IWAO MATSUOKA

1969

# Water Resources Data for Hawaii and other Pacific Areas

## Part 1. Surface Water Records

## Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

CALENDAR FOR WATER YEAR 1969

OCTOBER 1968

| S | M | T | W | T | F | S |
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NOVEMBER 1968

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DECEMBER 1968

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JANUARY 1969

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FEBRUARY 1969

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MARCH 1969

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APRIL 1969

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MAY 1969

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JUNE 1969

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JULY 1969

| S | M | T | W | T | F | S |
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AUGUST 1969

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SEPTEMBER 1969

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| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | | | | |

# 1969

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## Part 1. Surface Water Records

## Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
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Prepared in cooperation with the State of Hawaii, the Government of Guam, the Government of American Samoa, Trust Territory of the Pacific Islands, and with other State, county, and Federal agencies

Prepared in cooperation with

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

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

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

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

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# WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1969

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

## INTRODUCTION

Water resources data for the 1969 water year for Hawaii and other Pacific areas including records of streamflow or reservoir storage at gaging stations, partial-record stations, and miscellaneous sites, and records of water-quality data on the chemical and physical characteristics of surface- and ground-water, are given in this report. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey under the direction of Mearle M. Miller, district chief. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Hawaii and other Pacific areas.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled "Surface Water Supply of Mariana, Caroline, and Samoa Islands."

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

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

Distribution of these basic-data reports is limited; they are designed primarily for rapid release of data shortly after the end of the water year to meet local needs. The records later will be published in Geological Survey water-supply papers at 5-year intervals. These water-supply papers will be entirely on a water-year basis and will show discharge in cubic feet per second.

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

## COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii have had cooperative agreements for the systematic collection of streamflow records since 1909, and for water quality records since 1967. Cooperative agreements with the Territory of Guam for the collection of streamflow records began in 1953, with the Territory of American Samoa in 1957, and with the Trust Territory of the Pacific Islands in 1968. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Hawaii Department of Land and Natural Resources, Division of Water and Land Development, R. T. Chuck, manager-chief engineer.
Government of Guam, M. F. L. Guerrero, succeeded by C. G. D. Camacho, governor.
Government of American Samoa, O. S. Aspinall, succeeded by J. M. Haydon, governor.
Trust Territory of the Pacific Islands, W. R. Norwood, succeeded by E. E. Johnston, high commissioner.
City and County of Honolulu, Board of Water Supply, G. A. L. Yuen, manager and chief engineer.
City and County of Honolulu, Division of Engineering, Yoshio Kunimoto, succeeded by A. C. Zane, director and chief engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 35 gaging stations and 15 water-quality stations published in this report.

The following organizations aided in collecting records:

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

## DEFINITION OF TERMS

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

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

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

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Cubic foot per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

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

Mean discharge is the arithmetic average of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the tables is "Discharge (cfs)."

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

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

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

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

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

Milligrams per liter (mg/l, MG/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the weight of solute per unit volume of water. Milligrams or micrograms per liter may be converted to milliequivalents (one thousandth of a gram-equivalent weight of a constituent) per liter by multiplying by the factors in table 1, page 5. Concentration of suspended

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

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

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

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

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

sediment expressed in milligrams per liter is based on the weight of sediment in a liter of water-sediment mixture. Sediment concentrations that are expressed in parts per million may be converted to milligrams per liter by using the factors in table 2, page 5.

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

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined by sieve and sedimentation methods.

Particle-size classification, used in this report, agrees closely with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology (Lane and others, 1947, p. 937). The classification is as follows:

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

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

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.

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

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water. Commonly, the amount of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream or from well to well, and it may even vary in the same source with changes in the composition of the water.

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

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

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

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

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

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

## SPECIAL NETWORKS AND PROGRAMS

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

## DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16-8846.00, includes the part number "16" and a 6-digit number. The nonessential zeros following the decimal are not shown. For example, the complete number 16-8846.00 would appear as 16-8846., just to the left of the station name. In this report, the records are listed in downstream order by islands.

# PART 1. SURFACE WATER RECORDS

## Collection and computation of data

The base data collected at gaging stations consists of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that gives a continuous graph of the fluctuations or, for digital recorders, a tape punched at 15-minute intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in standard textbooks on the measurement of stream discharge. (See also SELECTED REFERENCES). Surface areas of lakes or reservoirs are determined from instrument surveys using standard methods. The configuration of the reservoir bottom is determined by sounding at many points.

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

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

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

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

The data in this report generally comprise a description of the station and tabulations of basic data. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents is given. Records are published for the water year, which begins on October 1 and ends on September 30. A calendar for the 1969 water year is shown on the reverse side of the front cover to facilitate finding the day of the week for any date.

The description of the gaging stations gives the location, drainage area, period of record, type and history of gages, extremes of discharge or contents, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Periods for which there are published records for the present station or for stations generally equivalent to the present

one are given under "PERIOD OF RECORD." The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified. Publication of average discharge for the period of record has been temporarily discontinued owing to technical difficulties involved in the changeover from fiscal to water year. The maximum discharge (or contents), the maximum gage height, and the minimum discharge if there is little or no regulation (or minimum contents) are given under "EXTREMES." The maximum and minimum daily discharge are given if there is extensive regulation. In the first paragraph headed "Current year," the data given are for the complete current water year unless otherwise specified. In the second paragraph under "EXTREMES" headed "Period of record:" the data given are for the period of record given in PERIOD OF RECORD paragraph. Reliable information concerning major floods or abnormally low flows that occurred outside the period of record is given in the third or last paragraph under "EXTREMES." Unless otherwise qualified, the maximum discharge (or contents) corresponds to the crest stage obtained by use of a water-stage recorder (graphic or digital) or crest-stage gage. If the maximum gage height did not occur at the same time as the maximum discharge (or contents), it is given separately. Information pertaining to the accuracy of the discharge records, to conditions that affect the natural flow at the gaging station, and availability of Water Quality records, is given under "REMARKS;" for reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir, is also under "REMARKS."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISIONS (FISCAL YEARS)" or "REVISIONS (WATER YEARS)" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the fiscal or

water years for which figures are revised in that report. In listing the years only one number is given; for instance, 1933 stands for either the fiscal year July 1, 1932, to June 30, 1933, or the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge were revised, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" tha only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given.

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

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

The monthly summary is given below the daily table. For stream-gaging stations the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX." and "MIN." give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month is also expressed in acre-feet (line headed "AC-FT").

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

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

Peak discharges and their times of occurrence and corresponding gage heights for many stations are listed below the yearly summary. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330.

In a general footnote, introduced by the word "NOTE," certain periods are indicated for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage are indicated only if they are a month or more in length and the accuracy of the records is affected. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs. Footnotes to reservoir tables may be used to explain the use of new capacity tables or for other special conditions.

## Accuracy of Data

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

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

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs;

to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations and miscellaneous sites.

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

## Publications

Each volume of the 1960 series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States" contains a listing of the numbers of all water-supply papers in which records of surface-water data were published for the area covered by the individual volumes. Each volume also contains a list of water-supply papers that give detailed information on major floods for the area. A new series of water-supply papers containing surface-water records for the 5-year period October 1, 1960, to September 30, 1965 (the 6-year period October 1, 1959, to September 30, 1965, for Hawaii and other Pacific areas), also will include lists of annual and special reports published as water-supply papers.

Records through June 1950 for the area covered by this report have been compiled and published in Water-Supply Paper 1319; records for July 1950 to June 1960 have been compiled and published in Water-Supply Papers 1739 and 1751. These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station.

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

## Other Data Available

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

More detailed information, than that published for most of the gaging stations, such as discharge measurements, gage-height record, and rating tables, is on file in the district office. Many gaging-stations records in Hawaii through 1968 have been analyzed to give several statistical summaries: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

# PART 2. WATER QUALITY RECORDS

## Collection and examination of data

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

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

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

Prior to the 1968 water year, data for chemical constituents and concentration of suspended sediment were reported in parts per million (ppm) and water temperatures were reported in degrees Fahrenheit (°F). In October 1967 the U.S. Geological Survey began to use the metric system; data for chemical constituents and concentrations of suspended sediment are now reported in milligrams per liter (mg/l) and water temperatures are given in degrees Celsius (centigrade, °C). In waters with a density of 1.000 g/ml (grams per milliliter), parts per million and milligrams per liter can be considered equal. In waters with a density greater than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter. To convert temperatures in degrees Fahrenheit to degrees Celsius, see table 3 on page 17.

In October 1968, the Geological Survey began reporting many of the chemical constituents as well as the minor elements and some pollutants in micrograms per liter instead of milligrams per liter. (See "Definition of Terms," p. 4.)

## Solutes

The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Skougstad and Brown (1970). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals across the channel to determine accurately the solute load.

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

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

*C = 5/9 (°F - 32) or °F = 9/5 (°C) + 32.

## Temperature

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

## Sediment

At some stations, suspended-sediment samples are collected daily with depth-integrating cable-suspended samplers from fixed sampling points at one or more verticals in the cross section. A hand sampler is used at many stations during periods of low flow. Depth-integrated samples

are collected periodically at many verticals in the cross section to determine the ratio of the cross-sectional distribution of the concentration of suspended sediment to the daily sampling verticals.

During periods of high or rapidly changing flow, samples are taken twice or more often throughout the day at most stations. For periods when no samples are collected, daily loads of suspended sediment are estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

## Publications

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

| Water year | WSP No. |
|---|---|
| 1964 | 1966 |
| 1965 | 1966 |
| 1966 | A1996 |
| 1967 | A2016 |

A In preparation.

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Skougstad, N. W., and Brown, E. R., 1970, Methods for collection and analysis of dissolved minerals and gases in water: U.S. Geol. Techniques Water-Resources Inv., book 5, chap. A-1.

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

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

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

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

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

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

_____1963, A summary of the work of the Inter-agency sedimentation project: Rept. S.

# PART 1. SURFACE WATER RECORDS

HAWAII, ISLAND OF KAUAI

16-0100. Kawaikoi Stream near Waimea

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

DRAINAGE AREA.--4.1 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 10,300 cfs Nov. 30 (gage height, 14.78 ft), from rating curve extended as explained below; minimum, 4.4 cfs Nov. 9.
Period of record: Maximum discharge, 11,300 cfs Jan. 13, 1967 (gage height, 15.33 ft), from rating curve extended above 470 cfs on basis of slope-area measurements at gage heights 12.12 and 13.43 ft; minimum, 1.14 cfs Sept. 21, 22, 1953.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 347 | 5.6 | 375 | 73 | 468 | 28 | 179 | 14 | 11 | 22 | 12 | 21 |
| 2 | 126 | 5.2 | 82 | 96 | 389 | 30 | 131 | 24 | 10 | 22 | 35 | 19 |
| 3 | 16 | 5.2 | 365 | 29 | 168 | 48 | 48 | 18 | 9.9 | 26 | 24 | 14 |
| 4 | 10 | 5.2 | 194 | 20 | 59 | 29 | 46 | 13 | 9.6 | 18 | 14 | 46 |
| 5 | 8.3 | 5.2 | 52 | 511 | 36 | 20 | 84 | 12 | 9.6 | 12 | 13 | 50 |
| 6 | 7.0 | 5.0 | 35 | 524 | 29 | 18 | 51 | 13 | 9.4 | 29 | 11 | 40 |
| 7 | 6.1 | 4.8 | 28 | 81 | 24 | 22 | 75 | 12 | 9.1 | 131 | 10 | 25 |
| 8 | 5.9 | 4.6 | 143 | 42 | 21 | 16 | 39 | 19 | 8.6 | 99 | 51 | 16 |
| 9 | 8.6 | 4.5 | 53 | 34 | 19 | 14 | 28 | 106 | 59 | 57 | 28 | 13 |
| 10 | 10 | 4.6 | 28 | 29 | 17 | 13 | 24 | 228 | 120 | 39 | 14 | 13 |
| 11 | 6.7 | 4.8 | 22 | 24 | 16 | 12 | 51 | 189 | 37 | 23 | 17 | 14 |
| 12 | 5.8 | 4.6 | 204 | 21 | 15 | 12 | 85 | 93 | 18 | 28 | 15 | 13 |
| 13 | 5.0 | 290 | 153 | 37 | 23 | 11 | 30 | 85 | 13 | 56 | 20 | 12 |
| 14 | 4.6 | 86 | 60 | 24 | 48 | 11 | 22 | 169 | 11 | 57 | 52 | 20 |
| 15 | 7.4 | 18 | 34 | 26 | 104 | 12 | 19 | 73 | 10 | 223 | 22 | 13 |
| 16 | 92 | 21 | 48 | 34 | 74 | 19 | 17 | 45 | 9.9 | 80 | 15 | 11 |
| 17 | 66 | 26 | 56 | 19 | 47 | 121 | 17 | 36 | 9.9 | 36 | 13 | 10 |
| 18 | 32 | 13 | 167 | 16 | 90 | 57 | 22 | 29 | 10 | 26 | 14 | 57 |
| 19 | 57 | 33 | 39 | 34 | 140 | 20 | 23 | 21 | 20 | 79 | 29 | 16 |
| 20 | 29 | 13 | 26 | 19 | 107 | 14 | 137 | 18 | 45 | 43 | 39 | 20 |
| 21 | 16 | 9.6 | 68 | 40 | 132 | 12 | 49 | 16 | 31 | 28 | 28 | 19 |
| 22 | 11 | 8.3 | 29 | 31 | 48 | 11 | 50 | 15 | 21 | 23 | 14 | 58 |
| 23 | 8.6 | 10 | 21 | 41 | 36 | 34 | 23 | 14 | 18 | 31 | 12 | 16 |
| 24 | 7.4 | 11 | 188 | 20 | 103 | 179 | 18 | 18 | 12 | 27 | 31 | 12 |
| 25 | 7.0 | 8.6 | 257 | 16 | 96 | 75 | 16 | 41 | 14 | 18 | 15 | 10 |
| 26 | 6.5 | 7.4 | 45 | 14 | 101 | 61 | 14 | 17 | 12 | 16 | 35 | 9.9 |
| 27 | 6.1 | 7.0 | 30 | 13 | 37 | 60 | 16 | 14 | 18 | 14 | 44 | 12 |
| 28 | 5.9 | 1,000 | 24 | 12 | 26 | 39 | 17 | 13 | 29 | 13 | 19 | 32 |
| 29 | 5.8 | 1,310 | 21 | 29 | ------ | 62 | 14 | 12 | 20 | 12 | 13 | 31 |
| 30 | 5.6 | 1,240 | 18 | 37 | ------ | 127 | 17 | 12 | 34 | 12 | 15 | 85 |
| 31 | 5.6 | ------ | 17 | 304 | ------ | 554 | ------ | 11 | ------ | 12 | 36 | ------ |
| TOTAL | 935.9 | 4,171.2 | 2,882 | 2,250 | 2,473 | 1,741 | 1,362 | 1,400 | 649.0 | 1,312 | 710 | 727.9 |
| MEAN | 30.2 | 139 | 93.0 | 72.6 | 88.3 | 56.2 | 45.4 | 45.2 | 21.6 | 42.3 | 22.9 | 24.3 |
| MAX | 347 | 1,310 | 375 | 524 | 468 | 554 | 179 | 228 | 120 | 223 | 52 | 85 |
| MIN | 4.6 | 4.5 | 17 | 12 | 15 | 11 | 14 | 11 | 8.6 | 12 | 10 | 9.9 |
| AC-FT | 1,860 | 8,270 | 5,720 | 4,460 | 4,910 | 3,450 | 2,700 | 2,780 | 1,290 | 2,600 | 1,410 | 1,440 |

CAL YR 1968: TOTAL 15,818.6 MEAN 43.2 MAX 1,310 MIN 2.3 AC-FT 31,380
WTR YR 1969: TOTAL 20,614.0 MEAN 56.5 MAX 1,310 MIN 4.5 AC-FT 40,890

PEAK DISCHARGE (BASE, 2,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-13 | 0200 | 8.85 | 2,680 | 1- 5 | 1400 | 8.23 | 2,210 |
| 11-30 | 0030 | 14.78 | 10,300 | | | | |

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

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

DRAINAGE AREA.--1.6 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 1,700 cfs Nov. 29 (gage height, 6.70 ft), from rating curve extended above 160 cfs; minimum recorded, 0.94 cfs June 20, but may have been less during period of no gage-height record Apr. 20 to July 17.
Period of record: Maximum discharge, 1,930 cfs Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 78 cfs; minimum, 0.12 cfs Sept. 21, 1953.

REMARKS.--Records fair except those for period of no gage-height, which are poor. No diversion above station. Recording rain gage located at station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 55 | 2.0 | 154 | 34 | 136 | 6.7 | 33 | 4.5 | 1.2 | 5.0 | 2.3 | 4.1 |
| 2 | 21 | 1.9 | 23 | 30 | 120 | 7.6 | 24 | 8.0 | 1.1 | 5.0 | 2.4 | 2.8 |
| 3 | 7.6 | 1.9 | 85 | 12 | 37 | 14 | 12 | 6.0 | 1.1 | 7.0 | 3.3 | 2.3 |
| 4 | 4.3 | 1.8 | 47 | 8.7 | 16 | 8.9 | 7.4 | 4.5 | 1.1 | 4.1 | 2.6 | 5.1 |
| 5 | 3.3 | 1.8 | 15 | 41 | 10 | 6.3 | 8.0 | 3.5 | 1.0 | 3.5 | 2.2 | 6.9 |
| 6 | 2.8 | 1.7 | 10 | 44 | 8.4 | 5.7 | 8.7 | 3.9 | 1.0 | 12 | 2.0 | 6.7 |
| 7 | 2.6 | 1.6 | 7.8 | 20 | 7.2 | 5.8 | 10 | 3.3 | 1.0 | 35 | 1.9 | 4.2 |
| 8 | 2.3 | 1.5 | 31 | 11 | 6.3 | 5.0 | 9.1 | 3.3 | 1.0 | 22 | 4.7 | 2.9 |
| 9 | 2.5 | 1.5 | 17 | 9.4 | 5.8 | 4.5 | 5.2 | 35 | 2.4 | 12 | 6.3 | 2.4 |
| 10 | 2.6 | 1.5 | 8.9 | 7.4 | 5.2 | 4.2 | 4.2 | 60 | 4.0 | 6.4 | 3.2 | 2.1 |
| 11 | 2.2 | 1.5 | 7.2 | 6.4 | 4.9 | 4.0 | 5.8 | 40 | 4.0 | 5.0 | 6.4 | 2.8 |
| 12 | 2.0 | 1.8 | 53 | 6.0 | 4.5 | 3.7 | 8.0 | 10 | 2.5 | 6.0 | 4.5 | 2.8 |
| 13 | 1.9 | 48 | 37 | 13 | 4.3 | 3.5 | 6.0 | 14 | 2.0 | 10 | 3.1 | 2.2 |
| 14 | 1.9 | 34 | 14 | 8.0 | 4.5 | 3.3 | 4.1 | 7.6 | 1.6 | 10 | 10 | 2.1 |
| 15 | 2.5 | 10 | 8.9 | 6.8 | 10 | 3.3 | 3.4 | 5.6 | 1.4 | 40 | 5.0 | 1.9 |
| 16 | 13 | 5.8 | 27 | 6.0 | 14 | 3.3 | 2.8 | 4.5 | 1.2 | 14 | 3.7 | 1.7 |
| 17 | 38 | 6.7 | 23 | 5.0 | 8.9 | 7.3 | 2.6 | 3.0 | 1.1 | 8.8 | 3.2 | 1.5 |
| 18 | 17 | 4.6 | 62 | 4.5 | 12 | 9.6 | 2.6 | 2.5 | 1.0 | 5.7 | 2.8 | 6.3 |
| 19 | 17 | 5.0 | 16 | 4.5 | 58 | 5.8 | 2.8 | 2.3 | 1.0 | 18 | 2.7 | 4.1 |
| 20 | 9.4 | 4.6 | 9.8 | 4.8 | 30 | 3.9 | 25 | 2.1 | 1.2 | 12 | 4.2 | 3.0 |
| 21 | 5.7 | 3.3 | 13 | 12 | 26 | 3.3 | 11 | 1.9 | 1.1 | 6.7 | 4.1 | 3.6 |
| 22 | 4.1 | 2.8 | 8.9 | 11 | 14 | 3.0 | 5.0 | 1.8 | 1.1 | 5.0 | 2.8 | 15 |
| 23 | 3.3 | 2.7 | 7.1 | 11 | 9.1 | 2.8 | 4.0 | 1.7 | 1.0 | 6.0 | 2.2 | 4.5 |
| 24 | 2.9 | 2.8 | 52 | 6.0 | 18 | 13 | 3.1 | 1.6 | 1.0 | 5.0 | 2.8 | 3.0 |
| 25 | 2.6 | 2.7 | 82 | 4.7 | 18 | 12 | 2.9 | 3.5 | 5.0 | 4.3 | 2.7 | 2.4 |
| 26 | 2.5 | 2.5 | 16 | 4.2 | 21 | 9.6 | 2.7 | 2.7 | 2.0 | 3.5 | 2.8 | 2.2 |
| 27 | 2.3 | 2.4 | 10 | 4.0 | 10 | 11 | 2.6 | 2.2 | 3.7 | 3.2 | 9.6 | 2.4 |
| 28 | 2.2 | 133 | 8.2 | 3.7 | 7.2 | 7.2 | 8.0 | 2.0 | 8.0 | 2.7 | 4.9 | 4.2 |
| 29 | 2.2 | 347 | 7.1 | 4.1 | ------ | 7.6 | 5.0 | 1.7 | 6.0 | 2.7 | 3.0 | 6.9 |
| 30 | 2.0 | 160 | 6.1 | 8.7 | ------ | 9.6 | 9.0 | 1.5 | 10 | 2.4 | 2.7 | 14 |
| 31 | 2.0 | ------ | 5.5 | 74 | ------ | 71 | ------ | 1.3 | ------ | 2.3 | 4.7 | ------ |
| TOTAL | 240.7 | 798.4 | 872.5 | 425.9 | 626.3 | 266.5 | 238.0 | 245.5 | 70.8 | 285.3 | 118.8 | 126.1 |
| MEAN | 7.76 | 26.6 | 28.1 | 13.7 | 22.4 | 8.60 | 7.93 | 7.92 | 2.36 | 9.20 | 3.83 | 4.20 |
| MAX | 55 | 347 | 154 | 74 | 136 | 71 | 33 | 60 | 10 | 40 | 10 | 15 |
| MIN | 1.9 | 1.5 | 5.5 | 3.7 | 4.3 | 2.8 | 2.6 | 1.3 | 1.0 | 2.3 | 1.9 | 1.5 |
| AC-FT | 477 | 1,580 | 1,730 | 845 | 1,240 | 529 | 472 | 487 | 140 | 566 | 236 | 250 |

CAL YR 1968: TOTAL 4,503.43 MEAN 12.3 MAX 347 MIN .94 AC-FT 8,930
WTR YR 1969: TOTAL 4,314.8 MEAN 11.8 MAX 347 MIN 1.0 AC-FT 8,560

PEAK DISCHARGE (BASE, 380 CFS).--Nov. 29 (2300) 1,700 cfs (6.70 ft).

NOTE.--No gage-height record Apr. 20 to July 17.

## 16-0140. Kokee ditch near Waimea

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30 | 5.6 | 55 | 42 | 19 | 25 | 54 | 20 | 13 | 24 | 12 | 21 |
| 2 | 44 | 5.3 | 33 | 55 | 11 | 27 | 50 | 26 | 13 | 21 | 19 | 18 |
| 3 | 26 | 5.1 | 34 | 31 | 25 | 24 | 44 | 24 | 12 | 27 | 30 | 12 |
| 4 | 15 | 5.1 | 34 | 34 | 31 | 12 | 48 | 19 | 12 | 19 | 16 | 36 |
| 5 | 11 | 5.1 | 19 | 38 | 16 | 11 | 62 | 18 | 12 | 13 | 14 | 31 |
| 6 | 9.4 | 4.7 | 15 | 30 | 15 | 16 | 54 | 18 | 11 | 19 | 12 | 40 |
| 7 | 7.9 | 4.5 | 13 | 16 | 20 | 27 | 64 | 17 | 11 | 61 | 11 | 26 |
| 8 | 6.9 | 4.3 | 30 | 46 | 17 | 21 | 50 | 19 | 11 | 64 | 19 | 15 |
| 9 | 8.2 | 4.2 | 23 | 57 | 21 | 22 | 36 | 49 | 15 | 46 | 36 | 12 |
| 10 | 14 | 4.3 | 18 | 48 | 37 | 26 | 31 | 77 | 66 | 37 | 15 | 12 |
| 11 | 8.2 | 4.5 | 16 | 42 | 37 | 25 | 48 | 75 | 37 | 25 | 16 | 12 |
| 12 | 6.7 | 4.6 | 20 | 36 | 38 | 24 | 64 | 60 | 21 | 24 | 16 | 13 |
| 13 | 5.8 | 71 | 19 | 37 | 41 | 23 | 40 | 66 | 16 | 31 | 12 | 10 |
| 14 | 5.1 | 76 | 13 | 30 | 42 | 22 | 30 | 73 | 13 | 51 | 42 | 17 |
| 15 | 4.9 | 32 | 12 | 31 | 28 | 23 | 27 | 58 | 12 | 69 | 25 | 12 |
| 16 | 36 | 23 | 25 | 56 | 34 | 23 | 25 | 48 | 12 | 67 | 16 | 9.4 |
| 17 | 53 | 38 | 47 | 48 | 15 | 61 | 25 | 38 | 11 | 40 | 13 | 8.6 |
| 18 | 41 | 20 | 34 | 43 | 30 | 35 | 27 | 33 | 11 | 29 | 13 | 42 |
| 19 | 45 | 34 | 13 | 64 | 15 | 34 | 30 | 27 | 13 | 52 | 17 | 17 |
| 20 | 34 | 20 | 13 | 50 | 34 | 25 | 67 | 23 | 26 | 40 | 31 | 15 |
| 21 | 22 | 14 | 27 | 55 | 22 | 22 | 53 | 20 | 36 | 31 | 31 | 18 |
| 22 | 14 | 12 | 12 | 36 | 5.6 | 20 | 51 | 19 | 58 | 24 | 15 | 45 |
| 23 | 11 | 13 | 7.4 | 46 | 6.7 | 21 | 32 | 18 | 22 | 30 | 11 | 17 |
| 24 | 9.2 | 15 | 21 | 36 | 30 | 75 | 26 | 20 | 14 | 28 | 25 | 11 |
| 25 | 8.2 | 12 | 8.6 | 41 | 26 | 68 | 23 | 39 | 17 | 20 | 16 | 9.6 |
| 26 | 7.4 | 10 | 28 | 38 | 31 | 54 | 22 | 21 | 15 | 17 | 17 | 8.9 |
| 27 | 6.9 | 9.6 | 40 | 36 | 16 | 59 | 22 | 17 | 15 | 16 | 42 | 9.9 |
| 28 | 6.5 | 40 | 23 | 35 | 21 | 43 | 24 | 16 | 30 | 14 | 20 | 17 |
| 29 | 6.2 | 78 | 17 | 36 | ------ | 59 | 21 | 15 | 22 | 13 | 13 | 34 |
| 30 | 5.8 | 30 | 21 | 45 | ------ | 55 | 23 | 14 | 28 | 13 | 13 | 54 |
| 31 | 5.6 | ------ | 37 | 25 | ------ | 79 | ------ | 14 | ------ | 12 | 29 | ------ |
| TOTAL | 514.9 | 604.9 | 728.0 | 1,263 | 684.3 | 1,061 | 1,173 | 1,001 | 605 | 977 | 617 | 603.4 |
| MEAN | 16.6 | 20.2 | 23.5 | 40.7 | 24.4 | 34.2 | 39.1 | 32.3 | 20.2 | 31.5 | 19.9 | 20.1 |
| MAX | 53 | 78 | 55 | 64 | 42 | 79 | 67 | 77 | 66 | 69 | 42 | 54 |
| MIN | 4.9 | 4.2 | 7.4 | 16 | 5.6 | 11 | 21 | 14 | 11 | 12 | 11 | 8.6 |
| AC-FT | 1,020 | 1,200 | 1,440 | 2,510 | 1,360 | 2,100 | 2,330 | 1,990 | 1,200 | 1,940 | 1,220 | 1,200 |

CAL YR 1968: TOTAL 7,402.2 MEAN 20.2 MAX 78 MIN 2.9 AC-FT 14,680
WTR YR 1969: TOTAL 9,832.5 MEAN 26.9 MAX 79 MIN 4.2 AC-FT 19,500

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

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

DRAINAGE AREA.--2.5 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 2,660 cfs Jan. 31 (gage height, 6.42 ft), from rating curve extended as explained below; minimum, 2.1 cfs June 8, 9.
Period of record: Maximum discharge, 4,530 cfs Jan. 16, 1921 (gage height, 8.44 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 cfs May 17, 18, May 30 to June 2, 1966.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 457 | 4.2 | 207 | 137 | 644 | 12 | 47 | 6.4 | 2.8 | 14 | 6.1 | 11 |
| 2 | 50 | 4.1 | 72 | 57 | 251 | 30 | 40 | 18 | 2.8 | 8.6 | 7.2 | 7.7 |
| 3 | 12 | 4.1 | 112 | 12 | 55 | 159 | 12 | 11 | 2.4 | 6.9 | 8.6 | 6.1 |
| 4 | 9.0 | 4.0 | 47 | 9.0 | 20 | 50 | 8.6 | 8.6 | 2.4 | 6.9 | 6.6 | 12 |
| 5 | 6.9 | 4.0 | 14 | 41 | 12 | 15 | 10 | 7.7 | 2.3 | 5.5 | 5.5 | 17 |
| 6 | 5.8 | 3.9 | 10 | 27 | 9.5 | 16 | 15 | 6.6 | 2.3 | 5.2 | 4.7 | 10 |
| 7 | 5.2 | 3.8 | 7.7 | 21 | 8.1 | 15 | 20 | 5.0 | 2.3 | 14 | 4.0 | 6.6 |
| 8 | 5.2 | 3.8 | 153 | 10 | 7.2 | 11 | 10 | 5.0 | 2.2 | 41 | 27 | 5.5 |
| 9 | 5.0 | 3.8 | 20 | 9.5 | 6.6 | 15 | 8.1 | 10 | 3.0 | 11 | 10 | 5.0 |
| 10 | 4.7 | 3.8 | 10 | 7.7 | 6.4 | 11 | 9.0 | 44 | 7.7 | 9.0 | 10 | 6.4 |
| 11 | 4.4 | 4.0 | 7.7 | 6.6 | 58 | 7.7 | 14 | 68 | 7.7 | 9.0 | 56 | 15 |
| 12 | 4.4 | 3.9 | 32 | 5.5 | 5.5 | 6.6 | 16 | 19 | 4.4 | 17 | 9.5 | 6.6 |
| 13 | 4.2 | 200 | 59 | 13 | 5.2 | 5.8 | 8.6 | 13 | 3.4 | 15 | 17 | 6.4 |
| 14 | 4.2 | 50 | 30 | 8.1 | 5.2 | 5.2 | 6.9 | 16 | 2.8 | 15 | 19 | 6.1 |
| 15 | 4.2 | 22 | 15 | 6.9 | 16 | 5.2 | 5.8 | 13 | 2.6 | 83 | 8.6 | 5.0 |
| 16 | 39 | 13 | 77 | 6.6 | 31 | 5.8 | 5.0 | 8.6 | 2.3 | 37 | 16 | 4.4 |
| 17 | 129 | 9.0 | 35 | 6.1 | 30 | 12 | 6.6 | 6.6 | 2.3 | 12 | 7.7 | 51 |
| 18 | 66 | 7.6 | 192 | 5.0 | 108 | 9.5 | 7.2 | 5.5 | 2.2 | 7.7 | 6.4 | 17 |
| 19 | 45 | 6.6 | 19 | 4.7 | 407 | 6.9 | 7.2 | 5.0 | 2.3 | 127 | 6.4 | 8.1 |
| 20 | 22 | 6.4 | 11 | 7.0 | 151 | 5.5 | 48 | 4.4 | 2.4 | 66 | 6.6 | 15 |
| 21 | 14 | 5.8 | 12 | 10 | 203 | 5.0 | 12 | 4.0 | 2.3 | 14 | 5.8 | 75 |
| 22 | 10 | 5.2 | 9.5 | 9.0 | 50 | 4.4 | 7.2 | 3.8 | 2.4 | 16 | 4.4 | 18 |
| 23 | 8.0 | 6.1 | 7.7 | 10 | 24 | 5.2 | 5.8 | 3.6 | 2.4 | 12 | 4.4 | 9.0 |
| 24 | 7.0 | 10 | 329 | 6.6 | 63 | 27 | 5.5 | 4.4 | 14 | 11 | 6.4 | 7.0 |
| 25 | 5.8 | 6.9 | 149 | 5.2 | 26 | 17 | 4.7 | 5.8 | 11 | 12 | 5.0 | 6.0 |
| 26 | 5.4 | 5.5 | 17 | 4.4 | 24 | 14 | 4.2 | 5.0 | 8.1 | 9.5 | 17 | 5.6 |
| 27 | 5.0 | 5.0 | 11 | 4.2 | 13 | 12 | 4.7 | 4.0 | 8.1 | 6.9 | 27 | 6.0 |
| 28 | 4.6 | 221 | 8.6 | 4.0 | 9.5 | 9.0 | 15 | 3.6 | 24 | 6.4 | 10 | 8.0 |
| 29 | 4.5 | 536 | 7.2 | 48 | ------ | 10 | 6.1 | 3.4 | 17 | 5.5 | 6.6 | 12 |
| 30 | 4.4 | 315 | 6.4 | 59 | ------ | 10 | 19 | 3.2 | 28 | 4.7 | 6.9 | 40 |
| 31 | 4.3 | ------ | 5.8 | 807 | ------ | 275 | ------ | 3.0 | ------ | 6.4 | 24 | ------ |
| TOTAL | 956.2 | 1478.5 | 1693.6 | 1368.1 | 2197.0 | 792.8 | 389.2 | 325.2 | 179.9 | 615.2 | 360.4 | 408.5 |
| MEAN | 30.8 | 49.3 | 54.6 | 44.1 | 78.5 | 25.6 | 13.0 | 10.5 | 6.00 | 19.8 | 11.6 | 13.6 |
| MAX | 457 | 536 | 329 | 807 | 644 | 275 | 48 | 68 | 28 | 127 | 56 | 75 |
| MIN | 4.2 | 3.8 | 5.8 | 4.0 | 5.2 | 4.4 | 4.2 | 3.0 | 2.2 | 4.7 | 4.0 | 4.4 |
| AC-FT | 1900 | 2930 | 3360 | 2710 | 4360 | 1570 | 772 | 645 | 357 | 1220 | 715 | 810 |

CAL YR 1968: TOTAL 9,220.2 MEAN 25.2 MAX 775 MIN 2.3 AC-FT 18,290
WTR YR 1969: TOTAL 10,764.6 MEAN 29.5 MAX 807 MIN 2.2 AC-FT 21,350

PEAK DISCHARGE (BASE, 1,300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-1 | 1700 | 4.76 | 1,460 | 1-31 | 0130 | 6.42 | 2,660 |
| 11-29 | 1730 | 6.00 | 2,320 | 2-19 | 0300 | 4.50 | 1,300 |

## 16-0291. Waimea ditch below wasteway, near Waimea

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

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

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

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

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts from Waimea River for irrigation of sugarcane in vicinity of Waimea.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.2 | 2.1 | 5.9 | .40 | .35 | 0 | 8.2 | 2.7 | 2.5 | 7.7 | 2.4 | 6.4 |
| 2 | .12 | 2.1 | 1.6 | .38 | .07 | 0 | 7.9 | 2.0 | 2.4 | 7.1 | 2.7 | 6.0 |
| 3 | .07 | 2.0 | .70 | .38 | .05 | 0 | 6.4 | 3.2 | 2.4 | 4.0 | 3.6 | 4.4 |
| 4 | .07 | 2.0 | 0 | .36 | .03 | 0 | 5.7 | 2.8 | 2.2 | 1.5 | 3.8 | 3.3 |
| 5 | .03 | 2.0 | 0 | .34 | .02 | 0 | 5.4 | 2.3 | 2.1 | 1.2 | 2.8 | 5.2 |
| 6 | .02 | 1.9 | 0 | .32 | .01 | 0 | 5.4 | 2.1 | 2.1 | .78 | 2.4 | 6.2 |
| 7 | .01 | 1.8 | 0 | .43 | .01 | 0 | 5.4 | 1.8 | 1.9 | 3.3 | 2.2 | 6.0 |
| 8 | .90 | 2.0 | 1.0 | .36 | .01 | 0 | 5.4 | 1.3 | 1.8 | 7.7 | 1.4 | 4.0 |
| 9 | 1.5 | 2.0 | .07 | .36 | 0 | 0 | 4.4 | 1.5 | 1.8 | 8.3 | 4.0 | 3.0 |
| 10 | .29 | 1.9 | .07 | .34 | 0 | 0 | 3.8 | 4.7 | 5.9 | 8.1 | 1.0 | 2.6 |
| 11 | .15 | 2.1 | .05 | .34 | 0 | 0 | 4.0 | 2.0 | 7.6 | 5.4 | 2.6 | 2.8 |
| 12 | .09 | 2.1 | .05 | .34 | 0 | 0 | 4.6 | 4.8 | 5.9 | 2.9 | 5.8 | 4.8 |
| 13 | .09 | 1.8 | .05 | .16 | 0 | 0 | 4.6 | 6.6 | 3.3 | 3.2 | 3.1 | 3.2 |
| 14 | .03 | .05 | .03 | .31 | 0 | 0 | 3.6 | 6.8 | 2.7 | 3.1 | 4.9 | 2.7 |
| 15 | .03 | .03 | .03 | .50 | 0 | 7.2 | 3.1 | 6.4 | 2.5 | 3.0 | 6.2 | 2.4 |
| 16 | .02 | .03 | .37 | .36 | 0 | 7.7 | 2.5 | 5.6 | 2.3 | 3.2 | 5.0 | 2.1 |
| 17 | .01 | .46 | .07 | .36 | 0 | 5.9 | 2.1 | 4.3 | 2.1 | 3.2 | 5.8 | 1.8 |
| 18 | .01 | 3.2 | 1.6 | .36 | 0 | 5.9 | 2.4 | 3.3 | 2.0 | 5.3 | 4.0 | 4.4 |
| 19 | .01 | 2.3 | 1.1 | 0 | 0 | 5.9 | 2.6 | 2.5 | 2.1 | 7.4 | 3.5 | 6.2 |
| 20 | 0 | 3.4 | .46 | 0 | 0 | 6.2 | 3.4 | 2.1 | 2.2 | 9.2 | 3.7 | 4.6 |
| 21 | 0 | 3.1 | .62 | 0 | 0 | 6.5 | 5.4 | 2.3 | 4.2 | 8.9 | 4.2 | 6.0 |
| 22 | 0 | 2.8 | .62 | 0 | 0 | 6.5 | 4.1 | 2.6 | 3.1 | 8.0 | 3.4 | 6.8 |
| 23 | 0 | 2.8 | .46 | 0 | 0 | 6.2 | 3.4 | 2.4 | 2.5 | 7.7 | 2.8 | 7.1 |
| 24 | 0 | 2.8 | .45 | 0 | 0 | 6.5 | 2.6 | 2.2 | 2.8 | 7.2 | 2.6 | 4.8 |
| 25 | 0 | 3.4 | .50 | 0 | 0 | 7.0 | 2.2 | 2.4 | 6.3 | 7.0 | 3.1 | 3.5 |
| 26 | 0 | 2.3 | .50 | 0 | 0 | 7.0 | 1.9 | 3.2 | 5.4 | 6.8 | 2.6 | 3.2 |
| 27 | 0 | 2.3 | .40 | 0 | 0 | 7.0 | 1.7 | 2.9 | 5.0 | 5.0 | 4.8 | 2.8 |
| 28 | 0 | 2.2 | .40 | 0 | 0 | 7.0 | 1.8 | 3.0 | 5.8 | 3.7 | 6.4 | 2.9 |
| 29 | 0 | 3.6 | .35 | .07 | ------ | 7.0 | 2.7 | 2.8 | 7.3 | 3.3 | 5.6 | 5.0 |
| 30 | 1.1 | 3.1 | .33 | .26 | ------ | 7.0 | 2.4 | 2.7 | 7.5 | 2.9 | 3.9 | 5.6 |
| 31 | 2.1 | ------ | .33 | .03 | ------ | 7.7 | ------ | 2.7 | ------ | 2.4 | 4.0 | ------ |
| TOTAL | 10.85 | 63.67 | 18.11 | 6.76 | .55 | 114.2 | 119.1 | 98.0 | 107.7 | 158.48 | 114.3 | 129.8 |
| MEAN | .35 | 2.12 | .58 | .22 | .020 | 3.68 | 3.97 | 3.16 | 3.59 | 5.11 | 3.69 | 4.33 |
| MAX | 4.2 | 3.6 | 5.9 | .50 | .35 | 7.7 | 8.2 | 6.8 | 7.6 | 9.2 | 6.4 | 7.1 |
| MIN | 0 | .03 | 0 | 0 | 0 | 0 | 1.7 | 1.3 | 1.8 | .78 | 1.0 | 1.8 |
| AC-FT | 22 | 126 | 36 | 13 | 1.1 | 227 | 236 | 194 | 214 | 314 | 227 | 257 |

CAL YR 1968: TOTAL 1,005.35 MEAN 2.75 MAX 11 MIN 0 AC-FT 1,990
WTR YR 1969: TOTAL 941.52 MEAN 2.58 MAX 9.2 MIN 0 AC-FT 1,870

NOTE.--No gage-height record Dec. 17 to Jan. 19.

## 16-0360. Makaweli River near Waimea

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

DRAINAGE AREA.--25 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 8,500 cfs Jan. 31 (gage height, 9.25 ft), from rating curve extended as explained below; minimum, 26 cfs Oct. 1.
Period of record: Maximum discharge, 15,900 cfs Apr. 15, 1963 (gage height, 12.25 ft), from rating curve extended above 3,200 cfs on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 cfs July 19, 1951.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Olokele ditch diverts all low flow from Olokele River 9 miles above station for irrigation in vicinity of Makaweli.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2040 | 35 | 1710 | 270 | 3330 | 66 | 175 | 46 | 31 | 57 | 37 | 56 |
| 2 | 240 | 35 | 548 | 356 | 1610 | 120 | 109 | 70 | 31 | 42 | 37 | 37 |
| 3 | 76 | 35 | 248 | 125 | 266 | 653 | 57 | 49 | 31 | 49 | 37 | 36 |
| 4 | 76 | 34 | 164 | 99 | 117 | 211 | 53 | 46 | 31 | 52 | 36 | 39 |
| 5 | 62 | 34 | 91 | 134 | 86 | 103 | 52 | 90 | 31 | 39 | 35 | 39 |
| 6 | 47 | 34 | 74 | 118 | 90 | 94 | 50 | 45 | 31 | 34 | 35 | 39 |
| 7 | 43 | 34 | 63 | 119 | 62 | 76 | 48 | 44 | 31 | 54 | 35 | 35 |
| 8 | 44 | 35 | 568 | 91 | 57 | 81 | 47 | 44 | 31 | 86 | 47 | 34 |
| 9 | 43 | 34 | 186 | 88 | 54 | 97 | 47 | 45 | 31 | 49 | 55 | 33 |
| 10 | 40 | 34 | 102 | 81 | 53 | 71 | 46 | 50 | 31 | 41 | 38 | 33 |
| 11 | 39 | 35 | 85 | 78 | 63 | 55 | 46 | 170 | 31 | 71 | 187 | 103 |
| 12 | 38 | 62 | 85 | 75 | 49 | 53 | 48 | 61 | 31 | 77 | 50 | 37 |
| 13 | 38 | 684 | 135 | 92 | 48 | 53 | 47 | 36 | 31 | 50 | 46 | 33 |
| 14 | 37 | 497 | 200 | 82 | 47 | 53 | 49 | 34 | 31 | 50 | 69 | 34 |
| 15 | 40 | 92 | 132 | 74 | 62 | 53 | 48 | 34 | 32 | 139 | 49 | 34 |
| 16 | 81 | 62 | 208 | 71 | 85 | 53 | 46 | 33 | 32 | 115 | 83 | 33 |
| 17 | 227 | 55 | 151 | 68 | 84 | 61 | 48 | 32 | 32 | 62 | 39 | 32 |
| 18 | 178 | 48 | 1280 | 66 | 399 | 58 | 57 | 32 | 32 | 42 | 39 | 176 |
| 19 | 129 | 46 | 227 | 64 | 1510 | 53 | 45 | 32 | 32 | 320 | 38 | 47 |
| 20 | 84 | 44 | 140 | 64 | 593 | 53 | 118 | 32 | 32 | 253 | 43 | 69 |
| 21 | 53 | 42 | 130 | 71 | 592 | 52 | 53 | 32 | 34 | 63 | 45 | 53 |
| 22 | 44 | 39 | 114 | 64 | 233 | 52 | 46 | 32 | 35 | 63 | 40 | 298 |
| 23 | 40 | 59 | 112 | 63 | 120 | 52 | 45 | 33 | 35 | 47 | 37 | 47 |
| 24 | 39 | 46 | 877 | 59 | 182 | 68 | 44 | 36 | 105 | 47 | 37 | 38 |
| 25 | 38 | 39 | 1180 | 56 | 100 | 53 | 43 | 40 | 84 | 87 | 39 | 49 |
| 26 | 37 | 37 | 176 | 55 | 88 | 52 | 43 | 35 | 56 | 48 | 44 | 35 |
| 27 | 37 | 37 | 120 | 54 | 62 | 51 | 43 | 32 | 42 | 39 | 54 | 36 |
| 28 | 37 | 237 | 111 | 53 | 55 | 51 | 94 | 32 | 56 | 37 | 49 | 33 |
| 29 | 35 | 934 | 105 | 159 | ------ | 51 | 44 | 31 | 53 | 37 | 40 | 49 |
| 30 | 35 | 948 | 95 | 178 | ------ | 51 | 100 | 31 | 93 | 36 | 40 | 42 |
| 31 | 35 | ------ | 87 | 2990 | ------ | 573 | ------ | 31 | ------ | 48 | 66 | ------ |
| TOTAL | 4032 | 4387 | 9504 | 6017 | 10097 | 3223 | 1791 | 1390 | 1219 | 2234 | 1526 | 1659 |
| MEAN | 130 | 146 | 307 | 194 | 361 | 104 | 59.7 | 44.8 | 40.6 | 72.1 | 49.2 | 55.3 |
| MAX | 2040 | 948 | 1710 | 2990 | 3330 | 653 | 175 | 170 | 105 | 320 | 187 | 298 |
| MIN | 35 | 34 | 63 | 53 | 47 | 51 | 43 | 31 | 31 | 34 | 35 | 32 |
| AC-FT | 8000 | 8700 | 18850 | 11930 | 20030 | 6390 | 3550 | 2760 | 2420 | 4430 | 3030 | 3290 |

CAL YR 1968: TOTAL 42,347 MEAN 116 MAX 4,200 MIN 23 AC-FT 84,000
WTR YR 1969: TOTAL 47,079 MEAN 129 MAX 3,330 MIN 31 AC-FT 93,380

PEAK DISCHARGE (BASE, 4,700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-1 | 1830 | 8.23 | 6,460 | 12-18 | 0900 | 8.19 | 6,380 |
| 12-1 | 0100 | 8.40 | 6,800 | 1-31 | 0600 | 9.25 | 8,500 |

NOTE.--No gage-height record May 14 to June 13.

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

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

DRAINAGE AREA.--18.8 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 9,120 cfs Dec. 1 (gage height, 8.84 ft); minimum, 17 cfs Oct. 7, 8, 14, 15, Nov. 9, 10.
Period of record: Maximum discharge, 39,000 cfs Apr. 15, 1963 (gage height, 14.87 ft), from rating curve extended above 7,600 cfs on basis of slope-area measurement of peak flow; minimum, 5.1 cfs May 21, 1954.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,390 | 20 | 1,540 | 297 | 3,410 | 67 | 204 | 35 | 20 | 59 | 26 | 56 |
| 2 | 213 | 20 | 959 | 253 | 1,770 | 111 | 126 | 59 | 20 | 27 | 34 | 29 |
| 3 | 49 | 20 | 209 | 65 | 319 | 656 | 60 | 53 | 20 | 46 | 30 | 23 |
| 4 | 44 | 20 | 136 | 48 | 164 | 234 | 44 | 38 | 20 | 61 | 30 | 27 |
| 5 | 28 | 20 | 105 | 91 | 118 | 136 | 39 | 122 | 20 | 27 | 25 | 25 |
| 6 | 20 | 19 | 92 | 57 | 113 | 128 | 36 | 86 | 20 | 23 | 23 | 23 |
| 7 | 17 | 18 | 83 | 78 | 77 | 92 | 33 | 33 | 20 | 35 | 23 | 21 |
| 8 | 58 | 20 | 520 | 44 | 66 | 112 | 32 | 36 | 20 | 63 | 26 | 21 |
| 9 | 44 | 17 | 189 | 38 | 61 | 159 | 35 | 38 | 20 | 37 | 27 | 21 |
| 10 | 26 | 18 | 122 | 32 | 73 | 117 | 42 | 45 | 20 | 33 | 23 | 21 |
| 11 | 21 | 19 | 100 | 29 | 90 | 118 | 46 | 306 | 20 | 75 | 113 | 103 |
| 12 | 19 | 26 | 95 | 27 | 51 | 94 | 41 | 107 | 20 | 92 | 32 | 22 |
| 13 | 18 | 365 | 132 | 48 | 45 | 62 | 30 | 54 | 20 | 52 | 28 | 22 |
| 14 | 17 | 339 | 300 | 29 | 40 | 58 | 38 | 33 | 20 | 37 | 33 | 22 |
| 15 | 17 | 54 | 238 | 26 | 49 | 56 | 32 | 27 | 20 | 157 | 33 | 47 |
| 16 | 182 | 33 | 280 | 24 | 78 | 55 | 28 | 25 | 20 | 122 | 87 | 22 |
| 17 | 218 | 28 | 241 | 23 | 78 | 59 | 33 | 23 | 20 | 59 | 33 | 68 |
| 18 | 254 | 26 | 682 | 23 | 712 | 45 | 49 | 23 | 20 | 31 | 30 | 194 |
| 19 | 142 | 23 | 240 | 22 | 2,040 | 36 | 33 | 22 | 20 | 338 | 26 | 38 |
| 20 | 73 | 23 | 148 | 22 | 746 | 32 | 135 | 22 | 20 | 373 | 26 | 73 |
| 21 | 44 | 22 | 118 | 23 | 838 | 31 | 46 | 22 | 20 | 96 | 27 | 184 |
| 22 | 30 | 20 | 104 | 21 | 306 | 30 | 37 | 22 | 30 | 73 | 23 | 270 |
| 23 | 26 | 48 | 97 | 21 | 170 | 30 | 32 | 22 | 22 | 49 | 23 | 40 |
| 24 | 23 | 36 | 504 | 20 | 261 | 42 | 37 | 24 | 72 | 54 | 24 | 32 |
| 25 | 23 | 22 | 714 | 20 | 144 | 32 | 30 | 31 | 53 | 159 | 24 | 30 |
| 26 | 22 | 19 | 173 | 20 | 100 | 28 | 27 | 22 | 47 | 56 | 40 | 20 |
| 27 | 21 | 19 | 128 | 20 | 77 | 28 | 27 | 21 | 29 | 36 | 54 | 21 |
| 28 | 20 | 85 | 109 | 20 | 67 | 28 | 105 | 21 | 41 | 29 | 34 | 36 |
| 29 | 20 | 576 | 97 | 106 | ------ | 28 | 35 | 21 | 28 | 27 | 24 | 26 |
| 30 | 20 | 511 | 90 | 302 | ------ | 30 | 169 | 20 | 89 | 26 | 24 | 52 |
| 31 | 41 | ------ | 86 | 2,740 | ------ | 822 | ------ | 20 | ------ | 49 | 68 | ------ |
| TOTAL | 3,140 | 2,486 | 8,631 | 4,589 | 12,063 | 3,556 | 1,661 | 1,433 | 831 | 2,401 | 1,073 | 1,589 |
| MEAN | 101 | 82.9 | 278 | 148 | 431 | 115 | 55.4 | 46.2 | 27.7 | 77.5 | 34.6 | 53.0 |
| MAX | 1,390 | 576 | 1,540 | 2,740 | 3,410 | 822 | 204 | 306 | 89 | 373 | 113 | 270 |
| MIN | 17 | 17 | 83 | 20 | 40 | 28 | 27 | 20 | 20 | 23 | 23 | 20 |
| AC-FT | 6,230 | 4,930 | 17,120 | 9,100 | 23,930 | 7,050 | 3,290 | 2,840 | 1,650 | 4,760 | 2,130 | 3,150 |

CAL YR 1968: TOTAL 31,047 MEAN 84.8 MAX 2,120 MIN 14 AC-FT 61,580
WTR YR 1969: TOTAL 43,453 MEAN 119 MAX 3,410 MIN 17 AC-FT 86,190

PEAK DISCHARGE (BASE, 3,600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1700 | 6.79 | 4,570 | 2-19 | 1600 | 8.10 | 7,150 |
| 12- 1 | 0300 | 8.84 | 9,120 | 3-31 | 1500 | 6.40 | 3,950 |
| 2- 1 | 2100 | 8.30 | 7,650 | | | | |

## 16-0525. Lawai Stream near Koloa

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

DRAINAGE AREA.--6.60 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 2,300 cfs Jan. 31 (gage height, 8.18 ft), from rating curve extended as explained below; minimum, 0.32 cfs June 20.
Period of record: Maximum discharge, 3,540 cfs Mar. 14, 1963 (gage height, 9.56 ft), from rating curve extended above 190 cfs on basis of slope-area measurements at gage heights 7.70 and 9.56 ft; minimum, 0.06 cfs Aug. 18, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 85 | .93 | 384 | 38 | 400 | 7.2 | 4.4 | 2.4 | .73 | .66 | .73 | .59 |
| 2 | 8.5 | .89 | 135 | 38 | 166 | 7.0 | 3.2 | 2.4 | 1.6 | .81 | .59 | .95 |
| 3 | 2.7 | .89 | 45 | 18 | 73 | 12 | 3.0 | 2.4 | .73 | 1.0 | .51 | .95 |
| 4 | 1.6 | 1.2 | 10 | 15 | 47 | 7.2 | 2.8 | 2.4 | .66 | .88 | .81 | 2.2 |
| 5 | 1.2 | .93 | 7.0 | 46 | 35 | 7.0 | 2.8 | 2.4 | .66 | .59 | .47 | 2.0 |
| 6 | 1.0 | 1.9 | 9.2 | 21 | 27 | 6.6 | 2.8 | 2.3 | .66 | .59 | .39 | .51 |
| 7 | .93 | 1.8 | 15 | 22 | 23 | 6.6 | 2.8 | 2.3 | .66 | .95 | .39 | .43 |
| 8 | .89 | 1.7 | 153 | 16 | 20 | 6.4 | 2.8 | 2.8 | .66 | .88 | 1.6 | .59 |
| 9 | 1.2 | .85 | 48 | 15 | 20 | 6.4 | 2.8 | 2.4 | .66 | .59 | .59 | .47 |
| 10 | 1.2 | .85 | 37 | 13 | 18 | 6.2 | 2.8 | 2.3 | .66 | .55 | .36 | .43 |
| 11 | .93 | .81 | 27 | 12 | 18 | 6.2 | 2.6 | 37 | .66 | .55 | 1.9 | .43 |
| 12 | .89 | 1.7 | 24 | 12 | 17 | 6.2 | 2.6 | 2.7 | .59 | .66 | .66 | .55 |
| 13 | .85 | 9.4 | 24 | 13 | 16 | 6.1 | 2.6 | 1.8 | .59 | .55 | .66 | .47 |
| 14 | .81 | 24 | 19 | 11 | 16 | 6.1 | 2.6 | 1.4 | .59 | .73 | .47 | .43 |
| 15 | .81 | 2.0 | 24 | 10 | 16 | 6.1 | 2.6 | 1.3 | .59 | 1.1 | 1.1 | .81 |
| 16 | 5.2 | 1.6 | 25 | 10 | 16 | 6.1 | 2.6 | 1.1 | .55 | .95 | 1.1 | .81 |
| 17 | 2.5 | 1.4 | 22 | 9.6 | 16 | 6.1 | 2.6 | .95 | .55 | .81 | .39 | 1.0 |
| 18 | 2.3 | 1.3 | 37 | 9.4 | 26 | 5.3 | 2.6 | .95 | .47 | .51 | .39 | .88 |
| 19 | 1.9 | 1.4 | 34 | 9.2 | 56 | 4.5 | 2.6 | .88 | .59 | .81 | .39 | .66 |
| 20 | 1.6 | 1.1 | 19 | 8.9 | 49 | 4.3 | 2.6 | .95 | .43 | .73 | .43 | .81 |
| 21 | 1.6 | 1.0 | 16 | 9.2 | 67 | 4.2 | 2.6 | .88 | .73 | .66 | .43 | .95 |
| 22 | 2.3 | 1.6 | 13 | 9.2 | 23 | 4.5 | 2.8 | .88 | .51 | .66 | .88 | 1.4 |
| 23 | 2.6 | .97 | 12 | 8.7 | 13 | 4.0 | 2.6 | .81 | .73 | .59 | .59 | .88 |
| 24 | 1.2 | 1.1 | 65 | 8.3 | 16 | 5.0 | 2.4 | .81 | .66 | .66 | .43 | 1.3 |
| 25 | 2.2 | 1.6 | 97 | 8.1 | 11 | 5.9 | 2.4 | .81 | .88 | .88 | 1.0 | 1.5 |
| 26 | 1.3 | 1.3 | 33 | 7.9 | 8.3 | 4.9 | 2.4 | .81 | 1.4 | .59 | 1.7 | 1.3 |
| 27 | .93 | 1.1 | 24 | 7.9 | 7.5 | 4.0 | 2.4 | .81 | 1.6 | .51 | .95 | 1.3 |
| 28 | 2.4 | .97 | 20 | 7.7 | 7.3 | 4.3 | 2.4 | .81 | .51 | .51 | .73 | 1.3 |
| 29 | 2.6 | 57 | 17 | 7.9 | ------ | 3.4 | 2.6 | .81 | .47 | .66 | .66 | 1.2 |
| 30 | .89 | 25 | 16 | 12 | ------ | 3.3 | 2.4 | .81 | .66 | .59 | .81 | 1.3 |
| 31 | 1.0 | ------ | 14 | 287 | ------ | 130 | ------ | .73 | ------ | .81 | .88 | ------ |
| TOTAL | 141.03 | 148.29 | 1,425.2 | 721.0 | 1,228.1 | 303.1 | 81.2 | 82.10 | 21.44 | 22.02 | 22.99 | 28.40 |
| MEAN | 4.55 | 4.94 | 46.0 | 23.3 | 43.9 | 9.78 | 2.71 | 2.65 | .71 | .71 | .74 | .95 |
| MAX | 85 | 57 | 384 | 287 | 400 | 130 | 4.4 | 37 | 1.6 | 1.1 | 1.9 | 2.2 |
| MIN | .81 | .81 | 7.0 | 7.7 | 7.3 | 3.3 | 2.4 | .73 | .43 | .51 | .36 | .43 |
| AC-FT | 280 | 294 | 2,830 | 1,430 | 2,440 | 601 | 161 | 163 | 43 | 44 | 46 | 56 |

CAL YR 1968 TOTAL 3,226.42 MEAN 8.82 MAX 384 MIN .81 AC-FT 6,400
WTR YR 1969 TOTAL 4,224.87 MEAN 11.6 MAX 400 MIN .36 AC-FT 8,380

PEAK DISCHARGE (BASE, 1,200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12- 1 | 0245 | 7.91 | 2,070 | 1-31 | 1800 | 8.18 | 2,300 |
| 12- 8 | 1300 | 7.38 | 1,640 | 3-31 | 1545 | 7.83 | 2,000 |

NOTE.--No gage-height record Apr. 1 to May 6.

## 16-0534. Upper Haiku ditch near Puhi

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

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

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

EXTREMES.--Period of record: Maximum daily discharge, 35 cfs July 23, 1968; no flow at times.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 21 | 17 | 20 | 1.8 | 11 | 2.1 | 2.8 | 20 | 9.8 | 16 | 20 | 5.8 |
| 2 | 2.0 | 7.8 | 6.3 | 9.3 | 6.6 | 1.9 | 7.6 | 15 | 15 | 20 | 19 | 13 |
| 3 | 1.2 | 7.8 | .44 | 0 | .58 | 2.8 | 3.6 | .02 | 15 | 17 | 20 | 17 |
| 4 | 2.0 | 19 | .06 | 0 | .03 | 2.2 | .08 | 2.4 | 14 | 5.4 | 19 | 17 |
| 5 | 1.2 | 22 | 0 | .45 | 0 | 2.1 | .04 | 16 | 15 | 5.6 | 19 | 14 |
| 6 | .85 | 23 | 0 | .01 | 0 | 2.2 | .03 | 22 | 14 | 5.6 | 23 | 7.3 |
| 7 | .73 | 23 | 0 | .07 | 0 | 2.2 | 5.8 | 20 | 8.5 | 14 | 22 | 7.3 |
| 8 | 3.5 | 18 | 5.2 | 0 | 0 | 2.2 | 15 | 16 | 8.5 | 18 | 17 | 15 |
| 9 | 6.4 | 6.4 | .03 | 0 | .01 | 2.2 | 22 | 12 | 13 | 18 | 11 | 19 |
| 10 | 14 | 6.2 | .01 | 0 | .01 | 2.1 | 25 | .03 | 13 | 19 | 11 | 20 |
| 11 | 19 | 20 | 0 | 0 | .01 | 2.1 | 17 | 1.8 | 9.0 | 16 | 14 | 21 |
| 12 | 19 | 20 | .01 | 0 | 0 | 2.1 | 2.5 | .78 | 16 | 9.6 | 17 | 16 |
| 13 | 12 | 5.1 | .01 | 0 | .06 | 2.1 | 5.8 | .23 | 15 | 9.6 | 16 | 5.2 |
| 14 | 7.8 | 1.9 | .66 | 0 | .36 | 2.2 | 19 | .06 | 8.2 | 15 | 16 | 5.0 |
| 15 | 7.8 | .08 | 1.8 | 0 | 1.1 | 2.1 | 23 | .04 | 8.0 | 22 | 13 | 21 |
| 16 | 5.5 | .02 | .71 | 0 | 1.9 | 2.2 | 22 | .04 | 12 | 24 | 11 | 19 |
| 17 | 1.4 | .02 | .57 | 0 | 2.0 | 2.3 | 19 | .04 | 14 | 21 | 11 | 15 |
| 18 | .88 | .01 | 1.2 | 0 | 4.3 | 2.2 | 15 | 4.0 | 15 | 22 | 17 | 14 |
| 19 | .15 | .01 | .08 | 0 | 8.7 | 11 | .08 | 14 | 14 | 22 | 20 | 16 |
| 20 | .04 | .01 | .01 | .01 | 4.8 | 20 | .55 | 19 | 12 | 23 | 19 | 16 |
| 21 | .03 | .01 | .01 | .01 | 5.4 | 13 | 14 | 22 | 5.2 | 23 | 19 | 15 |
| 22 | .02 | 0 | 0 | .01 | 2.5 | 12 | 22 | 20 | 5.2 | 23 | 16 | 12 |
| 23 | .01 | .01 | 0 | .01 | 2.4 | 13 | 23 | 18 | 13 | 23 | 11 | 12 |
| 24 | .01 | 2.5 | 2.4 | .01 | 3.4 | 21 | 22 | 13 | 14 | 23 | 11 | 12 |
| 25 | .02 | 7.7 | 2.8 | .01 | 2.2 | 27 | 17 | 13 | 14 | 19 | 18 | 12 |
| 26 | .04 | 9.6 | .04 | .01 | 2.2 | 26 | 10 | 21 | 16 | .36 | 19 | 12 |
| 27 | .70 | 7.8 | 0 | 7.5 | 2.2 | 25 | 10 | 21 | 13 | 4.0 | 16 | 12 |
| 28 | 18 | 3.4 | 0 | 22 | 2.2 | 17 | 17 | 19 | 3.7 | 18 | 15 | 12 |
| 29 | 26 | 13 | 0 | 27 | ------ | 9.2 | 20 | 20 | 3.7 | 22 | 12 | 13 |
| 30 | 28 | 8.1 | 0 | 22 | ------ | 9.2 | 22 | 16 | 12 | 22 | 6.7 | 15 |
| 31 | 23 | ------ | 0 | 12 | ------ | 22 | ------ | 9.8 | ------ | 22 | 6.8 | ------ |
| TOTAL | 222.28 | 249.47 | 42.34 | 102.20 | 63.96 | 264.7 | 382.88 | 356.24 | 348.8 | 522.16 | 485.5 | 411.6 |
| MEAN | 7.17 | 8.32 | 1.37 | 3.30 | 2.28 | 8.54 | 12.8 | 11.5 | 11.6 | 16.8 | 15.7 | 13.7 |
| MAX | 28 | 23 | 20 | 27 | 11 | 27 | 25 | 22 | 16 | 24 | 23 | 21 |
| MIN | .01 | 0 | 0 | 0 | 0 | 1.9 | .03 | .02 | 3.7 | .36 | 6.7 | 5.0 |
| AC-FT | 441 | 495 | 84 | 203 | 127 | 525 | 759 | 707 | 692 | 1040 | 963 | 816 |

CAL YR 1968: TOTAL 4,036.78 MEAN 11.0 MAX 35 MIN 0 AC-FT 8,010
WTR YR 1969: TOTAL 3,452.13 MEAN 9.46 MAX 28 MIN 0 AC-FT 6,850

## 16-0536. Lower Haiku ditch near Puhi

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

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

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

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

REMARKS.--Records good. Ditch diverts from Kamooloa Stream 0.4 mile below Papuaa Stream for irrigation of sugarcane in vicinity of Puhi.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 29 | 3.0 | 53 | 10 | 44 | 21 | 16 | 2.3 | 2.3 | 2.2 | 2.1 | 1.8 |
| 2 | 9.2 | 2.7 | 36 | 18 | 35 | 21 | 16 | 2.3 | 2.2 | 1.8 | 2.3 | 1.6 |
| 3 | 6.7 | 2.6 | 22 | 7.7 | 26 | 22 | 8.3 | 2.2 | 2.2 | 1.6 | 2.2 | 1.5 |
| 4 | 15 | 2.5 | 14 | 6.5 | 24 | 21 | 9.8 | 2.2 | 2.1 | 2.2 | 2.2 | 1.5 |
| 5 | 7.9 | 2.3 | 9.8 | 13 | 22 | 21 | 9.2 | 2.6 | 2.1 | 1.9 | 1.9 | 1.5 |
| 6 | 4.9 | 2.2 | 8.1 | 8.4 | 22 | 21 | 14 | 2.5 | 1.9 | 1.5 | 1.9 | 1.4 |
| 7 | 4.0 | 2.2 | 7.0 | 8.8 | 21 | 21 | 9.8 | 8.0 | 1.9 | 1.6 | 1.9 | 1.2 |
| 8 | 14 | 2.2 | 23 | 6.7 | 21 | 20 | 7.4 | 4.4 | 1.8 | 2.6 | 1.9 | 1.4 |
| 9 | 6.5 | 1.9 | 14 | 6.5 | 21 | 20 | 9.8 | 3.9 | 1.8 | 1.9 | 1.8 | 1.4 |
| 10 | 6.0 | 1.9 | 8.8 | 5.6 | 21 | 19 | 11 | 10 | 1.8 | 1.8 | 1.8 | 1.4 |
| 11 | 8.8 | 1.9 | 7.4 | 5.3 | 21 | 16 | 9.0 | 29 | 1.6 | 1.8 | 1.9 | 1.6 |
| 12 | 5.0 | 1.9 | 7.4 | 5.0 | 20 | 12 | 4.4 | 26 | 1.6 | 1.8 | 1.8 | 1.5 |
| 13 | 4.3 | 8.8 | 7.7 | 5.0 | 18 | 12 | 4.4 | 27 | 1.6 | 1.6 | 1.6 | 1.2 |
| 14 | 3.9 | 21 | 10 | 4.6 | 17 | 12 | 8.6 | 16 | 1.5 | 1.6 | 1.6 | 1.2 |
| 15 | 3.6 | 5.8 | 23 | 4.3 | 19 | 10 | 5.7 | 5.9 | 1.5 | 2.2 | 1.6 | 1.9 |
| 16 | 8.3 | 4.1 | 17 | 4.0 | 21 | 9.8 | 2.6 | 5.0 | 1.5 | 2.2 | 1.6 | 1.5 |
| 17 | 14 | 3.7 | 17 | 3.9 | 21 | 12 | 3.3 | 4.6 | 1.5 | 1.8 | 1.6 | 1.5 |
| 18 | 14 | 3.4 | 20 | 3.7 | 24 | 12 | 3.7 | 4.1 | 1.5 | 1.6 | 1.6 | 2.1 |
| 19 | 11 | 2.9 | 15 | 3.6 | 34 | 9.4 | 3.0 | 3.9 | 1.5 | 3.0 | 1.8 | 1.6 |
| 20 | 10 | 2.9 | 11 | 3.4 | 27 | 3.3 | 4.9 | 3.7 | 1.4 | 4.4 | 1.8 | 1.9 |
| 21 | 8.8 | 2.6 | 9.6 | 3.8 | 32 | 2.6 | 3.3 | 3.4 | 1.4 | 2.7 | 3.6 | 4.4 |
| 22 | 7.5 | 2.3 | 8.4 | 3.4 | 25 | 2.3 | 2.9 | 3.3 | 1.6 | 2.6 | 2.2 | 6.0 |
| 23 | 6.8 | 2.6 | 7.7 | 3.3 | 23 | 2.3 | 2.6 | 3.2 | 1.5 | 2.6 | 1.8 | 2.1 |
| 24 | 6.4 | 2.6 | 17 | 3.2 | 27 | 2.3 | 2.6 | 3.2 | 1.4 | 2.9 | 1.8 | 1.9 |
| 25 | 5.6 | 2.3 | 28 | 3.2 | 24 | 2.7 | 2.5 | 3.2 | 1.4 | 3.6 | 1.6 | 1.8 |
| 26 | 5.0 | 2.2 | 12 | 3.0 | 22 | 2.5 | 2.3 | 2.9 | 1.5 | 2.9 | 1.8 | 1.5 |
| 27 | 5.2 | 2.1 | 9.4 | 3.0 | 22 | 2.5 | 2.3 | 2.7 | 1.5 | 2.5 | 1.6 | 1.5 |
| 28 | 4.6 | 3.2 | 8.4 | 3.0 | 21 | 2.2 | 2.5 | 2.7 | 1.5 | 2.2 | 1.5 | 1.6 |
| 29 | 3.7 | 32 | 7.4 | 3.7 | ------ | 2.1 | 2.3 | 2.7 | 1.5 | 2.2 | 1.5 | 1.5 |
| 30 | 3.3 | 38 | 6.7 | 12 | ------ | 2.1 | 3.0 | 2.5 | 1.5 | 2.1 | 1.5 | 1.9 |
| 31 | 3.7 | ------ | 6.1 | 42 | ------ | 25 | ------ | 2.3 | ------ | 2.3 | 2.2 | ------ |
| TOTAL | 246.7 | 169.8 | 451.9 | 217.6 | 675 | 364.1 | 187.2 | 197.7 | 50.1 | 69.7 | 58.0 | 54.9 |
| MEAN | 7.96 | 5.66 | 14.6 | 7.02 | 24.1 | 11.7 | 6.24 | 6.38 | 1.67 | 2.25 | 1.87 | 1.83 |
| MAX | 29 | 38 | 53 | 42 | 44 | 25 | 16 | 29 | 2.3 | 4.4 | 3.6 | 6.0 |
| MIN | 3.3 | 1.9 | 6.1 | 3.0 | 17 | 2.1 | 2.3 | 2.2 | 1.4 | 1.5 | 1.5 | 1.2 |
| AC-FT | 489 | 337 | 896 | 432 | 1,340 | 722 | 371 | 392 | 99 | 138 | 115 | 109 |

CAL YR 1968: TOTAL 1,998.24 MEAN 5.46 MAX 53 MIN .79 AC-FT 3,960
WTR YR 1969: TOTAL 2,742.7 MEAN 7.51 MAX 53 MIN 1.2 AC-FT 5,440

## 16-0538. Kamooloa Stream near Puhi

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

DRAINAGE AREA.--5.94 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 5,750 cfs Nov. 29 (gage height, 7.50 ft), from rating curve extended as explained below; minimum, 0.04 cfs Sept. 14.
Period of record: Maximum discharge, 5,750 cfs Nov. 29, 1968 (gage height, 7.50 ft), from rating curve extended above 600 cfs on basis of slope-area measurements at gage height 4.86 and 6.66 ft; minimum, 0.02 cfs Feb. 8, 9, 1967.

REMARKS.--Records good. Diversion by Kamooloa ditch 4.3 miles above station to Kuia Stream. Upper Haiku ditch (see sta 16-0534) and Lower Haiku ditch (see sta 16-0536) divert 1.3 miles and 0.4 mile, respectively, above station for irrigation of sugarcane in vicinity of Puhi. Since July 19, 1966, Koloa tunnel (see sta 16-0544) has diverted 0.6 mile above station for irrigation of sugarcane in vicinity of Koloa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 28 | .12 | 1.000 | 104 | 466 | 9.7 | 1.2 | .12 | .23 | .14 | .14 | .10 |
| 2 | 2.9 | .12 | 293 | 95 | 274 | 9.7 | .60 | .12 | .20 | .14 | .14 | .09 |
| 3 | .32 | .12 | 114 | 35 | 88 | 51 | .48 | .12 | .20 | .14 | .14 | .09 |
| 4 | 5.4 | .12 | 37 | 26 | 52 | 20 | .40 | .12 | .20 | .17 | .14 | .09 |
| 5 | .36 | .10 | 1.7 | 57 | 35 | 11 | .36 | .14 | .20 | .17 | .14 | .09 |
| 6 | .26 | .10 | 1.3 | 33 | 26 | 12 | .32 | .14 | .20 | .14 | .12 | .09 |
| 7 | .20 | .10 | 1.2 | 41 | 19 | 8.0 | .29 | .14 | .20 | .17 | .12 | .09 |
| 8 | 3.3 | .10 | 114 | 23 | 19 | 8.4 | .26 | .23 | .20 | .17 | .12 | .09 |
| 9 | .26 | .10 | 2.4 | 21 | 12 | 6.4 | .26 | .40 | .17 | .17 | .12 | .07 |
| 10 | .23 | .10 | 1.3 | 17 | 4.1 | 3.4 | .23 | .52 | .17 | .14 | .12 | .06 |
| 11 | .26 | .10 | .96 | 15 | 10 | .44 | .23 | 15 | .17 | .17 | .14 | .07 |
| 12 | .20 | .10 | .96 | 13 | 1.2 | .40 | .26 | 16 | .17 | .17 | .14 | .07 |
| 13 | .17 | 1.1 | 8.7 | 19 | .26 | .40 | .23 | 14 | .17 | .17 | .12 | .06 |
| 14 | .17 | 60 | 77 | 11 | .40 | .36 | .20 | 4.6 | .17 | .14 | .12 | .06 |
| 15 | .17 | 3.5 | 110 | 6.1 | 2.6 | .32 | .17 | .56 | .20 | .20 | .12 | .10 |
| 16 | .73 | .29 | 78 | 2.4 | 13 | .26 | .14 | .48 | .20 | .17 | .12 | .09 |
| 17 | 5.0 | .26 | 91 | .72 | 7.8 | .26 | .20 | .44 | .20 | .14 | .12 | .09 |
| 18 | 1.8 | .23 | 123 | .44 | 121 | .26 | .17 | .36 | .17 | .12 | .12 | .10 |
| 19 | 38 | .20 | 78 | .36 | 278 | .23 | .14 | .32 | .17 | .20 | .12 | .07 |
| 20 | 27 | .17 | 57 | .26 | 110 | .20 | .20 | .32 | .14 | .23 | .12 | .07 |
| 21 | 18 | .17 | 49 | .20 | 140 | .17 | .17 | .29 | .14 | .17 | .12 | .10 |
| 22 | 11 | .14 | 38 | .14 | 62 | .17 | .14 | .26 | .17 | .14 | .12 | .23 |
| 23 | 10 | .14 | 26 | .12 | 35 | .17 | .12 | .26 | .17 | .17 | .10 | .12 |
| 24 | 9.0 | .14 | 143 | .12 | 71 | .17 | .12 | .26 | .17 | .14 | .10 | .10 |
| 25 | 4.8 | .12 | 212 | .10 | 41 | .14 | .14 | .26 | .14 | .17 | .10 | .10 |
| 26 | .70 | .12 | 65 | .10 | 22 | .12 | .14 | .23 | .17 | .14 | .10 | .10 |
| 27 | 2.2 | .12 | 50 | .10 | 14 | .12 | .14 | .23 | .17 | .14 | .10 | .10 |
| 28 | .52 | 9.8 | 41 | .10 | 11 | .14 | .17 | .23 | .17 | .12 | .09 | .10 |
| 29 | .17 | 559 | 32 | .12 | ------ | .40 | .14 | .23 | .17 | .12 | .07 | .10 |
| 30 | .14 | 278 | 26 | 8.7 | ------ | .40 | .12 | .23 | .14 | .12 | .09 | .10 |
| 31 | .14 | ------ | 19 | 405 | ------ | 201 | ------ | .23 | ------ | .17 | .10 | ------ |
| TOTAL | 171.40 | 914.78 | 2891.52 | 935.08 | 1,935.36 | 345.73 | 7.94 | 56.84 | 5.34 | 4.86 | 3.63 | 2.79 |
| MEAN | 5.53 | 30.5 | 93.3 | 30.2 | 69.1 | 11.2 | .26 | 1.83 | .18 | .16 | .12 | .093 |
| MAX | 38 | 559 | 1,000 | 405 | 466 | 201 | 1.2 | 16 | .23 | .23 | .14 | .23 |
| MIN | .14 | .10 | .96 | .10 | .26 | .12 | .12 | .12 | .14 | .12 | .07 | .06 |
| AC-FT | 340 | 1,810 | 5,740 | 1,850 | 3,840 | 686 | 16 | 113 | 11 | 9.6 | 7.2 | 5.5 |

CAL YR 1968: TOTAL 5,195.79 MEAN 14.2 MAX 1,000 MIN .04 AC-FT 10,310
WTR YR 1969: TOTAL 7,275.27 MEAN 19.9 MAX 1,000 MIN .06 AC-FT 14,430

PEAK DISCHARGE (BASE, 1,400 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1930 | 7.50 | 5,750 | 2-19 | 1800 | 5.25 | 2,440 |
| 12-8 | 1400 | 4.50 | 1,690 | 3-31 | 1500 | 6.48 | 4,010 |
| 1-31 | 1830 | 5.55 | 2,770 | | | | |

## 16-0542. Koloa ditch near Koloa

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 78 | 8.7 | 14 | 37 | 22 | 7.1 | 32 | 11 | 6.8 | 23 | 12 | 21 |
| 2 | 64 | 8.0 | 11 | 26 | 20 | 7.9 | 25 | 13 | 6.6 | 15 | 17 | 19 |
| 3 | 39 | 8.0 | 22 | 20 | 18 | 24 | 17 | 14 | 6.4 | 29 | 17 | 20 |
| 4 | 30 | 7.1 | 25 | 17 | 21 | 19 | 2.8 | 11 | 6.0 | 30 | 16 | 13 |
| 5 | 28 | 6.9 | 23 | 16 | 22 | 14 | 2.6 | 19 | 5.9 | 5.9 | 11 | 13 |
| 6 | 18 | 6.4 | 22 | 27 | 20 | 14 | 2.6 | 15 | 5.7 | 9.8 | 9.4 | 9.4 |
| 7 | 15 | 6.2 | 22 | 20 | 18 | 12 | 8.7 | 12 | 5.5 | 9.4 | 9.4 | 8.2 |
| 8 | 31 | 12 | 51 | 18 | 17 | 12 | 14 | 13 | 4.5 | 21 | 9.2 | 8.0 |
| 9 | 25 | 6.6 | 41 | 15 | 16 | 12 | 14 | 17 | 1.1 | 12 | 9.4 | 7.3 |
| 10 | 16 | 6.2 | 33 | 12 | 17 | 10 | 16 | 20 | .64 | 9.2 | 9.2 | 7.3 |
| 11 | 15 | 6.0 | 30 | 11 | 17 | 12 | 17 | 36 | .64 | 12 | 18 | 33 |
| 12 | 11 | 6.0 | 30 | 15 | 13 | 13 | 18 | 24 | .64 | 13 | 11 | 21 |
| 13 | 9.7 | 38 | 32 | 13 | 11 | 12 | 14 | 20 | .58 | 9.7 | 9.7 | 8.6 |
| 14 | 8.7 | 42 | 37 | 15 | 9.4 | 12 | 16 | 20 | .53 | 8.2 | 12 | 10 |
| 15 | 8.2 | 17 | 36 | 13 | 11 | 11 | 14 | 18 | .53 | 20 | 12 | 48 |
| 16 | 53 | 6.2 | 18 | 12 | 15 | 12 | 12 | 16 | .53 | 15 | 16 | 26 |
| 17 | 81 | 6.2 | 10 | 11 | 15 | 19 | 15 | 15 | .64 | 8.7 | 13 | 26 |
| 18 | 55 | 9.2 | 11 | 11 | 25 | 17 | 17 | 13 | 3.5 | 6.6 | 13 | 42 |
| 19 | 15 | 9.4 | 10 | 11 | 24 | 13 | 14 | 12 | 6.6 | 26 | 11 | 31 |
| 20 | 14 | 10 | 8.9 | 11 | 15 | 11 | 23 | 11 | 6.2 | 37 | 11 | 33 |
| 21 | 21 | 8.2 | 8.2 | 10 | 15 | 9.4 | 17 | 10 | 6.2 | 19 | 24 | 42 |
| 22 | 21 | 7.3 | 17 | 10 | 13 | 9.2 | 13 | 10 | 13 | 17 | 12 | 50 |
| 23 | 18 | 18 | 30 | 9.7 | 12 | 9.4 | 11 | 9.4 | 7.6 | 13 | 9.2 | 42 |
| 24 | 15 | 14 | 18 | 9.2 | 13 | 15 | 11 | 10 | 8.9 | 17 | 9.7 | 42 |
| 25 | 13 | 8.7 | 11 | 9.2 | 12 | 13 | 10 | 12 | 7.6 | 44 | 8.7 | 38 |
| 26 | 12 | 7.6 | 9.4 | 8.9 | 11 | 9.4 | 9.4 | 8.7 | 12 | 25 | 12 | 34 |
| 27 | 11 | 6.8 | 8.9 | 8.7 | 8.6 | 8.7 | 9.4 | 8.5 | 6.9 | 18 | 18 | 33 |
| 28 | 11 | 19 | 8.5 | 9.2 | 7.3 | 8.0 | 16 | 12 | 9.4 | 14 | 15 | 35 |
| 29 | 9.7 | 15 | 9.6 | 15 | ------ | 8.5 | 11 | 12 | 6.2 | 12 | 9.7 | 32 |
| 30 | 9.2 | 15 | 13 | 47 | ------ | 8.2 | 18 | 8.0 | 9.4 | 11 | 12 | 44 |
| 31 | 18 | ------ | 13 | 42 | ------ | 39 | ------ | 7.3 | ------ | 18 | 32 | ------ |
| TOTAL | 773.5 | 345.7 | 633.5 | 509.9 | 438.3 | 401.8 | 420.5 | 437.9 | 156.73 | 528.5 | 408.6 | 796.8 |
| MEAN | 25.0 | 11.5 | 20.4 | 16.4 | 15.7 | 13.0 | 14.0 | 14.1 | 5.22 | 17.0 | 13.2 | 26.6 |
| MAX | 81 | 42 | 51 | 47 | 25 | 39 | 32 | 36 | 13 | 44 | 32 | 50 |
| MIN | 8.2 | 6.0 | 8.2 | 8.7 | 7.3 | 7.1 | 2.6 | 7.3 | .53 | 5.9 | 8.7 | 7.3 |
| AC-FT | 1530 | 686 | 1260 | 1010 | 869 | 797 | 834 | 869 | 311 | 1050 | 810 | 1580 |

CAL YR 1968: TOTAL 5,971.16 MEAN 16.3 MAX 81 MIN .86 AC-FT 11,840
WTR YR 1969: TOTAL 5,851.73 MEAN 16.0 MAX 81 MIN .53 AC-FT 11,610

## 16-0544. Koloa tunnel near Koloa

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 428 | 8.2 | 25 | 21 | 22 | 31 | 41 | 11 | 7.9 | 7.2 | 5.6 | 11 |
| 2 | 72 | 7.2 | 17 | 21 | 17 | 32 | 52 | 14 | 7.9 | 5.0 | 6.2 | 10 |
| 3 | 25 | 6.8 | 14 | 21 | 15 | 32 | 40 | 21 | 7.5 | 5.6 | 5.9 | 9.0 |
| 4 | 17 | 7.2 | 64 | 21 | 15 | 32 | 41 | 18 | 7.2 | 7.2 | 5.4 | 7.0 |
| 5 | 12 | 9.6 | 63 | 21 | 15 | 29 | 29 | 24 | 7.2 | 6.2 | 4.5 | 6.8 |
| 6 | 8.9 | 6.8 | 52 | 20 | 15 | 28 | 21 | 14 | 6.4 | 4.8 | 4.5 | 5.8 |
| 7 | 7.2 | 6.8 | 47 | 20 | 15 | 28 | 28 | 14 | 6.4 | 4.8 | 4.5 | 4.8 |
| 8 | 13 | 7.5 | 275 | 20 | 15 | 28 | 18 | 15 | 7.5 | 6.8 | 4.5 | 4.3 |
| 9 | 8.2 | 6.2 | 94 | 20 | 15 | 28 | 17 | 20 | 12 | 4.5 | 4.5 | 3.9 |
| 10 | 7.9 | 5.9 | 60 | 20 | 15 | 28 | 18 | 30 | 13 | 5.3 | 4.5 | 3.9 |
| 11 | 7.9 | 6.4 | 52 | 20 | 15 | 19 | 21 | 259 | 12 | 4.5 | 9.0 | 6.4 |
| 12 | 6.8 | 6.4 | 48 | 19 | 15 | 14 | 29 | 76 | 12 | 4.5 | 6.0 | 6.2 |
| 13 | 6.2 | 27 | 46 | 19 | 18 | 14 | 20 | 41 | 12 | 4.5 | 5.2 | 3.9 |
| 14 | 5.9 | 15 | 44 | 23 | 18 | 14 | 15 | 41 | 11 | 4.5 | 6.0 | 3.9 |
| 15 | 5.6 | 14 | 42 | 21 | 19 | 14 | 15 | 39 | 11 | 6.2 | 6.6 | 16 |
| 16 | 81 | 14 | 30 | 26 | 23 | 15 | 14 | 34 | 11 | 6.2 | 7.8 | 6.8 |
| 17 | 90 | 14 | 24 | 22 | 18 | 16 | 15 | 25 | 11 | 5.0 | 6.8 | 5.0 |
| 18 | 66 | 14 | 24 | 21 | 19 | 16 | 19 | 21 | 8.9 | 4.5 | 6.4 | 23 |
| 19 | 18 | 14 | 24 | 21 | 21 | 15 | 25 | 14 | 6.4 | 8.6 | 6.0 | 8.9 |
| 20 | 17 | 14 | 23 | 21 | 21 | 18 | 46 | 13 | 6.2 | 14 | 5.8 | 10 |
| 21 | 16 | 14 | 22 | 19 | 25 | 10 | 19 | 14 | 5.9 | 6.8 | 11 | 25 |
| 22 | 16 | 13 | 22 | 19 | 26 | 10 | 14 | 12 | 6.4 | 6.2 | 7.0 | 40 |
| 23 | 15 | 14 | 23 | 19 | 28 | 9.6 | 13 | 10 | 5.9 | 6.2 | 5.8 | 18 |
| 24 | 13 | 12 | 24 | 20 | 30 | 11 | 12 | 11 | 5.0 | 6.4 | 5.0 | 16 |
| 25 | 18 | 8.6 | 23 | 19 | 30 | 14 | 11 | 10 | 5.0 | 17 | 5.0 | 13 |
| 26 | 17 | 10 | 21 | 19 | 30 | 12 | 10 | 7.5 | 5.0 | 22 | 7.0 | 9.6 |
| 27 | 17 | 9.3 | 21 | 14 | 31 | 11 | 10 | 8.6 | 5.6 | 15 | 9.0 | 8.9 |
| 28 | 15 | 13 | 21 | 9.3 | 30 | 9.6 | 13 | 12 | 5.6 | 6.2 | 7.0 | 9.6 |
| 29 | 9.6 | 22 | 21 | 24 | ------ | 8.9 | 11 | 10 | 5.0 | 5.9 | 5.0 | 9.6 |
| 30 | 9.6 | 18 | 21 | 121 | ------ | 8.9 | 18 | 8.6 | 5.0 | 5.6 | 6.4 | 14 |
| 31 | 11 | ------ | 21 | 125 | ------ | 187 | ------ | 8.2 | ------ | 6.8 | 13 | ------ |
| TOTAL | 1,060.8 | 344.9 | 1,308 | 826.3 | 576 | 743.0 | 655 | 855.9 | 238.9 | 224.0 | 196.9 | 320.3 |
| MEAN | 34.2 | 11.5 | 42.2 | 26.7 | 20.6 | 24.0 | 21.8 | 27.6 | 7.96 | 7.23 | 6.35 | 10.7 |
| MAX | 428 | 27 | 275 | 125 | 31 | 187 | 52 | 259 | 13 | 22 | 13 | 40 |
| MIN | 5.6 | 5.9 | 14 | 9.3 | 15 | 8.9 | 10 | 7.5 | 5.0 | 4.5 | 4.5 | 3.9 |
| AC-FT | 2100 | 684 | 2590 | 1640 | 1140 | 1470 | 1300 | 1700 | 474 | 444 | 391 | 635 |

CAL YR 1968: TOTAL 6,203.4 MEAN 16.9 MAX 428 MIN 2.1 AC-FT 12,300
WTR YR 1969: TOTAL 7,350.0 MEAN 20.1 MAX 428 MIN 3.9 AC-FT 14,580

NOTE.--No gage-height record Aug. 4 to Sept. 8.

## 16-0550. Huleia Stream near Lihue

LOCATION.--Lat 21°57'20", long 159°25'23", Kauai, on left bank 60 ft downstream from bridge on Kipu Road, 0.2 mile east of Kipu, and 3.6 miles southwest of Lihue.

DRAINAGE AREA.--17.6 sq mi.

PERIOD OF RECORD.--May 1912 to December 1915, water years 1962-67 (annual maximums), March 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). May 7, 1912, to Dec. 31, 1915, nonrecording gage at site 380 ft upstream at different datum. Apr. 23, 1962, to Feb. 28, 1967, crest-stage gage at site 60 ft upstream at datum 2.36 ft lower than present datum.

EXTREMES.--Current year: Maximum discharge, 12,000 cfs Nov. 29 (gage height, 16.67 ft), from rating curve extended as explained below; minimum, 4.4 cfs Sept. 27.
Period of record: Maximum discharge, 13,200 cfs Apr. 15, 1963 (gage height, 17.46 ft, present datum), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 16.37 ft; minimum, 3.9 cfs July 6, Sept. 13, 1967.

REMARKS.--Records good. Several diversions above station, including diversions into and out of the basin, principally for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 440 | 16 | 3,010 | 212 | 1,040 | 58 | 107 | 12 | 8.3 | 6.4 | 7.4 | 6.9 |
| 2 | 75 | 15 | 914 | 220 | 652 | 56 | 52 | 11 | 8.3 | 6.2 | 7.1 | 6.0 |
| 3 | 28 | 15 | 373 | 96 | 270 | 108 | 34 | 11 | 7.6 | 6.2 | 7.1 | 5.7 |
| 4 | 39 | 14 | 196 | 79 | 188 | 66 | 32 | 11 | 7.6 | 6.2 | 7.1 | 6.4 |
| 5 | 23 | 14 | 114 | 168 | 149 | 50 | 36 | 11 | 7.4 | 6.0 | 6.9 | 6.0 |
| 6 | 18 | 13 | 94 | 108 | 134 | 50 | 50 | 12 | 6.4 | 5.8 | 6.6 | 5.8 |
| 7 | 16 | 13 | 79 | 111 | 120 | 44 | 32 | 196 | 6.4 | 6.2 | 6.9 | 5.5 |
| 8 | 36 | 12 | 743 | 79 | 112 | 40 | 21 | 18 | 6.2 | 6.9 | 6.4 | 6.0 |
| 9 | 24 | 12 | 140 | 75 | 102 | 38 | 22 | 18 | 6.2 | 6.2 | 6.9 | 5.8 |
| 10 | 24 | 12 | 105 | 65 | 78 | 32 | 23 | 22 | 6.4 | 6.0 | 6.9 | 5.7 |
| 11 | 24 | 12 | 85 | 59 | 99 | 24 | 21 | 171 | 6.6 | 6.0 | 7.4 | 6.4 |
| 12 | 18 | 11 | 80 | 54 | 69 | 19 | 19 | 98 | 6.4 | 5.8 | 6.4 | 5.8 |
| 13 | 15 | 108 | 87 | 59 | 58 | 19 | 16 | 87 | 6.4 | 5.5 | 6.4 | 5.5 |
| 14 | 14 | 279 | 219 | 46 | 50 | 19 | 18 | 50 | 6.4 | 5.7 | 6.6 | 5.3 |
| 15 | 13 | 55 | 257 | 34 | 57 | 18 | 18 | 23 | 6.4 | 6.4 | 6.4 | 6.4 |
| 16 | 37 | 34 | 254 | 26 | 77 | 18 | 14 | 16 | 6.6 | 6.2 | 6.9 | 6.4 |
| 17 | 84 | 30 | 249 | 21 | 71 | 21 | 15 | 15 | 6.6 | 6.0 | 6.9 | 5.8 |
| 18 | 62 | 26 | 324 | 20 | 188 | 17 | 15 | 14 | 6.6 | 5.8 | 7.1 | 7.6 |
| 19 | 142 | 13 | 261 | 19 | 478 | 12 | 15 | 13 | 6.6 | 8.1 | 7.4 | 6.2 |
| 20 | 124 | 13 | 183 | 18 | 255 | 10 | 15 | 13 | 6.2 | 8.3 | 7.6 | 5.8 |
| 21 | 89 | 11 | 156 | 16 | 327 | 9.4 | 15 | 12 | 5.8 | 6.9 | 7.8 | 8.1 |
| 22 | 57 | 9.7 | 132 | 15 | 162 | 9.4 | 14 | 12 | 6.4 | 6.4 | 7.6 | 9.4 |
| 23 | 46 | 11 | 112 | 15 | 111 | 9.4 | 13 | 11 | 6.2 | 7.4 | 6.4 | 7.4 |
| 24 | 42 | 13 | 388 | 14 | 169 | 9.4 | 13 | 12 | 6.2 | 7.8 | 6.4 | 5.5 |
| 25 | 33 | 10 | 577 | 13 | 118 | 9.4 | 13 | 11 | 6.0 | 8.6 | 6.2 | 5.5 |
| 26 | 21 | 9.4 | 186 | 13 | 89 | 9.4 | 13 | 10 | 6.2 | 7.8 | 6.6 | 5.3 |
| 27 | 23 | 8.3 | 144 | 13 | 72 | 9.4 | 13 | 10 | 6.6 | 7.6 | 6.6 | 5.5 |
| 28 | 20 | 48 | 122 | 13 | 65 | 9.1 | 13 | 10 | 6.6 | 7.4 | 6.0 | 5.8 |
| 29 | 18 | 1,460 | 105 | 15 | ------ | 9.7 | 13 | 9.4 | 6.0 | 7.1 | 6.0 | 6.9 |
| 30 | 17 | 769 | 90 | 57 | ------ | 10 | 13 | 9.1 | 6.4 | 6.9 | 5.8 | 6.0 |
| 31 | 21 | ------ | 77 | 972 | ------ | 506 | ------ | 8.6 | ------ | 7.8 | 7.4 | ------ |
| TOTAL | 1,643 | 3,066.4 | 9,856 | 2,725 | 3,360 | 1,319.6 | 708 | 937.1 | 198.0 | 207.6 | 211.2 | 186.4 |
| MEAN | 53.0 | 102 | 318 | 87.9 | 191 | 42.6 | 23.6 | 30.2 | 6.60 | 6.70 | 6.81 | 6.21 |
| MAX | 440 | 1,460 | 3,010 | 972 | 1,040 | 506 | 107 | 196 | 8.3 | 8.6 | 7.8 | 9.4 |
| MIN | 13 | 8.3 | 77 | 13 | 50 | 9.1 | 13 | 8.6 | 5.8 | 5.5 | 5.8 | 5.3 |
| AC-FT | 3,260 | 6,080 | 19,550 | 5,410 | 10,630 | 2,620 | 1,400 | 1,860 | 393 | 412 | 419 | 370 |

CAL YR 1968: TOTAL 20,908.7 MEAN 57.1 MAX 3,010 MIN 8.3 AC-FT 41,470
WTR YR 1969: TOTAL 26,418.3 MEAN 72.4 MAX 3,010 MIN 5.3 AC-FT 52,400

PEAK DISCHARGE (BASE, 5,500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1800 | 16.67 | 12,000 | 1-31 | 1800 | 13.19 | 6,150 |
| 12-8 | 1230 | 13.98 | 7,270 | 3-31 | 1500 | 13.17 | 6,120 |

## 16-0568, Waiahi-Kuia aqueduct near Puhi

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

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

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

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

REMARKS.--Records good. Ditch diverts from Waiahi Stream into Kuia Stream, from which Koloa ditch (see sta 16-0542) diverts 50 ft downstream for power generation and irrigation of sugarcane in vicinity of Koloa.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 35 | 1.1 | 15 | 0 | 27 | .02 | 9.0 | .38 | 1.7 | 3.0 | 1.1 | .09 |
| 2 | 30 | 1.4 | 1.9 | 2.6 | 25 | .02 | 7.4 | .38 | 1.4 | 11 | 1.1 | 3.3 |
| 3 | 17 | 1.1 | .38 | .22 | 7.5 | .49 | 7.0 | .21 | 1.1 | 14 | 1.1 | 2.9 |
| 4 | 11 | 1.1 | .09 | 0 | 2.7 | 0 | 7.0 | .21 | .82 | 7.9 | .82 | .35 |
| 5 | 8.0 | 1.1 | 0 | 0 | 1.1 | 0 | 7.0 | 3.3 | .82 | 1.4 | .38 | .21 |
| 6 | 3.0 | .82 | 0 | .04 | .59 | 0 | 7.0 | 1.1 | .59 | 1.3 | .21 | .21 |
| 7 | 1.7 | .82 | 0 | 0 | .21 | 0 | 6.6 | 1.1 | .59 | 1.4 | .21 | .21 |
| 8 | 9.5 | 1.1 | 1.6 | 0 | .09 | 0 | 3.4 | 2.0 | .38 | .38 | .21 | .38 |
| 9 | 6.3 | .38 | .21 | 0 | .02 | 0 | .38 | 1.7 | .38 | .21 | .21 | .38 |
| 10 | 1.4 | .38 | 0 | 0 | .02 | .02 | .38 | 2.6 | .38 | .21 | .21 | .21 |
| 11 | 1.1 | .21 | 0 | 0 | .46 | 0 | .38 | 11 | .38 | .21 | .39 | 12 |
| 12 | 1.1 | 2.0 | 0 | 0 | 0 | 0 | .59 | 6.9 | .38 | .09 | .21 | 4.8 |
| 13 | 1.1 | 11 | 0 | 0 | 0 | 0 | .38 | 4.2 | .38 | .09 | .09 | .21 |
| 14 | 1.1 | 8.0 | .17 | 0 | 0 | 0 | .38 | 2.7 | .38 | .82 | .09 | 2.9 |
| 15 | .82 | .59 | .82 | 0 | .03 | 0 | .09 | 2.4 | .38 | 1.1 | .09 | 17 |
| 16 | 10 | .21 | .47 | 0 | .15 | 0 | .09 | 3.0 | .38 | .82 | .59 | 5.9 |
| 17 | 23 | .21 | 1.2 | 0 | .09 | .29 | .21 | 3.0 | .38 | .82 | .59 | 5.3 |
| 18 | 24 | .09 | 2.0 | 0 | 2.1 | .09 | .38 | 3.0 | .38 | 3.6 | .09 | 18 |
| 19 | 19 | .05 | .82 | 0 | 8.2 | .01 | .38 | 2.7 | .59 | 5.0 | .09 | 8.5 |
| 20 | 11 | .09 | .38 | 0 | 7.4 | 0 | .82 | 2.7 | .59 | 2.7 | .09 | 12 |
| 21 | 5.6 | .21 | .19 | 0 | 7.2 | 0 | .38 | 2.7 | .59 | 2.7 | .90 | 14 |
| 22 | 2.4 | .82 | 0 | 0 | 3.4 | 0 | .38 | 2.7 | .59 | 2.4 | .38 | 23 |
| 23 | 1.4 | 1.1 | 0 | 0 | 2.0 | 0 | .21 | 2.4 | .59 | 1.7 | .09 | 24 |
| 24 | 1.1 | .82 | 2.7 | 0 | 1.8 | 0 | .21 | 2.4 | .59 | 1.7 | .09 | 23 |
| 25 | 1.4 | .38 | 3.6 | 0 | .59 | 0 | .02 | 2.4 | 4.2 | 2.7 | .09 | 21 |
| 26 | 1.4 | .38 | .59 | 0 | .59 | 0 | 0 | 2.0 | 2.4 | 1.7 | .09 | 15 |
| 27 | 1.4 | .38 | .21 | 0 | .21 | 0 | 0 | 2.0 | 2.0 | 1.4 | .09 | 13 |
| 28 | 1.4 | 4.6 | 0 | 0 | .09 | 0 | 1.6 | 2.0 | 1.1 | 1.1 | .09 | 16 |
| 29 | 1.1 | 19 | 0 | 7.2 | ------ | 0 | 1.1 | 2.0 | 1.2 | .59 | .09 | 12 |
| 30 | 1.1 | 11 | 0 | 22 | ------ | 0 | 1.4 | 2.0 | 1.7 | .38 | .09 | 18 |
| 31 | 4.5 | ------ | 0 | 26 | ------ | 11 | ------ | 2.0 | ------ | 1.1 | .09 | ------ |
| TOTAL | 237.92 | 70.44 | 32.33 | 58.06 | 98.54 | 11.94 | 64.16 | 79.18 | 27.34 | 73.52 | 9.96 | 273.85 |
| MEAN | 7.67 | 2.35 | 1.04 | 1.87 | 3.52 | .39 | 2.14 | 2.55 | .91 | 2.37 | .32 | 9.13 |
| MAX | 35 | 19 | 15 | 26 | 27 | 11 | 9.0 | 11 | 4.2 | 14 | 1.1 | 24 |
| MIN | .82 | .05 | 0 | 0 | 0 | 0 | 0 | .21 | .38 | .09 | .09 | .09 |
| AC-FT | 472 | 140 | 64 | 115 | 195 | 24 | 127 | 157 | 54 | 146 | 20 | 543 |

CAL YR 1968: TOTAL 879.75 MEAN 2.40 MAX 38 MIN 0 AC-FT 1,740
WTR YR 1969: TOTAL 1,037.24 MEAN 2.84 MAX 35 MIN 0 AC-FT 2,060

## 16-0600. South Fork Wailua River near Lihue

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

DRAINAGE AREA.--22.4 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 23,200 cfs Dec. 1 (gage height, 18.28 ft); minimum, 3.8 cfs June 14, 15, 21.
Period of record: Maximum dischrge, 87,300 cfs Apr. 15, 1963 (gage height, 22.90 ft), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.69 cfs Sept. 21, 1953.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,920 | 7.6 | 4,890 | 356 | 2,940 | 142 | 533 | 10 | 6.4 | 38 | 13 | 75 |
| 2 | 470 | 6.8 | 951 | 461 | 1,590 | 155 | 308 | 32 | 6.6 | 16 | 13 | 57 |
| 3 | 145 | 7.0 | 565 | 199 | 488 | 514 | 145 | 16 | 7.3 | 14 | 17 | 7.3 |
| 4 | 160 | 6.8 | 393 | 166 | 279 | 335 | 114 | 13 | 7.6 | 54 | 15 | 5.9 |
| 5 | 90 | 5.9 | 231 | 312 | 215 | 215 | 106 | 187 | 7.0 | 14 | 13 | 7.0 |
| 6 | 60 | 5.5 | 164 | 209 | 205 | 212 | 99 | 55 | 6.6 | 9.0 | 11 | 7.9 |
| 7 | 45 | 5.0 | 148 | 253 | 127 | 161 | 70 | 41 | 5.9 | 16 | 11 | 6.4 |
| 8 | 53 | 5.0 | 926 | 164 | 105 | 161 | 37 | 36 | 5.0 | 27 | 12 | 6.8 |
| 9 | 82 | 4.8 | 390 | 151 | 90 | 195 | 16 | 83 | 5.0 | 12 | 16 | 6.4 |
| 10 | 62 | 4.8 | 171 | 135 | 144 | 139 | 19 | 182 | 6.4 | 12 | 14 | 5.9 |
| 11 | 56 | 4.6 | 100 | 124 | 196 | 105 | 55 | 882 | 5.9 | 38 | 80 | 106 |
| 12 | 40 | 4.8 | 131 | 117 | 89 | 92 | 60 | 557 | 5.0 | 32 | 12 | 7.0 |
| 13 | 38 | 221 | 255 | 99 | 74 | 61 | 41 | 265 | 4.3 | 18 | 5.9 | 4.5 |
| 14 | 26 | 556 | 581 | 61 | 65 | 9.8 | 59 | 112 | 3.8 | 13 | 5.7 | 9.7 |
| 15 | 16 | 112 | 833 | 49 | 112 | 36 | 44 | 60 | 3.9 | 53 | 4.6 | 260 |
| 16 | 299 | 47 | 484 | 30 | 186 | 72 | 10 | 74 | 4.3 | 55 | 32 | 23 |
| 17 | 930 | 51 | 432 | 20 | 164 | 194 | 9.0 | 69 | 4.6 | 25 | 12 | 47 |
| 18 | 390 | 32 | 787 | 19 | 1,000 | 74 | 15 | 58 | 4.5 | 13 | 23 | 219 |
| 19 | 223 | 15 | 373 | 18 | 1,790 | 36 | 16 | 48 | 4.8 | 260 | 10 | 45 |
| 20 | 156 | 24 | 241 | 16 | 758 | 28 | 122 | 32 | 5.0 | 325 | 14 | 77 |
| 21 | 123 | 29 | 190 | 16 | 713 | 17 | 51 | 12 | 3.9 | 73 | 27 | 217 |
| 22 | 87 | 16 | 153 | 27 | 399 | 9.5 | 20 | 10 | 5.6 | 43 | 12 | 332 |
| 23 | 65 | 32 | 153 | 27 | 265 | 19 | 13 | 9.8 | 8.7 | 28 | 4.8 | 48 |
| 24 | 14 | 79 | 942 | 25 | 405 | 83 | 11 | 12 | 8.7 | 31 | 4.3 | 22 |
| 25 | 9.5 | 33 | 1,000 | 24 | 255 | 78 | 9.2 | 20 | 30 | 163 | 4.1 | 21 |
| 26 | 9.8 | 26 | 309 | 24 | 188 | 15 | 8.4 | 13 | 22 | 64 | 4.8 | 6.6 |
| 27 | 14 | 18 | 209 | 23 | 141 | 12 | 7.3 | 12 | 13 | 31 | 9.2 | 5.7 |
| 28 | 19 | 194 | 175 | 23 | 131 | 9.2 | 78 | 9.8 | 28 | 19 | 8.7 | 6.6 |
| 29 | 9.2 | 2,280 | 151 | 76 | ------ | 6.6 | 14 | 12 | 16 | 12 | 6.4 | 16 |
| 30 | 7.3 | 2,290 | 138 | 471 | ------ | 12 | 136 | 9.0 | 46 | 11 | 4.8 | 7.9 |
| 31 | 13 | ------ | 128 | 2,800 | ------ | 1,690 | ------ | 7.0 | ------ | 27 | 49 | ------ |
| TOTAL | 5,631.8 | 6,123.6 | 16,594 | 6,495 | 13,114 | 4,888.1 | 2,225.9 | 2,938.6 | 291.8 | 1,546.0 | 469.3 | 1,666.6 |
| MEAN | 182 | 204 | 535 | 210 | 468 | 158 | 74.2 | 94.8 | 9.73 | 49.9 | 15.1 | 55.6 |
| MAX | 1,920 | 2,290 | 4,890 | 2,800 | 2,940 | 1,690 | 533 | 882 | 46 | 325 | 80 | 332 |
| MIN | 7.3 | 4.6 | 100 | 16 | 65 | 6.6 | 7.3 | 7.0 | 3.8 | 9.0 | 4.1 | 4.5 |
| AC-FT | 11,170 | 12,150 | 32,910 | 12,880 | 26,010 | 9,700 | 4,420 | 5,830 | 579 | 3,070 | 931 | 3,310 |

CAL YR 1968: TOTAL 46,530.8 MEAN 127 MAX 4,890 MIN 2.4 AC-FT 92,290
WTR YR 1969: TOTAL 61,984.7 MEAN 170 MAX 4,890 MIN 3.8 AC-FT 122,900

PEAK DISCHARGE (BASE, 5,800 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1600 | 14.70 | 6,280 | 1-30 | 1800 | 16.00 | 10,400 |
| 12- 1 | 0600 | 18.28 | 23,200 | 3-31 | 1830 | 17.24 | 16,200 |

## 16-0610. North Wailua ditch near Lihue

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

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40 | 17 | 23 | 23 | 31 | 22 | 26 | 22 | 20 | 27 | 22 | 29 |
| 2 | 23 | 18 | 6.6 | 22 | 26 | 24 | 28 | 24 | 19 | 24 | 23 | 26 |
| 3 | 22 | 17 | 0 | 20 | 13 | 27 | 23 | 22 | 19 | 27 | 23 | 24 |
| 4 | 26 | 17 | 0 | 20 | 13 | 24 | 23 | 22 | 19 | 28 | 22 | 27 |
| 5 | 23 | 16 | 0 | 21 | 18 | 24 | 25 | 27 | 19 | 24 | 20 | 28 |
| 6 | 22 | 16 | 13 | 21 | 25 | 23 | 24 | 24 | 19 | 24 | 20 | 25 |
| 7 | 21 | 16 | 20 | 21 | 22 | 21 | 24 | 21 | 18 | 28 | 21 | 23 |
| 8 | 22 | 17 | 24 | 20 | 21 | 23 | 23 | 22 | 18 | 27 | 24 | 24 |
| 9 | 20 | 16 | 20 | 20 | 21 | 22 | 25 | 24 | 20 | 26 | 24 | 23 |
| 10 | 20 | 17 | 20 | 20 | 24 | 22 | 25 | 27 | 22 | 27 | 24 | 24 |
| 11 | 20 | 19 | 20 | 20 | 24 | 21 | 24 | 28 | 20 | 29 | 32 | 28 |
| 12 | 19 | 23 | 25 | 19 | 22 | 21 | 24 | 27 | 20 | 28 | 26 | 24 |
| 13 | 18 | 29 | 26 | 20 | 22 | 20 | 22 | 23 | 19 | 26 | 26 | 24 |
| 14 | 18 | 26 | 28 | 19 | 23 | 20 | 26 | 23 | 18 | 25 | 25 | 27 |
| 15 | 20 | 20 | 26 | 18 | 29 | 20 | 23 | 23 | 18 | 29 | 26 | 32 |
| 16 | 20 | 23 | 23 | 18 | 29 | 23 | 22 | 22 | 19 | 28 | 30 | 29 |
| 17 | 24 | 20 | 22 | 17 | 27 | 25 | 23 | 22 | 19 | 25 | 29 | 30 |
| 18 | 23 | 19 | 24 | 17 | 34 | 23 | 26 | 21 | 19 | 25 | 27 | 31 |
| 19 | 29 | 20 | 20 | 17 | 36 | 21 | 22 | 21 | 20 | 34 | 28 | 27 |
| 20 | 25 | 21 | 20 | 17 | 30 | 21 | 27 | 21 | 20 | 32 | 27 | 30 |
| 21 | 22 | 18 | 20 | 17 | 27 | 21 | 23 | 20 | 19 | 27 | 27 | 31 |
| 22 | 20 | 17 | 20 | 18 | 23 | 21 | 23 | 20 | 25 | 27 | 24 | 29 |
| 23 | 20 | 27 | 20 | 17 | 20 | 23 | 22 | 20 | 21 | 26 | 23 | 26 |
| 24 | 19 | 22 | 27 | 16 | 25 | 26 | 22 | 22 | 29 | 27 | 24 | 28 |
| 25 | 19 | 19 | 25 | 16 | 21 | 23 | 21 | 20 | 23 | 29 | 23 | 26 |
| 26 | 18 | 18 | 21 | 16 | 22 | 22 | 20 | 21 | 28 | 25 | 27 | 26 |
| 27 | 17 | 17 | 20 | 16 | 21 | 22 | 21 | 22 | 26 | 23 | 28 | 24 |
| 28 | 17 | 31 | 20 | 16 | 21 | 21 | 27 | 21 | 27 | 22 | 25 | 26 |
| 29 | 17 | 40 | 20 | 21 | ------ | 24 | 25 | 20 | 25 | 21 | 24 | 23 |
| 30 | 17 | 34 | 19 | 25 | ------ | 23 | 26 | 20 | 27 | 21 | 24 | 27 |
| 31 | 18 | ------ | 19 | 31 | ------ | 26 | ------ | 20 | ------ | 25 | 29 | ------ |
| TOTAL | 659 | 630 | 591.6 | 599 | 670 | 699 | 715 | 692 | 635 | 816 | 777 | 801 |
| MEAN | 21.3 | 21.0 | 19.1 | 19.3 | 23.9 | 22.5 | 23.8 | 22.3 | 21.2 | 26.3 | 25.1 | 26.7 |
| MAX | 40 | 40 | 27 | 31 | 36 | 27 | 28 | 28 | 29 | 34 | 32 | 32 |
| MIN | 17 | 16 | 0 | 16 | 13 | 20 | 20 | 20 | 18 | 21 | 20 | 23 |
| AC-FT | 1,310 | 1,250 | 1,170 | 1,190 | 1,330 | 1,390 | 1,420 | 1,370 | 1,260 | 1,620 | 1,540 | 1,590 |

CAL YR 1968: TOTAL 7,773.95 MEAN 21.2 MAX 40 MIN 0 AC-FT 15,420
WTR YR 1969: TOTAL 8,284.6 MEAN 22.7 MAX 40 MIN 0 AC-FT 16,430

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

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 55 | 22 | 44 | 34 | 57 | 27 | 38 | 31 | 25 | 35 | 30 | 24 |
| 2 | 37 | 24 | 31 | 37 | 48 | 30 | 37 | 33 | 24 | 32 | 30 | 24 |
| 3 | 33 | 22 | 31 | 32 | 35 | 38 | 33 | 31 | 24 | 34 | 30 | 23 |
| 4 | 35 | 22 | 22 | 30 | 30 | 30 | 31 | 30 | 24 | 37 | 29 | 24 |
| 5 | 33 | 21 | 12 | 33 | 30 | 35 | 32 | 38 | 23 | 33 | 28 | 25 |
| 6 | 31 | 20 | 22 | 32 | 36 | 34 | 31 | 34 | 22 | 31 | 27 | 24 |
| 7 | 30 | 20 | 31 | 34 | 32 | 32 | 31 | 31 | 22 | 35 | 27 | 22 |
| 8 | 30 | 23 | 38 | 31 | 31 | 33 | 30 | 32 | 22 | 34 | 29 | 21 |
| 9 | 29 | 20 | 34 | 30 | 30 | 33 | 31 | 33 | 24 | 33 | 31 | 22 |
| 10 | 28 | 21 | 32 | 28 | 33 | 32 | 33 | 39 | 28 | 34 | 30 | 23 |
| 11 | 27 | 24 | 31 | 27 | 34 | 30 | 32 | 43 | 26 | 37 | 39 | 26 |
| 12 | 26 | 27 | 35 | 26 | 31 | 30 | 32 | 39 | 24 | 36 | 32 | 23 |
| 13 | 24 | 40 | 37 | 28 | 30 | 29 | 30 | 34 | 24 | 34 | 32 | 22 |
| 14 | 24 | 37 | 44 | 25 | 30 | 28 | 33 | 32 | 22 | 32 | 31 | 24 |
| 15 | 25 | 29 | 43 | 24 | 35 | 28 | 31 | 32 | 22 | 37 | 31 | 31 |
| 16 | 31 | 29 | 37 | 24 | 36 | 32 | 30 | 31 | 23 | 36 | 35 | 27 |
| 17 | 39 | 28 | 35 | 23 | 35 | 36 | 30 | 30 | 23 | 33 | 34 | 28 |
| 18 | 37 | 26 | 42 | 22 | 47 | 33 | 33 | 30 | 23 | 32 | 32 | 29 |
| 19 | 35 | 28 | 35 | 22 | 48 | 31 | 31 | 30 | 25 | 43 | 32 | 27 |
| 20 | 33 | 30 | 32 | 22 | 38 | 31 | 35 | 29 | 25 | 41 | 32 | 28 |
| 21 | 31 | 24 | 32 | 23 | 36 | 30 | 32 | 28 | 24 | 35 | 33 | 29 |
| 22 | 29 | 22 | 31 | 23 | 31 | 30 | 31 | 27 | 29 | 34 | 30 | 28 |
| 23 | 27 | 33 | 33 | 22 | 27 | 31 | 30 | 27 | 27 | 32 | 29 | 26 |
| 24 | 26 | 32 | 46 | 21 | 32 | 35 | 30 | 29 | 32 | 33 | 30 | 27 |
| 25 | 25 | 29 | 43 | 20 | 28 | 33 | 28 | 28 | 30 | 37 | 29 | 26 |
| 26 | 24 | 27 | 34 | 20 | 28 | 31 | 27 | 28 | 33 | 32 | 31 | 26 |
| 27 | 23 | 24 | 32 | 20 | 27 | 30 | 27 | 30 | 32 | 31 | 30 | 25 |
| 28 | 23 | 38 | 31 | 20 | 27 | 30 | 36 | 29 | 31 | 30 | 23 | 25 |
| 29 | 23 | 50 | 30 | 29 | ------ | 31 | 31 | 28 | 31 | 29 | 23 | 24 |
| 30 | 23 | 52 | 28 | 40 | ------ | 31 | 36 | 27 | 35 | 28 | 23 | 25 |
| 31 | 24 | ------ | 27 | 55 | ------ | 47 | ------ | 26 | ------ | 33 | 25 | ------ |
| TOTAL | 920 | 844 | 1,035 | 857 | 962 | 991 | 952 | 969 | 779 | 1,053 | 927 | 758 |
| MEAN | 29.7 | 28.1 | 33.4 | 27.6 | 34.4 | 32.0 | 31.7 | 31.3 | 26.0 | 34.0 | 29.9 | 25.3 |
| MAX | 55 | 52 | 46 | 55 | 57 | 47 | 38 | 43 | 35 | 43 | 39 | 31 |
| MIN | 23 | 20 | 12 | 20 | 27 | 27 | 27 | 26 | 22 | 28 | 23 | 21 |
| AC-FT | 1,820 | 1,670 | 2,050 | 1,700 | 1,910 | 1,970 | 1,890 | 1,920 | 1,550 | 2,090 | 1,840 | 1,500 |

CAL YR 1968: TOTAL 9,943 MEAN 27.2 MAX 55 MIN 12 AC-FT 19,720
WTR YR 1969: TOTAL 11,047 MEAN 30.3 MAX 57 MIN 12 AC-FT 21,910

## 16-0620. Stable storm ditch near Lihue

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 25 | .22 | .74 | 0 | .90 | 0 | .37 | 12 | 12 | 22 | .22 | .90 |
| 2 | .59 | .22 | .59 | 0 | .45 | 0 | .22 | 32 | 13 | .22 | 24 | .90 |
| 3 | .45 | .22 | .45 | 0 | .33 | 0 | .22 | 26 | 14 | .22 | 36 | .90 |
| 4 | .59 | .22 | .45 | 0 | .22 | 0 | .22 | 23 | 14 | .45 | 36 | 23 |
| 5 | .45 | .10 | .45 | .07 | .12 | 0 | .22 | 20 | 14 | .45 | 36 | 39 |
| 6 | .45 | 0 | .45 | .22 | .12 | 0 | .22 | .33 | 14 | .45 | 35 | 35 |
| 7 | .45 | 0 | .45 | .33 | .12 | 0 | .22 | .22 | 14 | .45 | 35 | 32 |
| 8 | .33 | 0 | .45 | .33 | .04 | 0 | .22 | 17 | 14 | .45 | 38 | 32 |
| 9 | .33 | 0 | .45 | .22 | 0 | 0 | .22 | 14 | 14 | .45 | 36 | 31 |
| 10 | .33 | 0 | .33 | .22 | 0 | 0 | .22 | .33 | 19 | .45 | 38 | 34 |
| 11 | .33 | 11 | .22 | 0 | 0 | 0 | .22 | .33 | 12 | .45 | 22 | 28 |
| 12 | .33 | 22 | .22 | 0 | 0 | 0 | .22 | .33 | 11 | .33 | .59 | 26 |
| 13 | .33 | 18 | .22 | 0 | 0 | 0 | .22 | .33 | .33 | .33 | .59 | 39 |
| 14 | .33 | .45 | .33 | 0 | 0 | 0 | .22 | .33 | 11 | .33 | .59 | 43 |
| 15 | .33 | .33 | .33 | 0 | 0 | 0 | .22 | .33 | 27 | .33 | 26 | 57 |
| 16 | .36 | .33 | .33 | 0 | 0 | 0 | .22 | .22 | 28 | .33 | 49 | 50 |
| 17 | .39 | .33 | .33 | 0 | 0 | 0 | 13 | .22 | 25 | .33 | 47 | 31 |
| 18 | .33 | .33 | .33 | 0 | .01 | 0 | 34 | .22 | 28 | .33 | 44 | .59 |
| 19 | .33 | .33 | .33 | 0 | .12 | 0 | 23 | .22 | 30 | .22 | 45 | .45 |
| 20 | .22 | .33 | .33 | 0 | .04 | 0 | 38 | .22 | 29 | .22 | 45 | .45 |
| 21 | .22 | .33 | .22 | 0 | .04 | 0 | 26 | .22 | 28 | .22 | 20 | .45 |
| 22 | .22 | .33 | .22 | 0 | .04 | 0 | 25 | .22 | 39 | .22 | .74 | .45 |
| 23 | .22 | .33 | .22 | 0 | .04 | 0 | 22 | .22 | 32 | .22 | .74 | .45 |
| 24 | .22 | .33 | .33 | 0 | .04 | 0 | 23 | .22 | 43 | .22 | .74 | .45 |
| 25 | .22 | .33 | .45 | 0 | .04 | 0 | 20 | .22 | 38 | .22 | 21 | .33 |
| 26 | .22 | .33 | .45 | 0 | .04 | 0 | 19 | .22 | 27 | .22 | 36 | .22 |
| 27 | .22 | .33 | .33 | 0 | .04 | 0 | 19 | .22 | 22 | .12 | 42 | .22 |
| 28 | .22 | .33 | .33 | 0 | .04 | 0 | 41 | 12 | 40 | .12 | 37 | .22 |
| 29 | .22 | 1.7 | .22 | 0 | ------ | .11 | 28 | 16 | 37 | .12 | 10 | .22 |
| 30 | .22 | 1.5 | 0 | .59 | ------ | .22 | 26 | 14 | 41 | .12 | .90 | .22 |
| 31 | .22 | ------ | 0 | 1.1 | ------ | .70 | ------ | 13 | ------ | .22 | .90 | ------ |
| TOTAL | 34.67 | 60.25 | 10.55 | 3.08 | 2.79 | 1.03 | 360.67 | 204.17 | 690.33 | 30.81 | 764.01 | 507.42 |
| MEAN | 1.12 | 2.01 | .34 | .099 | .10 | .033 | 12.0 | 6.59 | 23.0 | .99 | 24.6 | 16.9 |
| MAX | 25 | 22 | .74 | 1.1 | .90 | .70 | 41 | 32 | 43 | 22 | 49 | 57 |
| MIN | .22 | 0 | 0 | 0 | 0 | 0 | .22 | .22 | .33 | .12 | .22 | .22 |
| AC-FT | 69 | 120 | 21 | 6.1 | 5.5 | 2.0 | 715 | 405 | 1,370 | 61 | 1,520 | 1,010 |

CAL YR 1968: TOTAL 4,989.21 MEAN 13.6 MAX 46 MIN 0 AC-FT 9,900
WTR YR 1969: TOTAL 2,669.78 MEAN 7.31 MAX 57 MIN 0 AC-FT 5,300

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

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

DRAINAGE AREA.--6.6 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 5,880 cfs Nov. 29 (gage height, 9.83 ft), from rating curve extended as explained below; minimum, 1.6 cfs Nov. 12.
Period of record: Maximum discharge, 13,200 cfs Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 2,300 cfs on basis of slope-area measurement at gage height 10.65 ft; minimum, 0.23 cfs June 5, 1968.

REMARKS.--Records fair. Since 1925, Hanalei tunnel (see sta 16-1000) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see stas 16-0610 and 16-0620) divert water above station for power development and irrigation in vicinity of Lihue.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 935 | 24 | 644 | 135 | 1,180 | 48 | 199 | 17 | 4.0 | 75 | 66 | 83 |
| 2 | 164 | 26 | 303 | 65 | 463 | 54 | 152 | 19 | 3.6 | 70 | 42 | 61 |
| 3 | 74 | 24 | 307 | 35 | 195 | 208 | 72 | 5.2 | 3.3 | 86 | 24 | 54 |
| 4 | 179 | 24 | 154 | 32 | 101 | 97 | 52 | 4.3 | 3.2 | 108 | 19 | 34 |
| 5 | 59 | 22 | 90 | 73 | 124 | 72 | 62 | 126 | 3.0 | 67 | 14 | 19 |
| 6 | 45 | 21 | 58 | 59 | 112 | 61 | 50 | 61 | 2.5 | 59 | 12 | 13 |
| 7 | 41 | 20 | 44 | 53 | 52 | 41 | 48 | 37 | 2.4 | 109 | 12 | 8.9 |
| 8 | 36 | 20 | 296 | 33 | 38 | 53 | 36 | 28 | 2.0 | 99 | 24 | 8.9 |
| 9 | 35 | 19 | 64 | 30 | 34 | 45 | 45 | 57 | 6.5 | 79 | 18 | 8.0 |
| 10 | 35 | 19 | 43 | 27 | 73 | 36 | 52 | 206 | 9.7 | 110 | 16 | 8.0 |
| 11 | 33 | 12 | 36 | 24 | 60 | 31 | 46 | 302 | 6.4 | 139 | 129 | 123 |
| 12 | 31 | 46 | 109 | 23 | 30 | 28 | 44 | 170 | 17 | 120 | 66 | 33 |
| 13 | 31 | 89 | 112 | 25 | 28 | 28 | 34 | 90 | 26 | 93 | 73 | 9.8 |
| 14 | 29 | 105 | 337 | 23 | 30 | 27 | 51 | 66 | 15 | 79 | 74 | 22 |
| 15 | 30 | 28 | 296 | 22 | 98 | 28 | 35 | 55 | 4.1 | 151 | 39 | 148 |
| 16 | 169 | 40 | 125 | 22 | 97 | 84 | 28 | 40 | 4.3 | 123 | 49 | 47 |
| 17 | 344 | 26 | 79 | 21 | 61 | 117 | 19 | 37 | 4.0 | 88 | 34 | 98 |
| 18 | 123 | 24 | 295 | 21 | 386 | 63 | 14 | 39 | 4.5 | 86 | 22 | 224 |
| 19 | 73 | 24 | 64 | 21 | 851 | 38 | 5.8 | 35 | 5.2 | 325 | 33 | 126 |
| 20 | 48 | 25 | 44 | 21 | 293 | 35 | 26 | 32 | 5.0 | 233 | 25 | 157 |
| 21 | 37 | 23 | 43 | 20 | 216 | 31 | 5.6 | 31 | 4.5 | 125 | 48 | 250 |
| 22 | 34 | 23 | 38 | 20 | 151 | 31 | 5.2 | 30 | 19 | 112 | 58 | 210 |
| 23 | 31 | 63 | 46 | 19 | 92 | 63 | 3.2 | 28 | 6.3 | 93 | 53 | 120 |
| 24 | 31 | 31 | 551 | 19 | 146 | 126 | 3.2 | 36 | 42 | 103 | 57 | 129 |
| 25 | 29 | 23 | 282 | 18 | 97 | 64 | 3.0 | 28 | 22 | 163 | 29 | 110 |
| 26 | 28 | 23 | 74 | 18 | 72 | 46 | 2.9 | 25 | 63 | 99 | 20 | 105 |
| 27 | 27 | 21 | 50 | 18 | 59 | 41 | 2.8 | 29 | 41 | 83 | 30 | 97 |
| 28 | 26 | 458 | 41 | 17 | 45 | 34 | 26 | 14 | 37 | 74 | 16 | 108 |
| 29 | 26 | 975 | 36 | 83 | ------ | 63 | 3.7 | 4.6 | 27 | 68 | 36 | 86 |
| 30 | 26 | 1,130 | 32 | 363 | ------ | 52 | 74 | 4.0 | 50 | 66 | 57 | 117 |
| 31 | 26 | ------ | 30 | 1,030 | ------ | 597 | ------ | 3.8 | ------ | 95 | 93 | ------ |
| TOTAL | 2,835 | 3,408 | 4,723 | 2,390 | 5,184 | 2,342 | 1,200.4 | 1,659.9 | 443.5 | 3,380 | 1,288 | 2,617.6 |
| MEAN | 91.5 | 114 | 152 | 77.1 | 185 | 75.5 | 40.0 | 53.5 | 14.8 | 109 | 41.5 | 87.3 |
| MAX | 935 | 1,130 | 644 | 1,030 | 1,180 | 597 | 199 | 302 | 63 | 325 | 129 | 250 |
| MIN | 26 | 12 | 30 | 17 | 28 | 27 | 2.8 | 3.8 | 2.0 | 59 | 12 | 8.0 |
| AC-FT | 5,620 | 6,760 | 9,370 | 4,740 | 10,280 | 4,650 | 2,380 | 3,290 | 880 | 6,700 | 2,550 | 5,190 |

CAL YR 1968: TOTAL 24,410.40 MEAN 66.7 MAX 1,130 MIN .29 AC-FT 48,420
WTR YR 1969: TOTAL 31,471.4 MEAN 86.2 MAX 1,180 MIN 2.0 AC-FT 62,420

PEAK DISCHARGE (BASE, 2,500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-1 | 1700 | 8.17 | 3,620 | 12-8 | 1200 | 7.09 | 2,510 |
| 10-17 | 0900 | 8.42 | 3,930 | 1-31 | 1530 | 8.05 | 3,480 |
| 11-29 | 1830 | 9.83 | 5,880 | 3-31 | 1430 | 7.85 | 3,270 |

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

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

DRAINAGE AREA.--6.2 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 5,430 cfs Dec. 1 (gage height, 8.62 ft); minimum, 8.5 cfs June 21. Period of record: Maximum discharge, 18,400 cfs Nov. 12, 1955 (gage height, 14.7 ft, from floodmarks), from rating curve extended above 2,700 cfs; minimum, 6.8 cfs July 3, 13, 1926.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 753 | 12 | 1,170 | 46 | 445 | 30 | 137 | 18 | 14 | 34 | 22 | 22 |
| 2 | 153 | 12 | 266 | 47 | 322 | 30 | 128 | 28 | 12 | 24 | 24 | 18 |
| 3 | 61 | 12 | 232 | 31 | 165 | 82 | 58 | 17 | 12 | 26 | 25 | 15 |
| 4 | 48 | 11 | 154 | 28 | 78 | 45 | 46 | 15 | 12 | 33 | 22 | 16 |
| 5 | 34 | 10 | 89 | 105 | 56 | 34 | 46 | 27 | 11 | 22 | 18 | 19 |
| 6 | 27 | 9.9 | 62 | 62 | 58 | 30 | 36 | 19 | 10 | 19 | 17 | 16 |
| 7 | 24 | 9.4 | 52 | 60 | 42 | 27 | 38 | 15 | 10 | 42 | 17 | 14 |
| 8 | 22 | 9.4 | 268 | 36 | 35 | 24 | 31 | 17 | 9.9 | 44 | 16 | 14 |
| 9 | 22 | 9.0 | 86 | 32 | 31 | 24 | 30 | 45 | 11 | 28 | 16 | 12 |
| 10 | 20 | 9.4 | 57 | 27 | 34 | 23 | 35 | 170 | 23 | 36 | 17 | 12 |
| 11 | 18 | 13 | 47 | 24 | 46 | 19 | 37 | 163 | 15 | 47 | 41 | 42 |
| 12 | 16 | 9.4 | 75 | 21 | 27 | 17 | 35 | 163 | 11 | 38 | 20 | 14 |
| 13 | 15 | 59 | 152 | 20 | 24 | 17 | 25 | 81 | 9.9 | 28 | 17 | 13 |
| 14 | 14 | 130 | 190 | 17 | 27 | 16 | 27 | 88 | 9.9 | 25 | 21 | 14 |
| 15 | 13 | 22 | 229 | 17 | 116 | 15 | 22 | 53 | 9.0 | 60 | 17 | 61 |
| 16 | 71 | 20 | 126 | 16 | 101 | 53 | 20 | 42 | 9.9 | 46 | 26 | 19 |
| 17 | 242 | 18 | 83 | 15 | 53 | 72 | 20 | 38 | 11 | 33 | 31 | 54 |
| 18 | 65 | 15 | 142 | 14 | 53 | 42 | 26 | 34 | 9.4 | 28 | 28 | 80 |
| 19 | 47 | 17 | 73 | 15 | 165 | 24 | 20 | 30 | 9.9 | 155 | 30 | 34 |
| 20 | 36 | 15 | 58 | 13 | 98 | 19 | 39 | 27 | 11 | 90 | 29 | 39 |
| 21 | 26 | 13 | 71 | 12 | 81 | 17 | 20 | 25 | 9.0 | 47 | 29 | 136 |
| 22 | 23 | 12 | 47 | 12 | 62 | 17 | 20 | 22 | 16 | 44 | 20 | 78 |
| 23 | 20 | 45 | 45 | 11 | 48 | 26 | 17 | 20 | 10 | 33 | 17 | 40 |
| 24 | 19 | 30 | 319 | 10 | 84 | 69 | 20 | 28 | 13 | 44 | 17 | 35 |
| 25 | 17 | 20 | 217 | 9.9 | 62 | 36 | 16 | 26 | 16 | 51 | 17 | 30 |
| 26 | 16 | 20 | 83 | 9.4 | 52 | 25 | 14 | 20 | 16 | 41 | 21 | 28 |
| 27 | 15 | 15 | 64 | 9.4 | 38 | 23 | 15 | 19 | 15 | 33 | 22 | 27 |
| 28 | 14 | 429 | 53 | 9.4 | 32 | 19 | 29 | 17 | 24 | 28 | 17 | 30 |
| 29 | 14 | 1,280 | 46 | 26 | ------ | 26 | 20 | 15 | 14 | 24 | 15 | 24 |
| 30 | 14 | 1,080 | 39 | 203 | ------ | 28 | 37 | 15 | 27 | 22 | 15 | 40 |
| 31 | 14 | ------ | 35 | 371 | ------ | 373 | ------ | 14 | ------ | 28 | 29 | ------ |
| TOTAL | 1,893 | 3,366.5 | 4,630 | 1,329.1 | 2,435 | 1,302 | 1,064 | 1,311 | 390.9 | 1,253 | 673 | 996 |
| MEAN | 61.1 | 112 | 149 | 42.9 | 87.0 | 42.0 | 35.5 | 42.3 | 13.0 | 40.4 | 21.7 | 33.2 |
| MAX | 753 | 1,280 | 1,170 | 371 | 445 | 373 | 137 | 170 | 27 | 155 | 41 | 136 |
| MIN | 13 | 9.0 | 35 | 9.4 | 24 | 15 | 14 | 14 | 9.0 | 19 | 15 | 12 |
| AC-FT | 3,750 | 6,680 | 9,180 | 2,640 | 4,830 | 2,580 | 2,110 | 2,600 | 775 | 2,490 | 1,330 | 1,980 |

CAL YR 1968: TOTAL 19,648.6 MEAN 53.7 MAX 1,280 MIN 9.0 AC-FT 38,970
WTR YR 1969: TOTAL 20,643.5 MEAN 56.6 MAX 1,280 MIN 9.0 AC-FT 40,950

PEAK DISCHARGE (BASE, 1,600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-17 | 0900 | 5.54 | 1,780 | 1-30 | 2100 | 5.57 | 1,810 |
| 12- 1 | 0230 | 8.62 | 5,430 | 3-31 | 1600 | 5.96 | 2,160 |

## 16-0690. Wailua ditch near Kapaa

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

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

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

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

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from North Fork Wailua River to reservoir 2,000 ft above station and thence to fields for irrigation of sugarcane in vicinity of Kapaa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9.8 | 11 | .30 | 0 | .60 | 0 | 1.8 | 16 | 25 | 54 | 35 | 30 |
| 2 | 2.2 | 11 | .04 | 0 | .50 | 0 | 4.3 | 18 | 24 | 53 | 35 | 38 |
| 3 | 1.4 | 11 | .03 | 0 | .30 | 0 | 4.1 | 19 | 24 | 26 | 35 | 43 |
| 4 | 1.0 | 10 | .03 | 0 | .14 | 0 | 4.1 | 20 | 25 | 9.8 | 35 | 43 |
| 5 | 1.0 | 10 | 0 | 0 | .09 | 0 | 3.8 | 22 | 25 | 9.4 | 35 | 39 |
| 6 | 1.0 | 10 | 0 | 0 | .09 | 0 | 3.8 | 27 | 21 | 9.2 | 35 | 30 |
| 7 | 1.0 | 9.8 | 0 | 0 | .06 | 0 | 3.8 | 29 | 23 | 24 | 35 | 30 |
| 8 | 1.0 | 9.6 | 0 | 0 | .06 | 0 | 3.8 | 31 | 21 | 32 | 35 | 37 |
| 9 | .90 | 9.4 | 0 | 0 | .04 | 0 | 3.8 | 32 | 21 | 34 | 35 | 41 |
| 10 | .80 | 9.2 | 0 | 0 | .04 | 0 | 3.8 | 32 | 23 | 35 | 35 | 40 |
| 11 | .80 | 9.1 | 0 | 0 | .04 | 0 | 3.8 | 33 | 27 | 36 | 35 | 40 |
| 12 | .90 | 8.9 | 0 | 0 | .04 | 0 | 3.6 | 25 | 31 | 36 | 35 | 40 |
| 13 | .90 | 5.0 | 0 | 0 | 0 | 0 | 3.4 | 11 | 35 | 35 | 35 | 40 |
| 14 | .80 | .09 | 0 | 0 | 0 | 0 | 6.0 | 11 | 37 | 35 | 35 | 39 |
| 15 | .70 | .04 | 0 | 0 | 0 | 0 | 10 | 7.0 | 37 | 29 | 35 | 38 |
| 16 | .70 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 34 | 18 | 35 | 39 |
| 17 | .70 | 0 | 0 | 0 | 0 | 1.1 | 13 | 0 | 33 | 18 | 35 | 39 |
| 18 | .80 | 0 | 0 | 0 | 0 | 5.7 | 16 | 0 | 34 | 18 | 35 | 39 |
| 19 | .80 | .85 | 0 | 0 | 0 | 8.0 | 17 | 0 | 34 | 19 | 35 | 33 |
| 20 | .80 | 1.9 | 0 | 0 | 0 | 14 | 17 | 6.1 | 34 | 19 | 35 | 27 |
| 21 | .90 | 4.8 | 0 | 0 | 0 | 17 | 16 | 20 | 35 | 28 | 35 | 27 |
| 22 | .90 | 11 | 0 | 0 | 0 | 20 | 8.9 | 26 | 35 | 34 | 35 | 27 |
| 23 | .82 | 11 | 0 | 0 | 0 | 21 | 4.6 | 29 | 35 | 35 | 35 | 34 |
| 24 | .80 | 11 | 0 | 0 | 0 | 23 | 4.8 | 30 | 35 | 35 | 35 | 38 |
| 25 | 4.8 | 10 | 0 | 0 | 0 | 23 | 4.8 | 33 | 39 | 35 | 40 | 37 |
| 26 | 8.0 | 9.1 | 0 | 0 | 0 | 22 | 4.6 | 33 | 41 | 35 | 43 | 22 |
| 27 | 7.8 | 7.3 | 0 | .78 | 0 | 21 | 4.6 | 30 | 46 | 35 | 43 | 16 |
| 28 | 7.4 | 7.4 | 0 | 3.8 | 0 | 21 | 4.6 | 28 | 51 | 35 | 35 | 16 |
| 29 | 8.2 | 9.1 | 0 | 3.8 | ------ | 20 | 8.2 | 27 | 50 | 35 | 31 | 28 |
| 30 | 9.1 | 5.2 | 0 | 3.1 | ------ | 19 | 14 | 27 | 48 | 35 | 31 | 35 |
| 31 | 10 | ------ | 0 | .80 | ------ | 14 | ------ | 26 | ------ | 35 | 30 | ------ |
| TOTAL | 86.72 | 212.78 | .40 | 12.28 | 2.00 | 249.8 | 214.0 | 648.1 | 983 | 926.4 | 1,093 | 1,025 |
| MEAN | 2.80 | 7.09 | .013 | .40 | .071 | 8.06 | 7.13 | 20.9 | 32.8 | 29.9 | 35.3 | 34.2 |
| MAX | 10 | 11 | .30 | 3.8 | .60 | 23 | 17 | 33 | 51 | 54 | 43 | 43 |
| MIN | .70 | 0 | 0 | 0 | 0 | 0 | 1.8 | 0 | 21 | 9.2 | 30 | 16 |
| AC-FT | 172 | 422 | .8 | 24 | 4.0 | 495 | 424 | 1,290 | 1,950 | 1,840 | 2,170 | 2,030 |

CAL YR 1968: TOTAL 3,113.02 MEAN 8.51 MAX 26 MIN 0 AC-FT 6,170
WTR YR 1969: TOTAL 5,453.48 MEAN 14.9 MAX 54 MIN 0 AC-FT 10,820

NOTE.--No gage-height record July 24 to Aug. 28.

## 16-0700. Aahoaka ditch near Kapaa

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.7 | 0 | .60 | 0 | | | | | | 0 | 5.0 | 4.6 |
| 2 | 1.4 | 0 | .10 | 0 | | | | | | 0 | 4.6 | 4.4 |
| 3 | .61 | 0 | 0 | 0 | | | | | | 0 | 3.7 | 4.0 |
| 4 | 0 | 0 | 0 | 0 | | | | | | 0 | 2.5 | 3.5 |
| 5 | 0 | 0 | 0 | 0 | | | | | | 0 | .89 | 1.7 |
| 6 | 0 | 0 | 0 | 0 | | | | | | 0 | .89 | 1.8 |
| 7 | 0 | 0 | 0 | 0 | | | | | | 0 | .89 | .64 |
| 8 | 0 | 0 | 0 | 0 | | | | | | .16 | .89 | .56 |
| 9 | 0 | 0 | 0 | 0 | | | | | | .27 | 1.6 | .64 |
| 10 | 0 | 0 | 0 | 0 | | | | | | .55 | 1.1 | .74 |
| 11 | 0 | 0 | 0 | 0 | | | | | | 3.2 | 4.1 | 4.6 |
| 12 | 0 | 0 | 0 | 0 | | | | | | 3.2 | 4.8 | 3.3 |
| 13 | 0 | 0 | 0 | 0 | | | | | | 3.0 | 4.7 | .96 |
| 14 | 0 | 0 | 0 | 0 | | | | | | 2.8 | 5.1 | 1.2 |
| 15 | 0 | 0 | 0 | 0 | | | | | | 3.3 | 3.6 | 5.2 |
| 16 | 0 | 0 | 0 | 0 | | | | | | 3.5 | 4.1 | 4.4 |
| 17 | 0 | 0 | 0 | 0 | | | | | | 3.4 | 4.0 | 2.8 |
| 18 | 0 | 0 | 0 | 0 | | | | | | 3.3 | 3.8 | 5.4 |
| 19 | 0 | 0 | 0 | 0 | | | | | | 4.0 | 2.7 | 5.2 |
| 20 | 0 | 0 | 0 | 0 | | | | | | 4.0 | 4.0 | 5.2 |
| 21 | 0 | 0 | 0 | 0 | | | | | | 3.8 | 4.0 | 5.3 |
| 22 | 0 | 0 | 0 | 0 | | | | | | 3.8 | 4.6 | 5.3 |
| 23 | 0 | 0 | 0 | 0 | | | | | | 3.7 | 4.3 | 5.2 |
| 24 | 0 | 0 | 0 | 0 | | | | | | 3.8 | 4.4 | 5.0 |
| 25 | 0 | 0 | 0 | 0 | | | | | | 4.0 | 3.4 | 5.0 |
| 26 | 0 | 0 | 0 | 0 | | | | | | 3.9 | 1.6 | 5.0 |
| 27 | 0 | 0 | 0 | 0 | | | | | | 3.8 | 3.1 | 4.9 |
| 28 | 0 | 0 | 0 | 0 | | | | | | 3.7 | 2.5 | 4.8 |
| 29 | 0 | .40 | 0 | 0 | ------ | | | | | 4.3 | 1.5 | 4.5 |
| 30 | 0 | .50 | 0 | .34 | ------ | | | | | 4.7 | 3.9 | 4.5 |
| 31 | 0 | ------ | 0 | 0 | ------ | | ------ | | ------ | 5.1 | 5.0 | ------ |
| TOTAL | 3.71 | .90 | .70 | .34 | 0 | 0 | 0 | 0 | 0 | 79.28 | 101.26 | 110.34 |
| MEAN | .12 | .030 | .023 | .011 | 0 | 0 | 0 | 0 | 0 | 2.56 | 3.27 | 3.68 |
| MAX | 1.7 | .50 | .60 | .34 | 0 | 0 | 0 | 0 | 0 | 5.1 | 5.1 | 5.4 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .89 | .56 |
| AC-FT | 7.4 | 1.8 | 1.4 | .7 | 0 | 0 | 0 | 0 | 0 | 157 | 201 | 219 |

CAL YR 1968: TOTAL 205.52 MEAN .56 MAX 3.8 MIN 0 AC-FT 408
WTR YR 1969: TOTAL 296.53 MEAN .81 MAX 5.4 MIN 0 AC-FT 588

## 16-0710. North Fork Wailua River near Kapaa

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

DRAINAGE AREA.--18.7 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 10,000 cfs Nov. 29 (gage height, 10.02 ft), from rating curve extended as explained below; minimum, 6.4 cfs June 18, 20-22, 24.
Period of record: Maximum discharge, 53,200 cfs Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks), from rating curve extended above 3,700 cfs on basis of slope-area measurement of peak flow; minimum, 2.12 cfs Oct. 28, 1953.

