	1.80	1.30	1.95	2.74	.83	1.94	9.38	1.15	4.28
3	1.95	1.30	1.47	1.54	2.39	4.60	1.73	.75	2.31	11.9	1.25	2.05
4	1.87	23.8	2.58	2.40	1.70	4.55	1.47	.68	2.42	1.73	1.15	2.62
5	1.60	7.73	2.78	1.41	1.20	16.6	1.75	.65	1.41	1.35	1.30	4.46
6	2.17	1.87	2.84	1.35	.97	2.42	1.25	.62	4.86	1.15	1.46	3.96
7	4.53	1.66	2.28	1.30	.83	1.66	1.15	.58	*4.54	1.01	3.81	1.87
8	1.66	1.87	1.66	1.25	1.66	1.35	1.20	.58	7.41	.97	1.30	4.63
9	1.66	3.05	2.34	1.41	3.59	1.35	1.01	4.62	2.55	.87	1.41	1.80
10	2.94	1.80	1.41	1.37	4.25	1.30	.92	13.0	4.94	.87	1.25	1.95
11	1.66	2.02	1.30	2.22	7.10	1.25	.87	5.24	7.53	1.05	1.25	2.05
12	1.41	13.9	8.89	15.2	9.76	1.96	.83	16.3	3.18	2.36	1.59	1.97
13	2.25	2.42	*2.23	4.66	2.10	15.9	.79	4.16	1.66	1.05	4.08	*8.36
14	2.51	5.00	2.73	1.73	1.60	9.06	.75	11.1	1.41	1.72	1.82	5.03
15	1.54	1.87	2.84	1.88	3.22	8.91	.71	3.39	1.30	2.43	6.07	1.73
16	1.21	17.2	2.86	1.30	2.95	2.37	.71	2.50	1.25	10.5	11.1	1.66
17	1.10	11.1	4.88	4.80	7.99	1.66	1.44	31.7	1.15	1.20	4.68	5.84
18	1.05	5.70	1.87	5.37	6.04	1.47	2.44	4.12	1.05	2.15	4.05	
19	1.20	2.45	1.66	2.46	17.2	1.35	*1.20	2.25	1.10	5.38	1.77	2.53
20	1.25	1.95	4.48	11.1	3.20	1.20	1.18	2.55	1.01	5.86	3.93	1.66
21	1.01	1.60	1.95	3.59	3.58	1.10	.71	4.00	1.05	1.54	1.66	1.35
22	.97	1.41	2.49	2.05	4.42	1.05	.65	3.10	1.56	1.30	4.53	3.00
23	1.35	3.16	1.80	1.54	5.44	.97	.58	1.91	5.29	1.48	2.05	1.47
24	1.73	2.10	1.87	1.30	7.75	4.56	.55	5.63	2.44	5.40	1.66	1.41
25	2.05	1.54	1.66	1.91	2.45	2.57	1.50	2.46	2.34	*1.35	1.95	1.25
26	1.41	1.35	5.50	1.41	1.95	6.74	21.6	3.61	5.89	2.46	3.13	1.20
27	2.09	2.56	14.4	*1.35	1.66	1.41	1.73	1.95	11.6	4.70	2.38	1.10
28	*1.20	4.99	2.89	1.20	1.60	4.69	1.20	3.56	1.41	1.54	9.03	2.20
29	1.05	3.38	2.84	1.10	3.10	7.62	.92	-----	*4.99	1.30	8.82	5.32
30	2.42	11.4	2.77	1.01	1.54	3.83	.87	-----	1.35	2.49	2.40	2.05
31	1.60	7.02	-----	1.83	-----	1.54	2.78	-----	1.10	1.87	-----	-----
TOTAL	55.29	151.24	93.30	84.57	114.20	118.40	63.70	133.09	93.58	87.50	93.35	85.18
MEAN												
MGD	1.78	4.88	3.11	2.73	3.81	3.82	2.05	4.75	3.02	2.92	3.01	2.84
CFS	2.76	7.55	4.81	4.22	5.89	5.91	3.18	7.35	4.67	4.51	4.66	4.39
AC-FT	170	464	286	260	350	363	195	408	287	269	286	261

CALENDAR YEAR 1960 MAX 35.0 MIN 0.55 MEAN MGD 3.55 MEAN CFS 5.49 AC-FT 3,980
FISCAL YEAR 1960-61 MAX 31.7 MIN 0.55 MEAN MGD 3.21 MEAN CFS 4.97 AC-FT 3,600

Peak discharge (base, 200 mgd).--Aug. 12 (1 a.m.) 206 mgd (319 cfs), 3.01 ft; Oct. 20 (11 a.m.) 203 mgd (314 cfs), 3.00 ft; Feb. 17 (4:30 a.m.) 508 mgd (786 cfs), 3.87 ft; May 16 (9 a.m.) 209 mgd (323 cfs), 3.02 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

5060. Makapipi ditch near Mahiku

Location.--Lat 20°48'17", long 156°06'25", on right bank at entrance to tunnel No. 1, 1.8 miles south of Mahiku and 4.7 miles southeast of Keanae.

Records available.--July 1948 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 1,300 ft above mean sea level (by vertical angles).

Average discharge.--13 years, 2.95 mgd (4.56 cfs).

Extremes.--1948-61: Maximum daily discharge, 7.8 mgd (12.1 cfs) Nov. 21, 1951; minimum daily, 0.42 mgd (0.65 cfs) Mar. 22, 23, 25, Apr. 13, 14, 1958..

Remarks.--Records good except those for period of no gage-height record, which are fair.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	4.38	1.60	3.90	2.92	1.26	3.3	3.14	1.00	3.98	1.55	1.12	3.36	
2	3.98	1.66	3.58	2.78	1.22	3.4	3.90	1.00	3.90	4.98	1.08	3.21	
3	3.74	1.76	3.50	2.59	1.12	3.2	3.74	.96	3.74	7.00	1.04	3.07	
4	3.50	3.32	3.36	2.46	1.08	3.0	3.58	.96	3.74	6.50	1.04	2.85	
5	3.28	3.43	3.14	2.34	1.04	2.9	3.28	.92	3.66	5.96	1.00	3.00	
6	3.07	2.92	2.92	2.21	1.04	2.8	3.07	.92	3.50	5.60	1.00	4.06	
7	2.85	2.85	2.72	2.10	1.00	* 2.7	2.92	.88	3.58	4.98	.96	3.21	
8	2.59	2.92	2.53	1.93	1.00	2.59	2.78	.84	* 3.66	4.30	.96	4.14	
9	2.46	2.92	2.46	1.88	1.61	2.46	2.65	.242	3.90	3.82	.92	3.74	
10	2.40	2.92	2.34	1.76	3.22	2.40	2.53	4.38	3.98	3.50	.92	3.58	
11	2.21	2.92	2.34	1.71	3.50	2.28	2.40	4.22	3.66	3.21	.92	3.36	
12	2.10	3.82	* 3.63	2.70	3.74	2.55	2.21	5.06	3.43	2.92	.92	* 3.14	
13	2.04	3.07	2.53	2.45	3.98	4.30	2.10	5.33	3.21	2.65	.92	3.07	
14	1.93	2.92	2.46	1.98	4.06	4.98	1.98	5.58	3.00	2.46	.92	2.92	
15	1.88	2.72	2.46	1.93	4.22	5.06	1.88	5.42	2.72	2.28	.96	2.72	
16	1.76	2.72	2.46	1.98	4.38	4.38	1.82	5.14	2.53	2.10	2.41	2.59	
17	1.71	2.72	2.46	2.74	4.72	3.98	1.71	6.01	2.40	1.93	2.53	2.46	
18	1.66	3.23	2.46	2.28	4.81	3.74	1.66	6.05	2.21	1.82	1.82	2.34	
19	1.60	3.00	2.40	2.15	5.33	3.50	1.55	5.60	2.04	1.71	1.66	2.28	
20	1.55	2.78	2.34	2.04	5.51	3.28	1.46	5.42	1.93	1.66	1.97	2.21	
21	1.50	2.72	2.34	1.93	5.24	3.00	1.41	4.98	1.82	1.55	1.90	2.15	
22	1.46	2.65	2.28	1.82	5.15	2.72	1.36	4.72	1.71	1.50	2.04	2.10	
23	1.46	2.53	2.28	1.71	4.8	2.53	1.36	4.56	1.93	1.46	1.88	1.98	
24	2.07	2.40	2.21	1.66	4.6	2.40	1.26	4.38	1.93	1.41	1.88	2.22	
25	2.51	2.28	2.21	1.66	4.4	2.21	1.22	4.38	1.55	1.31	1.88	2.15	
26	1.60	2.10	2.40	* 1.55	4.1	2.10	1.22	4.30	1.50	1.26	2.29	1.88	
27	1.55	2.04	3.88	1.50	3.9	2.21	1.17	4.14	1.50	1.26	2.98	1.82	
28	1.50	2.81	3.43	1.41	3.7	3.74	1.12	4.06	1.50	1.22	3.90	1.99	
29	* 1.41	2.34	3.21	1.36	3.8	3.36	1.12	-----	1.66	1.17	4.30	2.87	
30	1.50	3.88	3.07	1.36	3.6	3.21	1.08	-----	1.55	1.12	3.74	2.21	
31	1.55	4.72	-----	1.31	-----	2.78	1.04	-----	1.50	-----	3.50	-----	
Total	68.80	86.67	83.30	62.20	101.13	97.06	63.72	103.63	82.92	84.19	55.36	82.68	
Mean	Mgd	2.22	2.80	2.78	2.01	3.37	3.13	2.06	3.70	2.67	2.81	1.79	2.76
	Cfs	3.43	4.33	4.30	3.11	5.21	4.84	3.19	5.72	4.13	4.35	2.77	4.27
	Ac-ft	211	266	256	191	310	298	196	318	254	258	170	254
Calendar Year	1960	Max	7.00	Min	1.00	Mean mgd	2.96	Mean cfs	4.58	Ac-ft	33 30		
Fiscal Year	1960-61	Max	7.00	Min	0.84	Mean mgd	2.66	Mean cfs	4.12	Ac-ft	2980		

* Discharge measurement made on this day.

Note.--No gage-height record for period Nov. 23 to Dec. 7; discharge estimated on basis of record from ditch station at Mahiku.

ISLAND OF MAUI

103

5080. Hanawi Stream near Kahuku

Location.--Lat $20^{\circ}48'35''$, long $156^{\circ}07'00''$, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Kahuku, and 4.5 miles southeast of Keanae.

Drainage area.--3.49 sq mi.

Records available.--January 1914 to January 1916, November 1921 to June 1961. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Jan. 9, 1914, to Jan. 6, 1916, at site 50 ft downstream in same pool at datum 0.12 ft lower.

Average discharge.--40 years (1914-15, 1922-61), 14.7 mgd (22.7 cfs).

Extremes.--Maximum discharge during year, 2,580 mgd (3,990 cfs) Feb. 16 (gage height, 10.14 ft), from rating curve extended above 260 mgd as explained below; minimum, 1.38 mgd (2.14 cfs) Nov. 6, 7, Feb. 6, 7, 8, 9.

1914-16, 1921-61: Maximum discharge, about 3,600 mgd (5,570 cfs) Jan. 18, 1916 (gage height, 11.6 ft at present site), by test on model of station site; minimum, 1.1 mgd (1.7 cfs) Feb. 19, 20, 1944.

Remarks.--Records fair. Water used for domestic supply and irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	1.38	1.0	10.1	3.0	85.0
.3	1.94	1.3	15.3	3.5	125
.4	2.60	1.6	21.5	4.0	176
.5	3.35	2.0	34.0	4.5	250
.7	5.30	2.5	56.0	5.0	370
				5.5	600

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.97	2.60	4.67	2.53	1.77	4.03	32.7	1.60	6.00	26.1	1.72	2.75
2	3.77	3.02	3.86	2.33	1.66	8.20	15.4	1.54	7.02	599	1.66	2.60
3	3.69	2.94	3.12	2.20	1.54	3.94	7.68	1.49	9.15	323	1.60	2.40
4	3.52	16.6	2.97	2.20	1.49	3.52	6.45	1.49	7.18	35.5	1.60	2.40
5	2.67	6.53	2.53	2.13	1.43	6.29	6.44	1.43	6.96	9.64	1.55	9.83
6	2.33	3.20	2.46	2.78	1.38	6.32	4.31	1.43	6.86	5.58	1.49	20.0
7	2.46	2.67	2.40	2.46	1.38	4.20	3.60	1.38	15.0	4.20	1.66	3.87
8	2.20	4.24	2.43	2.13	3.65	3.52	3.12	1.38	*14.2	3.52	1.49	84.9
9	3.17	4.10	6.72	2.00	22.6	*3.43	2.82	62.2	8.34	3.12	1.55	3.94
10	4.36	3.05	2.67	1.82	38.9	3.43	2.67	203	6.14	2.90	2.46	3.28
11	2.46	2.60	7.81	1.94	150	3.43	2.60	104	5.44	2.68	2.01	2.82
12	2.33	7.75	23.7	18.6	120	21.2	2.46	89.0	4.97	2.60	2.50	2.53
13	2.27	2.67	3.52	5.50	15.4	47.7	2.40	18.0	4.64	2.47	1.83	2.90
14	2.33	2.82	*5.07	13.7	5.30	20.0	2.40	73.7	4.31	2.34	1.72	*2.47
15	2.00	2.40	3.69	3.62	7.13	11.3	2.27	53.2	4.12	2.27	3.52	2.34
16	1.94	3.98	2.75	3.76	11.6	6.00	2.13	382	3.94	2.20	19.8	2.27
17	1.88	5.18	2.90	3.82	4.75	4.64	2.07	378	3.78	2.14	9.68	3.26
18	1.82	10.2	2.90	2.33	24.7	4.03	2.00	44.1	3.60	2.14	2.98	5.34
19	1.82	4.65	2.90	2.13	34.0	3.86	1.94	82.8	3.52	2.07	2.40	3.05
20	2.00	2.82	2.82	2.00	15.8	3.52	1.94	63.0	3.44	2.14	14.2	2.47
21	1.82	2.40	3.52	1.94	21.2	3.12	1.88	83.8	3.35	1.94	9.53	2.27
22	1.66	2.27	4.45	1.82	90.9	2.97	1.82	21.7	6.23	1.94	7.29	2.34
23	3.32	2.33	3.60	1.71	93.8	2.82	2.07	17.2	11.2	1.88	4.03	2.20
24	23.7	2.46	3.86	1.77	77.6	2.67	1.82	22.0	7.84	2.14	2.90	16.6
25	14.3	2.13	6.38	2.27	13.8	2.60	1.77	10.4	3.94	1.94	2.90	10.2
26	2.98	1.94	5.67	1.94	6.24	2.53	2.47	7.50	3.52	*2.58	10.0	4.97
27	2.13	3.68	18.6	1.88	4.31	35.9	2.13	5.72	3.69	6.31	15.5	3.12
28	1.94	14.1	4.56	1.66	5.21	101	1.82	7.86	3.77	2.47	18.2	13.1
29	*1.82	5.27	3.27	1.54	43.9	23.3	1.71	-----	4.53	1.88	12.6	19.6
30	6.31	19.0	2.75	1.77	4.86	9.37	1.66	-----	3.14	1.77	4.20	6.53
31	5.00	14.1	-----	1.71	-----	3.94	1.66	-----	3.20	-----	3.12	-----
TOTAL	118.97	162.70	148.55	99.99	869.05	362.78	128.21	1,740.92	182.92	1,060.46	167.69	186.35
MEAN												
MGD	3.84	5.25	4.95	3.23	29.0	11.7	4.14	62.2	5.90	35.3	5.41	6.21
CFS	5.94	8.12	7.66	4.99	44.8	18.1	6.40	96.2	9.13	54.6	8.37	9.61
AC-FT	365	499	456	307	2,670	1,110	393	5,340	561	3,250	515	572

Calendar Year 1960 Max 612 Min 1.38 Mean mgd 19.0 Mean cfs 29.4 Ac-ft 21,380
Fiscal Year 1960-61 Max 599 Min 1.38 Mean mgd 14.3 Mean cfs 22.1 Ac-ft 16,040

Peak discharge (base, 850 mgd).--Feb. 14 (4 p.m.) 1,340 mgd (2,070 cfs), 7.20 ft; Feb. 16 (11:30 p.m.) 2,580 mgd (3,990 cfs), 10.14 ft; Apr. 2 (1 a.m.) 1,150 mgd (1,780 cfs), 6.56 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

5100. Kapaula Gulch near Nahiku

Location.--Lat 20°48'45", long 156°07'05", on right bank 40 ft upstream from intake to Koolau ditch, 300 ft upstream from ditch trail, 1.9 miles southwest of Nahiku, and 4 miles southeast of Keanae.

Drainage area.--0.69 sq mi.

Records available.--November 1921 to June 1961. Prior to July 1959, published as Kapaula Stream near Nahiku.

Gage.--Water-stage recorder. Datum of gage is 1,346 ft above mean sea level (by vertical angles).

Average discharge.--39 years (1922-61), 10.8 mgd (16.7 cfs).

Extremes.--Maximum discharge during year, 1,470 mgd (2,270 cfs) Feb. 16 (gage height, 7.59 ft), from rating curve extended above 220 mgd as explained below; minimum, 0.52 mgd (0.3 cfs) Feb. 6-8.

1921-61: Maximum discharge, 1,780 mgd (2,750 cfs) Apr. 6, 1938 (gage height, 8.40 ft), from rating curve extended above 220 mgd by logarithmic plotting; minimum, 0.2 mgd (0.3 cfs) Nov. 23-25, 1933, Oct. 2-5, 1938.

Remarks.--Records fair. Water used for domestic supply and irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

(Shifting-control method used Feb. 17-22)

0.4	0.38	2.0	44.0
.5	1.08	2.5	83.0
.7	3.35	3.0	140
.9	6.50	3.5	218
1.2	13.4	4.0	320
1.5	16.8		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.38	2.31	3.82	1.52	1.19	3.12	26.0	0.73	3.12	2.98	0.94	1.86
2	2.77	2.74	3.08	1.30	1.08	5.91	14.7	.66	3.64	31.2	.87	1.75
3	2.70	3.25	2.43	1.19	.94	2.89	6.45	.66	5.12	17.5	.80	1.64
4	2.72	16.4	2.20	1.30	.87	2.31	4.89	.66	4.38	27.9	.73	1.64
5	1.86	6.23	1.97	1.19	.80	4.96	5.07	.59	3.49	4.54	.73	10.3
6	1.64	2.54	1.86	2.25	.73	5.23	3.35	.52	3.74	2.77	.73	21.4
7	1.97	1.97	1.86	1.97	.73	3.34	2.54	.52	13.3	2.20	.80	3.69
8	1.52	3.50	1.90	1.41	3.26	2.20	2.08	.52	*11.5	1.86	.73	22.6
9	2.71	3.50	5.87	1.30	20.2	1.97	1.75	56.4	4.65	1.52	.73	3.59
10	4.49	2.54	2.31	1.08	35.3	2.08	1.52	149	2.77	1.41	1.08	2.66
11	2.20	2.20	6.81	1.19	90.6	1.97	1.30	81.0	2.20	1.19	1.19	2.20
12	1.75	8.03	18.2	19.0	79.7	16.0	1.19	64.8	1.86	1.08	1.75	1.97
13	1.75	2.31	3.23	7.02	11.7	45.4	1.19	10.9	1.41	1.01	1.30	2.31
14	1.86	2.31	*5.25	17.2	3.60	15.5	1.30	49.7	1.08	.94	1.08	*1.97
15	1.41	1.86	3.38	4.81	5.54	9.05	1.08	34.7	1.01	.87	1.86	1.52
16	1.19	3.52	2.31	4.97	10.5	3.64	1.01	20.1	.94	.80	21.9	1.30
17	1.08	4.82	2.43	4.86	38.6	2.66	.94	182	.87	.73	9.91	1.86
18	1.01	9.15	2.43	2.08	20.1	2.20	.94	26.9	.80	.73	2.77	3.78
19	1.08	4.87	2.63	1.52	31.5	2.20	.87	43.6	.73	.73	1.86	2.54
20	1.30	2.31	2.50	1.30	11.7	2.08	*.87	36.6	.73	.80	9.85	1.86
21	1.01	1.75	3.12	1.19	16.8	1.64	.73	46.4	.66	.66	8.57	1.52
22	1.01	1.41	5.31	1.08	67.1	1.52	.73	16.1	1.05	.59	7.32	1.41
23	3.06	1.75	3.12	1.01	67.1	1.30	1.17	13.1	5.93	.59	3.93	1.19
24	20.1	1.86	3.35	1.01	62.6	1.19	.80	17.2	5.04	.87	2.66	17.4
25	14.2	1.30	6.04	1.97	10.1	1.08	.73	7.09	2.31	.66	2.43	9.80
26	2.91	1.19	5.28	1.30	4.36	1.08	2.16	4.62	1.64	*1.21	8.75	4.15
27	*1.75	3.83	17.0	1.52	3.00	21.4	1.41	3.00	1.64	4.51	16.7	2.77
28	1.41	14.2	3.89	*1.01	9.49	87.0	.94	4.24	1.55	2.31	17.9	12.2
29	1.19	6.11	2.43	.87	28.0	13.7	.80	-----	2.66	1.41	12.5	18.2
30	5.07	15.1	1.86	1.18	4.36	9.35	.73	-----	1.64	1.08	3.35	5.92
31	4.29	13.3	-----	1.30	-----	3.06	.73	-----	1.08	-----	2.31	-----
TOTAL	97.39	148.16	128.27	91.90	641.55	277.03	89.97	1,057.21	92.54	557.95	148.03	167.00
MEAN												
MGD	3.14	4.78	4.28	2.96	21.4	8.94	2.90	37.8	2.99	18.6	4.78	5.57
CFS	4.86	7.39	6.61	4.59	33.1	13.8	4.49	58.5	4.62	28.8	7.39	8.61
AC-FT	299	455	394	282	1,970	850	276	3,240	284	1,710	454	513

Calendar Year 1960	Max 275	Min 0.73	Mean mgd 12.3	Mean cfs 19.0	Ac-ft 13,790
Fiscal Year 1960-61	Max 315	Min 0.52	Mean mgd 9.58	Mean cfs 14.8	Ac-ft 10,730

* Discharge measurement made on this day.

5120. Koolau ditch at Nahiku weir, near Nahiku

Location--Lat $20^{\circ}48'55''$, long $156^{\circ}07'15''$, on right bank between Kapaula and Waiohine Stream, 1.8 miles southwest of Nahiku, and 3.8 miles southeast of Keanae.

Records available--February 1919 to June 1961. Gage-height records collected in this vicinity since 1904 are contained in the files of East Maui Irrigation Co.

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.

Average discharge--42 years, 22.0 mgd (34.0 cfs).

Extremes--1919-1961: Maximum daily discharge, 60 mgd (93 cfs) Feb. 18, 24, 1956; no flow at times.

Remarks--Records excellent. Flow regulated by spillways and gates. Ditch diverts water from nearly all streams from the Makapipi west to the Alo. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27.5	12.7	25.0	15.1	9.00	21.5	32.2	7.40	24.0	15.7	8.20	16.8
2	21.5	14.4	21.5	13.7	8.50	31.0	42.0	7.10	24.0	59.5	7.90	15.8
3	20.0	16.0	18.3	13.0	7.90	19.8	31.5	6.80	27.5	52.0	7.90	14.4
4	19.1	4.20	16.8	12.7	7.60	18.0	26.5	6.80	25.5	44.5	7.60	14.1
5	15.8	28.8	15.1	12.1	7.60	24.1	26.5	6.80	23.5	31.0	7.40	25.9
6	14.1	18.3	14.4	14.4	7.40	24.5	20.5	6.60	24.7	26.5	7.10	44.5
7	14.1	18.8	13.7	13.0	7.10	18.3	18.0	6.30	42.0	23.0	7.60	21.5
8	13.0	20.5	13.4	11.5	13.5	16.1	16.1	6.30	42.0	20.0	7.40	39.5
9	16.3	20.5	24.0	10.8	23.5	15.8	15.1	29.5	31.5	18.0	7.10	23.0
10	21.0	17.2	14.4	10.2	4.45	16.1	14.1	37.8	24.0	16.1	8.80	19.8
11	14.0	15.8	16.7	10.5	49.5	15.4	13.4	54.5	21.5	15.1	8.50	17.2
12	12.7	29.4	36.0	33.3	49.5	28.9	12.7	54.5	19.4	14.4	10.2	16.1
13	12.4	16.5	18.0	24.8	42.0	52.0	12.4	49.5	17.6	13.4	8.80	17.2
14	12.1	16.1	22.7	24.9	29.5	49.5	12.1	49.5	16.1	12.7	7.90	*15.4
15	10.8	14.1	18.7	17.2	32.0	44.5	11.5	49.5	15.4	12.1	12.1	14.1
16	10.2	19.8	15.8	21.4	34.5	30.0	10.5	52.0	14.4	11.5	39.6	13.4
17	9.60	23.5	16.1	23.6	47.0	25.0	10.2	42.0	13.4	10.8	30.5	15.1
18	9.60	31.5	15.4	14.7	47.0	22.0	9.90	37.0	12.7	10.5	15.4	19.8
19	9.30	22.0	15.1	13.4	49.5	20.5	9.90	37.0	12.4	10.2	13.0	16.1
20	9.90	16.1	15.4	12.4	44.5	18.3	* 9.18	35.7	11.8	9.90	30.6	14.1
21	9.00	14.1	16.8	11.5	47.0	16.5	9.00	21.9	11.2	9.30	28.0	12.7
22	8.50	12.7	20.5	10.8	49.5	15.4	8.80	32.0	13.9	9.00	26.2	12.4
23	12.2	12.7	16.5	10.2	49.5	14.4	9.60	42.0	26.5	8.80	17.2	11.8
24	34.2	12.7	17.6	9.90	49.5	14.1	8.50	49.5	22.5	9.60	14.4	23.3
25	34.0	11.2	34.5	12.1	44.5	13.4	7.90	37.0	14.1	8.80	14.1	29.8
26	14.1	10.2	25.5	10.2	34.5	12.7	11.8	30.0	12.4	*10.4	26.2	18.0
27	* 11.2	15.4	42.0	10.8	27.5	28.6	9.30	24.5	12.7	20.3	38.7	14.4
28	10.2	33.2	24.5	* 9.30	26.0	49.5	8.50	27.5	13.4	11.8	47.0	21.6
29	9.60	23.5	19.4	8.80	39.5	37.0	7.90	-----	17.2	9.60	* 42.0	39.5
30	20.4	44.5	16.8	9.30	24.5	33.4	7.60	-----	12.7	8.80	23.5	25.5
31	17.6	42.0	-----	9.30	21.5	7.40	-----	11.5	-----	19.4	-----	-----
Total	474.00	643.2	590.6	434.90	983.60	767.8	450.58	847.00	611.5	533.30	550.30	602.8
Mean												
Mgd	15.3	20.7	19.7	14.0	31.8	24.8	14.5	30.2	19.7	17.8	17.8	20.1
Cfs	23.7	32.0	30.5	21.7	49.2	38.4	22.4	46.7	30.5	27.5	27.5	31.1
Ac-ft	1450	1970	1810	1330	2930	2360	1380	2600	1880	1640	1690	1850
Calendar Year	1960		Max	54.5	Min	7.10	Mean mgd	24.8	Mean cfs	38.4	Ac-ft	27,890
Fiscal Year	1960-61		Max	59.5	Min	6.30	Mean mgd	20.4	Mean cfs	31.6	Ac-ft	22,890

* Discharge measurement made on this day.

ISLAND OF MAUI

5150. Waiohine Gulch near Nahiku

Location.--Lat $20^{\circ}49'05''$, long $156^{\circ}07'45''$, on left bank 200 ft upstream from intake to Melau ditch, 300 ft upstream from ditch trail, 2.4 miles southwest of Nahiku and 3.5 miles southeast of Keanae.

Drainage area.--0.32 sq mi.

Records available.--October 1921 to June 1961. Prior to July 1959 published as Waiohine Stream near Nahiku.

Gage.--Water-stage recorder. Datum of gage is 1,316.2 ft above mean sea level (by stadia traverse).

Average discharge.--39 years (1922-61), 7.51 mgd (11.6 cfs).

Extremes.--Maximum discharge during year, 506 mgd (783 cfs) Feb. 17 (gage height, 5.53 ft), from rating curve extended above 95 mgd on basis of slope-area measurements at gage height 4.57 ft and 5.60 ft; minimum, 1.67 mgd (2.98 cfs) Feb. 8, 9.

1921-61: Maximum discharge, 702 mgd (1,090 cfs) Apr. 16, 1960 (gage height, 6.24 ft); maximum gage-height of 6.24 ft also recorded on Apr. 7, 1938; minimum, 1.36 mgd (2.10 cfs) Oct. 9, 10, 1953.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table (gage height, in feet, and discharge,
in million gallons a day)

0.5	1.61	1.6	24.0
.6	2.23	2.0	43.5
.8	4.10	2.5	76.0
1.0	7.00	3.0	117
1.2	11.1	3.5	167

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	3.57	2.80	3.89	3.05	2.47	3.78	11.1	1.92	3.57	8.94	1.92	2.72
2	3.26	3.47	3.36	2.96	2.31	4.99	8.03	1.85	3.99	153	1.92	2.80
3	3.05	4.31	3.47	2.88	2.16	3.57	4.23	1.85	4.62	80.8	1.92	2.64
4	2.88	11.1	3.36	2.96	2.10	3.36	3.99	1.79	4.23	12.3	1.85	2.80
5	2.72	5.02	3.15	2.80	2.10	4.36	3.99	1.73	4.10	4.49	1.85	7.03
6	2.64	3.15	3.05	4.07	2.04	4.23	3.36	1.73	4.06	3.57	1.85	10.6
7	2.88	2.88	3.15	3.05	2.04	*3.47	3.05	1.73	7.23	3.26	1.98	3.62
8	2.64	3.99	3.29	2.96	3.98	3.15	2.88	1.67	8.20	2.96	1.85	11.8
9	3.74	3.89	4.48	2.72	11.7	3.05	2.72	34.1	4.36	2.80	1.92	3.57
10	4.29	3.26	3.26	2.64	15.0	2.96	2.64	52.6	3.47	2.72	2.16	3.78
11	2.96	3.36	4.35	2.72	35.0	2.88	2.64	32.7	3.26	2.64	2.16	3.15
12	2.80	6.69	*11.4	12.7	30.6	10.9	2.55	26.7	3.05	2.55	2.71	*3.05
13	2.88	3.05	3.68	4.23	6.25	25.1	2.55	5.89	2.88	2.47	2.04	3.57
14	2.80	3.47	4.57	9.78	3.57	9.77	2.47	26.1	2.80	2.39	2.04	3.05
15	2.64	2.88	3.99	3.36	4.10	5.48	2.47	14.3	2.72	2.39	2.92	2.80
16	2.55	4.25	3.26	7.26	5.69	3.89	2.39	75.7	2.64	2.31	11.3	2.72
17	2.47	4.84	3.68	5.77	16.8	3.47	2.31	80.2	2.55	2.23	4.97	3.68
18	2.39	6.22	3.57	3.05	10.4	3.15	*2.23	12.2	2.47	2.16	2.47	3.78
19	2.47	3.89	3.36	2.88	16.0	3.15	2.23	16.7	2.39	2.16	2.23	3.26
20	2.72	3.15	3.59	2.72	5.97	3.05	2.16	14.8	2.31	2.16	4.96	2.72
21	2.39	2.88	3.78	2.64	8.28	2.88	2.10	19.1	2.31	2.04	4.39	2.64
22	2.39	2.80	3.89	2.55	25.3	2.80	2.10	7.31	2.54	1.98	4.68	2.80
23	2.80	2.88	3.47	2.47	23.3	2.80	2.54	6.45	4.27	2.04	2.88	2.64
24	7.60	2.96	3.89	2.47	25.4	2.72	2.10	8.88	3.62	*2.23	2.72	7.20
25	6.73	2.64	5.96	3.22	5.90	2.64	2.04	4.88	2.55	2.10	2.64	5.15
26	2.88	2.64	5.10	*2.47	4.23	2.64	3.10	4.23	2.47	2.84	4.88	3.47
27	2.55	3.75	11.3	2.80	3.78	12.1	2.23	3.57	2.55	3.88	8.65	2.88
28	2.39	8.53	3.89	2.31	5.59	33.2	2.04	4.23	2.71	2.31	9.27	7.05
29	2.39	4.94	3.47	2.12	11.9	7.10	1.98	-----	3.84	2.04	7.54	7.86
30	4.08	9.81	3.15	2.70	3.89	5.09	1.92	-----	2.39	1.98	3.26	4.34
31	3.47	7.58	-----	2.72	3.26	1.92	-----	2.23	-----	2.88	-----	-----
TOTAL	98.02	137.08	127.81	113.14	297.85	185.69	94.06	464.91	106.38	321.74	110.81	129.17
MEAN												
MGD	3.16	4.42	4.26	3.65	9.93	5.99	3.03	16.6	3.43	10.7	3.57	4.31
CFS	4.89	6.84	6.59	5.65	15.4	9.27	4.69	25.7	5.31	16.6	5.53	6.66
AC-FT	301	421	392	347	914	570	289	1,430	326	987	340	396

CALENDAR YEAR 1960 MAX 117 MIN 2.04 MEAN MGD 7.22 MEAN CFS 11.2 AC FT 8,080
FISCAL YEAR 1960-61 MAX 153 MIN 1.67 MEAN MGD 5.99 MEAN CFS 9.27 AC FT 6,710

Peak discharge (base, 300 mgd).--Feb. 14 (3:30 p.m.) 396 mgd (613 cfs), 4.98 ft; Feb. 17 (3 a.m.) 506 mgd (783 cfs), 5.53 ft; Apr. 2 (1:30 a.m.) 332 mgd (514 cfs), 4.66 ft.

* Discharge measurement made on this day.

5180. West Wailuku Stream near Keanae

Location.--Lat $20^{\circ}49'15''$, long $156^{\circ}08'37''$, 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 October 1917, November 1921 to June 1961. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,344 ft above mean sea level (by vertical angles).

Average discharge.--41 years (1914-15, 1916-17, 1922-61) 24.2 mgd (37.4 cfs).

Extremes.--Maximum discharge during year, 3,420 mgd (5,290 cfs) Feb. 16 (gage height, 11.68 ft), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 1.33 mgd (2.06 cfs) Feb. 9.

1914-17, 1921-61: Maximum discharge, 4,500 mgd (6,900 cfs) Jan. 14, 1923 (gage height, about 13.5 ft) from floodmarks, from rating curve extended above 420 mgd as explained above; minimum, 0.3 mgd (0.5 cfs) July 26, 1922.

Remarks.--Records good except those for period of no gage-height record, which are poor. Water used for irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.3	1.08	1.0	7.60	3.0	121
.4	1.60	1.3	12.9	3.5	185
.5	2.25	1.6	21.0	4.0	270
.6	3.05	2.0	39.5	5.0	510
.8	5.00	2.5	73.0	6.0	815

DISCHARGE, IN MILLION GALLONS A DAY: FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	9.46	4.47	6.90	4.05	2.49	7.90	53.0	2.05	7.0	16.4	1.92	4.58
2	7.32	4.89	6.95	3.59	2.05	10.6	21.8	1.79	10	786	1.79	4.26
3	7.04	5.05	5.32	3.23	1.79	6.34	10.4	1.60	13	428	1.73	3.77
4	6.34	19.9	6.05	3.68	1.66	5.72	8.20	1.60	5.5	49.6	1.60	4.72
5	5.00	8.99	4.68	3.14	1.54	9.42	9.35	1.49	4.3	11.9	1.60	21.9
6	18.1	5.00	4.47	5.28	1.49	8.20	6.62	1.44	*15	7.75	1.60	35.0
7	7.66	4.26	3.95	4.41	1.49	*6.76	5.60	1.39	14.8	6.20	2.33	7.04
8	4.79	5.72	4.18	3.32	4.80	5.24	5.00	1.39	11.6	5.36	1.92	40.7
9	6.41	5.12	13.4	2.89	42.9	4.89	4.47	11.0	6.90	9.79	1.92	7.60
10	9.00	4.16	4.68	2.65	61.1	5.35	4.05	309	*5.60	5.96	4.09	6.48
11	5.36	4.63	15.4	3.14	-127	4.89	3.77	136	5.12	4.58	2.18	5.00
12	4.68	9.10	46.4	36.3	109	29.6	3.77	93.6	4.58	3.95	2.63	*4.98
13	4.26	3.95	6.48	10.5	17.5	61.3	3.59	15.1	4.16	3.59	1.73	5.36
14	4.16	4.05	8.73	15.7	7.90	23.9	3.23	82.3	3.86	3.32	1.39	4.16
15	3.50	3.41	5.72	7.49	8.59	12.1	2.97	77.1	3.59	3.05	4.08	3.77
16	3.41	5.96	4.58	8.80	15.8	7.60	2.81	500	3.32	2.81	22.9	3.50
17	3.14	8.01	4.89	6.70	57.3	6.34	2.65	450	3.14	2.57	13.1	5.45
18	3.05	17.5	5.00	4.47	25.0	5.60	*2.57	60	2.97	2.49	3.95	7.84
19	3.05	7.52	4.16	3.68	45.1	5.72	2.49	110	2.81	2.49	3.23	4.58
20	4.05	4.68	4.47	3.50	19.0	5.12	2.49	80	2.65	2.41	23.6	3.59
21	3.05	3.86	6.48	3.05	30.6	4.16	2.25	110	2.49	2.18	18.5	3.14
22	2.81	3.68	9.43	2.81	117	3.95	2.12	40	5.44	2.05	9.86	3.41
23	9.77	3.77	6.34	2.65	114	3.68	3.96	32	8.55	1.99	5.84	2.97
24	37.1	3.95	5.96	2.57	84.3	3.41	2.73	43	6.52	*2.81	4.68	36.9
25	24.9	2.97	8.88	4.71	21.0	2.41	1.99	17	3.32	2.49	4.68	20.7
26	5.84	3.14	7.12	*2.94	11.1	3.05	10.8	10	2.81	4.73	17.2	8.43
27	*4.37	9.63	25.0	2.65	8.35	86.3	4.19	6.0	2.81	10.4	27.2	5.96
28	3.77	26.6	7.04	2.12	16.8	196	2.65	10	3.31	3.41	25.1	24.2
29	3.59	6.96	5.60	1.92	51.0	22.2	2.12	-----	4.73	2.25	17.6	39.6
30	8.98	18.3	4.68	3.10	9.28	15.6	1.92	-----	2.65	2.05	6.90	15.1
31	7.70	17.4	-----	2.73	7.32	2.05	-----	2.25	-----	5.24	-----	-----
TOTAL	231.66	238.63	252.94	167.77	1,016.93	580.67	195.61	2,303.85	174.78	1,392.58	242.09	344.69
MEAN												
MGD	7.47	7.70	8.43	5.41	33.9	18.7	6.31	82.3	5.64	46.4	7.81	11.5
CFS	11.6	11.9	13.0	8.37	52.4	29.0	9.76	127	8.73	71.8	12.1	17.8
AC-FT	711	732	776	515	3,120	1,780	600	7,070	536	4,270	743	1,060

Calendar Year 1960 Max 972 Min 1.49 Mean mgd 24.8 Mean cfs 38.4 Ac-ft 27,820
Fiscal Year 1960-61 Max 786 Min 1.39 Mean mgd 19.6 Mean cfs 30.3 Ac-ft 21,910

Peak discharge (base, 1,200 mgd).--Feb. 16 (9 p.m.) 3,420 mgd (5,290 cfs), 11.68 ft; Apr. 2 (1:30 p.m.) 1,540 mgd (2,380 cfs), 7.91 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 16 to Mar. 6; discharge estimated on basis of records for nearby stations.

ISLAND OF MAUI

5220. Taro patch feeder ditch at Keanae

Location.--Lat 20°51'40", long 156°09'00", on left bank 25 ft downstream from intake, 500 ft downstream from highway bridge over Palauhulu Stream at Keanae, 4.2 miles northwest of Kehiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to June 1961.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 51 ft (from topographic map).

Average discharge.--26 years (1935-61), 2.33 mgd (3.61 cfs).

Extremes.--1934-61: Maximum daily discharge, 7.9 mgd (12.2 cfs) June 30, 1941, Feb. 10, 1955; minimum daily, 0.05 mgd (0.08 cfs) Mar. 5, 1939.

Remarks.--Records good except those for period of no gage-height record which are fair. Ditch diverts water from Palauhulu Stream, 80 ft above station, for irrigation of taro at Keanae.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.19	1.94	1.99	2.49	2.19	2.49	2.45	2.04	1.85	2.53	2.44	2.14
2	2.14	1.89	1.94	2.44	2.19	2.54	2.39	2.04	1.85	6.30	2.39	2.14
3	2.09	1.89	1.89	2.39	2.19	2.44	2.14	2.04	1.85	4.14	2.34	2.09
4	2.09	2.47	1.89	2.34	2.19	2.39	2.09	2.04	1.85	1.72	2.29	2.04
5	2.04	2.24	1.85	2.29	2.19	2.49	2.19	2.04	1.85	1.92	2.24	2.53
6	2.38	2.04	1.85	2.29	2.19	2.44	2.09	1.99	1.85	3.04	2.24	3.26
7	2.14	2.04	1.85	2.29	2.14	2.39	2.04	1.99	1.99	2.98	2.24	2.26
8	2.04	2.04	1.80	2.24	2.19	2.34	1.99	1.99	1.99	2.98	2.19	2.81
9	2.09	1.99	2.09	2.24	2.92	2.34	1.94	3.72	1.99	2.98	2.19	2.19
10	2.19	1.99	1.85	2.24	*3.61	2.34	1.94	5.71	1.99	2.93	2.24	2.09
11	2.04	1.94	2.10	2.24	4.67	2.29	1.89	4.61	1.89	2.87	2.19	1.99
12	1.99	1.99	2.65	3.21	4.38	2.81	1.85	4.13	1.85	2.82	2.14	1.94
13	1.99	1.94	1.99	2.76	2.76	3.90	1.85	2.82	1.85	2.76	2.09	1.94
14	1.94	1.89	1.99	2.82	2.39	3.15	1.85	3.15	1.85	2.71	2.09	A1.89
15	1.94	1.85	1.94	2.60	2.34	2.71	1.85	2.80	1.80	2.71	2.09	A1.80
16	1.89	1.85	1.89	2.69	2.39	2.49	1.80	4.22	1.80	2.65	2.87	A1.75
17	1.89	1.99	1.89	3.52	3.37	2.44	1.75	2.11	*1.80	2.60	2.76	A1.80
18	1.89	2.34	1.85	2.65	2.82	2.39	1.80	2.04	2.09	2.60	2.29	A1.80
19	1.89	2.09	1.85	2.60	3.54	2.34	2.14	2.19	2.44	2.60	2.19	A1.80
20	1.85	1.99	1.85	2.49	2.76	*2.29	2.14	2.19	2.44	2.60	2.71	A1.70
21	1.85	1.94	1.85	2.44	2.93	2.29	2.09	2.19	2.44	2.54	2.71	A1.85
22	1.85	1.94	1.89	2.39	3.94	2.29	2.09	1.94	2.49	2.49	2.71	*1.86
23	1.89	1.89	1.85	2.34	4.03	2.29	2.24	1.99	2.65	2.49	2.39	1.86
24	2.71	1.85	1.85	2.29	4.28	2.24	2.09	1.94	2.60	2.49	2.19	2.43
25	2.44	1.85	1.89	2.34	2.82	2.19	2.09	1.89	2.39	2.49	2.09	2.54
26	2.04	1.80	*1.89	2.24	2.65	2.19	2.34	1.89	2.34	2.65	2.66	2.09
27	1.99	1.94	2.41	2.19	2.60	3.25	2.19	1.85	2.34	3.09	2.73	2.04
28	1.94	2.34	2.19	2.19	2.60	4.75	2.09	1.85	2.34	2.65	3.15	2.22
29	1.94	2.04	2.60	2.19	3.21	2.52	2.09	-----	2.39	2.49	2.93	2.86
30	2.04	2.24	2.54	2.19	2.60	2.34	2.09	-----	2.34	2.49	2.39	2.49
31	1.99	2.34	-----	2.24	-----	2.09	*2.04	-----	2.29	-----	2.19	-----
TOTAL	63.38	62.57	59.96	75.87	87.08	79.45	63.62	71.40	65.48	84.31	74.36	64.20
MEAN												
MGD	2.04	2.02	2.00	2.45	2.90	2.56	2.05	2.55	2.11	2.81	2.40	2.14
CFS	3.16	3.12	3.09	3.79	4.49	3.96	3.17	3.95	3.27	4.35	3.71	3.31
AC-FT	195	192	184	233	267	244	195	219	201	259	228	197

CALENDAR YEAR 1960 MAX 7.80 MIN 1.26 MEAN MID 2.58 MEAN CFS 3.99 AC-FT 2,900
FISCAL YEAR 1960-61 MAX 6.30 MIN 1.70 MEAN MGD 2.33 MEAN CFS 3.61 AC-FT 2,610

* Discharge measurement made on this day.

A Discharge for period of no gage-height record was estimated on basis of gage readings and by comparison with other streams.

ISLAND OF MAUI

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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 June 1961. Gage-height records collected in this vicinity since 1904 are contained in files of East Maui Irrigation Co.

Gage.--Water-stage recorder. Jan. 1, 1910, to Dec. 31, 1912, staff gage at same site and datum. Altitude of gage is 1,233 ft (from topographic map).

Average discharge.--42 years (1918-61), 67.1 mgd (104 cfs).

Extremes.--1910-12, 1917-61: Maximum daily discharge, 172 mgd (266 cfs) Apr. 19, 1935; no flow at times.

Remarks.--Records good. Flow regulated gates and spillways. Ditch diverts water at altitude 1,200 ft from nearly all streams from Makapipi west to the Alo for power and irrigation in central Maui. No diversion above station except from several spillways.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	* 78.5	39.0	67.0	41.0	27.8	67.0	89.8	21.5	63.0	34.7	20.0	43.0
2	58.0	48.6	61.6	37.0	26.0	101	127	20.0	67.0	116	20.0	41.0
3	55.5	48.3	49.3	35.0	23.0	55.5	98.5	18.7	76.8	120	20.0	37.0
4	51.0	134	51.5	37.0	23.0	49.0	81.0	18.7	67.0	113	18.7	41.0
5	41.0	90.8	43.0	33.0	21.5	85.2	83.6	18.7	63.0	75.0	18.7	64.3
6	54.2	49.0	41.0	55.8	21.5	79.3	58.0	18.7	63.0	67.0	* 18.7	124
7	50.3	41.0	41.0	43.0	21.5	58.0	49.0	17.4	126	85.5	23.0	63.0
8	37.0	62.0	39.7	35.0	83.7	47.0	43.0	17.4	113	47.0	20.0	126
9	57.3	56.5	96.8	31.2	71.7	45.0	41.0	76.3	81.8	52.5	20.0	69.7
10	83.2	43.0	43.0	29.5	129	45.0	37.0	125	55.5	43.0	33.2	63.0
11	43.0	46.8	55.2	33.0	120	43.0	36.0	120	49.0	37.0	24.5	47.0
12	37.0	84.0	117	107	120	79.0	35.0	125	49.0	35.0	31.6	45.0
13	37.0	41.0	55.5	84.3	123	125	33.0	132	41.0	33.0	21.5	53.0
14	37.0	43.0	79.2	86.3	83.0	134	33.0	119	39.0	29.5	21.5	43.0
15	33.0	37.0	59.0	61.1	91.2	120	29.5	130	37.0	29.5	40.2	37.0
16	31.2	65.1	45.0	59.8	110	79.0	27.8	131	33.0	27.8	115	35.0
17	29.5	80.5	49.0	81.8	125	63.0	27.8	74.7	* 33.0	26.8	93.0	50.8
18	27.8	106	51.2	45.0	135	53.0	27.8	16.0	31.2	24.5	39.0	72.1
19	29.5	67.9	45.0	39.0	125	53.0	26.0	35.3	29.5	24.5	33.0	45.0
20	35.0	43.0	46.4	35.0	133	* 47.2	26.0	53.6	29.5	24.5	95.6	35.0
21	27.8	37.0	58.0	33.0	138	41.0	24.5	91.1	27.8	23.0	97.8	33.0
22	26.0	35.0	79.5	31.2	125	39.0	23.0	53.0	39.2	21.5	91.2	35.0
23	59.5	37.0	53.0	29.5	120	37.0	34.3	89.8	80.6	21.5	53.0	31.2
24	125	39.0	55.5	29.5	120	35.0	24.5	136	69.0	26.0	41.0	61.6
25	117	31.2	89.6	46.5	135	33.0	23.0	102	35.0	23.0	41.0	107
26	45.0	31.2	* 82.5	31.2	105	31.2	62.2	79.0	29.5	33.8	84.5	69.2
27	35.0	74.3	125	33.0	79.0	83.1	45.0	63.0	31.2	80.1	110	47.0
28	31.2	110	69.7	26.0	82.5	112	24.5	75.0	37.1	31.2	135	78.0
29	29.5	87.0	51.0	24.5	119	88.2	23.0	-----	54.2	23.0	123	127
30	85.7	136	45.0	32.8	83.0	99.9	21.5	-----	31.2	21.5	67.0	107
31	71.2	123	-----	31.2	-----	63.0	22.2	-----	27.8	-----	49.0	-----
Total	1558.9	1967.2	1845.2	1358.2	2690.4	2090.6	1336.5	1977.9	1605.9	1319.4	1619.7	1870.9
Mean	50.3	63.5	61.5	43.8	89.7	67.4	43.1	70.6	51.8	44.0	52.2	62.4
Mgd	77.8	98.2	95.2	67.8	139	104	66.7	109	80.1	68.1	80.8	96.5
Cfs	4,780	6,040	5,660	4,170	8,260	6,420	4,100	6,070	4,830	4,050	4,970	5,740
Ac-ft	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Calendar Year 1960	Max	140	Min	16.5	Mean mgd	69.9	Mean cfs	108	Ac-ft	78470		
Fiscal Year 1960-61	Max	138	Min	16.0	Mean mgd	58.2	Mean cfs	90.0	Ac-ft	65190		

* Discharge measurement made on this day.

ISLAND OF MAUI

5270. Honomanu Stream near Keanae

Location.--Lat 20°50'05", long 156°11'20", on left bank at Spreckels ditch intake, 3.3 miles southwest of Keanae School and 4.5 miles southeast of Kailua.

Drainage area.--3.17 sq mi.

Records available.--November 1913 to June 1961. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder, orifice and concrete control. November 1913 to Apr. 14, 1950, at site 500 ft upstream at different datum.

Average discharge.--47 years (1914-61), 15.2 mgd (23.5 cfs).

Extremes.--Maximum discharge during year, 735 mgd (1,140 cfs) Feb. 17 (gage height, 8.31 ft), from rating curve extended above 13 mgd as explained below; minimum, 0.55 mgd (0.85 cfs) Feb. 6-9.

1913-61: Maximum discharge, 2,310 mgd (3,570 cfs) Feb. 25, 1956 (gage height, 10.73 ft), from rating curve extended above 13 mgd by computation of flow through orifice and over dam; minimum, 0.08 mgd (0.12 cfs) Mar. 24, 1928.