REMARKS.--Records good. Wailua and Aahoaka ditches (see stas 16-0690 and 16-0700) divert above station for irrigation of sugarcane in vicinities of Kapaa and Wailua, respectively.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,530 | 19 | 2,270 | 282 | 1,790 | 107 | 393 | 40 | 19 | 48 | 56 | 89 |
| 2 | 398 | 42 | 872 | 422 | 1,020 | 114 | 325 | 33 | 18 | 64 | 55 | 53 |
| 3 | 178 | 42 | 736 | 278 | 537 | 321 | 173 | 17 | 18 | 92 | 37 | 41 |
| 4 | 216 | 40 | 459 | 258 | 314 | 187 | 132 | 12 | 17 | 154 | 28 | 36 |
| 5 | 112 | 38 | 292 | 359 | 254 | 140 | 136 | 116 | 15 | 100 | 17 | 15 |
| 6 | 86 | 36 | 226 | 199 | 295 | 124 | 130 | 81 | 9.6 | 78 | 16 | 19 |
| 7 | 72 | 36 | 197 | 225 | 220 | 101 | 114 | 46 | 8.7 | 124 | 17 | 14 |
| 8 | 68 | 36 | 695 | 136 | 170 | 107 | 98 | 31 | 8.2 | 138 | 17 | 15 |
| 9 | 64 | 36 | 379 | 136 | 150 | 94 | 94 | 77 | 8.2 | 71 | 21 | 12 |
| 10 | 61 | 35 | 268 | 136 | 140 | 86 | 110 | 325 | 8.7 | 75 | 18 | 12 |
| 11 | 58 | 36 | 195 | 132 | 200 | 77 | 114 | 571 | 8.7 | 173 | 100 | 89 |
| 12 | 57 | 20 | 263 | 139 | 91 | 70 | 112 | 413 | 8.2 | 143 | 68 | 38 |
| 13 | 54 | 174 | 413 | 150 | 81 | 67 | 98 | 225 | 7.4 | 98 | 62 | 9.2 |
| 14 | 52 | 282 | 680 | 139 | 89 | 48 | 98 | 195 | 7.8 | 83 | 89 | 7.8 |
| 15 | 41 | 74 | 699 | 136 | 245 | 33 | 68 | 143 | 8.2 | 173 | 49 | 179 |
| 16 | 181 | 73 | 390 | 125 | 261 | 104 | 51 | 112 | 7.8 | 185 | 54 | 36 |
| 17 | 510 | 61 | 292 | 118 | 165 | 270 | 45 | 96 | 7.8 | 110 | 46 | 52 |
| 18 | 220 | 53 | 590 | 118 | 435 | 130 | 35 | 92 | 6.9 | 91 | 44 | 280 |
| 19 | 136 | 53 | 292 | 98 | 1,050 | 76 | 26 | 83 | 6.9 | 450 | 22 | 125 |
| 20 | 114 | 53 | 208 | 100 | 461 | 38 | 59 | 67 | 6.9 | 310 | 43 | 145 |
| 21 | 80 | 49 | 210 | 103 | 348 | 32 | 30 | 41 | 6.9 | 149 | 40 | 121 |
| 22 | 71 | 43 | 158 | 100 | 262 | 29 | 31 | 33 | 8.8 | 118 | 53 | 388 |
| 23 | 64 | 100 | 170 | 85 | 181 | 40 | 36 | 19 | 11 | 91 | 43 | 114 |
| 24 | 62 | 72 | 952 | 49 | 278 | 172 | 37 | 20 | 9.0 | 105 | 46 | 85 |
| 25 | 58 | 47 | 748 | 50 | 203 | 124 | 34 | 27 | 22 | 172 | 36 | 75 |
| 26 | 56 | 46 | 286 | 50 | 173 | 84 | 32 | 20 | 19 | 114 | 17 | 64 |
| 27 | 54 | 39 | 226 | 53 | 127 | 75 | 32 | 25 | 30 | 77 | 30 | 83 |
| 28 | 39 | 839 | 206 | 57 | 110 | 63 | 74 | 30 | 11 | 64 | 23 | 78 |
| 29 | 11 | 2,250 | 197 | 149 | ------ | 91 | 36 | 20 | 7.8 | 56 | 21 | 78 |
| 30 | 11 | 2,540 | 173 | 802 | ------ | 90 | 118 | 19 | 13 | 52 | 54 | 86 |
| 31 | 12 | ------ | 156 | 1,490 | ------ | 903 | ------ | 19 | ------ | 81 | 106 | ------ |
| TOTAL | 4,726 | 7,264 | 13,898 | 6,674 | 9,651 | 3,997 | 2,871 | 3,048 | 345.5 | 3,839 | 1,328 | 2,439.0 |
| MEAN | 152 | 242 | 448 | 215 | 345 | 129 | 95.7 | 98.3 | 11.5 | 124 | 42.8 | 81.3 |
| MAX | 1,530 | 2,540 | 2,270 | 1,490 | 1,790 | 903 | 393 | 571 | 30 | 450 | 106 | 388 |
| MIN | 11 | 19 | 156 | 49 | 81 | 29 | 26 | 12 | 6.9 | 48 | 16 | 7.8 |
| AC-FT | 9,370 | 14,410 | 27,570 | 13,240 | 19,140 | 7,930 | 5,690 | 6,050 | 685 | 7,610 | 2,630 | 4,840 |

CAL YR 1968: TOTAL 50,438.0 MEAN 138 MAX 2,540 MIN 4.6 AC-FT 100,000
WTR YR 1969: TOTAL 60,080.5 MEAN 165 MAX 2,540 MIN 6.9 AC-FT 119,200

PEAK DISCHARGE (BASE, 4,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-17 | 1030 | 7.33 | 4,500 | 1-30 | 1830 | 8.13 | 5,890 |
| 11-29 | 1800 | 10.02 | 10,000 | 3-31 | 1630 | 7.65 | 4,980 |

## 16-0715. Left Branch Opaekaa Stream near Kapaa

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

DRAINAGE AREA.--0.7 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 221 cfs Dec. 1 (gage height, 7.72 ft), from rating curve extended above 86 cfs; minimum, 0.14 cfs Oct. 1.
Period of record: Maximum discharge, 365 cfs Apr. 15, 1963 (gage height, 5.21 ft), from rating curve extended above 13 cfs; minimum, 0.09 cfs Sept. 27-30, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31 | .61 | 68 | 4.6 | 11 | 1.3 | 5.3 | 1.4 | 1.6 | 1.6 | 2.2 | 1.6 |
| 2 | 11 | .61 | 21 | 5.2 | 9.4 | 1.3 | 4.6 | 1.5 | 1.6 | 1.4 | 2.1 | 1.6 |
| 3 | 2.8 | .61 | 16 | 3.6 | 5.5 | 1.5 | 3.3 | 1.4 | 1.5 | 1.3 | 2.1 | 1.6 |
| 4 | 1.6 | .57 | 12 | 3.4 | 3.9 | 1.3 | 2.9 | 1.4 | 1.4 | 1.2 | 2.0 | 1.6 |
| 5 | 1.2 | .57 | 10 | 5.9 | 3.2 | 1.1 | 2.7 | 1.3 | 1.4 | 1.1 | 2.0 | 1.6 |
| 6 | 1.0 | .57 | 7.5 | 5.0 | 2.8 | 1.1 | 2.5 | 1.2 | 1.4 | 1.1 | 1.9 | 1.6 |
| 7 | .87 | .57 | 6.9 | 5.0 | 2.4 | 1.1 | 2.3 | 1.2 | 1.4 | 1.2 | 1.9 | 1.5 |
| 8 | .83 | .57 | 16 | 3.9 | 2.1 | 1.0 | 2.2 | 1.2 | 1.4 | 2.0 | 1.8 | 1.6 |
| 9 | .78 | .57 | 10 | 3.7 | 1.8 | .94 | 2.2 | 1.4 | 1.4 | 1.5 | 1.8 | 1.5 |
| 10 | .74 | .57 | 7.8 | 3.3 | 1.9 | .94 | 2.1 | 2.8 | 1.6 | 1.4 | 1.8 | 1.4 |
| 11 | .66 | .61 | 6.7 | 3.0 | 2.0 | .94 | 2.1 | 7.5 | 1.4 | 1.5 | 2.1 | 1.8 |
| 12 | .66 | .57 | 6.9 | 2.6 | 1.6 | .83 | 2.1 | 8.6 | 1.4 | 1.4 | 1.9 | 1.5 |
| 13 | .61 | 1.6 | 6.7 | 2.4 | 1.5 | .83 | 2.0 | 5.3 | 1.4 | 1.4 | 1.7 | 1.4 |
| 14 | .57 | 11 | 5.9 | 2.3 | 1.4 | .83 | 2.0 | 4.2 | 1.4 | 1.4 | 1.7 | 1.4 |
| 15 | .57 | 1.4 | 8.1 | 2.0 | 1.7 | .83 | 1.8 | 3.5 | 1.3 | 1.9 | 1.6 | 1.8 |
| 16 | 2.3 | 1.0 | 7.3 | 1.9 | 1.7 | .87 | 1.8 | 3.0 | 1.3 | 1.7 | 1.7 | 1.5 |
| 17 | 5.2 | .94 | 7.0 | 1.8 | 1.5 | 1.5 | 1.8 | 2.8 | 1.3 | 1.6 | 1.6 | 1.7 |
| 18 | 1.8 | .87 | 13 | 1.7 | 1.4 | 1.1 | 1.8 | 2.5 | 1.2 | 1.6 | 1.6 | 2.2 |
| 19 | 1.1 | .83 | 8.6 | 1.6 | 1.5 | .87 | 1.7 | 2.3 | 1.2 | 6.1 | 1.6 | 1.7 |
| 20 | .94 | .87 | 7.1 | 1.6 | 1.4 | .83 | 1.7 | 2.2 | 1.1 | 4.1 | 1.6 | 1.7 |
| 21 | .87 | .78 | 6.4 | 1.6 | 1.5 | .83 | 1.7 | 2.1 | 1.1 | 2.8 | 1.7 | 2.2 |
| 22 | .83 | .74 | 5.5 | 1.5 | 1.5 | .83 | 1.8 | 2.0 | 1.2 | 2.5 | 1.6 | 5.0 |
| 23 | .78 | .94 | 5.0 | 1.5 | 1.4 | .87 | 1.6 | 1.9 | 1.1 | 2.3 | 1.6 | 2.5 |
| 24 | .74 | 1.1 | 8.9 | 1.4 | 1.7 | 1.4 | 1.6 | 1.9 | 1.3 | 2.6 | 1.6 | 2.2 |
| 25 | .70 | .94 | 13 | 1.4 | 1.6 | 1.4 | 1.5 | 1.9 | 1.2 | 2.3 | 1.6 | 2.2 |
| 26 | .70 | .94 | 7.4 | 1.3 | 1.6 | 1.1 | 1.5 | 1.8 | 1.2 | 3.3 | 1.6 | 2.1 |
| 27 | .70 | .83 | 6.4 | 1.2 | 1.4 | .94 | 1.5 | 1.8 | 1.3 | 2.9 | 1.7 | 2.1 |
| 28 | .66 | 9.2 | 5.7 | 1.2 | 1.3 | .87 | 1.5 | 1.7 | 1.3 | 2.4 | 1.6 | 2.1 |
| 29 | .66 | 44 | 5.0 | 1.4 | ------ | .87 | 1.4 | 1.7 | 1.2 | 2.3 | 1.6 | 2.0 |
| 30 | .66 | 37 | 4.4 | 5.5 | ------ | .87 | 1.8 | 1.6 | 1.3 | 2.2 | 1.6 | 2.1 |
| 31 | .66 | ------ | 4.1 | 6.9 | ------ | 9.2 | ------ | 1.6 | ------ | 2.4 | 1.6 | ------ |
| TOTAL | 74.19 | 121.98 | 324.3 | 89.4 | 71.7 | 40.19 | 64.8 | 76.7 | 39.9 | 64.5 | 54.5 | 56.8 |
| MEAN | 2.39 | 4.07 | 10.5 | 2.88 | 2.56 | 1.30 | 2.16 | 2.47 | 1.33 | 2.08 | 1.76 | 1.89 |
| MAX | 31 | 44 | 68 | 6.9 | 11 | 9.2 | 5.3 | 8.6 | 1.6 | 6.1 | 2.2 | 5.0 |
| MIN | .57 | .57 | 4.1 | 1.2 | 1.3 | .83 | 1.4 | 1.2 | 1.1 | 1.1 | 1.6 | 1.4 |
| AC-FT | 147 | 242 | 643 | 177 | 142 | 80 | 129 | 152 | 79 | 128 | 108 | 113 |

CAL YR 1968: TOTAL 914.20 MEAN 2.50 MAX 68 MIN .09 AC-FT 1,810
WTR YR 1969: TOTAL 1,078.96 MEAN 2.96 MAX 68 MIN .57 AC-FT 2,140

PEAK DISCHARGE (BASE, 140 CFS).--Dec. 1 (0430) 221 cfs (7.72 ft).

## 16-0770. Makaleha ditch near Kealia

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | .06 | 26 | .14 | 1.3 | .09 | 1.7 | 7.9 | 9.4 | 17 | 12 | 15 |
| 2 | 4.9 | .06 | 11 | .21 | 1.8 | .09 | 1.1 | 10 | 9.0 | 15 | 13 | 14 |
| 3 | 1.4 | .06 | 7.3 | .11 | 1.1 | .09 | .81 | 8.0 | 9.0 | 16 | 12 | 12 |
| 4 | .69 | .06 | 4.1 | .09 | .47 | .09 | .42 | 7.0 | 9.0 | 16 | 11 | 13 |
| 5 | .38 | 2.3 | 1.8 | .82 | .24 | .09 | .38 | 8.3 | 8.7 | 14 | 10 | 15 |
| 6 | .24 | 6.6 | .87 | 1.2 | .17 | .09 | .24 | 6.9 | 8.7 | 13 | 10 | 14 |
| 7 | .17 | 6.4 | .47 | .99 | .11 | .09 | .17 | 6.1 | 8.7 | 17 | 11 | 12 |
| 8 | .14 | 6.2 | 4.7 | .58 | .09 | .06 | .11 | 7.0 | 8.7 | 4.0 | 10 | 11 |
| 9 | .14 | 6.1 | 3.0 | .38 | .06 | .06 | .09 | 14 | 8.9 | 3.6 | 4.9 | 10 |
| 10 | .11 | 7.3 | 1.3 | .24 | .06 | .04 | .09 | 20 | 21 | 19 | 4.8 | 10 |
| 11 | .09 | 7.6 | .69 | .17 | .06 | .04 | .06 | 22 | 17 | 21 | 11 | 16 |
| 12 | .09 | .14 | .58 | .11 | .04 | .02 | .06 | 12 | 11 | 18 | 12 | 12 |
| 13 | .09 | .21 | .52 | .09 | .04 | 0 | .06 | 2.4 | 10 | 16 | 12 | 11 |
| 14 | 2.5 | 1.3 | .38 | .06 | .04 | 0 | 6.8 | 2.4 | 10 | 14 | 13 | 12 |
| 15 | 6.8 | .38 | .42 | .04 | .28 | 0 | 12 | 1.9 | 9.4 | 16 | 11 | 17 |
| 16 | 5.1 | .24 | .42 | .04 | .81 | 0 | 10 | .99 | 11 | 1.2 | 16 | 13 |
| 17 | 5.8 | .14 | .69 | .02 | .47 | .09 | 12 | .58 | 15 | 3.5 | 17 | 16 |
| 18 | 2.6 | .09 | 2.4 | .02 | .28 | .06 | 14 | .33 | 11 | 14 | 16 | 17 |
| 19 | 1.2 | .04 | 1.8 | .02 | .21 | .06 | 11 | .14 | 12 | 22 | 16 | 15 |
| 20 | .58 | .04 | .81 | 0 | .17 | .02 | 14 | 3.4 | 14 | 21 | 16 | 15 |
| 21 | .38 | .04 | .47 | 0 | .17 | 0 | 7.6 | 6.9 | 10 | 13 | 15 | 16 |
| 22 | .24 | .02 | .24 | 0 | .14 | .01 | 2.8 | 5.7 | 15 | .87 | 11 | 19 |
| 23 | .21 | .06 | .14 | 0 | .11 | 0 | 9.0 | 8.4 | 11 | 2.3 | 10 | 14 |
| 24 | .21 | .06 | .69 | 0 | .14 | 8.9 | 9.1 | 15 | 12 | 14 | 11 | 13 |
| 25 | .17 | .06 | 3.6 | 0 | .17 | 24 | 8.7 | 17 | 13 | 16 | 12 | 12 |
| 26 | .14 | .04 | 1.5 | 0 | .17 | 13 | 7.1 | 11 | 14 | 18 | 12 | 14 |
| 27 | .11 | 0 | 1.3 | 0 | .14 | .47 | 6.3 | 16 | 13 | 2.1 | 12 | 14 |
| 28 | .11 | .99 | .42 | 0 | .11 | .24 | 15 | 11 | 17 | 1.3 | 12 | 15 |
| 29 | .09 | 16 | .24 | 0 | ------ | .28 | 11 | 10 | 12 | 2.7 | 12 | 14 |
| 30 | .09 | 20 | .17 | .04 | ------ | .21 | 13 | 9.7 | 17 | 11 | 13 | 18 |
| 31 | .09 | ------ | .11 | .11 | ------ | 2.0 | ------ | 9.6 | ------ | 14 | 17 | ------ |
| TOTAL | 52.86 | 82.59 | 78.13 | 5.48 | 8.95 | 50.19 | 174.69 | 261.64 | 355.5 | 376.57 | 375.7 | 419 |
| MEAN | 1.71 | 2.75 | 2.52 | .18 | .32 | 1.62 | 5.82 | 8.43 | 11.8 | 12.1 | 12.1 | 14.0 |
| MAX | 18 | 20 | 26 | 1.2 | 1.8 | 24 | 15 | 22 | 21 | 22 | 17 | 19 |
| MIN | .09 | 0 | .11 | 0 | .04 | 0 | .06 | .14 | 8.7 | .87 | 4.8 | 10 |
| AC-FT | 105 | 164 | 155 | 11 | 18 | 100 | 346 | 519 | 705 | 747 | 745 | 831 |

CAL YR 1968: TOTAL 2,145.15 MEAN 5.86 MAX 26 MIN 0 AC-FT 4,250
WTR YR 1969: TOTAL 2,241.30 MEAN 6.14 MAX 26 MIN 0 AC-FT 4,450

## 16-0790. Kapahi ditch near Kealia

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

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15 | 12 | 4.5 | .45 | .65 | .01 | 3.6 | 8.6 | 4.9 | 16 | 4.6 | 7.3 |
| 2 | .45 | 11 | .75 | .31 | .47 | .01 | 11 | 12 | 4.7 | 10 | .19 | 6.8 |
| 3 | .38 | 13 | .58 | .25 | .03 | .05 | 13 | 9.2 | 4.6 | 12 | .10 | 5.4 |
| 4 | .31 | 3.9 | .38 | .31 | .03 | .03 | .19 | 8.4 | 4.6 | 5.1 | 1.9 | 5.2 |
| 5 | .25 | .31 | .25 | .59 | .03 | .26 | .10 | 8.5 | 4.4 | 3.3 | 5.2 | 7.3 |
| 6 | .25 | .25 | .25 | .19 | .01 | .38 | .06 | 7.6 | 4.2 | 3.3 | 4.9 | 5.0 |
| 7 | .28 | .25 | .25 | .25 | .01 | .25 | .03 | 7.4 | 4.2 | 5.9 | 4.9 | 4.7 |
| 8 | .19 | .88 | .79 | .19 | 0 | .25 | 3.3 | 7.6 | 4.2 | 15 | 6.4 | 4.6 |
| 9 | .19 | 1.3 | .31 | .10 | 0 | .25 | 23 | 22 | 4.4 | 21 | 11 | 4.4 |
| 10 | .19 | .90 | .25 | .10 | .01 | .25 | 18 | 37 | 26 | 15 | 12 | 4.4 |
| 11 | .58 | 1.5 | .14 | .06 | .01 | .25 | 17 | 11 | 11 | 8.9 | 19 | 25 |
| 12 | 1.4 | .45 | .19 | .10 | 0 | .19 | 16 | .58 | 5.7 | 2.0 | 6.2 | 5.2 |
| 13 | 1.1 | .45 | .19 | .06 | 0 | .34 | 11 | .25 | 4.9 | 1.9 | 5.2 | 4.6 |
| 14 | .58 | .62 | .14 | .06 | 0 | 5.2 | 10 | .25 | 4.7 | 6.0 | 8.0 | 7.1 |
| 15 | .25 | .14 | .19 | .03 | .21 | 11 | 9.2 | .19 | 4.4 | 18 | 5.3 | 27 |
| 16 | .31 | .14 | .19 | .03 | .01 | .19 | 7.4 | .14 | 5.2 | 23 | 12 | 6.1 |
| 17 | .82 | .14 | .19 | .03 | 0 | .15 | 8.6 | .14 | 8.4 | 19 | 18 | 9.3 |
| 18 | .31 | .14 | .31 | .03 | .03 | 1.2 | 11 | .10 | 5.2 | 10 | 13 | 12 |
| 19 | .25 | .14 | .25 | .03 | .03 | 6.7 | 7.6 | 3.8 | 5.8 | 13 | 14 | 7.5 |
| 20 | .19 | .14 | .25 | .03 | .03 | 8.0 | 11 | 14 | 7.4 | 7.4 | 16 | 2.4 |
| 21 | .19 | .14 | .19 | .03 | .03 | 8.0 | 10 | 9.4 | 4.9 | 14 | 17 | 3.1 |
| 22 | .19 | .14 | .19 | .03 | .01 | 6.1 | 15 | 9.8 | 12 | 21 | 8.0 | 7.9 |
| 23 | .45 | .25 | .19 | .14 | .01 | 8.2 | 7.0 | 6.6 | 5.7 | 17 | 6.1 | 8.0 |
| 24 | .45 | .19 | .19 | .03 | .03 | 2.2 | 6.6 | 9.5 | 6.0 | 12 | 6.6 | 6.6 |
| 25 | .90 | .31 | .45 | .03 | .01 | .25 | 6.2 | 12 | 7.1 | 11 | 7.1 | 5.9 |
| 26 | .82 | .58 | .25 | .03 | .01 | .14 | 6.3 | 6.2 | 8.8 | .34 | 9.7 | 5.7 |
| 27 | .31 | .58 | .25 | .14 | .01 | .14 | 9.4 | 8.0 | 7.0 | .10 | 9.6 | 6.6 |
| 28 | 2.0 | 1.4 | .19 | .01 | .01 | .14 | 16 | 6.1 | 12 | .06 | 7.8 | 6.8 |
| 29 | 4.9 | 6.1 | .19 | .10 | ------ | .14 | 11 | 5.6 | 6.4 | 5.1 | 5.0 | 6.6 |
| 30 | 12 | 1.3 | .19 | .36 | ------ | .10 | 18 | 5.2 | 13 | 6.6 | 5.0 | 7.0 |
| 31 | 12 | ------ | .68 | .27 | ------ | 2.5 | ------ | 5.0 | ------ | 8.7 | 11 | ------ |
| TOTAL | 57.46 | 58.64 | 13.31 | 4.36 | 1.68 | 62.87 | 286.58 | 242.15 | 211.8 | 311.70 | 260.79 | 225.5 |
| MEAN | 1.85 | 1.95 | .43 | .14 | .060 | 2.03 | 9.55 | 7.81 | 7.06 | 10.1 | 8.41 | 7.52 |
| MAX | 15 | 13 | 4.5 | .58 | .65 | 11 | 23 | 37 | 26 | 23 | 19 | 27 |
| MIN | .19 | .14 | .14 | .03 | 0 | .01 | .03 | .10 | 4.2 | .06 | .10 | 2.4 |
| AC-FT | 114 | 116 | 26 | 8.6 | 3.3 | 125 | 568 | 480 | 420 | 618 | 517 | 447 |

CAL YR 1968: TOTAL 992.70 MEAN 2.71 MAX 29 MIN .03 AC-FT 1,970
WTR YR 1969: TOTAL 1,736.84 MEAN 4.76 MAX 37 MIN 0 AC-FT 3,450

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

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

DRAINAGE AREA.--3.3 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 5,590 cfs Nov. 29 (gage height, 4.71 ft); no flow for many days. Period of record: Maximum discharge, 7,670 cfs Jan. 25, 1956 (gage height, 5.41 ft, present datum), from rating curve extended above 2,800 cfs; no flow at times.

REMARKS.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see sta 16-0790).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 454 | 0 | 802 | 26 | 264 | 18 | 68 | 0 | | 0 | 2.3 | 0 |
| 2 | 72 | 0 | 85 | 32 | 177 | 21 | 94 | 0 | | 0 | 6.9 | 0 |
| 3 | 31 | 0 | 128 | 20 | 61 | 38 | 24 | 0 | | .35 | 7.6 | 0 |
| 4 | 24 | 11 | 72 | 17 | 34 | 24 | 28 | 0 | | 6.5 | 4.1 | 0 |
| 5 | 21 | 12 | 34 | 94 | 27 | 21 | 45 | 0 | | 5.1 | 0 | 0 |
| 6 | 19 | 5.6 | 27 | 68 | 31 | 21 | 30 | 0 | | 3.0 | 0 | 0 |
| 7 | 18 | 5.6 | 21 | 48 | 24 | 19 | 30 | 0 | | 33 | 0 | 0 |
| 8 | 17 | 5.1 | 209 | 25 | 21 | 18 | 19 | 0 | | 24 | 0 | 0 |
| 9 | 18 | 4.0 | 44 | 27 | 20 | 17 | .51 | 14 | | 3.4 | .01 | 0 |
| 10 | 17 | 5.1 | 27 | 23 | 44 | 17 | 8.7 | 119 | | 9.2 | 0 | 0 |
| 11 | 16 | 6.9 | 23 | 19 | 57 | 16 | 9.9 | 142 | | 12 | 4.1 | 2.8 |
| 12 | 13 | 14 | 70 | 18 | 24 | 14 | 17 | 117 | | 16 | 0 | 0 |
| 13 | 13 | 52 | 84 | 17 | 27 | 14 | 11 | 57 | | 9.9 | 0 | 0 |
| 14 | 9.9 | 131 | 83 | 17 | 34 | 9.8 | 5.3 | 91 | | 2.7 | 0 | 0 |
| 15 | 5.6 | 24 | 93 | 16 | 124 | 8.2 | .01 | 48 | | 20 | 0 | 22 |
| 16 | 40 | 25 | 49 | 17 | 66 | 58 | 0 | 31 | | 12 | 0 | 0 |
| 17 | 202 | 24 | 34 | 16 | 37 | 114 | 0 | 31 | | 2.0 | .09 | 7.0 |
| 18 | 55 | 19 | 126 | 16 | 31 | 48 | 0 | 24 | | 0 | 0 | 30 |
| 19 | 37 | 28 | 40 | 20 | 64 | 18 | 0 | 17 | | 98 | 0 | 7.2 |
| 20 | 28 | 20 | 27 | 16 | 42 | 11 | .88 | 0 | | 36 | .26 | 12 |
| 21 | 21 | 18 | 37 | 16 | 47 | 9.1 | 0 | 0 | | 4.2 | .01 | 7.6 |
| 22 | 19 | 17 | 23 | 14 | 34 | 9.1 | .86 | 0 | | 5.6 | 0 | 82 |
| 23 | 17 | 64 | 21 | 14 | 25 | 35 | 0 | 0 | | .37 | 0 | 0 |
| 24 | 17 | 32 | 142 | 13 | 63 | 119 | 0 | 0 | | 4.1 | 0 | 0 |
| 25 | 14 | 28 | 124 | 13 | 40 | 50 | 0 | 3.3 | | 5.2 | 0 | 0 |
| 26 | 14 | 25 | 34 | 13 | 31 | 21 | 0 | 0 | | 43 | 0 | 0 |
| 27 | 14 | 20 | 25 | 12 | 23 | 31 | 0 | 0 | | 31 | 0 | 0 |
| 28 | 13 | 295 | 21 | 13 | 19 | 24 | 4.6 | 0 | | 23 | 0 | 1.6 |
| 29 | 8.7 | 1,240 | 19 | 27 | ------ | 36 | 0 | 0 | | 9.9 | 0 | .07 |
| 30 | 0 | 758 | 18 | 103 | ------ | 31 | 0 | 0 | | 0 | 0 | 9.1 |
| 31 | 0 | ------ | 16 | 127 | ------ | 269 | ------ | 0 | ------ | 1.4 | 0 | ------ |
| TOTAL | 1,248.2 | 2,889.3 | 2,558 | 917 | 1,491 | 1,159.2 | 396.76 | 694.3 | 0 | 420.92 | 25.37 | 181.37 |
| MEAN | 40.3 | 96.3 | 82.5 | 29.6 | 53.2 | 37.4 | 13.2 | 22.4 | 0 | 13.6 | .82 | 6.05 |
| MAX | 454 | 1,240 | 802 | 127 | 264 | 269 | 94 | 142 | 0 | 98 | 7.6 | 82 |
| MIN | 0 | 0 | 16 | 12 | 19 | 8.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 2,480 | 5,730 | 5,070 | 1,820 | 2,960 | 2,300 | 787 | 1,380 | 0 | 835 | 50 | 360 |

CAL YR 1968: TOTAL 11,193.59 MEAN 30.6 MAX 1,240 MIN 0 AC-FT 22,200
WTR YR 1969: TOTAL 11,981.42 MEAN 32.8 MAX 1,240 MIN 0 AC-FT 23,770

PEAK DISCHARGE (BASE, 1,900 CFS).--Nov. 29 (2100) 5,590 cfs (4.71 ft).

## 16-0870. Anahola ditch wasteway near Kealia

LOCATION.--Lat 22°08'16", long 159°22'28", Kauai, on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft north of Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles northwest of Kealia.

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

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

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

REMARKS.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 miles below gaging station 16-0890 on Anahola Stream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 | 3.1 | 24 | 7.9 | 11 | 7.3 | 8.2 | .37 | .18 | .70 | .02 | .18 |
| 2 | 19 | 3.1 | 15 | 9.2 | 8.9 | 7.3 | 10 | 84 | .18 | .07 | .37 | .02 |
| 3 | 9.5 | 4.5 | 16 | 6.7 | 7.6 | 8.2 | 7.6 | .18 | .18 | .70 | .02 | .02 |
| 4 | 9.8 | 3.6 | 12 | 6.1 | 6.7 | 7.6 | 7.0 | .37 | .18 | .07 | .07 | .56 |
| 5 | 6.7 | 2.8 | 10 | 18 | 6.1 | 7.3 | 7.6 | .37 | .18 | .37 | .02 | .18 |
| 6 | 5.0 | 2.7 | 9.5 | 22 | 6.4 | 7.6 | 6.7 | .37 | .18 | .56 | .02 | .37 |
| 7 | 4.5 | 2.5 | 8.9 | 10 | 5.8 | 7.3 | 6.7 | .37 | .18 | 1.2 | .07 | .02 |
| 8 | 4.0 | 2.5 | 16 | 8.2 | 5.5 | 7.0 | 6.4 | .37 | .18 | .99 | .07 | .07 |
| 9 | 6.1 | 2.5 | 11 | 7.9 | 5.2 | 7.0 | 3.4 | 1.6 | .37 | .84 | .07 | .07 |
| 10 | 4.5 | 2.5 | 9.2 | 7.3 | 5.8 | 6.7 | 84 | 1.7 | .99 | .59 | .07 | .07 |
| 11 | 3.6 | 5.2 | 7.9 | 6.7 | 6.7 | 6.1 | 1.2 | 11 | .37 | .84 | .56 | .70 |
| 12 | 3.3 | 3.1 | 11 | 6.4 | 5.2 | 5.8 | 1.6 | 29 | .07 | .70 | .02 | .02 |
| 13 | 3.1 | 15 | 12 | 6.1 | 7.6 | 5.8 | .70 | 21 | .18 | .37 | .02 | .02 |
| 14 | 1.4 | 17 | 11 | 5.8 | 7.6 | 7.6 | .84 | 21 | .18 | .18 | .18 | .07 |
| 15 | .84 | 4.8 | 11 | 5.8 | 15 | 7.9 | .70 | 17 | .07 | .70 | .02 | .56 |
| 16 | 9.0 | 5.8 | 11 | 5.5 | 11 | 8.5 | .37 | 13 | .56 | .70 | .18 | .02 |
| 17 | 30 | 5.2 | 9.8 | 5.2 | 8.9 | 11 | .56 | 13 | .70 | .18 | .07 | .18 |
| 18 | 20 | 3.8 | 13 | 5.2 | 8.2 | 10 | 1.4 | 9.8 | .02 | .37 | .37 | .70 |
| 19 | 15 | 7.3 | 10 | 7.3 | 9.2 | 7.6 | .37 | 7.9 | .07 | .70 | .56 | .18 |
| 20 | 9.8 | 4.5 | 9.5 | 5.0 | 8.2 | 3.1 | .99 | 3.9 | .07 | 84 | .70 | .37 |
| 21 | 7.3 | 3.3 | 12 | 4.8 | 8.5 | .84 | .37 | .70 | .02 | .37 | .99 | .56 |
| 22 | 5.8 | 2.8 | 9.5 | 4.5 | 7.9 | .84 | .70 | .18 | .37 | .18 | .18 | .70 |
| 23 | 5.0 | 15 | 9.2 | 4.3 | 7.6 | .70 | .18 | .18 | .18 | .02 | .07 | .02 |
| 24 | 4.8 | 7.6 | 14 | 4.0 | 8.9 | 1.2 | .18 | .99 | .56 | .07 | .56 | .02 |
| 25 | 4.3 | 4.8 | 14 | 4.0 | 8.9 | .56 | .37 | .70 | .37 | .37 | .02 | .02 |
| 26 | 4.0 | 5.8 | 11 | 3.6 | 8.5 | .56 | .37 | .07 | .37 | 1.1 | .18 | .07 |
| 27 | 3.6 | 4.0 | 9.8 | 3.6 | 7.6 | .56 | .70 | .18 | .07 | .18 | .07 | .07 |
| 28 | 3.6 | 15 | 9.2 | 3.6 | 7.3 | .56 | 1.4 | .18 | .70 | .07 | .07 | .07 |
| 29 | 3.3 | 52 | 8.2 | 5.5 | ------ | .56 | .18 | .07 | .02 | .02 | .02 | .02 |
| 30 | 3.1 | 31 | 7.3 | 8.5 | ------ | .56 | 1.2 | .18 | .56 | .02 | .56 | .18 |
| 31 | 3.3 | ------ | 7.0 | 9.2 | ------ | 3.2 | ------ | .18 | ------ | .07 | 1.2 | ------ |
| TOTAL | 229.24 | 242.8 | 349.0 | 217.9 | 221.8 | 156.84 | 78.82 | 156.75 | 8.31 | 14.54 | 7.40 | 6.11 |
| MEAN | 7.39 | 8.09 | 11.3 | 7.03 | 7.92 | 5.06 | 2.63 | 5.06 | .28 | .47 | .24 | .20 |
| MAX | 30 | 52 | 24 | 22 | 15 | 11 | 10 | 29 | .99 | 1.2 | 1.2 | .70 |
| MIN | .84 | 2.5 | 7.0 | 3.6 | 5.2 | .56 | .18 | .07 | .02 | .02 | .02 | .02 |
| AC-FT | 455 | 482 | 692 | 432 | 440 | 311 | 156 | 311 | 16 | 29 | 15 | 12 |

CAL YR 1968: TOTAL 1,983.75 MEAN 5.42 MAX 52 MIN .02 AC-FT 3,930
WTR YR 1969: TOTAL 1,689.51 MEAN 4.63 MAX 52 MIN .02 AC-FT 3,350

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

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

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

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

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

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta 16-0870).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20 | 0 | .65 | .02 | .01 | 0 | .04 | 5.5 | 3.6 | 12 | 5.5 | 5.7 |
| 2 | .13 | 0 | .23 | .02 | 0 | 0 | .04 | 8.0 | 3.4 | 7.3 | 10 | 4.7 |
| 3 | .02 | 0 | .13 | .02 | 0 | 0 | .04 | 5.2 | 3.3 | 11 | 6.0 | 4.0 |
| 4 | .02 | 0 | .06 | .02 | 0 | 0 | .02 | 4.4 | 3.3 | 7.3 | 7.5 | 6.0 |
| 5 | 0 | 0 | .06 | .44 | 0 | 0 | .02 | 4.4 | 3.0 | 8.4 | 4.8 | 8.2 |
| 6 | 0 | 0 | .04 | .29 | 0 | 0 | .02 | 4.2 | 3.0 | 10 | 4.2 | 9.9 |
| 7 | 0 | 0 | .02 | .06 | 0 | 0 | .02 | 3.9 | 2.9 | 20 | 5.7 | 4.8 |
| 8 | 0 | 0 | .13 | .06 | 0 | 0 | .02 | 4.0 | 2.9 | 17 | 5.2 | 4.2 |
| 9 | .02 | 0 | .04 | .02 | 0 | 0 | 3.0 | 16 | 3.9 | 13 | 3.9 | 3.7 |
| 10 | 0 | 0 | .02 | .02 | 0 | 0 | 5.5 | 26 | 13 | 14 | 3.7 | 3.9 |
| 11 | 0 | 0 | .02 | .02 | 0 | 0 | 9.2 | 13 | 6.9 | 13 | 13 | 13 |
| 12 | 0 | 0 | .02 | 0 | 0 | 0 | 13 | .17 | 3.9 | 11 | 4.7 | 4.8 |
| 13 | 0 | .04 | .02 | 0 | 0 | 0 | 8.3 | .09 | 3.3 | 7.9 | 4.5 | 4.5 |
| 14 | 1.3 | .15 | .02 | 0 | 0 | 0 | 9.0 | .09 | 3.0 | 7.3 | 7.9 | 6.3 |
| 15 | 2.0 | 0 | .02 | 0 | .10 | 0 | 7.9 | .09 | 3.0 | 18 | 4.7 | 12 |
| 16 | 7.3 | 0 | .02 | 0 | 0 | 0 | 6.2 | .04 | 7.2 | 15 | 6.8 | 5.2 |
| 17 | .29 | 0 | .01 | 0 | 0 | 0 | 6.6 | .04 | 11 | 9.3 | 5.9 | 9.1 |
| 18 | .06 | 0 | .06 | 0 | 0 | 0 | 12 | .04 | 4.4 | 9.5 | 8.4 | 14 |
| 19 | .04 | 0 | .02 | 0 | 0 | .16 | 6.4 | .04 | 5.2 | 19 | 8.1 | 7.5 |
| 20 | .02 | 0 | .04 | 0 | 0 | 3.2 | 9.8 | 3.4 | 5.2 | 18 | 9.9 | 9.0 |
| 21 | .02 | 0 | .02 | 0 | 0 | 4.5 | 6.8 | 5.7 | 3.4 | 11 | 15 | 11 |
| 22 | .02 | 0 | .02 | 0 | 0 | 4.7 | 8.1 | 5.3 | 7.3 | 9.1 | 6.6 | 12 |
| 23 | .02 | .06 | .01 | 0 | 0 | 5.3 | 5.2 | 5.2 | 3.6 | 7.9 | 5.2 | 6.8 |
| 24 | .02 | 0 | .06 | 0 | 0 | 9.8 | 4.8 | 17 | 7.8 | 8.8 | 7.7 | 6.8 |
| 25 | .02 | 0 | .09 | 0 | 0 | 7.1 | 4.5 | 10 | 8.4 | 12 | 4.7 | 6.4 |
| 26 | 0 | 0 | .06 | 0 | 0 | 6.4 | 4.0 | 5.3 | 9.0 | 20 | 5.7 | 7.2 |
| 27 | 0 | 0 | .06 | 0 | 0 | 6.0 | 6.3 | 5.9 | 7.3 | 11 | 5.7 | 6.2 |
| 28 | 0 | .08 | .04 | 0 | 0 | 5.5 | 13 | 4.7 | 10 | 7.5 | 5.0 | 6.8 |
| 29 | 0 | 11 | .04 | 0 | ------ | 6.8 | 5.9 | 4.4 | 5.2 | 6.2 | 4.7 | 5.3 |
| 30 | 0 | 1.3 | .02 | .02 | ------ | 6.4 | 11 | 4.2 | 11 | 5.7 | 7.4 | 9.7 |
| 31 | 0 | ------ | .02 | .01 | ------ | 7.2 | ------ | 3.9 | ------ | 7.4 | 12 | ------ |
| TOTAL | 31.30 | 12.63 | 2.07 | 1.02 | .11 | 73.06 | 166.72 | 170.20 | 168.4 | 354.6 | 210.1 | 218.7 |
| MEAN | 1.01 | .42 | .067 | .033 | .004 | 2.36 | 5.56 | 5.49 | 5.61 | 11.4 | 6.78 | 7.29 |
| MAX | 20 | 11 | .65 | .44 | .10 | 9.8 | 13 | 26 | 13 | 20 | 15 | 14 |
| MIN | 0 | 0 | .01 | 0 | 0 | 0 | .02 | .04 | 2.9 | 5.7 | 3.7 | 3.7 |
| AC-FT | 62 | 25 | 4.1 | 2.0 | .2 | 145 | 331 | 338 | 334 | 703 | 417 | 434 |

CAL YR 1968: TOTAL 861.43 MEAN 2.35 MAX 22 MIN 0 AC-FT 1,710
WTR YR 1969: TOTAL 1,408.91 MEAN 3.86 MAX 26 MIN 0 AC-FT 2,790

## 16-0890. Anahola Stream near Kealia

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

DRAINAGE AREA.--5.5 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 7,120 cfs Nov. 29 (gage height, 9.30 ft), from rating curve extended above 1,800 cfs on basis of slope-area measurement at gage height 10.6 ft; minimum, 3.1 cfs Oct. 15, 16. Period of record: Maximum discharge, 19,600 cfs Jan. 25, 1956 (gage height, 14.6 ft, from floodmarks), from rating curve extended above 590 cfs; minimum, 1.98 cfs Oct. 27, 1953.

REMARKS.--Records poor. Records include flow in Lower Anahola ditch (see sta 16-0910). Anahola ditch (see sta 16-0880) diverts 3 miles above station for irrigation in vicinity of Kealia.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 584 | 7.8 | 861 | 46 | 246 | 22 | 117 | 28 | 30 | 25 | 9.8 | 6.2 |
| 2 | 89 | 6.6 | 481 | 47 | 128 | 21 | 191 | 28 | 29 | 20 | 12 | 5.8 |
| 3 | 22 | 7.8 | 414 | 36 | 58 | 29 | 69 | 28 | 28 | 20 | 9.3 | 5.4 |
| 4 | 15 | 12 | 119 | 35 | 32 | 24 | 56 | 26 | 28 | 18 | 9.8 | 5.8 |
| 5 | 15 | 6.2 | 41 | 621 | 25 | 22 | 74 | 25 | 27 | 18 | 8.4 | 7.8 |
| 6 | 12 | 4.7 | 27 | 624 | 27 | 22 | 53 | 25 | 24 | 18 | 7.8 | 9.8 |
| 7 | 10 | 4.4 | 24 | 36 | 24 | 24 | 48 | 25 | 24 | 56 | 9.3 | 6.2 |
| 8 | 8.4 | 4.2 | 322 | 29 | 22 | 20 | 46 | 25 | 23 | 48 | 7.0 | 5.8 |
| 9 | 12 | 3.8 | 43 | 26 | 22 | 20 | 41 | 78 | 23 | 24 | 6.2 | 5.2 |
| 10 | 11 | 4.2 | 26 | 24 | 23 | 19 | 48 | 199 | 36 | 20 | 6.2 | 5.8 |
| 11 | 6.2 | 4.2 | 23 | 22 | 34 | 18 | 47 | 337 | 29 | 19 | 15 | 39 |
| 12 | 5.4 | 4.2 | 132 | 22 | 22 | 18 | 47 | 507 | 27 | 15 | 6.6 | 8.4 |
| 13 | 4.4 | 35 | 64 | 22 | 108 | 18 | 37 | 102 | 24 | 12 | 5.8 | 7.8 |
| 14 | 3.8 | 150 | 45 | 21 | 72 | 20 | 36 | 89 | 23 | 13 | 7.0 | 8.4 |
| 15 | 3.3 | 17 | 45 | 21 | 321 | 33 | 35 | 63 | 26 | 70 | 5.4 | 42 |
| 16 | 141 | 14 | 31 | 20 | 112 | 144 | 32 | 50 | 34 | 29 | 5.8 | 10 |
| 17 | 446 | 12 | 23 | 20 | 38 | 164 | 32 | 44 | 37 | 18 | 5.8 | 13 |
| 18 | 56 | 12 | 178 | 20 | 32 | 130 | 38 | 41 | 20 | 18 | 7.4 | 28 |
| 19 | 35 | 10 | 24 | 21 | 35 | 30 | 32 | 38 | 20 | 76 | 6.6 | 13 |
| 20 | 24 | 9.3 | 21 | 20 | 29 | 25 | 37 | 36 | 19 | 45 | 8.7 | 10 |
| 21 | 18 | 8.4 | 126 | 20 | 31 | 24 | 32 | 36 | 17 | 23 | 31 | 84 |
| 22 | 16 | 7.4 | 22 | 19 | 28 | 24 | 34 | 36 | 20 | 19 | 7.4 | 58 |
| 23 | 15 | 48 | 30 | 19 | 24 | 37 | 30 | 35 | 18 | 18 | 6.2 | 11 |
| 24 | 14 | 19 | 266 | 18 | 41 | 214 | 29 | 41 | 21 | 18 | 7.4 | 9.8 |
| 25 | 13 | 14 | 226 | 18 | 47 | 68 | 28 | 47 | 32 | 25 | 6.2 | 9.8 |
| 26 | 12 | 13 | 73 | 18 | 32 | 54 | 28 | 34 | 23 | 115 | 6.2 | 9.8 |
| 27 | 11 | 11 | 58 | 18 | 25 | 65 | 28 | 32 | 22 | 25 | 6.2 | 10 |
| 28 | 9.8 | 69 | 50 | 18 | 24 | 54 | 41 | 30 | 29 | 15 | 5.8 | 10 |
| 29 | 8.8 | 1,370 | 44 | 20 | ------ | 83 | 29 | 30 | 19 | 13 | 5.4 | 11 |
| 30 | 8.4 | 1,170 | 41 | 157 | ------ | 72 | 32 | 30 | 22 | 12 | 8.8 | 20 |
| 31 | 9.8 | ------ | 40 | 203 | ------ | 374 | ------ | 32 | ------ | 12 | 13 | ------ |
| TOTAL | 1,639.3 | 3,059.2 | 3,920 | 2,261 | 1,662 | 1,892 | 1,427 | 2,177 | 754 | 877 | 263.5 | 476.8 |
| MEAN | 52.9 | 102 | 126 | 72.9 | 59.4 | 61.0 | 47.6 | 70.2 | 25.1 | 28.3 | 8.50 | 15.9 |
| MAX | 584 | 1,370 | 861 | 624 | 321 | 374 | 191 | 507 | 37 | 115 | 31 | 84 |
| MIN | 3.3 | 3.8 | 21 | 18 | 22 | 18 | 28 | 25 | 17 | 12 | 5.4 | 5.2 |
| AC-FT | 3,250 | 6,070 | 7,780 | 4,480 | 3,300 | 3,750 | 2,830 | 4,320 | 1,500 | 1,740 | 523 | 945 |

CAL YR 1968: TOTAL 14,067.2 MEAN 38.4 MAX 1,370 MIN 2.8 AC-FT 27,900
WTR YR 1969: TOTAL 20,408.8 MEAN 55.9 MAX 1,370 MIN 3.3 AC-FT 40,480

PEAK DISCHARGE (BASE, 1,700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-1 | 1730 | 4.62 | 1,810 | 12-8 | 1300 | 4.52 | 1,720 |
| 10-17 | 0930 | 5.05 | 2,200 | 1-5 | 1330 | 6.65 | 3,800 |
| 11-14 | 0300 | 4.98 | 2,130 | 3-31 | 1400 | 5.78 | 2,930 |
| 11-29 | 1730 | 9.30 | 7,120 | 5-12 | 1330 | 5.40 | 2,550 |

## 16-0910. Lower Anahola ditch near Kealia

LOCATION.--Lat 22°08'13", long 159°19'31", Kauai, on left bank 100 ft downstream from last wasteway, 1.3 miles southwest of mouth of Anahola Stream, and 2.5 miles northwest of Kealia.

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

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

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.4 | 0 | .22 | 0 | .06 | 0 | 3.1 | 4.5 | 7.6 | 7.4 | 8.2 | 5.0 |
| 2 | 0 | 0 | .08 | 0 | 0 | 0 | 11 | 4.4 | 10 | 7.6 | 8.5 | 4.8 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 9.8 | 4.5 | 9.1 | 7.5 | 8.7 | 4.5 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 8.1 | 3.9 | 8.9 | 7.2 | 7.2 | 4.4 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 8.4 | 3.9 | 8.5 | 6.7 | 6.1 | 4.5 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 7.8 | 3.9 | 8.7 | 6.7 | 4.8 | 4.5 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7.5 | 3.8 | 8.2 | 9.4 | 6.1 | 4.2 |
| 8 | 0 | 0 | .01 | 0 | 0 | 0 | 7.4 | 3.9 | 8.2 | 10 | 7.0 | 3.8 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 7.4 | 6.2 | 8.2 | 12 | 6.8 | 3.8 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 7.1 | 7.4 | 9.6 | 9.3 | 6.1 | 4.0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 7.1 | 8.1 | 9.5 | 9.2 | 3.0 | 6.4 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 6.8 | 7.0 | 8.9 | 9.0 | 0 | 5.7 |
| 13 | 0 | .02 | 0 | 0 | 0 | 0 | 6.3 | 1.8 | 8.9 | 7.9 | 0 | 4.8 |
| 14 | 0 | .01 | 0 | 0 | 0 | 0 | 6.2 | 1.6 | 8.5 | 8.1 | 0 | 4.5 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 6.4 | 1.2 | 7.9 | 10 | 0 | 6.6 |
| 16 | .01 | 0 | 0 | 0 | 0 | 0 | 6.2 | .49 | 9.2 | 9.9 | 3.2 | 5.6 |
| 17 | .01 | 0 | 0 | 0 | 0 | .04 | 6.0 | .71 | 9.5 | 8.9 | 5.0 | 5.0 |
| 18 | 0 | 0 | 0 | 0 | 0 | .02 | 6.1 | .20 | 8.8 | 8.2 | 8.2 | 6.4 |
| 19 | 0 | 0 | 0 | 0 | 0 | .01 | 5.9 | .85 | 9.4 | 9.9 | 7.8 | 6.4 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 5.6 | 3.7 | 9.0 | 10 | 8.0 | 5.0 |
| 21 | 0 | 0 | 0 | 0 | 0 | .25 | 6.8 | 3.9 | 8.1 | 9.2 | 8.7 | 4.8 |
| 22 | 0 | 0 | 0 | 0 | 0 | 4.0 | 6.0 | 4.7 | 7.0 | 8.5 | 6.4 | 9.2 |
| 23 | 0 | .01 | 0 | 0 | 0 | 3.9 | 6.3 | 4.7 | 7.0 | 8.2 | 5.2 | 9.2 |
| 24 | 0 | 0 | 0 | 0 | 0 | 5.4 | 5.8 | 3.9 | 7.2 | 7.5 | 4.9 | 6.7 |
| 25 | .01 | 0 | 0 | 0 | 0 | 5.3 | 5.4 | 1.2 | 8.1 | 7.6 | 5.1 | 6.4 |
| 26 | 0 | 0 | 0 | 0 | 0 | 7.8 | 4.6 | 1.1 | 7.4 | 9.3 | 4.8 | 5.4 |
| 27 | 0 | 0 | 0 | 0 | 0 | 7.8 | 4.7 | 1.1 | 6.8 | 16 | 5.6 | 4.9 |
| 28 | .01 | 0 | 0 | .13 | 0 | 7.2 | 6.1 | 2.8 | 6.8 | 13 | 4.8 | 4.5 |
| 29 | 0 | .01 | 0 | .20 | ------ | 7.6 | 5.4 | 5.9 | 6.4 | 11 | 5.0 | 4.3 |
| 30 | 0 | .78 | 0 | .20 | ------ | 7.4 | 4.8 | 5.7 | 6.6 | 8.8 | 4.7 | 4.5 |
| 31 | 0 | ------ | | .13 | ------ | 7.7 | ------ | 5.6 | ------ | 8.8 | 5.1 | ------ |
| TOTAL | 2.44 | .83 | .31 | .66 | .06 | 64.42 | 196.1 | 112.65 | 248.0 | 282.8 | 165.0 | 159.8 |
| MEAN | .079 | .028 | .010 | .021 | .002 | 2.08 | 6.54 | 3.63 | 8.27 | 9.12 | 5.32 | 5.33 |
| MAX | 2.4 | .78 | .22 | .20 | .06 | 7.8 | 11 | 8.1 | 10 | 16 | 8.7 | 9.2 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 3.1 | .20 | 6.4 | 6.7 | 0 | 3.8 |
| AC-FT | 4.8 | 1.6 | .6 | 1.3 | .1 | 128 | 389 | 223 | 492 | 561 | 327 | 317 |

CAL YR 1968: TOTAL 532.23 MEAN 1.45 MAX 10 MIN 0 AC-FT 1,060
WTR YR 1969: TOTAL 1,233.07 MEAN 3.38 MAX 16 MIN 0 AC-FT 2,450

## 16-0932. Anahola Stream at Anahola

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

DRAINAGE AREA.--9.89 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 12,100 cfs Nov. 29 (gage height, 15.71 ft); minimum, 12 cfs Oct. 16.
Period of record: Maximum discharge, 13,000 cfs May 15, 1965 (gage height, 16.0 ft), from rating curve extended above 5,800 cfs on basis of contracted-opening measurement of peak flow; minimum, 3.8 cfs Aug. 21, Sept. 7, 1968.

REMARKS.--Records good. Anahola and Lower Anahola ditches (see stas 16-0880 and 16-0910) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 519 | 18 | 993 | 87 | 192 | 38 | 151 | 41 | 41 | 41 | 36 | 34 |
| 2 | 105 | 18 | 499 | 97 | 142 | 38 | 172 | 40 | 42 | 37 | 38 | 30 |
| 3 | 36 | 17 | 345 | 82 | 90 | 48 | 109 | 42 | 40 | 37 | 36 | 30 |
| 4 | 26 | 17 | 193 | 79 | 59 | 41 | 79 | 37 | 40 | 36 | 36 | 30 |
| 5 | 26 | 16 | 140 | 523 | 49 | 38 | 95 | 38 | 38 | 35 | 36 | 30 |
| 6 | 20 | 16 | 118 | 613 | 52 | 38 | 70 | 38 | 38 | 36 | 40 | 35 |
| 7 | 18 | 16 | 106 | 193 | 43 | 38 | 72 | 38 | 37 | 78 | 36 | 31 |
| 8 | 18 | 16 | 265 | 133 | 38 | 34 | 66 | 38 | 37 | 73 | 35 | 29 |
| 9 | 20 | 15 | 146 | 118 | 38 | 34 | 64 | 88 | 38 | 49 | 34 | 28 |
| 10 | 20 | 15 | 112 | 105 | 44 | 33 | 64 | 162 | 52 | 43 | 34 | 28 |
| 11 | 16 | 15 | 101 | 96 | 59 | 30 | 68 | 287 | 41 | 41 | 47 | 54 |
| 12 | 16 | 15 | 152 | 90 | 37 | 29 | 65 | 431 | 38 | 40 | 43 | 30 |
| 13 | 15 | 53 | 145 | 86 | 102 | 29 | 59 | 149 | 37 | 36 | 40 | 27 |
| 14 | 15 | 159 | 110 | 81 | 106 | 38 | 53 | 125 | 37 | 34 | 44 | 27 |
| 15 | 13 | 26 | 150 | 79 | 244 | 54 | 52 | 118 | 40 | 81 | 40 | 51 |
| 16 | 129 | 20 | 109 | 75 | 125 | 106 | 50 | 92 | 59 | 50 | 34 | 30 |
| 17 | 428 | 21 | 109 | 72 | 79 | 163 | 49 | 80 | 60 | 41 | 34 | 30 |
| 18 | 85 | 21 | 192 | 71 | 61 | 141 | 54 | 72 | 37 | 39 | 35 | 43 |
| 19 | 54 | 21 | 121 | 87 | 69 | 70 | 45 | 69 | 34 | 90 | 34 | 34 |
| 20 | 37 | 18 | 101 | 69 | 56 | 55 | 47 | 61 | 34 | 69 | 34 | 30 |
| 21 | 30 | 16 | 162 | 67 | 61 | 42 | 45 | 53 | 32 | 44 | 42 | 77 |
| 22 | 26 | 15 | 105 | 65 | 51 | 38 | 45 | 51 | 34 | 40 | 33 | 66 |
| 23 | 23 | 55 | 96 | 64 | 44 | 47 | 42 | 50 | 33 | 39 | 30 | 30 |
| 24 | 22 | 31 | 211 | 61 | 67 | 168 | 41 | 55 | 38 | 38 | 32 | 28 |
| 25 | 20 | 21 | 242 | 60 | 71 | 90 | 40 | 67 | 46 | 45 | 30 | 30 |
| 26 | 20 | 20 | 129 | 59 | 59 | 68 | 39 | 52 | 36 | 102 | 30 | 36 |
| 27 | 19 | 19 | 108 | 57 | 44 | 60 | 41 | 50 | 35 | 90 | 32 | 36 |
| 28 | 21 | 83 | 100 | 57 | 39 | 48 | 57 | 47 | 41 | 57 | 31 | 35 |
| 29 | 18 | 1,680 | 94 | 66 | ------ | 70 | 43 | 44 | 33 | 43 | 30 | 37 |
| 30 | 18 | 866 | 89 | 140 | ------ | 67 | 43 | 44 | 36 | 38 | 30 | 36 |
| 31 | 20 | ------ | 85 | 194 | ------ | 231 | ------ | 43 | ------ | 38 | 38 | ------ |
| TOTAL | 1,853 | 3,339 | 3,628 | 3,726 | 2,121 | 2,024 | 1,920 | 2,602 | 1,184 | 1,560 | 1,104 | 1,072 |
| MEAN | 59.8 | 111 | 182 | 120 | 75.8 | 65.3 | 64.0 | 83.9 | 39.5 | 50.3 | 35.6 | 35.7 |
| MAX | 519 | 1,680 | 993 | 613 | 244 | 231 | 172 | 431 | 60 | 102 | 47 | 77 |
| MIN | 13 | 15 | 85 | 57 | 37 | 29 | 39 | 37 | 32 | 34 | 30 | 27 |
| AC-FT | 3,680 | 6,620 | 11,160 | 7,390 | 4,210 | 4,010 | 3,810 | 5,160 | 2,350 | 3,090 | 2,190 | 2,130 |

CAL YR 1968: TOTAL 18,463.8 MEAN 50.4 MAX 1,680 MIN 3.8 AC-FT 36,620
WTR YR 1969: TOTAL 28,133 MEAN 77.1 MAX 1,680 MIN 13 AC-FT 55,800

PEAK DISCHARGE (BASE, 2,200 CFS).--Nov. 29 (1630) 12,100 cfs (15.71 ft); Jan. 5 (1330) 3,460 cfs (11.30 ft).

# HAWAII, ISLAND OF KAUAI

## 16-0970. Pohakuhonu Stream near Kilauea

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

DRAINAGE AREA.--1.8 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 1,900 cfs Nov. 29 (gage height, 6.04 ft), from rating curve extended as explained below; minimum, 1.4 cfs Nov. 12.

Period of record: Maximum discharge, 2,710 cfs Aug. 6, 1959 (gage height, 7.23 ft, from floodmark in well), from rating curve extended above 640 cfs on basis of slope-area measurement at gage height 11.0 ft; minimum, 1.1 cfs on several days in 1967, Mar. 3, 4, 1968.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 94 | 2.1 | 32 | 3.0 | 136 | 5.8 | 23 | 4.7 | 2.1 | 4.0 | 2.4 | 4.0 |
| 2 | 12 | 1.9 | 32 | 3.2 | 42 | 5.8 | 40 | 5.8 | 2.1 | 3.0 | 2.8 | 3.0 |
| 3 | 4.5 | 1.9 | 23 | 2.6 | 14 | 20 | 13 | 4.2 | 1.9 | 5.0 | 2.4 | 2.6 |
| 4 | 4.2 | 4.0 | 11 | 2.4 | 8.2 | 10 | 9.0 | 3.7 | 1.9 | 4.5 | 3.2 | 2.6 |
| 5 | 3.2 | 2.1 | 7.6 | 236 | 6.7 | 6.4 | 12.0 | 3.2 | 1.9 | 3.7 | 2.4 | 2.3 |
| 6 | 2.8 | 1.8 | 6.1 | 157 | 6.1 | 5.8 | 7.3 | 3.0 | 1.9 | 4.0 | 2.1 | 2.1 |
| 7 | 2.6 | 1.8 | 5.0 | 16 | 4.5 | 5.2 | 7.0 | 2.8 | 1.9 | 14 | 2.3 | 1.9 |
| 8 | 2.4 | 1.6 | 15 | 8.2 | 4.0 | 5.2 | 5.8 | 3.0 | 1.8 | 12 | 2.3 | 1.8 |
| 9 | 2.6 | 1.6 | 7.6 | 6.7 | 3.5 | 4.7 | 5.5 | 4.0 | 1.9 | 5.2 | 1.9 | 1.6 |
| 10 | 2.4 | 1.8 | 4.7 | 5.2 | 5.2 | 4.0 | 6.4 | 23 | 2.4 | 4.7 | 1.9 | 1.6 |
| 11 | 2.3 | 1.9 | 4.0 | 4.7 | 5.5 | 3.5 | 6.4 | 140 | 2.3 | 4.5 | 4.2 | 2.8 |
| 12 | 2.1 | 1.4 | 15 | 4.2 | 3.7 | 3.2 | 7.0 | 210 | 1.9 | 4.5 | 2.3 | 1.8 |
| 13 | 1.9 | 7.5 | 11 | 4.0 | 18 | 3.0 | 58 | 16 | 1.8 | 3.7 | 2.1 | 1.9 |
| 14 | 1.9 | 4.5 | 15 | 3.2 | 14 | 4.5 | 6.7 | 10 | 1.8 | 3.5 | 2.3 | 1.9 |
| 15 | 1.9 | 2.3 | 22 | 3.0 | 34 | 4.7 | 5.2 | 7.3 | 1.8 | 9.0 | 1.9 | 3.5 |
| 16 | 15 | 2.3 | 11 | 28 | 14 | 61 | 4.5 | 5.8 | 2.3 | 6.4 | 2.4 | 1.9 |
| 17 | 109 | 2.1 | 7.9 | 2.6 | 9.0 | 27 | 4.7 | 5.0 | 6.4 | 4.5 | 3.0 | 6.1 |
| 18 | 11 | 1.9 | 19 | 2.4 | 10 | 32 | 7.6 | 4.2 | 2.1 | 4.0 | 2.8 | 6.1 |
| 19 | 12 | 1.9 | 7.6 | 2.8 | 24 | 10 | 4.7 | 3.7 | 2.1 | 14 | 2.4 | 3.0 |
| 20 | 6.4 | 1.9 | 5.5 | 2.3 | 16 | 6.7 | 5.8 | 3.5 | 1.9 | 10 | 2.6 | 3.2 |
| 21 | 4.5 | 1.9 | 12 | 2.1 | 14 | 5.2 | 4.7 | 3.2 | 1.8 | 5.5 | 2.6 | 27 |
| 22 | 3.5 | 1.8 | 6.1 | 2.1 | 9.7 | 4.7 | 4.5 | 2.8 | 2.3 | 4.5 | 2.4 | 11 |
| 23 | 3.0 | 7.5 | 5.2 | 2.1 | 7.3 | 5.0 | 3.7 | 2.8 | 1.9 | 4.5 | 2.3 | 3.2 |
| 24 | 2.8 | 4.0 | 22 | 2.1 | 14 | 19 | 3.5 | 3.0 | 2.1 | 5.8 | 2.3 | 2.8 |
| 25 | 2.4 | 2.4 | 34 | 1.9 | 13 | 12 | 3.2 | 3.0 | 2.4 | 13 | 2.4 | 2.4 |
| 26 | 2.4 | 2.8 | 8.2 | 1.9 | 9.0 | 9.7 | 3.0 | 2.6 | 3.0 | 6.1 | 2.8 | 2.4 |
| 27 | 2.3 | 2.1 | 6.1 | 1.9 | 6.4 | 7.3 | 4.0 | 2.4 | 2.4 | 4.5 | 3.5 | 2.3 |
| 28 | 2.1 | 13 | 5.0 | 1.9 | 6.1 | 5.8 | 5.8 | 2.4 | 3.2 | 3.5 | 3.2 | 2.3 |
| 29 | 2.1 | 316 | 4.2 | 3.2 | ------ | 7.3 | 4.5 | 2.3 | 2.6 | 3.0 | 2.6 | 2.3 |
| 30 | 2.1 | 70 | 3.7 | 74 | ------ | 7.9 | 9.0 | 2.3 | 3.2 | 2.8 | 2.6 | 2.3 |
| 31 | 2.4 | ------ | 3.2 | 136 | ------ | 114 | ------ | 2.3 | ------ | 2.6 | 6.4 | ------ |
| TOTAL | 323.8 | 469.8 | 371.7 | 701.5 | 457.9 | 426.4 | 233.3 | 492.0 | 69.1 | 180.0 | 82.8 | 113.7 |
| MEAN | 10.4 | 15.7 | 12.0 | 22.6 | 16.4 | 13.8 | 7.78 | 15.9 | 2.30 | 5.81 | 2.67 | 3.79 |
| MAX | 109 | 316 | 34 | 236 | 136 | 114 | 40 | 210 | 6.4 | 14 | 6.4 | 27 |
| MIN | 1.9 | 1.4 | 3.2 | 1.9 | 3.5 | 3.0 | 3.0 | 2.3 | 1.8 | 2.6 | 1.9 | 1.6 |
| AC-FT | 642 | 932 | 737 | 1,390 | 908 | 846 | 463 | 976 | 137 | 357 | 164 | 226 |

CAL YR 1968: TOTAL 2,898.9 MEAN 7.92 MAX 316 MIN 1.3 AC-FT 5,750
WTR YR 1969: TOTAL 3,922.0 MEAN 10.7 MAX 316 MIN 1.4 AC-FT 7,780

PEAK DISCHARGE (BASE, 780 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1700 | 6.04 | 1,900 | 2- 1 | 0700 | 4.25 | 960 |
| 1- 5 | 1500 | 4.68 | 1,170 | | | | |

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

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

DRAINAGE AREA.--1.1 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 1,510 cfs Nov. 29 (gage height, 7.13 ft), from rating curve extended as explained below; minimum, 2.2 cfs Nov. 12, 22.
Period of record: Maximum discharge, 2,070 cfs Aug. 6, 1959 (gage height, 8.30 ft), from rating curve extended above 190 cfs on basis of slope-area measurement of peak flow; minimum, 1.8 cfs Sept. 6-8, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 94 | 2.9 | 38 | 4.3 | 76 | 6.4 | 26 | 6.6 | 3.3 | 13 | 8.3 | 11 |
| 2 | 22 | 2.7 | 33 | 4.6 | 35 | 6.4 | 48 | 7.2 | 3.2 | 8.7 | 10 | 8.8 |
| 3 | 7.7 | 3.1 | 28 | 3.7 | 17 | 16 | 17 | 5.5 | 3.2 | 12 | 8.4 | 7.8 |
| 4 | 11 | 4.8 | 15 | 3.6 | 9.4 | 11 | 11 | 5.0 | 3.1 | 12 | 13 | 8.2 |
| 5 | 6.1 | 2.9 | 9.0 | 125 | 7.1 | 6.7 | 17 | 4.7 | 3.1 | 9.3 | 8.4 | 8.1 |
| 6 | 4.7 | 2.6 | 6.7 | 107 | 6.9 | 7.7 | 9.6 | 4.5 | 2.9 | 12 | 7.5 | 8.4 |
| 7 | 4.1 | 2.4 | 5.7 | 20 | 5.4 | 6.0 | 8.8 | 4.2 | 2.9 | 34 | 8.6 | 7.0 |
| 8 | 3.8 | 2.4 | 21 | 10 | 4.8 | 6.1 | 7.3 | 4.7 | 2.9 | 27 | 8.0 | 6.5 |
| 9 | 8.3 | 2.4 | 8.8 | 7.3 | 4.4 | 5.3 | 7.0 | 8.8 | 2.9 | 16 | 7.1 | 6.3 |
| 10 | 4.3 | 2.7 | 5.9 | 6.0 | 6.5 | 4.7 | 9.4 | 34 | 2.9 | 16 | 7.3 | 6.4 |
| 11 | 3.6 | 2.9 | 5.0 | 5.2 | 9.4 | 4.4 | 9.4 | 81 | 3.9 | 16 | 15 | 13 |
| 12 | 3.3 | 2.5 | 24 | 4.7 | 4.8 | 4.1 | 11 | 130 | 3.6 | 15 | 8.1 | 6.5 |
| 13 | 3.1 | 12 | 15 | 4.3 | 23 | 4.0 | 7.4 | 23 | 2.9 | 12 | 7.5 | 6.7 |
| 14 | 2.9 | 8.8 | 21 | 4.0 | 18 | 6.0 | 8.8 | 16 | 2.9 | 11 | 7.8 | 6.7 |
| 15 | 2.8 | 3.4 | 24 | 3.8 | 42 | 6.6 | 6.8 | 11 | 2.9 | 28 | 7.1 | 17 |
| 16 | 15 | 3.6 | 14 | 3.6 | 22 | 36 | 6.1 | 7.8 | 4.0 | 18 | 9.3 | 7.5 |
| 17 | 80 | 3.2 | 9.7 | 3.4 | 13 | 35 | 6.4 | 7.1 | 11 | 13 | 11 | 18 |
| 18 | 17 | 2.8 | 24 | 3.3 | 11 | 39 | 11 | 6.2 | 7.8 | 12 | 10 | 17 |
| 19 | 16 | 2.9 | 9.7 | 3.8 | 22 | 14 | 6.4 | 5.3 | 7.2 | 34 | 8.4 | 10 |
| 20 | 8.7 | 2.8 | 7.0 | 3.2 | 15 | 8.5 | 9.1 | 4.9 | 6.4 | 27 | 8.8 | 11 |
| 21 | 6.3 | 2.4 | 17 | 3.1 | 17 | 6.6 | 6.8 | 4.6 | 5.9 | 15 | 9.9 | 35 |
| 22 | 5.0 | 2.3 | 7.6 | 3.0 | 11 | 6.3 | 6.4 | 4.4 | 8.1 | 13 | 7.8 | 23 |
| 23 | 4.4 | 13 | 6.5 | 2.9 | 7.6 | 6.6 | 5.4 | 4.3 | 6.4 | 13 | 7.2 | 11 |
| 24 | 3.9 | 5.6 | 29 | 2.8 | 19 | 27 | 5.3 | 5.5 | 7.5 | 15 | 7.0 | 11 |
| 25 | 3.6 | 3.5 | 35 | 2.8 | 18 | 16 | 4.9 | 5.7 | 9.0 | 28 | 7.4 | 8.9 |
| 26 | 3.4 | 3.6 | 11 | 2.7 | 11 | 12 | 4.6 | 4.1 | 9.9 | 17 | 8.2 | 8.5 |
| 27 | 3.2 | 3.0 | 7.3 | 2.7 | 7.4 | 9.1 | 6.3 | 3.9 | 9.9 | 13 | 8.6 | 7.6 |
| 28 | 3.1 | 16 | 6.0 | 2.7 | 6.9 | 7.2 | 10 | 3.7 | 11 | 11 | 8.2 | 8.1 |
| 29 | 2.9 | 231 | 5.1 | 5.2 | ------ | 11 | 7.2 | 3.6 | 8.1 | 9.6 | 7.2 | 7.2 |
| 30 | 3.0 | 67 | 4.6 | 40 | ------ | 12 | 13 | 3.4 | 9.9 | 8.8 | 8.3 | 9.0 |
| 31 | 3.6 | ------ | 4.3 | 71 | ------ | 86 | ------ | 3.4 | ------ | 9.0 | 16 | ------ |
| TOTAL | 360.8 | 421.2 | 457.9 | 469.7 | 450.6 | 433.7 | 313.4 | 424.1 | 168.7 | 490.4 | 275.4 | 321.2 |
| MEAN | 11.6 | 14.0 | 14.8 | 15.2 | 16.1 | 14.0 | 10.4 | 13.7 | 5.62 | 16.1 | 8.88 | 10.7 |
| MAX | 94 | 231 | 38 | 125 | 76 | 86 | 48 | 130 | 11 | 34 | 16 | 35 |
| MIN | 2.8 | 2.3 | 4.3 | 2.7 | 4.4 | 4.0 | 4.6 | 3.4 | 2.9 | 8.7 | 7.0 | 6.3 |
| AC-FT | 716 | 835 | 908 | 932 | 894 | 860 | 622 | 841 | 335 | 989 | 546 | 637 |

CAL YR 1968 TOTAL 3,929.5 MEAN 10.7 MAX 231 MIN 1.9 AC-FT 7,790
WTR YR 1969 TOTAL 4,595.1 MEAN 12.6 MAX 231 MIN 2.3 AC-FT 9,110

PEAK DISCHARGE (BASE, 580 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-17 | 0745 | 4.58 | 584 | 1- 5 | 1400 | 6.25 | 1,150 |
| 11-29 | 1600 | 7.13 | 1,510 | 5-12 | 1315 | 4.74 | 632 |

## 16-1000. Hanalei tunnel outlet near Lihue

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

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

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

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

REMARKS.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 59 | 12 | 36 | 21 | 59 | 13 | 27 | 15 | 4.6 | 63 | 42 | 58 |
| 2 | 33 | 12 | 50 | 17 | 45 | 16 | 24 | 18 | 6.7 | 56 | 49 | 50 |
| 3 | 26 | 12 | 38 | 14 | 31 | 26 | 18 | 15 | 11 | 56 | 45 | 45 |
| 4 | 29 | 12 | 26 | 14 | 19 | 20 | 16 | 14 | 12 | 61 | 44 | 49 |
| 5 | 20 | 10 | 20 | 21 | 22 | 18 | 19 | 27 | 11 | 51 | 41 | 58 |
| 6 | 17 | 9.9 | 17 | 19 | 21 | 16 | 17 | 18 | 10 | 50 | 39 | 48 |
| 7 | 16 | 9.9 | 16 | 17 | 14 | 15 | 17 | 16 | 10 | 63 | 40 | 43 |
| 8 | 15 | 9.9 | 29 | 14 | 11 | 16 | 15 | 17 | 10 | 63 | 45 | 44 |
| 9 | 14 | 9.9 | 19 | 14 | 11 | 16 | 17 | 22 | 15 | 58 | 30 | 43 |
| 10 | 14 | 9.5 | 16 | 14 | 13 | 15 | 17 | 4.5 | 10 | 64 | 34 | 45 |
| 11 | 14 | 10 | 16 | 11 | 14 | 14 | 17 | 8.2 | 16 | 67 | 66 | 65 |
| 12 | 14 | 14 | 27 | 13 | 12 | 14 | 16 | 7.2 | 35 | 65 | 49 | 49 |
| 13 | 13 | 20 | 28 | 13 | 13 | 14 | 15 | 3.7 | 32 | 58 | 54 | 49 |
| 14 | 13 | 15 | 40 | 13 | 12 | 14 | 18 | 5.0 | 32 | 54 | 56 | 57 |
| 15 | 14 | 10 | 31 | 13 | 20 | 14 | 15 | 2.2 | 35 | 66 | 53 | 69 |
| 16 | 21 | 13 | 23 | 13 | 18 | 20 | 14 | 1.6 | 36 | 62 | 64 | 61 |
| 17 | 29 | 11 | 19 | 13 | 14 | 25 | 15 | 5.2 | 29 | 53 | 61 | 64 |
| 18 | 21 | 10 | 30 | 13 | 35 | 19 | 16 | 15 | 37 | 55 | 53 | 73 |
| 19 | 18 | 11 | 19 | 13 | 48 | 15 | 14 | 14 | 38 | 71 | 54 | 62 |
| 20 | 15 | 12 | 17 | 13 | 32 | 15 | 19 | 14 | 38 | 68 | 54 | 64 |
| 21 | 13 | 11 | 17 | 13 | 28 | 15 | 14 | 14 | 36 | 59 | 56 | 64 |
| 22 | 12 | 11 | 16 | 13 | 24 | 14 | 14 | 13 | 55 | 56 | 47 | 68 |
| 23 | 12 | 16 | 17 | 13 | 19 | 19 | 14 | 13 | 42 | 51 | 44 | 56 |
| 24 | 12 | 9.5 | 41 | 12 | 24 | 25 | 14 | 10 | 56 | 57 | 46 | 58 |
| 25 | 12 | 7.9 | 28 | 12 | 20 | 19 | 14 | 1.1 | 50 | 62 | 44 | 53 |
| 26 | 12 | 8.4 | 17 | 12 | 19 | 17 | 13 | 5.0 | 56 | 52 | 52 | 55 |
| 27 | 12 | 8.4 | 16 | 12 | 16 | 15 | 14 | 5.0 | 54 | 45 | 62 | 50 |
| 28 | 12 | 36 | 15 | 12 | 15 | 14 | 19 | 5.5 | 58 | 44 | 51 | 56 |
| 29 | 12 | 55 | 14 | 21 | ------ | 19 | 18 | 4.6 | 55 | 42 | 49 | 48 |
| 30 | 12 | 52 | 14 | 26 | ------ | 17 | 19 | 4.6 | 62 | 42 | 52 | 62 |
| 31 | 12 | ------ | 14 | 55 | ------ | 36 | ------ | 4.6 | ------ | 50 | 62 | ------ |
| TOTAL | 549 | 448.7 | 726 | 494 | 629 | 545 | 499 | 323.0 | 952.3 | 1,764 | 1,538 | 1,666 |
| MEAN | 17.7 | 15.0 | 23.4 | 15.9 | 22.5 | 17.6 | 16.6 | 10.4 | 31.7 | 56.9 | 49.6 | 55.5 |
| MAX | 59 | 55 | 50 | 55 | 59 | 36 | 27 | 27 | 62 | 71 | 66 | 73 |
| MIN | 12 | 7.9 | 14 | 11 | 11 | 13 | 13 | 1.1 | 4.6 | 42 | 30 | 43 |
| AC-FT | 1,090 | 890 | 1,440 | 980 | 1,250 | 1,080 | 990 | 641 | 1,890 | 3,500 | 3,050 | 3,300 |

CAL YR 1968: TOTAL 9,237.7 MEAN 25.2 MAX 64 MIN 7.9 AC-FT 18,320
WTR YR 1969: TOTAL 10,134.0 MEAN 27.8 MAX 73 MIN 1.1 AC-FT 20,100

## 16-1030. Hanalei River near Hanalei

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

DRAINAGE AREA.--19.1 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 44,900 cfs Jan. 31 (gage height, 14.23 ft), from rating curve extended above 2,700 cfs; minimum, 55 cfs Oct. 14, 15.
Period of record: Maximum discharge, 44,900 cfs Nov. 13, 1965, Jan. 31, 1969 (gage height, 14.23 ft), from rating curve extended above 2,700 cfs; minimum, 39 cfs Mar. 4, 1963.

REMARKS.--Records poor. Since 1925, Hanalei tunnel (see sta 16-1000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,160 | 62 | 900 | 280 | 3,700 | 230 | 1,000 | 160 | 98 | 160 | 110 | 125 |
| 2 | 356 | 80 | 350 | 240 | 2,500 | 300 | 500 | 195 | 96 | 115 | 150 | 102 |
| 3 | 137 | 70 | 1,000 | 170 | 920 | 780 | 250 | 123 | 91 | 146 | 140 | 89 |
| 4 | 264 | 66 | 400 | 150 | 230 | 400 | 160 | 114 | 89 | 141 | 110 | 94 |
| 5 | 128 | 64 | 200 | 400 | 210 | 250 | 220 | 281 | 89 | 112 | 90 | 109 |
| 6 | 96 | 62 | 180 | 310 | 180 | 200 | 190 | 141 | 86 | 98 | 79 | 107 |
| 7 | 82 | 62 | 150 | 220 | 158 | 137 | 220 | 115 | 86 | 370 | 82 | 86 |
| 8 | 77 | 62 | 540 | 160 | 150 | 135 | 170 | 120 | 86 | 400 | 86 | 82 |
| 9 | 76 | 64 | 200 | 140 | 132 | 132 | 140 | 464 | 102 | 250 | 89 | 78 |
| 10 | 72 | 76 | 150 | 130 | 137 | 128 | 150 | 1,490 | 202 | 270 | 79 | 77 |
| 11 | 66 | 76 | 130 | 110 | 177 | 115 | 146 | 2170 | 117 | 240 | 218 | 193 |
| 12 | 62 | 200 | 400 | 100 | 120 | 108 | 142 | 1,570 | 77 | 270 | 95 | 83 |
| 13 | 59 | 370 | 600 | 110 | 150 | 106 | 139 | 500 | 73 | 230 | 92 | 80 |
| 14 | 57 | 220 | 630 | 100 | 220 | 103 | 132 | 500 | 72 | 210 | 134 | 88 |
| 15 | 56 | 110 | 270 | 110 | 390 | 110 | 120 | 282 | 69 | 500 | 108 | 188 |
| 16 | 390 | 88 | 250 | 110 | 380 | 170 | 115 | 202 | 84 | 350 | 183 | 89 |
| 17 | 1,200 | 80 | 230 | 100 | 330 | 320 | 150 | 202 | 113 | 180 | 120 | 400 |
| 18 | 290 | 70 | 580 | 90 | 900 | 260 | 180 | 158 | 75 | 180 | 109 | 390 |
| 19 | 250 | 80 | 210 | 98 | 1,800 | 180 | 130 | 137 | 73 | 1,100 | 106 | 170 |
| 20 | 160 | 95 | 180 | 98 | 900 | 150 | 350 | 128 | 70 | 680 | 114 | 300 |
| 21 | 130 | 80 | 190 | 98 | 700 | 140 | 190 | 117 | 70 | 200 | 126 | 670 |
| 22 | 100 | 70 | 160 | 110 | 400 | 130 | 150 | 112 | 84 | 210 | 95 | 420 |
| 23 | 88 | 120 | 150 | 100 | 250 | 200 | 120 | 109 | 72 | 180 | 85 | 150 |
| 24 | 80 | 100 | 1,200 | 90 | 470 | 450 | 130 | 123 | 109 | 200 | 87 | 170 |
| 25 | 73 | 85 | 1,000 | 86 | 340 | 300 | 110 | 137 | 142 | 270 | 85 | 130 |
| 26 | 70 | 75 | 180 | 82 | 270 | 240 | 98 | 111 | 109 | 170 | 106 | 150 |
| 27 | 67 | 68 | 150 | 80 | 200 | 200 | 120 | 108 | 109 | 130 | 125 | 120 |
| 28 | 65 | 1,500 | 120 | 78 | 160 | 170 | 250 | 106 | 148 | 100 | 121 | 190 |
| 29 | 62 | 3,700 | 100 | 600 | ------ | 240 | 200 | 103 | 123 | 92 | 89 | 130 |
| 30 | 70 | 2,500 | 90 | 700 | ------ | 230 | 200 | 102 | 154 | 90 | 96 | 220 |
| 31 | 76 | ------ | 85 | 3,400 | ------ | 3,100 | ------ | 99 | ------ | 150 | 174 | ------ |
| TOTAL | 5,919 | 10,355 | 10,975 | 8,650 | 16,474 | 9,714 | 6,172 | 10,279 | 2,968 | 7,794 | 3,483 | 5,280 |
| MEAN | 223 | 345 | 354 | 279 | 588 | 313 | 206 | 332 | 98.9 | 251 | 112 | 176 |
| MAX | 2,160 | 3,700 | 1,200 | 3,400 | 3,700 | 3,100 | 1,000 | 2170 | 202 | 1,100 | 218 | 670 |
| MIN | 56 | 62 | 85 | 78 | 120 | 103 | 98 | 99 | 70 | 90 | 79 | 77 |
| AC-FT | 13,720 | 20,540 | 21,770 | 17,160 | 32,680 | 19,270 | 12,240 | 20,390 | 5,890 | 15,460 | 6,910 | 10,470 |

CAL YR 1968: TOTAL 73,988 MEAN 202 MAX 3,700 MIN 52 AC-FT 146,800
WTR YR 1969: TOTAL 99,063 MEAN 271 MAX 3,700 MIN 56 AC-FT 196,500

PEAK DISCHARGE (BASE, 5,600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-1 | 1900 | 7.70 | 6,750 | 1-31 | /0600 | 14.23 | 44,900 |
| 10-17 | 1100 | 8.09 | 7,920 | 3-31 | /1500 | 13.46 | 37,600 |
| 11-29 | /1630 | 13.16 | 34,900 | 5-11 | 0100 | 8.38 | 8,790 |

/ About.
NOTE.--No gage-height record Oct. 17 to Feb. 6.

## 16-1080. Wainiha River near Hanalei

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

DRAINAGE AREA.--10.2 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 7,300 cfs Jan. 31 (gage height, 6.30 ft), from rating curve extended as explained below; minimum, 41 cfs Nov. 9.

Period of record: Maximum discharge recorded, 20,100 cfs Aug. 6, 1959 (gage height, 8.19 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurement at gage height 7.72 ft; minimum, 34.8 cfs Feb. 12, 1954.

Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft, from floodmarks (discharge, about 40,000 cfs, from unit-discharge study).

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.190 | 44 | 707 | 249 | 2810 | 168 | 664 | 69 | 63 | 179 | 78 | 163 |
| 2 | 150 | 51 | 264 | 182 | 1.840 | 235 | 458 | 182 | 62 | 136 | 122 | 101 |
| 3 | 83 | 55 | 1.120 | 119 | 403 | 759 | 152 | 123 | 61 | 146 | 93 | 86 |
| 4 | 74 | 45 | 353 | 98 | 167 | 271 | 114 | 82 | 61 | 160 | 87 | 119 |
| 5 | 56 | 43 | 137 | 344 | 160 | 166 | 198 | 179 | 61 | 95 | 72 | 157 |
| 6 | 50 | 43 | 104 | 252 | 136 | 154 | 155 | 73 | 60 | 101 | 66 | 102 |
| 7 | 48 | 42 | 90 | 158 | 96 | 117 | 200 | 64 | 60 | 324 | 70 | 81 |
| 8 | 47 | 42 | 425 | 111 | 83 | 140 | 121 | 82 | 59 | 365 | 130 | 80 |
| 9 | 46 | 42 | 137 | 90 | 73 | 187 | 129 | 300 | 119 | 182 | 102 | 70 |
| 10 | 45 | 54 | 96 | 75 | 88 | 110 | 151 | 678 | 213 | 220 | 107 | 93 |
| 11 | 44 | 53 | 77 | 65 | 86 | 83 | 154 | 840 | 124 | 214 | 371 | 260 |
| 12 | 44 | 240 | 339 | 60 | 65 | 75 | 169 | 660 | 81 | 221 | 106 | 79 |
| 13 | 43 | 310 | 518 | 74 | 75 | 71 | 106 | 400 | 72 | 162 | 174 | 86 |
| 14 | 42 | 110 | 537 | 60 | 99 | 71 | 133 | 353 | 67 | 137 | 195 | 81 |
| 15 | 48 | 70 | 205 | 67 | 334 | 75 | 95 | 200 | 64 | 454 | 167 | 104 |
| 16 | 212 | 60 | 197 | 71 | 331 | 111 | 88 | 124 | 64 | 256 | 268 | 80 |
| 17 | 534 | 53 | 151 | 57 | 250 | 275 | 108 | 106 | 66 | 128 | 146 | 372 |
| 18 | 245 | 50 | 466 | 55 | 1.080 | 203 | 165 | 92 | 64 | 126 | 109 | 362 |
| 19 | 217 | 60 | 143 | 68 | 2.350 | 122 | 90 | 81 | 69 | 908 | 108 | 118 |
| 20 | 111 | 74 | 119 | 67 | 916 | 121 | 344 | 77 | 67 | 556 | 114 | 210 |
| 21 | 81 | 54 | 124 | 71 | 695 | 110 | 119 | 73 | 66 | 141 | 111 | 605 |
| 22 | 63 | 49 | 106 | 87 | 336 | 92 | 106 | 71 | 131 | 147 | 83 | 368 |
| 23 | 56 | 90 | 100 | 77 | 177 | 176 | 73 | 69 | 77 | 114 | 72 | 106 |
| 24 | 52 | 56 | 804 | 61 | 398 | 408 | 88 | 112 | 345 | 158 | 92 | 124 |
| 25 | 49 | 51 | 566 | 56 | 260 | 231 | 66 | 105 | 116 | 220 | 83 | 96 |
| 26 | 48 | 49 | 127 | 55 | 217 | 191 | 61 | 88 | 147 | 104 | 145 | 109 |
| 27 | 47 | 49 | 96 | 54 | 141 | 177 | 84 | 71 | 140 | 81 | 192 | 96 |
| 28 | 46 | 1.460 | 83 | 54 | 122 | 137 | 230 | 67 | 178 | 73 | 122 | 160 |
| 29 | 45 | 2.740 | 69 | 359 | ------ | 221 | 155 | 66 | 170 | 69 | 98 | 93 |
| 30 | 46 | 1.500 | 62 | 542 | ------ | 204 | 181 | 64 | 239 | 67 | 123 | 235 |
| 31 | 49 | ------ | 59 | 2.630 | ------ | 2.440 | ------ | 63 | ------ | 117 | 204 | ------ |
| TOTAL | 3.911 | 7.639 | 8.381 | 6.368 | 13.788 | 7.901 | 4.957 | 5.614 | 3.166 | 6.361 | 4.010 | 4.796 |
| MEAN | 126 | 255 | 270 | 205 | 492 | 255 | 165 | 181 | 106 | 205 | 129 | 160 |
| MAX | 1.190 | 2.740 | 1.120 | 2.630 | 2810 | 2440 | 664 | 840 | 345 | 908 | 371 | 605 |
| MIN | 42 | 42 | 59 | 54 | 65 | 71 | 61 | 63 | 59 | 67 | 66 | 70 |
| AC-FT | 7.760 | 15.150 | 16.620 | 12.630 | 27.350 | 15.670 | 9.830 | 11.140 | 6.280 | 12.620 | 7.950 | 9.510 |

CAL YR 1968: TOTAL 51,812 MEAN 142 MAX 2,740 MIN 41 AC-FT 102,800
WTR YR 1969: TOTAL 76,892 MEAN 211 MAX 2,810 MIN 42 AC-FT 152,500

PEAK DISCHARGE (BASE, 3,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-17 | 0630 | 5.03 | 3,120 | 3-31 | 1500 | 5.64 | 4,790 |
| 11-29 | 1800 | 6.24 | 7,060 | 5-11 | 2330 | 5.03 | 3,120 |
| 1-31 | 0530 | 6.30 | 7,300 | 9-21 | 2200 | 5.22 | 3,600 |
| 2-19 | 0400 | 5.72 | 5,070 | | | | |

## 16-1300. Nahomalu Valley near Mana

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

DRAINAGE AREA.--3.77 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 572 cfs Nov. 30, Jan. 5 (gage height, 4.33 ft), from rating curve extended as explained below; no flow most of year.
Period of record: Maximum discharge, 973 cfs Dec. 16, 1964 (gage height, 5.16 ft), from rating curve extended above 23 cfs on basis of slope-area measurement at gage height 5.13 ft; no flow most of each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0 | 28 | 1.2 | 7.2 | | | | | | | |
| 2 | | 0 | 21 | 1.0 | 4.6 | | | | | | | |
| 3 | | 0 | 10 | 0 | 1.4 | | | | | | | |
| 4 | | 0 | 1.9 | 0 | .58 | | | | | | | |
| 5 | | 0 | .58 | 37 | .46 | | | | | | | |
| 6 | | 0 | .09 | 26 | .27 | | | | | | | |
| 7 | | 0 | 0 | 10 | .20 | | | | | | | |
| 8 | | 0 | 9.5 | 3.6 | .06 | | | | | | | |
| 9 | | 0 | 2.2 | 1.6 | .06 | | | | | | | |
| 10 | | 0 | .27 | 1.3 | .04 | | | | | | | |
| 11 | | 0 | 0 | 1.1 | .03 | | | | | | | |
| 12 | | 0 | 0 | .89 | .02 | | | | | | | |
| 13 | | 0 | 0 | 2.5 | .03 | | | | | | | |
| 14 | | 0 | 0 | 1.5 | 0 | | | | | | | |
| 15 | | 0 | 0 | 1.3 | 0 | | | | | | | |
| 16 | | 0 | 8.0 | .98 | 0 | | | | | | | |
| 17 | | 0 | 2.2 | .80 | 0 | | | | | | | |
| 18 | | 0 | 13 | .46 | 0 | | | | | | | |
| 19 | | 0 | 1.5 | .40 | .03 | | | | | | | |
| 20 | | 0 | .01 | .40 | .06 | | | | | | | |
| 21 | | 0 | 0 | .40 | 0 | | | | | | | |
| 22 | | 0 | 0 | .40 | 0 | | | | | | | |
| 23 | | 0 | 0 | .40 | 0 | | | | | | | |
| 24 | | 0 | 21 | .40 | 0 | | | | | | | |
| 25 | | 0 | 40 | .40 | 0 | | | | | | | |
| 26 | | 0 | 7.2 | .36 | 0 | | | | | | | |
| 27 | | 0 | 2.2 | .31 | 0 | | | | | | | |
| 28 | | 0 | 1.3 | .27 | 0 | | | | | | | |
| 29 | | 0 | .58 | .27 | ------ | | | | | | | |
| 30 | | 16 | .23 | .27 | ------ | | | | | | | |
| 31 | | ------ | .02 | .27 | ------ | | ------ | | ------ | | | ------ |
| TOTAL | 0 | 16 | 170.78 | 95.78 | 15.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MEAN | 0 | .53 | 5.51 | 3.09 | .54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MAX | 0 | 16 | 40 | 37 | 7.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | 32 | 339 | 190 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CAL YR 1968: TOTAL 302.05 MEAN .83 MAX 40 MIN 0 AC-FT 599
WTR YR 1969: TOTAL 297.60 MEAN .82 MAX 40 MIN 0 AC-FT 590

PEAK DISCHARGE (BASE, 93 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-30 | 2200 | 4.33 | 572 | 12-24 | 1630 | 3.37 | 250 |
| 12-16 | 2130 | 3.05 | 176 | 1- 5 | 1200 | 4.33 | 572 |

HAWAII, ISLAND OF OAHU

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

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

DRAINAGE AREA.--1.38 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 4,330 cfs Feb. 1 (gage height, 11.38 ft), from rating curve extended above 82 cfs on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.63 cfs Nov. 13.
Period of record: Maximum discharge, 5,490 cfs Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 68 cfs by test of model of station site; maximum gage height, 12.46 ft Apr. 15, 1963; minimum discharge, 0.12 cfs Mar. 2, 13, 1941.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 81 | 1.4 | 16 | 3.2 | 970 | 37 | 76 | 7.9 | 4.2 | 18 | 6.8 | 28 |
| 2 | 13 | 1.2 | 7.2 | 175 | 283 | 41 | 51 | 143 | 3.3 | 7.4 | 7.9 | 9.0 |
| 3 | 4.8 | 1.1 | 11 | 191 | 44 | 125 | 18 | 16 | 2.8 | 17 | 5.6 | 7.7 |
| 4 | 3.7 | .93 | 67 | 25 | 26 | 70 | 13 | 34 | 4.0 | 22 | 6.8 | 7.0 |
| 5 | 3.2 | .86 | 7.8 | 14 | 44 | 79 | 12 | 72 | 2.4 | 6.6 | 5.0 | 6.4 |
| 6 | 2.8 | .80 | 5.2 | 8.1 | 25 | 26 | 13 | 19 | 2.0 | 20 | 7.1 | 5.6 |
| 7 | 2.7 | .74 | 4.0 | 6.7 | 17 | 20 | 8.7 | 10 | 1.8 | 28 | 7.7 | 14 |
| 8 | 4.6 | .68 | 3.8 | 27 | 13 | 27 | 7.7 | 8.4 | 1.7 | 13 | 6.6 | 41 |
| 9 | 3.0 | .68 | 3.2 | 34 | 10 | 122 | 8.4 | 7.9 | 1.6 | 6.8 | 4.8 | 9.0 |
| 10 | 2.4 | .74 | 2.7 | 8.1 | 9.0 | 20 | 11 | 7.0 | 48 | 11 | 15 | 59 |
| 11 | 2.2 | .74 | 2.3 | 6.0 | 7.6 | 16 | 7.2 | 36 | 35 | 7.2 | 18 | 12 |
| 12 | 2.0 | .68 | 10 | 5.0 | 6.4 | 13 | 6.6 | 9.9 | 4.2 | 7.7 | 4.8 | 7.9 |
| 13 | 1.8 | .80 | 57 | 5.2 | 12 | 10 | 11 | 6.6 | 3.0 | 13 | 5.8 | 14 |
| 14 | 1.7 | 12 | 35 | 4.2 | 39 | 9.3 | 43 | 19 | 2.6 | 11 | 5.8 | 44 |
| 15 | 11 | 1.5 | 47 | 3.7 | 55 | 9.3 | 7.7 | 24 | 2.3 | 5.4 | 60 | 9.9 |
| 16 | 5.5 | .80 | 37 | 3.6 | 56 | 178 | 6.2 | 7.2 | 2.0 | 17 | 39 | 7.2 |
| 17 | 15 | 1.2 | 16 | 3.1 | 30 | 49 | 24 | 5.8 | 1.8 | 7.9 | 46 | 55 |
| 18 | 22 | .86 | 18 | 2.8 | 184 | 57 | 14 | 5.2 | 1.6 | 35 | 14 | 21 |
| 19 | 7.8 | 7.2 | 79 | 2.7 | 237 | 22 | 9.6 | 4.7 | 1.6 | 65 | 20 | 8.7 |
| 20 | 5.2 | 5.6 | 14 | 2.4 | 60 | 14 | 25 | 4.3 | 1.6 | 78 | 12 | 49 |
| 21 | 3.0 | 1.8 | 11 | 2.3 | 27 | 12 | 7.0 | 4.0 | 1.6 | 13 | 22 | 144 |
| 22 | 2.2 | .86 | 8.7 | 2.1 | 24 | 10 | 5.8 | 3.7 | 13 | 9.9 | 8.2 | 27 |
| 23 | 2.3 | 3.6 | 7.2 | 2.0 | 16 | 8.4 | 5.8 | 3.4 | 2.7 | 15 | 13 | 13 |
| 24 | 1.8 | 1.4 | 5.6 | 1.9 | 20 | 31 | 5.6 | 3.2 | 17 | 28 | 7.4 | 18 |
| 25 | 1.6 | 1.5 | 64 | 1.8 | 34 | 36 | 4.8 | 3.3 | 5.2 | 96 | 7.9 | 14 |
| 26 | 1.4 | 2.1 | 7.8 | 1.6 | 22 | 10 | 4.2 | 5.4 | 15 | 25 | 35 | 8.7 |
| 27 | 1.4 | 1.0 | 5.8 | 1.5 | 12 | 8.2 | 20 | 4.7 | 18 | 11 | 18 | 7.7 |
| 28 | 1.3 | 43 | 6.2 | 1.4 | 10 | 7.2 | 18 | 13 | 24 | 11 | 8.4 | 7.0 |
| 29 | 1.3 | 229 | 4.6 | 66 | ------ | 7.9 | 95 | 5.2 | 10 | 7.4 | 7.2 | 6.6 |
| 30 | 2.2 | 51 | 4.0 | 123 | ------ | 7.9 | 22 | 2.9 | 25 | 7.4 | 12 | 6.6 |
| 31 | 3.2 | ------ | 3.6 | 145 | ------ | 222 | ------ | 2.6 | ------ | 15 | 56 | ------ |
| TOTAL | 217.1 | 375.77 | 571.7 | 879.4 | 2293.0 | 1305.2 | 561.3 | 499.3 | 259.0 | 635.7 | 493.8 | 668.0 |
| MEAN | 7.00 | 12.5 | 18.4 | 28.4 | 81.9 | 42.1 | 18.7 | 16.1 | 8.63 | 20.5 | 15.9 | 22.3 |
| MAX | 81 | 229 | 79 | 191 | 970 | 222 | 95 | 143 | 48 | 96 | 60 | 144 |
| MIN | 1.3 | .68 | 2.3 | 1.4 | 6.4 | 7.2 | 4.2 | 2.6 | 1.6 | 5.4 | 4.8 | 5.6 |
| AC-FT | 431 | 745 | 1130 | 1740 | 4550 | 2590 | 1110 | 990 | 514 | 1260 | 979 | 1320 |

CAL YR 1968: TOTAL 5,244.35 MEAN 14.3 MAX 827 MIN .54 AC-FT 10,400
WTR YR 1969: TOTAL 8,759.27 MEAN 24.0 MAX 970 MIN .68 AC-FT 17,370

PEAK DISCHARGE (BASE, 1,300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-2 | 2400 | 8.85 | 2,810 | 2-1 | 1130 | 11.38 | 4,330 |
| 1-30 | 2230 | 7.10 | 1,760 | 3-31 | 0530 | 7.00 | 1,700 |

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

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

DRAINAGE AREA.--4.04 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 3,120 cfs Feb. 1 (gage height, 8.21 ft), from rating curve extended as explained below; minimum, 0.96 cfs Nov. 12, 13.
Period of record: Maximum discharge, 5,460 cfs Apr. 15, 1963 (gage height, 11.33 ft), from rating curve extended above 1,100 cfs on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963.

REMARKS.--Records good. Prior to 1960, Koolau ditch diverted water into Koolau and Ku Tree Reservoirs above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 158 | 2.5 | 37 | 8.2 | 1.050 | 50 | 149 | 13 | 4.4 | 61 | 14 | 82 |
| 2 | 34 | 1.8 | 22 | 328 | 398 | 26 | 140 | 217 | 4.8 | 20 | 16 | 20 |
| 3 | 18 | 1.6 | 15 | 430 | 120 | 75 | 45 | 27 | 4.4 | 25 | 14 | 16 |
| 4 | 7.9 | 1.6 | 106 | 83 | 52 | 77 | 28 | 30 | 4.2 | 35 | 14 | 17 |
| 5 | 5.0 | 1.4 | 18 | 42 | 37 | 45 | 24 | 81 | 4.0 | 12 | 10 | 17 |
| 6 | 4.0 | 1.2 | 11 | 28 | 37 | 61 | 26 | 50 | 3.6 | 25 | 10 | 12 |
| 7 | 3.2 | 1.2 | 9.2 | 23 | 25 | 32 | 17 | 17 | 3.4 | 54 | 16 | 13 |
| 8 | 3.6 | 1.1 | 8.2 | 64 | 21 | 27 | 15 | 14 | 3.2 | 47 | 11 | 34 |
| 9 | 7.3 | 1.1 | 7.9 | 87 | 18 | 125 | 14 | 13 | 2.9 | 15 | 7.9 | 16 |
| 10 | 3.8 | 1.2 | 6.5 | 32 | 16 | 33 | 15 | 13 | 37 | 14 | 7.3 | 27 |
| 11 | 2.7 | 1.2 | 5.7 | 22 | 15 | 26 | 14 | 12 | 61 | 11 | 12 | 18 |
| 12 | 2.4 | .96 | 8.2 | 17 | 13 | 21 | 12 | 17 | 7.0 | 8.9 | 7.3 | 11 |
| 13 | 2.1 | 1.1 | 90 | 16 | 12 | 18 | 12 | 9.6 | 4.4 | 8.9 | 14 | 22 |
| 14 | 1.8 | 10 | 49 | 14 | 53 | 16 | 24 | 14 | 3.6 | 41 | 12 | 21 |
| 15 | 1.7 | 4.2 | 34 | 13 | 63 | 16 | 12 | 34 | 3.0 | 17 | 59 | 12 |
| 16 | 3.6 | 1.7 | 69 | 12 | 110 | 160 | 9.6 | 12 | 2.7 | 26 | 18 | 8.2 |
| 17 | 15 | 2.0 | 31 | 10 | 40 | 109 | 44 | 8.2 | 2.5 | 19 | 56 | 23 |
| 18 | 17 | 1.7 | 32 | 8.9 | 113 | 117 | 28 | 7.3 | 2.4 | 13 | 28 | 25 |
| 19 | 17 | 4.2 | 164 | 8.6 | 176 | 42 | 22 | 7.0 | 2.9 | 81 | 28 | 9.6 |
| 20 | 14 | 7.9 | 36 | 8.2 | 92 | 25 | 102 | 7.0 | 3.2 | 59 | 29 | 33 |
| 21 | 6.2 | 2.7 | 22 | 8.2 | 41 | 21 | 21 | 6.8 | 2.7 | 20 | 48 | 115 |
| 22 | 3.8 | 1.6 | 22 | 7.3 | 34 | 21 | 14 | 6.5 | 14 | 16 | 14 | 38 |
| 23 | 5.3 | 1.3 | 15 | 6.8 | 27 | 16 | 12 | 6.2 | 5.3 | 25 | 21 | 15 |
| 24 | 3.4 | 1.6 | 13 | 6.2 | 49 | 53 | 11 | 6.0 | 4.6 | 50 | 20 | 19 |
| 25 | 2.4 | 1.5 | 134 | 6.0 | 80 | 58 | 9.6 | 6.2 | 7.0 | 100 | 14 | 20 |
| 26 | 2.1 | 2.5 | 24 | 5.7 | 52 | 22 | 8.9 | 11 | 8.9 | 50 | 28 | 11 |
| 27 | 2.0 | 2.9 | 16 | 5.3 | 27 | 16 | 8.6 | 6.8 | 57 | 20 | 29 | 9.2 |
| 28 | 1.8 | 62 | 15 | 5.0 | 20 | 14 | 14 | 21 | 24 | 20 | 13 | 9.2 |
| 29 | 2.1 | 416 | 12 | 81 | ------ | 22 | 80 | 8.2 | 12 | 15 | 11 | 9.2 |
| 30 | 2.1 | 123 | 10 | 98 | ------ | 19 | 67 | 5.5 | 49 | 13 | 30 | 9.2 |
| 31 | 3.8 | ------ | 9.2 | 113 | ------ | 285 | ------ | 4.4 | ------ | 19 | 55 | ------ |
| TOTAL | 357.1 | 664.76 | 1,051.9 | 1,597.4 | 2,791 | 1,648 | 998.7 | 691.7 | 349.1 | 940.8 | 666.5 | 691.6 |
| MEAN | 11.5 | 22.2 | 33.9 | 51.5 | 99.7 | 53.2 | 33.3 | 22.3 | 11.6 | 30.3 | 21.5 | 23.1 |
| MAX | 158 | 416 | 164 | 430 | 1,050 | 285 | 149 | 217 | 61 | 100 | 59 | 115 |
| MIN | 1.7 | .96 | 5.7 | 5.0 | 12 | 14 | 8.6 | 4.4 | 2.4 | 8.9 | 7.3 | 8.2 |
| AC-FT | 708 | 1,320 | 2,090 | 3,170 | 5,540 | 3,270 | 1,980 | 1,370 | 692 | 1,870 | 1,320 | 1,370 |

CAL YR 1968: TOTAL 7,097.46 MEAN 19.4 MAX 817 MIN .96 AC-FT 14,080
WTR YR 1969: TOTAL 12,448.56 MEAN 34.1 MAX 1,050 MIN .96 AC-FT 24,690

PEAK DISCHARGE (BASE, 700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1700 | 4.68 | 870 | 1-30 | 2330 | 4.55 | 805 |
| 11-29 | 1730 | 4.43 | 745 | 2- 1 | 1530 | 8.21 | 3,120 |
| 1- 2 | 1230 | 5.82 | 1,520 | 3-31 | 1630 | 5.35 | 1,240 |
| 1- 3 | 0130 | 5.72 | 1,460 | 5- 2 | 0230 | 5.58 | 1,380 |

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

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

DRAINAGE AREA.--0.86 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,300 cfs Jan. 2 (gage height, 6.14 ft), from rating curve extended above 170 cfs; no flow Nov. 3-5.
Period of record: Maximum discharge, 3,160 cfs Jan. 5, 1968 (gage height, 7.68 ft), from rating curve extended above 170 cfs; no flow at times.

REMARKS.--Records fair. Diversion from South Fork Kaukonahua Stream into Ku Tree Reservoir (capacity, 899 acre-ft) above station, then to Schofield Barracks for domestic use.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 48 | .05 | 8.5 | 1.3 | 120 | 8.7 | 14 | 1.5 | 1.1 | 1.3 | 1.6 | 9.3 |
| 2 | 6.4 | .02 | 3.2 | 100 | 65 | 7.2 | 7.9 | 20 | .87 | .50 | 1.8 | 2.7 |
| 3 | 3.9 | 0 | 2.4 | 110 | 14 | 16 | 3.5 | 7.8 | .99 | .60 | 1.7 | 2.1 |
| 4 | 1.1 | 0 | 5.0 | 20 | 6.2 | 17 | 2.8 | 5.0 | .67 | .90 | 2.4 | 1.7 |
| 5 | .36 | 0 | 1.2 | 8.0 | 4.7 | 5.2 | 2.7 | 2.5 | .52 | .40 | 1.2 | 1.8 |
| 6 | .16 | .01 | .68 | 4.0 | 4.0 | 9.8 | 2.9 | 4.1 | .49 | .60 | 1.1 | 1.2 |
| 7 | .06 | .01 | .47 | 3.0 | 3.4 | 5.2 | 2.2 | 2.5 | .33 | 1.2 | .77 | 1.1 |
| 8 | .05 | .02 | .46 | 20 | 3.2 | 4.2 | 2.0 | 1.8 | .59 | 1.0 | .83 | 1.3 |
| 9 | .06 | .03 | .40 | 25 | 3.0 | 18 | 2.1 | 2.0 | .31 | .50 | .79 | .89 |
| 10 | .16 | .03 | .26 | 6.0 | 2.9 | 5.1 | 2.3 | 1.7 | 1.1 | .45 | .67 | 1.3 |
| 11 | .09 | .03 | .16 | 3.5 | 2.8 | 3.9 | 2.2 | 1.6 | 1.3 | .35 | .85 | 1.1 |
| 12 | .05 | .02 | 1.2 | 2.5 | 2.6 | 3.4 | 1.8 | 1.3 | .40 | .30 | .74 | .73 |
| 13 | .05 | .04 | 2.9 | 2.0 | 2.7 | 3.2 | 2.1 | 1.3 | .39 | .30 | 1.8 | 15 |
| 14 | .07 | .55 | .89 | 1.5 | 2.6 | 3.1 | 6.0 | 1.5 | .35 | .80 | 1.4 | 2.7 |
| 15 | .05 | .41 | .10 | 1.0 | 2.4 | 2.8 | 2.0 | 1.4 | .30 | .45 | 1.6 | 1.3 |
| 16 | .05 | .16 | 9.7 | .80 | 2.8 | 7.0 | 1.7 | 1.0 | .20 | .60 | .99 | .98 |
| 17 | .54 | .27 | 5.6 | .60 | 6.5 | 7.0 | 1.9 | 1.1 | .15 | .40 | 7.3 | .90 |
| 18 | 9.0 | .18 | 8.5 | .45 | 11 | 4.4 | 4.2 | .99 | .10 | .35 | 1.7 | 1.1 |
| 19 | 6.1 | .50 | 33 | .35 | 12 | 3.0 | 5.5 | .87 | .15 | 2.0 | 1.8 | .68 |
| 20 | 3.3 | 1.1 | 7.6 | .30 | 16 | 2.9 | 22 | .96 | .30 | 1.5 | 1.6 | 5.5 |
| 21 | .87 | .26 | 3.7 | .25 | 7.5 | 2.5 | 3.8 | 1.1 | .25 | .50 | .99 | 4.0 |
| 22 | .34 | .07 | 2.4 | .20 | 6.2 | 2.6 | 2.4 | .99 | .70 | .40 | .66 | 2.9 |
| 23 | .20 | .06 | 1.5 | .15 | 4.2 | 2.2 | 2.3 | .97 | .45 | .80 | .95 | 1.6 |
| 24 | .12 | .03 | 2.0 | .10 | 8.7 | 2.5 | 2.1 | .70 | .40 | 3.0 | .92 | 1.8 |
| 25 | .04 | .05 | 32 | .08 | 8.2 | 2.4 | 1.9 | .97 | .45 | 10 | 2.3 | 7.2 |
| 26 | .03 | .07 | 3.7 | .06 | 7.5 | 2.0 | 1.9 | 1.3 | .60 | 3.0 | 6.2 | 2.0 |
| 27 | .04 | .02 | 2.2 | 1.0 | 3.8 | 1.9 | 1.9 | .79 | 1.2 | 2.0 | 6.2 | 1.2 |
| 28 | .04 | 8.5 | 2.2 | 1.5 | 3.4 | 1.8 | 1.7 | .80 | .50 | 1.8 | 1.6 | 1.1 |
| 29 | .04 | 36 | 1.6 | 10 | ------ | 1.8 | 1.6 | .86 | .60 | 1.6 | 1.1 | 1.1 |
| 30 | .04 | 23 | 1.2 | 7.4 | ------ | 1.8 | 1.8 | .78 | 1.1 | 1.5 | 2.6 | 1.2 |
| 31 | .09 | ------ | 1.2 | 12 | ------ | 38 | ------ | .92 | ------ | 3.6 | 6.7 | ------ |
| TOTAL | 81.40 | 71.49 | 145.92 | 343.04 | 337.3 | 196.6 | 113.2 | 71.10 | 16.86 | 42.70 | 62.86 | 77.48 |
| MEAN | 2.63 | 2.38 | 4.71 | 11.1 | 12.0 | 6.34 | 3.77 | 2.29 | .56 | 1.38 | 2.03 | 2.58 |
| MAX | 48 | 36 | 33 | 110 | 120 | 38 | 22 | 20 | 1.3 | 10 | 7.3 | 15 |
| MIN | .03 | 0 | .10 | .06 | 2.4 | 1.8 | 1.6 | .70 | .10 | .30 | .66 | .68 |
| AC-FT | 161 | 142 | 289 | 680 | 669 | 390 | 225 | 141 | 33 | 85 | 125 | 154 |

CAL YR 1968 TOTAL 1,306.36 MEAN 3.57 MAX 216 MIN 0 AC-FT 2,590
WTR YR 1969 TOTAL 1,559.95 MEAN 4.27 MAX 120 MIN 0 AC-FT 3,090

NOTE.--No gage-height record Jan. 2-27, June 14 to July 30.

## 16-2109. Poamoho tunnel near Wahiawa

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

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

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

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

REMARKS.--Records good except those for period of no gage-height record, which are poor. Tunnel diverts from Poamoho Stream to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 35 | .50 | 13 | 3.0 | 78 | 18 | 29 | 4.7 | 1.8 | 6.3 | 3.9 | 6.6 |
| 2 | 9.0 | .35 | 6.9 | 22 | 68 | 27 | 25 | 54 | 1.8 | 3.2 | 4.0 | 2.9 |
| 3 | 2.5 | .30 | 9.7 | 35 | 40 | 53 | 17 | 7.3 | 1.5 | 2.7 | 3.1 | 2.4 |
| 4 | 1.5 | .28 | 31 | 24 | 19 | 32 | 12 | 9.3 | 1.7 | 7.7 | 2.9 | 2.3 |
| 5 | 1.0 | .27 | 7.3 | 15 | 22 | 25 | 10 | 16 | 1.6 | 2.8 | 2.6 | 2.1 |
| 6 | .88 | .26 | 4.4 | 10 | 22 | 20 | 14 | 7.8 | 1.3 | 3.2 | 2.3 | 1.8 |
| 7 | .76 | .26 | 3.4 | 8.0 | 11 | 14 | 7.8 | 4.7 | 1.2 | 12 | 2.6 | 4.1 |
| 8 | 3.5 | .22 | 3.0 | 16 | 9.5 | 11 | 6.9 | 3.9 | 1.1 | 6.5 | 2.2 | 5.5 |
| 9 | 2.0 | .20 | 3.0 | 21 | 8.0 | 18 | 6.8 | 3.5 | 1.1 | 2.6 | 1.8 | 2.9 |
| 10 | 1.1 | .24 | 2.3 | 11 | 7.3 | 9.7 | 8.0 | 3.4 | 15 | 5.1 | 3.2 | 18 |
| 11 | .90 | .66 | 2.0 | 7.5 | 6.8 | 8.0 | 6.1 | 15 | 20 | 3.3 | 10 | 6.0 |
| 12 | .68 | .41 | 9.2 | 6.4 | 6.2 | 7.1 | 5.6 | 6.1 | 2.7 | 2.4 | 2.4 | 3.0 |
| 13 | .35 | .35 | 30 | 6.1 | 5.8 | 6.4 | 5.1 | 3.4 | 1.7 | 2.1 | 2.3 | 3.1 |
| 14 | .30 | 9.1 | 13 | 5.3 | 23 | 6.1 | 15 | 9.3 | 1.3 | 5.6 | 2.4 | 17 |
| 15 | 7.2 | 1.2 | 12 | 4.8 | 29 | 5.9 | 6.4 | 14 | 1.1 | 2.2 | 8.3 | 4.6 |
| 16 | 4.5 | .50 | 14 | 4.5 | 31 | 27 | 4.7 | 4.8 | 1.1 | 2.7 | 28 | 2.4 |
| 17 | 10 | .41 | 12 | 3.9 | 15 | 27 | 8.0 | 3.3 | .98 | 2.4 | 12 | 2.5 |
| 18 | 14 | .62 | 11 | 3.5 | 43 | 23 | 7.7 | 2.9 | .93 | 8.8 | 4.7 | 5.8 |
| 19 | 6.0 | 3.5 | 23 | 3.3 | 54 | 12 | 6.4 | 2.8 | .88 | 44 | 6.0 | 3.3 |
| 20 | 3.0 | 2.2 | 12 | 3.1 | 31 | 7.5 | 23 | 2.6 | .88 | 16 | 5.4 | 7.0 |
| 21 | 2.0 | .74 | 7.1 | 3.0 | 17 | 6.4 | 5.8 | 2.4 | .83 | 4.5 | 6.6 | 65 |
| 22 | 1.5 | .41 | 6.2 | 2.8 | 12 | 5.9 | 4.4 | 2.4 | 2.1 | 3.3 | 2.9 | 11 |
| 23 | 1.1 | .35 | 5.3 | 2.7 | 10 | 5.1 | 4.2 | 2.2 | 1.5 | 3.2 | 2.4 | 4.5 |
| 24 | .90 | .70 | 4.0 | 2.4 | 10 | 18 | 4.7 | 2.0 | 38 | 33 | 2.4 | 9.5 |
| 25 | .76 | 1.0 | 23 | 2.3 | 21 | 21 | 3.6 | 2.2 | 7.7 | 71 | 2.8 | 4.5 |
| 26 | .60 | 5.4 | 7.7 | 2.2 | 17 | 7.5 | 3.3 | 2.2 | 8.8 | 24 | 11 | 3.0 |
| 27 | .54 | .98 | 5.3 | 2.0 | 9.1 | 5.4 | 8.6 | 2.4 | 10 | 7.5 | 32 | 2.6 |
| 28 | .45 | 14 | 4.8 | 1.9 | 7.3 | 4.8 | 18 | 2.2 | 15 | 5.3 | 5.0 | 2.4 |
| 29 | .45 | 50 | 4.2 | 18 | ------ | 5.0 | 18 | 2.7 | 7.8 | 4.2 | 3.1 | 2.4 |
| 30 | .70 | 29 | 3.6 | 28 | ------ | 5.6 | 12 | 1.9 | 5.9 | 3.8 | 3.2 | 2.4 |
| 31 | 1.4 | ------ | 3.3 | 49 | ------ | 36 | ------ | 1.6 | ------ | 5.1 | 17 | ------ |
| TOTAL | 114.57 | 124.41 | 296.7 | 327.7 | 633.0 | 478.4 | 307.1 | 203.0 | 157.30 | 306.5 | 198.5 | 210.6 |
| MEAN | 3.70 | 4.15 | 9.57 | 10.6 | 22.6 | 15.4 | 10.2 | 6.55 | 5.24 | 9.89 | 6.40 | 7.02 |
| MAX | 35 | 50 | 31 | 49 | 78 | 53 | 29 | 54 | 38 | 71 | 32 | 65 |
| MIN | .30 | .20 | 2.0 | 1.9 | 5.8 | 4.8 | 3.3 | 1.6 | .83 | 2.1 | 1.8 | 1.8 |
| AC-FT | 227 | 247 | 588 | 650 | 1.260 | 949 | 609 | 403 | 312 | 608 | 394 | 418 |

CAL YR 1968: TOTAL 2,471.04 MEAN 6.75 MAX 265 MIN .02 AC-FT 4,900
WTR YR 1969: TOTAL 3,357.78 MEAN 9.20 MAX 78 MIN .20 AC-FT 6,660

NOTE.--No gage-height record Oct. 1 to Nov. 5.

## 16-2110. Poamoho Stream near Wahiawa

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

DRAINAGE AREA.--1.79 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 3,070 cfs Feb. 1 (gage height, 9.09 ft), from rating curve extended as explained below; minimum, 0.01 cfs on many days.
Period of record: Maximum discharge, 3,630 cfs Mar. 16, 1968 (gage height, 10.32 ft), from rating curve extended above 75 cfs on basis of slope-area measurement at gage height 7.26 ft; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Poamoho tunnel (see sta 16-2109) diverts 180 ft above station to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 51 | .13 | 1.1 | .26 | 620 | 1.1 | 41 | .01 | .01 | .04 | .02 | .08 |
| 2 | 1.3 | .06 | .83 | 155 | 93 | 7.3 | 14 | .08 | .02 | .05 | .04 | .02 |
| 3 | .61 | .04 | 1.8 | 170 | 1.3 | 107 | .24 | .03 | .02 | .05 | .04 | .01 |
| 4 | .44 | .04 | 26 | 13 | .07 | 5.5 | .16 | .05 | .03 | .06 | .06 | .01 |
| 5 | .39 | .03 | .77 | .10 | .97 | 1.7 | .16 | .05 | .02 | .06 | .01 | .01 |
| 6 | .34 | .04 | .62 | .03 | .12 | .15 | .94 | .05 | .03 | .05 | .01 | .01 |
| 7 | .28 | .03 | .54 | .04 | .02 | .08 | .15 | .06 | .02 | .06 | .01 | .02 |
| 8 | .26 | .02 | .49 | 17 | .03 | .08 | .14 | .08 | .02 | .05 | .02 | .03 |
| 9 | .37 | .03 | .47 | 10 | .04 | .15 | .15 | .09 | .03 | .06 | .04 | .04 |
| 10 | .33 | .06 | .35 | .04 | .05 | .06 | .16 | .11 | .05 | .06 | .02 | .02 |
| 11 | .21 | .35 | .27 | .04 | .06 | .04 | .14 | .12 | .01 | .06 | .10 | .01 |
| 12 | .16 | .19 | .71 | .04 | .06 | .03 | .15 | .11 | .01 | .02 | .10 | .02 |
| 13 | .13 | .09 | 13 | .06 | .07 | .04 | .15 | .12 | .01 | .01 | .10 | .03 |
| 14 | .10 | 2.3 | 1.2 | .02 | .57 | .04 | 1.2 | .13 | .01 | .01 | .10 | .03 |
| 15 | .12 | .62 | 4.6 | .04 | 1.5 | .06 | .07 | .12 | .01 | .01 | .14 | .02 |
| 16 | .75 | .11 | 11 | .05 | 3.9 | 29 | .01 | .12 | .01 | .02 | .04 | .02 |
| 17 | 1.8 | .07 | 1.3 | .06 | .52 | 4.6 | .02 | .13 | .01 | .03 | .02 | .04 |
| 18 | 2.4 | .22 | 10 | .06 | 43 | 4.8 | .04 | .12 | .01 | .05 | .01 | .05 |
| 19 | .59 | .57 | 42 | .07 | 96 | .15 | .05 | .01 | .01 | .04 | .01 | .04 |
| 20 | .51 | 1.4 | 1.1 | .07 | .68 | .05 | .09 | .01 | .02 | .02 | .01 | .05 |
| 21 | .39 | .27 | .89 | .05 | .09 | .04 | .01 | .01 | .02 | .01 | .01 | .42 |
| 22 | .27 | .10 | .83 | .03 | .08 | .04 | .01 | .01 | .02 | .01 | .01 | .01 |
| 23 | .23 | .07 | .77 | .05 | .05 | .05 | .02 | .01 | .01 | .01 | .02 | .01 |
| 24 | .19 | .29 | .68 | .06 | .08 | .80 | .03 | .01 | .10 | .02 | .02 | .01 |
| 25 | .15 | .58 | 45 | .07 | 3.1 | 3.8 | .03 | .02 | .01 | .10 | .01 | .01 |
| 26 | .13 | 1.9 | .85 | .07 | .14 | .09 | .02 | .02 | .02 | .01 | .06 | .01 |
| 27 | .11 | .29 | .68 | .04 | .04 | .03 | .03 | .03 | .04 | .01 | .02 | .01 |
| 28 | .10 | 28 | .62 | .01 | .03 | .02 | .01 | .03 | .03 | .01 | .01 | .01 |
| 29 | .10 | 75 | .47 | 2.7 | ------ | .04 | .01 | .04 | .01 | .01 | .01 | .01 |
| 30 | .16 | 16 | .31 | 23 | ------ | .07 | .01 | .04 | .02 | .01 | .01 | .01 |
| 31 | .22 | ------ | .25 | 65 | ------ | 289 | ------ | .04 | ------ | .05 | .10 | ------ |
| TOTAL | 64.14 | 128.90 | 169.50 | 457.06 | 865.57 | 455.91 | 59.20 | 1.86 | 0.64 | 1.06 | 1.18 | 1.07 |
| MEAN | 2.07 | 4.30 | 5.47 | 14.7 | 30.9 | 14.7 | 1.97 | .060 | .021 | .034 | .038 | .036 |
| MAX | 51 | 75 | 45 | 170 | 620 | 289 | 41 | .13 | .10 | .10 | .14 | .42 |
| MIN | .10 | .02 | .25 | .01 | .02 | .02 | .01 | .01 | .01 | .01 | .01 | .01 |
| AC-FT | 127 | 256 | 336 | 907 | 1,720 | 904 | 117 | 3.7 | 1.3 | 2.1 | 2.3 | 2.1 |

CAL YR 1968 TOTAL 1,552.45 MEAN 4.24 MAX 540 MIN .02 AC-FT 3,080
WTR YR 1969 TOTAL 2,206.09 MEAN 6.04 MAX 620 MIN .01 AC-FT 4,380

NOTE.--No gage-height record July 24 to Sept. 3.

## 16-2116. Makaha Stream near Makaha

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

DRAINAGE AREA.--2.31 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 308 cfs Dec. 3 (gage height, 3.83 ft), from rating curve extended as explained below; minimum, 0.12 cfs Nov. 6-12.
Period of record: Maximum discharge, 1,170 cfs Mar. 13, 1962 (gage height, 6.50 ft, from floodmarks), from rating curve extended above 51 cfs on basis of slope-area measurement of peak flow; no flow at times.
Maximum stage known since at least 1953, about 7.8 ft Nov. 24, 1954, from information by local resident (discharge, about 1,700 cfs).

REMARKS.--Records good. Wells and water-development tunnels in the vicinity and above the station may affect low-flow records. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.4 | .20 | 18 | 3.3 | 5.2 | 1.6 | 7.3 | .99 | .78 | .60 | .50 | .31 |
| 2 | 2.0 | .17 | 10 | 33 | 7.9 | 1.5 | 6.0 | 3.0 | .72 | .60 | .50 | .27 |
| 3 | 4.3 | .17 | 40 | 46 | 4.8 | 1.5 | 4.2 | 1.3 | .66 | .60 | .50 | .27 |
| 4 | 1.8 | .14 | 47 | 17 | 3.2 | 1.5 | 3.3 | 1.1 | .60 | .60 | .45 | .27 |
| 5 | .61 | .14 | 18 | 12 | 2.5 | 1.4 | 2.9 | .99 | .60 | .55 | .45 | .27 |
| 6 | .52 | .14 | 9.3 | 8.7 | 2.1 | 1.3 | 2.7 | 1.1 | .60 | .55 | .40 | .27 |
| 7 | .42 | .12 | 6.2 | 6.8 | 1.9 | 1.2 | 2.5 | 1.1 | .60 | .55 | .40 | .27 |
| 8 | .42 | .12 | 5.7 | 8.1 | 1.8 | 1.2 | 2.2 | .92 | .60 | .72 | .40 | .27 |
| 9 | .63 | .12 | 4.6 | 9.0 | 1.7 | 1.1 | 2.1 | .85 | .55 | .60 | .40 | .31 |
| 10 | .69 | .12 | 3.3 | 6.8 | 1.6 | 1.1 | 1.9 | .85 | 1.4 | .55 | .40 | .45 |
| 11 | .52 | .12 | 2.7 | 5.5 | 1.5 | 1.1 | 1.9 | .85 | 1.5 | .55 | .35 | .63 |
| 12 | .63 | .14 | 3.8 | 4.6 | 1.5 | 1.1 | 1.7 | .85 | .85 | .50 | .31 | .40 |
| 13 | .52 | .34 | 6.2 | 5.3 | 6.1 | .98 | 1.7 | 1.3 | .72 | .55 | .31 | .35 |
| 14 | .42 | 1.2 | 4.0 | 4.2 | 7.3 | 1.1 | 1.6 | 3.0 | .60 | .92 | .31 | .35 |
| 15 | .97 | .47 | 3.2 | 3.7 | 4.6 | 2.1 | 1.6 | 2.1 | .85 | .72 | .31 | .40 |
| 16 | .88 | .38 | 5.0 | 3.5 | 3.7 | 4.6 | 1.5 | 1.4 | 2.5 | .72 | .31 | .35 |
| 17 | .63 | .34 | 6.5 | 2.7 | 2.9 | 6.9 | 1.4 | 1.1 | 2.4 | .78 | .35 | .35 |
| 18 | .52 | .30 | 6.8 | 2.5 | 2.4 | 3.3 | 1.4 | .99 | 1.3 | .60 | .31 | .35 |
| 19 | .38 | .30 | 47 | 5.8 | 2.2 | 2.2 | 1.5 | .92 | 1.1 | 1.1 | .31 | .31 |
| 20 | .38 | .42 | 19 | 3.5 | 2.5 | 1.8 | 2.2 | .92 | .92 | 1.6 | .35 | .31 |
| 21 | .34 | .30 | 18 | 3.5 | 2.6 | 1.6 | 1.6 | .85 | .78 | .85 | .35 | 2.1 |
| 22 | .30 | .30 | 14 | 2.6 | 2.2 | 1.4 | 1.6 | .85 | .72 | .60 | .35 | 1.2 |
| 23 | .30 | .26 | 8.7 | 2.2 | 2.1 | 1.3 | 1.2 | .78 | .66 | .55 | .31 | .78 |
| 24 | .26 | .26 | 7.7 | 2.0 | 1.9 | 8.9 | 1.2 | .72 | .78 | .50 | .35 | .55 |
| 25 | .23 | .42 | 32 | 1.9 | 3.1 | 8.1 | 1.1 | .72 | .72 | .66 | .31 | .45 |
| 26 | .23 | .34 | 14 | 1.7 | 3.5 | 5.3 | 1.1 | .72 | .78 | 1.2 | .31 | .35 |
| 27 | .23 | .34 | 8.7 | 1.6 | 2.2 | 4.2 | 1.1 | .66 | 1.1 | .78 | .35 | .31 |
| 28 | .23 | 29 | 7.3 | 1.7 | 1.8 | 2.9 | 1.1 | .72 | .92 | .60 | .35 | .31 |
| 29 | .20 | 26 | 6.0 | 1.8 | ------ | 3.3 | 1.1 | 1.1 | .78 | .55 | .31 | .31 |
| 30 | .20 | 31 | 4.8 | 1.9 | ------ | 3.0 | .99 | .99 | .66 | .50 | .31 | .31 |
| 31 | .20 | ------ | 3.8 | 1.6 | ------ | 3.5 | ------ | .85 | ------ | .55 | .35 | ------ |
| TOTAL | 23.56 | 93.67 | 391.3 | 214.5 | 86.8 | 82.08 | 63.69 | 34.59 | 27.75 | 21.30 | 11.27 | 13.43 |
| MEAN | .76 | 3.12 | 12.6 | 6.92 | 3.10 | 2.65 | 2.12 | 1.12 | .92 | .69 | .36 | .45 |
| MAX | 4.3 | 31 | 47 | 46 | 7.9 | 8.9 | 7.3 | 3.0 | 2.5 | 1.6 | .50 | 2.1 |
| MIN | .20 | .12 | 2.7 | 1.6 | 1.5 | .98 | .99 | .66 | .55 | .50 | .31 | .27 |
| AC-FT | 47 | 186 | 776 | 425 | 172 | 163 | 126 | 69 | 55 | 42 | 22 | 27 |

CAL YR 1968: TOTAL 1,039.14 MEAN 2.84 MAX 47 MIN .10 AC-FT 2,060
WTR YR 1969: TOTAL 1,063.94 MEAN 2.91 MAX 47 MIN .12 AC-FT 2,110

PEAK DISCHARGE (BASE, 160 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-28 | 1630 | 3.67 | 268 | 12-19 | 0500 | 3.70 | 275 |
| 12- 3 | 0500 | 3.83 | 308 | 1- 3 | 0330 | 3.47 | 218 |

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

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

DRAINAGE AREA.--3.58 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 863 cfs Jan. 3 (gage height, 4.27 ft), from rating curve extended as explained below; minimum, 0.12 cfs Nov. 3.
Period of record: Maximum discharge, 1,340 cfs Dec. 23, 1964 (gage height, 4.75 ft), from rating curve extended above 160 cfs on basis of slope-area measurement at gage height 4.06 ft; no flow at times.

REMARKS.--Records good. Several water-development tunnels above station may affect flow.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .46 | .14 | 13 | 1.9 | 2.2 | 1.1 | 1.1 | .87 | .67 | .44 | .35 | .27 |
| 2 | .42 | .14 | 4.1 | 80 | 5.7 | 1.1 | 1.0 | 1.5 | .65 | .42 | .37 | .27 |
| 3 | .51 | .14 | 24 | 113 | 3.4 | 1.1 | .97 | 1.0 | .62 | .44 | .36 | .28 |
| 4 | .94 | .17 | 27 | 31 | 2.4 | 1.1 | .93 | .89 | .64 | .46 | .32 | .27 |
| 5 | .46 | .17 | 7.2 | 21 | 2.0 | 1.1 | .95 | .88 | .62 | .44 | .32 | .27 |
| 6 | .38 | .17 | 3.6 | 13 | 1.8 | 1.1 | .94 | .93 | .62 | .43 | .31 | .27 |
| 7 | .34 | .17 | 2.4 | 8.9 | 1.7 | 1.1 | .90 | .89 | .62 | .42 | .30 | .27 |
| 8 | .34 | .17 | 1.9 | 14 | 1.4 | 1.1 | .90 | .87 | .64 | .43 | .30 | .27 |
| 9 | .38 | .17 | 1.2 | 25 | 1.6 | 1.0 | .94 | .91 | .63 | .44 | .31 | .27 |
| 10 | .34 | .14 | .74 | 13 | 1.5 | 1.0 | .96 | .89 | .77 | .46 | .29 | .29 |
| 11 | .34 | .14 | .56 | 7.7 | 1.5 | 1.0 | .93 | .86 | .64 | .46 | .29 | .28 |
| 12 | .34 | .14 | .62 | 5.7 | 1.4 | 1.0 | .90 | .84 | .56 | .48 | .28 | .27 |
| 13 | .34 | .17 | .94 | 5.9 | 1.5 | 1.2 | .87 | .88 | .59 | .46 | .28 | .26 |
| 14 | .30 | .20 | .56 | 4.7 | 1.6 | 1.1 | .89 | .89 | .57 | .40 | .29 | .27 |
| 15 | .30 | .17 | .56 | 3.9 | 1.4 | 1.1 | .87 | .84 | .62 | .39 | .28 | .28 |
| 16 | .34 | .17 | .74 | 3.4 | 1.4 | 1.1 | .86 | .82 | .59 | .40 | .29 | .26 |
| 17 | .30 | .17 | 1.0 | 2.8 | 1.3 | 1.2 | .87 | .80 | .56 | .39 | .30 | .26 |
| 18 | .30 | .17 | 2.8 | 2.4 | 1.3 | 1.1 | .92 | .77 | .52 | .38 | .29 | .25 |
| 19 | .30 | .17 | 97 | 3.6 | 1.3 | .95 | .92 | .75 | .48 | .37 | .28 | .25 |
| 20 | .30 | .17 | 25 | 2.5 | 1.3 | .93 | .97 | .74 | .47 | .36 | .27 | .26 |
| 21 | .30 | .17 | 9.2 | 2.9 | 1.2 | .95 | .87 | .72 | .43 | .35 | .27 | .27 |
| 22 | .30 | .14 | 5.9 | 2.2 | 1.2 | .95 | .86 | .71 | .45 | .34 | .27 | .27 |
| 23 | .30 | .14 | 4.3 | 2.1 | 1.2 | .97 | .84 | .70 | .53 | .34 | .28 | .26 |
| 24 | .30 | .17 | 4.3 | 1.9 | 1.2 | 1.1 | .84 | .69 | .47 | .35 | .28 | .26 |
| 25 | .26 | .17 | 53 | 1.7 | 1.3 | 1.1 | .84 | .67 | .48 | .35 | .27 | .26 |
| 26 | .23 | .17 | 11 | 1.6 | 1.3 | 1.0 | .85 | .66 | .48 | .39 | .27 | .26 |
| 27 | .20 | .17 | 6.2 | 1.5 | 1.2 | 1.0 | .86 | .64 | .48 | .36 | .27 | .26 |
| 28 | .20 | 12 | 4.9 | 1.4 | 1.2 | .98 | .87 | .68 | .46 | .36 | .27 | .26 |
| 29 | .20 | 9.2 | 3.9 | 1.4 | ------ | 1.0 | .86 | .74 | .44 | .34 | .27 | .25 |
| 30 | .17 | 24 | 3.1 | 1.3 | ------ | .99 | .86 | .71 | .43 | .34 | .27 | .27 |
| 31 | .17 | ------ | 2.4 | 1.1 | ------ | 1.0 | ------ | .69 | ------ | .33 | .27 | ------ |
| TOTAL | 10.36 | 49.58 | 323.12 | 382.5 | 47.5 | 32.52 | 27.14 | 25.43 | 16.73 | 12.32 | 9.07 | 7.99 |
| MEAN | .33 | 1.65 | 10.4 | 12.3 | 1.70 | 1.05 | .90 | .82 | .56 | .40 | .29 | .27 |
| MAX | .94 | 24 | 97 | 113 | 5.7 | 1.2 | 1.1 | 1.5 | .77 | .48 | .37 | .29 |
| MIN | .17 | .14 | .56 | 1.1 | 1.2 | .93 | .84 | .64 | .43 | .33 | .27 | .25 |
| AC-FT | 21 | 98 | 641 | 759 | 94 | 65 | 54 | 50 | 33 | 24 | 18 | 16 |

CAL YR 1968 TOTAL 712.33 MEAN 1.95 MAX 97 MIN .14 AC-FT 1,410
WTR YR 1969 TOTAL 944.26 MEAN 2.59 MAX 113 MIN .14 AC-FT 1,870

PEAK DISCHARGE (BASE, 31 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-28 | 1645 | 2.66 | 89 | 12-25 | 0530 | 2.87 | 132 |
| 11-30 | 0400 | 2.73 | 101 | 1- 3 | 0345 | 4.27 | 863 |
| 12- 3 | 0515 | 2.90 | 140 | 1- 9 | 1330 | 2.78 | 111 |
| 12-19 | 0445 | 4.03 | 664 | | | | |

## 16-2128. Kipapa Stream near Wahiawa

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

DRAINAGE AREA.--4.29 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 2,720 cfs Feb. 1 (gage height, 9.84 ft), from rating curve extended as explained below; no flow part of Nov. 11, 12.
Period of record: Maximum discharge, 5,680 cfs May 14, 1963 (gage height, 12.29 ft), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 7.96 and 12.29 ft; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 89 | .29 | 30 | 5.4 | 594 | 23 | 84 | 5.1 | 2.2 | 10 | 4.5 | 9.9 |
| 2 | 21 | .23 | 18 | 25 | 175 | 13 | 56 | 123 | 1.5 | 8.3 | 5.1 | 4.3 |
| 3 | 29 | .23 | 16 | 140 | 67 | 25 | 19 | 18 | .94 | 5.8 | 3.3 | 2.9 |
| 4 | 13 | .23 | 101 | 30 | 25 | 20 | 11 | 16 | .94 | 5.1 | 2.2 | 2.2 |
| 5 | 4.9 | .21 | 16 | 15 | 17 | 10 | 8.9 | 84 | .82 | 4.1 | 1.8 | 2.3 |
| 6 | 2.2 | .17 | 9.2 | 9.0 | 15 | 16 | 13 | 37 | .60 | 2.5 | 2.0 | 2.0 |
| 7 | 1.2 | .13 | 7.1 | 8.0 | 9.6 | 10 | 6.0 | 11 | .50 | 13 | 1.8 | 3.9 |
| 8 | 27 | .10 | 5.3 | 15 | 7.4 | 7.7 | 4.7 | 7.1 | .46 | 31 | 1.7 | 9.2 |
| 9 | 8.2 | .06 | 4.7 | 20 | 6.2 | 14 | 4.5 | 6.8 | .42 | 4.3 | 1.3 | 3.9 |
| 10 | 3.0 | .02 | 3.2 | 8.0 | 5.3 | 7.4 | 4.3 | 6.2 | 22 | 5.4 | 1.1 | 27 |
| 11 | 1.6 | .01 | 2.5 | 6.0 | 4.9 | 5.1 | 3.7 | 5.1 | 32 | 4.1 | 4.1 | 11 |
| 12 | 1.1 | .11 | 27 | 5.0 | 4.1 | 4.5 | 3.2 | 5.5 | 3.9 | 2.0 | 1.8 | 3.2 |
| 13 | .70 | .19 | 98 | 4.0 | 3.5 | 3.7 | 2.9 | 3.7 | 1.5 | 1.5 | 2.5 | 2.3 |
| 14 | .50 | 5.0 | 31 | 3.5 | 32 | 3.3 | 12 | 37 | 1.0 | 14 | 5.1 | 29 |
| 15 | .50 | 2.5 | 23 | 3.0 | 64 | 3.0 | 4.3 | 32 | .76 | 4.5 | 12 | 5.8 |
| 16 | .60 | .50 | 77 | 2.6 | 105 | 123 | 2.5 | 8.9 | .60 | 3.8 | 7.1 | 2.5 |
| 17 | 17 | .21 | 25 | 2.2 | 21 | 45 | 15 | 4.1 | .50 | 5.3 | 8.0 | 29 |
| 18 | 12 | .15 | 23 | 2.0 | 85 | 27 | 12 | 2.9 | .38 | 2.2 | 13 | 23 |
| 19 | 7.4 | .15 | 98 | 1.8 | 108 | 14 | 6.0 | 2.5 | .42 | 36 | 25 | 4.7 |
| 20 | 3.0 | 1.9 | 29 | 1.7 | 35 | 7.7 | 12 | 2.1 | .42 | 23 | 22 | 9.6 |
| 21 | 1.5 | 1.0 | 17 | 1.9 | 20 | 5.8 | 6.2 | 1.8 | .35 | 7.7 | 14 | 99 |
| 22 | 1.3 | .35 | 16 | 1.7 | 16 | 4.7 | 3.2 | 1.6 | 4.8 | 5.3 | 5.3 | 28 |
| 23 | 9.1 | .19 | 13 | 1.7 | 11 | 3.9 | 2.5 | 1.4 | 2.2 | 4.7 | 3.2 | 8.6 |
| 24 | 1.3 | .26 | 11 | 1.7 | 12 | 17 | 2.2 | 1.3 | 11 | 16 | 2.6 | 8.0 |
| 25 | .60 | 3.2 | 94 | 1.7 | 35 | 27 | 1.8 | 1.3 | 5.5 | 31 | 2.2 | 5.5 |
| 26 | .42 | 1.6 | 20 | 1.5 | 26 | 8.0 | 1.7 | 1.4 | 11 | 40 | 6.3 | 3.5 |
| 27 | .35 | 1.2 | 13 | 1.4 | 11 | 4.7 | 3.3 | 1.5 | 4.5 | 9.9 | 12 | 2.7 |
| 28 | .32 | 72 | 10 | 1.4 | 8.0 | 3.5 | 9.8 | 6.6 | 3.9 | 7.4 | 4.7 | 2.5 |
| 29 | .29 | 312 | 8.0 | 30 | ------ | 2.9 | 23 | 2.9 | 2.1 | 4.3 | 3.5 | 2.2 |
| 30 | .32 | 106 | 6.8 | 71 | ------ | 3.7 | 34 | 1.3 | 2.7 | 3.3 | 8.6 | 2.5 |
| 31 | .32 | ------ | 6.0 | 57 | ------ | 138 | ------ | .94 | ------ | 7.5 | 20 | ------ |
| TOTAL | 258.72 | 510.19 | 858.8 | 478.2 | 1523.0 | 601.6 | 372.7 | 440.04 | 119.91 | 323.0 | 207.8 | 350.2 |
| MEAN | 8.35 | 17.0 | 27.7 | 15.4 | 54.4 | 19.4 | 12.4 | 14.2 | 4.00 | 10.4 | 6.70 | 11.7 |
| MAX | 89 | 312 | 101 | 140 | 594 | 138 | 84 | 123 | 32 | 40 | 25 | 99 |
| MIN | .29 | .01 | 2.5 | 1.4 | 3.5 | 2.9 | 1.7 | .94 | .35 | 1.5 | 1.1 | 2.0 |
| AC-FT | 513 | 1010 | 1700 | 949 | 3020 | 1190 | 739 | 873 | 238 | 641 | 412 | 695 |

CAL YR 1968: TOTAL 4,433.79 MEAN 12.1 MAX 411 MIN 0 AC-FT 8,790
WTR YR 1969: TOTAL 6,044.16 MEAN 16.6 MAX 594 MIN .01 AC-FT 11,990

PEAK DISCHARGE (BASE, 930 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1830 | 7.26 | 1,080 | 3-31 | 1530 | 7.91 | 1,400 |
| 2- 1 | 1430 | 9.84 | 2,720 | | | | |

NOTE.--No gage-height record Dec. 23 to Jan. 24.