Remarks.--Records fair except those for periods of no gage-height record and those above 15 mgd, which are poor. Water used for domestic use and irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

	0.6	0.25	1.6	8.20	4.0	16.0	
	.7	.69	2.0	10.3	5.0	16.5	
	.8	1.25	2.5	11.9	6.0	50.0	
	1.0	2.68	3.0	13.4	7.0	238	
	1.2	4.45	3.5	14.8	8.0	580	

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.73	2.76	4.16	2.44	1.70	4.16	11.7	1.25	3.33	40.2	1.08	3.0
2	4.16	3.09	4.16	2.21	1.44	5.60	6.87	.85	3.33	289	.97	2.7
3	5.50	2.84	8.88	1.97	1.25	3.41	4.64	.74	3.59	160	.85	2.4
4	4.73	14.0	4.92	2.52	1.31	2.92	3.69	.69	2.76	30.0	*.74	3.0
5	5.09	7.48	3.09	2.05	1.31	9.10	6.73	.60	2.44	5.74	.74	10
6	4.73	3.25	2.92	5.11	1.25	5.60	3.88	.55	2.68	3.59	.69	20
7	4.16	2.60	2.36	4.01	1.38	4.26	3.25	.55	1.15	2.60	1.19	4.5
8	2.84	3.50	3.94	3.63	*3.11	2.84	3.25	.55	7.10	2.21	1.08	25
9	8.38	3.09	10.6	2.60	30.6	2.68	2.29	57.1	4.35	6.62	1.02	5.0
10	8.47	2.92	23.1	3.71	33.1	3.25	1.97	161	2.92	2.84	2.18	4.0
11	4.54	6.04	17.5	3.69	64.7	3.25	1.83	66.8	2.36	2.05	.97	3.2
12	3.17	3.97	44.8	26.0	53.5	18.8	1.83	48.6	2.05	1.77	.97	3.1
13	2.84	2.21	3.97	8.10	8.83	34.0	1.70	6.90	1.77	1.64	.69	3.4
14	2.68	2.29	4.92	6.43	4.07	16.8	1.64	31.9	1.70	1.70	.69	2.6
15	2.29	2.05	3.97	5.60	6.60	1.51	39.3	1.51	1.64	2.20	2.5	
16	2.21	6.34	2.84	7.76	10.0	4.07	1.44	137	*1.51	1.51	19.4	2.2
17	1.97	11.2	4.45	7.07	32.0	3.09	1.38	126	1.44	1.44	8.01	3.0
18	1.90	12.2	3.33	3.50	12.5	2.60	1.44	20.1	1.38	1.38	2.29	4.0
19	1.90	4.84	3.25	2.60	31.1	2.44	1.38	58.4	1.25	1.31	6.79	3.0
20	2.68	2.68	4.07	2.29	11.5	2.21	1.38	43.9	1.19	1.97	18.4	2.5
21	1.97	2.13	*5.21	2.05	18.2	1.97	1.19	34.4	1.13	1.70	13	*2.0
22	1.90	2.13	6.20	1.90	61.9	1.83	1.08	10.9	3.51	1.38	8.5	2.06
23	9.33	2.13	3.97	1.77	48.8	1.77	2.62	10.4	5.32	1.19	5.0	1.77
24	22.9	2.36	3.50	1.83	54.1	1.70	1.44	12.0	3.97	1.70	3.0	34.4
25	12.0	1.83	5.21	3.09	9.70	1.64	1.08	5.40	1.83	1.90	3.0	15.9
26	3.59	2.34	4.26	2.05	4.83	1.57	19.6	4.26	1.44	4.06	11	4.45
27	2.60	7.71	18.0	1.83	3.97	53.2	2.92	3.41	1.44	9.44	17	3.50
28	2.21	17.4	4.54	1.64	8.81	106	1.38	4.26	6.45	2.44	16	16.4
29	1.97	4.73	3.88	1.51	27.6	13.1	1.08	-----	4.51	1.51	12	25.8
30	6.86	10.7	2.84	2.17	4.45	9.89	*4.91	-----	2.13	1.19	7.5	23.0
31	5.92	10.7	-----	1.90	-----	3.41	1.19	-----	1.44	-----	3.5	-----
TOTAL	150.22	163.51	218.84	123.40	552.61	333.76	98.29	887.81	93.33	585.72	170.45	238.38
MEAN												
MGD	4.85	5.27	7.29	3.98	18.4	10.8	3.17	31.7	3.01	19.5	5.50	7.95
CFS	7.50	8.16	11.3	6.16	28.5	16.7	4.90	49.1	4.66	30.2	8.51	12.3
AC-FT	461	502	672	379	1,700	1,020	302	2,720	286	1,800	523	732

Calendar Year 1960 Max 510 Min 0.91 Mean mgd 13.8 Mean cfs 21.4 Ac-ft 15,520
Fiscal Year 1960-61 Max 289 Min 0.55 Mean mgd 9.91 Mean cfs 15.3 Ac-ft 11,100

Peak discharge (base, 600 mgd).--Feb. 17 (1:30 a.m.) 735 mgd (1,140 cfs), 8.31 ft; Apr. 1 (12 p.m.) 605 mgd (936 cfs), 8.05 ft.

* Discharge measurement made on this day.

Note.--No gage-height record May 21 to June 21; discharge estimated on basis of comparison with nearby streams.

5310. Kula diversion from Haipuaena Stream, near Olinda

Location--Lat 20°48'24", long 156°13'27", on left bank 3.4 miles east of Olinda and 6.2 miles south of Kailua.Records available--July 1945 to June 1961.Gage--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).Average discharge--15 years (1946-61) 0.443 mgd (0.685 cfs).Extremes--1945-61: Maximum daily discharge, 2.05 mgd (3.17 cfs) Mar. 20, 1948; minimum daily, 0.01 mgd (0.02 cfs) for several days in 1953, 1954, and 1955.Remarks--Records good. Kula diversion flume diverts water from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.40	0.12	0.38	0.14	0.04	0.27	0.92	0.07	0.21	0.48	0.11	0.30
2	.30	.10	.23	.11	.04	.21	.80	.05	.16	.71	.08	.58
3	.64	.09	.54	.08	.04	.18	.41	.04	.13	.54	.07	.77
4	.58	.66	.60	.07	.06	.14	.31	.03	.11	.36	.05	.68
5	.76	.68	.27	.07	.04	.95	.41	.03	.09	.41	.04	1.23
6	.52	.30	.24	.12	.03	.60	.30	.02	.12	.30	.03	.94
7	.30	.23	.23	.20	.03	.40	.24	.02	.68	.21	.03	.50
8	.21	.16	.27	.12	.03	.20	.26	.02	.77	.16	.03	1.33
9	.18	.30	1.02	.12	.54	.14	.15	.90	*.59	.21	.03	.64
10	.55	.27	.81	.57	1.30	.18	.12	1.24	.27	.28	.03	.38
11	.49	.55	.60	.58	1.66	.30	.09	.86	.19	.18	.03	.30
12	.26	.40	.37	1.11	.66	*.53	.08	.77	.13	.13	.03	.21
13	.18	.19	.40	.91	.50	1.10	.07	.58	.10	.13	.26	.68
14	.19	.19	.43	.68	.36	.91	.06	.61	.07	.13	.38	.82
15	.13	.19	*.33	.50	.42	.72	.05	.81	.07	.11	.30	*.34
16	.10	.76	.30	.28	.83	.41	.04	.61	.05	.08	1.37	.21
17	.08	.93	.45	.34	1.54	.27	.04	.68	.04	.07	1.08	.19
18	.07	1.00	.33	.27	1.05	.19	.04	.58	*.03	.06	.38	.28
19	.06	.59	.40	.20	1.42	.16	.06	.72	.03	.07	.65	.27
20	.07	.27	.66	.15	.99	.20	.06	.64	.03	.16	1.21	.15
21	.07	.18	.86	.13	1.05	.14	.04	.58	.03	.16	.82	.11
22	.07	.13	.90	.10	1.27	.11	.04	.50	.05	.10	.56	*.09
23	.52	.11	.46	.08	.86	.10	*.04	.65	.20	.37	.43	.11
24	.68	.13	.34	.07	.84	.08	.04	1.02	.27	.61	.26	.87
25	.79	.14	.34	.09	.82	.07	.03	.56	.13	.30	.18	.92
26	.31	.11	.34	.10	.41	.07	.64	.34	.08	.25	.64	.41
27	.18	.83	.81	.07	.27	.48	.45	.24	.07	*.11	1.11	.26
28	.12	1.08	.45	.06	.40	.91	.23	.21	.44	.38	1.13	.65
29	.10	.58	.30	.04	.93	1.14	.13	-----	.76	.19	1.07	1.28
30	.15	.92	.20	.03	.43	.95	.10	-----	.37	.14	.64	1.28
31	.18	.92	-----	.03	-----	.40	.07	-----	.18	-----	.45	-----
TOTAL	9.04	13.11	13.86	7.42	18.86	12.51	6.32	13.38	6.45	8.39	13.48	16.78
MEAN												
MGD	0.292	0.423	0.462	0.239	0.629	0.404	0.204	0.478	0.208	0.280	0.435	0.559
CFS	0.451	0.654	0.715	0.370	0.973	0.624	0.315	0.739	0.322	0.433	0.673	0.865
AC-FT	28.0	40.0	43.0	23.0	58.0	38.0	19.0	41.0	20.0	26.0	41.0	51.0

CALENDARYEAR	1960	MAX	1.66	MIN	0.03	MEAN MGD	0.434	MEAN CFS	0.671	AC-FT	487
FISCAL YEAR 1960-61	MAX	1.66	MIN	0.02	MEAN MGD	0.382	MEAN CFS	0.591	AC-FT	428	

* Discharge measurement made on this day.

ISLAND OF MAUI

5311. Haipuena Stream at Kula pipeline intake, near Olinda

Location.--Lat $20^{\circ}48'24''$, long $156^{\circ}13'27''$, on left bank, at Kula pipeline intake, 3.4 miles east of Maui County Olinda Reservoir, and 6.2 miles south of Kailua.

Drainage area.--0.26 sq mi.

Records available.--January to April 1946 (fragmentary), May 1946 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--15 years, 0.537 mgd (0.831 cfs).

Extremes.--Maximum discharge during year 40.5 mgd (62.7 cfs) Apr. 1 (gage height, 2.87 ft), from rating curve extended above 1.3 mgd by logarithmic plotting; no flow many times.

1946-61: Maximum discharge, 87 mgd (135 cfs) between Jan. 23 and Feb. 9, 1948 (gage height, 3.72 ft), from rating curve extended above 1.3 mgd, as explained above; no flow at times each year.

Remarks.--Records fair. Kula pipeline diverts all water from Haipuena Stream at low stages.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.85	0	1.3	1.60
.9	.03	1.4	2.45
1.0	.18	1.6	4.70
1.1	.52	1.9	9.30
1.2	.98	2.3	17.8

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0	0	0	0	0	0	1.13	0	0	6.12	0	0
2	0	0	0	0	0	0	.10	0	0	17.1	0	.12
3	.05	0	.15	0	0	0	0	0	0	10.1	0	.04
4	0	.07	.01	0	0	0	0	0	0	1.37	0	.01
5	.04	.04	0	0	0	.28	0	0	0	.12	0	2.17
6	0	0	0	0	0	0	0	0	0	0	0	.67
7	0	0	0	0	0	0	0	0	.08	0	0	0
8	0	0	.03	0	0	0	0	0	.30	0	0	1.95
9	0	0	.22	0	3.15	0	0	4.22	*.07	0	0	.04
10	0	0	2.58	.73	1.46	0	0	11.4	0	0	0	0
11	0	*.13	2.20	.06	4.83	0	0	3.43	0	0	0	0
12	0	0	3.58	1.20	1.97	.05	0	2.34	0	0	0	0
13	0	0	*.14	.13	.41	1.29	0	.21	0	0	*.04	.57
14	0	0	0	.05	0	.67	0	3.86	0	0	0	.16
15	0	0	*0	0	0	.15	0	2.52	0	0	0	0
16	0	.09	0	0	.45	0	0	11.4	0	0	1.68	0
17	0	.59	0	0	1.13	0	0	5.04	0	0	.28	0
18	0	.55	0	0	.10	0	0	1.41	0	0	0	0
19	0	.03	0	0	1.10	0	0	6.19	0	0	.78	0
20	0	0	.10	0	.21	0	0	2.92	0	0	1.93	0
21	0	0	.04	0	.61	0	0	1.98	0	0	.37	0
22	0	0	.18	0	5.11	0	0	.52	0	0	0	0
23	0	0	0	0	2.75	0	0	.07	0	.15	0	0
24	*.51	0	0	0	2.94	0	0	.09	0	0	0	1.80
25	*.35	0	0	0	.28	0	0	0	0	0	0	.82
26	0	0	0	0	0	0	2.99	0	0	0	.01	0
27	0	*.12	.66	0	0	3.47	0	0	.21	0	.38	0
28	0	1.36	0	0	.71	5.13	0	0	.09	0	.35	1.16
29	0	0	0	0	1.57	.58	0	-----	.11	0	.31	2.16
30	0	.13	0	0	0	.17	0	-----	0	0	0	1.46
31	0	.07	-----	0	-----	0	0	-----	C	0	0	-----
TOTAL	0.95	3.18	9.89	2.17	28.78	12.72	4.36	57.60	0.65	35.17	6.13	13.13
MEAN												
MGD	0.031	0.103	0.330	0.070	0.959	0.410	0.141	2.06	0.021	1.17	0.198	0.438
CFS	0.047	0.159	0.510	0.108	1.48	0.635	0.217	3.18	0.033	1.81	0.306	0.677
AC-FT	2.90	9.80	30.0	6.70	88.0	39.0	13.0	177	7.00	108	19.0	40.0

CALENDAR YEAR	1960	MAX	39.0	MIN	0	MEAN MGD	0.578	MEAN CFS	0.894	AC-FT	648
FISCAL YEAR 1960-61	MAX	17.1	MIN	0	MEAN MGD	0.479	MEAN CFS	0.741	AC-FT	535	

Peak discharge (base, 44 mgd).--No peak above base.

* Discharge measurement made on this day.

5350. Haipuaena diversion ditch at Kolea Gulch, near Keanae

Location.--Lat 20°50'37", long 156°11'46", on right bank 15 ft downstream from end of tunnel in Kolea Gulch, 3.3 miles southwest of Keanae, and 3.7 miles southeast of Kailua.

Records available,--March 1938 to August 1960 (discontinued).

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 1,866 ft (from plane-table survey).

Average discharge,--22 years, 1,95 mgd (3,02 cfs).

Extremes.--1938-60: Maximum daily discharge, 11.4 mgd (17.6 cfs) Aug. 1st, 1950; minimum daily, 0.01 mgd (0.02 cfs) on several days in 1960.

Remarks.--Records good. Ditch diverts water from Haipuaena Stream for East Maui Irrigation Co.'s hydroelectric plant about 1 mile downstream from where it discharges into Koolau ditch for irrigation in central Maui.

Discharge, in million gallons a day, 1961

ISLAND OF MAUI

5360. Haipuaena Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'04", long 156°11'28", on left bank 200 ft upstream from Spreckels ditch, 2.8 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.7 miles southeast of Huelo.

Drainage area.--1.19 sq mi.

Records available.--October 1913 to June 1961. Prior to July 1955, published as Haipuaena Stream near Huelo. December 1910 to September 1913 at site 600 ft downstream; records not equivalent owing to inflow from Spreckels ditch. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,512.22 ft above mean sea level (East Maui Irrigation Co. bench mark).

Average discharge.--47 years (1914-61), 9.89 mgd (15.3 cfs).

Extremes.--Maximum discharge during year, 581 mgd (899 cfs) Feb. 17 (gage height, 5.36 ft), from rating curve extended above 150 mgd; minimum, 0.78 mgd (1.21 cfs) Feb. 6-9.

1913-61: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 12, 1940 (gage height, 6.91 ft), from rating curve extended above 150 mgd; minimum, slightly less than 0.1 mgd (about 0.2 cfs) several days during January, February, May, June 1945 and October 1953.

Remarks.--Records good. Kula pipeline diverts water above station. Haipuaena diversion ditch intake gate was closed.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.5	0.49	2.5	20.2
1.6	1.00	3.0	53.0
1.7	1.75	3.5	107
1.8	2.86	4.0	185
2.0	5.60	4.5	300

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	5.12	3.08	4.00	2.97	1.67	4.00	9.52	1.28	3.65	30.6	1.14	2.97
2	4.64	3.43	4.20	2.56	1.43	5.25	6.57	1.00	3.65	214	1.00	2.86
3	4.96	*3.72	6.42	2.32	1.28	3.54	4.96	.94	3.88	106	.94	2.97
4	4.16	1.61	4.78	2.97	1.21	3.20	3.88	.88	3.20	22.7	*.88	3.54
5	3.96	8.01	3.31	2.22	1.14	7.27	6.15	.83	2.86	6.40	.83	22.5
6	3.88	3.54	3.20	4.72	1.14	5.28	3.77	.78	2.86	4.00	.83	22.1
7	3.43	2.97	2.54	3.55	1.07	4.00	3.43	.78	10.3	3.31	1.35	4.90
8	2.43	3.65	3.05	3.23	*3.25	3.08	3.20	.78	7.20	2.86	1.21	2.87
9	7.70	3.20	8.67	2.43	2.46	2.86	2.43	53.7	4.89	5.90	1.07	5.38
10	7.18	2.86	9.26	3.19	2.79	3.08	2.22	111	3.31	2.97	2.22	4.80
11	3.77	4.84	18.2	3.31	56.1	3.20	2.02	59.6	2.86	2.22	1.21	3.54
12	2.86	3.87	25.7	20.3	48.3	18.4	1.93	43.9	2.43	2.02	1.14	3.43
13	2.43	2.22	4.16	7.28	9.83	39.5	1.75	7.96	2.12	1.84	.94	5.93
14	2.32	2.32	4.80	7.18	4.80	18.1	1.67	29.3	1.93	1.75	.94	5.33
15	2.02	2.02	3.68	4.05	5.44	7.40	1.59	24.7	1.75	1.59	2.40	2.97
16	1.84	5.52	3.08	7.96	8.67	4.48	1.51	103	*1.59	1.43	16.2	2.54
17	1.67	9.45	3.77	10.6	29.0	3.54	1.35	81.3	1.43	1.35	7.01	4.12
18	1.59	10.1	3.20	3.65	13.7	3.20	1.43	13.7	1.35	1.28	2.22	4.99
19	1.59	4.60	2.97	3.08	30.6	2.97	1.51	30.8	1.28	1.28	4.91	3.43
20	2.22	2.86	3.31	2.54	11.8	2.54	1.59	29.5	1.21	1.43	12.0	2.65
21	1.67	2.22	*5.12	2.22	15.4	2.22	1.28	24.2	1.14	1.35	8.21	*2.12
22	1.43	2.22	5.60	2.02	4.71	2.12	1.21	31.0	2.27	1.21	5.45	1.93
23	6.28	2.22	3.65	1.93	4.25	2.02	3.21	9.11	3.99	1.14	3.43	1.75
24	17.2	2.43	3.65	1.84	4.58	1.84	1.59	10.3	3.21	1.75	2.54	20.4
25	9.34	1.84	5.60	3.08	10.7	1.75	1.21	5.98	1.51	1.43	2.32	11.3
26	3.20	1.93	4.32	1.93	6.36	1.59	12.2	4.48	1.28	3.02	12.6	4.00
27	2.54	5.86	17.0	1.75	4.80	3.03	31.9	3.02	3.77	1.21	7.98	2.97
28	2.12	13.9	4.80	1.51	8.28	6.84	1.43	4.84	4.31	2.05	17.0	9.84
29	1.93	4.64	4.00	1.43	21.9	11.4	1.21	-----	4.31	1.35	13.0	19.1
30	6.91	9.88	3.31	1.94	4.64	7.50	*1.07	-----	1.84	1.28	4.64	14.9
31	6.09	10.2	-----	2.12	-----	3.65	1.21	-----	1.35	-----	3.43	-----
TOTAL	128.48	155.70	179.75	121.86	490.41	279.28	91.12	689.41	90.17	437.49	150.86	227.96
MEAN												
MGD	4.14	5.02	5.99	3.93	16.3	9.01	2.94	24.6	2.91	14.6	4.87	7.60
CFS	6.41	7.77	9.27	6.08	25.3	13.9	4.55	38.1	4.50	22.6	7.53	11.8
AC-FT	394	478	552	374	1,510	857	280	2,120	277	1,340	463	700

CALENDAR YEAR	1960	MAX	279	MIN	0.18	MEAN MGD	10.8	MEAN CFS	16.7	AC-FT	12,090
FISCAL YEAR 1960-61	MAX	214	MIN	0.78		MEAN MGD	8.34	MEAN CFS	12.9	AC-FT	9,340

Peak discharge (base, 350 mgd).--Feb. 17 (1 a.m.) 581 mgd (899 cfs), 5.36 ft; Apr. 1 (12 p.m.) 539 mgd (834 cfs), 5.24 ft.

* Discharge measurement made on this day.

5380. Spreckels ditch at Haipuena's weir, near Huelo

Location.--Lat 20°51'15", long 156°11'25", on left bank near Spreckels ditch trail between Haipuena and Puohokamo Streams, 2.7 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo.

Records available.--April 1922 to June 1961. May 1919 to April 1922 in files of East Maui Irrigation Co.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft upstream at different datum.

Average discharge.--38 years (1922-29, 1930-61), 13.5 mgd (20.9 cfs).

Extremes.--1922-61: Maximum daily discharge, 97 mgd (150 cfs) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

Remarks.--Records good. Flow regulated by gates and spillways. Spreckels ditch diverts water from all streams between Nuuailua and Kailua Streams, above Koolau ditch east of Puohokamo and below Koolau ditch west of Puohokamo. About 4 mgd was diverted from Spreckels ditch to East Maui Irrigation Co.'s hydroelectric plant at Kolea Gulch until June 30, 1961. Use of hydroelectric plant has been abandoned since then. Water used for irrigation in central Maui.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.7	10.7	14.7	9.08	6.43	13.3	20.3	5.06	9.04	19.8	3.90	9.08
2	15.8	13.4	16.2	8.00	4.90	17.8	22.0	3.90	8.32	8.30	3.62	8.54
3	16.7	* 13.7	16.9	7.32	4.38	11.7	18.8	3.48	16.3	71.0	3.34	8.27
4	15.3	36.7	17.3	8.68	4.38	10.2	14.0	3.34	12.3	4.21	* 3.20	12.8
5	13.0	23.6	11.7	6.20	4.05	21.5	19.0	3.20	10.7	21.9	3.20	40.9
6	14.2	12.6	11.7	15.1	3.90	18.5	13.6	3.06	6.93	12.5	3.06	48.5
7	13.3	10.2	9.62	13.6	3.76	14.8	11.0	2.92	27.8	10.2	4.90	16.4
8	9.35	14.6	10.1	11.3	11.7	10.2	10.7	2.92	28.0	8.81	4.85	47.5
9	21.2	12.4	25.5	8.24	9.89	8.27	4.50	18.5	16.9	4.21	17.4	
10	25.3	11.0	21.3	9.97	3.91	10.5	7.32	7.50	12.0	10.2	10.3	17.3
11	14.7	15.0	21.1	10.7	5.43	10.9	6.65	70.8	9.89	7.55	4.38	11.0
12	10.5	15.0	27.0	3.95	5.10	28.6	6.65	58.6	8.54	6.55	4.38	10.8
13	9.35	8.27	13.8	21.9	19.9	5.30	6.20	25.6	7.55	6.20	3.34	19.5
14	8.81	9.35	16.6	23.8	12.3	37.8	5.52	37.3	6.65	6.00	3.20	16.8
15	7.32	7.55	14.8	14.0	12.9	24.5	5.30	28.8	6.20	5.52	11.2	9.62
16	7.32	19.0	9.89	21.2	16.4	15.4	4.90	36.6	* 5.75	4.90	35.8	8.54
17	6.20	25.3	14.2	28.5	3.95	12.0	4.72	4.24	5.52	4.55	23.6	16.0
18	6.00	29.0	10.7	9.70	2.28	10.2	5.10	20.5	5.10	4.38	7.32	19.8
19	6.20	17.1	10.7	6.85	39.8	9.62	5.26	36.1	4.72	4.21	11.5	12.6
20	9.21	10.2	12.1	6.05	20.2	8.54	5.87	39.9	4.55	5.30	32.0	8.81
21	6.55	8.54	17.6	5.48	32.0	* 7.59	4.21	37.8	4.38	4.90	25.4	7.32
22	5.52	8.27	20.0	6.00	* 56.0	6.88	3.90	27.0	8.50	4.21	22.6	7.55
23	22.2	8.81	12.9	6.20	5.30	6.65	12.6	24.3	17.2	1.90	12.3	6.42
24	37.6	10.0	13.6	6.20	5.30	5.75	5.45	26.0	13.9	6.00	8.00	33.5
25	27.9	6.88	21.9	11.8	27.5	5.52	4.21	19.3	6.65	5.10	7.78	31.8
26	11.4	7.26	16.6	6.65	20.2	5.10	14.9	14.7	4.90	9.71	31.1	16.3
27	8.81	20.4	36.7	6.88	15.4	27.6	9.98	11.3	5.10	26.3	38.1	10.7
28	7.55	32.6	16.9	5.30	16.7	47.0	4.90	15.4	13.5	7.28	4.30	25.5
29	7.11	19.4	13.3	4.80	4.31	25.7	4.21	-----	19.2	4.55	35.7	42.9
30	25.9	29.7	10.4	7.87	16.2	23.1	3.90	-----	6.88	4.05	15.8	37.1
31	22.6	28.9	-----	8.92	11.3	4.84	-----	4.90	-----	11.0	-----	-----
Total	430.70	4954.3	485.81	356.89	733.20	521.14	273.96	720.28	319.47	427.77	431.78	579.25
Mean	13.9	16.0	16.2	11.5	24.4	15.8	8.84	25.7	10.3	14.3	13.9	19.3
Mgd	21.5	24.8	25.1	17.8	37.8	26.0	13.7	39.8	15.9	22.1	21.5	29.9
Cfs	1320	1520	1490	1090	2250	1600	841	2210	980	1310	1320	1780
Ac-ft												
Calendar Year	1960		Max	63.8	Min	0.15	Mean mgd	16.6	Mean cfs	25.7	Ac-ft	18650
Fiscal Year	1960-61		Max	83.0	Min	2.92	Mean mgd	15.8	Mean cfs	24.4	Ac-ft	17720

* Discharge measurement made on this day.

ISLAND OF MAUI

5410. Kooleu ditch at Haipuaena, near Huelo

Location.--Lat $20^{\circ}51'17''$, long $156^{\circ}11'19''$, on right bank 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo Church.

Records available.--April 1932 to June 1961.

Gage.--Water-stage recorder and Parshall flume. 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. Altitude of gage is 1,240 ft (from topographic map).

Average discharge.--29 years, 79.3 mgd (123 cfs).

Extremes.--1932-61: Maximum daily discharge, 193 mgd (299 cfs) Jan. 17, 1946; no flow Feb. 14-28, Mar. 7-18, 1933, Feb. 26 to Mar. 22, 1935.

Remarks.--Records good except those for period of no gage-height record, which are fair. Flow regulated by floodgates. Water used for domestic supply and irrigation in central Maui. Diversions made during cleaning of ditch.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	76.0	41.0	67.0	42.0	28.0	63.0	96.2	20.5	63.0	c 46.7	20.5	44.0	
2	63.0	49.4	64.2	39.0	25.0	102	128	19.4	67.0	c 175	* 19.4	42.0	
3	59.0	53.4	58.0	35.5	23.5	55.0	94.0	18.1	76.0	183	19.4	37.0	
4	55.0	c 14.9	56.4	37.0	22.0	50.0	78.0	18.1	67.0	139	19.4	42.0	
5	44.0	95.6	44.0	34.0	20.5	88.2	84.8	18.1	63.0	80.0	18.1	109	
6	56.2	50.0	42.0	55.0	20.5	79.3	59.0	16.8	67.0	67.0	18.1	152	
7	55.0	42.0	41.0	45.6	c 19.4	59.0	50.0	16.8	140	59.0	23.5	61.0	
8	39.0	63.5	40.3	35.5	58.5	46.0	44.0	16.8	116	50.0	20.5	152	
9	65.7	59.0	106	32.5	c 88.4	44.0	41.0	c 111	78.0	57.9	19.4	67.5	
10	87.8	* 47.0	53.9	29.5	176	46.0	37.0	c 174	59.0	46.0	332	63.0	
11	46.0	49.2	c 60.8	32.5	183	44.0	35.5	190	52.0	37.0	23.5	50.0	
12	39.0	81.2	c 135	127	183	104	34.0	176	46.0	35.5	30.8	46.0	
13	37.0	42.0	59.0	91.0	139	c 174	32.5	137	42.0	32.5	20.5	56.2	
14	37.0	44.0	80.2	94.8	85	162	32.5	132	39.0	31.0	20.5	44.0	
15	32.5	37.0	59.5	64.3	95.2	120	29.5	146	36.4	29.5	40.5	37.0	
16	32.5	68.3	46.0	69.5	120	76.0	28.0	162	34.0	28.0	130	34.0	
17	29.5	87.0	c 50	99.9	176	63.0	26.5	76.3	34.0	26.5	95.0	51.0	
18	29.5	114	c 52	48.0	162	55.0	26.5	30.9	32.5	25.0	37.0	72.1	
19	29.5	71.9	c 46	41.0	183	54.6	25.0	51.0	31.0	25.0	34.0	46.0	
20	37.0	44.0	c 48	37.0	149	48.0	25.0	75.1	29.5	25.0	101	35.5	
21	28.0	39.0	59.0	34.0	162	42.0	23.5	106	28.0	23.5	101	32.5	
22	26.5	35.5	75.9	31.0	176	39.0	23.5	59.0	39.6	22.0	90.4	34.0	
23	63.6	37.0	55.0	29.5	176	37.0	35.5	87.1	78.7	22.0	52.0	31.0	
24	140	39.0	59.0	28.0	183	35.5	25.0	143	68.1	26.5	41.0	86.0	
25	126	32.5	89.4	47.9	149	34.0	22.0	98.5	35.5	23.5	41.0	120	
26	46.5	31.0	81.5	31.0	103	32.5	71.2	76.0	31.0	31.0	100	67.9	
27	35.5	76.1	133	32.5	76.0	104	33.2	63.0	32.5	89.4	124	48.0	
28	32.5	121	69.5	26.5	79.4	176	23.5	78.2	45.3	31.0	159	80.1	
29	31.0	82.1	55.0	25.0	141	94.8	22.0	-----	56.2	23.5	134	146	
30	89.0	149	46.0	33.0	76.0	111	20.5	-----	31.0	20.5	67.0	114	
31	74.6	135	-----	31.0	-----	63.0	20.5	-----	28.0	-----	50.0	-----	
Total	1643.4	2065.7	1932.6	1440.0	3278.4	2301.9	1327.4	2316.7	1646.3	1511.5	1703.7	2000.8	
Mean	Mgd	53.0	66.6	64.4	46.5	109	74.2	42.8	82.7	53.1	50.4	55.0	66.7
	Cfs	82.0	103	99.6	71.9	169	115	66.2	128	82.2	78.0	85.1	103
	Ac-ft	5040	6340	5930	4420	10060	7060	4070	7110	5050	4640	5230	6140

Calendar Year 1960 Max 190 Min 19.4 Mean mgd 79.1 Mean cfs 122 Ac-ft 88,790
Fiscal Year 1960-61 Max 190 Min 16.8 Mean mgd 63.5 Mean cfs 98.2 Ac-ft 71,090

* Discharge measurement made on this day.

c Backwater from Puohokamoa intake.

a No gage-height record; discharge estimated on basis of record for Kooleu ditch at Keanae.

ISLAND OF MAUI

117

5k15. 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 Keanane, 3 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Records available.--December 1917 to June 1961.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

Average discharge.--42 years (1918-24, 1925-61), 5.82 mgd (9.00 cfs).

Extremes.--1917-61: Maximum daily discharge 92 mgd (142 cfs) Jan. 3, 1927; no flow at times.

Remarks.--Records good. Ditch is extension of Center ditch and picks up water from streams between the Kolea and Waikamoi Streams. Flow regulated by gates. Water used for irrigation in central Maui.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.38	<u>0.48</u>	1.00	0.93	1.18	0.85	2.27	0.42	1.55	7.00	0.28	0.66
2	1.23	.66	.85	.85	.54	1.23	5.20	.32	<u>3.36</u>	<u>82.1</u>	*.23	.60
3	1.15	.87	1.08	.72	.48	.93	2.08	.32	1.15	63.8	.23	.60
4	.93	<u>7.62</u>	1.24	.85	.42	.85	1.70	.32	1.07	21.9	*.23	.60
5	.78	2.60	.83	.60	.37	1.95	1.53	.28	.93	4.22	*.18	5.73
6	1.12	.78	.93	1.10	<u>.32</u>	1.45	1.30	.28	1.83	2.55	.18	5.79
7	1.65	.66	.72	.91	<u>.32</u>	.93	1.00	.28	2.42	1.70	.28	1.15
8	.78	1.23	<u>.66</u>	<u>.54</u>	.90	.78	.93	<u>.23</u>	2.92	1.38	.28	14.3
9	.72	1.00	1.64	.54	15.0	.78	.78	34.2	1.45	1.23	.28	1.53
10	1.61	*.72	.72	.54	10.2	.78	.72	<u>68.9</u>	1.00	1.00	.32	1.38
11	1.00	.66	3.20	.60	29.9	.66	.66	41.0	.85	.85	.32	1.07
12	.66	1.47	<u>18.4</u>	6.66	29.7	12.1	.60	33.0	.72	.78	.32	.93
13	.66	.66	1.00	1.95	5.28	42.0	.54	4.92	.66	.66	.23	1.30
14	.54	.66	1.07	5.99	2.55	14.3	.48	20.3	.60	.60	.18	1.07
15	.54	.54	1.07	1.61	2.17	4.81	.42	17.8	.54	.54	.28	.66
16	.48	.72	.72	6.39	2.18	2.77	.42	33.6	.54	.54	<u>7.15</u>	.60
17	.42	2.66	.85	<u>17.3</u>	9.80	2.08	.37	54.8	.54	.48	1.23	.93
18	.42	2.48	.99	3.90	6.54	1.61	.37	24.1	.54	.42	.54	1.30
19	.42	1.16	1.15	2.96	17.4	*1.89	.37	29.8	.48	.42	.37	1.07
20	.48	.72	.87	2.22	5.00	1.30	.42	47.7	.42	.42	1.07	.60
21	.42	.60	1.81	1.83	4.51	1.07	.37	27.6	.42	.37	.60	*.54
22	.37	.54	1.71	1.07	21.1	.93	<u>.32</u>	7.25	.42	.37	.93	.54
23	.54	.60	1.00	.85	22.3	.85	1.80	7.79	.72	<u>.32</u>	.54	<u>.48</u>
24	<u>2.01</u>	.78	1.07	.85	<u>31.4</u>	.72	.54	9.96	.60	.54	.37	3.97
25	1.72	.54	1.61	1.45	4.17	.66	.37	4.45	<u>.37</u>	.37	.37	.93
26	.54	.48	1.69	.78	2.66	<u>.60</u>	<u>11.0</u>	3.99	.37	.42	2.92	.72
27	.37	.94	9.42	.85	2.08	11.4	.62	2.50	.37	1.66	2.78	.48
28	.32	4.31	2.08	.60	4.69	<u>48.7</u>	.42	1.45	.48	.48	5.61	1.30
29	<u>.28</u>	1.45	1.38	.54	10.7	6.71	.37	-----	2.20	.32	3.87	2.95
30	1.04	3.09	1.15	.60	.78	2.94	.37	-----	.60	.32	1.23	5.61
31	1.01	2.52	-----	.95	-----	1.38	.42	-----	.37	-----	.78	-----
TOTAL	25.59	44.20	61.91	67.53	244.64	170.01	38.76	177.56	30.49	197.76	34.18	59.39
MEAN												
MGD	0.825	1.43	2.06	2.18	8.15	5.48	1.25	17.1	0.98	6.59	1.10	1.98
CFS	1.28	2.21	3.19	3.37	12.6	8.48	1.93	26.4	1.52	10.2	1.71	3.06
AC-FT	79.0	136	190	207	751	522	119	1.470	94.0	607	105	182
Calendar Year 1960			Max 64.0		Min 0.28		Mean mgd 5.38		Mean cfs 8.32		Ac-ft 6,030	
Fiscal Year 1960-61			Max 82.1		Min 0.18		Mean mgd 3.98		Mean cfs 6.16		Ac-ft 4,460	

* Discharge measurement made on this day.

ISLAND OF MAUI

5450. Pueokamoa 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 Mailua, and 4.4 miles southeast of Huelo.

Drainage area.--2.31 sq mi.

Records available.--June 1913 to June 1961. Prior to July 1954, published as Pueokamoa Stream near Huelo, December 1910 to May 1913 at site 200 ft downstream; records not equivalent due to inflow of Spreckels ditch. Monthly discharge only for some periods, published in WSP 1319.

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, water-stage recorder at site 130 ft downstream at different datum.

Average discharge.--48 years (1913-61), 21.6 mgd (33.4 cfs).

Extremes.--Maximum discharge during year, 781 mgd (1,210 cfs) Feb. 16 (gage height, 5.27 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 1.49 mgd (2.31 cfs) Feb. 8, 9 (gage height, 0.67 ft).

1913-60: Maximum discharge, 2,360 mgd (3,650 cfs) Feb. 16, 1961 (gage height, 9.31 ft); minimum, 0.4 mgd (0.6 cfs) Oct. 26, 1917.

Remarks.--Records good. Kula pipeline diverts small amount of water above station, at altitude 4,300 ft and 3,200 ft, for domestic supply.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.6	0.81	2.0	86.0
.7	1.86	2.5	165
.8	3.44	3.0	252
1.0	5.60	3.5	340
1.2	17.0	4.0	440
1.6	44.0		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	12.9	6.16	8.60	4.85	3.24	8.98	18.1	2.58	8.26	46.5	1.99	5.62
2	10.9	7.00	9.03	4.42	2.58	12.9	15.7	1.99	8.26	388	*1.86	5.10
3	10.1	*7.17	11.9	3.99	2.27	7.92	12.0	1.86	8.98	216	1.86	4.85
4	9.74	40.2	12.0	4.62	2.13	7.00	8.60	1.86	7.00	50.3	1.86	5.89
5	7.29	19.0	6.71	3.79	1.99	16.9	12.8	1.74	6.16	16.3	1.86	40.0
6	8.26	7.29	6.43	6.86	1.99	14.2	7.92	1.62	6.16	10.5	1.74	49.8
7	7.29	5.89	5.62	7.44	*1.74	10.9	6.16	1.62	25.7	7.60	2.58	10.2
8	5.62	7.76	5.35	5.30	5.67	7.00	5.89	1.62	17.5	6.43	2.27	64.1
9	19.6	6.71	20.0	4.42	50.7	5.62	4.85	117	10.5	10.7	1.99	11.9
10	19.4	5.89	12.7	3.44	61.2	5.89	4.20	252	7.00	6.43	4.66	10.1
11	8.98	8.70	30.3	5.89	120	6.16	3.79	147	5.89	5.10	2.42	7.00
12	6.43	7.92	65.4	40.8	117	39.7	3.79	113	5.35	4.20	2.27	*6.04
13	5.62	4.62	9.74	15.4	22.9	95.1	3.44	20.9	4.62	3.99	1.86	11.2
14	5.35	4.62	11.3	12.2	10.9	46.0	3.24	61.3	4.20	3.79	1.74	10.5
15	4.62	4.20	9.36	6.43	11.6	18.1	3.06	52.2	*3.60	3.44	4.43	5.62
16	4.42	12.9	6.71	12.8	19.0	10.5	2.74	175	3.44	3.06	31.0	4.85
17	3.99	20.0	8.60	24.3	63.2	7.92	2.58	161	3.06	2.90	15.1	8.13
18	3.79	22.9	7.00	6.71	31.5	6.71	3.06	30.8	2.90	2.74	4.42	11.1
19	3.60	10.9	6.16	5.10	69.3	*6.16	3.06	56.3	2.74	2.74	5.47	6.71
20	4.62	5.89	*6.16	4.42	27.2	5.35	3.44	60.2	2.58	2.74	21.2	4.85
21	4.20	4.62	9.36	3.79	34.7	4.62	2.42	54.1	2.42	2.58	16.0	4.20
22	3.44	4.62	11.6	3.60	98.9	4.42	2.27	23.1	5.02	2.27	12.8	3.99
23	14.3	4.62	7.29	3.44	93.7	3.99	7.56	21.8	9.09	*2.13	6.77	3.44
24	44.9	5.10	6.71	3.24	107	3.60	3.44	25.7	7.56	3.44	4.42	37.3
25	21.0	3.99	11.6	5.10	26.0	3.44	2.42	14.7	3.44	2.90	3.99	25.5
26	7.00	3.99	7.92	3.44	15.2	3.24	17.4	10.9	2.74	4.85	29.0	8.58
27	5.62	12.1	33.1	3.24	11.6	72.3	*5.53	8.60	2.58	17.8	36.4	6.16
28	4.62	29.6	9.36	2.74	17.5	153	2.90	11.4	7.40	4.24	43.1	19.0
29	3.99	10.5	6.71	2.58	51.0	25.2	2.42	-----	10.1	2.58	30.1	36.8
30	16.5	22.5	5.62	3.44	11.3	17.8	2.27	-----	3.79	2.27	10.1	27.5
31	14.5	25.7	-----	3.99	-----	8.26	2.58	-----	2.74	-----	6.71	-----
TOTAL	302.59	343.06	368.34	221.78	1,093.01	638.88	179.63	1,431.89	200.78	838.52	311.97	456.03
MEAN	9.76	11.1	12.3	7.15	36.4	20.6	5.79	51.1	6.48	28.0	10.1	15.2
MGD	15.1	17.1	19.0	11.1	56.4	31.9	8.96	79.1	10.0	43.2	15.6	23.5
CFS	929	1,050	1,130	681	3,350	1,960	551	4,390	616	2,570	957	1,400

Calendar Year 1960 Max 370 Min 1.62 Mean mgd 22.5 Mean cfs 34.8 Ac-ft 25,270
Fiscal Year 1960-61 Max 388 Min 1.62 Mean mgd 17.5 Mean cfs 27.1 Ac-ft 19,580

Peak discharge (base, 750 mgd).--Feb. 16 (10:30 p.m.) 781 mgd (1,210 cfs), 5.37 ft.

* Discharge measurement made on this day.

5528. Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda

Location.--Lat 20°48'25", long 156°14'00", on left bank 1,500 ft upstream from Kula pipeline at Waikamoi intake and 3.0 miles east of Olinda.

Drainage area.--2.49 sq mi.

Records available.--July 1954 to June 1961. Prior to July 1956 published as Waikamoi Stream above reservoir at Kula pipeline intake.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,487 ft above mean sea level (levels by Maui County Waterworks).

Average discharge.--7 years (1954-61), 1.78 mgd (2.75 cfs).

Extremes.--Maximum discharge during year, 155 mgd (240 cfs) Feb. 17 (gage height, 2.96 ft), from rating curve extended above 6.4 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) Nov. 7 (gage height, 0.08 ft).

1953-61: Maximum discharge, 1,680 mgd (2,600 cfs) Dec. 10, 1954 (gage height, 8.16 ft), from rating curve extended above 6.4 mgd on basis of computation of flow over dam; no flow at times.

Remarks.--Records good except for periods of no gage-height record, and those above 10 mgd, which are fair.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.1	0.01	0.8	1.70
.2	.05	1.0	6.20
.3	.14	1.2	12.5
.4	.28	1.5	25.0
.6	.74	2.0	56.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.18	*0.04	0.13	0.04	0.03	0.11	2.22	0.02	0.04	3.11	0.04	0.03
2	.10	.03	.08	.04	.02	.07	1.42	.02	.04	33.3	.03	.10
3	.19	.03	.14	.03	.02	.05	.20	.02	.03	25.8	.03	.06
4	.16	.22	.15	.03	.02	.04	.09	.02	.03	2.09	.03	.04
5	.16	.20	.08	.03	.01	.52	.11	.01	.03	.37	.03	3.0
6	.16	.08	.08	.04	.01	.37	.08	.01	.03	.12	.03	.50
7	.10	.07	.07	.05	.01	.18	.06	.01	.19	.07	.02	.10
8	.07	.05	.09	.04	.01	.08	.05	.01	.27	.05	.02	2.0
9	.06	.07	.35	.04	1.80	.05	.04	3.03	*.25	.07	.02	.08
10	.16	.08	2.68	.20	3.33	.06	.03	16.7	.08	.08	.03	.05
11	.15	.07	2.07	.19	5.84	.08	.02	6.03	.04	.04	.03	.04
12	.08	.08	6.79	1.35	5.82	*18	.02	3.87	.04	.03	.04	.04
13	.07	.05	.39	.75	.76	1.25	.02	.65	.03	.03	.08	.70
14	.06	.05	.22	.20	.19	.89	.01	3.00	.03	.04	.04	.20
15	.04	.05	.12	.15	.11	.41	.01	3.87	.04	.03	.09	.10
16	.04	.22	.08	.08	.27	.15	.01	20.8	.03	.03	.70	.08
17	.03	.40	.10	.08	2.57	.07	.01	25.7	.03	.03	.15	.07
18	.03	.63	.08	.07	.75	.04	.02	2.35	.02	.03	.05	.10
19	.03	.30	.09	.05	1.91	.04	.02	20.2	.02	.04	.20	.10
20	.04	.10	.17	.04	.82	.04	.04	6.64	.02	.04	2.0	.06
21	.03	.07	.23	.04	1.22	.03	.03	3.13	.01	.03	.30	.05
22	.03	.05	.55	.03	7.06	.02	.02	.83	.03	.03	.10	.04
23	.14	.04	.22	.02	4.81	.02	.03	.43	.08	.06	.06	.05
24	.50	.04	.12	.02	4.89	.02	.02	.55	.08	.12	.05	1.53
25	.36	.04	.09	.03	.78	.02	.02	.28	.04	.08	.04	1.53
26	.11	.03	.09	.03	.25	.02	6.96	.12	.02	.06	.10	.20
27	.07	.24	.56	.02	.11	2.81	.86	.08	.02	*.38	.50	.10
28	.04	1.50	.20	.02	.16	8.68	.11	.05	.06	.11	.20	1.80
29	.04	.23	.09	.02	3.22	1.04	.05	-----	.19	.07	.10	3.80
30	.05	.28	.05	.02	.25	.28	.03	-----	.10	.05	.05	2.63
31	.05	.43	-----	.03	-----	.18	.03	-----	.04	-----	.03	-----
TOTAL	3.35	5.77	16.16	3.78	47.05	17.80	12.64	118.43	1.96	66.39	5.19	19.18
MEAN												
MGD	0.108	0.186	0.539	0.122	1.57	0.574	0.408	4.23	0.63	2.21	0.167	0.64
CFS	0.167	0.288	0.833	0.189	2.43	0.888	0.631	6.54	0.98	3.42	0.258	0.99
AC-FT	10.0	18.0	50.0	12.0	144	55.0	39.0	363	6.00	204	16.0	59.0

Calendar Year 1960 Max 270 Min 0.01 Mean mgd 2.02 Mean cfs 3.13 Ac-ft 2,270
Fiscal Year 1960-61 Max 33.3 Min 0.01 Mean mgd 0.87 Mean cfs 1.35 Ac-ft 976

Peak discharge (base, 130 mgd).--Feb. 17 (1:00 a.m.) 155 mgd (240 cfs), 2.96 ft.

* Discharge measurement made on this day.

Note.--No gage-height record May 4 to June 15; discharge estimated on basis of records for nearby streams.

ISLAND OF MAUI

5650. Kamaia Gulch near Huelo

Location.--Lat $20^{\circ}58'02''$, long $156^{\circ}12'17''$, on left bank 700 ft upstream from Hamakua ditch trail crossing, 2 miles southeast of Kailua, 3.2 miles southeast of Huelo, and 3.5 miles west of Keanae.

Drainage area.--0.58 sq mi.

Records available.--December 1921 to June 1961. Prior to July 1959, published as Kamaia Stream near Huelo.

Gage.--Water-stage recorder and concrete weir. Altitude of gage is 1,310 ft (from topographic map). Prior to Aug. 1, 1934, water-stage recorder at site 40 ft downstream at different datum.

Average discharge.--39 years (1922-61), 4.42 mgd (6,84 cfs).

Extremes.--Maximum discharge during year, 354 mgd (548 cfs) Apr. 2 (gage height, 3.75 ft), from rating curve extended above 130 mgd; minimum, 0.30 mgd (0.46 cfs) Feb. 8, 9.

1921-61: Maximum discharge, 2,300 mgd (3,560 cfs) Nov. 18, 1930 (gage height, 7.93 ft, site and datum then in use), from rating curve extended above 50 mgd; minimum, 0.22 mgd (0.34 cfs) June 1, 1945.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	0.27	1.0	15.3
.3	.63	1.3	42.0
.4	1.34	2.0	79.0
.6	4.05	3.0	187

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.07	1.43	1.95	1.17	1.09	1.43	3.97	0.42	1.63	24.2	0.50	1.25
2	1.95	2.19	2.32	1.01	.68	2.45	4.04	*.39	1.84	135	*.42	1.17
3	1.84	3.42	4.50	.94	.63	1.34	3.05	*.39	2.45	58.8	*.42	1.09
4	1.43	15.8	2.76	1.17	.54	1.17	1.95	*.39	1.73	10.6	*.39	1.01
5	1.17	4.68	1.94	.94	.54	4.41	2.07	.36	1.43	2.73	*.36	9.40
6	1.17	1.84	1.84	2.07	.50	2.45	1.43	.33	1.43	2.19	.36	11.2
7	1.53	1.53	1.43	1.34	.46	1.84	1.17	.33	6.15	1.34	.54	2.07
8	1.09	2.16	1.42	.87	2.97	1.25	.94	.30	4.77	1.09	.50	14.0
9	4.27	1.84	3.74	.80	13.4	1.25	.87	39.4	2.19	1.27	*.54	2.19
10	3.98	1.43	1.25	.68	11.0	1.25	.74	36.6	1.63	1.09	1.37	2.75
11	1.84	1.34	3.98	.94	28.8	1.09	.68	32.2	1.34	.80	.87	1.53
12	1.25	1.53	9.86	10.8	23.6	13.2	.68	23.8	1.17	.74	.74	1.49
13	1.17	1.01	1.73	2.71	4.94	33.2	.63	4.46	.94	.68	.54	3.74
14	1.01	1.17	2.19	3.28	2.19	13.2	.58	18.3	.87	.63	.50	1.95
15	.87	.94	2.32	1.43	2.59	4.05	.54	8.45	.80	.58	1.46	1.17
16	.87	2.66	1.34	3.75	3.48	2.07	.50	34.0	.68	.54	8.93	1.09
17	.74	5.58	1.63	11.0	12.8	1.63	.46	38.6	.63	.50	2.49	2.46
18	.74	4.24	1.63	1.84	8.96	1.34	.54	5.46	.63	.50	1.09	3.04
19	.68	1.84	1.34	1.34	19.8	1.43	.46	7.43	.58	.50	.95	2.08
20	.87	1.34	1.25	1.17	5.38	1.09	.74	10.2	.54	.50	3.02	1.25
21	.80	1.09	1.95	.94	6.14	.94	.46	9.91	*.50	.46	1.38	1.09
22	.68	.94	*2.12	.87	13.0	*.80	.42	4.25	.84	.42	2.46	1.01
23	.80	1.09	1.63	.80	14.4	.74	3.11	3.19	1.53	.42	1.25	.87
24	6.40	1.34	2.07	.80	20.4	.68	.68	4.66	1.25	.74	1.09	1.31
25	5.51	.87	3.81	2.02	4.66	.63	.50	2.45	.74	.50	1.09	2.58
26	1.34	.74	2.19	.87	2.59	.58	2.20	1.84	.58	.98	7.41	1.84
27	1.09	1.72	10.4	1.01	1.84	6.31	.74	1.53	.68	4.57	7.96	1.17
28	.87	5.46	2.32	.68	1.95	29.4	.50	2.69	1.89	.87	10.1	3.78
29	.80	3.03	1.63	.63	7.24	8.45	.42	-----	3.19	.54	7.54	5.68
30	5.06	8.43	1.34	.80	1.73	4.07	.42	-----	.87	.54	2.19	6.39
31	4.82	5.92	-----	1.34	1.53	.46	-----	.68	-----	1.53	-----	-----
TOTAL	58.71	88.60	79.68	60.01	218.10	145.27	35.95	292.33	46.18	254.32	69.99	91.65
MEAN												
MGD	1.89	2.86	2.66	1.94	7.27	4.69	1.16	10.4	1.49	8.48	2.26	3.06
CFS	2.93	4.42	4.11	2.99	11.2	7.25	1.79	16.2	2.30	13.1	3.49	4.73
AC-FT	180	272	245	184	669	446	110	897	142	780	215	281

CALENDAR YEAR 1960 MAX 81.6 MIN 0.42 MEAN MGD 4.78 MEAN CFS 7.40 AC-FT 5,360
FISCAL YEAR 1960-61 MAX 135 MIN 0.30 MEAN MGD 3.95 MEAN CFS 6.11 AC-FT 4,420

Peak discharge (base, 250 mgd)...Feb. 14 (5 p.m.) 332 mgd (514 cfs), 3.67 ft; Feb. 16 (10 p.m.) 332 mgd (514 cfs), 3.67 ft; Apr. 2 (1 a.m.) 354 mgd (548 cfs), 3.75 ft.