## 16-2130. Waikele Stream at Waipahu

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

DRAINAGE AREA.--45.7 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 10,100 cfs Jan. 3 (gage height, 11.32 ft), from rating curve extended above 2,200 cfs on basis of slope-area measurement at gage height 9.65 ft; minimum, 16 cfs Nov. 11. Period of record: Maximum discharge, 13,600 cfs Nov. 28, 1954 (gage height, 14.82 ft, site and datum then in use), from rating curve extended above 730 cfs on basis of slope-area measurement of peak flow; minimum, 3.7 cfs Sept. 28, 29, 1962.

REMARKS.--Records good. Diversions above station for irrigation of sugarcane in vicinity of Waipahu. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 184 | 20 | 147 | 54 | 1.560 | 84 | 228 | 39 | 26 | 47 | 24 | 37 |
| 2 | 138 | 20 | 90 | 1.070 | 650 | 78 | 173 | 240 | 29 | 42 | 22 | 30 |
| 3 | 118 | 20 | 73 | 2410 | 245 | 88 | 88 | 73 | 23 | 49 | 24 | 26 |
| 4 | 130 | 18 | 95 | 406 | 130 | 90 | 67 | 60 | 23 | 40 | 22 | 21 |
| 5 | 52 | 18 | 84 | 210 | 100 | 73 | 60 | 96 | 20 | 39 | 22 | 21 |
| 6 | 40 | 20 | 61 | 150 | 90 | 78 | 61 | 141 | 20 | 39 | 20 | 21 |
| 7 | 34 | 24 | 55 | 120 | 80 | 78 | 53 | 49 | 20 | 41 | 20 | 19 |
| 8 | 41 | 28 | 56 | 205 | 73 | 69 | 40 | 41 | 29 | 60 | 18 | 21 |
| 9 | 53 | 24 | 48 | 342 | 69 | 70 | 30 | 34 | 22 | 43 | 18 | 26 |
| 10 | 33 | 22 | 46 | 167 | 67 | 73 | 30 | 37 | 19 | 38 | 20 | 28 |
| 11 | 24 | 16 | 44 | 116 | 65 | 61 | 30 | 44 | 79 | 38 | 18 | 46 |
| 12 | 28 | 20 | 51 | 98 | 62 | 58 | 43 | 39 | 36 | 34 | 20 | 27 |
| 13 | 27 | 23 | 176 | 92 | 61 | 57 | 42 | 34 | 26 | 34 | 20 | 21 |
| 14 | 19 | 46 | 96 | 86 | 78 | 56 | 36 | 40 | 23 | 43 | 19 | 33 |
| 15 | 21 | 34 | 78 | 80 | 131 | 56 | 35 | 87 | 26 | 46 | 23 | 34 |
| 16 | 21 | 34 | 186 | 75 | 227 | 148 | 30 | 46 | 24 | 37 | 30 | 22 |
| 17 | 34 | 33 | 100 | 72 | 96 | 205 | 34 | 41 | 24 | 36 | 25 | 18 |
| 18 | 26 | 30 | 102 | 67 | 145 | 95 | 46 | 43 | 34 | 36 | 34 | 63 |
| 19 | 30 | 28 | 526 | 67 | 240 | 73 | 50 | 32 | 32 | 59 | 51 | 28 |
| 20 | 26 | 26 | 198 | 65 | 128 | 54 | 61 | 31 | 31 | 66 | 65 | 22 |
| 21 | 25 | 23 | 100 | 72 | 98 | 46 | 55 | 28 | 30 | 44 | 48 | 91 |
| 22 | 20 | 20 | 86 | 73 | 81 | 46 | 39 | 29 | 32 | 32 | 34 | 118 |
| 23 | 22 | 22 | 72 | 65 | 73 | 44 | 30 | 26 | 28 | 27 | 28 | 36 |
| 24 | 20 | 26 | 71 | 65 | 69 | 36 | 26 | 27 | 27 | 30 | 22 | 25 |
| 25 | 20 | 20 | 584 | 65 | 95 | 76 | 28 | 32 | 37 | 33 | 22 | 24 |
| 26 | 19 | 18 | 128 | 65 | 124 | 57 | 36 | 29 | 24 | 100 | 20 | 20 |
| 27 | 22 | 22 | 84 | 64 | 84 | 37 | 36 | 24 | 29 | 44 | 26 | 19 |
| 28 | 21 | 82 | 73 | 66 | 73 | 34 | 39 | 26 | 34 | 31 | 30 | 19 |
| 29 | 20 | 680 | 66 | 68 | ------ | 39 | 30 | 34 | 30 | 29 | 22 | 18 |
| 30 | 18 | 463 | 60 | 127 | ------ | 46 | 85 | 37 | 36 | 24 | 20 | 17 |
| 31 | 20 | ------ | 56 | 206 | ------ | 215 | ------ | 27 | ------ | 24 | 39 | ------ |
| TOTAL | 1.306 | 1.880 | 3.692 | 5.888 | 4.994 | 2320 | 1.641 | 1.566 | 873 | 1.285 | 826 | 951 |
| MEAN | 42.1 | 62.7 | 119 | 222 | 178 | 74.8 | 54.7 | 50.5 | 29.1 | 41.5 | 26.6 | 31.7 |
| MAX | 184 | 680 | 584 | 2410 | 1.560 | 215 | 228 | 240 | 79 | 100 | 65 | 118 |
| MIN | 18 | 16 | 44 | 54 | 61 | 34 | 26 | 24 | 19 | 24 | 18 | 17 |
| AC-FT | 2590 | 3.730 | 7.320 | 13.660 | 9.910 | 4.600 | 3.250 | 3.110 | 1.730 | 2550 | 1.640 | 1.890 |

CAL YR 1968: TOTAL 21,560 MEAN 58.9 MAX 1,150 MIN 15 AC-FT 42,760
WTR YR 1969: TOTAL 28,222 MEAN 77.3 MAX 2,410 MIN 16 AC-FT 55,980

PEAK DISCHARGE (BASE, 1,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 2000 | 4.51 | 1,110 | 12-25 | 0800 | 4.61 | 1,190 |
| 11-29 | 2100 | 4.69 | 1,250 | 1- 3 | 0530 | 11.32 | 10,100 |
| 12-19 | 1000 | 4.85 | 1,400 | 2- 1 | 1630 | 8.17 | 5,120 |

## 16-2160. Waiawa Stream near Pearl City

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

DRAINAGE AREA.--26.4 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 13,300 cfs Jan. 3 (gage height, 17.04 ft), from rating curve extended as explained below; minimum, 3.1 cfs Aug. 12.
Period of record: Maximum discharge, 23,400 cfs Jan. 5, 1968 (gage height, 20.56 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 17.1 and 20.56 ft; minimum, 2.0 cfs June 11, 12, 1965.

REMARKS.--Records poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversions and return flows above station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 330 | 11 | 184 | 19 | 2290 | 52 | 208 | 17 | 5.5 | 14 | 8.7 | 24 |
| 2 | 202 | 9.0 | 112 | 1,100 | 749 | 40 | 133 | 644 | 6.1 | 12 | 6.8 | 13 |
| 3 | 117 | 8.2 | 39 | 3,270 | 185 | 52 | 48 | 47 | 5.5 | 10 | 6.1 | 9.0 |
| 4 | 34 | 8.5 | 431 | 419 | 62 | 54 | 25 | 23 | 5.7 | 14 | 7.0 | 7.8 |
| 5 | 12 | 10 | 53 | 165 | 37 | 31 | 18 | 250 | 5.7 | 11 | 6.8 | 6.8 |
| 6 | 9.0 | 8.7 | 24 | 84 | 34 | 23 | 20 | 112 | 5.5 | 8.5 | 6.6 | 7.0 |
| 7 | 8.2 | 7.0 | 16 | 56 | 22 | 23 | 14 | 21 | 5.5 | 20 | 5.9 | 5.9 |
| 8 | 94 | 7.3 | 16 | 197 | 18 | 18 | 10 | 13 | 5.3 | 29 | 5.0 | 5.0 |
| 9 | 30 | 7.8 | 13 | 221 | 15 | 18 | 8.5 | 15 | 5.1 | 12 | 4.6 | 8.0 |
| 10 | 16 | 7.3 | 10 | 87 | 13 | 17 | 8.2 | 9.3 | 8.9 | 8.2 | 4.5 | 14 |
| 11 | 11 | 7.0 | 8.7 | 43 | 12 | 13 | 8.0 | 6.3 | 49 | 12 | 4.3 | 22 |
| 12 | 11 | 7.8 | 8.5 | 29 | 11 | 11 | 7.3 | 5.5 | 12 | 7.0 | 3.7 | 7.5 |
| 13 | 9.0 | 9.3 | 511 | 23 | 9.9 | 9.3 | 6.6 | 5.1 | 6.8 | 5.9 | 3.8 | 6.3 |
| 14 | 9.3 | 14 | 81 | 19 | 228 | 8.2 | 11 | 4.6 | 5.1 | 14 | 5.1 | 34 |
| 15 | 8.0 | 7.8 | 37 | 16 | 373 | 8.0 | 11 | 23 | 4.6 | 12 | 21 | 21 |
| 16 | 9.6 | 6.6 | 738 | 15 | 456 | 598 | 7.0 | 14 | 4.5 | 7.8 | 13 | 8.5 |
| 17 | 15 | 6.1 | 242 | 13 | 65 | 270 | 9.8 | 8.0 | 4.5 | 7.0 | 8.7 | 13 |
| 18 | 16 | 5.7 | 132 | 12 | 185 | 127 | 21 | 5.9 | 4.2 | 6.8 | 9.3 | 40 |
| 19 | 22 | 6.1 | 1,250 | 11 | 323 | 49 | 15 | 5.3 | 4.0 | 45 | 14 | 11 |
| 20 | 14 | 6.1 | 533 | 10 | 94 | 28 | 35 | 5.1 | 3.7 | 42 | 38 | 9.2 |
| 21 | 11 | 5.9 | 98 | 10 | 53 | 18 | 26 | 5.1 | 3.6 | 22 | 21 | 294 |
| 22 | 11 | 5.7 | 73 | 9.6 | 35 | 15 | 13 | 5.1 | 3.6 | 12 | 11 | 78 |
| 23 | 12 | 5.3 | 31 | 9.3 | 29 | 11 | 8.5 | 5.5 | 3.4 | 8.0 | 6.8 | 22 |
| 24 | 12 | 5.5 | 25 | 9.0 | 21 | 20 | 6.6 | 5.5 | 13 | 11 | 5.3 | 16 |
| 25 | 9.9 | 5.1 | 1,400 | 9.6 | 60 | 79 | 5.7 | 5.5 | 29 | 69 | 4.8 | 14 |
| 26 | 8.5 | 6.1 | 600 | 9.9 | 75 | 29 | 5.1 | 5.7 | 17 | 123 | 5.5 | 9.3 |
| 27 | 8.5 | 6.6 | 100 | 9.6 | 42 | 15 | 4.8 | 5.5 | 16 | 36 | 9.0 | 7.8 |
| 28 | 8.5 | 10 | 35 | 8.2 | 23 | 11 | 15 | 5.5 | 11 | 18 | 12 | 7.0 |
| 29 | 8.0 | 2300 | 27 | 20 | ------ | 9.3 | 54 | 5.5 | 9.6 | 12 | 9.0 | 7.3 |
| 30 | 7.5 | 984 | 22 | 174 | ------ | 8.0 | 94 | 6.1 | 9.6 | 9.9 | 6.8 | 7.0 |
| 31 | 8.0 | ------ | 20 | 88 | ------ | 477 | ------ | 5.7 | ------ | 8.7 | 29 | ------ |
| TOTAL | 1,082.0 | 3,495.5 | 3,870.2 | 6,166.2 | 5,519.9 | 2,141.8 | 857.1 | 1,294.8 | 273.0 | 627.8 | 303.1 | 735.4 |
| MEAN | 34.9 | 117 | 222 | 199 | 197 | 69.1 | 28.6 | 41.8 | 9.10 | 20.3 | 9.78 | 24.5 |
| MAX | 330 | 2300 | 1,400 | 3,270 | 2,290 | 598 | 208 | 644 | 49 | 123 | 38 | 294 |
| MIN | 7.5 | 5.1 | 8.5 | 8.2 | 9.9 | 8.0 | 4.8 | 4.6 | 3.4 | 5.9 | 3.7 | 5.0 |
| AC-FT | 2,150 | 6,930 | 13,630 | 12,230 | 10,950 | 4,250 | 1,700 | 2,570 | 541 | 1,250 | 601 | 1,460 |

CAL YR 1968: TOTAL 25,430.9 MEAN 69.5 MAX 3,220 MIN 5.1 AC-FT 50,440
WTR YR 1969: TOTAL 29,366.8 MEAN 80.5 MAX 3,270 MIN 3.4 AC-FT 58,250

PEAK DISCHARGE (BASE, 2,300 CFS)

/ From floodmark.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1700 | 12.50 | 6,210 | 1- 3 | 0530 | 17.04 | 13,300 |
| 12-16 | 1200 | 8.30 | 2,460 | 2- 1 | 1530 | 14.72 | 9,180 |
| 12-19 | 0100 | 10.20 | 3,930 | 3-31 | 1600 | 9.08 | 3,010 |
| 12-25 | Unknown | /11.19 | 4,890 | 5- 2 | 0700 | 11.06 | 4,760 |

## 16-2230. Waimalu Stream near Aiea

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

DRAINAGE AREA.--6.07 sq mi.

PERIOD OF RECORD.--January 1952 to June 1962, July 1963 to current year.

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

EXTREMES.--Current year: Maximum discharge, 2,450 cfs Jan. 3 (gage height, 3.99 ft), from rating curve extended as explained below; minimum, 0.07 cfs Sept. 8.

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

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

REMARKS.--Records fair. Some return of irrigation water above station.

REVISIONS.--WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36 | .25 | 38 | 2.1 | 305 | 14 | 90 | 3.6 | .25 | 3.2 | 1.0 | 6.2 |
| 2 | 26 | .23 | 27 | 92 | 110 | 11 | 51 | 71 | .22 | 2.5 | .94 | 3.2 |
| 3 | 5.1 | .23 | 26 | 365 | 38 | 16 | 18 | 13 | .22 | 2.2 | .64 | 1.6 |
| 4 | 3.6 | .23 | 132 | 94 | 15 | 16 | 8.6 | 6.0 | .20 | 5.3 | .52 | 1.1 |
| 5 | .86 | .30 | 23 | 40 | 8.9 | 8.6 | 8.2 | 29 | .20 | 3.2 | .46 | .73 |
| 6 | .35 | .25 | 8.3 | 18 | 7.7 | 6.8 | 6.7 | 30 | .20 | 1.7 | .60 | .55 |
| 7 | .27 | .22 | 4.2 | 10 | 4.0 | 6.0 | 4.0 | 6.7 | .21 | 4.8 | .90 | .52 |
| 8 | .35 | .21 | 3.3 | 40 | 2.9 | 4.4 | 2.6 | 3.4 | .19 | 9.7 | 1.5 | 1.3 |
| 9 | .68 | .24 | 4.2 | 55 | 2.1 | 3.1 | 2.1 | 3.5 | .18 | 3.5 | 1.4 | 5.3 |
| 10 | .72 | .22 | 1.9 | 26 | 1.8 | 3.5 | 1.0 | 2.1 | 7.8 | 1.9 | 1.8 | 4.4 |
| 11 | .61 | .22 | .97 | 10 | 1.5 | 2.4 | 1.7 | 1.8 | 43 | 2.0 | 1.7 | 6.9 |
| 12 | .30 | .24 | .65 | 6.3 | 1.7 | 1.7 | 1.4 | 4.4 | 5.8 | .86 | 1.2 | 1.3 |
| 13 | .28 | .23 | 78 | 4.3 | 1.6 | 1.6 | 1.2 | 2.1 | 1.9 | .38 | .93 | .61 |
| 14 | .27 | 5.6 | 20 | 3.4 | 102 | 1.5 | 8.3 | 1.1 | .66 | 1.4 | 1.4 | 6.8 |
| 15 | .63 | 1.8 | 8.4 | 2.6 | 114 | 1.4 | 3.4 | 3.2 | .32 | 1.5 | 10 | 4.5 |
| 16 | .31 | .23 | 69 | 2.3 | 144 | 151 | 1.6 | 2.8 | .26 | .71 | 7.6 | 1.0 |
| 17 | 6.4 | .22 | 42 | 2.1 | 32 | 111 | 1.7 | 1.4 | .26 | 4.4 | 6.7 | 14 |
| 18 | 5.2 | .30 | 62 | 1.3 | 59 | 47 | 12 | .68 | .23 | 2.1 | 5.5 | 9.6 |
| 19 | 3.9 | .50 | 90 | 1.1 | 82 | 24 | 6.3 | .43 | .25 | 24 | 7.0 | 2.4 |
| 20 | 1.7 | .45 | 70 | .74 | 32 | 10 | 26 | .36 | .23 | 20 | 6.2 | 2.9 |
| 21 | .81 | .62 | 40 | .67 | 16 | 5.0 | 10 | .79 | .23 | 7.8 | 5.6 | 83 |
| 22 | .45 | .66 | 20 | .56 | 11 | 4.3 | 4.1 | .33 | .24 | 3.6 | 3.6 | 31 |
| 23 | .56 | .40 | 10 | .49 | 7.7 | 2.9 | 2.5 | .25 | .23 | 2.4 | 2.0 | 7.4 |
| 24 | .54 | .29 | 5.0 | .44 | 5.8 | 30 | 1.7 | .25 | 17 | 3.0 | .97 | 12 |
| 25 | .47 | .49 | 110 | .43 | 19 | 83 | 1.3 | .26 | 9.8 | 29 | .67 | 4.5 |
| 26 | .36 | .27 | 60 | .40 | 35 | 19 | 1.1 | .22 | 7.1 | 49 | .71 | 2.3 |
| 27 | .28 | .22 | 15 | .39 | 15 | 7.8 | .86 | .22 | 4.4 | 11 | 1.8 | 1.3 |
| 28 | .29 | .64 | 8.0 | .37 | 6.8 | 4.7 | 2.8 | .27 | 2.1 | 4.5 | 2.7 | .83 |
| 29 | .25 | 325 | 6.0 | .45 | ------ | 3.2 | 4.8 | .22 | 2.4 | 2.4 | 1.6 | .46 |
| 30 | .35 | 95 | 4.0 | 46 | ------ | 2.7 | 19 | .25 | 1.7 | 1.4 | .98 | .45 |
| 31 | .25 | ------ | 2.6 | 26 | ------ | 100 | ------ | .24 | ------ | .90 | 7.4 | ------ |
| TOTAL | 98.14 | 435.76 | 989.52 | 852.44 | 1,181.5 | 704.4 | 304.76 | 189.87 | 107.78 | 210.35 | 86.02 | 218.15 |
| MEAN | 3.17 | 14.5 | 31.9 | 27.5 | 42.2 | 22.7 | 10.2 | 6.12 | 3.59 | 6.79 | 2.77 | 7.27 |
| MAX | 36 | 325 | 132 | 365 | 305 | 151 | 90 | 71 | 43 | 49 | 10 | 83 |
| MIN | .25 | .21 | .65 | .37 | 1.5 | 1.4 | .86 | .22 | .18 | .38 | .46 | .45 |
| AC-FT | 195 | 864 | 1,960 | 1,690 | 2,340 | 1,400 | 604 | 377 | 214 | 417 | 171 | 433 |

CAL YR 1968 TOTAL 4,724.90 MEAN 12.9 MAX 476 MIN .18 AC-FT 9,370
WTR YR 1969 TOTAL 5,378.69 MEAN 14.7 MAX 365 MIN .18 AC-FT 10,670

PEAK DISCHARGE (BASE, 550 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1545 | 3.56 | 1,750 | 1- 4 | 0100 | 2.65 | 585 |
| 1- 3 | 0530 | 3.99 | 2,450 | 2- 1 | 1600 | 2.95 | 900 |

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

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

DRAINAGE AREA.--2.59 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 795 cfs Jan. 3 (gage height, 3.55 ft); minimum, 0.02 cfs Aug. 26. Period of record: Maximum discharge, 2,580 cfs May 14, 1963 (gage height, 6.63 ft), from rating curve extended above 77 cfs on basis of slope-area measurements at gage heights 6.29 and 6.63 ft; minimum, 0.02 cfs Sept. 13, 1966, Aug. 26, 1969.

REMARKS.--Records fair. Some return of irrigation water above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.4 | .08 | 20 | .44 | 195 | 2.5 | 31 | .76 | .20 | .64 | .12 | .23 |
| 2 | 6.1 | .08 | 15 | 75 | 47 | 3.0 | 15 | 39 | .22 | .90 | .11 | .11 |
| 3 | .20 | .07 | 24 | 250 | 10 | 3.7 | 4.7 | 3.7 | .38 | .89 | .10 | .12 |
| 4 | .15 | .07 | 80 | 53 | 4.1 | 6.9 | 2.0 | 1.2 | .29 | 1.3 | .10 | .13 |
| 5 | .10 | .06 | 18 | 17 | 1.9 | 3.4 | 3.1 | 10 | .29 | .56 | .10 | .12 |
| 6 | .14 | .06 | 6.0 | 5.6 | 1.2 | 1.2 | 2.3 | 11 | .29 | .26 | .09 | .11 |
| 7 | .12 | .05 | 3.0 | 3.6 | .75 | .84 | 2.1 | 1.8 | .22 | .24 | .11 | .10 |
| 8 | .11 | .05 | 1.4 | 20 | .53 | .55 | .44 | .65 | .16 | .71 | .12 | .09 |
| 9 | .25 | .05 | 1.2 | 23 | .34 | .36 | .30 | 1.6 | .16 | .50 | .11 | .06 |
| 10 | .12 | .04 | .75 | 8.7 | .30 | .30 | .29 | .44 | .18 | .20 | .11 | .08 |
| 11 | .22 | .04 | .60 | 5.3 | .20 | .28 | .27 | .29 | 14 | .17 | .11 | .20 |
| 12 | .19 | .05 | .50 | 6.9 | .26 | .27 | .25 | .75 | 1.0 | .15 | .10 | .13 |
| 13 | .12 | .08 | 40 | 4.1 | 2.0 | .27 | .24 | .52 | .19 | .16 | .11 | .13 |
| 14 | .11 | 3.5 | 16 | 2.6 | 46 | .27 | 1.3 | .27 | .23 | .17 | .10 | .13 |
| 15 | .36 | .95 | 5.0 | 1.5 | 47 | .26 | .62 | 2.3 | .36 | .16 | .10 | .10 |
| 16 | .17 | .07 | 23 | 1.1 | 57 | 70 | .27 | 1.3 | .09 | .16 | .10 | .09 |
| 17 | .95 | .09 | 18 | 1.2 | 8.3 | 37 | .25 | .40 | .09 | .17 | .11 | .07 |
| 18 | .80 | .09 | 15 | .86 | 18 | 14 | 2.0 | .27 | .09 | .16 | .10 | .10 |
| 19 | .65 | .10 | 30 | .45 | 28 | 5.8 | 1.2 | .22 | .11 | .94 | .11 | .11 |
| 20 | .36 | .11 | 19 | .36 | 8.5 | 2.3 | 5.1 | .22 | .08 | 3.5 | .10 | .12 |
| 21 | .28 | .10 | 12 | .25 | 4.3 | 1.2 | 2.4 | .22 | .09 | 1.3 | .09 | 22 |
| 22 | .20 | .09 | 6.0 | .25 | 3.2 | .72 | .75 | .22 | .10 | .43 | .09 | 6.3 |
| 23 | .15 | .09 | 2.0 | .24 | 2.3 | .45 | .34 | .22 | .10 | .23 | .09 | 1.1 |
| 24 | .12 | .11 | 5.0 | .25 | 1.4 | 13 | .26 | .31 | 1.2 | .19 | .06 | 2.0 |
| 25 | .11 | .12 | 25 | .27 | 4.2 | 32 | .24 | .20 | 1.8 | 4.2 | .05 | .71 |
| 26 | .11 | .12 | 80 | .25 | 9.7 | 5.6 | .24 | .21 | 1.4 | 15 | .04 | .19 |
| 27 | .10 | .11 | 10 | .24 | 4.4 | 2.0 | .22 | .21 | 1.1 | 2.9 | .05 | .14 |
| 28 | .10 | 1.7 | 4.0 | .23 | 1.7 | .91 | .23 | .22 | .81 | .75 | .05 | .12 |
| 29 | .09 | 100 | 1.8 | .26 | ------ | .48 | .22 | .21 | .54 | .31 | .05 | .14 |
| 30 | .09 | 52 | .72 | 8.2 | ------ | .32 | 4.3 | .20 | .27 | .15 | .05 | .14 |
| 31 | .08 | ------ | .56 | 6.0 | ------ | 49 | ------ | .21 | ------ | .13 | .05 | ------ |
| TOTAL | 21.05 | 160.13 | 483.53 | 497.15 | 507.66 | 258.88 | 81.93 | 79.12 | 26.04 | 37.53 | 2.78 | 35.17 |
| MEAN | .68 | 5.34 | 15.6 | 16.0 | 18.1 | 8.35 | 2.73 | 2.55 | .87 | 1.21 | .090 | 1.17 |
| MAX | 8.4 | 100 | 80 | 250 | 195 | 70 | 31 | 39 | 14 | 15 | .12 | 22 |
| MIN | .08 | .04 | .50 | .23 | .26 | .26 | .22 | .20 | .08 | .13 | .04 | .06 |
| AC-FT | 42 | 318 | 959 | 986 | 1,010 | 513 | 163 | 157 | 52 | 74 | 5.5 | 70 |

CAL YR 1968 TOTAL 1,814.48 MEAN 4.96 MAX 185 MIN .04 AC-FT 3,600
WTR YR 1969 TOTAL 2,190.97 MEAN 6.00 MAX 250 MIN .04 AC-FT 4,350

NOTE.--No gage-height record Nov. 29 to Dec. 30.

PEAK DISCHARGE (BASE, 240 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1530 | 2.63 | 354 | 3-16 | 2030 | 2.43 | 267 |
| 1- 3 | 0445 | 3.55 | 795 | 3-31 | 1545 | 2.57 | 326 |
| 2- 1 | 1400 | 3.38 | 710 | 5- 2 | 0645 | 2.70 | 385 |

## 16-2260. North Halawa Stream near Aiea

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

DRAINAGE AREA.--3.45 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,350 cfs Dec. 25 (gage height, 10.70 ft), from rating curve extended above 55 cfs on basis of slope-area measurements at gage heights 10.3, 13.04 and 13.46 ft; no flow many days.
Period of record: Maximum discharge, 6,650 cfs Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 420 cfs; maximum gage height, 13.46 ft May 14, 1963; no flow at times each year.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.3 | 0 | 34 | 1.2 | 326 | 6.6 | 66 | 5.5 | .45 | 7.1 | .76 | 5.0 |
| 2 | 6.3 | 0 | 23 | 70 | 83 | 9.3 | 38 | 83 | .37 | 4.1 | .65 | 1.7 |
| 3 | .45 | 0 | 40 | 176 | 21 | 11 | 14 | 15 | .27 | 2.8 | .55 | .76 |
| 4 | .13 | 0 | 152 | 83 | 8.6 | 10 | 7.6 | 6.3 | .19 | 2.0 | .41 | .50 |
| 5 | .04 | 0 | 24 | 33 | 4.4 | 5.4 | 6.0 | 39 | .15 | 1.2 | .30 | .37 |
| 6 | .01 | 0 | 7.1 | 15 | 2.8 | 3.6 | 6.2 | 22 | .1 | .76 | .21 | .27 |
| 7 | 0 | 0 | 3.4 | 7.8 | 1.8 | 2.7 | 3.9 | 8.6 | .07 | .94 | .17 | .13 |
| 8 | 0 | 0 | 2.2 | 24 | 1.3 | 2.5 | 3.1 | 5.3 | .04 | 2.3 | .09 | .38 |
| 9 | 0 | 0 | 1.8 | 33 | 1.0 | 2.0 | 2.7 | 3.9 | .03 | 1.7 | .04 | .70 |
| 10 | 0 | 0 | 1.0 | 17 | .82 | 1.4 | 2.3 | 3.0 | 7.9 | 2.8 | .02 | 2.2 |
| 11 | 0 | 0 | .70 | 7.6 | .65 | 1.2 | 2.2 | 2.5 | 39 | 1.5 | .01 | 1.6 |
| 12 | 0 | 0 | .76 | 4.4 | .55 | .94 | 1.8 | 4.1 | 6.3 | .76 | 0 | .41 |
| 13 | 0 | 0 | 76 | 3.3 | 10 | .70 | 1.7 | 2.0 | 2.3 | .60 | 0 | .19 |
| 14 | 0 | 4.7 | 19 | 2.4 | 91 | .65 | 9.0 | 4.2 | 1.2 | 1.2 | 0 | .79 |
| 15 | 0 | 1.2 | 7.1 | 1.8 | 87 | .60 | 3.1 | 11 | .76 | 1.4 | 3.8 | .76 |
| 16 | 0 | .33 | 35 | 1.5 | 105 | 107 | 1.8 | 5.8 | .55 | .82 | 1.7 | .30 |
| 17 | .52 | .15 | 33 | 1.2 | 24 | 72 | 2.0 | 3.0 | .41 | 1.5 | .88 | 1.3 |
| 18 | .55 | .06 | 22 | 1.1 | 47 | 37 | 13 | 1.8 | .27 | .82 | 1.3 | 1.6 |
| 19 | .50 | .03 | 54 | .94 | 62 | 21 | 6.0 | 1.4 | .15 | 11 | .88 | .37 |
| 20 | .33 | .03 | 40 | .88 | 22 | 9.2 | 15 | 1.2 | .09 | 11 | 1.4 | 3.9 |
| 21 | .13 | .02 | 22 | .76 | 11 | 5.6 | 7.8 | 1.1 | .07 | 4.9 | 5.1 | 51 |
| 22 | .06 | .02 | 15 | .70 | 7.6 | 4.1 | 4.1 | .94 | .07 | 2.8 | 2.2 | 18 |
| 23 | .03 | .01 | 5.5 | .60 | 5.1 | 3.1 | 2.8 | .88 | .06 | 1.8 | .82 | 4.7 |
| 24 | .01 | .01 | 3.1 | .45 | 4.1 | 47 | 2.0 | .70 | 13 | 2.0 | .45 | 8.9 |
| 25 | 0 | 0 | 176 | .37 | 13 | 82 | 1.6 | .76 | 7.6 | 17 | .33 | 3.0 |
| 26 | 0 | 0 | 24 | .21 | 21 | 20 | 1.2 | .70 | 7.3 | 34 | .17 | 1.3 |
| 27 | 0 | 0 | 9.7 | .15 | 10 | 8.9 | 1.8 | .70 | 4.8 | 9.4 | .33 | .70 |
| 28 | 0 | .74 | 5.5 | .10 | 4.9 | 5.5 | 2.4 | 2.9 | 5.3 | 4.1 | .65 | .55 |
| 29 | 0 | 225 | 3.6 | .29 | ------ | 4.1 | 13 | 1.1 | 3.6 | 2.2 | .37 | .41 |
| 30 | 0 | 81 | 2.2 | 18 | ------ | 3.3 | 22 | .65 | 3.9 | 1.2 | .27 | .21 |
| 31 | 0 | ------ | 1.5 | 28 | ------ | 75 | ------ | .55 | ------ | .94 | 6.7 | ------ |
| TOTAL | 17.36 | 313.30 | 844.16 | 534.75 | 976.62 | 563.39 | 264.1 | 239.58 | 106.30 | 136.64 | 30.56 | 112.00 |
| MEAN | .56 | 10.4 | 27.2 | 17.2 | 34.9 | 18.2 | 8.80 | 7.73 | 3.54 | 4.41 | .99 | 3.73 |
| MAX | 8.3 | 225 | 176 | 176 | 326 | 107 | 66 | 83 | 39 | 34 | 6.7 | 51 |
| MIN | 0 | 0 | .70 | .10 | .55 | .60 | 1.2 | .55 | .03 | .60 | 0 | .13 |
| AC-FT | 34 | 621 | 1670 | 1060 | 1940 | 1120 | 524 | 475 | 211 | 271 | 61 | 222 |

CAL YR 1968: TOTAL 3,272.55 MEAN 8.94 MAX 278 MIN 0 AC-FT 6,490
WTR YR 1969: TOTAL 4,138.76 MEAN 11.3 MAX 326 MIN 0 AC-FT 8,210

PEAK DISCHARGE (BASE, 470 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1530 | 10.23 | 1,120 | 1- 3 | 2400 | 9.02 | 666 |
| 12-25 | 0700 | 10.70 | 1,350 | 2- 1 | 1600 | 10.67 | 1,340 |
| 1- 3 | 0500 | 10.15 | 1,080 | 5- 2 | 0630 | 8.69 | 568 |

## 16-2275. Moanalua Stream near Kaneohe

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

DRAINAGE AREA.--0.94 sq mi.

PERIOD OF RECORD.--Current year.

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

EXTREMES.--Current year: Maximum discharge, 1,200 cfs Feb. 1 (gage height, 6.99 ft), from rating curve extended above 18 cfs on basis of slope-area measurement at gage height 5.94 ft; no flow for many days.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .47 | 0 | 4.5 | .49 | 194 | 1.5 | 4.6 | .68 | 0 | 0 | 0 | .46 |
| 2 | .28 | 0 | 4.0 | 14 | 4.0 | 1.4 | 3.0 | 19 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 2.0 | 46 | 4.0 | 1.4 | 2.4 | .52 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | .90 | 14 | 2.5 | 1.4 | 2.0 | .35 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | .60 | 7.3 | 1.8 | 1.2 | 1.7 | 1.9 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | .45 | 3.0 | 1.4 | 1.1 | 1.3 | .95 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | .35 | 1.7 | 1.1 | .99 | 1.1 | .38 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | .32 | 3.5 | .96 | 1.0 | .90 | .64 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | .30 | 4.9 | .86 | .91 | .80 | .49 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | .28 | 2.7 | .78 | .83 | .70 | .38 | 1.0 | 0 | 0 | .16 |
| 11 | 0 | 0 | .30 | 1.4 | .71 | .75 | .68 | .25 | 2.3 | 0 | 0 | .12 |
| 12 | 0 | 0 | .25 | 1.0 | .64 | .68 | .62 | .23 | .30 | 0 | 0 | 0 |
| 13 | 0 | 0 | 6.1 | .87 | 7.3 | .61 | .58 | .21 | .14 | 0 | 0 | 0 |
| 14 | 0 | 0 | 1.1 | .71 | 58 | .58 | .56 | .23 | 0 | 0 | 0 | .14 |
| 15 | 0 | 0 | .64 | .64 | 34 | .58 | .70 | .38 | 0 | 0 | .21 | 0 |
| 16 | 0 | 0 | 1.5 | .55 | 27 | 63 | .52 | .32 | 0 | 0 | .10 | 0 |
| 17 | .79 | 0 | 2.3 | .49 | 4.9 | 14 | .55 | .23 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 3.3 | .44 | 4.8 | 4.0 | 3.5 | .19 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 7.3 | .38 | 9.2 | 3.7 | 1.1 | .16 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 7.0 | .32 | 3.4 | 2.8 | 1.8 | .15 | 0 | .38 | 0 | 0 |
| 21 | 0 | 0 | 3.1 | .32 | 2.2 | 2.1 | 1.0 | .14 | 0 | .12 | 1.3 | 2.2 |
| 22 | 0 | 0 | 2.8 | .28 | 1.7 | 1.5 | .61 | .10 | 0 | 0 | .28 | 0 |
| 23 | 0 | 0 | 1.4 | .23 | 1.4 | 1.2 | .44 | .05 | 0 | 0 | 0 | .04 |
| 24 | 0 | 0 | .91 | .21 | 1.2 | 4.5 | .38 | 0 | 2.1 | .02 | 0 | .79 |
| 25 | 0 | 0 | 71 | .16 | 2.1 | 15 | .30 | 0 | .61 | 1.5 | 0 | .38 |
| 26 | 0 | 0 | 4.6 | .12 | 3.3 | 9.0 | .25 | 0 | .35 | 2.2 | 0 | .14 |
| 27 | 0 | 0 | 2.0 | .10 | 2.2 | 5.1 | .30 | 0 | .25 | .64 | 0 | 0 |
| 28 | 0 | 3.0 | 1.3 | .06 | 1.6 | 3.0 | .64 | 0 | .08 | .32 | 0 | 0 |
| 29 | 0 | 130 | 1.0 | .08 | ------ | 1.5 | 2.4 | 0 | 0 | .16 | 0 | 0 |
| 30 | 0 | 16 | .71 | 4.8 | ------ | 1.2 | 2.2 | 0 | 0 | .02 | 0 | 0 |
| 31 | 0 | ------ | .61 | 3.2 | ------ | 9.2 | ------ | 0 | ------ | 0 | .64 | ------ |
| TOTAL | 1.54 | 149.0 | 132.92 | 113.95 | 377.05 | 155.73 | 37.63 | 27.93 | 7.13 | 5.36 | 2.53 | 4.43 |
| MEAN | .050 | 4.97 | 4.29 | 3.68 | 13.5 | 5.02 | 1.25 | .90 | .24 | .17 | .082 | .15 |
| MAX | .79 | 130 | 71 | 46 | 194 | 63 | 4.6 | 19 | 2.3 | 2.2 | 1.3 | 2.2 |
| MIN | 0 | 0 | .25 | .06 | .64 | .58 | .25 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 3.1 | 296 | 264 | 226 | 748 | 309 | 75 | 55 | 14 | 11 | 5.0 | 8.8 |

CAL YR 1968 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969 TOTAL 1,015.20 MEAN 2.78 MAX 194 MIN 0 AC-FT 2,010

PEAK DISCHARGE (BASE, 250 CFS) / About.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1440 | 6.13 | 808 | 3-16 | 1500 | 4.60 | 250 |
| 12-25 | 0635 | 6.22 | 849 | 3-31 | 1930 | 4.62 | 256 |
| 1- 3 | 0455 | 5.39 | 501 | 5- 2 | /0530 | 4.62 | 256 |
| 2- 1 | 1615 | 6.99 | 1,200 | | | | |

## 16-2277. Moanalua Stream tributary near Kaneohe

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

DRAINAGE AREA.--0.62 sq mi.

PERIOD OF RECORD.--Current year.

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

EXTREMES.--Current year: Maximum discharge, 892 cfs Feb. 1 (gage height, 5.57 ft), from rating curve extended above 28 cfs on basis of slope-area measurement at gage height 5.19 ft; no flow for many days.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .02 | 0 | 1.6 | .28 | 81 | 1.3 | 3.5 | .60 | .10 | .20 | .20 | .30 |
| 2 | 0 | 0 | .76 | 6.5 | 7.4 | 1.3 | 2.6 | 12 | .08 | .20 | .21 | .16 |
| 3 | 0 | 0 | 3.5 | 12 | 2.2 | 1.5 | 1.7 | .80 | .08 | .20 | .18 | .13 |
| 4 | 0 | 0 | 6.8 | 3.2 | 1.3 | 1.3 | 1.3 | .40 | .08 | .18 | .15 | .12 |
| 5 | 0 | 0 | 1.1 | 2.0 | 1.1 | 1.1 | 1.0 | 1.8 | .08 | .18 | .14 | .12 |
| 6 | 0 | 0 | .57 | .95 | .82 | 1.0 | .80 | .90 | .08 | .18 | .15 | .11 |
| 7 | 0 | 0 | .42 | .67 | .67 | .92 | .70 | .45 | .08 | .16 | .17 | .11 |
| 8 | 0 | 0 | .34 | 1.1 | .58 | .92 | .60 | .56 | .08 | .16 | .16 | .14 |
| 9 | 0 | 0 | .24 | 1.3 | .51 | .88 | .54 | .50 | .08 | .16 | .15 | .12 |
| 10 | 0 | 0 | .17 | .75 | .49 | .88 | .50 | .40 | .59 | .15 | .17 | 1.5 |
| 11 | 0 | 0 | .17 | .54 | .43 | .83 | .45 | .35 | 1.2 | .14 | .14 | .27 |
| 12 | 0 | 0 | .20 | .45 | .40 | .79 | .40 | .30 | .26 | .15 | .11 | .17 |
| 13 | 0 | 0 | 2.1 | .42 | 3.5 | .72 | .36 | .29 | .20 | .19 | .08 | .17 |
| 14 | 0 | .36 | .80 | .37 | 22 | .67 | .35 | .30 | .14 | .19 | .06 | .24 |
| 15 | 0 | 0 | .80 | .33 | 15 | .62 | .38 | .40 | .12 | .20 | .12 | .13 |
| 16 | 0 | 0 | 1.7 | .31 | 12 | 21 | .35 | .32 | .10 | .22 | .13 | .14 |
| 17 | .28 | 0 | 1.7 | .28 | 4.0 | 7.6 | .40 | .27 | .10 | .20 | .15 | .16 |
| 18 | 0 | 0 | 3.2 | .25 | 3.5 | 3.7 | 2.5 | .25 | .10 | .21 | .15 | .19 |
| 19 | 0 | 0 | 6.4 | .24 | 7.0 | 1.8 | 1.0 | .24 | .09 | .51 | .17 | .18 |
| 20 | 0 | 0 | 6.6 | .24 | 2.5 | 1.3 | 1.4 | .24 | .08 | .51 | .20 | .79 |
| 21 | 0 | 0 | 1.2 | .24 | 1.8 | 1.0 | .80 | .24 | .08 | .29 | .32 | 13 |
| 22 | 0 | 0 | .72 | .24 | 1.4 | .86 | .52 | .23 | .08 | .26 | .21 | 1.5 |
| 23 | 0 | 0 | .40 | .24 | 1.2 | .77 | .45 | .22 | .35 | .22 | .16 | .91 |
| 24 | 0 | 0 | .37 | .20 | 1.2 | 3.9 | .40 | .22 | 1.0 | .32 | .15 | .64 |
| 25 | 0 | 0 | 24 | .20 | 1.9 | 11 | .37 | .22 | .40 | 4.6 | .17 | .38 |
| 26 | 0 | .19 | 1.3 | .20 | 1.7 | 5.0 | .34 | .21 | .30 | 2.0 | .18 | .29 |
| 27 | 0 | 0 | .73 | .20 | 1.2 | 2.5 | .40 | .20 | .27 | .48 | .21 | .25 |
| 28 | 0 | 0 | .53 | .18 | 1.1 | 1.2 | .60 | .18 | .24 | .32 | .18 | .25 |
| 29 | 0 | 34 | .42 | .29 | ------ | .94 | 1.9 | .16 | .22 | .25 | .18 | .33 |
| 30 | 0 | 6.9 | .37 | 3.4 | ------ | .70 | 1.5 | .14 | .21 | .23 | .24 | .30 |
| 31 | 0 | ------ | .33 | .92 | ------ | 5.0 | ------ | .12 | ------ | .22 | .40 | ------ |
| TOTAL | .30 | 41.45 | 69.54 | 38.49 | 177.90 | 83.00 | 28.11 | 23.51 | 6.87 | 13.48 | 5.39 | 23.10 |
| MEAN | .010 | 1.38 | 2.24 | 1.24 | 6.35 | 2.68 | .94 | .76 | .23 | .43 | .17 | .77 |
| MAX | .28 | 34 | 24 | 12 | 81 | 21 | 3.5 | 12 | 1.2 | 4.6 | .40 | 13 |
| MIN | 0 | 0 | .17 | .18 | .40 | .62 | .34 | .12 | .08 | .14 | .06 | .11 |
| AC-FT | .6 | 82 | 138 | 76 | 353 | 165 | 56 | 47 | 14 | 27 | 11 | 46 |

CAL YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969: TOTAL 511.14 MEAN 1.40 MAX 81 MIN 0 AC-FT 1,010

PEAK DISCHARGE (BASE, 150 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1725 | 4.02 | 250 | 2- 1 | 1610 | 5.57 | 892 |
| 12-25 | 0620 | 4.76 | 504 | 5- 2 | Unknown | /4.05 | 258 |
| 1- 3 | 0450 | 3.70 | 170 | | | | |

/ From floodmark.
NOTE.--No gage-height record Mar. 26 to June 9.

## 16-2280. Moanalua Stream near Honolulu

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

DRAINAGE AREA.--2.73 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,980 cfs Feb. 1 (gage height, 9.56 ft), from rating curve extended above 120 cfs on basis of slope-area measurement at gage height 11.82 ft; no flow many days.
Period of record: Maximum discharge, 4,580 cfs Nov. 18, 1930 (gage height, 12.58 ft, present datum), from rating curve extended above 110 cfs by test of model of station site; no flow at times each year.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0 | 16 | 1.2 | 290 | 5.3 | 27 | 1.2 | 0 | .02 | .08 | 0 |
| 2 | | 0 | 8.8 | 2.0 | 60 | 5.9 | 17 | 52 | 0 | 0 | .05 | 0 |
| 3 | | 0 | 5.0 | 120 | 10 | 12 | 6.7 | 7.6 | 0 | 0 | .03 | 0 |
| 4 | | 0 | 90 | 30 | 4.0 | 5.6 | 3.8 | 3.6 | 0 | 0 | .03 | 0 |
| 5 | | 0 | 21 | 18 | 1.5 | 3.2 | 2.6 | 9.8 | 0 | 0 | .01 | 0 |
| 6 | | 0 | 11 | 8.0 | .70 | 2.3 | 1.9 | 7.0 | 0 | 0 | .01 | 0 |
| 7 | | 0 | 6.5 | 4.7 | .30 | 1.8 | 1.3 | 2.5 | 0 | 0 | 0 | 0 |
| 8 | | 0 | 3.0 | 7.9 | .10 | 1.5 | .94 | 1.9 | 0 | 0 | 0 | 0 |
| 9 | | 0 | 1.8 | 14 | .05 | 1.1 | .78 | 1.7 | 0 | 0 | 0 | 0 |
| 10 | | 0 | .90 | 8.9 | 0 | .73 | .63 | 1.0 | 0 | 0 | 0 | 0 |
| 11 | | 0 | .50 | 4.4 | 0 | .45 | .41 | .68 | 1.9 | 0 | 0 | 0 |
| 12 | | 0 | .25 | 3.1 | 0 | .24 | .24 | .45 | .39 | 0 | 0 | 0 |
| 13 | | 0 | 23 | 2.0 | 2.0 | .15 | .17 | .21 | .06 | 0 | 0 | 0 |
| 14 | | 0 | 12 | 1.4 | 50 | .08 | .21 | .13 | .02 | 0 | 0 | 0 |
| 15 | | 0 | 7.0 | 1.1 | 45 | .05 | .30 | .46 | 0 | 0 | 0 | 0 |
| 16 | | 0 | 15 | .78 | 64 | 66 | .15 | .62 | 0 | 0 | 0 | 0 |
| 17 | | 0 | 20 | .53 | 10 | 50 | .11 | .21 | 0 | 0 | 0 | 0 |
| 18 | | 0 | 25 | .37 | 25 | 22 | 3.4 | .11 | 0 | 0 | 0 | 0 |
| 19 | | 0 | 34 | .24 | 40 | 11 | 1.8 | .11 | 0 | 0 | 0 | 0 |
| 20 | | 0 | 23 | .19 | 16 | 5.5 | 4.5 | .10 | 0 | 0 | 0 | 0 |
| 21 | | 0 | 15 | .19 | 8.2 | 3.4 | 2.6 | .08 | 0 | 0 | 0 | 27 |
| 22 | | 0 | 11 | .17 | 5.3 | 2.4 | 1.1 | .07 | 0 | 0 | 0 | 9.3 |
| 23 | | 0 | 5.8 | .13 | 3.5 | 1.7 | .58 | .06 | 0 | 0 | 0 | 1.5 |
| 24 | | 0 | 4.7 | .11 | 2.9 | 11 | .30 | .03 | 2.5 | 0 | 0 | 2.1 |
| 25 | | 0 | 140 | .10 | 4.9 | 40 | .17 | 0 | 1.6 | 13 | 0 | 1.0 |
| 26 | | 0 | 29 | .04 | 7.4 | 11 | .13 | 0 | .24 | 22 | 0 | .21 |
| 27 | | 0 | 10 | 0 | 4.8 | 5.0 | .11 | 0 | .17 | 6.4 | 0 | .06 |
| 28 | | .32 | 7.0 | 0 | 2.8 | 3.2 | .11 | 0 | .10 | 2.4 | 0 | .02 |
| 29 | | 129 | 5.0 | 0 | ------ | 2.2 | .89 | 0 | .10 | 1.0 | 0 | .02 |
| 30 | | 45 | 3.0 | 14 | ------ | 1.7 | 4.6 | 0 | .06 | .34 | 0 | .01 |
| 31 | | ------ | 1.8 | 15 | ------ | 26 | ------ | 0 | ------ | .19 | 0 | ------ |
| TOTAL | 0 | 174.32 | 556.05 | 258.55 | 658.45 | 302.50 | 84.53 | 91.62 | 7.14 | 45.35 | .21 | 41.22 |
| MEAN | 0 | 5.81 | 17.9 | 8.34 | 23.5 | 9.76 | 2.82 | 2.96 | .24 | 1.46 | .007 | 1.37 |
| MAX | 0 | 129 | 140 | 120 | 290 | 66 | 27 | 52 | 2.5 | 22 | .08 | 27 |
| MIN | 0 | 0 | .25 | 0 | 0 | .05 | .11 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | 346 | 1,100 | 513 | 1,310 | 600 | 168 | 182 | 14 | 90 | .42 | 82 |

CAL YR 1968: TOTAL 2,142.77 MEAN 5.85 MAX 277 MIN 0 AC-FT 4,250
WTR YR 1969: TOTAL 2,219.94 MEAN 6.08 MAX 290 MIN 0 AC-FT 4,400

PEAK DISCHARGE (BASE, 240 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1530 | 7.22 | 972 | 1-3 | /0530 | 6.70 | 790 |
| 12-25 | /0630 | 8.00 | 1,260 | 2-1 | 1630 | 9.56 | 1,980 |

/ About.
NOTE.--No gage-height record Dec. 2 to Jan. 6.

## 16-2289. Kalihi Stream near Kaneohe

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

DRAINAGE AREA.--0.60 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,510 cfs Feb. 1 (gage height, 5.36 ft), from rating curve extended as explained below; minimum, 0.07 cfs Nov. 17, 18.
Period of record: Maximum discharge, 1,510 cfs Feb. 1, 1969 (gage height, 5.36 ft), from rating curve extended above 49 cfs on basis of slope-area measurements at gage heights 3.88 and 4.96 ft; minimum, 0.07 cfs on several days in 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .71 | .10 | 2.3 | 1.0 | 182 | 1.3 | 2.8 | .55 | .23 | .37 | .55 | .23 |
| 2 | 1.1 | .12 | 1.6 | 6.2 | 3.5 | 1.1 | 2.5 | 9.4 | .20 | .60 | .52 | .20 |
| 3 | .57 | .10 | 5.6 | 16 | 1.9 | 1.0 | 1.8 | 1.5 | .20 | .59 | .46 | .23 |
| 4 | .18 | .10 | 8.4 | 7.5 | 1.6 | .94 | 1.5 | 1.1 | .23 | .62 | .49 | .26 |
| 5 | .12 | .10 | 2.4 | 6.8 | 1.5 | .87 | 1.5 | 9.2 | .18 | .55 | .39 | .20 |
| 6 | .12 | .10 | 1.5 | 3.2 | 1.4 | .83 | 1.4 | 3.1 | .18 | .53 | .34 | .16 |
| 7 | .10 | .10 | 1.1 | 2.4 | 1.3 | .76 | 1.2 | 1.7 | .18 | 1.4 | .37 | .16 |
| 8 | .10 | .10 | 1.1 | 2.7 | 1.2 | .74 | 1.1 | 1.5 | .18 | .62 | .34 | .23 |
| 9 | .12 | .10 | .87 | 2.8 | 1.2 | .62 | 1.0 | 1.3 | .18 | .46 | .31 | .16 |
| 10 | .10 | .10 | .72 | 2.4 | 1.1 | .58 | .87 | 1.0 | .88 | .46 | .37 | .32 |
| 11 | .10 | .10 | .62 | 1.9 | 1.1 | .52 | .76 | .94 | .92 | .37 | .33 | .16 |
| 12 | .10 | .10 | .66 | 1.5 | 1.0 | .62 | .69 | .87 | .34 | .34 | .26 | .16 |
| 13 | .10 | .10 | 1.0 | 1.3 | 1.6 | .46 | .69 | .79 | .26 | .54 | .26 | .16 |
| 14 | .10 | 3.6 | .62 | 1.2 | 17 | .52 | 1.1 | .83 | .23 | .46 | .26 | .65 |
| 15 | .17 | .08 | .52 | 1.0 | 11 | 1.3 | .69 | .87 | .20 | .28 | .94 | .22 |
| 16 | .10 | .08 | 1.6 | .94 | 4.0 | 38 | .58 | .65 | .20 | .37 | .34 | .20 |
| 17 | .69 | .10 | 1.6 | .87 | 2.1 | 17 | .65 | .58 | .20 | .31 | .34 | .34 |
| 18 | .16 | .08 | 1.3 | .79 | 1.9 | 6.6 | 1.1 | .55 | .18 | .37 | .33 | .26 |
| 19 | .12 | .16 | 8.2 | .69 | 1.8 | 3.8 | .72 | .52 | .18 | .87 | .28 | .23 |
| 20 | .16 | .08 | 7.3 | .72 | 1.6 | 2.6 | 1.0 | .46 | .20 | .79 | .28 | .71 |
| 21 | .10 | .08 | 2.9 | .62 | 1.4 | 2.3 | .69 | .43 | .20 | .49 | .31 | 14 |
| 22 | .16 | .08 | 3.0 | .58 | 1.4 | 1.9 | .58 | .37 | .30 | .52 | .26 | 2.4 |
| 23 | .10 | .10 | 2.0 | .58 | 1.3 | 1.6 | .55 | .34 | .18 | .43 | .20 | 1.3 |
| 24 | .12 | .10 | 1.5 | .52 | 1.4 | 2.3 | .52 | .31 | 1.7 | .52 | .20 | 1.5 |
| 25 | .12 | .12 | 26 | .49 | 1.6 | 6.0 | .43 | .34 | .76 | 2.5 | .26 | .98 |
| 26 | .12 | .27 | 3.7 | .49 | 1.6 | 3.0 | .40 | .28 | .62 | 2.1 | .23 | .72 |
| 27 | .12 | .10 | 2.4 | .46 | 1.3 | 2.1 | .58 | .42 | .46 | 1.1 | .28 | .65 |
| 28 | .12 | .16 | 2.0 | .40 | 1.1 | 1.6 | .49 | .43 | .46 | .87 | .20 | .55 |
| 29 | .12 | 30 | 1.6 | .52 | ------ | 1.3 | 1.4 | .28 | .40 | .72 | .23 | .52 |
| 30 | .12 | 9.5 | 1.3 | 2.3 | ------ | 1.2 | .87 | .28 | .43 | .65 | .28 | .49 |
| 31 | .10 | ------ | 1.1 | 9.3 | ------ | 3.3 | ------ | .28 | ------ | .65 | .52 | ------ |
| TOTAL | 6.32 | 46.01 | 96.51 | 78.17 | 250.9 | 106.76 | 30.16 | 41.17 | 11.06 | 21.45 | 10.73 | 28.35 |
| MEAN | .20 | 1.53 | 3.11 | 2.52 | 8.96 | 3.44 | 1.01 | 1.33 | .37 | .69 | .35 | .94 |
| MAX | 1.1 | 30 | 26 | 16 | 182 | 38 | 2.8 | 9.4 | 1.7 | 2.5 | .94 | 14 |
| MIN | .10 | .08 | .52 | .40 | 1.0 | .46 | .40 | .28 | .18 | .28 | .20 | .16 |
| AC-FT | 13 | 91 | 191 | 155 | 498 | 212 | 60 | 82 | 22 | 43 | 21 | 56 |

CAL YR 1968: TOTAL 655.26 MEAN 1.79 MAX 92 MIN .07 AC-FT 1,300
WTR YR 1969: TOTAL 727.59 MEAN 1.99 MAX 182 MIN .08 AC-FT 1,440

PEAK DISCHARGE (BASE, 200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1430 | 2.93 | 279 | 2- 1 | 1330 | 5.36 | 1,510 |
| 12-25 | 0630 | 2.75 | 228 | 5- 2 | 0400 | 2.66 | 207 |
| 1- 3 | 0430 | 2.80 | 240 | | | | |

## 16-2290. Kalihi Stream near Honolulu

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

DRAINAGE AREA.--2.61 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 2,390 cfs Feb. 1 (gage height, 10.00 ft), from rating curve extended as explained below; minimum, 0.30 cfs Oct. 14.
Period of record: Maximum discharge, about 12,400 cfs Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 280 cfs on basis of indirect measurements at gage heights 8.9, 10.96 and 11.27 ft; minimum, 0.09 cfs Oct. 22, 1933, July 29, 1966.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.7 | .44 | 25 | 6.0 | 255 | 15 | 32 | 4.4 | 2.3 | 1.9 | 3.4 | 3.0 |
| 2 | 3.7 | .47 | 18 | 38 | 62 | 13 | 20 | 47 | 1.9 | 2.6 | 3.0 | 2.0 |
| 3 | 3.6 | .47 | 26 | 85 | 23 | 14 | 12 | 7.7 | 1.9 | 2.4 | 2.8 | 2.0 |
| 4 | 1.5 | .44 | 60 | 42 | 15 | 12 | 9.5 | 5.9 | 1.9 | 3.0 | 3.0 | 1.9 |
| 5 | 1.1 | .47 | 17 | 38 | 11 | 11 | 9.5 | 32 | 1.6 | 2.3 | 2.6 | 1.9 |
| 6 | .82 | .48 | 11 | 16 | 9.1 | 9.1 | 8.7 | 12 | 1.5 | 2.2 | 2.4 | 1.6 |
| 7 | .65 | .46 | 8.2 | 12 | 7.4 | 8.7 | 8.0 | 8.4 | 1.4 | 6.5 | 2.3 | 1.5 |
| 8 | .57 | .45 | 8.0 | 19 | 6.8 | 8.0 | 7.4 | 7.4 | 1.4 | 4.0 | 2.2 | 2.2 |
| 9 | .73 | .44 | 6.2 | 17 | 6.8 | 7.4 | 6.8 | 7.9 | 1.4 | 2.8 | 2.0 | 1.8 |
| 10 | .65 | .43 | 4.7 | 13 | 6.5 | 6.8 | 6.8 | 6.2 | 6.7 | 2.8 | 2.2 | 3.4 |
| 11 | .57 | .46 | 4.3 | 10 | 5.9 | 6.2 | 6.5 | 5.4 | 11 | 2.2 | 2.8 | 2.3 |
| 12 | .50 | .44 | 5.6 | 8.0 | 5.6 | 6.2 | 6.2 | 5.4 | 3.8 | 1.9 | 1.9 | 1.8 |
| 13 | .36 | .50 | 16 | 6.2 | 12 | 5.6 | 5.9 | 4.9 | 2.6 | 2.3 | 2.2 | 1.6 |
| 14 | .36 | 8.5 | 9.0 | 5.2 | 70 | 5.1 | 9.4 | 5.6 | 2.3 | 3.8 | 2.0 | 5.0 |
| 15 | .65 | .50 | 5.8 | 4.5 | 69 | 6.4 | 6.5 | 6.5 | 2.0 | 2.4 | 11 | 2.4 |
| 16 | .57 | .45 | 14 | 3.8 | 64 | 144 | 5.9 | 5.1 | 1.8 | 2.8 | 3.0 | 1.8 |
| 17 | 1.6 | .46 | 19 | 3.5 | 27 | 81 | 6.5 | 4.4 | 1.8 | 2.4 | 3.6 | 2.4 |
| 18 | 1.3 | .44 | 23 | 3.3 | 30 | 35 | 10 | 4.0 | 2.1 | 2.4 | 4.0 | 2.4 |
| 19 | 1.1 | .50 | 47 | 3.1 | 34 | 23 | 7.4 | 3.6 | 1.8 | 8.0 | 4.0 | 2.0 |
| 20 | 1.5 | .50 | 41 | 3.1 | 20 | 16 | 17 | 3.6 | 1.6 | 7.4 | 2.8 | 6.0 |
| 21 | 1.0 | .43 | 20 | 3.3 | 15 | 13 | 8.0 | 3.4 | 1.5 | 4.2 | 4.0 | 49 |
| 22 | .95 | .41 | 16 | 2.8 | 12 | 11 | 6.8 | 3.4 | 1.6 | 4.0 | 2.3 | 13 |
| 23 | .70 | .46 | 12 | 2.8 | 10 | 9.8 | 5.9 | 3.0 | 2.0 | 3.0 | 2.0 | 8.4 |
| 24 | .55 | .44 | 9.0 | 2.8 | 9.8 | 25 | 5.4 | 2.6 | 11 | 11 | 1.7 | 8.8 |
| 25 | .52 | .48 | 110 | 2.5 | 15 | 40 | 4.4 | 2.8 | 4.6 | 36 | 1.7 | 5.6 |
| 26 | .52 | 2.5 | 25 | 2.4 | 16 | 15 | 4.2 | 2.8 | 3.2 | 22 | 1.8 | 4.2 |
| 27 | .50 | .90 | 12 | 2.3 | 11 | 14 | 4.4 | 3.6 | 2.4 | 8.0 | 2.3 | 3.8 |
| 28 | .50 | 4.0 | 10 | 2.4 | 9.1 | 11 | 5.1 | 3.0 | 2.2 | 5.9 | 1.8 | 3.6 |
| 29 | .50 | 140 | 8.8 | 4.6 | ------ | 9.1 | 9.0 | 2.4 | 1.9 | 4.9 | 1.8 | 3.4 |
| 30 | .48 | 42 | 7.4 | 28 | ------ | 8.7 | 6.8 | 2.3 | 2.0 | 4.2 | 2.0 | 3.2 |
| 31 | .48 | ------ | 6.4 | 12 | ------ | 34 | ------ | 2.3 | ------ | 4.0 | 5.5 | ------ |
| TOTAL | 31.23 | 208.92 | 605.4 | 402.6 | 838.0 | 624.1 | 262.0 | 219.0 | 85.2 | 173.3 | 90.1 | 152.0 |
| MEAN | 1.01 | 6.96 | 19.5 | 13.0 | 29.9 | 20.1 | 8.73 | 7.06 | 2.84 | 5.59 | 2.91 | 5.07 |
| MAX | 3.7 | 140 | 110 | 85 | 255 | 144 | 32 | 47 | 11 | 36 | 11 | 49 |
| MIN | .36 | .41 | 4.3 | 2.3 | 5.6 | 5.1 | 4.2 | 2.3 | 1.4 | 1.9 | 1.7 | 1.5 |
| AC-FT | 62 | 414 | 1,200 | 799 | 1,660 | 1,240 | 520 | 434 | 169 | 344 | 179 | 301 |

CAL YR 1968: TOTAL 2,656.27 MEAN 7.26 MAX 200 MIN .36 AC-FT 5,270
WTR YR 1969: TOTAL 3,691.85 MEAN 10.1 MAX 255 MIN .36 AC-FT 7,320

PEAK DISCHARGE (BASE, 390 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | /1500 | - | /1,600 | 1-3 | /0430 | - | /1,000 |
| 12-25 | /0700 | - | /700 | 2-1 | 1600 | 10.00 | 2,390 |

/ About
NOTE.--No gage-height record Oct. 17 to Jan. 28.

## 16-2293. Kalihi Stream at Kalihi

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

DRAINAGE AREA.--5.18 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 3,290 cfs Feb. 1 (gage height, 6.34 ft), from rating curve extended above 780 cfs on basis of slope-area measurements at gage heights 8.0 and 8.24 ft; minimum, 0.51 cfs Nov. 22.
Period of record: Maximum discharge, about 7,000 cfs Nov. 14, 1965; minimum, 0.16 cfs June 24, 1966.
Flood of May 14, 1960, reached a stage of 8.0 ft, from floodmarks, present site and datum (discharge, 6,350 cfs, from slope-area measurement of peak flow).

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.7 | .67 | 36 | 8.6 | 781 | 26 | 62 | 8.2 | 2.8 | 3.8 | 6.0 | 6.0 |
| 2 | 11 | .84 | 28 | 63 | 145 | 30 | 38 | 67 | 2.8 | 6.2 | 5.4 | 3.8 |
| 3 | 10 | .84 | 37 | 250 | 39 | 46 | 19 | 17 | 3.1 | 5.8 | 5.0 | 4.2 |
| 4 | 3.6 | .75 | 136 | 67 | 23 | 25 | 16 | 12 | 2.8 | 6.0 | 5.2 | 3.6 |
| 5 | 1.8 | .84 | 25 | 55 | 18 | 18 | 14 | 36 | 2.6 | 5.5 | 4.5 | 3.6 |
| 6 | 1.7 | .84 | 15 | 25 | 15 | 18 | 12 | 18 | 2.6 | 5.4 | 4.0 | 2.8 |
| 7 | 1.4 | .75 | 12 | 19 | 14 | 15 | 11 | 12 | 3.1 | 15 | 3.7 | 2.4 |
| 8 | 1.2 | .75 | 12 | 32 | 12 | 13 | 9.1 | 12 | 2.8 | 6.0 | 3.7 | 3.1 |
| 9 | 1.4 | .75 | 8.2 | 28 | 11 | 11 | 9.1 | 14 | 2.4 | 5.4 | 3.8 | 2.4 |
| 10 | 1.4 | .75 | 7.2 | 19 | 10 | 9.6 | 8.6 | 9.1 | 13 | 5.0 | 3.9 | 3.8 |
| 11 | 1.1 | .75 | 6.4 | 14 | 9.1 | 8.6 | 8.2 | 7.7 | 17 | 4.5 | 3.6 | 2.8 |
| 12 | 1.3 | .75 | 8.3 | 12 | 8.6 | 8.2 | 7.7 | 7.2 | 4.6 | 4.0 | 3.4 | 2.4 |
| 13 | 1.1 | 1.0 | 30 | 9.6 | 12 | 7.2 | 6.8 | 6.4 | 3.6 | 6.5 | 3.3 | 3.1 |
| 14 | 1.0 | 40 | 14 | 8.2 | 69 | 7.7 | 13 | 7.2 | 3.3 | 4.5 | 3.3 | 5.2 |
| 15 | 1.1 | 1.5 | 9.1 | 6.8 | 74 | 8.2 | 7.2 | 9.1 | 2.8 | 4.3 | 15 | 2.8 |
| 16 | 1.6 | .93 | 26 | 5.6 | 84 | 236 | 6.4 | 6.8 | 2.4 | 4.0 | 4.2 | 2.2 |
| 17 | 4.3 | 1.0 | 28 | 5.2 | 39 | 146 | 8.0 | 5.6 | 2.0 | 3.5 | 6.0 | 2.4 |
| 18 | 4.6 | .84 | 32 | 4.9 | 50 | 47 | 14 | 5.2 | 3.1 | 4.0 | 5.6 | 2.6 |
| 19 | 2.3 | 1.5 | 83 | 4.6 | 62 | 33 | 11 | 5.2 | 3.1 | 11 | 8.6 | 2.3 |
| 20 | 4.7 | 1.4 | 78 | 4.6 | 33 | 22 | 36 | 4.8 | 1.7 | 9.0 | 4.9 | 6.4 |
| 21 | 1.4 | .75 | 25 | 4.9 | 23 | 18 | 14 | 4.9 | 1.6 | 5.9 | 6.0 | 67 |
| 22 | 1.4 | .57 | 19 | 4.2 | 19 | 15 | 9.1 | 4.6 | 2.3 | 5.2 | 3.6 | 43 |
| 23 | 1.1 | .84 | 14 | 4.2 | 16 | 14 | 7.7 | 3.8 | 2.2 | 5.0 | 2.8 | 11 |
| 24 | .93 | .75 | 11 | 4.2 | 19 | 30 | 6.8 | 3.6 | 17 | 14 | 2.6 | 12 |
| 25 | .83 | 1.4 | 244 | 3.8 | 30 | 47 | 6.4 | 4.6 | 8.0 | 45 | 3.1 | 7.7 |
| 26 | .75 | 9.4 | 29 | 3.6 | 36 | 24 | 6.4 | 4.2 | 6.1 | 25 | 3.6 | 5.6 |
| 27 | .75 | 2.4 | 18 | 3.1 | 21 | 17 | 6.8 | 4.6 | 5.4 | 11 | 4.6 | 4.6 |
| 28 | .75 | 25 | 15 | 3.3 | 17 | 15 | 7.2 | 4.2 | 4.8 | 8.5 | 2.8 | 4.2 |
| 29 | .75 | 404 | 12 | 15 | ------ | 14 | 11 | 3.3 | 4.0 | 7.3 | 2.8 | 4.6 |
| 30 | 1.1 | 126 | 10 | 40 | ------ | 12 | 15 | 3.1 | 4.4 | 6.8 | 4.2 | 4.2 |
| 31 | 1.1 | ------ | 9.1 | 27 | ------ | 76 | ------ | 2.8 | ------ | 6.5 | 8.6 | ------ |
| TOTAL | 75.16 | 628.56 | 1037.3 | 755.4 | 1689.7 | 1017.5 | 407.5 | 314.2 | 137.4 | 259.6 | 147.8 | 231.8 |
| MEAN | 2.42 | 21.0 | 33.5 | 24.4 | 60.3 | 32.8 | 13.6 | 10.1 | 4.58 | 8.37 | 4.77 | 7.73 |
| MAX | 11 | 404 | 244 | 250 | 781 | 236 | 62 | 67 | 17 | 45 | 15 | 67 |
| MIN | .75 | .57 | 6.4 | 3.1 | 8.6 | 7.2 | 6.4 | 2.8 | 1.6 | 3.5 | 2.6 | 2.2 |
| AC-FT | 149 | 1250 | 2060 | 1500 | 3350 | 2020 | 808 | 623 | 273 | 515 | 293 | 460 |

CAL YR 1968: TOTAL 5,889.51 MEAN 16.1 MAX 718 MIN .57 AC-FT 11,680
WTR YR 1969: TOTAL 6,701.92 MEAN 18.4 MAX 781 MIN .57 AC-FT 13,290

PEAK DISCHARGE (BASE, 930 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1530 | 6.10 | 2,980 | 1- 3 | 0500 | 5.58 | 2,350 |
| 12-25 | 0730 | 4.51 | 1,310 | 2- 1 | 1630 | 6.34 | 3,290 |
| 1- 2 | 1430 | 4.04 | 968 | 3-17 | 0100 | 4.06 | 982 |

NOTE.--No gage-height record June 24 to Aug. 13.

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

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

DRAINAGE AREA.--3.35 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 734 cfs Nov. 29 (gage height, 4.94 ft), from rating curve extended above 420 cfs on basis of slope-area measurement at gage height 6.69 ft; minimum, 1.0 cfs Nov. 22, 28.
Period of record: Maximum discharge, 6,990 cfs Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 420 cfs by test of model of station site; minimum, 0.09 cfs Sept. 10, 11, 1925.

REMARKS.--Records fair. Low-flow regulation by reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively). Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.4 | 1.4 | 9.9 | 7.9 | 101 | 14 | 18 | 6.3 | 4.3 | 3.6 | 4.0 | 3.3 |
| 2 | 3.4 | 1.5 | 6.8 | 21 | 104 | 14 | 14 | 17 | 4.3 | 3.5 | 4.0 | 2.8 |
| 3 | 9.3 | 1.6 | 9.2 | 38 | 87 | 18 | 11 | 6.6 | 4.3 | 3.7 | 3.9 | 2.7 |
| 4 | 3.1 | 1.4 | 42 | 24 | 37 | 14 | 9.9 | 6.3 | 4.2 | 3.8 | 3.7 | 2.7 |
| 5 | 2.1 | 1.2 | 9.9 | 22 | 13 | 13 | 9.3 | 13 | 4.0 | 3.7 | 3.9 | 2.6 |
| 6 | 1.9 | 1.2 | 7.3 | 13 | 11 | 12 | 8.8 | 6.6 | 4.0 | 4.3 | 3.7 | 2.5 |
| 7 | 1.7 | 1.2 | 5.8 | 11 | 10 | 10 | 8.5 | 6.2 | 3.9 | 4.1 | 3.4 | 2.6 |
| 8 | 1.7 | 1.2 | 5.4 | 13 | 9.9 | 9.0 | 8.2 | 5.9 | 3.9 | 3.7 | 3.3 | 3.0 |
| 9 | 1.5 | 1.2 | 4.9 | 12 | 9.6 | 8.8 | 7.9 | 6.2 | 3.8 | 4.0 | 3.2 | 2.6 |
| 10 | 1.4 | 1.2 | 4.5 | 11 | 9.3 | 8.5 | 7.9 | 5.8 | 6.2 | 4.5 | 3.2 | 3.4 |
| 11 | 1.4 | 1.2 | 4.2 | 9.9 | 8.8 | 7.9 | 7.9 | 5.8 | 8.9 | 3.7 | 3.0 | 2.7 |
| 12 | 1.4 | 1.2 | 4.5 | 9.3 | 8.5 | 7.6 | 7.6 | 5.8 | 4.4 | 3.7 | 2.8 | 2.5 |
| 13 | 1.3 | 1.2 | 11 | 9.0 | 9.6 | 7.4 | 7.6 | 5.7 | 4.0 | 4.0 | 3.0 | 2.4 |
| 14 | 1.2 | 1.5 | 5.4 | 8.5 | 32 | 7.3 | 7.9 | 5.8 | 4.0 | 4.0 | 3.0 | 3.0 |
| 15 | 1.3 | 1.2 | 4.8 | 7.9 | 69 | 7.6 | 7.1 | 6.8 | 4.0 | 3.8 | 6.8 | 2.6 |
| 16 | 1.2 | 1.1 | 5.2 | 7.6 | 72 | 122 | 7.1 | 5.8 | 3.8 | 4.2 | 4.0 | 2.4 |
| 17 | 2.3 | 1.2 | 6.6 | 7.4 | 34 | 93 | 7.1 | 5.7 | 3.8 | 4.1 | 3.5 | 2.6 |
| 18 | 1.8 | 1.1 | 5.8 | 7.1 | 66 | 84 | 7.6 | 5.5 | 3.7 | 4.4 | 3.1 | 2.4 |
| 19 | 1.5 | 1.3 | 23 | 7.1 | 62 | 53 | 7.6 | 5.3 | 3.7 | 7.7 | 3.4 | 2.3 |
| 20 | 1.7 | 1.2 | 25 | 7.3 | 21 | 16 | 13 | 5.3 | 3.6 | 5.2 | 3.4 | 3.2 |
| 21 | 1.4 | 1.1 | 11 | 7.1 | 16 | 15 | 7.3 | 5.1 | 3.7 | 4.0 | 3.7 | 33 |
| 22 | 1.3 | 1.0 | 9.3 | 7.0 | 15 | 14 | 6.8 | 5.0 | 3.7 | 3.4 | 3.2 | 6.6 |
| 23 | 1.2 | 1.1 | 7.1 | 6.6 | 14 | 13 | 6.8 | 5.0 | 3.6 | 3.4 | 3.2 | 4.0 |
| 24 | 1.2 | 1.1 | 6.5 | 5.9 | 13 | 20 | 6.6 | 5.0 | 5.8 | 4.8 | 3.2 | 4.3 |
| 25 | 1.2 | 1.3 | 48 | 5.9 | 16 | 61 | 6.6 | 5.0 | 3.9 | 19 | 3.3 | 3.7 |
| 26 | 1.2 | 2.2 | 11 | 5.8 | 14 | 68 | 6.5 | 4.8 | 4.0 | 20 | 3.1 | 3.2 |
| 27 | 1.2 | 1.3 | 9.3 | 5.8 | 13 | 38 | 6.6 | 5.0 | 4.1 | 5.7 | 3.3 | 3.3 |
| 28 | 1.2 | 1.4 | 8.8 | 5.6 | 12 | 11 | 6.5 | 4.8 | 4.0 | 4.6 | 2.9 | 3.3 |
| 29 | 1.2 | 101 | 8.5 | 7.3 | ------ | 9.9 | 8.1 | 4.6 | 3.8 | 4.3 | 2.7 | 3.1 |
| 30 | 1.2 | 28 | 8.5 | 18 | ------ | 9.6 | 7.4 | 4.6 | 3.7 | 4.2 | 2.8 | 3.4 |
| 31 | 1.2 | ------ | 8.2 | 9.6 | ------ | 23 | ------ | 4.4 | ------ | 4.2 | 3.4 | ------ |
| TOTAL | 56.1 | 164.8 | 337.4 | 338.6 | 887.7 | 809.6 | 253.2 | 190.7 | 127.1 | 161.3 | 107.1 | 122.2 |
| MEAN | 1.81 | 5.49 | 10.9 | 10.9 | 31.7 | 26.1 | 8.44 | 6.15 | 4.24 | 5.20 | 3.45 | 4.07 |
| MAX | 9.3 | 101 | 48 | 38 | 104 | 122 | 18 | 17 | 8.9 | 20 | 6.8 | 33 |
| MIN | 1.2 | 1.0 | 4.2 | 5.6 | 8.5 | 7.3 | 6.5 | 4.4 | 3.6 | 3.4 | 2.7 | 2.3 |
| AC-FT | 111 | 327 | 669 | 672 | 1,760 | 1,610 | 502 | 378 | 252 | 320 | 212 | 242 |

CAL YR 1968: TOTAL 3,575.6 MEAN 9.77 MAX 355 MIN 1.0 AC-FT 7,090
WTR YR 1969: TOTAL 3,555.8 MEAN 9.74 MAX 122 MIN 1.0 AC-FT 7,050

PEAK DISCHARGE (BASE, 240 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1630 | 4.94 | 734 | 2-1 | 1630 | 4.30 | 410 |
| 12-25 | 0200 | 3.58 | 240 | 3-16 | 2000 | 4.17 | 371 |

## 16-2385. Waihi Stream at Honolulu

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

DRAINAGE AREA.--1.14 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 456 cfs Nov. 29 (gage height, 3.59 ft), from rating curve extended above 120 cfs by test of model of station site; minimum, 0.15 cfs Nov. 16, 18, 19.
Period of record: Maximum discharge, 3,250 cfs Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 60 cfs; minimum, 0.08 cfs Dec. 16, 18, 1913, Jan. 16-18, Feb. 4, 6, 1915, Mar. 16, 22, 1926.

REMARKS.--Records fair. Occasional small diversion for irrigation above station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.8 | .30 | 9.3 | 1.9 | 22 | 7.1 | 13 | 3.4 | .97 | 1.8 | 2.2 | 5.0 |
| 2 | 6.2 | .26 | 5.0 | 10 | 24 | 5.5 | 7.4 | 23 | .87 | 2.1 | 2.2 | 2.7 |
| 3 | 12 | .26 | 7.1 | 20 | 7.3 | 7.9 | 4.5 | 4.5 | .81 | 2.5 | 2.0 | 2.4 |
| 4 | 3.2 | .22 | 19 | 18 | 4.0 | 6.2 | 3.5 | 3.4 | 1.1 | 2.0 | 1.9 | 2.1 |
| 5 | 1.7 | .22 | 5.5 | 9.7 | 3.1 | 5.6 | 3.2 | 15 | .79 | 1.6 | 2.0 | 1.9 |
| 6 | 1.2 | .26 | 3.6 | 4.8 | 2.8 | 6.1 | 2.9 | 4.7 | .71 | 2.0 | 1.8 | 1.6 |
| 7 | .91 | .26 | 2.8 | 6.6 | 2.3 | 4.9 | 2.3 | 3.1 | .67 | 2.9 | 1.6 | 1.5 |
| 8 | .73 | .26 | 3.9 | 5.4 | 2.1 | 4.1 | 2.1 | 2.5 | .64 | 1.7 | 1.5 | 1.5 |
| 9 | .67 | .26 | 2.4 | 5.0 | 2.0 | 4.6 | 2.1 | 2.6 | .59 | 1.5 | 1.3 | 1.3 |
| 10 | .59 | .30 | 2.0 | 4.1 | 1.8 | 3.5 | 2.2 | 2.2 | 5.5 | 1.8 | 1.2 | 7.3 |
| 11 | .55 | .26 | 1.7 | 3.1 | 1.6 | 3.1 | 2.0 | 2.0 | 8.7 | 1.4 | 1.4 | 1.9 |
| 12 | .73 | .22 | 2.1 | 2.7 | 1.5 | 2.7 | 1.8 | 1.9 | 2.0 | 1.1 | 1.1 | 1.4 |
| 13 | .61 | .22 | 8.9 | 2.4 | 2.2 | 2.5 | 1.8 | 1.8 | 1.4 | 2.9 | 1.3 | 1.3 |
| 14 | .50 | .30 | 3.2 | 2.1 | 13 | 2.3 | 3.6 | 2.2 | 1.1 | 3.4 | 1.6 | 4.0 |
| 15 | .78 | .22 | 2.3 | 1.9 | 18 | 3.3 | 1.7 | 2.7 | 1.1 | 2.5 | 7.7 | 1.7 |
| 16 | .86 | .18 | 3.2 | 1.8 | 20 | 92 | 1.4 | 1.9 | .89 | 3.6 | 3.0 | 1.3 |
| 17 | 2.6 | .26 | 4.2 | 1.7 | 9.1 | 44 | 2.0 | 1.6 | .86 | 2.7 | 4.0 | 1.9 |
| 18 | .71 | .18 | 3.0 | 1.5 | 18 | 16 | 5.4 | 1.5 | .80 | 5.1 | 2.8 | 1.8 |
| 19 | 1.1 | 1.0 | 11 | 1.3 | 22 | 11 | 2.7 | 1.4 | .89 | 14 | 4.2 | 1.3 |
| 20 | 1.8 | .76 | 13 | 1.3 | 11 | 6.9 | 18 | 1.3 | .84 | 11 | 2.7 | 5.4 |
| 21 | .60 | .30 | 6.2 | 1.2 | 6.8 | 5.8 | 4.8 | 1.3 | .75 | 4.5 | 4.4 | 48 |
| 22 | .92 | .22 | 4.1 | 1.2 | 5.8 | 4.8 | 3.3 | 1.3 | 1.8 | 3.5 | 2.1 | 7.5 |
| 23 | .62 | .48 | 2.9 | 1.1 | 4.8 | 4.1 | 2.7 | 1.2 | 2.1 | 3.9 | 1.8 | 5.5 |
| 24 | .46 | .30 | 2.4 | 1.0 | 5.5 | 11 | 2.5 | 1.1 | 4.5 | 6.7 | 1.8 | 6.5 |
| 25 | .42 | .69 | 35 | .89 | 12 | 16 | 2.1 | 1.6 | 1.9 | 21 | 4.1 | 3.3 |
| 26 | .37 | 2.4 | 5.6 | .89 | 11 | 6.0 | 2.0 | 1.7 | 2.8 | 10 | 2.4 | 2.7 |
| 27 | .33 | .48 | 3.9 | .83 | 6.2 | 4.4 | 2.9 | 1.9 | 2.3 | 4.7 | 4.1 | 2.3 |
| 28 | .30 | 1.0 | 3.2 | .81 | 4.7 | 3.7 | 2.4 | 3.3 | 2.1 | 3.5 | 2.0 | 2.2 |
| 29 | .30 | 81 | 2.6 | 4.2 | ------ | 3.4 | 12 | 1.8 | 1.9 | 2.9 | 2.4 | 2.2 |
| 30 | .36 | 28 | 2.3 | 11 | ------ | 3.2 | 8.5 | 1.2 | 2.0 | 2.5 | 4.6 | 3.8 |
| 31 | .55 | ------ | 2.1 | 4.5 | ------ | 17 | ------ | 1.0 | ------ | 2.3 | 5.9 | ------ |
| TOTAL | 44.47 | 121.87 | 103.5 | 132.92 | 244.6 | 318.7 | 126.8 | 100.1 | 53.38 | 133.1 | 83.1 | 133.3 |
| MEAN | 1.43 | 4.06 | 5.92 | 4.29 | 8.74 | 10.3 | 4.23 | 3.23 | 1.78 | 4.29 | 2.68 | 4.44 |
| MAX | 12 | 81 | 35 | 20 | 24 | 92 | 18 | 23 | 8.7 | 21 | 7.7 | 48 |
| MIN | .30 | .18 | 1.7 | .81 | 1.5 | 2.3 | 1.4 | 1.0 | .59 | 1.1 | 1.1 | 1.3 |
| AC-FT | 88 | 242 | 364 | 264 | 485 | 632 | 252 | 199 | 106 | 264 | 165 | 264 |

CAL YR 1968 TOTAL 1,264.52 MEAN 3.46 MAX 97 MIN .18 AC-FT 2,510
WTR YR 1969 TOTAL 1,675.84 MEAN 4.59 MAX 92 MIN .18 AC-FT 3,320

PEAK DISCHARGE (BASE, 310 CFS).--Nov. 29 (1500) 456 cfs (3.59 ft).

## 16-2405. Waiakeakua Stream at Honolulu

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

DRAINAGE AREA.--1.06 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 912 cfs Nov. 29 (gage height, 4.44 ft), from rating curve extended above 110 cfs on basis of slope-area measurement at gage height 5.28 ft; minimum, 1.7 cfs on several days.
Period of record: Maximum discharge, 3,090 cfs Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 58 cfs; minimum, 0.6 cfs June 7, 8, 1926.

REMARKS.--Records good. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.0 | 2.2 | 8.5 | 3.3 | 13 | 7.8 | 16 | 6.0 | 4.3 | 4.9 | 5.0 | 7.5 |
| 2 | 5.0 | 2.2 | 5.7 | 8.6 | 13 | 6.3 | 11 | 18 | 4.1 | 5.6 | 5.0 | 5.2 |
| 3 | 9.5 | 2.2 | 8.2 | 18 | 6.2 | 6.4 | 7.7 | 6.3 | 4.1 | 5.2 | 4.7 | 5.0 |
| 4 | 4.3 | 2.0 | 20 | 17 | 4.6 | 6.2 | 6.8 | 5.6 | 4.2 | 4.7 | 4.7 | 4.9 |
| 5 | 3.3 | 1.9 | 6.3 | 9.9 | 3.6 | 5.9 | 6.4 | 17 | 4.0 | 4.5 | 4.9 | 4.7 |
| 6 | 3.0 | 1.9 | 4.6 | 5.4 | 4.1 | 6.4 | 6.0 | 8.0 | 4.0 | 5.2 | 4.7 | 4.5 |
| 7 | 2.7 | 1.9 | 4.0 | 9.5 | 3.7 | 5.7 | 4.6 | 5.7 | 3.8 | 6.4 | 4.6 | 5.0 |
| 8 | 2.7 | 1.9 | 5.5 | 7.5 | 3.4 | 5.2 | 4.1 | 5.4 | 3.8 | 4.7 | 4.5 | 4.3 |
| 9 | 2.7 | 1.9 | 4.0 | 6.4 | 3.4 | 5.6 | 4.9 | 5.4 | 3.7 | 4.7 | 4.2 | 4.1 |
| 10 | 2.6 | 2.0 | 3.4 | 5.7 | 3.4 | 4.7 | 6.0 | 5.3 | 9.7 | 5.0 | 4.2 | 8.7 |
| 11 | 2.5 | 1.9 | 3.2 | 4.6 | 3.2 | 4.5 | 5.9 | 5.4 | 18 | 4.5 | 4.1 | 5.0 |
| 12 | 2.6 | 1.9 | 3.8 | 4.2 | 3.1 | 4.3 | 5.4 | 5.6 | 5.3 | 4.3 | 4.0 | 4.2 |
| 13 | 2.5 | 1.9 | 10 | 4.0 | 5.8 | 4.2 | 5.6 | 5.2 | 4.6 | 4.5 | 4.2 | 4.2 |
| 14 | 2.4 | 2.3 | 4.0 | 3.8 | 30 | 4.2 | 7.0 | 5.7 | 4.3 | 6.9 | 3.7 | 5.7 |
| 15 | 2.8 | 2.0 | 3.6 | 3.4 | 33 | 6.6 | 5.0 | 6.4 | 4.2 | 5.4 | 10 | 4.2 |
| 16 | 2.7 | 1.9 | 4.6 | 3.3 | 24 | 121 | 4.9 | 5.3 | 4.1 | 5.9 | 5.3 | 4.0 |
| 17 | 4.0 | 2.0 | 6.5 | 3.2 | 9.8 | 41 | 5.7 | 5.0 | 4.2 | 5.6 | 7.0 | 4.3 |
| 18 | 2.5 | 1.8 | 4.6 | 3.2 | 14 | 14 | 7.8 | 4.9 | 4.2 | 6.9 | 5.6 | 4.6 |
| 19 | 2.8 | 2.8 | 9.3 | 3.1 | 13 | 12 | 5.7 | 4.7 | 4.2 | 13 | 7.5 | 4.1 |
| 20 | 3.7 | 2.7 | 12 | 3.0 | 8.6 | 8.0 | 15 | 4.6 | 4.2 | 11 | 6.4 | 6.5 |
| 21 | 2.5 | 2.4 | 7.2 | 3.0 | 7.0 | 7.0 | 6.8 | 4.6 | 4.0 | 6.3 | 7.6 | 45 |
| 22 | 3.1 | 2.0 | 6.2 | 3.0 | 6.4 | 6.6 | 5.9 | 4.6 | 3.8 | 5.7 | 5.0 | 10 |
| 23 | 2.8 | 2.3 | 4.2 | 3.0 | 5.7 | 6.3 | 5.4 | 4.3 | 5.4 | 6.7 | 4.7 | 7.2 |
| 24 | 2.5 | 2.0 | 3.8 | 3.1 | 6.3 | 15 | 5.3 | 4.2 | 21 | 8.6 | 4.7 | 8.3 |
| 25 | 2.4 | 2.2 | 30 | 3.1 | 11 | 22 | 5.0 | 5.0 | 4.9 | 16 | 5.7 | 5.9 |
| 26 | 2.3 | 3.9 | 6.0 | 3.0 | 9.8 | 8.8 | 4.9 | 5.0 | 6.4 | 9.8 | 5.2 | 5.3 |
| 27 | 2.3 | 2.3 | 4.7 | 3.0 | 6.4 | 7.2 | 5.7 | 5.3 | 4.9 | 6.6 | 7.0 | 5.0 |
| 28 | 2.3 | 3.6 | 4.3 | 3.0 | 6.0 | 6.6 | 5.4 | 9.2 | 5.0 | 5.7 | 4.9 | 4.9 |
| 29 | 2.2 | 85 | 4.0 | 8.7 | ------ | 6.3 | 14 | 5.7 | 4.5 | 6.0 | 5.3 | 4.9 |
| 30 | 2.4 | 22 | 3.6 | 17 | ------ | 6.4 | 9.3 | 4.7 | 5.0 | 5.0 | 6.3 | 5.5 |
| 31 | 2.5 | ------ | 3.3 | 5.0 | ------ | 13 | ------ | 4.5 | ------ | 4.9 | 7.8 | ------ |
| TOTAL | 95.6 | 169.0 | 209.1 | 182.0 | 261.5 | 385.2 | 209.2 | 192.6 | 167.9 | 200.2 | 168.5 | 202.7 |
| MEAN | 3.08 | 5.63 | 6.75 | 5.87 | 9.34 | 12.4 | 6.97 | 6.21 | 5.60 | 6.46 | 5.44 | 6.76 |
| MAX | 9.5 | 85 | 30 | 18 | 33 | 121 | 16 | 18 | 21 | 16 | 10 | 45 |
| MIN | 2.2 | 1.8 | 3.2 | 3.0 | 3.1 | 4.2 | 4.1 | 4.2 | 3.7 | 4.3 | 3.7 | 4.0 |
| AC-FT | 190 | 335 | 415 | 361 | 519 | 764 | 415 | 382 | 333 | 397 | 334 | 402 |

CAL YR 1968: TOTAL 2,467.8 MEAN 6.74 MAX 103 MIN 1.8 AC-FT 4,890
WTR YR 1969: TOTAL 2,443.5 MEAN 6.69 MAX 121 MIN 1.8 AC-FT 4,850

PEAK DISCHARGE (BASE, 310 CFS).--Nov. 29 (1500) 912 cfs (4.44 ft); Mar. 16 (1530) 560 cfs (3.88 ft).

## 16-2440. Pukele Stream near Honolulu

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

DRAINAGE AREA.--1.18 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 420 cfs Nov. 29 (gage height, 4.60 ft), from rating curve extended above 96 cfs on basis of slope-area measurement at gage height 6.13 ft; minimum, 0.18 cfs Nov. 22, 25.
Period of record: Maximum discharge, 2,600 cfs Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 71 cfs by test of model of station site; minimum, 0.08 cfs Oct. 31, 1929.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .23 | .22 | 5.8 | 2.3 | 7.1 | 3.2 | 8.6 | 2.2 | .62 | .82 | 1.6 | 1.3 |
| 2 | .61 | .22 | 2.8 | 3.9 | 14 | 3.1 | 6.8 | 9.6 | .60 | .88 | 1.6 | .88 |
| 3 | 1.6 | .22 | 3.2 | 13 | 4.4 | 3.5 | 3.6 | 3.0 | .60 | .97 | 1.4 | 1.1 |
| 4 | .35 | .22 | 23 | 12 | 2.1 | 3.1 | 2.8 | 2.1 | .60 | .82 | 1.3 | .97 |
| 5 | .32 | .22 | 4.5 | 8.9 | 1.7 | 2.8 | 2.7 | 4.1 | .60 | .82 | 1.2 | .97 |
| 6 | .32 | .22 | 1.9 | 3.8 | 1.7 | 2.8 | 2.7 | 3.0 | .59 | .80 | 1.1 | .97 |
| 7 | .32 | .22 | 1.6 | 4.7 | 1.7 | 2.6 | 2.5 | 2.1 | .56 | .88 | .97 | .97 |
| 8 | .32 | .22 | 3.3 | 4.6 | 1.7 | 2.6 | 2.5 | 2.0 | .56 | .82 | .88 | .88 |
| 9 | .32 | .22 | 2.0 | 6.2 | 1.6 | 2.4 | 2.4 | 2.0 | .56 | .82 | .82 | .82 |
| 10 | .32 | .22 | 1.6 | 4.3 | 1.5 | 2.3 | 2.4 | 1.9 | 3.0 | .82 | .76 | .88 |
| 11 | .32 | .22 | 1.5 | 2.8 | 1.4 | 2.2 | 2.2 | 1.9 | 12 | .82 | .70 | .82 |
| 12 | .32 | .21 | 1.9 | 2.6 | 1.3 | 2.1 | 2.1 | 1.8 | 1.6 | .82 | .70 | .76 |
| 13 | .32 | .20 | 11 | 2.5 | 1.4 | 2.0 | 2.1 | 1.7 | .97 | .88 | .70 | .76 |
| 14 | .32 | .20 | 3.0 | 2.3 | 19 | 1.9 | 2.2 | 1.6 | .97 | .88 | .70 | .82 |
| 15 | .33 | .20 | 1.7 | 2.2 | 22 | 2.8 | 1.9 | 1.4 | 1.1 | .76 | .88 | .70 |
| 16 | .31 | .20 | 2.1 | 2.1 | 21 | 53 | 1.8 | 1.3 | .97 | .76 | .65 | .65 |
| 17 | .29 | .20 | 3.9 | 1.9 | 7.1 | 28 | 2.1 | 1.2 | 1.1 | .76 | .70 | .60 |
| 18 | .29 | .20 | 3.1 | 1.8 | 7.6 | 9.7 | 2.8 | 1.1 | .97 | .76 | .65 | .60 |
| 19 | .29 | .20 | 7.0 | 1.6 | 13 | 8.7 | 2.1 | 1.1 | .97 | 2.0 | .70 | .60 |
| 20 | .28 | .20 | 15 | 1.5 | 7.6 | 4.5 | 10 | .98 | .88 | 4.1 | .70 | .60 |
| 21 | .26 | .20 | 6.5 | 1.3 | 5.0 | 3.2 | 3.3 | .97 | .82 | 1.4 | 2.3 | 15 |
| 22 | .26 | .20 | 4.0 | 1.1 | 3.7 | 2.7 | 2.0 | .88 | .82 | 1.2 | .65 | 4.4 |
| 23 | .26 | .20 | 2.6 | 1.0 | 3.0 | 2.6 | 1.9 | .79 | .82 | 2.7 | .70 | 1.3 |
| 24 | .25 | .20 | 2.2 | .92 | 3.1 | 11 | 2.0 | .73 | .76 | 1.7 | .70 | 1.9 |
| 25 | .24 | .20 | 21 | .86 | 5.5 | 15 | 1.9 | .76 | .76 | 5.4 | .76 | 1.1 |
| 26 | .24 | .20 | 5.6 | .81 | 6.3 | 6.4 | 1.8 | .71 | .97 | 8.4 | .76 | 1.1 |
| 27 | .24 | .20 | 3.4 | .71 | 4.0 | 3.8 | 1.8 | .69 | .82 | 3.7 | .70 | 1.1 |
| 28 | .24 | .78 | 2.9 | .68 | 3.1 | 2.9 | 1.7 | .70 | .82 | 1.9 | .70 | 1.1 |
| 29 | .23 | 47 | 2.7 | 1.0 | ------ | 2.7 | 5.4 | .66 | .82 | 1.6 | .76 | 1.1 |
| 30 | .22 | 16 | 2.6 | 11 | ------ | 2.6 | 5.5 | .61 | .82 | 1.6 | .88 | .97 |
| 31 | .22 | ------ | 2.5 | 2.9 | ------ | 4.1 | ------ | .62 | ------ | 1.6 | 1.5 | ------ |
| TOTAL | 10.44 | 69.41 | 156.7 | 107.28 | 172.6 | 200.3 | 93.6 | 54.20 | 38.05 | 52.27 | 29.12 | 45.72 |
| MEAN | .34 | 2.31 | 5.05 | 3.46 | 6.16 | 6.46 | 3.12 | 1.75 | 1.27 | 1.69 | .94 | 1.52 |
| MAX | 1.6 | 47 | 23 | 13 | 22 | 53 | 10 | 9.6 | 12 | 8.4 | 2.3 | 15 |
| MIN | .22 | .20 | 1.5 | .68 | 1.3 | 1.9 | 1.7 | .61 | .56 | .76 | .65 | .60 |
| AC-FT | 21 | 138 | 311 | 213 | 342 | 397 | 186 | 108 | 75 | 104 | 58 | 91 |

CAL YR 1968 TOTAL 948.43 MEAN 2.59 MAX 63 MIN .20 AC-FT 1,880
WTR YR 1969 TOTAL 1,029.69 MEAN 2.82 MAX 53 MIN .20 AC-FT 2,040

PEAK DISCHARGE (BASE, 140 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1445 | 4.60 | 420 | 3-16 | 1600 | 4.12 | 300 |
| 1-30 | 1230 | 3.68 | 197 | | | | |

## 16-2460. Waiomao Stream near Honolulu

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

DRAINAGE AREA.--1.04 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 436 cfs Nov. 29 (gage height, 4.62 ft), from rating curve extended above 140 cfs on basis of slope-area measurement at gage height 4.74 ft; no flow for Oct. 29 to Nov. 22.
Period of record: Maximum discharge, 1,550 cfs Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 98 cfs by test of model of station site; no flow at times.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .20 | 0 | 2.0 | .32 | 8.9 | 1.7 | 8.0 | 1.4 | .20 | .42 | .73 | 1.4 |
| 2 | 1.5 | 0 | 1.0 | 3.5 | 10 | 1.5 | 5.0 | 9.0 | .15 | .78 | .83 | .58 |
| 3 | 4.1 | 0 | 1.5 | 16 | 3.3 | 1.4 | 1.7 | 2.1 | .15 | 1.1 | .54 | .50 |
| 4 | 1.2 | 0 | 25 | 16 | 1.5 | 1.1 | 1.1 | 1.2 | .11 | .63 | .42 | .54 |
| 5 | .58 | 0 | 3.0 | 11 | 1.0 | .83 | 1.1 | 2.2 | .09 | .38 | .38 | .38 |
| 6 | .35 | 0 | .70 | 3.5 | .68 | .88 | 1.8 | 2.2 | .07 | .74 | .42 | .26 |
| 7 | .15 | 0 | .60 | 3.8 | .50 | .83 | 1.2 | 1.2 | .06 | 3.0 | .35 | .23 |
| 8 | .09 | 0 | 1.3 | 3.6 | .42 | .58 | .88 | .68 | .05 | .73 | .29 | .13 |
| 9 | .09 | 0 | .70 | 5.5 | .35 | .63 | .63 | .58 | .04 | .58 | .26 | .11 |
| 10 | .11 | 0 | .56 | 3.2 | .32 | .68 | .63 | .58 | 1.8 | .54 | .23 | .83 |
| 11 | .09 | 0 | .50 | 1.4 | .32 | .29 | .63 | .42 | 11 | .38 | .20 | .50 |
| 12 | .17 | 0 | .60 | 1.0 | .26 | .23 | .54 | .46 | 8.2 | .29 | .17 | .26 |
| 13 | .07 | 0 | 12 | 1.0 | 3.0 | .20 | .58 | .46 | .73 | .35 | .17 | .20 |
| 14 | .04 | 0 | 1.0 | .54 | 27 | .13 | 2.1 | .46 | .46 | 1.0 | .17 | .50 |
| 15 | .09 | 0 | .70 | .46 | 33 | 4.4 | .88 | 1.3 | .46 | .42 | .98 | .38 |
| 16 | .38 | 0 | .80 | .35 | 24 | 87 | .63 | .58 | .35 | .42 | .46 | .23 |
| 17 | .35 | 0 | 2.0 | .29 | 6.1 | 23 | 1.2 | .38 | .32 | .50 | .50 | .20 |
| 18 | .20 | 0 | 1.2 | .23 | 6.0 | 9.8 | 4.0 | .32 | .26 | .46 | .42 | .46 |
| 19 | .16 | 0 | 3.0 | .17 | 9.6 | 6.9 | 1.7 | .26 | .35 | 4.5 | .42 | .29 |
| 20 | .29 | 0 | 14 | .15 | 4.7 | 2.7 | 8.8 | .23 | .29 | 4.2 | .46 | 1.0 |
| 21 | .15 | 0 | 3.0 | .13 | 2.5 | 1.9 | 2.5 | .20 | .20 | 1.4 | 3.4 | 26 |
| 22 | .11 | 0 | 1.2 | .09 | 1.6 | 1.2 | 1.7 | .17 | .54 | 1.5 | .58 | 6.0 |
| 23 | .11 | .01 | .90 | .07 | 1.3 | 1.1 | 1.4 | .15 | .46 | 4.3 | .32 | 2.1 |
| 24 | .05 | .01 | .80 | .06 | 1.5 | 12 | 1.0 | .13 | .83 | 2.0 | .23 | 3.0 |
| 25 | .04 | .01 | 22 | .05 | 5.1 | 13 | .50 | .29 | .38 | 11 | .35 | 1.2 |
| 26 | .02 | .21 | 2.5 | .04 | 5.7 | 4.7 | .46 | .35 | 2.4 | 9.1 | .29 | .68 |
| 27 | .01 | .23 | .60 | .29 | 2.3 | 2.3 | .68 | 8.5 | .83 | 3.0 | .71 | .46 |
| 28 | .01 | .66 | .40 | .29 | 1.3 | 1.4 | 1.4 | 1.0 | .50 | 1.5 | .46 | .42 |
| 29 | 0 | 52 | .37 | .46 | ------ | 1.5 | 7.6 | 1.2 | .42 | .94 | .54 | .38 |
| 30 | 0 | 7.0 | .35 | 19 | ------ | 1.7 | 4.2 | .42 | .38 | .68 | 1.4 | .46 |
| 31 | 0 | ------ | .38 | 3.0 | ------ | 7.4 | ------ | .29 | ------ | .58 | 2.4 | ------ |
| TOTAL | 10.71 | 60.13 | 104.66 | 95.49 | 162.25 | 192.98 | 64.54 | 38.71 | 32.08 | 57.42 | 19.08 | 49.68 |
| MEAN | .34 | 2.00 | 3.38 | 3.08 | 5.79 | 6.23 | 2.15 | 1.25 | 1.07 | 1.85 | .62 | 1.66 |
| MAX | 4.1 | 52 | 25 | 19 | 33 | 87 | 8.8 | 9.0 | 11 | 11 | 3.4 | 26 |
| MIN | 0 | 0 | .35 | .04 | .26 | .13 | .46 | .13 | .04 | .29 | .17 | .11 |
| AC-FT | 21 | 119 | 208 | 189 | 322 | 383 | 128 | 77 | 64 | 114 | 38 | 99 |

CAL YR 1968: TOTAL 810.66 MEAN 2.21 MAX 102 MIN 0 AC-FT 1,610
WTR YR 1969: TOTAL 887.73 MEAN 2.43 MAX 87 MIN 0 AC-FT 1,760

PEAK DISCHARGE (BASE, 110 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1700 | 4.62 | 436 | 12-25 | 1300 | 3.54 | 162 |
| 12- 4 | 0900 | 3.68 | 185 | 1-30 | 1200 | 4.28 | 334 |
| 12-20 | 1230 | 3.31 | 126 | 3-16 | 1350 | 4.58 | 424 |

NOTE.--No gage-height record Nov. 30 to Dec. 30.

## 16-2470. Palolo Stream near Honolulu

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

DRAINAGE AREA.--3.63 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,330 cfs Nov. 29 (gage height, 3.79 ft), from rating curve extended as explained below; minimum, 0.23 cfs Nov. 4, 8, 11.
Period of record: Maximum discharge, 4,270 cfs Dec. 18, 1967 (gage height, 5.98 ft), from rating curve extended above 140 cfs on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 and 4.13 ft; minimum, 0.02 cfs June 25, 1958.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | .34 | 29 | 2.9 | 15 | 8.1 | 27 | 3.9 | 1.6 | 1.9 | 3.9 | 3.9 |
| 2 | 9.3 | .31 | 11 | 30 | 29 | 7.0 | 18 | 21 | 1.6 | 3.6 | 4.3 | 2.7 |
| 3 | 8.7 | .31 | 16 | 96 | 10 | 12 | 8.1 | 3.3 | 1.6 | 3.6 | 2.7 | 2.7 |
| 4 | 2.5 | .31 | 113 | 76 | 4.5 | 7.3 | 5.0 | 2.0 | 1.6 | 2.3 | 1.7 | 2.5 |
| 5 | 1.0 | .31 | 18 | 57 | 3.5 | 6.0 | 5.0 | 3.9 | 1.6 | 2.0 | 2.3 | 2.3 |
| 6 | .85 | .28 | 6.5 | 16 | 3.5 | 6.3 | 4.3 | 3.9 | 1.6 | 2.7 | 1.9 | 1.7 |
| 7 | .70 | .28 | 4.4 | 25 | 3.5 | 6.0 | 2.7 | 2.3 | 1.6 | 5.0 | 1.9 | 1.7 |
| 8 | 1.4 | .25 | 24 | 21 | 3.5 | 5.8 | 2.5 | 2.0 | 1.6 | 2.7 | 2.0 | 1.7 |
| 9 | .58 | .28 | 10 | 35 | 3.3 | 5.8 | 2.5 | 2.3 | 1.6 | 2.5 | 1.9 | 1.6 |
| 10 | .63 | .28 | 4.9 | 20 | 3.1 | 6.2 | 2.7 | 2.0 | 12 | 2.5 | 1.9 | 2.0 |
| 11 | .70 | .28 | 3.2 | 9.7 | 2.8 | 5.8 | 2.9 | 1.7 | 31 | 2.3 | 2.0 | 1.6 |
| 12 | .77 | .37 | 11 | 6.7 | 2.7 | 6.1 | 2.9 | 1.7 | 2.3 | 1.9 | 1.9 | 1.0 |
| 13 | .58 | .34 | 62 | 5.7 | 6.0 | 6.7 | 3.6 | 2.0 | 1.3 | 2.5 | 2.5 | 1.4 |
| 14 | .48 | 1.1 | 9.9 | 4.6 | 40 | 6.8 | 7.4 | 2.5 | 1.3 | 2.7 | 2.9 | 2.5 |
| 15 | 3.6 | .37 | 6.1 | 4.1 | 83 | 12 | 3.6 | 3.6 | 1.4 | 1.9 | 5.0 | 1.4 |
| 16 | .85 | .37 | 14 | 3.4 | 92 | 180 | 3.3 | 1.9 | 1.6 | 1.7 | 2.3 | 1.3 |
| 17 | 1.3 | .43 | 25 | 3.1 | 20 | 98 | 8.1 | 1.6 | 2.3 | 1.9 | 2.4 | 1.3 |
| 18 | .63 | .37 | 14 | 2.8 | 20 | 23 | 11 | 1.4 | 1.2 | 1.7 | 2.3 | 1.6 |
| 19 | 1.9 | 1.4 | 54 | 3.1 | 40 | 16 | 8.1 | 1.6 | 1.8 | 7.4 | 3.9 | 1.4 |
| 20 | 1.6 | .40 | 93 | 2.9 | 15 | 7.3 | 39 | 1.6 | 1.4 | 8.7 | 2.5 | 2.7 |
| 21 | .53 | .34 | 16 | 2.6 | 9.3 | 4.6 | 8.7 | 1.6 | 1.3 | 2.0 | 7.9 | 66 |
| 22 | .53 | .34 | 14 | 2.3 | 6.4 | 3.2 | 5.0 | 1.6 | 1.8 | 2.5 | 2.3 | 13 |
| 23 | .48 | .37 | 7.7 | 2.1 | 4.6 | 3.2 | 5.0 | 1.6 | 2.6 | 6.2 | 2.0 | 3.6 |
| 24 | .48 | .37 | 5.7 | 1.9 | 6.2 | 23 | 4.3 | 1.6 | 1.4 | 1.7 | 1.9 | 6.8 |
| 25 | .40 | .43 | 157 | 1.8 | 18 | 31 | 3.3 | 2.3 | 1.2 | 2.3 | 2.7 | 1.9 |
| 26 | .40 | .63 | 14 | 1.7 | 21 | 12 | 3.3 | 2.0 | 2.1 | 12 | 2.3 | 1.4 |
| 27 | .37 | .70 | 6.5 | 1.5 | 8.3 | 7.4 | 3.6 | 2.5 | 1.5 | 11 | 2.5 | 1.4 |
| 28 | .48 | 23 | 5.5 | 1.4 | 5.9 | 4.3 | 3.9 | 2.9 | 1.7 | 4.3 | 2.3 | 1.6 |
| 29 | .34 | 210 | 3.6 | 2.0 | ------ | 4.3 | 20 | 2.5 | 1.5 | 2.3 | 2.7 | 1.3 |
| 30 | .37 | 105 | 3.2 | 25 | ------ | 5.0 | 17 | 1.7 | 1.6 | 2.0 | 5.0 | 2.5 |
| 31 | .37 | ------ | 3.2 | 8.0 | ------ | 12 | ------ | 1.6 | ------ | 2.9 | 6.8 | ------ |
| TOTAL | 44.82 | 349.56 | 765.4 | 475.3 | 480.1 | 542.2 | 241.8 | 88.1 | 88.7 | 110.7 | 90.6 | 138.5 |
| MEAN | 1.45 | 11.7 | 24.7 | 15.3 | 17.1 | 17.5 | 8.06 | 2.84 | 2.96 | 3.57 | 2.92 | 4.62 |
| MAX | 9.3 | 210 | 157 | 96 | 92 | 180 | 39 | 21 | 31 | 12 | 7.9 | 66 |
| MIN | .34 | .25 | 3.2 | 1.4 | 2.7 | 3.2 | 2.5 | 1.4 | 1.2 | 1.7 | 1.7 | 1.0 |
| AC-FT | 89 | 693 | 1,520 | 943 | 952 | 1,080 | 480 | 175 | 176 | 220 | 180 | 275 |

CAL YR 1968 TOTAL 3,049.71 MEAN 8.33 MAX 210 MIN .25 AC-FT 6,050
WTR YR 1969 TOTAL 3,415.78 MEAN 9.36 MAX 210 MIN .25 AC-FT 6,780

PEAK DISCHARGE (BASE, 340 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1500 | 3.79 | 1,330 | 12-25 | 0700 | 3.06 | 695 |
| 12- 8 | 1545 | 2.58 | 341 | 1- 2 | 1500 | 2.93 | 595 |
| 12-19 | 0800 | 3.22 | 820 | 1- 4 | 0045 | 2.85 | 534 |
| 12-20 | 0400 | 2.66 | 397 | 3-16 | 1615 | 3.13 | 749 |

## 16-2490. Waimanalo Stream at Waimanalo

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

DRAINAGE AREA.--2.16 sq mi.

PERIOD OF RECORD.--January 1967 to current year.

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

EXTREMES.--Current year: Maximum discharge, 1,010 cfs Jan. 30 (gage height, 5.88 ft), from rating curve extended as explained below; minimum, 0.23 cfs Nov. 9.
Period of record: Maximum discharge, 3,810 cfs Dec. 18, 1967 (gage height, 9.54 ft), from rating curve extended above 81 cfs on basis of slope-area measurements at gage heights 6.72, 8.0, 9.54 and 10.0 ft; minimum, 0.23 cfs Nov. 9, 1968.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Water from Maunawili basin is diverted by Maunawili ditch into two reservoirs in Waimanalo basin, above station, for irrigation near Waimanalo; flow at station is affected by leakage, releases, and spill from these reservoirs. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | .36 | 26 | 11 | 73 | 3.2 | 3.4 | 2.2 | 4.2 | 1.2 | 1.3 | 1.6 |
| 2 | 6.8 | .36 | 5.3 | 50 | 21 | 2.6 | 4.8 | 3.9 | 3.0 | 1.2 | 1.3 | 1.6 |
| 3 | 8.2 | .36 | 8.9 | 71 | 13 | 2.4 | 2.6 | 4.2 | 1.8 | 1.0 | 1.2 | 1.6 |
| 4 | 3.9 | .54 | 8.5 | 32 | 8.6 | 2.2 | 2.4 | 4.5 | 2.0 | 1.2 | 1.2 | 1.4 |
| 5 | 2.4 | .36 | 1.8 | 68 | 6.8 | 2.0 | 4.2 | 2.4 | 1.8 | 1.2 | 1.2 | 1.0 |
| 6 | 2.4 | .40 | .44 | 16 | 6.2 | 2.0 | 4.8 | 14 | 1.8 | 1.4 | 1.1 | .87 |
| 7 | 1.6 | .36 | .36 | 18 | 5.1 | 1.8 | 2.4 | 5.6 | 1.8 | 2.0 | 1.0 | 1.0 |
| 8 | .49 | .36 | 8.5 | 17 | 5.3 | 1.6 | 1.8 | 4.5 | 1.6 | 1.2 | .92 | 1.4 |
| 9 | 1.0 | .33 | 3.0 | 27 | 5.1 | 2.0 | 2.2 | 2.2 | 1.6 | 1.4 | .86 | 1.4 |
| 10 | .44 | .36 | .54 | 17 | 4.5 | 2.4 | 2.0 | 1.2 | 2.2 | 1.4 | .82 | 1.4 |
| 11 | 1.0 | .44 | .44 | 14 | 4.8 | 2.2 | 2.2 | 2.2 | 3.0 | 1.2 | .76 | 1.4 |
| 12 | .44 | .44 | .40 | 13 | 3.7 | 2.4 | 1.8 | .68 | 5.1 | 1.2 | .76 | 1.6 |
| 13 | 1.8 | .49 | .36 | 12 | 8.2 | 2.6 | 1.6 | .87 | 2.8 | 1.6 | .76 | 1.2 |
| 14 | 1.0 | 2.0 | .36 | 11 | 27 | 3.4 | 1.8 | 1.8 | 1.8 | 1.4 | .76 | 1.4 |
| 15 | .49 | 3.0 | .36 | 9.4 | 38 | 8.9 | 1.6 | 3.2 | 4.5 | 1.5 | 1.8 | 1.8 |
| 16 | .76 | 3.9 | 8.0 | 10 | 18 | 48 | 1.0 | 1.4 | 2.2 | 1.5 | 1.1 | 1.8 |
| 17 | 1.6 | 3.9 | 5.7 | 9.0 | 13 | 13 | .87 | 1.0 | 1.2 | 1.7 | .84 | 1.8 |
| 18 | 1.2 | 2.8 | 3.9 | 8.6 | 11 | 3.4 | 1.0 | 1.8 | 2.0 | 1.6 | .84 | 1.8 |
| 19 | 2.0 | 2.4 | 14 | 8.2 | 8.2 | 2.4 | 3.7 | 1.8 | .87 | 1.6 | .84 | 1.6 |
| 20 | 2.8 | 3.2 | 64 | 7.2 | 4.5 | 1.0 | 4.5 | 1.0 | .76 | 1.4 | .87 | 1.8 |
| 21 | 1.0 | 2.0 | 28 | 6.5 | 5.6 | 1.2 | 1.6 | 1.2 | .68 | 1.3 | 1.4 | 7.0 |
| 22 | .49 | .54 | 20 | 6.8 | 7.2 | 1.2 | 3.2 | 1.0 | 1.8 | 1.3 | .76 | 9.0 |
| 23 | 1.2 | .36 | 9.0 | 6.5 | 6.8 | 2.2 | 1.2 | 2.0 | 2.2 | 1.6 | .68 | 7.9 |
| 24 | .40 | 2.0 | 6.5 | 5.9 | 4.5 | 1.6 | 2.2 | 1.0 | 1.4 | 1.4 | .76 | 5.9 |
| 25 | .40 | 1.2 | 133 | 5.6 | 3.2 | 3.2 | 1.2 | 2.0 | 1.6 | 1.4 | 1.2 | 6.2 |
| 26 | .36 | 1.2 | 26 | 6.8 | 3.7 | 3.7 | .60 | 2.1 | 1.6 | 3.7 | 1.0 | 2.8 |
| 27 | .49 | 3.2 | 20 | 5.6 | 3.9 | 3.2 | 2.6 | 1.0 | 1.6 | 1.8 | 1.4 | 1.4 |
| 28 | 1.0 | 3.0 | 17 | 5.1 | 3.4 | 1.6 | 2.4 | 2.0 | 1.0 | 1.4 | 1.4 | 3.9 |
| 29 | .40 | 41 | 14 | 5.6 | ------ | 1.8 | 3.7 | 1.6 | 1.2 | 1.4 | 1.4 | 2.6 |
| 30 | .40 | 29 | 13 | 61 | ------ | 3.4 | 2.4 | 2.2 | 1.4 | 1.4 | 1.2 | 1.0 |
| 31 | .40 | ------ | 12 | 14 | ------ | 3.0 | ------ | 2.0 | ------ | 1.4 | 1.2 | ------ |
| TOTAL | 48.06 | 109.86 | 459.36 | 558.8 | 323.3 | 135.6 | 71.77 | 78.55 | 60.51 | 46.0 | 32.63 | 77.17 |
| MEAN | 1.55 | 3.66 | 14.8 | 18.0 | 11.5 | 4.37 | 2.39 | 2.53 | 2.02 | 1.48 | 1.05 | 2.57 |
| MAX | 8.2 | 41 | 133 | 71 | 73 | 48 | 4.8 | 14 | 5.1 | 3.7 | 1.8 | 9.0 |
| MIN | .36 | .33 | .36 | 5.1 | 3.2 | 1.0 | .60 | .68 | .68 | 1.0 | .68 | .87 |
| AC-FT | 95 | 218 | 911 | 1,110 | 641 | 269 | 142 | 156 | 120 | 91 | 65 | 153 |

CAL YR 1968: TOTAL 1,848.68 MEAN 5.05 MAX 133 MIN .33 AC-FT 3,670
WTR YR 1969: TOTAL 2,001.61 MEAN 5.48 MAX 133 MIN .33 AC-FT 3,970

PEAK DISCHARGE (BASE, 450 CFS).--Dec. 25 (0645) 662 cfs (4.84 ft); Jan. 30 (1200) 1,010 cfs (5.88 ft).

NOTE.--No gage-height record July 14 to Aug. 19.

## 16-2540. Makawao Stream near Kailua

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

DRAINAGE AREA.--2.04 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 766 cfs Feb. 1 (gage height, 6.16 ft); minimum, 1.8 cfs Nov. 21-26. Period of record: Maximum discharge, 6,000 cfs Feb. 4, 1965 (gage height, 12.41 ft), from rating curve extended above 470 cfs on basis of slope-area measurement of peak flow; minimum, 0.43 cfs Sept. 8-12, 14, 16-20, 22, 23, 1964.

REMARKS.--Records good. Maunawili ditch diverts 1.5 miles above station for irrigation in vicinity of Waimanalo.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.4 | 2.0 | 15 | 9.3 | 62 | 10 | 11 | 4.7 | 3.6 | 2.8 | 2.8 | 2.2 |
| 2 | 2.8 | 2.0 | 9.6 | 22 | 27 | 9.8 | 10 | 7.6 | 3.6 | 2.9 | 2.7 | 2.2 |
| 3 | 2.7 | 2.0 | 7.7 | 43 | 19 | 9.6 | 9.6 | 5.0 | 3.4 | 2.8 | 2.6 | 2.2 |
| 4 | 2.4 | 2.0 | 10 | 30 | 16 | 9.3 | 9.3 | 4.8 | 3.3 | 2.7 | 2.6 | 2.2 |
| 5 | 2.2 | 2.0 | 6.9 | 35 | 14 | 9.1 | 9.3 | 4.7 | 3.3 | 2.6 | 2.6 | 2.2 |
| 6 | 2.2 | 2.0 | 5.8 | 22 | 12 | 8.6 | 9.3 | 8.4 | 3.3 | 2.8 | 2.6 | 2.2 |
| 7 | 2.1 | 2.0 | 5.4 | 20 | 12 | 7.3 | 8.6 | 5.2 | 3.3 | 3.3 | 2.6 | 2.2 |
| 8 | 2.1 | 2.0 | 7.2 | 18 | 11 | 6.5 | 8.3 | 5.0 | 3.2 | 3.3 | 2.6 | 2.2 |
| 9 | 2.1 | 2.0 | 6.9 | 20 | 11 | 6.3 | 8.1 | 4.8 | 3.2 | 3.2 | 2.6 | 2.2 |
| 10 | 2.1 | 2.0 | 5.6 | 17 | 10 | 6.3 | 8.3 | 4.7 | 4.0 | 3.3 | 2.4 | 2.4 |
| 11 | 2.2 | 2.0 | 5.4 | 14 | 9.8 | 6.1 | 8.1 | 4.7 | 4.8 | 3.3 | 2.4 | 2.2 |
| 12 | 2.2 | 2.0 | 5.4 | 13 | 9.3 | 6.1 | 7.1 | 4.7 | 3.7 | 3.2 | 2.2 | 2.2 |
| 13 | 2.1 | 2.0 | 5.8 | 12 | 11 | 6.1 | 6.7 | 4.5 | 3.6 | 3.3 | 2.2 | 2.2 |
| 14 | 2.1 | 2.8 | 5.2 | 10 | 48 | 6.1 | 6.5 | 4.5 | 3.3 | 3.6 | 2.2 | 2.2 |
| 15 | 2.2 | 2.1 | 5.0 | 9.6 | 49 | 15 | 5.6 | 4.5 | 3.3 | 3.9 | 2.7 | 2.1 |
| 16 | 5.0 | 1.9 | 6.1 | 9.1 | 32 | 96 | 5.4 | 4.3 | 3.2 | 3.9 | 2.4 | 2.1 |
| 17 | 4.2 | 1.9 | 7.1 | 8.6 | 24 | 39 | 5.6 | 4.2 | 3.3 | 4.0 | 2.4 | 2.2 |
| 18 | 2.7 | 1.9 | 6.7 | 8.1 | 20 | 24 | 6.1 | 4.2 | 3.0 | 3.7 | 2.4 | 2.2 |
| 19 | 2.4 | 1.9 | 10 | 7.6 | 18 | 18 | 5.6 | 4.0 | 3.2 | 3.7 | 2.4 | 2.2 |
| 20 | 2.2 | 2.0 | 22 | 7.3 | 16 | 16 | 5.6 | 4.0 | 3.0 | 3.7 | 2.4 | 2.4 |
| 21 | 2.2 | 1.9 | 13 | 6.9 | 14 | 14 | 5.2 | 4.0 | 2.9 | 3.4 | 2.4 | 6.9 |
| 22 | 2.4 | 1.8 | 14 | 6.5 | 14 | 13 | 5.0 | 4.2 | 3.2 | 3.4 | 2.2 | 4.5 |
| 23 | 2.2 | 1.8 | 12 | 6.3 | 13 | 12 | 5.0 | 3.9 | 2.9 | 3.7 | 2.2 | 2.8 |
| 24 | 2.2 | 1.8 | 11 | 6.1 | 12 | 12 | 4.8 | 3.7 | 2.9 | 3.6 | 2.1 | 2.8 |
| 25 | 2.2 | 1.9 | 60 | 5.8 | 12 | 20 | 4.8 | 4.0 | 2.8 | 3.6 | 2.2 | 2.4 |
| 26 | 2.2 | 2.2 | 22 | 5.6 | 12 | 14 | 4.8 | 3.7 | 3.0 | 4.2 | 2.2 | 2.4 |
| 27 | 2.1 | 2.0 | 17 | 6.1 | 11 | 12 | 5.0 | 3.9 | 2.9 | 3.4 | 2.2 | 2.2 |
| 28 | 2.0 | 1.9 | 14 | 6.7 | 10 | 12 | 4.8 | 4.5 | 2.8 | 3.2 | 2.2 | 2.2 |
| 29 | 2.0 | 26 | 12 | 7.1 | ------ | 11 | 5.0 | 4.2 | 2.8 | 2.9 | 2.2 | 2.2 |
| 30 | 2.0 | 22 | 11 | 34 | ------ | 11 | 4.8 | 3.7 | 2.8 | 2.9 | 2.4 | 2.4 |
| 31 | 2.0 | ------ | 9.8 | 11 | ------ | 11 | ------ | 3.7 | ------ | 2.8 | 2.4 | ------ |
| TOTAL | 73.9 | 103.8 | 354.6 | 437.7 | 529.1 | 457.2 | 203.3 | 142.0 | 97.6 | 103.1 | 74.5 | 75.0 |
| MEAN | 2.38 | 3.46 | 11.4 | 14.1 | 18.9 | 14.7 | 6.78 | 4.58 | 3.25 | 3.33 | 2.40 | 2.50 |
| MAX | 5.0 | 26 | 60 | 43 | 62 | 96 | 11 | 8.4 | 4.8 | 4.2 | 2.8 | 6.9 |
| MIN | 2.0 | 1.8 | 5.0 | 5.6 | 9.3 | 6.1 | 4.8 | 3.7 | 2.8 | 2.6 | 2.1 | 2.1 |
| AC-FT | 147 | 206 | 703 | 868 | 1,050 | 907 | 403 | 282 | 194 | 204 | 148 | 149 |

CAL YR 1968: TOTAL 2,764.3 MEAN 7.55 MAX 161 MIN 1.8 AC-FT 5,480
WTR YR 1969: TOTAL 2,651.8 MEAN 7.27 MAX 96 MIN 1.8 AC-FT 5,260

PEAK DISCHARGE (BASE, 390 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 1200 | 5.46 | 533 | 3-16 | 1700 | 6.00 | 710 |
| 2-1 | 1600 | 6.16 | 766 | | | | |

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

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

DRAINAGE AREA.--5.34 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 2,360 cfs Feb. 1 (gage height, 10.30 ft); minimum, 3.2 cfs Nov. 6.
Period of record: Maximum discharge, 9,690 cfs Feb. 4, 1965 (gage height, 15.62 ft, site and datum then in use), from rating curve extended above 700 cfs on basis of contracted-opening measurement of peak flow; minimum, 3.2 cfs Nov. 6, 1968.
A discharge of 1.97 cfs was measured June 8, 1959.

REMARKS.--Records fair. Maunawili ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.4 | 3.6 | 52 | 24 | 355 | 24 | 30 | 12 | 8.8 | 8.0 | 6.4 | 5.8 |
| 2 | 8.6 | 3.8 | 33 | 69 | 111 | 22 | 28 | 25 | 8.6 | 7.8 | 6.4 | 5.2 |
| 3 | 5.4 | 3.8 | 29 | 151 | 66 | 22 | 26 | 14 | 8.0 | 7.3 | 6.4 | 5.4 |
| 4 | 5.2 | 3.8 | 35 | 98 | 50 | 21 | 24 | 13 | 8.3 | 6.8 | 6.2 | 5.6 |
| 5 | 4.8 | 3.6 | 24 | 123 | 41 | 21 | 24 | 12 | 8.0 | 6.6 | 6.6 | 5.6 |
| 6 | 4.6 | 3.6 | 20 | 67 | 36 | 20 | 24 | 37 | 7.8 | 7.6 | 6.4 | 5.6 |
| 7 | 4.6 | 3.8 | 16 | 65 | 33 | 18 | 22 | 18 | 8.0 | 8.0 | 6.2 | 5.8 |
| 8 | 4.3 | 3.6 | 23 | 57 | 30 | 18 | 24 | 16 | 9.0 | 6.8 | 6.0 | 6.6 |
| 9 | 4.3 | 3.6 | 18 | 61 | 29 | 17 | 24 | 15 | 8.3 | 6.8 | 6.0 | 6.0 |
| 10 | 4.1 | 3.8 | 15 | 49 | 28 | 16 | 22 | 14 | 11 | 6.8 | 6.0 | 7.6 |
| 11 | 4.3 | 3.8 | 12 | 41 | 26 | 15 | 20 | 14 | 11 | 6.6 | 6.0 | 6.2 |
| 12 | 5.2 | 3.8 | 12 | 36 | 25 | 15 | 20 | 14 | 8.6 | 6.4 | 5.8 | 6.0 |
| 13 | 4.4 | 4.3 | 13 | 33 | 29 | 15 | 20 | 14 | 8.0 | 6.8 | 6.2 | 6.2 |
| 14 | 5.6 | 8.6 | 11 | 29 | 119 | 15 | 19 | 14 | 8.0 | 7.3 | 6.2 | 6.6 |
| 15 | 5.4 | 5.2 | 11 | 26 | 153 | 34 | 17 | 13 | 8.0 | 7.3 | 7.9 | 6.2 |
| 16 | 30 | 4.3 | 16 | 24 | 101 | 270 | 16 | 12 | 7.8 | 7.8 | 5.6 | 6.2 |
| 17 | 15 | 4.6 | 19 | 22 | 71 | 139 | 14 | 12 | 8.0 | 7.6 | 5.6 | 6.8 |
| 18 | 5.6 | 4.1 | 16 | 20 | 58 | 76 | 16 | 12 | 7.6 | 7.3 | 5.6 | 7.3 |
| 19 | 4.6 | 5.4 | 36 | 18 | 49 | 56 | 14 | 12 | 8.0 | 8.0 | 6.2 | 6.6 |
| 20 | 5.2 | 4.6 | 69 | 18 | 42 | 46 | 14 | 11 | 7.3 | 8.0 | 6.9 | 8.8 |
| 21 | 4.6 | 4.4 | 50 | 17 | 39 | 41 | 14 | 10 | 7.3 | 6.8 | 6.2 | 41 |
| 22 | 5.4 | 4.3 | 48 | 16 | 35 | 38 | 14 | 10 | 7.8 | 6.6 | 5.4 | 14 |
| 23 | 4.3 | 4.8 | 36 | 15 | 32 | 34 | 13 | 9.6 | 7.3 | 7.3 | 5.4 | 6.4 |
| 24 | 4.1 | 4.6 | 30 | 15 | 30 | 35 | 13 | 9.3 | 7.3 | 6.6 | 5.2 | 7.0 |
| 25 | 3.9 | 5.2 | 232 | 14 | 31 | 54 | 12 | 9.3 | 7.3 | 6.8 | 5.6 | 6.4 |
| 26 | 3.9 | 7.6 | 79 | 14 | 29 | 40 | 12 | 9.3 | 7.8 | 12 | 5.2 | 6.2 |
| 27 | 4.1 | 5.2 | 54 | 13 | 26 | 35 | 13 | 9.6 | 8.0 | 8.0 | 5.8 | 6.2 |
| 28 | 4.3 | 5.2 | 42 | 12 | 24 | 32 | 12 | 12 | 8.8 | 7.0 | 5.2 | 6.2 |
| 29 | 4.3 | 136 | 35 | 14 | ------ | 30 | 13 | 9.9 | 9.3 | 6.6 | 5.2 | 6.4 |
| 30 | 4.3 | 93 | 29 | 90 | ------ | 29 | 12 | 9.0 | 9.0 | 6.6 | 5.8 | 8.8 |
| 31 | 3.8 | ------ | 27 | 24 | ------ | 29 | ------ | 8.8 | ------ | 6.4 | 5.8 | ------ |
| TOTAL | 184.8 | 356.0 | 1,142 | 1,275 | 1,698 | 1,277 | 546 | 410.8 | 248.0 | 226.3 | 185.4 | 234.7 |
| MEAN | 5.96 | 11.9 | 36.8 | 41.1 | 60.6 | 41.2 | 18.2 | 13.3 | 8.27 | 7.30 | 5.98 | 7.82 |
| MAX | 30 | 136 | 232 | 151 | 355 | 270 | 30 | 37 | 11 | 12 | 7.9 | 41 |
| MIN | 3.8 | 3.6 | 11 | 12 | 24 | 15 | 12 | 8.8 | 7.3 | 6.4 | 5.2 | 5.2 |
| AC-FT | 367 | 706 | 2270 | 2530 | 3,370 | 2530 | 1,080 | 815 | 492 | 449 | 368 | 466 |

CAL YR 1968: TOTAL 7,974.4 MEAN 21.8 MAX 597 MIN 3.6 AC-FT 15,820
WTR YR 1969: TOTAL 7,784.0 MEAN 21.3 MAX 355 MIN 3.6 AC-FT 15,440

PEAK DISCHARGE (BASE, 700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1530 | 7.10 | 770 | 2-1 | 1600 | 10.30 | 2,360 |
| 1-30 | 1230 | 7.45 | 875 | 3-16 | 1700 | 8.08 | 1,110 |

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

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

DRAINAGE AREA.--3.21 sq mi.

PERIOD OF RECORD.--March 1967 to current year.

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

EXTREMES.--Current year: Maximum discharge, 10,800 cfs Feb. 1 (gage height, 12.42 ft), from rating curve extended above 1,800 cfs; minimum, 5.6 cfs Sept. 15, 16.
Period of record: Maximum discharge, 10,800 cfs Feb. 1, 1969 (gage height, 12.42 ft, control and datum then in use), from rating curve extended above 1,800 cfs; minimum, 5.5 cfs Sept. 23, 1968.

REMARKS.--Records poor. No diversion above station. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.3 | 7.0 | 16 | 14 | 810 | 23 | 26 | 16 | 13 | 10 | 9.6 | 7.7 |
| 2 | 10 | 7.0 | 10 | 45 | 56 | 23 | 23 | 38 | 13 | 11 | 8.5 | 7.0 |
| 3 | 7.8 | 7.0 | 12 | 88 | 38 | 22 | 22 | 17 | 13 | 10 | 8.5 | 7.0 |
| 4 | 7.0 | 7.0 | 17 | 61 | 31 | 22 | 21 | 16 | 13 | 11 | 8.1 | 7.0 |
| 5 | 7.0 | 7.0 | 11 | 38 | 30 | 21 | 22 | 18 | 12 | 11 | 8.5 | 7.0 |
| 6 | 7.0 | 7.0 | 9.9 | 30 | 29 | 21 | 20 | 31 | 12 | 11 | 8.1 | 6.7 |
| 7 | 6.7 | 7.0 | 9.4 | 26 | 28 | 21 | 20 | 18 | 12 | 13 | 8.1 | 6.4 |
| 8 | 6.3 | 7.0 | 10 | 29 | 27 | 21 | 20 | 17 | 12 | 10 | 8.1 | 8.1 |
| 9 | 6.1 | 7.0 | 9.2 | 33 | 26 | 20 | 20 | 17 | 12 | 10 | 8.5 | 6.7 |
| 10 | 5.9 | 7.0 | 9.0 | 28 | 25 | 20 | 20 | 17 | 15 | 11 | 8.5 | 8.1 |
| 11 | 5.9 | 6.5 | 8.7 | 25 | 25 | 19 | 19 | 17 | 13 | 11 | 8.5 | 6.7 |
| 12 | 5.9 | 6.5 | 8.5 | 24 | 25 | 19 | 19 | 17 | 12 | 11 | 7.7 | 6.4 |
| 13 | 5.9 | 6.5 | 9.0 | 23 | 28 | 18 | 19 | 16 | 11 | 10 | 8.1 | 6.2 |
| 14 | 5.9 | 11 | 8.5 | 23 | 52 | 21 | 20 | 16 | 12 | 9.6 | 7.7 | 6.3 |
| 15 | 6.3 | 7.8 | 8.3 | 22 | 54 | 28 | 18 | 16 | 12 | 10 | 10 | 5.9 |
| 16 | 22 | 7.4 | 11 | 22 | 41 | 59 | 18 | 15 | 13 | 12 | 8.1 | 5.9 |
| 17 | 13 | 7.0 | 11 | 21 | 34 | 40 | 20 | 15 | 12 | 11 | 8.1 | 6.4 |
| 18 | 11 | 7.0 | 10 | 21 | 31 | 30 | 23 | 15 | 12 | 11 | 8.6 | 6.2 |
| 19 | 11 | 7.8 | 26 | 20 | 30 | 26 | 19 | 15 | 12 | 12 | 8.5 | 6.2 |
| 20 | 10 | 7.4 | 23 | 20 | 28 | 25 | 18 | 15 | 12 | 12 | 8.8 | 8.1 |
| 21 | 9.6 | 7.0 | 18 | 20 | 27 | 24 | 18 | 15 | 12 | 11 | 8.8 | 15 |
| 22 | 10 | 6.5 | 17 | 19 | 26 | 23 | 17 | 15 | 13 | 12 | 8.8 | 10 |
| 23 | 9.6 | 6.5 | 14 | 19 | 25 | 22 | 17 | 15 | 12 | 11 | 8.5 | 8.5 |
| 24 | 9.2 | 6.5 | 13 | 18 | 26 | 25 | 17 | 14 | 12 | 10 | 8.1 | 9.6 |
| 25 | 8.7 | 7.0 | 123 | 18 | 28 | 28 | 16 | 14 | 12 | 11 | 8.5 | 8.1 |
| 26 | 8.3 | 7.4 | 24 | 18 | 28 | 24 | 16 | 14 | 12 | 14 | 8.1 | 7.0 |
| 27 | 7.8 | 7.4 | 20 | 18 | 24 | 23 | 17 | 14 | 11 | 11 | 9.6 | 6.7 |
| 28 | 7.4 | 7.0 | 18 | 18 | 24 | 22 | 15 | 17 | 9.6 | 11 | 7.7 | 7.0 |
| 29 | 7.4 | 103 | 17 | 18 | ------ | 21 | 16 | 14 | 10 | 11 | 7.7 | 7.0 |
| 30 | 7.4 | 32 | 16 | 34 | ------ | 23 | 15 | 14 | 10 | 10 | 8.1 | 7.0 |
| 31 | 7.4 | ------ | 15 | 17 | ------ | 26 | ------ | 13 | ------ | 10 | 9.9 | ------ |
| TOTAL | 261.8 | 335.2 | 532.5 | 830 | 1657 | 760 | 571 | 521 | 361.6 | 339.6 | 262.6 | 221.9 |
| MEAN | 8.45 | 11.2 | 17.2 | 26.8 | 59.2 | 24.5 | 19.0 | 16.8 | 12.1 | 11.0 | 8.47 | 7.40 |
| MAX | 22 | 103 | 123 | 88 | 810 | 59 | 26 | 38 | 15 | 14 | 10 | 15 |
| MIN | 5.9 | 6.5 | 8.3 | 14 | 24 | 18 | 15 | 13 | 9.6 | 9.6 | 7.7 | 5.9 |
| AC-FT | 519 | 665 | 1,060 | 1,650 | 3,290 | 1,510 | 1,130 | 1,030 | 717 | 674 | 521 | 440 |

CAL YR 1968: TOTAL 6,377.6 MEAN 17.4 MAX 465 MIN 5.5 AC-FT 12,650
WTR YR 1969: TOTAL 6,654.2 MEAN 18.2 MAX 810 MIN 5.9 AC-FT 13,200

PEAK DISCHARGE (BASE, 900 CFS).--Nov. 29 (1530) 1,040 cfs (6.85 ft); Feb. 1 (1530) 10,800 cfs (12.42 ft).

NOTE.--No gage-height record Feb. 1 to Apr. 22.

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

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

DRAINAGE AREA.--0.44 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 620 cfs Feb. 1 (gage height, 6.09 ft), from rating curve extended as explained below; minimum, 0.66 cfs Nov. 8.
Period of record: Maximum discharge, 620 cfs Feb. 1, 1969 (gage height, 6.09 ft), from rating curve extended above 10 cfs on basis of slope-area measurement of peak flow; minimum, 0.66 cfs Nov. 8, 1968.
A discharge of 0.37 cfs was measured Sept. 15, 1961.

REMARKS.--Records poor. Honolulu Board of Water Supply diverts water from tunnel in drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | .77 | 2.7 | 2.5 | 67 | 2.1 | 2.2 | 1.9 | 1.8 | 1.6 | 1.4 | 1.6 |
| 2 | 1.4 | .80 | 2.3 | 5.4 | 3.5 | 2.1 | 2.0 | 4.5 | 1.6 | 1.6 | 1.5 | 1.3 |
| 3 | 1.3 | .80 | 2.6 | 12 | 2.8 | 2.0 | 1.9 | 2.1 | 1.6 | 1.6 | 1.4 | 1.3 |
| 4 | 1.3 | .77 | 3.0 | 8.0 | 2.6 | 2.0 | 1.9 | 2.0 | 1.6 | 1.6 | 1.4 | 1.4 |
| 5 | 1.2 | .77 | 2.3 | 5.0 | 2.6 | 1.9 | 2.0 | 2.1 | 1.3 | 1.6 | 1.4 | 1.4 |
| 6 | 1.3 | .74 | 2.2 | 4.0 | 2.6 | 1.9 | 1.9 | 2.0 | 1.3 | 1.6 | 1.4 | 1.4 |
| 7 | 1.0 | .74 | 2.2 | 3.4 | 2.5 | 1.9 | 1.8 | 2.0 | 1.3 | 1.8 | 1.4 | 1.3 |
| 8 | .92 | .68 | 2.2 | 3.5 | 2.5 | 1.9 | 1.8 | 2.0 | 1.3 | 1.8 | 1.4 | 1.5 |
| 9 | .96 | .77 | 2.1 | 3.7 | 2.5 | 1.8 | 1.8 | 2.0 | 1.3 | 1.7 | 1.4 | 1.4 |
| 10 | .96 | .83 | 2.1 | 3.0 | 2.4 | 1.8 | 1.8 | 2.0 | 1.8 | 1.8 | 1.4 | 1.8 |
| 11 | .92 | .77 | 2.2 | 2.8 | 2.4 | 1.7 | 1.7 | 2.0 | 1.8 | 1.6 | 1.4 | 1.6 |
| 12 | .92 | .74 | 2.4 | 2.7 | 2.3 | 1.7 | 1.7 | 2.0 | 1.6 | 1.6 | 1.4 | 1.5 |
| 13 | .92 | 1.2 | 2.5 | 2.6 | 2.8 | 1.8 | 1.7 | 2.0 | 1.5 | 1.6 | 1.4 | 1.4 |
| 14 | .86 | 1.8 | 2.3 | 2.5 | 4.5 | 2.2 | 1.8 | 2.1 | 1.5 | 1.8 | 1.4 | 1.4 |
| 15 | .96 | 1.1 | 2.3 | 2.4 | 3.4 | 3.5 | 1.7 | 2.1 | 1.4 | 1.6 | 1.5 | 1.3 |
| 16 | 4.8 | 1.0 | 2.9 | 2.2 | 3.1 | 5.2 | 1.8 | 2.1 | 1.3 | 1.8 | 1.4 | 1.3 |
| 17 | 1.4 | 1.0 | 2.8 | 2.2 | 2.7 | 3.5 | 2.0 | 2.1 | 1.3 | 1.4 | 1.4 | 1.4 |
| 18 | 1.3 | 1.1 | 2.8 | 2.1 | 2.6 | 2.5 | 2.3 | 2.1 | 1.3 | 1.6 | 1.4 | 1.2 |
| 19 | 1.2 | 1.2 | 4.0 | 1.9 | 2.5 | 2.2 | 2.1 | 2.1 | 1.4 | 2.0 | 1.4 | 1.2 |
| 20 | 1.1 | 1.1 | 3.5 | 1.8 | 2.4 | 2.1 | 2.1 | 2.0 | 1.4 | 1.9 | 1.4 | 1.6 |
| 21 | 1.1 | 1.2 | 3.1 | 1.9 | 2.3 | 2.0 | 2.0 | 2.0 | 1.4 | 1.6 | 1.5 | 3.3 |
| 22 | 1.2 | 1.3 | 2.8 | 1.8 | 2.2 | 1.9 | 2.1 | 2.0 | 1.5 | 1.6 | 1.5 | 2.5 |
| 23 | 1.1 | 1.2 | 2.7 | 1.6 | 2.2 | 2.0 | 2.0 | 2.0 | 1.4 | 1.6 | 1.4 | 2.4 |
| 24 | 1.1 | 1.1 | 2.6 | 1.6 | 2.3 | 2.2 | 1.8 | 1.8 | 1.3 | 1.6 | 1.3 | 2.2 |
| 25 | .96 | 1.5 | 9.0 | 1.4 | 2.3 | 2.5 | 1.6 | 1.9 | 1.3 | 1.7 | 1.3 | 2.0 |
| 26 | .92 | 1.4 | 5.0 | 1.4 | 2.3 | 2.0 | 1.7 | 1.8 | 1.6 | 1.8 | 1.2 | 1.8 |
| 27 | .89 | 1.3 | 2.5 | 1.4 | 2.2 | 1.9 | 1.9 | 2.0 | 1.6 | 1.7 | 1.4 | 1.6 |
| 28 | .86 | 1.3 | 2.3 | 1.6 | 2.2 | 1.9 | 1.7 | 2.0 | 1.5 | 1.5 | 1.4 | 1.6 |
| 29 | .80 | 11 | 2.1 | 2.1 | ------ | 1.8 | 2.1 | 1.8 | 1.6 | 1.5 | 1.4 | 1.6 |
| 30 | .89 | 5.4 | 2.0 | 2.7 | ------ | 2.0 | 2.0 | 1.8 | 1.6 | 1.5 | 1.4 | 1.6 |
| 31 | .86 | ------ | 1.9 | 2.4 | ------ | 2.4 | ------ | 1.8 | ------ | 1.5 | 1.6 | ------ |
| TOTAL | 36.50 | 45.38 | 87.4 | 93.6 | 137.7 | 68.4 | 56.9 | 64.1 | 44.2 | 51.2 | 43.6 | 48.9 |
| MEAN | 1.18 | 1.51 | 2.82 | 3.02 | 4.92 | 2.21 | 1.90 | 2.07 | 1.47 | 1.65 | 1.41 | 1.63 |
| MAX | 4.8 | 11 | 9.0 | 12 | 67 | 5.2 | 2.3 | 4.5 | 1.8 | 2.0 | 1.6 | 3.3 |
| MIN | .80 | .68 | 1.9 | 1.4 | 2.2 | 1.7 | 1.6 | 1.8 | 1.3 | 1.4 | 1.2 | 1.2 |
| AC-FT | 72 | 90 | 173 | 186 | 273 | 136 | 113 | 127 | 88 | 102 | 86 | 97 |

CAL YR 1968: TOTAL 679.50 MEAN 1.86 MAX 28 MIN .68 AC-FT 1,350
WTR YR 1969: TOTAL 777.88 MEAN 2.13 MAX 67 MIN .68 AC-FT 1,540

PEAK DISCHARGE (BASE, 180 CFS).--Feb. 1 (1400) 620 cfs (6.09 ft).