* Discharge measurement made on this day.

5700. Kaililihihale Stream near Huelo

Location.--Lat 20°52'28", long 156°13'06", on left bank 200 ft upstream from Wailea 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.--3.57 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August 1919 to June 1961. July to December 1912, at site 700 ft downstream; records not equivalent due 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, at present site at datum 0.50 ft higher.

Average discharge.--44 years (1914-18, 1920-24, 1925-61), 24.9 mgd (38.5 cfs).

Extremes.--Maximum discharge during year, 1,440 mgd (2,230 cfs) Apr. 2 (gage height, 7.57 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 2.44 mgd (3.76 cfs) Nov. 7.

1910-18, 1919-61; Maximum discharge, 4,140 mgd (6,410 cfs) Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 400 mgd; minimum, 0.45 mgd (0.70 cfs) July 14, 1920.

Remarks.--Records good except those for periods of doubtful or no gage-height record and those above 400 mgd, which are fair. Water used for domestic supply and irrigation in central Maui.

Rating tables (gage height, in feet, and discharge, in million gallons a day)

June 1 to Nov. 12, 1960

Nov. 13 to July 31, 1961

1.8	1.50	2.7	40.0
1.9	2.90	3.0	70.0
2.0	4.90	3.5	135
2.2	10.6	4.0	215
2.4	19.2		

Note.--Same as preceding table
above 2.7 ft.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	14.1	9.00	10.3	6.90	4.68	10.4	29.7	3.20	10.7	124	3.35	8.00
2	13.3	11.2	12.5	6.40	3.50	15.0	21.3	42.90	11.1	625	3.20	7.22
3	11.4	12.3	25.1	5.90	3.10	9.02	16.8	2.90	13.6	314	3.05	6.96
4	9.96	71.2	15.8	7.15	2.90	8.00	12.0	2.90	10.4	61.1	2.90	6.18
5	8.68	26.1	10.2	5.65	2.74	27.9	13.8	2.75	9.36	17.8	2.75	52.9
6	8.68	9.64	10.2	9.57	2.74	15.4	10.0	2.60	9.02	12.2	2.75	63.1
7	9.64	8.04	8.36	7.26	2.59	12.2	9.70	2.60	36.0	10.0	3.35	11.1
8	7.40	*11.4	8.33	5.65	8.76	10.0	9.02	2.60	24.5	8.68	3.20	81.4
9	26.7	9.96	20.7	4.90	66.2	8.00	8.34	183	12.6	9.50	*3.35	12.2
10	22.7	8.04	8.36	4.10	69.8	8.34	8.34	247	9.70	8.00	7.08	13.3
11	10.8	9.27	30.0	5.15	162	8.00	8.00	188	8.68	6.70	4.37	9.70
12	8.04	9.61	63.8	50.6	148	75.5	8.68	140	7.74	6.18	3.76	8.34
13	7.15	6.40	9.32	15.5	25.9	166	8.68	23.6	6.96	5.66	3.05	16.9
14	6.90	6.65	11.3	8.05	12.2	65.2	8.34	91.4	6.44	5.19	2.75	12.5
15	6.15	5.65	11.2	6.15	14.4	21.2	8.00	50.1	5.92	4.78	6.36	8.00
16	5.90	16.5	7.40	11.7	23.7	13.0	8.00	216	5.40	4.58	38.4	7.22
17	5.40	26.9	8.04	10.5	75.9	10.4	7.22	182	5.19	4.37	13.0	11.5
18	5.15	23.1	7.15	5.90	50.3	9.02	8.00	33.7	4.78	4.17	5.40	17.6
19	4.90	10.5	6.90	5.40	106	9.22	6.70	55.2	4.58	3.96	5.15	10.7
20	5.65	7.72	6.40	4.90	30.8	7.48	8.00	70.0	4.37	3.96	16.8	7.48
21	5.40	6.65	9.43	4.50	40.4	6.70	5.92	62.3	*4.17	3.55	8.49	6.70
22	4.70	6.15	*11.9	4.30	100	*6.44	5.40	26.0	6.06	3.35	12.5	6.44
23	11.2	6.65	8.04	4.10	99.8	5.66	13.8	23.0	10.2	3.35	6.96	5.66
24	51.6	8.04	9.00	4.10	124	5.40	6.70	30.7	8.68	4.58	5.40	18.5
25	32.6	5.65	16.2	8.44	39.4	4.99	5.19	16.5	4.99	3.76	5.40	19.5
26	8.68	5.15	9.64	4.30	17.9	4.58	17.4	13.0	4.17	6.61	38.9	10.8
27	6.90	11.1	48.6	4.92	13.5	58.0	6.96	10.7	4.17	21.6	54.4	8.00
28	5.90	33.0	11.0	3.70	22.2	192	5.19	15.9	8.84	5.74	51.4	21.2
29	5.65	13.4	8.36	3.30	48.4	40.6	4.58	-----	12.8	3.96	39.4	37.2
30	24.6	35.2	7.40	4.73	11.4	19.3	3.96	-----	4.99	3.55	11.4	30.6
31	24.3	34.6	-----	6.19	9.36	2.55	-----	4.17	-----	9.02	-----	-----
TOTAL	380.13	464.77	430.93	259.91	1,333.21	862.31	297.27	1,700.55	280.28	1,299.88	377.29	536.90
MEAN												
MGD	12.3	15.0	14.4	8.38	44.4	27.8	9.59	60.7	9.04	43.3	12.2	17.9
CFS	19.0	23.2	22.2	13.0	68.7	43.0	14.8	94.0	14.0	67.0	18.8	27.7
AC-FT	1,170	1,430	1,320	798	4,090	2,650	912	5,220	860	3,990	1,160	1,650

Calendar Year 1960 Max 358 Min 2.59 Mean mgd 29.2 Mean cfs 43.6 Ac-ft 31,710
Fiscal Year 1960-61 Max 625 Min 2.59 Mean mgd 22.5 Mean cfs 34.8 Ac-ft 25,250

Peak discharge (base, 750 mgd)--Dec. 28 (7 a.m.) 790 mgd (1,220 cfs), 6.10 ft; Feb. 14 (6 p.m.) 1,260 mgd (1,950 cfs), 7.22 ft; Feb. 16 (10 p.m.) 1,260 mgd (1,950 cfs), 7.21 ft; Apr. 2 (1 a.m.) 1,440 mgd (2,230 cfs), 7.57 ft.

* Discharge measurement made on this day.

Note. Doubtful or no gage-height record Jan. 6 to Feb. 2; discharge estimated on basis of comparison with records for nearby streams.

ISLAND OF MAUI

5850. Hoolawanui Stream near Huelo

Location.--Lat 20°53'15", long 156°14'55", on right bank 250 ft upstream from intake of Waioea ditch, 2 miles west of Kailua, and 2 miles southwest of Huelo.

Drainage area.--1.34 sq mi.

Records available.--December 1910 to June 1961. 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.

Average discharge.--50 years (1911-61), 7.94 mgd (12.3 cfs).

Extremes.--Maximum discharge during year 782 mgd (1,210 cfs) Apr. 2 (gage height, 3.61 ft), from rating curve extended above 100 mgd as explained below; minimum, 0.64 mgd (0.99 cfs) Nov. 7.

1910-61: Maximum discharge, 3,240 mgd (5,010 cfs) Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 100 mgd by logarithmic plotting; minimum, 0.15 mgd (0.23 cfs) Oct. 25, 1917.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.2	0.51	0.9	17.2
.3	1.04	1.2	36.7
.4	1.96	1.8	165.5
.5	3.57	1.8	109
.6	5.80	2.0	140
.7	8.75		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	3.20	1.65	2.10	1.65	1.04	5.05	12.3	1.19	4.80	33.8	*1.27	1.55
2	2.85	1.75	2.53	1.55	.85	5.30	6.55	1.11	4.57	34.9	1.19	1.45
3	2.85	2.27	5.40	1.45	.79	3.95	6.30	1.04	5.05	130	1.19	1.36
4	2.38	12.8	3.35	1.65	*.74	3.95	4.80	1.04	3.95	28.8	1.11	1.27
5	2.10	3.89	2.38	1.45	.69	12.2	5.05	.97	3.57	12.3	1.04	5.15
6	2.10	1.96	2.38	1.75	.69	5.80	3.95	.91	3.28	8.75	1.04	10.6
7	2.10	1.75	1.96	1.55	*.64	4.57	3.57	.91	8.26	6.80	1.19	2.38
8	1.75	1.96	2.15	1.36	1.31	3.76	3.20	.85	6.30	5.55	1.04	15.4
9	2.91	1.85	4.07	1.27	7.87	3.57	2.85	46.9	3.95	5.05	1.11	3.02
10	3.46	1.65	1.96	1.27	10.7	3.57	2.68	*80.0	3.28	4.36	1.45	3.02
11	2.24	*1.65	3.91	1.36	42.4	3.20	2.38	61.9	3.02	3.95	1.11	2.24
12	1.75	1.65	18.3	6.51	37.1	19.7	2.38	47.2	2.68	3.57	1.04	2.24
13	*1.65	1.45	2.53	2.72	7.03	40.8	2.24	13.2	2.53	3.20	.91	3.28
14	1.55	1.45	2.68	1.55	4.05	16.6	1.96	32.4	*2.38	3.02	.85	2.53
15	1.45	1.36	2.85	1.36	4.36	8.05	1.96	13.1	2.24	2.85	.97	1.96
16	1.45	2.76	1.96	1.36	5.38	*6.30	1.85	74.2	2.10	2.53	5.20	*1.85
17	1.27	3.58	1.96	2.80	*17.0	5.30	1.85	63.8	1.96	2.38	1.65	2.53
18	1.27	3.57	1.85	1.36	12.5	4.57	1.85	20.1	1.85	2.24	1.04	3.02
19	1.27	1.96	1.75	1.27	27.5	4.80	1.65	20.0	1.75	2.24	.97	2.38
20	1.27	1.55	1.75	1.19	11.5	3.76	1.65	23.3	1.65	2.10	1.75	
21	1.19	1.45	1.96	1.11	12.7	3.57	1.55	21.6	1.55	1.96	1.27	1.65
22	1.11	1.36	2.53	1.04	*26.1	3.20	1.45	12.7	1.85	1.85	1.55	1.55
23	1.65	1.45	*1.96	1.04	31.4	2.85	3.27	10.3	2.53	1.75	1.11	1.45
24	7.50	1.75	2.38	1.04	39.4	2.68	1.65	10.7	1.96	1.85	.97	2.10
25	5.18	1.36	3.76	1.45	14.1	2.38	1.36	7.40	1.55	1.75	.91	3.57
26	1.65	1.27	1.96	1.04	8.75	*2.24	*5.84	6.30	1.45	1.96	4.07	2.38
27	1.36	1.96	7.68	1.11	6.80	7.98	1.75	5.30	1.45	3.20	5.38	1.85
28	1.27	5.06	2.24	.91	7.40	56.3	1.45	5.80	1.55	1.75	9.38	4.34
29	1.19	2.24	1.85	.91	14.9	13.4	1.36	-----	1.85	1.55	7.26	6.15
30	3.44	4.47	1.75	1.11	5.55	7.21	1.27	-----	1.45	1.45	2.10	5.96
31	3.45	5.63	-----	1.27	-----	4.57	1.27	-----	1.27	-----	1.75	-----
TOTAL MEAN	69.86	80.51	95.89	48.46	361.24	271.18	93.24	584.22	87.63	317.46	63.22	99.98
MEAN MGD	2.25	2.60	3.20	1.56	12.0	8.75	3.01	20.9	2.83	10.6	2.04	3.33
CFS	3.49	4.02	4.95	2.42	18.6	13.5	4.65	32.3	4.37	16.4	3.15	5.16
AC-FT	214	247	294	149	1110	832	286	1790	269	974	194	307

Calendar Year 1960 Max 266 Min 0.64 Mean mgd 8.29 Mean cfs 12.8 Ac-ft 9,300
Fiscal Year 1960-61 Max 130 Min 0.64 Mean mgd 5.95 Mean cfs 9.21 Ac-ft 6,670

Peak discharge (base, 400 mgd).--Feb. 14 (6 p.m.) 472 mgd (730 cfs), 3.08 ft; Feb. 16 (9 p.m.) 456 mgd (706 cfs), 3.04 ft; Apr. 2 (1 a.m.) 782 mgd (1,210 cfs), 3.61 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

123

5870, Honopou Stream near Kuelo

Location.--Lat 20°53'20", long 156°15'20", on left bank just upstream from Wailioa ditch intake, 2.2 miles southwest of Kuelo, and 2.5 miles west of Kailua.

Drainage area.--0.64 sq mi.

Records available.--December 1910 to June 1961. 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.

Average discharge.--50 years (1911-61), 3.17 mgd (4.90 cfs).

Extremes.--Maximum discharge during year, 133 mgd (206 cfs) Apr. 2 (gage height, 2.91 ft), from rating curve extended above 70 mgd as explained below; minimum, 0.30 mgd (0.46 cfs) May 23, 24, 25.

1910-61: Maximum discharge, 3,690 mgd (5,710 cfs) Nov. 18, 1930 (gage height, 7.28 ft) from rating curve extended above 70 mgd by model studies of the station site; minimum, 0.01 mgd (0.02 cfs) for several days in 1933, 1934.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.4	0.03	1.4	14.5
.5	.48	1.7	23.1
.6	1.26	2.0	35.0
.7	2.29	2.3	52.0
.9	4.92	2.6	81.0
1.1	8.10		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.26	0.60	1.00	0.76	0.48	2.53	5.12	0.60	*2.53	9.32	0.60	0.54
2	1.26	.60	1.00	.68	.42	2.53	3.29	.60	2.41	71.4	.60	.54
3	1.26	1.02	2.68	.60	.42	2.06	2.77	.54	2.29	44.9	.54	.54
4	1.08	4.78	1.54	.76	*36	1.90	2.53	.54	2.06	13.0	.54	.54
5	1.08	1.36	1.08	.60	36	6.10	2.53	.48	1.86	7.28	.48	1.95
6	1.08	.84	1.08	.68	.36	2.53	2.06	.48	1.76	5.38	.48	2.84
7	1.08	.76	1.00	.60	.36	1.96	1.96	.48	2.99	4.35	.54	.92
8	1.00	1.00	1.06	.54	.60	1.86	1.76	.48	2.78	3.64	*4.8	4.66
9	1.00	.84	2.02	.54	2.35	1.76	1.66	20.3	1.96	3.26	.54	1.36
10	1.08	.68	1.96	.54	3.86	1.66	1.56	21.1	1.56	2.77	.60	1.36
11	1.00	*.84	1.52	.54	14.6	1.66	1.56	20.3	1.46	2.41	.54	1.16
12	.84	.76	2.94	1.94	10.9	5.68	1.56	15.7	1.36	2.18	.48	1.08
13	.76	.68	1.08	1.08	3.45	16.7	1.36	6.62	1.26	1.96	.42	1.26
14	.68	.68	1.16	.60	2.29	7.03	1.26	12.5	1.16	1.76	.36	1.16
15	.68	.60	1.26	.60	*2.29	4.21	1.16	5.99	1.08	1.66	.42	.92
16	.60	1.00	1.00	.54	2.65	3.50	1.08	18.8	1.08	1.46	2.87	.84
17	.60	1.52	1.00	1.36	5.60	3.02	1.16	21.3	1.00	1.36	.76	1.08
18	.60	1.36	.92	.68	5.20	2.65	1.16	9.18	.92	1.16	.42	1.16
19	.60	.84	.92	.54	8.96	2.71	1.00	8.10	.84	1.08	.36	1.08
20	.60	.68	.84	.48	4.88	2.18	1.00	7.77	.84	1.08	.84	.84
21	.54	.60	1.08	.48	5.08	1.96	.92	7.44	.76	1.00	.48	.76
22	.48	.60	1.08	.42	6.23	1.76	.84	5.68	1.00	.92	.42	.68
23	.68	.68	.92	.42	8.42	*1.66	1.16	4.92	1.08	.84	.36	.60
24	1.04	.84	1.16	.42	11.4	1.56	.84	4.92	.92	.84	.30	.92
25	1.53	.60	1.89	.54	5.99	1.46	.76	3.93	.76	.84	.30	1.08
26	.60	.54	1.00	.42	4.64	1.36	2.78	3.38	.60	.84	.60	.92
27	.48	.87	2.94	.48	3.93	2.26	1.00	3.02	.50	1.46	1.24	.76
28	.48	2.06	1.00	.36	3.88	15.7	.76	3.02	.58	.76	2.18	1.60
29	.48	1.00	.84	.36	4.13	7.15	.68	-----	.76	.60	2.15	1.84
30	.84	1.64	.76	.42	*2.77	3.60	.68	-----	.54	.60	.68	2.46
31	1.08	2.53	-----	.60	-----	2.53	.68	-----	*.54	-----	.60	-----
Total	26.37	33.40	39.73	19.58	126.86	115.23	48.64	208.17	41.44	190.11	22.18	37.45
Mean	0.851	1.08	1.32	0.632	4.23	3.72	1.57	7.43	1.34	6.34	0.715	1.25
Mgd	1.32	1.67	2.04	0.978	6.54	5.76	2.43	11.5	2.07	9.81	1.11	1.93
Cfs	81	102	122	60	389	354	149	639	127	583	68	114
Ac-ft												
Calendar Year	1960		Max	60.6	Min	0.36	Mean mgd	3.02	Mean cfs	4.67	Ac-ft	3,400
Fiscal Year	1960-61		Max	71.4	Min	0.30	Mean mgd	2.49	Mean cfs	3.85	Ac-ft	2,790

Peak discharge (base, 130 mgd).--Apr. 2 (1:00 a.m.) 133 mgd (206 cfs), 2.91 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

5880. Waioea ditch at Honopou, near Euelo

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, 2.2 miles southwest of Euelo, and 2.5 miles west of Kailua.

Records available.--November 1922 to June 1961.

Gage.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

Average discharge.--38 years (1923-61), 113 mgd (175 cfs).

Extremes.--1922-61: Maximum daily discharge, 195 mgd (302 cfs) several days in 1954, 1955, and 1956; no flow Jan. 24-27, 1923.

Remarks.--Records good except those for period of no gage-height record which are fair. Waioea ditch receives water from Koolau ditch at Alo Stream and from all streams from Alo Stream west to Haleakala Stream at altitude of about 1,200 ft. Flow regulated by gates and spillways. Water used for domestic supply, power, and irrigation in central Maui.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	152	82.0	132	79.0	59.0	132	145	* 43.9	116	95.1	41.0	86.0
2	132	103	124	72.0	47.0	164	180	41.0	124	180	41.0	82.0
3	124	104	109	69.0	44.0	116	172	36.5	140	180	38.0	76.0
4	116	188	142	76.0	41.0	101	148	35.9	124	186	36.5	82.0
5	93.0	162	93.0	66.0	41.0	156	152	35.0	108	172	36.5	140
6	108	101	104	92.2	38.0	140	124	33.5	108	148	35.0	186
7	112	86.0	86.0	95.5	38.0	132	101	32.0	179	124	44.0	132
8	79.0	124	77.7	72.0	91.5	101	93.0	32.0	176	104	* 40.0	184
9	116	112	168	66.0	112	93.0	82.0	120	148	116	41.0	144
10	168	93.0	121	59.0	188	93.0	76.0	188	112	101	69.9	132
11	106	* 88.6	a 117	72.0	186	97.0	72.0	188	97.0	79.0	50.0	104
12	82.0	131	a 186	156	188	132	69.0	188	86.0	72.0	53.0	93.0
13	76.0	79.0	116	154	183	188	66.0	188	79.0	69.0	41.0	129
14	72.0	82.0	142	144	148	186	63.0	186	72.0	66.0	41.0	118
15	66.0	69.0	124	115	158	183	59.0	188	69.0	59.0	74.1	82.0
16	63.0	127	90.0	103	180	156	56.0	188	66.0	59.0	159	76.0
17	59.0	139	104	159	188	132	53.0	132	63.0	53.0	145	109
18	56.0	174	101	93.0	188	112	56.0	116	59.0	53.0	72	148
19	56.0	138	86.0	79.0	188	112	50.0	120	56.0	50.0	63.8	108
20	69.0	86.0	93.0	69.0	188	97.0	56.0	132	53.0	53.0	156	79.0
21	56.0	76.0	128	66.0	188	86.0	47.0	140	53.0	47.0	144	69.0
22	53.0	69.0	148	59.0	188	79.0	44.0	140	64.3	47.0	152	* 69.0
23	123	76.0	104	56.0	188	* 74.2	92.8	140	132	44.0	101	63.0
24	186	82.0	116	56.0	188	69.0	56.0	152	121	59.0	76.0	116
25	176	63.0	163	94.8	188	66.0	47.0	124	66.0	50.0	72.0	164
26	93.0	59.0	140	59.0	172	63.0	125	116	56.0	67.9	141	128
27	72.0	133	179	64.0	148	126	78.0	112	56.0	152	166	93.0
28	63.0	174	140	50.0	148	188	53.0	132	70.8	66.0	188	134
29	59.0	156	104	47.0	186	176	47.0	-----	127	47.0	186	183
30	167	181	90.0	62.3	156	156	44.0	-----	66.0	44.0	132	180
31	147	186	-----	68.3	-----	116	44.0	-----	53.0	-----	101	-----
Total	3,100.0	3,523.6	3,627.7	2,573.1	4,244.5	3,822.2	2,550.8	3,279.8	2,900.1	2,643.0	2,736.8	3,489.0
Mean												
Mgd	100	114	121	83.0	141	123	82.3	117	93.6	88.1	88.3	116
Cfs	155	176	187	128	218	190	127	181	145	136	137	179
Ac-ft	9,510	10,810	11,130	7,900	13,030	11,730	7,830	10,060	8,900	8,110	8,400	10,710
Calendar Year	1960	Max	188	Min	44.0	Mean mgd	123	Mean cfs	190	Ac-ft	137,700	
Fiscal Year	1960-61	Max	188	Min	32.0	Mean mgd	105	Mean cfs	162	Ac-ft	118,100	

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of nearby station.

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, 2.1 miles southwest of Huelo, and 2.5 miles west of Kailua.

Records available.--January 1918 to June 1961.

Gage.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 15, 1921, at site 300 ft upstream at different datum.

Average discharge.--43 years, 25.2 mgd (39.0 cfs).

Extremes.--1918-61: Maximum daily discharge, 116 mgd (179 cfs) Feb. 13, 14, 27, 1932; no flow at times.

Remarks.--Records good except those below 0.1 mgd, which are fair. Ditch diverts water from streams between Waikamoi and Halehaku Streams above Center and Lowrie ditches. Flow regulated by gates and spillways. Water used for irrigation in central Maui.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	11.1	0.55	3.74	1.29	0.85	2.07	6.63	0.35	7.13	18.2	0.29	0.59	
2	1.22	.66	4.08	1.08	.51	23.7	<u>21.9</u>	.35	3.16	<u>105</u>	.29	.55	
3	1.08	<u>.45</u>	9.31	.96	.47	1.60	9.76	.32	8.08	<u>54.1</u>	.35	.51	
4	.85	<u>88.3</u>	24.7	1.02	.43	1.45	.90	.29	2.79	.10	.32	<u>.43</u>	
5	.74	<u>46.9</u>	1.08	.90	.43	20.8	.85	.29	2.27	.10	.29	<u>4.24</u>	
6	.69	.74	1.36	1.68	.39	11.7	.85	.29	2.07	.08	.29	<u>8.80</u>	
7	1.47	.55	1.02	<u>4.13</u>	<u>.35</u>	6.37	.85	.29	<u>58.2</u>	.64	.29	<u>.57.4</u>	
8	.74	1.16	<u>.85</u>	.74	<u>11.4</u>	1.37	.85	<u>.26</u>	<u>58.3</u>	1.52	.27	<u>8.29</u>	
9	18.8	.74	38.6	.69	27.8	1.29	.85	<u>43.8</u>	16.9	1.45	.29	10.7	
10	42.9	.64	1.93	.69	95.0	1.22	.79	<u>49.9</u>	2.27	.72	.35	<u>6.28</u>	
11	2.09	1.03	10.0	2.26	99.0	1.08	.79	9.74	2.07	.26	.28	1.02	
12	.64	<u>8.92</u>	<u>80.1</u>	<u>50.6</u>	<u>99.0</u>	<u>35.4</u>	.79	<u>9.55</u>	<u>18.4</u>	.23	.32	.75	
13	.64	.69	<u>9.27</u>	<u>35.4</u>	<u>77.4</u>	<u>64.6</u>	1.46	19.5	1.60	.23	.26	<u>6.45</u>	
14	.59	.69	9.42	22.2	10.7	<u>39.4</u>	.90	30.3	1.45	1.20	<u>.23</u>	<u>6.88</u>	
15	.55	.59	1.73	6.98	* 10.9	51.4	.79	23.8	1.29	1.08	<u>.29</u>	.69	
16	.51	18.8	.96	9.43	37.8	10.4	.74	34.9	12.9	.96	59.0	.64	
17	.43	32.2	1.08	<u>4.68</u>	9.10	3.05	.69	11.4	1.22	.85	<u>37.9</u>	1.02	
18	.39	31.1	.90	2.21	89.0	2.56	.74	11.3	1.08	.74	.79	17.0	
19	.35	16.5	1.15	1.37	89.0	3.31	.59	11.3	1.02	.69	.55	1.29	
20	.35	.79	.90	1.15	83.1	2.07	.55	11.3	.69	.69	35.0	.69	
21	.32	.69	1.49	1.02	87.0	1.76	.51	11.1	.64	.64	25.9	.55	
22	.29	.64	7.34	.90	87.0	1.52	.43	11.1	.64	.55	<u>20.4</u>	.59	
23	<u>21.8</u>	.64	.96	.79	87.0	1.37	7.08	11.1	10.4	.51	.64	.55	
24	<u>69.1</u>	.99	1.52	.74	87.0	1.29	.75	11.1	4.29	.64	.42	26.2	
25	<u>67.8</u>	.59	18.7	14.8	84.8	1.15	.47	10.9	.59	.55	.35	<u>64.8</u>	
26	.85	.55	5.82	.74	38.7	<u>1.02</u>	18.5	10.3	.55	2.13	38.0	5.09	
27	.43	10.2	* 63.7	.79	11.1	<u>33.0</u>	30.1	<u>9.36</u>	.51	<u>35.4</u>	53.3	.79	
28	.35	53.6	9.80	1.54	7.08	56.4	.50	22.3	6.07	.59	91.0	13.7	
29	.32	11.6	1.91	.59	71.7	17.8	.43	-----	21.6	.39	772	85.9	
30	28.8	58.4	1.52	.59	6.37	34.6	.39	-----	.79	.35	54.2	63.2	
31	23.6	77.6	-----	.86	-----	8.77	.35	-----	.55	-----	.69	-----	
Total	280.17	487.50	314.94	201.62	3392.28	443.52	84.69	3664.9	221.35	230.59	450.97	535.90	
Mean	Mgd	9.04	15.7	10.5	6.50	46.4	14.3	2.73	13.1	7.14	7.69	14.5	17.9
	Cfs	14.0	24.3	16.2	10.1	71.8	22.1	4.22	20.3	11.0	11.9	22.4	27.7
	Ac-ft	860	1500	966	619	4270	1360	260	1120	679	708	1380	1640
Calendar Year	1960	Max	100	Min	0.08	Mean mgd	19.4	Mean cfs	30.0	Ac-ft	21740		
Fiscal Year	1960-61	Max	105	Min	0.08	Mean mgd	13.7	Mean cfs	21.2	Ac-ft	15370		

* Discharge measurement made on this day.

ISLAND OF MAUI

5900. Old Hamakua ditch at Honopou, near Huelo

Location.--Lat $20^{\circ}53'31''$, long $156^{\circ}15'16''$, on right bank 400 ft downstream from Honopou Stream and Wailea ditch trail crossing in Honopou Gulch, 2.0 miles southwest of Huelo, 2.5 miles west of Mailua, and 5.0 miles east of Haiku.

Records available.--January 1918 to June 1922, November 1936 to June 1961.

Gage.--Water-stage recorder and modified Parshall flume. Datum of gage is 1,117 ft above mean sea level (by vertical angles).

Average discharge.--28 years (1918-22, 1937-61), 2.17 mgd (3.36 cfs).

Extremes.--1918-22, 1936-61: Maximum daily discharge, 39.5 mgd (61.1 cfs) Apr. 7, 1938; no flow at times.

Remarks.--Records fair. Wailea and New Hamakua ditches divert most of flow above this station. Water stored in reservoirs to be used for irrigation in central Maui.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.06	0.04	0.06	0.05	0.03	0.05	0.04	0.03	0.08	1.80	0.02	0.03
2	.04	.03	.04	.04	.03	.05	.04	.03	.06	10.7	.02	.02
3	.04	.03	2.55	.04	.02	.05	.03	.03	.06	14	.02	.02
4	.03	5.92	.72	.04	.02	.04	.04	.02	.06	.05	.02	.02
5	.03	.76	.04	.03	.02	.22	.04	.03	.05	.05	.02	.38
6	.02	.04	.04	.03	.02	.18	.04	.03	.05	.05	.02	1.99
7	.03	.04	.04	.03	.02	.06	.04	.03	14.1	.05	.02	.07
8	.02	.04	.04	.03	.03	.04	.04	.03	1.92	.05	.02	8.62
9	.02	.03	.10	.03	4.07	.04	.04	1.96	.10	.05	.02	.08
10	.09	.03	.05	.03	9.03	.04	.04	.13	.05	.05	.03	.04
11	.04	.03	4.6	.03	12.2	.04	.04	.10	.05	.05	.03	.04
12	.03	.04	7.20	3.45	3.40	.13	.04	.09	.04	.05	.03	.04
13	.03	.04	.08	.28	.25	.26	.04	.07	.04	.05	.03	.04
14	.03	.04	.06	.05	.09	.12	.04	.08	.04	.13	.02	.04
15	.02	.03	.05	.05	.07	.07	.03	.04	.04	.06	.03	.04
16	.02	.04	.04	.04	.06	.07	.03	.07	.04	.05	.47	.04
17	.02	.12	.04	.84	.32	.04	.03	.08	.04	.04	.08	.04
18	.02	.15	.04	.07	.32	.04	.02	.05	.04	.04	.04	.04
19	.02	.08	.04	.04	.32	.06	.02	.05	.04	.04	.04	.04
20	.02	.04	.03	.04	.24	.04	.02	.05	.04	.04	.12	.04
21	.02	.03	.04	.04	.26	.04	.02	.05	.03	.03	.05	.04
22	.02	.03	.04	.64	.26	.04	.02	.05	.03	.03	.04	.03
23	.03	.03	.04	.04	.28	.04	.02	.04	.03	.03	.04	.03
24	2.95	.03	.04	.04	.28	.04	.02	.04	.03	.03	.04	.04
25	1.80	.02	.08	.04	.24	.04	.02	.04	.03	.03	.03	.19
26	.05	.03	.06	.03	.14	.04	.05	.04	.03	.03	.13	.05
27	.03	.04	* 4.98	.04	.09	.06	.04	.04	.03	.56	.20	.04
28	.02	1.91	.16	.03	.08	.12	.03	.12	.03	.04	.82	1.08
29	.02	.07	.07	.03	.19	.06	.03	-----	.04	.03	1.16	4.52
30	.03	.41	.06	.03	.08	.04	.03	-----	.04	.03	.06	1.14
31	.04	2.87	-----	.04	-----	.04	.03	-----	.03	-----	.04	-----
Total	5.64	13.04	17.29	5.34	32.46	2.20	1.01	3.41	17.29	143.8	3.71	18.93
Mean	0.182	0.421	0.576	0.172	1.08	0.071	0.033	0.122	0.558	0.479	0.120	0.628
Mgd	0.282	0.651	0.891	0.266	1.67	0.110	0.051	0.189	0.863	0.741	0.186	0.972
Cfs	17	40	53	16	100	6.8	3.1	10	53	44	11	58
Ac-ft												
Calendar Year	1960	Max	25.7	Min	0.01	Mean mgd 0.645	Mean cfs 0.998	Ac-ft 725				
Fiscal Year	1960-61	Max	14.1	Min	0.02	Mean mgd 0.369	Mean cfs 0.571	Ac-ft 413				

* Discharge measurement made on this day.

5920. Lowrie ditch at Honopou Gulch, near Huelo

Location--Lat $20^{\circ}54'57''$, long $156^{\circ}15'07''$, 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 June 1961. Published as "at Opana weir" 1910-27.

Gage--Water-stage recorder and concrete control. Datum of gage is 590.0 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Average discharge--47 years (1910-26, 1930-61), 27.4 mgd (42.4 cfs).

Extremes--1910-27, 1930-61: Maximum daily discharge, 75 mgd (116 cfs) Oct. 31, 1921; no flow at times.

Remarks--Records good. Lowrie ditch diverts water from all streams between Kailua and Haleakala Streams. Flow regulated by gates and spillways. Water used for irrigation of central Maui.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.5	7.64	20.2	17.8	8.48	15.4	15.7	6.87	14.7	9.61	*9.72	20.2
2	10.6	6.69	20.2	16.6	6.32	15.4	18.9	5.58	13.2	54.9	6.83	12.3
3	10.6	5.58	11.5	9.83	5.94	13.7	4.50	5.20	15.4	37.4	6.70	7.45
4	9.06	4.16	23.1	10.6	*5.76	13.2	10.4	5.02	19.0	44.9	52.0	6.88
5	8.40	32.9	14.7	8.84	5.39	27.4	12.3	4.65	16.6	47.4	4.84	18.4
6	11.5	14.7	10.8	9.50	5.02	15.2	12.7	4.50	15.2	34.9	4.65	49.9
7	18.4	16.6	8.40	9.28	4.84	7.53	14.2	4.34	33.7	22.4	5.20	18.1
8	14.4	16.6	7.26	7.83	7.48	21.4	13.7	4.34	35.0	25.0	4.84	4.32
9	10.9	*9.73	13.4	7.26	15.8	20.2	20.2	19.8	22.4	25.0	4.65	25.5
10	14.7	7.07	6.69	6.88	4.93	14.9	8.10	18.1	16.6	20.2	5.02	17.8
11	13.5	7.26	8.89	7.83	5.24	10.2	5.20	4.03	11.8	16.6	4.65	16.6
12	13.7	8.95	4.26	27.4	5.49	21.3	8.42	11.0	11.1	15.4	4.65	15.4
13	13.5	6.32	22.6	32.9	4.93	29.2	19.0	20.8	11.8	13.7	4.34	14.9
14	13.2	6.13	20.2	22.2	29.9	4.84	9.72	18.7	*16.4	12.8	4.18	12.3
15	6.99	5.39	15.4	16.7	20.2	31.8	9.50	21.3	14.4	11.1	5.39	7.45
16	6.32	6.50	8.40	15.0	19.0	*39.0	15.4	39.3	13.5	10.4	26.8	6.32
17	5.94	16.0	8.62	4.30	51.7	24.6	15.2	9.18	12.0	9.72	19.0	9.28
18	5.58	24.4	8.40	19.0	5.49	21.4	9.72	2.59	8.02	9.28	16.6	9.94
19	5.58	18.9	9.72	15.4	5.74	23.8	8.40	1.83	7.64	9.50	20.2	9.50
20	5.76	16.6	8.02	16.6	5.49	21.4	8.62	1.60	7.45	13.0	23.9	7.26
21	5.58	15.2	9.81	16.6	5.49	20.2	8.02	1.39	7.07	12.1	20.2	6.50
22	5.02	6.13	9.72	11.7	5.49	19.0	7.64	25.5	6.69	7.07	9.94	*7.07
23	6.13	6.50	*8.40	8.37	57.4	17.8	11.0	39.9	8.21	6.88	9.83	6.13
24	28.0	8.21	10.4	16.6	5.74	16.6	8.62	38.7	8.26	8.02	5.39	14.4
25	35.9	5.94	12.4	12.2	5.49	12.3	9.06	19.4	12.8	9.22	5.02	4.12
26	7.83	5.76	11.6	8.02	37.4	11.1	24.9	16.3	11.6	9.96	25.7	13.2
27	12.7	8.35	37.4	8.40	32.4	23.1	15.4	17.2	6.69	20.2	30.2	17.8
28	15.4	31.0	27.8	7.07	34.9	24.2	6.88	26.2	6.32	13.5	48.1	16.6
29	13.2	21.4	20.2	6.50	49.5	20.3	6.13	-----	11.8	15.4	4.82	49.9
30	7.64	26.2	17.8	6.69	22.6	14.7	7.89	-----	7.45	10.8	15.2	39.9
31	8.94	4.35	-----	8.65	-----	15.4	10.6	-----	5.76	-----	17.8	-----
Total	35847	453.75	454.63	431.25	10164.3	586.57	356.02	393.32	408.56	556.36	422.94	541.38
Mean												
Mgd	11.6	14.6	15.2	13.9	33.9	18.9	11.5	14.0	13.2	18.5	13.6	18.0
Cfs	17.9	22.6	23.5	21.5	52.5	29.2	17.8	21.7	20.4	28.6	21.0	27.9
Ac-ft	1100	1390	1400	1320	3120	1800	1090	1210	1250	1710	1300	1660
Calendar Year	1960	Max	57.4	Min	484	Mean mgd	22.3	Mean cfs	34.5	Ac-ft	25.000	
Fiscal Year	1960-61	Max	57.4	Min	139	Mean mgd	16.4	Mean cfs	25.4	Ac-ft	18350	

* Discharge measurement made on this day.

ISLAND OF MAUI

5940. Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", on right bank of ditch and 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 June 1961. Published as "at Peahi weird January 1910 to June 1919, as "at Manawai Gulch" July 1919 to December 1928, and as "at Kapalalassa Gulch" 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. Jan. 1, 1910, to Oct. 6, 1914, water-stage recorder at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, water-stage recorder at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, water-stage recorder at site 0.9 mile downstream at different datum.

Average discharge.--47 years (1910-12, 1913-14, 1915-28, 1930-61), 19.1 mgd (29.6 cfs) (averages prior to 1960 includes incomplete fiscal years 1913 and 1915).

Extremes.--1910-28, 1930-61: Maximum daily discharge, 135 mgd (209 cfs) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

Remarks.--Records good. Haiku ditch diverts water from all streams between Kailua Stream and Maliko Gulch. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.78	0.90	1.32	1.50	0.85	2.44	6.93	1.15	1.68	3.19	* 1.29	1.05
2	1.57	.90	1.05	1.50	.80	2.28	8.26	1.15	2.23	51.9	1.22	.90
3	1.88	.90	1.00	1.43	.80	2.02	5.4	1.15	8.27	41.0	1.22	.65
4	1.50	34.0	2.92	1.50	.75	1.90	8.21	1.15	4.06	52.2	1.15	.65
5	1.36	21.8	1.05	1.36	.70	1.61	14.0	1.15	3.50	37.8	1.15	1.42
6	1.22	1.36	1.00	1.43	.65	2.32	11.4	1.10	3.30	10.7	1.10	58.0
7	5.31	1.29	1.00	1.29	* .65	9.34	5.66	1.05	10.5	7.62	1.10	1.69
8	2.19	1.22	.95	1.15	.70	2.36	5.22	1.05	16.5	3.80	1.05	4.28
9	1.78	1.15	1.11	1.15	1.26	2.19	2.28	2.25	4.53	4.46	1.05	3.34
10	1.85	1.00	.95	1.10	56.8	2.02	6.37	11.1	2.70	3.24	1.05	1.00
11	1.57	.85	1.34	1.10	50.7	1.85	8.47	.90	2.19	2.70	1.00	.95
12	1.50	.95	4.24	2.54	35.5	1.29	6.60	3.27	2.10	2.44	1.00	.85
13	1.50	.85	1.41	2.14	21.6	2.41	2.02	29.5	1.94	2.28	1.00	.85
14	1.43	.80	1.22	1.29	1.92	1.48	1.85	7.27	* 1.85	2.47	1.00	.75
15	1.36	.80	1.10	1.22	1.85	6.94	1.64	19.8	1.71	3.02	1.15	.70
16	1.29	1.00	1.05	1.15	1.71	* 4.73	1.87	4.55	1.64	1.94	31.4	.65
17	1.22	1.41	1.00	3.20	59.3	4.06	1.50	1.83	2.33	1.78	2.27	.75
18	1.15	1.57	1.05	1.43	4.64	3.50	1.57	.33	1.87	1.71	1.22	.75
19	1.15	1.15	1.05	1.15	56.8	3.40	1.43	.28	1.50	1.71	1.10	.65
20	1.15	.95	1.05	1.10	34.7	2.90	1.36	.33	1.43	1.78	1.57	.51
21	1.10	.85	1.10	1.05	53.5	2.62	1.29	6.53	1.36	1.64	1.15	.48
22	1.10	.80	1.10	1.05	53.5	2.44	1.29	3.50	1.36	1.57	1.10	.44
23	1.15	.90	* 1.00	1.00	56.8	2.28	1.22	2.49	1.36	1.39	1.00	.40
24	24.0	.95	1.05	1.00	56.8	2.02	1.22	4.65	1.29	1.84	.95	11.7
25	1.22	.90	1.10	1.05	4.34	1.85	1.15	41.2	1.22	1.80	.95	1.00
26	1.36	.90	1.10	1.00	4.69	1.71	11.7	29.0	1.36	1.63	9.92	.51
27	1.00	1.18	34.9	.95	3.60	8.75	2.12	21.5	1.22	2.24	1.61	.40
28	.85	1.72	4.30	.90	3.40	16.9	1.43	4.78	1.15	1.57	53.6	.55
29	.85	1.62	2.10	.85	35.3	24.8	1.36	-----	1.36	1.80	37.0	.510
30	1.10	1.49	1.78	.85	2.80	3.21	1.15	-----	1.29	1.43	1.43	9.07
31	1.05	35.5	-----	.97	-----	13.7	1.22	-----	1.29	-----	1.05	-----
Total	79.53	137.14	114.55	111.32	699.57	25220	12203	36097	124.98	25285	17834	22424
Mean	2.56	4.42	3.82	3.59	233	8.14	3.94	12.9	4.03	8.43	5.75	7.47
Mgd	3.96	6.84	5.91	5.55	361	12.6	6.10	20.0	6.24	15.0	8.90	11.6
Cfs	3.44	4.21	3.52	3.42	2150	7.74	3.74	1110	3.84	7.76	5.47	6.88
Ac-ft												
Calendar Year	1960	Max	66.6	Min	0.42	Mean ngd	10.7	Mean cfs	16.5	Ac-ft	11980	
Fiscal Year	1960-61	Max	59.3	Min	0.28	Mean ngd	7.28	Mean cfs	11.3	Ac-ft	8150	

* Discharge measurement made on this day.

ISLAND OF MAUI

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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 June 1961. Records for January 1913 to December 1914 (fragmentary), at site 1 mile upstream, not equivalent owing to difference in drainage area.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

Average discharge.--16 years (1940-43, 1948-61), 11.2 mgd (17.3 cfs).

Extremes.--Maximum discharge during year, 469 mgd (725 cfs) Oct. 17 (gage height, 6.17 ft), from rating curve extended above 90 mgd on basis of slope-area measurement at gage height 8.35 ft; minimum, 2.69 mgd (4.16 cfs) Mar. 26.

1939-43, 1947-61: Maximum discharge, 1,990 mgd (3,080 cfs) Dec. 14, 1942 (gage-height, 7.02 ft, control then in use), from rating curve extended above 55 mgd by test on model of station site; minimum, 1.95 mgd (3.02 cfs) Feb. 9-11, 1954.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in million gallons a day)

2.7	2.47	3.6	29.0
2.9	4.93	3.8	44.5
3.0	6.55	4.0	64.0
3.2	11.0	4.5	125
3.4	18.5	5.0	210

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	4.79	4.25	7.95	4.66	3.85	4.25	4.9	4.25	4.12	52.8	3.85	4.93
2	4.79	4.12	7.55	4.39	3.58	4.25	10.2	4.78	4.12	192	3.58	6.28
3	5.94	4.79	24.8	4.25	3.46	3.98	5.74	3.35	4.12	110	*3.46	5.57
4	7.99	25.3	12.7	6.79	3.46	3.85	5.09	3.24	4.12	41.7	3.46	4.93
5	4.79	*21.1	6.55	4.66	3.35	16.2	4.93	3.13	3.85	10.0	3.46	22.1
6	5.89	4.66	10.4	4.93	3.35	6.38	4.79	3.02	3.71	7.15	3.35	10.5
7	5.41	4.66	7.75	8.99	3.35	4.66	4.79	3.02	7.56	5.90	3.46	5.25
8	4.52	4.25	8.55	4.79	4.25	4.12	4.39	3.02	10.1	5.09	3.46	33.0
9	4.39	3.98	13.6	4.39	1.75	3.98	3.98	78.5	4.93	4.79	3.35	7.02
10	5.41	3.85	8.35	4.71	24.3	4.39	3.85	57.0	3.85	4.66	3.24	5.90
11	6.39	3.97	17.7	5.09	15.4	3.71	3.85	21.2	3.02	4.52	3.24	5.25
12	4.39	4.39	25.6	8.32	10.2	21.5	3.71	25.6	3.46	4.39	3.24	4.66
13	4.25	3.98	5.90	5.25	4.93	76.8	3.58	9.69	*3.35	4.39	3.81	24.5
14	4.39	3.98	5.57	4.12	4.25	*33.5	3.46	30.6	3.24	4.39	4.39	12.2
15	4.12	3.85	5.90	3.85	3.98	9.96	3.46	9.03	3.13	4.12	4.52	5.25
16	3.98	10.7	4.93	45.9	4.25	6.06	3.35	6.71	3.02	3.85	18	4.79
17	3.98	37.3	10.3	76.3	6.16	5.09	3.58	29.6	3.02	3.85	8.0	5.81
18	3.85	10.9	7.28	8.47	5.90	4.66	4.25	14.7	3.02	3.71	5.0	12.2
19	3.71	5.92	*7.38	5.25	9.01	5.73	3.35	12.9	2.91	3.85	4.5	11.1
20	4.52	4.52	5.93	4.79	6.91	4.79	3.85	18.7	2.91	4.52	7.0	*5.09
21	4.52	4.12	9.35	4.39	4.93	4.25	3.35	9.28	2.91	3.85	5.0	4.52
22	4.12	3.85	12.7	4.39	10.8	4.12	3.24	6.75	2.80	3.58	5.0	4.25
23	3.98	6.72	6.95	4.12	18.7	4.12	7.10	6.55	2.80	4.57	4.5	4.25
24	3.98	5.41	5.25	3.98	32.4	3.98	4.12	8.36	2.80	5.74	4.5	4.25
25	3.85	4.39	5.74	4.25	7.23	3.85	*3.24	5.41	2.80	4.12	5.0	4.25
26	3.85	3.85	8.19	4.12	5.25	3.85	50.3	4.66	2.69	3.85	7.0	3.98
27	7.19	4.25	28.9	3.85	4.52	6.51	5.22	4.25	2.91	10.8	5.25	3.85
28	4.12	18.8	8.61	3.85	4.52	80.8	3.98	4.25	3.24	4.25	24.2	3.98
29	3.85	5.57	6.76	3.71	16.1	29.0	3.46	-----	4.52	3.85	17.0	6.23
30	5.29	9.67	4.93	3.58	4.79	10.9	3.24	-----	3.24	6.76	5.41	10.9
31	5.25	6.83	-----	3.98	-----	6.06	6.22	-----	3.10	-----	5.25	-----
TOTAL	147.50	243.93	302.07	264.12	250.68	385.30	222.57	391.55	115.37	527.05	184.48	246.79
MEAN												
MGD	4.76	7.87	10.1	8.52	8.36	12.4	7.18	14.0	3.72	17.6	3.95	8.23
CFS	7.36	12.2	15.6	13.2	12.9	19.2	11.1	21.6	5.76	27.2	9.21	12.7
AC-FT	453	749	927	811	769	1,180	683	1,200	354	1,620	566	757

Calendar Year	1960	Max	103	Min	3.02	Mean mgd	10.5	Mean cfs	16.2	Ac-ft	11,830
Fiscal Year	1960-61	Max	192	Min	2.69	Mean mgd	8.99	Mean cfs	13.9	Ac-ft	10,070

Peak discharge (base, 400 mgd).--Oct. 17 (3 a.m.) 469 mgd (725 cfs), 6.17 ft.

* Discharge measurement made on this day.

Note.--No gage-height record May 16-26; discharge estimated on basis of records for nearby stream.

ISLAND OF MAUI

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 5 miles southeast of Honokohau.

Drainage area.--4.09 sq mi.

Records available.--March 1913 to September 1920, May 1922 to June 1961. Monthly discharges only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 950 ft (by barometer).

Average discharge.--46 years (1913-20, 1922-61), 26.4 mgd (40.8 cfs).

Extremes.--Maximum discharge during year, 998 mgd (1,540 cfs) Oct. 17 (gage height, 6.05 ft), from rating curve extended above 120 mgd by logarithmic plotting; minimum, 10.1 mgd (15.6 cfs) many days.

1913-20, 1922-61: Maximum discharge, 2,420 mgd (3,740 cfs) Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft) from rating curve extended above 120 mgd, as explained above; minimum, 5.4 mgd (8.4 cfs) May 1, 1945, Jan. 5, 1946.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.9	7.30	2.9	67.0
2.1	13.2	3.2	102
2.2	17.1	3.5	147
2.5	34.5	4.0	250

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	14.0	12.0	12.6	11.0	12.6	11.3	60.1	13.6	14.0	67.1	11.7	18.6
2	20.2	*16.1	11.3	10.7	13.2	21.0	11.3	15.9	226	11.7	16.3	
3	33.0	23.5	38.4	10.7	10.4	17.6	11.0	16.3	122	11.3	15.5	
4	21.0	107	24.6	16.5	10.1	11.3	14.0	10.7	15.2	42.4	11.3	12.9
5	14.0	35.9	18.4	12.0	10.1	39.8	22.5	10.4	14.8	15.9	11.7	74.5
6	13.6	12.9	24.3	11.7	10.1	12.6	17.1	10.4	15.5	14.4	11.3	30.3
7	12.9	14.0	18.9	25.1	10.1	11.0	14.4	10.4	53.2	13.6	13.6	12.9
8	12.6	15.2	15.2	19.1	19.6	10.4	12.9	10.1	46.8	13.2	12.0	88.2
9	33.2	17.4	33.8	15.3	51.0	11.3	12.6	127	15.9	13.2	11.7	15.5
10	27.9	13.2	18.4	64.4	61.2	12.0	12.3	199	12.9	12.9	11.7	23.7
11	18.1	15.2	31.9	18.3	48.4	10.1	12.3	104	12.3	12.6	14.0	14.4
12	13.9	11.7	52.7	49.5	39.1	81.4	12.0	111	12.3	12.6	13.2	13.0
13	17.7	11.0	12.6	18.6	16.3	226	12.3	39.9	12.3	12.9	27.2	48.0
14	14.4	16.1	14.8	12.0	11.7	111	12.6	109	12.0	12.6	18.5	20.7
15	12.3	13.6	15.5	11.0	11.7	24.0	11.7	21.1	12.0	12.3	26.3	12.3
16	12.3	32.3	*12.3	51.9	15.7	15.2	11.7	56.1	12.0	12.3	54.0	11.7
17	12.0	57.2	15.8	154	34.0	13.2	18.9	77.8	12.0	12.3	33.3	32.3
18	11.7	27.1	17.4	14.8	20.7	13.2	18.9	35.1	11.7	12.0	15.2	59.3
19	11.7	14.4	18.4	12.3	77.0	13.2	12.6	54.8	11.7	13.2	12.3	*31.3
20	14.2	11.7	16.2	12.0	18.6	12.6	15.1	62.0	11.7	13.6	23.2	12.6
21	12.9	11.0	25.3	11.7	17.1	12.3	12.0	28.5	11.7	12.3	14.0	12.0
22	11.7	10.7	27.0	11.3	55.8	12.0	11.7	26.4	11.7	12.3	15.2	12.0
23	15.7	20.6	15.2	11.0	49.4	12.0	14.6	24.3	12.0	36.0	12.6	12.3
24	13.2	19.4	14.4	11.0	92.0	11.7	*11.7	40.2	12.3	24.5	12.3	15.2
25	17.1	11.3	17.1	12.3	15.5	11.7	10.7	16.7	12.3	15.1	14.4	
26	12.3	11.0	17.6	11.3	12.6	11.7	114	21.7	15.6	14.0	21.7	12.0
27	12.6	15.7	45.0	12.3	11.3	25.4	14.0	15.5	12.0	34.0	18.0	11.7
28	11.7	38.9	13.6	11.3	23.3	143	11.7	16.7	12.6	*14.0	90.3	15.3
29	11.3	47.3	12.6	10.7	43.6	64.5	11.3	-----	13.2	12.3	61.4	34.4
30	26.5	53.0	12.9	10.4	12.0	21.5	11.0	-----	11.7	12.6	17.4	47.9
31	16.3	29.3	-----	15.2	-----	14.4	53.8	-----	12.3	-----	14.0	-----
TOTAL	502.7	745.7	624.2	679.4	829.7	1,004.0	619.1	1,274.7	477.9	854.2	646.5	751.2
MEAN												
MGD	16.2	24.1	20.8	21.9	27.5	32.4	20.0	45.5	15.4	28.5	20.9	25.0
CFS	25.1	37.2	32.2	33.9	42.5	50.1	30.9	70.4	23.8	44.0	32.3	38.7
AC-FT	1,540	2,290	1,920	2,090	2,530	3,080	1,900	3,910	1,470	2,620	1,980	2,310

Calendar Year	1960	Max	226	Min	8.98	Mean mgd	27.4	Mean cfs	42.4	Ac-ft	30,820
Fiscal Year	1960-61	Max	226	Min	10.1	Mean mgd	24.7	Mean cfs	38.2	Ac-ft	27,640

Peak discharge (base, 700 mgd).--Oct. 17 (3 a.m.) 998 mgd (1,540 cfs), 6.05 ft.

* Discharge measurement made on this day.

6290. Honokowai ditch near Lahaina

Location.--Lat 20°55'57", long 156°37'31", on left bank just downstream from intake on Kapaloa Stream, and 5.4 miles northeast of Lahaina Lighthouse.

Records available.--July 1912 to January 1958, June 1958 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Dec. 31, 1917, staff gage at site 0.5 mile downstream at different datum. Nov. 15, 1918, to May 27, 1921, water-stage recorder at site 1.5 miles downstream at different datum.

Average discharge.--45 years (1912-16, 1919-57, 1958-61), 5.86 mgd (9.07 cfs).

Extremes.--1912-61: Maximum daily discharge, 43 mgd (66 cfs) June 30, 1930; no flow at times.

Remarks.--Records good. Ditch diverts water for power and irrigation from Amalu and Kapaloa Streams just above station. Flow regulated by headgates at intake.

Cooperation.--Records of daily discharges since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.51	3.19	4.33	3.52	3.84	3.25	14.2	4.88	3.81	9.69	3.34	6.31
2	5.51	4.95	3.75	3.51	3.39	4.04	6.29	4.11	4.68	26.8	3.47	5.57
3	3.32	7.57	6.36	3.25	3.39	3.43	4.28	4.11	5.00	18.1	2.85	4.43
4	3.32	19.1	7.23	3.97	3.39	3.19	3.39	3.93	4.14	8.47	3.72	4.51
5	3.23	7.70	5.50	3.84	3.31	10.8	5.52	3.81	3.85	3.88	4.65	16.0
6	3.39	3.54	4.76	3.47	3.15	3.95	3.96	3.35	4.91	3.48	4.65	8.71
7	3.15	3.70	6.14	5.53	3.15	3.48	3.84	3.15	13.7	3.88	4.57	4.62
8	3.15	5.50	5.09	4.64	3.02	3.33	3.39	3.27	11.5	3.88	4.02	15.3
9	7.70	5.24	8.22	4.21	8.59	3.15	3.19	15.2	4.47	3.88	4.04	5.58
10	6.68	3.88	5.89	3.76	14.5	3.15	3.15	26.3	3.40	3.31	4.35	8.32
11	4.38	3.36	7.39	2.29	12.7	3.15	3.15	22.4	3.04	3.34	* 6.28	5.40
12	3.28	3.15	11.6	9.57	10.3	19.6	3.15	21.5	2.80	3.30	6.09	4.28
13	4.10	3.15	4.15	5.58	5.39	22.0	3.15	12.0	2.72	3.18	7.60	9.72
14	3.78	3.57	4.40	2.62	3.56	7.05	3.15	15.5	2.68	3.38	6.66	6.14
15	3.15	3.64	5.01	2.92	3.63	5.57	3.15	6.39	2.68	3.73	9.61	4.39
16	2.92	8.00	3.85	2.92	4.96	5.09	2.95	12.6	2.68	3.48	12.8	4.35
17	2.93	8.57	3.90	9.61	9.62	5.05	5.60	13.3	2.55	3.48	9.36	12.2
18	2.92	6.59	4.10	3.89	8.22	5.05	5.38	9.20	2.40	2.78	4.60	15.1
19	2.92	* 4.34	4.43	3.43	17.4	4.43	3.18	12.9	2.27	3.25	4.11	8.47
20	3.12	3.54	4.48	3.39	5.88	3.39	3.82	12.9	2.32	3.02	7.61	4.66
21	3.15	3.51	6.77	3.27	5.37	3.33	3.20	8.33	2.47	3.44	4.53	4.35
22	3.15	3.15	7.21	3.15	13.9	3.15	3.15	7.12	2.55	3.45	5.62	4.35
23	3.66	5.48	4.18	3.15	12.5	3.15	2.96	7.04	2.55	7.68	4.40	4.35
24	4.06	5.56	4.34	3.15	17.3	3.15	2.86	11.1	2.68	6.76	4.27	5.38
25	5.24	3.87	4.96	3.15	4.75	3.15	3.15	4.63	2.93	5.84	4.25	5.80
26	3.25	3.51	4.20	3.15	3.89	3.15	16.4	5.92	3.77	4.48	7.66	4.30
27	3.15	4.69	7.64	3.15	3.53	5.07	4.24	4.06	3.57	9.00	7.01	4.23
28	3.15	8.72	3.89	3.15	5.32	18.1	3.62	4.63	3.34	4.12	21.1	5.35
29	3.15	10.0	3.69	3.15	8.12	8.21	3.40	-----	3.39	3.97	15.8	10.7
30	7.02	14.7	3.63	3.15	3.53	5.62	3.15	-----	3.73	3.73	6.14	6.55
31	4.37	9.97	-----	3.96	-----	3.74	14.6	-----	3.77	-----	4.92	-----
Total	119.80	185.44	161.09	121.50	209.60	181.97	148.62	263.63	120.35	170.78	200.08	209.42
Mean	3.86	5.98	5.37	3.92	6.99	5.87	4.79	9.42	3.88	5.69	6.45	6.98
Mgd	5.97	9.25	8.31	6.07	10.8	9.08	7.41	14.6	6.00	8.80	9.98	10.8
Cfs	3.68	569	494	373	643	558	456	809	369	524	614	643
Ac-ft												
Calendar Year	1960	Max	24.8	Min	1.82	Mean mgd	5.28	Mean cfs	8.17	Ac-ft	5.930	
Fiscal Year	1960-61	Max	26.8	Min	2.27	Mean mgd	5.73	Mean cfs	8.87	Ac-ft	6.420	

ISLAND OF MAUI

6460. Olowalu ditch near Olowalu

Location.--Lat $20^{\circ}49'33''$, long $156^{\circ}36'47''$, on left bank, 1.2 miles northeast of Olowalu, and 5.5 miles southeast of Lahaina.Records available.--August 1911 to June 1961. Monthly discharges only for some periods, published in WSP 1319.Gage.--Water-stage recorder and Parshall flume. Prior to June 30, 1916, staff gage in tailrace of powerhouse 1,000 ft downstream at different datum. July 28, 1916, to June 8, 1919, staff gage, and June 9, 1919 to June 21, 1932, water-stage recorder at site 300 ft upstream at different datum. July 1, 1932 to Oct. 7, 1933, records obtained by combining flows of three stations about 1,000 ft downstream.Average discharge.--45 years (1912-15, 1921-57, 1958-61), 4.86 mgd (7.52 cfs).Extremes.--1911-61: Maximum daily discharge, 13.7 mgd (21.2 cfs) Apr. 17, 1935; no flow at times.Remarks.--Records good. Ditch diverts water from Olowalu Stream at altitude of about 520 ft for power and irrigation. Regulated by headgates.Cooperation.--Records of daily discharges since January 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, for fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.41	2.66	2.78	3.18	2.16	3.92	9.12	9.61	8.43	5.86	2.65	3.66
2	4.57	2.70	2.75	2.95	2.16	3.65	10.2	7.86	7.42	9.26	2.58	3.66
3	5.29	2.76	2.85	2.80	2.22	3.36	9.03	6.22	6.46	8.93	2.50	3.66
4	5.24	4.99	3.60	3.57	2.22	3.32	7.03	5.41	6.25	8.55	2.49	3.74
5	4.40	4.93	3.66	2.56	2.22	8.77	6.13	4.81	6.31	6.41	2.45	6.36
6	4.16	3.17	4.71	2.53	2.16	7.90	5.43	4.45	6.06	5.24	2.39	7.45
7	3.88	3.04	4.22	2.53	2.17	6.89	4.98	4.20	8.35	4.66	2.45	4.68
8	3.67	3.09	3.72	2.53	2.50	5.36	4.58	4.00	8.46	4.27	2.39	8.78
9	4.49	3.08	3.67	2.53	3.29	2.96	4.24	7.35	7.86	3.99	2.34	7.49
10	4.84	2.89	3.26	2.92	6.67	3.79	4.03	10.9	6.40	3.83	2.33	6.66
11	4.18	2.94	3.40	2.96	5.77	3.37	3.84	10.6	5.76	3.70	* 2.39	5.31
12	3.84	2.76	7.20	4.98	4.38	4.14	3.63	10.4	5.36	3.50	2.30	4.44
13	3.60	2.62	5.83	4.48	3.64	11.0	3.56	10.1	5.03	3.42	2.97	6.67
14	3.46	2.77	4.81	3.21	3.29	10.9	3.46	10.0	4.79	3.31	3.01	5.26
15	3.27	2.64	4.11	2.91	2.93	10.3	3.35	9.93	4.61	3.25	2.76	4.32
16	3.24	2.78	3.51	2.80	2.79	9.67	3.24	9.65	4.43	3.18	4.57	3.81
17	3.13	4.78	3.64	4.14	3.41	8.08	5.51	10.2	4.39	3.10	3.67	4.51
18	3.07	5.09	3.52	3.44	3.37	7.22	5.73	9.77	4.15	3.03	2.81	6.42
19	2.99	* 3.49	3.40	3.21	3.91	7.74	4.40	10.1	4.03	3.03	* 2.71	7.45
20	3.08	2.74	3.27	3.14	3.85	6.03	3.84	10.2	3.94	2.97	3.54	4.88
21	3.02	2.59	3.77	3.04	3.66	5.33	3.42	9.91	3.83	2.87	2.59	4.17
22	2.92	2.63	4.26	2.95	8.17	4.82	3.25	9.51	3.84	2.86	2.48	3.87
23	3.36	2.72	3.45	2.85	8.63	4.49	3.08	9.25	3.70	3.11	2.36	3.53
24	2.89	2.68	3.16	2.46	9.35	4.20	2.92	9.23	3.57	3.08	2.31	3.74
25	2.96	2.46	3.28	2.25	8.46	4.01	3.06	9.07	3.60	2.90	2.36	3.41
26	2.81	2.43	3.14	2.19	5.96	4.19	9.21	8.92	3.49	2.79	2.32	3.11
27	2.72	2.74	4.55	2.14	4.57	4.05	9.64	8.60	3.52	3.08	2.67	2.94
28	2.64	3.68	4.53	2.23	4.08	8.64	7.74	8.59	3.53	2.79	6.92	2.87
29	2.58	3.58	4.75	2.22	7.23	8.87	5.95	-----	3.43	2.64	7.95	4.32
30	2.92	3.70	3.71	2.22	4.47	9.01	5.44	-----	3.29	2.68	4.64	3.42
31	2.71	3.46	-----	2.26	-----	6.58	9.13	-----	4.85	-----	3.80	-----
Total	110.34	98.59	116.53	90.18	129.69	192.56	168.17	238.84	159.14	123.09	95.70	144.59
Mean												
Mgd	3.56	3.18	3.88	2.91	4.32	6.21	5.42	8.53	5.13	4.10	3.09	4.82
Cfs	5.51	4.92	6.00	4.50	6.68	9.61	8.39	13.2	7.94	6.54	4.78	7.46
Ac-ft	3.39	3.03	3.58	2.77	3.98	5.91	5.16	7.33	4.88	3.78	2.94	4.44

Calendar Year	1960	Max	11.6	Min	2.14	Mean mgd	4.90	Mean cfs	7.58	Ac-ft	5,500
Fiscal Year	1960-61	Max	11.0	Min	2.14	Mean mgd	4.57	Mean cfs	7.07	Ac-ft	5,120

* Discharge measurement made on this day.

7000. Waiakea Stream at middle flume house, near Mountain View

Location.--Lat $19^{\circ}38'25''$, long $155^{\circ}10'35''$, on left bank at middle flume house, 800 ft upstream from Olas Sugar Co.'s main flume and 7.5 miles northwest of Mountain View.

Records available.--September 1930 to June 1961.

Gage.--Water-stage recorder and combined Parshall flume and concrete weir. Altitude of gage is 1,820 ft (by barometer).

Average discharge.--30 years (1931-61), 7.53 mgd (11.7 cfs).

Extremes.--Maximum discharge during year 158 mgd (244 cfs) Oct. 16 (gage height, 4.40 ft), from rating curve extended as explained below; minimum 0.05 mgd (0.08 cfs) Feb. 9.

1930-61: Maximum discharge, 166 mgd (257 cfs) Mar. 14, 1942 (gage height, 4.43 ft) from rating curve extended above 40 mgd on basis of weir formulas; no flow at times.

Remarks.--Records good except those for period of no gage height record, which are fair. Large part of flow comes from three tunnels.

Rating table (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Sept. 28 to Oct. 9)

0.05	0	1.0	5.06
.1	.11	1.5	9.60
.2	.38	2.0	15.3
.3	.73	2.5	24.0
.4	1.16	3.0	41.0
.6	2.24		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	6.49	4.13	10	9.10	4.59	12.5	1.84	0.21	2.65	5.98	4.98	6.41
2	5.98	4.90	8.0	8.51	3.98	11.5	1.84	.18	2.54	5.81	4.59	5.98
3	5.56	4.35	7.0	7.88	3.75	10.8	2.24	.16	2.40	11.4	4.43	5.56
4	5.14	4.67	6.6	7.22	3.46	9.82	2.25	.16	2.16	12.8	4.20	5.14
5	4.90	5.98	6.0	6.66	3.19	9.40	1.95	.14	1.95	10.5	4.05	4.98
6	5.39	5.48	5.6	6.58	3.06	8.33	1.72	.11	1.78	9.71	3.90	5.73
7	5.73	5.22	6.4	5.81	2.79	7.60	1.62	.08	1.64	9.00	3.83	6.32
8	5.48	5.22	6.0	5.31	2.55	6.84	1.57	.08	1.57	8.24	3.68	5.48
9	6.05	5.00	5.8	4.98	2.48	6.24	1.52	.08	1.41	7.70	3.60	4.90
10	6.15	5.4	5.6	5.14	2.62	5.73	1.42	.32	1.29	7.13	3.83	4.59
11	5.90	8.0	6.2	4.90	12.1	5.22	1.31	4.45	11.9	6.66	4.43	4.20
12	5.64	7.0	7.0	6.03	15.4	4.67	1.21	4.42	11.1	6.24	5.64	4.05
13	5.81	6.6	6.4	5.31	13.3	5.56	1.16	2.92	10.5	5.90	5.06	3.98
14	5.64	6.4	6.2	4.82	13.4	5.31	1.07	6.81	9.60	5.48	5.06	3.90
15	5.31	6.2	6.0	4.51	*14.3	4.90	1.03	7.35	8.90	5.06	4.91	3.53
16	5.14	6.0	5.8	14.0	15.9	4.43	.98	8.17	8.06	4.67	4.90	3.26
17	4.98	6.0	6.4	16.4	16.3	4.13	.98	7.88	7.41	4.28	8.65	3.06
18	4.82	6.4	6.0	14.0	16.0	3.90	.94	7.32	6.66	3.90	6.84	2.86
19	4.59	6.8	5.6	13.0	15.3	3.68	.89	8.65	6.15	3.90	6.71	2.73
20	4.43	6.0	7.0	12.6	15.1	3.39	.81	16.9	5.73	4.51	7.03	2.61
21	4.28	6.2	6.4	12.1	17.2	3.12	.73	20.2	*5.22	4.20	7.97	2.42
22	4.05	6.0	6.2	11.1	18.4	2.92	.69	24.6	6.05	4.13	8.15	2.30
23	3.90	6.6	6.0	10.4	21.0	2.73	.62	25.4	8.41	3.98	7.79	2.12
24	4.13	7.8	8.0	9.40	21.6	2.61	.58	25.2	8.33	4.13	7.88	2.18
25	4.43	7.0	15	8.42	21.6	2.48	*5.1	23.0	7.60	3.83	7.60	2.01
26	4.28	6.6	10	7.51	20.4	2.36	.47	20.8	7.97	5.10	8.60	1.89
27	4.05	6.0	*19	6.75	18.6	2.24	.41	19.3	7.88	7.32	8.33	1.67
28	4.20	5.6	10.3	6.24	17.0	2.12	.38	30.6	7.32	6.24	7.97	1.57
29	3.83	5.4	9.80	5.73	16.0	2.12	.32	-----	7.03	5.64	7.79	1.52
30	4.74	28	9.50	5.22	13.7	2.01	.26	-----	6.66	5.39	7.32	1.36
31	4.20	17	-----	4.82	-----	2.06	*.23	-----	6.32	-----	6.84	-----
TOTAL	155.22	211.95	229.80	230.45	365.07	160.72	33.55	266.49	358.70	188.83	186.56	108.31
MEAN	5.01	6.84	7.66	8.08	12.2	5.18	1.08	9.52	11.6	6.29	6.02	3.61
HGD	7.75	10.6	11.9	12.5	18.6	8.02	1.67	14.7	17.9	9.74	9.31	5.59
CFS	476	650	705	769	1,120	493	103	818	1,100	580	573	332
AC-FT												

Calendar Year 1960 Max 44.0 Min 2.01 Mean mgd 9.63 Mean cfs 14.9 Ac-ft 10,820
Fiscal Year 1960-61 Max 30.6 Min 0.08 Mean mgd 6.89 Mean cfs 10.7 Ac-ft 7,720

Peak discharge (base, 50 mgd).--Oct. 16 (5 p.m.) 158 mgd (244 cfs), 4.40 ft; Feb. 28 (5:30 a.m.) 75.8 mgd (117 cfs), 3.57 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 10 to Sept. 27; discharge estimated on basis of records for nearby streams.

ISLAND OF HAWAII

7012. Waiakea Stream near Hilo

Location.--Lat 19°41'35", long 155°05'55", 2.5 miles south of Hilo Post Office.Records available.--May 1957 to June 1961.Drainage area.--97 sq mi of which about 18 sq mi contribute directly to surface runoff.Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map).Extremes.--Maximum discharge during year, 205 mgd (317 cfs) Oct. 17 (gage height, 4.30 ft), from rating curve extended above 100 mgd as explained below; no flow at times.

1957-61: Maximum discharge, 790 mgd (1,220 cfs) Aug. 30, 1957 (gage height 5.88 ft), from rating curve extended above 100 mgd by logarithmic plotting; no flow at times.

Remarks.--Records fair. Hawaii Board of Water Supply diverts water at 1,500-ft elevation at rate of about 25 million gallons per year.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.81	0	1.8	3.00
1.0	.05	2.0	5.20
1.2	.21	2.5	16.5
1.4	.64	3.0	40.0
1.6	1.50	3.5	81.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1		0	0.76	0	0			0	19.3	0		
2		0	0	0	0			0	11.8	0		
3		0	0	0	0			0	9.46	0		
4		0	0	0	0			0	6.87	14.4		
5		0	0	0	0			0	4.26	0		
6		0	0	0	0			0	1.11	0		
7		0	0	0	0			0	.40	0		
8		0	0	0	0			0	0	0		
9		0	0	0	0			0	0	0		
10		0	0	0	0			0	0	0		
11		0	0	0	17.4			0	0	0		
12		0	0	0	18.9			0	0	0		
13		0	0	0	2.73			0	0	0		
14		0	0	0	0			0	0	0		
15		0	0	0	0			2.60	0	0		
16		0	0	1.19	0			0	0	0		
17		0	0	46.8	.32			0	0	0		
18		0	0	.21	.40			0	0	0		
19		0	0	0	.16			0	0	0		
20		0	0	0	0			3.72	0	0		
21		0	0	0	2.15			8.53	0	0		
22		0	0	0	7.71			7.80	0	0		
23		0	0	0	26.0			.19	0	0		
24		0	0	0	15.1			1.22	0	0		
25		0	0	0	15.7			.77	0	0		
26		0	0	0	6.60			.11	0	0		
27		0	15.5	0	3.59			0	0	0		
28		0	.02	0	1.45			47.9	0	0		
29		0	0	0	2.18			-----	0	0		
30		15.2	0	0	.04			-----	0	0		
31		23.2	-----	0	-----			-----	0	-----		
TOTAL	0	40.4	16.26	48.20	120.63	0	0	72.84	53.20	14.4	0	0
MEAN	0	1.30	0.543	1.65	4.02	0	0	2.60	1.72	0.460	0	0
MGD	0	2.02	0.680	2.41	6.22	0	0	4.02	2.69	0.743	0	0
CFS	0	124	50.0	148	370	0	0	224	163	44.0	0	0
AC-FT	0											

CALENDAR YEAR	1960	MAX	130	MIN	0	MEAN MGD	5.09	MEAN CFS	7.88	AC FT	5,730
FISCAL YEAR 1960-61	MAX	47.9	MIN	0	MEAN MGD	1.00	MEAN CFS	1.55	AC FT	1,120	

Peak discharge (base, 100 mgd).--Oct. 17 (10:30 a.m.) 205 mgd (317 cfs), 4.30 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

135

7040, Wailuku River above Hilo Boarding School ditch intake, near Hilo

Location.--Lat $19^{\circ}42'55''$, long $155^{\circ}09'10''$, on left bank, 1,000 ft upstream from intake of Hilo Boarding School ditch, 0.8 mile west of reservoir 1, and 4 miles west of Hilo.

Drainage area.--125 sq mi.

Records available.--July 1928 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (by barometer).

Average discharge.--31 years (1928-40, 1941-47, 1948-61), 177 mgd (274 cfs) (fiscal year 1929 was completed by compilation).

Extremes.--Maximum discharge during year 6,600 mgd (10,200 cfs) Nov. 11 (gage height, 15.94 ft) from rating curve extended above 3,400 mgd by logarithmic plotting; minimum, 0.62 mgd (0.96 cfs) July 3.

1928-61: Maximum discharge, 41,000 mgd (63,400 cfs) Aug. 11, 1940 (gage height, 28.6 ft, from flood marks), from rating curve extended above 3,400 mgd as explained above; minimum, 0.16 mgd (0.25 cfs) Mar. 9, 1941.

Remarks.--Records good. Board of Water Supply, County of Hawaii, diverts about 1 mgd above station for domestic supply, and water passing station is used for power by Hilo Electric Light Co. Kapehu ditch diverts water from Kapehu Stream into Wailuku River above Pukamau Falls.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0.60	1.3	3.30	3.0	70.0	7.0	650
.9	.86	1.5	6.00	4.0	155	9.0	1,190
1.0	1.23	2.0	19.0	5.0	282	11.0	2,080
1.1	1.73	2.5	40.0	6.0	446	13.0	3,440

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL FYEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	126	42.0	517	92.0	39.5	75.6	54.0	0.83	948	57.6	78.4	33.7
2	87.2	71.9	341	72.1	27.7	70.7	16.1	.80	448	211	56.4	29.7
3	69.3	46.2	205	58.2	22.2	55.8	21.8	1.10	370	480	46.8	26.1
4	54.6	53.3	192	48.0	21.1	46.2	36.0	.69	331	550	39.0	23.7
5	55.8	166	126	40.5	18.7	85.7	20.1	.67	328	176	35.0	21.5
6	95.2	72.1	106	35.0	16.4	64.4	16.4	.67	265	116	32.3	35.3
7	119	66.5	113	31.4	15.2	45.6	12.4	.64	227	80.5	30.5	69.3
8	82.4	103	79.1	31.0	13.5	36.0	11.9	.62	255	208	28.9	52.2
9	56.4	*70.8	61.8	27.7	12.4	31.0	11.3	.62	201	99.2	28.5	30.1
10	91.7	81.9	57.0	26.5	12.1	27.7	8.46	24.4	138	82.6	40.7	25.3
11	61.8	432	78.1	51.4	1,480	24.5	8.00	466	123	57.6	66.0	21.8
12	45.6	247	214	144	2,900	22.2	6.80	411	106	54.0	260	20.8
13	170	120	131	83.0	1,070	231	6.60	156	80.5	67.9	178	22.9
14	182	102	76.3	71.3	659	82.0	7.40	353	63.7	55.8	136	33.7
15	62.4	80.5	60.0	75.9	467	82.6	9.84	466	54.6	48.6	77.0	22.2
16	51.0	67.2	66.5	637	404	49.2	8.00	385	46.8	42.5	*63.8	17.7
17	40.5	66.5	79.8	1,550	456	36.5	6.20	275	41.0	38.5	161	14.9
18	35.0	70.7	52.8	409	384	31.0	4.56	179	36.5	39.0	82.6	13.8
19	30.5	89.0	45.0	221	454	27.3	3.85	465	32.3	55.0	61.8	12.4
20	26.9	55.2	170	137	323	23.7	3.52	1,020	31.0	159	81.2	11.6
21	22.9	58.8	97.6	97.6	867	21.5	3.12	2,060	*28.3	141	80.6	10.1
22	20.4	55.8	73.5	74.2	603	18.7	2.76	957	100	92.1	117	9.61
23	20.1	77.6	65.1	58.8	1,370	17.1	2.49	452	437	141	64.4	7.80
24	59.9	292	126	54.0	604	15.5	2.33	345	387	88.0	53.4	8.69
25	87.7	116	435	54.6	494	14.1	*1.78	331	175	61.8	53.4	12.1
26	44.0	77.0	271	40.0	290	13.5	1.93	397	388	175	182	13.2
27	43.5	60.0	1,130	35.0	193	12.1	1.67	419	299	464	122	12.9
28	36.0	49.8	307	31.0	142	11.3	1.07	1,540	144	171	71.4	11.1
29	29.7	46.2	186	27.7	131	10.8	.74	-----	120	107	59.4	9.84
30	108	1,790	126	25.3	94.4	10.8	1.10	-----	110	81.9	48.0	14.5
31	61.1	1,430	-----	25.3	-----	50.7	*1.10	-----	72.1	-----	39.5	-----
TOTAL	2,076.6	6,157.0	5,588.6	4,365.5	13,584.2	1,344.8	293.32	10,708.04	6,386.8	4,201.6	2,475.0	648.54
MEAN												
MGD	67.0	199	186	141	453	43.4	9.46	382	206	140	79.8	21.6
CFS	104	307	288	218	700	67.1	14.6	592	319	217	124	33.4
AC-FT	6,370	18,900	17,150	13,400	41,690	4,130	900	32,860	19,600	12,690	7,600	1,990

CALENDAR YEAR 1960	MAX 2,900	MIN 10.8	MEAN MOD	214	MEAN CFS	331	AC-FT	240,700
FISCAL YEAR 1960-61	MAX 2,900	MIN 0.62	MEAN MGD 158	MEAN CFS 244	-----	AC-FT 177,500		

Peak discharge (base, 5,600 mgd).--Nov. 11 (8 p.m.) 6,600 mgd (10,200 cfs), 15.94 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

7070. Kapehu ditch diversion near Hilo

Location.--Lat $19^{\circ}43'45''$, long $155^{\circ}11'05''$, on left bank 40 ft downstream from gate on Kapehu ditch, 3.1 miles northwest of Piihonua, and 6.2 miles west of Hilo.

Records available.--May 1954 to June 1961.

Gage.--Water-stage recorder and de Fabritis type-H flume.

Average discharge.--7 years, 1.66 mgd (2.57 cfs).

Extremes.--1954-61: Maximum daily discharge, 11.0 mgd (17.0 cfs) Apr. 25, 1957; no flow occasionally.

Remarks.--Records good except those for periods of no gage-height record which are poor. Ditch diverts water from Kapehu ditch for fluming of sugarcane near Hilo.

DISCHARGE, IN MILLION GALLONS A DAY; FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.65	1.93	2.06	2.55	2.13	0.54	2.13	0	3.26	3.32	3.26	2.87
2	2.55	2.09	2.02	2.50	1.86	0.56	2.13	0	2.50	3.55	3.20	2.81
3	2.45	1.93	2.0	2.50	1.78	0.65	2.13	0	2.65	4.44	3.15	2.70
4	2.40	2.13	2.2	2.45	1.74	0.58	2.13	0	2.50	4.32	3.04	2.60
5	2.40	2.17	2.1	2.40	1.63	0.60	2.01	0	2.65	3.72	3.04	2.55
6	2.40	2.01	2.0	2.40	1.55	0.56	2.35	0	2.50	3.55	3.04	2.81
7	2.50	1.97	2.0	2.35	1.51	0.56	2.55	0	2.40	3.49	2.98	3.15
8	2.35	2.13	2.0	2.35	1.12	0.56	2.65	0	2.40	3.78	2.92	2.87
9	2.30	1.93	2.0	2.30	1.09	1.83	2.40	0	2.30	3.66	2.92	2.76
10	2.35	1.97	2.0	2.25	1.74	2.92	2.21	.01	2.25	3.55	3.09	2.65
11	2.21	1.86	2.5	2.25	3.09	2.92	2.21	.02	2.25	3.43	3.37	2.60
12	2.17	1.93	2.3	2.65	2.43	2.87	2.13	.02	2.17	3.43	3.72	2.60
13	2.74	1.82	2.3	2.35	2.81	6.93	2.05	.02	2.17	3.49	3.66	2.65
14	2.35	1.82	2.2	2.60	2.76	6.00	2.45	2.55	3.13	3.43	3.32	2.70
15	2.17	1.78	2.1	2.35	*2.65	5.84	2.70	3.16	3.72	3.32	3.15	2.55
16	2.17	1.78	2.1	3.92	2.70	5.84	2.17	3.15	3.61	3.32	*3.09	2.45
17	2.09	1.78	2.2	3.52	2.76	5.76	2.01	2.92	3.61	3.26	3.66	2.40
18	2.05	1.82	2.1	1.89	2.76	5.60	1.93	2.76	3.49	3.26	3.09	2.35
19	2.01	1.78	2.2	1.70	2.65	5.60	1.82	3.21	3.49	3.49	3.09	2.40
20	1.97	1.70	2.5	2.13	2.65	5.44	1.78	5.06	3.43	3.90	3.15	2.45
21	1.93	1.70	2.3	2.35	3.04	5.44	1.74	6.32	*3.32	3.66	3.32	2.40
22	1.93	1.70	2.3	2.25	3.04	5.36	1.67	4.78	3.96	3.55	3.32	2.30
23	1.97	1.82	2.3	2.21	3.20	4.18	1.63	3.73	4.20	3.55	3.09	2.25
24	2.13	2.13	2.5	2.17	3.09	2.35	1.59	3.61	4.08	3.43	3.04	2.30
25	2.21	1.70	3.0	2.21	2.92	2.35	*1.48	3.61	4.02	3.26	3.04	2.45
26	2.01	1.67	3.9	2.13	2.76	2.25	1.48	3.78	4.32	4.02	3.49	2.40
27	1.97	1.63	3.0	2.09	2.65	2.17	1.41	3.92	3.96	4.08	3.37	2.40
28	1.97	1.59	*2.8	1.97	2.50	2.17	1.41	4.98	3.72	3.55	3.09	2.35
29	1.97	1.55	2.71	1.93	2.50	2.13	.45	-----	3.61	3.43	3.09	2.35
30	2.35	3.89	2.66	1.89	1.28	2.13	.01	-----	3.49	3.32	2.98	2.62
31	1.97	3.47	-----	1.93	-----	2.17	0	-----	3.43	-----	2.92	-----
TOTAL MEAN	68.69	61.18	70.35	72.54	71.39	94.86	56.81	57.61	98.59	107.56	98.69	76.74
MGD	2.22	1.97	2.34	2.34	2.38	3.06	1.83	2.06	3.18	3.59	3.18	2.56
CFS	3.43	3.05	3.62	3.62	3.68	4.73	2.84	3.19	4.92	5.35	4.92	3.96
AC-FT	211	188	216	223	219	291	174	177	303	330	303	236

Calendar Year 1960 Max 6.93 Min 0 Mean mgd 2.04 Mean cfs 3.16 Ac-ft 2,290
Fiscal Year 1960-61 Max 6.93 Min 0 Mean mgd 2.56 Mean cfs 3.96 Ac-ft 2,070

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 3-28; discharge estimated on basis of records for Kapehu ditch.

ISLAND OF HAWAII

137

7080. Kapehu ditch near Hilo

Location.--Lat 19°43'40", long 155°11'00", 0.9 mile downstream from intake, 3 miles west of Piibonua, and 6 miles west of Hilo.Records available.--March 1938 to June 1941, July 1942 to June 1948, July 1953 to June 1961. September 1948 to April 1951; June 1951 to September 1952; November 1952 to February 1953; June 1953 (monthly discharge only).Gage.--Water-stage recorder and de Fabritis flume. Altitude of gage is 2,000 ft (from topographic map).Average discharge.--19 years (1938-41, 1942-48, 1949-50, 1951-52, 1953-61), 1.47 mgd (2.27 cfs).Extremes.--1938-51, 1942-48, 1953-61: Maximum daily discharge, 7.56 mgd (11.7 cfs) Nov. 1, 1959; no flow at times.Remarks.--Records good. Ditch diverts water from Kapehu Stream 0.6 mile northwest of Station for domestic use in Hilo. Flow sometimes diverted into Kapehu diversion ditch.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.02	0.02	0.02	0.03	0.03	0.01	0	1.45	0	0	0.02	0.02
2	.02	.03	.03	.04	.03	0	0	1.41	0	.02	.03	.02
3	.02	.03	.03	.04	.03	0	0	1.38	0	.04	.02	.02
4	.02	.03	.03	.04	.03	0	.01	1.35	0	.02	.03	.02
5	.03	.03	.03	.03	.03	0	.01	1.32	0	.01	.03	.02
6	.03	.03	.03	.03	.03	0	.01	1.32	0	.01	.03	.02
7	.03	.02	.03	.03	.03	0	.01	1.32	.01	.01	.03	.02
8	.02	.03	.03	.03	.03	0	.01	1.29	.01	.02	.03	.02
9	.03	.03	.03	.03	.03	0	.01	1.29	.01	.01	.03	.02
10	.03	.03	.03	.03	.04	0	.01	2.46	.02	.01	.03	.02
11	.03	.03	.04	.03	.06	0	.01	5.18	.02	0	.03	.02
12	.03	.03	.03	.04	.04	0	.02	5.45	.02	.01	.03	.02
13	.09	.03	.03	.03	.03	.12	.01	4.65	.02	.02	.03	.02
14	.02	.03	.03	.04	.03	.02	.01	1.53	.02	.02	.02	.02
15	.02	.03	.03	.03	.03	.02	.01	0	.02	.02	.02	.02
16	.02	.03	.03	.48	.03	.02	0	.01	.02	.02	.02	.03
17	.02	.03	.03	.12	.02	.02	0	0	.02	.02	.03	.03
18	.03	.03	.03	.04	.03	.02	0	0	.02	.02	.02	.03
19	.03	.03	.03	.03	.03	.02	0	.01	.02	.02	.02	.03
20	.03	.03	.03	.04	.03	0	0	.06	.02	.03	.02	.03
21	.03	.03	.03	.02	.04	0	0	.26	0	.02	.02	.03
22	.03	.03	.03	.03	.04	0	0	.03	.04	.02	.02	.03
23	.03	.03	.03	.03	.04	0	0	0	.02	.02	.02	.03
24	.02	.03	.03	.03	.03	0	.01	0	.02	.02	.02	.04
25	.03	.03	.07	.03	.02	0	.02	0	.02	.03	.02	.04
26	.02	.02	.03	.02	.02	0	.02	0	.02	.04	.02	.04
27	.02	.03	.07	.03	.02	0	.02	.01	.03	.02	.02	.03
28	.02	.03	.02	.03	.02	0	.02	.26	.01	.02	.02	.03
29	.03	.03	.03	.03	.02	0	.40	-----	.01	.02	.02	.03
30	.03	.08	.03	.03	.02	0	1.01	-----	0	.02	.02	.05
31	.03	.06	-----	.03	-----	0	1.45	-----	0	-----	.02	-----
TOTAL MEAN	0.86	0.98	0.97	1.52	0.91	0.25	3.08	32.04	0.40	0.57	0.74	0.80
MGD	0.028	0.032	0.032	0.049	0.030	0.008	0.099	1.14	0.013	0.019	0.024	0.027
CFS	0.043	0.049	0.050	0.076	0.047	0.013	0.154	1.77	0.020	0.029	0.037	0.041
AC-FT	2.60	3.00	3.00	4.70	2.80	0.77	9.50	98.0	1.20	1.70	2.30	2.50
CALCULATED YEAR	1960	MAX	6.50	MIN	0	MEAN MGD	0.431	MEAN CFS	0.667	AC-FT	484	
FISCAL YEAR 1960-61	MAX	5.45	MIN	0	MEAN MGD	0.118	MEAN CFS	0.183	AC-FT	132		

ISLAND OF HAWAII

7420. Kukui Stream near Waimanu

Location.--Lat 20°09'14", long 155°40'15", on left bank 300 ft upstream from Waimanu trail crossing, 0.4 mile east from head of Awini ditch, and 2.2 miles west of Waimanu.

Drainage area.--0.21 sq mi.

Records available.--February 1939 to July 1952, September 1959 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 1,940 ft (by barometer).

Average discharge.--14 years (1939-52, 1960-61), 1.29 mgd (2.00 cfs).

Extremes.--1959-61: Maximum discharge during year, 187 mgd (289 cfs) Apr. 3 (gage height, 4.41 ft), from rating curve extended above 3 mgd on basis of shape of model rating; minimum, 0.21 mgd (0.32 cfs) several days.

1939-52, 1959-61: Maximum discharge, that of Apr. 3, 1961, from rating curve extended above 3 mgd on basis of shape of model rating as explained above; minimum, 0.13 mgd (0.20 cfs) Oct. 25, 1945.

Remarks.--Records good except those for period of no gage-height record, which are fair.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.0	1.5	1.13	0.58	0.36	0.72	0.33	0.26	0.68	0.28	0.28	0.39
2	.80	3.5	1.96	.55	.33	.61	.90	.23	.52	38.6	.28	.49
3	.74	1.6	.88	.52	.31	.48	.55	.21	2.14	42.0	.33	.31
4	.60	* 2.5	.92	.55	.31	.45	.88	.21	.80	10.8	.42	.28
5	.30	.61	.80	.52	.31	.81	.94	.21	.55	1.94	1.38	.59
6	.80	.52	.72	.52	.31	1.22	.39	.21	.48	1.18	.55	7.25
7	.70	.87	.68	.48	.31	.78	.33	.21	1.07	.92	.33	2.19
8	.50	1.00	.58	.48	.33	.48	.31	.21	.96	.76	.28	1.60
9	.35	4.71	.58	.45	.39	.48	.28	.45	.55	1.69	.28	.58
10	.90	2.95	2.23	.45	.92	.52	.26	11.3	.48	.72	.31	.64
11	.60	.92	3.72	.42	1.22	.39	.26	21.1	.42	.61	* 641	.48
12	4.0	.64	1.58	.85	1.91	.82	.26	2.63	.42	.55	2.97	1.61
13	5.0	.61	.72	.55	.78	8.43	.31	.84	.39	.52	.66	1.14
14	4.0	1.67	.84	.42	.45	4.06	.33	4.59	.36	.48	.42	.68
15	1.5	1.09	.96	.39	.42	1.39	.28	3.85	.36	.45	.55	.48
16	.90	1.00	.72	1.33	.48	.76	.26	3.40	.33	.42	1.21	.42
17	.70	.96	1.37	1.49	1.52	.72	.26	1.51	* 33	.42	1.62	.39
18	.50	1.69	.61	.48	.55	.58	.23	1.05	.33	.42	.58	.36
19	.80	.84	2.60	.42	.55	.52	.28	5.72	.33	.48	.55	.39
20	1.5	.64	.76	.42	1.29	.48	* 23	1.96	.33	.42	.42	.36
21	8.0	.64	.61	.39	3.10	.45	.21	2.39	.33	.39	.71	.39
22	1.5	.61	* .61	.39	3.19	.48	.21	1.42	.33	.39	.69	.39
23	3.5	2.11	.61	.42	* 6.09	.48	2.85	1.55	.33	.36	.42	.31
24	10	2.60	.87	.42	9.79	.39	.36	1.39	.33	.36	.45	.28
25	3.5	.72	2.77	.45	2.10	.36	.26	.68	.31	.36	.94	.26
26	2.0	.64	.87	.39	1.00	.33	.31	.58	.49	.42	1.05	.26
27	1.3	.58	2.62	.36	.68	.33	.28	.77	.39	.94	.42	.26
28	.90	.58	.76	.33	.64	.93	.23	1.80	.92	.39	.39	.28
29	1.5	.86	.68	.33	3.68	.33	.21	-----	.56	.31	.39	.26
30	3.0	4.31	.61	.39	.84	.31	.21	-----	.31	.31	.39	.75
31	2.0	1.92	-----	.39	-----	.31	.21	-----	.26	-----	.33	-----
TOTAL	63.59	45.39	35.37	16.13	44.16	28.80	13.21	70.73	16.39	107.89	20.01	24.07
MEAN												
MGD	2.05	1.46	1.18	0.520	1.47	0.929	0.426	2.53	0.529	3.60	0.645	0.802
CFS	3.17	2.26	1.83	0.805	2.28	1.44	0.659	3.91	0.818	5.56	0.999	1.24
AC-FT	195	139	109	50.0	136	88.0	41.0	217	50.0	331	61.0	74.0

Calendar Year 1960 Max 21.2 Min 0.31 Mean mgd 1.59 Mean cfs 2.46 Ac-ft 1,790
Fiscal Year 1960-61 Max 42.0 Min 0.21 Mean mgd 1.33 Mean cfs 2.06 Ac-ft 1,490

Peak discharge (base, 30 mgd).--Feb. 11 (12:30 p.m.) 34.5 mgd (53.4 cfs), 2.60 ft; Feb. 19 (2:30 p.m.) 32.5 mgd (50.3 cfs), 2.54 ft; Apr. 3 (1 a.m.) 187 mgd (289 cfs), 4.41 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 1 to Aug. 4; discharge estimated on basis of records for nearby streams.

ISLAND OF HAWAII

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7430. Avini ditch at East Honokane Iki Gulch, near Kiulii.

Location.--Lat 20°09'55", long 155°43'10", at flume across East Honokane Iki Gulch, 4.5 miles southeast of Kiulii.Records available.--October 1927 to June 1949, July 1950 to June 1961.Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).Average discharge.--31 years (1928-38, 1939-49, 1950-61), 11.9 mgd (18.4 cfs).Extremes.--1927-49, 1950-61: Maximum daily discharge, 33 mgd (51 cfs) Jan. 8, 1935, Aug. 10, 1938; no flow at times.Remarks.--Records good. Ditch diverts water at altitude 2,000 ft from all streams between the Waikaloa and the Honokane. Flow regulated by gates and spillways. Water used for irrigation in vicinity of Kohala.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	8.20	11.3	15.5	6.50	5.44	13.5	4.26	2.33	16.5	4.72	4.86	5.36
2	5.84	17.7	20.0	5.60	5.04	12.7	8.60	2.33	11.4	17.6	4.05	9.33
3	5.12	*11.5	11.1	5.12	3.15	9.22	14.0	1.94	17.3	10.9	5.04	5.76
4	4.80	16.5	13.3	5.28	2.61	13.1	18.6	1.79	16.1	3.98	7.64	4.26
5	4.40	13.6	12.3	5.60	2.27	15.1	15.5	1.69	10.7	2.90	14.7	6.43
6	7.10	8.90	9.66	5.44	2.05	14.6	10.8	1.54	9.44	5.97	13.1	2.7
7	5.84	7.30	9.88	5.44	1.84	12.6	6.40	1.49	17.6	9.06	7.80	20.0
8	4.56	14.7	7.30	7.40	2.00	8.40	4.96	1.36	18.0	8.30	5.76	20.1
9	3.91	21.9	7.40	6.20	2.91	7.30	4.19	1.32	12.9	8.10	4.96	13.5
10	6.93	20.1	8.44	5.04	10.2	11.1	3.77	2.4	7.80	7.20	*12.0	11.2
11	5.44	14.0	16.5	4.26	17.9	7.00	3.49	2.4	6.30	6.50	16.6	11.4
12	10.1	8.70	19.1	10.3	21.5	6.20	3.15	2.07	5.44	6.40	21.3	18.1
13	14.4	7.40	12.4	13.0	17.7	24.4	5.35	1.41	5.04	6.80	16.7	18.3
14	12.9	13.3	12.1	6.60	13.3	22.4	9.24	15.3	4.56	6.20	12.6	15.9
15	6.40	12.7	14.2	4.64	9.88	18.2	4.88	1.87	4.33	5.76	12.4	10.3
16	5.52	17.9	11.5	5.06	15.2	11.9	3.70	8.50	*5.04	5.44	12.1	8.10
17	5.04	15.8	13.3	16.5	21.7	9.22	3.08	5.84	5.04	5.12	19.4	6.30
18	5.68	19.1	9.00	7.80	19.1	7.90	2.98	4.56	4.72	4.80	13.6	5.92
19	6.80	17.0	12.1	4.96	17.0	6.50	*2.73	9.07	4.40	5.12	19.6	6.90
20	9.01	9.33	12.7	4.19	12.6	5.76	2.84	8.00	4.19	5.52	11.2	9.33
21	19.8	8.20	*9.88	3.77	23.4	5.36	2.38	10.5	3.98	4.08	11.8	7.20
22	16.7	7.30	10.9	3.29	*21.7	5.12	2.16	8.70	3.91	4.80	15.3	8.70
23	13.0	17.4	14.1	3.08	23.0	5.28	10.5	5.88	3.91	14.2	11.3	6.80
24	23.0	22.9	17.1	3.29	23.7	4.64	9.54	11.5	4.3	8.70	9.22	4.96
25	18.4	12.7	21.3	3.84	20.1	4.48	4.33	4.80	4.88	5.84	15.3	4.26
26	10.6	8.40	16.7	3.49	17.0	4.19	5.85	4.26	8.65	11.9	16.8	3.91
27	7.30	6.80	19.5	3.02	12.4	3.98	12.0	7.03	11.2	18.0	11.3	3.56
28	6.30	6.00	13.2	2.67	11.1	4.12	5.04	19.7	8.98	12.4	7.40	3.42
29	8.19	5.76	9.33	2.44	19.8	3.84	3.49	-----	17.6	7.40	7.60	4.56
30	17.7	21.9	7.70	2.61	15.2	4.19	2.84	-----	8.40	6.00	7.40	5.84
31	15.8	22.7	-----	3.49	-----	4.26	2.38	-----	5.44	-----	5.44	-----
TOTAL	294.78	418.79	387.49	170.12	390.79	286.56	193.01	240.23	268.88	231.31	348.49	283.20
MEAN	9.51	13.5	12.9	5.49	13.0	9.24	6.23	8.58	8.67	7.71	11.2	9.44
MGD	14.7	20.9	20.0	8.49	20.2	14.3	9.63	13.3	13.4	11.9	17.4	14.6
CFS	905	1,290	1,190	522	1,200	879	592	737	825	710	1,070	869
AC-FT												
CALENDAR YEAR 1960	MAX 24.4	MIN 1.84	MEAN MGD 10.2	MEAN CFS 15.8	AC-FT 11,500							
FISCAL YEAR 1960-61	MAX 24.9	MIN 1.32	MEAN MGD 9.63	MEAN CFS 14.9	AC-FT 10,790							

* Discharge measurement made on this day.

ISLAND OF HAWAII

7440. East Honokane Iki intake to Avini ditch at East Honokane Iki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokane Iki Gulch to Avini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1938, July 1939 to June 1949, July 1951 to June 1961.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--28 years (1928-36, 1937-38, 1939-40, 1941-49, 1951-61), 1.19 mgd (1.84 cfs).

Extremes.--1927-38, 1939-49, 1951-61: Maximum daily discharge, 8.4 mgd (13.0 cfs) Aug. 6, 1957; no flow at times.