NOTE.--No gage-height record Mar. 3 to Apr. 16.

## 16-2739. Kamooalii Stream at Kaneohe

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

DRAINAGE AREA.--4.38 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 12,000 cfs Feb. 1 (gage height, 10.16 ft), from rating curve extended as explained below; minimum, 7.7 cfs Nov. 12.

Period of record: Maximum discharge, 12,000 cfs Feb. 1, 1969 (gage height, 10.16 ft), from rating curve extended above 380 cfs on basis of slope-area measurements at gage heights 5.26, 7.14, 7.47 and 10.16 ft; minimum, 3.4 cfs Aug. 28, 1962.

Flood of Oct. 23, 1958, reached a stage of 8.3 ft, from floodmarks, former site and datum (discharge, 6,610 cfs, from rating curve extended above 120 cfs on basis of slope-area measurement at gage height 5.69 ft). Discharge for peaks of Feb. 4 and May 2, 1965, 6,190 and 5,400 cfs, respectively; results of slope-area measurements of peak flow.

REMARKS.--Records fair. Many diversions for irrigation above station. Recording rain gage located at station. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17 | 9.0 | 26 | 21 | 1.170 | 33 | 37 | 22 | 17 | 13 | 11 | 12 |
| 2 | 16 | 9.8 | 17 | 71 | 78 | 32 | 34 | 62 | 16 | 14 | 12 | 11 |
| 3 | 13 | 9.4 | 29 | 127 | 53 | 31 | 31 | 22 | 16 | 13 | 11 | 11 |
| 4 | 11 | 9.4 | 26 | 75 | 44 | 31 | 30 | 19 | 16 | 14 | 11 | 11 |
| 5 | 10 | 9.0 | 16 | 57 | 42 | 30 | 31 | 19 | 16 | 13 | 11 | 11 |
| 6 | 11 | 9.0 | 15 | 40 | 40 | 30 | 29 | 38 | 16 | 14 | 11 | 11 |
| 7 | 9.4 | 8.6 | 14 | 38 | 39 | 30 | 28 | 23 | 16 | 16 | 11 | 10 |
| 8 | 9.4 | 8.6 | 16 | 42 | 38 | 29 | 28 | 20 | 16 | 14 | 11 | 12 |
| 9 | 9.4 | 9.0 | 14 | 44 | 37 | 28 | 28 | 19 | 16 | 13 | 11 | 11 |
| 10 | 9.4 | 9.0 | 13 | 38 | 36 | 28 | 28 | 18 | 21 | 14 | 11 | 12 |
| 11 | 9.4 | 8.6 | 12 | 35 | 35 | 27 | 28 | 20 | 16 | 12 | 11 | 11 |
| 12 | 9.4 | 8.1 | 14 | 34 | 35 | 26 | 27 | 19 | 15 | 12 | 11 | 10 |
| 13 | 9.0 | 9.4 | 14 | 33 | 38 | 25 | 27 | 18 | 14 | 14 | 11 | 10 |
| 14 | 9.0 | 23 | 12 | 32 | 71 | 29 | 28 | 18 | 14 | 14 | 11 | 11 |
| 15 | 10 | 11 | 12 | 32 | 75 | 38 | 26 | 19 | 14 | 13 | 12 | 10 |
| 16 | 40 | 10 | 21 | 31 | 57 | 84 | 25 | 18 | 14 | 14 | 11 | 10 |
| 17 | 16 | 10 | 19 | 30 | 47 | 56 | 27 | 18 | 14 | 12 | 11 | 11 |
| 18 | 12 | 9.8 | 19 | 29 | 43 | 43 | 32 | 18 | 14 | 13 | 11 | 11 |
| 19 | 12 | 12 | 45 | 28 | 41 | 36 | 27 | 18 | 14 | 14 | 11 | 9.8 |
| 20 | 11 | 11 | 35 | 28 | 40 | 35 | 26 | 18 | 14 | 14 | 11 | 14 |
| 21 | 10 | 10 | 28 | 28 | 38 | 33 | 25 | 18 | 14 | 12 | 12 | 22 |
| 22 | 12 | 9.8 | 25 | 27 | 37 | 32 | 24 | 17 | 16 | 13 | 11 | 14 |
| 23 | 11 | 11 | 22 | 26 | 36 | 31 | 24 | 17 | 14 | 12 | 11 | 13 |
| 24 | 10 | 10 | 19 | 25 | 36 | 35 | 24 | 17 | 14 | 12 | 11 | 14 |
| 25 | 9.8 | 9.8 | 161 | 24 | 39 | 40 | 23 | 17 | 14 | 13 | 11 | 12 |
| 26 | 9.8 | 11 | 30 | 24 | 39 | 33 | 22 | 17 | 14 | 14 | 11 | 11 |
| 27 | 9.4 | 9.0 | 26 | 23 | 34 | 32 | 24 | 18 | 14 | 12 | 12 | 11 |
| 28 | 9.8 | 9.4 | 24 | 23 | 33 | 31 | 22 | 20 | 13 | 12 | 11 | 11 |
| 29 | 9.8 | 129 | 22 | 25 | ------ | 30 | 25 | 18 | 13 | 12 | 11 | 11 |
| 30 | 9.8 | 51 | 21 | 43 | ------ | 31 | 23 | 18 | 14 | 12 | 12 | 11 |
| 31 | 9.4 | ------ | 20 | 26 | ------ | 37 | ------ | 17 | ------ | 12 | 12 | ------ |
| TOTAL | 364.2 | 463.7 | 787 | 1.159 | 2.351 | 1.066 | 813 | 640 | 449 | 406 | 347 | 349.8 |
| MEAN | 11.7 | 15.5 | 25.4 | 37.4 | 84.0 | 34.4 | 27.1 | 20.6 | 15.0 | 13.1 | 11.2 | 11.7 |
| MAX | 40 | 129 | 161 | 127 | 1.170 | 84 | 37 | 62 | 21 | 16 | 12 | 22 |
| MIN | 9.0 | 8.1 | 12 | 21 | 33 | 25 | 22 | 17 | 13 | 12 | 11 | 9.8 |
| AC-FT | 722 | 920 | 1.560 | 2300 | 4.660 | 2110 | 1.610 | 1.270 | 891 | 805 | 688 | 694 |

CAL YR 1968: TOTAL 7,991.7 MEAN 21.8 MAX 500 MIN 6.8 AC-FT 15,850
WTR YR 1969: TOTAL 9,195.7 MEAN 25.2 MAX 1,170 MIN 8.1 AC-FT 18,240

PEAK DISCHARGE (BASE, 950 CFS).--Nov. 29 (1530) about 1,200 cfs; Feb. 1 (1600) 12,000 cfs (10.16 ft).

## 16-2750. Haiku Stream near Heeia

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

DRAINAGE AREA.--0.97 sq mi.

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to current year.

GAGE.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, nonrecording gage and Apr. 28, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datums.

EXTREMES.--Current year: Maximum discharge, 1,160 cfs Feb. 1 (gage height, 3.84 ft), from rating curve extended as explained below; minimum, 1.1 cfs on many days.
Period of record: Maximum discharge, 5,740 cfs May 2, 1965 (gage height, 7.94 ft), from rating curve extended above 57 cfs on basis of slope-area measurements at gage heights 3.87, 3.88 and 7.94 ft; minimum, 0.20 cfs July 20, 1957, Sept. 17, 1961.

REMARKS.--Records fair except those for periods of no gage-height record, which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

REVISIONS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.9 | 1.1 | 3.5 | 2.1 | 120 | 2.3 | 2.2 | 2.0 | 1.2 | 1.3 | 1.4 | 1.6 |
| 2 | 2.0 | 1.3 | 3.0 | 7.6 | 8.4 | 2.2 | 2.4 | 6.1 | 1.2 | 1.3 | 1.4 | 1.6 |
| 3 | 1.6 | 1.3 | 3.9 | 25 | 8.5 | 2.2 | 2.2 | 1.9 | 1.2 | 1.2 | 1.4 | 1.5 |
| 4 | 1.5 | 1.2 | 7.3 | 15 | 5.9 | 2.1 | 1.7 | 1.6 | 1.1 | 1.3 | 1.4 | 1.5 |
| 5 | 1.4 | 1.2 | 2.9 | 8.1 | 4.7 | 2.1 | 1.7 | 1.7 | 1.1 | 1.3 | 1.5 | 1.5 |
| 6 | 1.4 | 1.2 | 2.2 | 5.0 | 4.0 | 2.2 | 1.7 | 1.9 | 1.1 | 1.3 | 1.4 | 1.5 |
| 7 | 1.3 | 1.1 | 1.9 | 3.7 | 3.6 | 2.2 | 1.6 | 1.6 | 1.1 | 1.4 | 1.4 | 1.5 |
| 8 | 1.3 | 1.1 | 1.9 | 3.9 | 3.4 | 2.2 | 1.6 | 1.3 | 1.1 | 1.4 | 1.4 | 1.6 |
| 9 | 1.3 | 1.2 | 1.7 | 4.6 | 3.1 | 2.1 | 1.6 | 1.3 | 1.2 | 1.4 | 1.4 | 1.5 |
| 10 | 1.3 | 1.2 | 1.6 | 3.3 | 2.8 | 2.1 | 1.5 | 1.3 | 1.5 | 1.4 | 1.8 | 1.6 |
| 11 | 1.3 | 1.1 | 1.6 | 3.0 | 2.6 | 2.0 | 1.5 | 1.3 | 1.5 | 1.4 | 1.5 | 1.5 |
| 12 | 1.3 | 1.2 | 1.6 | 2.7 | 2.5 | 2.1 | 1.5 | 1.3 | 1.4 | 1.4 | 1.5 | 1.5 |
| 13 | 1.3 | 1.5 | 1.7 | 2.5 | 5.9 | 2.0 | 1.5 | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 |
| 14 | 1.3 | 8.0 | 1.8 | 2.4 | 28 | 2.1 | 1.5 | 1.3 | 1.4 | 1.5 | 1.8 | 1.6 |
| 15 | 1.5 | 2.5 | 1.6 | 2.3 | 17 | 2.4 | 1.5 | 1.3 | 1.4 | 1.4 | 4.0 | 1.5 |
| 16 | 4.0 | 1.7 | 1.9 | 2.2 | 9.3 | 25 | 1.4 | 1.3 | 1.3 | 1.4 | 2.5 | 1.5 |
| 17 | 1.7 | 1.5 | 2.5 | 2.1 | 4.9 | 11 | 1.5 | 1.3 | 1.3 | 1.4 | 2.0 | 1.5 |
| 18 | 1.5 | 1.4 | 2.8 | 2.1 | 3.3 | 6.5 | 1.5 | 1.3 | 1.3 | 1.4 | 2.2 | 1.5 |
| 19 | 1.5 | 1.9 | 4.6 | 2.0 | 3.0 | 4.0 | 1.6 | 1.3 | 1.3 | 1.5 | 1.9 | 1.5 |
| 20 | 1.2 | 1.6 | 4.1 | 2.0 | 2.9 | 2.9 | 1.5 | 1.3 | 1.3 | 1.5 | 1.7 | 1.5 |
| 21 | 1.2 | 1.4 | 4.0 | 2.0 | 2.8 | 2.3 | 1.4 | 1.3 | 1.3 | 1.5 | 1.6 | 4.3 |
| 22 | 1.4 | 1.3 | 4.0 | 2.0 | 2.6 | 2.3 | 1.4 | 1.3 | 1.5 | 1.5 | 1.6 | 2.8 |
| 23 | 1.3 | 1.5 | 2.7 | 1.9 | 2.5 | 2.2 | 1.4 | 1.3 | 1.3 | 1.4 | 1.6 | 1.8 |
| 24 | 1.3 | 1.4 | 2.3 | 1.9 | 2.5 | 2.3 | 1.4 | 1.3 | 1.3 | 1.4 | 1.6 | 1.7 |
| 25 | 1.2 | 1.3 | 43 | 1.9 | 2.5 | 6.9 | 1.3 | 1.3 | 1.3 | 1.4 | 1.6 | 1.6 |
| 26 | 1.2 | 1.5 | 6.6 | 1.9 | 2.5 | 5.7 | 1.3 | 1.2 | 1.3 | 1.5 | 1.6 | 1.6 |
| 27 | 1.1 | 1.4 | 3.7 | 1.9 | 2.4 | 2.8 | 1.3 | 1.2 | 1.3 | 1.5 | 1.6 | 1.5 |
| 28 | 1.1 | 1.8 | 3.0 | 1.9 | 2.4 | 2.0 | 1.2 | 1.2 | 1.3 | 1.4 | 1.6 | 1.5 |
| 29 | 1.3 | 70 | 2.5 | 2.1 | ------ | 1.9 | 1.4 | 1.2 | 1.3 | 1.4 | 1.6 | 1.5 |
| 30 | 1.3 | 6.0 | 2.3 | 3.0 | ------ | 1.9 | 2.2 | 1.2 | 1.3 | 1.4 | 1.6 | 1.5 |
| 31 | 1.2 | ------ | 2.2 | 2.0 | ------ | 2.0 | ------ | 1.2 | ------ | 1.4 | 1.6 | ------ |
| TOTAL | 45.2 | 121.9 | 130.4 | 124.1 | 264.0 | 114.0 | 47.5 | 47.4 | 38.5 | 43.4 | 52.7 | 50.3 |
| MEAN | 1.46 | 4.06 | 4.21 | 4.00 | 9.43 | 3.68 | 1.58 | 1.53 | 1.28 | 1.40 | 1.70 | 1.68 |
| MAX | 4.0 | 70 | 43 | 25 | 120 | 25 | 2.4 | 6.1 | 1.5 | 1.5 | 4.0 | 4.3 |
| MIN | 1.1 | 1.1 | 1.6 | 1.9 | 2.4 | 1.9 | 1.2 | 1.2 | 1.1 | 1.2 | 1.4 | 1.5 |
| AC-FT | 90 | 242 | 259 | 246 | 524 | 226 | 94 | 94 | 76 | 86 | 105 | 100 |

CAL YR 1968 TOTAL 1,157.8 MEAN 3.16 MAX 119 MIN 1.1 AC-FT 2,300
WTR YR 1969 TOTAL 1,079.4 MEAN 2.96 MAX 120 MIN 1.1 AC-FT 2,140

PEAK DISCHARGE (BASE, 340 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | /1500 | 3.28 | 504 | 2- 1 | /1600 | 3.84 | 1,160 |
| 12-25 | 0630 | 3.54 | 754 | | | | |

/ About.
NOTE.--No gage-height record Oct. 12 to Dec. 2, Jan. 11 to Feb. 2.

## 16-2780. Iolekaa Stream mauka near Heeia

LOCATION.--Lat 21°25'15", long 157°49'50", Oahu, on left bank 0.7 mile upstream from confluence with Haiku Stream, 1.5 miles southwest of Heeia, and 1.8 miles west of Kaneohe Post Office.

DRAINAGE AREA.--0.29 sq mi.

PERIOD OF RECORD.--March 1940 to current year.

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

EXTREMES.--Current year: Maximum discharge, 204 cfs Feb. 1 (gage height, 3.14 ft), from rating curve extended as explained below; minimum, 0.14 cfs Feb. 9, 10.
Period of record: Maximum discharge, 797 cfs May 2, 1965 (gage height, 5.6 ft), from rating curve extended above 3.3 cfs by test of model of station site; minimum, 0.06 cfs Feb. 12, 1967.

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

REVISIONS (FISCAL YEARS).--WSP 935: 1940. WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .43 | .42 | .35 | .38 | 29 | .31 | .56 | .25 | .24 | .21 | .22 | .20 |
| 2 | .25 | .43 | .38 | 3.1 | .50 | .31 | .64 | 1.0 | .24 | .21 | .22 | .20 |
| 3 | .27 | .43 | 1.2 | 7.5 | .38 | .31 | .58 | .33 | .25 | .21 | .21 | .20 |
| 4 | .29 | .44 | 1.2 | 4.0 | .26 | .30 | .47 | .31 | .25 | .21 | .21 | .20 |
| 5 | .31 | .44 | .42 | 1.6 | .20 | .30 | .47 | .31 | .25 | .20 | .21 | .20 |
| 6 | .32 | .44 | .31 | .89 | .16 | .30 | .47 | .29 | .26 | .21 | .21 | .20 |
| 7 | .34 | .42 | .28 | .70 | .16 | .30 | .37 | .27 | .26 | .21 | .21 | .20 |
| 8 | .35 | .42 | .27 | 1.0 | .16 | .30 | .37 | .27 | .25 | .21 | .21 | .20 |
| 9 | .35 | .42 | .24 | 1.0 | .15 | .31 | .37 | .29 | .26 | .21 | .19 | .21 |
| 10 | .34 | .42 | .23 | .77 | .19 | .32 | .37 | .31 | .28 | .21 | .19 | .22 |
| 11 | .35 | .42 | .23 | .65 | .22 | .34 | .37 | .31 | .27 | .22 | .18 | .21 |
| 12 | .36 | .45 | .24 | .58 | .20 | .36 | .37 | .31 | .26 | .22 | .18 | .21 |
| 13 | .37 | .50 | .27 | .53 | .24 | .35 | .37 | .31 | .27 | .23 | .18 | .21 |
| 14 | .38 | .52 | .23 | .50 | .44 | .40 | .37 | .24 | .26 | .22 | .18 | .22 |
| 15 | .38 | .56 | .23 | .40 | .42 | .56 | .37 | .23 | .27 | .22 | .18 | .22 |
| 16 | .66 | .48 | .32 | .30 | .35 | 5.8 | .33 | .23 | .27 | .22 | .18 | .22 |
| 17 | .29 | .43 | .29 | .29 | .25 | 2.6 | .35 | .23 | .26 | .22 | .18 | .23 |
| 18 | .29 | .40 | .49 | .29 | .21 | 1.9 | .31 | .23 | .26 | .22 | .18 | .22 |
| 19 | .31 | .38 | .53 | .28 | .19 | 1.2 | .33 | .23 | .26 | .22 | .18 | .22 |
| 20 | .32 | .36 | .49 | .28 | .17 | .90 | .31 | .23 | .28 | .22 | .18 | .24 |
| 21 | .35 | .34 | .82 | .28 | .18 | .72 | .28 | .23 | .28 | .22 | .18 | .48 |
| 22 | .40 | .35 | .42 | .28 | .20 | .58 | .30 | .23 | .24 | .22 | .18 | .18 |
| 23 | .38 | .35 | .35 | .26 | .22 | .50 | .30 | .24 | .21 | .22 | .18 | .18 |
| 24 | .38 | .35 | .30 | .26 | .24 | .54 | .30 | .23 | .21 | .22 | .18 | .18 |
| 25 | .39 | .35 | 11 | .26 | .26 | 1.6 | .25 | .24 | .21 | .22 | .18 | .18 |
| 26 | .41 | .35 | 1.6 | .26 | .26 | 1.4 | .25 | .24 | .21 | .23 | .18 | .19 |
| 27 | .40 | .35 | .90 | .26 | .27 | .70 | .26 | .24 | .21 | .22 | .18 | .19 |
| 28 | .42 | .35 | .78 | .26 | .29 | .53 | .25 | .24 | .21 | .21 | .18 | .19 |
| 29 | .42 | .40 | .58 | .27 | ------ | .47 | .29 | .24 | .21 | .21 | .18 | .19 |
| 30 | .42 | 1.2 | .42 | .32 | ------ | .47 | .27 | .24 | .21 | .21 | .18 | .19 |
| 31 | .42 | ------ | .40 | .26 | ------ | .50 | ------ | .24 | ------ | .22 | .18 | ------ |
| TOTAL | 11.35 | 13.17 | 25.77 | 28.01 | 35.77 | 25.48 | 10.90 | 8.79 | 7.40 | 6.70 | 5.86 | 6.38 |
| MEAN | .37 | .44 | .83 | .90 | 1.28 | .82 | .36 | .28 | .25 | .22 | .19 | .21 |
| MAX | .66 | 1.2 | 11 | 7.5 | 29 | 5.8 | .64 | 1.0 | .28 | .23 | .22 | .48 |
| MIN | .25 | .34 | .23 | .26 | .15 | .30 | .25 | .23 | .21 | .20 | .18 | .18 |
| AC-FT | 23 | 26 | 51 | 56 | 71 | 51 | 22 | 17 | 15 | 13 | 12 | 13 |

CAL YR 1968 TOTAL 266.22 MEAN .73 MAX 23 MIN .18 AC-FT 528
WTR YR 1969 TOTAL 185.58 MEAN .51 MAX 29 MIN .15 AC-FT 368

NOTE.--No gage-height record Mar. 5 to Apr. 24.

## 16-2830. Kahaluu Stream near Hecia

LOCATION.--Lat 21°26'20", long 157°51'20", Oahu, on left bank 40 ft upstream from intake of Libby ditch, 0.5 mile upstream from forest-reserve boundary, and 3.0 miles northwest of Hecia.

DRAINAGE AREA.--0.28 sq mi.

PERIOD OF RECORD.--October 1935 to current year.

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

EXTREMES.--Current year: Maximum discharge, 410 cfs Feb. 1 (gage height, 5.87 ft), from rating curve extended as explained below; minimum, 0.18 cfs Aug. 28, 29.
Period of record: Maximum discharge, 1,730 cfs Feb. 4, 1965 (gage height, 8.46 ft, from floodmarks), from rating curve extended above 16 cfs by test of model of station site; minimum, 0.05 cfs at times in 1958, 1962 and 1963.

REMARKS.--Records good. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. Recording rain gage located at station.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area, WSP 1719: 1937-39, 1943-44.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.8 | .32 | 1.4 | .27 | 36 | .50 | 2.0 | .71 | .44 | .32 | .32 | .22 |
| 2 | 1.0 | .32 | .79 | 4.5 | 1.8 | .50 | .87 | 4.4 | .44 | .32 | .32 | .22 |
| 3 | .57 | .27 | 1.4 | 9.4 | .50 | .50 | .44 | .87 | .38 | .27 | .32 | .22 |
| 4 | .38 | .27 | 2.2 | 2.7 | .38 | .50 | .38 | .79 | .38 | .27 | .32 | .22 |
| 5 | .27 | .22 | .50 | 1.3 | .32 | .57 | .44 | 2.2 | .32 | .27 | .32 | .22 |
| 6 | .22 | .22 | .38 | .57 | .27 | .50 | .38 | 1.6 | .32 | .27 | .32 | .22 |
| 7 | .22 | .22 | .32 | .44 | .27 | .50 | .32 | .57 | .32 | .32 | .27 | .22 |
| 8 | .22 | .22 | .38 | 1.1 | .22 | .44 | .27 | .44 | .32 | .32 | .27 | .27 |
| 9 | .27 | .27 | .27 | 1.9 | .22 | .50 | .27 | .50 | .32 | .32 | .27 | .22 |
| 10 | .32 | .22 | .22 | .73 | .22 | .50 | .32 | .87 | .44 | .32 | .27 | .38 |
| 11 | .27 | .22 | .22 | .44 | .22 | .44 | .32 | 1.1 | .44 | .32 | .27 | .32 |
| 12 | .27 | .22 | .22 | .38 | .22 | .32 | .32 | 1.0 | .38 | .32 | .27 | .27 |
| 13 | .32 | .27 | .38 | .32 | 1.5 | .27 | .32 | .95 | .38 | .32 | .27 | .27 |
| 14 | .32 | 2.5 | .27 | .32 | 7.8 | .27 | .32 | .95 | .38 | .27 | .27 | .38 |
| 15 | .38 | .50 | .22 | .32 | 6.0 | .27 | .32 | .95 | .32 | .27 | .38 | .27 |
| 16 | .38 | .32 | 1.6 | .32 | 3.2 | 16 | .32 | .95 | .32 | .27 | .38 | .27 |
| 17 | .32 | .27 | .79 | .32 | .71 | 2.1 | .50 | .95 | .32 | .38 | .38 | .44 |
| 18 | .32 | .27 | 1.4 | .27 | .44 | .71 | .64 | .87 | .32 | .32 | .32 | .32 |
| 19 | .32 | .27 | 2.0 | .27 | .71 | .50 | .57 | .79 | .32 | .38 | .38 | .27 |
| 20 | .32 | .22 | 1.6 | .27 | .50 | .32 | .50 | .71 | .32 | .38 | .38 | .27 |
| 21 | .32 | .22 | 1.5 | .27 | .44 | .32 | .44 | .71 | .32 | .32 | .32 | 3.6 |
| 22 | .32 | .22 | .87 | .27 | .38 | .27 | .64 | .64 | .38 | .32 | .32 | .95 |
| 23 | .32 | .22 | .50 | .27 | .38 | .27 | .71 | .57 | .32 | .32 | .32 | .44 |
| 24 | .32 | .22 | .47 | .27 | .38 | .38 | .50 | .50 | .32 | .32 | .32 | .38 |
| 25 | .32 | .22 | 11 | .27 | .38 | 3.2 | .38 | .50 | .32 | .38 | .27 | .32 |
| 26 | .32 | .22 | .79 | .27 | .50 | .87 | .38 | .50 | .38 | .57 | .22 | .32 |
| 27 | .32 | .22 | .44 | .27 | .44 | .50 | .50 | .57 | .32 | .50 | .27 | .32 |
| 28 | .38 | .27 | .38 | .27 | .44 | .38 | .50 | .57 | .32 | .38 | .22 | .27 |
| 29 | .32 | 14 | .32 | .32 | ------ | .38 | .57 | .57 | .32 | .38 | .22 | .27 |
| 30 | .32 | 3.3 | .27 | 1.5 | ------ | .32 | .87 | .57 | .32 | .38 | .22 | .27 |
| 31 | .32 | ------ | .27 | .50 | ------ | 2.8 | ------ | .50 | ------ | .38 | .27 | ------ |
| TOTAL | 14.07 | 26.72 | 33.37 | 30.62 | 64.84 | 35.90 | 15.31 | 28.37 | 10.50 | 10.48 | 9.27 | 12.63 |
| MEAN | .45 | .89 | 1.08 | .99 | 2.32 | 1.16 | .51 | .92 | .35 | .34 | .30 | .42 |
| MAX | 3.8 | 14 | 11 | 9.4 | 36 | 16 | 2.0 | 4.4 | .44 | .57 | .38 | 3.6 |
| MIN | .22 | .22 | .22 | .27 | .22 | .27 | .27 | .44 | .32 | .27 | .22 | .22 |
| AC-FT | 28 | 53 | 66 | 61 | 129 | 71 | 30 | 56 | 21 | 21 | 18 | 25 |

CAL YR 1968: TOTAL 269.93 MEAN .74 MAX 19 MIN .21 AC-FT 535
WTR YR 1969: TOTAL 292.08 MEAN .80 MAX 36 MIN .22 AC-FT 579

PEAK DISCHARGE (BASE, 47 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1430 | 2.97 | 92 | 2- 1 | 1300 | 5.87 | 410 |
| 12-25 | 0600 | 2.56 | 68 | 3-16 | 0930 | 2.20 | 51 |
| 1- 3 | 0430 | 2.56 | 68 | | | | |

## 16-2835. Kahaluu Stream at Kahaluu

LOCATION.--Lat 21°27'23", long 157°5D'15", Oahu, on right bank at downstream side of private road bridge, 0.1 mile downstream from Ahuimanu Stream, and 0.5 mile south of Kahaluu.

DRAINAGE AREA.--3.73 sq mi.

PERIOD OF RECORD.--Annual maximum gage height, water years 1960-62, 1965, February 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Nov. 2D, 1959, to Sept. 30, 1962, and Oct. 1, 1964, to June 30, 1965, crest-stage gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 4,310 cfs Feb. 1 (gage height, 16.98 ft), from rating curve extended as explained below; minimum, 2.6 cfs Aug. 25, 30, Sept. 6.
Period of record: Maximum gage height, 17.71 ft May 2, 1965 (discharge not determined); maximum discharge determined, 4,310 cfs Feb. 1, 1969 (gage height, 16.98 ft), from rating curve extended above 240 cfs on basis of slope-area measurement at gage height 14.55 ft; minimum discharge, 2.6 cfs several days in 1968 and 1969.

REMARKS.--Records poor. Honolulu Board of Water Supply diverts water from tunnel in drainage area. Effluent of about 0.2 cfs from sewage treatment plant enters Ahuimanu Stream above station. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 33 | 4.2 | 42 | 12 | 1,010 | 17 | 34 | 9.0 | 8.4 | 5.9 | 3.8 | 3.8 |
| 2 | 22 | 4.6 | 28 | 142 | 175 | 16 | 23 | 74 | 7.9 | 5.4 | 4.2 | 3.8 |
| 3 | 24 | 4.2 | 39 | 278 | 60 | 16 | 19 | 14 | 7.9 | 5.9 | 3.8 | 3.8 |
| 4 | 11 | 4.2 | 41 | 92 | 44 | 17 | 16 | 11 | 7.9 | 5.4 | 3.8 | 3.2 |
| 5 | 6.9 | 4.2 | 20 | 65 | 38 | 19 | 19 | 17 | 7.4 | 5.0 | 3.8 | 3.5 |
| 6 | 5.4 | 3.8 | 16 | 34 | 31 | 16 | 18 | 28 | 7.4 | 6.9 | 3.8 | 3.2 |
| 7 | 5.0 | 3.8 | 13 | 29 | 29 | 14 | 15 | 16 | 7.4 | 6.9 | 4.2 | 3.5 |
| 8 | 5.9 | 3.8 | 16 | 53 | 26 | 13 | 14 | 11 | 6.9 | 5.4 | 3.5 | 3.8 |
| 9 | 5.9 | 4.2 | 12 | 68 | 24 | 11 | 14 | 11 | 6.4 | 5.4 | 3.5 | 3.8 |
| 10 | 5.0 | 4.2 | 10 | 30 | 24 | 9.6 | 14 | 11 | 13 | 5.9 | 4.2 | 5.0 |
| 11 | 4.6 | 4.6 | 10 | 24 | 23 | 9.0 | 13 | 11 | 9.0 | 5.4 | 4.6 | 4.2 |
| 12 | 4.2 | 4.2 | 10 | 21 | 21 | 9.6 | 12 | 11 | 7.4 | 5.4 | 4.2 | 3.8 |
| 13 | 3.8 | 5.0 | 11 | 20 | 41 | 8.4 | 13 | 10 | 7.4 | 5.4 | 3.8 | 3.8 |
| 14 | 4.2 | 38 | 8.4 | 18 | 194 | 7.4 | 14 | 9.6 | 6.9 | 5.4 | 3.8 | 5.0 |
| 15 | 4.2 | 9.0 | 7.9 | 15 | 140 | 18 | 13 | 9.6 | 6.4 | 4.6 | 5.9 | 3.8 |
| 16 | 13 | 5.0 | 23 | 14 | 73 | 183 | 13 | 9.6 | 6.4 | 5.9 | 4.2 | 4.2 |
| 17 | 9.0 | 4.6 | 20 | 12 | 39 | 59 | 14 | 9.0 | 6.4 | 5.9 | 4.2 | 5.9 |
| 18 | 6.9 | 4.2 | 31 | 11 | 33 | 32 | 19 | 9.0 | 5.9 | 6.4 | 3.8 | 5.9 |
| 19 | 5.9 | 5.0 | 42 | 10 | 32 | 24 | 15 | 9.0 | 5.4 | 7.9 | 5.0 | 5.0 |
| 20 | 5.4 | 4.2 | 25 | 10 | 26 | 20 | 14 | 9.0 | 5.0 | 7.9 | 5.9 | 5.4 |
| 21 | 5.0 | 4.2 | 20 | 8.4 | 24 | 18 | 14 | 9.6 | 4.6 | 5.9 | 4.6 | 31 |
| 22 | 5.0 | 3.8 | 13 | 7.9 | 22 | 17 | 13 | 8.4 | 6.4 | 5.9 | 5.0 | 11 |
| 23 | 5.0 | 4.2 | 14 | 7.4 | 21 | 15 | 13 | 8.4 | 5.4 | 5.9 | 4.2 | 7.4 |
| 24 | 4.6 | 3.5 | 61 | 6.9 | 21 | 17 | 12 | 7.9 | 5.0 | 5.4 | 3.8 | 7.4 |
| 25 | 4.2 | 3.8 | 339 | 6.4 | 20 | 58 | 10 | 9.0 | 5.0 | 5.9 | 5.6 | 5.9 |
| 26 | 4.2 | 3.8 | 44 | 5.9 | 21 | 26 | 9.6 | 7.9 | 7.4 | 17 | 3.5 | 4.6 |
| 27 | 4.2 | 3.5 | 27 | 5.4 | 17 | 20 | 11 | 8.4 | 6.4 | 6.9 | 4.2 | 4.2 |
| 28 | 4.2 | 3.8 | 23 | 5.4 | 16 | 17 | 10 | 9.6 | 6.4 | 5.0 | 3.5 | 4.2 |
| 29 | 4.2 | 198 | 17 | 7.4 | ------ | 18 | 11 | 9.0 | 5.9 | 4.6 | 3.5 | 4.2 |
| 30 | 4.6 | 84 | 15 | 24 | ------ | 16 | 10 | 9.0 | 6.4 | 4.2 | 3.8 | 4.2 |
| 31 | 4.6 | ------ | 13 | 7.4 | ------ | 42 | ------ | 8.4 | ------ | 4.6 | 5.0 | ------ |
| TOTAL | 235.1 | 437.6 | 1,011.3 | 1,050.5 | 2,245 | 783.0 | 439.6 | 394.4 | 205.7 | 189.6 | 130.7 | 168.5 |
| MEAN | 7.58 | 14.6 | 32.6 | 33.9 | 80.2 | 25.3 | 14.7 | 12.7 | 6.86 | 6.12 | 4.22 | 5.62 |
| MAX | 33 | 198 | 339 | 278 | 1,010 | 183 | 34 | 74 | 13 | 17 | 5.9 | 31 |
| MIN | 3.8 | 3.5 | 7.9 | 5.4 | 16 | 7.4 | 9.6 | 7.9 | 4.6 | 4.2 | 3.5 | 3.2 |
| AC-FT | 466 | 868 | 2,010 | 2,080 | 4,450 | 1,550 | 872 | 782 | 408 | 376 | 259 | 334 |

CAL YR 1968: TOTAL 5,294.1 MEAN 14.5 MAX 492 MIN 2.8 AC-FT 10,500
WTR YR 1969: TOTAL 7,291.0 MEAN 20.0 MAX 1,010 MIN 3.2 AC-FT 14,460

PEAK DISCHARGE (BASE, 600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1500 | 13.06 | 1,680 | 1- 3 | 2330 | 11.15 | 760 |
| 12-25 | 0700 | 14.30 | 2,420 | 2- 1 | 1230 | 16.98 | 4,310 |
| 1- 2 | 1400 | 12.60 | 1,450 | 3-16 | 0830 | 11.76 | 1,030 |
| 1- 3 | 0430 | 13.30 | 1,820 | | | | |

## 16-2836. South Fork Waihee Stream near Heeia

LOCATION.--Lat 21°26'42", long 157°52'10", Oahu, on left bank 0.6 mile upstream from confluence with North Fork, 3.0 miles southwest of Waiahole School, and 4.0 miles northwest of Heeia.

DRAINAGE AREA.--0.03 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 224 cfs Feb. 1 (gage height, 3.66 ft), from rating curve extended above 3.9 cfs; minimum, 2.0 cfs several days.
Period of record: Maximum discharge, 279 cfs May 2, 1965 (gage height, 3.96 ft), from rating curve extended above 3.9 cfs; minimum, 1.4 cfs many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.1 | 2.4 | 2.6 | 2.1 | 18 | 2.2 | 2.7 | 2.4 | 2.4 | 2.3 | 2.4 | 2.2 |
| 2 | 2.6 | 2.3 | 2.4 | 3.4 | 2.3 | 2.2 | 2.3 | 4.0 | 2.3 | 2.3 | 2.4 | 2.2 |
| 3 | 3.4 | 2.3 | 2.7 | 4.7 | 2.3 | 2.2 | 2.3 | 2.6 | 2.3 | 2.3 | 2.4 | 2.2 |
| 4 | 2.5 | 2.3 | 2.7 | 2.5 | 2.3 | 2.2 | 2.3 | 2.6 | 2.3 | 2.3 | 2.4 | 2.2 |
| 5 | 2.4 | 2.3 | 2.4 | 2.3 | 2.3 | 2.2 | 2.3 | 3.4 | 2.3 | 2.3 | 2.4 | 2.2 |
| 6 | 2.4 | 2.3 | 2.3 | 2.1 | 2.3 | 2.2 | 2.3 | 2.8 | 2.3 | 2.4 | 2.3 | 2.2 |
| 7 | 2.4 | 2.3 | 2.3 | 2.1 | 2.3 | 2.2 | 2.3 | 2.4 | 2.3 | 2.5 | 2.3 | 2.2 |
| 8 | 2.4 | 2.3 | 2.3 | 2.4 | 2.3 | 2.2 | 2.3 | 2.4 | 2.3 | 2.4 | 2.3 | 2.2 |
| 9 | 2.5 | 2.3 | 2.3 | 2.5 | 2.3 | 2.2 | 2.3 | 2.4 | 2.3 | 2.4 | 2.3 | 2.2 |
| 10 | 2.4 | 2.3 | 2.3 | 2.1 | 2.3 | 2.2 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 |
| 11 | 2.4 | 2.3 | 2.3 | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 |
| 12 | 2.4 | 2.3 | 2.3 | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 |
| 13 | 2.4 | 2.4 | 2.6 | 2.1 | 2.6 | 2.2 | 2.3 | 2.4 | 2.4 | 2.4 | 2.3 | 2.3 |
| 14 | 2.4 | 2.8 | 2.3 | 2.1 | 3.9 | 2.1 | 2.3 | 2.4 | 2.3 | 2.4 | 2.3 | 2.6 |
| 15 | 2.4 | 2.6 | 2.3 | 2.1 | 3.9 | 2.1 | 2.3 | 2.4 | 2.3 | 2.4 | 2.4 | 2.3 |
| 16 | 2.4 | 2.5 | 2.7 | 2.1 | 3.0 | 6.6 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.3 |
| 17 | 2.4 | 2.4 | 2.5 | 2.1 | 2.3 | 2.5 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.4 |
| 18 | 2.4 | 2.4 | 2.6 | 2.1 | 2.3 | 2.4 | 2.5 | 2.4 | 2.3 | 2.4 | 2.3 | 2.3 |
| 19 | 2.4 | 2.4 | 2.8 | 2.1 | 2.3 | 2.3 | 2.4 | 2.5 | 2.3 | 2.4 | 2.3 | 2.2 |
| 20 | 2.4 | 2.4 | 2.5 | 2.2 | 2.3 | 2.2 | 2.4 | 2.5 | 2.3 | 2.4 | 2.2 | 2.3 |
| 21 | 2.4 | 2.4 | 2.6 | 2.2 | 2.2 | 2.2 | 2.4 | 2.5 | 2.3 | 2.3 | 2.2 | 3.3 |
| 22 | 2.4 | 2.4 | 2.4 | 2.2 | 2.2 | 2.2 | 2.4 | 2.5 | 2.3 | 2.3 | 2.2 | 2.3 |
| 23 | 2.4 | 2.4 | 2.3 | 2.1 | 2.2 | 2.2 | 2.4 | 2.4 | 2.3 | 2.3 | 2.2 | 2.3 |
| 24 | 2.4 | 2.3 | 2.5 | 2.1 | 2.2 | 2.3 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.3 |
| 25 | 2.4 | 2.3 | 4.6 | 2.1 | 2.2 | 3.0 | 2.4 | 2.4 | 2.3 | 2.4 | 2.2 | 2.3 |
| 26 | 2.4 | 2.4 | 2.3 | 2.1 | 2.2 | 2.3 | 2.4 | 2.4 | 2.3 | 2.5 | 2.2 | 2.3 |
| 27 | 2.4 | 2.4 | 2.2 | 2.1 | 2.2 | 2.2 | 2.6 | 2.4 | 2.3 | 2.4 | 2.3 | 2.3 |
| 28 | 2.4 | 2.4 | 2.2 | 2.1 | 2.2 | 2.2 | 2.4 | 2.5 | 2.3 | 2.4 | 2.3 | 2.3 |
| 29 | 2.4 | 7.4 | 2.2 | 2.2 | ------ | 2.2 | 2.6 | 2.4 | 2.3 | 2.4 | 2.3 | 2.3 |
| 30 | 2.4 | 2.9 | 2.2 | 3.0 | ------ | 2.2 | 2.5 | 2.4 | 2.3 | 2.4 | 2.2 | 2.3 |
| 31 | 2.4 | ------ | 2.2 | 2.2 | ------ | 3.1 | ------ | 2.4 | ------ | 2.4 | 2.3 | ------ |
| TOTAL | 76.5 | 76.9 | 77.1 | 71.7 | 83.3 | 74.9 | 71.3 | 78.2 | 69.5 | 73.5 | 71.1 | 69.4 |
| MEAN | 2.47 | 2.56 | 2.49 | 2.31 | 2.98 | 2.42 | 2.38 | 2.52 | 2.32 | 2.37 | 2.29 | 2.31 |
| MAX | 3.4 | 7.4 | 4.6 | 4.7 | 18 | 6.6 | 2.7 | 4.0 | 2.4 | 2.5 | 2.4 | 3.3 |
| MIN | 2.4 | 2.3 | 2.2 | 2.1 | 2.2 | 2.1 | 2.3 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 |
| AC-FT | 152 | 153 | 153 | 142 | 165 | 149 | 141 | 155 | 138 | 146 | 141 | 138 |

CAL YR 1968: TOTAL 937.4 MEAN 2.56 MAX 8.1 MIN 2.2 AC-FT 1,860
WTR YR 1969: TOTAL 893.4 MEAN 2.45 MAX 18 MIN 2.1 AC-FT 1,770

PEAK DISCHARGE (BASE, 31 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1730 | 2.23 | 53 | 2-1 | 1230 | 3.66 | 224 |
| 12-18 | 2100 | 1.89 | 34 | 3-16 | 0800 | 2.29 | 57 |
| 12-25 | 0530 | 2.14 | 47 | | | | |

NOTE.--No gage-height record Oct. 1 to Nov. 21.

## 16-2837. North Fork Waihee Stream near Heeia

LOCATION.--Lat 21°26'46", long 157°52'18", Oahu, on left bank 0.6 mile upstream from confluence with South Fork, 2.8 miles southwest of Waiahole School, and 4.3 miles northwest of Heeia.

DRAINAGE AREA.--0.03 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 212 cfs Feb. 1 (gage height, 2.82 ft), from rating curve as explained below; minimum, 1.8 cfs Jan. 28, 29.
Period of record: Maximum discharge, 376 cfs Feb. 4, 1965 (gage height, 3.38 ft), from rating curve extended above 19 cfs; minimum, 1.3 cfs on many days in 1963.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.0 | 1.9 | 2.2 | 1.9 | 16 | 1.9 | 2.4 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 |
| 2 | 2.3 | 1.9 | 2.0 | 3.2 | 2.1 | 1.9 | 2.1 | 3.6 | 2.4 | 2.4 | 2.4 | 2.4 |
| 3 | 3.3 | 1.9 | 2.2 | 3.6 | 2.0 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.5 |
| 4 | 2.2 | 1.9 | 1.9 | 2.4 | 1.9 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 |
| 5 | 2.1 | 1.9 | 2.0 | 2.0 | 1.9 | 1.9 | 2.1 | 2.9 | 2.4 | 2.4 | 2.4 | 2.4 |
| 6 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 7 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 8 | 2.1 | 1.9 | 1.9 | 2.1 | 1.9 | 1.9 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 9 | 2.2 | 1.9 | 1.9 | 2.1 | 1.9 | 1.9 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 10 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.6 |
| 11 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.5 |
| 12 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.5 |
| 13 | 2.1 | 1.9 | 2.0 | 1.9 | 2.2 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.5 |
| 14 | 2.1 | 2.1 | 1.9 | 1.9 | 3.6 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.9 |
| 15 | 2.1 | 2.0 | 1.9 | 1.9 | 3.3 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.7 | 2.4 |
| 16 | 2.1 | 2.0 | 2.3 | 1.9 | 2.7 | 5.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 |
| 17 | 2.1 | 1.9 | 2.0 | 1.9 | 2.0 | 2.2 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.6 |
| 18 | 2.1 | 1.9 | 2.1 | 1.9 | 2.0 | 2.1 | 2.2 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 |
| 19 | 2.0 | 1.9 | 2.4 | 1.9 | 2.1 | 2.0 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 20 | 2.0 | 1.9 | 2.0 | 1.9 | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 21 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 3.4 |
| 22 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.6 |
| 23 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 24 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.1 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 25 | 2.0 | 2.0 | 4.4 | 1.9 | 2.0 | 2.7 | 2.1 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 |
| 26 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.4 | 2.4 | 2.5 | 2.4 | 2.4 |
| 27 | 1.9 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 28 | 1.9 | 2.0 | 1.9 | 1.9 | 1.9 | 2.0 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 29 | 1.9 | 6.3 | 1.9 | 1.9 | ------ | 2.0 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 30 | 1.9 | 2.4 | 1.9 | 2.5 | ------ | 2.0 | 2.2 | 2.4 | 2.4 | 2.4 | 2.4 | 2.3 |
| 31 | 1.9 | ------ | 1.9 | 1.9 | ------ | 2.7 | ------ | 2.4 | ------ | 2.4 | 2.5 | ------ |
| TOTAL | 65.8 | 63.1 | 63.7 | 63.5 | 73.0 | 66.2 | 63.9 | 72.7 | 72.0 | 74.5 | 74.8 | 74.4 |
| MEAN | 2.12 | 2.10 | 2.05 | 2.05 | 2.61 | 2.14 | 2.13 | 2.35 | 2.40 | 2.40 | 2.41 | 2.48 |
| MAX | 3.3 | 6.3 | 4.4 | 3.6 | 16 | 5.9 | 2.4 | 3.6 | 2.4 | 2.5 | 2.7 | 3.4 |
| MIN | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.3 |
| AC-FT | 131 | 125 | 126 | 126 | 145 | 131 | 127 | 144 | 143 | 148 | 148 | 148 |

CAL YR 1968: TOTAL 835.0 MEAN 2.28 MAX 6.9 MIN 1.9 AC-FT 1,660
WTR YR 1969: TOTAL 827.6 MEAN 2.27 MAX 16 MIN 1.9 AC-FT 1,640

PEAK DISCHARGE (BASE, 31 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 3 | 1530 | 1.68 | 41 | 1-30 | 1130 | 1.59 | 34 |
| 11-29 | 1800 | 1.90 | 60 | 2- 1 | 1300 | 2.82 | 212 |
| 12-25 | 0700 | 1.87 | 57 | 3-16 | 0800 | 1.79 | 50 |
| 1- 3 | 0500 | 1.64 | 38 | | | | |

## 16-2840. Waihee Stream near Heeia

LOCATION.--Lat 21°27'00", long 157°51'40", Oahu, on left bank 70 ft upstream from intake of Kihe ditch, 120 ft downstream from forest-reserve boundary, 3.5 miles northwest of Heeia, and 4.0 miles northwest of Kaneohe Post Office.

DRAINAGE AREA.--0.93 sq mi.

PERIOD OF RECORD.--December 1935 to current year.

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

EXTREMES.--Current year: Maximum discharge, about 1,100 cfs Feb. 1; minimum, 4.8 cfs Mar. 14, 15.
Period of record: Maximum discharge, 5,110 cfs Feb. 4, 1965 (gage height, 8.72 ft, from floodmarks), from rating curve extended above 77 cfs on basis of slope-area measurements at gage heights 6.06 and 8.72 ft; minimum, 3.4 cfs Oct. 15, 16, 1962.

REMARKS.--Records poor. Honolulu Board of Water Supply diverts water from tunnel in drainage area. Records of surface bed material for the water year 1969 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1956-57. WSP 1937: 1940-43(M), 1947(M), 1948(P), 1949-50(M), 1953(M), 1955(M), 1958(M), 1959(P). (WATER YEAR).--WRD Hawaii 1968: 1967(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 | 5.5 | 9.2 | 6.0 | 180 | 5.3 | 9.0 | 5.3 | 5.3 | 5.5 | 6.0 | 6.0 |
| 2 | 9.0 | 5.5 | 7.4 | 15 | 16 | 5.1 | 7.4 | 12 | 5.3 | 5.5 | 6.0 | 5.8 |
| 3 | 12 | 5.5 | 8.0 | 34 | 9.2 | 5.1 | 6.8 | 6.2 | 5.3 | 5.5 | 6.0 | 5.8 |
| 4 | 8.3 | 5.5 | 9.2 | 15 | 8.1 | 5.1 | 6.2 | 5.3 | 5.3 | 5.5 | 5.8 | 5.8 |
| 5 | 6.8 | 5.5 | 7.6 | 10 | 7.2 | 5.1 | 6.0 | 8.2 | 5.3 | 5.3 | 5.8 | 5.8 |
| 6 | 6.4 | 5.5 | 7.0 | 8.7 | 6.8 | 5.1 | 5.8 | 7.7 | 5.3 | 5.7 | 5.8 | 5.8 |
| 7 | 6.2 | 5.5 | 6.6 | 8.1 | 6.6 | 5.1 | 5.7 | 6.0 | 5.1 | 5.7 | 5.8 | 5.7 |
| 8 | 6.4 | 5.3 | 6.6 | 9.1 | 6.2 | 5.1 | 5.7 | 5.5 | 5.1 | 5.7 | 5.8 | 5.8 |
| 9 | 6.6 | 5.3 | 6.0 | 11 | 6.0 | 5.1 | 5.8 | 5.3 | 5.1 | 5.7 | 5.8 | 5.8 |
| 10 | 6.4 | 5.3 | 6.0 | 9.2 | 6.0 | 5.0 | 5.8 | 5.3 | 5.5 | 5.8 | 5.8 | 6.0 |
| 11 | 6.0 | 5.3 | 5.8 | 8.1 | 5.8 | 5.0 | 5.7 | 5.1 | 5.5 | 5.8 | 5.8 | 5.8 |
| 12 | 5.8 | 5.3 | 5.7 | 7.4 | 5.8 | 5.0 | 5.7 | 5.3 | 5.5 | 5.8 | 6.0 | 5.8 |
| 13 | 5.8 | 5.5 | 6.6 | 7.2 | 7.6 | 5.0 | 5.5 | 5.1 | 5.5 | 5.8 | 6.0 | 5.8 |
| 14 | 5.8 | 6.9 | 5.7 | 7.2 | 18 | 5.1 | 5.7 | 5.1 | 5.3 | 5.8 | 6.0 | 8.1 |
| 15 | 6.2 | 5.5 | 5.3 | 7.0 | 20 | 5.0 | 5.5 | 5.1 | 5.3 | 5.8 | 6.6 | 6.4 |
| 16 | 6.0 | 5.3 | 7.7 | 7.0 | 16 | 29 | 5.5 | 5.1 | 5.1 | 5.8 | 6.2 | 5.8 |
| 17 | 6.4 | 5.1 | 7.2 | 6.8 | 9.2 | 12 | 5.7 | 5.1 | 5.1 | 5.8 | 6.2 | 6.4 |
| 18 | 6.2 | 5.0 | 8.0 | 6.6 | 8.1 | 8.1 | 5.8 | 5.1 | 5.3 | 5.8 | 6.0 | 6.0 |
| 19 | 6.0 | 5.1 | 11 | 6.6 | 8.3 | 7.0 | 5.7 | 5.1 | 5.3 | 5.8 | 6.0 | 5.8 |
| 20 | 6.0 | 5.1 | 9.2 | 6.4 | 7.2 | 6.4 | 5.6 | 5.1 | 5.3 | 5.8 | 6.2 | 6.0 |
| 21 | 6.0 | 5.0 | 8.3 | 6.4 | 6.8 | 6.0 | 5.5 | 5.1 | 5.3 | 5.8 | 6.2 | 10 |
| 22 | 6.0 | 5.1 | 7.4 | 6.4 | 6.6 | 5.8 | 5.5 | 5.0 | 5.7 | 5.7 | 6.2 | 7.2 |
| 23 | 6.0 | 5.1 | 7.2 | 6.4 | 6.2 | 5.7 | 5.5 | 5.0 | 5.5 | 5.8 | 6.0 | 6.2 |
| 24 | 6.0 | 5.1 | 6.7 | 6.4 | 6.0 | 5.8 | 5.5 | 5.1 | 5.5 | 5.8 | 5.9 | 5.7 |
| 25 | 5.8 | 5.1 | 33 | 6.2 | 5.8 | 9.5 | 5.5 | 5.1 | 5.5 | 5.8 | 5.8 | 5.5 |
| 26 | 5.8 | 5.1 | 9.2 | 6.2 | 5.7 | 7.4 | 5.5 | 5.1 | 5.5 | 6.4 | 5.8 | 5.5 |
| 27 | 5.7 | 5.1 | 7.6 | 6.2 | 5.5 | 6.6 | 5.5 | 5.3 | 5.5 | 5.8 | 5.8 | 5.5 |
| 28 | 5.5 | 5.5 | 7.2 | 6.2 | 5.3 | 6.0 | 5.3 | 5.3 | 5.5 | 5.8 | 5.8 | 5.5 |
| 29 | 5.5 | 39 | 6.6 | 6.4 | ------ | 5.8 | 5.5 | 5.1 | 5.5 | 5.8 | 5.8 | 5.5 |
| 30 | 5.5 | 16 | 6.2 | 11 | ------ | 5.7 | 5.5 | 5.3 | 5.5 | 5.8 | 5.8 | 5.5 |
| 31 | 5.5 | ------ | 6.0 | 9.2 | ------ | 10 | ------ | 5.3 | ------ | 5.8 | 6.0 | ------ |
| TOTAL | 203.6 | 204.6 | 251.2 | 273.4 | 406.0 | 213.0 | 175.4 | 174.7 | 160.8 | 178.2 | 184.7 | 182.3 |
| MEAN | 6.57 | 6.82 | 8.10 | 8.82 | 14.5 | 6.87 | 5.85 | 5.64 | 5.36 | 5.75 | 5.96 | 6.08 |
| MAX | 12 | 39 | 33 | 34 | 180 | 29 | 9.0 | 12 | 5.7 | 6.4 | 6.6 | 10 |
| MIN | 5.5 | 5.0 | 5.3 | 6.0 | 5.3 | 5.0 | 5.3 | 5.0 | 5.1 | 5.3 | 5.8 | 5.5 |
| AC-FT | 404 | 406 | 498 | 542 | 805 | 422 | 348 | 347 | 319 | 353 | 366 | 362 |

CAL YR 1968: TOTAL 2,860.9 MEAN 7.82 MAX 66 MIN 5.0 AC-FT 5,670
WTR YR 1969: TOTAL 2,607.9 MEAN 7.14 MAX 180 MIN 5.0 AC-FT 5,170

PEAK DISCHARGE (BASE, 140 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1400 | 3.76 | 184 | 1- 3 | 0400 | 3.47 | 158 |
| 12-25 | 0630 | 4.34 | 246 | 2- 1 | 1300 | - | /1,100 |

/ About.
NOTE.--No gage-height record Feb. 1,

## 16-2845. Waihee Stream at Kahaluu

LOCATION.--Lat 21°27'31", long 157°50'26", Oahu, on left bank 20 ft upstream from Ahaolelo Road, 300 ft upstream from mouth, and 0.3 mile southwest of Kahaluu.

DRAINAGE AREA.--2.26 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1958, 1960-63, 1965-66, October 1966 to current year.

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

EXTREMES.--Current year: Maximum discharge, 3,020 cfs Feb. 1 (gage height, 11.70 ft), from rating curve extended above 170 cfs; minimum, 8.8 cfs Oct. 14.
Period of record: Maximum discharge, 3,020 cfs Feb. 1, 1969 (gage height, 11.70 ft), from rating curve extended above 170 cfs; minimum, 7.3 cfs Aug. 31, 1968.

REMARKS.--Records fair except those for period of no gage-height record and those above 300 cfs; which are poor. Diversions above station for irrigation of taro and other crops. Honolulu Board of Water Supply diverts water from tunnel and well in drainage area. Records of chemical analyses and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36 | 10 | 20 | 13 | 669 | 16 | 25 | 11 | 10 | 12 | 11 | 12 |
| 2 | 22 | 11 | 17 | 35 | 64 | 16 | 17 | 24 | 10 | 12 | 11 | 11 |
| 3 | 29 | 10 | 17 | 120 | 34 | 16 | 15 | 16 | 9.8 | 12 | 10 | 12 |
| 4 | 21 | 10 | 19 | 92 | 28 | 16 | 14 | 14 | 10 | 12 | 10 | 12 |
| 5 | 13 | 10 | 17 | 46 | 25 | 16 | 14 | 17 | 10 | 12 | 10 | 11 |
| 6 | 12 | 10 | 15 | 32 | 24 | 14 | 14 | 25 | 9.8 | 12 | 10 | 11 |
| 7 | 10 | 9.6 | 14 | 26 | 22 | 14 | 13 | 18 | 9.8 | 11 | 10 | 11 |
| 8 | 11 | 9.6 | 14 | 35 | 20 | 12 | 12 | 14 | 9.8 | 11 | 10 | 11 |
| 9 | 16 | 9.6 | 13 | 45 | 19 | 12 | 12 | 13 | 9.8 | 11 | 10 | 11 |
| 10 | 13 | 9.6 | 13 | 29 | 17 | 12 | 12 | 13 | 16 | 12 | 11 | 11 |
| 11 | 11 | 9.6 | 13 | 23 | 17 | 13 | 12 | 12 | 13 | 12 | 11 | 11 |
| 12 | 10 | 9.6 | 12 | 20 | 16 | 12 | 12 | 14 | 11 | 11 | 11 | 11 |
| 13 | 10 | 10 | 13 | 18 | 22 | 12 | 12 | 12 | 11 | 11 | 11 | 11 |
| 14 | 9.6 | 27 | 12 | 16 | 55 | 13 | 12 | 12 | 11 | 11 | 10 | 16 |
| 15 | 10 | 13 | 11 | 15 | 60 | 17 | 11 | 12 | 11 | 11 | 12 | 13 |
| 16 | 13 | 11 | 16 | 14 | 48 | 74 | 11 | 12 | 11 | 11 | 11 | 12 |
| 17 | 16 | 11 | 15 | 13 | 31 | 33 | 12 | 11 | 11 | 12 | 11 | 13 |
| 18 | 12 | 10 | 17 | 12 | 27 | 22 | 12 | 11 | 10 | 11 | 10 | 13 |
| 19 | 12 | 12 | 23 | 12 | 26 | 18 | 11 | 11 | 10 | 12 | 10 | 12 |
| 20 | 11 | 11 | 20 | 12 | 24 | 16 | 11 | 11 | 10 | 11 | 11 | 12 |
| 21 | 10 | 11 | 18 | 12 | 23 | 14 | 11 | 11 | 10 | 11 | 11 | 21 |
| 22 | 10 | 11 | 16 | 11 | 22 | 14 | 11 | 11 | 14 | 11 | 10 | 19 |
| 23 | 10 | 11 | 15 | 11 | 21 | 13 | 11 | 11 | 11 | 11 | 11 | 16 |
| 24 | 10 | 11 | 14 | 11 | 21 | 14 | 11 | 11 | 11 | 11 | 11 | 14 |
| 25 | 10 | 11 | 72 | 11 | 21 | 24 | 11 | 12 | 11 | 11 | 11 | 13 |
| 26 | 10 | 11 | 25 | 10 | 21 | 17 | 11 | 11 | 14 | 14 | 11 | 12 |
| 27 | 10 | 11 | 17 | 9.8 | 19 | 15 | 13 | 12 | 12 | 12 | 12 | 12 |
| 28 | 10 | 13 | 15 | 9.8 | 17 | 13 | 12 | 13 | 12 | 11 | 11 | 11 |
| 29 | 10 | 117 | 14 | 13 | ------ | 14 | 13 | 11 | 12 | 11 | 11 | 11 |
| 30 | 10 | 37 | 13 | 25 | ------ | 13 | 13 | 11 | 12 | 11 | 11 | 11 |
| 31 | 10 | ------ | 13 | 16 | ------ | 20 | ------ | 11 | ------ | 11 | 12 | ------ |
| TOTAL | 407.6 | 467.6 | 543 | 767.6 | 1414 | 545 | 381 | 408 | 333.0 | 355 | 333 | 377 |
| MEAN | 13.1 | 15.6 | 17.5 | 24.8 | 50.5 | 17.6 | 12.7 | 13.2 | 11.1 | 11.5 | 10.7 | 12.6 |
| MAX | 36 | 117 | 72 | 120 | 669 | 74 | 25 | 24 | 16 | 14 | 12 | 21 |
| MIN | 9.6 | 9.6 | 11 | 9.8 | 16 | 12 | 11 | 11 | 9.8 | 11 | 10 | 11 |
| AC-FT | 808 | 927 | 1,080 | 1,520 | 2,800 | 1,080 | 756 | 809 | 660 | 704 | 660 | 748 |

CAL YR 1968: TOTAL 6,238.4 MEAN 17.0 MAX 277 MIN 8.0 AC-FT 12,370
WTR YR 1969: TOTAL 6,331.8 MEAN 17.3 MAX 669 MIN 9.6 AC-FT 12,560

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1500 | 5.67 | 531 | 2- 1 | 1300 | 11.70 | 3,020 |
| 1- 4 | 0030 | 5.29 | 469 | 3-16 | 0930 | 4.69 | 351 |

NOTE.--No gage-height record Nov. 30 to Jan. 3.

## 16-2850. Waiahole tunnel at Waianu, near Waiahole

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

PERIOD OF RECORD.--December 1950 to May 1969 (discontinued).

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

EXTREMES.--Period of record: Maximum daily discharge, 114 cfs July 28, 1954; minimum daily, 24.8 cfs Jan. 24-29, 1952.

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

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1968 TO MAY 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 59 | 32 | 36 | 34 | 88 | 43 | 72 | 50 | | | | |
| 2 | 42 | 32 | 34 | 66 | 50 | 43 | 63 | 74 | | | | |
| 3 | 37 | 32 | 36 | 59 | 43 | 44 | 52 | 51 | | | | |
| 4 | 36 | 32 | 66 | 43 | 39 | 44 | 50 | 50 | | | | |
| 5 | 36 | 32 | 37 | 42 | 40 | 45 | 49 | 87 | | | | |
| 6 | 35 | 32 | 34 | 37 | 40 | 44 | 50 | 64 | | | | |
| 7 | 35 | 32 | 33 | 36 | 39 | 43 | 49 | 53 | | | | |
| 8 | 36 | 32 | 33 | 41 | 39 | 43 | 48 | 51 | | | | |
| 9 | 35 | 32 | 32 | 43 | 39 | 45 | 48 | 50 | | | | |
| 10 | 34 | 32 | 32 | 39 | 39 | 43 | 48 | 50 | | | | |
| 11 | 34 | 32 | 32 | 37 | 39 | 43 | 48 | 66 | | | | |
| 12 | 34 | 32 | 34 | 37 | 39 | 43 | 48 | 52 | | | | |
| 13 | 34 | 32 | 55 | 37 | 41 | 43 | 48 | 50 | | | | |
| 14 | 34 | 33 | 41 | 36 | 56 | 43 | 54 | 69 | | | | |
| 15 | 35 | 32 | 50 | 36 | 57 | 44 | 48 | 67 | | | | |
| 16 | 34 | 31 | 49 | 36 | 57 | 60 | 48 | 53 | | | | |
| 17 | 37 | 31 | 38 | 36 | 44 | 58 | 55 | 50 | | | | |
| 18 | 34 | 31 | 37 | 37 | 46 | 63 | 51 | 50 | | | | |
| 19 | 34 | 32 | 49 | 37 | 49 | 52 | 49 | 50 | | | | |
| 20 | 34 | 32 | 37 | 37 | 44 | 48 | 51 | 50 | | | | |
| 21 | 33 | 31 | 38 | 37 | 43 | 48 | 49 | 49 | | | | |
| 22 | 34 | 31 | 37 | 37 | 43 | 47 | 48 | 49 | | | | |
| 23 | 33 | 31 | 38 | 36 | 42 | 47 | 48 | 49 | | | | |
| 24 | 33 | 32 | 36 | 36 | 43 | 60 | 50 | 49 | | | | |
| 25 | 33 | 32 | 60 | 36 | 44 | 68 | 49 | 49 | | | | |
| 26 | 33 | 31 | 38 | 36 | 44 | 51 | 48 | 49 | | | | |
| 27 | 33 | 31 | 36 | 36 | 43 | 48 | 54 | 50 | | | | |
| 28 | 33 | 37 | 35 | 36 | 43 | 47 | 52 | 56 | | | | |
| 29 | 33 | 60 | 35 | 40 | ------ | 50 | 74 | 50 | | | | |
| 30 | 33 | 45 | 35 | 50 | ------ | 47 | 58 | 49 | | | | |
| 31 | 33 | ------ | 34 | 45 | ------ | 74 | ------ | 49 | ------ | | | ------ |
| TOTAL | 1,093 | 999 | 1,217 | 1,231 | 1,273 | 1,521 | 1,559 | 1,685 | | | | |
| MEAN | 35.3 | 33.3 | 39.3 | 39.7 | 45.5 | 49.1 | 52.0 | 54.4 | | | | |
| MAX | 59 | 60 | 66 | 66 | 88 | 74 | 74 | 87 | | | | |
| MIN | 33 | 31 | 32 | 34 | 39 | 43 | 48 | 49 | | | | |
| AC-FT | 2,170 | 1,980 | 2,410 | 2,440 | 2,520 | 3,020 | 3,090 | 3,340 | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 15,595 | MEAN | 42.6 | MAX | 84 | MIN | 31 | AC-FT | 30,930 |
| WTR YR 1969: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |

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

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

PERIOD OF RECORD.--January 1951 to May 1969 (discontinued).

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

EXTREMES.--Period of record: Maximum daily discharge, 99 cfs Nov. 12, 1965; no flow most of time each year.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Station measures releases from Waiahole tunnel to Waiahole Stream.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1968 TO MAY 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31 | 0 | 9.4 | 12 | 58 | 25 | .02 | 0 | | | | |
| 2 | 12 | 0 | 8.2 | 37 | 28 | 25 | .02 | .05 | | | | |
| 3 | 0 | 0 | 24 | 31 | 22 | 26 | .02 | 0 | | | | |
| 4 | 0 | 0 | 62 | 19 | 18 | 26 | 0 | 0 | | | | |
| 5 | 0 | 0 | 33 | 18 | 19 | 27 | 0 | .43 | | | | |
| 6 | 0 | 0 | 31 | 14 | 19 | 26 | 0 | 0 | | | | |
| 7 | 0 | 0 | 30 | 26 | 18 | 25 | 0 | 0 | | | | |
| 8 | .38 | 0 | 30 | 36 | 15 | 25 | 0 | 0 | | | | |
| 9 | 0 | 0 | 29 | 38 | 13 | 27 | 0 | 0 | | | | |
| 10 | 0 | 0 | 8.6 | 35 | 13 | 25 | 0 | 0 | | | | |
| 11 | 0 | 0 | .05 | 34 | 13 | 25 | 0 | 0 | | | | |
| 12 | 0 | 0 | .35 | 34 | 13 | 25 | 7.7 | 0 | | | | |
| 13 | 0 | 0 | 15 | 34 | 15 | 25 | 25 | 0 | | | | |
| 14 | 0 | .18 | 8.0 | 33 | 28 | 25 | 0 | 0 | | | | |
| 15 | .02 | 0 | 15 | 33 | 28 | 26 | 0 | 0 | | | | |
| 16 | 0 | 0 | 15 | 33 | 28 | 30 | 0 | 0 | | | | |
| 17 | .12 | 0 | 15 | 25 | 18 | .20 | 0 | 0 | | | | |
| 18 | 0 | 0 | 14 | 22 | 19 | .08 | 0 | 0 | | | | |
| 19 | 0 | 0 | 25 | 22 | 21 | .05 | 0 | 0 | | | | |
| 20 | 0 | 0 | 16 | 13 | 17 | .05 | 0 | 0 | | | | |
| 21 | 0 | 0 | 15 | 2.0 | 20 | .05 | 0 | 0 | | | | |
| 22 | 0 | 0 | 14 | 14 | 24 | .05 | 0 | 0 | | | | |
| 23 | 0 | 0 | 15 | 15 | 24 | .05 | 0 | 0 | | | | |
| 24 | 0 | 0 | 13 | 15 | 24 | .05 | 0 | 0 | | | | |
| 25 | 0 | 0 | 33 | 15 | 25 | .08 | 0 | 0 | | | | |
| 26 | 0 | 0 | 15 | 15 | 26 | .05 | 0 | 0 | | | | |
| 27 | 0 | 0 | 13 | 15 | 25 | .03 | 0 | 0 | | | | |
| 28 | 0 | 2.2 | 13 | 15 | 25 | .03 | 0 | 0 | | | | |
| 29 | 0 | 24 | 12 | 18 | ------ | .03 | .02 | 0 | | | | |
| 30 | 0 | 17 | 12 | 26 | ------ | .03 | 0 | 0 | | | | |
| 31 | 0 | ------ | 12 | 22 | ------ | .14 | ------ | 0 | ------ | | | ------ |
| TOTAL | 43.52 | 43.38 | 555.60 | 721.0 | 616 | 413.97 | 32.78 | .48 | | | | |
| MEAN | 1.40 | 1.45 | 17.9 | 23.3 | 22.0 | 13.4 | 1.09 | .015 | | | | |
| MAX | 31 | 24 | 62 | 38 | 58 | 30 | 25 | .43 | | | | |
| MIN | 0 | 0 | .05 | 2.0 | 13 | .03 | 0 | 0 | | | | |
| AC-FT | 86 | 86 | 1,100 | 1,430 | 1,220 | 821 | 65 | 1.0 | | | | |

CAL YR 1968: TOTAL 3,353.71 MEAN 9.16 MAX 62 MIN 0 AC-FT 6,650
WTR YR 1969: TOTAL - MEAN - MAX - MIN - AC-FT -

NOTE.--No gage-height record Jan. 2 to Feb. 4.

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

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

PERIOD OF RECORD.--January 1951 to May 1969 (discontinued).

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

EXTREMES.--Period of record: Maximum daily discharge, 125 cfs July 28, 1954; minimum daily, 2.29 cfs Dec. 9, 1956.

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

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1968 TO MAY 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30 | 36 | 28 | 23 | 33 | 18 | 79 | 56 | | | | |
| 2 | 30 | 36 | 28 | 29 | 23 | 18 | 69 | 82 | | | | |
| 3 | 41 | 36 | 13 | 28 | 22 | 18 | 58 | 58 | | | | |
| 4 | 38 | 36 | 6.1 | 24 | 21 | 18 | 56 | 56 | | | | |
| 5 | 37 | 36 | 4.4 | 24 | 21 | 18 | 55 | 95 | | | | |
| 6 | 37 | 36 | 4.0 | 23 | 21 | 18 | 56 | 73 | | | | |
| 7 | 37 | 36 | 3.5 | 10 | 21 | 18 | 55 | 60 | | | | |
| 8 | 37 | 36 | 3.5 | 5.1 | 24 | 18 | 55 | 58 | | | | |
| 9 | 38 | 36 | 3.4 | 4.9 | 26 | 18 | 55 | 57 | | | | |
| 10 | 39 | 36 | 24 | 4.0 | 26 | 18 | 55 | 57 | | | | |
| 11 | 39 | 36 | 33 | 3.6 | 26 | 18 | 54 | 71 | | | | |
| 12 | 38 | 36 | 34 | 3.6 | 26 | 18 | 46 | 58 | | | | |
| 13 | 38 | 36 | 40 | 3.6 | 27 | 18 | 26 | 57 | | | | |
| 14 | 38 | 37 | 33 | 3.6 | 29 | 18 | 59 | 77 | | | | |
| 15 | 39 | 35 | 35 | 3.5 | 30 | 18 | 55 | 74 | | | | |
| 16 | 38 | 35 | 35 | 3.4 | 30 | 35 | 54 | 60 | | | | |
| 17 | 40 | 35 | 23 | 11 | 27 | 61 | 60 | 58 | | | | |
| 18 | 39 | 34 | 23 | 15 | 27 | 66 | 58 | 57 | | | | |
| 19 | 38 | 35 | 25 | 15 | 28 | 58 | 56 | 57 | | | | |
| 20 | 38 | 36 | 23 | 24 | 27 | 54 | 58 | 57 | | | | |
| 21 | 38 | 34 | 23 | 35 | 23 | 54 | 54 | 57 | | | | |
| 22 | 38 | 34 | 23 | 23 | 18 | 53 | 54 | 56 | | | | |
| 23 | 38 | 35 | 23 | 21 | 18 | 52 | 53 | 56 | | | | |
| 24 | 37 | 35 | 23 | 21 | 18 | 63 | 56 | 56 | | | | |
| 25 | 37 | 36 | 27 | 21 | 19 | 75 | 55 | 56 | | | | |
| 26 | 37 | 35 | 23 | 21 | 18 | 57 | 54 | 56 | | | | |
| 27 | 37 | 35 | 23 | 21 | 18 | 55 | 59 | 57 | | | | |
| 28 | 37 | 37 | 23 | 21 | 18 | 54 | 59 | 63 | | | | |
| 29 | 37 | 39 | 23 | 22 | ------ | 55 | 79 | 56 | | | | |
| 30 | 37 | 30 | 23 | 24 | ------ | 54 | 65 | 56 | | | | |
| 31 | 37 | ------ | 23 | 23 | ------ | 81 | ------ | 56 | ------ | | | ------ |
| TOTAL | 1,159 | 1,065 | 678.9 | 514.3 | 665 | 1,197 | 1,707 | 1,903 | | | | |
| MEAN | 37.4 | 35.5 | 21.9 | 16.6 | 23.8 | 38.6 | 56.9 | 61.4 | | | | |
| MAX | 41 | 39 | 40 | 35 | 33 | 81 | 79 | 95 | | | | |
| MIN | 30 | 30 | 3.4 | 3.4 | 18 | 18 | 26 | 56 | | | | |
| AC-FT | 2,300 | 2,110 | 1,350 | 1,020 | 1,320 | 2,370 | 3,390 | 3,770 | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 13,641.2 | MEAN | 37.3 | MAX | 82 | MIN | 2.7 | AC-FT | 27,060 |
| WTR YR 1969; | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |

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

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

PERIOD OF RECORD.--August 1956 to May 1969 (discontinued).

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

EXTREMES.--Period of record: Maximum daily discharge, 151 cfs Oct. 23, 1958; minimum daily, 9.3 cfs Dec. 9, 1956.

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

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1968 TO MAY 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40 | 42 | 35 | 30 | 39 | 28 | 87 | 68 | | | | |
| 2 | 36 | 42 | 35 | 34 | 30 | 28 | 81 | 94 | | | | |
| 3 | 47 | 42 | 23 | 35 | 30 | 28 | 69 | 70 | | | | |
| 4 | 46 | 42 | 16 | 31 | 29 | 28 | 67 | 69 | | | | |
| 5 | 45 | 42 | 14 | 29 | 29 | 28 | 66 | 103 | | | | |
| 6 | 44 | 42 | 13 | 30 | 29 | 28 | 67 | 90 | | | | |
| 7 | 44 | 42 | 13 | 20 | 29 | 29 | 66 | 73 | | | | |
| 8 | 45 | 42 | 12 | 13 | 31 | 29 | 66 | 70 | | | | |
| 9 | 46 | 42 | 12 | 13 | 33 | 29 | 66 | 69 | | | | |
| 10 | 46 | 42 | 28 | 12 | 33 | 29 | 66 | 69 | | | | |
| 11 | 46 | 41 | 38 | 12 | 34 | 29 | 66 | 84 | | | | |
| 12 | 46 | 41 | 40 | 12 | 34 | 29 | 60 | 71 | | | | |
| 13 | 45 | 41 | 46 | 12 | 34 | 29 | 38 | 69 | | | | |
| 14 | 45 | 42 | 40 | 12 | 36 | 29 | 69 | 85 | | | | |
| 15 | 45 | 41 | 41 | 11 | 37 | 30 | 66 | 89 | | | | |
| 16 | 45 | 41 | 42 | 11 | 37 | 42 | 65 | 73 | | | | |
| 17 | 46 | 41 | 32 | 17 | 35 | 68 | 70 | 71 | | | | |
| 18 | 45 | 40 | 31 | 21 | 35 | 72 | 69 | 70 | | | | |
| 19 | 45 | 40 | 33 | 21 | 36 | 64 | 67 | 70 | | | | |
| 20 | 44 | 41 | 31 | 28 | 36 | 62 | 68 | 69 | | | | |
| 21 | 44 | 39 | 31 | 39 | 33 | 62 | 66 | 69 | | | | |
| 22 | 44 | 39 | 31 | 29 | 28 | 61 | 65 | 69 | | | | |
| 23 | 44 | 40 | 30 | 27 | 28 | 61 | 65 | 69 | | | | |
| 24 | 44 | 40 | 30 | 27 | 28 | 69 | 68 | 68 | | | | |
| 25 | 43 | 41 | 34 | 27 | 28 | 84 | 67 | 68 | | | | |
| 26 | 43 | 40 | 31 | 27 | 28 | 66 | 66 | 68 | | | | |
| 27 | 42 | 40 | 30 | 27 | 28 | 64 | 69 | 68 | | | | |
| 28 | 42 | 41 | 30 | 27 | 28 | 63 | 70 | 74 | | | | |
| 29 | 42 | 46 | 30 | 28 | ------ | 64 | 88 | 69 | | | | |
| 30 | 42 | 37 | 30 | 30 | ------ | 63 | 76 | 68 | | | | |
| 31 | 42 | ------ | 30 | 30 | ------ | 88 | ------ | 68 | ------ | | | ------ |
| TOTAL | 1,363 | 1,232 | 912 | 722 | 895 | 1,483 | 2,039 | 2,284 | | | | |
| MEAN | 44.0 | 41.1 | 29.4 | 23.3 | 32.0 | 47.8 | 68.0 | 73.7 | | | | |
| MAX | 47 | 46 | 46 | 39 | 39 | 88 | 88 | 103 | | | | |
| MIN | 36 | 37 | 12 | 11 | 28 | 28 | 38 | 68 | | | | |
| AC-FT | 2,700 | 2,440 | 1,810 | 1,430 | 1,780 | 2,940 | 4,040 | 4,530 | | | | |

CAL YR 1968: TOTAL 16,511 MEAN 45.1 MAX 86 MIN 12 AC-FT 32,750
WTR YR 1969: TOTAL - MEAN - MAX - MIN - AC-FT -

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

LOCATION.--Lat 21°30'00", long 157°51'54", Oahu, on right bank 0.3 mile downstream from Waikeekee Stream, 0.7 mile west of Waikane, and 1.2 miles northwest of Waiahole School.

DRAINAGE AREA.--2.22 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 4,020 cfs Feb. 1 (gage height, 9.04 ft), from rating curve extended as explained below; minimum, 2.2 cfs Nov. 4-9, 11-13.
Period of record: Maximum discharge, 8,800 cfs Feb. 4, 1965 (gage height, 10.76 ft), from rating curve extended above 120 cfs on basis of slope-area measurements at gage heights 4.88, 9.46, and 10.76 ft; minimum, 1.2 cfs Oct. 10, 11, 1962.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Recording rain gage located at station.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23 | 2.4 | 16 | 8.7 | 866 | 8.3 | 35 | 7.0 | 4.9 | 5.5 | 5.5 | 4.0 |
| 2 | 12 | 2.4 | 11 | 124 | 87 | 8.0 | 25 | 21 | 4.9 | 4.7 | 5.5 | 3.6 |
| 3 | 12 | 2.4 | 15 | 197 | 39 | 7.6 | 17 | 8.7 | 4.7 | 4.4 | 4.9 | 3.4 |
| 4 | 8.0 | 2.4 | 53 | 57 | 26 | 7.3 | 12 | 7.0 | 4.7 | 4.2 | 4.9 | 3.4 |
| 5 | 5.8 | 2.2 | 19 | 42 | 19 | 7.0 | 10 | 17 | 4.7 | 4.0 | 4.7 | 3.4 |
| 6 | 4.7 | 2.2 | 13 | 28 | 16 | 7.0 | 9.0 | 18 | 4.4 | 4.2 | 4.4 | 3.2 |
| 7 | 4.2 | 2.2 | 11 | 21 | 14 | 6.7 | 8.5 | 9.1 | 4.7 | 6.1 | 4.4 | 3.4 |
| 8 | 4.7 | 2.2 | 9.1 | 28 | 12 | 6.7 | 8.0 | 7.6 | 4.4 | 5.5 | 4.4 | 3.8 |
| 9 | 4.4 | 2.2 | 8.0 | 31 | 11 | 6.7 | 7.6 | 7.3 | 4.2 | 4.2 | 4.2 | 3.6 |
| 10 | 3.8 | 2.4 | 7.3 | 22 | 9.9 | 6.4 | 7.4 | 7.0 | 10 | 4.4 | 4.4 | 6.4 |
| 11 | 3.8 | 2.4 | 6.7 | 18 | 9.1 | 7.0 | 7.2 | 7.3 | 12 | 4.2 | 4.4 | 4.9 |
| 12 | 3.6 | 2.2 | 7.6 | 14 | 8.7 | 6.1 | 7.2 | 8.7 | 6.7 | 4.0 | 4.0 | 3.8 |
| 13 | 3.6 | 2.4 | 21 | 14 | 15 | 5.8 | 7.0 | 7.0 | 5.5 | 4.2 | 4.0 | 3.6 |
| 14 | 3.4 | 4.2 | 9.5 | 12 | 90 | 5.8 | 8.6 | 26 | 4.9 | 4.7 | 4.0 | 11 |
| 15 | 3.4 | 2.8 | 14 | 11 | 134 | 8.7 | 7.0 | 18 | 4.7 | 4.0 | 4.2 | 5.5 |
| 16 | 3.6 | 2.6 | 28 | 9.9 | 128 | 110 | 6.6 | 11 | 4.4 | 4.2 | 4.0 | 4.0 |
| 17 | 4.4 | 2.6 | 19 | 9.1 | 41 | 44 | 8.0 | 9.1 | 4.4 | 4.2 | 4.0 | 6.5 |
| 18 | 3.6 | 2.6 | 15 | 8.7 | 27 | 24 | 7.4 | 8.0 | 4.2 | 4.4 | 4.4 | 5.5 |
| 19 | 3.4 | 3.0 | 26 | 8.3 | 23 | 18 | 6.4 | 7.6 | 4.2 | 7.0 | 4.4 | 4.0 |
| 20 | 3.2 | 2.8 | 16 | 7.6 | 19 | 14 | 7.0 | 7.0 | 4.2 | 6.1 | 4.4 | 4.9 |
| 21 | 3.0 | 2.6 | 20 | 7.3 | 15 | 12 | 6.0 | 6.7 | 3.8 | 4.9 | 5.2 | 27 |
| 22 | 3.2 | 2.4 | 19 | 7.0 | 13 | 10 | 6.0 | 6.4 | 5.2 | 4.7 | 4.0 | 12 |
| 23 | 3.2 | 2.4 | 19 | 6.7 | 11 | 9.5 | 5.8 | 6.1 | 4.0 | 4.9 | 4.0 | 6.7 |
| 24 | 3.0 | 2.4 | 14 | 6.4 | 11 | 14 | 9.2 | 6.1 | 3.8 | 5.5 | 4.0 | 5.8 |
| 25 | 2.8 | 3.0 | 66 | 6.4 | 12 | 29 | 6.4 | 5.8 | 3.8 | 5.8 | 3.6 | 4.9 |
| 26 | 2.8 | 2.6 | 25 | 6.1 | 13 | 11 | 5.8 | 5.5 | 4.7 | 23 | 3.8 | 4.7 |
| 27 | 2.8 | 2.4 | 19 | 5.8 | 10 | 9.4 | 6.4 | 5.5 | 4.7 | 11 | 4.4 | 4.2 |
| 28 | 2.8 | 7.5 | 16 | 5.5 | 8.7 | 8.8 | 6.4 | 7.3 | 4.4 | 19 | 3.6 | 4.2 |
| 29 | 2.6 | 103 | 12 | 6.7 | ------ | 8.6 | 11 | 5.5 | 4.2 | 6.7 | 3.6 | 4.0 |
| 30 | 2.6 | 62 | 11 | 29 | ------ | 8.2 | 9.5 | 5.2 | 4.4 | 6.1 | 4.2 | 4.0 |
| 31 | 2.6 | ------ | 9.5 | 20 | ------ | 60 | ------ | 4.9 | ------ | 5.8 | 5.2 | ------ |
| TOTAL | 150.0 | 240.9 | 555.7 | 778.2 | 1,688.4 | 495.6 | 284.4 | 284.4 | 149.8 | 191.6 | 134.7 | 169.4 |
| MEAN | 4.84 | 8.03 | 17.9 | 25.1 | 60.3 | 16.0 | 9.48 | 9.17 | 4.99 | 6.18 | 4.35 | 5.65 |
| MAX | 23 | 103 | 66 | 197 | 866 | 110 | 35 | 26 | 12 | 23 | 5.5 | 27 |
| MIN | 2.6 | 2.2 | 6.7 | 5.5 | 8.7 | 5.8 | 5.8 | 4.9 | 3.8 | 4.0 | 3.6 | 3.2 |
| AC-FT | 298 | 478 | 1,100 | 1,540 | 3,350 | 983 | 564 | 564 | 297 | 380 | 267 | 336 |

CAL YR 1968: 3,298.8 MEAN 9.01 MAX 179 MIN 2.2 AC-FT 6,540
WTR YR 1969: 5,123.1 MEAN 14.0 MAX 866 MIN 2.2 AC-FT 10,160

PEAK DISCHARGE (BASE, 700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-2 | 2400 | 5.54 | 1,030 | 3-31 | 1530 | /5.01 | 774 |
| 2-1 | 1200 | 9.04 | 4,020 | | | | |

/ From floodmark in well.
NOTE.--No gage-height record Mar. 26 to Apr. 25.

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

LOCATION.--Lat 21°32'38", long 157°53'07", Oahu, on right bank 600 ft upstream from Kawa Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 4,650 cfs Feb. 1 (gage height, 7.54 ft), from rating curve extended as explained below; minimum, 13 cfs several days in November.
Period of record: Maximum discharge, 5,430 cfs Apr. 15, 1963 (gage height, 8.10 ft), from rating curve extended above 530 cfs on basis of computation of peak flow over submerged weir; minimum, 10 cfs Sept. 17, 18, 20, 1961.

REMARKS.--Records fair. Approximately 9 cfs is diverted by Waiahole Water Co. at 800-ft elevation, 2.3 miles above station. Recording rain gage located at station.

REVISIONS (FISCAL YEARS).--WSP 1937: 1959-60.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 14 | 43 | 26 | 1,330 | 34 | 109 | 35 | 41 | 26 | 25 | 26 |
| 2 | 70 | 14 | 32 | 267 | 272 | 33 | 70 | 122 | 25 | 22 | 24 | 23 |
| 3 | 50 | 14 | 32 | 417 | 97 | 39 | 46 | 39 | 23 | 25 | 23 | 22 |
| 4 | 40 | 14 | 59 | 111 | 61 | 35 | 39 | 35 | 23 | 23 | 22 | 21 |
| 5 | 30 | 14 | 34 | 85 | 72 | 44 | 37 | 503 | 22 | 21 | 22 | 21 |
| 6 | 25 | 13 | 29 | 51 | 73 | 40 | 36 | 168 | 21 | 26 | 21 | 21 |
| 7 | 20 | 13 | 28 | 42 | 46 | 35 | 31 | 61 | 21 | 36 | 22 | 24 |
| 8 | 22 | 13 | 25 | 79 | 39 | 34 | 29 | 46 | 21 | 29 | 21 | 27 |
| 9 | 22 | 13 | 24 | 89 | 36 | 44 | 29 | 40 | 20 | 23 | 21 | 23 |
| 10 | 20 | 14 | 23 | 47 | 34 | 34 | 28 | 36 | 41 | 27 | 21 | 123 |
| 11 | 18 | 14 | 22 | 38 | 33 | 32 | 28 | 124 | 45 | 23 | 24 | 35 |
| 12 | 17 | 13 | 22 | 36 | 30 | 30 | 27 | 50 | 25 | 22 | 20 | 27 |
| 13 | 16 | 15 | 59 | 33 | 50 | 29 | 26 | 36 | 23 | 23 | 20 | 25 |
| 14 | 15 | 18 | 48 | 31 | 212 | 30 | 37 | 36 | 22 | 25 | 20 | 113 |
| 15 | 17 | 14 | 162 | 29 | 322 | 43 | 26 | 47 | 21 | 21 | 30 | 36 |
| 16 | 17 | 14 | 101 | 28 | 318 | 363 | 25 | 35 | 21 | 25 | 29 | 29 |
| 17 | 20 | 14 | 49 | 27 | 108 | 128 | 35 | 31 | 21 | 25 | 27 | 80 |
| 18 | 19 | 13 | 44 | 25 | 125 | 103 | 30 | 29 | 20 | 32 | 25 | 37 |
| 19 | 17 | 15 | 90 | 25 | 227 | 59 | 27 | 28 | 20 | 56 | 25 | 28 |
| 20 | 16 | 15 | 47 | 25 | 92 | 46 | 29 | 28 | 20 | 38 | 25 | 41 |
| 21 | 16 | 14 | 46 | 24 | 63 | 40 | 25 | 27 | 20 | 28 | 31 | 292 |
| 22 | 16 | 13 | 39 | 23 | 51 | 37 | 25 | 26 | 23 | 27 | 24 | 69 |
| 23 | 17 | 15 | 48 | 23 | 46 | 34 | 24 | 25 | 20 | 28 | 25 | 41 |
| 24 | 15 | 15 | 36 | 22 | 44 | 48 | 45 | 25 | 24 | 42 | 23 | 37 |
| 25 | 15 | 17 | 162 | 21 | 45 | 80 | 32 | 25 | 21 | 101 | 23 | 32 |
| 26 | 14 | 16 | 53 | 20 | 45 | 41 | 27 | 24 | 23 | 76 | 25 | 28 |
| 27 | 14 | 14 | 41 | 20 | 38 | 36 | 53 | 25 | 24 | 37 | 32 | 27 |
| 28 | 14 | 15 | 39 | 20 | 35 | 34 | 55 | 41 | 23 | 68 | 24 | 26 |
| 29 | 14 | 319 | 33 | 38 | ------ | 34 | 88 | 25 | 23 | 29 | 23 | 25 |
| 30 | 15 | 164 | 30 | 171 | ------ | 32 | 46 | 23 | 23 | 28 | 24 | 25 |
| 31 | 14 | ------ | 28 | 103 | ------ | 146 | ------ | 39 | ------ | 28 | 42 | ------ |
| TOTAL | 725 | 883 | 1,528 | 1,996 | 3,944 | 1,797 | 1,164 | 1,834 | 720 | 1,040 | 763 | 1,384 |
| MEAN | 23.4 | 29.4 | 49.3 | 64.4 | 141 | 58.0 | 38.8 | 59.2 | 24.0 | 33.5 | 24.6 | 46.1 |
| MAX | 90 | 319 | 162 | 417 | 1,330 | 363 | 109 | 503 | 45 | 101 | 42 | 292 |
| MIN | 14 | 13 | 22 | 20 | 30 | 29 | 24 | 23 | 20 | 21 | 20 | 21 |
| AC-FT | 1,440 | 1,750 | 3,030 | 3,960 | 7,820 | 3,560 | 2,310 | 3,640 | 1,430 | 2,060 | 1,510 | 2,750 |

CAL YR 1968: TOTAL 12,676 MEAN 34.6 MAX 407 MIN 13 AC-FT 25,140
WTR YR 1969: TOTAL 17,778 MEAN 48.7 MAX 1,330 MIN 13 AC-FT 35,260

PEAK DISCHARGE (BASE, 1,600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1- 3 | 0100 | 6.08 | 2,830 | 5- 5 | 1100 | 4.82 | 1,630 |
| 2- 1 | 1200 | 7.54 | 4,650 | | | | |

## 16-3020. Punaluu ditch near Punaluu

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

PERIOD OF RECORD.--May 1953 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 54 cfs Oct. 31, 1964; no flow for several days in 1963, 1966, 1969.

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

REVISIONS (FISCAL YEARS).--WSP 1719: 1954-55.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14 | 14 | 14 | 2.0 | 6.2 | .06 | 7.5 | 12 | 13 | 5.8 | 5.8 | 17 |
| 2 | 10 | 14 | 8.3 | 1.3 | .19 | .02 | 8.0 | 11 | 13 | 5.8 | 6.0 | 17 |
| 3 | .08 | 14 | 3.7 | .69 | .11 | .06 | 7.9 | 11 | 13 | 6.0 | 5.9 | 17 |
| 4 | .06 | 14 | 3.9 | .10 | .08 | .07 | 7.6 | 11 | 13 | 6.0 | 6.0 | 17 |
| 5 | .08 | 13 | 3.7 | 0 | .07 | .09 | 7.5 | 10 | 13 | 6.2 | 6.5 | 17 |
| 6 | 13 | 13 | 3.7 | 0 | .06 | .09 | 7.5 | 10 | 15 | 5.8 | 8.3 | 16 |
| 7 | 13 | 13 | 3.6 | 0 | .06 | 2.2 | 7.3 | 11 | 15 | 5.0 | 11 | 17 |
| 8 | 13 | 13 | 3.5 | 0 | .06 | 3.2 | 7.3 | 11 | 15 | 5.8 | 11 | 17 |
| 9 | 12 | 13 | 3.4 | 0 | .05 | 3.1 | 7.4 | 11 | 16 | 5.8 | 11 | 17 |
| 10 | 6.0 | 12 | 3.4 | 0 | .06 | 3.2 | 7.4 | 11 | 16 | 5.8 | 13 | 20 |
| 11 | 8.0 | 11 | 3.4 | 0 | .11 | 3.2 | 7.4 | 11 | 13 | 5.8 | 14 | 18 |
| 12 | 8.0 | 11 | 3.4 | 0 | .11 | 1.7 | 7.4 | 10 | 12 | 5.8 | 15 | 17 |
| 13 | 8.0 | 11 | 3.6 | 0 | .14 | .72 | 7.0 | 11 | 11 | 5.8 | 15 | 13 |
| 14 | 9.0 | 7.2 | 3.6 | .01 | .14 | .69 | 6.3 | 11 | 8.0 | 5.8 | 15 | 11 |
| 15 | 5.5 | 4.1 | 3.2 | .01 | .22 | .57 | 11 | 11 | 8.0 | 5.8 | 15 | 18 |
| 16 | 5.4 | 3.9 | 3.4 | .01 | .23 | .17 | 12 | 11 | 8.0 | 5.7 | 16 | 18 |
| 17 | 5.9 | 7.5 | 3.3 | .01 | .15 | 0 | 11 | 11 | 8.0 | 5.7 | 16 | 19 |
| 18 | 6.0 | 12 | 3.2 | .01 | .23 | .04 | 11 | 12 | 8.0 | 5.7 | 16 | 18 |
| 19 | 10 | 12 | 3.2 | 0 | .23 | .05 | 11 | 13 | 8.0 | 5.6 | 16 | 17 |
| 20 | 13 | 12 | 2.8 | 0 | .26 | 3.5 | 11 | 13 | 7.2 | 5.5 | 16 | 18 |
| 21 | 13 | 12 | 2.8 | 0 | .08 | 7.9 | 11 | 13 | 7.0 | 5.5 | 17 | 22 |
| 22 | 13 | 12 | 2.6 | 0 | .06 | 7.5 | 10 | 14 | 7.0 | 5.5 | 15 | 17 |
| 23 | 13 | 12 | 2.6 | 1.2 | .04 | 7.3 | 10 | 13 | 7.0 | 5.6 | 15 | 16 |
| 24 | 13 | 12 | 2.6 | 2.7 | .02 | 7.5 | 9.9 | 13 | 6.0 | 5.5 | 16 | 15 |
| 25 | 12 | 13 | 2.6 | 3.5 | .06 | 8.2 | 9.5 | 13 | 5.8 | 5.4 | 16 | 14 |
| 26 | 12 | 13 | 2.4 | 1.9 | .11 | 7.7 | 11 | 15 | 5.8 | 5.3 | 16 | 15 |
| 27 | 12 | 12 | 2.3 | 1.6 | .12 | 7.6 | 11 | 14 | 5.8 | 5.5 | 15 | 17 |
| 28 | 12 | 12 | 2.0 | 1.7 | .13 | 7.4 | 10 | 13 | 5.8 | 5.5 | 15 | 17 |
| 29 | 12 | 14 | 1.8 | 1.8 | ------ | 7.3 | 11 | 14 | 5.8 | 5.5 | 15 | 17 |
| 30 | 12 | 13 | 1.9 | 1.8 | ------ | 7.3 | 10 | 14 | 5.8 | 5.6 | 16 | 18 |
| 31 | 13 | ------ | 1.9 | 1.4 | ------ | 7.4 | ------ | 13 | ------ | 5.7 | 17 | ------ |
| TOTAL | 297.02 | 349.7 | 109.8 | 21.74 | 9.38 | 105.83 | 273.9 | 372 | 295.0 | 175.8 | 411.5 | 507 |
| MEAN | 9.58 | 11.7 | 3.54 | .70 | .34 | 3.41 | 9.13 | 12.0 | 9.83 | 5.67 | 13.3 | 16.9 |
| MAX | 14 | 14 | 14 | 3.5 | 6.2 | 8.2 | 12 | 15 | 16 | 6.2 | 17 | 22 |
| MIN | .06 | 3.9 | 1.8 | 0 | .02 | 0 | 6.3 | 10 | 5.8 | 5.0 | 5.8 | 11 |
| AC-FT | 589 | 694 | 218 | 43 | 19 | 210 | 543 | 738 | 585 | 349 | 816 | 1,010 |

CAL YR 1968 TOTAL 4,001.39 MEAN 10.9 MAX 24 MIN .03 AC-FT 7,940
WTR YR 1969 TOTAL 2,928.67 MEAN 8.02 MAX 22 MIN 0 AC-FT 5,810

NOTE.--No gage-height record June 14 to July 15.

## 16-3030. Punaluu Stream near Punaluu

LOCATION.--Lat 21°33'33", long 157°54'06", Oahu, on left bank at Punaluu ditch diversion dam, 1.4 miles west of Kahana, and 1.8 miles southwest of Punaluu.

DRAINAGE AREA.--2.78 sq mi.

PERIOD OF RECORD.--May 1953 to current year.

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

EXTREMES.--Current year: Maximum discharge, 3,180 cfs Feb. 1 (gage height, 6.33 ft), from rating curve extended as explained below; minimum, 1.1 cfs Nov. 7.
Period of record: Maximum discharge, 3,180 cfs Feb. 1, 1969 (gage height, 6.33 ft), from rating curve extended above 170 cfs on basis of slope-area measurement at gage height 5.77 ft; no flow at times.

REMARKS.--Records fair. Records do not include flow of Punaluu ditch (see sta 16-3020). Recording rain gage located at station.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1956(P), 1957(M), 1959(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20 | 1.4 | 17 | 20 | 648 | 25 | 57 | 13 | 10 | 8.2 | 7.2 | 4.1 |
| 2 | 9.9 | 1.5 | 14 | 168 | 102 | 25 | 42 | 31 | 8.2 | 8.2 | 7.2 | 3.7 |
| 3 | 11 | 1.4 | 20 | 196 | 56 | 30 | 32 | 15 | 8.6 | 8.2 | 6.3 | 3.4 |
| 4 | 14 | 1.4 | 35 | 71 | 41 | 25 | 29 | 15 | 9.1 | 7.6 | 6.0 | 3.4 |
| 5 | 7.9 | 1.4 | 20 | 58 | 42 | 33 | 28 | 49 | 9.1 | 8.0 | 5.7 | 3.4 |
| 6 | 3.8 | 1.2 | 18 | 43 | 37 | 30 | 28 | 34 | 9.1 | 9.0 | 5.7 | 3.4 |
| 7 | 3.4 | 1.2 | 17 | 37 | 32 | 25 | 23 | 23 | 8.6 | 10 | 5.7 | 3.7 |
| 8 | 3.6 | 1.3 | 17 | 51 | 30 | 25 | 23 | 19 | 7.7 | 7.6 | 5.3 | 3.7 |
| 9 | 6.3 | 1.4 | 16 | 52 | 29 | 30 | 22 | 19 | 7.7 | 8.2 | 5.3 | 3.4 |
| 10 | 11 | 1.8 | 15 | 37 | 28 | 25 | 22 | 16 | 13 | 7.6 | 5.3 | 14 |
| 11 | 11 | 1.6 | 14 | 32 | 27 | 24 | 21 | 32 | 14 | 7.0 | 5.7 | 5.7 |
| 12 | 11 | 1.6 | 15 | 29 | 25 | 22 | 20 | 23 | 9.1 | 7.0 | 4.7 | 5.0 |
| 13 | 11 | 2.2 | 24 | 27 | 43 | 22 | 20 | 17 | 8.6 | 7.0 | 4.7 | 7.4 |
| 14 | 10 | 11 | 25 | 25 | 135 | 39 | 23 | 19 | 11 | 7.0 | 4.4 | 34 |
| 15 | 12 | 9.9 | 46 | 24 | 162 | 50 | 15 | 19 | 7.7 | 6.9 | 5.7 | 5.3 |
| 16 | 11 | 7.5 | 36 | 23 | 140 | 150 | 12 | 15 | 7.2 | 7.2 | 7.2 | 5.3 |
| 17 | 16 | 6.3 | 29 | 23 | 66 | 70 | 15 | 12 | 7.2 | 7.2 | 6.0 | 9.0 |
| 18 | 14 | 3.0 | 27 | 22 | 65 | 90 | 14 | 11 | 7.7 | 7.2 | 4.7 | 6.3 |
| 19 | 7.8 | 5.0 | 57 | 21 | 88 | 46 | 14 | 10 | 7.7 | 10 | 4.7 | 5.3 |
| 20 | 3.0 | 4.8 | 32 | 21 | 56 | 35 | 15 | 10 | 8.2 | 8.2 | 5.0 | 6.0 |
| 21 | 3.0 | 4.6 | 31 | 20 | 48 | 27 | 12 | 10 | 7.7 | 6.3 | 5.3 | 59 |
| 22 | 3.2 | 4.8 | 28 | 19 | 42 | 24 | 12 | 10 | 8.2 | 6.8 | 4.4 | 17 |
| 23 | 3.2 | 3.8 | 29 | 19 | 35 | 23 | 13 | 10 | 7.2 | 6.0 | 4.1 | 10 |
| 24 | 3.0 | 2.2 | 26 | 18 | 35 | 31 | 16 | 10 | 14 | 13 | 4.1 | 9.1 |
| 25 | 3.0 | 2.4 | 70 | 18 | 35 | 65 | 15 | 10 | 9.1 | 23 | 4.1 | 7.2 |
| 26 | 3.0 | 2.6 | 35 | 18 | 35 | 36 | 13 | 10 | 9.6 | 25 | 4.4 | 6.3 |
| 27 | 2.8 | 1.8 | 29 | 18 | 30 | 29 | 24 | 10 | 9.1 | 11 | 5.8 | 6.0 |
| 28 | 2.8 | 2.6 | 27 | 18 | 25 | 26 | 23 | 10 | 8.6 | 8.2 | 4.1 | 5.7 |
| 29 | 2.8 | 61 | 24 | 29 | ------ | 25 | 26 | 9.6 | 8.2 | 7.2 | 4.1 | 5.3 |
| 30 | 2.8 | 42 | 22 | 41 | ------ | 24 | 20 | 8.6 | 8.6 | 7.2 | 4.1 | 5.7 |
| 31 | 2.0 | ------ | 20 | 48 | ------ | 56 | ------ | 9.6 | ------ | 7.2 | 4.7 | ------ |
| TOTAL | 229.3 | 194.7 | 835 | 1,246 | 2,137 | 1,187 | 649 | 509.8 | 269.8 | 278.2 | 161.7 | 266.8 |
| MEAN | 7.40 | 6.49 | 26.9 | 40.2 | 76.3 | 38.3 | 21.6 | 16.4 | 8.99 | 8.97 | 5.22 | 8.89 |
| MAX | 20 | 61 | 70 | 196 | 648 | 150 | 57 | 49 | 14 | 25 | 7.2 | 59 |
| MIN | 2.0 | 1.2 | 14 | 18 | 25 | 22 | 12 | 8.6 | 7.2 | 6.0 | 4.1 | 3.4 |
| AC-FT | 455 | 386 | 1,660 | 2,470 | 4,240 | 2,350 | 1,290 | 1,010 | 535 | 552 | 321 | 529 |

CAL YR 1968: TOTAL 6,193.1 MEAN 16.9 MAX 206 MIN 1.2 AC-FT 12,280
WTR YR 1969: TOTAL 7,964.3 MEAN 21.8 MAX 648 MIN 1.2 AC-FT 15,800

PEAK DISCHARGE (BASE, 930 CFS).--Jan. 2 (2330) 2,210 cfs (5.00 ft); Feb. 1 (1230) 3,180 cfs (6.33 ft).

## 16-3042. Kaluanui Stream near Punaluu

LOCATION.--Lat 21°35'22", long 157°54'38", Oahu, on right bank 0.8 mile downstream from Sacred Falls, 1.6 miles west of Punaluu Beach Park, and 1.7 miles south of cemetery in Hauula.

DRAINAGE AREA.--1.11 sq mi.

PERIOD OF RECORD.--April 1967 to current year.

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

EXTREMES.--Current year: Maximum discharge, 2,010 cfs Feb. 1 (gage height, 10.0 ft), from rating curve extended as explained below; minimum, not determined; minimum daily, 0.05 cfs Nov. 10.
Period of record: Maximum discharge, 2,010 cfs Feb. 1, 1969 (gage height, 10.0 ft), from rating curve extended above 14 cfs on basis of slope-area measurements at gage heights 8.85 and 10.0 ft; minimum, not determined; minimum daily, 0.05 cfs Nov. 10, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26 | .22 | 6.1 | .81 | 230 | 2.3 | 15 | 2.4 | 1.4 | 3.6 | 1.7 | 4.1 |
| 2 | 5.8 | .20 | 2.6 | 78 | 19 | 1.8 | 6.3 | 12 | .81 | 1.4 | 1.7 | 1.3 |
| 3 | 1.6 | .23 | 15 | 52 | 4.9 | 6.5 | 3.7 | 2.3 | .59 | 2.0 | 1.8 | .85 |
| 4 | 1.0 | .22 | 24 | 13 | 2.5 | 2.8 | 2.3 | 2.5 | .56 | 2.3 | 1.7 | 1.7 |
| 5 | .73 | .19 | 4.1 | 11 | 5.0 | 2.5 | 3.7 | 5.0 | .66 | 1.2 | 1.3 | 1.4 |
| 6 | .63 | .15 | 2.8 | 3.2 | 5.7 | 2.6 | 4.2 | 5.7 | .48 | 2.8 | 1.2 | .94 |
| 7 | .54 | .12 | 2.3 | 2.2 | 2.0 | 1.8 | 1.8 | 2.4 | .37 | 7.5 | 3.0 | 3.9 |
| 8 | .54 | .10 | 3.6 | 16 | 1.6 | 2.2 | 1.5 | 1.7 | .35 | 4.0 | 1.6 | .99 |
| 9 | .95 | .07 | 2.3 | 8.4 | 1.3 | 1.8 | 1.4 | 1.5 | .27 | 1.7 | 1.0 | .85 |
| 10 | .57 | .05 | 1.4 | 2.7 | 1.1 | 1.4 | 1.9 | 1.8 | 17 | 3.1 | .94 | 11 |
| 11 | .51 | .08 | 1.1 | 1.8 | 1.3 | 1.1 | 1.6 | 6.0 | 7.2 | 2.1 | 2.2 | 2.5 |
| 12 | .42 | .25 | 3.3 | 1.2 | .94 | 1.1 | 1.8 | 5.8 | 1.3 | 2.2 | 1.1 | 1.3 |
| 13 | .40 | .19 | 12 | 1.0 | 28 | .94 | 1.3 | 3.4 | .85 | 3.9 | .73 | 1.1 |
| 14 | .38 | 7.5 | 8.4 | 1.0 | 68 | 2.3 | 6.4 | 8.7 | .66 | 3.7 | .89 | 19 |
| 15 | .36 | .63 | 4.0 | .81 | 61 | 10 | 1.8 | 6.3 | .53 | 2.1 | 5.4 | 2.3 |
| 16 | .40 | .32 | 5.4 | .81 | 26 | 46 | 1.3 | 2.5 | .48 | 3.2 | 2.9 | 1.4 |
| 17 | 2.5 | .27 | 5.2 | .63 | 5.4 | 7.9 | 5.0 | 1.7 | .42 | 3.1 | 4.0 | 6.5 |
| 18 | 1.5 | .40 | 7.7 | .54 | 13 | 18 | 3.3 | 1.4 | .35 | 4.0 | 2.0 | 2.8 |
| 19 | 1.1 | 3.0 | 18 | .51 | 15 | 4.9 | 2.5 | 1.2 | .33 | 11 | 2.4 | 1.5 |
| 20 | 1.0 | 2.1 | 3.9 | .44 | 7.2 | 2.5 | 4.0 | 1.0 | .40 | 6.2 | 2.1 | 5.5 |
| 21 | .69 | .51 | 11 | .40 | 4.6 | 2.2 | 1.7 | .99 | .37 | 2.6 | 2.8 | 35 |
| 22 | .57 | .36 | 4.7 | .36 | 3.2 | 1.8 | 1.2 | .94 | 3.2 | 3.5 | 1.2 | 5.7 |
| 23 | .54 | 2.7 | 6.4 | .38 | 2.5 | 1.5 | 1.0 | .81 | .81 | 2.5 | .99 | 2.4 |
| 24 | .40 | 2.0 | 2.6 | .36 | 2.6 | 23 | 1.1 | .77 | .45 | 5.6 | 1.3 | 4.1 |
| 25 | .32 | 3.7 | 37 | .30 | 4.8 | 32 | 1.0 | 1.8 | 1.7 | 9.4 | .94 | 2.1 |
| 26 | .27 | 1.7 | 4.3 | .27 | 4.8 | 4.1 | .81 | 1.4 | 2.5 | 13 | 3.0 | 1.6 |
| 27 | .25 | .63 | 2.6 | .25 | 2.0 | 2.6 | 10 | 2.2 | 1.8 | 3.2 | 7.4 | 1.3 |
| 28 | .23 | .80 | 2.2 | .23 | 1.6 | 2.2 | 9.4 | 2.0 | 2.4 | 2.3 | 1.8 | 1.4 |
| 29 | .23 | 67 | 1.7 | 2.5 | ------ | 2.5 | 10 | 2.7 | 1.5 | 1.8 | 1.8 | 1.4 |
| 30 | .22 | 19 | 1.2 | 7.1 | ------ | 4.1 | 4.0 | .99 | 4.4 | 1.7 | 2.4 | 2.1 |
| 31 | .25 | ------ | .95 | 5.9 | ------ | 23 | ------ | .70 | ------ | 2.8 | 3.0 | ------ |
| TOTAL | 50.90 | 114.69 | 207.85 | 214.10 | 525.04 | 219.44 | 111.01 | 90.60 | 54.14 | 119.5 | 66.29 | 128.03 |
| MEAN | 1.64 | 3.82 | 6.70 | 6.91 | 18.8 | 7.08 | 3.70 | 2.92 | 1.80 | 3.85 | 2.14 | 4.27 |
| MAX | 26 | 67 | 37 | 78 | 230 | 46 | 15 | 12 | 17 | 13 | 7.4 | 35 |
| MIN | .22 | .05 | .95 | .23 | .94 | .94 | .81 | .70 | .27 | 1.2 | .73 | .85 |
| AC-FT | 101 | 227 | 412 | 425 | 1040 | 435 | 220 | 180 | 107 | 237 | 131 | 254 |

CAL YR 1968: TOTAL 1,422.03 MEAN 3.89 MAX 97 MIN .05 AC-FT 2,820
WTR YR 1969: TOTAL 1,901.59 MEAN 5.21 MAX 230 MIN .05 AC-FT 3,770

PEAK DISCHARGE (BASE, 500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1- 2 | 1200 | 9.14 | 1,130 | 2- 1 | 1000 | 10.0 | 2,010 |
| 1- 2 | 2400 | 9.02 | 1,040 | | | | |

## 16-3089.9. Malaekahana Stream near Laie

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

DRAINAGE AREA.--0.64 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 335 cfs Feb. 1 (gage height, 4.94 ft), from rating curve extended as explained below; no flow Oct. 30 to Nov. 12.
Period of record: Maximum discharge, 500 cfs Jan. 6, 1964 (gage height, 5.54 ft), from rating curve extended above 6.6 cfs on basis of slope-area measurement at gage height 4.89 ft; no flow at times most years.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 22 | 0 | 3.0 | .59 | 68 | .63 | 6.2 | .54 | .19 | .91 | .11 | .91 |
| 2 | 2.6 | 0 | 7.7 | 33 | 8.1 | .67 | 3.0 | 5.4 | .15 | .29 | .35 | .25 |
| 3 | 3.5 | 0 | 8.6 | 47 | 2.6 | 2.0 | 1.0 | .63 | .13 | .21 | .35 | .11 |
| 4 | 1.0 | 0 | 8.1 | 11 | 1.2 | .85 | .67 | .41 | .10 | .32 | .19 | .09 |
| 5 | .32 | 0 | 1.8 | 8.1 | .85 | .77 | .63 | .76 | .10 | .19 | .15 | .10 |
| 6 | .19 | 0 | .97 | 2.9 | .80 | .85 | .51 | 1.0 | .08 | .29 | .13 | .09 |
| 7 | .13 | 0 | .71 | 2.1 | .71 | .55 | .47 | .51 | .08 | 1.7 | .13 | .11 |
| 8 | .10 | 0 | .67 | 9.5 | .63 | .44 | .44 | .35 | .07 | 1.2 | .13 | .21 |
| 9 | .09 | 0 | .97 | 6.1 | .55 | .41 | .41 | .27 | .06 | .32 | .13 | .09 |
| 10 | .08 | 0 | .67 | 2.3 | .51 | .55 | .41 | .25 | 1.3 | .25 | .09 | 4.5 |
| 11 | .07 | 0 | .51 | 1.5 | .47 | .41 | .41 | .23 | 1.1 | .32 | 1.4 | .97 |
| 12 | .07 | 0 | .47 | 1.1 | .44 | .35 | .38 | .94 | .29 | .17 | .23 | .27 |
| 13 | .06 | .01 | 3.2 | 1.6 | 7.8 | .35 | .35 | .41 | .13 | .11 | .13 | .10 |
| 14 | .05 | 7.4 | 1.5 | 1.4 | 47 | .99 | .91 | 2.2 | .09 | .88 | .09 | .60 |
| 15 | .04 | .51 | .97 | .85 | 34 | 5.3 | .51 | 1.2 | .07 | .44 | .67 | .25 |
| 16 | .10 | .19 | 1.6 | .75 | 11 | 36 | .32 | .80 | .06 | 1.2 | .47 | .10 |
| 17 | 1.7 | .10 | 2.2 | .59 | 2.2 | 4.4 | 1.2 | .29 | .05 | .51 | .60 | .08 |
| 18 | 1.3 | .06 | 5.3 | .47 | 3.3 | 3.6 | .47 | .23 | .05 | .21 | .41 | .50 |
| 19 | .91 | .90 | 16 | .47 | 6.3 | 1.6 | .47 | .19 | .05 | 3.7 | .17 | .70 |
| 20 | .44 | 1.3 | 2.9 | .44 | 3.4 | .80 | .63 | .17 | .05 | 3.0 | .10 | .70 |
| 21 | .29 | .38 | 6.3 | .41 | 2.2 | .67 | .47 | .15 | .05 | .47 | .30 | 7.0 |
| 22 | .15 | .17 | 3.4 | .41 | 1.2 | .59 | .27 | .15 | 1.5 | .51 | .25 | 1.5 |
| 23 | .10 | .19 | 2.0 | .41 | .91 | .51 | .23 | .15 | .32 | .71 | .11 | .35 |
| 24 | .08 | 2.4 | 3.6 | .38 | 1.1 | 8.5 | .25 | .13 | .15 | 2.2 | .08 | .33 |
| 25 | .06 | 1.6 | 30 | .35 | 1.2 | 12 | .23 | .11 | .13 | 3.9 | .06 | .30 |
| 26 | .05 | .63 | 3.3 | .35 | 1.4 | 1.6 | .21 | .11 | .98 | 3.0 | .07 | .18 |
| 27 | .04 | .32 | 1.5 | .32 | .85 | .85 | 1.7 | .10 | .47 | .75 | 4.6 | .16 |
| 28 | .03 | .17 | 1.1 | .29 | .63 | .80 | 1.2 | .11 | .35 | .30 | .44 | .16 |
| 29 | .01 | 20 | .80 | .59 | ------ | .97 | 1.0 | .10 | .27 | .21 | .13 | .18 |
| 30 | 0 | 27 | .71 | 8.2 | ------ | 1.1 | 1.8 | .10 | .67 | .15 | .11 | .18 |
| 31 | 0 | ------ | .63 | 5.0 | ------ | 23 | ------ | .13 | ------ | .13 | 1.2 | ------ |
| TOTAL | 35.56 | 63.33 | 121.18 | 148.47 | 209.35 | 112.11 | 26.75 | 18.12 | 9.09 | 28.55 | 13.38 | 21.07 |
| MEAN | 1.15 | 2.11 | 3.91 | 4.79 | 7.48 | 3.62 | .89 | .58 | .30 | .92 | .43 | .70 |
| MAX | 22 | 27 | 30 | 47 | 68 | 36 | 6.2 | 5.4 | 1.5 | 3.7 | 4.6 | 7.0 |
| MIN | 0 | 0 | .47 | .29 | .44 | .35 | .21 | .10 | .05 | .11 | .06 | .08 |
| AC-FT | 71 | 126 | 240 | 294 | 415 | 222 | 53 | 36 | 18 | 57 | 27 | 42 |

CAL YR 1968: TOTAL 782.69 MEAN 2.14 MAX 75 MIN 0 AC-FT 1,550
WTR YR 1969: TOTAL 806.96 MEAN 2.21 MAX 68 MIN 0 AC-FT 1,600

PEAK DISCHARGE (BASE, 190 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1700 | 4.68 | 276 | 2- 1 | 0900 | 4.94 | 335 |
| 1- 3 | 0100 | 4.93 | 332 | 3-31 | 1930 | 4.28 | 196 |

## 16-3250. Kananani Stream at Pupukea Military Road, near Maunawai

LOCATION.--Lat 21°37'25", long 158°01'04", Oahu, on right bank 75 ft upstream from Pupukea Military Road and 3.5 miles southeast of Maunawai.

DRAINAGE AREA.--3.13 sq mi.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961, 1963, June 1963 to current year.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 590 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,510 cfs Feb. 1 (gage height, 8.72 ft), from rating curve extended as explained below; minimum, 0.01 cfs Nov. 12, 13.
Period of record: Maximum discharge, 1,720 cfs Apr. 20, 1968 (gage height, 9.13 ft), from rating curve extended above 42 cfs on basis of slope-area measurement at gage height 8.12 ft; minimum, 0.01 cfs Nov. 12, 13, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 135 | .06 | 17 | 4.7 | 422 | 19 | 57 | 8.2 | 1.8 | 11 | 3.5 | 5.9 |
| 2 | 22 | .06 | 25 | 179 | 110 | 11 | 45 | 31 | 1.8 | 3.5 | 4.2 | 3.2 |
| 3 | 3.1 | .06 | 44 | 236 | 28 | 28 | 20 | 11 | 1.6 | 5.6 | 5.0 | 2.0 |
| 4 | 1.9 | .05 | 56 | 102 | 18 | 13 | 15 | 7.0 | 1.6 | 4.4 | 3.3 | 2.4 |
| 5 | 1.3 | .05 | 20 | 24 | 12 | 12 | 13 | 4.6 | 1.5 | 3.2 | 3.1 | 2.4 |
| 6 | .90 | .10 | 8.0 | 16 | 13 | 12 | 12 | 5.0 | 1.4 | 3.5 | 2.6 | 1.7 |
| 7 | .67 | .08 | 5.0 | 13 | 9.2 | 9.2 | 10 | 5.6 | 1.3 | 11 | 2.9 | 3.3 |
| 8 | .50 | .06 | 3.7 | 41 | 7.8 | 8.2 | 9.4 | 3.7 | 1.3 | 9.4 | 2.9 | 2.9 |
| 9 | .41 | .04 | 4.5 | 28 | 6.9 | 7.7 | 8.8 | 3.3 | 1.3 | 3.5 | 2.3 | 1.9 |
| 10 | .37 | .03 | 3.5 | 14 | 6.6 | 7.0 | 8.4 | 3.2 | 15 | 2.4 | 2.1 | 8.0 |
| 11 | .33 | .02 | 3.0 | 9.6 | 6.1 | 6.7 | 7.7 | 3.1 | 22 | 2.6 | 6.4 | 7.0 |
| 12 | .27 | .01 | 2.7 | 8.0 | 5.6 | 6.1 | 7.1 | 6.0 | 4.2 | 2.3 | 2.8 | 2.5 |
| 13 | .24 | .33 | 38 | 9.3 | 39 | 5.7 | 6.7 | 3.5 | 2.4 | 2.4 | 2.0 | 1.8 |
| 14 | .30 | 24 | 12 | 7.8 | 310 | 5.7 | 13 | 8.3 | 1.8 | 8.9 | 1.9 | 8.4 |
| 15 | .33 | 2.8 | 6.4 | 6.2 | 237 | 8.6 | 7.5 | 13 | 1.9 | 4.7 | 7.6 | 4.5 |
| 16 | 1.1 | 1.1 | 7.9 | 5.9 | 204 | 150 | 5.7 | 8.2 | 1.9 | 10 | 5.6 | 2.0 |
| 17 | 2.1 | .67 | 12 | 5.6 | 36 | 43 | 13 | 3.5 | 1.6 | 5.6 | 6.1 | 1.6 |
| 18 | 5.9 | .45 | 14 | 5.1 | 85 | 28 | 7.3 | 2.8 | 1.5 | 3.5 | 4.8 | 6.5 |
| 19 | 4.5 | .80 | 83 | 5.0 | 63 | 15 | 6.6 | 2.5 | 1.5 | 25 | 2.9 | 2.1 |
| 20 | 2.5 | 5.8 | 17 | 4.4 | 37 | 10 | 10 | 2.3 | 1.6 | 25 | 3.2 | 9.1 |
| 21 | 1.3 | 1.8 | 16 | 4.1 | 29 | 8.6 | 6.1 | 2.2 | 1.6 | 6.7 | 4.5 | 98 |
| 22 | .74 | .98 | 17 | 4.0 | 20 | 7.7 | 5.0 | 2.2 | 5.2 | 5.9 | 3.2 | 18 |
| 23 | .45 | .67 | 7.5 | 4.0 | 16 | 7.3 | 4.5 | 2.1 | 3.5 | 8.7 | 2.0 | 5.7 |
| 24 | .30 | 1.9 | 5.9 | 3.7 | 16 | 81 | 4.4 | 2.1 | 1.9 | 17 | 1.8 | 5.2 |
| 25 | .24 | 6.8 | 145 | 3.6 | 18 | 134 | 4.1 | 2.2 | 1.9 | 24 | 1.6 | 5.1 |
| 26 | .16 | 1.9 | 16 | 3.5 | 20 | 22 | 3.8 | 2.3 | 6.4 | 17 | 3.7 | 3.0 |
| 27 | .10 | 1.7 | 10 | 3.3 | 13 | 14 | 6.9 | 2.4 | 4.7 | 6.2 | 18 | 2.6 |
| 28 | .06 | 1.1 | 8.2 | 3.2 | 10 | 12 | 9.0 | 2.6 | 3.5 | 4.5 | 5.1 | 2.6 |
| 29 | .05 | 147 | 6.4 | 5.3 | ------ | 12 | 7.9 | 2.1 | 3.5 | 3.6 | 2.6 | 3.0 |
| 30 | .05 | 160 | 5.7 | 28 | ------ | 12 | 17 | 1.8 | 4.9 | 3.5 | 3.0 | 3.1 |
| 31 | .06 | ------ | 5.2 | 29 | ------ | 164 | ------ | 1.8 | ------ | 3.6 | 12 | ------ |
| TOTAL | 187.23 | 360.42 | 625.6 | 816.3 | 1,798.2 | 880.5 | 351.9 | 159.6 | 106.1 | 248.2 | 132.7 | 225.5 |
| MEAN | 6.04 | 12.0 | 20.2 | 26.3 | 64.2 | 28.4 | 11.7 | 5.15 | 3.54 | 8.01 | 4.28 | 7.52 |
| MAX | 135 | 160 | 145 | 236 | 422 | 164 | 57 | 31 | 22 | 25 | 18 | 98 |
| MIN | .05 | .01 | 2.7 | 3.2 | 5.6 | 5.7 | 3.8 | 1.8 | 1.3 | 2.3 | 1.6 | 1.6 |
| AC-FT | 371 | 715 | 1,240 | 1,620 | 3,570 | 1,750 | 698 | 317 | 210 | 492 | 263 | 447 |

CAL YR 1968: TOTAL 5,206.84 MEAN 14.2 MAX 555 MIN .01 AC-FT 10,330
WTR YR 1969: TOTAL 5,892.25 MEAN 16.1 MAX 422 MIN .01 AC-FT 11,690

PEAK DISCHARGE (BASE, 650 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 1 | 1830 | 7.63 | 1,070 | 2- 1 | 1530 | 8.72 | 1,510 |
| 1- 3 | 0200 | 7.42 | 1,010 | | | | |

## 16-3290. Kaiwikoele Stream tributary near Maunawai

LOCATION.--Lat 21°36'49", long 158°01'23", Oahu, on left bank at upstream side of Paalaa Uka Pupukea Road, 0.2 mile upstream from mouth, 2.3 miles south of Camp Pupukea, and 3.6 miles southeast of Maunawai.

DRAINAGE AREA.--0.97 sq mi.

PERIOD OF RECORD.--November 1967 to current year.

GAGE.--Water-stage recorder and concrete-ford control. Altitude of gage is 730 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,080 cfs Feb. 1 (gage height, 8.65 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 1,080 cfs Feb. 1, 1969 (gage height, 8.65 ft), from rating curve extended above 24 cfs on basis of slope-area measurement at gage height 8.34 ft; no flow most of time each year.

REMARKS.--Records fair. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0 | 0 | 0 | 110 | | 2.0 | | | | | |
| 2 | | 0 | 0 | .11 | 15 | | 5.9 | | | | | |
| 3 | | 0 | 0 | 25 | 2.2 | | .01 | | | | | |
| 4 | | 0 | .42 | 8.8 | .04 | | 0 | | | | | |
| 5 | | 0 | 0 | .35 | 0 | | 0 | | | | | |
| 6 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 7 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 8 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 9 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 10 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 11 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 12 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 13 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 14 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 15 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 16 | | 0 | 0 | 0 | 1.3 | | 0 | | | | | |
| 17 | | 0 | 0 | 0 | .01 | | 0 | | | | | |
| 18 | | 0 | 2.7 | 0 | 1.0 | | 0 | | | | | |
| 19 | | 0 | 0 | 0 | .21 | | 0 | | | | | |
| 20 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 21 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 22 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 23 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 24 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 25 | | 0 | 12 | 0 | 0 | | 0 | | | | | |
| 26 | | 0 | .25 | 0 | 0 | | 0 | | | | | |
| 27 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 28 | | 0 | 0 | 0 | 0 | | 0 | | | | | |
| 29 | | 0 | 0 | 0 | ------ | | 0 | | | | | |
| 30 | | .10 | 0 | 0 | ------ | | 0 | | ------ | | | ------ |
| 31 | | ------ | 0 | 0 | ------ | | ------ | | | | | |
| TOTAL | 0 | .10 | 15.37 | 34.26 | 129.76 | 0 | 7.91 | 0 | 0 | 0 | 0 | 0 |
| MEAN | 0 | .003 | .50 | 1.11 | 4.63 | 0 | .26 | 0 | 0 | 0 | 0 | 0 |
| MAX | 0 | .10 | 12 | 25 | 110 | 0 | 5.9 | 0 | 0 | 0 | 0 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | .2 | 30 | 68 | 257 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |

CAL YR 1968: TOTAL 437.46 MEAN 1.20 MAX 223 MIN 0 AC-FT 868
WTR YR 1969: TOTAL 187.40 MEAN .51 MAX 110 MIN 0 AC-FT 372

PEAK DISCHARGE (BASE, 100 CFS).--Feb. 1 (1530) 1,080 cfs( 8.65 ft).

## 16-3300. Kamananui Stream at Maunawai

LOCATION.--Lat 21°38'20", long 158°03'27", Oahu, on right bank at Maunawai, 25 ft upstream from Elehaha Stream, 4.9 miles northeast of Waialua School, and 7.3 miles southwest of Kahuku School.

DRAINAGE AREA.--9.79 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to May 13, 1965, at datum 2.00 ft higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft higher.

EXTREMES.--Current year: Maximum discharge, 3,840 cfs Feb. 1 (gage height, 9.52 ft), from rating curve extended as explained below; no flow Nov. 6-13.
Period of record: Maximum discharge, 5,270 cfs Mar. 16, 1968 (gage height, 10.14 ft), from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights 6.25, 8.13 and 10.14 ft; no flow at times.

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

REVISIONS (FISCAL YEARS).--WSP 1937: 1958-60.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 93 | .01 | 19 | 6.3 | 787 | 30 | 100 | 8.4 | 1.8 | 9.8 | 3.6 | 8.4 |
| 2 | 51 | .01 | 28 | 225 | 215 | 20 | 60 | 59 | 2.0 | 4.6 | 3.4 | 5.0 |
| 3 | 5.8 | .01 | 42 | 386 | 53 | 37 | 30 | 14 | 1.8 | 3.2 | 5.0 | 2.7 |
| 4 | 4.6 | .01 | 68 | 208 | 30 | 20 | 25 | 9.4 | 1.5 | 5.5 | 3.6 | 2.1 |
| 5 | 2.3 | .01 | 28 | 55 | 21 | 19 | 20 | 7.5 | 1.5 | 3.7 | 3.2 | 2.4 |
| 6 | 1.2 | 0 | 11 | 34 | 18 | 18 | 17 | 7.5 | 1.3 | 2.6 | 2.7 | 2.0 |
| 7 | .68 | 0 | 6.9 | 24 | 15 | 15 | 15 | 7.5 | 1.2 | 11 | 2.6 | 2.0 |
| 8 | .47 | 0 | 5.5 | 46 | 12 | 12 | 14 | 5.3 | 1.1 | 11 | 2.7 | 3.5 |
| 9 | .31 | 0 | 6.3 | 61 | 10 | 9.2 | 13 | 4.6 | .88 | 4.8 | 2.1 | 2.1 |
| 10 | .22 | 0 | 4.4 | 30 | 8.7 | 7.0 | 12 | 4.4 | 9.0 | 3.0 | 1.9 | 3.7 |
| 11 | .14 | 0 | 3.2 | 19 | 7.8 | 6.2 | 11 | 4.2 | 30 | 2.4 | 6.1 | 13 |
| 12 | .09 | 0 | 2.9 | 15 | 6.9 | 5.8 | 9.6 | 6.3 | 6.9 | 2.6 | 4.2 | 3.7 |
| 13 | .03 | 0 | 31 | 16 | 50 | 5.4 | 8.0 | 5.5 | 3.0 | 1.9 | 2.3 | 2.3 |
| 14 | .01 | 21 | 21 | 16 | 450 | 7.2 | 16 | 6.6 | 2.1 | 6.2 | 1.8 | 4.9 |
| 15 | .01 | 6.0 | 11 | 11 | 360 | 10 | 11 | 20 | 1.5 | 6.3 | 5.0 | 8.1 |
| 16 | .01 | 2.0 | 8.7 | 9.4 | 300 | 240 | 7.4 | 13 | 1.5 | 6.3 | 7.5 | 3.0 |
| 17 | .25 | .88 | 18 | 8.1 | 60 | 70 | 17 | 6.0 | 1.2 | 8.4 | 5.4 | 1.8 |
| 18 | 2.4 | .47 | 16 | 7.2 | 140 | 50 | 8.0 | 4.2 | 1.1 | 4.2 | 6.9 | 5.0 |
| 19 | 6.6 | .42 | 168 | 6.9 | 110 | 25 | 6.6 | 3.7 | .88 | 21 | 3.6 | 3.2 |
| 20 | 3.6 | 6.8 | 41 | 6.3 | 90 | 15 | 13 | 3.2 | .88 | 37 | 3.0 | 7.5 |
| 21 | 2.0 | 3.6 | 22 | 5.5 | 50 | 11 | 8.0 | 3.0 | .88 | 12 | 3.0 | 102 |
| 22 | .97 | 1.4 | 36 | 5.0 | 35 | 9.0 | 6.6 | 2.9 | 2.5 | 6.0 | 3.7 | 48 |
| 23 | .52 | .80 | 13 | 4.8 | 27 | 7.8 | 5.0 | 2.7 | 6.3 | 8.1 | 1.8 | 9.1 |
| 24 | .25 | .88 | 9.1 | 4.8 | 22 | 150 | 4.5 | 2.4 | 2.3 | 17 | 1.4 | 5.8 |
| 25 | .10 | 8.7 | 283 | 4.4 | 27 | 260 | 4.3 | 2.6 | 1.6 | 21 | 1.2 | 7.8 |
| 26 | .03 | 3.6 | 43 | 4.2 | 31 | 35 | 4.2 | 2.7 | 2.0 | 29 | 1.6 | 4.6 |
| 27 | .01 | 2.4 | 20 | 3.7 | 20 | 23 | 6.4 | 2.7 | 7.2 | 10 | 19 | 3.4 |
| 28 | .01 | 1.8 | 14 | 3.6 | 18 | 17 | 8.0 | 2.9 | 3.7 | 5.5 | 9.4 | 3.0 |
| 29 | .01 | 157 | 11 | 4.2 | ------ | 14 | 6.6 | 2.4 | 3.7 | 4.4 | 3.7 | 3.0 |
| 30 | .01 | 186 | 8.7 | 25 | ------ | 20 | 24 | 2.1 | 3.4 | 3.7 | 3.0 | 3.4 |
| 31 | .01 | ------ | 7.2 | 46 | ------ | 250 | ------ | 1.9 | ------ | 3.6 | 9.4 | ------ |
| TOTAL | 176.64 | 403.80 | 1,006.9 | 1,301.4 | 2,975.4 | 1,418.6 | 491.2 | 228.6 | 104.72 | 275.8 | 133.8 | 276.5 |
| MEAN | 5.70 | 13.5 | 32.5 | 42.0 | 106 | 45.8 | 16.4 | 7.37 | 3.49 | 8.90 | 4.32 | 9.22 |
| MAX | 93 | 186 | 283 | 386 | 787 | 260 | 100 | 59 | 30 | 37 | 19 | 102 |
| MIN | .01 | 0 | 2.9 | 3.6 | 6.9 | 5.6 | 4.2 | 1.9 | .88 | 1.9 | 1.2 | 1.8 |
| AC-FT | 350 | 801 | 2,000 | 2,580 | 5,900 | 2,810 | 974 | 453 | 208 | 547 | 265 | 548 |

CAL YR 1968: TOTAL 7,889.25 MEAN 21.6 MAX 1,220 MIN 0 AC-FT 15,650
WTR YR 1969: TOTAL 8,793.36 MEAN 24.6 MAX 787 MIN 0 AC-FT 17,440

PEAK DISCHARGE (BASE, 1,100 CFS).--Jan. 3 (0230) 1,230 cfs (6.11 ft); Feb. 1 (1600) 3,840 cfs (9.52 ft).

NOTE.--No gage-height record Feb. 13 to Mar. 14, Mar. 16 to Apr. 29.

## 16-3430, Helemano Stream at Haleiwa

LOCATION.--Lat 21°34'40", long 158°06'12", Oahu, on left bank at upstream side of private road bridge, 0.3 mile east of Weed Circle, and 1.1 miles southeast of Waialua School at Haleiwa.

DRAINAGE AREA.--14.2 sq mi.

PERIOD OF RECORD.--November 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1.57 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 11,300 cfs Feb. 1 (gage height, 17.63 ft, from floodmark in well), from rating curve extended as explained below; minimum, 0.01 cfs on several days.
Period of record: Maximum discharge, 11,300 cfs Feb. 1, 1969 (gage height, 17.63 ft, from floodmark in well), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 10.54, 14.2, 15.34 and 17.63 ft; minimum, 0.01 cfs on several days in 1968.

REMARKS.--Records fair. Minor regulation by reservoir on upstream tributary. Diversions into basin for irrigation of sugarcane; low flow affected by irrigation return flow and releases.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 46 | .03 | 29 | 1.9 | 3,600 | 7.2 | 163 | 8.1 | .47 | .94 | 1.1 | .68 |
| 2 | 93 | .02 | 16 | 456 | 800 | 14 | 130 | 55 | .47 | 1.0 | .94 | 2.0 |
| 3 | 5.7 | .02 | 8.1 | 678 | 90 | 102 | 40 | 21 | .55 | 1.6 | .78 | 2.0 |
| 4 | 1.1 | .02 | 159 | 111 | 40 | 40 | 20 | 5.4 | .68 | 1.1 | .63 | 1.0 |
| 5 | .16 | .02 | 33 | 41 | 15 | 25 | 12 | 3.0 | .78 | .94 | .63 | .88 |
| 6 | .05 | .02 | 7.5 | 28 | 30 | 16 | 16 | 4.8 | .83 | 1.0 | .59 | .78 |
| 7 | .05 | .03 | 3.0 | 18 | 20 | 13 | 13 | 4.7 | .83 | 1.3 | .63 | .59 |
| 8 | .05 | .01 | 1.9 | 31 | 14 | 8.7 | 6.4 | 1.8 | .83 | 4.2 | .73 | .63 |
| 9 | .11 | .01 | 1.4 | 73 | 10 | 7.5 | 4.6 | 1.1 | .78 | 4.6 | .78 | .73 |
| 10 | .18 | .01 | .47 | 38 | 7.8 | 6.7 | 3.8 | .63 | .88 | 1.2 | .63 | .83 |
| 11 | .03 | .13 | .51 | 15 | 5.2 | 5.2 | 3.7 | .40 | 41 | .78 | .47 | .88 |
| 12 | .03 | .01 | .16 | 10 | 4.2 | 3.2 | 3.2 | 6.1 | 6.8 | .55 | .47 | 3.7 |
| 13 | .03 | .02 | 100 | 9.0 | 3.4 | 2.6 | 2.2 | 3.7 | 1.4 | .47 | .55 | 2.2 |
| 14 | .02 | .04 | 43 | 7.0 | 39 | 3.5 | 2.0 | 1.4 | .55 | .47 | .63 | .94 |
| 15 | .03 | .02 | 18 | 5.4 | 86 | 2.3 | 9.6 | 28 | .40 | .47 | .73 | 11 |
| 16 | .04 | .02 | 22 | 4.4 | 121 | 49 | 3.8 | 13 | .40 | .51 | .78 | 4.4 |
| 17 | .08 | .02 | 28 | 3.4 | 31 | 90 | 1.9 | 4.9 | .51 | .55 | 1.7 | 2.3 |
| 18 | .02 | .02 | 21 | 2.7 | 80 | 72 | 5.1 | 1.9 | .59 | .63 | 2.4 | 1.0 |
| 19 | .02 | .01 | 175 | 2.3 | 183 | 26 | 5.2 | 1.0 | .59 | .31 | 2.3 | 2.4 |
| 20 | .02 | .01 | 52 | 2.1 | 61 | 14 | 8.2 | .55 | .63 | 7.2 | 1.1 | 1.8 |
| 21 | .02 | .01 | 21 | 1.4 | 48 | 6.7 | 17 | .43 | .63 | 6.5 | .78 | 17 |
| 22 | .07 | .01 | 16 | .88 | 21 | 3.6 | 5.2 | .43 | .63 | 2.6 | .73 | 58 |
| 23 | .15 | .01 | 9.0 | .78 | 15 | 2.7 | 2.6 | .40 | .68 | 1.1 | .94 | 6.4 |
| 24 | .30 | .01 | 6.5 | .68 | 11 | 3.1 | 1.4 | .40 | .73 | .88 | .78 | 3.2 |
| 25 | .06 | .01 | 194 | .59 | 10 | 80 | .88 | .40 | 12 | 16 | .59 | 2.0 |
| 26 | .02 | .01 | 46 | .55 | 39 | 31 | .68 | .40 | 3.0 | 83 | .59 | 2.5 |
| 27 | .01 | .01 | 17 | .55 | 25 | 8.7 | .51 | .40 | .88 | 13 | .83 | 1.7 |
| 28 | .02 | .02 | 10 | .55 | 10 | 4.8 | 18 | .40 | .73 | 4.2 | 3.8 | .40 |
| 29 | .04 | 290 | 6.7 | .63 | ------ | 3.2 | 7.8 | .43 | 1.1 | 2.3 | 2.8 | .26 |
| 30 | .02 | 205 | 4.4 | 30 | ------ | 2.4 | 24 | .47 | .94 | 1.7 | 1.5 | .47 |
| 31 | .01 | ------ | 2.8 | 147 | ------ | 229 | ------ | .43 | ------ | 1.4 | 1.2 | ------ |
| TOTAL | 147.44 | 495.58 | 1052.44 | 1722.81 | 5419.60 | 884.1 | 531.77 | 171.07 | 81.29 | 162.50 | 33.11 | 132.67 |
| MEAN | 4.76 | 16.5 | 33.9 | 55.6 | 194 | 28.5 | 17.7 | 5.52 | 2.71 | 5.24 | 1.07 | 4.42 |
| MAX | 93 | 290 | 194 | 678 | 3,600 | 229 | 163 | 55 | 41 | 83 | 3.8 | 58 |
| MIN | .01 | .01 | .16 | .55 | 3.4 | 2.3 | .51 | .40 | .40 | .31 | .47 | .26 |
| AC-FT | 292 | 983 | 2090 | 3,420 | 10,750 | 1,750 | 1,050 | 339 | 161 | 322 | 66 | 263 |

CAL YR 1968: TOTAL 8,645.66 MEAN 23.6 MAX 3,090 MIN .01 AC-FT 17,150
WTR YR 1969: TOTAL 10,834.38 MEAN 29.7 MAX 3,600 MIN .01 AC-FT 21,490

PEAK DISCHARGE (BASE, 1,200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-2 | 1430 | 12.23 | 3,860 | 2-1 | /1300 | ≠17.63 | 11,300 |
| 1-3 | 0230 | 12.03 | 3,680 | | | | |

/ About.
≠ From floodmark in well.
NOTE.--No gage-height record Feb. 1-9.

## 16-3450. Opaeula Stream near Wahiawa

LOCATION.--Lat 21°33'55", long 158°00'10", Oahu, on left bank 4.3 miles northeast of Leilehua High School in Wahiawa and 8.1 miles east of Waialua School.

DRAINAGE AREA.--2.98 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 3,900 cfs Feb. 1 (gage height, 10.12 ft), from rating curve extended as explained below; minimum, 0.06 cfs Nov. 13.
Period of record: Maximum discharge, 3,900 cfs Feb. 1, 1969 (gage height, 10.12 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 6.74 and 10.12 ft; minimum, 0.06 cfs Nov. 13, 1968.