Remarks.--Records good.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.59	1.01	2.14	0.32	0.23	1.35	0.26	0.10	1.70	0.26	0.08	0.14
2	.35	2.58	3.68	.29	.14	1.20	.84	.10	1.25	1.57	.08	.35
3	.26	*1.48	1.06	.26	.08	.75	1.34	.08	3.24	.14	.08	.23
4	.23	2.24	1.50	.26	.04	.55	2.06	.08	2.44	.04	.08	.12
5	.17	1.01	1.24	.26	.03	2.06	1.35	.06	1.40	1.79	.71	.66
6	.26	.55	.84	.23	.03	1.77	.87	.04	1.15	1.77	.48	2.95
7	.23	.42	.79	.23	.03	1.15	.38	.04	3.10	1.20	.20	1.77
8	.17	1.86	.48	.23	.03	.63	.26	.03	3.39	.91	.10	1.72
9	.12	4.49	.44	.20	.03	.50	.23	.05	1.85	.71	.08	.87
10	.43	3.07	.93	.17	1.04	.87	.14	3.57	.87	.55	*1.50	.67
11	.23	1.14	2.33	.14	2.97	.41	.12	2.95	.59	.44	2.59	.59
12	1.58	.55	2.61	1.13	4.49	.53	.12	.45	.48	.38	3.85	2.72
13	1.94	.44	1.11	1.05	2.63	4.12	.69	1.24	.38	.35	1.50	1.66
14	1.41	.92	1.01	.32	.79	2.63	.70	2.82	.35	.32	.87	1.01
15	.38	.81	1.50	.17	.55	1.66	.23	2.21	.32	.29	.55	.48
16	.26	2.43	.87	.23	1.53	1.20	.14	2.35	*.26	.23	.67	.35
17	.20	1.38	.67	1.51	3.89	.87	.10	2.63	.26	.23	2.63	.26
18	.17	2.91	.44	.38	2.85	.71	.10	1.66	.26	.20	.83	.26
19	.23	1.96	1.33	.20	1.77	.55	*.08	2.05	.23	.20	.79	.26
20	.54	.55	1.25	.12	1.33	.48	.10	.34	.23	.20	.44	.35
21	3.49	.41	*.57	.10	4.35	.41	.08	.39	.20	.14	.47	.26
22	.81	.38	.55	.10	*3.67	.38	.06	.31	.20	.14	1.01	.51
23	1.83	2.71	1.11	.08	3.05	.38	.64	.20	.23	.93	.44	.26
24	3.71	4.42	1.77	.08	3.15	.32	.59	.23	.20	.32	.29	.17
25	2.38	.91	2.90	.08	1.56	.26	.29	.12	.20	.17	.96	.14
26	1.01	.48	1.20	.08	1.25	.23	1.21	.10	.38	1.15	1.56	.12
27	.55	.38	2.13	.06	1.01	.23	1.16	.17	.32	2.51	.59	.12
28	.41	.32	.75	.04	.96	.23	.29	.26	.92	.63	.29	.12
29	.83	.32	.44	.04	1.58	.20	.20	-----	1.38	.23	.26	.14
30	2.06	3.93	.38	.04	1.30	.17	.12	-----	.38	.17	.29	.44
31	1.77	4.64	-----	.10	-----	.17	.10	-----	.23	-----	.23	-----
TOTAL MEAN	28.60	50.70	38.02	8.50	46.36	26.97	14.85	24.63	28.39	18.17	24.50	19.70
MGD	0.923	1.64	1.27	0.274	1.55	0.870	0.479	0.880	0.916	0.606	0.790	0.657
CFS	1.43	2.53	1.96	0.424	2.39	1.35	0.741	1.36	1.42	0.937	1.22	1.02
AC-FT	88.0	156	117	26.0	142	83.0	46.0	76.0	87.0	56.0	75.0	60.0
CALENDAR YEAR 1960 MAX	4.72	MIN	0.03	MEAN MGD	1.20	MEAN CFS	1.86	AC-FT	1,350			
FISCAL YEAR 1960-61 MAX	4.64	MIN	0.03	MEAN MGD	0.902	MEAN CFS	1.40	AC-FT	1,010			

* Discharge measurement made on this day.

7510. Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'20", long 155°44'15", on right bank of open section of ditch in Pololu Valley just downstream from boundary between land of Honokane and land of Pololu, 2.8 miles upstream from mouth of Pololu Stream and 4 miles south of Niulii.

Records available.--August 1927 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 1,100 ft (from topographic map).

Average discharge.--32 years (1928-38, 1939-61), 27.1 mgd (41.9 cfs).

Extremes.--1927-61: Maximum daily discharge, 65 mgd (101 cfs) July 16, 1958; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Kohala ditch receives flow of Avini ditch at Honokane Gulch and diverts water at altitude of about 1,200 ft from Honokane and all streams west. Water is used for irrigation in vicinity of Kohala.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	28.5	30.0	41.6	22.5	18.1	30.6	16.9	13.9	44	17.6	18.9	16.9
2	24.0	39.8	43.8	21.4	17.4	29.5	21.1	13.9	30	39.3	18.6	22.7
3	22.1	31.5	31.9	20.6	16.0	23.6	29.5	13.3	44	60.0	19.1	19.5
4	22.3	40.1	36.7	20.6	15.3	21.8	39.6	13.2	40	47.5	20.9	17.7
5	20.7	43.4	2	20.6	15.0	33.1	27.6	12.9	30	29.1	29.5	18.5
6	23.4	26.2	29.1	20.4	14.5	33.5	22.6	12.8	26	26.2	29.3	49.1
7	21.9	23.0	31.5	20.6	14.1	29.3	19.1	12.6	46	29.3	22.3	47.8
8	20.6	32.6	23.8	22.3	14.1	22.7	17.4	12.6	48	26.2	20.2	47.0
9	19.5	41.8	24.8	21.2	15.0	21.2	16.0	12.8	38	24.6	19.4	43.1
10	23.0	40.8	24.2	19.5	21.8	23.6	15.6	49.5	32	23.2	31.8	26.8
11	21.6	33.3	37.1	18.6	37.0	20.6	15.3	68.4	26	21.8	38.6	27.2
12	26.5	25.0	46.7	27.4	44.9	20.7	15.1	49.5	24	21.4	45.1	38.1
13	35.8	23.0	36.7	44.9	40.8	48.3	16.9	37.0	22	21.4	36.2	38.9
14	34.4	29.7	31.7	22.3	35.5	42.1	21.4	32.5	20	20.7	30.4	32.6
15	23.2	28.7	35.8	19.4	28.0	38.6	16.8	44.1	* 18	19.9	27.6	25.2
16	21.1	37.2	31.9	17.8	36.5	28.5	15.4	39.1	18.3	19.2	26.8	21.9
17	20.2	34.9	31.7	32.2	43.1	23.4	14.8	35.1	18.3	18.9	43.3	19.9
18	20.6	40.3	26.8	23.0	43.1	16.7	* 15.4	22	17.8	18.4	31.1	20.2
19	21.8	39.6	29.2	19.4	39.6	6.57	14.8	36	17.5	18.9	31.7	20.6
20	24.2	25.8	32.8	18.4	29.3	6.02	16.8	30	17.0	19.9	27.0	22.8
21	39.8	23.6	27.6	17.7	* 48.0	5.91	14.5	38	16.9	18.4	26.6	20.7
22	28.0	22.1	29.1	16.8	43.6	5.80	13.9	32	16.9	19.1	35.3	21.6
23	35.5	34.8	* 35.2	16.5	46.7	5.80	25.0	26	17.0	34.4	27.8	19.4
24	48.9	47.3	42.8	16.8	67.8	5.70	24.1	40	17.0	24.8	23.8	18.1
25	43.3	34.4	47.5	16.9	41.3	5.70	16.9	24	17.6	21.1	30.6	17.4
26	30.0	26.6	39.4	16.9	39.1	5.60	23.6	20	20.6	33.0	35.3	16.6
27	22.7	23.8	41.3	16.0	29.1	5.60	35.1	30	24.6	44.9	28.5	16.0
28	20.6	22.7	32.2	15.3	26.2	5.50	16.6	50	22.4	31.7	22.1	13.9
29	23.0	21.9	26.4	15.3	41.8	5.50	15.9	-----	38.9	23.6	21.8	17.2
30	40.6	42.1	23.2	15.3	34.6	10.9	14.7	-----	22.7	21.1	21.8	18.7
31	38.6	47.8	-----	16.0	-----	17.7	13.9	-----	18.9	-----	19.4	-----
TOTAL	846.4	1,004.6	1,006.7	632.6	937.3	602.10	604.9	815.1	812.4	815.8	859.8	760.1
MEAN												
MGD	27.3	32.4	33.6	20.4	31.2	19.4	19.5	29.1	26.2	27.2	27.7	25.3
CFS	42.2	50.1	51.9	31.6	48.3	30.0	30.2	45.0	40.5	42.1	42.9	39.2
AC-FT	2,600	3,080	3,090	1,940	2,880	1,850	1,860	2,500	2,490	2,500	2,640	2,690

Calendar Year 1960 Max 63.0 Min 5.50 Mean mgd 29.4 Mean cfs 45.5 Ac-ft 33,030
Fiscal Year 1960-61 Max 62.4 Min 5.50 Mean mgd 26.6 Mean cfs 41.8 Ac-ft 29,760

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 18 to Mar. 15; discharge estimated on basis of recorded range in stage and records for nearby stations.

ISLAND OF HAWAII

7550. Kehena ditch near Kohala

Location.--Lat 20°07'25", long 155°45'05", on right bank at old Honokane weir, near head of West Branch of Konokane Mai Gulch, and 6.5 miles southeast of Kohala.

Records available.--December 1917 to November 1919, April 1928 to June 1961.

Gage.--Water-stage recorder and artificial control. Altitude of gage is 3,850 ft (from topographic map). Prior to Apr. 26, 1928, water-stage recorder at same site at different datum.

Average discharge.--34 years (1918-19, 1928-61), 7.69 mgd (11.9 cfs).

Extremes.--1917-19, 1928-61: Maximum daily discharge, 54 mgd (84 cfs) Mar. 23, 1919; no flow at times.

Remarks.--Records good. Intake on Honokane Mai Gulch 2 miles upstream from station at altitude of about 4,200 ft. Kahua Ranch diverts small quantity of water from ditch 2 miles above station for watering stock. Water used for irrigation in vicinity of Hawi.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	6.24	7.06	10.6	1.32	1.30	8.20	0.23	0.44	14.7	1.77	0.86	1.33
2	2.95	13.7	17.0	0.70	1.15	6.89	1.42	0.33	11.9	39.6	0.33	1.30
3	2.06	9.37	5.72	0.70	0.56	3.45	6.68	0.33	21.0	47.0	0.14	0.90
4	1.68	10.9	9.60	0.70	0.33	2.06	1.34	0.14	11.8	27.2	0.14	0.84
5	1.15	8.85	6.57	1.30	0.25	1.95	7.63	0.14	7.67	7.87	0.28	1.83
6	1.50	4.40	6.86	1.32	0.10	9.18	5.26	0.14	7.22	3.92	0.17	1.43
7	0.98	2.49	6.48	1.57	0	4.45	1.87	0.06	13.9	2.50	0.44	1.73
8	0.70	6.25	4.20	2.28	0	2.28	1.15	0	25.1	2.28	0.56	16.0
9	0.56	13.9	5.00	1.50	1.25	1.87	0.70	0	10.8	1.68	0.84	4.72
10	2.78	12.5	2.95	0.98	4.03	2.28	0.44	38.6	4.72	1.12	7.22	2.72
11	1.68	4.45	7.64	0.70	10.8	1.68	0.23	4.70	8.72	0.86	7.87	3.93
12	2.44	2.28	16.9	6.47	27.7	1.95	0.08	26.4	1.87	0.36	7.87	10.7
13	5.69	1.68	7.63	7.59	17.1	21.1	0.98	8.48	1.92	0.44	4.72	9.60
14	5.88	2.28	5.00	2.30	15.1	17.6	0.04	12.7	0.98	0.23	3.48	3.59
15	2.06	3.20	6.37	1.32	11.9	12.3	0.04	21.1	0.84	0.23	1.87	2.93
16	1.68	6.37	5.92	1.15	19.1	5.42	0	14.8	8.70	0.83	1.30	2.06
17	1.50	6.37	3.00	2.95	28.4	2.95	0	9.60	0.86	0.23	0.83	2.67
18	1.50	11.4	3.20	1.87	26.2	2.06	2.19	7.67	0.33	0.14	4.20	7.22
19	2.06	11.0	3.17	0.98	14.3	1.50	5.38	31.0	0.14	0.33	3.39	4.20
20	3.86	3.68	4.72	0.70	8.91	1.15	6.01	23.1	0.08	0.70	4.20	4.45
21	9.10	2.50	5.78	0.70	41.2	0.98	0.15	24.0	0	0.44	4.45	2.28
22	4.66	1.97	7.17	0.56	22.5	0.70	1.70	19.4	0	1.53	5.92	3.20
23	18.5	7.71	5.60	0.33	32.9	0.70	3.03	8.32	0.14	6.89	4.43	2.06
24	35.5	21.4	19.67	0.33	39.8	0.44	2.28	15.1	1.15	2.95	2.50	1.15
25	10.2	6.44	22.0	0.33	15.4	0.23	0.70	10.3	1.60	1.50	4.72	4.98
26	>0.77	2.72	8.80	0.33	11.9	0.14	1.44	13.8	3.65	6.81	6.89	0.70
27	2.50	1.67	9.88	0.33	6.48	0.11	10.4	15.1	2.30	11.3	4.72	4.70
28	1.68	1.50	4.20	0.33	6.46	0	2.50	15.9	3.20	4.48	2.06	3.50
29	2.13	1.32	2.28	0.14	21.1	0	1.32	-----	7.95	1.87	2.95	6.89
30	12.2	12.6	1.30	0.02	0.85	0.17	0.70	-----	2.50	1.15	2.28	8.49
31	10.7	22.6	-----	0.39	-----	0.14	0.44	-----	1.50	1.15	-----	-----
TOTAL	162.19	229.52	226.64	42.62	389.25	136.98	90.68	363.45	168.22	177.94	109.03	143.62
MEAN												
MGD	5.23	7.27	7.55	1.37	13.0	4.42	2.93	13.0	5.43	5.93	3.32	4.79
CFS	0.09	11.3	11.7	2.19	20.1	6.64	4.53	20.1	8.39	9.10	5.14	7.41
AC-FT	498	692	695	191	1.190	420	276	1.120	516	546	316	441

Calendar Year 1960 Max 46.4 Min 0 Mean mgd 6.30 Mean cfs 9.75 Ac-ft 7,080
Fiscal Year 1960-61 Max 47.0 Min 0 Mean mgd 6.11 Mean cfs 9.45 Ac-ft 6,840

* Discharge measurement made on this day.

7560. Kohakohau Stream near Kamuela

Location.--Lat 20°0'30" long 155°40'58", 0.2 mile below Kohala Forest Reserve Boundary and 2 miles northwest of Kamuela.

Drainage area.--2.34 sq mi.

Records available.--March 1956 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (from topographic map).

Average discharge.--5 years, 7.81 mgd (12.1 cfs).

Extremes.--Maximum discharge during year 803 mgd (1,240 cfs) Apr. 3 (gage height, 7.01 ft), from rating curve extended above 20 mgd by test on model of station site; minimum, 0.22 mgd (0.34 cfs) Feb. 9.

1956-61: Maximum discharge, 2,510 mgd (3,880 cfs) Aug. 7, 1958 (gage height, 10.76 ft), from rating curve extended above 20 mgd as explained above; minimum, that of Feb. 9, 1961.

Remarks.--Records good except those above 20 mgd which are fair. Parker Ranch pipeline diverts water above station.

Rating table (gage height, in feet, and discharge,
in million gallons a day)

0.4	0.13	1.0	7.20
.5	.27	1.2	13.8
.6	.54	1.4	23.0
.7	1.14	1.6	36.0
.8	2.50	2.0	66.0
.9	4.50	3.0	143

DISCHARGE: IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.50	4.10	4.98	0.50	0.29	3.20	0.38	0.31	8.88	0.67	0.46	0.62
2	1.35	17.1	14.1	0.46	0.23	2.33	0.58	0.31	6.02	83.7	0.43	0.62
3	1.35	6.99	2.84	0.40	0.22	1.14	1.58	0.29	25.9	123	0.40	0.46
4	1.14	9.28	3.50	0.46	0.22	0.84	5.25	0.27	7.13	28.0	0.40	0.40
5	0.84	5.25	3.20	0.50	0.22	1.00	3.02	0.27	2.17	4.28	0.54	1.15
6	0.67	2.01	2.67	0.43	0.20	4.48	1.86	0.25	2.33	1.71	0.98	2.5
7	0.58	14.35	3.02	0.40	0.20	1.71	0.78	0.22	12.9	1.14	0.67	17.5
8	0.50	2.91	1.46	0.46	0.20	0.98	0.50	0.23	21.5	0.84	0.72	15.7
9	0.46	12.4	2.50	0.43	0.07	0.91	0.40	0.27	5.92	0.67	0.58	2.17
10	0.72	19.9	1.06	0.35	0.35	1.71	0.35	0.35	68.5	2.01	0.50	1.35
11	0.58	2.33	11.3	0.33	0.87	0.72	0.35	0.21	1.14	0.46	1.06	2.14
12	0.46	1.06	14.9	3.45	12.8	0.62	0.33	20.4	0.84	0.43	1.46	10.2
13	1.71	0.78	2.01	2.53	5.25	25.0	0.33	3.20	0.67	0.38	1.14	22.5
14	2.67	2.74	1.35	0.67	0.86	12.3	0.33	11.8	0.58	0.35	0.62	3.02
15	0.91	2.45	1.86	0.43	2.17	0.31	0.31	12.4	0.50	0.33	0.54	1.46
16	1.14	6.45	1.24	0.38	4.53	3.02	0.31	9.27	0.43	0.33	0.58	0.91
17	0.78	7.87	4.80	0.54	13.8	1.46	0.31	5.25	0.40	0.33	0.11	0.72
18	1.24	13.7	1.24	0.46	1.48	0.91	0.43	3.40	0.38	0.31	1.97	0.91
19	1.86	9.02	2.52	0.33	4.02	0.67	0.73	5.28	0.35	0.31	2.88	0.72
20	3.82	1.38	2.17	0.38	1.63	0.54	1.58	18.3	0.33	0.33	1.35	1.24
21	12.7	1.24	1.46	0.50	4.94	0.46	0.46	17.0	0.33	0.31	2.01	0.78
22	3.20	1.06	1.86	0.38	10.8	0.40	0.35	10.5	0.33	0.72	2.84	1.58
23	15.6	8.63	2.17	0.31	23.5	0.38	0.35	9.02	0.33	1.46	1.71	0.78
24	27.8	15.8	5.88	0.33	4.11	0.35	0.33	9.16	0.35	0.62	1.35	0.54
25	17.9	2.01	20.8	0.31	13.0	0.35	0.27	4.75	0.43	0.46	3.80	0.46
26	2.33	0.84	5.25	0.27	6.30	0.35	7.12	5.76	0.38	1.36	2.01	0.40
27	0.91	0.67	9.18	0.27	2.17	0.33	5.38	4.04	0.58	0.80	1.14	0.38
28	0.67	0.54	1.71	0.25	2.50	0.33	0.67	12.7	0.54	1.46	0.62	0.38
29	3.49	0.58	0.91	0.25	21.3	0.35	0.40	-----	0.91	0.78	0.67	0.54
30	8.86	14.9	0.67	0.23	4.50	0.35	0.33	-----	0.54	0.54	0.58	0.50
31	7.79	30.0	-----	0.29	-----	0.33	0.31	-----	0.40	-----	0.46	-----
TOTAL	126.53	205.54	133.71	17.23	250.20	85.83	35.88	355.88	105.70	264.58	41.39	119.63
MEAN	4.08	6.63	4.46	0.556	8.34	2.77	1.16	12.7	3.41	8.82	1.34	3.99
MGD	6.31	10.3	6.90	0.860	12.9	4.28	1.79	19.7	5.27	13.6	2.07	6.17
CFS	388	631	410	53.0	768	263	110	1,090	324	812	127	367
AC-FT												

Calendar Year 1960 Max 359 Min 0.20 Mean mgd 7.49 Mean cfs 11.6 Ac-ft 8,410
Fiscal Year 1960-61 Max 123 Min 0.20 Mean mgd 4.77 Mean cfs 7.38 Ac-ft 5,380

Peak discharge (base, 200 mgd).--Feb. 19 (1 p.m.) 284 mgd (439 cfs), 4.50 ft; Apr. 3 (3:30 a.m.) 803 mgd (1,240 cfs), 7.01 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

7570. Waikoloa Stream near Kamuela

Location--Lat 20°03'17", long 155°40'02", on left bank 350 ft downstream from Parker Ranch boundary and 2.1 miles north of Kamuela.Drainage area--0.78 sq. mi.Records available--May 1947 to June 1961.Gage--Water-stage recorder and artificial control. Altitude of gage is 3,580 ft (from topographic map).Average discharge--1^{1/2} years, 5.09 mgd (7.88 cfs).Extremes--Maximum discharge during year, 340 mgd (526 cfs) Apr. 3 (gage height, 4.68 ft), from rating curve extended above 19 mgd by logarithmic plotting; minimum, 1.02 mgd (1.58 cfs) Feb. 5-9.

1947-61: Maximum discharge 860 mgd (1,330 cfs) Oct. 23, 1957 (gage height, 6.55 ft) from rating curve extended above 19 mgd as explained above; minimum, 0.79 mgd (1.22 cfs) June 9, 1957.

Remarks--Records good.

Rating table, (gage height, in feet, and discharge, in million gallons a day)

1.2	0.58	2.0	13.2
1.3	1.24	2.3	24.0
1.4	2.13	2.6	40.0
1.5	3.25	3.0	70.0
1.7	6.10		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.46	4.69	4.50	1.95	1.77	3.02	1.41	1.04	3.64	1.41	1.10	1.41
2	1.95	*9.60	8.23	1.86	1.59	2.25	.97	3.13	42.1	*97	1.59	
3	1.95	6.75	4.63	1.86	1.41	2.13	.97	7.29	61.5	1.10	1.24	
4	1.95	6.85	6.02	1.86	1.41	1.86	4.73	.91	3.76	17.7	1.32	1.10
5	1.77	4.28	4.05	1.95	1.32	5.64	3.54	.84	2.13	4.31	2.71	1.93
6	1.68	2.80	3.56	1.95	1.32	3.64	2.63	.84	2.66	2.46	2.69	16.8
7	1.59	2.66	3.33	2.13	1.32	3.48	1.77	.84	6.25	1.95	1.68	8.91
8	1.50	3.92	2.57	2.24	1.32	2.35	1.50	.84	8.77	1.77	1.86	7.81
9	1.50	9.73	3.64	2.24	3.51	2.66	1.32	1.08	3.96	1.59	*1.50	2.46
10	1.86	8.79	2.46	1.95	4.39	3.51	1.32	2.91	2.04	1.41	1.77	1.95
11	1.68	3.25	9.87	1.86	5.77	2.04	1.17	2.41	1.68	1.32	1.77	2.51
12	1.86	2.35	7.87	4.53	6.06	2.08	1.17	8.34	1.59	1.24	2.91	7.68
13	4.75	2.04	2.91	3.05	3.51	14.9	1.17	3.13	1.41	1.24	2.13	4.45
14	3.63	4.88	2.69	2.04	*3.13	8.08	1.17	6.81	1.41	1.17	1.41	3.25
15	2.13	4.01	3.13	1.86	2.46	5.10	1.10	10.7	1.41	1.17	1.24	2.13
16	2.46	7.63	3.06	1.86	2.80	3.02	1.10	7.08	1.41	1.17	1.68	1.77
17	1.95	8.06	6.87	2.46	4.67	2.24	*1.04	4.61	1.32	1.10	4.31	1.68
18	2.91	10.4	2.80	1.95	5.03	1.95	1.17	3.25	1.24	1.04	2.13	1.68
19	3.02	6.79	3.87	1.77	3.38	1.86	1.17	12.1	1.24	1.04	2.91	1.86
20	4.54	2.91	*3.32	1.59	2.57	1.68	1.32	6.35	1.24	1.04	1.68	2.46
21	10.0	2.91	2.57	1.59	18.3	1.59	1.17	6.37	1.24	*97	2.13	1.86
22	3.55	2.91	2.80	1.59	3.21	1.50	1.04	3.99	1.24	*71	2.46	
23	4.55	5.90	2.91	1.59	6.65	1.50	1.24	2.69	1.24	2.57	1.86	1.86
24	12.1	5.98	3.95	1.68	16.6	1.41	1.17	3.98	1.24	1.50	1.95	1.50
25	7.37	3.02	10.3	1.77	7.36	1.41	1.04	3.02	1.41	1.24	4.20	1.41
26	2.91	2.24	4.83	1.68	3.78	1.41	3.29	2.80	1.68	1.77	2.24	1.41
27	2.13	1.95	8.29	1.59	2.46	1.32	3.40	2.39	1.68	3.91	1.68	1.32
28	1.95	1.95	2.90	1.50	2.46	1.24	1.50	6.01	1.59	1.77	1.32	1.32
29	6.40	2.72	2.35	1.41	11.4	1.41	1.17	-----	2.13	1.32	1.32	1.41
30	7.25	10.3	2.04	1.41	3.91	1.32	1.10	-----	1.50	1.24	1.24	1.50
31	5.64	12.6	-----	1.50	-----	1.32	1.04	-----	1.32	-----	1.17	-----
TOTAL	110.99	164.87	132.22	60.27	136.87	69.36	52.49	165.75	73.85	165.73	60.44	90.72
MEAN												
MGD	3.58	5.32	4.41	1.94	4.56	2.88	1.69	5.92	2.38	5.52	1.95	3.02
CFS	5.54	8.23	6.82	3.01	7.06	4.46	2.62	9.16	3.69	8.55	3.02	4.68
AC-FT	341	506	406	185	420	274	161	509	227	509	185	278

Calendar Year 1960 Max 123 Min 1.24 Mean mgd 4.95 Mean cfs 7.66 Ac-ft 5,560
Fiscal Year 1960-61 Max 61.5 Min 0.84 Mean mgd 3.57 Mean cfs 5.52 Ac-ft 4,000

* Discharge measurement made on this day.

ISLAND OF HAWAII

145

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 and 1.5 miles north of Kamuela.Drainage area--1.18 sq mi.Records available--May 1947 to June 1961.Gage--Water-stage recorder and artificial control. Altitude of gage is 3,450 ft (from topographic map).Average discharge--14 years, 6.33 mgd (9.79 cfs).Extremes--Maximum discharge during year, 272 mgd (421 cfs) Apr. 3 (gage height, 4.31 ft), from rating curve extended above 14 mgd by logarithmic plotting; minimum, 0.96 mgd (1.01 cfs) Feb. 9.

1947-61: Maximum discharge, 1.180 mgd (1,830 cfs) Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 14 mgd as explained above; minimum, 0.65 mgd (1.01 cfs) Dec. 1, 1954.

Remarks--Records good. Diversion above station for livestock and domestic use.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.60	2.0	8.60
1.5	1.15	2.2	14.5
1.6	2.00	2.4	24.0
1.7	3.05	2.6	36.5
1.8	4.50	3.0	71.0
1.9	6.40	3.5	129

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	2.50	5.55	5.70	2.10	1.66	3.31	1.50	1.15	4.18	1.36	1.22	1.58
2	2.10	*14.4	11.7	1.82	1.90	2.83	2.36	1.15	3.44	58.8	1.15	1.58
3	2.00	9.05	5.89	1.74	1.43	2.20	3.78	1.03	9.77	87.2	1.29	1.29
4	2.00	9.42	7.98	1.82	1.36	1.82	5.89	1.03	4.56	28.2	1.50	1.22
5	1.74	5.29	5.33	2.20	1.36	7.27	4.03	1.03	2.40	5.63	3.04	2.45
6	1.66	3.05	3.88	2.20	1.29	4.38	3.01	.96	2.88	2.83	3.09	24.5
7	1.50	3.01	3.76	2.30	1.29	3.71	2.00	.96	8.03	2.20	2.00	11.9
8	1.43	4.68	2.72	2.30	1.36	2.40	1.58	.96	12.6	1.74	2.10	10.0
9	1.36	14.7	4.24	2.20	3.50	2.82	1.43	1.03	4.97	1.66	*1.66	2.72
10	1.66	13.5	2.72	2.00	4.47	4.06	1.36	45.4	2.30	1.43	1.82	2.10
11	1.43	4.02	13.0	1.82	5.56	2.20	1.29	60.7	1.82	1.29	1.82	3.10
12	1.66	2.61	11.4	4.99	7.98	2.07	1.22	14.4	1.58	1.29	3.05	9.71
13	5.19	2.30	3.18	3.15	3.86	23.6	1.22	3.65	1.50	1.22	2.50	4.91
14	4.30	6.26	2.83	2.10	*3.31	11.1	1.22	8.90	*1.36	1.22	1.58	3.44
15	2.20	5.10	3.44	1.74	2.72	6.95	1.22	14.2	1.29	1.22	1.43	2.30
16	2.40	10.8	3.44	1.74	3.05	3.44	1.22	10.8	1.29	1.15	1.83	1.74
17	2.00	10.9	8.86	2.50	5.81	2.40	*1.10	5.96	1.29	1.15	5.25	1.66
18	2.63	15.1	3.18	2.00	6.15	2.10	1.29	3.57	1.29	1.10	2.56	1.66
19	2.63	8.70	4.45	1.66	4.02	1.74	1.22	18.9	1.22	1.22	3.33	1.74
20	4.14	3.31	*3.92	1.66	2.94	1.58	1.43	9.08	1.22	1.22	2.00	2.40
21	14.0	3.44	2.72	1.66	28.0	1.50	1.22	8.82	1.15	1.10	2.61	1.66
22	3.91	3.31	3.05	1.58	6.79	1.43	1.10	5.24	1.22	1.91	2.72	2.40
23	5.28	7.74	3.31	1.66	8.11	1.36	1.22	2.83	1.15	3.07	2.10	1.66
24	18.3	7.78	4.47	1.74	25.3	1.29	1.22	4.40	1.22	1.66	2.20	1.36
25	10.7	3.44	13.8	1.74	10.6	1.29	1.10	3.23	1.36	5.01	1.29	
26	3.15	2.40	6.24	1.66	4.34	1.29	4.20	3.05	1.66	1.82	2.61	1.29
27	2.30	*11.0	11.6	1.58	2.72	1.22	4.48	2.39	1.58	4.33	1.82	1.22
28	2.10	2.10	3.31	1.50	2.50	1.22	1.66	7.43	1.58	2.10	1.50	1.22
29	8.82	2.85	2.50	1.43	15.9	1.36	1.29	-----	2.20	1.50	1.50	1.29
30	10.1	14.0	2.30	1.36	4.50	1.36	1.15	-----	1.43	1.36	1.36	1.36
31	6.75	19.7	-----	1.50	-----	1.29	1.10	-----	1.29	-----	1.29	-----
TOTAL	132.54	220.61	164.92	61.45	173.38	106.59	59.08	242.25	84.83	223.34	68.94	106.75
MEAN												
MGD	4.28	7.12	5.50	1.98	5.78	3.44	1.91	8.65	2.74	7.44	2.22	3.56
CFS	6.61	11.0	8.50	3.07	8.94	5.32	2.95	13.4	4.23	11.5	3.44	5.50
AC-FT	407	677	506	189	532	327	181	743	260	685	212	328
CALENDAR YEAR	1960	MAX	139	MIN	1.22	MEAN MGD	6.39	MEAN CFS	9.89	AC FT	7,180	
FISCAL YEAR 1960-61	MAX	67.2	MIN	0.96	MEAN MGD	4.51	MEAN CFS	6.98	AC FT	5,050		

Peak discharge (base, 100 mgd).--Apr. 3 (4 a.m.) 272 mgd (421 cfs), 4.31 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

7590, Hauani Stream near Kamuela

Location--Lat 20°02'28", long 155°39'05", 1,350 ft below Hawaii County pipeline intake and 1.8 miles northeast of Kamuela.Drainage area--0.47 sq mi.Records available--March 1956 to June 1961.Gage--Water-stage recorder. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply benchmark).Extremes--Maximum discharge during year, 282 mgd (436 cfs) Apr. 3 (gage height, 3.73 ft) from rating curve extended above 23 mgd by logarithmic plotting; no flow Jan. 25-26, Feb. 7-8.

1956-60: Maximum discharge, 325 mgd (503 cfs) Oct. 23, 1957 (gage height, 4.65 ft) from rating curve extended above 7 mgd by slope-conveyance study; no flow Jan. 25-26, Feb. 7-8, 1961.

Remarks--Records good.

Rating table, (gage height, in feet, and discharge, in million gallons a day)

0.7	0	1.6	8.40
.8	.12	1.8	15.3
1.0	.74	2.0	25.0
1.2	1.86	2.2	37.0
1.4	4.04	2.4	52.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.29	1.08	0.83	0.26	0.06	0.41	0.14	0.02	0.41	0.06	0.08	0.08
2	2.58	2.10	.21	.06	.32	.32	.02	.32	23.5	.06	.08	.08
3	.26	1.30	1.28	.21	.04	.26	.39	.01	.94	39.2	.10	.04
4	.26	1.64	1.53	.23	.03	.18	.47	.01	.47	6.84	.08	.03
5	.21	.70	.78	.26	.03	.94	.26	.01	.23	1.16	.21	.14
6	.18	.41	.44	.29	.02	.47	.18	.01	.21	.47	.26	3.59
7	.16	.45	.44	.26	.04	.38	.10	.01	.94	.38	.14	1.93
8	.18	.57	.41	.21	.04	.26	.08	.01	2.18	.29	.16	2.06
9	.18	3.32	.58	.18	.14	.42	.03	.06	.70	.23	.10	.41
10	.16	2.23	.41	.18	.29	.48	.02	17.0	.26	.18	.10	.29
11	.14	.66	3.15	.18	.39	.18	.02	20.7	.18	.14	.08	.37
12	.23	.44	1.81	.54	.59	.18	.01	3.38	.14	.12	.18	1.29
13	1.48	.38	.44	.32	.29	5.28	.01	.66	.14	.12	.21	.70
14	.55	1.00	.41	.18	.21	2.26	.01	1.47	.10	.10	.08	.50
15	.23	.73	.41	.16	.16	.92	.01	1.94	.08	*.06	*.06	.38
16	.23	2.20	.48	.16	.16	.41	.01	2.19	.06	.06	.12	.23
17	.18	1.61	1.06	.29	.44	.29	.01	.95	.04	.06	.52	.21
18	.18	2.78	.41	.18	.38	.18	.03	.47	.04	.06	.25	.21
19	.21	1.27	.50	.16	.32	.14	.02	4.77	.04	.08	.37	.21
20	.90	.50	.41	.16	.27	.14	.02	1.49	*.03	.10	.16	.21
21	2.15	.47	.35	.16	6.68	.12	.01	1.25	.04	.06	.18	.16
22	.56	.47	.38	.16	.93	.12	.01	.60	.04	.28	.26	.35
23	1.25	.84	.38	.14	.78	.12	.01	.29	.06	.35	.16	.16
24	5.70	.66	5.78	.16	8.46	.08	*.01	.41	.06	.16	.23	.10
25	1.86	.38	1.29	.08	2.06	.06	.01	.29	.08	.10	.55	.10
26	.47	.32	*.58	.10	.54	.04	.35	.29	.18	.10	.26	.06
27	.35	.29	1.52	.06	.35	.04	.35	.18	.16	.26	.18	.06
28	.26	.26	.44	.04	.32	.04	.06	.67	.08	.12	.12	.04
29	2.84	.36	.32	.04	2.67	.06	.02	-----	.08	.10	.14	.04
30	1.42	1.84	.29	.04	.47	.08	.01	-----	.04	.08	.10	.06
31	.82	4.00	-----	.06	-----	.04	.01	-----	.03	-----	.08	-----
TOTAL	24.12	35.74	29.21	5.66	27.22	14.90	2.99	59.16	8.36	74.82	5.58	14.09
MEAN												
MGD	0.778	1.15	0.974	0.183	0.907	0.481	0.096	2.11	0.270	2.49	0.180	0.470
CFS	1.20	1.78	1.51	0.283	1.40	0.744	0.149	3.27	0.417	3.86	0.279	0.727
AC-FT	76.0	110	90.0	17.0	84.0	46.0	9.20	182	26.0	230	17.0	43.0

Calendar Year	1960	Max	65.6	Min	0.02	Mean mgd	1.22	Mean cfs	1.89	Mean ac-ft	1,370
Fiscal Year	1960-61	Max	39.2	Min	0.01	Mean mgd	0.827	Mean cfs	1.28	Mean ac-ft	928

Peak discharge (base, 50 mgd)...Apr. 3 (3:30 a.m.) 282 mgd (436 cfs), 3.73 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

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7592. Right Branch Waiaha Stream near Holualoa

Location.--Lat 19°38'42", long 155°54'53", on right bank, 1000 ft above Huchue Ranch water tanks, 2.6 miles east of Holualoa cemetery, and 4.6 miles southeast from Honokohau School.

Records available.--April 1960 to June 1961.

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

Extremes.--Maximum discharge during year, 110 mgd (170 cfs) Mar. 29 (gage height, 4.07 ft); no flow for many days.

1960-61: Maximum discharge, that of Mar. 29; no flow for many days.

Remarks.--Records good.

Rating table, Apr. 16, 1960 to June 30, 1961 (gage height, in feet, and discharge, in million gallons a day)

1.06	0	1.4	0.40	2.0	4.50
1.1	.01	1.5	.70	2.2	7.50
1.2	.07	1.6	1.14	2.4	11.5
1.3	.20	1.8	2.40		

Discharge, in million gallons a day, 1960

Day	April	May	June	Day	April	May	June	Day	April	May	June	Day	April	May	June
1	-	0.08	0.31	7	-	0.01	0.29	13	-	0.51	0.03	19	0.10	0.13	0.31
2	-	.08	.23	8	-	.01	.21	14	-	.27	.05	20	.11	.12	.09
3	-	.03	.15	9	-	.12	.16	15	-	.10	.04	21	.05	.10	.05
4	-	.02	.09	10	-	.23	.09	16	0	.08	.03	22	.06	.09	.03
5	-	*.01	.15	11	-	.37	.05	17	0	.06	.02	23	.10	.10	*.18
6	-	.01	.48	12	-	2.13	.05	18	.02	.07	.51	24	.05	1.01	.20
Total															
Mean in million gallons a day															
Mean in cubic feet per second															
Runoff in acre-feet															

*Discharge measurement made on this day.

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.02	0.01	0.25	0.01	0.03	0.01	0.06	0	0.01	0.25	0.05	0.45
2	.02	.02	.09	.01	.02	.01	.05	0	.01	.21	.03	.33
3	.01	.06	.03	.01	.02	.0	.02	0	.02	.66	.04	.16
4	.01	.02	.03	.01	.02	0	.01	0	.03	1.20	.08	.18
5	.01	.01	.06	.01	.01	.39	.01	0	.05	.33	.07	.44
6	.01	.01	.04	.05	.01	.01	.01	0	.20	.13	.07	.52
7	.01	.02	.03	.05	.01	.03	.0	0	.11	.15	.16	.67
8	.01	.02	.03	.28	.01	.03	0	0	.05	.10	.10	.316
9	.03	.01	.01	.11	.01	.01	0	0	.02	.05	.12	.48
10	.01	.01	.04	.05	.01	.01	0	0	.01	.04	.13	.15
11	.03	.01	.03	.05	.01	.01	0	0	.02	.03	.09	.12
12	.03	.23	.01	.11	.01	.01	0	.02	.05	.02	.06	*.13
13	.01	.35	.02	.11	.01	.01	0	.16	.07	.02	.05	.11
14	.01	.25	.05	.05	.01	.01	0	.13	.04	.02	.11	.36
15	.01	.15	.02	.03	.01	.01	0	.05	.02	.01	.17	.62
16	.01	.09	.01	.01	.01	.11	0	.02	.02	.01	.10	.62
17	.01	.06	.01	.01	.01	.03	0	.01	.01	.01	.08	.21
18	.01	.04	.01	.05	*.01	.02	0	.01	.01	.02	.20	.28
19	0	.03	.01	.04	.01	.01	0	.01	.01	.08	.15	.18
20	0	.03	.01	.31	.01	.01	0	.01	.01	.09	.12	.16
21	0	.02	.01	.21	.01	.01	A0	.01	.01	.34	.47	.12
22	0	.01	.01	.08	.01	.01	A0	.01	.01	.23	.20	.09
23	0	.01	.01	.07	.01	.01	0	.01	.01	2.01	.27	.09
24	0	.02	.01	.06	.01	.01	0	.01	.01	.86	.12	.06
25	.18	.06	0	.05	.01	.01	0	.03	.01	.21	.08	.05
26	.05	.04	0	.03	.01	.01	0	.02	.01	.11	.13	.04
27	.01	.03	0	.02	.01	0	.01	.01	.21	.10	.03	
28	.01	.02	0	.02	.01	0	.01	8.10	.24	.09	.03	
29	0	.02	0	.02	.01	0	0	-----	*9.68	.13	.67	.08
30	0	.01	*0	.04	.01	0	0	-----	*.67	.07	.51	.06
31	0	.11	-----	.07	-----	0	0	-----	*.18	-----	.71	-----
TOTAL	0.49	1.78	0.83	2.03	0.35	0.85	0.18	0.53	26.56	7.84	5.33	9.98
MEAN												
MGD	0.016	0.057	0.028	0.065	0.012	0.027	0.006	0.019	0.857	0.261	0.172	0.933
CFS	0.025	0.089	0.043	0.101	0.018	0.042	0.009	0.029	1.33	0.404	0.266	0.515
AC-FT	1.50	5.50	2.50	6.20	1.10	2.60	0.55	1.60	82.0	24.0	16.0	31.0
CALENDAR YEAR 1960 MAX	-	MIN	-	MEAN MGD	-	MEAN CFS	-	MEAN CPS	-	AC-FT	-	
FISCAL YEAR 1960-61 MAX	9.68	MIN	0	MEAN MGD	0.155	MEAN CFS	0.240	MEAN CPS	175	AC-FT	-	

* Discharge measurement made on this day.

A No gage-height record; discharge estimated on basis of records for nearby streams.

ISLAND OF HAWAII

7593. Waiaha Stream at Luauai

Location.--Lat 19°38'12", long 155°55'45", on right bank 1.4 miles above Board of Water Supply office, 1.6 miles east of Molualoa Cemetery and 4.2 miles southeast of Honokohau School.

Drainage area.--7.30 sq mi.

Records available.--April 1960 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

Extremes.--1960: Maximum discharge during period April to June, 30.7 mgd (47.5 cfs) May 12 (gage height, 2.86 ft), from rating curve extended above 2.0 mgd on basis of slope-area measurement at gage height 4.60 ft; no flow Apr. 14-16, May 5-8.

1960-61: Maximum discharge during fiscal year, 188 mgd (291 cfs) Mar. 29 (gage height, 4.61 ft), from rating curve extended above 2.0 mgd as explained above; no flow many days.

Remarks.--Records good. Ruehue Ranch diverts flow for domestic use from tributary above station.

Discharge, in million gallons a day, 1960

Day	April	May	June	Day	April	May	June	Day	April	May	June	Day	April	May	June
1	-	0.01	0.66	7	-	0	0.54	13	-	1.17	0.06	19	0.51	0.14	0.85
2	-	.02	.53	8	-	0	.39	14	0	0.47	.07	20	.18	.13	.17
3	-	.01	.26	9	-	.03	.27	15	0	.13	.03	21	.03	.09	.06
4	-	.01	.14	10	-	.05	.10	16	0	.19	.02	22	.22	.11	.02
5	-	*0	.44	11	-	.81	.04	17	.01	.02	.01	23	.11	.09	*.43
6	-	0	1.11	12	-	4.94	.06	18	.03	.06	1.55	24	.02	1.52	.37
Total															
Mean in million gallons a day															
Mean in cubic feet per second															
Runoff in acre-feet															

* Discharge measurement made on this day.

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0.01	0.60	0	0.01	0	0.18	0	0	0.62	0.02	0.67
2	0	.04	.19	0	.01	0	.02	0	.01	.38	.01	.46
3	0	.12	.10	0	0	0	.01	0	0	.74	.04	.28
4	0	.02	.08	0	.01	0	0	0	0	2.78	.10	.24
5	0	.01	.16	.03	0	.26	0	0	.01	.64	.06	.79
6	0	.01	.07	.05	0	.02	0	0	.26	.20	.06	1.01
7	0	.04	.08	.02	0	.01	0	0	.04	.16	.17	.18
8	0	.01	.06	.33	0	0	0	0	.02	.08	.17	1.80
9	0	.01	.04	.09	0	0	0	0	.01	.05	.22	1.31
10	0	0	.08	.03	0	0	0	0	.01	.01	.46	.28
11	.01	*0	.02	.02	0	0	0	0	.04	0	.17	.21
12	.01	0	.02	.11	0	0	0	0	.04	0	.08	*.22
13	0	.32	.01	.08	0	0	0	.30	.02	.01	.06	.20
14	0	.18	.01	.02	0	0	0	.13	0	0	.25	.72
15	0	.04	.01	.01	0	0	0	.02	.01	0	.74	.98
16	0	.02	.01	.01	0	.04	0	.01	.01	0	.20	1.00
17	0	.01	.09	0	0	.01	0	.01	.01	0	.10	.38
18	0	.01	.12	0	0	0	0	0	0	.04	*.23	.29
19	0	.02	.06	.01	0	0	0	0	0	.06	.16	.20
20	0	.02	.08	.44	0	0	0	0	0	0	.03	.13
21	0	.01	.06	.32	0	0	0	0	0	1.28	.69	.19
22	0	.01	.03	.09	0	0	0	0	0	.41	.21	.14
23	0	.01	.02	.07	0	0	0	0	0	5.08	.43	.10
24	0	.47	.01	.03	0	0	0	0	0	1.82	.14	.09
25	<u>.32</u>	.24	.01	.07	0	0	0	0	0	.29	.08	.07
26	.04	.13	.01	.04	0	0	0	0	0	.17	.20	.04
27	.01	.06	0	.01	0	0	0	0	18.8	.19	.14	.02
28	0	.03	0	.01	0	0	0	0	27.1	.17	.17	.02
29	0	.02	0	.01	0	0	0	0	* 22.2	.10	1.81	.04
30	0	.01	0	.04	0	0	0	0	* 23.8	.06	.94	.03
31	0	.08	-----	.03	-----	0	0	0	* .36	1.29	-----	-----
Total	0.39	1.96	2.03	1.97	0.03	0.34	0.21	0.48	71.34	15.37	9.53	29.38
Mean												
Mgd	0.012	0.063	0.068	0.064	0.001	0.011	0.007	0.017	2.30	0.512	0.307	0.979
Cfs	0.019	0.098	0.105	0.099	0.002	0.017	0.011	0.026	3.56	0.792	0.475	1.51
Ac-ft	1.2	6.0	6.2	6.0	0.09	1.0	0.6	1.5	219	47	29	90

Calendar Year 1960 Max Min Mean mgd Mean cfs - Mean ac-ft -
Fiscal Year 1960-61 Max 27.1 Min 0 Mean mgd 364 Mean cfs 563 Mean ac-ft 408

Peak discharge (base, 90 mgd).--Mar. 29 (7 p.m.) 188 mgd (291 cfs), 4.61 ft; June 8 (5 p.m.) 148 mgd (229 cfs), 4.31 ft.

* Discharge measurement made on this day.

ISLAND OF HAWAII

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7595. Waiaha Stream near Holualoa

Location.--Lat $19^{\circ}38'20''$, long $155^{\circ}56'35''$, on left bank one-half mile above Board of Water Supply office, 1.2 miles north of Holualoa Post Office, and 3.5 miles east of Kailua, Kona.

Drainage area.--7.3 sq mi. (High flows break out of channel and enter adjacent streams.)

Records available.--December 1957 to June 1961.

Gage.--Water-stage recorder and concrete and rock control. Altitude of gage is 1,940 ft (from topographic map).

Extremes.--Maximum discharge during year 304 mgd (470 cfs) June 8 (gage height, 3.82 ft) from rating curve extended above 8.3 mgd by logarithmic plotting; no flow for many days.

1957-61: Maximum discharge, 558 mgd (863 cfs) Jan. 18, 1959 (gage height, 4.76 ft), from rating curve extended above 8.3 mgd by logarithmic plotting; no flow for many days.

Remarks.--Records good except those above 8.3 mgd, which are poor and those for periods of no gage-height record, which are fair. Emeke Ranch has an offstream reservoir about one mile upstream from the gage and diverts water from the stream.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.23	0	0.8	3.50
.3	.03	1.0	7.10
.4	.17	1.5	23.0
.5	.54	1.8	39.5
.6	1.18		

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1		0	0.12	0	0.01			0	0	0.13	0	0.39
2		0	.02	0	0			0	0	.20	0	.25
3		.12	.02	0	0			0	0	.10	0	.05
4		.02	.02	0	0			0	0	2.73	0	.03
5		.01	.03	0	0			0	0	.67	0	.38
6		0	.04	0	0			0	0	.02	0	.54
7		.01	.14	0	0			0	0	.01	0	.95
8		.01	.06	.95	0			0	0	.01	.04	33.0
9		.01	.03	.08	0			0	0	0	.03	1.68
10		0	.03	.02	0			0	0	0	.03	.03
11		0	.02	.01	0			0	0	0	.02	.02
12		0	.01	.01	0			0	.01	0	.01	.02
13		.69	.01	.01	0			.10	.01	0	.01	.02
14		.06	.01	.01	0			.03	.01	0	.08	.32
15		.03	.01	0	0			.01	.01	0	.87	.58
16		.02	.01	0	0			0	.01	0	.15	.60
17		.01	.07	0	0			0	.01	0	.03	.09
18		.01	.12	0	0			0	0	0	.05	.05
19		.01	.03	0	0			0	0	0	.03	.05
20		.01	.02	.61	0			0	0	0	.02	.03
21		0	.02	.33	0			0	0	1.49	.03	.02
22		0	.02	.03	0			0	0	.18	.02	.02
23		0	.01	.02	0			0	0	5.71	.03	.01
24		.31	.01	.01	0			0	0	4.55	.02	.01
25		.15	.01	0	0			0	0	.07	.01	
26		.05	.01	0	0			0	0	.02	.01	0
27		.03	.01	0	0			0	22.7	.01	.01	
28		.02	0	0	0			0	37.4	.01	.01	0
29		.01	0	0	0			-----	*26.2	0	2.57	0
30		.01	0	.02	0			-----	3.24	0	1.11	0
31		.01	-----	.03	-----			-----	.16	-----	1.44	-----
TOTAL	0	1.61	0.91	2.14	0.01	0	0	0.14	89.76	15.91	6.63	39.15
MEAN												
MGD	0	0.052	0.030	0.069	0	0	0	0.005	2.90	0.530	0.214	1.31
CFS	0	0.080	0.047	0.107	0.001	0	0	0.008	4.48	0.820	0.331	2.02
AC-FT	0	4.90	2.80	6.60	0.03	0	0	0.43	275	49.0	20.0	120

CALENDAR YEAR 1960 MAX 6.52 MIN 0 MEAN MGD 0.057 MEAN CFS 0.088 AC-FT 64
FISCAL YEAR 1960-61 MAX 37.4 MIN 0 MEAN MGD 0.428 MEAN CFS 0.662 AC-FT 479

Peak discharge (base, 100 mgd).--Mar. 27 (5 p.m.) 163 mgd (252 cfs), 3.04 ft; Mar. 29 (8 p.m.) 174 mgd (269 cfs), 3.11 ft; June 8 (6 p.m.) 304 mgd (470 cfs), 3.82 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 24 to Aug. 1; discharge estimated on basis of records for nearby Waiaha Stream stations.

ISLAND OF HAWAII

7598. Kilaue Stream near Honauau

Location.--Lat $19^{\circ}24'52''$, long $155^{\circ}50'56''$, on right bank 2.3 miles east of Belt Road, and 3.2 miles southeast of Honauau cemetery.

Records available.--April 1958 to June 1961.

Gage.--Water-stage recorder and natural rock control. Datum of gage is 2,898 ft (by stadia traverse).

Extremes.--Maximum discharge during year, 9.60 mgd (14.9 cfs) Mar. 28 (gage height, 1.51 ft), from rating curve extended above 3.7 mgd by logarithmic plotting; no flow on many days.

1958-61: Maximum discharge 67 mgd (104 cfs) Jan. 13, 1959 (gage height, 2.32 ft); no flow on many days.