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

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 80 | .19 | 15 | 3.4 | 825 | 12 | 106 | 6.4 | 1.4 | 15 | 4.9 | 12 |
| 2 | 34 | .15 | 12 | 201 | 151 | 8.4 | 80 | 63 | 1.5 | 66 | 4.1 | 4.6 |
| 3 | 4.4 | .13 | 18 | 205 | 37 | 43 | 26 | 9.2 | 1.5 | 8.1 | 5.5 | 2.9 |
| 4 | 2.2 | .13 | 186 | 61 | 16 | 18 | 14 | 9.2 | 1.3 | 8.0 | 3.8 | 2.6 |
| 5 | 1.4 | .12 | 15 | 21 | 14 | 13 | 11 | 7.2 | 1.1 | 6.3 | 4.6 | 3.6 |
| 6 | 1.1 | .12 | 7.4 | 10 | 25 | 10 | 26 | 10 | 1.1 | 2.9 | 2.9 | 2.6 |
| 7 | .84 | .11 | 6.6 | 7.6 | 9.1 | 9.9 | 10 | 6.0 | .98 | 16 | 5.0 | 5.0 |
| 8 | .72 | .10 | 4.2 | 40 | 6.2 | 7.1 | 7.9 | 4.1 | .84 | 25 | 4.6 | 4.2 |
| 9 | .72 | .08 | 6.4 | 36 | 5.1 | 6.6 | 6.8 | 3.6 | .76 | 4.9 | 3.1 | 3.5 |
| 10 | 1.7 | .07 | 3.4 | 13 | 4.6 | 5.2 | 8.4 | 3.2 | 65 | 3.6 | 2.2 | 16 |
| 11 | 1.1 | .08 | 2.5 | 6.8 | 4.3 | 4.3 | 8.2 | 13 | 75 | 7.4 | 5.3 | 15 |
| 12 | .84 | .07 | 4.7 | 5.2 | 4.1 | 3.8 | 6.4 | 16 | 7.9 | 3.5 | 4.3 | 3.7 |
| 13 | .72 | .09 | 130 | 4.7 | 3.9 | 3.6 | 6.4 | 4.6 | 4.0 | 4.1 | 2.5 | 3.0 |
| 14 | .54 | 13 | 43 | 4.7 | 130 | 3.4 | 21 | 44 | 2.8 | 12 | 2.3 | 44 |
| 15 | .45 | 6.6 | 14 | 4.0 | 149 | 4.8 | 9.2 | 49 | 2.2 | 5.4 | 15 | 11 |
| 16 | 3.2 | 1.9 | 22 | 3.6 | 136 | 129 | 5.1 | 15 | 1.9 | 3.7 | 13 | 3.7 |
| 17 | 8.5 | 1.1 | 17 | 3.6 | 19 | 51 | 19 | 5.1 | 1.7 | 7.3 | 14 | 7.6 |
| 18 | 8.5 | .68 | 23 | 3.0 | 79 | 80 | 14 | 3.8 | 1.4 | 4.6 | 7.9 | 19 |
| 19 | 6.6 | .60 | 95 | 2.7 | 89 | 18 | 9.9 | 3.3 | 1.4 | 34 | 6.2 | 4.9 |
| 20 | 3.3 | 10 | 16 | 2.4 | 41 | 8.7 | 25 | 3.1 | 1.4 | 26 | 8.4 | 11 |
| 21 | 3.3 | 3.1 | 9.9 | 2.1 | 23 | 6.2 | 9.2 | 2.7 | 1.6 | 7.6 | 8.6 | 88 |
| 22 | 1.6 | 1.3 | 21 | 1.9 | 14 | 5.8 | 5.1 | 2.4 | 4.8 | 5.4 | 4.4 | 26 |
| 23 | .93 | .88 | 9.3 | 1.9 | 11 | 4.7 | 4.2 | 2.2 | 5.9 | 5.2 | 2.7 | 6.8 |
| 24 | .64 | 2.1 | 7.6 | 1.8 | 7.9 | 88 | 4.0 | 1.9 | 2.7 | 16 | 2.9 | 6.7 |
| 25 | .51 | 4.6 | 116 | 1.7 | 28 | 101 | 3.6 | 2.0 | 14 | 35 | 3.4 | 6.8 |
| 26 | .42 | 3.5 | 14 | 1.5 | 24 | 16 | 3.3 | 3.6 | 6.2 | 47 | 4.1 | 3.8 |
| 27 | .36 | 3.2 | 7.4 | 1.4 | 9.9 | 8.7 | 21 | 3.6 | 6.4 | 8.9 | 20 | 3.0 |
| 28 | .31 | 7.1 | 5.8 | 1.3 | 6.2 | 6.2 | 33 | 3.9 | 6.0 | 5.2 | 7.9 | 2.8 |
| 29 | .27 | 205 | 5.6 | 18 | ------ | 5.8 | 31 | 2.4 | 7.4 | 4.1 | 3.6 | 3.2 |
| 30 | .27 | 95 | 4.2 | 28 | ------ | 8.0 | 29 | 3.0 | 8.2 | 3.7 | 5.4 | 3.7 |
| 31 | .23 | ------ | 3.7 | 77 | ------ | 147 | ------ | 1.8 | ------ | 4.6 | 20 | ------ |
| TOTAL | 169.67 | 361.10 | 845.7 | 775.3 | 1872.3 | 837.2 | 563.7 | 308.3 | 238.38 | 406.5 | 202.6 | 330.7 |
| MEAN | 5.47 | 12.0 | 27.3 | 25.0 | 66.9 | 27.0 | 18.8 | 9.95 | 7.95 | 13.1 | 6.54 | 11.0 |
| MAX | 80 | 205 | 186 | 205 | 825 | 147 | 106 | 63 | 75 | 66 | 20 | 88 |
| MIN | .23 | .07 | 2.5 | 1.3 | 3.9 | 3.4 | 3.3 | 1.8 | .76 | 2.9 | 2.2 | 2.6 |
| AC-FT | 337 | 716 | 1680 | 1540 | 3710 | 1660 | 1120 | 612 | 473 | 806 | 402 | 656 |

CAL YR 1968: TOTAL 4,893.75 MEAN 13.4 MAX 653 MIN .07 AC-FT 9,710
WTR YR 1969: TOTAL 6,911.45 MEAN 18.9 MAX 825 MIN .07 AC-FT 13,710

PEAK DISCHARGE (BASE, 1,200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-2 | 1330 | 7.22 | 1,700 | 2-1 | 1330 | 10.12 | 3,900 |
| 1-3 | 0200 | 6.42 | 1,230 | | | | |

## 16-4000. Halawa Stream near Halawa

LOCATION.--Lat 21°09'31", long 156°45'53", Molokai, on right bank 600 ft downstream from Hipuapua Stream and 1.5 miles west of Halawa.

DRAINAGE AREA.--4.62 sq mi.

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). Prior to June 25, 1923, at site 350 ft upstream at different datum. June 25, 1923, to July 18, 1932, and Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft higher.

EXTREMES.--Current year: Maximum discharge, 2,870 cfs Jan. 9 (gage height, 9.67 ft, from peak-stage indicator), from rating curve extended as explained below; minimum, 1.9 cfs Nov. 9, 10.
Period of record: Maximum discharge, 26,900 cfs Feb. 4, 1965 (gage height, 19.91 ft, from floodmarks), from rating curve extended above 86 cfs on basis of slope-area measurement of peak flow; minimum, 0.76 cfs about Nov. 23, 1962.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.8 | 6.0 | 56 | 13 | 90 | 52 | 64 | 19 | 12 | 7.9 | 14 | 41 |
| 2 | 8.3 | 4.2 | 33 | 17 | 202 | 26 | 50 | 86 | 5.8 | 4.9 | 14 | 29 |
| 3 | 13 | 3.6 | 68 | 167 | 69 | 57 | 15 | 22 | 5.0 | 8.8 | 8.3 | 21 |
| 4 | 11 | 2.7 | 263 | 62 | 17 | 21 | 13 | 16 | 8.7 | 20 | 9.1 | 17 |
| 5 | 5.6 | 2.5 | 48 | 113 | 11 | 19 | 19 | 15 | 5.0 | 5.6 | 6.1 | 13 |
| 6 | 4.6 | 2.3 | 18 | 27 | 10 | 47 | 51 | 24 | 4.3 | 11 | 11 | 12 |
| 7 | 4.1 | 2.2 | 13 | 44 | 8.1 | 29 | 20 | 10 | 4.0 | 38 | 26 | 11 |
| 8 | 3.6 | 2.0 | 16 | 162 | 6.7 | 18 | 11 | 7.7 | 3.8 | 19 | 14 | 22 |
| 9 | 4.2 | 1.9 | 24 | 350 | 11 | 26 | 14 | 6.7 | 3.7 | 39 | 6.6 | 10 |
| 10 | 3.3 | 2.4 | 20 | 90 | 6.7 | 13 | 21 | 6.1 | 16 | 48 | 14 | 122 |
| 11 | 2.9 | 6.0 | 8.6 | 40 | 6.3 | 62 | 18 | 12 | 100 | 12 | 21 | 25 |
| 12 | 2.6 | 11 | 179 | 20 | 5.9 | 36 | 51 | 24 | 11 | 6.9 | 14 | 15 |
| 13 | 6.7 | 3.8 | 262 | 10 | 49 | 14 | 33 | 6.4 | 8.8 | 5.5 | 21 | 13 |
| 14 | 3.8 | 7.5 | 38 | 8.0 | 331 | 11 | 52 | 34 | 5.5 | 57 | 14 | 45 |
| 15 | 8.1 | 8.5 | 47 | 15 | 211 | 164 | 17 | 118 | 4.5 | 29 | 93 | 13 |
| 16 | 27 | 5.2 | 27 | 20 | 130 | 219 | 14 | 38 | 4.0 | 33 | 34 | 9.7 |
| 17 | 6.4 | 3.7 | 78 | 10 | 40 | 201 | 26 | 11 | 4.3 | 41 | 80 | 29 |
| 18 | 13 | 2.6 | 34 | 7.0 | 46 | 125 | 18 | 7.5 | 3.9 | 31 | 86 | 34 |
| 19 | 7.5 | 2.2 | 42 | 14 | 67 | 57 | 11 | 6.4 | 3.6 | 109 | 41 | 12 |
| 20 | 32 | 3.0 | 76 | 8.1 | 24 | 27 | 55 | 5.9 | 3.5 | 74 | 47 | 37 |
| 21 | 6.8 | 4.9 | 52 | 7.5 | 27 | 22 | 20 | 5.3 | 3.4 | 19 | 31 | 189 |
| 22 | 20 | 2.5 | 134 | 6.9 | 36 | 16 | 14 | 5.9 | 7.3 | 15 | 19 | 36 |
| 23 | 8.0 | 2.1 | 106 | 15 | 25 | 14 | 10 | 5.6 | 5.2 | 28 | 31 | 23 |
| 24 | 6.0 | 36 | 30 | 11 | 50 | 101 | 22 | 4.8 | 3.6 | 45 | 18 | 44 |
| 25 | 4.5 | 20 | 218 | 23 | 116 | 172 | 37 | 60 | 3.3 | 46 | 47 | 20 |
| 26 | 4.0 | 13 | 46 | 6.9 | 49 | 36 | 9.1 | 45 | 3.3 | 24 | 17 | 22 |
| 27 | 3.8 | 7.0 | 35 | 5.9 | 21 | 24 | 45 | 30 | 4.0 | 13 | 42 | 18 |
| 28 | 3.8 | 22 | 49 | 5.5 | 19 | 16 | 30 | 40 | 4.4 | 9.3 | 15 | 14 |
| 29 | 4.8 | 194 | 51 | 22 | ------ | 16 | 160 | 9.0 | 11 | 7.5 | 13 | 17 |
| 30 | 14 | 65 | 20 | 48 | ------ | 26 | 49 | 6.4 | 23 | 12 | 53 | 14 |
| 31 | 11 | ------ | 15 | 21 | ------ | 33 | ------ | 5.8 | ------ | 16 | 66 | ------ |
| TOTAL | 261.2 | 449.8 | 2106.6 | 1369.8 | 1684.7 | 1700 | 969.1 | 693.5 | 285.9 | 835.4 | 926.1 | 927.7 |
| MEAN | 8.43 | 15.0 | 68.0 | 44.2 | 60.2 | 54.8 | 32.3 | 22.4 | 9.53 | 26.9 | 29.9 | 30.9 |
| MAX | 32 | 194 | 263 | 350 | 331 | 219 | 160 | 118 | 100 | 109 | 93 | 189 |
| MIN | 2.6 | 1.9 | 8.6 | 5.5 | 5.9 | 11 | 9.1 | 4.8 | 3.3 | 4.9 | 6.1 | 9.7 |
| AC-FT | 518 | 892 | 4180 | 2720 | 3340 | 3370 | 1920 | 1380 | 567 | 1660 | 1840 | 1840 |

CAL YR 1968: TOTAL 10,137.0 MEAN 27.7 MAX 538 MIN 1.9 AC-FT 20,110
WTR YR 1969: TOTAL 12,209.8 MEAN 33.4 MAX 350 MIN 1.9 AC-FT 24,220

PEAK DISCHARGE (BASE, 1,900 CFS).--Jan. 9 (time unknown) 2,870 cfs (9.67 ft, from peak-stage indicator).

NOTE.--No gage-height record Jan. 9-18.

## 16-4036. Kapuhi Stream near Pelekunu

LOCATION.--Lat 21°07'57", long 156°52'56", Molokai, on left bank 400 ft downstream from Kawailena Stream, 2.1 miles south of former village of Pelekunu, and 5.6 miles north of Kamalo.
DRAINAGE AREA.--1.20 sq mi.
PERIOD OF RECORD.--August 1968 to current year.
GAGE.--Water-stage recorder. Altitude of gage is 870 ft (from topographic map).
EXTREMES.--August to September 1968: Maximum discharge during period, about 40 cfs Sept. 26; minimum, 1.8 cfs Sept. 20.
Water year 1969: Maximum discharge, 1,220 cfs Jan. 8 (gage height, 5.82 ft, from peak-stage indicator), from rating curve extended above 14 cfs; minimum, 1.9 cfs Nov. 7-14, 17-23.
REMARKS.--Records good except those for periods of no gage-height record and those above 30 cfs, which are poor. No diversion above station.

Discharge measurements made prior to beginning of continuous discharge record

Feb. 1, 1968..... 5.0 July 14, 1968..... 2.8

DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST TO SEPTEMBER 1968

| DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.9 | 3.1 | 6 | 2.4 | 2.1 | 11 | 2.2 | 1.9 | 16 | 2.2 | 2.0 | 21 | 2.2 | 1.9 | 26 | 2.1 | 16 |
| 2 | 2.5 | 2.1 | 7 | 2.4 | 2.2 | 12 | 3.5 | 1.9 | 17 | 2.2 | 1.9 | 22 | 2.1 | 1.9 | 27 | 2.1 | 5.0 |
| 3 | 2.7 | 2.1 | 8 | 2.3 | 2.1 | 13 | 2.4 | 1.9 | 18 | 2.1 | 2.0 | 23 | 2.1 | 2.0 | 28 | 2.1 | 4.5 |
| 4 | 6.1 | 2.1 | 9 | 2.3 | 1.9 | 14 | 2.2 | 1.9 | 19 | 2.1 | 1.9 | 24 | 2.1 | 5.9 | 29 | 2.2 | 4.7 |
| 5 | 2.6 | 2.1 | 10 | 2.3 | 2.0 | 15 | 2.2 | 2.1 | 20 | 2.1 | 1.8 | 25 | 2.1 | 4.5 | 30 | 2.1 | 4.5 |
| | | | | | | | | | | | | | | | 31 | 2.2 | |
| TOTAL | | | | | | | | | | | | | | | | 76.1 | 92.0 |
| MEAN | | | | | | | | | | | | | | | | 2.45 | 3.07 |
| MAX | | | | | | | | | | | | | | | | 6.1 | 16 |
| MIN | | | | | | | | | | | | | | | | 2.1 | 1.8 |
| AC-FT | | | | | | | | | | | | | | | | 151 | 182 |

PEAK DISCHARGE (BASE, 300 CFS).--No peak above base.
NOTE.--No gage-height record Sept. 20-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.1 | 2.0 | 13 | 4.8 | 41 | 14 | 70 | 4.6 | 3.1 | 3.2 | 3.0 | 5.2 |
| 2 | 25 | 2.0 | 10 | 14 | 56 | 9.1 | 26 | 15 | 3.0 | 3.0 | 3.1 | 5.5 |
| 3 | 9.0 | 2.0 | 47 | 45 | 49 | 18 | 12 | 5.8 | 3.0 | 2.7 | 2.8 | 4.2 |
| 4 | 4.0 | 2.0 | 87 | 11 | 20 | 12 | 9.9 | 5.2 | 3.1 | 2.8 | 2.8 | 3.6 |
| 5 | 3.3 | 2.0 | 22 | 50 | 12 | 9.1 | 8.4 | 4.8 | 2.9 | 2.7 | 2.8 | 3.6 |
| 6 | 3.0 | 2.0 | 8.7 | 12 | 9.5 | 18 | 29 | 4.6 | 2.8 | 3.4 | 3.1 | 3.1 |
| 7 | 2.9 | 1.9 | 5.2 | 14 | 8.0 | 11 | 12 | 4.4 | 2.8 | 4.2 | 3.0 | 2.9 |
| 8 | 2.8 | 1.9 | 4.2 | 120 | 7.1 | 9.1 | 8.7 | 4.1 | 2.7 | 3.2 | 2.8 | 3.0 |
| 9 | 3.2 | 1.9 | 4.8 | 150 | 6.3 | 9.1 | 8.0 | 4.1 | 2.7 | 4.1 | 2.5 | 2.8 |
| 10 | 2.6 | 1.9 | 3.9 | 50 | 6.1 | 7.1 | 7.4 | 3.9 | 7.7 | 3.8 | 2.6 | 3.1 |
| 11 | 2.5 | 1.9 | 3.5 | 17 | 5.6 | 6.6 | 9.5 | 4.2 | 9.0 | 3.1 | 2.9 | 2.8 |
| 12 | 2.4 | 1.9 | 31 | 11 | 5.2 | 6.3 | 13 | 4.1 | 3.8 | 2.7 | 2.6 | 2.7 |
| 13 | 2.3 | 1.9 | 88 | 9.0 | 8.8 | 5.8 | 8.7 | 3.8 | 3.5 | 2.9 | 4.6 | 2.8 |
| 14 | 2.2 | 2.2 | 20 | 8.5 | 26 | 7.0 | 11 | 16 | 3.2 | 7.5 | 3.6 | 2.7 |
| 15 | 2.1 | 2.0 | 8.7 | 9.0 | 29 | 21 | 7.1 | 20 | 3.1 | 4.6 | 5.8 | 2.5 |
| 16 | 2.1 | 2.2 | 16 | 8.7 | 28 | 33 | 7.1 | 6.6 | 3.0 | 5.6 | 3.6 | 2.4 |
| 17 | 2.1 | 1.9 | 13 | 6.8 | 14 | 37 | 7.7 | 5.4 | 3.0 | 4.2 | 6.1 | 2.6 |
| 18 | 2.1 | 1.9 | 7.4 | 6.3 | 18 | 25 | 7.1 | 4.8 | 2.9 | 6.4 | 5.2 | 3.0 |
| 19 | 2.1 | 1.9 | 7.3 | 10 | 26 | 14 | 6.8 | 4.4 | 2.9 | 20 | 3.9 | 2.6 |
| 20 | 3.7 | 1.9 | 19 | 6.8 | 15 | 10 | 16 | 4.1 | 2.8 | 9.5 | 3.5 | 4.1 |
| 21 | 3.0 | 1.9 | 35 | 6.3 | 11 | 8.4 | 8.4 | 3.9 | 2.8 | 5.6 | 3.2 | 7.2 |
| 22 | 2.5 | 1.9 | 50 | 6.8 | 10 | 7.4 | 8.4 | 3.6 | 3.0 | 4.8 | 2.9 | 3.4 |
| 23 | 2.3 | 2.0 | 9.1 | 7.1 | 9.1 | 6.6 | 6.6 | 3.5 | 2.8 | 4.2 | 2.9 | 3.1 |
| 24 | 2.2 | 14 | 7.1 | 10 | 9.5 | 15 | 6.1 | 4.6 | 2.7 | 4.4 | 2.8 | 3.9 |
| 25 | 2.1 | 4.1 | 123 | 9.2 | 23 | 15 | 5.6 | 5.0 | 2.7 | 3.9 | 4.8 | 2.9 |
| 26 | 2.1 | 2.3 | 22 | 6.3 | 16 | 8.7 | 5.2 | 3.9 | 2.7 | 3.5 | 3.8 | 4.1 |
| 27 | 2.1 | 2.2 | 8.4 | 5.8 | 9.9 | 7.1 | 5.4 | 3.4 | 2.7 | 3.4 | 3.8 | 3.1 |
| 28 | 2.1 | 123 | 18 | 5.4 | 8.4 | 6.3 | 5.0 | 3.2 | 2.8 | 3.1 | 2.9 | 3.1 |
| 29 | 2.2 | 375 | 16 | 18 | ------ | 6.1 | 7.0 | 3.1 | 2.9 | 3.0 | 2.9 | 4.4 |
| 30 | 2.1 | 37 | 7.1 | 17 | ------ | 5.8 | 5.6 | 3.1 | 5.5 | 3.0 | 3.5 | 3.2 |
| 31 | 2.0 | ------ | 5.2 | 10 | ------ | 9.4 | ------ | 3.1 | ------ | 3.5 | 6.1 | ------ |
| TOTAL | 108.2 | 602.7 | 720.6 | 665.8 | 487.5 | 378.0 | 348.7 | 170.3 | 101.6 | 142.0 | 109.9 | 103.6 |
| MEAN | 3.49 | 20.0 | 23.2 | 21.5 | 17.4 | 12.2 | 11.6 | 5.49 | 3.39 | 4.58 | 3.55 | 3.45 |
| MAX | 25 | 375 | 123 | 150 | 56 | 37 | 70 | 20 | 9.0 | 20 | 6.1 | 7.2 |
| MIN | 2.0 | 1.9 | 3.5 | 4.8 | 5.2 | 5.8 | 5.0 | 3.1 | 2.7 | 2.7 | 2.5 | 2.4 |
| AC-FT | 215 | 1,200 | 1,430 | 1,320 | 967 | 750 | 692 | 338 | 202 | 282 | 218 | 205 |

CAL YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969: TOTAL 3,938.9 MEAN 10.8 MAX 375 MIN 1.9 AC-FT 7,810

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0030 | 5.27 | 872 | 1- 2 | 2000 | 4.93 | 675 |
| 12- 3 | 1400 | 5.07 | 752 | 1- 3 | 0800 | 4.81 | 615 |
| 12- 4 | 0630 | 4.15 | 348 | 1- 8 | Unknown | /5.82 | 1,220 |
| 12-21 | 2300 | 4.60 | 520 | 3-17 | 1800 | 4.04 | 312 |
| 12-25 | 0700 | 4.75 | 588 | | | | |

/ From peak-stage indicator.
NOTE.--No gage-height record Jan. 3-15.

# HAWAII, ISLAND OF MOLOKAI

## 16-4039. Kawainui Stream near Pelekunu

LOCATION.--Lat 21°07'59", long 156°52'38", Molokai, on right bank 900 ft upstream from confluence with Kapuhi Stream, 2.1 miles south of former village of Pelekunu, and 5.7 miles north of Kamalo.
DRAINAGE AREA.--1.17 sq mi.
PERIOD OF RECORD.--August 1968 to current year.
GAGE.--Water-stage recorder. Altitude of gage is 770 ft (from topographic map).
EXTREMES.--August to September 1968: Maximum discharge during period, 39 cfs Sept. 26 (gage height, 2.62 ft); minimum, 0.70 cfs Sept. 22.
Water year 1969: Maximum discharge, 1,630 cfs Jan. 8 (gage height, 7.36 ft), from rating curve extended above 43 cfs; minimum, 0.75 cfs Nov. 22.
REMARKS.--Records fair except those for periods of no gage-height record and those above 90 cfs, which are poor. No diversion above station.

Discharge measurements made prior to beginning of continuous discharge record

Feb. 2, 1968..... 3.8  July 11, 1968..... 2.8  July 11, 1968..... 2.6

DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST TO SEPTEMBER 1968

| DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.2 | 3.6 | 6 | 2.3 | 2.0 | 11 | 1.5 | 1.0 | 16 | 1.3 | 1.1 | 21 | 1.4 | 1.1 | 26 | 1.2 | 11 |
| 2 | 2.1 | 1.4 | 7 | 1.9 | 1.8 | 12 | 4.3 | 1.0 | 17 | 1.3 | .90 | 22 | 1.3 | .75 | 27 | 1.4 | 2.7 |
| 3 | 2.9 | 1.1 | 8 | 1.8 | 1.5 | 13 | 2.1 | .95 | 18 | 1.2 | .95 | 23 | 1.2 | 1.2 | 28 | 1.4 | 2.2 |
| 4 | 7.0 | 1.0 | 9 | 1.7 | 1.0 | 14 | 1.5 | .90 | 19 | 1.2 | 1.1 | 24 | 1.2 | 3.9 | 29 | 1.8 | 3.1 |
| 5 | 3.2 | .95 | 10 | 1.6 | 1.0 | 15 | 1.4 | 1.2 | 20 | 1.2 | .85 | 25 | 1.4 | 2.6 | 30 | 1.1 | 2.2 |
| | | | | | | | | | | | | | | | 31 | 1.4 | |

| | AUG | SEP |
|---|---|---|
| TOTAL | 61.5 | 56.05 |
| MEAN | 1.98 | 1.87 |
| MAX | 7.0 | 11 |
| MIN | 1.1 | .75 |
| AC-FT | 122 | 111 |

PEAK DISCHARGE (BASE, 300 CFS).--No peak above base.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 1.2 | 19 | 6.7 | 38 | 17 | 91 | 5.4 | 2.9 | 3.4 | 2.7 | 7.0 |
| 2 | 8.9 | 1.4 | 10 | 8.9 | 86 | 12 | 44 | 21 | 2.8 | 2.5 | 2.9 | 8.0 |
| 3 | 3.2 | 1.2 | 25 | 33 | 75 | 22 | 19 | 8.4 | 2.7 | 2.1 | 2.5 | 6.0 |
| 4 | 2.5 | 1.1 | 90 | 13 | 27 | 21 | 14 | 6.6 | 3.4 | 2.2 | 2.5 | 4.5 |
| 5 | 3.3 | 1.1 | 36 | 37 | 15 | 14 | 11 | 6.0 | 2.6 | 2.0 | 2.6 | 4.2 |
| 6 | 2.1 | 1.0 | 15 | 16 | 11 | 24 | 48 | 5.8 | 2.5 | 3.0 | 3.0 | 3.6 |
| 7 | 2.0 | 1.0 | 9.3 | 18 | 8.8 | 20 | 17 | 5.6 | 2.3 | 5.4 | 2.7 | 3.3 |
| 8 | 1.9 | 1.0 | 12 | 124 | 7.4 | 14 | 12 | 5.2 | 2.2 | 3.6 | 2.5 | 3.5 |
| 9 | 2.4 | 1.1 | 7.1 | 149 | 6.4 | 13 | 10 | 5.2 | 2.1 | 5.4 | 2.2 | 3.1 |
| 10 | 1.8 | 1.2 | 6.0 | 38 | 5.6 | 9.5 | 9.2 | 4.8 | 10 | 4.8 | 2.3 | 3.5 |
| 11 | 1.8 | 1.0 | 5.4 | 15 | 5.0 | 8.3 | 12 | 5.4 | 13 | 4.0 | 2.7 | 3.1 |
| 12 | 1.8 | 1.0 | 40 | 9.5 | 4.5 | 7.2 | 17 | 5.0 | 5.0 | 3.3 | 2.4 | 2.8 |
| 13 | 1.7 | .95 | 74 | 7.5 | 9.4 | 6.4 | 16 | 4.5 | 4.0 | 3.7 | 8.4 | 3.0 |
| 14 | 1.7 | 1.4 | 27 | 7.2 | 45 | 7.7 | 15 | 20 | 3.2 | 10 | 6.8 | 2.8 |
| 15 | 1.6 | 1.3 | 14 | 7.1 | 37 | 21 | 8.6 | 30 | 2.8 | 5.6 | 11 | 2.6 |
| 16 | 1.5 | 1.2 | 20 | 6.1 | 37 | 44 | 9.0 | 15 | 2.6 | 7.6 | 7.4 | 2.4 |
| 17 | 1.5 | 1.0 | 14 | 4.9 | 21 | 50 | 11 | 7.8 | 2.4 | 5.2 | 12 | 2.8 |
| 18 | 1.5 | .90 | 9.1 | 4.4 | 21 | 40 | 9.8 | 6.8 | 2.2 | 8.0 | 8.0 | 3.5 |
| 19 | 1.4 | .95 | 7.7 | 7.4 | 32 | 22 | 8.8 | 5.6 | 2.0 | 23 | 12 | 3.0 |
| 20 | 2.8 | 1.0 | 17 | 4.8 | 19 | 14 | 22 | 5.2 | 1.9 | 14 | 7.4 | 5.0 |
| 21 | 2.0 | .90 | 23 | 4.4 | 14 | 11 | 12 | 4.7 | 1.8 | 8.6 | 6.0 | 9.0 |
| 22 | 1.7 | .80 | 31 | 4.6 | 13 | 9.0 | 10 | 4.2 | 2.2 | 7.0 | 5.6 | 5.0 |
| 23 | 2.8 | 1.1 | 14 | 5.0 | 11 | 7.4 | 9.0 | 3.9 | 1.8 | 5.4 | 5.2 | 4.0 |
| 24 | 2.1 | 7.3 | 8.8 | 6.4 | 12 | 15 | 8.0 | 3.5 | 1.6 | 4.7 | 4.8 | 5.0 |
| 25 | 1.8 | 3.8 | 73 | 6.2 | 30 | 22 | 7.4 | 6.9 | 1.5 | 4.3 | 8.5 | 3.5 |
| 26 | 1.7 | 1.5 | 39 | 4.7 | 24 | 13 | 6.4 | 7.3 | 1.4 | 4.0 | 7.2 | 4.5 |
| 27 | 1.5 | 1.2 | 15 | 4.2 | 14 | 10 | 7.2 | 5.4 | 1.4 | 3.7 | 7.6 | 3.7 |
| 28 | 1.5 | 94 | 19 | 3.9 | 11 | 8.3 | 6.2 | 3.8 | 1.8 | 3.3 | 5.0 | 3.7 |
| 29 | 1.9 | 296 | 14 | 15 | ------ | 7.2 | 9.4 | 3.3 | 2.2 | 3.0 | 4.9 | 5.4 |
| 30 | 2.3 | 54 | 9.1 | 18 | ------ | 7.1 | 7.0 | 3.0 | 7.7 | 2.8 | 5.2 | 4.5 |
| 31 | 1.4 | ------ | 7.4 | 11 | ------ | 12 | ------ | 2.9 | ------ | 2.6 | 8.0 | ------ |
| TOTAL | 68.1 | 482.60 | 710.9 | 600.9 | 640.1 | 509.1 | 487.0 | 228.2 | 96.0 | 168.2 | 172.0 | 126.0 |
| MEAN | 2.20 | 16.1 | 22.9 | 19.4 | 22.9 | 16.4 | 16.2 | 7.36 | 3.20 | 5.43 | 5.55 | 4.20 |
| MAX | 8.9 | 296 | 90 | 149 | 86 | 50 | 91 | 21 | 13 | 23 | 12 | 9.0 |
| MIN | 1.4 | .80 | 5.4 | 3.9 | 4.5 | 6.4 | 6.2 | 2.9 | 1.4 | 2.0 | 2.2 | 2.4 |
| AC-FT | 135 | 957 | 1410 | 1190 | 1270 | 1010 | 966 | 453 | 190 | 334 | 341 | 250 |

CAL YR 1968: TOTAL - MEAN - MAX - MIN. - AC-FT -
WTR YR 1969: TOTAL 4,289.10 MEAN 11.8 MAX 296 MIN .80 AC-FT 8,510

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0330 | 4.97 | 550 | 1-8 | 2400 | 7.36 | 1,630 |
| 12-25 | 0700 | 4.18 | 305 | | | | |

NOTE.--No gage-height record Apr. 8 to May 22, July 5 to Aug. 21, Aug. 28 to Sept. 30.

## 16-4042. Pilipililau Stream near Pelekunu

LOCATION.--Lat 21°08'08", long 156°53'09", Molokai, on right bank 500 ft downstream from unnamed tributary, 1.9 miles south of former village of Pelekunu, and 5.8 miles north of Kamalo.
DRAINAGE AREA.--0.49 sq mi.
PERIOD OF RECORD.--August 1968 to current year.
GAGE.--Water-stage recorder. Altitude of gage is 1,000 ft (from topographic map).
EXTREMES.--August to September 1968: Maximum discharge during period, 3.8 cfs Aug. 4 (gage height, 1.85 ft); minimum, 0.59 cfs Sept. 23.
Water year 1969: Maximum discharge, 168 cfs Nov. 28 (gage height, 3.41 ft), from rating curve extended above 3.8 cfs; minimum, 0.53 cfs Nov. 22.
REMARKS.--Records good except those above 8 cfs, which are poor.

Discharge measurements made prior to beginning of continuous discharge record

Feb. 2, 1968..... 1.6 July 17, 1968..... 0.80

DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST TO SEPTEMBER 1968

| DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP | DAY | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .84 | .84 | 6 | .84 | .71 | 11 | .77 | .65 | 16 | .71 | .65 | 21 | .71 | .62 | 26 | .71 | 1.4 |
| 2 | .80 | .71 | 7 | .80 | .77 | 12 | .84 | .65 | 17 | .71 | .65 | 22 | .71 | .62 | 27 | .71 | 1.0 |
| 3 | .88 | .71 | 8 | .80 | .68 | 13 | .80 | .65 | 18 | .71 | .68 | 23 | .71 | .60 | 28 | .71 | .88 |
| 4 | 1.4 | .68 | 9 | .80 | .65 | 14 | .77 | .65 | 19 | .71 | .65 | 24 | .71 | 1.1 | 29 | .77 | 1.1 |
| 5 | .88 | .68 | 10 | .80 | .65 | 15 | .77 | .68 | 20 | .71 | .65 | 25 | .71 | 1.0 | 30 | .71 | .88 |
| | | | | | | | | | | | | | | | 31 | .80 | |

| | AUG | SEP |
|---|---|---|
| TOTAL | 24.30 | 22.84 |
| MEAN | .78 | .76 |
| MAX | 1.4 | 1.4 |
| MIN | .71 | .60 |
| AC-FT | 48 | 45 |

PEAK DISCHARGE (BASE, 80 CFS).--No peak above base.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .90 | .65 | 1.9 | 2.1 | 5.8 | 3.1 | 10 | 1.9 | 1.4 | 1.2 | 1.0 | 1.0 |
| 2 | 7.0 | .65 | 1.7 | 2.6 | 9.2 | 2.5 | 5.5 | 3.6 | 1.4 | 1.1 | 1.0 | 1.1 |
| 3 | 2.0 | .62 | 7.4 | 7.4 | 11 | 3.4 | 3.4 | 1.9 | 1.4 | 1.1 | 1.0 | 1.0 |
| 4 | 1.5 | .62 | 13 | 3.5 | 5.3 | 2.5 | 3.1 | 1.8 | 1.4 | 1.1 | 1.0 | 1.0 |
| 5 | 1.1 | .62 | 3.8 | 7.9 | 4.0 | 2.3 | 2.8 | 1.7 | 1.4 | 1.1 | 1.0 | .96 |
| 6 | 1.0 | .62 | 2.5 | 5.4 | 3.3 | 3.4 | 6.3 | 1.7 | 1.3 | 1.3 | 1.0 | .96 |
| 7 | .88 | .59 | 2.0 | 4.5 | 2.8 | 2.5 | 3.4 | 1.6 | 1.3 | 1.3 | 1.0 | .92 |
| 8 | .82 | .59 | 2.1 | 18 | 2.5 | 2.3 | 3.0 | 1.6 | 1.3 | 1.1 | .96 | .92 |
| 9 | .96 | .59 | 1.9 | 21 | 2.4 | 2.3 | 2.8 | 1.6 | 1.3 | 1.2 | .96 | .92 |
| 10 | .84 | .59 | 1.5 | 11 | 2.3 | 2.1 | 2.7 | 1.5 | 1.8 | 1.2 | .96 | .92 |
| 11 | .80 | .59 | 1.4 | 5.0 | 2.2 | 2.0 | 2.7 | 1.6 | 1.7 | 1.1 | .92 | .88 |
| 12 | .78 | .56 | 4.9 | 3.5 | 2.1 | 1.9 | 3.6 | 1.6 | 1.4 | 1.1 | .96 | .88 |
| 13 | .76 | .56 | 9.8 | 3.0 | 4.3 | 1.9 | 2.7 | 1.6 | 1.4 | 1.1 | 1.1 | .92 |
| 14 | .73 | .71 | 3.3 | 2.7 | 4.9 | 2.6 | 2.7 | 4.5 | 1.3 | 1.6 | 1.1 | .88 |
| 15 | .71 | .62 | 2.4 | 2.5 | 3.8 | 4.7 | 2.3 | 5.3 | 1.3 | 1.2 | 1.3 | .84 |
| 16 | .70 | .70 | 2.6 | 2.4 | 5.1 | 6.4 | 2.3 | 2.2 | 1.3 | 1.2 | 1.0 | .84 |
| 17 | .69 | .59 | 2.5 | 2.1 | 3.6 | 7.0 | 2.3 | 1.9 | 1.2 | 1.1 | 1.1 | .84 |
| 18 | .68 | .56 | 2.1 | 2.0 | 3.6 | 5.3 | 2.3 | 1.8 | 1.2 | 1.2 | 1.2 | .84 |
| 19 | .68 | .56 | 2.4 | 3.1 | 4.8 | 3.8 | 2.3 | 1.7 | 1.2 | 2.0 | 1.1 | .84 |
| 20 | 1.0 | .56 | 3.5 | 2.1 | 3.6 | 3.1 | 3.3 | 1.7 | 1.2 | 1.4 | 1.0 | .88 |
| 21 | .80 | .56 | 4.9 | 1.9 | 3.0 | 2.8 | 2.4 | 1.7 | 1.2 | 1.2 | .96 | 1.0 |
| 22 | .70 | .56 | 6.4 | 2.0 | 2.8 | 2.5 | 2.4 | 1.7 | 1.2 | 1.1 | .92 | .88 |
| 23 | .65 | .56 | 2.8 | 2.0 | 2.4 | 2.4 | 2.1 | 1.6 | 1.1 | 1.1 | .88 | .88 |
| 24 | .65 | .89 | 2.3 | 3.0 | 2.7 | 3.4 | 2.0 | 1.6 | 1.1 | 1.1 | .88 | .92 |
| 25 | .65 | .65 | 10 | 2.7 | 4.9 | 3.8 | 2.0 | 1.7 | 1.1 | 1.1 | 1.0 | .84 |
| 26 | .65 | .56 | 6.0 | 1.9 | 3.6 | 2.5 | 1.9 | 1.7 | 1.1 | 1.1 | .96 | .92 |
| 27 | .65 | .56 | 3.5 | 1.9 | 2.7 | 2.3 | 1.9 | 1.6 | 1.1 | 1.0 | 1.0 | .84 |
| 28 | .65 | 13 | 4.6 | 1.8 | 2.7 | 2.2 | 1.9 | 1.5 | 1.2 | 1.0 | .92 | .84 |
| 29 | .68 | 32 | 3.5 | 4.0 | ------ | 2.1 | 2.1 | 1.4 | 1.2 | 1.0 | .92 | .96 |
| 30 | .65 | 4.1 | 2.6 | 3.9 | ------ | 2.1 | 1.9 | 1.4 | 1.4 | 1.0 | 1.0 | .84 |
| 31 | .65 | ------ | 2.1 | 2.5 | ------ | 2.3 | ------ | 1.4 | ------ | 1.1 | 1.1 | ------ |
| TOTAL | 31.91 | 65.59 | 121.4 | 139.4 | 111.4 | 93.5 | 90.1 | 60.1 | 38.9 | 36.5 | 31.20 | 27.26 |
| MEAN | 1.03 | 2.19 | 3.92 | 4.50 | 3.98 | 3.02 | 3.00 | 1.94 | 1.30 | 1.18 | 1.01 | .91 |
| MAX | 7.0 | 32 | 13 | 21 | 11 | 7.0 | 10 | 5.3 | 1.8 | 2.0 | 1.3 | 1.1 |
| MIN | .65 | .56 | 1.4 | 1.8 | 2.1 | 1.9 | 1.9 | 1.4 | 1.1 | 1.0 | .88 | .84 |
| AC-FT | 63 | 130 | 241 | 276 | 221 | 185 | 179 | 119 | 77 | 72 | 62 | 54 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 847.26 | MEAN | 2.32 | MAX | 32 | MIN | .56 | AC-FT | 1,680 | | |

PEAK DISCHARGE (BASE, 80 CFS).--Nov. 28 (2400) 168 cfs (3.41 ft); Jan. 8 (time unknown) 131 cfs (3.23 ft, from recorded range in stage).

## 16-4051. Molokai tunnel at east portal

LOCATION.--Lat 21°08'38", long 156°55'16", Molokai, on left bank 100 ft downstream from the east portal, 5.3 miles southeast of Kalaupapa, and 7.5 miles northeast of Kaunakakai.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (from tunnel plans).

EXTREMES.--Period of record: Maximum daily discharge, 14 cfs July 19, 1969; no flow for many days each year.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells in Waikolu Valley near the east portal and one well in the tunnel slightly below the station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.8 | 1.8 | 2.6 | 2.4 | .01 | 0 | 9.4 | 3.0 | 2.4 | 4.2 | 3.6 | 7.3 |
| 2 | 12 | 1.4 | 2.8 | 3.8 | .01 | 0 | 12 | 2.0 | 2.4 | 3.0 | 2.6 | 6.6 |
| 3 | 9.2 | 1.4 | 2.2 | 9.5 | 2.0 | .02 | 4.4 | .20 | 2.4 | 2.5 | 3.2 | 5.2 |
| 4 | 3.0 | 1.4 | 1.4 | 6.8 | .01 | .85 | 4.4 | .20 | 2.5 | 2.2 | 3.2 | 3.6 |
| 5 | .74 | 1.3 | 1.2 | 8.3 | .01 | 1.1 | 4.6 | 2.3 | 2.4 | 2.2 | 3.0 | 4.2 |
| 6 | .54 | 1.3 | 1.9 | 5.0 | .01 | 3.4 | 9.5 | 2.8 | 2.4 | 4.0 | 3.6 | 3.0 |
| 7 | 1.4 | 1.9 | 1.8 | 5.0 | .01 | 1.2 | 5.5 | 2.6 | 2.2 | 8.3 | 5.2 | 2.4 |
| 8 | .97 | 1.9 | 2.2 | 9.2 | .01 | 0 | 4.0 | 2.6 | 2.2 | 4.6 | 3.6 | 2.6 |
| 9 | 1.1 | 1.9 | 3.0 | 8.6 | .01 | 0 | 3.8 | 2.6 | 2.2 | 5.2 | 2.4 | 2.6 |
| 10 | 1.4 | 1.9 | 1.9 | 2.9 | .08 | .06 | 3.6 | 2.6 | 4.7 | 7.9 | 3.0 | 2.8 |
| 11 | 1.4 | 1.3 | 1.5 | .01 | 0 | 0 | 6.6 | 2.8 | 11 | 4.2 | 3.0 | 3.2 |
| 12 | 1.4 | 1.8 | 2.7 | .01 | 0 | 0 | 7.6 | 3.0 | 4.0 | 3.0 | 3.0 | 3.2 |
| 13 | 1.4 | 1.8 | 2.4 | .03 | 0 | 0 | 5.5 | 2.6 | 2.8 | 2.6 | 7.8 | 2.2 |
| 14 | 1.5 | 2.0 | 1.3 | .01 | 0 | 0 | 6.6 | 4.7 | 2.5 | 9.5 | 7.0 | 2.2 |
| 15 | 1.3 | 1.4 | 1.3 | .01 | 0 | 0 | 3.6 | 10 | 2.4 | 7.0 | 10 | 2.8 |
| 16 | 1.3 | 2.0 | 2.2 | .01 | 0 | 0 | 4.2 | 4.0 | 2.2 | 6.0 | 5.0 | 2.6 |
| 17 | 1.3 | 1.6 | 3.8 | .01 | .04 | .03 | 5.0 | 3.2 | 2.2 | 6.6 | 7.9 | 3.2 |
| 18 | 1.5 | 1.4 | 1.9 | 0 | 0 | 0 | 5.0 | 2.8 | 2.0 | 6.0 | 7.6 | 4.0 |
| 19 | 1.3 | 1.3 | 1.5 | 0 | 0 | .26 | 4.2 | 2.6 | 2.0 | 14 | 4.4 | 3.6 |
| 20 | 7.4 | 1.3 | 1.1 | .81 | 0 | .48 | 7.9 | 2.6 | 2.0 | 9.5 | 3.8 | 5.2 |
| 21 | 2.4 | 1.2 | 1.1 | 1.1 | 0 | .42 | 5.5 | 2.5 | 2.0 | 4.6 | 3.8 | 9.5 |
| 22 | 4.2 | 1.2 | .99 | 1.6 | 0 | .36 | 6.0 | 2.6 | 2.0 | 3.4 | 2.5 | 4.4 |
| 23 | 1.8 | 1.2 | 1.9 | 2.8 | 0 | .31 | 3.8 | 2.4 | 2.0 | 4.0 | 2.4 | 3.0 |
| 24 | 1.6 | 3.0 | 1.5 | 1.7 | .10 | .42 | 3.0 | 2.4 | 1.9 | 4.0 | 2.2 | 5.2 |
| 25 | 1.5 | 6.0 | 1.1 | 3.1 | 0 | .36 | 2.8 | 3.2 | 1.9 | 4.0 | 4.2 | 3.2 |
| 26 | 1.4 | 2.2 | 2.5 | .82 | 0 | .31 | 2.6 | 5.0 | 1.9 | 3.8 | 5.0 | 5.2 |
| 27 | 1.4 | 1.8 | 1.8 | .60 | 0 | .31 | 2.8 | 4.4 | 1.9 | 2.6 | 6.0 | 4.6 |
| 28 | 1.5 | 4.3 | .01 | .27 | 0 | .04 | 2.8 | 3.2 | 1.9 | 2.4 | 4.0 | 3.0 |
| 29 | 1.4 | 5.2 | .01 | 1.7 | ------ | 0 | 4.0 | 2.6 | 1.9 | 3.0 | 3.4 | 6.2 |
| 30 | 1.8 | 4.0 | 2.3 | 3.6 | ------ | 0 | 4.6 | 2.5 | 4.6 | 3.0 | 4.0 | 4.4 |
| 31 | 1.5 | ------ | 2.6 | 1.6 | ------ | 0 | ------ | 2.4 | ------ | 3.4 | 8.9 | ------ |
| TOTAL | 72.45 | 62.2 | 56.51 | 81.29 | 2.30 | 9.93 | 155.3 | 92.40 | 80.9 | 150.7 | 139.3 | 121.2 |
| MEAN | 2.34 | 2.07 | 1.82 | 2.62 | .082 | .32 | 5.18 | 2.98 | 2.70 | 4.86 | 4.49 | 4.04 |
| MAX | 12 | 6.0 | 3.8 | 9.5 | 2.0 | 3.4 | 12 | 10 | 11 | 14 | 10 | 9.5 |
| MIN | .54 | 1.2 | .01 | 0 | 0 | 0 | 2.6 | .20 | 1.9 | 2.2 | 2.2 | 2.2 |
| AC-FT | 144 | 123 | 112 | 161 | 4.6 | 20 | 308 | 183 | 160 | 299 | 276 | 240 |

CAL YR 1968: TOTAL 564.27 MEAN 1.54 MAX 13 MIN 0 AC-FT 1,120
WTR YR 1969: TOTAL 1,024.48 MEAN 2.81 MAX 14 MIN 0 AC-FT 2,030

## 16-4053. Molokai tunnel at west portal

LOCATION.--Lat 21°07'27", long 156°59'50", Molokai, on left bank 50 ft upstream from the west portal, 2.5 miles northeast of Kaunakakai, and 4.7 miles south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from tunnel plans).

EXTREMES.--Period of record: Maximum daily discharge, 18 cfs July 19, 1969; minimum daily, 1.8 cfs Oct. 15, 1967.

REMARKS.--Records excellent. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.0 | 5.0 | 6.1 | 5.6 | 3.3 | 3.9 | 11 | 6.9 | 6.3 | 8.8 | 7.7 | 11 |
| 2 | 14 | 4.6 | 5.6 | 6.2 | 3.3 | 3.9 | 16 | 5.9 | 6.3 | 7.4 | 6.9 | 11 |
| 3 | 13 | 4.6 | 5.6 | 12 | 5.2 | 4.1 | 8.0 | 3.9 | 6.3 | 6.9 | 7.4 | 8.5 |
| 4 | 7.1 | 4.8 | 4.6 | 10 | 3.5 | 4.3 | 7.7 | 3.9 | 6.1 | 6.6 | 7.2 | 7.2 |
| 5 | 4.1 | 4.6 | 4.3 | 11 | 3.5 | 5.0 | 8.2 | 5.6 | 6.1 | 6.3 | 6.9 | 8.0 |
| 6 | 3.9 | 4.6 | 5.0 | 8.5 | 3.5 | 6.7 | 13 | 6.6 | 6.1 | 7.7 | 7.4 | 6.6 |
| 7 | 4.3 | 5.3 | 5.0 | 8.0 | 3.5 | 5.8 | 9.4 | 6.6 | 6.1 | 13 | 9.7 | 5.8 |
| 8 | 4.1 | 5.3 | 4.8 | 12 | 3.5 | 3.7 | 7.7 | 6.3 | 6.1 | 9.1 | 8.0 | 6.1 |
| 9 | 4.1 | 5.3 | 6.3 | 11 | 3.5 | 3.7 | 7.4 | 6.3 | 6.3 | 9.1 | 6.3 | 6.1 |
| 10 | 4.6 | 5.3 | 4.8 | 7.0 | 3.9 | 3.9 | 7.4 | 6.3 | 7.4 | 12 | 6.9 | 6.3 |
| 11 | 4.6 | 4.6 | 4.6 | 3.1 | 3.5 | 3.7 | 10 | 6.3 | 15 | 8.5 | 6.9 | 6.3 |
| 12 | 4.6 | 5.3 | 5.3 | 3.1 | 3.5 | 3.5 | 11 | 6.6 | 8.2 | 7.4 | 7.2 | 6.3 |
| 13 | 4.6 | 5.3 | 5.8 | 3.3 | 3.5 | 3.5 | 9.1 | 6.1 | 7.2 | 6.9 | 10 | 5.6 |
| 14 | 4.8 | 5.5 | 4.3 | 3.1 | 3.5 | 3.5 | 10 | 7.6 | 6.6 | 13 | 12 | 5.6 |
| 15 | 4.6 | 4.6 | 4.3 | 3.1 | 3.5 | 3.5 | 7.4 | 14 | 6.3 | 12 | 14 | 6.1 |
| 16 | 4.6 | 5.0 | 4.8 | 3.1 | 3.5 | 3.5 | 7.7 | 8.0 | 6.3 | 10 | 9.4 | 5.8 |
| 17 | 4.6 | 4.8 | 6.6 | 3.1 | 3.9 | 3.7 | 9.1 | 7.2 | 6.1 | 11 | 11 | 6.6 |
| 18 | 4.8 | 4.6 | 5.1 | 3.3 | 3.7 | 3.5 | 9.1 | 6.9 | 6.1 | 9.1 | 12 | 6.9 |
| 19 | 4.6 | 4.6 | 4.3 | 3.3 | 3.7 | 3.7 | 7.7 | 6.6 | 6.1 | 18 | 8.5 | 7.4 |
| 20 | 10 | 4.6 | 4.1 | 3.9 | 3.7 | 3.9 | 12 | 6.3 | 5.8 | 14 | 7.4 | 8.6 |
| 21 | 5.8 | 4.6 | 4.1 | 4.3 | 3.5 | 3.9 | 9.4 | 6.3 | 5.8 | 9.4 | 8.0 | 12 |
| 22 | 7.1 | 4.6 | 4.1 | 4.5 | 3.5 | 3.9 | 10 | 6.3 | 5.8 | 7.7 | 6.6 | 9.2 |
| 23 | 4.6 | 4.6 | 4.8 | 6.3 | 3.7 | 3.7 | 8.0 | 6.3 | 5.8 | 8.0 | 6.3 | 6.3 |
| 24 | 4.8 | 5.0 | 4.8 | 4.8 | 3.9 | 3.9 | 6.9 | 6.3 | 5.8 | 8.5 | 6.1 | 8.2 |
| 25 | 4.6 | 10 | 4.1 | 6.6 | 3.7 | 3.9 | 6.6 | 7.2 | 5.8 | 8.2 | 7.4 | 6.6 |
| 26 | 4.3 | 5.8 | 5.4 | 4.1 | 3.9 | 3.9 | 6.6 | 9.1 | 5.8 | 8.0 | 8.8 | 7.6 |
| 27 | 4.3 | 5.0 | 5.3 | 4.1 | 3.9 | 3.7 | 6.6 | 8.8 | 5.8 | 7.2 | 10 | 8.5 |
| 28 | 4.8 | 6.2 | 3.3 | 3.5 | 3.9 | 3.7 | 6.6 | 7.4 | 5.8 | 6.6 | 8.2 | 6.1 |
| 29 | 4.3 | 9.8 | 3.3 | 4.4 | ------ | 3.5 | 7.2 | 6.9 | 6.1 | 7.4 | 7.2 | 8.7 |
| 30 | 4.8 | 7.2 | 5.3 | 6.6 | ------ | 3.5 | 9.1 | 6.6 | 8.0 | 7.4 | 7.2 | 8.5 |
| 31 | 4.6 | ------ | 5.8 | 5.5 | ------ | 3.5 | ------ | 6.6 | ------ | 7.4 | 12 | ------ |
| TOTAL | 170.0 | 161.1 | 151.6 | 178.4 | 102.7 | 122.1 | 265.9 | 211.7 | 197.3 | 282.6 | 260.6 | 223.5 |
| MEAN | 5.48 | 5.37 | 4.89 | 5.75 | 3.67 | 3.94 | 8.86 | 6.83 | 6.58 | 9.12 | 8.41 | 7.45 |
| MAX | 14 | 10 | 6.6 | 12 | 5.2 | 6.7 | 16 | 14 | 15 | 18 | 14 | 12 |
| MIN | 4.1 | 4.6 | 3.3 | 3.1 | 3.3 | 3.5 | 6.6 | 3.9 | 5.8 | 6.3 | 6.1 | 5.6 |
| AC-FT | 337 | 320 | 301 | 354 | 204 | 242 | 527 | 420 | 391 | 561 | 517 | 443 |

CAL YR 1968: TOTAL 1,674.3 MEAN 4.57 MAX 16 MIN 2.2 AC-FT 3,320
WTR YR 1969: TOTAL 2,327.5 MEAN 6.38 MAX 18 MIN 3.1 AC-FT 4,620

## 16-4055. Waikolu Stream at altitude 900 ft, near Kalaupapa

LOCATION.--Lat 21°08'43", long 156°55'18", Molokai, on right bank 1.8 miles southwest of Haupu Bay, 2.3 miles upstream from mouth, and 5.2 miles southeast of Kalaupapa.

DRAINAGE AREA.--1.99 sq mi.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

EXTREMES.--Current year: Maximum discharge, 1,680 cfs Nov. 28 (gage height, 5.62 ft), from rating curve extended above 43 cfs; minimum, 0.90 cfs Nov. 9, 10.
Period of record: Maximum discharge, 2,080 cfs (revised) Apr. 13, 1965 (gage height, 6.12 ft), from rating curve extended above 43 cfs; minimum, 0.34 cfs Oct. 20, 1967.
Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum (discharge, 6,220 cfs, by slope-area measurement).
REVISIONS.--The maximum discharge for the water year 1965 has been revised to 2,080 cfs Apr. 13, 1965 (gage height, 6.12 ft), superseding figure published in WSP 1937.

REMARKS.--Records fair except those for period of no gage-height record and those above 90 cfs, which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

REVISIONS (FISCAL YEAR).--WSP 1719: 1959.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | 1.1 | 3.6 | 1.9 | 70 | 23 | 107 | 3.0 | 1.9 | 1.7 | 1.3 | 1.6 |
| 2 | 65 | 1.1 | 1.9 | 11 | 92 | 11 | 28 | 25 | 1.9 | 1.7 | 1.5 | 1.5 |
| 3 | 7.4 | 1.1 | 60 | 64 | 110 | 26 | 4.6 | 7.1 | 1.9 | 1.7 | 1.3 | 1.4 |
| 4 | 2.8 | 1.1 | 173 | 6.7 | 14 | 10 | 7.1 | 5.4 | 1.9 | 1.5 | 1.3 | 1.4 |
| 5 | 1.7 | 1.1 | 17 | 24 | 7.1 | 5.8 | 8.5 | 2.4 | 1.9 | 1.5 | 1.3 | 1.4 |
| 6 | 1.6 | 1.1 | 5.4 | 3.9 | 58 | 16 | 52 | 1.7 | 1.9 | 1.9 | 1.5 | 1.4 |
| 7 | 1.4 | 1.1 | 2.7 | 6.2 | 5.4 | 12 | 7.6 | 1.7 | 1.9 | 3.6 | 1.7 | 1.4 |
| 8 | 1.4 | 1.1 | 5.6 | 20 | 5.0 | 7.1 | 5.0 | 1.7 | 1.9 | 1.9 | 1.3 | 1.4 |
| 9 | 1.5 | 1.1 | 4.6 | 80 | 4.6 | 7.6 | 3.6 | 1.7 | 1.9 | 2.7 | 1.3 | 1.3 |
| 10 | 1.3 | 1.1 | 2.1 | 18 | 4.3 | 5.8 | 3.3 | 1.7 | 8.7 | 3.6 | 1.3 | 1.3 |
| 11 | 1.3 | 1.1 | 1.9 | 5.4 | 4.3 | 5.4 | 11 | 1.7 | 13 | 1.7 | 1.1 | 1.3 |
| 12 | 1.3 | 1.1 | 112 | 5.0 | 4.3 | 5.0 | 26 | 1.9 | 2.1 | 1.5 | 1.3 | 1.3 |
| 13 | 1.3 | 1.1 | 100 | 4.8 | 53 | 4.6 | 7.6 | 1.9 | 2.1 | 1.5 | 5.7 | 1.3 |
| 14 | 1.2 | 1.1 | 12 | 4.8 | 67 | 12 | 8.1 | 37 | 2.1 | 16 | 3.9 | 1.3 |
| 15 | 1.2 | 1.1 | 5.8 | 5.0 | 57 | 48 | 3.3 | 52 | 2.1 | 3.9 | 12 | 1.3 |
| 16 | 1.2 | 1.1 | 11 | 5.4 | 42 | 55 | 3.9 | 5.4 | 1.9 | 3.3 | 1.9 | 1.3 |
| 17 | 1.2 | 1.1 | 8.9 | 5.0 | 18 | 82 | 6.7 | 2.7 | 1.9 | 2.7 | 2.5 | 1.3 |
| 18 | 1.2 | 1.1 | 7.1 | 4.6 | 29 | 47 | 6.2 | 2.1 | 1.9 | 3.9 | 3.8 | 1.3 |
| 19 | 1.2 | 1.1 | 17 | 19 | 41 | 13 | 6.8 | 2.1 | 1.9 | 20 | 1.4 | 1.3 |
| 20 | 2.0 | 1.1 | 33 | 5.4 | 22 | 7.1 | 23 | 1.9 | 1.9 | 5.4 | 1.3 | 1.3 |
| 21 | 1.3 | 1.1 | 52 | 5.0 | 12 | 5.8 | 8.6 | 2.1 | 1.9 | 1.7 | 1.2 | 1.8 |
| 22 | 2.0 | 1.1 | 31 | 6.3 | 16 | 5.0 | 13 | 1.9 | 1.9 | 1.9 | 1.4 | 1.9 |
| 23 | 1.3 | 1.1 | 5.4 | 11 | 13 | 5.0 | 3.9 | 1.9 | 1.7 | 1.5 | 1.3 | 1.3 |
| 24 | 1.2 | 8.4 | 3.9 | 19 | 15 | 34 | 2.7 | 1.9 | 1.7 | 1.7 | 1.4 | 2.4 |
| 25 | 1.1 | 2.9 | 93 | 15 | 52 | 36 | 2.4 | 2.4 | 1.7 | 1.7 | 1.7 | 1.3 |
| 26 | 1.1 | 1.1 | 8.4 | 5.4 | 28 | 11 | 2.1 | 5.8 | 1.7 | 1.5 | 1.4 | 3.3 |
| 27 | 1.1 | 1.1 | 3.6 | 4.3 | 9.1 | 8.6 | 2.1 | 3.9 | 1.7 | 1.5 | 1.3 | 2.1 |
| 28 | 1.1 | 170 | 16 | 3.9 | 9.7 | 6.2 | 2.1 | 2.1 | 1.7 | 1.5 | 1.3 | 1.3 |
| 29 | 1.1 | 313 | 20 | 38 | ------ | 5.8 | 6.5 | 1.9 | 1.7 | 1.3 | 1.3 | 4.4 |
| 30 | 1.1 | 26 | 3.8 | 33 | ------ | 7.1 | 7.1 | 1.9 | 1.9 | 1.3 | 1.4 | 2.1 |
| 31 | 1.1 | ------ | 2.1 | 16 | ------ | 14 | ------ | 1.9 | ------ | 1.3 | 1.7 | ------ |
| TOTAL | 111.8 | 547.8 | 923.8 | 457.0 | 810.6 | 541.9 | 379.8 | 187.8 | 74.3 | 98.6 | 64.1 | 49.0 |
| MEAN | 3.61 | 18.3 | 26.6 | 14.7 | 29.0 | 17.5 | 12.7 | 6.06 | 2.48 | 3.18 | 2.07 | 1.63 |
| MAX | 65 | 313 | 173 | 80 | 110 | 82 | 107 | 52 | 13 | 20 | 12 | 4.4 |
| MIN | 1.1 | 1.1 | 1.9 | 1.9 | 4.3 | 4.6 | 2.1 | 1.7 | 1.7 | 1.3 | 1.1 | 1.3 |
| AC-FT | 222 | 1,090 | 1,630 | 906 | 1,610 | 1,070 | 753 | 373 | 147 | 196 | 127 | 97 |

CAL YR 1968: TOTAL 4,019.62 MEAN 11.0 MAX 313 MIN .98 AC-FT 7,970
WTR YR 1969: TOTAL 4,146.5 MEAN 11.4 MAX 313 MIN 1.1 AC-FT 8,220

PEAK DISCHARGE (BASE, 570 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 2 | /0200 | ≠3.83 | 581 | 12- 4 | 0600 | 3.99 | 655 |
| 11-28 | 2300 | 5.62 | 1,680 | 1- 3 | 0600 | 4.17 | 745 |
| 12- 3 | 1300 | 4.13 | 725 | 1- 9 | /0030 | ≠3.93 | 625 |

/ About.
≠ From recorded range in stage.
NOTE.--No gage-height record Aug. 17 to Sept. 21.

## 16-4080. Waikolu Stream below pipeline crossing, near Kalaupapa

LOCATION.--Lat 21°09'45", long 156°55'54", Molokai, on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 sq mi.

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

EXTREMES.--Current year: Maximum discharge, 450 cfs Nov. 28 (gage height, 3.70 ft), from rating curve extended as explained below; minimum, 6.8 cfs several days in November.
Period of record: Maximum discharge, 6,600 cfs Oct. 31, 1961 (gage height, 13.75 ft, present datum, from floodmarks), from ratiug curve extended above 39 cfs on basis of slope-area measurement of peak flow; minimum, 2.0 cfs Nov. 1, 2, 1925, Juue 5, 1926.

REMARKS.--Records fair. Since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.5 | 7.3 | 11 | 13 | 73 | 31 | 135 | 20 | 18 | 16 | 12 | 14 |
| 2 | 81 | 7.3 | 10 | 17 | 99 | 26 | 56 | 41 | 18 | 15 | 12 | 13 |
| 3 | 14 | 7.3 | 53 | 66 | 134 | 33 | 24 | 23 | 18 | 15 | 12 | 12 |
| 4 | 10 | 7.3 | 156 | 20 | 29 | 21 | 27 | 21 | 18 | 15 | 12 | 11 |
| 5 | 10 | 7.3 | 29 | 34 | 19 | 18 | 26 | 19 | 18 | 15 | 12 | 11 |
| 6 | 9.3 | 7.3 | 15 | 16 | 16 | 29 | 66 | 18 | 17 | 15 | 13 | 11 |
| 7 | 8.7 | 7.1 | 13 | 16 | 16 | 21 | 26 | 18 | 17 | 17 | 13 | 11 |
| 8 | 8.5 | 7.1 | 14 | 41 | 15 | 19 | 22 | 18 | 16 | 15 | 12 | 10 |
| 9 | 8.9 | 7.1 | 13 | 90 | 15 | 19 | 20 | 17 | 16 | 16 | 12 | 10 |
| 10 | 8.3 | 7.0 | 12 | 24 | 14 | 17 | 20 | 17 | 27 | 16 | 12 | 10 |
| 11 | 8.3 | 7.0 | 11 | 16 | 14 | 16 | 30 | 18 | 34 | 15 | 11 | 10 |
| 12 | 8.1 | 7.0 | 79 | 14 | 14 | 16 | 55 | 18 | 18 | 15 | 11 | 9.8 |
| 13 | 8.0 | 7.0 | 144 | 14 | 91 | 16 | 26 | 18 | 18 | 15 | 14 | 9.8 |
| 14 | 7.9 | 7.1 | 26 | 14 | 106 | 28 | 26 | 57 | 17 | 25 | 14 | 9.8 |
| 15 | 7.9 | 7.0 | 16 | 15 | 96 | 68 | 21 | 102 | 17 | 16 | 20 | 9.8 |
| 16 | 7.8 | 7.1 | 18 | 16 | 63 | 107 | 21 | 29 | 16 | 16 | 12 | 9.6 |
| 17 | 7.8 | 7.0 | 19 | 14 | 33 | 132 | 23 | 22 | 16 | 15 | 13 | 9.6 |
| 18 | 7.6 | 7.0 | 16 | 13 | 42 | 87 | 22 | 21 | 16 | 15 | 17 | 9.6 |
| 19 | 7.6 | 7.0 | 23 | 25 | 45 | 34 | 38 | 20 | 16 | 34 | 12 | 9.3 |
| 20 | 10 | 7.0 | 39 | 14 | 29 | 25 | 52 | 19 | 16 | 18 | 12 | 9.6 |
| 21 | 8.0 | 7.0 | 48 | 13 | 24 | 23 | 30 | 19 | 16 | 14 | 11 | 15 |
| 22 | 9.5 | 6.8 | 54 | 14 | 27 | 21 | 45 | 19 | 16 | 14 | 11 | 11 |
| 23 | 8.0 | 6.8 | 17 | 18 | 22 | 21 | 24 | 18 | 16 | 13 | 11 | 9.8 |
| 24 | 7.6 | 11 | 14 | 26 | 33 | 61 | 21 | 19 | 16 | 13 | 11 | 11 |
| 25 | 7.5 | 9.7 | 90 | 22 | 62 | 71 | 20 | 21 | 16 | 14 | 11 | 10 |
| 26 | 7.3 | 7.0 | 22 | 13 | 40 | 28 | 19 | 24 | 16 | 13 | 11 | 13 |
| 27 | 7.3 | 6.8 | 15 | 12 | 21 | 24 | 19 | 21 | 16 | 13 | 12 | 11 |
| 28 | 7.3 | 74 | 24 | 12 | 35 | 22 | 19 | 19 | 16 | 13 | 11 | 10 |
| 29 | 7.6 | 182 | 28 | 53 | ------ | 21 | 23 | 18 | 16 | 13 | 10 | 12 |
| 30 | 7.5 | 32 | 15 | 41 | ------ | 26 | 24 | 18 | 16 | 13 | 11 | 12 |
| 31 | 7.3 | ------ | 14 | 24 | ------ | 30 | ------ | 18 | ------ | 12 | 14 | ------ |
| TOTAL | 333.1 | 485.4 | 1058 | 740 | 1227 | 1111 | 980 | 750 | 527 | 484 | 382 | 324.7 |
| MEAN | 10.7 | 16.2 | 34.1 | 23.9 | 43.8 | 35.8 | 32.7 | 24.2 | 17.6 | 15.6 | 12.3 | 10.8 |
| MAX | 81 | 182 | 156 | 90 | 134 | 132 | 135 | 102 | 34 | 34 | 20 | 15 |
| MIN | 7.3 | 6.8 | 10 | 12 | 14 | 16 | 19 | 17 | 16 | 12 | 10 | 9.3 |
| AC-FT | 661 | 963 | 2100 | 1470 | 2430 | 2200 | 1940 | 1490 | 1050 | 960 | 758 | 644 |

CAL YR 1968: TOTAL 7,331.7 MEAN 20.1 MAX 182 MIN 6.8 AC-FT 14,540
WTR YR 1969: TOTAL 8,402.2 MEAN 23.0 MAX 182 MIN 6.8 AC-FT 16,670

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

## 16-4114. Kakaako Gulch near Mauna Loa

LOCATION.--Lat 21°10'39", long 157°12'31", Molokai, on left bank 1.0 mile downstream from Kamakahi Gulch and 3.0 miles north of Mauna Loa School.

DRAINAGE AREA.--5.34 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,450 cfs Jan. 9 (gage height, 5.30 ft, from floodmark in well), from rating curve developed as explained below; no flow most of time.
Period of record: Maximum discharge, 1,760 cfs Nov. 12, 1965 (gage height, 6.28 ft), from rating curve based on slope-area measurements at gage heights 0.72, 1.43 and 6.28 ft; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 2 | 0 | 0 | .95 | 0 | | | | | | 0 | | |
| 3 | 20 | 0 | 12 | 20 | | | | | | 1.9 | | |
| 4 | 5.0 | 0 | 24 | 0 | | | | | | 0 | | |
| 5 | 0 | 0 | 0 | 5.0 | | | | | | 0 | | |
| 6 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 7 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 8 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 9 | 0 | 0 | 0 | 40 | | | | | | 0 | | |
| 10 | 0 | 0 | 0 | 5.0 | | | | | | 0 | | |
| 11 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 12 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 13 | 0 | 0 | 20 | 0 | | | | | | 0 | | |
| 14 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 15 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 16 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 17 | 0 | 0 | 1.0 | 0 | | | | | | 0 | | |
| 18 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 19 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 20 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 21 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 22 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 23 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 24 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 25 | 0 | 0 | 15 | 0 | | | | | | 0 | | |
| 26 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 27 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 28 | 0 | 0 | 0 | 0 | | | | | | 0 | | |
| 29 | 0 | 0 | 0 | 0 | ------ | | | | | 0 | | |
| 30 | 0 | 5.4 | 0 | 0 | ------ | | | | | 0 | | |
| 31 | 0 | ------ | 0 | 0 | ------ | | ------ | | ------ | 0 | | ------ |
| TOTAL | 25.0 | 5.4 | 72.95 | 70.0 | 0 | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 |
| MEAN | .81 | .18 | 2.35 | 2.26 | 0 | 0 | 0 | 0 | 0 | .061 | 0 | 0 |
| MAX | 20 | 5.4 | 24 | 40 | 0 | 0 | 0 | 0 | 0 | 1.9 | 0 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 50 | 11 | 145 | 139 | 0 | 0 | 0 | 0 | 0 | 3.8 | 0 | 0 |

CAL YR 1968: TOTAL 282.76 MEAN .77 MAX 45 MIN 0 AC-FT 561
WTR YR 1969: TOTAL 175.25 MEAN .48 MAX 40 MIN 0 AC-FT 348

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 3 | Unknown | ≠2.68 | 544 | 1- 9 | Unknown | ≠5.30 | 1,450 |
| 12- 3 | 1100 | 2.40 | 460 | | | | |

≠ From recorded range in stage.
≠ From floodmark in well.
NOTE.--No gage-height record Dec. 8 to Jan. 19.

## 16-4140. Kaunakakai Gulch at Kaunakakai

LOCATION.--Lat 21°06'21", long 157°00'34", Molokai, on left bank 0.6 mile upstream from Molokai Ranch pipeline crossing, 1.3 miles northeast of Kaunakakai Post Office, and 1.7 miles upstream from mouth.

DRAINAGE AREA.--6.57 sq mi.

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

GAGE.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,810 cfs Nov. 29 (gage height, 7.74 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 3,060 cfs Oct. 31, 1961 (gage height, 9.30 ft), from rating curve extended above 620 cfs on basis of slope-area measurement of peak flow; no flow at times each year.

REMARKS.--Records fair. No diversion above station. Diversion from Molokai tunnel, which entered gulch above station May 20, 1965, to Dec. 19, 1966, now enters below station.

REVISIONS (FISCAL YEARS).--WSP 1289: 1950-51. WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 2.1 | 0 | 2.9 | 0 | 9.1 | | 0 | 0 | 0 | |
| 2 | 2.4 | 0 | .01 | 0 | 17 | 0 | 13 | | 0 | 0 | 0 | |
| 3 | 5.2 | 0 | 3.8 | 40 | 32 | 0 | 1.7 | | 0 | 0 | 0 | |
| 4 | .50 | 0 | 66 | 6.7 | 9.3 | 0 | .01 | | 0 | 0 | 0 | |
| 5 | 0 | 0 | 10 | 11 | .94 | 0 | 0 | | 0 | 0 | 0 | |
| 6 | 0 | 0 | 1.5 | 3.8 | .03 | 0 | 4.5 | | 0 | 0 | 0 | |
| 7 | 0 | 0 | .05 | .52 | 0 | 0 | 3.7 | | 0 | 0 | 0 | |
| 8 | 0 | 0 | 0 | 5.9 | 0 | 0 | .04 | | 0 | 0 | 0 | |
| 9 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 10 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 11 | 0 | 0 | 0 | 2.8 | 0 | 0 | 0 | | 5.3 | 0 | 0 | |
| 12 | 0 | 0 | 0 | .17 | 0 | 0 | 0 | | 1.4 | 0 | 0 | |
| 13 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 14 | 0 | 0 | 6.0 | 0 | .75 | 0 | 0 | | 0 | .18 | .22 | |
| 15 | 0 | 0 | .95 | 0 | .79 | 0 | 0 | | 0 | 1.7 | 0 | |
| 16 | 0 | 0 | .01 | 0 | 7.8 | 0 | 0 | | 0 | 0 | 0 | |
| 17 | 0 | 0 | 2.9 | 0 | 1.6 | .72 | 0 | | 0 | 0 | 0 | |
| 18 | 0 | 0 | .54 | 0 | .14 | 5.9 | 0 | | 0 | 0 | 0 | |
| 19 | 0 | 0 | .75 | 0 | 3.5 | 1.9 | 0 | | 0 | 1.3 | 0 | |
| 20 | .08 | 0 | 15 | 0 | 2.7 | 0 | 0 | | 0 | 4.5 | 0 | |
| 21 | .01 | 0 | 5.2 | 0 | .15 | 0 | 0 | | 0 | .06 | 0 | |
| 22 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 23 | 0 | 0 | 1.9 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 24 | 0 | 0 | .03 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 25 | 0 | 0 | 42 | 1.2 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 26 | 0 | 0 | 8.6 | 0 | 3.4 | 0 | 0 | | 0 | 0 | 0 | |
| 27 | 0 | 0 | 1.4 | 0 | 1.2 | 0 | 0 | | 0 | 0 | 0 | |
| 28 | 0 | 30 | .01 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | |
| 29 | 0 | 361 | 3.0 | 0 | ------ | 0 | 0 | | 0 | 0 | 0 | |
| 30 | 0 | 12 | .73 | 1.1 | ------ | 0 | 0 | | 0 | 0 | 0 | |
| 31 | 0 | ------ | 0 | .84 | ------ | 0 | ------ | | ------ | 0 | 0 | ------ |
| TOTAL | 8.19 | 403 | 241.48 | 144.03 | 84.20 | 8.52 | 32.05 | 0 | 6.7 | 7.74 | .22 | 0 |
| MEAN | .26 | 13.4 | 7.79 | 4.65 | 3.01 | .27 | 1.07 | 0 | .27 | .25 | .007 | 0 |
| MAX | 5.2 | 361 | 66 | 55 | 32 | 5.9 | 13 | 0 | 5.3 | 4.5 | .22 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 16 | 799 | 479 | 286 | 167 | 17 | 64 | 0 | 13 | 15 | .4 | 0 |

CAL YR 1968: TOTAL 1,264.99 MEAN 3.46 MAX 361 MIN 0 AC-FT 2,510
WTR YR 1969: TOTAL 936.13 MEAN 2.56 MAX 361 MIN 0 AC-FT 1,860

PEAK DISCHARGE (BASE, 160 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0100 | 7.74 | 1,810 | 1- 4 | 0930 | 5.05 | 362 |
| 12- 4 | 1000 | 4.65 | 248 | 1- 9 | 0200 | 4.75 | 273 |

## 16-4150. East Fork Kawela Gulch near Kamalo

LOCATION.--Lat 21°06'46", long 156°54'23", Molokai, on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo, and 7.6 miles northeast of Kaunakakai.

DRAINAGE AREA.--0.45 sq mi.

PERIOD OF RECORD.--September 1946 to current year. Published as Right Branch of East Fork Kawela Stream near Kamalo prior to July 1958 and as Right Branch of East Fork Kawela Gulch near Kamalo July 1958 to June 1960.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

EXTREMES.--Current year: Maximum discharge, 268 cfs Jan. 9 (gage height, 4.65 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 2,260 cfs Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 6.6 cfs on basis of slope-area measurement at gage height 6.50 ft; no flow at times each year.

REMARKS.--Records fair. Molokai Ranch diverts from gage pool. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

REVISIONS (FISCAL YEARS).--WSP 1319: Drainage area. WSP 1719: 1947-49. WSP 1937: 1948(M), 1951(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .30 | 0 | 1.2 | .35 | 24 | 6.2 | 36 | .43 | 0 | 2.1 | .79 | 4.7 |
| 2 | .60 | 0 | .91 | 2.1 | 26 | 2.4 | 7.8 | 8.0 | 0 | .74 | .85 | 5.4 |
| 3 | 1.5 | 0 | 13 | 18 | 22 | 8.3 | 2.2 | 1.4 | 0 | .02 | .17 | 3.3 |
| 4 | .50 | 0 | 23 | 3.6 | 3.7 | 4.4 | 2.2 | .64 | 0 | 0 | 0 | 1.4 |
| 5 | .30 | 0 | 4.0 | 11 | 1.0 | 1.6 | 2.1 | .07 | 0 | 0 | 0 | 1.7 |
| 6 | .10 | 0 | 1.0 | 3.0 | .51 | 3.4 | 10 | 0 | 0 | 1.1 | 1.1 | .64 |
| 7 | 0 | 0 | .08 | 2.3 | .32 | 7.4 | 2.7 | 0 | 0 | 3.9 | 1.6 | .05 |
| 8 | 0 | 0 | .06 | 15 | .23 | 1.7 | 1.4 | 0 | 0 | 2.2 | .29 | 0 |
| 9 | 0 | 0 | .64 | 27 | .17 | 2.0 | 1.9 | 0 | 0 | 2.9 | 0 | 0 |
| 10 | 0 | 0 | .01 | 3.4 | .08 | .79 | 1.5 | 0 | 4.6 | 3.9 | 0 | .32 |
| 11 | 0 | 0 | 0 | .69 | 0 | .15 | 5.0 | 0 | 8.8 | 1.4 | .78 | .64 |
| 12 | 0 | 0 | 11 | .14 | 0 | .01 | 6.9 | 0 | .92 | .37 | .32 | .22 |
| 13 | .10 | 0 | 29 | .02 | .01 | .01 | 3.2 | 0 | .02 | .18 | 5.6 | .37 |
| 14 | 0 | 0 | 4.1 | .43 | 12 | 0 | 4.5 | 3.6 | 0 | 6.6 | 3.2 | .23 |
| 15 | .30 | 0 | 1.2 | .92 | 13 | 6.8 | 1.3 | 12 | 0 | 4.3 | 5.9 | .02 |
| 16 | 1.5 | .61 | 4.0 | 2.8 | 12 | 13 | 2.6 | 1.4 | 0 | 4.9 | 2.0 | 0 |
| 17 | .30 | 0 | 4.0 | .62 | 4.3 | 13 | 3.2 | .43 | 0 | 3.6 | 5.3 | 0 |
| 18 | .60 | 0 | 2.5 | .02 | 9.7 | 8.7 | 3.2 | .09 | 0 | 4.2 | 4.5 | 1.6 |
| 19 | .20 | 0 | 3.1 | 2.1 | 12 | 3.6 | 2.5 | .02 | 0 | 17 | 1.4 | .48 |
| 20 | 7.0 | 0 | 9.4 | .65 | 8.0 | 1.1 | 9.7 | 0 | 0 | 6.4 | .85 | 3.6 |
| 21 | .70 | 0 | 5.4 | .59 | 3.1 | .32 | 2.8 | 0 | 0 | 2.1 | .74 | 8.2 |
| 22 | .30 | 0 | 9.9 | .74 | 3.8 | .10 | 3.4 | 0 | 0 | 2.2 | .03 | 2.1 |
| 23 | .10 | 0 | 1.2 | 3.1 | 4.7 | 0 | 1.2 | 0 | 0 | 2.2 | 0 | .33 |
| 24 | 0 | 3.5 | .79 | 3.0 | 2.9 | 4.9 | .26 | 0 | 0 | 1.6 | .01 | 3.5 |
| 25 | 0 | 2.7 | 28 | 3.8 | 13 | 8.5 | 0 | 1.3 | 0 | .85 | 2.8 | .85 |
| 26 | 0 | .16 | 2.6 | .50 | 6.8 | 2.2 | 0 | 4.0 | 0 | .64 | 2.3 | 3.7 |
| 27 | 0 | 0 | .91 | .01 | 2.2 | 1.4 | 0 | 2.2 | 0 | .06 | 2.9 | 2.0 |
| 28 | 0 | 46 | 5.2 | 0 | .64 | .39 | .08 | .18 | 0 | 0 | .59 | 1.8 |
| 29 | 0 | 76 | 5.0 | 11 | ------ | 0 | 1.5 | 0 | 0 | 0 | .29 | 5.6 |
| 30 | 0 | 7.0 | 1.2 | 12 | ------ | .16 | 2.2 | 0 | 4.3 | 0 | 2.5 | 2.4 |
| 31 | 0 | ------ | .55 | 5.1 | ------ | 3.3 | ------ | 0 | ------ | 1.3 | 6.2 | ------ |
| TOTAL | 14.40 | 135.97 | 172.95 | 133.98 | 186.16 | 105.83 | 121.34 | 35.76 | 18.64 | 76.76 | 53.01 | 55.15 |
| MEAN | .46 | 4.53 | 5.58 | 4.32 | 6.65 | 3.41 | 4.04 | 1.15 | .62 | 2.48 | 1.71 | 1.84 |
| MAX | 7.0 | 76 | 29 | 27 | 26 | 13 | 36 | 12 | 8.8 | 17 | 6.2 | 8.2 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 29 | 270 | 343 | 266 | 369 | 210 | 241 | 71 | 37 | 152 | 105 | 109 |

CAL YR 1968: TOTAL 927.02 MEAN 2.53 MAX 76 MIN 0 AC-FT 1,840
WTR YR 1969: TOTAL 1,109.95 MEAN 3.04 MAX 76 MIN 0 AC-FT 2,200

PEAK DISCHARGE (BASE, 160 CFS).--Nov. 28 (2300) 258 cfs (4.61 ft); Jan. 9 (0030) 268 cfs (4.65 ft).

## 16-4160. Punaula Gulch near Pukoo

LOCATION.--Lat 21°05'50", long 156°48'48", Molokai, on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

DRAINAGE AREA.--0.24 sq mi.

PERIOD OF RECORD.--March 1947 to current year. Prior to July 1958, published as Punaula Stream near Pukoo.

GAGE.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 407 cfs Jan. 9 (gage height, 5.27 ft), from rating curve extended as explained below; minimum, 0.03 cfs Nov. 19, 20.
Period of record: Maximum discharge, 569 cfs Feb. 4, 1965 (gage height, 7.17 ft), from rating curve extended above 14 cfs by test of model of station site; minimum, 0.02 cfs Mar. 13, 1947, Feb. 19, 1954.

REMARKS.--Records good. No diversion above station. Records of chemical analyses for water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1319: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .50 | .10 | 6.0 | .20 | 4.4 | 2.2 | 8.3 | .44 | .32 | .30 | .94 | 2.4 |
| 2 | .70 | .07 | 1.1 | .68 | 20 | 1.2 | 2.3 | 4.5 | .12 | .26 | 1.9 | 1.6 |
| 3 | 1.0 | .06 | 2.6 | 9.2 | 2.7 | 1.9 | .44 | .56 | .11 | 1.1 | .33 | .60 |
| 4 | .80 | .05 | 7.4 | 1.9 | .44 | .76 | .40 | .40 | .12 | .76 | .68 | .56 |
| 5 | .50 | .04 | 1.2 | 6.3 | .26 | .40 | .91 | .52 | .10 | .20 | .26 | .40 |
| 6 | .40 | .04 | .40 | .60 | .24 | 2.2 | 3.1 | .88 | .08 | .88 | .30 | .56 |
| 7 | .30 | .04 | .24 | 2.1 | .16 | 1.1 | .76 | .30 | .07 | 1.8 | .95 | .52 |
| 8 | .25 | .04 | .39 | 6.3 | .31 | 2.0 | .33 | .22 | .07 | .70 | .60 | .52 |
| 9 | .30 | .04 | 1.9 | 12 | .40 | 1.1 | .48 | .18 | .07 | 1.8 | .22 | .30 |
| 10 | .25 | .06 | 1.1 | 1.2 | .16 | .48 | .36 | .16 | 1.7 | 1.8 | .20 | 4.6 |
| 11 | .20 | .08 | .24 | .40 | .12 | .40 | .48 | .27 | 2.7 | .30 | .30 | .65 |
| 12 | .10 | .17 | 5.6 | .28 | .11 | .43 | 2.1 | .44 | .33 | .20 | .22 | .33 |
| 13 | .50 | .05 | 13 | .22 | 1.1 | .24 | 8.2 | .16 | .22 | 1.7 | 2.0 | .30 |
| 14 | .30 | .04 | 1.2 | .20 | 8.6 | .25 | 2.0 | 3.5 | .12 | 2.2 | 1.0 | 1.3 |
| 15 | .80 | .04 | .76 | .55 | 8.3 | 4.1 | .48 | 5.8 | .09 | .70 | 5.3 | .30 |
| 16 | 1.5 | .06 | 1.9 | .64 | 6.2 | 8.4 | .44 | .48 | .08 | 2.2 | 1.6 | .20 |
| 17 | .50 | .05 | 7.6 | .20 | 1.5 | 11 | .94 | .22 | .08 | 1.1 | 5.4 | .54 |
| 18 | 1.0 | .04 | 1.3 | .14 | 3.3 | 6.9 | .65 | .16 | .07 | 1.7 | 4.7 | 1.7 |
| 19 | .60 | .03 | 1.5 | .59 | 3.0 | 1.5 | .33 | .12 | .06 | 4.0 | 1.7 | .30 |
| 20 | 2.0 | .48 | 2.8 | .18 | .65 | .52 | 2.3 | .11 | .06 | 3.0 | 1.9 | 1.2 |
| 21 | .50 | .17 | 3.0 | .14 | 1.0 | .48 | .60 | .10 | .07 | .52 | 1.0 | 8.9 |
| 22 | 1.0 | .05 | 3.2 | .16 | 1.1 | .33 | .56 | .20 | .98 | .48 | .44 | .88 |
| 23 | .50 | .04 | 3.9 | .53 | .84 | .28 | .30 | .12 | .18 | .65 | 2.0 | .52 |
| 24 | .40 | 3.0 | .88 | .31 | 2.7 | 3.0 | .24 | .10 | .08 | 1.1 | 1.7 | 2.0 |
| 25 | .30 | .89 | 13 | .55 | 3.4 | 3.3 | .22 | 2.2 | .06 | 1.6 | 2.9 | .48 |
| 26 | .20 | .26 | 1.0 | .14 | 2.7 | .60 | .16 | 1.8 | .07 | .95 | 1.2 | 1.2 |
| 27 | .10 | .16 | .48 | .10 | .56 | .36 | 1.4 | .96 | .22 | .33 | 1.5 | .60 |
| 28 | .08 | 4.3 | .63 | .09 | .41 | .26 | 1.3 | 1.2 | .09 | .26 | .44 | .60 |
| 29 | .09 | 27 | .76 | 2.4 | ------ | .24 | 9.9 | .24 | .12 | .26 | .40 | .77 |
| 30 | .26 | 3.0 | .30 | 2.3 | ------ | .63 | 1.6 | .14 | 1.5 | .30 | 3.6 | .44 |
| 31 | .22 | ------ | .22 | .61 | ------ | .63 | ------ | .20 | ------ | 1.4 | 5.0 | ------ |
| TOTAL | 16.15 | 40.45 | 85.60 | 51.21 | 74.66 | 57.19 | 51.58 | 26.68 | 9.94 | 34.55 | 50.68 | 35.27 |
| MEAN | .52 | 1.35 | 2.76 | 1.65 | 2.67 | 1.84 | 1.72 | .86 | .33 | 1.11 | 1.63 | 1.18 |
| MAX | 2.0 | 27 | 13 | 12 | 20 | 11 | 9.9 | 5.8 | 2.7 | 4.0 | 5.4 | 8.9 |
| MIN | .08 | .03 | .22 | .09 | .11 | .24 | .16 | .10 | .06 | .20 | .20 | .20 |
| AC-FT | 32 | 80 | 170 | 102 | 148 | 113 | 102 | 53 | 20 | 69 | 101 | 70 |

CAL YR 1968: TOTAL 495.07 MEAN 1.35 MAX 32 MIN .03 AC-FT 982
WTR YR 1969: TOTAL 533.96 MEAN 1.46 MAX 27 MIN .03 AC-FT 1,060

PEAK DISCHARGE (BASE, 140 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12- 1 | 1930 | 3.62 | 187 | 2- 2 | 1430 | 4.62 | 329 |
| 1- 9 | 0030 | 5.27 | 407 | | | | |

## 16-4195. Papio Gulch at Halawa

LOCATION.--Lat 21°08'55", long 156°44'16", Molokai, on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mile south of Halawa.

DRAINAGE AREA.--0.94 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 640 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 449 cfs Jan. 9 (gage height, 5.23 ft), from rating curve extended as explained below; minimum, 0.04 cfs sometime during period Aug. 24 to Sept. 30.
Period of record: Maximum discharge, 2,720 cfs Apr. 13, 1965 (gage height, 11.25 ft), from rating curve extended above 17 cfs on basis of slope-area measurements at gage heights 4.60, 7.15, and 11.25 ft; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Diversion above station for domestic use at Puu O Hoku Ranch.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .20 | .20 | .30 | .46 | .89 | 1.0 | .75 | .58 | .40 | .24 | .18 | .50 |
| 2 | .30 | .26 | .28 | .49 | 6.0 | .72 | .92 | 1.8 | .37 | .20 | .20 | .30 |
| 3 | .50 | .24 | .63 | 6.5 | 3.7 | .72 | .64 | .72 | .34 | .28 | .20 | .25 |
| 4 | .35 | .24 | 6.8 | 3.6 | 1.0 | .68 | .61 | .55 | .34 | .26 | .16 | .22 |
| 5 | .25 | .24 | 1.2 | 6.4 | .84 | .61 | .61 | .52 | .31 | .20 | .16 | .20 |
| 6 | .22 | .26 | .43 | 1.8 | .72 | .58 | .96 | .49 | .31 | .22 | .16 | .25 |
| 7 | .21 | .24 | .22 | 5.3 | .68 | .58 | .78 | .55 | .31 | .37 | .16 | .21 |
| 8 | .20 | .22 | .18 | 6.4 | .64 | .55 | .58 | .43 | .31 | .26 | .16 | .14 |
| 9 | .25 | .22 | .63 | 24 | .61 | .52 | .58 | .40 | .31 | .26 | .12 | .10 |
| 10 | .21 | .24 | .97 | 4.7 | .58 | .52 | .64 | .37 | .34 | .72 | .14 | 1.1 |
| 11 | .18 | .26 | .37 | 2.6 | .58 | .49 | .58 | .43 | .64 | .40 | .18 | .40 |
| 12 | .14 | .24 | 1.7 | 1.9 | .55 | .49 | 1.1 | .49 | .52 | .24 | .12 | .25 |
| 13 | .40 | .20 | 6.1 | 1.6 | .52 | .46 | .72 | .34 | .43 | .22 | .14 | .10 |
| 14 | .30 | .22 | .84 | 1.3 | 12 | .46 | .84 | .31 | .37 | .37 | .14 | .40 |
| 15 | .50 | .28 | .46 | 1.2 | 7.0 | 1.3 | .68 | 1.2 | .31 | .46 | .31 | .20 |
| 16 | 1.0 | .22 | .46 | 1.0 | 5.0 | 5.7 | .55 | .61 | .28 | .37 | .49 | .10 |
| 17 | .30 | .20 | 6.3 | .84 | 1.5 | 5.7 | .58 | .46 | .28 | .58 | .90 | .30 |
| 18 | .40 | .18 | 1.8 | .75 | 1.1 | 2.5 | .55 | .40 | .26 | .43 | 1.1 | .50 |
| 19 | .30 | .18 | 3.2 | .75 | 1.0 | 1.4 | .52 | .40 | .26 | 1.0 | .55 | .10 |
| 20 | 1.5 | .20 | 3.1 | .72 | .88 | .98 | .68 | .37 | .24 | 1.1 | .40 | .40 |
| 21 | .50 | .16 | 1.1 | .68 | .88 | .64 | .61 | .37 | .26 | .52 | .43 | 2.0 |
| 22 | .60 | .14 | 2.5 | .68 | .88 | .58 | .52 | .37 | .34 | .34 | .26 | .50 |
| 23 | .40 | .14 | 1.5 | .94 | .68 | .55 | .49 | .34 | .31 | .37 | .22 | .27 |
| 24 | .30 | .10 | .73 | .75 | .68 | 1.4 | .49 | .40 | .26 | .46 | .30 | .40 |
| 25 | .25 | .10 | 11 | .68 | 2.0 | 3.1 | .49 | .52 | .24 | .46 | .80 | .25 |
| 26 | .22 | .10 | 2.5 | .61 | 1.0 | 1.2 | .49 | .96 | .24 | .37 | .50 | .30 |
| 27 | .20 | .10 | 1.4 | .58 | .81 | .81 | .61 | .61 | .24 | .26 | .56 | .20 |
| 28 | .18 | .10 | 1.4 | .58 | .72 | .72 | .58 | .58 | .24 | .22 | .30 | .16 |
| 29 | .22 | .26 | 1.2 | .61 | ------ | .64 | 1.2 | .46 | .26 | .22 | .20 | .25 |
| 30 | .28 | .94 | .84 | .75 | ------ | .64 | 1.3 | .43 | .26 | .20 | .35 | .11 |
| 31 | .22 | ------ | .58 | .72 | ------ | .75 | ------ | .40 | ------ | .20 | 1.0 | ------ |
| TOTAL | 11.08 | 6.68 | 60.72 | 79.89 | 53.44 | 36.99 | 20.65 | 16.86 | 9.58 | 11.80 | 10.89 | 10.46 |
| MEAN | .36 | .22 | 1.96 | 2.58 | 1.91 | 1.19 | .69 | .54 | .32 | .38 | .35 | .35 |
| MAX | 1.5 | .94 | 11 | 24 | 12 | 5.7 | 1.3 | 1.8 | .64 | 1.1 | 1.1 | 2.0 |
| MIN | .14 | .10 | .18 | .46 | .52 | .46 | .49 | .31 | .24 | .20 | .12 | .10 |
| AC-FT | 22 | 13 | 120 | 158 | 106 | 73 | 41 | 33 | 19 | 23 | 22 | 21 |

CAL YR 1968: TOTAL 703.56 MEAN 1.92 MAX 63 MEAN .10 AC-FT 1,400
WTR YR 1969: TOTAL 329.04 MEAN .90 MAX 24 MEAN .10 AC-FT 653

PEAK DISCHARGE (BASE, 210 CFS).--Jan. 9 (0100) 449 cfs (5.23 ft).

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

## 16-5001. Kepuni Gulch near Kahikinui House

LOCATION.--Lat 20°37'21", long 156°15'16", Maui, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 miles east of Kahikinui House, and 8.5 miles west of Kaupo.

DRAINAGE AREA.--1.91 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). Prior to Feb. 13, 1964, at site 50 ft downstream at different datum.

EXTREMES.--Current year: Maximum discharge, 236 cfs Dec. 9 (gage height, 4.80 ft), from rating curve defined as explained below; no flow most of time.
Period of record: Maximum discharge, 964 cfs Jan. 17, 1968 (gage height, 8.23 ft), from rating curve defined only by computation of peak flow over dam at gage heights 4.80, 6.38 and 7.95 ft; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 0 | 0 | 0 | | | | | | | |
| 2 | | | 0 | 0 | .34 | | | | | | | |
| 3 | | | 0 | 0 | 0 | | | | | | | |
| 4 | | | 0 | 0 | 0 | | | | | | | |
| 5 | | | 0 | 21 | 0 | | | | | | | |
| 6 | | | 0 | .01 | 0 | | | | | | | |
| 7 | | | 0 | 0 | 0 | | | | | | | |
| 8 | | | 0 | 0 | 0 | | | | | | | |
| 9 | | | 5.2 | 2.3 | 0 | | | | | | | |
| 10 | | | 0 | 0 | 0 | | | | | | | |
| 11 | | | 0 | 0 | 0 | | | | | | | |
| 12 | | | 0 | 0 | 0 | | | | | | | |
| 13 | | | 0 | 0 | 0 | | | | | | | |
| 14 | | | 0 | 0 | 0 | | | | | | | |
| 15 | | | 0 | 0 | 0 | | | | | | | |
| 16 | | | 0 | 0 | 0 | | | | | | | |
| 17 | | | 0 | 0 | 0 | | | | | | | |
| 18 | | | 0 | 0 | 0 | | | | | | | |
| 19 | | | 0 | 0 | 0 | | | | | | | |
| 20 | | | 4.1 | 0 | 0 | | | | | | | |
| 21 | | | 0 | 0 | 0 | | | | | | | |
| 22 | | | 0 | 0 | 0 | | | | | | | |
| 23 | | | 0 | 0 | 0 | | | | | | | |
| 24 | | | 0 | 0 | 0 | | | | | | | |
| 25 | | | 22 | 0 | 0 | | | | | | | |
| 26 | | | 0 | 0 | 0 | | | | | | | |
| 27 | | | 0 | 0 | 0 | | | | | | | |
| 28 | | | 0 | 0 | 0 | | | | | | | |
| 29 | | | 0 | 0 | ------ | | | | | | | |
| 30 | | | 0 | 0 | ------ | | | | | | | |
| 31 | | ------ | 0 | 0 | ------ | | ------ | | ------ | | | ------ |
| TOTAL | 0 | 0 | 31.3 | 23.31 | .34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MEAN | 0 | 0 | 1.01 | .75 | .012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MAX | 0 | 0 | 22 | 21 | .34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | 0 | 62 | 46 | .7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CAL YR 1968: TOTAL 182.95 MEAN .50 MAX 53 MIN 0 AC-FT 363
WTR YR 1969: TOTAL 54.95 MEAN .15 MAX 22 MIN 0 AC-FT 109

PEAK DISCHARGE (BASE, 78 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12- 9 | 1700 | 4.80 | 236 | 1- 5 | 1500 | 3.67 | 99 |
| 12-25 | 1330 | 4.00 | 134 | | | | |

## 16-5010. Palikea Stream below diversion dam, near Kipahulu

LOCATION.--Lat 20°41'05", long 156°04'10", Maui, on left bank 50 ft downstream from old diversion dam, 2 miles northwest of Kipahulu, and 2.1 miles upstream from mouth.

DRAINAGE AREA.--6.29 sq mi.

PERIOD OF RECORD.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to current year. Published as Oheo Stream at elevation 1,550 ft, near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

GAGE.--Water-stage recorder. Datum of gage is 1,546 ft above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft upstream at different datum.

EXTREMES.--Current year: Maximum discharge, 9,550 cfs Feb. 1 (gage height, 13.05 ft), from rating curve extended as explained below; minimum, 0.01 cfs on several days.
Period of record: Maximum discharge, 16,100 cfs Jan. 23, 1965 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 3,300 cfs on basis of computations of peak flow over dam at gage heights 12.68 and 17.5 ft; no flow at times.

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

REVISIONS (FISCAL YEARS).--WSP 1155: 1939(M). WSP 1569: Drainage area. WSP 1719: 1932-34, 1937-40, 1948, 1949-50(P), 1951, 1952-54(P), 1956-58(P). WSP 1937: 1932-38(M), 1940-47(M), 1948-49(P), 1950(M), 1951-53(P), 1956(P), 1957(M), 1958-59(P), 1960(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .85 | .05 | 75 | .37 | 2580 | 173 | 830 | 9.9 | 6.0 | 104 | 114 | 212 |
| 2 | 29 | .02 | 491 | .32 | 1.290 | 402 | 271 | 212 | .77 | 438 | 77 | 99 |
| 3 | 8.4 | .01 | 146 | 133 | 677 | 981 | 21 | 187 | .48 | 31 | 32 | 69 |
| 4 | 1.0 | .01 | 45 | 65 | 69 | 499 | 4.7 | 216 | .48 | 42 | 25 | 14 |
| 5 | .32 | .01 | 7.3 | 688 | 25 | 616 | 2.4 | 370 | .36 | 4.2 | 16 | 13 |
| 6 | .16 | .01 | 1.9 | 55 | 110 | 419 | 3.8 | 132 | .36 | 33 | 26 | 4.1 |
| 7 | .32 | .01 | 1.5 | 274 | 17 | 127 | 1.1 | 13 | .31 | 111 | 11 | 22 |
| 8 | .04 | .01 | .85 | 158 | 58 | 128 | 1.7 | 3.5 | .31 | 29 | 12 | 126 |
| 9 | .03 | .01 | 6.4 | 137 | 39 | 502 | 1.4 | 1.9 | .31 | 8.5 | 2.6 | 12 |
| 10 | .02 | .01 | 1.4 | 7.4 | 6.5 | 42 | 5.0 | 1.2 | .31 | 61 | 69 | 98 |
| 11 | .01 | .01 | .70 | 1.8 | 3.3 | 185 | 73 | 17 | .31 | 22 | 85 | 21 |
| 12 | .23 | .01 | .37 | 1.0 | 1.2 | 18 | 199 | 226 | .31 | 3.1 | 30 | 18 |
| 13 | .88 | 71 | 61 | .63 | .48 | 7.8 | 153 | 3.9 | .42 | 1.4 | 162 | 22 |
| 14 | .04 | 11 | 110 | .13 | 6.4 | 2.6 | 182 | 1.4 | .36 | 448 | 54 | 57 |
| 15 | 13 | .93 | 1.120 | .04 | 9.2 | 17 | 33 | 21 | .31 | 87 | 527 | 6.3 |
| 16 | 140 | .23 | 98 | .03 | 221 | 181 | 50 | 2.0 | .31 | 30 | 152 | 2.0 |
| 17 | 14 | .04 | 41 | .03 | 275 | 341 | 67 | .62 | .31 | 47 | 145 | 3.9 |
| 18 | 118 | .02 | 25 | .03 | 755 | 166 | 66 | .55 | .31 | 75 | 89 | 15 |
| 19 | 106 | .01 | 3.2 | .03 | 1.560 | 161 | 82 | .48 | .31 | 427 | 53 | 14 |
| 20 | 199 | .01 | 54 | .03 | 512 | 14 | 255 | .48 | .26 | 320 | 44 | 37 |
| 21 | 9.1 | .01 | 5.3 | .03 | 218 | 8.6 | 22 | .42 | .26 | 56 | 10 | 371 |
| 22 | 231 | .01 | 33 | .04 | 260 | 4.7 | 51 | .77 | .36 | 24 | 5.0 | 64 |
| 23 | 23 | 20 | 315 | .04 | 233 | 1.9 | 8.9 | .42 | .36 | 45 | 40 | 11 |
| 24 | 1.8 | 33 | 21 | .03 | 110 | 1.2 | 11 | .36 | .36 | 72 | 4.1 | 95 |
| 25 | 1.0 | 60 | 494 | .03 | 158 | 11 | 11 | .42 | .31 | 128 | 87 | 24 |
| 26 | .50 | 26 | 19 | .03 | 83 | .77 | 1.4 | 11 | .42 | 29 | 76 | 36 |
| 27 | .27 | .56 | 3.6 | .03 | 17 | .42 | 148 | 16 | .36 | 7.4 | 85 | 12 |
| 28 | 1.1 | 97 | 9.1 | .02 | 61 | .36 | 109 | .86 | .50 | 2.6 | 7.9 | 11 |
| 29 | .10 | 1.850 | 1.7 | 322 | ------ | .48 | 254 | 4.5 | 5.7 | 3.3 | 2.8 | 18 |
| 30 | .10 | 322 | 1.0 | 1.240 | ------ | 62 | 86 | .69 | 189 | 3.9 | 29 | 8.8 |
| 31 | .32 | ------ | .63 | 838 | ------ | 1.290 | ------ | 2.5 | ------ | 240 | 100 | ------ |
| TOTAL | 899.59 | 2,491.99 | 3,192.95 | 3,922.09 | 9,355.08 | 6,363.83 | 3,004.4 | 1,457.87 | 210.53 | 2,933.4 | 2,172.4 | 1,516.1 |
| MEAN | 29.0 | 83.1 | 103 | 127 | 334 | 205 | 100 | 47.0 | 7.02 | 94.6 | 70.1 | 50.5 |
| MAX | 231 | 1,850 | 1,120 | 1,240 | 2,580 | 1,290 | 830 | 370 | 189 | 448 | 527 | 371 |
| MIN | .01 | .01 | .37 | .02 | .48 | .36 | 1.1 | .36 | .26 | 1.4 | 2.6 | 2.0 |
| AC-FT | 1,780 | 4,940 | 6,330 | 7,780 | 18,560 | 12,620 | 5,960 | 2,890 | 418 | 5,820 | 4,310 | 3,010 |

CAL YR 1968: TOTAL 23,159.09 MEAN 63.3 MAX 2,210 MIN .01 AC-FT 45,940
WTR YR 1969: TOTAL 37,520.23 MEAN 103 MAX 2,580 MIN .01 AC-FT 74,420

PEAK DISCHARGE (BASE, 2,800 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 1630 | 10.74 | 7,240 | 2-1 | 1200 | 13.05 | 9,550 |
| 12-15 | 1730 | 9.66 | 5,020 | 2-19 | 0530 | 12.37 | 8,870 |
| 12-25 | 1400 | 9.63 | 4,810 | 3-31 | 0500 | 9.95 | 6,150 |

## 16-5020. Hahalawe Gulch near Kipahulu

LOCATION.--Lat 20°40'54", long 156°02'50", Maui, on left bank at old ditch intake, 0.7 mile upstream from mouth, and 1.8 miles northeast of Kipahulu Church.

DRAINAGE AREA.--0.43 sq mi.

PERIOD OF RECORD.--February 1927 to March 1935, May 1935 to April 1937, May 1938 to current year (discontinued as a continuous-record station; converted to a crest-stage partial-record station). Monthly discharge only May, June 1938, published in WSP 1319. Published as Right Branch Kahalawe Stream near Kipahulu 1927-56 and as Right Branch Hahalawe Stream near Kipahulu 1956-60.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to May 1, 1938, at datum 8.0 ft lower.

EXTREMES.--Current year: Maximum discharge, 1,270 cfs Feb. 1 (gage height, 4.55 ft), from rating curve extended as explained below; minimum, 0.51 cfs Nov. 22.
Period of record: Maximum discharge, 3,560 cfs Apr. 29, 1937 (gage height, 15.74 ft, datum then in use), from rating curve extended above 83 cfs on basis of slope-area measurement at gage height 4.80 and by test of model of station site; minimum, 0.23 cfs Dec. 18, 1929.

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

REVISIONS (FISCAL YEARS).--WSP 1219: 1935(M), 1937(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.8 | 1.8 | 5.2 | 2.0 | 167 | 5.7 | 43 | 4.2 | 4.0 | 6.2 | 11 | 15 |
| 2 | 12 | 1.4 | 9.4 | 1.8 | 47 | 9.8 | 13 | 12 | 2.8 | 31 | 7.4 | 9.0 |
| 3 | 4.2 | 1.2 | 5.1 | 9.5 | 18 | 32 | 4.8 | 4.2 | 2.6 | 7.2 | 8.0 | 6.5 |
| 4 | 3.0 | .98 | 3.4 | 4.6 | 5.2 | 7.4 | 3.6 | 6.7 | 2.8 | 8.6 | 4.9 | 4.2 |
| 5 | 2.4 | .92 | 2.4 | 43 | 4.4 | 8.0 | 3.8 | 8.1 | 2.3 | 3.5 | 4.8 | 4.4 |
| 6 | 2.2 | .86 | 2.3 | 8.3 | 7.8 | 9.6 | 4.1 | 17 | 1.9 | 5.8 | 6.6 | 3.8 |
| 7 | 2.6 | .76 | 2.1 | 11 | 7.3 | 5.6 | 3.0 | 3.8 | 1.6 | 7.7 | 5.5 | 6.0 |
| 8 | 1.8 | .71 | 1.8 | 5.8 | 29 | 9.0 | 3.3 | 3.0 | 1.4 | 3.8 | 5.4 | 15 |
| 9 | 1.7 | .86 | 7.5 | 12 | 12 | 15 | 3.3 | 2.6 | 1.7 | 4.2 | 3.6 | 4.4 |
| 10 | 1.5 | .71 | 1.9 | 3.8 | 4.4 | 4.6 | 3.0 | 2.4 | 1.4 | 6.6 | 8.4 | 20 |
| 11 | 1.4 | .86 | 1.7 | 2.8 | 3.4 | 5.2 | 7.5 | 5.1 | 4.6 | 3.5 | 4.7 | 5.6 |
| 12 | 1.5 | 1.0 | 1.9 | 2.4 | 2.8 | 3.8 | 8.8 | 9.7 | 4.1 | 2.9 | 4.9 | 4.4 |
| 13 | 2.6 | 4.5 | 11 | 2.2 | 2.6 | 5.1 | 7.6 | 2.8 | 3.8 | 2.9 | 16 | 5.8 |
| 14 | 1.4 | 1.9 | 7.0 | 1.9 | 4.9 | 3.3 | 8.9 | 6.0 | 2.3 | 31 | 8.3 | 11 |
| 15 | 1.4 | 1.7 | 31 | 1.7 | 6.4 | 11 | 5.7 | 8.9 | 1.7 | 6.1 | 30 | 3.9 |
| 16 | 7.7 | .92 | 18 | 1.6 | 35 | 15 | 6.2 | 3.0 | 1.6 | 5.2 | 10 | 3.1 |
| 17 | 2.4 | .71 | 15 | 1.4 | 6.9 | 21 | 7.3 | 2.6 | 2.2 | 6.8 | 16 | 3.8 |
| 18 | 5.0 | .67 | 5.1 | 1.4 | 16 | 11 | 5.5 | 2.2 | 1.6 | 6.8 | 18 | 6.7 |
| 19 | 6.6 | .56 | 3.2 | 1.2 | 43 | 12 | 6.2 | 2.4 | 1.4 | 17 | 14 | 5.5 |
| 20 | 5.4 | .71 | 7.6 | 1.1 | 6.4 | 4.3 | 9.7 | 2.6 | 1.3 | 18 | 11 | 5.1 |
| 21 | 2.6 | .76 | 28 | .98 | 4.8 | 3.5 | 4.0 | 2.1 | 1.1 | 6.7 | 5.3 | 35 |
| 22 | 15 | .81 | 10 | .92 | 4.4 | 3.2 | 5.0 | 4.3 | 4.1 | 5.6 | 4.8 | 11 |
| 23 | 3.4 | 6.0 | 29 | .86 | 8.2 | 2.8 | 3.2 | 2.4 | 1.8 | 6.0 | 9.2 | 5.3 |
| 24 | 2.4 | 2.9 | 12 | .81 | 8.5 | 3.4 | 4.4 | 2.0 | 1.8 | 6.4 | 4.1 | 9.9 |
| 25 | 1.9 | 7.7 | 23 | .76 | 8.1 | 3.2 | 3.7 | 4.8 | 2.8 | 13 | 10 | 4.4 |
| 26 | 1.7 | 4.2 | 4.8 | .71 | 4.6 | 2.6 | 2.8 | 6.7 | 3.7 | 5.2 | 6.5 | 9.0 |
| 27 | 1.4 | 1.9 | 3.5 | .67 | 3.5 | 2.3 | 14 | 4.4 | 2.4 | 4.3 | 6.6 | 4.4 |
| 28 | 3.2 | 1.3 | 7.6 | .63 | 5.0 | 2.1 | 9.7 | 3.0 | 2.4 | 3.5 | 3.9 | 4.6 |
| 29 | 1.5 | 124 | 3.0 | 4.0 | ------ | 3.2 | 31 | 6.2 | 3.2 | 5.8 | 3.7 | 4.7 |
| 30 | 2.1 | 5.4 | 2.4 | 45 | ------ | 5.2 | 9.6 | 2.6 | 6.9 | 4.0 | 6.1 | 3.5 |
| 31 | 2.8 | ------ | 2.2 | 51 | ------ | 62 | ------ | 4.4 | ------ | 28 | 11 | ------ |
| TOTAL | 107.6 | 178.70 | 242.9 | 225.84 | 476.6 | 291.9 | 245.7 | 152.2 | 77.3 | 273.3 | 269.7 | 235.0 |
| MEAN | 3.47 | 5.96 | 7.84 | 7.29 | 17.0 | 9.42 | 8.19 | 4.91 | 2.58 | 8.82 | 8.70 | 7.83 |
| MAX | 15 | 124 | 31 | 51 | 167 | 62 | 43 | 17 | 6.9 | 31 | 30 | 35 |
| MIN | 1.4 | .56 | 1.7 | .63 | 2.6 | 2.1 | 2.8 | 2.0 | 1.1 | 2.9 | 3.6 | 3.1 |
| AC-FT | 213 | 354 | 482 | 448 | 945 | 579 | 487 | 302 | 153 | 542 | 535 | 466 |

CAL YR 1968: TOTAL 2,223.07 MEAN 6.07 MAX 354 MIN .56 AC-FT 4,410
WTR YR 1969: TOTAL 2,776.74 MEAN 7.61 MAX 167 MIN .63 AC-FT 5,510

PEAK DISCHARGE (BASE, 360 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0400 | 3.57 | 592 | 2-19 | 0430 | 3.36 | 480 |
| 1-30 | 1800 | 3.88 | 786 | 3-31 | 0500 | 4.06 | 912 |
| 2-1 | 0630 | 4.55 | 1,270 | | | | |

## 16-5080. Hanawi Stream near Nahiku

LOCATION.--Lat 20°48'35", long 156°07'00", Maui, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

DRAINAGE AREA.--3.49 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

EXTREMES.--Current year: Maximum discharge, 3,800 cfs Feb. 1 (gage height, 9.86 ft), from rating curve extended as explained below; minimum, 1.7 cfs Nov. 18, 19, 21, 22.
Period of record: Maximum discharge, about 5,570 cfs Jan. 18, 1916 (gage height, 11.6 ft, present site and datum), from rating curve extended above 410 cfs by test of model of station site; minimum, 1.6 cfs Nov. 14, 19, 20, 1962, Feb. 10, 11, 16, 17, 1963.

REMARKS.--Records good except those above 900 cfs, which are fair. No diversion above station.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.1 | 2.7 | 16 | 4.0 | 1,150 | 115 | 839 | 14 | 4.9 | 43 | 52 | 81 |
| 2 | 3.1 | 2.8 | 9.4 | 3.9 | 615 | 78 | 245 | 106 | 4.7 | 157 | 25 | 38 |
| 3 | 3.0 | 2.6 | 6.7 | 222 | 493 | 395 | 39 | 59 | 4.4 | 20 | 16 | 76 |
| 4 | 2.9 | 2.6 | 150 | 52 | 44 | 239 | 30 | 51 | 5.0 | 7.9 | 12 | 18 |
| 5 | 2.8 | 2.6 | 23 | 210 | 16 | 172 | 74 | 17 | 4.6 | 5.7 | 15 | 16 |
| 6 | 2.7 | 2.5 | 14 | 40 | 11 | 282 | 106 | 12 | 4.4 | 96 | 37 | 15 |
| 7 | 2.8 | 2.5 | 5.2 | 116 | 9.6 | 73 | 72 | 9.9 | 4.2 | 29 | 12 | 12 |
| 8 | 2.6 | 2.5 | 3.8 | 107 | 9.8 | 30 | 47 | 8.8 | 4.1 | 14 | 9.4 | 21 |
| 9 | 2.6 | 2.5 | 11 | 69 | 10 | 101 | 22 | 8.1 | 4.1 | 14 | 8.3 | 13 |
| 10 | 2.5 | 2.5 | 4.9 | 11 | 11 | 25 | 16 | 7.8 | 4.8 | 13 | 10 | 12 |
| 11 | 2.5 | 2.4 | 3.2 | 6.8 | 11 | 19 | 123 | 7.8 | 64 | 7.0 | 9.6 | 9.9 |
| 12 | 2.4 | 2.4 | 105 | 5.7 | 11 | 16 | 176 | 7.9 | 9.4 | 5.8 | 14 | 9.2 |
| 13 | 2.4 | 2.4 | 336 | 5.0 | 24 | 15 | 80 | 6.7 | 7.2 | 5.6 | 95 | 11 |
| 14 | 2.3 | 2.3 | 81 | 4.7 | 201 | 15 | 32 | 73 | 5.3 | 141 | 63 | 9.4 |
| 15 | 2.4 | 2.3 | 50 | 4.4 | 190 | 89 | 22 | 215 | 4.8 | 41 | 179 | 8.4 |
| 16 | 2.5 | 2.5 | 16 | 4.2 | 271 | 118 | 45 | 32 | 4.5 | 9.2 | 28 | 8.1 |
| 17 | 2.4 | 2.3 | 11 | 4.1 | 194 | 332 | 46 | 13 | 4.4 | 9.9 | 46 | 7.7 |
| 18 | 3.3 | 2.2 | 15 | 4.1 | 273 | 188 | 34 | 10 | 4.1 | 8.6 | 51 | 8.6 |
| 19 | 20 | 2.2 | 5.4 | 4.0 | 450 | 122 | 70 | 9.9 | 4.0 | 60 | 58 | 8.6 |
| 20 | 57 | 2.3 | 4.3 | 5.4 | 243 | 25 | 93 | 7.9 | 3.9 | 32 | 21 | 8.8 |
| 21 | 4.9 | 2.2 | 4.5 | 3.9 | 241 | 16 | 26 | 7.0 | 3.8 | 13 | 13 | 17 |
| 22 | 18 | 2.3 | 31 | 3.9 | 165 | 13 | 106 | 6.5 | 3.7 | 9.6 | 11 | 14 |
| 23 | 4.7 | 2.9 | 16 | 3.8 | 81 | 11 | 20 | 6.4 | 3.6 | 10 | 13 | 10 |
| 24 | 3.3 | 2.8 | 7.3 | 3.7 | 100 | 159 | 13 | 6.0 | 3.5 | 9.9 | 10 | 9.9 |
| 25 | 3.0 | 3.9 | 45 | 3.7 | 109 | 80 | 11 | 12 | 3.9 | 14 | 30 | 9.4 |
| 26 | 2.9 | 2.6 | 9.8 | 3.5 | 75 | 24 | 10 | 14 | 4.1 | 8.3 | 23 | 30 |
| 27 | 2.8 | 2.4 | 5.5 | 3.4 | 29 | 16 | 13 | 7.9 | 3.6 | 7.0 | 15 | 20 |
| 28 | 3.6 | 135 | 4.9 | 3.4 | 59 | 13 | 18 | 6.5 | 3.4 | 6.6 | 12 | 11 |
| 29 | 2.9 | 1,050 | 4.8 | 168 | ------ | 27 | 76 | 5.9 | 4.2 | 6.6 | 11 | 14 |
| 30 | 2.8 | 62 | 4.5 | 752 | ------ | 91 | 33 | 5.6 | 19 | 6.6 | 21 | 11 |
| 31 | 2.8 | ------ | 4.2 | 469 | ------ | 586 | ------ | 5.3 | ------ | 76 | 28 | ------ |
| TOTAL | 177.0 | 1,315.2 | 1,008.4 | 2,301.6 | 5,096.4 | 3,485 | 2,537 | 759.9 | 209.6 | 887.3 | 948.3 | 488.0 |
| MEAN | 5.71 | 43.8 | 32.5 | 74.2 | 182 | 112 | 84.6 | 24.5 | 6.99 | 28.6 | 30.6 | 16.3 |
| MAX | 57 | 1,050 | 336 | 752 | 1,150 | 586 | 839 | 215 | 64 | 157 | 179 | 81 |
| MIN | 2.3 | 2.2 | 3.2 | 3.4 | 9.6 | 11 | 10 | 5.3 | 3.4 | 5.6 | 8.3 | 7.7 |
| AC-FT | 351 | 2,610 | 2,000 | 4,570 | 10,110 | 6,910 | 5,030 | 1,510 | 416 | 1,760 | 1,880 | 968 |

CAL YR 1968 TOTAL 8,903.0 MEAN 24.3 MAX 1,050 MIN 2.2 AC-FT 17,660
WTR YR 1969 TOTAL 19,213.7 MEAN 52.6 MAX 1,150 MIN 2.2 AC-FT 38,110

PEAK DISCHARGE (BASE, 1,600 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0430 | 9.42 | 3,490 | 2-19 | 0415 | 6.68 | 1,830 |
| 1- 3 | 1800 | 6.18 | 1,610 | 3- 3 | 0730 | 6.41 | 1,700 |
| 2- 1 | 1000 | 9.86 | 3,800 | 3-31 | 0100 | 7.40 | 2,200 |

16-5120. Koolau ditch at Nahiku weir, near Nahiku

LOCATION.--Lat 20°48'55", long 156°07'15", Maui, on right bank between Kapaula and Waiohue Gulches, 1.8 miles southwest of Nahiku, and 3.8 miles southeast of Keanae.

PERIOD OF RECORD.--February 1919 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level. Prior to Apr. 28, 1922, nonrecording gage at same site and datum.

EXTREMES.--Period of record: Maximum daily discharge, 99 cfs Apr. 27, May 11, 1963, May 25, 1964; no flow at times.

REMARKS.--Records excellent. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17 | 10 | 40 | 18 | 80 | 88 | 88 | 56 | 24 | 66 | 74 | 85 |
| 2 | 16 | 10 | 25 | 17 | 72 | 87 | 87 | 74 | 23 | 58 | 68 | 84 |
| 3 | 15 | 10 | 27 | 46 | 80 | 88 | 83 | 72 | 23 | 44 | 60 | 77 |
| 4 | 15 | 9.6 | 48 | 62 | 83 | 88 | 76 | 74 | 23 | 36 | 49 | 66 |
| 5 | 14 | 9.2 | 18 | 68 | 58 | 88 | 76 | 56 | 22 | 28 | 49 | 61 |
| 6 | 13 | 9.2 | 20 | 54 | 47 | 88 | 86 | 45 | 20 | 69 | 70 | 57 |
| 7 | 13 | 8.8 | 32 | 78 | 42 | 86 | 85 | 41 | 20 | 77 | 51 | 52 |
| 8 | 12 | 8.8 | 25 | 84 | 41 | 80 | 82 | 40 | 19 | 54 | 42 | 71 |
| 9 | 12 | 8.8 | 33 | 71 | 38 | 85 | 64 | 36 | 19 | 51 | 36 | 54 |
| 10 | 11 | 8.4 | 26 | 37 | 36 | 66 | 51 | 34 | 22 | 52 | 41 | 51 |
| 11 | 11 | 8.4 | 21 | 28 | 35 | 54 | 78 | 34 | 74 | 35 | 41 | 42 |
| 12 | 11 | 8.0 | 33 | 23 | 34 | 54 | 86 | 34 | 41 | 30 | 40 | 39 |
| 13 | 10 | 8.0 | 89 | 21 | 42 | 57 | 84 | 33 | 33 | 27 | 84 | 25 |
| 14 | 10 | 8.0 | 85 | 20 | 87 | 56 | 77 | 44 | 26 | 77 | 79 | 40 |
| 15 | 10 | 7.8 | 80 | 18 | 86 | 84 | 63 | 90 | 23 | 74 | 88 | 36 |
| 16 | 10 | 8.4 | 52 | 17 | 88 | 91 | 82 | 83 | 22 | 42 | 83 | 34 |
| 17 | 10 | 7.8 | 39 | 16 | 87 | 91 | 81 | 54 | 20 | 44 | 84 | 32 |
| 18 | 13 | 7.8 | 45 | 15 | 81 | 88 | 79 | 44 | 19 | 38 | 84 | 36 |
| 19 | 44 | 7.4 | 25 | 15 | 67 | 85 | 78 | 43 | 18 | 74 | 84 | 35 |
| 20 | 59 | 7.8 | 21 | 15 | 88 | 76 | 84 | 37 | 17 | 82 | 76 | 36 |
| 21 | 18 | 7.4 | 24 | 14 | 63 | 58 | 68 | 34 | 17 | 54 | 57 | 56 |
| 22 | 46 | 7.8 | 72 | 14 | 88 | 50 | 82 | 32 | 17 | 44 | 49 | 60 |
| 23 | 20 | 9.2 | 62 | 15 | 87 | 45 | 60 | 30 | 15 | 45 | 50 | 46 |
| 24 | 14 | 9.6 | 37 | 15 | 87 | 75 | 49 | 28 | 15 | 44 | 44 | 43 |
| 25 | 13 | 14 | 51 | 14 | 88 | 87 | 47 | 43 | 18 | 54 | 66 | 41 |
| 26 | 12 | 9.6 | 39 | 14 | 85 | 72 | 44 | 59 | 18 | 37 | 62 | 64 |
| 27 | 12 | 8.0 | 28 | 14 | 77 | 57 | 53 | 42 | 16 | 32 | 56 | 58 |
| 28 | 14 | 23 | 24 | 13 | 84 | 49 | 59 | 33 | 15 | 29 | 48 | 48 |
| 29 | 12 | 88 | 22 | 40 | ------ | 70 | 80 | 30 | 19 | 28 | 45 | 51 |
| 30 | 11 | 75 | 21 | 93 | ------ | 84 | 72 | 28 | 39 | 27 | 66 | 43 |
| 31 | 11 | ------ | 20 | 89 | ------ | 89 | ------ | 26 | ------ | 71 | 80 | ------ |
| TOTAL | 509 | 423.8 | 1,184 | 1,058 | 1,931 | 2,316 | 2,184 | 1,409 | 697 | 1,523 | 1,906 | 1,523 |
| MEAN | 16.4 | 14.1 | 38.2 | 34.1 | 69.0 | 74.7 | 72.8 | 45.5 | 23.2 | 49.1 | 61.5 | 50.8 |
| MAX | 59 | 88 | 89 | 93 | 88 | 91 | 88 | 90 | 74 | 82 | 88 | 85 |
| MIN | 10 | 7.4 | 18 | 13 | 34 | 45 | 44 | 26 | 15 | 27 | 36 | 25 |
| AC-FT | 1,010 | 841 | 2,350 | 2,100 | 3,830 | 4,590 | 4,330 | 2,790 | 1,380 | 3,020 | 3,780 | 3,020 |

CAL YR 1968: TOTAL 11,030.8 MEAN 30.1 MAX 96 MIN 7.0 AC-FT 21,880
WTR YR 1969: TOTAL 16,663.8 MEAN 45.7 MAX 93 MIN 7.4 AC-FT 33,050

## 16-5180. West Wailuaiki Stream near Keanae

LOCATION.--Lat 20°49'15", long 156°08'37", Maui, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

DRAINAGE AREA.--3.66 sq mi.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder. Datum of gage is 1,343.6 ft above mean sea level (by vertical angles).

EXTREMES.--Current year: Maximum discharge, 6,780 cfs Jan. 30 (gage height, 11.63 ft), from rating curve extended above 650 cfs; minimum, 1.7 cfs Nov. 22.
Period of record: Maximum discharge, 9,900 cfs Jan. 14, 1923 (gage height, 13.5 ft, from floodmarks), from rating curve extended above 650 cfs; minimum, 0.5 cfs July 26, 1922.

REMARKS.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft below station, for domestic supply and irrigation of sugarcane in central Maui.

REVISIONS.--WSP 1569: Drainage area. All published peak discharges prior to Oct. 1, 1967, and above 3,270 cfs (gage height, 9.18 ft) have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.4 | 2.7 | 13 | 6.2 | 1.010 | 142 | 1.080 | 20 | 6.2 | 96 | 72 | 136 |
| 2 | 4.9 | 3.2 | 21 | 5.8 | 893 | 72 | 404 | 119 | 5.9 | 266 | 39 | 54 |
| 3 | 5.8 | 2.6 | 14 | 267 | 710 | 371 | 55 | 50 | 6.2 | 30 | 22 | 37 |
| 4 | 4.1 | 2.4 | 201 | 88 | 72 | 251 | 40 | 56 | 6.3 | 12 | 16 | 25 |
| 5 | 3.6 | 2.4 | 48 | 142 | 21 | 204 | 60 | 21 | 5.3 | 8.5 | 17 | 21 |
| 6 | 3.2 | 2.2 | 29 | 58 | 14 | 381 | 142 | 15 | 5.0 | 175 | 62 | 30 |
| 7 | 3.2 | 2.1 | 13 | 136 | 12 | 101 | 94 | 12 | 4.7 | 49 | 15 | 16 |
| 8 | 3.2 | 2.1 | 9.3 | 102 | 10 | 32 | 66 | 11 | 4.6 | 21 | 11 | 27 |
| 9 | 4.6 | 2.2 | 33 | 81 | 9.6 | 103 | 27 | 10 | 4.8 | 20 | 9.1 | 16 |
| 10 | 3.0 | 2.1 | 12 | 20 | 8.5 | 27 | 19 | 16 | 16 | 18 | 12 | 15 |
| 11 | 2.7 | 2.1 | 7.8 | 13 | 7.8 | 20 | 144 | 12 | 135 | 10 | 10 | 11 |
| 12 | 2.7 | 1.9 | 115 | 10 | 7.3 | 16 | 234 | 10 | 16 | 8.9 | 19 | 10 |
| 13 | 2.4 | 1.8 | 528 | 8.7 | 24 | 13 | 112 | 8.2 | 12 | 8.3 | 159 | 13 |
| 14 | 2.3 | 1.8 | 126 | 7.8 | 280 | 12 | 36 | 99 | 8.0 | 242 | 112 | 11 |
| 15 | 2.2 | 2.2 | 35 | 7.0 | 261 | 80 | 27 | 328 | 6.6 | 81 | 266 | 8.7 |
| 16 | 2.6 | 8.0 | 19 | 6.6 | 354 | 169 | 56 | 49 | 6.0 | 16 | 39 | 8.0 |
| 17 | 2.7 | 2.9 | 20 | 6.0 | 216 | 394 | 56 | 18 | 5.6 | 16 | 71 | 7.5 |
| 18 | 12 | 2.2 | 40 | 5.8 | 270 | 302 | 38 | 13 | 5.1 | 12 | 89 | 8.5 |
| 19 | 66 | 2.0 | 13 | 5.5 | 334 | 171 | 94 | 13 | 4.8 | 79 | 69 | 8.7 |
| 20 | 88 | 2.1 | 10 | 5.2 | 248 | 29 | 129 | 11 | 4.6 | 48 | 27 | 8.7 |
| 21 | 10 | 1.9 | 12 | 5.0 | 305 | 19 | 39 | 10 | 4.5 | 18 | 17 | 25 |
| 22 | 28 | 2.0 | 46 | 4.7 | 213 | 15 | 146 | 9.1 | 4.4 | 13 | 13 | 18 |
| 23 | 8.3 | 7.9 | 20 | 4.8 | 104 | 13 | 32 | 8.5 | 3.8 | 15 | 16 | 10 |
| 24 | 5.5 | 4.6 | 12 | 4.7 | 128 | 213 | 20 | 7.5 | 3.6 | 12 | 11 | 11 |
| 25 | 4.5 | 6.0 | 29 | 4.6 | 147 | 123 | 16 | 15 | 4.4 | 19 | 44 | 9.6 |
| 26 | 3.9 | 3.1 | 16 | 4.3 | 109 | 38 | 13 | 18 | 5.1 | 10 | 29 | 52 |
| 27 | 3.5 | 2.2 | 10 | 4.2 | 37 | 22 | 18 | 12 | 4.0 | 8.3 | 14 | 20 |
| 28 | 5.7 | 216 | 10 | 4.0 | 67 | 17 | 27 | 9.8 | 3.6 | 7.3 | 11 | 18 |
| 29 | 3.7 | 1.610 | 9.4 | 166 | ------ | 31 | 121 | 7.7 | 5.2 | 7.3 | 12 | 38 |
| 30 | 3.2 | 32 | 7.7 | 782 | ------ | 89 | 55 | 7.0 | 50 | 7.3 | 29 | 18 |
| 31 | 3.0 | ------ | 6.8 | 346 | ------ | 508 | ------ | 6.6 | ------ | 136 | 34 | ------ |
| TOTAL | 302.9 | 1.936.7 | 1.486.0 | 2.311.9 | 5.872.2 | 3.978 | 3.400 | 1.002.4 | 357.3 | 1.469.9 | 1.366.1 | 691.7 |
| MEAN | 9.77 | 64.6 | 47.9 | 74.6 | 210 | 128 | 113 | 32.3 | 11.9 | 47.4 | 44.1 | 23.1 |
| MAX | 88 | 1.610 | 528 | 782 | 1.010 | 508 | 1.080 | 328 | 135 | 266 | 266 | 136 |
| MIN | 2.2 | 1.8 | 6.8 | 4.0 | 7.3 | 12 | 13 | 6.6 | 3.6 | 7.3 | 9.1 | 7.5 |
| AC-FT | 601 | 3.840 | 2.950 | 4.590 | 11.650 | 7.890 | 6.740 | 1.990 | 709 | 2.920 | 2.710 | 1.370 |

CAL YR 1968: TOTAL 11,746.0 MEAN 32.1 MAX 1,610 MIN 1.8 AC-FT 23,300
WTR YR 1969: TOTAL 24,175.1 MEAN 66.2 MAX 1,610 MIN 1.8 AC-FT 47,950

PEAK DISCHARGE (BASE, 1,900 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0430 | 11.27 | 6,240 | 4- 1 | 1500 | 7.90 | 2,450 |
| 1-30 | 2000 | 11.63 | 6,780 | | | | |

## 16-5230. Koolau ditch near Keanae

LOCATION.--Lat 20°49'53", long 156°10'30", Maui, on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office, and 5.1 miles southeast of Kailua.

PERIOD OF RECORD.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,237.7 ft above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, nonrecording gage at same site and datum.

EXTREMES.--Period of record: Maximum daily discharge, 266 cfs Apr. 19, 1935; no flow at times.

REMARKS.--Records good. Ditch diverts at altitude 1,260 ft from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 47 | 30 | 36 | 50 | 186 | 195 | 184 | 182 | 66 | 211 | 211 | 222 |
| 2 | 48 | 32 | 54 | 46 | 164 | 196 | 189 | 96 | 63 | 225 | 205 | 218 |
| 3 | 50 | 29 | 55 | 121 | 164 | 193 | 193 | 15 | 64 | 175 | 193 | 210 |
| 4 | 40 | 28 | 106 | 191 | 115 | 194 | 194 | 34 | 68 | 115 | 166 | 205 |
| 5 | 38 | 27 | 58 | 181 | 153 | 194 | 194 | 19 | 56 | 82 | 156 | 191 |
| 6 | 36 | 26 | 64 | 156 | 126 | 194 | 191 | .12 | 54 | 204 | 210 | 188 |
| 7 | 36 | 26 | 61 | 194 | 104 | 196 | 192 | 24 | 51 | 219 | 156 | 174 |
| 8 | 34 | 25 | 69 | 195 | 95 | 184 | 194 | 107 | 49 | 174 | 121 | 211 |
| 9 | 36 | 26 | 80 | 195 | 86 | 198 | 193 | 97 | 51 | 182 | 99 | 167 |
| 10 | 32 | 25 | 95 | 154 | 79 | 149 | 163 | 103 | 66 | 163 | 136 | 160 |
| 11 | 31 | 24 | 60 | 102 | 75 | 107 | 180 | 104 | 219 | 100 | 118 | 121 |
| 12 | 30 | 23 | 76 | 82 | 72 | 123 | 192 | 98 | 143 | 86 | 126 | 107 |
| 13 | 29 | 23 | 168 | 69 | 83 | 142 | 194 | 80 | 108 | 82 | 219 | 142 |
| 14 | 28 | 23 | 175 | 62 | 194 | 139 | 198 | 115 | 73 | 217 | 219 | 122 |
| 15 | 27 | 24 | 173 | 57 | 193 | 196 | 188 | 216 | 64 | 214 | 225 | 97 |
| 16 | 30 | 48 | 106 | 53 | 194 | 192 | 196 | 217 | 57 | 146 | 217 | 91 |
| 17 | 30 | 26 | 90 | 49 | 195 | 191 | 196 | 173 | 54 | 152 | 220 | 85 |
| 18 | 44 | 23 | 95 | 46 | 194 | 192 | 198 | 130 | 51 | 118 | 219 | 101 |
| 19 | 182 | 22 | 62 | 45 | 193 | 198 | 196 | 135 | 48 | 208 | 217 | 101 |
| 20 | 192 | 24 | 75 | 43 | 190 | 198 | 194 | 107 | 46 | 216 | 214 | 101 |
| 21 | 76 | 23 | 62 | 40 | 138 | 175 | 198 | 95 | 45 | 168 | 174 | 167 |
| 22 | 173 | 23 | 195 | 40 | 194 | 148 | 194 | 87 | 47 | 134 | 146 | 190 |
| 23 | 69 | 48 | 185 | 40 | 195 | 132 | 198 | 83 | 43 | 150 | 171 | 134 |
| 24 | 46 | 38 | 114 | 39 | 194 | 184 | 170 | 76 | 40 | 138 | 122 | 127 |
| 25 | 40 | 59 | 131 | 38 | 195 | 195 | 148 | 148 | 52 | 167 | 198 | 114 |
| 26 | 36 | 32 | 135 | 36 | 195 | 197 | 128 | 183 | 61 | 106 | 190 | 188 |
| 27 | 34 | 25 | 86 | 35 | 197 | 187 | 170 | 130 | 46 | 88 | 157 | 173 |
| 28 | 53 | 57 | 80 | 34 | 196 | 158 | 186 | 98 | 42 | 80 | 128 | 157 |
| 29 | 36 | 161 | 72 | 100 | ------ | 188 | 194 | 80 | 59 | 79 | 122 | 176 |
| 30 | 32 | 86 | 62 | 194 | ------ | 192 | 196 | 74 | 155 | 78 | 206 | 150 |
| 31 | 32 | ------ | 54 | 196 | ------ | 186 | ------ | 70 | ------ | 197 | 214 | ------ |
| TOTAL | 1,647 | 1,086 | 2,934 | 2,883 | 4,359 | 5,513 | 5,601 | 3,176.12 | 2,041 | 4,674 | 5,475 | 4,590 |
| MEAN | 53.1 | 36.2 | 94.6 | 93.0 | 156 | 178 | 187 | 102 | 68.0 | 151 | 177 | 153 |
| MAX | 192 | 161 | 195 | 196 | 197 | 198 | 198 | 217 | 219 | 225 | 225 | 222 |
| MIN | 27 | 22 | 36 | 34 | 72 | 107 | 128 | .12 | 40 | 78 | 99 | 85 |
| AC-FT | 3,270 | 2,150 | 5,820 | 5,720 | 8,650 | 10,940 | 11,110 | 6,300 | 4,050 | 9,270 | 10,860 | 9,100 |

CAL YR 1968: TOTAL 32,474 MEAN 88.7 MAX 227 MIN 22 AC-FT 64,410
WTR YR 1969: TOTAL 43,979.12 MEAN 120 MAX 225 MIN .12 AC-FT 87,230

## 16-5240. Honomanu Stream at Haiku-uka boundary, near Kailiili

LOCATION.--Lat 20°49'19", long 156°12'15", Maui, on left bank at Haiku-uka trail crossing, 4.5 miles southwest of Keanae, 4.8 miles southeast of Kailiili, and 5 miles south of Kailua.

DRAINAGE AREA.--2.54 sq mi.

PERIOD OF RECORD.--October 1919 to February 1927, July 1932 to December 1934, June 1962 to November 1968 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

EXTREMES.--Maximum discharge during period October to November 1968, 1,990 cfs Nov. 29 (gage height, 9.89 ft), from rating curve extended above 120 cfs; minimum, 0.22 cfs Nov. 12-14, 19-22.
Period of record: Maximum discharge, 2,000 cfs Jan. 14, 1923 (gage height, 9.93 ft), from rating curve extended above 120 cfs; minimum, 0.09 cfs Nov. 20, 1962.

REMARKS.--Records good. Diversion above station for domestic use since September 1968.

REVISIONS (FISCAL YEARS).--WSP 1719: 1920-21. WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER TO NOVEMBER 1968

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .64 | .56 | | | | | | | | | | |
| 2 | 1.6 | .45 | | | | | | | | | | |
| 3 | 1.4 | .33 | | | | | | | | | | |
| 4 | .68 | .30 | | | | | | | | | | |
| 5 | .48 | .28 | | | | | | | | | | |
| 6 | .42 | .26 | | | | | | | | | | |
| 7 | .39 | .26 | | | | | | | | | | |
| 8 | .36 | .24 | | | | | | | | | | |
| 9 | .33 | .24 | | | | | | | | | | |
| 10 | .30 | .24 | | | | | | | | | | |
| 11 | .28 | .24 | | | | | | | | | | |
| 12 | .28 | .24 | | | | | | | | | | |
| 13 | .28 | .22 | | | | | | | | | | |
| 14 | .28 | .24 | | | | | | | | | | |
| 15 | .30 | .28 | | | | | | | | | | |
| 16 | .39 | 1.7 | | | | | | | | | | |
| 17 | .33 | .48 | | | | | | | | | | |
| 18 | .71 | .30 | | | | | | | | | | |
| 19 | 14 | .24 | | | | | | | | | | |
| 20 | 44 | .26 | | | | | | | | | | |
| 21 | 2.0 | .24 | | | | | | | | | | |
| 22 | 5.6 | .36 | | | | | | | | | | |
| 23 | 1.4 | 1.2 | | | | | | | | | | |
| 24 | .78 | .73 | | | | | | | | | | |
| 25 | .56 | 1.3 | | | | | | | | | | |
| 26 | .45 | .64 | | | | | | | | | | |
| 27 | .39 | .36 | | | | | | | | | | |
| 28 | 1.0 | 33 | | | | | | | | | | |
| 29 | .48 | 564 | | | | | | | | | | |
| 30 | 1.3 | 16 | | | ------ | | | | | | | |
| 31 | 1.0 | ------ | | | ------ | | ------ | | ------ | | | ------ |
| TOTAL | 82.41 | 625.19 | | | | | | | | | | |
| MEAN | 2.66 | 20.8 | | | | | | | | | | |
| MAX | 44 | 564 | | | | | | | | | | |
| MIN | .28 | .22 | | | | | | | | | | |
| AC-FT | 163 | 1,240 | | | | | | | | | | |

CAL YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 700 CFS).--Nov. 29 (0730) 1,990 cfs (9.89 ft).

## 16-5310. Kula diversion from Haipuaena Stream near Olinda

LOCATION.--Lat 20°48'24", long 156°13'27", Maui, on left bank of Haipuaena Stream, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

PERIOD OF RECORD.--July 1945 to current year.

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 3.17 cfs Mar. 20, 1948; no flow Nov. 4, 1964.

REMARKS.--Records excellent. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .17 | .26 | .05 | .25 | 2.4 | 2.7 | 2.2 | .91 | .15 | .76 | 1.9 | 1.8 |
| 2 | .60 | .17 | .93 | .19 | .26 | 1.9 | 1.1 | 2.3 | .12 | .70 | 2.0 | 1.7 |
| 3 | .83 | .11 | 1.6 | 1.3 | .22 | 2.7 | 1.5 | 1.5 | .10 | 1.1 | 1.1 | 1.7 |
| 4 | .34 | .08 | 1.8 | 1.0 | 1.0 | 2.5 | 1.7 | 2.0 | .09 | .94 | .70 | 1.2 |
| 5 | .21 | .06 | 1.4 | .94 | .84 | 2.1 | 1.7 | 1.5 | .08 | .49 | .89 | 1.1 |
| 6 | .14 | .04 | 1.4 | .79 | .49 | 2.5 | 2.7 | 1.0 | .06 | 2.1 | 1.4 | .91 |
| 7 | .11 | .04 | .84 | .91 | .34 | 1.5 | 2.2 | .52 | .07 | 1.8 | .91 | 1.1 |
| 8 | .08 | .03 | .45 | .97 | .28 | 1.3 | 2.0 | .36 | .08 | 1.4 | .70 | 1.4 |
| 9 | .10 | .03 | .43 | .97 | .23 | 2.6 | 1.3 | .30 | .08 | 1.3 | .43 | 1.1 |
| 10 | .09 | .02 | .47 | 1.1 | .18 | 1.4 | .73 | .25 | .17 | 1.1 | .38 | 1.4 |
| 11 | .07 | .02 | .40 | .67 | .15 | .73 | 2.1 | .56 | 1.8 | .54 | .73 | 1.1 |
| 12 | .05 | .02 | 1.0 | .45 | .14 | .49 | 2.8 | .58 | .91 | .38 | .71 | .67 |
| 13 | .04 | .02 | 1.8 | .34 | .17 | .36 | 2.0 | .30 | .54 | .39 | 2.5 | 1.1 |
| 14 | .04 | .02 | 1.4 | .26 | 2.5 | .28 | 1.4 | .40 | .34 | 2.2 | 2.2 | 1.2 |
| 15 | .04 | .02 | 1.0 | .21 | 2.2 | .34 | 1.0 | 2.7 | .21 | 1.4 | 1.8 | .62 |
| 16 | .04 | .32 | .88 | .30 | 2.6 | 2.3 | 1.5 | 1.3 | .15 | .94 | 1.1 | .40 |
| 17 | .04 | .19 | 1.0 | .23 | 2.4 | 2.8 | 1.8 | .57 | .14 | 1.2 | 1.2 | .38 |
| 18 | .05 | .09 | 1.5 | .15 | 2.1 | 2.0 | 1.5 | .38 | .10 | .64 | 1.2 | .47 |
| 19 | 1.9 | .06 | .79 | .15 | 2.3 | 1.5 | 2.3 | .30 | .08 | 2.1 | 1.0 | .36 |
| 20 | 1.6 | .04 | .47 | .18 | 1.4 | .94 | 2.4 | .28 | .07 | 1.6 | 1.1 | .30 |
| 21 | .79 | .03 | .36 | .18 | 1.3 | .59 | 1.6 | .52 | .05 | 1.1 | 1.0 | .92 |
| 22 | 1.6 | .04 | .58 | .17 | 1.1 | .43 | 2.3 | .45 | .05 | .70 | .62 | 1.1 |
| 23 | .89 | .38 | .57 | .19 | .97 | .34 | 1.2 | .28 | .06 | 1.3 | .49 | .72 |
| 24 | .38 | .28 | .36 | .17 | 1.0 | 1.6 | .91 | .19 | .07 | 1.5 | .43 | 1.1 |
| 25 | .25 | .26 | 1.1 | .14 | 1.1 | 2.1 | .70 | .47 | .05 | 1.6 | 1.5 | .62 |
| 26 | .18 | .34 | 1.1 | .10 | 1.1 | 1.4 | .43 | 1.5 | .06 | 1.1 | 1.4 | 1.2 |
| 27 | .14 | .18 | .54 | .08 | .88 | .91 | .76 | 1.5 | .10 | .57 | .76 | 1.1 |
| 28 | .14 | .29 | .49 | .06 | 1.7 | .70 | 1.3 | .93 | .09 | .40 | .47 | 1.1 |
| 29 | .14 | .28 | .88 | .84 | ------ | .54 | 2.3 | .38 | .38 | .30 | .54 | 1.4 |
| 30 | .56 | .04 | .55 | .80 | ------ | .82 | 1.7 | .25 | 1.1 | .34 | 1.4 | 1.2 |
| 31 | .53 | ------ | .32 | 1.4 | ------ | 2.9 | ------ | .18 | ------ | 1.9 | 1.3 | ------ |
| TOTAL | 12.14 | 3.76 | 26.46 | 15.49 | 31.35 | 45.27 | 49.13 | 24.66 | 7.35 | 33.89 | 33.86 | 30.47 |
| MEAN | .39 | .13 | .85 | .50 | 1.12 | 1.46 | 1.64 | .80 | .24 | 1.09 | 1.09 | 1.02 |
| MAX | 1.9 | .38 | 1.8 | 1.4 | 2.6 | 2.9 | 2.8 | 2.7 | 1.8 | 2.2 | 2.5 | 1.8 |
| MIN | .04 | .02 | .05 | .06 | .14 | .28 | .43 | .18 | .05 | .30 | .38 | .30 |
| AC-FT | 24 | 7.5 | 52 | 31 | 62 | 90 | 97 | 49 | 15 | 67 | 67 | 60 |

CAL YR 1968: TOTAL 179.89 MEAN .49 MAX 2.4 MIN .02 AC-FT 357
WTR YR 1969: TOTAL 313.83 MEAN .86 MAX 2.9 MIN .02 AC-FT 622

## 16-5380. Spreckels ditch at Haipuaena weir, near Huelo

LOCATION.--Lat 20°51'15", long 156°11'25", Maui, on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 miles west of Keanae, and 4.5 miles southeast of Huelo.