Remarks.--Records good except those for period of no gage-height record, which are fair.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0	0.9	.40
.6	.03	1.0	.79
.7	.08	1.1	1.40
.8	.18	1.2	2.30

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.04	<u>0</u>	<u>0.73</u>	0.04	0.05	<u>0</u>	<u>0.11</u>	<u>0</u>	<u>0</u>	0.08	0.01	0.18
2	.05	.01	.08	.01	.09	0	.06	0	.01	.09	<u>0</u>	.17
3	.04	.27	.08	.03	.06	0	<u>0.01</u>	0	0	<u>1.18</u>	<u>0</u>	.07
4	.03	.04	.13	.02	.05	0	<u>0</u>	0	0	.75	.01	.12
5	.01	.01	.32	.04	.03	<u>.82</u>	<u>0</u>	0	.01	.09	0	.21
6	.01	.04	.09	.18	.03	.16	0	0	.50	.02	.03	.56
7	<u>0</u>	.12	.16	.13	.03	.12	<u>0</u>	0	.10	.01	.43	.22
8	0	.05	.06	.38	.01	.05	0	0	.05	.01	*.58	<u>1.27</u>
9	0	.02	.10	.07	.01	.01	0	0	.02	.11	.23	.14
10	.04	0	.22	.02	.03	0	0	0	.01	.04	.22	.03
11	.24	0	.06	.01	.01	0	0	.02	.06	<u>0</u>	.08	.04
12	.09	.76	.03	.02	*.05	0	0	.34	.05	.01	.62	.25
13	.01	.22	.04	.19	.06	0	0	.54	*.02	.14	.06	.06
14	0	.36	.13	.05	.04	0	0	.17	0	.09	.04	.10
15	0	.09	.06	.01	.02	<u>.06</u>	0	.05	0	.03	.39	.34
16	0	.03	.03	<u>0</u>	.22	.06	0	.03	0	.02	.24	.14
17	0	.34	.06	.13	.14	.03	0	.10	0	.03	<u>.76</u>	.07
18	0	.07	.11	.03	.08	.01	0	.13	0	.17	.20	.12
19	0	.04	*.02	0	.03	.01	0	.11	.13	.06	.06	.05
20	0	.04	.35	.11	.01	.01	0	.36	.15	.13	.68	.02
21	0	.02	.09	.09	.01	0	0	.06	.02	.12	.05	.01
22	.02	.02	.04	.06	<u>0</u>	0	0	.05	0	.26	.01	.01
23	.02	.03	.02	.04	<u>0</u>	0	0	.03	0	.42	.02	.02
24	0	.10	.02	<u>.84</u>	.01	0	0	.02	.69	.42	0	.08
25	0	.07	.01	.46	.05	.02	0	.01	.1	.11	0	.05
26	0	.54	<u>0</u>	.14	.06	.02	0	.01	.07	.09	.06	.01
27	0	.14	.03	.07	.01	0	0	.01	<u>1.44</u>	.41	.34	.34
28	0	.04	.04	.06	0	0	0	0	<u>1.18</u>	.27	.07	.52
29	0	.02	.05	.10	0	0	0	-----	<u>1.02</u>	.12	.15	.45
30	0	.01	.06	.06	0	0	0	-----	<u>.17</u>	.05	.10	.05
31	0	.61	-----	.04	-----	.53	0	-----	<u>.12</u>	-----	.10	-----
TOTAL	0.60	4.11	3.22	3.43	1.19	1.98	0.18	2.04	5.93	5.33	5.54	5.70
MEAN												
MGD	0.019	0.133	0.107	0.111	0.040	0.064	0.006	0.073	0.191	0.178	0.179	0.190
CFS	0.030	0.205	0.166	0.171	0.061	0.099	0.009	0.113	0.296	0.275	0.276	0.294
AC-FT	1.80	13.0	9.90	11.0	3.70	6.10	0.55	6.3	18	16.0	17.0	18

Calendar Year 1960	Max 1.63	Min 0	Mean mgd 0.084	Mean cfs 0.130	Ac-ft 95
Fiscal Year 1960-61	Max 1.44	Min 0	Mean mgd 0.108	Mean cfs 0.167	Ac-ft 121

Peak discharge (base, 20 mgd)--No peak above base.

* Discharge measurement made on this day.

Note--No gage-height record Feb. 23 to Mar. 13; discharge estimated on basis of records for nearby streams.

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, 5.7 miles northwest of Inarajan, and 6.0 miles south of Agat.

Drainage area.--2.0 sq mi.

Records available.--September 1952 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 12 ft (from topographic map). Prior to Oct. 16, 1953, site at datum 0.62 ft higher.

Average discharge.--8 years (1953-61), 7.72 cfs.

Extremes.--Maximum discharge during year, 7,460 cfs Oct. 19 (gage height, 7.04 ft), from rating curve extended above 230 cfs on basis of slope-area measurement at gage height, 3.51 ft and 7.04 ft; minimum, 0.64 cfs July 1.

1952-61: Maximum discharge, that of Oct. 19, 1960; minimum, 0.20 cfs June 23, 1960.

Remarks.--Records good except those for period of no gage-height record, which are poor. Water diverted upstream at Piga Spring for Umatac village.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.56	0.8	28.5
.3	1.80	1.1	66.0
.4	4.00	1.4	133
.6	12.5	1.8	255

Discharge, in cubic feet a second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.74	23.2	8.05	47.6	31.9	12.0	3.75	11.8	3.50	2.00	1.80	8.05
2	1.09	17.5	26.8	20.3	14.3	8.50	4.30	9.00	3.50	2.15	1.80	3.25
3	1.18	12.1	57.5	13.7	34.6	6.85	3.75	7.25	2.55	2.15	1.80	4.88
4	1.06	6.85	37.7	10.5	11.5	6.45	* 3.50	6.45	4.30	2.15	1.63	3.25
5	* 1.18	29.8	29.2	11.3	27.6	5.65	3.50	6.45	5.18	* 2.15	1.47	8.41
6	1.47	8.50	14.3	8.05	11.0	5.30	3.25	5.65	3.00	2.15	6.00	3.50
7	1.32	6.05	11.0	10.8	10.0	4.95	3.25	4.95	2.90	1.97	* 7.50	19.9
8	1.18	7.25	9.00	8.50	10.3	4.60	3.50	4.60	2.80	1.97	* 4.03	6.05
9	3.50	6.45	20.6	36.3	8.05	14.3	5.85	4.95	2.70	1.97	3.00	4.30
10	10.6	6.45	11.5	15.9	7.65	7.25	3.25	4.30	2.60	1.97	3.25	3.75
11	3.50	5.30	12.5	17.3	6.85	30.6	3.00	6.85	2.60	* 3.00	2.35	3.25
12	2.15	11.3	11.5	* 15.4	6.85	39.5	3.25	4.30	2.60	1.97	2.35	2.75
13	1.63	4.28	27.2	12.0	16.9	33.5	7.25	3.75	3.00	1.97	1.97	2.55
14	11.5	12.0	13.1	11.0	14.4	12.0	1.25	3.75	8.00	2.35	1.80	3.00
15	11.0	* 16.5	17.2	10.5	7.25	9.50	13.1	3.75	5.00	2.35	1.31	2.35
16	23.5	10.5	10.5	15.1	6.05	8.05	11.7	3.50	3.00	1.97	4.30	2.35
17	4.95	7.25	9.00	35.1	5.65	49.0	21.3	3.50	2.30	1.80	3.25	2.35
18	3.50	57.6	57.3	36.9	5.30	14.6	21.9	3.25	2.10	1.97	2.55	2.35
19	4.30	11.0	52.4	* 22.1	5.65	13.1	11.5	3.25	2.00	1.97	2.35	2.15
20	13.1	181	15.0	* 45.7	7.25	10.0	8.05	* 3.25	2.00	1.80	2.15	1.97
21	28.1	76.9	39.2	41.6	5.65	8.05	6.85	3.00	2.00	1.63	1.97	* 6.65
22	32.2	31.4	14.3	17.2	4.60	7.25	6.05	3.00	2.00	1.47	4.64	2.75
23	11.0	18.0	11.5	13.1	5.30	6.85	6.05	3.00	2.50	1.63	2.35	2.35
24	6.85	13.1	9.50	11.0	15.6	5.65	5.65	3.00	10.0	1.47	2.15	2.75
25	5.30	11.0	9.00	9.50	5.65	5.30	16.4	3.00	20.0	1.63	2.15	2.55
26	4.60	8.50	22.5	11.0	4.95	4.95	10.7	2.75	5.00	2.55	1.97	3.75
27	9.67	6.85	10.5	9.50	8.77	4.95	6.85	2.75	2.50	2.15	2.55	2.55
28	5.30	6.45	8.05	8.05	7.65	4.95	6.05	2.75	2.50	2.15	2.15	2.55
29	4.60	13.2	7.25	7.65	* 23.4	4.30	6.85	-----	2.20	2.15	1.97	32.9
30	4.30	11.4	7.65	7.25	23.9	4.60	11.3	-----	2.20	1.80	1.80	20.7
31	5.30	10.7	-----	7.65	-----	4.00	46.8	-----	2.00	-----	3.27	-----
Total	219.67	785.90	590.80	746.45	354.52	356.55	393.50	127.80	118.53	60.61	95.42	189.91
Mean												
Md	7.09	25.4	19.7	24.1	11.8	11.5	12.7	4.56	3.82	2.02	3.08	6.33
Cfs	4.36	1560	1170	1480	703	707	780	253	235	120	189	377
Ac-ft												
Calendar Year	1960	Max	221	Min	0.25	Mean mgd			Mean cfs	9.09	Ac-ft	6.600
Fiscal Year	1960-61	Max	221	Min	0.74	Mean mgd			Mean cfs	11.1	Ac-ft	8.010

Peak discharge (base, 650 cfs).--Aug. 20 (1:30 a.m.) 1,490 cfs (3.53 ft); Oct. 19 (7:15 p.m.) 7,460 cfs (7.04 ft); Jan. 14 (10:30 a.m.) 1,640 cfs (3.66 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 7 to Apr. 4; discharge estimated on basis of records for nearby streams.

ISLAND OF GUAM

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 June 1961.

Gage.--Water-stage recorder and broad-crested concrete weir. Altitude of gage is 85 ft (by barometer).

Average discharge.--8 years (1953-61), 2.93 cfs.

Extremes.--Maximum discharge during year, 2,940 cfs Oct. 19 (gage height, 4.16 ft) from rating curve extended above 55 cfs as explained below; minimum, 0.10 cfs July 6.

1953-61: Maximum discharge, 2,940 cfs that of Oct. 19, 1960, from rating curve extended above 55 cfs on basis of slope-area measurements at gage heights 3.68 and 4.16 ft; no flow part of day July 17, 1953 (caused by diversion), May 4, 5, 1960.

Remarks.--Records good. Water is diverted half a mile upstream for domestic use and at station for irrigation and municipal use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.04	0.8	5.00
.2	.18	1.0	10.0
.3	.47	1.2	20.0
.4	.93	1.5	45.0
.5	1.57	2.0	118
.6	2.40	2.5	265
.7	3.52		

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.31	2.83	2.95	24.6	15.3	6.22	1.29	3.75	1.04	0.63	0.43	2.29
2	.25	6.15	8.08	12.4	8.20	3.17	1.57	3.40	.98	.72	.40	.82
3	.20	5.08	30.6	6.67	17.2	2.32	1.29	2.32	.82	.68	.43	.82
4	.20	1.82	4.56	4.32	5.00	2.15	1.29	2.15	1.20	*.77	.40	.72
5	*.18	7.09	4.92	4.51	7.39	1.90	*1.29	1.82	1.33	.68	.40	1.39
6	<u>16</u>	2.69	2.51	2.95	4.45	1.82	1.16	1.57	.87	.63	2.09	.87
7	20	1.29	1.74	2.51	3.32	1.65	<u>1.10</u>	1.43	.82	.63	3.48	4.32
8	23	<u>1.16</u>	<u>1.36</u>	2.15	2.73	1.57	1.10	1.36	.82	.82	1.36	1.36
9	1.55	1.16	3.47	7.05	2.32	2.56	1.94	1.43	.82	.93	.93	.87
10	1.38	1.74	2.73	6.80	2.15	2.40	1.16	1.29	.77	.63	1.16	.77
11	.87	1.29	2.59	7.74	1.90	10.50	1.10	2.02	.72	.68	.72	.59
12	.51	3.63	3.58	*7.50	1.82	17.10	1.10	1.36	.77	.55	.55	.51
13	.34	15.7	6.45	4.80	3.95	19.40	2.29	1.16	.82	.55	.43	.40
14	2.63	4.90	4.30	2.73	2.62	5.20	<u>4.50</u>	1.10	1.23	.55	.40	.40
15	4.99	3.51	5.21	2.23	2.07	3.17	5.62	1.10	.82	.59	<u>4.14</u>	.40
16	5.22	*3.64	3.64	3.08	1.74	2.51	3.85	1.10	.77	.55	*1.49	.40
17	1.82	1.90	2.95	14.2	1.57	<u>20.2</u>	8.86	1.04	.77	.55	.82	.40
18	1.83	17.9	32.0	11.8	<u>1.50</u>	8.75	9.45	.98	.63	.47	.59	.40
19	2.72	4.85	4.24	*12.7	1.74	5.40	5.50	1.04	.63	.47	.51	.37
20	1.36	<u>76.5</u>	5.00	23.0	2.23	3.64	2.84	*.98	.72	.43	.40	.40
21	2.38	21.7	5.96	17.1	1.90	2.73	2.15	.98	.63	.43	.43	*1.88
22	<u>6.58</u>	10.0	4.30	6.20	1.57	2.32	1.74	.98	.72	.40	1.55	.59
23	2.67	4.81	2.73	4.65	1.50	2.15	1.74	.93	.87	.40	.72	.59
24	1.22	3.81	2.15	3.06	3.32	1.82	1.65	.93	2.41	.43	.55	.55
25	.98	2.62	2.31	2.40	1.74	1.74	5.36	.93	<u>8.38</u>	.43	.40	.55
26	.82	1.82	3.62	11.1	1.50	1.57	4.82	.93	1.50	<u>1.16</u>	.40	1.77
27	2.68	1.43	2.51	5.00	6.01	1.57	3.17	.87	1.04	.59	.37	.93
28	2.03	1.16	1.90	2.95	4.15	1.74	2.23	.87	.87	.95	.37	.87
29	1.10	1.67	1.82	2.32	*9.66	1.50	2.07	-----	.82	.59	.37	15.8
30	.77	5.29	2.15	2.07	10.2	1.43	7.82	-----	.77	.51	.37	9.39
31	1.12	4.18	-----	2.25	-----	1.29	12.3	-----	.68	-----	.59	-----
Total	49.30	266.97	200.49	337.14	130.75	141.49	143.85	39.82	36.04	18.40	27.25	51.42
Mean												
Mgd	1.59	8.61	6.68	10.9	4.36	4.56	4.64	1.42	1.16	0.613	0.879	1.71
Cfs	98	530	398	669	259	281	285	79	71	36	54	102
Ac-ft												

Calendar Year 1960 Max 127 Min 0.02 Mean-mgd Mean cfs 328 Ac-ft 2380
Fiscal Year 1960-61 Max 127 Min 0.16 Mean-mgd Mean cfs 3.95 Ac-ft 2860

Peak discharge (base, 350 cfs).--Aug. 20 (1 a.m.) 427 cfs (2.81 ft); Sept. 19 (7 a.m.) 514 cfs (2.93 ft); Oct. 19 (7:30 p.m.) 2,940 cfs (4.16 ft); Jan. 14 (10 a.m.) 469 cfs (2.87 ft).

* Discharge measurement made on this day.

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.--4.5 sq mi.

Records available.--September 1952 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (by barometer).

Average discharge.--8 years (1953-61), 15.2 cfs.

Extremes.--Maximum discharge during year, 2,110 cfs Aug. 20 (gage height, 12.31 ft), from rating curve extended above 620 cfs on basis of velocity-area studies; minimum, 0.99 cfs July 6, 7.

1952-61: Maximum discharge, 2,110 cfs Oct. 15, 1953, Oct. 6, 1957, Aug. 20, 1960, from rating curve extended above 620 cfs as explained above; maximum gage height, 12.31 ft Oct. 15, 1953, Aug. 20, 1960; minimum, 0.99 cfs July 6, 7, 1960.

Remarks.--Records are good except those for periods of fragmentary gage-height record and peaks above 2,000 cfs, which are poor. Village of Inarajan diverts about 40,000 gpd from above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	1.53	1.4	51.0
.5	2.76	1.8	108
.6	4.50	2.2	178
.8	9.90	3.0	295
1.0	19.0	4.0	460

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.74	11.6	12.5	f 65.8	63.8	19.0	9.60	16.0	7.20	5.15	3.57	16.7
2	1.74	38.9	54.5	f 79.8	24.6	14.1	11.4	16.0	6.65	4.92	3.75	3.75
3	1.74	15.7	f 19.4	30.0	47.8	12.9	9.60	13.0	5.90	5.62	3.75	6.12
4	2.58	9.15	f 35.0	20.0	15.8	12.5	9.30	12.0	10.1	6.65	3.40	4.50
5	1.84	32.7	23.6	15.0	f 3.9	12.1	9.90	11.0	11.4	*5.15	3.24	7.72
6	*1.74	9.80	15.8	13.0	16.3	11.0	8.70	10.0	6.40	5.40	8.25	3.93
7	1.74	6.40	12.9	12.0	19.0	10.3	8.40	9.00	6.90	4.92	9.92	5.49
8	2.48	6.90	11.8	13.0	15.6	f 9.60	8.40	9.00	6.40	4.92	5.65	3.93
9	1.23	8.22	21.1	f 76.2	12.5	19.5	12.4	11.0	6.15	4.70	5.40	3.75
10	4.50	13.9	12.9	25.0	11.0	12.1	8.40	10.0	5.90	4.70	4.92	4.78
11	2.95	8.24	11.8	*35.3	10.6	40.9	f 8.25	21.0	5.90	6.52	*3.88	3.57
12	2.48	14.6	62.3	82.0	11.0	56.8	f 8.70	10.0	6.15	4.50	3.57	3.24
13	1.95	34.1	f 11.9	13.2	44.5	56.6	*16.4	9.00	6.15	4.50	3.24	3.24
14	9.69	13.3	f 29.0	11.0	15.6	23.6	f 26.6	8.50	10.3	5.15	3.24	3.40
15	15.7	11.0	f 35.9	11.0	11.8	16.3	21.6	8.00	6.40	4.92	1.22	2.95
16	6.94	8.40	17.9	28.2	10.3	14.1	25.6	8.00	5.90	4.50	4.50	3.08
17	6.69	7.20	17.9	76.4	9.30	f 6.23	47.3	8.00	5.90	4.50	4.31	3.08
18	5.48	*14.4	f 20.1	50.8	f 9.00	f 27.3	22.0	7.50	5.40	4.12	4.12	2.95
19	5.15	18.7	f 11.0	f 21.3	10.6	28.6	16.3	7.50	4.92	3.93	3.57	2.78
20	3.93	29.6	30.0	f 45.1	14.1	16.8	12.5	7.00	5.40	4.12	3.57	2.78
21	24.0	89.3	17.0	39.1	10.6	14.1	11.0	7.00	4.92	3.75	3.40	*11.1
22	15.4	36.8	14.0	21.0	9.30	13.6	9.90	7.00	5.65	3.75	4.84	3.57
23	6.40	54.6	13.0	16.8	9.90	12.9	10.6	*6.65	7.04	3.75	3.57	3.57
24	4.12	24.8	12.0	14.1	21.1	11.8	11.8	6.65	17.3	3.57	2.95	4.12
25	4.12	31.4	12.0	15.2	9.30	11.0	22.2	6.90	f 29.3	3.75	2.78	3.57
26	9.25	16.3	25.0	31.6	9.00	10.6	16.3	6.90	8.70	6.90	2.95	3.57
27	10.5	13.6	35.0	13.2	59.4	11.4	17.4	f 6.40	7.50	4.12	3.57	3.57
28	5.90	12.5	15.0	12.9	26.6	11.4	12.5	f 6.40	6.15	5.35	2.95	3.75
29	4.31	*16.8	15.0	12.1	34.4	9.90	11.8	-----	5.90	4.12	2.78	20.2
30	3.57	26.7	20.0	11.4	*37.0	11.7	*12.1	-----	5.90	3.57	2.78	19.0
31	16.8	15.2	-----	11.8	-----	9.60	13.0	5.65	-----	3.57	-----	-----
Total	197.73	1,215.11	1,206.9	1,115.0	663.70	604.40	806.35	265.40	2,394.3	1,415.2	1,341.9	1,677.6
Mean												
Mgd												
Cfs	6.38	39.2	40.2	36.0	22.1	19.5	26.0	9.48	7.72	4.72	4.33	5.59
Ac-ft	3.92	2,410	2,390	2,210	1,320	1,200	1,600	526	475	281	266	333

Calendar Year 1960 Max 296 Min 1.43 Mean mgd 15.2 Mean cfs 15.2 Ac-ft 1,1010
Fiscal Year 1960-61 Max 296 Min 1.74 Mean mgd 18.5 Mean cfs 18.5 Ac-ft 1,3400

Peak discharge (base, 1,500 cfs).--Aug. 20 (2:00 a.m.) 2,110 cfs (12.31 ft); Sept. 3 (2 a.m.) 1,730 cfs (10.60 ft); Sept. 18 (4:30 a.m.) 1,700 cfs (10.46 ft); Oct. 19 (9 p.m.) 2,060 cfs (12.13 ft); Jan. 14 (6 a.m.) 2,000 cfs (11.84 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 20-30, Oct. 3-8, 10, Jan. 31 to Feb. 22; discharge estimated on basis of records for nearby streams and rainfall records.

f Fragmentary gage-height record; discharge computed from partly estimated gage-heights.

ISLAND OF GUAM

8400; Paulilus River near Inarajan

Location.--Lat 13°17'05" N, long 144°45'00" E, on right bank 0.3 mile above mouth, 0.9 mile northeast of Inarajan, and 3.8 miles south of Talofofo.

Drainage area.--1.9 sq mi.

Records available.--October 1952 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (by barometer).

Average discharge.--8 years (1953-61), 5.18 cfs.

Extremes.--Maximum discharges during year, 536 cfs Sept. 18 or 19 (gage height, 4.98 ft), from rating curve extended above 210 cfs by logarithmic plotting; minimum, 0.33 cfs July 7, 1956.

1952-61: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended from 50 cfs to 300 cfs by test on model of station site, and extended above by logarithmic plotting; minimum, 0.16 cfs June 2, 1954, Apr. 27, May 1, 1955, May 18, 1956.

Remarks.--Records good except those for period of no gage-height record, which are poor. No regulation or diversion.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.12	0.9	14.0
.3	.36	1.1	27.0
.4	.80	1.3	44.0
.5	1.48	1.6	76.0
.7	4.80	2.0	106

Discharge, in cubic feet a second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	0.65	2.38	4.10	20.0	11.6	9.27	2.75	4.60	1.83	1.32	0.98	8.77	
2	.51	12.4	10.6	25.0	14.4	5.20	3.35	4.60	1.72	1.24	.92	2.20	
3	.43	7.70	47.1	10.0	18.3	4.90	2.75	3.60	1.72	1.24	.92	2.00	
4	.47	4.60	5.85	6.00	6.60	4.60	2.75	3.60	2.55	1.41	.86	1.64	
5	.43	13.9	8.82	5.00	39.0	4.35	2.55	3.35	5.10	*1.32	.80	4.22	
6	*.39	3.60	4.90	4.50	7.40	4.35	2.55	3.15	2.23	1.32	1.57	1.90	
7	.36	2.38	4.10	4.00	6.20	3.85	2.55	2.75	1.95	1.24	4.35	1.72	
8	.43	2.38	3.60	4.50	6.60	3.35	2.55	2.55	1.83	1.17	2.38	1.64	
9	2.67	2.23	7.93	25.0	6.20	10.8	3.35	3.15	1.83	1.10	1.83	1.32	
10	2.38	2.55	6.60	8.00	5.50	6.78	2.55	2.75	1.72	1.04	1.95	1.64	
11	.98	2.75	4.10	11.0	4.60	17.3	*2.23	6.29	1.51	1.32	1.32	1.64	
12	.75	4.60	3.12	25.0	4.60	14.6	2.23	2.95	1.41	1.17	1.24	1.24	
13	.70	10.7	35.7	*6.60	21.2	16.4	4.90	2.38	1.41	1.10	1.04	1.10	
14	1.28	4.35	7.40	4.90	8.40	9.93	78.1	2.23	2.74	1.17	.92	1.04	
15	6.25	4.10	8.90	4.60	4.90	5.20	6.60	2.08	2.75	1.24	*3.16	.98	
16	3.60	3.60	5.85	8.00	4.35	4.90	5.85	2.08	1.72	1.17	2.40	.98	
17	2.65	3.15	6.20	25.0	3.85	27.2	25.1	2.08	1.61	1.17	1.32	.98	
18	2.38	*5.25	5.00	16.0	3.60	7.00	7.47	1.95	1.41	1.10	1.04	.92	
19	1.72	6.72	30.0	35.0	4.10	12.4	4.90	1.95	1.24	1.04	.98	.86	
20	1.41	101	8.00	15.0	7.40	5.85	3.85	1.83	1.24	.92	.98	.92	
21	3.04	4.59	5.00	13.0	5.50	4.60	3.60	1.83	1.10	.86	.86	*.92	
22	4.53	16.4	4.50	7.00	3.85	4.60	3.35	1.72	1.17	.86	.86	1.04	
23	2.23	10.9	4.00	6.00	3.35	4.10	3.60	*1.61	1.51	.86	.86	1.10	
24	1.04	7.00	3.50	5.50	8.29	3.85	4.10	1.61	6.71	.80	.75	1.24	
25	.98	10.0	3.50	6.00	3.50	3.35	5.68	1.61	8.86	.86	.75	1.24	
26	2.29	5.20	8.00	10.0	3.15	3.15	11.2	1.61	3.60	1.24	.75	1.10	
27	4.46	4.10	10.1	7.00	19.7	3.15	4.90	1.61	2.23	1.24	.86	1.10	
28	2.40	3.85	5.00	6.60	14.3	3.15	4.60	1.61	1.72	1.32	.86	1.17	
29	1.24	*5.20	5.00	5.20	15.5	3.15	3.85	-----	1.51	1.10	.80	1.50	
30	.92	10.3	7.00	4.90	*26.1	6.52	7.76	-----	1.51	.98	.75	6.67	
31	4.01	5.85	-----	6.20	-----	3.35	38.7	-----	1.41	-----	.80	-----	
Total	57.58	432.77	346.55	340.50	292.14	221.20	260.27	73.13	70.85	33.92	39.86	54.79	
Mean	Mgd	Cfs	1.86	14.0	11.6	11.0	9.74	7.14	8.40	2.61	2.29	1.13	1.29
	Ac-ft		114	858	687	675	579	439	516	145	141	67	79

Calendar Year 1960	Max 101	Min 0.27	Mean mgd	Mean cfs	5.01	Ac-ft 3,640
Fiscal Year 1960-61	Max 101	Min 0.36	Mean mgd	Mean cfs	6.09	Ac-ft 4,410

Peak discharge (base, 320 cfs).--Aug. 20 (3 a.m.) 423 cfs (4.33 ft); Sept. 18 or 19 (time unknown) 536 cfs (4.98 ft); Oct. 19 (time unknown) 370 cfs (4.00 ft); Jan. 14 (10:30 a.m.) 320 cfs (3.64 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 17 to Oct. 12, Oct. 17-27; discharge estimated on basis of records for nearby streams.

ISLAND OF GUAM

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8470. Imong River near Agat

Location.--Lat $13^{\circ}20'14''$ N, long $144^{\circ}41'55''$ 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 June 1961.

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

Extremes.--1960: Maximum discharge during period March to June, 108 cfs May 29 (gage height, 1.64 ft); minimum daily, 1.50 cfs on several days.

1960-61: Maximum discharge during fiscal year, 3,370 cfs Oct. 19 (gage height, 10.06 ft), from rating curve extended above 35 cfs on basis of slope-area measurements at gage heights of 10.06 ft and 7.46 ft; minimum, 1.25 cfs July 7, 8.

Remarks.--Records good except for period of no gage-height record, which is poor. No diversion or regulation.

Rating table, Mar. 8, 1960 to June 30, 1961 (gage height, in feet, and discharge, in cubic feet per second)

0.35	1.14	1.0	33.6
.4	1.80	1.4	75.0
.5	4.00	1.8	131
.6	7.50	2.2	199
.8	18.7		

Discharge, in cubic feet per second, March to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1									-	1.80	2.15	2.75
2									-	1.80	2.15	*2.15
3									-	1.80	2.35	2.15
4									-	1.80	1.80	2.15
5									-	1.95	2.35	1.95
6									-	1.80	2.15	1.95
7									-	1.80	2.15	1.80
8									*1.80	1.80	1.95	2.15
9									1.95	1.80	1.80	2.35
10									1.95	1.65	1.65	<u>3.32</u>
11									1.95	1.65	1.50	2.15
12									1.95	2.15	1.80	
13									1.95	1.95	1.95	1.80
14									1.80	1.95	1.80	1.65
15									1.65	3.05	1.65	<u>1.50</u>
16									1.65	3.20	1.65	1.65
17									1.65	2.15	1.65	1.80
18									3.17	1.95	1.65	1.65
19									2.15	*1.95	1.65	1.50
20									1.95	1.80	1.65	1.95
21									2.75	1.95	1.65	1.95
22									2.15	1.95	1.65	1.50
23									2.15	1.95	1.80	1.50
24									2.15	1.95	1.95	3.49
25									1.80	1.95	1.50	2.55
26									1.80	1.95	1.50	
27									1.80	2.15	1.50	1.65
28									1.80	2.35	1.50	1.80
29									1.80	1.95	6.42	2.74
30									1.80	1.95	<u>10.3</u>	1.95
31									1.80	-----	3.28	-----
Total									-	59.90	70.50	61.10
Mean												
Med												
Cfs												
Ac-ft												
Calendar Year	1960	Max		Min		Mean mgd			Mean cfs		Ac-ft	
Fiscal Year	1960- 61	Max		Min		Mean mgd			Mean cfs		Ac-ft	

* Discharge measurement made on this day.

8470. Imong River near Agat, Guam--Continued

Discharge, in cubic feet per second, July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.80	4.90	8.00	30.0	19.0	27.3	5.60	10.0	3.75	3.25	2.75	12.4
2	1.65	11.5	35.6	26.0	24.3	16.9	5.40	8.00	3.75	3.00	2.55	2.35
3	1.50	34.7	44.0	26.7	87.1	12.1	5.30	*6.70	3.75	3.25	3.50	2.35
4	1.80	13.3	19.8	12.7	23.6	8.50	5.20	7.10	4.60	3.25	2.75	4.90
5	1.65	34.2	21.5	10.0	43.2	6.70	5.10	6.70	4.60	3.00	2.55	7.10
6	1.65	11.0	16.2	8.50	19.4	5.90	5.00	6.30	3.50	3.00	6.37	4.00
7	1.25	6.70	12.7	9.00	15.7	5.20	4.90	5.90	3.75	3.00	6.30	5.74
8	1.70	8.00	10.0	8.00	15.1	4.60	4.80	5.55	3.50	3.25	4.90	3.75
9	2.79	13.0	26.5	15.5	16.3	29.7	6.50	8.00	3.50	3.00	3.75	3.50
10	1.80	8.00	15.4	12.1	15.7	19.4	5.00	5.55	3.50	3.00	3.50	3.25
11	1.65	7.46	11.0	23.2	13.3	66.0	4.60	5.90	3.25	3.25	3.50	2.75
12	*2.55	19.3	14.2	15.2	12.1	45.6	5.00	4.90	3.25	2.55	3.25	2.35
13	2.15	40.7	49.6	9.50	50.8	65.2	8.00	4.90	3.50	2.55	2.75	2.55
14	15.4	12.7	16.3	8.00	20.8	*20.1	120	4.60	5.52	3.00	2.75	3.00
15	12.8	11.0	14.2	7.50	15.7	9.50	12.0	4.60	*3.50	3.00	17.7	2.55
16	9.33	9.00	11.5	14.3	11.0	*8.50	11.0	4.60	3.75	3.00	4.30	2.55
17	4.90	7.50	12.1	26.7	8.50	48.6	17.0	4.60	3.75	3.75	3.50	2.35
18	5.20	51.5	26.9	30.0	7.10	11.5	11.0	4.30	3.50	2.75	3.00	2.15
19	6.50	159	12.7	*164	6.30	10.5	10.0	4.60	3.25	2.75	2.55	2.15
20	4.60	85.3	10.0	45.1	13.9	9.00	8.00	4.30	3.25	2.75	2.55	2.15
21	39.5	46.1	19.4	29.4	11.0	7.50	6.50	4.00	3.25	2.55	2.35	5.34
22	40.7	22.9	*10.8	13.9	8.00	7.10	6.00	4.00	3.25	2.55	2.75	2.55
23	16.7	*17.5	13.0	10.5	7.50	6.70	6.00	4.00	4.30	2.55	2.35	3.00
24	11.2	13.8	9.50	9.00	31.7	6.50	6.50	4.00	11.8	2.55	*2.35	3.00
25	9.00	12.6	9.00	*10.2	12.1	6.30	11.0	4.00	21.1	2.55	2.35	3.25
26	6.70	9.50	13.7	8.50	9.00	6.10	12.0	3.75	4.90	2.55	2.35	2.35
27	10.4	8.50	16.0	8.50	9.00	6.00	9.00	4.30	4.30	*2.55	3.00	2.35
28	6.70	8.50	9.00	8.50	8.50	6.20	6.50	3.75	3.75	2.75	2.35	2.35
29	5.20	8.50	11.3	8.50	42.5	5.80	6.50	-----	3.50	2.55	2.35	*12.7
30	4.90	10.5	13.7	8.50	43.9	7.00	10.0	-----	3.50	2.55	2.35	12.4
31	6.98	9.00	-----	8.00	-----	5.80	50.0	-----	3.25	2.35	2.35	-----
Total	240.45	716.26	513.60	625.50	622.10	501.80	389.40	148.90	141.62	86.05	111.67	123.18
Mean												
Md	7.76	23.1	17.1	20.2	20.7	16.2	12.6	5.32	4.57	2.87	3.60	4.11
Cfs	4.77	14.20	10.20	12.40	12.30	9.95	7.72	2.95	2.81	1.71	2.21	2.44
Ac-ft												

Calendar Year 1960 Max - Min - Mean-mgd
Fiscal Year 1960-61 Max 164 Min 1.25 Mean-mgd
Mean cfs 11.6 Ac-ft 8370

Peak discharge (base, 900 cfs).--Aug. 19 (about 11 p.m.) 952 cfs (4.75 ft); Sept. 13 (1 p.m.) 977 cfs (4.82 ft); Oct. 19 (7:30 p.m.) 3,370 cfs (10.06 ft); Jan. 14 (time unknown) 1,620 cfs (6.44 ft).

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 23 to Feb. 3; discharge estimated on basis of records for nearby streams.

ISLAND OF GUAM

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8480. Almagosa Springs near Agat

Location.--Lat $13^{\circ}20'45''$ N, long $144^{\circ}40'45''$ E, on left bank 3.5 miles southeast of Agat and 3.5 miles northeast of Umatac.Drainage area.--0.7 sq mi.Records available.--September 1951 to June 1961.Gage.--Water-stage recorder and concrete control. Altitude of gage is 620 ft (by barometer).Average discharge.--9 years (1952-61), 3.31 cfs.Extremes.--Maximum discharge during year, 221 cfs Oct. 19 (gage height, 3.67 ft), from rating curve extended above 20 cfs as explained below; no flow at times.

1951-61: Maximum discharge, 760 cfs Oct. 15, 1953 (gage height, 5.02 ft), from rating curve extended above 20 cfs on basis of tests on model of station site; no flow at times.

Remarks.--Records good except those for periods of doubtful or fragmentary gage-height record, which are poor. Several pipelines above station divert water for domestic use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0	0	0.6	3.25
.1	.021	.7	5.10
.2	.140	.9	10.3
.3	.450	1.2	21.8
.4	1.01	1.5	38.3
.5	1.93	2.0	73.0

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	1.24	2.95	6.62	2.80	3.10	0.41	8.90	0.30	0.21	0	2.61
2	.02	1.96	7.59	1.26	4.70	2.65	.30	*6.30	.30	.14	0	.16
3	.02	10.9	12.3	12.6	19.6	2.30	.21	4.31	*27	.12	.01	.21
4	.03	20.0	8.34	9.46	12.9	1.95	.96	3.25	21	.10	.01	.57
5	.03	22.0	8.90	6.30	8.40	1.60	.03	2.66	.21	.07	0	.14
6	.03	14.7	7.26	4.31	5.70	1.40	.01	2.05	.33	.07	.03	.02
7	.03	8.06	6.54	3.59	4.50	*1.16	.01	1.52	.24	.03	.16	1.43
8	.03	5.82	4.89	2.53	3.70	.94	.01	1.16	.33	.01	.12	.54
9	.03	7.06	9.13	3.43	3.10	2.71	.26	1.52	.18	.01	.09	.04
10	.03	5.82	8.34	3.59	2.70	2.53	.01	.94	.16	.01	.06	.06
11	.03	4.49	6.30	3.10	2.20	7.47	.03	1.08	.14	.03	.01	.21
12	.03	10.7	6.30	2.66	1.90	9.18	.07	.64	.14	.01	.01	.18
13	.03	23.9	9.19	*1.93	4.70	16.3	*.41	.45	.12	.01	.01	.16
14	f 1.90	15.5	7.02	1.62	5.10	11.3	26.6	.30	.16	.01	.01	.14
15	*f 6.92	9.18	5.58	1.42	3.70	7.50	12.3	.21	.24	.01	1.85	.10
16	1.62	5.10	4.49	2.74	2.50	5.10	8.90	.10	.16	.04	.30	.04
17	.38	3.42	4.31	8.43	1.90	19.0	7.26	.01	.16	.09	.33	.02
18	.10	7.69	7.73	1.22	1.50	12.6	6.92	.01	.10	.01	*.06	.03
19	.47	4.86	6.30	36.8	1.10	9.46	7.78	.01	.09	.01	.01	.04
20	.45	6.08	5.58	19.2	2.95	7.78	4.89	.01	.03	.01	.01	.05
21	1.63	32.2	7.13	18.3	2.30	5.58	3.59	.01	.01	0	.01	.20
22	13.0	26.7	8.62	12.0	1.20	4.31	2.66	.03	.01	0	.01	.01
23	19.7	15.9	5.82	9.20	1.00	3.59	2.05	.16	.03	0	.01	.01
24	7.82	*1.23	3.95	6.80	3.25	2.80	1.62	.14	1.84	.01	.01	.01
25	10.1	*9.18	4.16	5.10	2.95	2.17	3.75	.27	6.43	0	.01	.01
26	4.49	6.78	4.13	3.95	1.90	1.72	6.16	.30	1.12	0	.01	.01
27	3.95	5.10	4.81	2.95	1.60	1.52	3.42	.30	.26	0	.01	.01
28	3.59	4.13	2.95	2.40	1.50	1.01	3.95	.30	.01	0	.01	.01
29	2.53	3.77	3.25	2.65	4.70	.88	5.34	-----	.06	0	.01	.85
30	1.72	3.77	2.95	2.15	7.25	.88	7.50	-----	.21	0	.01	1.36
31	1.62	3.59	-----	1.70	-----	.59	14.7	-----	.33	-----	.01	-----
Total	823.6	4103.6	186.81	2423.3	123.30	151.08	132.11	36.94	14.18	1.01	3.19	9.23
Mean												
Mgd Cfs	2.66	1.32	6.23	7.82	4.11	4.87	4.26	1.32	0.457	0.034	0.103	0.308
Ac-ft	163	814	371	481	244	300	262	73	28	2.0	6.3	18
Calendar Year	1960	Max	60.8	Min	0	Mean mgd		Mean cfs	3.29	Ac-ft	2390	
Fiscal Year	1960-61	Max	60.8	Min	0	Mean mgd		Mean cfs	3.82	Ac-ft	2760	

Peak discharge (base, 80 cfs).--Aug. 20 (2 a.m.) 118 cfs (2.64 ft); Oct. 19 (8 p.m.) 221 cfs (3.67 ft); Jan. 14 (12 m) 88.4 cfs (2.24 ft).

* Discharge measurement made on this day.

Note.--Doubtful gage-height record Oct. 21 to Dec. 6; discharge estimated on basis of gage-height graph and records for Finile River near Agat.

† Fragmentary gage-height record; discharge estimated same as for doubtful gage-height record.

ISLAND OF GUAM

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.--5.8 sq mi.Records available.--September 1951 to July 1952, November 1952 to June 1961.Gage.--Water-stage recorder and concrete dam control. Datum of gage is 111.35 ft above mean sea level (from U. S. Navy construction plans).Average discharge.--8 years (1953-61), 14.4 cfs.Extremes.--Maximum discharge during year, 2,150 cfs Oct. 19 (gage height, 2.52 ft); no flow many times.

1951-61: Maximum discharge, not determined, occurred on Oct. 15, 1953 (gage height at least 4.5 ft as reversal occurred at this point); no flow many times.

Remarks.--Records fair. Fena Valley Reservoir impounds low flow for domestic use. Records include only flow over spillway.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0	0	0.5	189
.1	16.9	.6	248
.2	48	.7	313
.3	89	.9	457
.4	136		

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1		0	<u>12.1</u>	72.5	62.9	40.9	9.90	<u>34.2</u>	<u>0</u>			0	
2		0	<u>56.2</u>	88.9	55.2	25.1	9.90	<u>25.1</u>	<u>0</u>			0	
3		0	<u>88.6</u>	89.0	<u>155</u>	16.9	<u>7.86</u>	<u>14.4</u>	<u>0</u>			0	
4		0	48.5	44.3	<u>55.2</u>	16.9	<u>7.86</u>	<u>25.1</u>	<u>1.78</u>			0	
5		0	59.0	<u>12.1</u>	75.8	14.4	5.99	14.4	9.90			1.50	
6		0	<u>47.8</u>	19.5	<u>47.8</u>	<u>12.1</u>	<u>4.28</u>	<u>12.1</u>	<u>1.50</u>			0	
7		0	34.2	19.5	<u>16.9</u>	<u>2.78</u>	<u>4.28</u>	<u>7.86</u>	<u>.54</u>			0	
8		0	19.5	16.9	0	<u>4.28</u>	5.99	<u>4.28</u>	<u>.54</u>			0	
9		0	56.9	28.0	0	<u>4.24</u>	<u>14.4</u>	<u>14.4</u>	0			0	
10		0	47.8	40.9	0	<u>40.9</u>	<u>4.28</u>	<u>9.90</u>	0			0	
11		0	25.1	102	0	<u>81.3</u>	<u>1.50</u>	<u>9.90</u>	0			0	
12		0	34.2	47.8	0	<u>59.0</u>	<u>1.50</u>	<u>5.99</u>	0			0	
13		0	79.0	*22.2	0	<u>83.6</u>	<u>16.9</u>	<u>2.78</u>	0			0	
14		0	37.5	14.4	0	<u>47.8</u>	<u>219</u>	<u>1.50</u>	<u>1.39</u>			0	
15		0	25.1	12.1	0	<u>28.0</u>	<u>59.2</u>	0	<u>1.50</u>			0	
16		0	22.2	40.8	0	<u>22.2</u>	<u>40.9</u>	0	<u>.54</u>			0	
17		0	22.2	79.3	0	<u>149</u>	<u>40.9</u>	0	0			0	
18		0	67.2	82.5	0	<u>51.5</u>	<u>37.5</u>	0	0			0	
19		205	28.0	<u>310</u>	0	<u>47.8</u>	<u>40.9</u>	<u>.54</u>	0			0	
20		328	16.9	<u>238</u>	27.8	<u>31.1</u>	*19.5	<u>.54</u>	0			0	
21		154	51.0	103	25.1	22.2	14.4	0	0			0	
22		98.5	37.5	55.2	12.1	19.5	14.4	0	0			0	
23		47.8	56.0	40.9	9.90	16.9	12.1	0	0			0	
24		31.1	37.5	34.2	40.9	14.4	12.1	0	<u>19.5</u>			0	
25		*37.5	28.0	31.1	14.4	14.4	31.9	0	<u>41.8</u>			0	
26		25.1	31.1	28.0	9.90	12.1	7.55	0	<u>9.90</u>			0	
27		16.9	37.5	25.1	14.4	12.1	2.22	0	<u>4.28</u>			0	
28		14.4	19.5	28.0	2.22	12.1	2.22	0	0			0	
29		19.5	22.2	31.1	75.4	9.90	34.2	-----	0			.81	
30		19.5	14.4	31.1	59.3	14.4	34.2	-----	0			<u>19.5</u>	
31		19.5	-----	31.1	-----	9.90	86.0	-----	0			-----	
Total		0	1016.8	1172.7	1.819.5	780.20	975.86	911.74	182.99	93.17	0	0	21.81
Mean		Mgd	Cfs	32.8	39.1	58.7	26.0	31.5	29.4	6.54	3.01	0	0.727
		Ac-ft		2020	2330	3610	1550	1940	1810	363	185	0	43
Calendar Year	1960	Max	328	Min	0	Mean regd	Mean cfs	16.0	Ac-ft	11640			
Fiscal Year	1960-61	Max	328	Min	0	Mean regd	Mean cfs	19.1	Ac-ft	13850			

* Discharge measurement made on this day.

ISLAND OF GUAM

159

8500. Talofofo River near Talofofo

Location--Lat 13°21'05" N, long 144°43'50" E, on left bank 1.5 miles southwest of Talofofo and 5.3 miles north of Inarajan.Drainage area--16.2 sq mi.Records available--November 1951 to June 1961.Gage--Water-stage recorder and steel weir. Altitude of gage is 40 ft (by barometer).Average discharge--9 years (1952-61), 47.1 cfs.Extremes--Maximum discharge during year, 2,900 cfs Oct. 20 (gage height, 9.07 ft), from rating curve extended above 340 cfs as explained below; minimum, 2.53 cfs July 7, 6.

1951-61: Maximum discharge, 3,560 cfs Oct. 15, 1953 (gage height, 12.69 ft), from rating curve extended above 340 cfs by test on model of station site; minimum, 0.52 cfs July 18, 1959.

Remarks--Records good except those for period of no gage-height record and those above 1,100 cfs which are poor and those from 400 cfs to 1,100 cfs, which are fair. An average of about 10 cfs is diverted from Fena Reservoir and springs above station for domestic use.

Rating tables (gage-height, in feet, and discharge, in cubic feet per second)

July 1, 1960, to Oct. 19, 1960

Oct. 20, 1960, to June 30, 1960

0.3	0.62	2.5	133	0.9	3.10	2.0	75.0
.5	1.31	3.0	205	1.0	4.80		
.8	2.90	4.0	375	1.2	10.5		
1.2	12.1	5.0	575	1.4	20.5		
1.6	37.0	6.0	795	1.7	43.0		
2.0	76.0	7.5	1,220				

Note--Same as
preceding table
above 2.1 ft.

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.34	53.4	*39.7	182	116	107	22.4	65.1	7.86	7.00	3.61	272
2	2.84	115	117	196	100	*56.3	22.4	53.0	*8.00	6.50	3.44	218
3	2.77	101	203	227	369	44.0	21.2	39.6	8.00	6.00	3.61	172
4	3.19	69.2	104	106	882	39.6	19.4	72.4	17.0	7.50	3.61	183
5	3.48	127	144	73.5	156	37.0	18.3	41.3	33.0	6.00	3.27	27.8
6	2.77	47.3	93.6	55.0	80.1	33.8	17.2	37.0	10.0	7.50	18.3	
7	2.71	29.8	83.4	56.0	80.4	32.2	16.6	29.2	10.0	5.50	4.41	23.1
8	2.71	27.6	50.0	51.0	89.8	*23.1	16.6	24.4	11.0	5.50	1.41	18.8
9	2.90	31.0	117	106	80.5	83.4	33.2	55.9	9.00	5.00	9.18	16.6
10	3.19	22.7	99.9	154	83.8	119	18.8	31.5	8.00	*4.46	7.53	14.6
11	3.62	20.2	62.5	51.8	77.2	151	14.1	40.7	7.00	6.00	6.24	11.4
12	4.35	36.7	172	188	71.7	158	13.2	27.8	7.50	4.63	*5.76	8.52
13	3.62	153	164	78.0	99.8	199	28.4	21.8	7.50	4.46	4.80	8.52
14	*4.37	46.1	88.1	58.0	64.2	121	528	18.8	9.00	4.46	4.29	7.53
15	42.9	34.6	*60.0	59.0	30.0	67.3	94.8	16.1	9.00	5.52	61.7	6.96
16	2.34	39.3	52.0	140	25.7	55.2	*66.6	15.6	7.00	5.28	11.8	7.53
17	11.1	35.5	59.0	*318	22.4	392	143	14.1	6.00	22.0	6.72	6.72
18	8.38	68.6	170	256	212	104	86.6	13.6	6.00	6.96	5.52	6.72
19	28.2	911	68.0	346	22.4	96.6	96.5	13.2	6.00	5.52	5.04	6.96
20	12.5	1170	53.0	872	90.8	72.8	43.0	15.0	5.50	4.80	4.63	7.20
21	20.9	440	199	259	71.5	54.1	42.9	11.8	5.50	4.46	4.46	35.1
22	51.8	212	88.0	109	37.0	47.0	38.0	11.0	5.50	4.46	4.63	*12.8
23	45.7	131	166	78.3	31.5	42.2	30.8	10.5	45.0	4.29	4.80	14.2
24	32.0	88.2	92.3	71.7	97.4	37.9	30.0	98.4	100	4.12	4.12	24.4
25	37.3	102	69.3	60.7	37.0	33.8	88.2	9.84	45.0	3.95	3.61	11.8
26	31.7	68.0	77.0	55.2	29.2	32.2	21.9	9.18	25.0	3.78	4.46	16.8
27	7.30	51.0	77.4	50.0	39.0	29.2	49.0	9.18	14.0	4.95	10.5	21.4
28	36.4	48.0	53.0	44.0	56.3	27.8	43.0	7.86	10.0	5.28	28.6	
29	21.4	54.0	45.2	53.0	206	25.7	72.4	-----	8.50	3.61	4.29	25.2
30	20.2	68.0	54.0	45.0	174	29.2	78.3	-----	8.00	3.44	3.78	130
31	50.5	60.0	-----	47.7	-----	25.0	155	-----	7.50	4.12	-----	
Total	593.24	44612	29214	49131	25481	23764	1969.8	72530	46636	17076	27050	846.86
Mean												
Mgd	19.1	144	97.4	158	84.9	76.7	63.5	25.9	15.0	5.69	8.73	28.2
Cfs	1180	8850	5790	9740	5050	4710	3910	1440	925	339	537	1680
Ac-ft												
Calendar Year	1960	Max	1.170	Min	1.16	Mean-mgd	Mean-mgd	Mean cfs	51.0	Ac-ft	37.010	
Fiscal Year	1960-61	Max	1.170	Min	2.71	Mean-mgd	Mean-mgd	Mean cfs	61.0	Ac-ft	44.150	

Peak discharge (base, 2,300 cfs)--Aug. 20 (5 a.m.) 2,460 cfs (8.73 ft); Oct. 20 (12:30 a.m.) 2,900 cfs (9.07 ft).

* Discharge measurement made on this day.

Note--No gage-height record Mar. 2 to Apr. 9; discharge estimated on basis of records for nearby streams.

ISLAND OF GUAM

8550. Ugum River near Talofolo

Location.--Lat 13°20'00" N, long 144°44'55" E, on left bank 0.3 mile upstream from confluence with Talofolo River, 1.3 miles south of Talofolo Village, and 4.2 miles north of Inarajan.

Drainage area.--7.20 sq mi.

Records available.--June 1952 to June 1961.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level (revised).

Average discharge.--9 years (1952-61), 27.2 cfs.

Extremes.--Maximum discharge during year, 5,900 cfs Oct. 19 (gage height, 11.90 ft), from rating curve extended above 900 cfs on basis of slope-area measurement at 11.3, 11.4, 11.9 and 11.8 ft; minimum, 3.40 cfs July 7, 8.

1952-61: Maximum discharge, that of Oct. 19, 1960; minimum, 3.19 cfs June 15, 1960.

Remarks.--Records good except those for periods of discharges between 200 cfs and 1,500 cfs, which are fair, and discharges above 1,500 cfs, which are poor. Discharges for days of no gage-height record are considered poor. No diversion or regulation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.60	1.6	115
.5	4.80	2.0	197
.6	6.00	2.5	264
.8	17.5	3.0	324
1.0	32.0	4.0	450
1.3	66.0		

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.06	23.4	28.0	71.5	58.6	42.0	22.7	35.0	17.0	13.3	10.0	38.1
2	3.84	34.2	46.4	77.6	53.0	30.4	22.7	29.6	16.4	12.2	9.20	12.2
3	3.62	39.3	136	65.5	99.7	28.0	21.4	24.8	*14.3	11.7	9.20	12.1
4	4.29	24.6	46.7	42.0	41.0	25.6	21.4	35.5	20.1	13.8	8.80	12.9
5	4.29	44.8	63.2	36.0	79.6	24.0	20.8	27.2	24.7	14.3	8.40	25.8
6	3.62	24.8	37.0	31.2	41.0	24.0	20.8	23.4	15.4	11.7	13.8	13.3
7	3.62	15.9	32.0	33.0	37.0	22.7	20.1	21.4	14.3	11.2	21.1	29.2
8	3.84	18.2	28.0	30.4	40.0	22.0	20.8	20.1	15.9	11.2	15.4	14.8
9	19.5	17.8	45.2	56.9	39.0	44.0	25.6	23.4	13.8	11.2	12.7	10.8
10	10.8	17.5	46.6	70.9	36.0	32.0	18.2	20.8	13.3	*10.4	11.2	10.8
11	*8.40	15.4	32.0	97.1	30.4	89.7	17.0	24.8	13.3	11.7	10.0	9.20
12	6.95	31.8	88.8	88.6	32.0	63.7	18.2	20.1	13.8	10.0	*9.20	8.80
13	5.06	57.2	110	44.2	73.4	81.6	29.9	18.2	14.3	9.60	8.40	8.80
14	11.8	30.8	55.6	38.0	41.6	50.8	26.5	17.5	20.9	10.8	8.00	9.20
15	40.0	27.7	52.2	34.0	32.0	36.0	45.5	17.5	15.9	10.8	28.5	8.40
16	35.1	29.2	44.2	56.0	28.8	31.2	42.9	17.0	13.3	10.0	14.1	8.00
17	14.3	20.8	38.0	124	27.2	117	64.1	17.0	13.2	11.2	10.0	7.65
18	12.7	96.7	113	92.1	25.6	44.2	42.8	17.0	12.7	9.60	9.20	7.30
19	13.3	24.6	70.2	*f 284	28.0	44.2	38.0	17.0	12.2	9.20	8.80	7.30
20	11.2	3.52	45.3	a80	33.0	36.0	27.2	17.0	12.2	9.20	8.40	*7.30
21	58.1	178	*43.6	a70	27.2	31.2	24.0	16.4	11.7	9.20	7.65	12.1
22	33.2	*82.7	38.0	a50	24.8	*29.6	22.7	15.9	11.7	8.80	9.00	8.80
23	22.1	66.6	37.0	a43	24.0	28.0	22.7	15.4	18.4	8.80	8.40	8.00
24	12.9	49.7	30.4	a40	41.5	27.2	23.4	14.8	49.3	8.80	7.65	9.20
25	13.7	50.8	28.8	a38	24.0	24.8	42.0	14.8	58.3	8.80	7.30	9.20
26	11.7	36.0	41.9	a50	23.4	24.0	46.3	14.8	22.7	9.60	7.30	8.00
27	21.2	31.2	47.7	*f 37.0	38.6	24.0	32.1	15.4	17.5	9.20	9.20	8.40
28	13.8	29.6	31.2	36.0	34.0	24.8	24.8	14.8	15.4	9.20	7.65	8.40
29	11.2	34.0	33.0	34.0	68.2	23.4	24.8	-----	14.8	9.20	7.30	14.9
30	10.0	40.0	46.3	33.0	70.7	28.0	*40.2	-----	14.3	9.20	7.30	45.1
31	19.1	34.0	-----	34.0	-----	23.4	123	-----	13.8	-----	8.40	-----
Total	4 48.29	1800.7	1536.3	1918.0	1253.3	1177.5	1231.1	566.6	554.9	313.90	321.55	394.05
Mean												
Md Cfs	14.5	58.1	51.2	61.9	41.8	38.0	39.7	20.2	17.9	10.5	10.4	13.1
Ac-ft	889	3570	3050	3800	2490	2340	2440	1120	1100	623	638	782
Calendar Year	1960	Max	352	Min	3.40	Mean-mg						
Fiscal Year	1960-61	Max	352	Min	3.62	Mean-mg						
Mean cfs												
Mean ofs												
Ac-ft												
Ac-ft												

Peak discharge (base, 1,400 cfs)...Oct. 19 (11 p.m.) 5,900 cfs (11.90 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby streams.

f Fragmentary gage-height record; discharge computed from partly estimated gage-heights.

8580. Ylig River near Yona

Location.--Lat $13^{\circ}23'20''$ N, long $144^{\circ}45'00''$ 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 June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (by barometer).

Average discharge.--9 years, 22.8 cfs.

Extremes.--Maximum discharge during year, 2,950 cfs, Sept. 12 (gage height, 14.32 ft), from rating curve extended above 260 cfs on basis of slope-area measurement at gage height 15.87 ft; minimum, 1.61 cfs July 8, 9.

1952-61: Maximum discharge, 4,040 cfs Oct. 15, 1953 (gage height, 19.36 ft), from rating curve extended above 260 cfs as explained above; minimum, 0.16 cfs, June 18, 19, 20, 21, 22, 1959.

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

Rating table (gage height, in feet, and discharge,
in cubic feet per second)

0.3	0.98	1.5	53.0
.4	1.93	2.0	129
.5	3.30	3.0	259
.7	7.40	4.0	408
.9	14.0	5.0	576
1.2	26.5		

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.29	30.6	25.8	58.9	45.4	46.3	12.0	39.6	6.71	5.56	2.70	24.4
2	1.93	11.0	34.5	95.0	43.8	31.1	11.5	24.1	6.71	4.90	2.70	19.0
3	1.71	49.5	51.9	97.6	116	25.8	11.5	21.0	6.48	4.70	2.70	16.4
4	3.30	30.2	82.2	43.0	36.6	23.0	11.0	18.5	12.2	5.79	2.70	16.4
5	2.85	65.2	98.4	35.8	71.4	23.0	10.5	18.5	18.3	4.90	2.29	16.8
6	2.17	30.4	45.4	29.2	33.0	20.5	10.5	17.2	6.94	*5.33	6.12	14.0
7	2.05	23.6	34.4	*44.5	41.0	18.5	9.5	15.2	7.17	4.50	38.8	16.8
8	1.71	22.5	28.0	27.4	37.4	17.6	9.0	14.4	8.27	4.50	8.27	14.0
9	2.98	20.5	46.1	72.6	31.1	70.6	*10.0	22.1	6.71	3.90	8.27	14.0
10	2.85	20.0	34.4	81.0	26.3	33.6	8.27	15.2	6.02	3.75	6.02	11.4
11	2.85	17.2	27.4	11.5	23.0	42.8	7.69	16.4	5.79	5.33	4.90	9.72
12	2.85	16.4	39.0	15.3	22.5	71.4	7.69	14.0	6.25	3.90	4.50	9.43
13	2.17	77.9	65.7	47.0	56.2	84.8	10.3	12.5	6.02	3.60	3.90	9.14
14	5.57	28.0	41.4	36.6	25.2	52.2	122	11.4	6.02	3.75	3.75	8.56
15	39.7	28.6	33.7	33.0	22.0	34.4	22.0	11.0	6.02	5.79	38.4	8.27
16	16.4	25.2	29.8	54.0	19.5	29.2	14.8	10.7	5.33	4.30	*7.95	7.98
17	12.2	23.0	30.4	128	17.6	61.6	66.5	10.3	4.90	8.75	5.79	7.17
18	12.2	81.4	66.7	110	17.2	29.2	63.2	9.43	4.90	4.30	5.10	6.71
19	57.9	26.8	31.1	*166	18.0	26.8	33.8	9.14	4.70	3.75	4.70	6.48
20	14.4	45.6	28.0	91.4	54.4	23.6	20.0	9.43	4.50	3.45	4.10	*6.02
21	13.3	124	25.2	104	24.1	22.0	18.0	8.27	4.50	3.30	3.75	24.6
22	49.4	*68.6	22.5	48.0	18.0	20.5	16.0	7.69	4.30	3.15	5.97	7.69
23	22.5	64.2	84.8	39.0	16.8	20.0	14.8	7.69	21.7	3.00	6.28	13.2
24	37.5	36.6	30.4	96.3	33.8	18.0	14.0	*7.40	46.1	3.15	3.75	13.6
25	65.0	35.0	35.7	37.4	16.8	17.2	45.7	7.69	26.7	3.00	3.45	7.98
26	39.9	28.5	25.2	53.8	15.2	16.0	25.2	7.40	14.1	3.00	5.56	11.0
27	11.0	24.6	48.9	29.8	22.5	15.0	17.6	7.40	9.43	3.15	18.1	14.2
28	38.3	31.7	23.6	27.4	25.2	14.0	15.6	*7.17	7.40	2.85	5.79	23.5
29	27.4	22.5	21.0	25.8	89.3	13.0	28.3	-----	6.71	3.00	4.70	29.4
30	22.0	64.9	39.0	22.5	*134	12.5	32.8	-----	6.48	2.55	4.10	47.6
31	27.8	34.4	-----	22.5	-----	12.5	46.8	-----	5.79	-----	4.30	-----
Total	64318	1959.2	1581.6	2025.5	11533	946.7	746.55	380.81	293.15	124.90	229.41	655.05
Mean												
Mgd Cfs	20.7	63.2	52.7	65.3	38.4	30.5	24.1	13.6	9.46	4.16	7.40	21.8
Ac-ft	1280	3890	3140	4020	2290	1880	1480	755	581	248	455	1300

Calendar Year 1960 Max 456 Min 0.28 Mean-mgd 746.55 Mean cfs 24.0 Ac-ft 17,470
Fiscal Year 1960-61 Max 456 Min 1.71 Mean-mgd 946.7 Mean cfs 29.4 Ac-ft 21,320

Peak discharge (base, 2,000 cfs)--Aug. 20 (2 a.m.) 2,580 cfs (13.12 ft); Sept. 12 (8 a.m.) 2,950 cfs (14.32 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 27 to Jan. 8; discharge estimated on basis of record for Pago River near Ordot.

ISLAND OF GUAM

8650. Pago River near Ordot

Location.--Lat 13°26'10" N, long 144°45'15" E, on left bank three-quarters of a mile south of Ordot, 2.5 miles south of Agana and 3.6 miles southeast of Asan.

Drainage area.--6.18 sq mi.

Records available.--September 1951 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (by barometer).

Average discharge.--9 years (1952-61), 22.1 cfs.

Extremes.--Maximum discharge during year, 4,350 cfs Aug. 20 (gage height, 14.67 ft), from rating curve extended above 190 cfs as explained below; minimum, 1.03 cfs July 8.

1951-61: Maximum discharge, 5,310 cfs Oct. 15, 1953 (gage height, 16.76 ft), from rating curve extended above 190 cfs on basis of slope-area measurements at gage heights 13.22 ft and 15.01 ft; no flow June 5-7, 10-23, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No regulation or diversion.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.35	1.0	72.0
.2	1.50	1.3	140
.3	3.96	1.7	205
.4	7.90	2.0	256
.5	13.5	3.0	455
.6	21.0	4.0	681
.8	42.0		

Discharge, in cubic feet per second, July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	2.10	26.8	20.0	50	64.0	*40.0	7.45	29.7	3.96	3.96	2.10	88.7	
2	1.70	92.3	25.0	120	55.0	26.5	7.45	18.5	3.96	3.34	2.10	8.90	
3	1.32	36.5	40.0	120	146	20.1	7.45	14.2	3.64	3.64	2.10	6.55	
4	1.70	20.1	70.0	35	34.9	17.0	7.00	12.8	8.76	5.30	2.10	8.27	
5	1.32	48.8	120	28	33.3	17.8	6.55	14.2	14.5	3.64	1.90	8.40	
6	1.16	21.0	30.0	*23	24.6	17.0	6.55	12.2	4.94	*3.34	2.74	7.00	
7	*1.32	14.2	21.0	42.0	19.3	13.5	6.55	10.5	5.30	3.06	2.00	9.69	
8	1.16	12.8	18.0	41.1	21.9	12.2	6.10	9.40	5.30	3.06	3.64	8.26	
9	1.70	13.0	40.0	76.5	19.3	6.17	*6.10	10.5	4.60	2.80	3.64	7.00	
10	2.10	12.2	25.0	54.8	15.6	29.9	5.30	8.40	3.96	2.80	3.34	6.00	
11	4.49	12.2	18.0	76.3	14.2	39.3	5.30	12.2	4.28	4.28	2.56	5.20	
12	2.80	11.6	500	184	12.8	42.3	4.94	7.45	4.60	3.34	2.56	4.70	
13	1.90	97.7	60.0	43.4	35.0	128	7.00	7.00	3.64	2.80	2.32	4.40	
14	15.0	23.7	30.0	31.6	17.0	54.2	94.4	6.55	3.64	2.80	10.9	4.10	
15	31.7	41.9	20.0	30.5	13.5	31.6	15.6	6.55	3.64	5.82	9.41	3.80	
16	12.2	21.0	18.0	30.5	12.2	24.6	10.5	6.55	3.34	3.64	*3.96	*3.64	
17	7.00	*18.5	19.0	263	11.0	48.2	29.6	6.10	3.34	6.69	2.80	3.64	
18	7.90	63.4	70.0	100	10.5	21.9	37.1	5.70	3.34	3.34	3.06	3.34	
19	62.1	260	25.0	135	9.95	19.3	19.9	5.70	3.06	2.80	3.06	3.06	
20	11.0	561	18.0	97.9	10.5	17.0	12.2	5.70	3.34	2.32	2.32	3.64	
21	15.7	105	16.0	44.8	20.0	14.9	12.4	*5.30	3.64	2.32	2.32	33.5	
22	32.4	65.6	15.0	32.7	9.95	13.5	9.40	4.94	3.34	2.10	2.56	6.55	
23	13.6	44.8	100	27.5	8.40	12.8	9.40	4.94	25.6	2.10	2.56	20.5	
24	8.40	34.9	20.0	32.8	18.7	12.2	8.90	4.94	20.2	2.10	2.32	12.6	
25	48.0	30.0	30.0	22.8	9.40	11.0	36.9	4.60	31.4	2.10	2.10	5.70	
26	20.8	25.0	17.0	20.1	8.00	9.95	16.3	4.60	7.45	2.10	2.32	5.70	
27	50.1	20.0	50.0	18.5	30.0	8.90	10.5	4.60	6.10	2.10	12.3	5.79	
28	27.7	30.0	17.0	16.3	25.0	8.40	9.40	4.28	5.30	2.10	3.64	16.5	
29	21.8	20.0	14.0	15.6	60.0	8.40	19.5	-----	4.94	2.10	2.32	9.90	
30	13.5	70.0	30.0	13.5	25.0	7.90	26.1	-----	4.28	1.80	2.32	22.4	
31	11.6	30.0	-----	14.9	-----	7.90	35.8	-----	4.28	-----	3.34	-----	
Total	4 35.27	1884.0	1496.0	1842.1	1020.00	797.95	497.64	248.10	211.67	93.79	124.71	337.43	
Mean	Mgd Cfs Ac-ft	14.0 863	60.8 3740	49.9 2970	59.4 3650	34.0 2020	25.7 1580	16.1 987	8.86 492	6.83 420	3.13 186	4.02 247	11.2 669
Calendar Year	1960	Max	561	Min	0.23	Mean mgd	Mean cfs	21.4	Ac-ft	15,510			
Fiscal Year	1960-61	Max	561	Min	1.16	Mean mgd	Mean cfs	24.6	Ac-ft	17,820			

Peak discharge (base, 2,400 cfs).--Aug. 20 (2 a.m.) 4,350 cfs (14.67 ft); Sept. 12 (time unknown) 3,730 cfs (13.24 ft); Sept. 23 (time unknown) 2,600 cfs (10.20 ft); Nov. 30 (time unknown) 2,800 cfs (10.78 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 25 to Oct. 6, Nov. 26 to Dec. 1, June 9-16; discharge estimated on basis of record for Ylig River near Yona, and some other nearby streams.

8840. Finile Stream at Agat

Location.--Lat $13^{\circ}22'41''$ N, long $144^{\circ}39'26''$ E, on right bank, 0.4 mile upstream from estuary and 0.4 mile southwest of Agat school
(AMS (AFEE) W843 Agat SF Quadrangle map, 1:25,000, dated 1954).

Drainage area.--0.26 sq mi.

Records available.--April 1960 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Extremes.--1960: Maximum discharge during period April to June, 13.4 cfs May 30 (gage height, 0.77 ft); minimum, 0.11 cfs several days in May.

1960-61: Maximum discharge during year, 655 cfs Oct. 19 (gage height, 3.39 ft), from rating curve extended above 30 cfs by slope-conveyance method; minimum, 0.22 cfs (0.17 ft) July 1, 2.

Records.--Records good except those below 0.4 cfs and above 30 cfs which are fair, and for periods of doubtful gage-height record which are poor. No regulation or diversion.

Discharge, in cubic feet per second, 1960

Day	April	May	June	Day	April	May	June	Day	April	May	June	Day	April	May	June
1	*0.22	0.16	0.44	7	0.26	0.26	0.22	13	0.22	0.22	0.16	19	0.16	*0.16	0.16
2	.22	.16	.34	8	.22	.13	.22	14	.18	.13	.13	20	.16	.16	.16
3	.22	.30	.34	9	.18	.13	.30	15	.36	.13	.13	21	.22	.30	.27
4	.22	.16	.30	10	.18	.13	.18	16	.18	.16	.13	22	.22	.22	.26
5	.26	.16	.22	11	.18	.16	.16	17	.16	.16	.13	23	.34	.16	.70
6	.26	.16	.18	12	.18	.22	.16	18	.16	.16	.13	24	.13	.30	.16
													.78	.30	.56
Total															
Mean in cubic feet per second															
Runoff in acre-feet															

* Discharge measurement made on this day.

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.22	0.70	1.62	4.25	1.75	*1.62	0.95	1.37	0.62	0.56	0.50	2.91
2	1.75	2.28	3.67	3.75	1.75	1.37	.95	1.15	.56	.56	.50	.56
3	.50	2.61	1.90	1.90	3.05	1.37	.95	1.05	.56	.56	.50	.70
4	.50	1.25	2.13	1.75	1.62	1.25	.95	1.41	.78	.56	.50	.70
5	.44	2.58	1.90	1.49	2.47	1.37	.95	1.15	.78	.56	.50	.70
6	.44	1.15	2.61	*1.25	1.62	1.37	.95	.95	.62	*.62	1.12	.79
7	.39	.86	1.62	1.49	1.75	1.25	.95	.86	.62	.62	.95	1.39
8	.39	.86	1.25	1.49	1.62	1.25	.86	.86	.56	.56	.70	.70
9	1.20	1.16	1.75	1.62	1.62	2.39	1.11	1.18	.62	.56	.56	1.49
10	.78	.86	1.37	1.37	1.62	1.75	*.86	.86	.56	.70	.56	.78
11	.78	.95	2.11	1.25	1.25	1.89	.86	.86	.56	.70	.50	.62
12	.50	2.21	1.62	1.62	1.25	2.94	.86	.78	.56	.56	.50	.56
13	.39	4.71	1.62	1.15	1.81	2.92	1.15	.78	.62	.56	.44	.50
14	1.20	1.37	1.37	1.15	1.49	1.90	4.84	.78	.62	.62	1.03	.44
15	.78	2.07	1.25	1.15	1.25	1.75	1.37	.70	.62	.62	.62	.44
16	.86	1.62	1.15	1.25	1.15	1.62	1.15	.78	.56	.56	*.44	.44
17	.50	1.25	1.49	4.34	1.15	2.81	1.65	.78	.56	.62	.44	.44
18	*.56	4.25	2.04	*3.60	1.15	1.75	2.29	.70	.56	.62	.44	.50
19	.62	*8.11	1.25	1.11	1.25	2.30	1.37	.78	.56	.62	.39	*.50
20	1.26	7.42	1.15	2.92	1.85	1.62	1.05	.78	.56	.56	.39	.56
21	.78	5.51	2.85	3.12	1.25	2.51	4.48	*.62	.56	.56	.44	.44
22	2.24	2.38	1.25	1.90	1.15	1.62	1.37	.56	.56	.50	.39	1.00
23	1.05	2.21	1.15	1.75	1.15	1.62	1.15	.56	.91	.50	.39	.62
24	1.55	2.05	1.15	1.75	1.15	1.49	.95	.56	1.32	.50	.39	.50
25	.86	*1.80	2.73	1.75	1.05	1.37	2.11	.56	.78	.50	.39	.56
26	.62	1.75	1.49	1.62	1.05	1.25	1.37	.56	.62	.56	.56	.44
27	1.05	1.62	3.51	1.49	1.44	1.25	.95	.56	.56	.50	.39	.70
28	.56	4.88	1.49	1.49	1.49	1.15	.95	.50	.56	.50	.39	1.22
29	.56	1.90	1.25	1.49	2.97	1.15	1.15	-----	.56	.56	.39	1.05
30	.56	1.90	1.37	1.37	2.44	1.15	1.64	-----	.56	.56	.44	-----
31	.87	1.90	-----	1.65	-----	.95	1.70	-----	.56	-----	-----	-----
Total	24.76	76.17	53.11	69.27	47.61	52.00	43.89	23.04	19.75	17.25	16.18	22.67
Mean												
Mgd Cfs	0.799	2.45	1.77	2.23	1.59	1.68	1.42	0.823	0.637	0.575	0.522	0.746
Ac-ft	49	151	105	137	94	103	87	46	39	34	32	45
Calendar Year 1960	Max	Max	Max	Min	Min	Min	Mean mgd	Mean mgd	Mean cfs	Mean cfs	Ac-ft	Ac-ft
Fiscal Year 1960-61	Max	Max	11.1	Min	0.22	0.22	Mean mgd	Mean mgd	Mean cfs	Mean cfs	Ac-ft	Ac-ft
											922	

Peak discharge (base, 200 cfs).--Aug. 19 (12 p.m.) 229 cfs (2.33 ft); Sept. 2 (11 a.m.) 290 cfs (2.53 ft); Oct. 19 (7:45 p.m.) 655 cfs (3.39 ft).

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record July 3-17, July 21-28; discharge estimated on basis of fragmentary, reconstructed, and estimated recorder graph.

ISLAND OF GUAM

8880. Cetti River near Umatac

Location.--Lat 13°18'58" N, long 144°39'21" E, on right bank 0.1 mile above estuary and 1.3 miles northeast of Umatac school. (AMS (AFPE) W43 Inarajan NF Quadrangle map, 1:25,000, dated 1954).

Drainage area.--0.72 sq mi.

Records available.--Feb. 1960 to June 1961.

Gage.--Water-stage recorder and concrete control. Elevation of gage 25 ft (from topographic map).

Extremes.--1960: Maximum discharge during period February to June, 100 cfs May 29 (gage height, 1.27 ft); minimum, 0.18 cfs May 15.

1960-61: Maximum discharge during fiscal year, 1,420 cfs Oct. 19 (gage height, 6.19 ft), from rating curve extended above 205 cfs by slope-area measurement at gage height 6.19 ft; minimum, 0.37 cfs July 7.

Rating tables (gage height, in feet, and discharge, cubic feet per second)

Feb. 12, 1960 to Jan. 12, 1961

Jan. 13 to June 30, 1961

0.17	0.27	0.6	11.5	0.2	0.53	0.8	24.5
.2	.44	.8	24.5	.26	1.17	1.0	50.0
.25	.87	1.0	50.0	.32	2.22		
.3	1.50	1.2	87.0	.4	4.30		
.4	3.70			.6	12.0		

Discharge, in cubic feet per second, February to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1								-	0.67	0.37	0.51	0.97
2								-	.67	.44	.51	1.08
3								-	.67	.44	.51	.77
4								-	.67	.44	.44	.67
5								-	.59	.44	.59	.67
6								-	.59	.59	.44	.59
7								-	.59	.59	.37	.59
8								-	.59	.67	.37	.67
9								-	.67	.67	.37	.66
10								-	.51	.67	.32	.79
11								-	.51	.67	.44	.59
12								* 0.59	.59	.77	.51	.59
13									.67	.51	.67	.59
14									.67	.51	.59	.51
15									.67	.44	.92	.51
16									.67	.51	.95	* .29
17									.67	.51	.51	.51
18									.67	.82	.51	.59
19									.59	.44	.51	.59
20									.59	.51	.37	.67
21									.59	.59	.37	.67
22									.59	.44	.59	.67
23									.59	.44	.59	.67
24									.67	.44	.59	.37
25									.67	.37	.51	2.02
26									.59	.32	.59	.67
27									.59	.32	.67	.59
28									.67	.32	.59	.67
29									.67	.32	.51	2.62
30									-----	* .32	.51	1.22
31									-----	.37	.51	.465
Total								-	15.82	18.01	19.81	21.76
Mean								-	0.510	0.600	0.639	0.725
Mgd								-	31	36	39	43
Cfs												
Ac-ft												

Calendar Year	Max	Min	Mean mgd	Mean cfs	Ac-ft
Fiscal Year	Max	Min	Mean mgd	Mean cfs	Ac-ft

* Discharge measurement made on this day.

ISLAND OF GUAM

8860. Gatti River near Umatac---Continued

Discharge, in cubic feet per second, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	* 0.60	4.02	2.00	13.3	* 8.96	3.70	1.50	7.60	1.31	0.53	0.81	4.18
2	.70	4.58	* 21.4	5.70	4.50	2.70	1.50	4.30	1.47	.53	.62	1.04
3	.70	4.07	22.3	3.70	23.8	2.20	1.21	3.42	1.47	.62	.81	.92
4	* .60	2.70	21.5	2.95	2.95	2.00	1.21	3.16	2.22	.81	.62	1.84
5	* .51	13.7	14.3	2.70	9.59	2.00	1.21	3.16	2.43	.81	.53	5.62
6	.51	2.45	6.62	2.20	2.95	1.80	1.21	2.44	1.17	* .81	4.60	1.47
7	.44	1.65	4.60	7.18	5.10	1.65	.97	2.44	1.31	.81	3.66	7.79
8	.59	1.50	3.20	2.20	2.70	1.50	1.20	2.22	1.17	.81	* 2.39	1.64
9	.67	4.95	10.9	8.00	2.70	7.85	1.85	2.44	1.17	.71	1.47	1.31
10	2.02	1.80	4.30	3.45	2.20	2.70	.97	2.02	1.04	.71	1.31	1.17
11	.87	1.35	4.92	2.45	2.20	13.9	.97	2.44	1.04	.92	1.17	1.04
12	.77	4.08	3.70	2.45	2.24	9.53	* .94	1.82	1.04	.71	1.04	.92
13	.67	24.3	4.30	2.00	5.90	13.2	4.46	1.64	1.31	.71	.92	.81
14	12.9	6.50	3.45	1.65	2.95	4.60	4.27	1.64	3.01	.81	7.70	1.17
15	4.54	* 4.30	5.70	1.65	2.20	3.20	4.44	1.47	1.04	.81	.92	
16	5.76	3.20	2.95	2.87	1.80	2.95	5.18	1.47	.92	.71	1.47	.81
17	1.50	2.95	2.95	7.32	1.80	23.4	6.00	1.47	* .92	.92	1.17	.71
18	1.08	2.70	11.0	* 11.4	1.58	4.00	7.42	1.47	.81	.71	1.04	
19	3.61	41.7	4.00	* 74.5	1.65	3.70	4.00	1.47	.81	.62	.92	* .71
20	1.65	55.0	* 3.20	9.00	2.68	3.00	2.90	1.31	.81	.62	.92	.71
21	9.18	17.0	27.1	8.16	1.65	2.70	4.84	1.31	.81	.62	.92	1.89
22	35.8	113	4.30	4.30	1.35	* 2.40	2.66	1.17	.81	.62	1.17	.81
23	5.72	4.90	3.20	3.45	1.71	2.20	2.66	* 1.04	1.04	.53	.92	1.31
24	2.20	3.70	2.70	3.20	4.33	2.20	2.44	1.17	6.42	.62	.81	1.04
25	1.65	2.95	4.86	2.70	1.65	2.00	6.35	1.17	8.90	* .53	.81	1.62
26	1.21	2.45	5.45	2.20	1.50	2.00	3.70	1.17	1.31	.71	.81	.92
27	3.47	2.00	4.00	2.00	2.15	1.65	3.42	1.31	.81	.62	1.28	.92
28	1.65	1.80	2.95	2.00	2.20	1.80	3.70	1.17	.81	.62	.81	.92
29	1.50	3.61	2.95	2.00	12.3	1.65	4.95	-----	.71	.62	.62	7.15
30	1.21	3.70	2.95	2.00	8.30	1.80	7.12	-----	.62	.62	.62	9.89
31	1.08	2.70	-----	1.80	-----	1.50	18.2	-----	.62	-----	2.02	-----
Total	105.36	267.91	217.75	200.48	127.59	131.48	151.88	58.91	49.33	20.80	44.88	61.96
Mean												
Med	3.40	8.64	7.26	6.47	4.25	4.24	4.90	2.10	1.59	0.693	1.45	2.07
Cfs	209	531	432	398	253	261	301	117	98	41	89	123
Ac-ft												
Calendar Year 1960			Max	-	Min	0.44	Mean mgd		Mean cfs	-	Ac-ft	
Fiscal Year 1960-61			Max	74.5	Min		Mean mgd		Mean cfs	3.94	Ac-ft	2.850

Peak discharge (base, 800 cfs)...Sept. 21 (3:15 p.m.) 835 cfs (4.23 ft); Oct. 19 (7:30 p.m.) 1,420 cfs (6.19 ft); Nov. 3 (4:00 a.m.) 829 cfs (4.21 ft).

*Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby streams.

ISLAND OF TUTUILA

9060. Vaitolu Stream near Aoa

Location.--Lat $14^{\circ}17'50''$ S, long $170^{\circ}35'45''$ W, on left bank three-eighths mile above Aoa Village and 0.5 mile above mouth.

Drainage area.--0.22 sq mi.

Records available.--March 1958 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 185 ft (from topographic map).

Extremes.--Maximum discharge during year, 72.8 mgd (113 cfs) Nov. 29 (gage height 4.52 ft), from rating curve extended above 2 mgd by logarithmic plotting; minimum, 0.04 mgd (0.06 cfs) Sept. 15.

1958-61: Maximum discharge, 83.5 mgd (129 cfs) Feb. 5, 1959 (gage height, 4.75 ft), from rating curve extended above 2 mgd as explained above; minimum, 0.03 mgd (0.05 cfs) June 22-27, 1960 (gage height, 1.12 ft).

Remarks.--Records good, except those for period of no gage-height record, which are fair.

Rating table (gage height in feet, and discharge, in million gallons a day)

1.1	0.03	1.6	2.18
1.2	.20	1.7	3.00
1.3	.50	1.8	3.90
1.4	.94	1.9	4.95
1.5	1.49	2.0	6.15

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.18	0.34	0.06	0.05	0.20	1.04	0.69	0.27	0.70	0.78	0.30	0.20
2	.17	*.20	.06	.04	.15	.70	.43	.22	.49	.62	.96	.40
3	.24	.20	.09	.05	.15	1.10	.25	.22	2.36	.58	.36	.39
4	.30	.13	.06	.06	*.13	.70	.20	a .17	.70	.50	.30	.20
5	.27	.13	.05	*.04	.11	.84	.20	a .15	1.08	.50	.27	.00
6	.33	.11	.05	.08	.11	.50	.20	*.15	*.70	.50	.27	.46
7	*.20	.10	.05	.10	.11	.36	.20	.15	.81	*.46	.27	.30
8	.13	.10	.05	.08	.11	.30	.17	.16	1.10	*.46	.27	.27
9	.11	.08	.08	.10	.11	.48	.20	.21	.74	.46	*.25	.38
10	.13	.06	.06	.08	.11	.27	.20	.15	.66	.46	.25	.25
11	.17	.06	.06	.16	.11	.25	.17	.13	.36	.43	.22	.25
12	.11	.06	.08	.22	.11	*.25	.15	.13	*.44	*.43	.22	*.25
13	.08	.08	.08	.10	.15	.31	.17	.13	4.47	.43	.22	.36
14	*.08	.06	.06	.10	1.62	.25	.17	.11	2.44	.39	.20	.27
15	.06	.06	*.04	.11	*.39	.25	.15	.11	2.94	.63	.20	.25
16	.06	.08	.08	.17	.20	.25	.15	.15	2.06	2.61	.25	.27
17	.08	.13	.08	.10	.15	.38	.15	.32	1.58	.70	.22	.22
18	.06	.08	.08	.40	.22	.57	.17	.17	2.22	.54	.20	.20
19	.10	.10	.10	.13	.22	.59	.27	.13	.78	.43	*.20	.20
20	.06	.08	.06	.10	2.07	.43	.17	*.10	2.94	.48	.20	.17
21	.06	.15	.05	.10	.71	.30	.15	.10	3.08	.46	.20	.17
22	.06	*.19	.05	.10	.39	.25	.15	.10	1.43	.43	.20	.15
23	.06	.13	.06	.17	.25	.22	*.13	.12	.94	.39	.25	.15
24	.05	.11	.06	.97	.20	.22	.22	.37	1.23	.36	.20	.15
25	.05	.72	.05	2.80	*.17	.22	.20	.13	1.27	.33	*.17	.15
26	.06	2.24	.06	.83	.15	.22	.28	.11	1.03	.33	.17	*.13
27	.05	.43	.06	.25	.53	.22	.17	.40	2.65	*.33	.17	.13
28	.05	.17	.05	.21	.36	.25	.17	.80	3.16	.30	.17	.13
29	.08	.10	.05	.68	3.89	.25	.15	-----	1.33	.30	.33	.13
30	.10	.08	.05	.50	1.77	.31	.15	-----	-----	.27	.20	.13
31	1.51	.06	-----	.30	-----	.25	1.15	-----	.78	-----	.17	-----
TOTAL	5.05	6.62	1.87	9.18	14.95	12.53	7.38	5.46	47.41	15.89	7.86	12.50
MEAN												
MGD	0.163	0.214	0.062	0.296	0.498	0.404	0.238	0.195	1.53	0.530	0.254	0.417
CFS	0.252	0.330	0.096	0.458	0.771	0.625	0.368	0.302	2.37	0.819	0.392	0.645
AC-FT	15.0	20.0	5.70	28.0	46.0	38.0	23.0	17.0	145	49.0	24.0	38.0

Calendar Year 1960 Max 4.81 Min 0.03 Mean mgd 0.298 Mean cfs 0.461 Ac-ft 335
Fiscal Year 1960-61 Max 5.00 Min 0.04 Mean mgd 0.402 Mean cfs 0.622 Ac-ft 449

Peak discharge (base, 20 mgd).--Nov. 14 (2 a.m.) 36.2 mgd (56.0 cfs), 3.44 ft; Nov. 20 (7:30 a.m.) 52.0 mgd (80.5 cfs), 3.93 ft; Nov. 29 (7 p.m.) 72.8 mgd (113 cfs), 4.52 ft; Mar. 13 (5:30 p.m.) 51.0 mgd (78.9 cfs), 3.90 ft; Mar. 21 (10 a.m.) 34.7 mgd (53.7 cfs), 3.39 ft; Mar. 27 (11 p.m.) 34.1 mgd (52.8 cfs), 3.37 ft; Apr. 16 (9 a.m.) 31.7 mgd (49.0 cfs), 3.29 ft; June 4 (12:30 p.m.) 60.4 mgd (93.5 cfs), 4.17 ft.

* Discharge measurement made on this day.

** No gage-height record; discharge estimated on basis of records for nearby streams.

ISLAND OF TUTUILA

167

9120. Afono Stream at Afono

Location.--Lat $14^{\circ}16'55''$ S, long $170^{\circ}39'10''$ W, on left bank at Afono Village and 1500 ft above mouth.Drainage area.--1.01 sq mi.Records available.--October 1958 to June 1961.Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).Extremes.--Maximum discharge during fiscal year, 418 mgd (647 cfs) Nov. 29 (gage height, 4.52 ft), from rating curve extended above 14 mgd on basis of logarithmic plotting; minimum, 0.32 mgd (0.50 cfs) Oct. 10, 14.

1958-61: Maximum discharge, 486 mgd (752 cfs) Feb. 5, 1959 (gage height, 4.69 ft), from rating curve extended above 14 mgd as explained above; minimum, 0.23 mgd (0.36 cfs) June 9, July 16, 1959.

Remarks.--Records good. A 2-inch pipeline diverts 0.037 mgd above station for domestic use in Afono.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.4	0.14	1.9	4.83
1.5	.44	2.0	7.06
1.6	.99	2.2	13.5
1.7	1.86	2.4	22.5
1.8	3.17	2.7	43.0

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.86	5.25	1.76	0.44	1.76	4.80	2.94	2.62	2.87	2.57	1.06	1.53
2	5.45	3.83	1.38	.52	1.47	3.17	2.41	2.19	1.90	2.19	2.71	4.53
3	4.58	3.32	1.80	.57	1.21	2.87	1.21	1.66	15.8	1.86	1.47	6.56
4	3.02	2.78	1.38	.48	1.06	3.62	.92	1.21	5.46	1.66	1.14	18.6
5	6.20	3.77	1.21	.44	.99	4.02	.86	5.75	6.08	1.56	1.06	5.26
6	5.61	1.96	1.06	.44	.92	2.19	.99	3.72	4.64	1.38	.99	2.72
7	2.87	1.56	1.06	.48	.86	1.76	.80	1.86	4.92	1.38	.86	1.86
8	2.07	1.29	.92	.36	.74	1.56	.80	1.66	8.36	1.29	.86	*1.56
9	1.76	1.14	.86	.48	.62	4.26	.86	2.24	*6.27	1.29	.80	1.93
10	2.72	1.06	.80	.36	*.52	1.96	.80	1.76	3.92	1.21	.92	1.47
11	13.8	1.06	.74	*.79	.57	1.47	.93	1.38	3.02	1.14	*.85	1.29
12	4.48	.99	.68	1.14	.62	1.21	*.81	1.14	2.72	1.14	.80	1.38
13	2.57	.92	.57	.44	.57	1.52	.57	1.14	28.4	*38.1	.68	2.77
14	2.07	.86	.52	.36	1.92	1.47	.57	1.14	16.9	36.3	.68	2.72
15	1.66	.80	.57	.52	.80	*1.06	.52	1.06	13.3	14.7	.68	1.76
16	1.56	.74	.57	.97	.62	1.14	.52	1.14	13.7	24.0	.68	2.07
17	1.56	1.04	.57	.48	.57	3.06	.48	2.10	12.3	4.15	.68	1.86
18	1.47	.74	.52	2.13	1.17	*5.85	.57	2.30	20.8	2.44	.57	1.38
19	1.96	11.0	*.54	.80	1.34	3.99	1.71	2.23	5.45	1.96	.57	1.14
20	1.47	2.53	.57	1.14	1.21	2.07	.99	1.38	7.47	1.76	.80	.99
21	1.14	1.86	.52	.57	1.14	1.56	.57	1.53	23.8	1.75	.62	.92
22	1.29	6.51	.62	.52	.86	1.29	.57	1.47	12.0	2.59	.72	.86
23	1.14	6.44	.52	2.03	.68	1.21	.48	1.21	4.83	1.76	1.38	.80
24	.92	2.87	.48	4.50	.68	1.06	.86	1.93	3.92	1.56	.86	.74
25	.86	11.3	.48	13.8	.86	.99	3.62	1.32	2.87	1.38	.68	.68
26	.86	19.7	.48	4.99	.62	.92	4.32	1.21	3.97	1.29	.62	.68
27	.68	4.98	.62	1.86	1.64	.99	2.04	2.10	10.5	1.21	.57	.68
28	.62	3.02	.52	1.72	1.47	*.86	6.41	3.93	25.8	1.14	.62	.68
29	.62	2.31	.48	6.73	26.0	.99	2.61	-----	6.78	1.06	1.88	.68
30	.69	1.96	.44	2.72	10.7	.92	1.47	-----	4.28	.99	1.56	.68
31	8.61	1.66	-----	2.19	-----	.86	6.26	3.17	-----	.80	-----	-----
TOTAL	86.37	109.25	23.24	54.97	64.19	64.70	49.47	54.38	286.20	156.81	29.17	70.78
MEAN	2.79	3.52	0.775	1.77	2.14	2.09	1.60	1.94	9.23	5.23	0.941	2.36
MGD	4.31	5.45	1.20	2.74	3.31	3.23	2.47	3.00	14.3	8.09	1.46	3.65
CFS	265	335	71.0	169	197	199	152	167	878	481	90.0	217
AC-FT												

CALENDAR YEAR 1960 MAX 26.0 MIN 0.36 MEAN MOD 2.00 MEAN CPS 3.09 AC-FT 2,240
FISCAL YEAR 1960-61 MAX 38.1 MIN 0.36 MEAN MGD 2.88 MEAN CFS 4.46 AC-FT 3,220
Peak discharge (base, 70 mgd).--Aug. 19 (12 a.m.) 143 mgd (221 cfs), 3.50 ft; Nov. 29 (8:30 p.m.) 418 mgd (647 cfs), 4.52 ft; Mar. 13 (5:30 p.m.) 149 mgd (231 cfs), 3.53 ft; Mar. 18 (2:30 a.m.) 72.6 mgd (118 cfs), 3.05 ft; Mar. 21 (5:30 a.m.) 215 mgd (333 cfs), 3.82 ft; Mar. 28 (11 a.m.) 82 mgd (127 cfs), 3.08 ft; Apr. 15 (5 p.m.) 218 mgd (337 cfs), 3.83 ft; June 4 (11:30 a.m.) 85 mgd (138 cfs), 3.11 ft.

* Discharge measurement made on this day.

ISLAND OF TUTUILA

9205. Aasu Stream at Aasu

Location.--Lat 14°19'00" S, long 170°45'35" W, on right bank at Aasu Village and 300 ft above mouth.

Drainage area.--1.01 sq mi.

Records available.--October 1958 to June 1961.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

Extremes.--Maximum discharge during fiscal year, 154 mgd (238 cfs) Nov. 29 (gage height, 3.43 ft), from rating curve extended above 10 mgd as explained below; minimum, 0.48 mgd (0.74 cfs) Oct. 8.

1958-61: Maximum discharge, 189 mgd (292 cfs) Aug. 29, 1959 (gage height, 3.62 ft), from rating curve extended above 10 mgd by logarithmic plotting; minimum, 0.37 mgd (0.57 cfs) July 14-17, 1959.

Remarks.--Records good except those for periods of no and fragmentary gage-height records, which are fair.

Rating table (gage height, in feet, and discharge, in million gallons a day)

1.3	0.54	1.9	13.4
1.4	1.37	2.0	17.4
1.5	2.70	2.1	22.4
1.6	4.50	2.2	28.0
1.7	6.75	2.3	34.0
1.8	9.60		

Discharge, in million gallons a day, fiscal year July 1960 to June 1961

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.45	5.88	5.40	0.82	5.62	7.03	a 3.0	2.30	5.95	7.32	2.89	2.03
2	5.65	5.17	* 4.72	.82	5.17	5.17	a 3.5	2.63	4.95	6.07	5.62	2.81
3	5.62	7.06	6.06	.82	5.40	6.50	a 4.8	f 6.0	10.6	5.40	3.06	4.95
4	5.60	10.0	5.40	.82	4.50	a 8.8	a 3.1	3.42	6.75	4.72	2.56	1.66
5	11.3	8.16	4.50	.74	3.96	* a 10	a 3.1	2.43	8.18	4.32	2.30	9.48
6	10.4	5.62	3.96	.82	3.60	6.30	a 3.1	1.90	7.10	3.96	2.16	5.62
7	6.75	4.72	3.60	.90	3.42	5.40	a 3.1	1.63	6.52	3.60	2.03	4.72
8	5.85	4.32	3.24	.74	3.24	5.17	a 2.6	1.90	6.94	3.24	2.03	4.50
9	* 4.95	3.96	3.06	.74	3.06	6.38	a 2.2	1.76	6.52	3.06	1.90	4.32
10	4.50	3.60	2.70	* .67	2.70	4.50	a 3.0	1.63	7.71	2.70	2.30	4.14
11	7.52	3.42	2.56	* 1.05	2.43	3.96	a 2.4	1.76	5.85	2.70	2.43	3.96
12	6.07	3.24	2.43	2.03	2.43	3.96	a 2.0	1.50	5.17	2.43	1.90	4.11
13	4.95	2.88	2.30	.90	2.30	3.96	a 1.6	2.03	13.6	2.70	1.63	8.06
14	5.17	2.56	2.16	.74	2.16	3.24	a 1.6	f 2.0	2.43	1.63	5.62	
15	4.95	2.43	2.03	1.07	1.90	2.70	a 2.5	1.90	13.4	3.80	1.50	4.50
16	4.50	2.30	1.90	1.57	1.76	3.60	a 1.2	* 2.56	12.4	20.8	1.90	5.17
17	4.50	2.95	1.90	.82	* 1.76	7.79	a 1.1	8.11	11.5	6.30	2.66	4.50
18	5.78	2.16	1.76	1.17	4.49	16.0	a 1.3	6.52	12.6	4.14	1.76	3.78
19	4.95	16.7	1.63	1.07	* 2.99	10.2	a 1.2	5.40	8.74	3.42	1.50	3.24
20	4.50	9.22	1.63	* 1.27	4.02	7.60	1.27	3.60	f 8.4	* 3.42	1.50	3.06
21	5.05	6.01	1.50	.74	4.57	5.85	.90	4.32	7.60	3.69	1.37	2.88
22	5.17	17.6	1.50	.82	3.06	a 4.5	.82	3.60	8.90	5.21	1.63	* a 2.7
23	4.32	18.0	1.37	2.03	2.30	a 4.0	.74	3.42	* 7.03	4.16	2.31	a 2.6
24	3.60	11.9	1.27	2.76	2.16	a 3.5	1.55	3.78	6.30	3.24	1.50	a 2.6
25	3.42	24.0	1.27	11.6	2.41	a 3.1	4.15	2.70	* 6.07	a 3.0	1.27	a 2.5
26	* 3.24	30.9	1.55	10.5	1.90	a 2.8	2.90	2.43	8.55	a 2.7	1.17	a 2.6
27	2.88	15.4	1.27	6.33	1.63	a 3.1	1.76	3.72	11.9	a 4.0	* 1.54	a 2.9
28	2.70	11.1	1.07	5.02	2.13	a 2.8	1.76	5.30	18.5	a 3.1	2.85	a 3.2
29	3.06	8.74	.98	7.61	11.1	a 4.0	1.37	-----	11.1	* a 2.5	4.30	a 2.8
30	3.06	7.03	.90	5.40	8.43	a 3.0	1.55	-----	8.74	2.56	3.24	a 2.7
31	4.74	6.52	-----	5.17	-----	a 2.6	3.58	7.60	-----	2.03	-----	
Total	161.00	263.55	75.62	77.56	106.60	167.51	68.75	90.95	285.17	130.69	68.47	132.65
Mean												
Mgd	5.19	8.50	2.52	2.50	3.55	5.40	2.22	3.25	9.20	4.36	2.21	4.42
Cfs	8.03	13.2	3.90	3.87	5.50	8.36	3.43	5.03	14.2	6.75	3.42	6.84
Ac-ft	4.94	809	232	238	327	514	211	279	875	401	210	407

Calendar Year 1960 Max 30.9 Min 0.60 Mean mgd 4.04 Mean cfs 6.25 Ac-ft 4,530
Fiscal Year 1960-61 Max 30.9 Min 0.67 Mean mgd 4.46 Mean cfs 6.90 Ac-ft 5,000

Peak discharge (base, 70 mgd).--Aug. 19 (6 p.m.) 87.0 mgd (135 cfs), 2.90 ft; Nov. 29 (8 p.m.) 154 mgd (238 cfs), 3.43 ft; Apr. 16 (9 a.m.) 77.1 mgd (119 cfs), 2.81 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, weather records and records for nearby streams.

f Fragmentary record; discharge estimated on basis of recorded stage, weather records and records for nearby streams.

9310. Atauloma Stream at Afao

Location.--Lat $14^{\circ}21'05''$ S, long $170^{\circ}47'45''$ W, on left bank at Afao Village, 100 ft above bridge and 500 ft above mouth.

Drainage area.--0.59 sq mi.

Records available.--October 1958 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

Extremes.--Maximum discharge during fiscal year, 82.3 mgd (127 cfs) July 30 (gage height, 2.43 ft), from rating curve extended above 2.5 mgd as explained below; minimum, 0.12 mgd (0.19 cfs) Oct. 17.

1958-61: Maximum discharge, 170 mgd (263 cfs) Feb. 13, 1959 (gage height, 3.06 ft) from rating curve extended above 2.5 mgd by application of weir formula; minimum, 0.11 mgd (0.17 cfs) July 14, Aug. 22, 24-25, 1959.

Remarks.--Records good. Metered flow of 10,400 gallons per day (average) diverted above station for domestic use.

Rating table (gage height in feet, and discharge, in million gallons a day)

0.4	0.08	0.9	2.95
.5	.26	1.0	4.35
.6	.60	1.1	6.10
.7	1.13	1.2	8.20
.8	1.89	1.3	10.8

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.90	0.94	*0.83	0.26	0.89	3.31	0.55	0.55	2.03	1.13	0.34	0.51
2	.90	.89	.96	.26	.83	2.35	.73	.83	1.36	.89	.87	.51
3	.73	1.10	1.00	.23	1.20	1.28	.48	1.34	4.65	.78	.40	.73
4	.73	1.02	.73	.23	.64	1.17	.40	1.01	1.81	.73	.56	3.55
5	1.39	*1.07	.64	*.23	.44	1.13	.40	.83	2.66	.64	.40	1.80
6	1.43	.68	.60	*.24	.34	.78	*.40	.51	1.89	.64	.34	1.05
7	1.00	.55	.51	.26	*.31	.64	.40	.67	*1.27	.55	.34	.73
8	.68	.48	.48	.21	.31	.60	.37	*1.43	1.20	.51	.31	.60
9	.55	.44	.48	.21	.26	.69	.34	.89	1.06	.48	.31	.51
10	.71	.37	.44	.19	.23	.48	.40	.55	2.13	*.48	*.38	.51
11	1.48	.34	.40	.20	.21	.40	.37	.48	1.13	.48	.40	.48
12	1.13	.34	.40	.54	.21	.40	.31	.37	*.89	.56	.31	.51
13	.73	.31	.37	.21	.21	.48	.28	.37	5.72	.55	.31	2.63
14	.68	.31	.37	*.19	1.09	2.32	.28	*.51	5.46	.48	.28	1.13
15	.60	.26	.34	.26	.48	.78	.39	.44	4.02	1.09	.26	*.81
16	.55	*.26	.34	.26	.31	.77	*.28	.85	2.57	6.71	*.52	1.20
17	.60	.40	.31	.19	.59	3.63	.26	2.37	1.89	1.35	1.13	.78
18	*1.47	.26	.34	.35	1.25	5.35	.31	1.78	1.73	.89	.60	.60
19	.78	10.1	.34	.26	.91	*2.75	.28	1.41	1.20	.73	.44	.55
20	.64	2.62	.31	.21	2.50	2.41	.31	.83	1.06	.68	.37	.48
21	.55	1.68	.28	.19	*1.52	1.28	.23	.87	.89	.68	.34	.40
22	*.68	4.21	.25	.17	.83	.94	.21	.73	1.43	.68	*.37	.37
23	.51	2.73	.26	.26	.55	.89	.21	.55	1.06	.64	.40	.34
24	.44	1.99	.23	.26	.48	.68	*.31	.57	1.34	.54	.26	.31
25	.40	3.98	.23	*2.07	.48	.60	.46	.55	1.13	.51	.23	.28
26	.40	7.63	.39	1.08	.34	.55	.40	.48	2.14	*.44	.55	.26
27	.37	2.31	.34	.51	.34	.60	.28	1.08	4.85	.51	.78	.28
28	.34	1.66	.28	.40	.70	.55	.66	*1.85	4.60	.44	1.60	.39
29	.55	1.28	.26	.84	*1.77	.93	.50	-----	1.99	.37	.83	.31
30	3.11	1.06	.26	.51	2.66	*.55	.40	-----	1.35	.34	.68	.26
31	.89	1.06	-----	.48	-----	.51	1.21	-----	1.13	-----	.48	-----
TOTAL	25.92	52.33	12.98	11.76	22.88	39.80	12.41	25.70	67.67	25.50	15.39	22.87
MEAN												
MGD	0.836	1.69	0.433	0.379	0.763	1.28	0.400	0.918	2.18	0.850	0.496	0.762
CFS	1.29	2.61	0.669	0.587	1.18	1.99	0.619	1.42	3.38	1.32	0.768	1.18
AC-FT	80.0	161	40.0	36.0	70.0	122	38.0	79.0	208	78.0	47.0	70.0

CALENDAR YEAR	1960	MAX	10.1	MIN	0.17	MEAN MOD	0.944	MEAN CFS	1.46	AC-FT	1,060
FISCAL YEAR 1960-61	MAX	10.1	MIN	0.17	MEAN MGD	0.918	MEAN CFS	1.42	AC-FT	AC-FT	1,030

Peak discharge (base, 40 mgd).--July 30 (1:30 a.m.) 82.3 mgd (127 cfs), 2.43 ft; Aug. 19 (3 p.m.) 70.0 mgd (108 cfs), 2.31 ft.