PERIOD OF RECORD.--April 1922 to current year. Published as "at Haipuaena, near Huelo" 1930-35.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft upstream at different datum.

EXTREMES.--Period of record: Maximum daily discharge, 150 cfs Feb. 10, 1955, Feb. 18, 1956; no flow at times.

REMARKS.--Records good. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 cfs was diverted above station to East Maui Irrigation Co. powerplant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui.

REVISIONS (FISCAL YEARS).--WSP 770: 1932-33.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.8 | 7.0 | 16 | 9.4 | 113 | 114 | 128 | 42 | 12 | 82 | 57 | 105 |
| 2 | 9.4 | 7.9 | 20 | 8.8 | 62 | 97 | 102 | 85 | 11 | 109 | 60 | 87 |
| 3 | 12 | 6.2 | 19 | 68 | 69 | 120 | 63 | 66 | 12 | 48 | 46 | 63 |
| 4 | 7.9 | 5.6 | 62 | 68 | 50 | 114 | 70 | 82 | 13 | 22 | 40 | 47 |
| 5 | 7.3 | 5.4 | 27 | 59 | 34 | 114 | 80 | 43 | 9.8 | 16 | 42 | 40 |
| 6 | 6.7 | 5.2 | 18 | 34 | 22 | 114 | 107 | 30 | 8.5 | 92 | 87 | 57 |
| 7 | 7.0 | 4.9 | 9.8 | 57 | 17 | 94 | 90 | 22 | 11 | 79 | 38 | 58 |
| 8 | 6.4 | 4.7 | 7.0 | 69 | 16 | 59 | 77 | 19 | 11 | 43 | 27 | 85 |
| 9 | 6.4 | 4.9 | 22 | 68 | 14 | 106 | 49 | 17 | 11 | 63 | 20 | 51 |
| 10 | 5.9 | 4.7 | 13 | 30 | 12 | 51 | 39 | 19 | 34 | 46 | 36 | 54 |
| 11 | 5.6 | 4.3 | 9.4 | 17 | 11 | 33 | 92 | 23 | 96 | 23 | 25 | 30 |
| 12 | 5.4 | 4.1 | 35 | 14 | 9.8 | 23 | 112 | 19 | 32 | 20 | 35 | 23 |
| 13 | 5.2 | 4.1 | 132 | 12 | 16 | 19 | 96 | 14 | 24 | 20 | 106 | 54 |
| 14 | 5.2 | 4.1 | 107 | 11 | 118 | 20 | 67 | 38 | 14 | 112 | 88 | 34 |
| 15 | 4.9 | 4.3 | 73 | 10 | 115 | 70 | 56 | 107 | 12 | 78 | 108 | 21 |
| 16 | 5.6 | 19 | 37 | 12 | 118 | 116 | 89 | 68 | 10 | 29 | 73 | 19 |
| 17 | 5.6 | 5.6 | 28 | 9.1 | 109 | 120 | 85 | 34 | 9.8 | 34 | 97 | 18 |
| 18 | 8.5 | 4.1 | 55 | 8.2 | 116 | 116 | 64 | 24 | 8.8 | 24 | 91 | 20 |
| 19 | 54 | 3.7 | 18 | 8.8 | 117 | 72 | 86 | 27 | 8.2 | 89 | 78 | 22 |
| 20 | 78 | 3.7 | 14 | 8.5 | 114 | 33 | 107 | 20 | 7.9 | 89 | 54 | 22 |
| 21 | 17 | 3.5 | 16 | 7.3 | 113 | 32 | 62 | 24 | 7.6 | 40 | 36 | 61 |
| 22 | 45 | 3.6 | 89 | 6.7 | 113 | 29 | 100 | 17 | 8.2 | 28 | 28 | 54 |
| 23 | 14 | 11 | 47 | 6.4 | 100 | 29 | 50 | 15 | 7.3 | 44 | 42 | 34 |
| 24 | 9.1 | 9.0 | 21 | 6.4 | 100 | 91 | 35 | 12 | 6.7 | 51 | 23 | 33 |
| 25 | 7.9 | 12 | 54 | 6.4 | 110 | 108 | 28 | 54 | 10 | 59 | 73 | 28 |
| 26 | 7.3 | 6.7 | 31 | 5.9 | 88 | 54 | 21 | 58 | 15 | 24 | 56 | 82 |
| 27 | 6.7 | 4.3 | 19 | 5.4 | 46 | 42 | 48 | 42 | 8.8 | 19 | 29 | 46 |
| 28 | 20 | 29 | 19 | 5.2 | 74 | 31 | 59 | 24 | 7.3 | 16 | 22 | 39 |
| 29 | 8.2 | 91 | 19 | 52 | ------ | 64 | 107 | 16 | 20 | 16 | 23 | 68 |
| 30 | 7.9 | 30 | 13 | 113 | ------ | 98 | 74 | 13 | 75 | 17 | 64 | 33 |
| 31 | 9.4 | ------ | 11 | 88 | ------ | 122 | ------ | 12 | ------ | 97 | 74 | ------ |
| TOTAL | 408.3 | 313.6 | 1,061.2 | 884.5 | 1,996.8 | 2305 | 2243 | 1,086 | 521.9 | 1,529 | 1,678 | 1,388 |
| MEAN | 13.2 | 10.5 | 34.2 | 28.5 | 71.3 | 74.4 | 74.8 | 35.0 | 17.4 | 49.3 | 54.1 | 46.3 |
| MAX | 78 | 91 | 132 | 113 | 118 | 122 | 128 | 107 | 96 | 112 | 108 | 105 |
| MIN | 4.9 | 3.5 | 7.0 | 5.2 | 9.8 | 19 | 21 | 12 | 6.7 | 16 | 20 | 18 |
| AC-FT | 810 | 622 | 2,100 | 1,750 | 3,960 | 4,570 | 4,450 | 2,150 | 1,040 | 3,030 | 3,330 | 2,750 |

CAL YR 1968: TOTAL 9,891.9 MEAN 27.0 MAX 132 MIN 3.5 AC-FT 19,620
WTR YR 1969: TOTAL 15,415.3 MEAN 42.2 MAX 132 MIN 3.5 AC-FT 30,580

## 16-5410. Koolau ditch at Haipuaena, near Huelo

LOCATION.--Lat 20°51'17", long 156°11'19", Maui, on right bank at Haipuaena Stream, 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo.

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

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (from topographic map). Prior to Mar. 21, 1933, at datum 1.94 ft lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower, than present datum.

EXTREMES.--Period of record: Maximum daily discharge, 300 cfs July 1, 17, 1963; no flow at times.

REMARKS.--Records excellent. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 48 | 30 | 37 | 50 | 261 | 208 | 266 | 186 | 64 | 228 | 220 | 269 |
| 2 | 48 | 31 | 53 | 46 | 229 | 198 | 253 | 146 | 62 | 275 | 212 | 235 |
| 3 | 50 | 28 | 54 | 151 | 225 | 214 | 217 | 12 | 62 | 183 | 193 | 215 |
| 4 | 41 | 27 | 107 | 206 | 124 | 210 | 219 | 12 | 66 | 116 | 163 | 202 |
| 5 | 38 | 26 | 40 | 177 | 153 | 210 | 235 | .92 | 56 | 84 | 156 | 190 |
| 6 | 37 | 26 | 71 | 154 | 124 | 207 | 274 | 1.7 | 52 | 239 | 181 | 194 |
| 7 | 37 | 25 | 63 | 200 | 102 | 198 | 244 | 24 | 50 | 232 | 158 | 178 |
| 8 | 34 | 24 | 68 | 210 | 93 | 168 | 203 | 112 | 49 | 174 | 124 | 231 |
| 9 | 35 | 25 | 86 | 207 | 85 | 202 | 201 | 101 | 51 | 186 | 101 | 168 |
| 10 | 32 | 24 | 94 | 145 | 78 | 131 | 165 | 106 | 75 | 170 | 137 | 160 |
| 11 | 31 | 23 | 60 | 96 | 75 | 88 | 240 | 108 | 252 | 102 | 118 | 120 |
| 12 | 30 | 22 | 91 | 78 | 72 | 111 | 272 | 100 | 138 | 88 | 122 | 107 |
| 13 | 29 | 22 | 213 | 68 | 89 | 137 | 235 | 82 | 120 | 84 | 263 | 153 |
| 14 | 27 | 22 | 191 | 62 | 218 | 136 | 210 | 134 | 73 | 268 | 248 | 121 |
| 15 | 27 | 22 | 186 | 57 | 217 | 214 | 195 | 222 | 62 | 236 | 276 | 98 |
| 16 | 29 | 48 | 72 | 54 | 223 | 236 | 223 | 227 | 58 | 145 | 235 | 92 |
| 17 | 30 | 25 | 6.8 | 50 | 210 | 252 | 233 | 173 | 54 | 147 | 258 | 87 |
| 18 | 50 | 22 | 7.1 | 47 | 212 | 246 | 206 | 131 | 50 | 117 | 256 | 101 |
| 19 | 187 | 20 | .21 | 46 | 212 | 217 | 235 | 134 | 47 | 241 | 241 | 103 |
| 20 | 206 | 22 | 44 | 43 | 202 | 200 | 264 | 105 | 45 | 243 | 218 | 102 |
| 21 | 77 | 20 | 78 | 42 | 152 | 173 | 209 | 97 | 43 | 168 | 176 | 178 |
| 22 | 174 | 20 | 211 | 41 | 210 | 146 | 241 | 87 | 44 | 134 | 146 | 196 |
| 23 | 66 | 46 | 176 | 41 | 200 | 132 | 202 | 84 | 41 | 150 | 171 | 133 |
| 24 | 46 | 38 | 105 | 39 | 202 | 201 | 171 | 75 | 39 | 147 | 122 | 128 |
| 25 | 39 | 57 | 135 | 38 | 206 | 225 | 150 | 157 | 50 | 178 | 213 | 114 |
| 26 | 36 | 32 | 128 | 37 | 194 | 204 | 130 | 192 | 59 | 108 | 192 | 210 |
| 27 | 34 | 24 | 82 | 35 | 182 | 187 | 175 | 130 | 45 | 91 | 153 | 176 |
| 28 | 54 | 63 | 76 | 34 | 190 | 159 | 201 | 97 | 41 | 82 | 127 | 154 |
| 29 | 35 | 241 | 69 | 129 | ------ | 202 | 266 | 81 | 58 | 81 | 122 | 182 |
| 30 | 33 | 93 | 60 | 259 | ------ | 248 | 226 | 73 | 170 | 81 | 206 | 151 |
| 31 | 31 | ------ | 54 | 230 | ------ | 282 | ------ | 69 | ------ | 231 | 226 | ------ |
| TOTAL | 1,671 | 1,148 | 2,718.11 | 3,072 | 4,740 | 5,942 | 6,561 | 3,259.62 | 2,076 | 5,009 | 5,734 | 4,748 |
| MEAN | 53.9 | 38.3 | 87.7 | 99.1 | 169 | 192 | 219 | 105 | 69.2 | 162 | 185 | 158 |
| MAX | 206 | 241 | 213 | 259 | 261 | 282 | 274 | 227 | 252 | 275 | 276 | 269 |
| MIN | 27 | 20 | .21 | 34 | 72 | 88 | 130 | .92 | 39 | 81 | 101 | 87 |
| AC-FT | 3,310 | 2,280 | 5,390 | 6,090 | 9,400 | 11,790 | 13,010 | 6,470 | 4,120 | 9,940 | 11,370 | 9,420 |

CAL YR 1968: TOTAL 33,555.11 MEAN 91.7 MAX 277 MIN .21 AC-FT 66,560
WTR YR 1969: TOTAL 46,678.73 MEAN 128 MAX 282 MIN .21 AC-FT 92,590

## 16-5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo

LOCATION.--Lat 20°51'48", long 156°11'00", Maui, on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 miles west of Keanae, and 4.4 miles southeast of Huelo.

PERIOD OF RECORD.--December 1917 to November 1924, January 1925 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 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 the Waikamoi for irrigation in central Maui.

REVISIONS (FISCAL YEARS).--WSP 1719: 1918-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .50 | .18 | 3.3 | 1.2 | 127 | 89 | 134 | 4.0 | 1.2 | 5.4 | 4.3 | 72 |
| 2 | .50 | .18 | 2.2 | 1.1 | 130 | 45 | 80 | 38 | 1.1 | 89 | 4.3 | 13 |
| 3 | .43 | .13 | 1.5 | 42 | 124 | 116 | 12 | 21 | 1.1 | 5.3 | 3.9 | 5.5 |
| 4 | .43 | .13 | 35 | 25 | 16 | 94 | 7.6 | 42 | 1.1 | 2.2 | 3.0 | 3.7 |
| 5 | .43 | .13 | 2.9 | 6.9 | 5.4 | 105 | 27 | 20 | .92 | 1.6 | 2.5 | 3.3 |
| 6 | .36 | .13 | 2.1 | 3.5 | 3.6 | 99 | 66 | 5.1 | .83 | 50 | 36 | 10 |
| 7 | .43 | .13 | 1.4 | 5.0 | 2.9 | 42 | 14 | 3.2 | .83 | 5.8 | 5.8 | 4.9 |
| 8 | .36 | .13 | 1.1 | 13 | 2.4 | 25 | 4.6 | 2.8 | .74 | 3.3 | 2.5 | 14 |
| 9 | .30 | .13 | 1.0 | 12 | 2.0 | 71 | 3.4 | 2.1 | .83 | 4.0 | 2.0 | 4.4 |
| 10 | .30 | .13 | .83 | 3.8 | 1.4 | 22 | 2.8 | 1.9 | 5.7 | 4.0 | 2.7 | 4.9 |
| 11 | .36 | .13 | .66 | 2.9 | .92 | 20 | 23 | 2.4 | 58 | 2.4 | 2.1 | 2.9 |
| 12 | .36 | .13 | 20 | 2.4 | .83 | 12 | 56 | 1.8 | 2.1 | 2.1 | 1.8 | 2.4 |
| 13 | .30 | .09 | 101 | 2.0 | 9.9 | 2.2 | 20 | 1.2 | 1.6 | 2.0 | 42 | 8.4 |
| 14 | .30 | .09 | 19 | 1.6 | 91 | 3.0 | 3.2 | 26 | 1.2 | 81 | 32 | 2.6 |
| 15 | .30 | .13 | 7.4 | 1.4 | 77 | 8.0 | 2.6 | 105 | 1.1 | 16 | 81 | 1.9 |
| 16 | .30 | .35 | 4.4 | 1.2 | 97 | 54 | 6.4 | 19 | 1.0 | 2.8 | 6.7 | 1.6 |
| 17 | .30 | .09 | 9.1 | 1.0 | 70 | 120 | 6.5 | 4.3 | 1.0 | 2.6 | 17 | 1.4 |
| 18 | .36 | .09 | 12 | .92 | 104 | 87 | 2.6 | 3.2 | .92 | 2.6 | 27 | 1.8 |
| 19 | 1.6 | .09 | 1.6 | .92 | 111 | 36 | 12 | 2.8 | .83 | 49 | 14 | 1.5 |
| 20 | 11 | .09 | 1.1 | .83 | 99 | 5.6 | 18 | 2.1 | .83 | 15 | 6.2 | 1.5 |
| 21 | .36 | .09 | 1.0 | .66 | 76 | 4.2 | 2.9 | 1.8 | .83 | 4.8 | 4.0 | 14 |
| 22 | 1.7 | .09 | 11 | .58 | 84 | 3.2 | 42 | 1.5 | .92 | 3.6 | 3.2 | 7.0 |
| 23 | .36 | .18 | 6.7 | .58 | 45 | 2.8 | 3.4 | 1.5 | .83 | 3.8 | 3.8 | 2.9 |
| 24 | .30 | .36 | 3.6 | .58 | 73 | 59 | 2.8 | 1.2 | .83 | 4.8 | 2.5 | 2.4 |
| 25 | .24 | .74 | 13 | .58 | 62 | 47 | 2.1 | 6.9 | .92 | 10 | 19 | 2.0 |
| 26 | .30 | .43 | 2.9 | .50 | 40 | 5.8 | 1.9 | 8.2 | 1.0 | 3.4 | 3.8 | 24 |
| 27 | .30 | .24 | 3.0 | .50 | 24 | 4.0 | 3.7 | 4.0 | .92 | 2.6 | 3.0 | 4.7 |
| 28 | .36 | 19 | 2.5 | .43 | 42 | 3.0 | 9.9 | 2.2 | .74 | 2.2 | 2.4 | 2.9 |
| 29 | .18 | 110 | 2.1 | 45 | ------ | 11 | 73 | 1.8 | 1.1 | 1.9 | 2.2 | 3.3 |
| 30 | .18 | 8.5 | 1.8 | 102 | ------ | 46 | 17 | 1.5 | 18 | 1.8 | 3.6 | 2.2 |
| 31 | .18 | ------ | 1.4 | 51 | ------ | 121 | ------ | 1.4 | ------ | 54 | 5.8 | ------ |
| TOTAL | 23.68 | 142.31 | 276.59 | 331.08 | 1521.35 | 1362.8 | 660.4 | 339.9 | 109.02 | 439.0 | 350.1 | 227.1 |
| MEAN | .76 | 4.74 | 8.92 | 10.7 | 54.3 | 44.0 | 22.0 | 11.0 | 3.63 | 14.2 | 11.3 | 7.57 |
| MAX | 11 | 110 | 101 | 102 | 130 | 121 | 134 | 105 | 58 | 89 | 81 | 72 |
| MIN | .18 | .09 | .66 | .43 | .83 | 2.2 | 1.9 | 1.2 | .74 | 1.6 | 1.8 | 1.4 |
| AC-FT | 47 | 282 | 549 | 657 | 3,020 | 2,700 | 1,310 | 674 | 216 | 871 | 694 | 450 |

CAL YR 1968: TOTAL 2,083.45 MEAN 5.69 MAX 110 MIN .09 AC-FT 4,130
WTR YR 1969: TOTAL 5,783.33 MEAN 15.8 MAX 134 MIN .09 AC-FT 11,470

## 16-5430. Middle Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili

LOCATION.--Lat 20°49'42", long 156°12'50", Maui, on left bank 200 ft downstream from Haiku-uka trail crossing, 4.0 miles east of Kailiili, and 4.5 miles south of Kailua.

DRAINAGE AREA.--0.48 sq mi.

PERIOD OF RECORD.--March 1919 to February 1927, July 1932 to June 1934, June 1962 to April 1969 (discontinued).

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 2,900 ft (from topographic map). Prior to June 12, 1962, at site 200 ft upstream at different datum.

EXTREMES.--Maximum discharge during period October 1968 to April 1969, 406 cfs Nov. 29 (gage height, 4.78 ft), from rating curve extended as explained below; minimum, 0.08 cfs several days in November.
Period of record: Maximum discharge, 469 cfs Nov. 14, 1965 (gage height, 5.09 ft), from rating curve extended above 14 cfs on basis of slope-conveyance study; minimum, 0.06 cfs Nov. 12, 16-20, 1962, Jan. 20, 1965.

REMARKS.--Records good. Kula pipeline (see sta 16-5310) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use. Recording rain gage located at station.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1968 TO APRIL 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .30 | .16 | .34 | .20 | 50 | 23 | 102 | | | | | |
| 2 | .56 | .16 | 2.9 | .18 | 98 | 8.0 | 36 | | | | | |
| 3 | 1.0 | .14 | 1.9 | 19 | 66 | 31 | 6.0 | | | | | |
| 4 | .54 | .12 | 19 | 4.7 | 7.3 | 40 | 5.1 | | | | | |
| 5 | .43 | .12 | 4.7 | 2.4 | 1.8 | 37 | 6.1 | | | | | |
| 6 | .23 | .10 | 2.3 | .62 | .67 | 45 | 13 | | | | | |
| 7 | .16 | .10 | .82 | 1.8 | .43 | 12 | 9.5 | | | | | |
| 8 | .12 | .08 | .30 | 5.3 | .43 | 3.7 | 7.8 | | | | | |
| 9 | .12 | .08 | 1.2 | 5.3 | .34 | 21 | 2.3 | | | | | |
| 10 | .10 | .08 | .34 | .60 | .30 | 3.9 | 1.0 | | | | | |
| 11 | .10 | .08 | .26 | .26 | .30 | 1.5 | 17 | | | | | |
| 12 | .10 | .08 | 13 | .23 | .26 | .82 | 32 | | | | | |
| 13 | .10 | .08 | 43 | .20 | 2.6 | .48 | 13 | | | | | |
| 14 | .10 | .08 | 13 | .20 | 26 | .48 | 3.0 | | | | | |
| 15 | .10 | .10 | 4.0 | .20 | 21 | 2.6 | 2.0 | | | | | |
| 16 | .12 | .63 | 1.5 | .20 | 31 | 15 | 6.7 | | | | | |
| 17 | .12 | .14 | 1.3 | .18 | 29 | 39 | 5.9 | | | | | |
| 18 | .21 | .08 | 3.2 | .18 | 26 | 36 | 3.4 | | | | | |
| 19 | 7.4 | .08 | .34 | .20 | 32 | 22 | 14 | | | | | |
| 20 | 10 | .08 | .30 | .16 | 27 | 3.0 | 17 | | | | | |
| 21 | .62 | .08 | .30 | .14 | 32 | 1.2 | 4.4 | | | | | |
| 22 | 3.9 | .10 | 2.2 | .14 | 23 | .67 | 17 | | | | | |
| 23 | .52 | .26 | .48 | .14 | 13 | .54 | 2.9 | | | | | |
| 24 | .14 | .18 | .26 | .14 | 19 | 19 | 1.5 | | | | | |
| 25 | .14 | .20 | 8.0 | .14 | 18 | 12 | .90 | | | | | |
| 26 | .14 | .18 | .77 | .12 | 12 | 3.0 | .48 | | | | | |
| 27 | .14 | .10 | .30 | .12 | 3.7 | 1.7 | .74 | | | | | |
| 28 | .20 | 15 | .26 | .12 | 9.1 | .82 | 2.8 | | | | | |
| 29 | .16 | 109 | .30 | 25 | ------ | .90 | 25 | | | | | |
| 30 | .22 | 2.2 | .23 | 55 | ------ | 9.9 | 5.9 | | | | | |
| 31 | .23 | ------ | .20 | 16 | ------ | 49 | ------ | | ------ | | | ------ |
| TOTAL | 28.32 | 129.87 | 127.00 | 139.17 | 550.23 | 444.21 | 364.42 | | | | | |
| MEAN | .91 | 4.33 | 4.10 | 4.49 | 19.7 | 14.3 | 12.1 | | | | | |
| MAX | 10 | 109 | 43 | 55 | 98 | 49 | 102 | | | | | |
| MIN | .10 | .08 | .20 | .12 | .26 | .48 | .48 | | | | | |
| AC-FT | 56 | 258 | 252 | 276 | 1,090 | 881 | 723 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 1,194.40 | MEAN | 3.26 | MAX | 109 | MIN | .08 | AC-FT | 2,370 |
| WTR YR 1969: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |

PEAK DISCHARGE (BASE, 140 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0700 | 4.78 | 406 | 3- 4 | 0900 | 3.15 | 152 |
| 1-30 | 1830 | 4.11 | 282 | 3- 6 | 2230 | 3.21 | 159 |
| 2- 2 | 0300 | 4.13 | 286 | 4- 1 | 0700 | 3.62 | 211 |
| 2-19 | 1900 | 3.24 | 163 | | | | |

## 16-5450. Puohokamoa Stream above Spreckels ditch, near Huelo

LOCATION.--Lat 20°51'21", long 156°11'29", Maui, on right bank 150 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

DRAINAGE AREA.--2.35 sq mi.

PERIOD OF RECORD.--June 1913 to current year. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1954, published as "near Huelo." Records for December 1910 to May 1913 at site 700 ft downstream not equivalent owing to inflow of Spreckels ditch.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 1,322.04 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to May 31, 1934, at site 130 ft downstream at different datum.

EXTREMES.--Current year: Maximum discharge, 3,480 cfs Nov. 29 (gage height, 7.23 ft), from rating curve extended above 920 cfs; minimum, 0.99 cfs Nov. 21, 22.
Period of record: Maximum discharge, 3,650 cfs Apr. 16, 1960 (gage height, 9.31 ft), from rating curve extended above 630 cfs; minimum, 0.6 cfs Oct. 26, 1917.

REMARKS.--Records good. Kula pipeline (see sta 16-5310) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use.

REVISIONS (FISCAL YEARS).--WSP 1319: 1914. WSP 1719: 1920, 1930, 1933. WSP 1937: Drainage area. (WATER YEARS).--WRD Hawaii 1968: 1966-67(P). Published records for some peak discharges in the water year 1965 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.8 | 2.6 | 12 | 5.7 | 668 | 169 | 828 | 25 | 6.7 | 49 | 43 | 184 |
| 2 | 4.5 | 3.0 | 17 | 5.1 | 923 | 78 | 284 | 193 | 6.0 | 241 | 34 | 60 |
| 3 | 6.7 | 2.4 | 20 | 148 | 447 | 374 | 50 | 48 | 6.4 | 31 | 25 | 38 |
| 4 | 3.7 | 2.0 | 151 | 52 | 49 | 284 | 46 | 59 | 6.7 | 12 | 19 | 28 |
| 5 | 3.5 | 2.0 | 42 | 27 | 24 | 290 | 67 | 26 | 5.1 | 9.4 | 20 | 24 |
| 6 | 3.0 | 2.0 | 27 | 13 | 16 | 253 | 110 | 19 | 4.8 | 180 | 74 | 35 |
| 7 | 3.0 | 1.8 | 14 | 20 | 12 | 88 | 78 | 15 | 4.5 | 49 | 22 | 34 |
| 8 | 2.6 | 1.8 | 9.8 | 36 | 12 | 39 | 63 | 13 | 4.8 | 24 | 15 | 58 |
| 9 | 2.6 | 1.8 | 16 | 42 | 10 | 129 | 32 | 11 | 5.1 | 39 | 12 | 31 |
| 10 | 2.4 | 1.8 | 12 | 15 | 8.6 | 34 | 23 | 11 | 22 | 27 | 20 | 30 |
| 11 | 2.4 | 1.7 | 7.0 | 10 | 7.8 | 24 | 108 | 12 | 146 | 14 | 14 | 18 |
| 12 | 2.4 | 1.5 | 105 | 8.2 | 7.4 | 18 | 202 | 11 | 16 | 11 | 19 | 14 |
| 13 | 2.2 | 1.4 | 450 | 7.4 | 35 | 15 | 103 | 8.6 | 12 | 11 | 122 | 38 |
| 14 | 2.0 | 1.4 | 91 | 6.7 | 276 | 16 | 45 | 115 | 8.2 | 218 | 99 | 20 |
| 15 | 2.0 | 1.8 | 43 | 6.0 | 221 | 58 | 35 | 306 | 6.7 | 63 | 190 | 12 |
| 16 | 2.0 | 11 | 23 | 7.0 | 263 | 309 | 76 | 42 | 5.7 | 19 | 44 | 11 |
| 17 | 2.2 | 2.6 | 16 | 5.1 | 207 | 551 | 65 | 21 | 5.1 | 19 | 73 | 9.8 |
| 18 | 3.5 | 1.7 | 27 | 4.5 | 234 | 262 | 39 | 15 | 4.5 | 14 | 80 | 10 |
| 19 | 30 | 1.4 | 11 | 5.1 | 278 | 141 | 78 | 15 | 4.2 | 118 | 46 | 11 |
| 20 | 69 | 1.4 | 9.0 | 4.5 | 184 | 35 | 114 | 12 | 4.0 | 63 | 29 | 12 |
| 21 | 8.2 | 1.2 | 8.6 | 4.0 | 213 | 23 | 39 | 11 | 3.7 | 25 | 20 | 44 |
| 22 | 26 | 1.2 | 54 | 3.7 | 160 | 19 | 127 | 9.8 | 4.0 | 17 | 16 | 29 |
| 23 | 7.6 | 3.5 | 25 | 3.7 | 88 | 19 | 33 | 8.6 | 3.5 | 24 | 22 | 17 |
| 24 | 4.0 | 3.2 | 12 | 3.5 | 132 | 207 | 23 | 7.4 | 3.2 | 30 | 14 | 19 |
| 25 | 3.2 | 4.0 | 66 | 3.2 | 109 | 102 | 19 | 32 | 4.2 | 35 | 60 | 13 |
| 26 | 3.0 | 2.6 | 20 | 3.0 | 68 | 35 | 15 | 35 | 7.0 | 14 | 33 | 70 |
| 27 | 2.8 | 1.7 | 11 | 2.8 | 33 | 25 | 26 | 20 | 4.2 | 11 | 18 | 29 |
| 28 | 6.6 | 153 | 9.8 | 2.6 | 63 | 19 | 36 | 12 | 3.5 | 9.8 | 13 | 21 |
| 29 | 3.5 | 984 | 11 | 180 | ------ | 31 | 206 | 9.0 | 8.4 | 9.4 | 12 | 34 |
| 30 | 2.8 | 26 | 8.2 | 479 | ------ | 204 | 56 | 8.2 | 66 | 9.4 | 34 | 18 |
| 31 | 2.8 | ------ | 6.4 | 197 | ------ | 492 | ------ | 7.4 | ------ | 151 | 42 | ------ |
| TOTAL | 225.0 | 1,227.5 | 1,334.8 | 1,310.8 | 4,748.8 | 4,343 | 3,026 | 1,138.0 | 392.2 | 1,547.0 | 1,284 | 971.8 |
| MEAN | 7.26 | 40.9 | 43.1 | 42.3 | 170 | 140 | 101 | 36.7 | 13.1 | 49.9 | 41.4 | 32.4 |
| MAX | 69 | 984 | 450 | 479 | 923 | 551 | 828 | 306 | 146 | 241 | 190 | 184 |
| MIN | 2.0 | 1.2 | 6.4 | 2.6 | 7.4 | 15 | 15 | 7.4 | 3.2 | 9.4 | 12 | 9.8 |
| AC-FT | 446 | 2,430 | 2,650 | 2,600 | 9,420 | 8,610 | 6,000 | 2,260 | 778 | 3,070 | 2,550 | 1,930 |

CAL YR 1968: TOTAL 10,512.5 MEAN 28.7 MAX 984 MIN 1.2 AC-FT 20,850
WTR YR 1969: TOTAL 21,548.9 MEAN 59.0 MAX 984 MIN 1.2 AC-FT 42,740

PEAK DISCHARGE (BASE, 1,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0530 | 7.23 | 3,480 | 3-17 | 0230 | 5.53 | 1,860 |
| 12-13 | 0200 | 4.86 | 1,360 | 3-30 | 2130 | 6.40 | 2,630 |
| 2- 2 | 0400 | 7.17 | 3,420 | 5- 2 | 0600 | 6.19 | 2,430 |
| 2-19 | 1900 | 4.68 | 1,240 | 5-14 | 2100 | 4.63 | 1,210 |
| 3- 5 | 1200 | 4.47 | 1,110 | | | | |

## 16-5700. Nailiilihaele Stream near Huelo

LOCATION.--Lat 20°52'28", long 156°13'06", Maui, on left bank 200 ft upstream from Wailoa ditch intake, 1,000 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.4 miles southeast of Huelo Church.

DRAINAGE AREA.--3.49 sq mi (revised).

PERIOD OF RECORD.--December 1910 to December 1911, October 1913 to June 1918, August to October 1919, December 1919 to June 1924, January 1925 to current year. Gage-height records for July to December 1912 at site 700 ft downstream not equivalent owing to diversion. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 1,205 ft above mean sea level (by vertical angles). Dec. 9, 1910, to Dec. 31, 1911, nonrecording gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, water-stage recorder at present site at datum 0.50 ft higher.

EXTREMES.--Current year: Maximum discharge, 3,650 cfs Feb. 2 (gage height, 9.20 ft), from rating curve extended above 600 cfs; minimum, 2.9 cfs Nov. 21, 22.
Period of record: Maximum discharge, 6,410 cfs Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 600 cfs; minimum, 0.70 cfs July 14, 1920.

REMARKS.--Records good. No diversion above station since 1922. All low flow diverted into Wailoa ditch (see sta 16-5880) 200 ft below station for domestic supply, power, and irrigation.

REVISIONS (FISCAL YEARS).--WSP 1569: 1925-56.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.6 | 4.8 | 17 | 10 | 656 | 209 | 721 | 35 | 9.8 | 41 | 48 | 215 |
| 2 | 8.3 | 5.4 | 15 | 9.4 | 888 | 110 | 291 | 234 | 9.4 | 225 | 39 | 144 |
| 3 | 8.0 | 4.8 | 21 | 168 | 424 | 528 | 72 | 76 | 9.0 | 33 | 35 | 54 |
| 4 | 6.6 | 4.5 | 228 | 53 | 60 | 314 | 58 | 93 | 11 | 16 | 30 | 38 |
| 5 | 6.2 | 4.3 | 54 | 42 | 30 | 317 | 86 | 34 | 8.0 | 13 | 24 | 32 |
| 6 | 6.0 | 4.3 | 33 | 18 | 22 | 172 | 155 | 26 | 7.2 | 163 | 121 | 53 |
| 7 | 6.2 | 4.0 | 19 | 19 | 18 | 112 | 107 | 21 | 7.2 | 54 | 30 | 60 |
| 8 | 6.0 | 4.0 | 15 | 45 | 17 | 57 | 88 | 18 | 6.9 | 28 | 22 | 112 |
| 9 | 5.6 | 4.0 | 27 | 53 | 15 | 153 | 44 | 16 | 6.9 | 63 | 18 | 44 |
| 10 | 5.4 | 4.0 | 17 | 20 | 13 | 45 | 34 | 15 | 46 | 36 | 29 | 41 |
| 11 | 5.4 | 3.8 | 12 | 15 | 11 | 32 | 118 | 16 | 175 | 19 | 21 | 25 |
| 12 | 5.1 | 3.6 | 161 | 13 | 11 | 24 | 189 | 13 | 18 | 16 | 25 | 21 |
| 13 | 4.8 | 3.6 | 531 | 12 | 37 | 21 | 134 | 11 | 14 | 16 | 127 | 39 |
| 14 | 4.5 | 3.8 | 92 | 11 | 418 | 21 | 71 | 131 | 11 | 211 | 90 | 24 |
| 15 | 4.5 | 4.3 | 37 | 9.8 | 320 | 112 | 52 | 407 | 9.4 | 62 | 224 | 18 |
| 16 | 4.5 | 23 | 24 | 11 | 329 | 519 | 116 | 54 | 8.3 | 22 | 71 | 17 |
| 17 | 4.5 | 6.0 | 20 | 9.0 | 201 | 632 | 95 | 23 | 8.0 | 23 | 94 | 15 |
| 18 | 6.2 | 4.3 | 25 | 8.0 | 317 | 249 | 51 | 18 | 7.2 | 21 | 95 | 16 |
| 19 | 21 | 3.8 | 16 | 8.6 | 314 | 120 | 80 | 19 | 6.9 | 146 | 57 | 16 |
| 20 | 56 | 3.8 | 14 | 7.6 | 192 | 49 | 141 | 15 | 6.6 | 87 | 36 | 18 |
| 21 | 9.4 | 3.3 | 13 | 6.9 | 208 | 33 | 47 | 13 | 6.2 | 33 | 26 | 76 |
| 22 | 24 | 3.1 | 120 | 6.6 | 182 | 27 | 167 | 11 | 6.6 | 24 | 22 | 40 |
| 23 | 8.6 | 4.8 | 45 | 6.2 | 107 | 30 | 34 | 12 | 6.0 | 35 | 38 | 22 |
| 24 | 6.6 | 6.9 | 22 | 6.0 | 141 | 224 | 30 | 10 | 5.6 | 37 | 19 | 23 |
| 25 | 6.0 | 8.0 | 101 | 6.0 | 120 | 131 | 24 | 55 | 6.6 | 57 | 99 | 19 |
| 26 | 5.6 | 5.4 | 30 | 5.6 | 72 | 42 | 21 | 54 | 9.4 | 22 | 46 | 98 |
| 27 | 5.4 | 3.8 | 18 | 5.4 | 40 | 35 | 52 | 28 | 6.9 | 18 | 26 | 32 |
| 28 | 11 | 181 | 16 | 5.1 | 98 | 26 | 61 | 16 | 5.6 | 15 | 20 | 26 |
| 29 | 6.2 | 949 | 17 | 240 | ------ | 47 | 231 | 13 | 14 | 14 | 19 | 30 |
| 30 | 5.6 | 34 | 13 | 431 | ------ | 259 | 62 | 11 | 61 | 14 | 40 | 19 |
| 31 | 5.4 | ------ | 11 | 213 | ------ | 545 | ------ | 11 | ------ | 200 | 55 | ------ |
| TOTAL | 276.2 | 1303.4 | 1784 | 1474.2 | 5261 | 5195 | 3432 | 1509 | 513.7 | 1764 | 1646 | 1387 |
| MEAN | 8.91 | 43.4 | 57.5 | 47.6 | 188 | 168 | 114 | 48.7 | 17.1 | 56.9 | 53.1 | 46.2 |
| MAX | 56 | 949 | 531 | 431 | 888 | 632 | 721 | 407 | 175 | 225 | 224 | 215 |
| MIN | 4.5 | 3.1 | 11 | 5.1 | 11 | 21 | 21 | 10 | 5.6 | 13 | 18 | 15 |
| AC-FT | 548 | 2590 | 3540 | 2920 | 10440 | 10300 | 6810 | 2990 | 1020 | 3500 | 3260 | 2750 |

CAL YR 1968: TOTAL 12,546.8 MEAN 34.3 MAX 949 MIN 3.1 AC-FT 24,890
WTR YR 1969: TOTAL 25,545.5 MEAN 70.0 MAX 949 MIN 3.1 AC-FT 50,670

PEAK DISCHARGE (BASE, 1,200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0700 | 8.92 | 3,380 | 3- 3 | 0900 | 6.13 | 1,240 |
| 12-13 | 0130 | 6.91 | 1,730 | 3-17 | 0200 | 7.73 | 2,320 |
| 1-29 | 2330 | 7.90 | 2,460 | 3-31 | 0100 | 8.48 | 2,980 |
| 2- 2 | 0500 | 9.20 | 3,650 | 5- 2 | 0530 | 7.42 | 2,090 |

## 16-5745. Kailua Stream near Kailiili

LOCATION.--Lat 20°50'28", long 156°14'24", Maui, on right bank 0.4 mile downstream from Haiku-uka boundary trail, 2.1 miles east of Kailiili, and 3.9 miles south of Kailua.

DRAINAGE AREA.--1.10 sq mi (revised).

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

GAGE.--Water-stage recorder. Altitude of gage is 2,840 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,740 cfs Nov. 29 (gage height, 10.43 ft), from rating curve extended above 39 cfs; minimum, 0.06 cfs Nov. 21, 22.
Period of record: Maximum discharge, 1,780 cfs Feb. 3, 1965 (gage height, 10.51 ft), from rating curve extended above 39 cfs; minimum, 0.03 cfs June 17, 18, 1966.

REMARKS.--Records good except those above 80 cfs, which are fair. Diversion above station at altitude 4,250 ft by Maui County Board of Water Supply for irrigation and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .33 | .15 | 1.8 | .67 | 89 | 40 | 371 | 2.8 | .45 | 15 | 5.8 | 42 |
| 2 | .28 | .15 | 3.0 | .56 | 282 | 11 | 71 | 31 | .39 | 63 | 4.5 | 13 |
| 3 | .45 | .12 | 7.3 | 50 | 209 | 45 | 7.0 | 8.1 | .36 | 4.5 | 2.1 | 5.2 |
| 4 | .48 | .10 | 60 | 15 | 13 | 90 | 5.7 | 7.4 | .36 | 1.6 | 1.4 | 3.9 |
| 5 | .33 | .09 | 8.8 | 8.4 | 3.6 | 72 | 6.5 | 3.8 | .31 | .98 | 1.7 | 2.8 |
| 6 | .28 | .08 | 3.5 | 2.3 | 2.4 | 143 | 21 | 2.3 | .26 | 56 | 3.9 | 2.1 |
| 7 | .24 | .08 | 1.8 | 3.2 | 1.8 | 21 | 12 | 1.7 | .24 | 10 | 1.6 | 2.0 |
| 8 | .20 | .08 | 1.2 | 10 | 1.5 | 5.5 | 12 | 1.4 | .24 | 4.4 | 1.2 | 3.7 |
| 9 | .16 | .07 | 1.6 | 19 | 1.2 | 35 | 4.0 | 1.2 | .24 | 4.1 | .86 | 2.3 |
| 10 | .15 | .07 | 1.8 | 3.0 | .98 | 5.6 | 2.6 | 1.1 | 1.2 | 2.8 | 1.2 | 2.8 |
| 11 | .13 | .07 | .94 | 1.6 | .78 | 3.3 | 24 | 1.0 | 24 | 1.4 | 1.1 | 1.8 |
| 12 | .12 | .07 | 22 | 1.2 | .67 | 2.5 | 70 | .94 | 2.0 | 1.1 | 1.7 | 1.4 |
| 13 | .12 | .07 | 111 | .94 | 2.4 | 2.0 | 21 | .74 | 1.1 | 1.0 | 43 | 1.9 |
| 14 | .10 | .07 | 24 | .82 | 44 | 1.7 | 4.4 | 5.5 | .67 | 94 | 28 | 1.7 |
| 15 | .09 | .08 | 4.9 | .67 | 32 | 29 | 3.5 | 31 | .50 | 23 | 55 | 1.1 |
| 16 | .08 | 1.6 | 2.9 | 1.2 | 47 | 21 | 7.8 | 4.0 | .42 | 2.6 | 5.0 | .86 |
| 17 | .08 | .67 | 2.5 | .74 | 67 | 63 | 8.1 | 1.6 | .33 | 2.4 | 9.7 | .70 |
| 18 | .08 | .39 | 6.2 | .50 | 47 | 83 | 4.4 | 1.2 | .28 | 1.6 | 9.0 | .63 |
| 19 | 1.6 | .24 | 1.9 | .50 | 68 | 42 | 21 | .94 | .22 | 37 | 3.8 | .59 |
| 20 | 22 | .12 | 1.4 | .50 | 44 | 4.2 | 28 | .78 | .20 | 14 | 2.6 | .63 |
| 21 | 1.7 | .07 | 1.1 | .45 | 58 | 2.6 | 6.7 | .70 | .20 | 3.1 | 2.0 | 3.2 |
| 22 | 2.0 | .06 | 2.1 | .31 | 38 | 2.1 | 25 | .59 | .18 | 2.0 | 1.4 | 2.2 |
| 23 | 1.2 | .08 | 1.4 | .26 | 18 | 1.8 | 4.6 | .56 | .16 | 2.5 | 1.4 | 1.1 |
| 24 | .67 | .09 | .94 | .22 | 26 | 32 | 3.2 | .48 | .15 | 8.4 | 1.1 | 1.4 |
| 25 | .45 | .12 | 28 | .22 | 28 | 16 | 2.4 | 1.6 | .15 | 4.8 | 8.0 | 1.1 |
| 26 | .36 | .15 | 4.7 | .18 | 22 | 4.7 | 1.8 | 3.0 | .18 | 2.0 | 5.8 | 9.9 |
| 27 | .31 | .12 | 1.6 | .15 | 5.9 | 3.1 | 1.8 | 2.4 | .16 | 1.4 | 1.8 | 4.8 |
| 28 | .26 | 27 | 1.3 | .13 | 11 | 2.3 | 1.9 | 1.7 | .15 | 1.1 | 1.3 | 2.5 |
| 29 | .26 | 408 | 2.0 | 64 | ------ | 2.0 | 39 | .90 | .20 | .94 | 1.2 | 7.7 |
| 30 | .22 | 5.8 | 1.2 | 154 | ------ | 9.8 | 9.4 | .63 | 16 | .86 | 3.4 | 3.8 |
| 31 | .18 | ------ | .86 | 24 | ------ | 91 | ------ | .53 | ------ | 19 | 3.2 | ------ |
| TOTAL | 34.91 | 445.86 | 313.74 | 364.72 | 1,164.23 | 887.2 | 800.8 | 121.59 | 51.30 | 386.58 | 213.76 | 128.81 |
| MEAN | 1.13 | 14.9 | 10.1 | 11.8 | 41.6 | 28.6 | 26.7 | 3.92 | 1.71 | 12.5 | 6.90 | 4.29 |
| MAX | 22 | 408 | 111 | 154 | 282 | 143 | 371 | 31 | 24 | 94 | 55 | 42 |
| MIN | .08 | .06 | .86 | .13 | .67 | 1.7 | 1.8 | .48 | .15 | .86 | .86 | .59 |
| AC-FT | 69 | 884 | 622 | 723 | 2310 | 1,760 | 1,590 | 241 | 102 | 767 | 424 | 255 |

CAL YR 1968: TOTAL 2,045.56 MEAN 5.59 MAX 408 MIN .06 AC-FT 4,060
WTR YR 1969: TOTAL 4,913.50 MEAN 13.5 MAX 408 MIN .06 AC-FT 9,750

PEAK DISCHARGE (BASE, 310 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0700 | 10.43 | 1,740 | 3-6 | 2200 | 7.12 | 570 |
| 12-13 | 0200 | 5.90 | 325 | 3-18 | 0100 | 5.85 | 318 |
| 1-29 | 2330 | 8.22 | 866 | 4-1 | 0630 | 8.35 | 910 |
| 2-2 | 0230 | 9.70 | 1,410 | 5-2 | 0530 | 6.46 | 432 |
| 2-19 | 1830 | 6.19 | 378 | | | | |

## 16-5850. Hoolawanui Stream near Huelo

LOCATION.--Lat 20°53'15", long 156°14'55", Maui, on right bank 250 ft upstream from Wailoa ditch intake, 2 miles west of Kailua, and 2 miles southwest of Huelo.

DRAINAGE AREA.--1.34 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to June 20, 1914, nonrecording gage at site 180 ft downstream at different datum. June 20, 1914, to Oct. 24, 1933, water-stage recorder at site 80 ft downstream at datum 4.43 ft lower.

EXTREMES.--Current year: Maximum discharge, 2,130 cfs Feb. 2 (gage height, 6.21 ft), from rating curve extended above 140 cfs; minimum, 0.56 cfs Nov. 27, 28.
Period of record: Maximum discharge, 5,010 cfs Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 150 cfs; minimum, 0.23 cfs Oct. 25, 1917.

REMARKS.--Records good except those above 300 cfs, which are fair. No diversion above station. All low flow diverted into Wailoa ditch (see sta 16-5880) 250 ft below station for domestic supply, power, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | .84 | 8.2 | 4.3 | 137 | 60 | 247 | 13 | 5.2 | 8.0 | 12 | 46 |
| 2 | 4.1 | .90 | 5.2 | 4.0 | 382 | 38 | 108 | 69 | 4.9 | 36 | 11 | 22 |
| 3 | 1.9 | .84 | 8.0 | 43 | 151 | 157 | 34 | 22 | 4.7 | 7.9 | 9.8 | 17 |
| 4 | 1.3 | .78 | 57 | 15 | 41 | 120 | 25 | 22 | 4.9 | 4.7 | 8.5 | 14 |
| 5 | 1.2 | .78 | 19 | 17 | 24 | 103 | 25 | 14 | 4.2 | 4.0 | 7.9 | 11 |
| 6 | 1.2 | .73 | 12 | 9.4 | 17 | 63 | 38 | 12 | 4.0 | 28 | 24 | 13 |
| 7 | 1.2 | .73 | 8.2 | 9.4 | 14 | 50 | 31 | 10 | 3.8 | 13 | 9.8 | 13 |
| 8 | 1.1 | .73 | 6.2 | 16 | 13 | 28 | 28 | 8.8 | 3.6 | 9.2 | 8.2 | 22 |
| 9 | 1.0 | .78 | 8.9 | 19 | 11 | 41 | 19 | 8.2 | 3.3 | 13 | 7.3 | 12 |
| 10 | 1.0 | .73 | 5.9 | 9.9 | 9.2 | 21 | 16 | 7.3 | 7.8 | 9.5 | 9.7 | 11 |
| 11 | 1.0 | .73 | 4.3 | 7.8 | 8.2 | 17 | 30 | 7.9 | 31 | 6.7 | 7.9 | 8.8 |
| 12 | .96 | .67 | 42 | 6.2 | 7.6 | 14 | 52 | 7.0 | 6.2 | 6.2 | 7.6 | 8.2 |
| 13 | .96 | .67 | 139 | 5.5 | 11 | 12 | 38 | 6.2 | 4.9 | 5.6 | 23 | 8.5 |
| 14 | .96 | .96 | 32 | 4.9 | 92 | 11 | 23 | 21 | 4.4 | 39 | 22 | 7.6 |
| 15 | .96 | .96 | 17 | 4.6 | 78 | 22 | 28 | 92 | 4.0 | 18 | 48 | 6.7 |
| 16 | .90 | .78 | 13 | 4.6 | 85 | 120 | 26 | 17 | 3.8 | 11 | 20 | 6.4 |
| 17 | .90 | .73 | 11 | 3.8 | 60 | 166 | 24 | 12 | 3.6 | 9.5 | 21 | 5.9 |
| 18 | 1.2 | .67 | 10 | 3.5 | 100 | 79 | 17 | 9.8 | 3.3 | 8.2 | 20 | 5.9 |
| 19 | 2.0 | .67 | 7.4 | 3.8 | 79 | 47 | 23 | 9.2 | 3.1 | 28 | 16 | 5.9 |
| 20 | 5.3 | .61 | 6.2 | 3.1 | 69 | 26 | 38 | 8.2 | 3.1 | 22 | 12 | 6.4 |
| 21 | 1.4 | .61 | 5.2 | 2.9 | 72 | 19 | 19 | 7.3 | 2.9 | 14 | 10 | 15 |
| 22 | 2.3 | .61 | 20 | 2.8 | 65 | 15 | 40 | 7.0 | 2.9 | 10 | 9.2 | 8.8 |
| 23 | 1.3 | .73 | 10 | 2.6 | 42 | 14 | 18 | 6.7 | 2.7 | 11 | 11 | 6.7 |
| 24 | 1.1 | .96 | 6.6 | 2.4 | 43 | 50 | 14 | 5.9 | 2.5 | 16 | 7.9 | 6.4 |
| 25 | 1.0 | 1.0 | 34 | 2.4 | 40 | 36 | 12 | 11 | 2.9 | 15 | 21 | 5.9 |
| 26 | .96 | .73 | 12 | 2.3 | 30 | 19 | 11 | 14 | 2.7 | 8.8 | 14 | 17 |
| 27 | .96 | .61 | 8.2 | 2.2 | 21 | 17 | 13 | 9.5 | 2.5 | 7.9 | 8.8 | 10 |
| 28 | 1.4 | 55 | 7.4 | 2.0 | 31 | 13 | 12 | 7.0 | 2.3 | 7.3 | 7.6 | 8.2 |
| 29 | 1.0 | 353 | 8.2 | 41 | ------ | 14 | 36 | 5.9 | 3.5 | 7.0 | 7.6 | 8.2 |
| 30 | .96 | 18 | 5.6 | 120 | ------ | 67 | 16 | 5.6 | 7.9 | 6.7 | 9.8 | 6.7 |
| 31 | .90 | ------ | 4.9 | 56 | ------ | 125 | ------ | 5.4 | ------ | 31 | 12 | ------ |
| TOTAL | 43.62 | 446.54 | 542.6 | 431.4 | 1733.0 | 1584 | 1061 | 461.9 | 146.6 | 422.2 | 424.6 | 344.2 |
| MEAN | 1.41 | 14.9 | 17.5 | 13.9 | 61.9 | 51.1 | 35.4 | 14.9 | 4.89 | 13.6 | 13.7 | 11.5 |
| MAX | 5.3 | 353 | 139 | 120 | 382 | 166 | 247 | 92 | 31 | 39 | 48 | 46 |
| MIN | .90 | .61 | 4.3 | 2.0 | 7.6 | 11 | 11 | 5.4 | 2.3 | 4.0 | 7.3 | 5.9 |
| AC-FT | 86 | 886 | 1080 | 856 | 3440 | 3140 | 2100 | 916 | 291 | 837 | 842 | 683 |

CAL YR 1968: TOTAL 3,738.76 MEAN 10.2 MAX 353 MIN .61 AC-FT 7,420
WTR YR 1969: TOTAL 7,641.66 MEAN 20.9 MAX 382 MIN .61 AC-FT 15,160

PEAK DISCHARGE (BASE, 620 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0600 | 5.33 | 1,530 | 3-17 | 0230 | 3.80 | 740 |
| 1-29 | 2400 | 3.65 | 680 | 3-30 | 2130 | 3.51 | 624 |
| 2- 2 | 0530 | 6.21 | 2,130 | | | | |

## 16-5870. Honopou Stream near Huelo

LOCATION.--Lat 20°53'20", long 156°15'20", Maui, on left bank 75 ft upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo, and 2.5 miles west of Kailua.

DRAINAGE AREA.--0.64 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

EXTREMES.--Current year: Maximum discharge, 382 cfs Feb. 2 (gage height, 3.27 ft), from rating curve extended as explained below; minimum, 0.24 cfs Nov. 17-22, 26-28.
Period of record: Maximum discharge, 5,710 cfs Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 110 cfs by test of model of station site; minimum, 0.02 cfs several days in 1933, 1934.

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

REVISIONS (FISCAL YEARS).--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .55 | .35 | 4.4 | 3.4 | 58 | 22 | 83 | 5.7 | 2.4 | 1.9 | 4.8 | 13 |
| 2 | 1.8 | .41 | 3.6 | 3.2 | 110 | 17 | 45 | 24 | 2.2 | 7.8 | 4.4 | 7.3 |
| 3 | .72 | .35 | 4.6 | 19 | 56 | 69 | 19 | 9.0 | 2.2 | 2.4 | 4.2 | 6.2 |
| 4 | .55 | .35 | 22 | 7.3 | 22 | 40 | 15 | 9.0 | 2.0 | 1.6 | 3.8 | 5.9 |
| 5 | .55 | .35 | 8.2 | 7.6 | 15 | 42 | 14 | 6.4 | 1.9 | 1.4 | 3.4 | 5.2 |
| 6 | .55 | .35 | 6.2 | 5.7 | 11 | 22 | 16 | 5.7 | 1.8 | 5.9 | 13 | 6.4 |
| 7 | .55 | .35 | 4.8 | 5.4 | 8.8 | 19 | 15 | 5.0 | 1.6 | 3.4 | 4.8 | 6.2 |
| 8 | .47 | .35 | 4.2 | 8.0 | 7.5 | 14 | 13 | 4.6 | 1.6 | 2.7 | 4.2 | 11 |
| 9 | .47 | .35 | 6.0 | 9.3 | 6.4 | 16 | 10 | 4.2 | 1.5 | 3.6 | 3.6 | 6.2 |
| 10 | .47 | .35 | 3.8 | 5.9 | 5.2 | 11 | 8.8 | 3.8 | 2.6 | 3.0 | 4.4 | 5.7 |
| 11 | .47 | .35 | 3.2 | 5.0 | 4.6 | 9.2 | 11 | 3.6 | 9.8 | 2.4 | 3.8 | 4.8 |
| 12 | .47 | .29 | 17 | 4.6 | 4.0 | 8.0 | 15 | 3.2 | 2.4 | 2.4 | 3.4 | 4.4 |
| 13 | .47 | .29 | 65 | 4.2 | 4.7 | 6.8 | 13 | 2.9 | 1.9 | 2.4 | 6.6 | 4.2 |
| 14 | .47 | .47 | 15 | 3.8 | 37 | 6.5 | 10 | 6.1 | 1.9 | 9.2 | 6.9 | 3.8 |
| 15 | .55 | .35 | 10 | 3.8 | 39 | 11 | 9.2 | 34 | 1.8 | 4.6 | 18 | 3.4 |
| 16 | .47 | .35 | 8.2 | 3.4 | 42 | 48 | 11 | 9.0 | 1.6 | 3.4 | 8.2 | 3.0 |
| 17 | .47 | .29 | 7.1 | 3.0 | 24 | 72 | 11 | 6.4 | 1.5 | 3.2 | 8.8 | 2.9 |
| 18 | .63 | .24 | 6.4 | 2.7 | 40 | 29 | 8.2 | 5.4 | 1.5 | 3.2 | 8.2 | 2.9 |
| 19 | 1.2 | .24 | 5.2 | 2.9 | 32 | 18 | 8.8 | 5.0 | 1.4 | 9.4 | 6.6 | 2.7 |
| 20 | 1.1 | .24 | 4.4 | 2.4 | 23 | 14 | 12 | 4.2 | 1.4 | 8.0 | 5.7 | 2.5 |
| 21 | .63 | .24 | 4.0 | 2.2 | 22 | 11 | 8.0 | 3.8 | 1.4 | 5.7 | 5.0 | 6.8 |
| 22 | .81 | .24 | 11 | 2.0 | 22 | 9.0 | 11 | 3.4 | 1.4 | 4.6 | 4.6 | 3.6 |
| 23 | .55 | .29 | 6.2 | 1.9 | 18 | 8.2 | 7.3 | 3.4 | 1.2 | 4.8 | 5.8 | 2.7 |
| 24 | .47 | .35 | 4.6 | 1.8 | 18 | 21 | 6.6 | 3.0 | 1.1 | 4.8 | 4.0 | 2.5 |
| 25 | .47 | .41 | 15 | 1.6 | 16 | 16 | 5.9 | 4.9 | 1.2 | 6.2 | 9.2 | 2.5 |
| 26 | .47 | .29 | 6.6 | 1.5 | 14 | 9.8 | 5.2 | 5.6 | 1.1 | 3.8 | 5.4 | 5.9 |
| 27 | .47 | .24 | 5.4 | 1.4 | 11 | 8.5 | 5.9 | 4.4 | 1.0 | 3.6 | 4.2 | 3.2 |
| 28 | .63 | 15 | 5.2 | 1.2 | 14 | 7.3 | 5.6 | 3.0 | .91 | 3.4 | 3.6 | 3.0 |
| 29 | .47 | 81 | 5.2 | 15 | ------ | 7.5 | 12 | 2.7 | 1.4 | 3.0 | 3.6 | 2.9 |
| 30 | .41 | 7.3 | 4.2 | 30 | ------ | 35 | 6.4 | 2.7 | 2.4 | 3.0 | 4.2 | 2.7 |
| 31 | .41 | ------ | 3.8 | 15 | ------ | 47 | ------ | 2.5 | ------ | 9.6 | 4.4 | ------ |
| TOTAL | 18.77 | 112.03 | 280.5 | 184.2 | 685.2 | 674.8 | 421.9 | 196.6 | 58.11 | 134.4 | 180.8 | 143.5 |
| MEAN | .61 | 3.73 | 9.05 | 5.94 | 24.5 | 21.8 | 14.1 | 6.34 | 1.94 | 4.34 | 5.83 | 4.78 |
| MAX | 1.8 | 81 | 65 | 30 | 110 | 72 | 83 | 34 | 9.8 | 9.6 | 18 | 13 |
| MIN | .41 | .24 | 3.2 | 1.2 | 4.0 | 6.5 | 5.2 | 2.5 | .91 | 1.4 | 3.4 | 2.5 |
| AC-FT | 37 | 222 | 556 | 365 | 1360 | 1340 | 837 | 390 | 115 | 267 | 359 | 285 |

CAL YR 1968: TOTAL 1,538.64 MEAN 4.20 MAX 86 MIN .24 AC-FT 3,050
WTR YR 1969: TOTAL 3,090.81 MEAN 8.47 MAX 110 MIN .24 AC-FT 6,130

PEAK DISCHARGE (BASE, 170 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0030 | 3.16 | 318 | 3-16 | 2200 | 3.22 | 352 |
| 12-13 | 0400 | 2.87 | 194 | 3-30 | 2130 | 3.05 | 262 |
| 2- 2 | 0130 | 3.27 | 382 | 5- 2 | 0530 | 2.93 | 214 |
| 3- 3 | 0930 | 2.87 | 194 | | | | |

## 16-5880. Wailoa ditch at Honopou, near Huelo

LOCATION.--Lat 20°53'20", long 156°15'19", Maui, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, and 2.2 miles southwest of Huelo.

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

EXTREMES.--Period of record: Maximum daily discharge, 326 cfs Apr. 1, 1967; no flow Jan. 24-27, 1923.

REMARKS.--Records excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft. Water is used for domestic supply, power, and irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 82 | 50 | 148 | 96 | 220 | 202 | 253 | 284 | 128 | 300 | 283 | 235 |
| 2 | 89 | 56 | 134 | 95 | 229 | 202 | 255 | 292 | 121 | 317 | 281 | 281 |
| 3 | 98 | 47 | 154 | 103 | 215 | 188 | 263 | 226 | 122 | 290 | 280 | 278 |
| 4 | 74 | 44 | 157 | 107 | 212 | 179 | 263 | 232 | 135 | 220 | 274 | 278 |
| 5 | 67 | 43 | 146 | 108 | 209 | 190 | 263 | 211 | 108 | 160 | 264 | 276 |
| 6 | 63 | 42 | 141 | 106 | 203 | 186 | 263 | 170 | 100 | 296 | 290 | 275 |
| 7 | 66 | 40 | 134 | 108 | 202 | 185 | 263 | 147 | 99 | 306 | 277 | 277 |
| 8 | 58 | 39 | 131 | 108 | 202 | 185 | 263 | 203 | 98 | 289 | 250 | 281 |
| 9 | 60 | 41 | 112 | 155 | 181 | 185 | 263 | 196 | 99 | 288 | 205 | 275 |
| 10 | 54 | 39 | 82 | 138 | 160 | 185 | 287 | 189 | 135 | 284 | 240 | 275 |
| 11 | 52 | 38 | 79 | 101 | 148 | 182 | 280 | 199 | 296 | 217 | 233 | 259 |
| 12 | 50 | 36 | 110 | 99 | 138 | 193 | 263 | 188 | 239 | 183 | 222 | 233 |
| 13 | 48 | 35 | 137 | 98 | 146 | 200 | 263 | 156 | 190 | 174 | 288 | 257 |
| 14 | 45 | 38 | 109 | 96 | 232 | 198 | 267 | 162 | 143 | 305 | 286 | 260 |
| 15 | 44 | 40 | 108 | 96 | 221 | 207 | 270 | 246 | 122 | 280 | 292 | 206 |
| 16 | 47 | 107 | 103 | 96 | 192 | 202 | 271 | 251 | 111 | 262 | 284 | 193 |
| 17 | 48 | 51 | 98 | 95 | 175 | 280 | 272 | 247 | 104 | 263 | 285 | 177 |
| 18 | 72 | 38 | 102 | 94 | 190 | 264 | 275 | 234 | 96 | 236 | 284 | 199 |
| 19 | 200 | 36 | 96 | 94 | 169 | 216 | 280 | 225 | 91 | 286 | 283 | 200 |
| 20 | 265 | 37 | 95 | 93 | 155 | 290 | 286 | 197 | 87 | 286 | 280 | 209 |
| 21 | 130 | 35 | 98 | 90 | 155 | 289 | 285 | 182 | 85 | 251 | 275 | 271 |
| 22 | 188 | 34 | 108 | 82 | 155 | 271 | 279 | 168 | 88 | 226 | 260 | 278 |
| 23 | 122 | 78 | 108 | 81 | 154 | 262 | 279 | 162 | 80 | 234 | 274 | 257 |
| 24 | 80 | 74 | 103 | 78 | 154 | 286 | 282 | 140 | 74 | 263 | 232 | 254 |
| 25 | 66 | 100 | 104 | 77 | 154 | 294 | 275 | 171 | 91 | 279 | 280 | 229 |
| 26 | 60 | 60 | 106 | 71 | 154 | 292 | 245 | 221 | 118 | 235 | 280 | 277 |
| 27 | 56 | 40 | 100 | 68 | 184 | 291 | 270 | 231 | 89 | 194 | 271 | 274 |
| 28 | 110 | 76 | 100 | 65 | 202 | 277 | 284 | 205 | 77 | 173 | 241 | 270 |
| 29 | 64 | 281 | 100 | 113 | ------ | 288 | 290 | 164 | 125 | 166 | 225 | 275 |
| 30 | 57 | 271 | 98 | 194 | ------ | 285 | 286 | 147 | 252 | 168 | 280 | 257 |
| 31 | 59 | ------ | 96 | 207 | ------ | 247 | ------ | 137 | ------ | 278 | 237 | ------ |
| TOTAL | 2,574 | 1,946 | 3,497 | 3,212 | 5,111 | 7,201 | 8,138 | 5,183 | 3,703 | 7,709 | 8,236 | 7,566 |
| MEAN | 83.0 | 64.9 | 113 | 104 | 183 | 232 | 271 | 199 | 123 | 249 | 266 | 252 |
| MAX | 265 | 281 | 157 | 207 | 232 | 294 | 290 | 292 | 296 | 317 | 292 | 281 |
| MIN | 44 | 34 | 79 | 65 | 138 | 182 | 253 | 137 | 74 | 160 | 205 | 177 |
| AC-FT | 5,110 | 3,860 | 6,940 | 6,370 | 10,140 | 14,280 | 16,140 | 12,260 | 7,340 | 15,290 | 16,340 | 15,010 |

CAL YR 1968: TOTAL 49,448.5 MEAN 135 MAX 315 MIN 8.5 AC-FT 98,080
WTR YR 1969: TOTAL 65,076 MEAN 178 MAX 317 MIN 34 AC-FT 129,100

HAWAII, ISLAND OF MAUI

16-5890. New Hamakua ditch at Honopou, near Huelo

LOCATION.--Lat 20°53'28", long 156°15'22", Maui, on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, and 2.1 miles southwest of Huelo.

PERIOD OF RECORD.--January 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft higher.

EXTREMES.--Period of record: Maximum daily discharge, 182 cfs Nov. 2, 1967; no flow at times.

REMARKS.--Records excellent. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .43 | .09 | 4.4 | .02 | .09 | .05 | 146 | 92 | 1.6 | 123 | 134 | 162 |
| 2 | .58 | .07 | 19 | .02 | .12 | .05 | 147 | 118 | 1.5 | 155 | 124 | 159 |
| 3 | .58 | .06 | 3.5 | .05 | .05 | .07 | 154 | 64 | 1.4 | 86 | 107 | 145 |
| 4 | .38 | .05 | .06 | .02 | .02 | .05 | 154 | 107 | 1.5 | 5.7 | 62 | 128 |
| 5 | .38 | .05 | .03 | .03 | .02 | .05 | 154 | 21 | 1.2 | 1.2 | 41 | 97 |
| 6 | .34 | .05 | .03 | .02 | .01 | .03 | 154 | 11 | 1.1 | 114 | 141 | 106 |
| 7 | .38 | .05 | .03 | .03 | 4.4 | .03 | 154 | 7.3 | 1.0 | 142 | 72 | 123 |
| 8 | .30 | .04 | .03 | .04 | .15 | .04 | 154 | 22 | .96 | 91 | 14 | 161 |
| 9 | .26 | .04 | 30 | .03 | .12 | .03 | 136 | 5.8 | .96 | 92 | 3.8 | 96 |
| 10 | .22 | .04 | 87 | .03 | .09 | .03 | 70 | 9.0 | 21 | 87 | 42 | 123 |
| 11 | .18 | .03 | 53 | .02 | .07 | .04 | 116 | 21 | 144 | 3.5 | 15 | 26 |
| 12 | .18 | .03 | 39 | .03 | .07 | .04 | 129 | 9.3 | 39 | 1.9 | 5.4 | 8.4 |
| 13 | .15 | .02 | 35 | .02 | .06 | .04 | 127 | 2.6 | 25 | 1.6 | 152 | 50 |
| 14 | .15 | .06 | .03 | .03 | .09 | .05 | 128 | 29 | 1.7 | 144 | 150 | 37 |
| 15 | .12 | .12 | .02 | .03 | .09 | .06 | 118 | 142 | 1.4 | 148 | 161 | 7.0 |
| 16 | .09 | 21 | .02 | .03 | .06 | 17 | 128 | 146 | 1.2 | 36 | 156 | 6.6 |
| 17 | .15 | .26 | .02 | .03 | .05 | 150 | 127 | 83 | 1.2 | 40 | 157 | 5.8 |
| 18 | .22 | .09 | .02 | .03 | .05 | 89 | 127 | 20 | 1.0 | 3.7 | 156 | 7.0 |
| 19 | 98 | .06 | .02 | .03 | .05 | 22 | 128 | 32 | .96 | 138 | 153 | 6.0 |
| 20 | 104 | .05 | .02 | .03 | .05 | 134 | 128 | 16 | .89 | 156 | 140 | 7.3 |
| 21 | 1.6 | .03 | .02 | .03 | .04 | 69 | 127 | 14 | .89 | 132 | 77 | 116 |
| 22 | 100 | .03 | .04 | .03 | .04 | 24 | 127 | 7.0 | .82 | 60 | 30 | 131 |
| 23 | .79 | .03 | .03 | .03 | .04 | 28 | 125 | 6.0 | .76 | 87 | 85 | 26 |
| 24 | .26 | .15 | .02 | .02 | .05 | 114 | 70 | 5.1 | .70 | 97 | 11 | 31 |
| 25 | .18 | .43 | .04 | .02 | .04 | 151 | 28 | 87 | .64 | 125 | 123 | 10 |
| 26 | .15 | .30 | .02 | .02 | .04 | 137 | 5.3 | 140 | .76 | 17 | 128 | 112 |
| 27 | .09 | .06 | .02 | .02 | .04 | 98 | 72 | 96 | .70 | 11 | 47 | 97 |
| 28 | .81 | 25 | .02 | .02 | .05 | 46 | 120 | 23 | .58 | 5.1 | 9.0 | 62 |
| 29 | .22 | 172 | .02 | 14 | ------ | 108 | 127 | 5.6 | 4.5 | 3.1 | 7.5 | 95 |
| 30 | .12 | 36 | .02 | 27 | ------ | 152 | 127 | 3.7 | 77 | 2.6 | 122 | 55 |
| 31 | .09 | ------ | .02 | .04 | ------ | 155 | ------ | 1.9 | ------ | 120 | 152 | ------ |
| TOTAL | 311.40 | 256.29 | 271.50 | 41.80 | 6.05 | 1494.66 | 3607.3 | 1347.3 | 335.92 | 2229.4 | 2777.7 | 2196.1 |
| MEAN | 10.0 | 8.54 | 8.76 | 1.35 | .22 | 48.2 | 120 | 43.5 | 11.2 | 71.9 | 89.6 | 73.2 |
| MAX | 104 | 172 | 87 | 27 | 4.4 | 155 | 154 | 146 | 144 | 156 | 161 | 162 |
| MIN | .09 | .02 | .02 | .02 | .01 | .03 | 5.3 | 1.9 | .58 | 1.2 | 3.8 | 6.0 |
| AC-FT | 618 | 508 | 539 | 83 | 12 | 2960 | 7160 | 2670 | 666 | 4420 | 5510 | 4360 |

CAL YR 1968: TOTAL 7,138.13 MEAN 19.5 MAX 172 MIN .01 AC-FT 14,160
WTR YR 1969: TOTAL 14,875.42 MEAN 40.8 MAX 172 MIN .01 AC-FT 29,510

## 16-5920. Lowrie ditch at Honopou Gulch, near Huelo

LOCATION.--Lat 20°54'57", long 156°15'07", Maui, on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.7 miles northwest of Kailua.

PERIOD OF RECORD.--January 1910 to March 1927, February 1930 to current year. Published as "at Opana weir, near Huelo" 1910-27.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

EXTREMES.--Period of record: Maximum daily discharge, 116 cfs Oct. 31, 1921; no flow at times.

REMARKS.--Records excellent. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 | 4.0 | 31 | .93 | 8.1 | 1.6 | 86 | 44 | 20 | 67 | 67 | 78 |
| 2 | 8.4 | 3.8 | 21 | .84 | 16 | 1.6 | 79 | 76 | 25 | 88 | 64 | 77 |
| 3 | 7.2 | 3.5 | 15 | 5.7 | 6.4 | 2.2 | 76 | 60 | 22 | 45 | 52 | 76 |
| 4 | 6.1 | 3.3 | 13 | 2.2 | 4.0 | 1.7 | 76 | 72 | 22 | 21 | 40 | 71 |
| 5 | 5.7 | 3.3 | 5.3 | 2.1 | 2.8 | 1.7 | 76 | 40 | 18 | 15 | 29 | 50 |
| 6 | 5.4 | 3.1 | 1.6 | 1.6 | 2.4 | 1.6 | 76 | 38 | 16 | 68 | 67 | 57 |
| 7 | 6.4 | 3.0 | 1.2 | 1.4 | 1.9 | 1.4 | 76 | 29 | 11 | 74 | 45 | 70 |
| 8 | 5.4 | 3.0 | 1.0 | 2.0 | 1.7 | 1.4 | 76 | 32 | 11 | 49 | 28 | 77 |
| 9 | 5.0 | 3.1 | 1.3 | 1.8 | 1.4 | 1.3 | 66 | 35 | 15 | 49 | 25 | 63 |
| 10 | 4.6 | 3.1 | 5.2 | 1.4 | 20 | 1.2 | 57 | 35 | 19 | 53 | 39 | 70 |
| 11 | 4.4 | 3.6 | 9.9 | 1.3 | 33 | 1.1 | 66 | 29 | 92 | 32 | 28 | 37 |
| 12 | 4.4 | 3.0 | 18 | 1.1 | 44 | 1.0 | 79 | 20 | 30 | 30 | 22 | 29 |
| 13 | 4.2 | 2.6 | 15 | 1.0 | 44 | 1.0 | 79 | 22 | 21 | 28 | 73 | 40 |
| 14 | 3.8 | 6.6 | 2.2 | .93 | 63 | 1.0 | 77 | 34 | 13 | 80 | 77 | 44 |
| 15 | 3.8 | 5.3 | 1.6 | .84 | 11 | 3.3 | 62 | 78 | 15 | 74 | 79 | 29 |
| 16 | 4.0 | 6.8 | 1.3 | .76 | 6.8 | 5.5 | 78 | 77 | 26 | 28 | 77 | 35 |
| 17 | 4.4 | 4.2 | 1.1 | .76 | 4.2 | 4.4 | 78 | 50 | 19 | 33 | 77 | 44 |
| 18 | 5.9 | 3.1 | 1.0 | .68 | 3.5 | 14 | 78 | 33 | 17 | 32 | 77 | 36 |
| 19 | 13 | 3.0 | .84 | .60 | 4.9 | 4.6 | 77 | 30 | 16 | 70 | 76 | 19 |
| 20 | 52 | 2.8 | .68 | 5.0 | 3.3 | 12 | 78 | 23 | 14 | 76 | 71 | 20 |
| 21 | 24 | 3.0 | .60 | 11 | 2.8 | 50 | 74 | 34 | 16 | 57 | 46 | 51 |
| 22 | 47 | 2.6 | 1.7 | 5.9 | 2.5 | 68 | 74 | 27 | 13 | 36 | 32 | 72 |
| 23 | 27 | 3.1 | 3.0 | 5.9 | 2.4 | 59 | 62 | 34 | 12 | 40 | 46 | 33 |
| 24 | 17 | 5.2 | 1.6 | 7.5 | 2.2 | 74 | 39 | 22 | 14 | 53 | 29 | 28 |
| 25 | 7.6 | 6.4 | 2.5 | 11 | 2.1 | 85 | 39 | 28 | 14 | 73 | 61 | 26 |
| 26 | 5.4 | 4.6 | 1.7 | 9.9 | 1.8 | 82 | 31 | 79 | 11 | 36 | 68 | 54 |
| 27 | 4.2 | 3.3 | 1.4 | 11 | 1.6 | 74 | 53 | 43 | 9.9 | 31 | 35 | 59 |
| 28 | 6.8 | 19 | 1.3 | 10 | 1.4 | 69 | 46 | 26 | 7.9 | 32 | 45 | 32 |
| 29 | 4.8 | 99 | 1.2 | 39 | ------ | 68 | 78 | 22 | 11 | 36 | 38 | 45 |
| 30 | 4.8 | 39 | 1.1 | 78 | ------ | 84 | 76 | 20 | 25 | 25 | 38 | 42 |
| 31 | 4.4 | ------ | 1.0 | 37 | ------ | 85 | ------ | 19 | ------ | 71 | 73 | ------ |
| TOTAL | 319.1 | 259.4 | 164.32 | 259.14 | 299.2 | 861.6 | 2068 | 1211 | 575.8 | 1502 | 1624 | 1464 |
| MEAN | 10.3 | 8.65 | 5.30 | 8.36 | 10.7 | 27.8 | 68.9 | 39.1 | 19.2 | 48.5 | 52.4 | 48.8 |
| MAX | 52 | 99 | 31 | 78 | 63 | 85 | 86 | 79 | 92 | 88 | 79 | 78 |
| MIN | 3.8 | 2.6 | .60 | .60 | 1.4 | 1.0 | 31 | 19 | 7.9 | 15 | 22 | 19 |
| AC-FT | 633 | 515 | 326 | 514 | 593 | 1,710 | 4,100 | 2400 | 1140 | 2980 | 3,220 | 2900 |

CAL YR 1968: TOTAL 7,930.32 MEAN 21.7 MAX 99 MIN .60 AC-FT 15,730
WTR YR 1969: TOTAL 10,607.56 MEAN 29.1 MAX 99 MIN .60 AC-FT 21,040

## 16-5940. Haiku ditch at Honopou Gulch, near Kailua

LOCATION.--Lat 20°55'05", long 156°14'55", Maui, on right bank on west side of Honopou Gulch, 160 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles east of Haiku.

PERIOD OF RECORD.--January 1910 to December 1928, February 1930 to current year. Published as "at Peahi weir, near Huelo" prior to July 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft above mean sea level. Prior to Oct. 7, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mile downstream at different datum.

EXTREMES.--Period of record: Maximum daily discharge, 209 cfs Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

REMARKS.--Records excellent. Ditch diverts from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .82 | .55 | 6.3 | .19 | 1.3 | .16 | 65 | 12 | 1.6 | 48 | 51 | 85 |
| 2 | 1.0 | .55 | 4.9 | .16 | 1.9 | .16 | 80 | 61 | 1.6 | 100 | 32 | 52 |
| 3 | .82 | .50 | 1.9 | 1.3 | .50 | .19 | 80 | 26 | 1.6 | 37 | 20 | 46 |
| 4 | .76 | .50 | .76 | .34 | .31 | .19 | 80 | 58 | 1.7 | 1.7 | 5.7 | 12 |
| 5 | .70 | .50 | .40 | .40 | .28 | .22 | 80 | 8.5 | 1.6 | 1.4 | 5.2 | 8.5 |
| 6 | .65 | .50 | .34 | .28 | .25 | .22 | 80 | 6.6 | 1.5 | 71 | 76 | 18 |
| 7 | .76 | .55 | .31 | .25 | .22 | .16 | 89 | 5.5 | 1.4 | 73 | 10 | 23 |
| 8 | .70 | .55 | .28 | .31 | .22 | .16 | 81 | 5.5 | 1.4 | 17 | 5.2 | 46 |
| 9 | .65 | .55 | .25 | .28 | .19 | .14 | 74 | 5.1 | 1.2 | 39 | 4.7 | 17 |
| 10 | .65 | .55 | 2.3 | .22 | .16 | .16 | 33 | 4.7 | 1.2 | 19 | 6.4 | 29 |
| 11 | .65 | .60 | 2.5 | .22 | .14 | .14 | 67 | 4.9 | 85 | 2.0 | 5.2 | 6.6 |
| 12 | .65 | .46 | 12 | .19 | .12 | .12 | 101 | 4.6 | 2.8 | 1.7 | 4.4 | 5.7 |
| 13 | .65 | .31 | 14 | .19 | .11 | .12 | 102 | 4.1 | 1.5 | 1.5 | 85 | 17 |
| 14 | .60 | 2.6 | .40 | .25 | .16 | .12 | 89 | 12 | 1.6 | 89 | 43 | 14 |
| 15 | .60 | 1.1 | .34 | .25 | .81 | .72 | 27 | 102 | 1.4 | 50 | 40 | 5.2 |
| 16 | .70 | .70 | .28 | .22 | .40 | .31 | 95 | 82 | 1.4 | 3.4 | 47 | 4.7 |
| 17 | .70 | .60 | .22 | .22 | .28 | .44 | 93 | 7.7 | 1.3 | 2.6 | 49 | 4.7 |
| 18 | .82 | .55 | .19 | .19 | .25 | .49 | 85 | 4.0 | 1.2 | 2.2 | 52 | 4.7 |
| 19 | .76 | .50 | .16 | .16 | .34 | .28 | 90 | 3.7 | 1.2 | 47 | 49 | 4.4 |
| 20 | 30 | .50 | .14 | .14 | .28 | 36 | 92 | 3.4 | 1.1 | 50 | 30 | 4.4 |
| 21 | 1.1 | .55 | .14 | 2.9 | .25 | 32 | 62 | 3.2 | 1.1 | 15 | 11 | 34 |
| 22 | 1.1 | .55 | .25 | 44 | .25 | 12 | 76 | 2.9 | 1.2 | 4.4 | 7.8 | 45 |
| 23 | .82 | .55 | .37 | 47 | .22 | 11 | 49 | 2.8 | 1.1 | 4.6 | 13 | 6.1 |
| 24 | .70 | .65 | .22 | 21 | .22 | 57 | 7.6 | 2.7 | 1.1 | 31 | 6.5 | 4.7 |
| 25 | .60 | .70 | .40 | 5.2 | .22 | 48 | 6.6 | 14 | 1.1 | 52 | 33 | 4.6 |
| 26 | .60 | .65 | .28 | 4.6 | .22 | 36 | 6.3 | 61 | 1.1 | 6.3 | 27 | 39 |
| 27 | .55 | .60 | .22 | 1.6 | .22 | 16 | 23 | 3.2 | 1.1 | 5.2 | 7.6 | 27 |
| 28 | .70 | 15 | .19 | .16 | .22 | 11 | 16 | 2.2 | 1.1 | 4.6 | 6.3 | 5.5 |
| 29 | .60 | 89 | .19 | 18 | ------ | 15 | 84 | 1.9 | 1.9 | 4.3 | 6.1 | 15 |
| 30 | .60 | 17 | .22 | 76 | ------ | 50 | 67 | 1.8 | 13 | 4.0 | 8.7 | 15 |
| 31 | .55 | ------ | .22 | 35 | ------ | 49 | ------ | 1.7 | ------ | 67 | 58 | ------ |
| TOTAL | 51.56 | 138.47 | 50.67 | 261.22 | 10.04 | 377.50 | 1,980.5 | 519.1 | 137.1 | 854.9 | 805.8 | 603.8 |
| MEAN | 1.66 | 4.62 | 1.63 | 8.43 | .36 | 12.2 | 66.0 | 16.7 | 4.57 | 27.6 | 26.0 | 20.1 |
| MAX | 30 | 89 | 14 | 76 | 1.9 | 57 | 102 | 102 | 85 | 100 | 85 | 85 |
| MIN | .55 | .31 | .14 | .14 | .11 | .12 | 6.3 | 1.7 | 1.1 | 1.4 | 4.4 | 4.4 |
| AC-FT | 102 | 275 | 100 | 518 | 20 | 749 | 3,930 | 1,030 | 272 | 1,700 | 1,600 | 1,200 |

CAL YR 1968: TOTAL 5,312.85 MEAN 14.5 MAX 101 MIN .05 AC-FT 10,540
WTR YR 1969: TOTAL 5,790.66 MEAN 15.9 MAX 102 MIN .11 AC-FT 11,490

## 16-5962, Halehaku Gulch near Kailiili

LOCATION.--Lat 20°50'53", long 156°15'13", Maui, on left bank 1.2 miles east of Kailiili, 3.1 miles northeast of Olinda Prison Camp, and 3.9 miles east of Makawao.

DRAINAGE AREA.--0.13 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,610 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 60 cfs Nov. 29 (gage height, 2.83 ft), from rating curve extended above 2.3 cfs; minimum, 0.04 cfs Nov. 27, 28.
Period of record: Maximum discharge, 60 cfs Nov. 29, 1968 (gage height, 2.83 ft), from rating curve extended above 2.3 cfs; minimum, 0.04 cfs Oct. 19, 20, 1967, Nov. 27, 28, 1968.

REMARKS.--Records good except those above 5 cfs, which are fair. No diversion above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .17 | .12 | .86 | .62 | 6.2 | 4.7 | 15 | 1.7 | .46 | .62 | 1.3 | 2.9 |
| 2 | .20 | .10 | .62 | .56 | 18 | 3.7 | 9.4 | 4.2 | .46 | 3.0 | 1.2 | 2.3 |
| 3 | .17 | .10 | .74 | 1.7 | 3.2 | 6.6 | 4.1 | 2.4 | .42 | 1.3 | 1.1 | 1.7 |
| 4 | .17 | .10 | 3.5 | 1.8 | 4.9 | 9.7 | 3.0 | 2.3 | .42 | .80 | 1.0 | 1.5 |
| 5 | .14 | .10 | 2.2 | 1.6 | 2.6 | 7.6 | 2.4 | 1.9 | .42 | .62 | .86 | 1.3 |
| 6 | .14 | .09 | 1.2 | 1.2 | 2.0 | 8.7 | 3.4 | 1.7 | .37 | 3.5 | .93 | 1.2 |
| 7 | .14 | .09 | .86 | 1.1 | 1.6 | 6.7 | 3.3 | 1.5 | .37 | 1.9 | .86 | 1.0 |
| 8 | .12 | .09 | .74 | 1.4 | 1.3 | 3.4 | 3.2 | 1.3 | .33 | 1.4 | .80 | .93 |
| 9 | .12 | .08 | .62 | 1.9 | 1.2 | 4.2 | 2.4 | 1.2 | .33 | 1.2 | .74 | .86 |
| 10 | .12 | .08 | .56 | 1.5 | 1.0 | 3.1 | 1.9 | 1.1 | .43 | 1.1 | .74 | .80 |
| 11 | .12 | .08 | .51 | 1.2 | .93 | 2.3 | 2.3 | 1.0 | 1.2 | .93 | .68 | .74 |
| 12 | .10 | .08 | .96 | .93 | .80 | 1.8 | 5.6 | .93 | .56 | .80 | .68 | .68 |
| 13 | .10 | .08 | 6.7 | .80 | .99 | 1.6 | 4.3 | .86 | .51 | .68 | 1.5 | .68 |
| 14 | .10 | .08 | 3.4 | .74 | 4.3 | 1.4 | 2.7 | 1.1 | .46 | 3.8 | 2.3 | .62 |
| 15 | .10 | .08 | 1.9 | .68 | 4.0 | 1.3 | 2.1 | 3.2 | .42 | 3.2 | 4.0 | .56 |
| 16 | .10 | .10 | 1.4 | .62 | 5.5 | 2.9 | 2.1 | 1.8 | .42 | 1.8 | 2.2 | .51 |
| 17 | .09 | .09 | 1.2 | .56 | 5.7 | 6.4 | 2.1 | 1.4 | .37 | 1.3 | 1.9 | .46 |
| 18 | .09 | .08 | 1.1 | .51 | 7.1 | 7.4 | 1.9 | 1.2 | .37 | 1.1 | 1.9 | .42 |
| 19 | .14 | .08 | 1.0 | .42 | 5.3 | 6.2 | 2.4 | 1.1 | .33 | 2.2 | 1.8 | .42 |
| 20 | .56 | .06 | .86 | .29 | 6.4 | 3.1 | 4.1 | 1.0 | .33 | 2.6 | 1.5 | .37 |
| 21 | .23 | .05 | .74 | .29 | 6.7 | 2.3 | 3.0 | .86 | .33 | 1.8 | 1.2 | .42 |
| 22 | .23 | .05 | .74 | .33 | 7.1 | 1.8 | 4.1 | .80 | .33 | 1.4 | 1.1 | .37 |
| 23 | .20 | .06 | .68 | .33 | 4.9 | 1.6 | 2.8 | .74 | .29 | 1.2 | .93 | .33 |
| 24 | .17 | .05 | .62 | .33 | 4.2 | 2.6 | 2.1 | .68 | .29 | 1.3 | .86 | .33 |
| 25 | .17 | .05 | 1.8 | .33 | 4.7 | 3.2 | 1.8 | .68 | .29 | 1.4 | 1.1 | .33 |
| 26 | .17 | .05 | 1.3 | .29 | 3.6 | 2.3 | 1.6 | .68 | .29 | 1.2 | 1.1 | .69 |
| 27 | .14 | .04 | 1.0 | .29 | 2.8 | 1.9 | 1.4 | .68 | .26 | 1.1 | .93 | .74 |
| 28 | .12 | 1.3 | .86 | .26 | 2.5 | 1.6 | 1.2 | .62 | .26 | .93 | .80 | .56 |
| 29 | .12 | 15 | .80 | 1.7 | ------ | 1.5 | 1.9 | .56 | .26 | .86 | .74 | .74 |
| 30 | .12 | 1.8 | .74 | 8.1 | ------ | 2.1 | 2.1 | .56 | .58 | .80 | .74 | .68 |
| 31 | .12 | ------ | .68 | 4.6 | ------ | 5.7 | ------ | .51 | ------ | 1.3 | .74 | ------ |
| TOTAL | 4.78 | 20.21 | 40.89 | 36.98 | 119.52 | 119.4 | 99.7 | 40.26 | 12.16 | 47.14 | 38.23 | 25.14 |
| MEAN | .15 | .67 | 1.32 | 1.19 | 4.27 | 3.85 | 3.32 | 1.30 | .41 | 1.52 | 1.23 | .84 |
| MAX | .56 | 15 | 6.7 | 8.1 | 18 | 9.7 | 15 | 4.2 | 1.2 | 3.8 | 4.0 | 2.9 |
| MIN | .09 | .04 | .51 | .26 | .80 | 1.3 | 1.2 | .51 | .26 | .62 | .68 | .33 |
| AC-FT | 9.5 | 40 | 81 | 73 | 237 | 237 | 198 | 80 | 24 | 94 | 76 | 50 |

CAL YR 1968: TOTAL 261.59 MEAN .71 MAX 15 MIN .04 AC-FT 519
WTR YR 1969: TOTAL 604.41 MEAN 1.66 MAX 18 MIN .04 AC-FT 1,200

PEAK DISCHARGE (BASE, 13 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0530 | 2.83 | 60 | 3- 4 | 0800 | 1.77 | 18 |
| 1-29 | 2330 | 1.85 | 20 | 3-17 | 2000 | 1.67 | 15 |
| 2- 2 | 0430 | 2.78 | 57 | 4- 1 | 2130 | 1.87 | 21 |
| 2-21 | 2100 | 1.60 | 14 | 5- 2 | 0530 | 1.77 | 18 |

## 16-5995. Opana tunnel at Kailiili

LOCATION.--Lat 20°51'04", long 156°16'17", Maui, on left bank at tunnel outlet, 0.3 mile north of Kailiili, and 2.7 miles east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 13 cfs Apr. 1, 1969; minimum daily, 0.23 cfs Oct. 5, 6, 1965.

REMARKS.--Records good. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.0 | 2.2 | 5.7 | 4.2 | 10 | 10 | 13 | 6.5 | 3.3 | 7.9 | 6.3 | 8.6 |
| 2 | 1.6 | 2.0 | 5.2 | 3.9 | 12 | 8.8 | 11 | 8.6 | 3.1 | 10 | 5.7 | 7.9 |
| 3 | 2.0 | 1.6 | 7.0 | 7.5 | 12 | 10 | 9.4 | 7.7 | 3.0 | 6.3 | 4.6 | 6.3 |
| 4 | 1.0 | 1.4 | 9.4 | 8.8 | 10 | 11 | 8.8 | 7.5 | 2.9 | 4.1 | 4.1 | 5.5 |
| 5 | .79 | 1.4 | 8.4 | 8.4 | 9.2 | 10 | 8.4 | 7.0 | 2.8 | 3.2 | 3.9 | 4.9 |
| 6 | .72 | 1.3 | 6.5 | 7.0 | 8.2 | 11 | 9.2 | 6.3 | 2.6 | 9.4 | 4.1 | 4.5 |
| 7 | .65 | 1.2 | 5.4 | 7.7 | 7.7 | 11 | 9.2 | 5.7 | 2.5 | 8.1 | 3.7 | 4.1 |
| 8 | .65 | 1.1 | 4.8 | 8.1 | 7.0 | 9.0 | 8.8 | 5.4 | 2.4 | 6.2 | 3.4 | 4.2 |
| 9 | .58 | 1.1 | 4.8 | 9.0 | 6.5 | 9.8 | 8.1 | 5.1 | 2.4 | 5.4 | 3.1 | 4.1 |
| 10 | .58 | 1.1 | 4.6 | 7.5 | 6.0 | 8.6 | 7.3 | 4.9 | 3.0 | 4.8 | 3.3 | 3.9 |
| 11 | 1.0 | 1.0 | 4.1 | 6.2 | 5.7 | 7.9 | 8.2 | 4.8 | 7.5 | 3.8 | 3.1 | 3.8 |
| 12 | 1.6 | .94 | 5.3 | 5.5 | 5.4 | 7.3 | 11 | 4.6 | 4.2 | 3.4 | 3.2 | 3.6 |
| 13 | 1.4 | .94 | 10 | 5.1 | 5.5 | 6.5 | 9.4 | 4.4 | 3.3 | 3.3 | 7.1 | 3.4 |
| 14 | 1.4 | 1.0 | 8.8 | 4.8 | 10 | 6.2 | 8.4 | 4.8 | 3.0 | 10 | 9.2 | 3.3 |
| 15 | 1.4 | 1.4 | 7.5 | 4.6 | 9.6 | 6.2 | 7.9 | 9.0 | 2.8 | 9.4 | 10 | 3.0 |
| 16 | 1.4 | 2.5 | 6.8 | 4.9 | 10 | 7.9 | 7.9 | 6.5 | 2.5 | 6.3 | 7.0 | 2.8 |
| 17 | 1.3 | 2.6 | 6.5 | 4.4 | 10 | 10 | 8.1 | 5.5 | 2.4 | 5.4 | 6.5 | 2.5 |
| 18 | 1.6 | 1.4 | 7.5 | 3.9 | 11 | 11 | 7.5 | 4.9 | 2.3 | 4.8 | 6.6 | 2.3 |
| 19 | 3.7 | .94 | 6.0 | 4.1 | 10 | 10 | 8.4 | 4.8 | 2.2 | 7.8 | 5.8 | 2.2 |
| 20 | 8.4 | .94 | 5.2 | 3.9 | 11 | 8.6 | 9.6 | 4.6 | 2.0 | 8.8 | 5.2 | 2.0 |
| 21 | 4.5 | .79 | 4.8 | 3.6 | 10 | 7.7 | 8.6 | 4.5 | 2.0 | 6.3 | 4.6 | 2.5 |
| 22 | 3.8 | .42 | 4.9 | 3.4 | 10 | 7.0 | 9.4 | 4.2 | 2.0 | 5.2 | 4.4 | 2.6 |
| 23 | 3.3 | .79 | 4.5 | 3.2 | 9.8 | 6.3 | 8.4 | 4.1 | 1.8 | 5.2 | 4.1 | 2.2 |
| 24 | 3.0 | .86 | 4.2 | 3.1 | 9.6 | 7.7 | 7.7 | 4.1 | 1.8 | 5.8 | 3.9 | 2.2 |
| 25 | 2.5 | .86 | 7.1 | 3.0 | 10 | 8.8 | 7.0 | 4.2 | 1.8 | 6.2 | 5.7 | 2.2 |
| 26 | 2.3 | .86 | 7.9 | 2.9 | 9.8 | 7.5 | 6.5 | 4.4 | 1.8 | 5.1 | 5.8 | 3.7 |
| 27 | 2.0 | .72 | 5.8 | 2.6 | 8.8 | 6.8 | 6.2 | 4.4 | 1.8 | 4.5 | 4.4 | 4.6 |
| 28 | 2.6 | 2.7 | 5.4 | 2.5 | 8.4 | 6.2 | 5.7 | 4.4 | 1.8 | 4.2 | 3.8 | 3.3 |
| 29 | 2.3 | 12 | 6.0 | 5.7 | ------ | 5.8 | 7.2 | 3.8 | 1.8 | 3.9 | 3.6 | 5.6 |
| 30 | 2.2 | 7.9 | 5.1 | 11 | ------ | 6.1 | 8.1 | 3.6 | 4.3 | 3.8 | 4.1 | 5.4 |
| 31 | 2.5 | ------ | 4.6 | 9.4 | ------ | 10 | ------ | 3.4 | ------ | 6.3 | 4.1 | ------ |
| TOTAL | 63.77 | 55.96 | 189.8 | 169.9 | 253.2 | 260.7 | 254.4 | 163.7 | 81.1 | 184.9 | 154.4 | 117.2 |
| MEAN | 2.06 | 1.87 | 6.12 | 5.48 | 9.04 | 8.41 | 8.48 | 5.28 | 2.70 | 5.96 | 4.98 | 3.91 |
| MAX | 8.4 | 12 | 10 | 11 | 12 | 11 | 13 | 9.0 | 7.5 | 10 | 10 | 8.6 |
| MIN | .58 | .42 | 4.1 | 2.5 | 5.4 | 5.8 | 5.7 | 3.4 | 1.8 | 3.2 | 3.1 | 2.0 |
| AC-FT | 126 | 111 | 376 | 337 | 502 | 517 | 505 | 325 | 161 | 367 | 306 | 232 |

CAL YR 1968: TOTAL 1,304.25 MEAN 3.56 MAX 12 MIN .42 AC-FT 2,590
WTR YR 1969: TOTAL 1,949.03 MEAN 5.34 MAX 13 MIN .42 AC-FT 3,870

## 16-6024. Awalau Gulch at Kailiili

LOCATION.--Lat 20°51'11", long 156°16'25", Maui, on left bank 150 ft downstream from Left Fork, 0.4 mile north of Kailiili, and 2.6 miles east of Makawao.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,260 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 343 cfs Nov. 29 (gage height, 3.00 ft), from rating curve extended as explained below; minimum, 0.07 cfs several days.
Period of record: Maximum discharge, 343 cfs Nov. 29, 1968 (gage height, 3.00 ft), from rating curve extended above 26 cfs on basis of slope-area measurement of peak flow; minimum, 0.07 cfs Dec. 4-6, 1966, several days in 1968.

REMARKS.--Records good. Two pipes divert from Left Fork, above station, for ranch use. Excess water from Opana tunnel spills into Awalau Gulch 0.2 mile above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .32 | 1.4 | 5.0 | 4.3 | 8.5 | 17 | 27 | 6.0 | 3.1 | 6.6 | 6.0 | 6.0 |
| 2 | 1.0 | 1.2 | 4.3 | 3.9 | 61 | 16 | 15 | 10 | 2.9 | 8.4 | 5.5 | 4.6 |
| 3 | 1.4 | .65 | 5.5 | 6.0 | 16 | 19 | 7.4 | 6.6 | 2.9 | 5.5 | 4.6 | 4.3 |
| 4 | .44 | .48 | 7.4 | 6.0 | 6.0 | 18 | 7.4 | 6.6 | 2.7 | 3.6 | 4.3 | 3.9 |
| 5 | .24 | .44 | 6.6 | 6.6 | 6.0 | 14 | 7.4 | 6.0 | 2.5 | 2.5 | 3.9 | 3.4 |
| 6 | .09 | .32 | 5.5 | 6.0 | 5.5 | 11 | 8.4 | 6.0 | 2.3 | 6.6 | 4.3 | 3.1 |
| 7 | .07 | .28 | 4.6 | 6.6 | 5.5 | 7.4 | 7.4 | 5.5 | 2.3 | 6.6 | 3.9 | 2.9 |
| 8 | .07 | .22 | 4.3 | 6.6 | 6.0 | 6.0 | 7.4 | 5.0 | 2.2 | 5.5 | 3.4 | 2.9 |
| 9 | .07 | .23 | 4.3 | 6.6 | 6.0 | 7.4 | 6.0 | 5.0 | 2.0 | 5.5 | 3.1 | 2.7 |
| 10 | .07 | .20 | 4.3 | 6.0 | 6.0 | 6.0 | 5.5 | 5.0 | 2.7 | 4.6 | 3.4 | 2.7 |
| 11 | .11 | .16 | 3.9 | 5.5 | 6.0 | 6.0 | 6.6 | 5.0 | 6.6 | 3.6 | 3.1 | 2.9 |
| 12 | .27 | .08 | 4.6 | 4.6 | 6.0 | 6.0 | 11 | 4.6 | 3.9 | 3.4 | 3.1 | 2.9 |
| 13 | .58 | .09 | 8.4 | 4.6 | 6.0 | 6.0 | 9.6 | 4.3 | 3.4 | 3.1 | 6.0 | 2.9 |
| 14 | .47 | .09 | 6.0 | 4.6 | 6.6 | 6.6 | 7.4 | 4.6 | 2.7 | 8.4 | 6.6 | 2.7 |
| 15 | .60 | .76 | 6.0 | 4.3 | 6.0 | 6.6 | 7.4 | 7.4 | 2.5 | 7.4 | 7.4 | 2.7 |
| 16 | .65 | 2.0 | 6.0 | 4.6 | 6.0 | 10 | 8.4 | 6.0 | 2.0 | 5.5 | 6.0 | 2.5 |
| 17 | .49 | 1.9 | 6.0 | 4.3 | 9.6 | 12 | 7.4 | 6.0 | 1.8 | 5.0 | 5.5 | 2.3 |
| 18 | .66 | .76 | 6.0 | 3.9 | 12 | 8.4 | 7.4 | 5.5 | 1.5 | 4.6 | 5.5 | 2.2 |
| 19 | 3.1 | .14 | 5.5 | 3.9 | 13 | 7.4 | 9.6 | 5.5 | 1.4 | 6.0 | 5.0 | 2.0 |
| 20 | 8.4 | .09 | 5.0 | 3.6 | 14 | 6.0 | 9.6 | 5.0 | 1.4 | 6.6 | 4.6 | 1.9 |
| 21 | 4.3 | .07 | 4.6 | 3.6 | 19 | 5.5 | 7.4 | 5.0 | 1.4 | 5.5 | 4.3 | 2.3 |
| 22 | 3.6 | .07 | 5.0 | 3.6 | 19 | 5.5 | 9.6 | 4.6 | 1.4 | 5.0 | 3.9 | 2.5 |
| 23 | 3.1 | .08 | 4.6 | 3.4 | 19 | 5.5 | 7.4 | 4.3 | 1.2 | 5.0 | 3.9 | 1.9 |
| 24 | 2.5 | .07 | 4.3 | 3.4 | 18 | 6.0 | 6.6 | 4.3 | 1.2 | 5.5 | 3.6 | 1.8 |
| 25 | 1.8 | .07 | 6.9 | 3.1 | 18 | 6.0 | 6.6 | 4.6 | 1.3 | 6.0 | 5.5 | 1.9 |
| 26 | 1.5 | .21 | 6.0 | 2.9 | 17 | 5.5 | 6.6 | 4.6 | 1.2 | 5.5 | 5.5 | 3.6 |
| 27 | 1.3 | .11 | 5.5 | 2.7 | 16 | 5.5 | 6.6 | 4.3 | 1.1 | 5.0 | 4.3 | 3.6 |
| 28 | 2.0 | 6.6 | 5.0 | 2.3 | 16 | 5.5 | 6.0 | 4.3 | 1.0 | 4.6 | 3.6 | 3.1 |
| 29 | 1.6 | 54 | 5.5 | 6.9 | ------ | 5.5 | 7.4 | 3.9 | 1.2 | 4.3 | 3.4 | 4.6 |
| 30 | 1.3 | 6.0 | 5.0 | 11 | ------ | 6.8 | 6.6 | 3.6 | 3.6 | 3.9 | 3.6 | 4.6 |
| 31 | 1.9 | ------ | 4.6 | 6.6 | ------ | 9.9 | ------ | 3.4 | ------ | 6.0 | 3.6 | ------ |
| TOTAL | 44.00 | 78.77 | 166.2 | 152.0 | 353.7 | 264.0 | 254.1 | 162.5 | 67.4 | 165.3 | 140.4 | 91.4 |
| MEAN | 1.42 | 2.63 | 5.36 | 4.90 | 12.6 | 8.52 | 8.47 | 5.24 | 2.25 | 5.33 | 4.53 | 3.05 |
| MAX | 8.4 | 54 | 8.4 | 11 | 61 | 19 | 27 | 10 | 6.6 | 8.4 | 7.4 | 6.0 |
| MIN | .07 | .07 | 3.9 | 2.3 | 5.5 | 5.5 | 5.5 | 3.4 | 1.0 | 2.5 | 3.1 | 1.8 |
| AC-FT | 87 | 156 | 330 | 301 | 702 | 524 | 504 | 322 | 134 | 328 | 278 | 181 |

CAL YR 1968: TOTAL 1,214.12 MEAN 3.32 MAX 54 MIN .07 AC-FT 2,410
WTR YR 1969: TOTAL 1,939.77 MEAN 5.31 MAX 61 MIN .07 AC-FT 3,850

PEAK DISCHARGE (BASE, 34 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0600 | 3.00 | 343 | 3- 3 | 1700 | 1.11 | 53 |
| 1-29 | 2330 | 1.33 | 90 | 3-16 | 1900 | 1.18 | 65 |
| 2- 2 | 0330 | 2.70 | 305 | 4- 1 | 2100 | 1.64 | 143 |
| 2-21 | 2030 | 1.08 | 48 | 5- 2 | 0530 | 1.37 | 97 |

## 16-6180. Kahakuloa Stream near Honokohau

LOCATION.--Lat 20°58'54", long 156°33'26", Maui, on right bank 0.5 mile downstream from Kapuna Stream, 1.3 miles south of Kahakuloa, 2 miles west of Puu Makawana, and 4.3 miles southeast of Honokohau.

DRAINAGE AREA.--3.47 sq mi.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1 mile upstream not equivalent owing to difference in drainage areas.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,100 cfs Nov. 29 (gage height, 6.03 ft), from rating curve extended above 510 cfs on basis of slope-area measurements at gage heights 6.70 and 8.48 ft; minimum, 4.5 cfs several days.

Period of record: Maximum discharge, 3,080 cfs Dec. 14, 1942 (gage height, 7.02 ft, control then in use), from rating curve extended above 86 cfs by test of model of station site; minimum, 3.02 cfs Feb. 9-11, 1954.

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

REVISIONS (FISCAL YEARS).--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.5 | 4.8 | 7.7 | 6.4 | 18 | 22 | 124 | 14 | 10 | 13 | 16 | 22 |
| 2 | 67 | 4.8 | 6.6 | 6.2 | 235 | 15 | 104 | 36 | 9.8 | 22 | 16 | 13 |
| 3 | 12 | 4.7 | 20 | 54 | 118 | 46 | 26 | 13 | 9.5 | 12 | 16 | 12 |
| 4 | 6.6 | 4.7 | 157 | 16 | 20 | 15 | 20 | 18 | 18 | 11 | 33 | 10 |
| 5 | 6.0 | 4.7 | 33 | 55 | 11 | 31 | 41 | 14 | 10 | 8.7 | 13 | 9.8 |
| 6 | 5.7 | 4.5 | 17 | 12 | 9.0 | 13 | 92 | 11 | 9.5 | 41 | 60 | 12 |
| 7 | 5.9 | 4.5 | 9.8 | 18 | 8.0 | 11 | 31 | 11 | 9.2 | 18 | 22 | 12 |
| 8 | 5.7 | 4.5 | 7.5 | 31 | 7.7 | 11 | 18 | 10 | 9.2 | 9.8 | 13 | 31 |
| 9 | 5.5 | 4.5 | 10 | 61 | 7.3 | 32 | 15 | 10 | 9.2 | 41 | 10 | 11 |
| 10 | 5.4 | 4.5 | 11 | 12 | 6.9 | 14 | 13 | 10 | 21 | 22 | 18 | 20 |
| 11 | 5.4 | 5.2 | 6.4 | 8.7 | 6.6 | 12 | 33 | 18 | 100 | 10 | 11 | 10 |
| 12 | 5.4 | 4.5 | 97 | 7.5 | 6.6 | 16 | 45 | 16 | 14 | 9.2 | 9.5 | 8.4 |
| 13 | 5.2 | 4.5 | 231 | 7.1 | 31 | 17 | 30 | 10 | 13 | 9.0 | 34 | 55 |
| 14 | 5.0 | 5.0 | 19 | 6.9 | 248 | 9.8 | 17 | 50 | 10 | 36 | 18 | 17 |
| 15 | 9.5 | 5.0 | 10 | 6.4 | 252 | 98 | 13 | 140 | 9.8 | 15 | 76 | 9.5 |
| 16 | 7.2 | 4.8 | 14 | 6.2 | 170 | 181 | 14 | 43 | 9.2 | 10 | 18 | 9.0 |
| 17 | 5.2 | 4.7 | 15 | 6.0 | 27 | 193 | 22 | 14 | 9.0 | 13 | 24 | 8.7 |
| 18 | 5.0 | 5.0 | 22 | 5.9 | 47 | 76 | 22 | 12 | 9.0 | 12 | 53 | 12 |
| 19 | 5.7 | 4.5 | 11 | 6.0 | 24 | 30 | 16 | 12 | 8.7 | 32 | 23 | 8.4 |
| 20 | 6.6 | 4.5 | 12 | 5.9 | 16 | 18 | 30 | 12 | 8.7 | 19 | 16 | 8.4 |
| 21 | 5.4 | 4.5 | 18 | 6.4 | 13 | 14 | 16 | 11 | 8.4 | 12 | 13 | 42 |
| 22 | 6.4 | 4.5 | 69 | 5.9 | 16 | 13 | 26 | 10 | 9.2 | 10 | 10 | 29 |
| 23 | 5.7 | 4.7 | 39 | 5.7 | 15 | 12 | 13 | 10 | 8.4 | 14 | 25 | 12 |
| 24 | 5.2 | 8.5 | 10 | 5.9 | 27 | 64 | 12 | 10 | 8.2 | 56 | 10 | 11 |
| 25 | 5.0 | 7.3 | 57 | 7.7 | 32 | 128 | 11 | 24 | 9.0 | 52 | 25 | 9.0 |
| 26 | 5.0 | 5.4 | 16 | 5.7 | 13 | 23 | 11 | 36 | 9.5 | 13 | 18 | 12 |
| 27 | 4.8 | 4.7 | 9.0 | 5.7 | 11 | 28 | 28 | 35 | 9.0 | 10 | 10 | 9.8 |
| 28 | 6.2 | 44 | 19 | 5.9 | 10 | 15 | 43 | 16 | 8.2 | 9.2 | 9.2 | 10 |
| 29 | 5.4 | 291 | 11 | 51 | ------ | 15 | 97 | 12 | 11 | 9.0 | 8.4 | 9.5 |
| 30 | 5.0 | 18 | 7.7 | 52 | ------ | 34 | 45 | 10 | 10 | 8.7 | 17 | 9.0 |
| 31 | 5.4 | ------ | 6.9 | 12 | ------ | 127 | ------ | 10 | ------ | 35 | 23 | ------ |
| TOTAL | 245.0 | 486.5 | 979.6 | 502.1 | 1406.1 | 1333.8 | 1028 | 658 | 397.7 | 592.6 | 668.1 | 452.5 |
| MEAN | 7.90 | 16.2 | 31.6 | 16.2 | 50.2 | 43.0 | 34.3 | 21.2 | 13.3 | 19.1 | 21.6 | 15.1 |
| MAX | 67 | 291 | 231 | 61 | 252 | 193 | 124 | 140 | 100 | 56 | 76 | 55 |
| MIN | 4.8 | 4.5 | 6.4 | 5.7 | 6.6 | 9.8 | 11 | 10 | 8.2 | 8.7 | 8.4 | 8.4 |
| AC-FT | 486 | 965 | 1,940 | 996 | 2,790 | 2650 | 2040 | 1,310 | 789 | 1,180 | 1,330 | 898 |

CAL YR 1968: TOTAL 6,357.6 MEAN 17.4 MAX 291 MIN 4.5 AC-FT 12,610
WTR YR 1969: TOTAL 8,750.0 MEAN 24.0 MAX 291 MIN 4.5 AC-FT 17,360

PEAK DISCHARGE (BASE, 500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0200 | 6.03 | 1,100 | 2-16 | 0400 | 5.24 | 527 |
| 12-12 | 2300 | 5.76 | 878 | 3-17 | 0230 | 5.64 | 785 |
| 1- 9 | 0100 | 5.45 | 652 | 3-31 | 1600 | 5.58 | 741 |

## 16-6200. Honokohau Stream near Honokohau

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

DRAINAGE AREA.--4.11 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 1,740 cfs Mar. 30 (gage height, 6.32 ft), from rating curve extended above 180 cfs; minimum, 10 cfs several days.
Period of record: Maximum discharge, 3,740 cfs Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft), from rating curve extended above 180 cfs; minimum, 8.4 cfs May 1, 1945, Jan. 5, 1946.

REMARKS.--Records good except those above 400 cfs, which are fair. No diversion above station. All medium and low flow, together with the inflow from 2 development tunnels below station, is diverted into Honokohau ditch.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11 | 11 | 14 | 13 | 238 | 138 | 422 | 46 | 30 | 40 | 47 | 86 |
| 2 | 102 | 11 | 14 | 13 | 489 | 53 | 231 | 85 | 29 | 124 | 42 | 42 |
| 3 | 18 | 11 | 27 | 62 | 350 | 123 | 50 | 39 | 31 | 42 | 35 | 38 |
| 4 | 11 | 10 | 165 | 22 | 33 | 171 | 62 | 79 | 45 | 32 | 47 | 35 |
| 5 | 10 | 10 | 28 | 106 | 22 | 221 | 72 | 40 | 30 | 27 | 45 | 33 |
| 6 | 10 | 10 | 18 | 22 | 20 | 73 | 114 | 36 | 29 | 124 | 106 | 35 |
| 7 | 12 | 10 | 13 | 41 | 19 | 65 | 60 | 34 | 28 | 51 | 49 | 34 |
| 8 | 12 | 10 | 13 | 69 | 18 | 51 | 50 | 33 | 28 | 29 | 31 | 62 |
| 9 | 11 | 10 | 13 | 78 | 17 | 168 | 44 | 33 | 28 | 93 | 25 | 29 |
| 10 | 11 | 13 | 13 | 23 | 17 | 33 | 40 | 33 | 58 | 47 | 55 | 42 |
| 11 | 11 | 11 | 11 | 15 | 17 | 28 | 99 | 35 | 112 | 27 | 29 | 28 |
| 12 | 11 | 10 | 121 | 14 | 16 | 26 | 120 | 33 | 31 | 26 | 29 | 26 |
| 13 | 11 | 10 | 351 | 14 | 41 | 25 | 86 | 32 | 29 | 26 | 159 | 41 |
| 14 | 11 | 10 | 54 | 13 | 173 | 25 | 63 | 75 | 27 | 123 | 56 | 40 |
| 15 | 19 | 10 | 20 | 13 | 173 | 63 | 44 | 192 | 27 | 36 | 166 | 27 |
| 16 | 13 | 13 | 31 | 13 | 216 | 387 | 47 | 46 | 27 | 30 | 93 | 32 |
| 17 | 14 | 10 | 37 | 13 | 87 | 315 | 62 | 35 | 26 | 38 | 112 | 35 |
| 18 | 11 | 10 | 30 | 13 | 184 | 213 | 49 | 33 | 26 | 58 | 58 | 37 |
| 19 | 22 | 10 | 31 | 13 | 137 | 90 | 52 | 33 | 26 | 182 | 80 | 26 |
| 20 | 35 | 10 | 34 | 13 | 48 | 40 | 98 | 33 | 26 | 81 | 44 | 36 |
| 21 | 12 | 10 | 18 | 15 | 41 | 34 | 42 | 32 | 33 | 35 | 32 | 103 |
| 22 | 23 | 10 | 54 | 13 | 57 | 32 | 104 | 31 | 35 | 26 | 27 | 51 |
| 23 | 16 | 12 | 18 | 13 | 38 | 31 | 38 | 33 | 50 | 47 | 57 | 42 |
| 24 | 11 | 26 | 14 | 13 | 119 | 105 | 36 | 31 | 43 | 45 | 26 | 34 |
| 25 | 11 | 15 | 92 | 18 | 85 | 113 | 34 | 103 | 38 | 71 | 90 | 27 |
| 26 | 11 | 12 | 20 | 13 | 50 | 37 | 33 | 74 | 35 | 28 | 41 | 66 |
| 27 | 11 | 10 | 15 | 12 | 26 | 38 | 128 | 58 | 28 | 25 | 32 | 32 |
| 28 | 14 | 117 | 37 | 12 | 61 | 32 | 110 | 35 | 26 | 24 | 27 | 32 |
| 29 | 11 | 537 | 19 | 204 | ------ | 32 | 210 | 31 | 49 | 24 | 27 | 33 |
| 30 | 36 | 24 | 14 | 149 | ------ | 142 | 84 | 31 | 41 | 25 | 49 | 28 |
| 31 | 13 | ------ | 13 | 57 | ------ | 328 | ------ | 31 | ------ | 114 | 82 | ------ |
| TOTAL | 535 | 983 | 1,352 | 1,102 | 2,792 | 3,232 | 2,684 | 1,495 | 1,071 | 1,700 | 1,798 | 1,212 |
| MEAN | 17.3 | 32.8 | 43.6 | 35.5 | 99.7 | 104 | 89.5 | 48.2 | 35.7 | 54.8 | 58.0 | 40.4 |
| MAX | 102 | 537 | 351 | 204 | 489 | 387 | 422 | 192 | 112 | 182 | 166 | 103 |
| MIN | 10 | 10 | 11 | 12 | 16 | 25 | 33 | 31 | 26 | 24 | 25 | 26 |
| AC-FT | 1,060 | 1,950 | 2,680 | 2,190 | 5,540 | 6,410 | 5,320 | 2,970 | 2,120 | 3,370 | 3,570 | 2,400 |

CAL YR 1968: TOTAL 12,660 MEAN 34.6 MAX 537 MIN 10 AC-FT 25,110
WTR YR 1969: TOTAL 19,956 MEAN 54.7 MAX 537 MIN 10 AC-FT 39,580

PEAK DISCHARGE (BASE, 1,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-29 | 0300 | 6.00 | 1,500 | 3-17 | 0230 | 6.03 | 1,520 |
| 3- 9 | 0100 | 5.95 | 1,460 | 3-30 | 2230 | 6.32 | 1,740 |

## 16-6385. Kahoma Stream at Lahaina

LOCATION.--Lat 20°53'10", long 156°40'36", Maui, on right bank 0.2 mile west of Kelawea, 0.6 mile northeast of Lahaina, 0.6 mile downstream from Kanaha Stream, and 0.9 mile upstream from mouth.

DRAINAGE AREA.--5.22 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 768 cfs Mar. 17 (gage height, 6.98 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 2,490 cfs July 11, 1965 (gage height, 11.03 ft), from rating curve extended above 21 cfs on basis of slope-area measurements at gage heights 5.90, 6.01, 7.58, 8.07 and 11.03 ft; no flow many days each year.
Maximum discharge of flood of May 13, 1960, 7,750 cfs, by slope-area measurement at site 0.5 mile upstream.

REMARKS.--Records fair. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Recording rain gage located at station.

REVISIONS (WATER YEARS).--WRD Hawaii 1968: 1966-67(P). Published records of some peak discharges in the water years 1963-65 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 2.4 | 47 | 38 | 255 | 0 | 0 | .47 | .12 | 76 |
| 2 | .32 | 0 | 0 | 2.5 | 175 | 16 | 61 | 17 | 0 | 72 | .48 | 9.6 |
| 3 | .02 | 0 | .24 | 4.8 | 236 | 144 | 5.2 | 11 | 0 | 2.4 | .50 | .02 |
| 4 | .02 | 0 | 6.7 | 2.9 | 6.3 | 197 | 14 | 14 | 0 | 0 | .08 | .02 |
| 5 | 0 | 0 | .04 | 55 | 1.8 | 112 | 9.6 | 3.3 | .70 | 0 | .08 | 0 |
| 6 | 0 | 0 | 0 | 5.1 | 1.6 | 71 | 15 | 0 | .52 | 8.4 | 0 | 0 |
| 7 | 0 | 0 | 0 | 11 | 1.0 | 18 | 6.0 | 0 | 0 | 10 | .08 | 0 |
| 8 | 0 | 0 | 0 | 21 | 3.7 | 7.1 | 3.3 | 0 | 0 | .24 | 0 | 0 |
| 9 | 0 | 0 | .70 | 42 | 3.7 | 120 | 1.8 | 1.7 | 0 | .02 | 0 | 0 |
| 10 | 0 | 0 | .61 | 5.3 | 1.5 | 3.3 | 4.0 | 7.9 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | .02 | 1.8 | .05 | 2.0 | 16 | 8.2 | .26 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 1.4 | .05 | 1.7 | 106 | 3.3 | 0 | 0 | 0 | .08 |
| 13 | 0 | 0 | 31 | 1.2 | 0 | 4.3 | 33 | 1.3 | 0 | 0 | 46 | 0 |
| 14 | 0 | 0 | 5.7 | 1.2 | 0 | 5.4 | 17 | 4.0 | 0 | 105 | 15 | 0 |
| 15 | 0 | 0 | 0 | 1.2 | 0 | 5.4 | 2.3 | 4.2 | 0 | 3.1 | 21 | 0 |
| 16 | 0 | 0 | .18 | 1.2 | 3.4 | 79.0 | 4.6 | 2.0 | 0 | 0 | .91 | 0 |
| 17 | 0 | 0 | 6.0 | 1.2 | 46 | 109.0 | 1.3 | 0 | .02 | 0 | 3.3 | .18 |
| 18 | 0 | 0 | 7.4 | 1.2 | 110 | 45.0 | 1.6 | 0 | 0 | .11 | .75 | .08 |
| 19 | 0 | 0 | 23 | 1.2 | 106 | 13.0 | 11 | 0 | 0 | 151 | .01 | .19 |
| 20 | 16 | 0 | 19 | 1.2 | 60 | 1.5 | 64 | 0 | 0 | 54 | 0 | 0 |
| 21 | .02 | 0 | 3.8 | 1.2 | 17 | 5.2 | 3.0 | 0 | 0 | 9.4 | 0 | 3.4 |
| 22 | 0 | 0 | 2.4 | 1.0 | 14 | 5.4 | 11 | 0 | 0 | .20 | 0 | 1.8 |
| 23 | 0 | .01 | 2.2 | 1.1 | 4.0 | 5.4 | .26 | .39 | 0 | .89 | 0 | .18 |
| 24 | 0 | 0 | 2.3 | .62 | 25 | 1.9 | .10 | 0 | 0 | 1.1 | 0 | .01 |
| 25 | 0 | 0 | 42 | .78 | 29 | 0 | 0 | 0 | 0 | 14 | 8.0 | .44 |
| 26 | 0 | 0 | 3.2 | .83 | 20 | 0 | 1.5 | 0 | 0 | .85 | .06 | 14 |
| 27 | 0 | 0 | 3.1 | .40 | .25 | 0 | 33 | 0 | 0 | 0 | 0 | 16 |
| 28 | 0 | 24 | 14 | .19 | 12 | 0 | 20 | 0 | 0 | 0 | .08 | 8.5 |
| 29 | 0 | 240 | 2.5 | 43 | ------ | 0 | 14 | 0 | 0 | 0 | .33 | 7.9 |
| 30 | 0 | .12 | 2.5 | 71 | ------ | 13 | 5.1 | 0 | 3.5 | .01 | .80 | .23 |
| 31 | 0 | ------ | 2.3 | 40 | ------ | 128 | ------ | 0 | ------ | 2.4 | 9.1 | ------ |
| TOTAL | 16.38 | 264.13 | 180.89 | 324.92 | 924.35 | 1,151.6 | 719.66 | 78.29 | 5.00 | 435.59 | 106.68 | 138.63 |
| MEAN | .53 | 8.80 | 5.84 | 10.5 | 33.0 | 37.1 | 24.0 | 2.53 | .17 | 14.1 | 3.44 | 4.62 |
| MAX | 16 | 240 | 42 | 71 | 236 | 197 | 255 | 17 | 3.5 | 151 | 46 | 76 |
| MIN | 0 | 0 | 0 | .19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 32 | 524 | 359 | 644 | 1,830 | 2,280 | 1,430 | 155 | 9.9 | 864 | 212 | 275 |

CAL YR 1968: TOTAL 1,311.20 MEAN 3.58 MAX 240 MIN 0 AC-FT 2,600
WTR YR 1969: TOTAL 4,346.12 MEAN 11.9 MAX 255 MIN 0 AC-FT 8,620

PEAK DISCHARGE (BASE, 390 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 11-28 | 2300 | 6.68 | 663 | 3-17 | 0230 | 6.98 | 768 |
| 1-30 | 0030 | 5.87 | 396 | 4-1 | 0930 | 6.32 | 541 |
| 2-3 | 0730 | 5.97 | 426 | 4-27 | 2200 | 6.18 | 494 |
| 2-19 | 1500 | 6.14 | 482 | 7-19 | 1800 | 5.93 | 414 |
| 3-5 | 1530 | 6.48 | 593 | | | | |

## 16-6462. Olowalu Stream at Olowalu

LOCATION.--Lat 20°49'23", long 156°37'15", Maui, on downstream side of center pier of plantation road bridge, 0.6 mile northeast of Olowalu, and 5.5 miles southeast of Lahaina.

DRAINAGE AREA.--4.08 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 507 cfs Mar. 16 (gage height, 3.83 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 1,300 cfs Mar. 24, 1967 (gage height, 5.40 ft), from rating curve extended above 66 cfs on basis of slope-area measurements at gage heights 3.39, 3.58, 3.72, 5.31 and 5.40 ft; no flow most of time each year.
Maximum discharge of flood of Nov. 2, 1961, 743 cfs, by slope-area measurement.

REMARKS.--Records good. All low flow is diverted 1.5 miles above station by Olowalu ditch for domestic use and irrigation of sugarcane in vicinity of Olowalu. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | .35 | 0 | .63 | 29 | 128 | 2.4 | 0 | 0 | 1.2 | 3.9 |
| 2 | 6.4 | 0 | 2.6 | 0 | 109 | 20 | 91 | 1.2 | 0 | 1.5 | 0 | .28 |
| 3 | .77 | 0 | 56 | 14 | 129 | 24 | 20 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 14 | 10 | 37 | 55 | 9.0 | .04 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 1.4 | 54 | 15 | 63 | 6.0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 27 | 7.0 | 49 | 4.6 | 0 | 0 | 1.0 | 4.0 | 0 |
| 7 | 0 | 0 | 0 | 32 | 2.0 | 28 | 3.0 | 0 | 0 | 2.1 | 1.0 | 0 |
| 8 | 0 | 0 | 0 | 65 | .02 | 21 | 2.5 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 1.7 | 63 | 0 | 27 | .68 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 1.1 | 34 | 0 | 18 | .06 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 18 | 0 | 13 | .94 | 0 | 2.4 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 11 | 0 | 9.4 | 10 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 28 | 9.6 | 0 | 6.0 | 5.9 | 0 | 0 | 0 | .85 | 0 |
| 14 | 0 | 0 | 10 | 5.0 | .16 | 3.8 | 3.5 | 0 | 0 | 6.7 | .94 | 0 |
| 15 | 0 | 0 | 2.0 | 2.7 | 2.4 | 3.2 | 1.4 | 0 | 0 | .65 | 9.8 | 0 |
| 16 | 0 | 0 | 9.5 | 1.4 | 24 | 124 | .56 | 0 | 0 | 0 | 2.0 | 0 |
| 17 | 0 | 0 | 45 | .34 | 18 | 150 | .82 | 0 | 0 | 0 | 4.8 | 0 |
| 18 | 0 | 0 | 24 | 0 | 23 | 61 | .32 | 0 | 0 | 0 | 4.3 | 0 |
| 19 | 0 | 0 | 19 | 0 | 26 | 39 | 0 | 0 | 0 | 26 | .74 | 0 |
| 20 | 0 | 0 | 76 | 0 | 18 | 12 | 2.4 | 0 | 0 | 17 | 0 | 0 |
| 21 | 0 | 0 | 13 | .27 | 16 | 4.3 | .17 | 0 | 0 | 2.1 | 0 | .22 |
| 22 | 0 | 0 | 5.7 | 0 | 13 | 1.8 | 9.6 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | 2.0 | 0 | 11 | 1.3 | 1.7 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | .45 | 0 | 17 | 1.0 | .09 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | 64 | 0 | 28 | .89 | 0 | 0 | 0 | 0 | 2.4 | 0 |
| 26 | 0 | 0 | 21 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 0 | 0 | 5.5 | 0 | 19 | 0 | .11 | .08 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 16 | 0 | 17 | 0 | .80 | 2.4 | 0 | 0 | 0 | 0 |
| 29 | 0 | 107 | 8.3 | 1.2 | ------ | 0 | 14 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 6.8 | 1.7 | 4.2 | ------ | 23 | 17 | .82 | 0 | 0 | 0 | 0 |
| 31 | 0 | ------ | 0 | 0 | ------ | 44 | ------ | 0 | ------ | 1.4 | 0 | ------ |
| TOTAL | 7.17 | 113.8 | 428.30 | 352.71 | 558.21 | 831.69 | 334.15 | 6.94 | 2.4 | 58.45 | 32.03 | 4.40 |
| MEAN | .23 | 3.79 | 13.8 | 11.4 | 19.9 | 26.8 | 11.1 | .22 | .080 | 1.89 | 1.03 | .15 |
| MAX | 6.4 | 107 | 76 | 65 | 129 | 150 | 128 | 2.4 | 2.4 | 26 | 9.8 | 3.9 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 14 | 23 | 850 | 700 | 1,110 | 1,650 | 663 | 14 | 4.8 | 116 | 64 | 8.7 |

CAL YR 1968: TOTAL 1,465.38 MEAN 4.00 MAX 135 MIN 0 AC-FT 2,910
WTR YR 1969: TOTAL 2,730.25 MEAN 7.48 MAX 150 MIN 0 AC-FT 5,420

PEAK DISCHARGE (BASE, 340 CFS).--Mar. 16 (1730) 507 cfs (3.83 ft); Mar. 30 (2200) 396 cfs (3.53 ft).

## 16-6600. Kulanihakoi Gulch near Kihei

LOCATION.--Lat 20°46'06", long 156°27'03", Maui, on right bank 0.5 mile northeast of Lihue Cemetery, 0.8 mile upstream from mouth, and 1.3 miles southeast of Kihei.

DRAINAGE AREA.--14.4 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 864 cfs Dec. 25 (gage height, 3.01 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 2,740 cfs Mar. 24, 1967 (gage height, 6.39 ft), from rating curve extended above 150 cfs on basis of slope-area measurement of peak flow; no flow most of time each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 0 | | | | | | | | | |
| 2 | | | 0 | | | | | | | | | |
| 3 | | | 0 | | | | | | | | | |
| 4 | | | 0 | | | | | | | | | |
| 5 | | | 0 | | | | | | | | | |
| 6 | | | 0 | | | | | | | | | |
| 7 | | | 0 | | | | | | | | | |
| 8 | | | 0 | | | | | | | | | |
| 9 | | | 0 | | | | | | | | | |
| 10 | | | 0 | | | | | | | | | |
| 11 | | | 0 | | | | | | | | | |
| 12 | | | 0 | | | | | | | | | |
| 13 | | | 0 | | | | | | | | | |
| 14 | | | 0 | | | | | | | | | |
| 15 | | | 0 | | | | | | | | | |
| 16 | | | 0 | | | | | | | | | |
| 17 | | | 0 | | | | | | | | | |
| 18 | | | 0 | | | | | | | | | |
| 19 | | | 0 | | | | | | | | | |
| 20 | | | .14 | | | | | | | | | |
| 21 | | | 0 | | | | | | | | | |
| 22 | | | 0 | | | | | | | | | |
| 23 | | | 0 | | | | | | | | | |
| 24 | | | 0 | | | | | | | | | |
| 25 | | | 35 | | | | | | | | | |
| 26 | | | 0 | | | | | | | | | |
| 27 | | | 0 | | | | | | | | | |
| 28 | | | 0 | | ------ | | | | | | | |
| 29 | | | 0 | | ------ | | | | | | | |
| 30 | | | 0 | | ------ | | | | | | | |
| 31 | | ------ | 0 | | ------ | | ------ | | ------ | | | ------ |
| TOTAL | 0 | 0 | 35.14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MEAN | 0 | 0 | 1.13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MAX | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | 0 | 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CAL YR 1968: TOTAL 134.60 MEAN .37 MAX 49 MIN 0 AC-FT 267
WTR YR 1969: TOTAL 35.14 MEAN .096 MAX 35 MIN 0 AC-FT 70

PEAK DISCHARGE (BASE, 62 CFS).--Dec. 25 (1400) 864 cfs (3.01 ft).

## 16-7000. Waiakea Stream near Mountain View

LOCATION.--Lat 19°38'30", long 155°10'28", Hawaii, on left bank 200 ft upstream from Olaa Flume Road, 7.3 miles northwest of Mountain View, and 8.0 miles southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 sq mi.

PERIOD OF RECORD.--September 1930 to current year. Prior to July 1960, published as "at middle flume house, near Mountain View."

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

EXTREMES.--Current year: Maximum discharge, 551 cfs Feb. 19 (gage height, 4.43 ft), from rating curve extended above 160 cfs; minimum, 1.0 cfs June 29.
Period of record: Maximum discharge, 565 cfs Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 160 cfs; no flow at times.

REMARKS.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

REVISIONS (FISCAL YEARS).--WSP 1937: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.9 | 7.2 | 12 | 8.2 | 62 | 46 | 20 | 27 | 4.6 | 5.3 | 16 | 16 |
| 2 | 7.6 | 6.7 | 9.7 | 7.6 | 63 | 52 | 32 | 25 | 4.3 | 17 | 16 | 17 |
| 3 | 7.1 | 6.4 | 9.3 | 7.0 | 70 | 62 | 34 | 40 | 4.1 | 15 | 16 | 16 |
| 4 | 6.7 | 6.2 | 9.9 | 6.9 | 64 | 87 | 34 | 49 | 4.0 | 12 | 15 | 17 |
| 5 | 6.5 | 6.0 | 10 | 10 | 58 | 72 | 32 | 44 | 3.9 | 9.3 | 14 | 16 |
| 6 | 6.6 | 5.6 | 9.9 | 9.7 | 52 | 67 | 29 | 38 | 3.8 | 9.3 | 16 | 16 |
| 7 | 6.9 | 5.4 | 9.3 | 9.0 | 42 | 58 | 27 | 33 | 3.6 | 13 | 15 | 15 |
| 8 | 6.3 | 5.0 | 8.5 | 7.8 | 34 | 54 | 24 | 28 | 3.4 | 12 | 14 | 14 |
| 9 | 6.1 | 4.7 | 7.8 | 7.5 | 29 | 62 | 22 | 26 | 3.2 | 11 | 13 | 13 |
| 10 | 8.1 | 4.4 | 7.1 | 7.2 | 26 | 53 | 20 | 22 | 3.1 | 11 | 13 | 12 |
| 11 | 11 | 4.2 | 6.5 | 6.7 | 22 | 44 | 28 | 20 | 3.6 | 10 | 13 | 11 |
| 12 | 11 | 4.0 | 6.2 | 6.3 | 19 | 36 | 70 | 18 | 3.4 | 10 | 12 | 10 |
| 13 | 10 | 3.9 | 27 | 5.8 | 17 | 31 | 60 | 16 | 3.0 | 9.8 | 17 | 9.9 |
| 14 | 8.9 | 3.8 | 26 | 5.6 | 19 | 27 | 62 | 15 | 2.6 | 9.9 | 27 | 9.4 |
| 15 | 8.2 | 3.9 | 25 | 5.3 | 32 | 24 | 52 | 14 | 2.4 | 9.8 | 66 | 8.5 |
| 16 | 7.5 | 3.4 | 27 | 4.9 | 41 | 21 | 46 | 13 | 2.4 | 9.3 | 73 | 7.8 |
| 17 | 7.0 | 3.1 | 27 | 4.6 | 39 | 20 | 44 | 12 | 2.2 | 8.7 | 62 | 7.3 |
| 18 | 8.1 | 3.0 | 27 | 4.3 | 71 | 19 | 39 | 10 | 2.0 | 8.2 | 56 | 7.3 |
| 19 | 8.1 | 2.7 | 25 | 4.1 | 153 | 18 | 35 | 9.4 | 2.0 | 15 | 47 | 7.9 |
| 20 | 20 | 2.5 | 23 | 3.9 | 108 | 17 | 33 | 8.9 | 1.8 | 22 | 38 | 6.9 |
| 21 | 16 | 2.4 | 21 | 3.8 | 106 | 16 | 32 | 8.2 | 1.7 | 18 | 31 | 12 |
| 22 | 16 | 2.4 | 19 | 3.6 | 88 | 15 | 34 | 7.6 | 1.5 | 20 | 28 | 15 |
| 23 | 15 | 2.2 | 17 | 3.2 | 74 | 14 | 32 | 7.0 | 1.4 | 20 | 26 | 14 |
| 24 | 14 | 2.1 | 16 | 3.0 | 56 | 13 | 30 | 6.5 | 1.4 | 19 | 24 | 14 |
| 25 | 13 | 2.0 | 15 | 2.9 | 57 | 16 | 27 | 6.2 | 1.3 | 19 | 22 | 14 |
| 26 | 12 | 2.0 | 14 | 2.7 | 49 | 14 | 24 | 5.9 | 1.2 | 18 | 20 | 14 |
| 27 | 11 | 1.8 | 13 | 2.5 | 41 | 13 | 24 | 6.0 | 1.2 | 17 | 19 | 13 |
| 28 | 10 | 2.0 | 12 | 2.4 | 40 | 12 | 26 | 5.5 | 1.1 | 16 | 18 | 12 |
| 29 | 8.9 | 6.6 | 11 | 8.5 | ------ | 12 | 32 | 5.3 | 1.1 | 15 | 17 | 11 |
| 30 | 8.5 | 15 | 9.8 | 41 | ------ | 11 | 29 | 5.0 | 1.7 | 15 | 16 | 10 |
| 31 | 8.1 | ------ | 8.9 | 52 | ------ | 15 | ------ | 4.8 | ------ | 15 | 16 | ------ |
| TOTAL | 302.1 | 130.6 | 469.9 | 258.0 | 1542 | 1021 | 1033 | 536.3 | 77.0 | 419.6 | 796 | 367.0 |
| MEAN | 9.74 | 4.35 | 15.2 | 8.32 | 55.1 | 32.9 | 34.4 | 17.3 | 2.57 | 13.5 | 25.7 | 12.2 |
| MAX | 20 | 15 | 27 | 52 | 153 | 87 | 70 | 49 | 4.6 | 22 | 73 | 17 |
| MIN | 6.1 | 1.8 | 6.2 | 2.4 | 17 | 11 | 20 | 4.8 | 1.1 | 5.3 | 12 | 6.9 |
| AC-FT | 599 | 259 | 932 | 512 | 3060 | 2020 | 2050 | 1060 | 153 | 832 | 1580 | 728 |

CAL YR 1968: TOTAL 4,067.60 MEAN 11.1 MAX 63 MIN .70 AC-FT 8,070
WTR YR 1969: TOTAL 6,952.5 MEAN 19.0 MAX 153 MIN 1.1 AC-FT 13,790

PEAK DISCHARGE (BASE, 100 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 0130 | 3.48 | 106 | 4-12 | 0430 | 3.93 | 255 |
| 2-19 | 0900 | 4.43 | 551 | 5- 3 | 1700 | 3.72 | 168 |
| 2-21 | 2230 | 3.59 | 128 | 8-16 | 0300 | 3.65 | 145 |
| 3- 4 | 1930 | 4.23 | 418 | | | | |

## 16-7017.5. Wailuku River near Humuula

LOCATION.--Lat 19°42'55", long 155°18'36", Hawaii, on right bank 300 ft upstream from trail terminus, 10 miles east of Humuula, and 14 miles west of Hilo.

DRAINAGE AREA.--34.8 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 536 cfs Aug. 15 (gage height, 6.32 ft), from rating curve extended above 18 cfs; minimum, 0.03 cfs on several days.
Period of record: Maximum discharge, 2,600 cfs Aug. 8, 1967 (gage height, 10.27 ft), from rating curve extended above 18 cfs; no flow Oct. 4-6, Nov. 2, 1965.

REMARKS.--Records good except those above 40 cfs, which are poor. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7.8 | .07 | .82 | .13 | 15 | 42 | 3.7 | .82 | .13 | .16 | 1.0 | .46 |
| 2 | 30 | .07 | .24 | .13 | 26 | 15 | 9.0 | .88 | .12 | .27 | .30 | .40 |
| 3 | 3.9 | .06 | 2.8 | .16 | 50 | 8.1 | .70 | 9.6 | .12 | .15 | .52 | .33 |
| 4 | .46 | .06 | 1.2 | .33 | 21 | 10 | .58 | 23 | .10 | .10 | .33 | .30 |
| 5 | .20 | .06 | .33 | 3.4 | 8.5 | 5.5 | .27 | 3.2 | .10 | .05 | .24 | .27 |
| 6 | .15 | .06 | .33 | .76 | 5.0 | 68 | .64 | 2.0 | .09 | .10 | .27 | .27 |
| 7 | .13 | .06 | .24 | .40 | 1.5 | 15 | .58 | 1.1 | .07 | .27 | .22 | .22 |
| 8 | .12 | .05 | .24 | .36 | 1.0 | 6.6 | .33 | .88 | .07 | .30 | .18 | .22 |
| 9 | .09 | .06 | .24 | .40 | .88 | 11 | .33 | .76 | .07 | .15 | .18 | .20 |
| 10 | .07 | .06 | .13 | .46 | .88 | 5.4 | .33 | .70 | .07 | .18 | .22 | .22 |
| 11 | .10 | .06 | .10 | .24 | .88 | 4.5 | 2.0 | .64 | .10 | .15 | .20 | .20 |
| 12 | 1.6 | .06 | .07 | .20 | .82 | 3.7 | 15 | .58 | .13 | .12 | .24 | .18 |
| 13 | .58 | .06 | .70 | .18 | .76 | 2.4 | 7.4 | .52 | .09 | .15 | 1.9 | .18 |
| 14 | .15 | .09 | 4.4 | .16 | .76 | 1.7 | 2.4 | .46 | .07 | .20 | 9.5 | .18 |
| 15 | .18 | .13 | 1.6 | .15 | 1.9 | 1.1 | 1.3 | .46 | .06 | .30 | 157 | .15 |
| 16 | .33 | .09 | 1.1 | .13 | 4.4 | 1.0 | .88 | .46 | .06 | .12 | 40 | .13 |
| 17 | .13 | .06 | 5.2 | .12 | 5.6 | .94 | 1.8 | .36 | .04 | .09 | 12 | .13 |
| 18 | .33 | .06 | 4.7 | .12 | 54 | .88 | .88 | .36 | .03 | .05 | 8.1 | .13 |
| 19 | .20 | .05 | .82 | .12 | 143 | .82 | 1.6 | .33 | .03 | 18 | 5.4 | .16 |
| 20 | 4.6 | .04 | .46 | .10 | 102 | .76 | 2.2 | .33 | .03 | 23 | 4.4 | .12 |
| 21 | .36 | .04 | .36 | .10 | 116 | .64 | 1.6 | .27 | .03 | 1.2 | 2.8 | 2.1 |
| 22 | .22 | .03 | .33 | .10 | 68 | .58 | 1.9 | .27 | .03 | .40 | 2.0 | 1.5 |
| 23 | .16 | .04 | .24 | .10 | 28 | .46 | 1.3 | .24 | .04 | .70 | 1.9 | .70 |
| 24 | .13 | .05 | .22 | .10 | 13 | .40 | .88 | .22 | .03 | .46 | 1.6 | .27 |
| 25 | .12 | .05 | .22 | .10 | 9.5 | .52 | .88 | .22 | .04 | 1.0 | 1.6 | .22 |
| 26 | .10 | .04 | .22 | .10 | 6.6 | .36 | .64 | .20 | .04 | .64 | .88 | .18 |
| 27 | .09 | .03 | .18 | .09 | 4.4 | .33 | 1.6 | .20 | .03 | .24 | .70 | .15 |
| 28 | .09 | .03 | .18 | .09 | 8.9 | .33 | 2.1 | .16 | .03 | .20 | .52 | .13 |
| 29 | .09 | .24 | .22 | 5.0 | ------ | .30 | 2.1 | .16 | .03 | .18 | .46 | .12 |
| 30 | .09 | 1.2 | .16 | 36 | ------ | .27 | 2.2 | .16 | .12 | .20 | .40 | .12 |
| 31 | .09 | ------ | .15 | 15 | ------ | .67 | ------ | .16 | ------ | .40 | .36 | ------ |
| TOTAL | 52.66 | 3.06 | 28.20 | 64.83 | 698.28 | 209.26 | 67.12 | 49.70 | 2.00 | 49.53 | 255.42 | 9.94 |
| MEAN | 1.70 | .10 | .91 | 2.09 | 24.9 | 6.75 | 2.24 | 1.60 | .067 | 1.60 | 8.24 | .33 |
| MAX | 30 | 1.2 | 5.2 | 36 | 143 | 68 | 15 | 23 | .13 | 23 | 157 | 2.1 |
| MIN | .07 | .03 | .07 | .09 | .76 | .27 | .27 | .16 | .03 | .05 | .18 | .12 |
| AC-FT | 104 | 6.1 | 56 | 129 | 1,380 | 415 | 133 | 99 | 4.0 | 98 | 507 | 20 |

CAL YR 1968: TOTAL 386.13 MEAN 1.06 MAX 71 MIN .03 AC-FT 766
WTR YR 1969: TOTAL 1,490.00 MEAN 4.08 MAX 157 MIN .03 AC-FT 2,960

PEAK DISCHARGE (BASE, 310 CFS).--Mar. 6 (1530) 371 cfs (5.68 ft); Aug. 15 (0700) 536 cfs (6.32 ft).

## 16-7018. Wailuku River near Kaumana

LOCATION.--Lat 19°43'15", long 155°16'08", Hawaii, on right bank 0.2 mile upstream from Waipahoehoe Gulch and 8.4 miles west of Kaumana.

DRAINAGE AREA.--43.4 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 3,170 cfs Aug. 15 (gage height, 8.37 ft); minimum, 0.22 cfs June 29. Period of record: Maximum discharge, 9,580 cfs Aug. 8, 1967 (gage height, 13.35 ft), from rating curve extended above 2,200 cfs; minimum, 0.22 cfs June 29, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19 | 1.1 | 12 | 1.2 | 196 | 398 | 27 | 12 | 1.1 | 4.1 | 19 | 5.8 |
| 2 | 153 | 1.0 | 2.2 | 1.1 | 280 | 180 | 165 | 13 | .91 | 8.7 | 6.8 | 6.1 |
| 3 | 26 | .94 | 80 | 1.1 | 518 | 82 | 19 | 117 | .88 | 1.7 | 12 | 4.9 |
| 4 | 6.6 | .88 | 23 | 3.7 | 185 | 142 | 12 | 242 | .85 | 1.5 | 6.6 | 4.1 |
| 5 | 4.4 | .82 | 5.9 | 41 | 55 | 55 | 11 | 35 | .73 | .82 | 4.9 | 3.4 |
| 6 | 3.5 | .76 | 4.9 | 8.3 | 41 | 484 | 9.4 | 23 | .67 | 3.0 | 6.1 | 3.3 |
| 7 | 3.3 | .73 | 4.1 | 4.6 | 24 | 103 | 7.2 | 16 | .61 | 8.6 | 4.3 | 2.8 |
| 8 | 2.5 | .67 | 7.5 | 3.5 | 18 | 44 | 6.3 | 13 | .58 | 6.9 | 3.4 | 2.7 |
| 9 | 2.2 | .70 | 5.4 | 3.7 | 14 | 110 | 5.5 | 10 | .58 | 2.2 | 2.7 | 2.4 |
| 10 | 1.9 | .67 | 2.5 | 5.5 | 11 | 43 | 5.2 | 8.8 | .55 | 5.3 | 3.1 | 2.3 |
| 11 | 3.4 | .58 | 1.7 | 2.7 | 8.5 | 31 | 41 | 7.8 | .64 | 2.4 | 5.1 | 2.2 |
| 12 | 25 | .55 | 1.5 | 2.0 | 7.2 | 27 | 184 | 6.5 | 1.1 | 1.8 | 3.8 | 2.1 |
| 13 | 11 | .55 | 22 | 1.7 | 6.1 | 19 | 86 | 5.4 | .70 | 2.1 | 33 | 1.7 |
| 14 | 2.5 | .88 | 70 | 1.4 | 6.5 | 15 | 35 | 4.7 | .52 | 3.1 | 113 | 1.9 |
| 15 | 9.1 | 1.4 | 22 | 1.3 | 25 | 12 | 22 | 5.4 | .43 | 4.9 | 1,570 | 1.4 |
| 16 | 10 | .82 | 20 | 1.2 | 73 | 12 | 17 | 5.5 | .40 | 2.5 | 397 | 1.2 |
| 17 | 2.5 | .58 | 49 | 1.1 | 82 | 11 | 22 | 4.4 | .40 | 2.0 | 85 | 1.1 |
| 18 | 7.0 | .52 | 55 | 1.1 | 769 | 11 | 17 | 3.3 | .37 | 1.6 | 60 | 1.1 |
| 19 | 3.7 | .46 | 14 | 1.0 | 1,370 | 7.8 | 21 | 3.0 | .28 | 240 | 30 | 2.1 |
| 20 | 59 | .43 | 9.0 | .94 | 1,350 | 7.2 | 24 | 2.7 | .31 | 270 | 24 | 1.2 |
| 21 | 7.0 | .37 | 6.8 | .85 | 1,030 | 5.7 | 20 | 2.6 | .28 | 19 | 16 | 46 |
| 22 | 4.9 | .34 | 5.7 | .79 | 476 | 4.9 | 27 | 2.6 | .25 | 14 | 14 | 15 |
| 23 | 3.5 | .37 | 4.6 | .79 | 196 | 4.1 | 19 | 2.0 | .31 | 15 | 14 | 7.6 |
| 24 | 2.7 | .40 | 3.7 | .76 | 85 | 3.8 | 15 | 1.7 | .28 | 13 | 14 | 4.1 |
| 25 | 2.2 | .46 | 3.1 | .73 | 76 | 4.9 | 13 | 1.4 | .28 | 21 | 14 | 3.8 |
| 26 | 1.9 | .49 | 3.0 | .70 | 44 | 3.7 | 9.7 | 1.4 | .37 | 15 | 9.7 | 2.6 |
| 27 | 1.7 | .37 | 2.3 | .70 | 28 | 3.1 | 24 | 1.7 | .31 | 8.1 | 7.6 | 2.2 |
| 28 | 1.7 | .28 | 2.1 | .67 | 104 | 2.8 | 40 | 1.2 | .28 | 6.1 | 6.5 | 1.8 |
| 29 | 1.4 | 8.4 | 2.4 | 72 | ------ | 2.5 | 33 | 1.2 | .25 | 5.7 | 5.4 | 1.5 |
| 30 | 1.3 | 38 | 1.6 | 446 | ------ | 2.2 | 28 | 1.2 | 2.0 | 5.9 | 5.2 | 1.4 |
| 31 | 1.2 | ------ | 1.3 | 208 | ------ | 5.4 | ------ | 1.1 | ------ | 15 | 4.9 | ------ |
| TOTAL | 385.1 | 64.52 | 448.3 | 820.13 | 7,078.3 | 1,337.1 | 965.3 | 556.6 | 17.22 | 711.02 | 2,501.1 | 140.8 |
| MEAN | 12.4 | 2.15 | 14.5 | 26.5 | 253 | 59.3 | 32.2 | 18.0 | .57 | 22.9 | 80.7 | 4.69 |
| MAX | 153 | 38 | 80 | 446 | 1,370 | 484 | 184 | 242 | 2.0 | 270 | 1,570 | 46 |
| MIN | 1.2 | .28 | 1.3 | .67 | 6.1 | 2.2 | 5.2 | 1.1 | .25 | .82 | 2.7 | 1.1 |
| AC-FT | 764 | 128 | 889 | 1,630 | 14,040 | 3,640 | 1,920 | 1,100 | 34 | 1,410 | 4,960 | 279 |

CAL YR 1968: TOTAL 4,423.41 MEAN 12.1 MAX 569 MIN .28 AC-FT 8,770
WTR YR 1969: TOTAL 15,525.49 MEAN 42.5 MAX 1,570 MIN .25 AC-FT 30,790

PEAK DISCHARGE (BASE, 1,500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 2-19 | 1000 | 7.56 | 2,450 | 3-6 | 1530 | 6.75 | 1,840 |
| 2-21 | 2230 | 6.55 | 1,700 | 8-15 | 0730 | 8.37 | 3,170 |

## 16-7040. Wailuku River at Piihonua

LOCATION.--Lat 19°42'58", long 155°09'13", Hawaii, on left bank 0.2 mile downstream from Hookelekele Stream, 0.9 mile west of Piihonua, and 4.1 miles west of Hilo Post Office.

DRAINAGE AREA.--125 sq mi.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 18,300 cfs Feb. 19 (gage height, 17.92 ft); minimum, 8.8 cfs Nov. 28.
Period of record: Maximum discharge, 63,400 cfs Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 11,000 cfs; minimum, 0.25 cfs Mar. 9, 1941.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts about 6 cfs above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63.

REVISIONS (FISCAL YEARS).--WSP 865: 1929-36(M). WSP 965: 1941. Published records for July 1928 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200 | 33 | 329 | 28 | 2,610 | 3,410 | 472 | 346 | 28 | 187 | 445 | 184 |
| 2 | 546 | 29 | 190 | 26 | 3,120 | 1,900 | 2,530 | 370 | 24 | 465 | 215 | 258 |
| 3 | 261 | 25 | 645 | 24 | 4,550 | 1,460 | 866 | 1,190 | 23 | 155 | 294 | 186 |
| 4 | 109 | 22 | 456 | 59 | 1,900 | 2,900 | 498 | 2,100 | 21 | 102 | 179 | 159 |
| 5 | 77 | 19 | 324 | 338 | 896 | 1,660 | 350 | 680 | 18 | 59 | 131 | 132 |
| 6 | 64 | 18 | 240 | 118 | 846 | 2,850 | 285 | 490 | 17 | 132 | 259 | 126 |
| 7 | 81 | 15 | 185 | 85 | 510 | 1,410 | 241 | 330 | 15 | 304 | 151 | 112 |
| 8 | 49 | 14 | 206 | 61 | 396 | 989 | 185 | 248 | 13 | 260 | 122 | 113 |
| 9 | 40 | 13 | 198 | 51 | 288 | 1,980 | 154 | 196 | 15 | 141 | 95 | 91 |
| 10 | 50 | 13 | 103 | 95 | 210 | 905 | 142 | 159 | 14 | 208 | 97 | 103 |
| 11 | 393 | 12 | 73 | 50 | 165 | 609 | 151 | 137 | 18 | 140 | 191 | 86 |
| 12 | 347 | 12 | 58 | 37 | 135 | 491 | 1,800 | 121 | 31 | 99 | 143 | 75 |
| 13 | 213 | 11 | 828 | 33 | 112 | 389 | 1,530 | 98 | 22 | 97 | 843 | 64 |
| 14 | 98 | 11 | 1,400 | 30 | 194 | 309 | 996 | 84 | 15 | 96 | 1,980 | 72 |
| 15 | 71 | 16 | 693 | 27 | 1,120 | 240 | 748 | 77 | 14 | 125 | 9,090 | 60 |
| 16 | 102 | 18 | 704 | 24 | 1,580 | 224 | 504 | 74 | 13 | 92 | 3,390 | 50 |
| 17 | 59 | 12 | 535 | 22 | 1,350 | 259 | 650 | 64 | 12 | 73 | 1,420 | 44 |
| 18 | 142 | 11 | 788 | 19 | 5,130 | 284 | 547 | 56 | 9.5 | 63 | 1,200 | 47 |
| 19 | 135 | 10 | 317 | 17 | 10,900 | 233 | 610 | 53 | 9.5 | 1,770 | 693 | 129 |
| 20 | 636 | 9.5 | 208 | 15 | 5,510 | 224 | 639 | 48 | 9.5 | 2,180 | 550 | 66 |
| 21 | 208 | 9.4 | 152 | 13 | 6,080 | 179 | 545 | 44 | 11 | 461 | 374 | 611 |
| 22 | 178 | 9.2 | 122 | 11 | 3,040 | 155 | 785 | 49 | 11 | 354 | 340 | 390 |
| 23 | 132 | 9.0 | 101 | 11 | 1,720 | 130 | 556 | 43 | 11 | 277 | 399 | 245 |
| 24 | 93 | 9.0 | 80 | 10 | 988 | 111 | 380 | 38 | 11 | 323 | 391 | 158 |
| 25 | 73 | 9.0 | 66 | 9.9 | 1,080 | 208 | 320 | 34 | 11 | 432 | 382 | 147 |
| 26 | 61 | 9.0 | 58 | 9.4 | 836 | 150 | 222 | 32 | 11 | 314 | 259 | 106 |
| 27 | 52 | 9.0 | 50 | 9.2 | 667 | 116 | 356 | 46 | 10 | 183 | 201 | 88 |
| 28 | 52 | 8.9 | 45 | 9.0 | 1,460 | 98 | 790 | 33 | 10 | 135 | 169 | 74 |
| 29 | 48 | 126 | 46 | 703 | ------ | 86 | 896 | 29 | 10 | 126 | 140 | 66 |
| 30 | 50 | 772 | 38 | 5,240 | ------ | 78 | 679 | 29 | 34 | 153 | 124 | 59 |
| 31 | 38 | ------ | 32 | 4,090 | ------ | 154 | ------ | 28 | ------ | 266 | 118 | ------ |
| TOTAL | 4,658 | 1,294.0 | 9,270 | 11,274.5 | 57,393 | 24,191 | 19,427 | 7,326 | 471.5 | 9,792 | 24,385 | 4,100 |
| MEAN | 150 | 43.1 | 299 | 364 | 2,050 | 780 | 648 | 236 | 15.7 | 316 | 787 | 137 |
| MAX | 636 | 772 | 1,400 | 5,240 | 10,900 | 3,410 | 2,530 | 2,100 | 34 | 2,180 | 9,090 | 611 |
| MIN | 38 | 8.9 | 32 | 9.0 | 112 | 78 | 142 | 28 | 9.5 | 59 | 95 | 44 |
| AC-FT | 9,240 | 2,570 | 18,390 | 22,360 | 113,800 | 47,980 | 38,530 | 14,530 | 935 | 19,420 | 48,370 | 8,130 |

CAL YR 1968 TOTAL 66,907.6 MEAN 183 MAX 4,200 MIN 8.9 AC-FT 132,700
WTR YR 1969 TOTAL 173,582.0 MEAN 476 MAX 10,900 MIN 8.9 AC-FT 344,300

PEAK DISCHARGE (BASE, 8,700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 0100 | 16.71 | 13,800 | 2-21 | 2230 | 15.49 | 10,200 |
| 2-19 | 1015 | 17.92 | 18,300 | 8-15 | 0600 | 17.82 | 17,900 |

# HAWAII, ISLAND OF HAWAII

## 16-7170. Honolii Stream near Papaikou

(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hawaii, on left bank 0.7 mile downstream from Pohakupaa Stream, 4.1 miles west of Papaikou, and 4.8 miles northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 1,540 ft (from topographic map). Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911, to Mar. 24, 1913, water-stage recorder, at site 0.5 mile npstream at different datum.

EXTREMES.--Current year: Maximum discharge, 6,780 cfs Mar. 4 (gage height, 14.28 ft); minimum, 7.0 cfs Nov. 28. Period of record: Maximnm discharge, 9,450 cfs Aug. 3, 1967 (gage height, 16.95 ft); minimum, 0.8 cfs Jan. 31, 1912.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 cfs above station for fluming cane and domestic use. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 73 | 20 | 119 | 16 | 1,270 | 1,500 | 550 | 76 | 25 | 140 | 221 | 89 |
| 2 | 289 | 19 | 73 | 15 | 1,630 | 654 | 1,130 | 150 | 20 | 433 | 85 | 115 |
| 3 | 85 | 17 | 153 | 15 | 1,870 | 688 | 225 | 702 | 21 | 64 | 140 | 64 |
| 4 | 37 | 15 | 123 | 40 | 446 | 1,910 | 107 | 759 | 20 | 42 | 59 | 78 |
| 5 | 28 | 14 | 165 | 174 | 146 | 652 | 89 | 154 | 19 | 27 | 45 | 54 |
| 6 | 25 | 13 | 126 | 59 | 195 | 1,050 | 68 | 91 | 15 | 157 | 144 | 56 |
| 7 | 38 | 12 | 75 | 44 | 79 | 341 | 87 | 63 | 15 | 263 | 61 | 45 |
| 8 | 23 | 12 | 55 | 37 | 72 | 336 | 61 | 51 | 14 | 136 | 46 | 56 |
| 9 | 20 | 12 | 56 | 29 | 59 | 1,000 | 56 | 46 | 14 | 67 | 36 | 41 |
| 10 | 32 | 12 | 34 | 50 | 43 | 167 | 64 | 40 | 13 | 157 | 74 | 46 |
| 11 | 157 | 11 | 26 | 29 | 36 | 117 | 526 | 46 | 25 | 59 | 134 | 37 |
| 12 | 217 | 11 | 22 | 23 | 31 | 89 | 981 | 44 | 46 | 51 | 97 | 34 |
| 13 | 74 | 9.9 | 751 | 20 | 27 | 80 | 516 | 32 | 21 | 61 | 548 | 29 |
| 14 | 36 | 11 | 776 | 18 | 168 | 67 | 590 | 31 | 16 | 48 | 800 | 38 |
| 15 | 28 | 19 | 202 | 16 | 883 | 51 | 122 | 30 | 13 | 69 | 3,130 | 31 |
| 16 | 36 | 19 | 197 | 15 | 969 | 63 | 177 | 32 | 12 | 46 | 712 | 27 |
| 17 | 26 | 13 | 172 | 14 | 698 | 70 | 336 | 31 | 12 | 38 | 327 | 25 |
| 18 | 67 | 11 | 299 | 13 | 2,340 | 59 | 163 | 27 | 11 | 34 | 391 | 34 |
| 19 | 70 | 9.9 | 65 | 12 | 3,690 | 65 | 208 | 28 | 12 | 742 | 140 | 70 |
| 20 | 391 | 9.5 | 44 | 11 | 1,450 | 79 | 251 | 26 | 13 | 923 | 89 | 32 |
| 21 | 91 | 9.1 | 36 | 11 | 2,010 | 55 | 173 | 25 | 11 | 82 | 59 | 332 |
| 22 | 53 | 8.1 | 37 | 9.9 | 878 | 59 | 377 | 30 | 9.9 | 80 | 103 | 160 |
| 23 | 41 | 8.1 | 35 | 9.3 | 463 | 40 | 130 | 26 | 9.4 | 70 | 110 | 82 |
| 24 | 31 | 8.0 | 27 | 8.9 | 158 | 35 | 94 | 27 | 9.2 | 62 | 115 | 47 |
| 25 | 27 | 9.2 | 24 | 8.6 | 325 | 159 | 81 | 22 | 10 | 111 | 104 | 56 |
| 26 | 25 | 8.6 | 23 | 8.2 | 308 | 58 | 56 | 21 | 11 | 77 | 59 | 40 |
| 27 | 23 | 7.9 | 21 | 7.9 | 149 | 42 | 148 | 37 | 9.4 | 44 | 46 | 37 |
| 28 | 27 | 8.1 | 20 | 7.8 | 656 | 36 | 365 | 23 | 9.3 | 35 | 42 | 33 |
| 29 | 29 | 64 | 33 | 421 | ------ | 32 | 405 | 21 | 10 | 40 | 36 | 30 |
| 30 | 36 | 367 | 22 | 2,780 | ------ | 62 | 204 | 22 | 83 | 59 | 34 | 29 |
| 31 | 24 | ------ | 18 | 2,010 | ------ | 280 | ------ | 22 | ------ | 158 | 39 | ------ |
| TOTAL | 2,159 | 769.4 | 3,829 | 5,932.6 | 21,049 | 9,896 | 8,330 | 2,735 | 529.2 | 4,375 | 8,026 | 1,847 |
| MEAN | 69.6 | 25.6 | 124 | 191 | 752 | 319 | 278 | 88.2 | 17.6 | 141 | 259 | 61.6 |
| MAX | 391 | 367 | 776 | 2,780 | 3,690 | 1,910 | 1,130 | 759 | 83 | 923 | 3,130 | 332 |
| MIN | 20 | 7.9 | 18 | 7.8 | 27 | 32 | 56 | 21 | 9.2 | 27 | 34 | 25 |
| AC-FT | 4,280 | 1,520 | 7,590 | 11,770 | 41,750 | 19,630 | 16,520 | 5,420 | 1,050 | 8,680 | 15,920 | 3,660 |

CAL YR 1968 TOTAL 31,565.9 MEAN 86.2 MAX 2,610 MIN 6.9 AC-FT 62,610
WTR YR 1969 TOTAL 69,476.2 MEAN 190 MAX 3,690 MIN 7.8 AC-FT 137,800

PEAK DISCHARGE (BASE, 4,000 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 0100 | 13.30 | 5,800 | 2-21 | 2045 | 12.52 | 5,070 |
| 2- 1 | 0630 | 11.35 | 4,080 | 3- 4 | 0115 | 14.28 | 6,780 |
| 2- 3 | 1030 | 11.34 | 4,070 | 8-15 | 0215 | 13.09 | 5,590 |
| 2-19 | 0845 | 14.04 | 6,540 | | | | |

HAWAII, ISLAND OF HAWAII

## 16-7176. Alia Stream near Hilo

LOCATION.--Lat 19°50'38", long 155°06'21", Hawaii, on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 miles south of Honomu, and 8 miles north of Hilo.

DRAINAGE AREA.--0.58 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 489 ft above mean sea level (by stadia survey).

EXTREMES.--Current year: Maximum discharge, 371 cfs Feb. 1 (gage height, 4.07 ft); minimum, 0.85 cfs Nov. 13, 14.
Period of record: Maximum discharge, 393 cfs Nov. 8, 1964 (gage height, 4.12 ft); minimum, 0.85 cfs Nov. 13, 14, 1968.

REMARKS.--Records good. No diversion above station. Spring water not used by sugar mills enters stream above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 | 5.8 | 23 | 11 | 103 | 34 | 34 | 21 | 12 | 15 | 20 | 17 |
| 2 | 9.2 | 5.6 | 19 | 10 | 92 | 33 | 29 | 24 | 10 | 17 | 17 | 17 |
| 3 | 11 | 5.3 | 18 | 11 | 36 | 75 | 29 | 29 | 12 | 13 | 16 | 16 |
| 4 | 11 | 4.2 | 23 | 13 | 25 | 67 | 25 | 31 | 12 | 10 | 14 | 16 |
| 5 | 9.2 | 3.5 | 23 | 19 | 22 | 86 | 24 | 24 | 10 | 7.7 | 13 | 16 |
| 6 | 8.5 | 3.4 | 24 | 18 | 24 | 44 | 22 | 22 | 9.0 | 15 | 16 | 15 |
| 7 | 9.6 | 3.5 | 22 | 16 | 18 | 28 | 33 | 20 | 8.3 | 15 | 16 | 15 |
| 8 | 8.7 | 3.2 | 17 | 12 | 17 | 28 | 24 | 18 | 8.1 | 14 | 13 | 15 |
| 9 | 7.7 | 3.7 | 16 | 10 | 15 | 36 | 22 | 18 | 9.4 | 13 | 12 | 14 |
| 10 | 7.4 | 3.4 | 13 | 12 | 14 | 19 | 22 | 17 | 8.1 | 13 | 12 | 14 |
| 11 | 12 | 3.2 | 11 | 11 | 12 | 17 | 25 | 17 | 14 | 12 | 14 | 13 |
| 12 | 11 | 1.2 | 10 | 9.2 | 11 | 15 | 26 | 17 | 14 | 12 | 13 | 13 |
| 13 | 11 | .85 | 70 | 8.7 | 10 | 14 | 25 | 16 | 12 | 13 | 16 | 13 |
| 14 | 9.9 | .91 | 48 | 8.3 | 36 | 13 | 26 | 16 | 9.6 | 12 | 24 | 13 |
| 15 | 8.1 | 1.4 | 33 | 8.1 | 111 | 13 | 22 | 22 | 8.5 | 13 | 46 | 13 |
| 16 | 7.2 | 3.7 | 30 | 7.9 | 61 | 13 | 23 | 19 | 8.1 | 11 | 30 | 13 |
| 17 | 7.2 | 3.9 | 29 | 7.4 | 48 | 18 | 26 | 17 | 7.7 | 11 | 23 | 13 |
| 18 | 9.4 | 3.9 | 30 | 7.2 | 75 | 16 | 22 | 16 | 7.4 | 11 | 25 | 14 |
| 19 | 12 | 4.3 | 26 | 7.0 | 82 | 13 | 22 | 16 | 7.7 | 15 | 18 | 16 |
| 20 | 12 | 4.5 | 22 | 6.4 | 49 | 12 | 24 | 15 | 8.7 | 18 | 17 | 14 |
| 21 | 9.9 | 4.7 | 20 | 6.4 | 42 | 11 | 22 | 14 | 7.9 | 13 | 16 | 24 |
| 22 | 10 | 4.2 | 23 | 6.2 | 38 | 11 | 24 | 15 | 7.4 | 14 | 18 | 20 |
| 23 | 9.2 | 3.5 | 22 | 6.4 | 36 | 9.6 | 21 | 14 | 7.2 | 13 | 17 | 17 |
| 24 | 7.7 | 3.7 | 17 | 6.6 | 32 | 12 | 20 | 15 | 6.8 | 12 | 17 | 16 |
| 25 | 7.0 | 4.0 | 16 | 6.4 | 32 | 27 | 19 | 14 | 6.6 | 13 | 16 | 16 |
| 26 | 6.4 | 3.7 | 15 | 6.4 | 32 | 19 | 18 | 14 | 7.9 | 12 | 15 | 15 |
| 27 | 6.0 | 3.2 | 13 | 6.4 | 27 | 19 | 26 | 15 | 7.2 | 11 | 14 | 16 |
| 28 | 6.8 | 3.9 | 14 | 6.2 | 33 | 18 | 33 | 13 | 7.0 | 10 | 15 | 15 |
| 29 | 6.2 | 29 | 14 | 18 | ------ | 18 | 27 | 12 | 6.8 | 11 | 16 | 15 |
| 30 | 5.6 | 29 | 13 | 64 | ------ | 31 | 25 | 12 | 12 | 12 | 16 | 15 |
| 31 | 6.0 | ------ | 12 | 94 | ------ | 44 | ------ | 11 | ------ | 15 | 16 | ------ |
| TOTAL | 274.9 | 158.36 | 686 | 440.2 | 1133 | 813.6 | 740 | 544 | 273.4 | 396.7 | 551 | 459 |
| MEAN | 8.87 | 5.28 | 22.1 | 14.2 | 40.5 | 26.2 | 24.7 | 17.5 | 9.11 | 12.8 | 17.8 | 15.3 |
| MAX | 12 | 29 | 70 | 94 | 111 | 86 | 34 | 31 | 14 | 18 | 46 | 24 |
| MIN | 5.6 | .85 | 10 | 6.2 | 10 | 9.6 | 18 | 11 | 6.6 | 7.7 | 12 | 13 |
| AC-FT | 545 | 314 | 1360 | 873 | 2250 | 1610 | 1470 | 1080 | 542 | 787 | 1090 | 910 |

CAL YR 1968: TOTAL 4,444.26 MEAN 12.1 MAX 72 MIN .85 AC-FT 8,820
WTR YR 1969: TOTAL 6,470.16 MEAN 17.7 MAX 111 MIN .85 AC-FT 12,830

PEAK DISCHARGE (BASE, 160 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 0330 | 3.61 | 242 | 3- 5 | 0700 | 3.75 | 278 |
| 2- 1 | 1230 | 4.07 | 371 | 3- 9 | 0130 | 3.28 | 171 |
| 2-15 | 0700 | 3.67 | 258 | 3-31 | 0100 | 3.54 | 225 |
| 2-19 | 0300 | 3.52 | 220 | | | | |

HAWAII, ISLAND OF HAWAII

## 16-7178, Pohakupuka Stream near Papaaloa

LOCATION.--Lat 19°57'20", long 155°11'20", Hawaii, on right bank 200 ft downstream from Highway 19, 2.8 miles northwest of Honohina, and 3.0 miles southwest of Papaaloa.

DRAINAGE AREA.--2.76 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 250 ft above mean sea level (by stadia survey).

EXTREMES.--Current year: Maximum discharge, 3,210 cfs Mar. 31 (gage height, 10.64 ft), from rating curve extended above 1,100 cfs; minimum, 1.4 cfs Nov. 20-25, 28.
Period of record: Maximum discharge, 5,340 cfs Nov. 26, 1967 (gage height, 13.37 ft), from rating curve extended above 1,100 cfs; minimum, 0.28 cfs Nov. 9, 1962.

REMARKS.--Records good. No diversion above station. Irrigation ditches in basin occasionally overflow, but amount reaching stream is small.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.3 | 2.1 | 4.8 | 4.7 | 100 | 286 | 253 | 22 | 6.2 | 29 | 39 | 26 |
| 2 | 33 | 2.1 | 2.5 | 4.5 | 250 | 120 | 328 | 44 | 6.2 | 131 | 15 | 43 |
| 3 | 10 | 1.9 | 24 | 13 | 200 | 329 | 112 | 147 | 6.6 | 9.7 | 47 | 16 |
| 4 | 4.3 | 1.8 | 119 | 11 | 109 | 588 | 75 | 142 | 8.9 | 6.4 | 10 | 40 |
| 5 | 3.4 | 1.9 | 76 | 9.8 | 37 | 339 | 51 | 28 | 6.2 | 5.0 | 8.0 | 17 |
| 6 | 3.1 | 1.8 | 31 | 8.5 | 26 | 289 | 74 | 18 | 6.0 | 55 | 68 | 17 |
| 7 | 3.1 | 1.8 | 11 | 8.5 | 19 | 89 | 169 | 15 | 4.8 | 42 | 17 | 10 |
| 8 | 2.9 | 1.8 | 5.3 | 6.8 | 16 | 88 | 55 | 15 | 4.8 | 23 | 8.8 | 11 |
| 9 | 2.6 | 1.7 | 3.8 | 6.7 | 15 | 281 | 31 | 23 | 4.8 | 14 | 7.0 | 9.0 |
| 10 | 2.5 | 1.7 | 3.1 | 7.0 | 13 | 59 | 32 | 16 | 4.8 | 21 | 6.2 | 8.4 |
| 11 | 3.0 | 1.7 | 2.5 | 6.0 | 12 | 38 | 315 | 20 | 114 | 8.6 | 13 | 8.0 |
| 12 | 3.2 | 1.7 | 2.4 | 5.2 | 12 | 32 | 265 | 20 | 54 | 7.2 | 13 | 7.4 |
| 13 | 2.8 | 1.6 | 600 | 5.0 | 11 | 28 | 140 | 20 | 9.4 | 9.1 | 156 | 6.9 |
| 14 | 2.9 | 1.6 | 194 | 4.8 | 236 | 25 | 100 | 18 | 6.9 | 8.6 | 290 | 7.0 |
| 15 | 2.4 | 1.6 | 35 | 4.6 | 697 | 23 | 35 | 30 | 6.2 | 10 | 674 | 7.0 |
| 16 | 2.3 | 1.6 | 16 | 4.4 | 408 | 43 | 54 | 25 | 6.0 | 6.7 | 140 | 6.4 |
| 17 | 2.2 | 1.6 | 21 | 4.2 | 194 | 61 | 90 | 15 | 5.4 | 5.6 | 62 | 6.3 |
| 18 | 2.2 | 1.6 | 43 | 4.2 | 616 | 67 | 53 | 12 | 4.8 | 6.0 | 63 | 6.5 |
| 19 | 6.3 | 1.6 | 11 | 4.5 | 756 | 32 | 62 | 12 | 4.8 | 96 | 25 | 21 |
| 20 | 34 | 1.5 | 8.5 | 4.9 | 291 | 34 | 99 | 10 | 4.9 | 117 | 21 | 7.6 |
| 21 | 9.2 | 1.4 | 8.1 | 4.8 | 307 | 24 | 48 | 10 | 4.8 | 13 | 13 | 23 |
| 22 | 4.4 | 1.4 | 13 | 4.3 | 182 | 24 | 100 | 12 | 4.8 | 14 | 48 | 29 |
| 23 | 3.2 | 1.4 | 8.0 | 4.2 | 122 | 19 | 34 | 9.0 | 4.8 | 12 | 38 | 18 |
| 24 | 2.7 | 1.4 | 6.6 | 4.1 | 60 | 20 | 22 | 9.0 | 4.8 | 7.8 | 39 | 7.8 |
| 25 | 2.4 | 1.4 | 6.1 | 3.8 | 113 | 294 | 19 | 8.0 | 4.2 | 8.4 | 27 | 7.4 |
| 26 | 2.2 | 1.5 | 6.0 | 3.7 | 147 | 44 | 17 | 8.0 | 3.5 | 6.2 | 13 | 6.8 |
| 27 | 2.2 | 1.5 | 5.6 | 3.8 | 53 | 26 | 56 | 8.8 | 3.5 | 5.1 | 11 | 10 |
| 28 | 2.3 | 1.8 | 5.2 | 3.6 | 183 | 21 | 147 | 7.8 | 3.4 | 4.6 | 11 | 9.8 |
| 29 | 2.2 | 19 | 6.2 | 181 | ------ | 18 | 113 | 7.1 | 3.3 | 5.0 | 9.6 | 9.1 |
| 30 | 2.1 | 3.9 | 5.4 | 600 | ------ | 68 | 57 | 6.2 | 3.7 | 8.1 | 9.3 | 9.3 |
| 31 | 2.0 | ------ | 4.9 | 300 | ------ | 377 | ------ | 6.2 | ------ | 24 | 9.1 | ------ |
| TOTAL | 166.4 | 69.4 | 1,289.0 | 1,241.6 | 5,185 | 3,786 | 3,006 | 744.1 | 316.5 | 719.1 | 1,911.0 | 411.7 |
| MEAN | 5.37 | 2.31 | 41.6 | 40.1 | 185 | 122 | 100 | 24.0 | 10.6 | 23.2 | 61.6 | 13.7 |
| MAX | 34 | 19 | 600 | 600 | 756 | 588 | 328 | 147 | 114 | 131 | 674 | 43 |
| MIN | 2.0 | 1.4 | 2.4 | 3.6 | 11 | 18 | 17 | 6.2 | 3.3 | 4.6 | 6.2 | 6.3 |
| AC-FT | 330 | 138 | 2560 | 2460 | 10,280 | 7,510 | 5,960 | 1,480 | 628 | 1,430 | 3,790 | 817 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 7,915.1 | MEAN | 21.6 | MAX | 600 | MIN | 1.4 | AC-FT | 15,700 |
| WTR YR 1969: | TOTAL | 18,845.8 | MEAN | 51.6 | MAX | 756 | MIN | 1.4 | AC-FT | 37,380 |

PEAK DISCHARGE (BASE, 1,400 CFS, REVISED)

/ About.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 2- 1 | /1245 | 8.47 | 1,810 | 3-31 | 0130 | 10.64 | 3,210 |
| 2-18 | 0700 | 8.51 | 1,840 | 4-11 | 1930 | 8.60 | 1,890 |
| 3- 5 | 0715 | 9.76 | 2,590 | 8-15 | 0315 | 8.15 | 1,640 |

## 16-7178.2. Manowaiopae Stream near Laupahoehoe

LOCATION.--Lat 19°58'35", long 155°14'45", Hawaii, on left bank 1.0 mile upstream from mouth, 1.2 miles south of Laupahoehoe, and 1.5 miles west of Papaaloa.

DRAINAGE AREA.--1.04 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,200 cfs Mar. 31 (gage height, 4.62 ft), from rating curve extended above 150 cfs; minimum, 0.23 cfs Nov. 25, 28, Dec. 1-3, 11.
Period of record: Maximum discharge, 1,890 cfs Nov. 26, 1967 (gage height, 5.43 ft), from rating curve extended above 150 cfs; minimum, 0.11 cfs Oct. 13, 15, 16, 1965.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts from 0.02 to 0.15 cfs by pipeline from 5 springs along the stream above station for domestic use in the Laupahoehoe area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .92 | .56 | .32 | 2.3 | 45 | 70 | 60 | 9.8 | 4.1 | 1.8 | 1.9 | 6.5 |
| 2 | .89 | .57 | .30 | 2.3 | 93 | 31 | 85 | 10 | 4.0 | 7.9 | 1.9 | 6.9 |
| 3 | .91 | .50 | .33 | 7.7 | 73 | 70 | 30 | 22 | 4.0 | 1.8 | 2.5 | 5.9 |
| 4 | .83 | .41 | 12 | 3.9 | 29 | 133 | 25 | 19 | 3.9 | 1.7 | 1.9 | 6.1 |
| 5 | .84 | .43 | 13 | 3.3 | 19 | 112 | 21 | 9.8 | 4.0 | 1.7 | 1.9 | 5.5 |
| 6 | .80 | .44 | .50 | 3.1 | 16 | 81 | 31 | 9.8 | 4.0 | 3.0 | 5.8 | 5.3 |
| 7 | .78 | .43 | .33 | 3.0 | 14 | 33 | 52 | 9.7 | 3.6 | 2.9 | 2.2 | 5.1 |
| 8 | .75 | .41 | .33 | 2.9 | 12 | 32 | 22 | 9.4 | 3.2 | 1.9 | 2.2 | 4.9 |
| 9 | .74 | .42 | .32 | 2.9 | 11 | 91 | 18 | 8.6 | 3.2 | 1.9 | 2.2 | 4.7 |
| 10 | .72 | .44 | .32 | 2.8 | 10 | 28 | 17 | 7.4 | 3.2 | 1.8 | 2.3 | 4.6 |
| 11 | .69 | .43 | .31 | 2.6 | 9.1 | 25 | 104 | 7.4 | 20 | 1.7 | 2.3 | 4.4 |
| 12 | .68 | .43 | .39 | 2.6 | 8.3 | 22 | 59 | 7.4 | 9.0 | 1.7 | 2.3 | 4.3 |
| 13 | .65 | .39 | 147 | 2.5 | 7.6 | 20 | 34 | 7.5 | 3.8 | 1.7 | 18 | 4.1 |
| 14 | .64 | .38 | 29 | 2.4 | 105 | 18 | 26 | 7.2 | 3.2 | 1.8 | 56 | 4.0 |
| 15 | .62 | .46 | 6.8 | 2.4 | 247 | 16 | 19 | 9.1 | 3.2 | 1.7 | 139 | 3.8 |
| 16 | .59 | .35 | 4.3 | 2.3 | 106 | 16 | 19 | 8.3 | 3.0 | 1.7 | 26 | 3.7 |
| 17 | .59 | .37 | 3.8 | 2.3 | 50 | 17 | 24 | 6.3 | 2.6 | 1.7 | 14 | 3.6 |
| 18 | .60 | .36 | 3.7 | 2.2 | 206 | 19 | 19 | 5.5 | 2.5 | 1.7 | 15 | 3.5 |
| 19 | .67 | .37 | 2.9 | 2.2 | 180 | 14 | 17 | 5.6 | 2.4 | 4.9 | 13 | 3.3 |
| 20 | .71 | .39 | 2.7 | 2.1 | 66 | 13 | 24 | 5.6 | 2.3 | 8.4 | 11 | 3.1 |
| 21 | .77 | .36 | 2.7 | 2.1 | 79 | 11 | 16 | 5.6 | 2.2 | 1.9 | 9.9 | 3.2 |
| 22 | .61 | .35 | 2.8 | 2.0 | 44 | 11 | 22 | 5.7 | 2.3 | 1.8 | 11 | 3.1 |
| 23 | .51 | .33 | 2.5 | 2.0 | 34 | 10 | 14 | 5.5 | 2.2 | 1.7 | 9.7 | 2.9 |
| 24 | .52 | .32 | 2.5 | 1.9 | 31 | 9.6 | 13 | 5.5 | 2.1 | 1.8 | 9.6 | 2.7 |
| 25 | .52 | .31 | 2.5 | 1.9 | 33 | 117 | 13 | 5.5 | 2.4 | 1.8 | 7.8 | 2.6 |
| 26 | .55 | .32 | 2.5 | 1.8 | 34 | 17 | 12 | 5.5 | 2.2 | 1.8 | 7.3 | 2.6 |
| 27 | .54 | .31 | 2.5 | 1.8 | 23 | 13 | 11 | 5.4 | 1.9 | 1.7 | 7.0 | 2.5 |
| 28 | .56 | .41 | 2.5 | 1.8 | 44 | 12 | 25 | 5.2 | 1.8 | 1.7 | 6.9 | 2.4 |
| 29 | .56 | .38 | 2.5 | 35 | ------ | 11 | 23 | 4.7 | 1.8 | 1.8 | 6.8 | 2.5 |
| 30 | .58 | .34 | 2.4 | 161 | ------ | 20 | 13 | 4.1 | 1.9 | 1.8 | 6.6 | 2.4 |
| 31 | .56 | ------ | 2.3 | 100 | ------ | 133 | ------ | 4.0 | ------ | 1.9 | 6.4 | ------ |
| TOTAL | 20.90 | 11.97 | 256.35 | 369.1 | 1,629.0 | 1,225.6 | 868 | 242.1 | 110.0 | 73.1 | 410.4 | 120.2 |
| MEAN | .67 | .40 | 8.27 | 11.9 | 58.2 | 39.5 | 28.9 | 7.81 | 3.67 | 2.36 | 13.2 | 4.01 |
| MAX | .92 | .57 | 147 | 161 | 247 | 133 | 104 | 22 | 20 | 8.4 | 139 | 6.9 |
| MIN | .51 | .31 | .30 | 1.8 | 7.6 | 9.6 | 11 | 4.0 | 1.8 | 1.7 | 1.9 | 2.4 |
| AC-FT | 41 | 24 | 508 | 732 | 3,230 | 2,430 | 1,720 | 480 | 218 | 145 | 814 | 238 |

CAL YR 1968 TOTAL 2,026.65 MEAN 5.54 MAX 147 MIN .30 AC-FT 4,020
WTR YR 1969 TOTAL 5,336.72 MEAN 14.6 MAX 247 MIN .30 AC-FT 10,590

PEAK DISCHARGE (BASE, 470 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-30 | 0300 | 3.93 | 718 | 3-25 | 0845 | 3.68 | 580 |
| 2-15 | 1800 | 3.96 | 736 | 3-31 | 0145 | 4.62 | 1,200 |
| 2-18 | 0700 | 4.17 | 869 | 4-11 | 1845 | 4.44 | 1,060 |
| 3- 5 | 0645 | 4.57 | 1,160 | 8-15 | 0645 | 3.82 | 652 |

# HAWAII, ISLAND OF HAWAII

## 16-7200, Kawainui Stream near Kamuela

LOCATION.--Lat 20°05'18", long 155°40'58", Hawaii, on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 miles north of Kamuela.

DRAINAGE AREA.--1.58 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 685 cfs Mar. 6 (gage height, 5.85 ft), from rating curve extended as explained below; minimum, 0.07 cfs Jan. 20.
Period of record: Maximum discharge, 2,400 cfs Jan. 11, 1967 (gage height, 9.15 ft), from rating curve extended above 53 cfs on basis of computation of peak flow over dam; minimum, 0.03 cfs Oct. 5, 6, 1965.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.2 | .37 | 2.0 | .43 | 18 | 127 | 87 | 8.6 | .13 | 19 | 16 | 57 |
| 2 | 2.8 | .37 | 2.1 | .28 | 37 | 26 | 89 | 9.6 | .59 | 23 | 4.9 | 42 |
| 3 | 1.9 | .26 | 7.1 | 33 | 171 | 19 | 32 | 37 | 13 | 3.8 | 13 | 19 |
| 4 | 1.2 | .15 | 53 | 25 | 40 | 32 | 30 | 26 | 15 | 1.9 | 4.3 | 30 |
| 5 | .82 | .21 | 27 | 18 | 8.6 | 31 | 22 | 5.3 | 2.8 | 1.1 | 9.3 | 7.2 |
| 6 | .60 | .21 | 19 | 50 | 3.3 | 118 | 27 | 3.0 | 1.2 | 41 | 36 | 3.8 |
| 7 | .65 | .15 | 9.0 | 13 | 1.9 | 15 | 45 | 1.6 | .68 | 48 | 23 | 2.4 |
| 8 | .54 | .15 | 2.5 | 5.8 | 1.3 | 13 | 46 | 1.1 | .65 | 35 | 4.2 | 2.5 |
| 9 | .43 | .15 | 1.4 | 36 | .90 | 36 | 24 | .90 | .54 | 18 | 2.0 | 2.0 |
| 10 | .38 | .21 | 1.1 | 14 | .82 | 0.1 | 16 | .65 | .65 | 19 | 17 | 1.9 |
| 11 | .26 | .32 | .76 | 3.1 | .82 | 3.6 | 100 | .82 | 45 | 14 | 17 | 1.5 |
| 12 | .26 | .21 | 2.9 | 1.4 | .74 | 2.0 | 160 | .90 | 23 | 11 | 27 | 1.1 |
| 13 | .21 | .10 | 177 | .83 | .60 | 1.4 | 74 | .60 | 6.3 | 6.1 | 104 | .90 |
| 14 | .16 | .09 | 76 | 1.7 | 70 | .99 | 58 | .38 | 2.3 | 68 | 113 | 2.8 |
| 15 | .21 | .10 | 11 | .97 | 113 | .74 | 36 | .65 | 1.4 | 14 | 139 | 1.9 |
| 16 | .21 | .21 | 68 | .61 | 96 | 16 | 71 | 2.4 | .90 | 5.9 | 26 | 1.3 |
| 17 | .16 | .32 | 22 | .37 | 32 | 51 | 56 | 1.4 | .65 | 10 | 47 | 1.1 |
| 18 | .16 | .15 | 17 | .18 | 64 | 61 | 32 | .90 | .43 | 18 | 31 | 12 |
| 19 | .43 | .82 | 4.2 | .09 | 60 | 15 | 51 | .65 | .38 | 83 | 6.3 | 18 |
| 20 | 21 | 1.2 | 3.0 | .08 | 48 | 11 | 76 | .43 | .38 | 85 | 6.7 | 6.3 |
| 21 | 6.5 | 1.2 | 6.3 | 11 | 59 | 4.7 | 26 | .32 | .32 | 8.8 | 3.1 | 23 |
| 22 | 4.5 | .99 | 2.4 | 1.9 | 44 | 8.3 | 69 | .43 | 4.7 | 10 | 2.5 | 15 |
| 23 | 2.3 | 2.5 | 2.1 | .85 | 38 | 4.3 | 12 | 5.5 | 2.2 | 20 | 6.7 | 8.1 |
| 24 | 1.2 | 1.3 | 1.2 | .48 | 18 | 16 | 4.0 | 8.1 | .99 | 30 | 27 | 6.5 |
| 25 | .82 | 6.3 | 5.3 | .52 | 42 | 72 | 2.3 | 8.5 | .74 | 15 | 15 | 8.8 |
| 26 | .54 | 5.1 | 4.8 | .34 | 79 | 9.6 | 1.4 | 40 | .90 | 4.2 | 14 | 35 |
| 27 | .43 | 1.9 | 1.8 | .20 | 22 | 3.3 | 12 | 18 | 1.3 | 2.0 | 6.1 | 17 |
| 28 | .60 | 7.0 | 1.2 | .22 | 66 | 2.6 | 22 | 2.8 | 2.3 | 1.3 | 7.9 | 26 |
| 29 | .54 | 29 | 1.4 | 54 | ------ | 1.8 | 26 | 1.2 | 14 | 18 | 13 | 21 |
| 30 | .65 | 6.7 | .90 | 47 | ------ | 1.8 | 14 | .70 | 20 | 12 | 26 | 9.8 |
| 31 | .48 | ------ | .61 | 38 | ------ | 22 | ------ | .54 | ------ | 51 | 16 | ------ |
| TOTAL | 53.14 | 67.74 | 534.07 | 359.35 | 1,135.98 | 734.23 | 1,320.7 | 188.97 | 163.43 | 697.1 | 784.0 | 384.90 |
| MEAN | 1.71 | 2.26 | 17.2 | 11.6 | 40.6 | 23.7 | 44.0 | 6.10 | 5.45 | 22.5 | 25.3 | 12.8 |
| MAX | 21 | 29 | 177 | 54 | 171 | 127 | 160 | 40 | 45 | 85 | 139 | 57 |
| MIN | .16 | .09 | .61 | .08 | .60 | .74 | 1.4 | .32 | .13 | 1.1 | 2.0 | .90 |
| AC-FT | 105 | 134 | 1,060 | 713 | 2,250 | 1,460 | 2,620 | 375 | 324 | 1,380 | 1,560 | 763 |

CAL YR 1968 TOTAL 4,436.87 MEAN 12.1 MAX 260 MIN .09 AC-FT 8,800
WTR YR 1969 TOTAL 6,423.61 MEAN 17.6 MAX 177 MIN .08 AC-FT 12,740

PEAK DISCHARGE (BASE, 310 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12-16 | 1600 | 5.73 | 649 | 3-17 | 2345 | 5.63 | 619 |
| 2- 3 | 1645 | 4.77 | 383 | 4-12 | 0415 | 4.48 | 317 |
| 3- 6 | 1615 | 5.85 | 685 | 8-15 | 0300 | 4.83 | 398 |

HAWAII, ISLAND OF HAWAII

## 16-7203. Kawaiki Stream near Kamuela

LOCATION.--Lat 20°05'13", long 155°40'59", Hawaii, on right bank 0.2 mile upstream from Upper Hamakua ditch intake and 4.4 miles north of Kamuela.

DRAINAGE AREA.--0.45 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 171 cfs Mar. 17 (gage height, 3.71 ft), from rating curve extended above 33 cfs; minimum, 0.03 cfs Nov. 12-15.
Period of record: Maximum discharge, 171 cfs Mar. 17, 1969 (gage height, 3.71 ft), from rating curve extended above 33 cfs; minimum, 0.03 cfs Nov. 12-15, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .48 | .06 | .48 | .21 | 3.9 | 28 | 29 | 3.3 | .24 | 4.5 | 4.7 | 16 |
| 2 | .48 | .05 | 1.2 | .18 | 9.1 | 4.5 | 23 | 2.4 | .54 | 5.5 | 1.3 | 10 |
| 3 | .32 | .05 | 4.1 | 12 | 49 | 4.3 | 8.8 | 6.9 | 5.3 | .95 | 4.5 | 6.1 |
| 4 | .21 | .05 | 16 | 5.5 | 11 | 7.5 | 8.5 | 5.0 | 3.7 | .61 | 1.3 | 8.8 |
| 5 | .15 | .05 | 6.4 | 5.5 | 2.2 | 8.5 | 5.5 | 1.2 | .68 | .42 | 2.5 | 2.1 |
| 6 | .10 | .05 | 6.7 | 14 | .76 | 31 | 8.5 | .76 | .36 | 12 | 12 | 1.3 |
| 7 | .18 | .04 | 2.4 | 3.3 | .48 | 3.3 | 11 | .42 | .32 | 9.4 | 7.5 | .85 |
| 8 | .10 | .04 | .68 | 1.5 | .36 | 4.1 | 14 | .36 | .24 | 8.5 | 1.2 | 1.1 |
| 9 | .07 | .05 | .42 | 14 | .28 | 11 | 6.7 | .42 | .18 | 4.5 | .61 | .76 |
| 10 | .06 | .08 | .32 | 3.5 | .24 | 2.4 | 3.5 | .42 | .24 | 4.3 | 6.4 | .85 |
| 11 | .05 | .07 | .24 | .76 | .24 | 1.2 | 34 | .42 | 13 | 3.3 | 4.5 | .68 |
| 12 | .05 | .04 | 1.8 | .42 | .21 | .76 | 42 | .42 | 5.8 | 2.1 | 5.8 | .54 |
| 13 | .05 | .04 | 46 | .28 | .21 | .61 | 20 | .36 | 1.5 | 1.2 | 22 | .48 |
| 14 | .06 | .03 | 19 | .85 | 22 | .54 | 14 | .36 | .61 | 16 | 35 | 1.8 |
| 15 | .06 | .04 | 2.2 | .32 | 29 | .54 | 11 | .61 | .36 | 3.1 | 44 | .68 |
| 16 | .06 | .05 | 22 | .32 | 25 | 9.1 | 19 | 1.5 | .32 | 1.6 | 6.4 | .54 |
| 17 | .06 | .24 | 5.3 | .21 | 8.1 | 16 | 16 | .76 | .28 | 3.5 | 14 | .48 |
| 18 | .06 | .10 | 4.1 | .15 | 14 | 12 | 8.1 | .54 | .18 | 5.0 | 8.8 | 4.5 |
| 19 | .12 | .68 | 1.1 | .12 | 15 | 3.9 | 12 | .48 | .18 | 17 | 2.4 | 5.5 |
| 20 | 5.3 | .61 | .95 | .12 | 9.4 | 2.7 | 18 | .42 | .21 | 21 | 3.1 | 1.8 |
| 21 | 1.3 | .42 | 1.3 | 4.5 | 20 | 1.3 | 8.1 | .36 | .15 | 1.9 | 1.1 | 9.1 |
| 22 | .95 | .36 | .61 | .48 | 9.1 | 2.2 | 16 | .42 | 3.1 | 3.3 | 1.2 | 4.7 |
| 23 | .42 | .61 | .68 | .24 | 11 | 1.2 | 2.4 | 3.3 | .68 | 7.2 | 2.9 | 2.5 |
| 24 | .21 | .24 | .42 | .18 | 6.7 | 6.4 | 1.1 | 3.5 | .36 | 12 | 8.8 | 1.8 |
| 25 | .12 | 2.1 | 2.4 | .18 | 12 | 18 | .61 | 3.1 | .36 | 4.5 | 3.9 | 2.4 |
| 26 | .08 | .85 | 1.3 | .12 | 23 | 2.1 | .42 | 12 | .42 | 1.3 | 5.0 | 9.4 |
| 27 | .05 | .28 | .54 | .10 | 6.4 | 1.2 | 5.0 | 3.9 | .61 | .68 | 1.6 | 4.3 |
| 28 | .10 | 4.5 | .48 | .12 | 17 | .95 | 9.1 | .68 | .68 | .48 | 3.1 | 7.2 |
| 29 | .10 | 8.5 | .61 | 18 | ------ | .42 | 8.8 | .42 | 5.3 | 6.7 | 3.9 | 5.0 |
| 30 | .15 | 1.3 | .36 | 9.7 | ------ | .48 | 3.5 | .36 | 5.8 | 3.7 | 7.2 | 2.4 |
| 31 | .08 | ------ | .28 | 8.1 | ------ | 7.5 | ------ | .28 | ------ | 13 | 3.9 | ------ |
| TOTAL | 11.58 | 21.58 | 150.37 | 104.96 | 305.68 | 193.70 | 367.63 | 55.37 | 51.70 | 179.24 | 230.61 | 113.66 |
| MEAN | .37 | .72 | 4.85 | 3.39 | 10.9 | 6.25 | 12.3 | 1.79 | 1.72 | 5.78 | 7.44 | 3.79 |
| MAX | 5.3 | 8.5 | 46 | 18 | 49 | 31 | 42 | 12 | 13 | 21 | 44 | 16 |
| MIN | .05 | .03 | .24 | .10 | .21 | .42 | .42 | .28 | .15 | .42 | .61 | .48 |
| AC-FT | 23 | 43 | 298 | 208 | 606 | 384 | 729 | 110 | 103 | 356 | 457 | 225 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968 | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT - |
| WTR YR 1969 | TOTAL | 1,786.08 | MEAN | 4.89 | MAX | 49 | MIN | .03 | AC-FT 3,540 |

PEAK DISCHARGE (BASE, 90 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12-16 | 1415 | 3.[illegible] | 122 | 3- 6 | 1615 | 2.87 | 99 |
| 1- 9 | 0700 | 2.80 | 94 | 3-17 | 2315 | 3.71 | 171 |
| 2- 3 | 1645 | 2.80 | 94 | 8-15 | 0300 | 2.90 | 101 |

## 16-7205. Upper Hamakua ditch below Kawaiki Stream, near Kamuela

LOCATION.--Lat 20°05'15", long 155°40'42", Hawaii, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 miles north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 49 cfs Nov. 2, 1967; minimum daily, 0.05 cfs Oct. 4-6, 1965.

REMARKS.--Records fair. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.7 | .42 | 2.7 | .72 | 22 | 27 | 23 | 11 | .72 | 21 | 20 | 25 |
| 2 | 3.6 | .42 | 4.5 | .62 | 25 | 21 | 22 | 10 | 1.9 | 20 | 7.0 | 24 |
| 3 | 2.4 | .38 | 8.0 | 9.2 | 27 | 20 | 15 | 16 | 18 | 4.8 | 15 | 22 |
| 4 | 1.4 | .31 | 19 | 22 | 22 | 24 | 15 | 14 | 17 | 2.5 | 5.9 | 23 |
| 5 | .89 | .28 | 25 | 18 | 14 | 24 | 9.3 | 5.9 | 4.1 | 1.4 | 8.5 | 9.3 |
| 6 | .72 | .24 | 26 | 25 | 4.6 | 25 | 14 | 3.6 | 2.0 | 22 | 26 | 4.8 |
| 7 | .78 | .20 | 14 | 19 | 2.6 | 7.0 | 18 | 2.3 | 1.2 | 26 | 21 | 3.2 |
| 8 | .56 | .17 | 3.5 | 9.0 | 1.7 | 8.8 | 20 | 1.5 | .94 | 26 | 5.8 | 3.5 |
| 9 | .45 | .20 | 1.8 | 20 | 1.4 | 16 | 12 | 1.1 | .78 | 23 | 3.0 | 3.0 |
| 10 | .42 | .28 | 1.4 | 19 | 1.0 | 5.4 | 6.5 | .89 | .84 | 20 | 13 | 2.5 |
| 11 | .34 | .42 | 1.0 | 4.4 | .94 | 3.8 | 21 | 1.0 | 21 | 15 | 17 | 2.0 |
| 12 | .31 | .24 | 3.3 | 2.3 | .78 | 3.0 | 26 | 1.3 | 23 | 14 | 17 | 1.4 |
| 13 | .28 | .17 | 27 | 1.4 | .72 | 2.1 | 20 | .84 | 9.1 | 7.7 | 27 | 1.2 |
| 14 | .24 | .10 | 27 | 2.9 | 20 | 1.5 | 24 | .72 | 3.2 | 24 | 27 | 4.8 |
| 15 | .28 | .14 | 16 | 1.5 | 27 | 1.4 | 12 | 1.4 | 1.9 | 18 | 27 | 3.0 |
| 16 | .28 | .20 | 14 | 1.1 | 26 | 10 | 24 | 4.1 | 1.2 | 8.5 | 25 | 1.7 |
| 17 | .20 | .72 | 24 | .78 | 24 | 18 | 21 | 2.3 | .89 | 16 | 26 | 1.4 |
| 18 | .24 | .42 | 20 | .62 | 26 | 12 | 11 | 1.4 | .72 | 17 | 24 | 14 |
| 19 | .50 | 1.4 | 6.4 | .45 | 25 | 7.6 | 18 | .94 | .67 | 27 | 11 | 21 |
| 20 | 18 | 1.6 | 4.6 | .42 | 24 | 5.5 | 22 | .72 | .67 | 27 | 16 | 8.3 |
| 21 | 9.2 | 1.4 | 9.1 | 14 | 20 | 3.6 | 12 | .67 | .62 | 12 | 4.0 | 14 |
| 22 | 6.0 | 1.1 | 3.2 | 3.0 | 24 | 4.6 | 21 | .72 | 8.8 | 16 | 3.8 | 22 |
| 23 | 2.9 | 2.7 | 3.1 | 1.4 | 24 | 3.4 | 4.8 | 9.1 | 3.0 | 17 | 11 | 12 |
| 24 | 1.5 | 1.3 | 1.8 | .84 | 18 | 10 | 2.7 | 11 | 1.3 | 18 | 19 | 8.7 |
| 25 | .89 | 8.7 | 7.4 | .84 | 24 | 17 | 2.5 | 10 | .94 | 19 | 19 | 12 |
| 26 | .62 | 6.8 | 7.4 | .67 | 26 | 4.7 | 2.3 | 21 | 1.3 | 5.8 | 14 | 22 |
| 27 | .50 | 1.8 | 2.7 | .50 | 20 | 3.2 | 8.8 | 12 | 2.2 | 3.1 | 7.8 | 21 |
| 28 | .67 | 6.0 | 1.9 | .50 | 26 | 3.1 | 14 | 3.8 | 3.4 | 2.3 | 13 | 22 |
| 29 | .62 | 25 | 2.3 | 14 | ------ | 2.5 | 16 | 2.0 | 19 | 15 | 16 | 21 |
| 30 | .78 | 9.8 | 1.4 | 24 | ------ | 2.5 | 12 | 1.2 | 19 | 18 | 25 | 13 |
| 31 | .50 | ------ | .94 | 26 | ------ | 13 | ------ | .89 | ------ | 23 | 22 | ------ |
| TOTAL | 58.77 | 72.91 | 290.44 | 244.16 | 477.74 | 310.7 | 449.9 | 153.39 | 169.39 | 490.1 | 496.8 | 346.8 |
| MEAN | 1.90 | 2.43 | 9.37 | 7.88 | 17.1 | 10.0 | 15.0 | 4.95 | 5.65 | 15.8 | 16.0 | 11.6 |
| MAX | 18 | 25 | 27 | 26 | 27 | 27 | 26 | 21 | 23 | 27 | 27 | 25 |
| MIN | .20 | .10 | .94 | .42 | .72 | 1.4 | 2.3 | .67 | .62 | 1.4 | 3.0 | 1.2 |
| AC-FT | 117 | 145 | 576 | 484 | 948 | 616 | 892 | 304 | 336 | 972 | 985 | 688 |

CAL YR 1968: TOTAL 2,373.34 MEAN 6.48 MAX 34 MIN .10 AC-FT 4,710
WTR YR 1969: TOTAL 3,561.10 MEAN 9.76 MAX 27 MIN .10 AC-FT 7,060

## 16-7248. Upper Hamakua ditch above Alakahi Stream, near Kamuela

LOCATION.--Lat 20°04'31", long 155°40'26", Hawaii, on right bank 0.1 mile upstream from Alakahi Stream and 3.6 miles north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,890 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 30 cfs Apr. 12, 1969; no flow for many days in 1968.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 0 | 1.9 | .36 | 17 | 26 | 22 | 10 | .45 | 17 | 18 | 23 |
| 2 | 2.3 | 0 | 2.7 | .20 | 20 | 18 | 24 | 10 | .93 | 17 | 6.1 | 22 |
| 3 | 1.6 | 0 | 6.0 | 7.2 | 27 | 16 | 16 | 13 | 13 | 4.3 | 11 | 20 |
| 4 | .80 | 0 | 16 | 18 | 20 | 21 | 15 | 14 | 14 | 1.8 | 5.0 | 21 |
| 5 | .43 | 0 | 22 | 14 | 11 | 21 | 11 | 6.3 | 3.3 | .92 | 6.2 | 9.3 |
| 6 | .27 | 0 | 22 | 21 | 3.6 | 22 | 12 | 3.9 | 1.3 | 17 | 22 | 4.7 |
| 7 | .35 | 0 | 11 | 15 | 1.9 | 6.9 | 19 | 2.2 | .77 | 21 | 18 | 2.7 |
| 8 | .16 | 0 | 2.7 | 7.0 | 1.2 | 6.8 | 19 | 1.5 | .58 | 22 | 4.8 | 2.8 |
| 9 | .06 | 0 | 1.3 | 17 | .81 | 14 | 12 | 1.2 | .40 | 19 | 2.2 | 2.1 |
| 10 | .01 | 0 | .93 | 16 | .57 | 5.1 | 7.2 | .88 | .35 | 16 | 10 | 2.0 |
| 11 | 0 | 0 | .66 | 3.7 | .47 | 3.5 | 22 | .85 | 17 | 12 | 14 | 1.5 |
| 12 | 0 | 0 | 1.2 | 1.7 | .32 | 2.6 | 30 | .97 | 19 | 11 | 12 | 1.1 |
| 13 | 0 | 0 | 28 | .98 | .18 | 1.9 | 24 | .64 | 7.2 | 5.9 | 26 | .84 |
| 14 | 0 | 0 | 25 | 1.9 | 16 | 1.3 | 23 | .58 | 2.3 | 20 | 27 | 3.4 |
| 15 | 0 | 0 | 13 | 1.0 | 25 | 1.0 | 15 | .93 | 1.1 | 15 | 27 | 1.9 |
| 16 | 0 | 0 | 12 | .70 | 25 | 8.4 | 24 | 3.2 | .73 | 7.2 | 24 | 1.1 |
| 17 | 0 | 0 | 21 | .42 | 19 | 17 | 22 | 1.7 | .54 | 12 | 25 | .80 |
| 18 | 0 | 0 | 17 | .22 | 22 | 5.2 | 13 | .99 | .34 | 13 | 24 | 8.8 |
| 19 | 0 | 0 | 5.5 | .12 | 21 | 7.7 | 20 | .84 | .24 | 23 | 9.7 | 16 |
| 20 | 12 | .01 | 3.3 | .04 | 21 | 5.7 | 23 | .59 | .28 | 25 | 10 | 6.6 |
| 21 | 6.3 | .04 | 7.2 | 10 | 16 | 3.3 | 14 | .40 | .15 | 11 | 4.0 | 11 |
| 22 | 4.2 | .02 | 2.7 | 2.2 | 19 | 4.7 | 22 | .44 | 5.1 | 13 | 3.3 | 18 |
| 23 | 1.7 | .68 | 2.4 | .88 | 20 | 3.2 | 7.2 | 6.4 | 1.9 | 14 | 8.9 | 10 |
| 24 | .67 | .21 | 1.3 | .49 | 15 | 9.0 | 4.0 | 8.6 | .71 | 17 | 16 | 6.6 |
| 25 | .30 | 4.6 | 4.8 | .47 | 21 | 21 | 3.2 | 7.2 | .46 | 18 | 16 | 9.5 |
| 26 | .09 | 4.3 | 5.8 | .30 | 24 | 5.0 | 2.8 | 18 | .71 | 5.7 | 12 | 17 |
| 27 | 0 | .96 | 2.0 | .15 | 16 | 3.2 | 8.4 | 10 | .93 | 2.5 | 7.7 | 18 |
| 28 | .08 | 3.5 | 1.2 | .10 | 23 | 3.1 | 12 | 3.1 | 1.7 | 1.7 | 10 | 18 |
| 29 | .03 | 20 | 1.5 | 9.6 | ------ | 2.2 | 16 | 1.4 | 12 | 16 | 12 | 18 |
| 30 | .14 | 7.6 | .88 | 19 | ------ | 2.2 | 12 | .86 | 14 | 16 | 22 | 11 |
| 31 | 0 | ------ | .55 | 20 | ------ | 11 | ------ | .61 | ------ | 20 | 18 | ------ |
| TOTAL | 33.49 | 41.92 | 243.52 | 189.73 | 407.05 | 279.0 | 474.8 | 131.28 | 121.47 | 415.02 | 431.9 | 288.02 |
| MEAN | 1.08 | 1.40 | 7.86 | 6.12 | 14.5 | 9.00 | 15.8 | 4.23 | 4.05 | 13.4 | 13.9 | 9.63 |
| MAX | 12 | 20 | 28 | 21 | 27 | 26 | 30 | 18 | 19 | 25 | 27 | 23 |
| MIN | 0 | 0 | .55 | .04 | .18 | 1.0 | 2.0 | .40 | .15 | .92 | 2.2 | .84 |
| AC-FT | 66 | 83 | 483 | 376 | 807 | 553 | 942 | 260 | 241 | 823 | 857 | 573 |

CAL YR 1968 TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969 TOTAL 3,058.00 MEAN 8.38 MAX 30 MIN 0 AC-FT 6,070

## 16-7250. Alakahi Stream near Kamuela

LOCATION.--Lat 20°04'27", long 155°40'25", Hawaii, on right bank 25 ft upstream from Upper Hamakua ditch intake and 3.5 miles north of Kamuela.

DRAINAGE AREA.--0.87 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 3,900 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 171 cfs Mar. 17 (gage height, 4.86 ft), from rating curve extended as explained below; minimum, 0.07 cfs Nov. 15.
Period of record: Maximum discharge, 1,420 cfs Jan. 11, 1967 (gage height, 8.65 ft), from rating curve extended above 28 cfs on basis of computation of peak flow over dam; minimum, 0.03 cfs on several days in 1965.

REMARKS.--Records fair. Parker Ranch pipeline diverts from tributary 0.4 mile above station for ranch use in Kamuela area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.6 | .22 | 1.6 | .46 | 6.9 | 42 | 19 | 8.4 | .70 | 10 | 8.8 | 23 |
| 2 | 1.4 | .22 | 2.7 | .39 | 15 | 13 | 52 | 7.2 | 1.3 | 11 | 3.0 | 19 |
| 3 | 1.4 | .14 | 5.4 | 5.5 | 56 | 10 | 27 | 12 | 9.8 | 3.4 | 8.5 | 11 |
| 4 | .90 | .13 | 18 | 15 | 18 | 14 | 15 | 12 | 9.8 | 2.6 | 2.9 | 18 |
| 5 | .70 | .12 | 12 | 9.8 | 6.0 | 20 | 24 | 3.6 | 2.5 | 1.4 | 5.8 | 5.5 |
| 6 | .65 | .11 | 12 | 19 | 2.6 | 30 | 11 | 2.1 | 1.2 | 18 | 20 | 3.3 |
| 7 | .70 | .12 | 5.7 | 7.9 | 1.4 | 9.3 | 23 | 1.5 | .90 | 17 | 13 | 2.3 |
| 8 | .50 | .09 | 2.1 | 4.0 | 1.0 | 8.2 | 20 | 1.4 | .70 | 18 | 3.0 | 2.1 |
| 9 | .43 | .11 | 1.3 | 14 | .75 | 19 | 27 | 1.2 | .55 | 10 | 1.8 | 1.9 |
| 10 | .39 | .12 | .90 | 10 | .65 | 7.3 | 15 | 1.1 | .55 | 9.7 | 10 | 1.7 |
| 11 | .36 | .09 | .65 | 2.8 | .60 | 5.5 | 9.8 | 1.0 | 17 | 6.0 | 7.8 | 1.5 |
| 12 | .39 | .09 | .80 | 1.5 | .50 | 3.0 | 44 | 1.0 | 13 | 5.8 | 14 | 1.3 |
| 13 | .36 | .09 | 59 | 1.1 | .46 | 1.8 | 60 | .90 | 4.5 | 2.5 | 39 | 1.2 |
| 14 | .32 | .09 | 32 | 1.8 | 27 | 1.4 | 30 | .90 | 1.7 | 21 | 39 | 2.3 |
| 15 | .32 | .09 | 5.1 | 1.4 | 46 | 1.3 | 29 | 1.2 | 1.1 | 5.0 | 44 | 1.9 |
| 16 | .29 | .11 | 17 | 1.1 | 41 | 12 | 19 | 2.4 | .85 | 2.4 | 15 | 1.4 |
| 17 | .29 | .12 | 10 | .85 | 16 | 29 | 34 | 1.8 | .60 | 6.0 | 26 | 1.2 |
| 18 | .29 | .10 | 8.4 | .70 | 23 | 24 | 29 | 1.4 | .55 | 10 | 19 | 4.7 |
| 19 | .36 | .29 | 3.1 | .60 | 22 | 11 | 20 | 1.2 | .60 | 23 | 7.7 | 9.2 |
| 20 | 3.2 | .60 | 1.7 | .60 | 20 | 8.4 | 23 | 1.0 | .55 | 30 | 7.8 | 3.7 |
| 21 | 2.4 | .60 | 2.3 | 7.3 | 18 | 6.3 | 28 | .90 | .55 | 5.0 | 3.1 | 11 |
| 22 | 2.2 | .32 | 1.5 | 2.4 | 17 | 7.5 | 19 | .90 | 4.2 | 7.0 | 2.8 | 9.0 |
| 23 | 1.3 | .55 | 1.4 | 1.3 | 19 | 6.2 | 32 | 5.7 | 1.6 | 14 | 6.0 | 6.6 |
| 24 | .75 | .43 | 1.0 | 1.0 | 13 | 9.4 | 13 | 7.7 | .90 | 16 | 15 | 3.2 |
| 25 | .43 | 1.9 | 2.3 | .75 | 21 | 31 | 6.6 | 5.7 | .80 | 9.2 | 8.4 | 3.6 |
| 26 | .39 | 2.4 | 3.5 | .65 | 33 | 10 | 3.4 | 23 | .95 | 3.0 | 7.5 | 15 |
| 27 | .39 | .95 | 1.5 | .60 | 13 | 6.6 | 9.8 | 10 | 1.1 | 1.9 | 4.2 | 9.6 |
| 28 | .29 | 3.3 | 1.0 | .60 | 28 | 6.2 | 19 | 2.6 | 1.4 | 1.4 | 6.1 | 13 |
| 29 | .29 | 15 | 1.3 | 13 | ------ | 5.8 | 21 | 1.5 | 8.4 | 11 | 7.6 | 11 |
| 30 | .29 | 3.6 | .95 | 15 | ------ | 5.5 | 10 | 1.0 | 10 | 7.0 | 15 | 5.5 |
| 31 | .25 | ------ | .65 | 12 | ------ | 8.9 | ------ | .75 | ------ | 20 | 9.0 | ------ |
| TOTAL | 23.83 | 32.10 | 216.85 | 153.10 | 466.86 | 373.6 | 692.6 | 123.05 | 98.35 | 308.3 | 380.8 | 203.7 |
| MEAN | .77 | 1.07 | 7.00 | 4.94 | 16.7 | 12.1 | 23.1 | 3.97 | 3.28 | 9.95 | 12.3 | 6.79 |
| MAX | 3.2 | 15 | 59 | 19 | 56 | 42 | 60 | 23 | 17 | 30 | 44 | 23 |
| MIN | .25 | .09 | .65 | .39 | .46 | 1.3 | 3.4 | .75 | .55 | 1.4 | 1.8 | 1.2 |
| AC-FT | 47 | 64 | 430 | 304 | 926 | 741 | 1,370 | 244 | 195 | 612 | 755 | 404 |

CAL YR 1968 TOTAL 2,116.52 MEAN 5.78 MAX 61 MIN .09 AC-FT 4,200
WTR YR 1969 TOTAL 3,073.14 MEAN 8.42 MAX 60 MIN .09 AC-FT 6,100

PEAK DISCHARGE (BASE, 93 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12-16 | 1645 | 4.09 | 93 | 4- 2 | 0715 | 4.08 | 93 |
| 2- 3 | 1600 | 4.16 | 99 | 4-13 | 0215 | 4.15 | 98 |
| 3-17 | 2330 | 4.86 | 171 | 8-15 | 0030 | 4.09 | 93 |

## 16-7322. Wailoa Stream near Waipio

LOCATION.--Lat 20°05'28", long 155°37'01", Hawaii, on right bank 1.0 mile downstream from confluence of Waipio and Waima Streams, 1.8 miles southwest of Waipio, and 3.3 miles southwest of Kukuihaele.

DRAINAGE AREA.--14.3 sq mi.

PERIOD OF RECORD.--August 1901 to January 1902 (prior to any upstream diversions), July 1911 to December 1912 (gage heights only), February 1964 to September 1969 (discontinued). Published as Waipio River at elevation 360 ft, near Waipio 1901-2 and as Waipio River below Waima Stream, near Waipio 1911-12.

GAGE.--Water-stage recorder. Altitude of gage is 150 ft (from topographic map). Aug. 15, 1901, to Jan. 22, 1902, and July 20, 1911, to Dec. 31, 1912, nonrecording gage at site 1.0 mile upstream (400 ft below Waima Stream) at different datums.

EXTREMES.--Current year: Maximum discharge, 3,030 cfs Mar. 18 (gage height, 6.04 ft), from rating curve extended as explained below; minimum, 34 cfs Oct. 18.

Period of record: Maximum discharge, 8,500 cfs Jan. 11, 1967 (gage height, 7.8 ft, from floodmarks), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 34 cfs Oct. 18, 1968.

Flood of Nov. 8, 1963, reached a stage of 8.2 ft, from floodmarks (discharge, 6,130 cfs, by slope-area measurement).

REMARKS.--Records poor. Upper and Lower Hamakua ditches divert water out of basin from upstream tributaries for irrigation in vicinity of Kamuela and for mill and domestic use, power generation, and irrigation on Hamakua coast. Parker Ranch pipeline diverts from Alakahi Stream for ranch use in Kamuela area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 39 | 44 | 45 | 48 | 43 | 115 | 197 | 64 | 54 | 78 | 78 | 89 |
| 2 | 38 | 43 | 45 | 48 | 48 | 74 | 210 | 59 | 54 | 86 | 56 | 96 |
| 3 | 38 | 43 | 59 | 108 | 169 | 62 | 116 | 67 | 62 | 56 | 69 | 63 |
| 4 | 38 | 43 | 97 | 67 | 83 | 71 | 93 | 89 | 77 | 56 | 56 | 91 |
| 5 | 38 | 43 | 67 | 58 | 50 | 77 | 85 | 67 | 56 | 55 | 57 | 54 |
| 6 | 38 | 43 | 58 | 64 | 46 | 108 | 105 | 64 | 54 | 103 | 128 | 48 |
| 7 | 38 | 44 | 48 | 50 | 46 | 79 | 151 | 60 | 54 | 97 | 98 | 47 |
| 8 | 38 | 44 | 43 | 46 | 45 | 71 | 123 | 58 | 54 | 109 | 59 | 47 |
| 9 | 38 | 44 | 43 | 65 | 45 | 83 | 81 | 56 | 54 | 80 | 57 | 47 |
| 10 | 38 | 44 | 43 | 52 | 44 | 69 | 65 | 57 | 54 | 78 | 79 | 47 |
| 11 | 38 | 45 | 43 | 48 | 44 | 64 | 192 | 56 | 102 | 59 | 76 | 47 |
| 12 | 41 | 46 | 44 | 45 | 44 | 60 | 310 | 56 | 91 | 63 | 74 | 47 |
| 13 | 41 | 46 | 246 | 45 | 45 | 60 | 174 | 54 | 65 | 55 | 152 | 47 |
| 14 | 38 | 46 | 93 | 45 | 115 | 60 | 126 | 56 | 56 | 118 | 200 | 47 |
| 15 | 38 | 48 | 53 | 47 | 168 | 60 | 92 | 57 | 58 | 65 | 229 | 47 |
| 16 | 39 | 48 | 72 | 46 | 134 | 84 | 145 | 67 | 59 | 53 | 93 | 47 |
| 17 | 39 | 48 | 61 | 46 | 79 | 108 | 130 | 62 | 58 | 56 | 123 | 47 |
| 18 | 39 | 48 | 56 | 45 | 86 | 208 | 91 | 57 | 55 | 66 | 98 | 48 |
| 19 | 41 | 48 | 50 | 45 | 79 | 67 | 103 | 56 | 50 | 123 | 56 | 63 |
| 20 | 50 | 49 | 48 | 45 | 81 | 56 | 139 | 55 | 50 | 173 | 60 | 48 |
| 21 | 44 | 50 | 48 | 48 | 74 | 50 | 80 | 54 | 50 | 70 | 47 | 67 |
| 22 | 44 | 50 | 48 | 46 | 82 | 56 | 128 | 54 | 54 | 58 | 48 | 62 |
| 23 | 44 | 50 | 48 | 45 | 77 | 51 | 71 | 60 | 50 | 96 | 53 | 53 |
| 24 | 44 | 50 | 48 | 45 | 69 | 71 | 59 | 67 | 50 | 139 | 84 | 47 |
| 25 | 44 | 50 | 48 | 45 | 82 | 215 | 52 | 59 | 50 | 92 | 60 | 47 |
| 26 | 44 | 50 | 48 | 45 | 100 | 78 | 49 | 100 | 50 | 63 | 53 | 60 |
| 27 | 45 | 49 | 48 | 45 | 71 | 58 | 72 | 79 | 51 | 60 | 50 | 73 |
| 28 | 45 | 52 | 47 | 45 | 88 | 54 | 120 | 57 | 52 | 57 | 51 | 70 |
| 29 | 44 | 76 | 48 | 64 | ------ | 49 | 111 | 56 | 55 | 71 | 52 | 63 |
| 30 | 44 | 48 | 48 | 65 | ------ | 51 | 80 | 55 | 63 | 66 | 77 | 51 |
| 31 | 44 | ------ | 48 | 50 | ------ | 78 | ------ | 55 | ------ | 94 | 57 | ------ |
| TOTAL | 1,271 | 1,432 | 1,841 | 1,606 | 2,137 | 2,447 | 3,550 | 1,913 | 1,742 | 2,495 | 2,530 | 1,710 |
| MEAN | 41.0 | 47.7 | 59.4 | 51.8 | 76.3 | 78.9 | 118 | 61.7 | 58.1 | 80.5 | 81.6 | 57.0 |
| MAX | 50 | 76 | 246 | 108 | 169 | 215 | 310 | 100 | 102 | 173 | 229 | 96 |
| MIN | 38 | 43 | 43 | 45 | 43 | 49 | 49 | 54 | 50 | 53 | 47 | 47 |
| AC-FT | 2,520 | 2,840 | 3,650 | 3,190 | 4,240 | 4,850 | 7,040 | 3,790 | 3,460 | 4,950 | 5,020 | 3,390 |

CAL YR 1968 TOTAL 27,745 MEAN 75.8 MAX 676 MIN 38 AC-FT 55,030
WTR YR 1969 TOTAL 24,674 MEAN 67.6 MAX 310 MIN 38 AC-FT 48,940

PEAK DISCHARGE (BASE, 1,300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 3-18 | 0030 | 6.04 | 3,030 | 4-11 | 1800 | 4.67 | 1,320 |
| 4- 1 | 1900 | 4.79 | 1,430 | 8-15 | 0330 | 4.74 | 1,380 |

## 16-7330. Lower Hamakua ditch wasteway near Kukuihaele

LOCATION.--Lat 20°07'07", long 155°35'09", Hawaii, on left bank 50 ft downstream from Lower Hamakua ditch, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 980 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 19 cfs Dec. 30, 1965, Jan. 2, 1966; no flow most of the time each year.

REMARKS.--Records good. The wasteway diverts excess water from Lower Hamakua ditch (see sta 16-7331).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 0 | 0 | 0 | 2.8 | 14 | 16 | 6.4 | 0 | 9.2 | 9.7 | 7.3 |
| 2 | | 0 | 0 | 0 | 4.8 | 12 | 14 | 8.0 | 0 | 5.3 | 2.8 | 10 |
| 3 | | 0 | 1.3 | 2.2 | 10 | 8.7 | 8.0 | 4.5 | 7.5 | .88 | .91 | 6.0 |
| 4 | | 0 | 10 | 12 | 0 | 10 | 6.9 | 7.9 | 11 | 0 | 1.3 | 9.3 |
| 5 | | 0 | 12 | 6.5 | 0 | 12 | 6.3 | 4.6 | 5.5 | 0 | 0 | 7.7 |
| 6 | | 0 | 12 | 7.7 | 0 | 14 | 7.3 | 1.9 | 0 | 0 | 8.8 | 2.3 |
| 7 | | 0 | 9.1 | 7.6 | 0 | 9.7 | 10 | .09 | 0 | 3.7 | 10 | 0 |
| 8 | | 0 | 0 | .73 | 0 | 7.3 | 6.4 | 0 | 0 | 7.3 | 1.4 | 0 |
| 9 | | 0 | 0 | 5.9 | 0 | 11 | 4.4 | 0 | 0 | 6.0 | 0 | 0 |
| 10 | | 0 | 0 | 8.6 | 0 | 7.8 | 3.1 | 0 | 0 | 4.5 | 0 | 0 |
| 11 | | 0 | 0 | 0 | 0 | 7.8 | 4.2 | 0 | 6.1 | .58 | 4.4 | 0 |
| 12 | | 0 | 0 | 0 | 0 | 5.8 | 7.2 | 0 | 12 | 2.7 | 1.8 | 0 |
| 13 | | 0 | 12 | 0 | 0 | 1.6 | 2.2 | 0 | 9.8 | .83 | 7.8 | 0 |
| 14 | | 0 | 6.7 | 0 | 6.4 | 0 | 0 | 0 | 5.4 | 5.3 | 7.5 | 0 |
| 15 | | 0 | 1.2 | 0 | 16 | 0 | 3.5 | 0 | .92 | .70 | 4.1 | 0 |
| 16 | | 0 | .61 | 0 | 16 | 0 | 12 | 4.2 | 0 | 0 | 2.3 | 0 |
| 17 | | 0 | 6.2 | 0 | 13 | 11 | 13 | 5.3 | 0 | 0 | 11 | 0 |
| 18 | | 0 | 9.8 | 0 | 9.9 | 9.4 | 11 | 0 | 0 | 0 | 11 | 0 |
| 19 | | 0 | 2.9 | 0 | 11 | 7.6 | 9.1 | 0 | 0 | 8.3 | 6.9 | 6.2 |
| 20 | | 0 | 0 | 0 | 13 | 5.4 | 9.1 | 0 | 0 | 12 | 9.4 | 2.6 |
| 21 | | 0 | 0 | 0 | 8.9 | 4.9 | 7.8 | 0 | 0 | 6.4 | 4.5 | 0 |
| 22 | | 0 | 0 | 0 | 11 | 4.9 | 9.6 | 0 | 3.2 | 0 | .74 | 3.1 |
| 23 | | 0 | 0 | 0 | 12 | 4.9 | 7.6 | 2.2 | 2.8 | 1.6 | 4.4 | 3.8 |
| 24 | | 0 | 0 | 0 | 8.1 | 6.9 | 4.4 | 8.9 | 0 | 4.1 | 2.4 | .12 |
| 25 | | 0 | 0 | 0 | 11 | 14 | 4.4 | 6.2 | 0 | 3.6 | 6.9 | 0 |
| 26 | | 0 | 0 | 0 | 13 | 12 | 4.4 | 11 | 0 | 0 | 2.1 | 2.8 |
| 27 | | 0 | 0 | 0 | 11 | 7.2 | 4.4 | 10 | 0 | 0 | 1.4 | 8.9 |
| 28 | | 0 | 0 | 0 | 12 | 7.5 | 9.8 | 2.4 | .13 | 0 | 3.3 | 9.4 |
| 29 | | 1.6 | 0 | 0 | ------ | 6.3 | 12 | 0 | .15 | 1.6 | 5.2 | 10 |
| 30 | | 0 | 0 | 8.6 | ------ | 4.0 | 9.6 | 0 | 7.9 | 8.0 | 10 | 7.6 |
| 31 | | ------ | 0 | 8.1 | ------ | 12 | ------ | 0 | ------ | 8.5 | 7.6 | ------ |
| TOTAL | 0 | 1.6 | 83.81 | 67.93 | 189.9 | 239.7 | 227.7 | 83.59 | 72.40 | 101.09 | 149.65 | 97.12 |
| MEAN | 0 | .053 | 2.70 | 2.19 | 6.78 | 7.73 | 7.59 | 2.70 | 2.41 | 3.26 | 4.83 | 3.24 |
| MAX | 0 | 1.6 | 12 | 12 | 16 | 14 | 16 | 11 | 12 | 12 | 11 | 10 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 0 | 3.2 | 166 | 135 | 377 | 475 | 452 | 166 | 144 | 200 | 297 | 193 |

CAL YR 1968: TOTAL 715.57 MEAN 1.96 MAX 14 MIN 0 AC-FT 1,420
WTR YR 1969: TOTAL 1,314.49 MEAN 3.60 MAX 16 MIN 0 AC-FT 2,610

## 16-7331. Lower Hamakua ditch below main weir, near Kukuihaele

LOCATION.--Lat 20°07'07", long 155°35'09", Hawaii, on left bank 30 ft upstream from main weir, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 990 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 68 cfs Mar. 2, 1964; minimum daily, 0.08 cfs Dec. 6, 1965.

REMARKS.--Records good. At high flow, water can be diverted from the ditch 0.1 mile upstream and at the gage (see sta 16-7330) to prevent flume damage downstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 46 | 40 | 36 | 37 | 51 | 52 | 53 | 54 | 50 | 56 | 53 | 57 |
| 2 | 44 | 40 | 36 | 37 | 53 | 51 | 47 | 54 | 50 | 56 | 53 | 56 |
| 3 | 44 | 40 | 41 | 42 | 50 | 51 | 51 | 56 | 53 | 52 | 54 | 54 |
| 4 | 44 | 40 | 50 | 50 | 46 | 51 | 50 | 54 | 52 | 51 | 52 | 56 |
| 5 | 44 | 40 | 50 | 51 | 54 | 51 | 51 | 53 | 50 | 46 | 51 | 56 |
| 6 | 45 | 40 | 50 | 50 | 48 | 48 | 50 | 53 | 51 | 58 | 57 | 54 |
| 7 | 44 | 40 | 48 | 48 | 44 | 45 | 50 | 53 | 50 | 57 | 56 | 52 |
| 8 | 44 | 40 | 44 | 46 | 42 | 53 | 52 | 53 | 48 | 56 | 57 | 51 |
| 9 | 43 | 40 | 41 | 52 | 41 | 54 | 51 | 53 | 48 | 56 | 51 | 50 |
| 10 | 43 | 40 | 39 | 47 | 40 | 53 | 52 | 53 | 48 | 54 | 56 | 50 |
| 11 | 43 | 40 | 37 | 43 | 40 | 52 | 54 | 53 | 56 | 54 | 57 | 47 |
| 12 | 40 | 39 | 36 | 41 | 39 | 51 | 51 | 53 | 53 | 54 | 56 | 46 |
| 13 | 39 | 39 | 50 | 40 | 38 | 52 | 51 | 52 | 52 | 50 | 61 | 46 |
| 14 | 42 | 39 | 46 | 39 | 48 | 52 | 52 | 51 | 52 | 54 | 54 | 50 |
| 15 | 42 | 39 | 44 | 39 | 51 | 51 | 56 | 56 | 52 | 58 | 46 | 47 |
| 16 | 42 | 39 | 48 | 38 | 47 | 54 | 53 | 57 | 52 | 56 | 44 | 45 |
| 17 | 42 | 40 | 50 | 38 | 46 | 53 | 52 | 52 | 50 | 58 | 57 | 45 |
| 18 | 42 | 40 | 51 | 38 | 48 | 54 | 51 | 54 | 52 | 62 | 56 | 51 |
| 19 | 40 | 42 | 46 | 37 | 50 | 52 | 53 | 54 | 57 | 62 | 54 | 58 |
| 20 | 51 | 39 | 45 | 37 | 51 | 52 | 56 | 53 | 56 | 62 | 54 | 52 |
| 21 | 50 | 37 | 45 | 44 | 50 | 51 | 53 | 52 | 56 | 59 | 53 | 56 |
| 22 | 50 | 36 | 44 | 39 | 53 | 52 | 54 | 52 | 58 | 58 | 54 | 59 |
| 23 | 45 | 37 | 44 | 37 | 51 | 51 | 52 | 56 | 56 | 61 | 56 | 54 |
| 24 | 43 | 36 | 41 | 36 | 53 | 52 | 53 | 53 | 56 | 57 | 59 | 52 |
| 25 | 42 | 39 | 42 | 36 | 54 | 52 | 54 | 51 | 54 | 52 | 56 | 54 |
| 26 | 42 | 43 | 48 | 35 | 47 | 51 | 53 | 56 | 56 | 53 | 56 | 59 |
| 27 | 39 | 37 | 41 | 35 | 51 | 53 | 59 | 53 | 54 | 52 | 54 | 58 |
| 28 | 40 | 38 | 40 | 34 | 52 | 54 | 57 | 53 | 59 | 45 | 54 | 57 |
| 29 | 42 | 45 | 40 | 41 | ------ | 53 | 54 | 53 | 62 | 53 | 54 | 57 |
| 30 | 42 | 41 | 39 | 52 | ------ | 54 | 53 | 52 | 59 | 56 | 56 | 56 |
| 31 | 41 | ------ | 38 | 50 | ------ | 56 | ------ | 50 | ------ | 54 | 54 | ------ |
| TOTAL | 1,340 | 1,185 | 1,350 | 1,289 | 1,338 | 1,611 | 1,578 | 1,652 | 1,602 | 1,712 | 1,685 | 1,585 |
| MEAN | 43.2 | 39.5 | 43.5 | 41.6 | 47.8 | 52.0 | 52.6 | 53.3 | 53.4 | 55.2 | 54.4 | 52.8 |
| MAX | 51 | 45 | 51 | 52 | 54 | 56 | 59 | 57 | 62 | 62 | 61 | 59 |
| MIN | 39 | 36 | 36 | 34 | 38 | 45 | 47 | 50 | 48 | 45 | 44 | 45 |
| AC-FT | 2,660 | 2,350 | 2,680 | 2,560 | 2,650 | 3,200 | 3,130 | 3,280 | 3,180 | 3,400 | 3,340 | 3,140 |

CAL YR 1968: TOTAL 16,535 MEAN 45.2 MAX 63 MIN 17 AC-FT 32,780
WTR YR 1969: TOTAL 17,927 MEAN 49.1 MAX 62 MIN 34 AC-FT 35,560

## 16-7332. Honokaa diversion at Honokaa

LOCATION.--Lat 20°05'12", long 155°28'36", Hawaii, on left bank 50 ft downstream from Lower Hamakua ditch and 0.5 mile northwest of Honokaa Hospital.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 950 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 23 cfs Apr. 25, May 22, 1964; no flow Dec. 8, 1965.

REMARKS.--Records good. The diversion is from Lower Hamakua ditch (see sta 16-7333) for use in Honokaa Sugar Co. mill.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 | 14 | 11 | 16 | 16 | 17 | 18 | 17 | 17 | 17 | 18 | 19 |
| 2 | 16 | 14 | 11 | 14 | 16 | 16 | 18 | 17 | 16 | 18 | 18 | 19 |
| 3 | 15 | 14 | 11 | 14 | 16 | 17 | 18 | 18 | 16 | 17 | 18 | 19 |
| 4 | 14 | 14 | 12 | 16 | 16 | 18 | 18 | 17 | 17 | 16 | 18 | 19 |
| 5 | 14 | 14 | 12 | 16 | 16 | 17 | 18 | 17 | 17 | 16 | 16 | 19 |
| 6 | 14 | 12 | 14 | 15 | 16 | 17 | 18 | 17 | 17 | 16 | 19 | 19 |
| 7 | 14 | 12 | 16 | 15 | 16 | 17 | 18 | 18 | 17 | 16 | 19 | 19 |
| 8 | 14 | 12 | 16 | 15 | 16 | 18 | 17 | 18 | 17 | 17 | 19 | 18 |
| 9 | 14 | 12 | 16 | 15 | 16 | 18 | 17 | 18 | 16 | 17 | 19 | 18 |
| 10 | 14 | 13 | 14 | 15 | 16 | 18 | 17 | 18 | 16 | 17 | 19 | 18 |
| 11 | 14 | 12 | 13 | 15 | 15 | 18 | 17 | 18 | 17 | 18 | 19 | 18 |
| 12 | 14 | 11 | 13 | 15 | 14 | 18 | 17 | 18 | 17 | 18 | 18 | 18 |
| 13 | 14 | 11 | 15 | 15 | 14 | 18 | 17 | 18 | 17 | 18 | 18 | 18 |
| 14 | 14 | 11 | 16 | 14 | 15 | 18 | 17 | 18 | 17 | 19 | 20 | 18 |
| 15 | 14 | 11 | 16 | 14 | 17 | 18 | 18 | 18 | 17 | 19 | 18 | 18 |
| 16 | 14 | 11 | 16 | 14 | 17 | 18 | 18 | 19 | 17 | 17 | 14 | 18 |
| 17 | 14 | 11 | 16 | 14 | 17 | 18 | 18 | 18 | 17 | 17 | 17 | 18 |
| 18 | 14 | 11 | 16 | 14 | 17 | 18 | 17 | 18 | 17 | 17 | 19 | 16 |
| 19 | 13 | 11 | 16 | 14 | 17 | 18 | 17 | 19 | 18 | 18 | 19 | 18 |
| 20 | 14 | 11 | 16 | 14 | 17 | 18 | 17 | 18 | 18 | 18 | 19 | 19 |
| 21 | 14 | 11 | 16 | 15 | 17 | 18 | 18 | 18 | 18 | 18 | 19 | 19 |
| 22 | 14 | 11 | 16 | 14 | 17 | 18 | 18 | 17 | 18 | 18 | 19 | 19 |
| 23 | 15 | 11 | 16 | 14 | 17 | 18 | 17 | 18 | 18 | 18 | 19 | 19 |
| 24 | 16 | 11 | 16 | 14 | 17 | 18 | 18 | 18 | 17 | 18 | 19 | 19 |
| 25 | 16 | 11 | 16 | 14 | 17 | 18 | 18 | 18 | 18 | 17 | 19 | 19 |
| 26 | 16 | 11 | 16 | 14 | 17 | 18 | 17 | 18 | 18 | 18 | 19 | 19 |
| 27 | 16 | 11 | 15 | 14 | 17 | 18 | 18 | 18 | 18 | 17 | 19 | 20 |
| 28 | 15 | 11 | 16 | 14 | 17 | 18 | 18 | 18 | 18 | 16 | 19 | 20 |
| 29 | 14 | 11 | 15 | 13 | ------ | 18 | 18 | 17 | 17 | 17 | 19 | 19 |
| 30 | 14 | 11 | 16 | 15 | ------ | 18 | 17 | 17 | 17 | 17 | 19 | 20 |
| 31 | 14 | ------ | 16 | 16 | ------ | 18 | ------ | 17 | ------ | 18 | 19 | ------ |
| TOTAL | 448 | 352 | 460 | 451 | 456 | 551 | 527 | 551 | 515 | 538 | 573 | 559 |
| MEAN | 14.4 | 11.7 | 14.8 | 14.5 | 16.3 | 17.8 | 17.6 | 17.8 | 17.2 | 17.4 | 18.5 | 18.6 |
| MAX | 16 | 14 | 16 | 16 | 17 | 18 | 18 | 19 | 18 | 19 | 20 | 20 |
| MIN | 13 | 11 | 11 | 13 | 14 | 16 | 17 | 17 | 16 | 16 | 14 | 16 |
| AC-FT | 888 | 698 | 912 | 895 | 904 | 1,090 | 1,050 | 1,090 | 1,020 | 1,070 | 1,140 | 1,110 |

CAL YR 1968: TOTAL 5,581.8 MEAN 15.2 MAX 20 MIN 2.8 AC-FT 11,070
WTR YR 1969: TOTAL 5,981 MEAN 16.4 MAX 20 MIN 11 AC-FT 11,860

16-7333. Lower Hanakua ditch below Honokaa diversion, at Honokaa

LOCATION.--Lat 20°05'12", long 155°28'34", Hawaii, on right bank 50 ft downstream from tunnel, 100 ft downstream from Honokaa diversion, and 0.5 mile northwest of Honokaa Hospital.

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

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 950 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 40 cfs May 19, 1968; no flow Dec. 7, 8, 1965, Apr. 16, 1967.

REMARKS.--Records good. Excess water is spilled at wasteway 8.5 miles above station (see sta 16-7330) and water for Honokaa Sugar Co. mill is diverted 100 ft above station (see sta 16-7332).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26 | 22 | 23 | 18 | 27 | 32 | 32 | 32 | 30 | 27 | 31 | 31 |
| 2 | 24 | 22 | 20 | 19 | 28 | 32 | 28 | 32 | 29 | 27 | 30 | 32 |
| 3 | 24 | 23 | 25 | 21 | 28 | 30 | 28 | 32 | 31 | 26 | 32 | 30 |
| 4 | 23 | 23 | 32 | 27 | 22 | 30 | 28 | 33 | 31 | 26 | 30 | 31 |
| 5 | 23 | 23 | 33 | 27 | 27 | 29 | 29 | 31 | 29 | 25 | 28 | 31 |
| 6 | 22 | 24 | 29 | 27 | 26 | 30 | 28 | 31 | 27 | 27 | 30 | 30 |
| 7 | 22 | 24 | 27 | 28 | 22 | 28 | 28 | 31 | 26 | 28 | 29 | 28 |
| 8 | 21 | 23 | 24 | 27 | 22 | 30 | 29 | 31 | 25 | 26 | 28 | 26 |
| 9 | 21 | 23 | 21 | 28 | 20 | 31 | 29 | 31 | 24 | 27 | 27 | 26 |
| 10 | 21 | 23 | 21 | 28 | 19 | 30 | 28 | 30 | 24 | 28 | 27 | 26 |
| 11 | 20 | 24 | 20 | 26 | 19 | 30 | 30 | 30 | 27 | 28 | 30 | 25 |
| 12 | 20 | 25 | 20 | 24 | 19 | 28 | 31 | 29 | 28 | 30 | 27 | 25 |
| 13 | 17 | 25 | 30 | 22 | 19 | 29 | 29 | 29 | 27 | 26 | 33 | 24 |
| 14 | 21 | 25 | 25 | 22 | 26 | 28 | 28 | 28 | 27 | 27 | 30 | 26 |
| 15 | 21 | 25 | 24 | 21 | 36 | 28 | 31 | 30 | 27 | 29 | 29 | 26 |
| 16 | 21 | 25 | 24 | 20 | 30 | 29 | 30 | 32 | 26 | 29 | 22 | 25 |
| 17 | 21 | 26 | 26 | 19 | 27 | 32 | 30 | 30 | 25 | 27 | 33 | 24 |
| 18 | 21 | 25 | 27 | 19 | 28 | 29 | 29 | 32 | 24 | 31 | 32 | 26 |
| 19 | 18 | 28 | 25 | 19 | 28 | 30 | 31 | 32 | 28 | 33 | 30 | 32 |
| 20 | 23 | 26 | 24 | 19 | 29 | 30 | 31 | 31 | 29 | 33 | 31 | 29 |
| 21 | 31 | 24 | 24 | 23 | 28 | 29 | 31 | 30 | 29 | 31 | 29 | 27 |
| 22 | 29 | 23 | 23 | 21 | 30 | 29 | 32 | 31 | 29 | 30 | 29 | 33 |
| 23 | 26 | 23 | 23 | 19 | 29 | 28 | 30 | 32 | 28 | 32 | 31 | 31 |
| 24 | 24 | 22 | 21 | 18 | 29 | 29 | 31 | 31 | 28 | 31 | 31 | 27 |
| 25 | 23 | 22 | 20 | 18 | 32 | 32 | 32 | 30 | 29 | 29 | 32 | 30 |
| 26 | 22 | 26 | 25 | 18 | 30 | 28 | 30 | 30 | 29 | 30 | 30 | 30 |
| 27 | 20 | 23 | 21 | 17 | 29 | 29 | 33 | 30 | 28 | 26 | 31 | 33 |
| 28 | 20 | 22 | 20 | 18 | 30 | 31 | 34 | 30 | 30 | 24 | 31 | 31 |
| 29 | 23 | 28 | 20 | 21 | ------ | 30 | 32 | 31 | 30 | 27 | 29 | 31 |
| 30 | 24 | 28 | 19 | 28 | ------ | 29 | 31 | 31 | 28 | 32 | 30 | 30 |
| 31 | 22 | ------ | 18 | 28 | ------ | 33 | ------ | 31 | ------ | 30 | 30 | ------ |
| TOTAL | 694 | 725 | 734 | 690 | 739 | 922 | 903 | 954 | 832 | 882 | 922 | 856 |
| MEAN | 22.4 | 24.2 | 23.7 | 22.3 | 26.4 | 29.7 | 30.1 | 30.8 | 27.7 | 28.4 | 29.7 | 28.5 |
| MAX | 31 | 28 | 33 | 28 | 36 | 33 | 34 | 33 | 31 | 33 | 33 | 33 |
| MIN | 17 | 22 | 18 | 17 | 19 | 28 | 28 | 28 | 24 | 24 | 22 | 24 |
| AC-FT | 1,380 | 1,440 | 1,460 | 1,370 | 1,470 | 1,830 | 1,790 | 1,890 | 1,650 | 1,750 | 1,830 | 1,700 |

CAL YR 1968: TOTAL 8,991.89 MEAN 24.6 MAX 40 MIN 59 AC-FT 17,840
WTR YR 1969: TOTAL 9,853 MEAN 27.0 MAX 36 MIN 17 AC-FT 19,540

## 16-7430. Awini ditch at East Honokane Iki Gulch, near Niulii

LOCATION.--Lat 20°09'55", long 155°43'10", Hawaii, at upper end of flume across East Honokane Iki Gulch and 4.5 miles southeast of Niulii.

PERIOD OF RECORD.--October 1927 to June 1938, September 1938 to June 1949, July 1950 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 58 cfs Nov. 2, 1967, Dec. 13, 1968; no flow at times.

REMARKS.--Records good. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.8 | .95 | 8.0 | 6.2 | 19 | 51 | 50 | 15 | 7.0 | 19 | 23 | 19 |
| 2 | 4.6 | 1.1 | 4.9 | 5.6 | 30 | 31 | 52 | 17 | 6.5 | 23 | 14 | 25 |
| 3 | 3.7 | .90 | 13 | 24 | 46 | 24 | 43 | 31 | 15 | 12 | 19 | 11 |
| 4 | 3.0 | .70 | 36 | 34 | 31 | 43 | 35 | 27 | 23 | 7.3 | 14 | 18 |
| 5 | 2.6 | .58 | 30 | 22 | 11 | 35 | 32 | 13 | 12 | 4.9 | 12 | 10 |
| 6 | 2.4 | .55 | 23 | 28 | 5.0 | 41 | 35 | 12 | 8.7 | 37 | 30 | 9.7 |
| 7 | 2.2 | .11 | 14 | 19 | 4.2 | 25 | 46 | 11 | 6.8 | 34 | 27 | 8.4 |
| 8 | 2.0 | 0 | 9.4 | 15 | 3.9 | 18 | 34 | 12 | 5.7 | 36 | 14 | 8.4 |
| 9 | 1.8 | 0 | 7.4 | 25 | 3.6 | 28 | 25 | 13 | 5.1 | 22 | 11 | 8.3 |
| 10 | 1.6 | .33 | 7.7 | 16 | 3.6 | 14 | 22 | 12 | 4.6 | 20 | 13 | 8.8 |
| 11 | 1.4 | .12 | 10 | 12 | 3.6 | 11 | 41 | 14 | 36 | 15 | 20 | 10 |
| 12 | 1.2 | 0 | 12 | 9.7 | 4.2 | 10 | 51 | 13 | 37 | 15 | 19 | 9.5 |
| 13 | 1.1 | 0 | 58 | 8.1 | 7.4 | 9.9 | 39 | 11 | 18 | 12 | 47 | 8.8 |
| 14 | .95 | 0 | 51 | 7.3 | 44 | 9.0 | 38 | 11 | 13 | 32 | 41 | 12 |
| 15 | 2.5 | 0 | 27 | 6.7 | 55 | 8.4 | 24 | 23 | 11 | 19 | 47 | 11 |
| 16 | 3.8 | 0 | 30 | 6.4 | 52 | 13 | 43 | 29 | 8.8 | 13 | 16 | 9.4 |
| 17 | 1.9 | .03 | 32 | 5.7 | 37 | 24 | 38 | 17 | 7.6 | 14 | 24 | 8.4 |
| 18 | 1.8 | 1.7 | 26 | 5.1 | 47 | 21 | 24 | 12 | 6.5 | 15 | 26 | 9.4 |
| 19 | 3.8 | 5.2 | 18 | 5.3 | 41 | 13 | 28 | 11 | 5.8 | 31 | 9.9 | 23 |
| 20 | 24 | 4.8 | 14 | 5.2 | 43 | 12 | 46 | 9.2 | 5.4 | 46 | 10 | 19 |
| 21 | 17 | 4.0 | 14 | 7.0 | 34 | 9.0 | 23 | 8.1 | 4.9 | 19 | 8.1 | 22 |
| 22 | 16 | 2.7 | 18 | 5.7 | 31 | 9.2 | 38 | 7.6 | 7.4 | 15 | 7.4 | 28 |
| 23 | 18 | 3.6 | 14 | 4.7 | 32 | 8.4 | 19 | 15 | 8.5 | 24 | 8.4 | 24 |
| 24 | 4.8 | 8.0 | 11 | 4.3 | 20 | 18 | 16 | 22 | 5.9 | 24 | 16 | 20 |
| 25 | 3.2 | 18 | 11 | 7.6 | 29 | 49 | 14 | 15 | 4.9 | 26 | 9.7 | 22 |
| 26 | 2.4 | 14 | 21 | 5.8 | 28 | 21 | 13 | 39 | 5.0 | 14 | 7.7 | 29 |
| 27 | 1.9 | 8.6 | 13 | 4.6 | 22 | 17 | 21 | 27 | 5.6 | 11 | 6.5 | 32 |
| 28 | 2.2 | 23 | 9.9 | 4.3 | 43 | 15 | 29 | 14 | 9.8 | 9.9 | 7.6 | 32 |
| 29 | 1.6 | 31 | 16 | 23 | ------ | 12 | 37 | 11 | 10 | 17 | 11 | 30 |
| 30 | 1.4 | 14 | 10 | 40 | ------ | 12 | 24 | 8.8 | 14 | 18 | 15 | 24 |
| 31 | 1.2 | ------ | 7.6 | 40 | ------ | 32 | ------ | 7.8 | ------ | 35 | 9.5 | ------ |
| TOTAL | 142.85 | 143.97 | 576.9 | 413.3 | 730.5 | 643.9 | 980 | 488.5 | 319.5 | 640.1 | 543.8 | 510.1 |
| MEAN | 4.61 | 4.80 | 18.6 | 13.3 | 26.1 | 20.8 | 32.7 | 15.8 | 10.6 | 20.6 | 17.5 | 17.0 |
| MAX | 24 | 31 | 58 | 40 | 55 | 51 | 52 | 39 | 37 | 46 | 47 | 32 |
| MIN | .95 | 0 | 4.9 | 4.3 | 3.6 | 8.4 | 13 | 7.6 | 4.6 | 4.9 | 6.5 | 8.3 |
| AC-FT | 283 | 286 | 1,140 | 820 | 1,450 | 1,280 | 1,940 | 969 | 634 | 1,270 | 1,080 | 1,010 |

CAL YR 1968: TOTAL 4,538.72 MEAN 12.4 MAX 58 MIN 0 AC-FT 9,000
WTR YR 1969: TOTAL 6,133.42 MEAN 16.8 MAX 58 MIN 0 AC-FT 12,170

## 16-7440. East Honokane Iki intake to Awini ditch near Niulii

LOCATION.--Lat 20°09'55", long 155°43'15", Hawaii, on intake tunnel leading from East Branch Honokane Iki Stream to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

PERIOD OF RECORD.--October 1927 to May 1928, July 1928 to December 1936, July 1937 to June 1938, July 1939 to July 1940, September 1940 to June 1949, July 1951 to current year. Prior to July 1960, published as "at East Honokane Iki Gulch, near Niulii."

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 13.0 cfs Aug. 6, 1957; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Records are of diversion from East Branch Honokane Iki Stream to Awini ditch (see sta 16-7430) for irrigation in vicinity of Kohala.

REVISIONS (FISCAL YEARS).--WSP 725: 1928-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .20 | .01 | .30 | .30 | .99 | 1.5 | 10 | 1.6 | .13 | 1.9 | 2.5 | .66 |
| 2 | .10 | .01 | .10 | .20 | 1.1 | .99 | 7.8 | 2.2 | .10 | 2.8 | .99 | .70 |
| 3 | .07 | .01 | 1.1 | 2.5 | 2.2 | .87 | 5.8 | 5.9 | 1.1 | .42 | 1.7 | .47 |
| 4 | .05 | .01 | 6.0 | 3.5 | 1.4 | .47 | 4.9 | 4.6 | 2.2 | .20 | .75 | 2.0 |
| 5 | .05 | 0 | 5.0 | 3.0 | 1.0 | .16 | 4.4 | 1.4 | .42 | .13 | .76 | 1.1 |
| 6 | .05 | 0 | 1.5 | 3.5 | .99 | .79 | 5.0 | .93 | .16 | 7.4 | 3.7 | .87 |
| 7 | .05 | 0 | .80 | 2.5 | .93 | .70 | 5.0 | .81 | .10 | 6.4 | 2.8 | .56 |
| 8 | .05 | 0 | .60 | 2.0 | .87 | .52 | 3.4 | .81 | .07 | 6.6 | .93 | .52 |
| 9 | .01 | 0 | .50 | 3.0 | .75 | .87 | 3.7 | .75 | .05 | 2.3 | .56 | .52 |
| 10 | .01 | 0 | .50 | 2.0 | .61 | .33 | 4.2 | .70 | .05 | 2.2 | 1.8 | .47 |
| 11 | .01 | 0 | .60 | 1.0 | .56 | .28 | 9.4 | 1.0 | 5.4 | 1.0 | 3.2 | .42 |
| 12 | .01 | 0 | 1.0 | .90 | .52 | .61 | 8.8 | .93 | 3.4 | 1.0 | 2.8 | .28 |
| 13 | .01 | 0 | 7.0 | .70 | .47 | .56 | 6.3 | .61 | .93 | .52 | 9.0 | .28 |
| 14 | .01 | 0 | 4.0 | .60 | 2.1 | .56 | 5.7 | .56 | .42 | 6.0 | 2.0 | .33 |
| 15 | .01 | 0 | 2.5 | .47 | 2.4 | .56 | 4.5 | 1.8 | .28 | 2.1 | 1.2 | .28 |
| 16 | .01 | 0 | 3.0 | .47 | 2.0 | .66 | 6.0 | 1.9 | .20 | .75 | .61 | .24 |
| 17 | 0 | 0 | 4.0 | .42 | 1.4 | .81 | 5.3 | .75 | .16 | .99 | .66 | .20 |
| 18 | 0 | .30 | 3.5 | .37 | 1.7 | .66 | 3.5 | .52 | .10 | 1.2 | .61 | .16 |
| 19 | .01 | .80 | 2.5 | .33 | 1.2 | .61 | 4.2 | .42 | .07 | 5.0 | .52 | 1.0 |
| 20 | 3.5 | .50 | 2.0 | .37 | 1.2 | .61 | 4.9 | .37 | .05 | 5.2 | .52 | .66 |
| 21 | 1.2 | .20 | 1.5 | .66 | 1.3 | .56 | 2.9 | .33 | .05 | 2.0 | .52 | 1.8 |
| 22 | .70 | .10 | 3.0 | .37 | 1.1 | .56 | 3.8 | .33 | .10 | 1.6 | .52 | 1.4 |
| 23 | .42 | .40 | 2.0 | .24 | 1.0 | .52 | 2.7 | .52 | .07 | 2.7 | .52 | .93 |
| 24 | .16 | 1.0 | 1.5 | .20 | .93 | .70 | 2.0 | 1.2 | .05 | 2.8 | .56 | .70 |
| 25 | .07 | 2.0 | 1.0 | .42 | .93 | 1.7 | 1.4 | 1.3 | .03 | 2.5 | .52 | 1.2 |
| 26 | .05 | .80 | 3.0 | .33 | .87 | 2.5 | 1.1 | 5.8 | .03 | 1.0 | .52 | 3.1 |
| 27 | .05 | .40 | 1.5 | .20 | .87 | 2.5 | 2.3 | 2.6 | .03 | .70 | .47 | 2.9 |
| 28 | .05 | 4.0 | 1.0 | .13 | 1.1 | 1.8 | 4.4 | .52 | .05 | .61 | .47 | 2.8 |
| 29 | .05 | 6.0 | 2.0 | 1.2 | ------ | 1.2 | 5.7 | .28 | .07 | 1.6 | .56 | 2.2 |
| 30 | .03 | 2.0 | 1.5 | 1.4 | ------ | 1.1 | 3.1 | .20 | .42 | 1.6 | .56 | 1.0 |
| 31 | .01 | ------ | 1.0 | 1.3 | ------ | 4.5 | ------ | .16 | ------ | 3.8 | .52 | ------ |
| TOTAL | 7.00 | 18.54 | 65.50 | 34.58 | 32.49 | 30.76 | 142.2 | 41.80 | 16.29 | 75.02 | 43.35 | 29.75 |
| MEAN | .23 | .62 | 2.11 | 1.12 | 1.16 | .99 | 4.74 | 1.35 | .54 | 2.42 | 1.40 | .99 |
| MAX | 3.5 | 6.0 | 7.0 | 3.5 | 2.4 | 4.5 | 10 | 5.9 | 5.4 | 7.4 | 9.0 | 3.1 |
| MIN | 0 | 0 | .10 | .13 | .47 | .28 | 1.1 | .16 | .03 | .13 | .47 | .16 |
| AC-FT | 14 | 37 | 130 | 69 | 64 | 61 | 282 | 83 | 32 | 149 | 86 | 59 |

CAL YR 1968: TOTAL 348.42 MEAN .95 MAX 7.0 MIN 0 AC-FT 691
WTR YR 1969: TOTAL 537.28 MEAN 1.47 MAX 10 MIN 0 AC-FT 1,070

NOTE.--No gage-height record Nov. 18 to Jan. 14.

## 16-7455. Awini ditch at Awini weir, near Kohala

LOCATION.--Lat 20°08'20", long 155°43'55", Hawaii, on right bank at Awini weir, 6 miles south of Niulii, and 8 miles southeast of Kohala.

PERIOD OF RECORD.--July 1907 to June 1917 (published as Kohala ditch at Awini weir, near Kohala), May 1963 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 1,840 ft (from topographic map). July 1, 1907, to June 30, 1917, nonrecording gage at same site at different datum.

EXTREMES.--Period of record: Maximum daily discharge, 56 cfs May 20, 24, 1964; no flow at times.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane and empties into Kohala ditch (see sta 16-7509) for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.7 | .80 | 11 | 5.0 | 22 | 36 | 50 | 21 | 7.0 | 20 | 24 | 20 |
| 2 | 4.1 | .80 | 4.0 | 4.5 | 30 | 25 | 52 | 24 | 6.4 | 25 | 15 | 26 |
| 3 | 2.7 | .69 | 16 | 26 | 40 | 17 | 47 | 36 | 12 | 11 | 21 | 12 |
| 4 | 2.2 | .59 | 38 | 36 | 32 | 38 | 42 | 36 | 27 | 5.5 | 15 | 20 |
| 5 | 1.6 | .26 | 33 | 25 | 12 | 39 | 38 | 17 | 14 | 2.7 | 12 | 11 |
| 6 | 1.8 | 0 | 26 | 32 | 4.4 | 40 | 40 | 14 | 9.0 | 34 | 33 | 11 |
| 7 | 1.6 | 0 | 18 | 22 | 3.5 | 30 | 47 | 14 | 7.0 | 35 | 30 | 9.0 |
| 8 | .93 | 0 | 12 | 20 | 3.3 | 23 | 41 | 14 | 5.8 | 39 | 16 | 9.0 |
| 9 | .80 | 0 | 10 | 28 | 3.0 | 31 | 33 | 15 | 4.4 | 25 | 12 | 9.0 |
| 10 | .49 | 0 | 10 | 20 | 2.7 | 17 | 31 | 14 | 2.7 | 22 | 15 | 9.0 |
| 11 | .02 | 0 | 12 | 16 | 2.7 | 14 | 47 | 16 | 30 | 14 | 25 | 10 |
| 12 | .50 | 0 | 15 | 12 | 3.5 | 12 | 53 | 17 | 38 | 15 | 22 | 10 |
| 13 | .80 | 0 | 55 | 11 | 5.5 | 12 | 47 | 13 | 22 | 11 | 55 | 9.0 |
| 14 | .69 | 0 | 48 | 10 | 30 | 11 | 44 | 12 | 14 | 31 | 43 | 12 |
| 15 | 1.2 | 0 | 30 | 8.0 | 43 | 11 | 31 | 25 | 11 | 21 | 48 | 11 |
| 16 | 4.4 | 0 | 33 | 7.0 | 42 | 15 | 49 | 35 | 8.3 | 14 | 17 | 9.5 |
| 17 | 1.6 | 0 | 35 | 6.4 | 37 | 26 | 45 | 21 | 6.1 | 14 | 25 | 6.4 |
| 18 | 1.6 | .50 | 28 | 6.1 | 42 | 24 | 32 | 14 | 4.7 | 15 | 27 | 6.7 |
| 19 | 3.3 | 4.0 | 22 | 5.8 | 38 | 15 | 39 | 12 | 3.8 | 28 | 10 | 23 |
| 20 | 26 | 3.5 | 18 | 6.1 | 39 | 14 | 50 | 10 | 3.5 | 35 | 11 | 19 |
| 21 | 21 | 3.0 | 18 | 7.7 | 31 | 11 | 32 | 8.6 | 2.7 | 18 | 8.5 | 22 |
| 22 | 18 | 2.0 | 22 | 6.7 | 32 | 12 | 43 | 8.3 | 4.7 | 16 | 8.0 | 30 |
| 23 | 11 | 3.0 | 18 | 5.5 | 31 | 11 | 28 | 15 | 6.7 | 22 | 9.0 | 26 |
| 24 | 5.8 | 11 | 13 | 4.9 | 22 | 21 | 22 | 25 | 4.1 | 22 | 17 | 21 |
| 25 | 3.5 | 22 | 13 | 8.3 | 25 | 46 | 19 | 16 | 2.7 | 25 | 10 | 25 |
| 26 | 2.5 | 16 | 24 | 7.0 | 25 | 29 | 17 | 41 | 3.0 | 14 | 8.5 | 29 |
| 27 | 1.8 | 12 | 16 | 5.5 | 23 | 24 | 27 | 33 | 3.5 | 11 | 7.0 | 37 |
| 28 | 2.0 | 25 | 12 | 4.9 | 37 | 22 | 32 | 15 | 7.4 | 9.8 | 8.0 | 36 |
| 29 | 1.4 | 34 | 20 | 19 | ------ | 16 | 44 | 11 | 8.0 | 12 | 12 | 35 |
| 30 | 1.2 | 16 | 12 | 39 | ------ | 17 | 32 | 8.6 | 12 | 20 | 16 | 29 |
| 31 | .93 | ------ | 10 | 41 | ------ | 38 | ------ | 8.0 | ------ | 31 | 10 | ------ |
| TOTAL | 132.16 | 155.14 | 652.0 | 456.4 | 661.6 | 697 | 1,154 | 569.5 | 291.5 | 618.0 | 590.0 | 542.6 |
| MEAN | 4.26 | 5.17 | 21.0 | 14.7 | 23.6 | 22.5 | 38.5 | 18.4 | 9.72 | 19.9 | 19.0 | 18.1 |
| MAX | 26 | 34 | 55 | 41 | 43 | 46 | 53 | 41 | 38 | 39 | 55 | 37 |
| MIN | .02 | 0 | 4.0 | 4.5 | 2.7 | 11 | 17 | 8.0 | 2.7 | 2.7 | 7.0 | 6.4 |
| AC-FT | 262 | 308 | 1,290 | 905 | 1,310 | 1,380 | 2,290 | 1,130 | 578 | 1,230 | 1,170 | 1,080 |

CAL YR 1968: TOTAL 5,237.63 MEAN 14.3 MAX 55 MIN 0 AC-FT 10,390
WTR YR 1969: TOTAL 6,519.90 MEAN 17.9 MAX 55 MIN 0 AC-FT 12,930

NOTE.--No gage-height record Nov. 18 to Jan. 15, Aug. 10 to Sept. 16.

## 16-7475. East Branch Honokane Nui Stream near Niulii

LOCATION.--Lat 20°08'18", long 155°44'00", Hawaii, on left bank 500 ft upstream from Awini falls, 1.2 miles upstream from confluence with West Branch, and 6.0 miles south of Niulii.

DRAINAGE AREA.--4.96 sq mi.

PERIOD OF RECORD.--May 1963 to September 1969 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is 1,080 ft (from topographic map). Prior to Dec. 13, 1964, at datum 1.00 ft higher.

EXTREMES.--Current year: Maximum discharge not determined; maximum daily, 110 cfs Dec. 13, Aug. 13; minimum, not determined; mininum daily, 15 cfs for many days.
Period of record: Maximum discharge, not determined; maximum daily, 150 cfs Jan. 11, 1967; minimum, not determined; minimum daily, 14 cfs Sept. 14-23, 1965.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 | 16 | 15 | 17 | 45 | 80 | 90 | 25 | 20 | 50 | 40 | 50 |
| 2 | 17 | 16 | 17 | 16 | 35 | 50 | 100 | 30 | 20 | 50 | 45 | 55 |
| 3 | 18 | 16 | 20 | 35 | 80 | 35 | 70 | 35 | 25 | 30 | 35 | 40 |
| 4 | 17 | 16 | 70 | 50 | 35 | 70 | 65 | 40 | 40 | 25 | 30 | 40 |
| 5 | 17 | 16 | 60 | 35 | 25 | 50 | 65 | 25 | 25 | 25 | 25 | 35 |
| 6 | 16 | 15 | 30 | 40 | 20 | 30 | 60 | 25 | 20 | 60 | 50 | 30 |
| 7 | 16 | 15 | 20 | 25 | 20 | 15 | 90 | 20 | 20 | 80 | 35 | 20 |
| 8 | 17 | 15 | 15 | 20 | 20 | 15 | 70 | 20 | 20 | 80 | 30 | 20 |
| 9 | 17 | 15 | 15 | 35 | 20 | 15 | 50 | 20 | 20 | 50 | 25 | 20 |
| 10 | 17 | 15 | 15 | 20 | 20 | 15 | 45 | 20 | 20 | 45 | 25 | 20 |
| 11 | 17 | 15 | 15 | 15 | 18 | 15 | 70 | 20 | 30 | 35 | 35 | 20 |
| 12 | 16 | 15 | 15 | 15 | 20 | 15 | 100 | 20 | 40 | 40 | 40 | 20 |
| 13 | 16 | 15 | 110 | 15 | 20 | 15 | 70 | 20 | 35 | 35 | 110 | 20 |
| 14 | 16 | 15 | 90 | 17 | 60 | 15 | 65 | 20 | 30 | 80 | 50 | 20 |
| 15 | 16 | 15 | 35 | 17 | 90 | 15 | 35 | 30 | 25 | 50 | 45 | 20 |
| 16 | 15 | 15 | 35 | 17 | 85 | 15 | 90 | 18 | 25 | 30 | 20 | 20 |
| 17 | 16 | 15 | 30 | 17 | 70 | 15 | 85 | 20 | 20 | 30 | 50 | 25 |
| 18 | 16 | 15 | 30 | 17 | 85 | 15 | 50 | 20 | 20 | 40 | 45 | 30 |
| 19 | 16 | 15 | 25 | 17 | 80 | 15 | 60 | 20 | 20 | 70 | 30 | 35 |
| 20 | 30 | 15 | 20 | 17 | 70 | 15 | 90 | 20 | 20 | 75 | 30 | 30 |
| 21 | 20 | 16 | 20 | 20 | 60 | 15 | 60 | 20 | 25 | 40 | 25 | 30 |
| 22 | 17 | 16 | 25 | 18 | 60 | 15 | 80 | 20 | 25 | 35 | 25 | 45 |
| 23 | 17 | 15 | 20 | 18 | 60 | 15 | 40 | 20 | 25 | 40 | 25 | 40 |
| 24 | 15 | 15 | 18 | 18 | 35 | 18 | 35 | 20 | 25 | 45 | 40 | 30 |
| 25 | 15 | 20 | 18 | 18 | 50 | 20 | 35 | 30 | 25 | 40 | 40 | 35 |
| 26 | 15 | 20 | 30 | 16 | 50 | 20 | 30 | 40 | 25 | 30 | 35 | 40 |
| 27 | 15 | 16 | 15 | 16 | 40 | 20 | 35 | 35 | 25 | 25 | 30 | 50 |
| 28 | 17 | 15 | 15 | 16 | 80 | 20 | 40 | 25 | 25 | 25 | 30 | 45 |
| 29 | 17 | 60 | 20 | 25 | ------ | 20 | 70 | 20 | 25 | 30 | 30 | 45 |
| 30 | 17 | 20 | 15 | 60 | ------ | 20 | 45 | 20 | 35 | 40 | 35 | 35 |
| 31 | 17 | ------ | 15 | 60 | ------ | 40 | ------ | 20 | ------ | 50 | 35 | ------ |
| TOTAL | 524 | 518 | 893 | 742 | 1,353 | 748 | 1,890 | 738 | 755 | 1,380 | 1,145 | 965 |
| MEAN | 16.9 | 17.3 | 28.8 | 23.9 | 48.3 | 24.1 | 63.0 | 23.8 | 25.2 | 44.5 | 36.9 | 32.2 |
| MAX | 30 | 60 | 110 | 60 | 90 | 80 | 100 | 40 | 40 | 80 | 110 | 55 |
| MIN | 15 | 15 | 15 | 15 | 18 | 15 | 30 | 18 | 20 | 20 | 20 | 20 |
| AC-FT | 1,040 | 1,030 | 1,770 | 1,470 | 2,680 | 1,480 | 3,750 | 1,460 | 1,500 | 2,740 | 2,270 | 1,910 |

CAL YR 1968: TOTAL 9,383 MEAN 25.6 MAX 110 MIN 15 AC-FT 18,610
WTR YR 1969: TOTAL 11,651 MEAN 31.9 MAX 110 MIN 15 AC-FT 23,110

NOTE.--No gage-height record for entire year.

## 16-7509. Kohala ditch at Honokane, near Niulii

LOCATION.--Lat 20°09'50", long 155°43'50", Hawaii, on land of Honokane, on Honokane trail at tunnel adit, 28 ft from right side of tunnel, and 4.4 miles south of Niulii.

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

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

EXTREMES.--Period of record: Maximum daily discharge, 96 cfs May 24, 1964; no flow at times.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream. Water is used for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26 | 16 | 25 | 22 | 61 | 76 | 70 | 45 | 27 | 62 | 56 | 62 |
| 2 | 24 | 16 | 21 | 21 | 49 | 60 | 83 | 49 | 26 | 65 | 55 | 65 |
| 3 | 23 | 16 | 27 | 42 | 74 | 48 | 66 | 55 | 37 | 39 | 44 | 46 |
| 4 | 21 | 16 | 63 | 50 | 48 | 64 | 59 | 66 | 57 | 30 | 37 | 56 |
| 5 | 20 | 16 | 55 | 41 | 36 | 56 | 59 | 45 | 38 | 27 | 33 | 40 |
| 6 | 19 | 16 | 43 | 54 | 28 | 63 | 54 | 39 | 30 | 62 | 56 | 34 |
| 7 | 19 | 16 | 34 | 36 | 25 | 13 | 74 | 36 | 27 | 73 | 55 | 30 |
| 8 | 19 | 16 | 26 | 30 | 23 | 8.0 | 65 | 35 | 26 | 73 | 39 | 30 |
| 9 | 19 | 16 | 24 | 41 | 22 | 12 | 55 | 36 | 25 | 59 | 31 | 29 |
| 10 | 19 | 16 | 23 | 28 | 22 | 6.0 | 51 | 35 | 26 | 56 | 36 | 29 |
| 11 | 19 | 16 | 26 | 21 | 21 | 4.5 | 65 | 36 | 57 | 46 | 49 | 30 |
| 12 | 17 | 16 | 26 | 21 | 22 | 4.7 | 77 | 36 | 67 | 49 | 47 | 30 |
| 13 | 17 | 16 | 88 | 26 | 25 | 4.6 | 63 | 33 | 50 | 40 | 83 | 28 |
| 14 | 17 | 16 | 73 | 27 | 63 | 4.4 | 58 | 32 | 38 | 71 | 41 | 30 |
| 15 | 17 | 16 | 48 | 25 | 80 | 4.3 | 43 | 42 | 32 | 57 | 42 | 31 |
| 16 | 19 | 16 | 44 | 24 | 76 | 4.7 | 74 | 52 | 30 | 40 | 29 | 30 |
| 17 | 18 | 16 | 10 | 23 | 63 | 11 | 70 | 41 | 29 | 41 | 59 | 30 |
| 18 | 18 | 16 | 21 | 23 | 74 | 17 | 56 | 34 | 27 | 48 | 56 | 31 |
| 19 | 20 | 19 | 34 | 22 | 70 | 5.9 | 66 | 32 | 27 | 77 | 36 | 52 |
| 20 | 42 | 19 | 30 | 23 | 69 | 5.3 | 77 | 30 | 26 | 80 | 34 | 48 |
| 21 | 39 | 19 | 35 | 38 | 60 | 4.2 | 62 | 28 | 26 | 51 | 32 | 48 |
| 22 | 34 | 18 | 30 | 26 | 62 | 4.2 | 72 | 28 | 28 | 44 | 30 | 56 |
| 23 | 27 | 17 | 28 | 23 | 63 | 3.8 | 52 | 35 | 30 | 50 | 32 | 51 |
| 24 | 21 | 20 | 28 | 22 | 47 | 5.2 | 47 | 45 | 27 | 54 | 46 | 46 |
| 25 | 19 | 33 | 28 | 25 | 62 | 26 | 46 | 38 | 26 | 55 | 46 | 50 |
| 26 | 18 | 31 | 42 | 23 | 64 | 20 | 41 | 63 | 25 | 39 | 39 | 52 |
| 27 | 18 | 23 | 31 | 21 | 51 | 44 | 49 | 62 | 26 | 34 | 33 | 59 |
| 28 | 18 | 38 | 26 | 21 | 73 | 44 | 54 | 40 | 30 | 30 | 33 | 57 |
| 29 | 17 | 54 | 33 | 39 | ------ | 38 | 62 | 33 | 35 | 38 | 39 | 57 |
| 30 | 17 | 38 | 27 | 65 | ------ | 35 | 54 | 30 | 52 | 48 | 54 | 49 |
| 31 | 17 | ------ | 24 | 62 | ------ | 50 | ------ | 28 | ------ | 59 | 46 | ------ |
| TOTAL | 658 | 617 | 1,073 | 965 | 1,433 | 746.8 | 1,824 | 1,239 | 1,007 | 1,597 | 1,348 | 1,286 |
| MEAN | 21.2 | 20.6 | 34.6 | 31.1 | 51.2 | 24.1 | 60.8 | 40.0 | 33.6 | 51.5 | 43.5 | 42.9 |
| MAX | 42 | 54 | 88 | 65 | 80 | 76 | 83 | 66 | 67 | 80 | 83 | 65 |
| MIN | 17 | 16 | 10 | 21 | 21 | 3.8 | 41 | 28 | 25 | 27 | 29 | 29 |
| AC-FT | 1,310 | 1,220 | 2,130 | 1,910 | 2,840 | 1,480 | 3,620 | 2,460 | 2,000 | 3,170 | 2,670 | 2,550 |

CAL YR 1968: TOTAL 11,733.8 MEAN 32.1 MAX 88 MIN 0 AC-FT 23,270
WTR YR 1969: TOTAL 13,793.8 MEAN 37.8 MAX 88 MIN 3.8 AC-FT 27,360

NOTE.--No gage-height record Jan. 11 to Mar. 11, May 15 to July 8.

HAWAII, ISLAND OF HAWAII

16-7510. Kohala ditch at Pololu, near Niulii

LOCATION.--Lat 20°10'19", long 155°44'20", Hawaii, on right bank of open section of ditch, on land of Pololu, 0.5 mile upstream from Pololu Strean, and 3.7 miles south of Niulii.

PERIOD OF RECORD.--August 1927 to June 1938, September 1938 to current year.

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

EXTREMES.--Period of record: Maximum daily discharge, 102 cfs May 24, Oct. 19, 1964; no flow at times.

REMARKS.--Records good. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream and all streams west. Water is used for irrigation in vicinity of Kohala.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 26 | 17 | 26 | 24 | 63 | 78 | 74 | 48 | 29 | 65 | 60 | 67 |
| 2 | 25 | 17 | 23 | 23 | 51 | 62 | 78 | 54 | 28 | 68 | 42 | 67 |
| 3 | 24 | 17 | 31 | 46 | 76 | 50 | 72 | 64 | 39 | 41 | 48 | 50 |
| 4 | 22 | 17 | 65 | 59 | 50 | 66 | 65 | 69 | 59 | 32 | 40 | 62 |
| 5 | 21 | 17 | 62 | 45 | 38 | 58 | 65 | 48 | 40 | 29 | 35 | 42 |
| 6 | 20 | 17 | 45 | 58 | 29 | 65 | 64 | 42 | 32 | 64 | 64 | 34 |
| 7 | 20 | 17 | 36 | 38 | 26 | 14 | 76 | 38 | 29 | 75 | 60 | 32 |
| 8 | 20 | 17 | 27 | 32 | 24 | 7.1 | 71 | 37 | 28 | 75 | 40 | 32 |
| 9 | 20 | 17 | 25 | 44 | 23 | 13 | 62 | 38 | 27 | 65 | 34 | 31 |
| 10 | 20 | 17 | 24 | 30 | 23 | 5.6 | 58 | 37 | 28 | 62 | 38 | 31 |
| 11 | 20 | 17 | 27 | 22 | 22 | 4.1 | 71 | 38 | 59 | 49 | 54 | 32 |
| 12 | 18 | 17 | 29 | 22 | 23 | 3.5 | 78 | 39 | 71 | 54 | 48 | 32 |
| 13 | 18 | 17 | 82 | 28 | 25 | 3.4 | 70 | 35 | 52 | 42 | 76 | 31 |
| 14 | 17 | 17 | 75 | 29 | 65 | 3.2 | 65 | 34 | 40 | 69 | 50 | 32 |
| 15 | 18 | 17 | 53 | 27 | 82 | 3.1 | 50 | 44 | 34 | 64 | 51 | 33 |
| 16 | 21 | 17 | 49 | 26 | 78 | 3.8 | 76 | 54 | 32 | 43 | 33 | 33 |
| 17 | 19 | 17 | 12 | 25 | 65 | 13 | 73 | 43 | 31 | 45 | 66 | 32 |
| 18 | 19 | 17 | 22 | 24 | 76 | 20 | 63 | 36 | 29 | 52 | 62 | 34 |
| 19 | 20 | 20 | 35 | 23 | 72 | 5.0 | 72 | 34 | 29 | 73 | 39 | 57 |
| 20 | 45 | 20 | 31 | 24 | 71 | 4.4 | 77 | 32 | 28 | 76 | 36 | 50 |
| 21 | 40 | 20 | 36 | 40 | 62 | 3.2 | 64 | 30 | 28 | 58 | 34 | 52 |
| 22 | 34 | 20 | 32 | 28 | 64 | 3.2 | 74 | 30 | 30 | 48 | 33 | 62 |
| 23 | 28 | 18 | 30 | 24 | 65 | 3.0 | 54 | 37 | 32 | 56 | 34 | 56 |
| 24 | 22 | 21 | 30 | 23 | 49 | 5.7 | 49 | 47 | 29 | 58 | 51 | 50 |
| 25 | 20 | 34 | 30 | 26 | 64 | 46 | 48 | 40 | 28 | 60 | 49 | 54 |
| 26 | 19 | 32 | 44 | 24 | 66 | 23 | 45 | 66 | 27 | 42 | 41 | 60 |
| 27 | 18 | 27 | 33 | 22 | 53 | 49 | 52 | 64 | 28 | 35 | 35 | 64 |
| 28 | 19 | 41 | 28 | 22 | 75 | 48 | 59 | 42 | 32 | 32 | 34 | 62 |
| 29 | 18 | 61 | 35 | 41 | ------ | 40 | 68 | 35 | 37 | 42 | 39 | 62 |
| 30 | 18 | 39 | 29 | 67 | ------ | 38 | 61 | 32 | 54 | 52 | 60 | 54 |
| 31 | 17 | ------ | 25 | 64 | ------ | 56 | ------ | 30 | ------ | 66 | 49 | ------ |
| TOTAL | 686 | 659 | 1.131 | 1.030 | 1.480 | 797.3 | 1.955 | 1.317 | 1.069 | 1.692 | 1.435 | 1.390 |
| MEAN | 22.1 | 22.0 | 36.5 | 33.2 | 52.9 | 25.7 | 65.2 | 42.5 | 35.6 | 54.6 | 46.3 | 46.3 |
| MAX | 45 | 61 | 82 | 67 | 82 | 78 | 78 | 69 | 71 | 76 | 76 | 67 |
| MIN | 17 | 17 | 12 | 22 | 22 | 3.0 | 45 | 30 | 27 | 29 | 33 | 31 |
| AC-FT | 1.360 | 1.310 | 2.240 | 2.040 | 2.940 | 1.580 | 3.880 | 2.610 | 2.120 | 3.360 | 2.850 | 2.760 |

CAL YR 1968: TOTAL 12,142 MEAN 33.2 MAX 82 MIN 0 AC-FT 24,080
WTR YR 1969: TOTAL 14,641.3 MEAN 40.1 MAX 82 MIN 3.0 AC-FT 29,040

## 16-7560. Kohakohau Stream near Kamuela

LOCATION.--Lat 20°02'38", long 155°41'10", Hawaii, on left bank 0.6 mile upstream from Oolamakapehu Gulch and 1.7 miles northwest of Kamuela.

DRAINAGE AREA.--2.51 sq mi.

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1967, at site 0.5 mile upstream at different datums.

EXTREMES.--Current year: Maximum discharge, 405 cfs Mar. 18 (gage height, 4.59 ft), from rating curve extended above 46 cfs on basis of computation of flow over dam at gage height 6.20 ft; no flow Oct. 18, 19, Oct. 27 to Nov. 28.
Period of record: Maximum discharge, 3,880 cfs Aug. 7, 1958 (gage height, 10.76 ft, site and datum then in use), from rating curve extended above 70 cfs by test of model of station site; no flow Oct. 18, 19, Oct. 27 to Nov. 28, 1968.

REMARKS.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.9 | 0 | 1.5 | .74 | 7.8 | 76 | 48 | 6.0 | .95 | 8.0 | 15 | 18 |
| 2 | 2.3 | 0 | 2.0 | .60 | 16 | 29 | 67 | 5.8 | .88 | 7.3 | 3.8 | 46 |
| 3 | 1.7 | 0 | 2.4 | 3.3 | 93 | 8.0 | 34 | 9.5 | 5.2 | 2.2 | 7.0 | 12 |
| 4 | .88 | 0 | 15 | 13 | 45 | 12 | 24 | 20 | 6.6 | 1.3 | 3.4 | 23 |
| 5 | .60 | 0 | 17 | 14 | 6.0 | 22 | 22 | 4.1 | 2.5 | 1.0 | 3.5 | 9.3 |
| 6 | .43 | 0 | 7.0 | 40 | 3.0 | 44 | 11 | 2.8 | 1.7 | 14 | 27 | 4.3 |
| 7 | .35 | 0 | 5.4 | 15 | 2.2 | 22 | 30 | 2.3 | 1.5 | 27 | 20 | 3.0 |
| 8 | .26 | 0 | 2.1 | 5.0 | 1.7 | 7.3 | 37 | 1.8 | 1.3 | 24 | 4.0 | 2.4 |
| 9 | .22 | 0 | 1.5 | 35 | 1.6 | 22 | 21 | 1.7 | 1.1 | 9.5 | 2.4 | 2.0 |
| 10 | .18 | 0 | 1.3 | 23 | 1.4 | 7.3 | 15 | 1.4 | .88 | 9.5 | 6.4 | 1.8 |
| 11 | .10 | 0 | .88 | 4.1 | 1.2 | 3.3 | 55 | 1.3 | 8.3 | 4.4 | 10 | 1.7 |
| 12 | .08 | 0 | .60 | 2.4 | 1.0 | 2.7 | 104 | 1.3 | 16 | 5.4 | 12 | 1.5 |
| 13 | .06 | 0 | 86 | 1.8 | .88 | 2.2 | 62 | 1.2 | 3.5 | 2.4 | 64 | 1.3 |
| 14 | .04 | 0 | 50 | 2.7 | 19 | 1.8 | 45 | 1.0 | 2.4 | 32 | 76 | 1.4 |
| 15 | .04 | 0 | 8.3 | 1.7 | 64 | 1.6 | 24 | 1.0 | 1.4 | 8.8 | 98 | 1.3 |
| 16 | .03 | 0 | 40 | 1.7 | 75 | 5.4 | 50 | 1.1 | 1.2 | 3.3 | 20 | 1.2 |
| 17 | .01 | 0 | 21 | 1.3 | 24 | 21 | 44 | .88 | .95 | 3.3 | 40 | 1.1 |
| 18 | 0 | 0 | 17 | 1.0 | 38 | 54 | 28 | .95 | .74 | 6.4 | 30 | 2.4 |
| 19 | 0 | 0 | 4.3 | .88 | 32 | 10 | 36 | .81 | .60 | 36 | 8.3 | 5.2 |
| 20 | .04 | 0 | 2.7 | .74 | 35 | 6.4 | 47 | .60 | .67 | 58 | 9.5 | 2.4 |
| 21 | .22 | 0 | 3.4 | 17 | 15 | 3.8 | 25 | .67 | .56 | 9.5 | 4.3 | 11 |
| 22 | .22 | 0 | 2.0 | 3.0 | 32 | 3.1 | 48 | .67 | .74 | 4.7 | 3.1 | 9.3 |
| 23 | .22 | 0 | 1.6 | 1.6 | 25 | 2.7 | 12 | 1.4 | .74 | 10 | 4.1 | 6.0 |
| 24 | .10 | 0 | 1.3 | 1.2 | 12 | 5.4 | 5.0 | 2.8 | .60 | 19 | 15 | 2.7 |
| 25 | .04 | 0 | 2.2 | 1.0 | 34 | 42 | 3.8 | 1.8 | .52 | 17 | 10 | 2.3 |
| 26 | .01 | 0 | 2.9 | .74 | 49 | 7.8 | 2.9 | 18 | .52 | 4.0 | 5.2 | 13 |
| 27 | 0 | 0 | 1.6 | .60 | 17 | 3.4 | 6.8 | 13 | .39 | 2.7 | 5.4 | 16 |
| 28 | 0 | 0 | 1.4 | .52 | 41 | 2.5 | 15 | 2.7 | .39 | 1.8 | 4.7 | 19 |
| 29 | 0 | 14 | 1.7 | 9.0 | ------ | 2.0 | 27 | 1.6 | .60 | 6.6 | 5.8 | 17 |
| 30 | 0 | 3.8 | 1.1 | 31 | ------ | 1.8 | 16 | 1.3 | 1.7 | 8.0 | 19 | 7.2 |
| 31 | 0 | ------ | .88 | 16 | ------ | 5.2 | ------ | 1.2 | ------ | 24 | 11 | ------ |
| TOTAL | 10.03 | 17.8 | 306.06 | 249.62 | 692.78 | 438.2 | 965.5 | 110.68 | 65.13 | 371.1 | 547.9 | 244.8 |
| MEAN | .32 | .59 | 9.87 | 8.05 | 24.7 | 14.1 | 32.2 | 3.57 | 2.17 | 12.0 | 17.7 | 8.16 |
| MAX | 2.3 | 14 | 86 | 40 | 93 | 76 | 104 | 20 | 16 | 58 | 98 | 46 |
| MIN | 0 | 0 | .60 | .52 | .88 | 1.6 | 2.9 | .60 | .39 | 1.0 | 2.4 | 1.1 |
| AC-FT | 20 | 35 | 607 | 495 | 1,370 | 869 | 1,920 | 220 | 129 | 736 | 1,090 | 486 |

CAL YR 1968 TOTAL 2,828.74 MEAN 7.73 MAX 175 MIN 0 AC-FT 5,610
WTR YR 1969 TOTAL 4,019.60 MEAN 11.0 MAX 104 MIN 0 AC-FT 7,970

PEAK DISCHARGE (BASE, 310 CFS).--Dec. 16 (1630) 380 cfs (4.54 ft); Mar. 18 (0045) 405 cfs (4.59 ft).

## 16-7565. Keanuiomano Stream near Kamuela

LOCATION.--Lat 20°01'48", long 155°42'05", Hawaii, on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 miles west of Kamuela.

DRAINAGE AREA.--4.30 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,410 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 825 cfs Mar. 18 (gage height, 5.73 ft); no flow many days.
Period of record: Maximum discharge, 3,540 cfs Apr. 20, 1968 (gage height, 10.02 ft), from rating curve extended above 910 cfs on basis of contracted-opening measurement at gage height 8.26 ft; no flow at times most years.