* Discharge measurement made on this day.

ISLAND OF TUTUIUA

9480. Matuu Stream at Matuu

Location.--Lat 14°19'20" S, long 170°41'15" W, on left bank 0.25 mile above Matuu Village and 0.5 mile above mouth.Drainage area.--0.24 sq mi.Records available.--March 1958 to June 1961.Gage.--Water-stage recorder. Altitude of gage is 75 ft (from topographic map).Extremes.--Maximum discharge during fiscal year, 132 mgd (204 cfs) Nov. 29 (gage height, 2.97 ft), from rating curve extended above 6.0 mgd as explained below; minimum, 0.11 mgd (0.17 cfs) Oct. 14.

1958-61: Maximum discharge 213 mgd (330 cfs) June 23, 1958 (gage height, 3.45 ft), from rating curve extended above 6.0 mgd on basis of formula for broad-crested weir; minimum, 0.09 mgd (0.14 cfs) Sept. 20-23, 1958.

Remarks.--Records good, except those for periods of no gage-height record, which are fair.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.5	0.03	1.1	2.07
.6	.14	1.2	4.25
.7	.34	1.3	6.00
.8	.64	1.4	8.20
.9	1.09	1.5	10.9
1.0	1.81	1.6	14.1

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	1.53	1.77	0.48	0.16	0.54	*2.23	3.48	0.91	2.23	0.91	*0.36	0.39
2	2.82	2.30	.42	.16	.47	1.59	1.45	1.08	1.30	.77	2.14	2.81
3	1.66	*1.30	1.25	.16	.42	2.73	.64	.73	*4.06	.68	.60	2.72
4	.82	1.04	.60	.16	.42	1.17	.44	.44	1.66	.60	.42	1.21
5	2.06	1.00	.48	*.16	.35	1.00	.39	.36	2.16	*.56	.36	2.34
6	1.73	.56	.42	.14	.35	.60	.34	.31	3.26	.50	.34	*1.45
7	.86	.42	.39	.16	.30	.48	.29	.34	1.67	.48	.31	.86
8	.54	.36	.31	.14	.30	.44	.31	.74	*2.12	.48	*.29	.60
9	.42	.29	.29	.14	.29	1.15	.31	.84	1.52	.44	.27	.68
10	.94	.27	.27	.14	.21	.50	*.52	.44	2.32	.42	.29	.56
11	6.04	.25	.27	.21	.23	.46	.27	.34	1.09	.39	.31	.48
12	*1.37	.25	.25	.68	.24	.39	.23	.27	1.11	.39	.25	.48
13	.73	.25	.25	.14	.23	.87	.23	*.31	13.2	.42	.23	*1.91
14	.50	.23	.23	*.12	*1.47	.60	.37	.48	9.42	.39	.21	.95
15	.44	.23	.21	.14	.44	.41	.23	.31	7.32	1.56	.19	.60
16	.42	.21	*.23	.40	.25	.95	.21	2.01	*4.20	.525	.42	.86
17	.44	*.57	.21	.16	.19	3.10	.21	1.26	2.70	1.09	.42	.64
18	.86	.25	.19	1.76	1.10	6.21	.19	1.04	5.73	.73	.23	.48
19	.60	4.45	.19	.34	.91	2.34	1.35	.85	1.59	*.54	.19	.36
20	*.48	1.30	.17	.48	.67	1.09	.42	.54	2.93	.54	.09	.31
21	.36	1.00	.19	.23	.48	*.68	.25	.86	3.49	.50	.30	.29
22	.44	4.05	.19	.17	.31	.50	.21	.73	3.49	2.01	.35	.27
23	.36	1.81	.19	1.86	*.27	.42	.19	.42	1.59	.82	.45	.25
24	.27	1.09	.19	1.32	.23	.34	.31	.72	1.30	.56	.31	.25
25	.25	6.56	.19	5.59	*.29	1.31	2.72	.44	1.45	.48	.23	.23
26	.39	6.61	.21	1.23	.21	.42	2.90	.34	3.35	.55	.23	.23
27	.25	1.66	.29	.48	.82	1.52	1.37	1.97	6.70	.44	.21	.27
28	.21	.95	.19	*.89	.64	.60	.95	2.97	9.11	.39	.33	.43
29	.23	.68	.17	2.69	7.62	.88	.77	-----	2.23	.34	1.19	.23
30	2.44	*.56	.16	.90	5.11	.56	*.56	-----	1.45	.34	.56	.21
31	.646	.54	-----	.70	-----	.39	2.43	-----	1.09	-----	.29	-----
TOTAL	36.92	41.81	9.08	22.01	25.00	34.93	24.54	22.05	106.84	23.67	12.53	34.24
MEAN												
MGD	1.19	1.35	0.303	0.710	0.843	1.13	0.792	0.788	3.45	0.789	0.404	1.14
CFS	1.84	2.09	0.468	1.10	1.30	1.74	1.22	1.22	5.33	1.22	0.683	1.77
AC-FT	113	128	28.0	68.0	78.0	107	75.0	68.0	328	73.0	38.0	105

Calendar Year 1960 Max 7.97 Min 0.11 Mean mgd 0.830 Mean cfs 1.28 Ac-ft 931
Fiscal Year 1960-61 Max 13.2 Min 0.12 Mean mgd 1.08 Mean cfs 1.67 Ac-ft 1,210

Peak discharge (base, 50 mgd).--Nov. 29 (7:30 p.m.) 132 mgd (204 cfs), 2.97 ft; Mar. 13 (2 p.m.) 84.0 mgd (130 cfs), 2.60 ft; June 4 (11:30 a.m.) 82.0 mgd (127 cfs), 2.58 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 30 to Nov. 12, May 20-23; discharge estimated on basis of records for nearby streams.

9600. West Branch Alega Stream at Alega

Location.--Lat 14°18'05" S, long 170°38'35" W, on left bank 500 ft above confluence with East Branch and 0.25 mile northwest of Alega Village.

Drainage area.--0.16 sq mi.

Records available.--March 1958 to June 1961.

Gage.--Water-stage recorder. Altitude of gage is 85 ft (from topographic map).

Extremes.--Maximum discharge during fiscal year, 39.7 mgd (61.4 cfs) Nov. 29 (gage height, 2.82 ft), from rating curve extended above 4 mgd as explained below; minimum, 0.30 mgd (0.46 cfs) Sept. 30, Oct. 3.

1958-61: Maximum discharge, 55.2 mgd (85.4 cfs) June 23, 1958 (gage height, 3.15 ft), from rating curve extended above 4 mgd by logarithmic plotting; minimum, 0.20 mgd (0.31 cfs) July 11-12, 1959.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in million gallons a day)

0.8	0.15	1.3	2.75
.9	.38	1.4	3.75
1.0	.74	1.5	4.90
1.1	1.26	1.6	6.25
1.2	1.90	1.7	7.80

DISCHARGE, IN MILLION GALLONS A DAY, FISCAL YEAR JULY 1960 TO JUNE 1961

DAY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
1	0.74	1.20	0.79	0.30	0.66	1.77	1.00	0.89	0.94	1.90	0.74	0.70
2	.75	1.09	.62	.30	.58	*1.26	.90	.91	.79	1.58	1.66	.99
3	.66	.99	.84	.30	.55	1.26	.70	.55	3.76	1.45	.89	1.14
4	.5!	.79	.66	.30	.51	1.17	.60	.48	*1.90	1.38	.79	4.48
5	.91	.74	.55	*.32	.48	1.14	*.48	1.81	2.15	1.26	.74	1.90
6	.99	.62	.55	.32	.48	.84	.44	*1.04	1.70	1.20	.74	1.41
7	.66	.55	.51	.35	.44	.70	.44	.70	1.80	1.09	.70	*1.04
8	*.55	.51	*.51	.35	.44	.66	.48	.58	2.04	1.04	.70	.89
9	.48	.51	.51	.35	.41	1.45	.44	.74	1.83	.99	.66	.94
10	.63	.48	.48	.35	.38	.89	.44	.55	1.77	*.99	.70	.74
11	2.32	.48	.48	.44	.41	.74	.41	.48	1.32	.99	.66	.70
12	1.04	.44	.44	.47	.44	.70	.38	.44	1.38	.89	.62	*.70
13	.70	.44	.41	.32	.44	.94	.38	.44	7.57	.94	.58	.94
14	.62	.41	.38	.32	1.49	*.74	.38	.44	5.28	.84	.58	.84
15	.55	*.38	.38	.35	.51	.72	.38	.41	4.93	2.87	*.55	.74
16	.51	.38	.38	.38	.44	.80	.38	.44	5.15	4.30	.58	.74
17	.51	.48	.38	.32	.41	1.10	.38	.55	4.89	1.90	.55	.79
18	.51	.38	.38	.63	*.56	2.00	*.38	.51	7.02	1.51	.55	.70
19	*.55	1.02	.38	.41	.55	.90	.64	.51	3.15	1.26	.55	.64
20	.55	.48	.38	.41	.58	.80	*.41	.44	3.30	1.20	.55	.60
21	.55	.51	.35	.35	.55	.70	.38	.55	5.11	1.28	.51	*.55
22	.70	.99	.35	.35	.48	.64	.38	.44	4.21	1.51	.55	.55
23	.55	.84	.35	.48	.44	.60	.38	.48	2.95	1.09	.66	.55
24	.48	.62	.32	*1.10	.41	.56	.41	.70	2.41	*1.04	.55	.54
25	.41	2.08	.32	3.41	.44	.54	.85	.48	2.15	.99	.51	.52
26	.48	3.98	.32	1.55	.38	.52	1.01	.44	2.66	.89	.51	.58
27	.38	1.77	.35	.70	.48	.56	.51	.82	4.49	.51	.60	
28	.38	1.20	.32	.66	.44	.50	1.21	1.24	7.54	.84	.51	.80
29	.38	*.94	.32	1.84	3.83	.56	.66	-----	3.45	.79	.58	.50
30	.76	.79	.30	.99	2.89	.94	.55	-----	2.58	.74	.55	.40
31	4.84	.70	-----	.79	-----	.50	2.22	-----	2.07	-----	.51	-----
TOTAL	24.69	26.79	13.31	19.51	21.10	26.80	18.60	18.06	102.29	39.64	20.04	27.15
MEAN												
MGD	0.796	0.864	0.444	0.629	0.703	0.865	0.600	0.645	3.30	1.32	0.646	0.905
CFS	1.23	1.34	0.686	0.974	1.09	1.34	0.928	0.998	5.10	2.04	1.00	1.40
AC-FT	76.0	82.0	41.0	60.0	65.0	82.0	57.0	53.0	314	122	62.0	83.0

Calendar Year	1960	Max	4.84	Min	0.30	Mean mgd	0.742	Mean cfs	1.15	Ac-ft	83k
Fiscal Year	1960-61	Max	7.57	Min	0.30	Mean mgd	0.981	Mean cfs	1.52	Ac-ft	1,100

Peak discharge (base, 20 mgd).--July 31 (2:30 a.m.) 21.5 mgd (33.3 cfs), 2.30 ft; Nov. 29 (8:30 p.m.) 39.7 mgd (61.4 cfs), 2.82 ft; Mar. 13 (4:30 p.m.) 28.0 mgd (43.3 cfs), 2.51 ft; Mar. 17 (9:30 p.m.) 23.0 mgd (35.6 cfs), 2.35 ft; Mar. 28 (10:30 a.m.) 21.2 mgd (32.8 cfs), 2.29 ft.

* Discharge measurement made on this day.

Note.--No gage-height record: Dec. 15 to Jan. 5, June 18-21, 24-30; discharge estimated on basis of record for nearby streams.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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 area 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 stream flow 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 fiscal years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during fiscal year 1961

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge MGD (XXX) CFS

ISLAND OF KAUAI

40-0110.	Waiahoali Stream at Kokee ditch diversion near Waimea.	Lat 22°07'25", long 159°37'25", 0.3 mile from mouth and 12 miles northeast of Waimea.	1.7	1909-12, 1919-25, 1961	5-29-61	2.24	3.46
120.	Kauaikinana Stream at Camp 10 road crossing near Waimea.	Lat 22°07'45", long 159°38'05", 0.6 mile from mouth and 12.2 miles northeast at Waimea.	1.2	1911-16, 1919-25, 1961	5-29-61	.924	1.43

ISLAND OF OAHU

40-2010.	Right Branch North Fork Kaukonahua Stream, near Wahiawa	Lat 21°31'15", long 157°56'55", 200 ft upstream from intake of Wahiawa Water Co. tunnel and the confluence of Right and Left Branches.	1.2	1913-53	9-30-60 4-14-61 5-25-61	4.01 1.34 1.75	6.20 2.07 2.71
2296.	Waolani Stream at mouth, at Honolulu	Lat 21°19'20", long 157°51'34", at Liliuokalani Gardens, 0.35 mile west of Kawanakoa School and 0.8 mile southwest of St. Francis Hospital.	1.70	1960-61	10-18-60	.208	.322
2351.	Nuuanu Stream above Waclani confluence at Honolulu.	Lat 21°19'20", long 157°51'33", at Liliuokalani Gardens, 0.3 miles west of Kawanakoa School and 0.8 miles southwest of St. Francis Hospital.	4.48	1960-61	10-18-60	2.02	2.13
2744.99	Keahala Stream at Kam Highway, at Kaneohe.	Lat 21°25'12", long 157°48'15", 36 ft upstream from bridge at Kamehameha Highway in Kaneohe.	.59	1959-61	4-5-61	2.76	4.27
2831.	Kahaluu Stream, left bank tributary, near Kahaluu.	Lat 21°26'21", long 157°51'10", 3.5 miles northwest of Parker School, and 1.9 miles southwest of Kahaluu.	.12	1960-61	7-22-60 4-6-61	.308 .333	.477 .515
2931.	Waianu Stream at Waiahole.	Lat 21°28'59", long 157°51'49", 0.6 miles southwest of Waiahole School and 2.3 miles southwest of Kahaluu.	1.65	1959-61	4-5-61	2.99	4.63
2959.95	Kahana Stream at maula trail crossing near Kahana.	Lat 21°32'17", long 157°53'29", 1.76 miles upstream from main bridge on Kamehameha Highway and 2.84 miles southwest of Kaaawa School.	3.21	1960-61	7-26-60 3-30-61	11.0 9.69	17.0 15.0
3250.	Kamananui Stream at Pupukea Military Road, near Maunawai.	Lat 21°37'25", long 158°01'04", 3.5 miles southeast of Maunawai and 4.5 miles east of Kawaiola Camp.	3.15	1959-61	10-11-60 10-11-60 5-25-61	4.02 3.66 .73	6.22 5.66 1.13
3350.	Kamananui Stream above Kamananui ditch near Wahiawa.	Lat 21°35'00", long 158°00'22", 1000 ft upstream from Kamananui ditch intake and 5.4 miles north of Leilehua High School.	4.74	1960-61	10-10-60 5-24-61	2.31 1.39	3.57 2.15

Discharge measurements made at low-flow partial-record stations during fiscal year 1961--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge MOD (cfs)
ISLAND OF GUAM, MARIANA ISLANDS						
40-8010.	La Sa Fua River near Umatac	Lat 13°18'25" N, long 144°39'45" E, 0.6 mile northeast of Umatac, 3.1 miles north of Merizo and 5.5 miles south of Agat.	1.93	1953-61	3-8-61 4-19-61 6-20-61	1.25 .943 1.04
8100.	Right Branch Umatac River at Umatac	Lat 13°17'50" N, long 144°39'50" E, 50 ft upstream from Left Branch and 0.3 mile southeast of Umatac Catholic Church.	0.33	1960-61	3-8-61 4-19-61 6-16-61	1.52 .770 1.06
8120.	Left Fork of Left Branch Umatac River Near Umatac.	Lat 13°17'25" N, long 144°39'50" E, 0.4 mile upstream from Right Fork and 1.2 miles southeast of Umatac Catholic Church.	.15	1960-61	3-8-61 4-19-61 6-16-61	.277 .264 .160
8130.	Piga Spring near Umatac.	Lat 13°17'55" N, long 144°40'47" E, at Umatac Village water diversion at the source of the Right Fork of Left Branch Umatac River, 1.4 mile due east of the Umatac Church.	None	1955-61	3-8-61 4-19-61 6-16-61	.167 .167 .167
8140.	Right Fork of Left Branch Umatac River at Umatac.	Lat 13°17'40" N, long 144°40'20" E, 50 ft upstream from Left Fork and 0.9 mile southeast of Umatac Catholic Church.	.16	1960-61	3-8-61 4-19-61 6-16-61	.315 .205 .222
8170.	Toguan River near Umatac.	Lat 13°17'05" N, long 144°39'35" E, at highway bridge, 1.0 mile south of Umatac Catholic Church.	.21	1951-61	3-9-61 4-20-61 6-16-61	.344 .202 .339
8200.	Geus River above diversion near Merizo	Lat 13°16'45" N, long 144°40'55" E, just upstream from pipeline diversion to village of Merizo, and 2.0 miles northeast of Merizo School.	.20	1960-61	3-9-61 4-20-61 6-14-61	.224 .191 .195
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 mile northeast of Merizo School.	None	1954-61	3-9-61 4-20-61 6-14-61	.096 .107 .067
8300.	Right Fork of Right Branch Inarajan River near Inarajan.	Lat 13°17'00" N, long 144°43'25" E, just above confluence with Left Fork, 1.6 miles northwest of Inarajan Catholic Church and 5.35 miles southwest of Talofofo School.	.62	1960-61	3-9-61 4-20-61 6-14-61	1.61 1.08 .966
8310.	Left Fork of Right Branch Inarajan River near Inarajan.	Lat 13°17'00" N, long 144°43'25" E, just above confluence with Right Fork, 1.65 miles of Inarajan Catholic Church and 5.3 miles south-west of Talofofo School.	.44	1960-61	3-9-61 4-20-61 6-14-61	1.59 1.28 1.32
8330.	Right Fork of Left Branch Inarajan River near Inarajan.	Lat 13°17'25" N, long 144°43'45" E, just above filter plant, 1.65 miles northwest of Inarajan Catholic Church and 4.9 miles southwest of Talofofo School.	.27	1960-61	3-9-61 4-20-61 6-14-61	1.17 .687 .687
8340.	Left Fork of Left Branch Inarajan River near Inarajan.	Lat 13°17'10" N, long 144°44'10" E, just upstream from confluence with Right Fork, 1.0 mile northwest of Inarajan Catholic Church, and 4.8 miles southwest of Talofofo School.	.17	1960-61	3-9-61 4-20-61 6-14-61	.267 .178 .178
8420.	Asalonso River near Talofofo.	Lat 13°19'41" N, long 144°45'34" E, 300 ft below highway bridge on Route 4, 1.8 miles south of Talofofo Village school.	1.50	1951-61	3-22-61 4-24-61 6-23-61	.727 .755 .486
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.	6.5	1951-61	3-16-61 6-23-61	4.31 12.9

Discharge measurements made at low-flow partial-record stations during fiscal year 1961--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (0000) MOD CFS
40-8520.	Sarasa River near Talofofo	Lat 13°20'20" N, long 144°44'05" E, 50 ft upstream from Talofofo River, 1.6 miles southwest of Talofofo School and 4.5 miles northwest of Inarajan church.	.42	1960-61	3-16-61 4-24-61 6-15-61	.934 .776 .153
8540.	Left Branch Ugum River near Talofofo.	Lat 13°19'10" N, long 144°43'45" E, 50 ft upstream from Right Branch and 2.9 miles southwest of Talofofo school.	2.96	1961	3-22-61 4-28-61 6-15-61	5.26 5.04 5.50
8545.	Right Branch Ugum River near Talofofo.	Lat 13°19'10" N, long 144°43'45" E, at mouth at Left Branch, 2.9 miles southwest of Talofofo school.	2.70	1961	3-22-61 4-28-61 6-15-61	4.77 3.86 4.52
8590.	Left Branch Ylig River above pumping station near Yona.	Lat 13°24'05" N, long 144°45'05" E, 0.2 mile upstream from pumping station, 0.28 mile upstream from Ylig River, 1.7 miles southwest of Yona Catholic Church and 3.2 miles north of Talofofo Catholic Church.	1.98	1960-61	3-10-61 4-25-61 6-20-61	1.67 .856 1.43
8620.	Lonfit River near Ordot.	Lat 13°26'05" N, long 144°45'10" E, just upstream from Sigua River, 0.9 mile south of Ordot, 2.6 miles south of Agana, and 3.5 miles southeast of Asan.	3.1	1951-61	3-13-61 4-21-61 6-16-61	1.88 1.26 1.45
8630.	Sigua River near Ordot.	Lat 13°26'10" N, long 144°45'10" E, just upstream from Lonfit River, 0.9 mile south of Ordot, 2.6 miles south of Agana, and 3.5 miles southeast of Asan.	3.1	1961	3-13-61 4-24-61 6-16-61	1.88 1.07 2.09
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.	None	1953-61	9-15-60 6-2-61	2.52 2.19
8790.	Fonte River 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 mile southeast of Asan Village.	.60	1961	3-7-61 4-26-61 6-6-61	.388 .239 .314
8820.	Atantano River near Agat.	Lat 13°25'15" N, long 144°40'35" E, 500 ft upstream from highway bridge, 2.9 miles northeast of Agat school and 5.6 miles northwest of Yona Catholic Church.	2.81	1958-61	3-20-58 4-20-60 5-24-60 6-29-60 3-17-61 4-19-61 6-22-61	.825 .177 .506 1.33 1.31 1.20 2.18
8850.	Taleyfac River near Agat.	Lat 13°21'40" N, long 144°39'00" E, 800 ft upstream from bridge on Agat-Umatac Road, 1.7 miles southwest of Agat School and 5.0 miles northwest of Umatac Catholic Church.	.46	1959-61	3-10-61 4-21-61 6-15-61	1.50 .913 1.59
8878.	Right Branch of Cetti River near Umatac.	Lat 13°18'58" N, 144°39'21" E, at confluence with Left Branch of Cetti River, fifty feet upstream from gaging station on Cetti River, 1.3 miles northwest of Umatac school.	.37	1961	3-17-61 4-25-61 6-19-61	.718 .458 .491
8879.	Left Branch of Cetti River near Umatac.	Lat 13°18'58" N, long 144°39'21" E, at confluence with Right Branch of Cetti River, fifty feet upstream from gaging station on Cetti River.	.28	1961	3-17-61 4-25-61 6-19-61	.190 .114 .207

Discharge measurements made at low-flow partial-record stations during fiscal year 1961--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs) MGD OFS
ISLAND OF TUTUIA, AMERICAN SAMOA						
40-9000.	Vailoa Stream at Tula Village.	Lat 14°17'12" S, long 170°34'36" W, at Tula Village 100 ft above old reservoir.		1958-61	9-21-60 9-28-60	.011 .008 .011
9010.	Right Fork Vaisa Stream at Onenoa Village.	Lat 14°17'03" S, long 170°34'55" W, at Onenoa Village, 100 ft above a branch and 10 ft below a 15 ft waterfall.		1958-61	9-21-60 9-28-60	.017 .012 .019
9020.	Left Fork Vaisa Stream at Onenoa Village.	Lat 14°17'06" S, long 170°34'56" W, at Onenoa Village, 20 ft below 30 ft waterfall and 6 ft above 8 ft waterfall.		1958-61	9-21-60 9-28-60	.073 .056 .114 .086
9030.	Afimuao Stream at Onenoa Village.	Lat 14°17'08" S, long 170°35'06" W, at Onenoa Village, 10 ft below a branch and 25 ft above large tree on right bank.		1958-61	9-21-60 9-28-60	.027 .012 .019
9040.	Laloulu Stream at Aoa Village.	Lat 14°17'34" S, long 170°35'09" W, at Aoa Village 50 ft above reservoir and 100 ft below a branch.		1958-61	9-22-60 9-29-60	.010 .003 .009
9050.	Lepa Stream at Aoa Village.	Lat 14°17'49" S, long 170°35'32" W, at Aoa Village 100 ft above 2 waterfalls and 100 ft downstream from lower bridge.		1958-61	9-22-60 9-29-60	.028 .025 .038
9070.	Panota Stream at Masausi Village.	Lat 14°17'16" S, long 170°36'23" W, at Masausi Village, 75 ft below 50-ft waterfall, 20 ft above breadfruit tree on right bank.		1958-61	9-26-60	.026 .041
9080.	Vaipito Stream at Masausi Village.	Lat 14°17'24" S, long 170°36'33" W, at Masausi Village, 10 ft above trail crossing, immediately above 8-ft waterfall and 40 ft above 40-ft waterfall at large tree on left bank.		1958-61	9-26-60	.030 .046
9090.	Tagau Stream at Masefau Village.	Lat 14°17'10" S, long 170°38'32" W, at Masefau Village, 100 ft above reservoir and 50 ft below 75-ft waterfall.		1958-61	9-26-60	.026 .040
9100.	Talaloa Stream at Masefau Village.	Lat 14°17'04" S, long 170°38'16" W, at Masefau Village.		1958-61	9-26-60	.080 .123
9110.	Pago Stream at Afono.	Lat 14°17'24" S, long 170°39'04" W, at Afono Village, 25 ft above reservoir.		1959-61	9-26-60	.101 .155
9130.	O'ao'a Stream at Vatia.	Lat 14°16'33" S, long 170°40'41" W, at Vatia Village, 15 ft below a branch 7 ft below a small tree on right bank.		1958-61	9-26-60	.054 .084
9140.	Leafu Stream at Vatia Village.	Lat 14°16'21" S, long 170°40'45" W, at Vatia Village 70 ft above reservoir.		1958-61	9-26-60	.077 .119
9160.	Leua Stream at Fagasa Village.	Lat 14°18'28" S, long 170°43'10" W, at Fagasa Village, 100 ft below old U.S.M.O. reservoir.		1959-61	9-28-60 10-4-60	.015 .025 .023 .039
9170.	Leele Stream at Fagasa Village.	Lat 14°18'35" S, long 170°43'10" W, at Fagasa Village, 40 ft above crossing of 2-inch galvanized pipe, taking water from spring at roadside. Concrete sump built around spring outlet.		1959-61	9-28-60 10-4-60	.153 .136 .236 .211
9180.	Lesina Stream at Fagasa Village.	Lat 14°18'45" S, long 170°43'35" W, at Fagasa Village under crossing of 3-inch galvanized pipe carrying water from spring to village and 75 ft above last house in village.		1959-61	9-28-60 10-4-60	.002 .002 .003 .003
9190.	Fagafue Stream near Aasau Village.	Lat 14°19'33" S, long 170°45'11" W, near Aasau above three inflows on right bank (no outstanding landmark).		1959-61	9-27-60	.795 1.23

Discharge measurements made at low-flow partial record stations during fiscal year 1961-Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge MOD excess CFS
ISLAND OF TUTUILA, AMERICAN SAMOA--Continued						
40-9192.	Upper Right Branch Fagafue Stream near Aasuu.	Lat 14°19'28" S, long 170°45'08" W, near Aasuu at altitude 80 ft and about 2,100 ft from mouth of stream.		1960-61	9-27-60	0.218 0.338
9194.	Lower Right Branch Fagafue Stream near Aasuu.	Lat 14°19'25" S, long 170°45'07" W, near Aasuu at altitude 70 ft and about 1,800 ft from mouth of stream.		1960-61	9-27-60	.068 .105
9198.	Aasuu Stream at Aolau Village.	Lat 14°19'56" S, long 170°45'58" W, at altitude 1,050 ft.		1960-61	9-24-60 10-3-60	.080 .123 .058 .090
9200.	Aasuu Stream at Aasuu Village	Lat 14°19'15"S, long 170°45'34" W, at Aasuu Village 300 ft below 100-ft waterfall in a pool 25 ft long.		1959-61	9-27-60 10-10-60	1.14 1.75 .776 1.19
9220.	Vaise Stream at Aolau Tuai Village.	Lat 14°19'06" S, long 170°46'53" W, at Aolau Tuai Village.		1959-61	9-27-60	.230 .356
9230.	Vailolo Stream at Aolau Tuai Village.	Lat 14°19'15" S, long 170°47'14" W, at Aolau Tuai Village, 100 ft below branch.		1959-61	9-27-60	.911 1.40
9240.	Matavai Stream at Fagamalo Village.	Lat 14°19'15" S, long 170°48'18" W, at Fagamalo Village, 25 ft upstream from 90° bend to right in stream, 5 ft above first small waterfall in a series of small waterfalls.		1959-61	9-27-60	.231 .357
9250.	Moloata Stream at Moloata Village.	Lat 14°19'44" S, long 170°48'16" W, at Moloata Village, 100 ft below 45° bend to right in stream, 50 ft below point where stream comes back to one channel after being divided by boulders. #35 chiseled on rock on right bank.		1959-61	9-27-60	1.00 1.55
9260.	Vaitale Stream at Poloa Village.	Lat 14°20'29" S, long 170°49'20" W, at Poloa Village.		1959-61	9-23-60 9-30-60	.045 .069 .036 .056
9270.	Leafu Stream at Amanave Village.	Lat 14°20'50" S, long 170°49'28" W, at Amanave Village, 100 ft above village reservoir between a medium size and a large pool about 3 ft and 5 ft from each.		1959-61	9-20-60 9-30-60	.028 .044 .023 .036
9280.	Afutale Stream at Agugulu Village.	Lat 14°21'13" S, long 170°48'46" W, at Agugulu Village, 30 ft downstream from branch and at mouth of pool.		1959-61	9-20-60 9-30-60	.184 .284 .151 .234
9290.	Utumea Stream at Utumea Village.	Lat 14°21'04" S, long 170°48'30" W, at Utumea Village, 50 ft above village reservoir.		1959-61	9-23-60 9-30-60	.214 .331 .174 .269
9298.	Utuanua Itiiti Stream at Seetaga Village.	Lat 14°20'49" S, long 170°48'14" W, at Seetaga Village; site is on right branch altitude 50 ft and 800 ft from mouth of stream.		1960-61	9-23-60 9-30-60	.155 .240 .101 .157
9300.	Utuanua Tele Stream at Seetaga Village.	Lat 14°20'43" S, 170°48'12" W, at Seetaga Village 15-ft above first waterfall and 35 ft below second waterfall. Village trail at left bank and taro plantation at right bank.		1959-61	9-23-60 9-30-60	.130 .201 .095 .147
9320.	Asili Stream near Asili Village.	Lat 14°20'45" S, long 170°47'29" W, near Asili Village, 100 ft below branch.		1959-61	9-23-60 10-1-60	.618 .956 .505 .781
9325.	Asili Stream at Asili Village.	Lat 14°21'06" S, long 170°47'26" W, at Asili Village, 30 ft above former gaging station control.		1959-61	9-23-60 10-1-60	.586 .907 .611 .946
9330.	Vaipuga Stream at Amalua Village	Lat 14°20'47" S, long 170°47'09" W, at Amalua Village.		1959-61	9-24-60 10-3-60	.046 .072 .033 .051

Discharge measurements made at low-flow partial record stations during fiscal year 1961--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge MOD CFS
<u>ISLAND OF TUTUILA, AMERICAN SAMOA--Continued</u>						
40-9340.	Leafu Stream near Leone Village.	Lat 14°20'49" S, long 170°46'40" W, near Leone Village, 30 ft above new reservoir which is 30 ft above 100-ft waterfall.		1958-61	9-24-60 10-3-60	.905 .679 1.39 1.05
9350.	Fuafua Stream at Malaeloa Village.	Lat 14°21'02" S, long 170°45'51" W, at Malaeloa Village, 35 ft below branch.		1959-61	9-24-60 10-3-60	.184 .158 .285 .244
9355.	Sigaloa Stream at Malaeloa Village.	Lat 14°21'23" S, long 170°45'53" W, at Malaeloa Village, 20 ft above reservoir on left bank of valley.		1959-61	9-24-60 10-3-60	.012 .006 .019 .009
9360.	Leaveave Stream at Mapusaga Fou Village	Lat 14°20'16" S, long 170°45'08" W, at Mapusaga Fou Village immediately above reservoir.		1959-61	9-24-60 10-3-60	.066 .054 .102 .083
9370.	Mapusaga Tuai Stream at Mapusaga Tuai Village.	Lat 14°20'44" S, long 170°44'54" W, at Mapusaga Tuai Village, 40 ft above reservoir.		1959-61	9-23-60 10-1-60	.115 .112 .178 .173
9380.	Right Branch Taumata Stream at Old Government Dairy.	Lat 14°19'30" S, long 170°44'07" W, at Old Government Dairy, 1000 ft above reservoir and 75 ft waterfall.		1959-61	9-23-60 10-3-60	.078 .080 .121 .123
9390.	Left Branch Taumata Stream at Old Government Dairy.	Lat 14°19'39" S, long 170°43'51" W, at Old Government Dairy, 75 ft below a small branch.		1959-61	9-23-60 10-3-60	.149 .109 .231 .168
9400.	Right Branch Veitele Stream at Tafuna Village	Lat 14°20'05" S, long 170°43'39" W, at Tafuna Village above reservoir and second pool.		1958-61	9-23-60 10-3-60	.228 .183 .353 .283
9410.	Left Branch Vaitele Stream at Tafuna	Lat 14°20'09" S, long 170°43'29" W, at Tafuna Village.		1958-61	9-23-60 10-3-60	.141 .101 .218 .157
9420.	Asofitu Stream near Muuuli Village.	Lat 14°20'05" S, long 170°43'09" W, near Muuuli Village 50 ft below 20 ft waterfall.		1959-61	9-23-60 10-3-60	.132 .098 .205 .151
9430.	Papa Stream near Muuuli Village.	Lat 14°19'59" S, long 170°42'53" W, near Muuuli Village, 20 ft above 2nd waterfall above reservoir and 30 ft below 15 ft waterfall.		1959-61	9-22-60 9-30-60	.359 .296 .556 .458
9440.	Tauase Stream near Muuuli Village.	Lat 14°19'51" S, long 170°42'34" W, near Muuuli Village 200 ft below 100 ft waterfall.		1959-61	9-22-60 9-30-60	.672 .487 1.04 .754
9450.	Amaille Stream at Muuuli Village.	Lat 14°19'54" S, long 170°41'55" W, at Muuuli Village, 200 ft below 100 ft waterfall.		1959-61	9-22-60 9-30-60	.184 .243 .285 .376
9460.	Avau Stream at Faganeanea Village.	Lat 14°19'37" S, long 170°41'45" W, at Faganeanea Village above 4th waterfall above right branch.		1959-61	9-22-60 9-30-60	.080 .112 .124 .173
9470.	Afu Stream at Faganeanea Village.	Lat 14°19'24" S, long 170°41'34" W, at Faganeanea Village immediately below 60 ft waterfall.		1958-61	9-22-60 9-30-60	.036 .023 .056 .036
9490.	Faga'alu Stream at Faga'alu Village.	Lat 14°18'43" S, long 170°41'58" W, at Faga'alu Village immediately above Virgin pool waterfall.		1959-61	10-1-60 10-4-60	.099 .131 .154 .202
9500.	Utumoa Stream near Pago Pago Village.	Lat 14°18'40" S, long 170°42'30" W, at aerator near Pago Pago Village, 10 ft above public works catchment and 200 ft above V-notch weir.		1959-61	9-28-60 10-4-60	.189 .162 .293 .250
9505.	Utumoa Stream at Pago Pago.	Lat 14°18'29" S, long 170°42'32" W, at Pago Pago Village, 20 ft above Pago Pago Village intake.		1959-61	9-28-60 10-3-60	.111 .084 .172 .130
9510.	Vaipito Stream at Pago Pago Village.	Lat 14°18'38" S, long 170°42'39" W, at Pago Pago Village, 50 ft above Steffany reservoir.		1959-61	9-28-60 10-4-60	.060 .063 .092 .098

Discharge measurements made at low-flow partial-record stations during fiscal year 1961--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge XXXIX MGD CFS
<u>ISLAND OF TUTUILA, AMERICAN SAMOA--Continued</u>						
40-9530.	Matagimale Stream above reservoir at Aua.	Lat 14°17'21" S, long 170°40'07" W, above village reservoir, midway between upper and lower waterfalls at Aua.		1959-61	9-22-60 9-29-60	.080 .077 .119
9535.	Lalolama Stream at Aua.	Lat 14°17'29" S, long 170°39'43" W, at trail crossing at Aua.		1959-61	9-22-60 9-29-60	.056 .046 .071
9550.	Ogesosopo Stream at Ogesosopo Village.	Lat 14°18'18" S, 170°40'01" W, at Ogesosopo Village, 30 ft below 75-ft waterfall and 15-ft above 10-ft waterfall and 200 ft above village catchment.		1959-61	9-21-60 9-29-60	.062 .044 .096 .068
9555.	Vaisina Stream at Laulii Fou Village.	Lat 14°18'37" S, 170°39'40" W, at Laulii Fou Village, 40 ft above reservoir.		1959-61	9-21-60 9-29-60	.039 .030 .061 .047
9560.	Ululoloa Stream at Laulii Tuai Village.	Lat 14°18'18" S, long 170°39'25" W, at Laulii Tuai Village, 20 ft below 7-ft waterfall.		1959-61	9-21-60 9-29-60	.018 .032 .028 .050
9565.	Maga Stream at Laulii Tuai Village.	Lat 14°18'13" S, long 170°39'22" W, at Laulii Tuai Village, 10 ft below 40-ft waterfall immediately above which Maga and Kiaeugogo Streams branch.		1959-61	9-21-60 9-29-60	.249 .238 .386 .369
9570.	Lele'a Stream at Laulii Tuai Village.	Lat 14°18'15" S, long 170°39'19" W, at Laulii Tuai Village, 15 ft below branch and 60 ft below waterfall.		1959-61	9-21-60 9-29-60	.122 .097 .188 .150
9580.	Middle Fork Visa Stream at Aumi Village.	Lat 14°18'29" S, long 170°38'54" W, at Aumi Village, 15 ft above 3rd waterfall.		1958-61	9-21-60 9-29-60	.071 .044 .110 .068
9585.	Left Branch Visa Stream at Aumi Village.	Lat 14°18'32" S, long 170°38'53" W, at Aumi Village 10 ft above 1st waterfall and 20 ft below 2nd waterfall.		1958-61	9-21-60 9-29-60	.037 .020 .058 .031
9610.	Auto Stream at Auto Village.	Lat 14°17'46" S, long 170°38'09" W, at Auto Village, 60 ft above reservoir and 200 ft below a tributary atop a 100-ft waterfall and 300 ft upstream from trail crossing.		1958-61	9-22-60 9-29-60	.224 .182 .346 .282
9620.	Lalo'i Stream at Amouli Village.	Lat 14°18'11" S, long 170°35'35" W, at Amouli Village, 10 ft above reservoir.		1958-61	9-22-60 9-29-60	.036 .025 .055 .039
9630.	Televai Stream at Amouli Village.	Lat 14°17'54" S, long 170°35'11" W, at Amouli Village 50 ft below a branch.		1958-61	9-22-60 9-29-60	.014 .027 .021 .042
9640.	Leafu Stream at Auasi Village.	Lat 14°18'03" S, long 170°34'46" W, at Auasi Village above 2nd waterfall and 25 ft below 3rd waterfall.		1958-61	10-29-58 7-30-59 8-11-59 9-22-60 9-28-60	.053 .071 .062 .055 .039 .082 .110 .096 .085 .060
9650.	Valalili Stream at Alao Village.	Lat 14°17'50" S, long 170°34'23" W, at Alao Village 200 ft above new reservoir.		1958-61	9-21-60 9-28-60	.038 .028 .058 .043
9660.	Vel fusi Stream at Alao Village.	Lat 14°17'46" S, long 170°34'21" W, at Alao Village, 25 ft above old reservoir.		1958-61	9-21-60 9-28-60	.019 .008 .030 .012

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements 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 fiscal year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent fiscal years for which the annual maximum has been determined. The maximum discharge for each year since the crest-stage gage was established is given. The peak discharge for some years may have been published in a previous report as a measurement of discharge. Figures given herein supersede all previous figures of peak discharge for the floods listed.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cubic feet per second)
<u>ISLAND OF KAUAI</u>							
40-0280.	Waimea River below Kekaha ditch intake.	Lat 22°02'40", long 159°28'35", on right bank 500 ft below Kekaha ditch intake, 6.5 miles north of Waimea and 6.9 miles northeast of Kekaha.	45.0	1921-61	10-2-60	15.71	4,400 6,810
<u>ISLAND OF OAHU</u>							
40-2113.	Makaleha Stream near Waialua.	Lat 21°33'56", long 158°09'24", on left downstream wingwall of bridge on plantation road, 1.9 miles southwest of Sugar Mill, Waialua.	4.24	1957-61	12-29-61	3.35	89 138
2115.	Makua Stream at Makua.	Lat 21°32'05", long 158°13'25", on left bank 0.5 mile upstream from Farrington Highway, 0.55 mile northeast of cemetery, Makua.	4.07	1957-61	5-1-61	5.30	(+)
2122.	Mailiili Stream at Iualualei Naval Reservation.	Lat 21°27'34", long 158°08'05", on right downstream wingwall of bridge at Iualualei Naval Reservation, 3.4 miles east of cemetery, Waianae.	1.76	1957-61	5-2-61	.02	(+)
2124.01	Awanui Stream at Gilbert near Barber's Point Lighthouse.	Lat 21°19'54", long 158°06'05", on center pier of railroad bridge, 0.15 mile southsast of Gilbert and 2.3 miles northwest of Barber's Point Lighthouse.	2.64	1958-61	3-3-61	.78	(+)
2126.01	Waikale Stream at Wheeler Field.	Lat 21°28'42", long 158°03'08", on left bank crossing, 0.3 mile west of east-west runway at Wheeler Field, 1.9 miles southwest of Wahiawa Post Office.	5.93	1959-61	12-4-60	5.36	(+)
2127.	Waikakalaua Stream near Wahiawa.	Lat 21°27'50", long 158°01'38", 2.4 miles southeast of Wahiawa Post Office.	7.14	1957-61	2-13-61	3.85	77 119
2165.	Waimano Flood Channel at Pearl City.	Lat 21°23'55", long 157°58'16", on left bank 200 ft below bridge near intersection of Hoolauloa and Hookahi Streets at Pearl City, 0.6 mile above mouth, and 2.6 miles east of Waipahu Mill.	2.59	1955-61	12-4-60	0.74	(+)
2285.	Moanalua Stream at altitude 100 ft, near Honolulu.	Lat 21°22'00", long 157°53'57", on left abutment of bridge in Moanalua Golf Course, 4.55 miles northwest of Honolulu Post Office.	4.16	1957-61	12-30-60	4.3	600 928
2354.	Waolani Stream at Honolulu.	Lat 21°20'00", long 157°51'04", on downstream side of right wingwall of Wylie Street bridge of Honolulu and 1.8 miles northeast of Honolulu Post Office.	1.28	1957-61	12-30-60	2.10	195 302

* Discharge not determined.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (XXX) MGD CFS
<u>ISLAND OF OAHU--Continued</u>							
40-2375.	Pauoa Stream at Lusitana Street at Honolulu.	Lat 21°10'18", long 157°51'03" on upstream side of left abutment of Lusitana Street bridge at Honolulu.	1.52	1957-61	1-26-61	1.6	(+)
2472.	Waialae-Nui Gulch at Honolulu.	Lat 21°16'51", long 157°47'04", on right bank 75 ft downstream from Kalanianaole Highway at Honolulu.	1.75	1957-61	12-30-60	3.4	168 260
2475.	Wailupe Stream at Aina Haina.	Lat 21°17'46", long 157°45'29", on right downstream wingwall at Aina Street bridge at Aina Haina.	2.35	1957-61	12-30-60	1.48	215 333
2479.	Kuliouou Stream at Kuliouou.	Lat 21°17'44", long 157°43'33", at footbridge 0.4 mile upstream from Kalanianaole Highway bridge at Kuliouou.	1.21	1957-61	12-30-60	1.46	(+)
2488.	Pacific Ocean tributary at Waimanalo.	Lat 21°20'31", long 157°42'39", on upstream side of left wingwall of Hihimanu Street culvert, 0.8 mile northwest of Waimanalo Post Office.	1.21	1957-61	1-26-61	0.53	9 14
2605.	Maunawili Stream near Kailua.	Lat 21°22'49", long 157°45'48", on upstream side of right pier of bridge on abandoned highway, 400 ft upstream from Kalanianaole Highway, and 1.7 miles southwest of Kailua Post Office.	5.62	1957-61	1-26-61	6.72	313 484
2648.	Kawainui Swamp Canal at Kaneohe Ranch Co. pump at Kailua.	Lat 21°24'34", long 157°45'30", on right bank of drainage channel of Kaneohe Ranch Co.'s pump at mauka end of Kainui Street in Kailua.	-	1956-61	8-3-60	3.48	(+)
2744.99	Keahala Stream at Kamehameha Highway at Kaneohe.	Lat 21°25'12", long 157°48'15", on left bank 36 ft upstream from bridge at Kamehameha Highway at Kaneohe.	0.59	1958-61	12-4-60	2.57	(+)
2835.	Kahaluu Stream at Kahaluu.	Lat 21°27'23", long 157°50'15", at private road bridge 0.45 mile above estuary and 0.5 mile south of Kahaluu.	3.70	1959-61	12-30-60	3.50	(+)
2959.	Makaua Stream at Kasava.	Lat 21°33'36", long 157°51'24", on left downstream wingwall of Kamehameha Highway bridge at Keaava.	0.53	1957-61	1-14-61	2.15	(+)
3045.	Kaluanui Stream at altitude 30 ft, near Hauula.	Lat 21°35'55", long 157°54'25", on left downstream wingwall of abandoned railroad bridge, 0.6 mile upstream from bridge on Kamehameha Highway and 1.2 miles southeast of cemetery, Hauula.	2.12	1957-61	1-14-61	3.46	660 1,020
3105.01	Malaeakahana Stream at altitude 30 ft, near Kahuku.	Lat 21°39'46", long 157°57'12", on right foundation and wingwall of plantation railroad bridge, 1.3 miles south of Sugar Mill, Kahuku.	3.80	1958-61	1-14-61	4.45	420 650
3110.	Oio Stream near Kahuku.	Lat 21°41'32", long 157°59'48", on right bank 0.6 mile upstream from Kamehameha Highway bridge and 3.1 miles west of Sugar Mill, Kahuku.	2.22	1957-61	4-20-61	2.63	85 132
3400.	Anahulu Stream near Haleiwa.	Lat 21°35'28", long 158°04'45", on right bank 1.7 miles southeast from junction of Emerson Road and Kamehameha Highway and 2.5 miles east of Waialua School, Haleiwa.	11.9	1957-61	2-13-61	5.11	1,040 1,610
3500.	Opaeula Stream near Waialua.	Lat 21°35'08", long 158°05'58", on left bank 0.6 mile upstream from Kamehameha Highway bridge and 2.1 miles northeast of Waialua.	5.96	1955-61	2-13-61	4.43	400 619

* Discharge not determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs) MGD
<u>ISLAND OF MAUI</u>							
40-6070.	Iao Stream at Wailuku.	Lat 20°53'30", long 156°30'27", 560 ft upstream from Market Street bridge at Wailuku and 1.9 miles above mouth.	8.24	1952-61	10-17-60	2.38	500 774
<u>ISLAND OF GUAM</u>							
40-8010.	Ia Sa Fua River near Umatac.	Lat 13°18'25" N, long 144°39'45" E, 0.6 mile northeast of Umatac, 3.1 miles north of Merizo, and 5.5 miles south of Agat.	1.93	1953-61	10-19-60	5.50	1,050
8620.	Lonfit River near Ordot.	Lat 13°26'05" N, long 144°45'10" E, just upstream from Sigua River, 0.9 mile south of Ordot, 2.6 miles south of Agana and 3.5 miles southeast of Asan.	3.1	1951-61	8-20-60	16.66	2,150

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements made at miscellaneous sites during fiscal year 1961

Stream	Tributary to	Location	Measured Previously (Fiscal Years)	Date	Discharge (Mgd)	Discharge (Cfs)
<u>ISLAND OF KAUAI</u>						
Kalalau Stream	Pacific Ocean	Lat 22°09'45", long 159°38'10", at 5.5 miles southwest of Kauai Electric Power House (drainage area, 1.6 sq mi, approximately).	1932-55*, 1956-60	6-3-61	2.52	3.90
Kalalau Stream tributary No. 4	Kalalau Stream	Lat 22°10'05", long 159°38'55", at mouth, 5.8 miles southwest of Kauai Electric Power House.	1957-58	6-3-61	.173	.275
Kalalau Stream tributary No. 3	Kalalau Stream	Lat 22°10'30", long 159°38'55", at mouth, 6.0 miles southwest of Kauai Electric Power House.	1946-49, 1956-60	6-3-61	.840	1.30
Honopou Stream	Pacific Ocean	Lat 22°10'00", long 159°40'25", at mouth, 10.9 miles northwest of Mana.	1957-60	6-4-61	2.14	3.31
Milolii Stream	Pacific Ocean	Lat 22°08'55", long 159°43'30", at mouth, 8.3 miles northwest of Mana.	1946-48, 1951, 1954-60	6-3-61	1.42	2.20
<u>ISLAND OF HAWAII</u>						
Honolii Stream	Pacific Ocean	Lat 19°45'36", long 155°05'50", above old belt road near Hilo.	1959-60	1-31-61	7.50	11.6
Hanawi Stream	Pacific Ocean	Lat 19°48'30", long 155°06'15", above new highway bridge.	1959-60	1-31-61	2.73	4.22
Kawaihui Stream	Pacific Ocean	Lat 19°49'20", long 155°06'36", 0.6 mile northwest of Onomea.		1-31-61	3.01	4.66
Paheehee Stream	Pacific Ocean	Lat 19°52'37", long 155°06'45", 0.5 mile north of Honomanu.		1-31-61 3-22-61	1.93 5.48	2.99 8.48
Kohakohau Stream	Keanuiomano Stream	Lat 20°01'45", long 155°42'05", at bridge, at junction of Kohala, Kawaihae, and Waimea roads, 2.0 miles west of Kamuela Post Office.	1955-60	8-8-60 9-26-60 1-17-61 1-24-61 3-14-61 5-9-61	1.23 5.99 .119 .113 .332 .431	1.90 9.27 .184 .175 .514 .667

* Operated as a continuous-record gaging station.

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