REMARKS.--Records good. Two Parker Ranch pipeline diversions above station. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 0 | .03 | .28 | 6.5 | 128 | 73 | 4.3 | .23 | 5.2 | 14 | 27 |
| 2 | 1.3 | 0 | 0 | .19 | 11 | 26 | 122 | 4.6 | .15 | 4.9 | 3.1 | 40 |
| 3 | 1.4 | 0 | .28 | .18 | 169 | 7.1 | 37 | 5.0 | 2.2 | 1.6 | 4.9 | 8.4 |
| 4 | .55 | 0 | 10 | 10 | 69 | 9.2 | 23 | 16 | 5.6 | .76 | 2.7 | 20 |
| 5 | .33 | 0 | 16 | 12 | 5.7 | 18 | 22 | 2.8 | 1.6 | .55 | 1.6 | 5.7 |
| 6 | .21 | 0 | 3.8 | 57 | 2.4 | 70 | 8.8 | 1.5 | .70 | 8.5 | 24 | 3.1 |
| 7 | .13 | 0 | 4.4 | 13 | 1.5 | 18 | 27 | .73 | .46 | 21 | 39 | 2.0 |
| 8 | .07 | 0 | 1.2 | 4.6 | 1.1 | 6.4 | 41 | .02 | .36 | 22 | 3.3 | 1.5 |
| 9 | .07 | 0 | .52 | 50 | .88 | 20 | 19 | .01 | .23 | 8.8 | 1.5 | 1.3 |
| 10 | .08 | 0 | .52 | 23 | .76 | 6.4 | 13 | .01 | .17 | 7.9 | 3.8 | 1.2 |
| 11 | .05 | 0 | .21 | 4.0 | .63 | 3.3 | 95 | 0 | 4.3 | 2.9 | 8.2 | 1.0 |
| 12 | .02 | 0 | .06 | 1.8 | .30 | 2.1 | 218 | 0 | 14 | 5.1 | 11 | .85 |
| 13 | .01 | 0 | 171 | 1.2 | .01 | 1.5 | 103 | 0 | 2.2 | 1.8 | 96 | .76 |
| 14 | 0 | 0 | 72 | 1.6 | 18 | 1.2 | 55 | 0 | .82 | 33 | 133 | .73 |
| 15 | .01 | 0 | 8.2 | 1.2 | 101 | 1.1 | 23 | 0 | .38 | 7.8 | 189 | .73 |
| 16 | .01 | 0 | 58 | 1.0 | 139 | 2.8 | 69 | 0 | .27 | 2.6 | 18 | .63 |
| 17 | .01 | 0 | 20 | .79 | 21 | 18 | 55 | 0 | .21 | 2.0 | 40 | .57 |
| 18 | 0 | 0 | 15 | .59 | 34 | 112 | 35 | 0 | .16 | 3.9 | 30 | .59 |
| 19 | 0 | 0 | 3.9 | .43 | 28 | 8.8 | 31 | 0 | .14 | 37 | 7.1 | 3.9 |
| 20 | 0 | 0 | 1.6 | .31 | 36 | 6.4 | 57 | 0 | .14 | 93 | 8.6 | 1.8 |
| 21 | 0 | 0 | 1.8 | 13 | 21 | 3.5 | 24 | 0 | .12 | 10 | 3.8 | 7.6 |
| 22 | 0 | 0 | 1.2 | 2.7 | 35 | 2.6 | 62 | 0 | .11 | 3.7 | 2.4 | 7.2 |
| 23 | 0 | 0 | .94 | 1.1 | 21 | 2.0 | 12 | .02 | .22 | 6.2 | 3.1 | 4.7 |
| 24 | 0 | 0 | .73 | .68 | 10 | 3.8 | 5.5 | .98 | .40 | 17 | 13 | 2.0 |
| 25 | 0 | 0 | .70 | .52 | 35 | 49 | 4.1 | .52 | .40 | 18 | 7.8 | 1.5 |
| 26 | 0 | 0 | 1.8 | .34 | 81 | 8.2 | 3.1 | 8.7 | .26 | 3.1 | 4.0 | 10 |
| 27 | 0 | 0 | .97 | .22 | 15 | 3.1 | 4.6 | 12 | .23 | 1.7 | 4.1 | 16 |
| 28 | 0 | 0 | .76 | .13 | 44 | 2.0 | 11 | 1.5 | .12 | 1.1 | 3.5 | 15 |
| 29 | 0 | 8.4 | 1.0 | 4.2 | ------ | 1.5 | 23 | .76 | .27 | 3.4 | 4.6 | 13 |
| 30 | 0 | 2.3 | .59 | 35 | ------ | 1.2 | 13 | .50 | .88 | 7.0 | 14 | 6.4 |
| 31 | 0 | ------ | .41 | 11 | ------ | 3.4 | ------ | .36 | ------ | 19 | 8.6 | ------ |
| TOTAL | 5.45 | 10.7 | 397.62 | 252.06 | 907.78 | 546.6 | 1,289.1 | 60.31 | 37.33 | 360.51 | 707.7 | 205.16 |
| MEAN | .18 | .36 | 12.8 | 8.13 | 32.4 | 17.6 | 43.0 | 1.95 | 1.24 | 11.6 | 22.8 | 6.84 |
| MAX | 1.4 | 8.4 | 171 | 57 | 169 | 128 | 218 | 16 | 14 | 93 | 189 | 40 |
| MIN | 0 | 0 | 0 | .13 | .01 | 1.1 | 3.1 | 0 | .11 | .55 | 1.5 | .57 |
| AC-FT | 11 | 21 | 789 | 500 | 1,800 | 1,080 | 2,560 | 120 | 74 | 715 | 1,400 | 407 |

CAL YR 1968: TOTAL 3,509.24 MEAN 9.59 MAX 311 MIN 0 AC-FT 6,960
WTR YR 1969: TOTAL 4,780.32 MEAN 13.1 MAX 218 MIN 0 AC-FT 9,480

PEAK DISCHARGE (BASE, 550 CFS).--Dec. 16 (1730) 598 cfs (5.27 ft); Mar. 18 (0100) 825 cfs (5.73 ft).

## 16-7570. Waikoloa Stream near Kamuela

LOCATION.--Lat 20°03'17", long 155°40'01", Hawaii, on left bank 0.2 mile south of Puu Iki and 2.2 miles north of Kamuela.

DRAINAGE AREA.--0.78 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,570 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 620 cfs Mar. 18 (gage height, 4.61 ft), from rating curve extended above 95 cfs; minimum, 0.94 cfs Nov. 13-16, 18.
Period of record: Maximum discharge, 1,930 cfs Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 95 cfs; minimum, 0.74 cfs Sept. 28 to Oct. 7, 1965.

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

REVISIONS (FISCAL YEARS).--WSP 1155: 1948(M). WSP 1569: Drainage area. WSP 1937: 1949-50(P), 1951-60. WRD Hawaii 1967: 1966(M). Published records for high-water periods in fiscal years 1948-51, 1954-60, and water years 1960-61, 1963 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.3 | 1.3 | 2.5 | 1.7 | 5.2 | 37 | 43 | 9.1 | 2.4 | 6.3 | 7.5 | 15 |
| 2 | 2.2 | 1.3 | 3.5 | 1.6 | 8.0 | 12 | 43 | 8.9 | 3.0 | 6.3 | 3.8 | 15 |
| 3 | 2.1 | 1.3 | 4.5 | 11 | 51 | 6.1 | 27 | 7.5 | 10 | 3.2 | 5.6 | 7.8 |
| 4 | 1.7 | 1.2 | 15 | 10 | 20 | 6.5 | 21 | 9.1 | 7.5 | 2.6 | 3.7 | 13 |
| 5 | 1.5 | 1.2 | 12 | 9.3 | 4.3 | 12 | 18 | 5.4 | 3.6 | 2.4 | 5.1 | 6.3 |
| 6 | 1.4 | 1.1 | 10 | 12 | 3.0 | 21 | 17 | 4.2 | 2.8 | 8.8 | 17 | 4.6 |
| 7 | 1.4 | 1.1 | 5.5 | 6.5 | 2.6 | 8.9 | 25 | 3.6 | 2.6 | 8.9 | 12 | 3.8 |
| 8 | 1.3 | 1.1 | 3.0 | 3.8 | 2.2 | 5.9 | 26 | 3.2 | 2.4 | 11 | 4.0 | 3.7 |
| 9 | 1.3 | 1.1 | 2.5 | 16 | 2.2 | 12 | 15 | 3.1 | 2.3 | 8.0 | 3.0 | 3.6 |
| 10 | 1.3 | 1.2 | 2.0 | 8.0 | 2.1 | 6.1 | 11 | 3.0 | 2.6 | 7.5 | 7.4 | 3.2 |
| 11 | 1.1 | 1.1 | 1.5 | 3.4 | 2.1 | 4.8 | 40 | 2.7 | 20 | 5.2 | 6.1 | 3.1 |
| 12 | 1.1 | 1.0 | 1.5 | 2.4 | 1.9 | 3.7 | 71 | 2.7 | 16 | 4.8 | 8.5 | 2.8 |
| 13 | 1.1 | .94 | 70 | 2.2 | 1.8 | 3.4 | 32 | 2.7 | 5.0 | 3.2 | 29 | 2.8 |
| 14 | 1.2 | .94 | 25 | 2.7 | 32 | 3.0 | 28 | 2.6 | 3.6 | 11 | 45 | 3.1 |
| 15 | 1.2 | .94 | 5.0 | 2.3 | 55 | 2.8 | 16 | 3.0 | 3.0 | 5.2 | 46 | 3.1 |
| 16 | 1.2 | .94 | 7.0 | 2.3 | 50 | 14 | 30 | 4.8 | 2.8 | 3.2 | 13 | 3.0 |
| 17 | 1.2 | 1.0 | 9.0 | 1.9 | 11 | 26 | 27 | 4.3 | 2.6 | 3.6 | 23 | 2.8 |
| 18 | 1.2 | .94 | 8.0 | 1.8 | 12 | 54 | 15 | 3.2 | 2.4 | 7.6 | 20 | 3.7 |
| 19 | 1.2 | 1.4 | 4.0 | 1.8 | 8.6 | 8.0 | 17 | 3.0 | 2.6 | 14 | 8.0 | 6.7 |
| 20 | 1.6 | 1.4 | 2.8 | 1.7 | 13 | 5.9 | 24 | 2.7 | 2.4 | 26 | 9.1 | 4.0 |
| 21 | 1.6 | 1.1 | 2.4 | 5.9 | 68 | 4.2 | 15 | 2.4 | 2.3 | 5.9 | 5.6 | 13 |
| 22 | 1.6 | 1.1 | 2.4 | 2.8 | 12 | 4.0 | 22 | 2.4 | 2.8 | 4.4 | 4.8 | 9.1 |
| 23 | 1.4 | 1.1 | 2.3 | 2.1 | 9.8 | 3.8 | 8.9 | 5.0 | 2.7 | 12 | 6.3 | 6.1 |
| 24 | 1.3 | 1.0 | 2.1 | 1.8 | 8.3 | 11 | 6.1 | 7.2 | 2.3 | 19 | 11 | 3.7 |
| 25 | 1.2 | 1.2 | 2.7 | 1.7 | 15 | 34 | 5.0 | 4.3 | 2.3 | 9.4 | 7.0 | 3.2 |
| 26 | 1.2 | 1.5 | 3.4 | 1.6 | 27 | 8.0 | 4.6 | 18 | 2.3 | 3.8 | 5.0 | 8.5 |
| 27 | 1.2 | 1.2 | 2.4 | 1.6 | 9.1 | 4.6 | 12 | 8.8 | 2.3 | 3.0 | 4.6 | 9.4 |
| 28 | 1.2 | 2.0 | 2.3 | 1.5 | 16 | 4.0 | 20 | 3.6 | 2.3 | 2.7 | 6.3 | 9.1 |
| 29 | 1.3 | 14 | 2.6 | 5.8 | ------ | 3.2 | 20 | 3.0 | 3.6 | 5.8 | 7.5 | 9.4 |
| 30 | 1.3 | 4.0 | 2.2 | 11 | ------ | 3.7 | 12 | 2.7 | 5.2 | 5.6 | 10 | 7.5 |
| 31 | 1.3 | ------ | 1.8 | 6.1 | ------ | 9.4 | ------ | 2.6 | ------ | 12 | 7.5 | ------ |
| TOTAL | 43.2 | 50.70 | 220.9 | 144.3 | 392.0 | 343.0 | 671.6 | 148.8 | 127.7 | 232.4 | 352.4 | 190.1 |
| MEAN | 1.39 | 1.69 | 7.13 | 4.65 | 14.0 | 11.1 | 22.4 | 4.80 | 4.26 | 7.50 | 11.4 | 6.34 |
| MAX | 2.3 | 14 | 70 | 16 | 55 | 54 | 71 | 18 | 20 | 26 | 46 | 15 |
| MIN | 1.1 | .94 | 1.5 | 1.5 | 1.8 | 2.8 | 4.6 | 2.4 | 2.3 | 2.4 | 3.0 | 2.8 |
| AC-FT | 86 | 101 | 438 | 286 | 778 | 680 | 1330 | 295 | 253 | 461 | 699 | 377 |

CAL YR 1968: TOTAL 2,150.10 MEAN 5.87 MAX 91 MIN .94 AC-FT 4,260
WTR YR 1969: TOTAL 2,917.10 MEAN 7.99 MAX 71 MIN .94 AC-FT 5,790

PEAK DISCHARGE (BASE, 160 CFS).--Mar. 18 (0100) 620 cfs (4.61 ft).

NOTE.--No gage-height record Nov. 21 to Dec. 20.

## 16-7580. Waikoloa Stream at Marine Dam, near Kamuela

LOCATION.--Lat 20°02'48", long 155°39'58", Hawaii, on right bank 160 ft upstream from Marine Dam, 0.4 mile east of Puu Ohu, and 1.6 miles north of Kamuela.

DRAINAGE AREA.--1.18 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,460 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 662 cfs Mar. 18 (gage height, 4.51 ft), from rating curve extended as explained below; minimum, 0.94 cfs Nov. 14, 16, 18.
Period of record: Maximum discharge, 3,390 cfs Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 120 cfs on basis of computations of flow over dam at gage heights 5.46 and 5.96 ft; minimum, 0.59 cfs Oct. 3-6, 1965.

REMARKS.--Records good. Diversion above station for livestock and domestic use.

REVISIONS (FISCAL YEARS).--WSP 1569: Drainage area. WRD Hawaii 1967: 1966(M). Published records for high-water periods in fiscal years 1948-52, 1954-60, and water years 1960-63 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.0 | 1.2 | 2.8 | 2.2 | 6.9 | 48 | 46 | 11 | 2.9 | 7.2 | 10 | 18 |
| 2 | 5.3 | 1.2 | 4.1 | 2.0 | 11 | 15 | 61 | 11 | 3.5 | 7.5 | 4.8 | 16 |
| 3 | 3.2 | 1.2 | 6.0 | 15 | 73 | 8.1 | 35 | 8.4 | 12 | 3.6 | 6.9 | 9.2 |
| 4 | 2.3 | 1.2 | 24 | 17 | 29 | 8.4 | 25 | 11 | 11 | 2.9 | 4.8 | 16 |
| 5 | 2.0 | 1.2 | 19 | 14 | 6.0 | 15 | 22 | 6.2 | 4.4 | 2.5 | 5.7 | 7.5 |
| 6 | 1.9 | 1.2 | 16 | 18 | 3.8 | 26 | 20 | 5.1 | 3.5 | 10 | 22 | 5.1 |
| 7 | 1.8 | 1.1 | 8.9 | 9.8 | 3.2 | 12 | 34 | 4.3 | 3.0 | 12 | 16 | 4.1 |
| 8 | 1.7 | 1.1 | 3.6 | 5.3 | 2.8 | 7.8 | 35 | 3.8 | 2.9 | 15 | 5.5 | 3.8 |
| 9 | 1.8 | 1.1 | 2.6 | 26 | 2.6 | 15 | 20 | 3.5 | 2.8 | 10 | 4.0 | 3.6 |
| 10 | 1.7 | 1.2 | 2.3 | 13 | 2.5 | 8.6 | 15 | 3.3 | 2.8 | 11 | 9.0 | 3.3 |
| 11 | 1.6 | 1.1 | 2.0 | 4.6 | 2.5 | 6.7 | 55 | 3.2 | 27 | 6.4 | 8.4 | 3.0 |
| 12 | 1.6 | 1.1 | 2.0 | 3.0 | 2.4 | 5.1 | 91 | 3.0 | 25 | 6.0 | 9.2 | 2.9 |
| 13 | 1.5 | 1.0 | 94 | 2.9 | 2.3 | 4.4 | 47 | 3.0 | 7.2 | 3.8 | 34 | 2.8 |
| 14 | 1.5 | 1.0 | 33 | 3.8 | 45 | 3.8 | 35 | 2.9 | 4.6 | 15 | 63 | 3.0 |
| 15 | 1.5 | 1.1 | 7.8 | 3.0 | 78 | 3.6 | 20 | 3.3 | 3.5 | 7.2 | 67 | 2.9 |
| 16 | 1.4 | 1.0 | 10 | 2.9 | 66 | 19 | 38 | 5.3 | 3.2 | 4.3 | 16 | 2.8 |
| 17 | 1.4 | 1.1 | 12 | 2.5 | 15 | 35 | 35 | 4.8 | 2.9 | 4.1 | 29 | 2.5 |
| 18 | 1.4 | 1.0 | 12 | 2.3 | 17 | 67 | 22 | 3.8 | 2.8 | 9.0 | 25 | 3.3 |
| 19 | 1.4 | 1.4 | 5.1 | 2.2 | 12 | 11 | 20 | 3.5 | 2.8 | 21 | 10 | 6.9 |
| 20 | 1.9 | 1.3 | 3.5 | 2.2 | 16 | 8.1 | 30 | 3.2 | 2.6 | 38 | 11 | 4.1 |
| 21 | 1.7 | 1.2 | 3.0 | 9.5 | 11 | 5.5 | 20 | 2.9 | 2.4 | 9.2 | 6.7 | 16 |
| 22 | 1.8 | 1.2 | 2.9 | 3.8 | 16 | 5.1 | 32 | 2.9 | 3.0 | 6.0 | 5.3 | 10 |
| 23 | 1.6 | 1.2 | 2.8 | 2.6 | 14 | 4.6 | 13 | 5.8 | 2.9 | 16 | 6.9 | 8.4 |
| 24 | 1.5 | 1.1 | 2.5 | 2.4 | 14 | 11 | 8.4 | 8.9 | 2.5 | 29 | 14 | 4.4 |
| 25 | 1.4 | 1.5 | 3.3 | 2.2 | 23 | 49 | 6.7 | 5.3 | 2.4 | 15 | 7.5 | 4.0 |
| 26 | 1.3 | 1.9 | 4.3 | 2.2 | 34 | 11 | 5.8 | 23 | 2.4 | 5.8 | 5.3 | 11 |
| 27 | 1.3 | 1.4 | 3.0 | 2.0 | 13 | 6.4 | 13 | 13 | 2.4 | 4.1 | 4.8 | 14 |
| 28 | 1.3 | 2.6 | 2.8 | 1.9 | 20 | 4.8 | 26 | 4.6 | 2.5 | 3.5 | 6.4 | 13 |
| 29 | 1.4 | 22 | 3.2 | 8.1 | ------ | 4.0 | 27 | 3.5 | 3.5 | 6.4 | 7.5 | 13 |
| 30 | 1.3 | 5.8 | 2.6 | 17 | ------ | 4.0 | 14 | 3.2 | 5.3 | 7.5 | 11 | 10 |
| 31 | 1.2 | ------ | 2.3 | 8.1 | ------ | 11 | ------ | 3.0 | ------ | 14 | 7.8 | ------ |
| TOTAL | 55.7 | 62.7 | 303.4 | 211.4 | 542.0 | 444.0 | 871.9 | 179.7 | 159.7 | 313.0 | 444.5 | 224.6 |
| MEAN | 1.80 | 2.09 | 9.79 | 6.82 | 19.4 | 14.3 | 29.1 | 5.80 | 5.32 | 10.1 | 14.3 | 7.49 |
| MAX | 5.3 | 22 | 94 | 26 | 78 | 67 | 91 | 23 | 27 | 38 | 67 | 18 |
| MIN | 1.2 | 1.0 | 2.0 | 1.9 | 2.3 | 3.6 | 5.8 | 2.9 | 2.4 | 2.5 | 4.0 | 2.5 |
| AC-FT | 110 | 124 | 602 | 419 | 1,080 | 881 | 1,730 | 356 | 317 | 621 | 882 | 445 |

CAL YR 1968 TOTAL 2,833.1 MEAN 7.74 MAX 161 MIN 1.0 AC-FT 5,620
WTR YR 1969 TOTAL 3,812.6 MEAN 10.4 MAX 94 MIN 1.0 AC-FT 7,560

PEAK DISCHARGE (BASE, 160 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 2-3 | 1915 | 3.24 | 165 | 4-1 | 1915 | 3.23 | 163 |
| 3-18 | 0130 | 4.51 | 662 | 8-15 | 0115 | 3.35 | 192 |

## 16-7590. Hauani Gulch near Kamuela

LOCATION.--Lat 20°02'28", long 155°39'05", Hawaii, on left bank 800 ft downstream from small tributary and 1.8 miles northeast of Kamuela.

DRAINAGE AREA.--0.47 sq mi.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder and, since Feb. 27, 1963, concrete control. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark).

EXTREMES.--Current year: Maximum discharge, 200 cfs Mar. 17 (gage height, 3.22 ft), from rating curve extended above 37 cfs; no flow Nov. 9, 10.
Period of record: Maximum discharge, 503 cfs Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 11 cfs on basis of slope-conveyance study; no flow at times.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Diversion above station for livestock and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .19 | .04 | 2.5 | .10 | .70 | 10 | 13 | 2.2 | .34 | .62 | 1.4 | 4.1 |
| 2 | 4.4 | .03 | 7.2 | .10 | 1.0 | 2.5 | 17 | 1.6 | .50 | .62 | .77 | 2.9 |
| 3 | .67 | .04 | 2.0 | 1.5 | 18 | 1.0 | 7.3 | 1.2 | 2.1 | .28 | .96 | 1.4 |
| 4 | .25 | .03 | 1.8 | 2.0 | 5.0 | 1.0 | 5.8 | 1.5 | 1.4 | .22 | .67 | 2.6 |
| 5 | .18 | .03 | .43 | 1.5 | .50 | 2.5 | 4.2 | 1.0 | .56 | .20 | .94 | 1.0 |
| 6 | .15 | .02 | .22 | 2.0 | .30 | 4.0 | 4.1 | .94 | .41 | 1.9 | 3.8 | .80 |
| 7 | .13 | .02 | .15 | 1.0 | .25 | 2.0 | 10 | .86 | .37 | 1.5 | 2.6 | .69 |
| 8 | .16 | .01 | .11 | .80 | .20 | .80 | 9.6 | .79 | .37 | 2.3 | .85 | .65 |
| 9 | .12 | 0 | .10 | 3.0 | .20 | 2.5 | 3.7 | .72 | .34 | 1.4 | .64 | .61 |
| 10 | .12 | 0 | 23 | 1.0 | .20 | .90 | 2.3 | .70 | .37 | 2.0 | 1.9 | .57 |
| 11 | .12 | .02 | 13 | .60 | .20 | .70 | 18 | .66 | 6.3 | .93 | .91 | .52 |
| 12 | .12 | .03 | 1.8 | .40 | .20 | .53 | 31 | .56 | 5.0 | .71 | 2.0 | .47 |
| 13 | .10 | .05 | .97 | .25 | .20 | .44 | 11 | .49 | 1.0 | .43 | 6.4 | .44 |
| 14 | .10 | .06 | 1.7 | .26 | 10 | .41 | 6.9 | .46 | .56 | 3.0 | 19 | .46 |
| 15 | .09 | .05 | 1.9 | .40 | 20 | .38 | 3.7 | .56 | .45 | 1.1 | 15 | .42 |
| 16 | .08 | .05 | .83 | .25 | 15 | 5.9 | 10 | .72 | .37 | .55 | 3.0 | .40 |
| 17 | .08 | .06 | .38 | .25 | 2.0 | 13 | 8.9 | .61 | .34 | .69 | 6.1 | .37 |
| 18 | .10 | .06 | .29 | .20 | 2.5 | 16 | 5.2 | .49 | .31 | 1.8 | 3.5 | .52 |
| 19 | .17 | .05 | .23 | .20 | 2.0 | 1.9 | 3.2 | .48 | .34 | 4.9 | 1.3 | .91 |
| 20 | .11 | .04 | .25 | .20 | 2.5 | 1.1 | 7.4 | .49 | .28 | 7.4 | 1.2 | .53 |
| 21 | .09 | .04 | .20 | 1.0 | 1.5 | .72 | 3.5 | .45 | .28 | 1.3 | .85 | 4.4 |
| 22 | .08 | .04 | 1.8 | .40 | 2.0 | .65 | 7.6 | .46 | .28 | .90 | .72 | 1.3 |
| 23 | .05 | .12 | .68 | .25 | 1.5 | .53 | 2.0 | .74 | .25 | 4.5 | .75 | .85 |
| 24 | .06 | .07 | 7.0 | .25 | 1.5 | 1.6 | 1.3 | 1.3 | .25 | 8.3 | 1.7 | .62 |
| 25 | .05 | .05 | 1.3 | .20 | 2.5 | 13 | 1.0 | .82 | .25 | 2.3 | .90 | .53 |
| 26 | .06 | 2.0 | .60 | .20 | 4.0 | 1.9 | .91 | 5.6 | .25 | .95 | .74 | 3.0 |
| 27 | .06 | .80 | .40 | .20 | 1.5 | .89 | 2.6 | 1.8 | .22 | .72 | .75 | 2.3 |
| 28 | .05 | .16 | .25 | .20 | 2.0 | .68 | 7.5 | .62 | .25 | .57 | 1.1 | 1.6 |
| 29 | .05 | .09 | .40 | .90 | ------ | .53 | 7.0 | .45 | .28 | 2.2 | 1.1 | 1.8 |
| 30 | .04 | .56 | .20 | 2.0 | ------ | .62 | 2.3 | .41 | .37 | 1.1 | 1.2 | 1.2 |
| 31 | .04 | ------ | .15 | .80 | ------ | 1.5 | ------ | .37 | ------ | 3.2 | .85 | ------ |
| TOTAL | 8.07 | 4.62 | 71.84 | 22.41 | 97.45 | 90.18 | 218.01 | 30.05 | 24.39 | 58.59 | 83.60 | 37.96 |
| MEAN | .26 | .15 | 2.32 | .72 | 3.48 | 2.91 | 7.27 | .97 | .81 | 1.89 | 2.70 | 1.27 |
| MAX | 4.4 | 2.0 | 23 | 3.0 | 20 | 16 | 31 | 5.6 | 6.3 | 8.3 | 19 | 4.4 |
| MIN | .04 | 0 | .10 | .10 | .20 | .38 | .91 | .37 | .22 | .20 | .64 | .37 |
| AC-FT | 16 | 9.2 | 142 | 44 | 193 | 179 | 432 | 60 | 48 | 116 | 166 | 75 |

CAL YR 1968 TOTAL 520.20 MEAN 1.42 MAX 32 MIN 0 AC-FT 1,030
WTR YR 1969 TOTAL 747.17 MEAN 2.05 MAX 31 MIN 0 AC-FT 1,480

PEAK DISCHARGE (BASE, 78 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12-24 | 0530 | 2.68 | 92 | 8-15 | 0030 | 2.62 | 84 |
| 3-17 | 2400 | 3.22 | 200 | | | | |

NOTE.--No gage-height record Jan. 15 to Mar. 10.

## 16-7592. Right Branch Waiaha Stream near Holualoa

LOCATION.--Lat 19°38'41", long 155°54'55", Hawaii, on right bank 1,000 ft upstream from reservoir, 1.0 mile northeast of Holualoa Makai Camp, and 2.9 miles northeast of Holualoa School.

DRAINAGE AREA.--1.89 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,630 cfs Oct. 3 (gage height, 5.78 ft), from rating curve extended as explained below; no flow many days.

Period of record: Maximum discharge, 1,630 cfs Oct. 3, 1968 (gage height, 5.78 ft), from rating curve extended above 1.3 cfs on basis of slope-area measurements at gage heights 4.07 and 5.78 ft; no flow at times each year.

REVISIONS.--The maximum discharge for the water year 1967 has been revised to 466 cfs Apr. 25, 1967 (gage height, 4.86 ft), superseding figure published in WRD Hawaii, 1967.

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

REVISIONS.--Some figures of peak discharge for the water year 1967 have been revised as shown in the following table. They supersede figures published in WRD Hawaii, 1967.

REVISED PEAK DISCHARGE.--1967: Apr. 1 (1845) 290 cfs (4.50 ft; Apr. 25 (1700) 466 cfs (4.86 ft).

Published records for high-water periods in water years 1963-65 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .21 | 0 | 0 | .02 | .20 | 3.9 | 0 | .70 | .01 | .05 | 5.3 | .25 |
| 2 | 4.4 | .01 | 0 | .02 | .08 | .42 | 0 | .72 | .01 | 2.4 | 8.3 | .21 |
| 3 | 98 | .01 | 0 | .03 | .26 | .21 | 0 | .25 | .02 | .39 | 1.5 | .19 |
| 4 | 1.9 | .01 | 0 | .09 | .11 | 7.5 | 0 | .12 | .03 | .14 | .63 | .62 |
| 5 | .42 | .01 | 0 | 7.6 | .04 | .42 | .39 | .10 | .02 | .07 | .21 | 1.2 |
| 6 | .21 | .01 | 0 | 9.3 | .02 | .14 | .09 | .19 | .01 | .05 | .16 | .51 |
| 7 | .10 | .01 | 0 | 3.4 | .01 | .08 | .02 | .44 | .02 | .06 | .11 | .19 |
| 8 | .08 | 0 | 0 | .59 | .01 | .05 | .01 | .12 | .04 | .10 | .09 | .12 |
| 9 | .07 | 0 | 0 | 10 | .01 | .47 | 0 | .11 | .02 | .16 | .17 | .10 |
| 10 | .05 | 0 | 0 | .51 | .01 | .16 | 0 | .10 | .02 | .10 | 1.5 | .10 |
| 11 | .04 | 0 | 0 | .17 | .01 | .07 | .25 | .06 | .63 | .14 | .12 | .23 |
| 12 | .02 | 0 | 0 | .09 | .01 | .05 | .07 | .06 | .84 | .09 | .12 | 1.1 |
| 13 | .02 | 0 | 0 | .06 | .01 | .03 | .02 | .02 | .30 | .06 | 1.6 | .30 |
| 14 | .02 | 0 | .02 | .05 | .01 | .02 | .01 | .02 | .17 | .05 | .27 | .12 |
| 15 | .02 | 0 | .01 | .03 | .20 | .02 | .01 | .01 | .08 | .05 | .14 | .10 |
| 16 | .02 | 0 | .50 | .02 | 6.3 | .01 | .01 | .01 | .05 | .06 | .10 | .25 |
| 17 | .02 | 0 | 3.0 | .02 | 2.0 | .01 | .01 | .01 | .04 | .04 | .09 | .16 |
| 18 | .01 | 0 | 1.8 | .01 | .42 | .01 | .01 | .01 | .04 | .03 | 17 | .19 |
| 19 | .01 | 0 | .36 | .01 | 3.6 | .01 | .03 | .01 | .04 | .02 | 3.0 | .21 |
| 20 | .01 | 0 | .23 | .31 | .42 | .01 | .04 | .01 | .03 | .04 | 1.9 | .14 |
| 21 | .01 | 0 | .25 | .52 | .19 | 0 | .02 | .01 | .02 | .05 | .48 | .10 |
| 22 | .01 | 0 | .09 | .07 | .12 | 0 | .04 | .02 | .04 | .30 | .19 | .08 |
| 23 | .01 | 0 | .07 | .03 | .09 | 0 | .04 | .02 | .11 | .41 | 1.2 | .07 |
| 24 | .01 | 0 | .04 | .02 | .07 | 0 | .02 | .02 | .12 | .16 | .36 | .06 |
| 25 | .01 | 0 | .33 | .01 | .06 | 0 | .01 | .01 | .09 | .07 | .17 | .05 |
| 26 | .01 | 0 | .23 | .01 | .04 | 0 | .01 | .01 | .11 | .08 | .11 | .03 |
| 27 | 0 | 0 | .08 | .01 | .04 | 0 | .06 | .01 | .17 | .12 | .09 | .02 |
| 28 | 0 | 0 | .06 | .01 | .02 | 0 | .05 | .01 | .08 | .11 | .07 | .02 |
| 29 | 0 | 0 | .09 | 0 | ------ | 0 | .01 | .01 | .06 | .08 | .11 | .01 |
| 30 | 0 | 0 | .04 | 0 | ------ | 0 | .49 | .01 | .06 | .07 | .25 | .02 |
| 31 | 0 | ------ | .03 | 0 | ------ | 0 | ------ | .01 | ------ | .07 | .42 | ------ |
| TOTAL | 105.69 | .06 | 7.23 | 33.01 | 14.36 | 13.59 | 1.72 | 3.21 | 3.28 | 5.62 | 45.76 | 6.75 |
| MEAN | 3.41 | .002 | .23 | 1.06 | .51 | .44 | .057 | .10 | .11 | .18 | 1.48 | .22 |
| MAX | 98 | .01 | 3.0 | 10 | 6.3 | 7.5 | .49 | .72 | .84 | 2.4 | 17 | 1.2 |
| MIN | 0 | 0 | 0 | 0 | .01 | 0 | 0 | .01 | .01 | .02 | .07 | .01 |
| AC-FT | 210 | .1 | 14 | 65 | 28 | 27 | 3.4 | 6.4 | 6.5 | 11 | 91 | 13 |

CAL YR 1968: TOTAL 336.82 MEAN .92 MAX 98 MIN 0 AC-FT 668
WTR YR 1969: TOTAL 240.28 MEAN .66 MAX 98 MIN 0 AC-FT 477

PEAK DISCHARGE (BASE, 78 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 3 | 1430 | 5.78 | 1,630 | 3- 4 | 1430 | 3.51 | 100 |
| 1- 5 | 1430 | 3.46 | 94 | 8- 2 | 1530 | 3.80 | 138 |
| 1- 9 | 0730 | 3.52 | 101 | 8-18 | 1800 | 4.30 | 230 |

## 16-7593. Waiaha Stream at Luawai, near Holualoa

LOCATION.--Lat 19°38'12", long 155°55'45", Hawaii, on right bank at Luawai, 1.8 miles northeast of Holualoa School, and 4.2 miles southeast of Honokohau School.

DRAINAGE AREA.--8.74 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 3,100 cfs Oct. 3 (gage height, 8.46 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 3,100 cfs Oct. 3, 1968 (gage height, 8.46 ft), from rating curve extended above 33 cfs on basis of slope-area measurements at gage heights 4.34, 4.51, and 8.46 ft; no flow at times each year.

REMARKS.--Records good. Huehue Ranch diverts entire low flow of a tributary above station for domestic use.

REVISIONS (WATER YEAR).--Published records for a high-water period in the water year 1965 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .20 | | 0 | 0 | 0 | 1.7 | 0 | .02 | 0 | .03 | 6.9 | .28 |
| 2 | 7.0 | | .03 | 0 | 0 | .12 | 0 | .39 | 0 | 5.5 | 26 | .15 |
| 3 | 224 | | .01 | 0 | .60 | .07 | 0 | .15 | 0 | .60 | 2.6 | .64 |
| 4 | 7.5 | | 0 | 0 | .01 | 3.4 | 0 | .05 | 0 | .20 | 6.2 | 2.0 |
| 5 | .87 | | 0 | 12 | 0 | .04 | .06 | .04 | 0 | .09 | .32 | 4.0 |
| 6 | .35 | | 0 | 20 | 0 | .03 | .01 | .21 | 0 | .03 | .25 | 3.0 |
| 7 | .15 | | 0 | 7.8 | 0 | .02 | 0 | 1.3 | 0 | .02 | .15 | .52 |
| 8 | .11 | | 0 | .87 | 0 | .01 | 0 | .14 | .01 | .16 | .12 | .30 |
| 9 | .07 | | 0 | 22 | 0 | .18 | 0 | .57 | 0 | .22 | 2.6 | .20 |
| 10 | .05 | | 0 | .76 | 0 | .09 | 0 | .25 | 0 | .12 | 3.6 | .37 |
| 11 | .04 | | 0 | .22 | 0 | .01 | 0 | .04 | 1.2 | .20 | .35 | .87 |
| 12 | .02 | | 0 | .09 | 0 | 0 | 0 | .11 | 1.8 | .11 | .40 | 5.3 |
| 13 | .03 | | 0 | .04 | 0 | 0 | 0 | .01 | .40 | .06 | 2.1 | .80 |
| 14 | .03 | | 0 | .01 | 0 | 0 | 0 | 0 | .12 | .04 | .40 | .28 |
| 15 | .02 | | 0 | 0 | 0 | 0 | 0 | 0 | .04 | .04 | .35 | .15 |
| 16 | .04 | | .54 | 0 | 5.8 | 0 | 0 | 0 | .03 | .04 | .18 | .12 |
| 17 | .02 | | 4.9 | 0 | 1.9 | 0 | 0 | 0 | .02 | .03 | .12 | .09 |
| 18 | .02 | | 2.2 | 0 | .44 | 0 | 0 | 0 | .02 | .03 | 97 | .25 |
| 19 | .01 | | .35 | 0 | 1.1 | 0 | 0 | 0 | .02 | .03 | 18 | .28 |
| 20 | .01 | | .18 | 0 | .11 | 0 | 0 | 0 | .02 | .10 | 8.6 | .14 |
| 21 | 0 | | .22 | 0 | .04 | 0 | 0 | 0 | .02 | .05 | 1.0 | .08 |
| 22 | 0 | | .06 | 0 | 0 | 0 | 0 | 0 | .02 | .03 | .30 | .05 |
| 23 | 0 | | .02 | 0 | 0 | 0 | 0 | 0 | .03 | .15 | 2.5 | .02 |
| 24 | 0 | | .01 | 0 | 0 | 0 | 0 | 0 | .06 | .07 | .56 | .01 |
| 25 | 0 | | .16 | 0 | 0 | 0 | 0 | 0 | .05 | .02 | .30 | .01 |
| 26 | 0 | | .14 | 0 | 0 | 0 | 0 | 0 | .18 | .02 | .18 | .01 |
| 27 | 0 | | .03 | 0 | 0 | 0 | .03 | 0 | .12 | .03 | .09 | .01 |
| 28 | 0 | | .01 | 0 | 0 | 0 | .01 | 0 | .05 | .03 | .06 | .01 |
| 29 | 0 | | .01 | 0 | ------ | 0 | 0 | 0 | .04 | .02 | .08 | .01 |
| 30 | 0 | | 0 | 0 | ------ | 0 | .04 | 0 | .03 | .02 | .33 | .01 |
| 31 | 0 | ------ | 0 | 0 | ------ | 0 | ------ | 0 | ------ | .01 | .64 | ------ |
| TOTAL | 240.54 | 0 | 8.87 | 63.79 | 10.00 | 5.67 | .15 | 3.28 | 4.28 | 8.10 | 182.28 | 19.96 |
| MEAN | 7.76 | 0 | .29 | 2.06 | .36 | .18 | .005 | .11 | .14 | .26 | 5.88 | .67 |
| MAX | 224 | 0 | 4.9 | 22 | 5.8 | 3.4 | .06 | 1.3 | 1.8 | 5.5 | 97 | 5.3 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .06 | .01 |
| AC-FT | 477 | 0 | 18 | 127 | 20 | 11 | .3 | 6.5 | 8.5 | 16 | 362 | 40 |

CAL YR 1968: TOTAL 709.95 MEAN 1.94 MAX 224 MIN 0 AC-FT 1,410
WTR YR 1969: TOTAL 546.92 MEAN 1.50 MAX 224 MIN 0 AC-FT 1,080

PEAK DISCHARGE (BASE, 140 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 3 | 1500 | 8.46 | 3,100 | 8- 2 | 1600 | 4.91 | 604 |
| 1- 9 | 0730 | 3.75 | 212 | 8-18 | 1730 | 6.01 | 1,200 |

## 16-7598. Kiilae Stream near Honaunau

LOCATION.--Lat 19°24'52", long 155°50'56", Hawaii, on right bank 2.4 miles northeast of Kealia and 3.0 miles southeast of Honaunau Post Office.

DRAINAGE AREA.--0.67 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

EXTREMES.--Current year: Maximum discharge, 26 cfs Nov. 29 (gage height, 1.59 ft); no flow many days. Period of record: Maximum discharge, 104 cfs Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 5.7 cfs; no flow at times each year.

REMARKS.--Records good. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .01 | 0 | .11 | 0 | 0 | .04 | 0 | .10 | 0 | .06 | 1.9 | .48 |
| 2 | .01 | 0 | .54 | .01 | 0 | .02 | 0 | .03 | 0 | .06 | .14 | .07 |
| 3 | .38 | .04 | 2.0 | .22 | 0 | 0 | .39 | .13 | 0 | .71 | .13 | .06 |
| 4 | .10 | .04 | .12 | .47 | 0 | 0 | .06 | .03 | 0 | .05 | .05 | .16 |
| 5 | .03 | 0 | .04 | 1.6 | 0 | 0 | .14 | .06 | 0 | 0 | 0 | .07 |
| 6 | .01 | 0 | .02 | 4.7 | 0 | .29 | .04 | .09 | 0 | 0 | 0 | .03 |
| 7 | 0 | 0 | 0 | .76 | 0 | .04 | .02 | .16 | 0 | 1.2 | 0 | .01 |
| 8 | 0 | 0 | 0 | .14 | 0 | 0 | .01 | .33 | 0 | .15 | 0 | 0 |
| 9 | 0 | 0 | .01 | 2.7 | 0 | 1.1 | 0 | .51 | 0 | .10 | 0 | 0 |
| 10 | 0 | 0 | .02 | .16 | 0 | .26 | 0 | .09 | 0 | .14 | 1.4 | .02 |
| 11 | 0 | 0 | .06 | .04 | 0 | .06 | .14 | .11 | .07 | .78 | .06 | .18 |
| 12 | 0 | 0 | .03 | .01 | 0 | .02 | .22 | .07 | .31 | .08 | .20 | .04 |
| 13 | .02 | 0 | 0 | 0 | 0 | .13 | .07 | 0 | .04 | .03 | .61 | .01 |
| 14 | .03 | 0 | 0 | 0 | 0 | .09 | 0 | 0 | .02 | .21 | .11 | 0 |
| 15 | 0 | .40 | 1.6 | 0 | .96 | .03 | 0 | 0 | 0 | .57 | .04 | 0 |
| 16 | .18 | .01 | 1.0 | 0 | .89 | 0 | 0 | 0 | 0 | .25 | 0 | 0 |
| 17 | .22 | .01 | 3.5 | 0 | 1.4 | .11 | .03 | 0 | 0 | .01 | .25 | 0 |
| 18 | .10 | 0 | 2.0 | 0 | .15 | .10 | .24 | 0 | 0 | 0 | 1.5 | 0 |
| 19 | .04 | 0 | .12 | 0 | .03 | .24 | .52 | 0 | .01 | 0 | .34 | .05 |
| 20 | .16 | 0 | .18 | 0 | 0 | .08 | .13 | 0 | 0 | 1.3 | .10 | 0 |
| 21 | .03 | 0 | .08 | 0 | 0 | .12 | .03 | 0 | .03 | 1.2 | .68 | 0 |
| 22 | 0 | 0 | 0 | 0 | .24 | .07 | .01 | 0 | 0 | .26 | .33 | 0 |
| 23 | .02 | 0 | 0 | 0 | .10 | .04 | .01 | 0 | .04 | .04 | .10 | 0 |
| 24 | 0 | 0 | 0 | 0 | .01 | .14 | 0 | 0 | .85 | .03 | .10 | .15 |
| 25 | 0 | 0 | .47 | 0 | 0 | .08 | 0 | 0 | .07 | 0 | .15 | .20 |
| 26 | 0 | 0 | .08 | 0 | 0 | .03 | .10 | 0 | .02 | 0 | .41 | .05 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | .36 | .11 | .09 | 0 | .02 | 0 |
| 28 | 0 | 0 | .01 | 0 | 0 | 0 | .06 | .01 | .06 | 0 | .03 | 0 |
| 29 | 0 | 3.2 | .03 | 0 | ------ | 0 | .01 | 0 | .02 | .01 | .04 | .12 |
| 30 | 0 | .40 | 0 | 0 | ------ | 0 | .14 | 0 | .98 | .02 | .10 | .24 |
| 31 | 0 | ------ | 0 | 0 | ------ | 0 | ------ | 0 | ------ | 0 | 1.0 | ------ |
| TOTAL | 1.34 | 4.10 | 12.02 | 10.81 | 3.78 | 3.09 | 2.73 | 1.83 | 2.61 | 7.26 | 9.77 | 1.94 |
| MEAN | .043 | .14 | .39 | .35 | .14 | .10 | .091 | .059 | .087 | .23 | .32 | .065 |
| MAX | .38 | 3.2 | 3.5 | 4.7 | 1.4 | 1.1 | .52 | .51 | .98 | 1.3 | 1.9 | .48 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 2.7 | 8.1 | 24 | 21 | 7.5 | 6.1 | 5.4 | 3.6 | 5.2 | 14 | 19 | 3.8 |

CAL YR 1968: TOTAL 86.53 MEAN .24 MAX 5.0 MIN 0 AC-FT 172
WTR YR 1969: TOTAL 61.28 MEAN .17 MAX 4.7 MIN 0 AC-FT 122

PEAK DISCHARGE (BASE, 25 CFS).--Nov. 29 (1400) 26 cfs (1.59 ft).

## 16-7640. Hilea Gulch tributary near Honuapo

LOCATION.--Lat 19°10'27", long 155°35'58", Hawaii, on right bank 0.5 mile upstream from mouth, 6.6 miles northwest of Honuapo, and 6.7 miles west of Punaluu.

DRAINAGE AREA.--9.17 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,100 cfs Jan. 5 (gage height, 6.11 ft), from rating curve extended above 75 cfs; no flow Jan. 24-26, 28, 29.
Period of record: Maximum discharge, 1,220 cfs Dec. 30, 1966 (gage height, 6.35 ft), from rating curve extended above 75 cfs; no flow at times each year.

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

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 35 | .83 | 13 | .01 | .60 | 12 | 4.7 | 25 | .72 | .13 | 4.5 | 17 |
| 2 | 4.7 | .26 | 23 | .01 | .73 | 10 | .44 | 3.6 | .13 | 39 | 1.9 | 3.7 |
| 3 | 59 | .15 | 17 | .02 | .46 | 31 | 8.1 | 6.3 | .13 | 92 | 1.6 | .76 |
| 4 | 21 | .11 | 3.1 | 11 | .10 | 7.4 | 9.9 | 31 | .23 | 28 | .79 | .72 |
| 5 | 31 | .08 | 3.0 | 236 | 12 | 49 | 7.4 | 34 | .13 | 6.8 | .20 | 1.4 |
| 6 | 12 | .04 | 9.1 | 80 | 3.9 | 4.5 | .87 | 5.5 | .06 | 24 | .13 | 2.5 |
| 7 | 8.3 | .02 | 8.5 | 28 | 2.3 | .87 | .26 | 3.8 | .03 | 18 | .09 | 2.6 |
| 8 | 2.3 | .02 | 3.1 | 4.0 | 2.1 | 32 | .13 | 2.5 | .08 | 6.6 | .08 | 9.7 |
| 9 | .87 | .02 | 1.3 | 8.9 | .75 | 16 | 1.8 | 1.1 | .23 | 2.0 | .47 | 6.2 |
| 10 | .64 | .01 | .62 | 3.0 | .43 | 3.4 | 1.4 | 1.9 | .76 | 2.5 | 1.5 | 17 |
| 11 | .60 | .01 | .34 | .41 | .30 | .94 | .48 | 1.4 | 1.2 | .72 | .57 | 3.9 |
| 12 | 20 | .01 | .72 | .28 | .17 | .43 | .11 | .26 | .48 | .16 | 1.3 | 1.6 |
| 13 | 3.6 | .92 | .32 | .18 | .07 | .25 | .10 | .15 | .33 | .11 | 29 | .40 |
| 14 | 1.2 | 8.4 | 10 | .14 | 2.6 | .17 | 8.2 | .11 | .07 | 3.5 | 3.6 | .30 |
| 15 | 1.0 | 11 | 13 | .11 | 17 | .10 | .56 | 2.7 | .02 | 1.4 | 48 | .21 |
| 16 | 14 | 5.1 | 23 | .10 | 4.8 | .07 | .40 | 4.8 | .30 | .96 | 63 | .16 |
| 17 | 3.5 | .77 | 62 | .06 | .77 | .90 | .28 | 1.1 | .24 | 6.4 | 53 | .23 |
| 18 | 2.6 | .73 | 22 | .03 | 1.3 | .27 | .10 | .30 | .02 | 1.6 | 84 | .39 |
| 19 | .76 | .39 | 2.6 | .02 | 32 | .06 | .04 | 1.1 | 16 | 70 | 80 | 1.1 |
| 20 | .40 | 12 | .76 | .02 | 5.5 | .03 | 3.6 | .83 | 1.6 | 56 | 13 | .23 |
| 21 | .33 | 1.1 | .54 | .02 | 6.4 | .02 | .50 | .63 | 2.9 | 5.1 | 5.4 | 57 |
| 22 | 6.7 | .17 | .55 | .02 | 4.9 | .02 | .04 | 1.1 | 9.4 | 34 | 28 | 11 |
| 23 | .67 | .08 | .34 | .01 | .26 | .39 | .02 | .28 | 1.0 | 16 | 6.5 | 9.0 |
| 24 | .38 | .07 | .15 | 0 | .13 | 9.5 | 3.7 | .16 | 1.3 | 9.4 | 42 | 11 |
| 25 | .23 | 21 | .13 | 0 | .15 | 11 | .55 | .15 | 1.6 | 41 | 3.8 | 2.5 |
| 26 | .17 | 1.8 | .12 | 0 | .09 | .84 | .65 | 6.3 | 4.0 | 5.0 | 14 | .44 |
| 27 | .19 | .17 | .07 | .01 | .03 | .25 | 3.1 | 7.9 | 3.0 | 1.2 | 3.8 | .66 |
| 28 | .21 | 5.7 | .07 | 0 | .02 | .25 | 1.0 | .35 | 1.7 | .35 | .64 | .48 |
| 29 | 3.9 | 40 | .05 | 0 | ------ | .13 | 3.3 | .16 | 1.1 | 43 | .40 | .16 |
| 30 | 22 | 40 | .02 | .04 | ------ | .13 | 18 | .15 | .30 | 8.8 | 27 | .15 |
| 31 | 2.8 | ------ | .02 | .19 | ------ | .35 | ------ | 1.8 | ------ | 33 | 44 | ------ |
| TOTAL | 260.05 | 150.96 | 218.52 | 372.58 | 99.86 | 192.27 | 79.73 | 146.43 | 49.06 | 556.73 | 562.27 | 162.49 |
| MEAN | 8.39 | 5.03 | 7.05 | 12.0 | 3.57 | 6.20 | 2.66 | 4.72 | 1.64 | 18.0 | 18.1 | 5.42 |
| MAX | 59 | 40 | 62 | 236 | 32 | 49 | 18 | 34 | 16 | 92 | 84 | 57 |
| MIN | .17 | .01 | .02 | 0 | .02 | .02 | .02 | .11 | .02 | .11 | .08 | .15 |
| AC-FT | 516 | 299 | 433 | 739 | 198 | 381 | 158 | 290 | 97 | 1,100 | 1,120 | 322 |

CAL YR 1968 TOTAL 3,108.53 MEAN 8.49 MAX 103 MIN 0 AC-FT 6,170
WTR YR 1969 TOTAL 2,850.95 MEAN 7.81 MAX 236 MIN 0 AC-FT 5,650

PEAK DISCHARGE (BASE, 600 CFS).--Jan. 5 (0745) 1,100 cfs (6.11 ft).

## 16-7650. Hilea Gulch tributary No. 2 near Honuapo

LOCATION.--Lat 19°10'17", long 155°36'05", Hawaii, on right bank 0.5 mile upstream from mouth, 6.3 miles northwest of Honuapo, and 6.6 miles west of Punaluu.

DRAINAGE AREA.--1.86 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 2,880 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 431 cfs Jan. 5 (gage height, 6.67 ft), from rating curve extended above 41 cfs; no flow many days.
Period of record: Maximum discharge, 523 cfs Dec. 30, 1966 (gage height, 7.16 ft), from rating curve extended above 41 cfs; no flow many days each year.

REMARKS.--Records good except those above 90 cfs, which are fair. No diversion above station.

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.6 | 0 | 2.4 | 0 | 0 | 2.5 | 0 | 9.0 | 0 | 0 | .60 | 4.6 |
| 2 | 0 | 0 | 4.6 | 0 | 0 | 3.0 | 0 | .51 | 0 | 33 | .10 | .42 |
| 3 | 17 | 0 | 3.0 | 0 | 0 | 13 | .44 | 2.0 | 0 | 43 | 0 | 0 |
| 4 | 1.4 | 0 | .26 | 4.7 | 0 | 2.3 | 1.2 | 11 | 0 | 11 | 0 | 0 |
| 5 | 3.0 | 0 | .14 | 148 | 1.4 | 31 | .52 | 10 | 0 | 1.7 | 0 | 0 |
| 6 | .10 | 0 | .97 | 46 | .05 | .90 | 0 | 84 | 0 | 14 | 0 | 0 |
| 7 | 0 | 0 | .57 | 13 | 0 | 0 | 0 | .02 | 0 | 14 | 0 | 0 |
| 8 | 0 | 0 | .09 | 1.1 | 0 | 2.1 | 0 | .02 | 0 | 2.8 | 0 | .86 |
| 9 | 0 | 0 | .01 | 2.9 | 0 | 2.2 | 0 | 0 | 0 | .05 | 0 | .35 |
| 10 | 0 | 0 | 0 | .48 | 0 | .16 | 0 | 0 | 0 | 0 | 0 | 2.6 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .10 |
| 12 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 |
| 14 | 0 | .81 | 3.5 | 0 | .19 | 0 | .76 | 0 | 0 | 1.5 | .31 | 0 |
| 15 | 0 | 1.5 | 3.0 | 0 | 4.6 | 0 | 0 | 0 | 0 | .04 | 23 | 0 |
| 16 | 1.4 | .31 | 8.3 | 0 | .42 | 0 | 0 | 0 | 0 | .13 | 39 | 0 |
| 17 | 0 | .01 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 1.7 | 30 | 0 |
| 18 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | .17 | 40 | 0 |
| 19 | 0 | 0 | .36 | 0 | 13 | 0 | 0 | 0 | 1.9 | 55 | 33 | 0 |
| 20 | 0 | 1.4 | 0 | 0 | 1.8 | 0 | .53 | 0 | .18 | 29 | 2.5 | 0 |
| 21 | 0 | .03 | 0 | 0 | .83 | 0 | .05 | 0 | .16 | 1.2 | .28 | 28 |
| 22 | .23 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0 | 1.1 | 17 | 12 | 1.5 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | 2.2 | 2.0 | 1.2 |
| 24 | 0 | 0 | 0 | 0 | 0 | .93 | 0 | 0 | 0 | 2.2 | 20 | 2.6 |
| 25 | 0 | 9.8 | 0 | 0 | 0 | 1.6 | 0 | 0 | 0 | 17 | 87 | .14 |
| 26 | 0 | .16 | 0 | 0 | 0 | 0 | 0 | .51 | .36 | 1.1 | 4.0 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .90 | .10 | 0 | .42 | 0 |
| 28 | 0 | .33 | 0 | 0 | 0 | 0 | 0 | 0 | .05 | 0 | 0 | 0 |
| 29 | 0 | 13 | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 11 | 0 | 0 |
| 30 | 4.2 | 12 | 0 | 0 | ------ | 0 | 3.4 | 0 | 0 | 2.2 | 11 | 0 |
| 31 | .13 | ------ | 0 | 0 | ------ | 0 | ------ | 0 | ------ | 8.1 | 17 | ------ |
| TOTAL | 34.46 | 39.35 | 96.20 | 216.18 | 24.39 | 59.69 | 7.30 | 34.80 | 3.86 | 269.09 | 247.08 | 42.37 |
| MEAN | 1.11 | 1.31 | 3.10 | 6.97 | .87 | 1.93 | .24 | 1.12 | .13 | 8.68 | 7.97 | 1.41 |
| MAX | 17 | 13 | 53 | 148 | 13 | 31 | 3.4 | 11 | 1.9 | 55 | 40 | 28 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 68 | 78 | 191 | 429 | 48 | 118 | 14 | 69 | 7.7 | 534 | 490 | 84 |

CAL YR 1968: TOTAL 928.21 MEAN 2.54 MAX 54 MIN 0 AC-FT 1,840
WTR YR 1969: TOTAL 1,074.77 MEAN 2.94 MAX 148 MIN 0 AC-FT 2,130

PEAK DISCHARGE (BASE, 310 CFS).--Jan. 5 (0730) 431 cfs (6.67 ft).

## 16-7670. Ninole Gulch near Punaluu

LOCATION.--Lat 19°10'44", long 155°33'46", Hawaii, on right bank 300 ft downstream from forest-reserve boundary, 4.6 miles northwest of Punaluu, and 6.0 miles north of Honuapo.

DRAINAGE AREA.--15.5 sq mi.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,100 cfs Jan. 5 (gage height, 6.40 ft), from rating curve extended above 30 cfs; no flow for many days.
Period of record: Maximum discharge, 2,100 cfs Jan. 5, 1969 (gage height, 6.40 ft), from rating curve extended above 30 cfs; no flow for many days each year.

REMARKS.--Records good except those above 60 cfs, which are poor. No diversion above station.

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.0 | 0 | 4.4 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | .06 | .79 |
| 2 | .50 | 0 | 15 | 0 | 0 | 0 | 0 | .10 | 0 | 22 | 0 | .04 |
| 3 | 15 | 0 | 9.2 | 0 | 0 | 57 | .89 | 0 | 0 | 124 | 0 | 0 |
| 4 | 5.0 | 0 | .85 | 4.2 | 0 | 4.5 | .04 | .54 | 0 | 15 | 0 | 0 |
| 5 | 7.5 | 0 | 1.4 | 324 | .10 | 56 | .70 | 16 | 0 | 3.4 | 0 | 0 |
| 6 | 2.0 | 0 | .46 | 53 | 0 | .90 | .04 | .96 | 0 | 5.0 | 0 | 0 |
| 7 | 1.0 | 0 | 2.3 | 12 | .06 | 0 | 0 | .36 | 0 | 5.1 | 0 | 0 |
| 8 | .10 | 0 | 0 | .54 | .11 | 21 | 0 | .78 | 0 | .30 | 0 | .08 |
| 9 | 0 | 0 | 0 | .60 | 0 | 4.1 | 0 | .04 | 0 | 0 | 0 | .04 |
| 10 | 0 | 0 | 0 | .05 | 0 | .42 | 0 | .08 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | .02 | 0 | .06 | 0 | 0 | 0 | 0 |
| 12 | 6.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | .30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.3 | 0 |
| 14 | .05 | 1.2 | 0 | 0 | .03 | 0 | .30 | 0 | 0 | 0 | 0 | 0 |
| 15 | .05 | 1.7 | .06 | 0 | .30 | 0 | 0 | .23 | 0 | 0 | 6.3 | 0 |
| 16 | 2.0 | 0 | .13 | 0 | 0 | 0 | 0 | .53 | 0 | 0 | 75 | 0 |
| 17 | .30 | 0 | 125 | 0 | 0 | 0 | 0 | .05 | 0 | 0 | 79 | 0 |
| 18 | .20 | 0 | 2.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 0 |
| 19 | 0 | 0 | .19 | 0 | .76 | 0 | 0 | .02 | .15 | 29 | 45 | 0 |
| 20 | 0 | 0 | 0 | 0 | .05 | 0 | 0 | 0 | .04 | 16 | 2.8 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .39 | .57 | 44 |
| 22 | .80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .24 | 18 | 14 | 4.0 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | 3.1 | .91 | .80 |
| 24 | 0 | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0 | 9.4 | 13 | .01 |
| 25 | 0 | 8.6 | 0 | 0 | 0 | 5.6 | .01 | 0 | 0 | 20 | .21 | 0 |
| 26 | 0 | 2.0 | 0 | 0 | 0 | .08 | 0 | .09 | 0 | .82 | 1.3 | 0 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | .28 | .11 | 0 | .01 | .22 | 0 |
| 28 | 0 | 11 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | 0 | 0 | 0 |
| 29 | 0 | 25 | 0 | 0 | ------ | 0 | .69 | 0 | 0 | 14 | 0 | 0 |
| 30 | 5.3 | 40 | 0 | 0 | ------ | 0 | 11 | 0 | 0 | .27 | 4.9 | 0 |
| 31 | .16 | ------ | 0 | 0 | ------ | 0 | ------ | 0 | ------ | 7.5 | 18 | ------ |
| TOTAL | 54.26 | 89.5 | 161.69 | 394.39 | 1.41 | 151.12 | 13.97 | 31.95 | 0.44 | 293.29 | 371.57 | 49.76 |
| MEAN | 1.75 | 2.98 | 5.22 | 12.7 | .050 | 4.87 | .47 | 1.03 | .015 | 9.46 | 12.0 | 1.66 |
| MAX | 15 | 40 | 125 | 324 | .76 | 57 | 11 | 16 | .24 | 124 | 108 | 44 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 108 | 178 | 321 | 782 | 2.8 | 300 | 28 | 63 | .9 | 582 | 737 | 99 |

CAL YR 1968 TOTAL 1,426.19 MEAN 3.90 MAX 130 MIN 0 AC-FT 2,830
WTR YR 1969 TOTAL 1,613.35 MEAN 4.42 MAX 324 MIN 0 AC-FT 3,200

PEAK DISCHARGE (BASE, 1,000 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1- 5 | 0745 | 6.40 | 2,100 | 8-18 | 1730 | 5.59 | 1,040 |
| 7- 3 | 1430 | 5.95 | 1,420 | | | | |

## 16-7705. Paauau Gulch at Pahala

LOCATION.--Lat 19°12'39", long 155°28'48", Hawaii, on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mile north of Pahala.

DRAINAGE AREA.--1.74 sq mi.

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

GAGE.--Water-stage recorder. Datum of gage is 972 ft above mean sea level (by stadia survey).

EXTREMES.--Current year: Maximum discharge, 3,600 cfs Jan. 5 (gage height, 5.90 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 3,600 cfs Jan. 5 1969 (gage height, 5.90 ft), from rating curve extended above 360 cfs on basis of slope-area measurement at gage height 4.40 ft; no flow most of time.

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

REVISIONS.--WRD Hawaii 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .88 | 0 | 1.6 | .01 | 0 | 0 | .04 | 0 | | 0 | 0 | |
| 2 | .14 | 0 | 3.4 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| 3 | 163 | 0 | 1.5 | 0 | 0 | .08 | 0 | 0 | | 1.3 | 0 | |
| 4 | 8.0 | 0 | .55 | 0 | 0 | .22 | 0 | .06 | | .56 | 0 | |
| 5 | .09 | 0 | .35 | 336 | 0 | .22 | .02 | .65 | | 0 | 0 | |
| 6 | .05 | 0 | .35 | 30 | .14 | .22 | .15 | 4.3 | | 0 | 0 | |
| 7 | .02 | 0 | .13 | 8.8 | .16 | .06 | 0 | .19 | | 0 | 0 | |
| 8 | 0 | 0 | 6.0 | 2.9 | .02 | 0 | .03 | 0 | | 0 | 0 | |
| 9 | 0 | 0 | .08 | 1.0 | 0 | 0 | .09 | 0 | | 0 | 0 | |
| 10 | .02 | 0 | .01 | .31 | .27 | .16 | 0 | 0 | | 0 | 0 | |
| 11 | 2.4 | 0 | 0 | 1.6 | 0 | .05 | 0 | .14 | | 0 | 0 | |
| 12 | .53 | 0 | 0 | .60 | 0 | 0 | 0 | 1.1 | | 0 | 0 | |
| 13 | .11 | 0 | 0 | .56 | 0 | 0 | 0 | 0 | | 0 | .10 | |
| 14 | 0 | 0 | 0 | .60 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| 15 | 0 | 2.4 | 0 | .01 | 0 | 0 | 0 | 0 | | 0 | .15 | |
| 16 | .04 | 0 | .04 | 0 | 0 | 0 | 0 | 0 | | 0 | .20 | |
| 17 | 0 | 0 | 4.2 | 0 | 0 | 0 | 0 | 0 | | 0 | .10 | |
| 18 | 0 | 1.3 | 7.1 | 0 | 0 | 0 | 0 | 0 | | 0 | .30 | |
| 19 | 0 | .31 | .08 | 0 | .25 | 0 | 0 | 1.2 | | 0 | .10 | |
| 20 | 0 | .40 | 0 | 0 | .19 | 0 | 0 | .02 | | 0 | 0 | |
| 21 | 0 | 0 | .27 | 0 | .16 | 0 | 0 | 0 | | 0 | 0 | |
| 22 | 0 | .12 | .09 | 0 | .02 | 0 | 0 | 0 | | 0 | .10 | |
| 23 | 0 | 0 | .02 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| 24 | 0 | 0 | 0 | 0 | .01 | .11 | 0 | 0 | | 0 | .15 | |
| 25 | 0 | 0 | 0 | 0 | .06 | .01 | 0 | .07 | | 0 | 0 | |
| 26 | 0 | 0 | 0 | 0 | .03 | 0 | 0 | 0 | | 0 | 0 | |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| 29 | 0 | .15 | 0 | 0 | ------ | 0 | 1.7 | 0 | | 0 | 0 | |
| 30 | 0 | 8.7 | 0 | 0 | ------ | 0 | .02 | 0 | | 0 | 0 | |
| 31 | 0 | ------ | .21 | 0 | ------ | 0 | ------ | 0 | ------ | 0 | 0 | ------ |
| TOTAL | 175.28 | 13.38 | 25.98 | 382.39 | 1.31 | 1.13 | 2.05 | 7.73 | 0 | 1.86 | 1.20 | 0 |
| MEAN | 5.65 | .45 | .84 | 12.3 | .047 | .036 | .068 | .25 | 0 | .060 | .039 | 0 |
| MAX | 163 | 8.7 | 7.1 | 336 | .27 | .22 | 1.7 | 4.3 | 0 | 1.3 | .30 | 0 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 348 | 26 | 52 | 758 | 2.6 | 2.2 | 4.1 | 15 | 0 | 3.7 | 2.4 | 0 |

CAL YR 1968: TOTAL 532.85 MEAN 1.46 MAX 163 MIN 0 AC-FT 1,060
WTR YR 1969: TOTAL 612.31 MEAN 1.68 MAX 336 MIN 0 AC-FT 1,210

PEAK DISCHARGE (BASE, 160 CFS).--Oct. 3 (1900) 3,390 cfs (5.83 ft); Jan. 5 (0800) 3,600 cfs (5.90 ft).

## 16-8000. Denni Spring

LOCATION.--Lat 15°11'57" N., long 145°46'05" E., Saipan, 2.8 miles southeast of Tanapag, 3.1 miles east of Garapan, and 5.6 miles northeast of Chalan Kanoa.

PERIOD OF RECORD.--August 1952 to June 1954 (published as Donni Spring near Garapan), February to April 1968, current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 261 ft (from U.S. Navy).

EXTREMES.--Period of record: Maximum daily discharge, 1.84 cfs Nov. 3, 4, 11, 12, 1952; minimum daily, 0.02 cfs Sept. 16, 17, 1969.

REMARKS.--Records good.

DISCHARGE, IN CUBIC FEET PER SECOND, JANUARY TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | .72 | .45 | .36 | .21 | .10 | .10 | .04 | .06 | .04 |
| 2 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .06 | .04 |
| 3 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .08 | .04 |
| 4 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .08 | .04 |
| 5 | | | | .60 | .45 | .36 | .21 | .10 | .10 | .04 | .08 | .04 |
| 6 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .08 | .04 |
| 7 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .10 | .04 |
| 8 | | | | .66 | .45 | .35 | .21 | .10 | .10 | .04 | .10 | .04 |
| 9 | | | | .66 | .45 | .36 | .21 | .10 | .10 | .04 | .10 | .04 |
| 10 | | | | .66 | .40 | .36 | .21 | .10 | .10 | .06 | .10 | .04 |
| 11 | | | | .66 | .45 | .28 | .21 | .10 | .10 | .06 | .10 | .04 |
| 12 | | | | .55 | .45 | .28 | .21 | .10 | .10 | .06 | .10 | .04 |
| 13 | | | | .55 | .45 | .28 | .21 | .10 | .06 | .06 | .08 | .04 |
| 14 | | | | .55 | .40 | .28 | .21 | .10 | .06 | .06 | .08 | .04 |
| 15 | | | | .55 | .40 | .28 | .21 | .10 | .06 | .06 | .08 | .04 |
| 16 | | | | .55 | .40 | .28 | .21 | .10 | .06 | .06 | .08 | .02 |
| 17 | | | | .55 | .45 | .28 | .21 | .10 | .06 | .06 | .08 | .02 |
| 18 | | | | .55 | .45 | .28 | .21 | .10 | .06 | .08 | .08 | .04 |
| 19 | | | | .45 | .45 | .28 | .15 | .10 | .06 | .08 | .06 | .04 |
| 20 | | | | .45 | .45 | .28 | .15 | .10 | .06 | .06 | .06 | .04 |
| 21 | | | | .45 | .45 | .28 | .15 | .10 | .06 | .06 | .06 | .04 |
| 22 | | | | .45 | .45 | .28 | .15 | .10 | .06 | .06 | .06 | .04 |
| 23 | | | | .45 | .45 | .28 | .15 | .10 | .06 | .06 | .06 | .20 |
| 24 | | | | .45 | .36 | .28 | .15 | .10 | .06 | .06 | .06 | .28 |
| 25 | | | | .45 | .36 | .28 | .15 | .10 | .06 | .06 | .06 | .24 |
| 26 | | | | .45 | .36 | .28 | .15 | .10 | .06 | .06 | .06 | .21 |
| 27 | | | | .45 | .36 | .21 | .15 | .10 | .06 | .06 | .06 | .18 |
| 28 | | | | .45 | .36 | .21 | .15 | .10 | .06 | .06 | .06 | .15 |
| 29 | | | | .45 | ------ | .21 | .15 | .10 | .06 | .06 | .06 | .12 |
| 30 | | | | .45 | ------ | .21 | .15 | .10 | .06 | .06 | .06 | .10 |
| 31 | | ------ | | .45 | ------ | .21 | ------ | .10 | ------ | .06 | .06 | ------ |
| TOTAL | | | | 16.96 | 11.95 | 9.13 | 5.58 | 3.10 | 2.28 | 1.72 | 2.30 | 2.32 |
| MEAN | | | | .55 | .43 | .29 | .19 | .10 | .076 | .055 | .074 | .077 |
| MAX | | | | .72 | .45 | .36 | .21 | .10 | .10 | .08 | .10 | .28 |
| MIN | | | | .45 | .36 | .21 | .15 | .10 | .06 | .04 | .06 | .02 |
| AC-FT | | | | 34 | 24 | 18 | 11 | 6.1 | 4.5 | 3.4 | 4.6 | 4.6 |

CAL YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969: TOTAL - MEAN - MAX - MIN - AC-FT -

## 16-8010. South Fork Talofofo Stream

LOCATION.--Lat 15°13'01" N., long 145°46'42" E., Saipan, on right bank 300 ft upstream from confluence with Middle and North Forks, 2.4 miles southeast of Tanapag, and 3.8 miles east of Garapan.

DRAINAGE AREA.--0.73 sq mi.

PERIOD OF RECORD.--Current year.

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map).

EXTREMES.--Maximum discharge, 1,230 cfs Nov. 19 (gage height, 7.18 ft, from rating curve extended above 1.2 cfs on basis of estimate of discharge from high-water marks; maximum gage height, 8.14 ft Nov. 2, from floodmark (backwater from vegetation); no flow most of time.

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

Discharge measurements made prior to beginning of continuous discharge record

| Date | Discharge (cfs) |
|---|---|
| Feb. 13, 1968 | 0.10 |
| Mar. 27 | No flow |
| May 3 | .10 |
| May 31 | .08 |
| July 24 | .17 |
| Aug. 30 | 7.7 |

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 10 | 2.5 | .60 | .25 | .11 | | | | 0 | | 0 |
| 2 | 1.0 | 100 | 2.3 | .60 | .25 | .16 | | | | 0 | | 0 |
| 3 | 1.0 | 15 | 2.1 | .60 | .30 | .13 | | | | 0 | | 0 |
| 4 | 1.0 | 5.0 | 2.0 | .60 | .20 | .11 | | | | 0 | | 0 |
| 5 | 1.0 | 4.0 | 1.9 | .60 | .20 | .09 | | | | 0 | | 0 |
| 6 | 1.0 | 3.5 | 1.8 | .60 | .18 | .06 | | | | 0 | | 0 |
| 7 | 1.0 | 3.5 | 1.7 | .60 | .15 | .03 | | | | 0 | | 0 |
| 8 | 1.0 | 3.2 | 1.6 | .50 | .15 | .02 | | | | 0 | | 0 |
| 9 | 1.0 | 3.2 | 1.5 | .50 | .15 | .02 | | | | 0 | | 0 |
| 10 | 1.0 | 3.1 | 1.4 | .50 | .15 | .02 | | | | 0 | | 0 |
| 11 | 1.0 | 3.0 | 1.3 | .40 | .15 | .01 | | | | 0 | | 0 |
| 12 | 2.0 | 2.8 | 1.2 | .40 | .15 | 0 | | | | 0 | | 0 |
| 13 | 2.0 | 2.8 | 1.1 | .40 | .15 | 0 | | | | 0 | | 0 |
| 14 | 1.0 | 3.1 | 1.0 | .40 | .15 | .03 | | | | 0 | | 0 |
| 15 | 1.0 | 16 | 1.0 | .40 | .15 | 0 | | | | 0 | | 0 |
| 16 | 1.0 | 11 | 1.0 | .40 | .15 | 0 | | | | 0 | | 0 |
| 17 | 1.0 | 3.0 | 1.0 | .40 | .18 | 0 | | | | 0 | | 0 |
| 18 | 1.0 | 4.3 | .90 | .40 | .15 | .03 | | | | 0 | | 0 |
| 19 | 1.0 | 60 | .90 | .30 | .20 | 0 | | | | 0 | | 0 |
| 20 | 1.0 | 32 | .90 | .30 | .18 | 0 | | | | 0 | | 0 |
| 21 | 1.0 | 3.1 | .90 | .30 | .17 | .02 | | | | 0 | | 0 |
| 22 | 5.0 | 4.1 | .90 | .30 | .18 | 0 | | | | 0 | | 0 |
| 23 | 50 | 11 | .80 | .30 | .19 | 0 | | | | 0 | | .38 |
| 24 | 6.0 | 4.0 | .80 | .25 | .17 | 0 | | | | 0 | | 0 |
| 25 | 5.0 | 3.4 | .80 | .30 | .16 | 0 | | | | 0 | | 0 |
| 26 | 4.0 | 3.3 | .80 | .25 | .15 | 0 | | | | 0 | | 0 |
| 27 | 3.5 | 3.0 | .70 | .25 | .14 | 0 | | | | 0 | | 0 |
| 28 | 3.0 | 2.9 | .70 | .30 | .14 | 0 | | | | .05 | | 0 |
| 29 | 3.0 | 2.5 | .70 | .25 | ------ | 0 | | | | 0 | | 0 |
| 30 | 2.5 | 2.9 | .70 | .25 | ------ | 0 | | | | 0 | | 0 |
| 31 | 2.5 | ------ | .70 | .25 | ------ | 0 | ------ | | ------ | .13 | | ------ |
| TOTAL | 107.7 | 328.7 | 37.60 | 12.50 | 4.89 | .84 | 0 | 0 | 0 | .18 | 0 | .38 |
| MEAN | 3.47 | 11.0 | 1.21 | .40 | .17 | .027 | 0 | 0 | 0 | .006 | 0 | .013 |
| MAX | 50 | 100 | 2.5 | .60 | .30 | .16 | 0 | 0 | 0 | .13 | 0 | .38 |
| MIN | 1.0 | 2.5 | .70 | .25 | .14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 214 | 652 | 75 | 25 | 9.7 | 1.7 | 0 | 0 | 0 | .4 | 0 | .8 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | |
| WTR YR 1969: | TOTAL | 492.79 | MEAN | 1.35 | MAX | 100 | MIN | 0 | AC-FT | 977 | |

PEAK DISCHARGE (BASE, 400 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-23 | /0330 | - | Unknown | 11-19 | 1400 | 7.18 | 1,230 |
| 11- 2 | /1200 | ≠8.14 | /1,000 | | | | |

/ About.
≠ From floodmark.
NOTE.--No gage-height record Oct. 2 to Nov. 7, Dec. 1 to Feb. 20.

## 16-8015. Middle Fork Talofofo Stream

LOCATION.--Lat 15°13'05" N., long 145°46'36" E., Saipan, on left bank 700 ft upstream from confluence with South and North Forks, 2.2 miles southeast of Tanapag, and 3.7 miles east of Garapan.
DRAINAGE AREA.--0.35 sq mi.
PERIOD OF RECORD.--February 1968 to current year.
GAGE.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map).
EXTREMES.--Current year: Maximum discharge, 526 cfs Nov. 19 (gage height, 5.22 ft), from rating curve extended above 1.1 cfs; minimum, 0.08 cfs July 3.
Period of record: Maximum discharge, 526 cfs Nov. 19, 1968 (gage height, 5.22 ft), from rating curve extended above 1.1 cfs; minimum, 0.08 cfs July 3, 1969.
REVISIONS.--The maximum discharge for the period February to September 1968 has been revised to 428 cfs June 28, 1968 (gage height, 4.64 ft), superseding figure published in WRD Hawaii, 1968.
REMARKS.--Records good except those above 10 cfs, which are poor. No diversion above station.
REVISIONS.--Revised figures of discharge, in cubic feet per second, for high-water periods in the water year 1968, superseding those published in WRD Hawaii, 1968, are given below:

| 1968 | | 1968-Con. | | 1968-Con. | |
|---|---|---|---|---|---|
| Apr. 11 | 10 | July 21 | 15 | Sept. 4 | 20 |
| 12 | 18 | 24 | 7.0 | 11 | 20 |
| May 17 | 6.1 | Sept. 2 | 25 | 12 | 17 |
| June 28 | 15 | 3 | 27 | | |

| Month | Cfs-days | Maximum | Minimum | Mean | Run-off in acre-feet |
|---|---|---|---|---|---|
| April 1968 | 37.15 | 18 | .17 | 1.24 | 74 |
| May | 14.48 | 6.1 | .23 | .467 | 29 |
| June | 23.16 | 15 | .20 | .772 | 46 |
| July | 51.49 | 15 | .31 | 1.66 | 102 |
| September | 170.10 | 27 | .78 | 5.67 | 340 |

REVISED PEAK DISCHARGE.--1968: Apr. 12 (0130) 160 cfs (3.23 ft); June 28 (0730) 428 cfs (4.64 ft); July 21 (time unknown) 143 cfs (3.12 ft); Sept. 2 (2200) 314 cfs (4.07 ft); Sept. 12 (1300) 142 cfs (3.11 ft).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .96 | 4.6 | 1.4 | .74 | .57 | .39 | .27 | .30 | .21 | .13 | .30 | .25 |
| 2 | .96 | 64 | 1.3 | .74 | .52 | .43 | .27 | .30 | .21 | .17 | .25 | .17 |
| 3 | .96 | 7.5 | 1.2 | .74 | .62 | .39 | .36 | .30 | .21 | .13 | .20 | .17 |
| 4 | .96 | 3.9 | 1.2 | .74 | .47 | .39 | .30 | .30 | .21 | .17 | .20 | .19 |
| 5 | .89 | 2.9 | 1.2 | .74 | .47 | .39 | .30 | .27 | .21 | .15 | .15 | .17 |
| 6 | .89 | 2.3 | 1.2 | .74 | .43 | .36 | .30 | .27 | .23 | .19 | .15 | .19 |
| 7 | .83 | 2.1 | 1.1 | .74 | .39 | .36 | .30 | .27 | .23 | .13 | .12 | .21 |
| 8 | .78 | 2.1 | 1.1 | .68 | .39 | .36 | .30 | .33 | .23 | .17 | .10 | .17 |
| 9 | .78 | 2.0 | 1.1 | .68 | .39 | .36 | .30 | .30 | .27 | .13 | .67 | .17 |
| 10 | .78 | 2.0 | 1.1 | .68 | .39 | .36 | .30 | .33 | .23 | .13 | .85 | .13 |
| 11 | .89 | 1.8 | 1.0 | .62 | .39 | .39 | .30 | .27 | .23 | .15 | .21 | .15 |
| 12 | 1.2 | 1.7 | 1.1 | .62 | .39 | .43 | .33 | .27 | .25 | .15 | .12 | .17 |
| 13 | 1.0 | 1.8 | .96 | .62 | .36 | .39 | .30 | .27 | .21 | .15 | .10 | .17 |
| 14 | .89 | 2.2 | .96 | .62 | .39 | .47 | .50 | .21 | .19 | .15 | .19 | .15 |
| 15 | .89 | 3.9 | .96 | .62 | .39 | .43 | .30 | .21 | .17 | .15 | .25 | .15 |
| 16 | .89 | 3.0 | .96 | .62 | .39 | .47 | .27 | .21 | .15 | .17 | .25 | .15 |
| 17 | .83 | 2.0 | 1.0 | .68 | .43 | .47 | .27 | .23 | .15 | .19 | .21 | .15 |
| 18 | .83 | 1.7 | .96 | .68 | .39 | .47 | .27 | .23 | .15 | .17 | .21 | .17 |
| 19 | .78 | 35 | .88 | .62 | .47 | .43 | .27 | .23 | .15 | .30 | .19 | .15 |
| 20 | .83 | 20 | .88 | .62 | .43 | .39 | .27 | .25 | .15 | .17 | .19 | .19 |
| 21 | .89 | 4.5 | .88 | .62 | .47 | .36 | .25 | .23 | .12 | .21 | .19 | .19 |
| 22 | 2.6 | 4.5 | .88 | .62 | .47 | .30 | .25 | .23 | .12 | .17 | .19 | .23 |
| 23 | 25 | 5.8 | .81 | .62 | .43 | .30 | .23 | .23 | .12 | .21 | .19 | 1.6 |
| 24 | 3.9 | 3.3 | .81 | .57 | .43 | .27 | .23 | .25 | .13 | .21 | .13 | .21 |
| 25 | 2.4 | 2.6 | .81 | .62 | .43 | .27 | .23 | .23 | .12 | .20 | .19 | .21 |
| 26 | 2.0 | 2.4 | .81 | .57 | .43 | .27 | .27 | .21 | .15 | .20 | .55 | .23 |
| 27 | 2.1 | 2.0 | .81 | .57 | .43 | .33 | .30 | .21 | .27 | .20 | .21 | .30 |
| 28 | 1.8 | 1.7 | .81 | .62 | .39 | .27 | .30 | .19 | .19 | .70 | .21 | .36 |
| 29 | 1.7 | 1.6 | .81 | .57 | ------ | .27 | .25 | .19 | .13 | .30 | .19 | .39 |
| 30 | 1.6 | 1.5 | .81 | .52 | ------ | .27 | .27 | .19 | .12 | .25 | .17 | .62 |
| 31 | 1.5 | ------ | .81 | .57 | ------ | .27 | ------ | .19 | ------ | 1.0 | .17 | ------ |
| TOTAL | 63.31 | 196.4 | 30.61 | 20.01 | 12.15 | 11.31 | 8.66 | 7.70 | 5.51 | 6.90 | 7.30 | 7.76 |
| MEAN | 2.04 | 6.55 | .99 | .65 | .43 | .36 | .29 | .25 | .18 | .22 | .24 | .26 |
| MAX | 25 | 64 | 1.4 | .74 | .62 | .47 | .50 | .33 | .27 | 1.0 | .85 | 1.6 |
| MIN | .78 | 1.5 | .81 | .52 | .36 | .27 | .23 | .19 | .12 | .13 | .10 | .13 |
| AC-FT | 126 | 390 | 61 | 40 | 24 | 22 | 17 | 15 | 11 | 14 | 14 | 15 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 377.62 | MEAN | 1.03 | MAX | 64 | MIN | .10 | AC-FT | 749 |

PEAK DISCHARGE (BASE, 150 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-23 | 0330 | 3.83 | 200 | 11-19 | 1430 | 5.22 | 526 |
| 11- 2 | 1200 | 5.00 | 460 | | | | |

## 16-8083. Finile River at Agat

LOCATION.--Lat 13°22'41" N., long 144°39'26" E., Guam, on right bank 0.4 mile upstream from estuary and 0.4 mile southeast of Agat School.

DRAINAGE AREA.--0.26 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 231 cfs Nov. 23 (gage height, 3.18 ft), from rating curve extended as explained below; minimum, 0.11 cfs July 14, 17, 18.
Period of record: Maximum discharge, 318 cfs Sept. 25, 1967 (gage height, 3.80 ft), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 3.66 ft; minimum, 0.09 cfs June 1, 3, July 6, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.0 | 2.6 | 3.6 | .86 | .62 | .39 | .22 | .22 | .22 | .19 | .44 | .44 |
| 2 | 1.8 | 2.4 | 3.3 | .86 | .62 | .34 | .22 | .19 | .19 | .16 | .22 | .78 |
| 3 | 1.5 | 2.2 | 2.9 | .78 | .62 | .34 | .22 | .19 | .19 | .16 | .30 | .95 |
| 4 | 4.7 | 2.0 | 3.1 | .78 | .62 | .34 | .19 | .19 | .19 | .16 | .70 | .50 |
| 5 | 2.4 | 1.9 | 2.6 | .86 | .62 | .34 | .19 | .22 | .19 | .16 | 1.2 | .56 |
| 6 | 2.0 | 2.0 | 2.4 | .86 | .56 | .34 | .19 | .26 | .19 | .16 | 1.3 | .50 |
| 7 | 1.9 | 2.0 | 2.4 | .95 | .56 | .30 | .19 | .39 | .19 | .19 | .56 | 2.8 |
| 8 | 1.9 | 1.9 | 2.4 | .95 | .56 | .30 | .19 | .26 | .19 | .16 | .39 | .70 |
| 9 | 3.0 | 1.9 | 2.2 | .95 | .56 | .30 | .19 | .22 | .19 | .16 | .39 | .50 |
| 10 | 1.8 | 1.9 | 2.2 | .95 | .56 | .26 | .19 | .22 | .19 | .16 | .44 | .50 |
| 11 | 1.5 | 3.0 | 2.0 | .95 | .56 | .26 | .22 | .19 | .19 | .16 | .34 | .39 |
| 12 | 1.9 | 2.4 | 2.0 | .95 | .56 | .26 | .22 | .19 | .16 | .19 | .30 | .34 |
| 13 | 3.1 | 2.2 | 1.9 | .95 | .56 | .26 | .22 | .19 | .16 | .16 | .34 | .50 |
| 14 | 3.0 | 2.4 | 1.9 | .95 | .56 | .30 | .22 | .22 | .16 | .13 | .34 | .56 |
| 15 | 8.0 | 2.0 | 1.8 | .86 | .56 | .34 | .22 | .19 | .19 | .16 | .34 | .70 |
| 16 | 2.0 | 1.9 | 1.6 | .86 | .56 | .39 | .22 | .19 | .13 | .16 | .39 | .44 |
| 17 | 6.0 | 2.4 | 1.6 | .86 | .50 | .34 | .22 | .19 | .13 | .13 | .30 | 1.4 |
| 18 | 2.0 | 3.8 | 1.6 | .86 | .50 | .30 | .22 | .26 | .13 | .13 | .30 | .62 |
| 19 | 1.8 | 15 | 1.5 | .78 | .50 | .30 | .22 | .39 | .16 | .22 | .26 | 1.4 |
| 20 | 1.6 | 2.2 | 1.4 | .78 | .50 | .30 | .22 | .26 | .16 | .22 | .22 | .62 |
| 21 | 1.5 | 3.4 | 1.4 | .78 | .44 | .30 | .30 | .22 | .16 | .22 | .19 | .50 |
| 22 | 25 | 6.6 | 1.2 | .86 | .44 | .26 | .22 | .22 | .19 | .22 | .19 | .64 |
| 23 | 13 | 25 | 1.2 | .86 | .44 | .26 | .22 | .22 | .16 | .39 | .19 | .70 |
| 24 | 3.0 | 8.9 | 1.2 | .78 | .39 | .26 | .22 | .22 | .16 | .22 | .16 | .62 |
| 25 | 2.0 | 5.0 | 1.2 | .78 | .39 | .26 | .22 | .22 | .16 | .19 | .16 | .56 |
| 26 | 1.8 | 4.5 | 1.2 | .78 | .39 | .26 | .22 | .26 | .16 | .49 | .30 | .62 |
| 27 | 5.0 | 3.1 | 1.2 | .78 | .39 | .26 | .22 | .22 | .16 | .86 | .56 | .70 |
| 28 | 2.8 | 2.9 | 1.0 | .70 | .39 | .26 | .19 | .22 | .16 | .62 | .50 | .56 |
| 29 | 2.7 | 2.9 | 1.0 | .70 | ------ | .26 | .19 | .22 | .16 | .56 | .44 | .50 |
| 30 | 2.7 | 6.6 | 1.0 | .62 | ------ | .26 | .26 | .22 | .13 | .56 | .34 | .50 |
| 31 | 2.6 | ------ | .95 | .62 | ------ | .26 | ------ | .22 | ------ | 1.5 | .44 | ------ |
| TOTAL | 119.0 | 127.0 | 56.95 | 25.86 | 14.53 | 9.20 | 6.45 | 7.09 | 5.10 | 9.15 | 12.54 | 21.10 |
| MEAN | 3.84 | 4.23 | 1.84 | .83 | .52 | .30 | .22 | .23 | .17 | .30 | .40 | .70 |
| MAX | 25 | 25 | 3.6 | .95 | .62 | .39 | .30 | .39 | .22 | 1.5 | 1.3 | 2.8 |
| MIN | 1.5 | 1.9 | .95 | .62 | .39 | .26 | .19 | .19 | .13 | .13 | .16 | .34 |
| AC-FT | 236 | 252 | 113 | 51 | 29 | 18 | 13 | 14 | 10 | 18 | 25 | 42 |

CAL YR 1968: TOTAL 609.63 MEAN 1.67 MAX 25 MIN .39 AC-FT 1,210
WTR YR 1969: TOTAL 413.97 MEAN 1.13 MAX 25 MIN .13 AC-FT 821

PEAK DISCHARGE (BASE, 170 CFS).--Nov. 23 (0300) 231 cfs (3.18 ft).

## 16-8160. Umatac River at Umatac

LOCATION.--Lat 13°17'45" N., long 144°39'50" E., Guam, on left bank 0.2 mile upstream from mouth, 0.3 mile southeast of Umatac, and 5.7 miles northwest of Inarajan.

DRAINAGE AREA.--2.04 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 8 ft (from topographic map). Prior to Oct. 16, 1953, at datum 0.62 ft higher.

EXTREMES.--Current year: Maximum discharge, 4,820 cfs Nov. 23 (gage height, 5.73 ft), from rating curve extended as explained below; minimum, 0.30 cfs June 4, 5.
Period of record: Maximum discharge, 7,460 cfs Oct. 19, 1960 (gage height, 7.04 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 3.51 and 7.04 ft; minimum, 0.20 cfs June 23, 1960.

REMARKS.--Records good. Upstream diversion at Piga Spring for domestic use at Umatac. Recording rain gage located at station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 28 | 7.6 | 23 | 2.6 | 1.6 | 1.1 | .74 | .74 | .49 | .84 | 8.5 | 8.5 |
| 2 | 10 | 7.2 | 10 | 2.6 | 1.5 | .94 | .74 | .64 | .42 | .56 | 4.6 | 18 |
| 3 | 8.0 | 7.2 | 9.5 | 2.6 | 2.0 | .94 | .64 | .56 | .42 | .49 | 4.0 | 13 |
| 4 | 10 | 5.6 | 8.5 | 2.6 | 2.0 | .94 | .64 | .49 | .42 | .49 | 17 | 9.5 |
| 5 | 30 | 5.3 | 7.6 | 2.6 | 1.6 | .84 | .64 | .74 | .42 | .42 | 16 | 9.3 |
| 6 | 10 | 5.3 | 6.4 | 2.4 | 1.6 | .74 | .64 | .94 | .42 | .42 | 14 | 7.2 |
| 7 | 6.8 | 6.0 | 5.6 | 2.8 | 1.5 | .64 | .64 | 5.7 | .42 | .36 | 7.2 | 8.0 |
| 8 | 83 | 6.0 | 5.0 | 2.8 | 1.5 | .74 | .56 | 1.1 | .42 | .36 | 5.0 | 6.4 |
| 9 | 10 | 6.8 | 4.6 | 2.8 | 1.5 | .64 | .64 | .84 | .49 | .36 | 5.9 | 11 |
| 10 | 6.8 | 4.6 | 4.3 | 2.8 | 1.3 | .64 | .74 | .74 | .42 | .36 | 8.0 | 14 |
| 11 | 6.8 | 7.4 | 4.3 | 4.6 | 1.5 | .64 | .56 | .74 | .42 | .49 | 6.0 | 8.5 |
| 12 | 9.3 | 5.3 | 4.3 | 2.8 | 1.5 | .64 | .64 | .64 | .42 | .49 | 9.3 | 7.2 |
| 13 | 27 | 4.6 | 4.6 | 2.4 | 1.5 | .64 | .56 | .94 | .42 | .49 | 6.0 | 6.4 |
| 14 | 8.5 | 4.3 | 4.0 | 2.4 | 1.3 | .84 | .56 | .94 | .42 | .42 | 5.6 | 6.0 |
| 15 | 57 | 4.0 | 3.8 | 2.4 | 1.2 | 1.2 | .64 | .64 | .42 | .42 | 5.3 | 5.3 |
| 16 | 12 | 3.8 | 3.5 | 2.2 | 1.2 | 1.2 | .84 | .64 | .42 | .42 | 9.8 | 4.6 |
| 17 | 8.5 | 4.0 | 3.5 | 2.0 | 1.2 | .94 | .74 | .64 | .49 | .36 | 6.8 | 4.3 |
| 18 | 7.2 | 8.0 | 3.5 | 2.0 | 1.2 | .94 | .56 | 1.1 | .42 | .36 | 5.3 | 4.0 |
| 19 | 6.0 | 132 | 3.5 | 2.0 | 1.3 | .84 | .56 | 1.1 | .36 | .49 | 4.6 | 5.3 |
| 20 | 5.6 | 12 | 3.2 | 1.8 | 1.2 | .84 | .56 | .84 | .36 | .49 | 5.3 | 3.8 |
| 21 | 7.6 | 15 | 3.5 | 1.8 | 1.1 | .84 | .64 | .71 | .42 | .84 | 4.6 | 3.2 |
| 22 | 165 | 11 | 3.2 | 4.2 | 1.1 | .74 | .56 | .74 | .42 | .84 | 4.3 | 3.0 |
| 23 | 158 | 263 | 3.2 | 2.8 | 1.1 | .74 | .56 | .74 | .42 | 1.5 | 4.6 | 3.0 |
| 24 | 14 | 32 | 3.2 | 2.2 | 1.2 | .74 | .56 | .84 | .36 | 1.1 | 4.6 | 9.3 |
| 25 | 10 | 16 | 3.0 | 2.0 | 1.1 | .74 | .56 | .84 | .42 | .94 | 4.6 | 4.6 |
| 26 | 8.0 | 11 | 3.8 | 2.0 | .94 | .84 | .56 | .84 | .36 | 1.2 | 20 | 6.3 |
| 27 | 115 | 9.0 | 3.0 | 1.8 | .94 | .94 | .64 | .74 | .36 | 13 | 32 | 4.3 |
| 28 | 22 | 8.0 | 2.8 | 1.8 | .94 | .84 | .64 | .64 | .36 | 4.6 | 10 | 4.3 |
| 29 | 12 | 8.0 | 2.6 | 1.8 | ------ | .84 | .64 | .56 | .36 | 14 | 7.6 | 3.2 |
| 30 | 9.0 | 54 | 2.6 | 1.6 | ------ | .74 | .84 | .56 | .42 | 14 | 9.0 | 3.5 |
| 31 | 8.0 | ------ | 2.6 | 1.6 | ------ | .74 | ------ | .49 | ------ | 12 | 6.0 | ------ |
| TOTAL | 879.1 | 674.0 | 156.2 | 74.8 | 37.62 | 25.62 | 19.04 | 28.41 | 12.39 | 73.11 | 261.5 | 205.0 |
| MEAN | 28.4 | 22.5 | 5.04 | 2.41 | 1.34 | .83 | .63 | .92 | .41 | 2.36 | 8.44 | 6.83 |
| MAX | 165 | 263 | 23 | 4.6 | 2.0 | 1.2 | .84 | 5.7 | .49 | 14 | 32 | 18 |
| MIN | 5.6 | 3.8 | 2.6 | 1.6 | .94 | .64 | .56 | .49 | .36 | .36 | 4.0 | 3.0 |
| AC-FT | 1740 | 1340 | 310 | 148 | 75 | 51 | 38 | 56 | 25 | 145 | 519 | 407 |

CAL YR 1968: TOTAL 3,109.11 MEAN 8.49 MAX 263 MIN .74 AC-FT 6,170
WTR YR 1969: TOTAL 2,446.79 MEAN 6.70 MAX 263 MIN .36 AC-FT 4,850

PEAK DISCHARGE (BASE, 1,200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 8 | 1300 | 4.26 | 2,440 | 10-27 | 1100 | 3.81 | 1,810 |
| 10-15 | 0100 | 3.38 | 1,340 | 11-19 | 0600 | 3.32 | 1,280 |
| 10-23 | 0130 | 4.08 | 2,170 | 11-23 | 0400 | 5.73 | 4,820 |

## 16-8210. Geus River near Merizo

LOCATION.--Lat 13°16'15" N., long 144°40'40" E., Guam, on left bank 0.7 mile northeast of Merizo, 2.2 miles southeast of Umatac, and 4.7 miles west of Inarajan.

DRAINAGE AREA.--0.95 sq mi.

PERIOD OF RECORD.--April 1953 to current year.

GAGE.--Water-stage recorder and broad-crested weir. Altitude of gage is 60 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 992 cfs Nov. 23 (gage height, 3.38 ft), from rating curve extended as explained below; no flow June 21, 25-30.
Period of record: Maximum discharge, 2,940 cfs Oct. 19, 1960 (gage height, 4.16 ft), from rating curve extended above 66 cfs on basis of slope-area measurements at gage heights 4.00 and 4.16 ft; no flow for many days in 1966, June 21, 25-30, 1969.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Water is diverted 0.5 mile upstream for domestic use and at station for irrigation.

REVISIONS (FISCAL YEARS).--WSP 1937: 1954(P), 1959(P).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.8 | 2.2 | 10 | .60 | .23 | .33 | .10 | .28 | .05 | .05 | 1.9 | 1.6 |
| 2 | 3.3 | 2.2 | 5.0 | .60 | .23 | .31 | .09 | .18 | .05 | .12 | .77 | 4.2 |
| 3 | 1.8 | 2.2 | 3.5 | .50 | .40 | .31 | .10 | .20 | .07 | .05 | .55 | 4.8 |
| 4 | 3.9 | 1.6 | 2.5 | .50 | .34 | .28 | .10 | .18 | .18 | .03 | 7.8 | 3.5 |
| 5 | 8.7 | 1.5 | 2.2 | .50 | .28 | .20 | .12 | .31 | .28 | .02 | 6.2 | 1.6 |
| 6 | 5.8 | 1.7 | 2.0 | .50 | .25 | .23 | .09 | .55 | .09 | .02 | 3.6 | .98 |
| 7 | 3.0 | 3.1 | 1.8 | .60 | .25 | .25 | .09 | 1.9 | .10 | .02 | 1.7 | .98 |
| 8 | 12 | 2.8 | 1.6 | .72 | .25 | .25 | .10 | .40 | .03 | .01 | .63 | .68 |
| 9 | 4.3 | 3.5 | 1.4 | .59 | .25 | .25 | .14 | .25 | .04 | .01 | .40 | 1.7 |
| 10 | 2.2 | 2.1 | 1.3 | .51 | .25 | .18 | .12 | .25 | .09 | .01 | 1.2 | 8.7 |
| 11 | 1.6 | 2.7 | 1.3 | .93 | .25 | .18 | .12 | .16 | .40 | .02 | 2.0 | 3.4 |
| 12 | 1.5 | 2.3 | 1.2 | .47 | .28 | .14 | .16 | .14 | .37 | .03 | .93 | 1.6 |
| 13 | 12 | 1.7 | 1.4 | .43 | .46 | .18 | .20 | .23 | .10 | .03 | .18 | 1.3 |
| 14 | 3.8 | 1.5 | 1.2 | .43 | .53 | .23 | .23 | .37 | .18 | .04 | .55 | 2.0 |
| 15 | 17 | 1.3 | 1.0 | .40 | .31 | .31 | .18 | .20 | .02 | .02 | .63 | 2.3 |
| 16 | 5.6 | 1.2 | 1.0 | .43 | .43 | .28 | .18 | .14 | .02 | .02 | 1.6 | 1.3 |
| 17 | 2.7 | 1.9 | 1.0 | .37 | .37 | .37 | .18 | .14 | .02 | .02 | 2.8 | .93 |
| 18 | 2.1 | 3.3 | 1.0 | .31 | .43 | .37 | .18 | .20 | .03 | .02 | .72 | .98 |
| 19 | 1.7 | 55 | 1.0 | .28 | .59 | .34 | .18 | .40 | .02 | .03 | .28 | 20 |
| 20 | 1.5 | 6.7 | 1.0 | .40 | .55 | .31 | .14 | .25 | .01 | .03 | .28 | 3.8 |
| 21 | 2.0 | 5.4 | 1.0 | .40 | .43 | .31 | .14 | .18 | 0 | .16 | .18 | 1.6 |
| 22 | 60 | 8.0 | .90 | .93 | .47 | .37 | .20 | .16 | .01 | .25 | .12 | 2.0 |
| 23 | 72 | 91 | .90 | .59 | .43 | .31 | .18 | .16 | .01 | .72 | .07 | 2.8 |
| 24 | 5.4 | 8.5 | .90 | .47 | .43 | .28 | .12 | .16 | .01 | .40 | .04 | 9.3 |
| 25 | 3.2 | 5.0 | .80 | .40 | .40 | .25 | .14 | .20 | 0 | .14 | .06 | 3.8 |
| 26 | 2.4 | 3.4 | 1.0 | .43 | .34 | .16 | .16 | .16 | 0 | .18 | .60 | 2.4 |
| 27 | 41 | 2.5 | .80 | .43 | .34 | .18 | .16 | .18 | 0 | 3.0 | 12 | 2.2 |
| 28 | 14 | 2.0 | .70 | .31 | .28 | .23 | .16 | .16 | 0 | .20 | 4.0 | 1.4 |
| 29 | 4.2 | 1.8 | .70 | .34 | ------ | .18 | .09 | .18 | 0 | 4.1 | 1.8 | 1.0 |
| 30 | 3.0 | 12 | .70 | .25 | ------ | .12 | .25 | .18 | 0 | 4.6 | 3.0 | 1.1 |
| 31 | 2.5 | ------ | .60 | .25 | ------ | .09 | ------ | .07 | ------ | 5.4 | 1.4 | ------ |
| TOTAL | 310.0 | 240.1 | 51.40 | 14.87 | 10.05 | 7.78 | 4.40 | 8.52 | 2.18 | 19.75 | 57.99 | 93.95 |
| MEAN | 10.0 | 8.00 | 1.66 | .48 | .36 | .25 | .15 | .27 | .073 | .64 | 1.87 | 3.13 |
| MAX | 72 | 91 | 10 | .93 | .59 | .37 | .25 | 1.9 | .40 | 5.4 | 12 | 20 |
| MIN | 1.5 | 1.2 | .60 | .25 | .23 | .09 | .09 | .07 | 0 | .01 | .04 | .68 |
| AC-FT | 615 | 476 | 102 | 29 | 20 | 15 | 8.7 | 17 | 4.3 | 39 | 115 | 186 |

CAL YR 1968: TOTAL 1,197.51 MEAN 3.27 MAX 91 MIN .16 AC-FT 2,380
WTR YR 1969: TOTAL 820.99 MEAN 2.25 MAX 91 MIN 0 AC-FT 1,630

PEAK DISCHARGE (BASE, 350 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-23 | 0100 | 3.08 | 634 | 11-19 | 0500 | 2.78 | 408 |
| 10-27 | 1030 | 2.88 | 476 | 11-23 | 0300 | 3.38 | 992 |

NOTE.--No gage-height record Dec. 1 to Jan. 7.

## 16-8350. Inarajan River near Inarajan

LOCATION.--Lat 13°16'40" N., long 144°44'15" E., Guam, on right bank 0.6 mile northwest of Inarajan and 4.9 miles east of Merizo.

DRAINAGE AREA.--4.49 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum gage height, 12.63 ft Nov. 23 (discharge not determined); minimum discharge, 1.3 cfs July 6.
Period of record: Maximum gage height, 12.90 ft Oct. 11, 1963 (discharge not determined); minimum discharge, 0.99 cfs July 14, 1959.

REMARKS.--Records good. Stage-discharge relation not determined above gage height 11.0 ft owing to ungaged overbank flow. Village of Inarajan diverts about 40,000 gallons a day above station for domestic use.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 44 | 20 | 72 | 7.8 | 4.3 | 3.7 | 2.6 | 2.1 | 1.7 | 2.4 | 7.8 | 15 |
| 2 | 17 | 19 | 29 | 7.8 | 4.3 | 3.4 | 2.5 | 1.9 | 1.7 | 1.9 | 4.1 | 36 |
| 3 | 14 | 21 | 24 | 7.8 | 5.7 | 3.2 | 2.4 | 2.0 | 1.7 | 1.6 | 5.7 | 22 |
| 4 | 12 | 17 | 22 | 7.5 | 5.3 | 3.1 | 2.4 | 1.9 | 1.6 | 1.6 | 31 | 14 |
| 5 | 37 | 16 | 19 | 7.5 | 4.5 | 3.1 | 2.2 | 2.5 | 1.6 | 1.6 | 27 | 8.1 |
| 6 | 23 | 15 | 18 | 7.5 | 4.3 | 3.2 | 2.2 | 3.0 | 1.6 | 1.5 | 13 | 6.6 |
| 7 | 16 | 25 | 17 | 8.1 | 4.3 | 3.1 | 2.1 | 14 | 1.6 | 1.5 | 7.2 | 7.8 |
| 8 | 18 | 24 | 16 | 8.1 | 4.1 | 3.1 | 2.2 | 2.5 | 1.6 | 1.4 | 4.7 | 5.5 |
| 9 | 13 | 30 | 16 | 8.1 | 3.9 | 3.1 | 2.6 | 2.0 | 1.9 | 1.4 | 3.9 | 6.9 |
| 10 | 12 | 18 | 14 | 8.1 | 3.9 | 3.0 | 2.2 | 1.9 | 1.7 | 1.4 | 14 | 19 |
| 11 | 12 | 26 | 14 | 12 | 4.1 | 3.0 | 2.2 | 1.9 | 1.5 | 2.2 | 7.8 | 9.8 |
| 12 | 13 | 18 | 14 | 7.8 | 3.9 | 3.0 | 2.4 | 1.9 | 1.5 | 2.1 | 16 | 7.8 |
| 13 | 43 | 16 | 14 | 6.9 | 3.9 | 3.0 | 2.4 | 2.2 | 1.5 | 2.2 | 6.9 | 7.5 |
| 14 | 17 | 14 | 14 | 6.6 | 3.9 | 3.4 | 2.4 | 2.4 | 1.5 | 1.7 | 5.5 | 6.3 |
| 15 | 119 | 13 | 12 | 6.6 | 3.9 | 4.1 | 2.4 | 1.9 | 1.4 | 1.4 | 4.5 | 8.6 |
| 16 | 23 | 12 | 12 | 6.3 | 4.1 | 3.9 | 2.4 | 1.9 | 1.5 | 1.6 | 7.2 | 6.9 |
| 17 | 18 | 17 | 12 | 6.0 | 4.1 | 3.4 | 2.2 | 1.9 | 1.7 | 1.5 | 6.9 | 5.3 |
| 18 | 14 | 23 | 12 | 6.0 | 4.1 | 3.6 | 2.2 | 2.6 | 1.6 | 1.4 | 4.7 | 5.3 |
| 19 | 12 | 342 | 12 | 5.7 | 4.1 | 3.4 | 2.1 | 2.6 | 1.6 | 2.2 | 3.9 | 26 |
| 20 | 12 | 29 | 12 | 5.5 | 3.9 | 3.0 | 2.4 | 2.1 | 1.5 | 2.1 | 4.9 | 8.7 |
| 21 | 14 | 36 | 12 | 5.7 | 3.9 | 2.8 | 3.2 | 2.0 | 1.6 | 3.7 | 3.7 | 6.3 |
| 22 | 408 | 30 | 11 | 7.8 | 3.7 | 2.8 | 2.1 | 2.0 | 1.8 | 2.4 | 3.2 | 5.5 |
| 23 | 390 | 408 | 10 | 6.3 | 3.7 | 2.8 | 2.0 | 2.0 | 1.7 | 4.1 | 3.1 | 6.9 |
| 24 | 25 | 76 | 9.8 | 5.7 | 3.7 | 2.8 | 2.1 | 1.9 | 1.5 | 2.8 | 3.1 | 8.1 |
| 25 | 20 | 30 | 9.5 | 5.3 | 3.6 | 2.8 | 2.1 | 1.9 | 1.5 | 2.0 | 3.1 | 6.3 |
| 26 | 15 | 29 | 12 | 5.1 | 3.2 | 2.8 | 2.1 | 2.2 | 1.5 | 5.8 | 22 | 6.3 |
| 27 | 198 | 22 | 9.1 | 4.9 | 3.2 | 3.1 | 2.0 | 1.9 | 1.6 | 38 | 48 | 5.5 |
| 28 | 40 | 19 | 8.7 | 4.7 | 3.2 | 2.8 | 1.9 | 1.9 | 1.5 | 9.9 | 14 | 4.7 |
| 29 | 30 | 18 | 8.4 | 4.9 | ------ | 2.6 | 1.9 | 1.8 | 1.5 | 19 | 8.7 | 4.7 |
| 30 | 25 | 174 | 8.4 | 4.7 | ------ | 2.6 | 2.6 | 1.8 | 1.6 | 12 | 6.6 | 6.7 |
| 31 | 20 | ------ | 8.1 | 4.5 | ------ | 2.5 | ------ | 1.8 | ------ | 16 | 5.7 | ------ |
| TOTAL | 1,674 | 1,557 | 482.0 | 207.3 | 112.8 | 96.2 | 68.5 | 76.4 | 47.8 | 150.4 | 307.9 | 294.1 |
| MEAN | 54.0 | 51.9 | 15.5 | 6.69 | 4.03 | 3.10 | 2.28 | 2.46 | 1.59 | 4.85 | 9.93 | 9.80 |
| MAX | 408 | 408 | 72 | 12 | 5.7 | 4.1 | 3.2 | 14 | 1.9 | 38 | 48 | 36 |
| MIN | 12 | 12 | 8.1 | 4.5 | 3.2 | 2.5 | 1.9 | 1.8 | 1.4 | 1.4 | 3.1 | 4.7 |
| AC-FT | 3,320 | 3,090 | 956 | 411 | 224 | 191 | 136 | 152 | 95 | 298 | 611 | 583 |

CAL YR 1968: TOTAL 6,786.3 MEAN 18.5 MAX 408 MIN 1.8 AC-FT 13,460
WTR YR 1969: TOTAL 5,074.4 MEAN 13.9 MAX 408 MIN 1.4 AC-FT 10,070

PEAK DISCHARGE (BASE, 1,700 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-23 | 0100 | 12.40 | Unknown | 11-19 | 0700 | 12.18 | Unknown |
| 10-27 | 1100 | 11.90 | Unknown | 11-23 | 0500 | 12.63 | Unknown |

## 16-8400. Pauliluc River near Inarajan

LOCATION.--Lat 13°17'05" N., long 144°45'00" E., Guam, on right bank 0.3 mile upstream from mouth, 0.9 mile northeast of Inarajan, and 3.8 miles south of Talofofo.

DRAINAGE AREA.--1.86 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,400 cfs Nov. 23 (gage height, 12.50 ft, from floodmark in well), from rating curve extended above 210 cfs; minimum, 0.29 cfs Apr. 18.
Period of record: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended above 210 cfs; minimum, 0.15 cfs May 16, 21-23, 29, 1966.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.5 | 4.0 | 10 | 1.9 | 1.1 | .88 | .66 | .50 | .44 | .70 | 3.5 | 1.6 |
| 2 | 3.4 | 4.0 | 4.0 | 1.9 | 1.1 | .88 | .62 | .50 | .44 | .58 | 1.8 | 5.7 |
| 3 | 3.2 | 4.5 | 3.5 | 1.8 | 1.4 | .93 | .58 | .45 | .41 | .44 | 1.6 | 2.6 |
| 4 | 2.9 | 3.5 | 3.5 | 1.8 | 1.8 | .83 | .58 | .45 | .38 | .44 | 8.0 | 1.4 |
| 5 | 5.6 | 3.5 | 3.5 | 1.8 | 1.4 | .78 | .58 | .50 | .38 | .41 | 4.3 | 1.2 |
| 6 | 3.9 | 3.5 | 3.2 | 1.8 | 1.3 | .78 | .54 | .50 | .38 | .38 | 3.2 | 1.0 |
| 7 | 3.4 | 4.5 | 3.2 | 1.9 | 1.2 | .74 | .50 | 2.0 | .38 | .38 | 2.4 | 1.1 |
| 8 | 3.0 | 4.5 | 3.0 | 2.2 | 1.2 | .74 | .54 | .70 | .38 | .35 | 1.6 | 1.0 |
| 9 | 2.8 | 5.0 | 3.0 | 2.2 | 1.1 | .70 | .54 | .60 | .38 | .35 | 1.2 | 1.0 |
| 10 | 2.6 | 4.0 | 3.0 | 2.2 | 1.0 | .70 | .54 | .50 | .38 | .35 | 1.1 | 1.4 |
| 11 | 2.6 | 5.0 | 2.5 | 3.2 | 1.0 | .70 | .44 | .45 | .38 | .35 | 1.2 | 1.6 |
| 12 | 2.8 | 4.0 | 2.5 | 2.5 | 1.0 | .66 | .41 | .45 | .38 | .35 | 1.6 | 1.3 |
| 13 | 7.6 | 4.0 | 2.5 | 2.2 | 1.1 | .62 | .41 | .50 | .38 | .35 | 1.2 | 1.6 |
| 14 | 3.5 | 4.0 | 2.5 | 2.0 | 1.1 | .78 | .41 | .50 | .38 | .35 | 1.2 | 1.3 |
| 15 | 23 | 3.5 | 2.5 | 1.8 | 1.1 | 1.1 | .41 | .45 | .35 | .45 | 1.1 | 1.2 |
| 16 | 5.8 | 3.5 | 2.2 | 1.7 | 1.0 | 1.1 | .41 | .45 | .50 | .41 | 1.0 | 1.1 |
| 17 | 6.7 | 4.0 | 2.2 | 1.6 | 1.0 | 1.2 | .38 | .47 | .44 | .38 | 1.1 | .99 |
| 18 | 5.0 | 4.5 | 2.2 | 1.5 | .99 | 1.0 | .38 | .50 | .35 | .35 | .99 | 1.0 |
| 19 | 4.0 | 100 | 2.2 | 1.4 | .99 | .93 | .38 | .54 | .38 | .47 | .88 | .99 |
| 20 | 3.0 | 5.0 | 2.2 | 1.4 | .99 | .83 | .38 | .50 | .38 | .47 | .83 | 1.0 |
| 21 | 4.0 | 6.0 | 2.2 | 1.4 | .93 | .78 | .58 | .47 | .38 | .58 | .74 | .99 |
| 22 | 150 | 4.0 | 2.0 | 1.7 | .93 | .83 | .44 | .47 | .44 | .58 | .66 | 1.4 |
| 23 | 130 | 200 | 2.0 | 1.7 | .88 | .74 | .41 | .44 | .41 | .93 | .66 | 3.5 |
| 24 | 5.0 | 15 | 2.0 | 1.6 | .88 | .74 | .50 | .44 | .38 | .93 | .70 | 2.1 |
| 25 | 4.0 | 5.0 | 2.0 | 1.5 | .88 | .70 | .44 | .44 | .38 | .74 | .66 | 2.0 |
| 26 | 3.5 | 5.0 | 2.2 | 1.4 | .83 | .66 | .44 | .50 | .38 | 1.0 | 3.3 | 1.7 |
| 27 | 50 | 4.0 | 2.0 | 1.3 | .83 | .78 | .44 | .47 | .38 | 12 | 8.0 | 1.4 |
| 28 | 10 | 4.0 | 2.0 | 1.2 | .83 | .78 | .44 | .47 | .38 | 4.9 | 3.4 | 1.2 |
| 29 | 6.0 | 3.5 | 2.0 | 1.2 | ------ | .78 | .44 | .47 | .35 | 4.3 | 2.0 | 1.1 |
| 30 | 5.0 | 20 | 2.0 | 1.2 | ------ | .74 | .50 | .44 | .38 | 2.8 | 2.0 | 1.7 |
| 31 | 4.0 | ------ | 1.9 | 1.1 | ------ | .66 | ------ | .44 | ------ | 4.5 | 1.4 | ------ |
| TOTAL | 469.8 | 445.0 | 85.7 | 54.1 | 29.86 | 25.07 | 14.32 | 16.56 | 11.73 | 41.57 | 63.32 | 47.17 |
| MEAN | 15.2 | 14.8 | 2.76 | 1.75 | 1.07 | .81 | .48 | .53 | .39 | 1.34 | 2.04 | 1.57 |
| MAX | 150 | 200 | 10 | 3.2 | 1.8 | 1.2 | .66 | 2.0 | .50 | 12 | 8.0 | 5.7 |
| MIN | 2.6 | 3.5 | 1.9 | 1.1 | .83 | .62 | .38 | .44 | .35 | .35 | .66 | .99 |
| AC-FT | 932 | 883 | 170 | 107 | 59 | 50 | 28 | 33 | 23 | 83 | 126 | 94 |

CAL YR 1968: TOTAL 2,003.38 MEAN 5.47 MAX 200 MIN .25 AC-FT 3,970
WTR YR 1969: TOTAL 1,304.20 MEAN 3.57 MAX 200 MIN .35 AC-FT 2,590

PEAK DISCHARGE (BASE, 400 CFS).--Oct. 23 (about 0100) 1,450 cfs (9.20 ft, from floodmark); Nov. 23 (about 0500) 2,400 cfs (12.50 ft, from floodmark).

NOTE.--No gage-height record Oct. 18 to Jan. 3.

## 16-8470. Imong River near Agat

LOCATION.--Lat 13°20'14" N., long 144°41'55" E., Guam, on left bank 500 ft upstream from Fena Valley Reservoir, 1.4 miles southwest of Fena Dam spillway, and 4.3 miles southeast of Agat School.

DRAINAGE AREA.--1.93 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 2,450 cfs Nov. 23 (gage height, 8.30 ft), from rating curve extended as explained below; minimum, about 0.6 cfs, occurred during period Dec. 29 to July 22.
Period of record: Maximum discharge, 3,370 cfs Oct. 19, 1960 (gage height, 10.06 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 7.46 and 10.06 ft; minimum, 0.37 cfs May 21, 22, 26, 1966.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station prior to Jan. 1, 1969.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 32 | 11 | 66 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 10 | 4.3 |
| 2 | 16 | 11 | 24 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 5.2 | 5.9 |
| 3 | 12 | 10 | 18 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 6.3 | 5.2 |
| 4 | 11 | 8.5 | 14 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 18 | 4.3 |
| 5 | 27 | 8.0 | 13 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 20 | 3.2 |
| 6 | 13 | 7.5 | 10 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 13 | 3.0 |
| 7 | 10 | 8.0 | 10 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 6.7 | 4.3 |
| 8 | 31 | 9.5 | 9.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 4.3 | 3.0 |
| 9 | 11 | 8.5 | 9.0 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.5 | 3.0 |
| 10 | 9.5 | 7.1 | 8.0 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 10 | 5.6 |
| 11 | 8.5 | 9.0 | 7.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 6.3 | 4.0 |
| 12 | 9.0 | 8.0 | 9.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 4.6 | 4.0 |
| 13 | 20 | 7.1 | 8.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.8 | 3.5 |
| 14 | 9.5 | 8.0 | 7.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.5 | 3.2 |
| 15 | 65 | 6.7 | 7.1 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.2 | 3.5 |
| 16 | 13 | 6.7 | 6.7 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 4.7 | 3.0 |
| 17 | 14 | 8.5 | 6.7 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.8 | 2.8 |
| 18 | 9.5 | 12 | 6.3 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 3.0 | 2.6 |
| 19 | 8.0 | 253 | 6.3 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 2.8 | 2.6 |
| 20 | 7.5 | 58 | 5.9 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 2.8 | 2.4 |
| 21 | 9.0 | 68 | 5.9 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 2.4 | 2.2 |
| 22 | 205 | 47 | 5.6 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.8 | 2.2 | 2.2 |
| 23 | 99 | 274 | 5.6 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 3.0 | 2.4 | 4.0 |
| 24 | 15 | 100 | 5.6 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.8 | 2.2 | 3.5 |
| 25 | 12 | 27 | 5.2 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.5 | 2.2 | 3.5 |
| 26 | 10 | 23 | 5.2 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 4.3 | 5.8 | 3.0 |
| 27 | 42 | 18 | 5.2 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 22 | 6.3 | 4.0 |
| 28 | 26 | 14 | 4.9 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 13 | 5.6 | 3.5 |
| 29 | 13 | 12 | 5.0 | 4.0 | ------ | 2.5 | 2.0 | 1.5 | 1.0 | 13 | 5.6 | 3.0 |
| 30 | 13 | 81 | 4.5 | 4.0 | ------ | 2.5 | 2.0 | 1.5 | 1.0 | 18 | 5.6 | 5.5 |
| 31 | 12 | ------ | 4.5 | 4.0 | ------ | 2.5 | ------ | 1.5 | ------ | 20 | 4.9 | ------ |
| TOTAL | 792.5 | 1130.1 | 310.7 | 124.0 | 84.0 | 77.5 | 60.0 | 46.5 | 30.0 | 119.4 | 180.7 | 107.8 |
| MEAN | 25.6 | 37.7 | 10.0 | 4.00 | 3.00 | 2.50 | 2.00 | 1.50 | 1.00 | 3.85 | 5.83 | 3.59 |
| MAX | 205 | 274 | 66 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 22 | 20 | 5.9 |
| MIN | 7.5 | 6.7 | 4.5 | 4.0 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 1.0 | 2.2 | 2.2 |
| AC-FT | 1570 | 2240 | 616 | 246 | 167 | 154 | 119 | 92 | 60 | 237 | 358 | 214 |

CAL YR 1968: TOTAL 4,094.3 MEAN 11.2 MAX 274 MIN 2.0 AC-FT 8,120
WTR YR 1969: TOTAL 3,063.2 MEAN 8.39 MAX 274 MIN 1.0 AC-FT 6,080

PEAK DISCHARGE (BASE, 1,400 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-22 | 1800 | 6.59 | 1,680 | 11-23 | 0400 | 8.30 | 2,450 |
| 11-19 | 0830 | 7.24 | 1,970 | | | | |

NOTE.--No gage-height record Dec. 29 to July 22.

## 16-8490. Fena Dam spillway near Agat

LOCATION.--Lat 13°21'30" N., long 144°42'10" E., Guam, on left bank 4.0 miles southeast of Agat and 5.5 miles southwest of Yona.

DRAINAGE AREA.--5.81 sq mi.

PERIOD OF RECORD.--September 1951 to July 1952, November 1952 to current year.

GAGE.--Water-stage recorder and concrete-dam control. Datum of gage is 111.35 ft above mean sea level (from U.S. Navy construction plans).

EXTREMES.--Current year: Maximum discharge, 2,640 cfs Nov. 23 (gage height, 2.90 ft), from rating curve extended above 130 cfs on basis of broad-crested weir formula; no flow for many days.
Period of record: Maximum discharge, not determined, occurred Oct. 15, 1953 (gage height, at least 4.5 ft); no flow for many days each year.

REMARKS.--Records fair. About 10 cfs is diverted from Fena Valley Reservoir and tributary springs for military and civilian use. Records represent only flow over spillway. Recording rain gage located at station prior to Nov. 26, 1968.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 103 | 28 | 89 | | | | | | | | | |
| 2 | 71 | 25 | 28 | | | | | | | | | |
| 3 | 34 | 20 | 22 | | | | | | | | | |
| 4 | 31 | 17 | 17 | | | | | | | | | |
| 5 | 67 | 14 | 17 | | | | | | | | | |
| 6 | 44 | 14 | 14 | | | | | | | | | |
| 7 | 28 | 14 | 9.9 | | | | | | | | | |
| 8 | 44 | 17 | 7.9 | | | | | | | | | |
| 9 | 31 | 14 | 9.9 | | | | | | | | | |
| 10 | 20 | 7.9 | 7.9 | | | | | | | | | |
| 11 | 20 | 12 | 7.9 | | | | | | | | | |
| 12 | 20 | 14 | 9.9 | | | | | | | | | |
| 13 | 67 | 14 | 7.9 | | | | | | | | | |
| 14 | 31 | 20 | 6.0 | | | | | | | | | |
| 15 | 184 | 9.9 | 4.3 | | | | | | | | | |
| 16 | 55 | 4.3 | 4.3 | | | | | | | | | |
| 17 | 55 | 2.8 | 4.3 | | | | | | | | | |
| 18 | 34 | 14 | 2.8 | | | | | | | | | |
| 19 | 20 | 398 | 2.8 | | | | | | | | | |
| 20 | 20 | 55 | 1.5 | | | | | | | | | |
| 21 | 22 | 55 | .54 | | | | | | | | | |
| 22 | 493 | 44 | 0 | | | | | | | | | |
| 23 | 341 | 660 | 0 | | | | | | | | | |
| 24 | 63 | 136 | 0 | | | | | | | | | |
| 25 | 38 | 44 | 0 | | | | | | | | | |
| 26 | 28 | 31 | 0 | | | | | | | | | |
| 27 | 75 | 22 | 0 | | | | | | | | | |
| 28 | 71 | 20 | 0 | | | | | | | | | |
| 29 | 34 | 17 | 0 | | ------ | | | | | | | |
| 30 | 31 | 83 | 0 | | ------ | | | | | | | |
| 31 | 28 | ------ | 0 | | ------ | | ------ | | ------ | | | ------ |
| TOTAL | 2203 | 1826.9 | 274.84 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MEAN | 71.0 | 60.9 | 8.87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MAX | 493 | 660 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIN | 20 | 2.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | 4370 | 3620 | 545 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CAL YR 1968: TOTAL 10,993.68 MEAN 30.0 MAX 660 MIN 0 AC-FT 21,810
WTR YR 1969: TOTAL 4,304.74 MEAN 11.8 MAX 660 MIN 0 AC-FT 8,540

## 16-8550. Ugum River near Talofofo

LOCATION.--Lat 13°20'00" N., long 144°44'55" E., Guam, on left bank 0.3 mile upstream from confluence with Talofofo River, 1.3 miles south of Talofofo, and 4.2 miles north of Inarajan.

DRAINAGE AREA.--6.96 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level.

EXTREMES.--Current year: Maximum discharge, 5,900 cfs Nov. 23 (gage height, 11.90 ft), from rating curve extended as explained below; minimum, 2.8 cfs June 26-30.
Period of record: Maximum discharge, 7,660 cfs Dec. 4, 1963 (gage height, 12.06 ft), from rating curve extended above 910 cfs on basis of slope-area measurements at gage heights 11.30, 11.36, 11.87 and 11.90 ft; minimum, 1.1 cfs July 18, 1965.

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

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 56 | 32 | 111 | 16 | 9.6 | 7.6 | 5.3 | 5.1 | 4.3 | 3.6 | 23 | 12 |
| 2 | 31 | 32 | 41 | 16 | 9.2 | 7.3 | 5.1 | 4.8 | 4.3 | 4.1 | 16 | 36 |
| 3 | 30 | 35 | 35 | 14 | 10 | 7.0 | 4.8 | 4.5 | 4.1 | 3.8 | 18 | 28 |
| 4 | 24 | 29 | 35 | 14 | 11 | 6.6 | 4.8 | 4.8 | 4.1 | 3.6 | 40 | 17 |
| 5 | 98 | 26 | 33 | 14 | 9.6 | 6.2 | 4.8 | 5.6 | 3.8 | 3.6 | 47 | 12 |
| 6 | 40 | 26 | 30 | 14 | 9.2 | 6.2 | 4.8 | 5.6 | 3.8 | 3.6 | 29 | 10 |
| 7 | 27 | 31 | 29 | 16 | 8.8 | 5.9 | 4.8 | 10 | 3.6 | 3.4 | 18 | 13 |
| 8 | 60 | 31 | 26 | 17 | 8.8 | 5.9 | 4.8 | 8.0 | 3.6 | 3.2 | 11 | 10 |
| 9 | 30 | 31 | 27 | 16 | 8.8 | 5.9 | 5.1 | 5.6 | 3.8 | 3.2 | 8.8 | 10 |
| 10 | 24 | 26 | 26 | 17 | 8.4 | 5.6 | 5.1 | 5.1 | 4.3 | 3.0 | 18 | 18 |
| 11 | 23 | 34 | 25 | 23 | 8.8 | 5.6 | 4.8 | 5.1 | 4.3 | 3.6 | 18 | 15 |
| 12 | 26 | 31 | 24 | 17 | 8.8 | 5.3 | 4.8 | 4.8 | 4.1 | 4.1 | 14 | 13 |
| 13 | 68 | 30 | 25 | 15 | 8.8 | 5.6 | 4.8 | 5.1 | 4.1 | 4.3 | 10 | 12 |
| 14 | 28 | 33 | 23 | 14 | 8.8 | 6.2 | 4.8 | 4.8 | 3.8 | 4.1 | 9.2 | 11 |
| 15 | 150 | 24 | 23 | 14 | 8.0 | 9.6 | 4.8 | 4.5 | 3.8 | 3.8 | 8.0 | 14 |
| 16 | 35 | 23 | 23 | 13 | 8.0 | 8.4 | 4.8 | 4.3 | 3.6 | 3.8 | 14 | 10 |
| 17 | 44 | 22 | 22 | 13 | 8.0 | 7.0 | 4.8 | 4.3 | 3.6 | 3.6 | 16 | 9.2 |
| 18 | 28 | 26 | 22 | 13 | 8.0 | 6.2 | 4.8 | 4.8 | 3.4 | 3.6 | 9.6 | 8.8 |
| 19 | 24 | 370 | 22 | 13 | 8.0 | 6.2 | 4.8 | 7.0 | 3.4 | 4.5 | 7.6 | 9.6 |
| 20 | 23 | 45 | 21 | 12 | 8.0 | 5.6 | 4.8 | 4.8 | 3.4 | 4.3 | 7.3 | 8.4 |
| 21 | 23 | 66 | 21 | 12 | 7.6 | 5.3 | 6.6 | 4.5 | 3.2 | 4.8 | 6.6 | 9.6 |
| 22 | 543 | 37 | 19 | 18 | 7.3 | 5.3 | 5.3 | 4.3 | 3.0 | 4.3 | 5.9 | 8.0 |
| 23 | 456 | 820 | 18 | 18 | 7.3 | 5.6 | 4.8 | 4.3 | 3.0 | 6.2 | 6.2 | 12 |
| 24 | 51 | 106 | 18 | 13 | 7.3 | 5.3 | 4.8 | 4.3 | 3.0 | 5.9 | 5.9 | 12 |
| 25 | 40 | 49 | 18 | 12 | 7.3 | 5.3 | 5.1 | 4.1 | 3.0 | 4.5 | 5.6 | 11 |
| 26 | 34 | 42 | 21 | 11 | 7.0 | 5.6 | 4.8 | 4.5 | 2.8 | 6.2 | 23 | 10 |
| 27 | 177 | 36 | 18 | 11 | 7.0 | 5.6 | 4.8 | 4.8 | 2.8 | 47 | 43 | 11 |
| 28 | 83 | 33 | 17 | 10 | 7.0 | 5.3 | 4.5 | 4.5 | 2.8 | 26 | 23 | 8.4 |
| 29 | 41 | 32 | 17 | 10 | ------ | 5.3 | 4.8 | 4.5 | 2.8 | 34 | 17 | 8.0 |
| 30 | 35 | 115 | 16 | 10 | ------ | 5.3 | 5.1 | 4.5 | 2.8 | 28 | 15 | 19 |
| 31 | 34 | ------ | 16 | 9.6 | ------ | 5.1 | ------ | 4.5 | ------ | 41 | 12 | ------ |
| TOTAL | 2,386 | 2,273 | 822 | 435.6 | 234.4 | 188.9 | 148.0 | 157.4 | 106.4 | 282.7 | 505.7 | 386.0 |
| MEAN | 77.0 | 75.8 | 26.5 | 14.1 | 8.37 | 6.09 | 4.93 | 5.08 | 3.56 | 9.12 | 16.3 | 12.9 |
| MAX | 543 | 820 | 111 | 23 | 11 | 9.6 | 6.6 | 10 | 4.3 | 47 | 47 | 36 |
| MIN | 23 | 22 | 16 | 9.6 | 7.0 | 5.1 | 4.5 | 4.1 | 2.8 | 3.0 | 5.6 | 8.0 |
| AC-FT | 4,730 | 4,510 | 1,630 | 864 | 465 | 375 | 294 | 312 | 211 | 561 | 1,000 | 766 |

CAL YR 1968: TOTAL 10,926.6 MEAN 29.9 MAX 820 MIN 5.3 AC-FT 21,670
WTR YR 1969: TOTAL 7,926.1 MEAN 21.7 MAX 543 MIN 2.8 AC-FT 15,720

PEAK DISCHARGE (BASE, 1,100 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-15 | 0300 | 8.86 | 1,150 | 11-19 | 1100 | 9.85 | 1,330 |
| 10-23 | 0330 | 11.68 | 3,660 | 11-23 | 0730 | 11.90 | 5,900 |

## 16-8580. Ylig River near Yona

LOCATION.--Lat 13°23'20" N., long 144°45'00" E., Guam, on right bank 2 miles upstream from mouth, 2.1 miles southwest of Yona, and 5.8 miles south of Agana.

DRAINAGE AREA.--6.58 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 4,150 cfs Nov. 23 (gage height, 17.85 ft), from rating curve extended as explained below; minimum, 0.13 cfs June 27, 28, 30.
Period of record: Maximum discharge, 4,900 cfs Sept. 9, 1963 (gage height, 19.77 ft, from floodmarks), from rating curve extended above 620 cfs on basis of slope-area measurements at gage heights 11.24 and 15.87 ft; minimum not determined; minimum daily, 0.10 cfs May 15 to June 14, June 16-20, 1966.

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

REVISIONS (FISCAL YEARS).--WSP 1937: 1957-58.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40 | 23 | 100 | 6.5 | 2.8 | 2.2 | .87 | .73 | .40 | 4.7 | 59 | 68 |
| 2 | 20 | 18 | 30 | 6.2 | 2.7 | 1.9 | .87 | .55 | .36 | 1.7 | 100 | 50 |
| 3 | 20 | 15 | 25 | 6.2 | 3.1 | 1.6 | .73 | .45 | .28 | .87 | 105 | 45 |
| 4 | 15 | 14 | 25 | 6.0 | 3.5 | 1.7 | .73 | .50 | .24 | .73 | 133 | 26 |
| 5 | 70 | 14 | 25 | 6.0 | 2.8 | 1.6 | .73 | .60 | .21 | .55 | 115 | 21 |
| 6 | 30 | 15 | 20 | 6.0 | 2.7 | 1.4 | .73 | 1.0 | .18 | .40 | 44 | 55 |
| 7 | 20 | 12 | 20 | 6.5 | 2.7 | 1.3 | .73 | 2.4 | .18 | .32 | 28 | 31 |
| 8 | 50 | 15 | 15 | 6.0 | 2.5 | 1.2 | .80 | 1.8 | .24 | .28 | 21 | 22 |
| 9 | 20 | 17 | 15 | 6.0 | 2.4 | 1.1 | .94 | .94 | .28 | .24 | 17 | 34 |
| 10 | 15 | 11 | 15 | 5.8 | 2.2 | 1.0 | .87 | .66 | .40 | .28 | 20 | 24 |
| 11 | 15 | 16 | 15 | 6.0 | 2.2 | 1.0 | .73 | .55 | .45 | .36 | 15 | 20 |
| 12 | 15 | 12 | 15 | 5.3 | 2.2 | 1.0 | .80 | .45 | 1.8 | .66 | 12 | 16 |
| 13 | 50 | 14 | 15 | 4.7 | 2.2 | .94 | .87 | .45 | 1.3 | .55 | 11 | 17 |
| 14 | 15 | 17 | 13 | 5.1 | 2.5 | .94 | .80 | .45 | .66 | .45 | 11 | 16 |
| 15 | 100 | 10 | 13 | 4.5 | 2.2 | 1.0 | .73 | .45 | .50 | .40 | 10 | 16 |
| 16 | 34 | 8.3 | 13 | 4.1 | 2.1 | 1.6 | .66 | .36 | .45 | 1.9 | 21 | 13 |
| 17 | 23 | 7.8 | 12 | 3.9 | 2.0 | 1.9 | .66 | .32 | .50 | 1.4 | 14 | 12 |
| 18 | 20 | 53 | 12 | 3.7 | 2.1 | 1.5 | .66 | .28 | .32 | .80 | 10 | 11 |
| 19 | 17 | 383 | 12 | 3.5 | 2.4 | 1.4 | .60 | 1.6 | .24 | .87 | 8.9 | 12 |
| 20 | 15 | 27 | 10 | 3.5 | 2.2 | 1.2 | .60 | 1.3 | .21 | 1.5 | 8.3 | 11 |
| 21 | 16 | 65 | 10 | 3.5 | 2.0 | 1.1 | .60 | .60 | .21 | 2.1 | 13 | 11 |
| 22 | 644 | 50 | 9.0 | 4.7 | 1.8 | 1.1 | .55 | .40 | .21 | 2.4 | 8.6 | 9.8 |
| 23 | 337 | 750 | 8.0 | 4.9 | 1.8 | 1.0 | .50 | .32 | .40 | 5.1 | 7.5 | 17 |
| 24 | 46 | 138 | 8.0 | 3.9 | 1.8 | 1.0 | .45 | .28 | .40 | 4.5 | 7.5 | 13 |
| 25 | 32 | 33 | 8.0 | 3.5 | 1.8 | .94 | .45 | .24 | .24 | 2.2 | 7.5 | 11 |
| 26 | 26 | 26 | 8.0 | 3.2 | 1.7 | 1.0 | .50 | .36 | .18 | 2.5 | 7.0 | 10 |
| 27 | 141 | 24 | 7.5 | 2.9 | 1.7 | 1.0 | .50 | .80 | .15 | 36 | 39 | 22 |
| 28 | 33 | 20 | 7.0 | 2.9 | 1.7 | 1.0 | .45 | .80 | .15 | 35 | 54 | 33 |
| 29 | 25 | 18 | 7.0 | 2.8 | ------ | 1.0 | .40 | .55 | .15 | 51 | 63 | 12 |
| 30 | 24 | 175 | 6.5 | 2.7 | ------ | .94 | .45 | .50 | .13 | 62 | 32 | 22 |
| 31 | 20 | ------ | 6.5 | 6.0 | ------ | .87 | ------ | .50 | ------ | 104 | 28 | ------ |
| TOTAL | 1,948 | 2001.1 | 505.5 | 146.5 | 63.8 | 38.43 | 19.96 | 21.19 | 11.42 | 325.76 | 1,030.3 | 680.8 |
| MEAN | 62.8 | 66.7 | 16.3 | 4.73 | 2.28 | 1.24 | .66 | .68 | .38 | 10.5 | 33.2 | 22.7 |
| MAX | 644 | 750 | 100 | 6.5 | 3.5 | 2.2 | .94 | 2.4 | 1.8 | 104 | 133 | 68 |
| MIN | 15 | 7.8 | 6.5 | 2.7 | 1.7 | .87 | .40 | .24 | .13 | .24 | 7.0 | 9.8 |
| AC-FT | 3,860 | 3,970 | 1,000 | 291 | 127 | 76 | 40 | 42 | 23 | 646 | 2040 | 1,350 |

CAL YR 1968: TOTAL 10,508.4 MEAN 28.7 MAX 750 MIN 1.4 AC-FT 20,840
WTR YR 1969: TOTAL 6,792.76 MEAN 18.6 MAX 750 MIN .13 AC-FT 13,470

PEAK DISCHARGE (BASE, 2,000 CFS).--Oct. 22 (1800) 2,690 cfs (13.50 ft); Nov. 23 (0530) 4,150 cfs (17.85 ft).

NOTE.--No gage-height record Nov. 30 to Jan. 1.

## 16-8650. Pago River near Ordot

LOCATION.--Lat 13°26'10" N., long 144°45'15" E., Guam, on left bank 0.8 mile south of Ordot, 2.5 miles south of Agana, and 3.6 miles southeast of Asan.

DRAINAGE AREA.--6.17 sq mi.

PERIOD OF RECORD.--September 1951 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 4,590 cfs Nov. 23 (gage height, 14.95 ft, from floodmark in well), from rating curve extended as explained below; minimum not determined; minimum daily, 0.10 cfs June 19-22, 27-30, July 7, 8.
Period of record: Maximum discharge, 9,470 cfs Aug. 2, 1962 (gage height, 18.87 ft, from floodmarks), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 13.22, 15.07 and 18.87 ft; no flow for many days in 1959 and 1966.

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

REVISIONS (FISCAL YEARS).--WSP 1937: 1954(M), 1958(M), drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40 | 20 | 100 | 6.0 | 2.3 | 1.5 | .90 | 1.0 | .29 | .36 | 50 | 48 |
| 2 | 20 | 17 | 30 | 5.0 | 2.3 | 1.3 | .78 | .50 | .29 | .90 | 70 | 66 |
| 3 | 20 | 15 | 25 | 4.5 | 2.6 | 1.3 | .78 | .30 | .23 | .29 | 80 | 42 |
| 4 | 15 | 15 | 25 | 4.9 | 3.1 | 1.5 | .68 | .25 | .18 | .23 | 100 | 24 |
| 5 | 70 | 12 | 20 | 4.6 | 2.6 | 1.2 | .58 | .30 | .14 | .18 | 90 | 17 |
| 6 | 30 | 13 | 20 | 4.6 | 2.3 | 1.0 | .49 | 1.0 | .14 | .15 | 40 | 32 |
| 7 | 20 | 10 | 15 | 4.9 | 2.1 | 1.0 | .49 | 2.0 | .14 | .10 | 25 | 29 |
| 8 | 40 | 15 | 15 | 5.7 | 2.1 | .90 | .49 | 1.0 | .18 | .10 | 15 | 19 |
| 9 | 20 | 15 | 15 | 6.6 | 1.9 | .78 | .58 | .60 | .23 | .15 | 10 | 36 |
| 10 | 15 | 10 | 15 | 5.7 | 1.9 | .78 | .78 | .50 | .23 | .15 | 8.9 | 18 |
| 11 | 15 | 20 | 15 | 4.6 | 1.9 | .78 | .49 | .50 | 1.5 | .15 | 8.9 | 16 |
| 12 | 15 | 10 | 15 | 4.3 | 1.9 | .78 | .49 | .40 | .68 | .78 | 7.0 | 13 |
| 13 | 40 | 10 | 15 | 5.3 | 1.9 | .78 | .49 | .40 | .42 | 1.2 | 7.0 | 21 |
| 14 | 15 | 15 | 10 | 5.7 | 2.3 | .90 | .35 | .42 | .29 | 1.5 | 10 | 20 |
| 15 | 49 | 10 | 10 | 4.0 | 1.9 | 1.2 | .35 | .35 | .23 | 2.1 | 7.4 | 27 |
| 16 | 21 | 10 | 10 | 4.0 | 1.7 | 1.5 | .29 | .29 | .18 | 2.8 | 21 | 21 |
| 17 | 14 | 15 | 10 | 3.6 | 1.7 | 1.5 | .29 | .23 | .14 | 1.3 | 12 | 12 |
| 18 | 11 | 60 | 10 | 3.3 | 1.7 | 1.2 | .23 | .23 | .14 | .90 | 9.4 | 10 |
| 19 | 8.9 | 175 | 10 | 3.3 | 1.7 | 1.0 | .23 | .18 | .10 | .35 | 8.4 | 10 |
| 20 | 7.9 | 25 | 10 | 3.1 | 1.5 | .90 | .23 | 1.0 | .10 | .29 | 7.9 | 9.4 |
| 21 | 7.0 | 50 | 10 | 3.3 | 1.3 | .78 | .23 | .90 | .10 | .23 | 7.4 | 10 |
| 22 | 500 | 40 | 9.0 | 4.0 | 1.2 | .68 | .29 | .49 | .10 | .29 | 6.6 | 9.4 |
| 23 | 254 | 750 | 9.0 | 5.3 | 1.3 | .68 | .23 | .35 | .23 | 1.0 | 6.1 | 102 |
| 24 | 40 | 100 | 9.0 | 4.6 | 1.3 | .58 | .18 | .23 | .29 | 1.9 | 6.1 | 18 |
| 25 | 30 | 30 | 8.0 | 3.3 | 1.3 | .58 | .49 | .18 | .18 | 1.2 | 6.6 | 14 |
| 26 | 20 | 25 | 9.0 | 2.8 | 1.3 | .58 | .49 | 1.5 | .14 | .90 | 6.6 | 12 |
| 27 | 70 | 20 | 8.0 | 2.6 | 1.5 | .58 | .35 | 1.7 | .10 | 13 | 8.4 | 10 |
| 28 | 30 | 20 | 7.0 | 2.6 | 1.3 | .78 | .29 | .90 | .10 | 20 | 14 | 14 |
| 29 | 25 | 15 | 7.0 | 2.6 | ------ | .90 | .23 | .49 | .10 | 50 | 44 | 9.4 |
| 30 | 20 | 150 | 7.0 | 2.3 | ------ | .90 | .50 | .42 | .10 | 50 | 37 | 30 |
| 31 | 20 | ------ | 6.0 | 2.3 | ------ | .90 | ------ | .35 | ------ | 100 | 34 | ------ |
| TOTAL | 1502.8 | 1692 | 484.0 | 129.4 | 51.9 | 29.74 | 13.27 | 18.96 | 7.27 | 252.50 | 764.7 | 719.2 |
| MEAN | 48.5 | 56.4 | 15.6 | 4.17 | 1.85 | .96 | .44 | .61 | .24 | 8.15 | 24.7 | 24.0 |
| MAX | 500 | 750 | 100 | 6.6 | 3.1 | 1.5 | .90 | 2.0 | 1.5 | 100 | 100 | 102 |
| MIN | 7.0 | 10 | 6.0 | 2.3 | 1.2 | .58 | .18 | .18 | .10 | .10 | 6.1 | 9.4 |
| AC-FT | 2980 | 3360 | 960 | 257 | 103 | 59 | 26 | 38 | 14 | 501 | 1520 | 1430 |

CAL YR 1968: TOTAL 9,594.8 MEAN 26.2 MAX 866 MIN 1.3 AC-FT 19,030
WTR YR 1969: TOTAL 5,665.74 MEAN 15.5 MAX 750 MIN .10 AC-FT 11,240

PEAK DISCHARGE (BASE, 2,700 CFS).--Oct. 22 (about 1800) 3,870 cfs (13.60 ft, from floodmark in well; Nov. 23 (about 0600) 4,590 cfs (14.95 ft, from floodmark in well).

NOTE.--No gage-height record Oct. 24 to Jan. 3.

## 16-8752. Benoki-gawa at Benoki

LOCATION.--Lat 26°47'06" N., long 128°14'59" E., Okinawa, on left bank 0.9 mile southeast of Benoki and 1.6 miles east of Sate.

DRAINAGE AREA.--3.8 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 3,340 cfs June 27 (gage height, 8.43 ft); minimum, 3.1 cfs Jan. 13, 14.
Period of record: Maximum discharge, 6,700 cfs May 12, 1966 (gage height, 10.45 ft), from rating curve extended above 2,400 cfs; minimum, 2.5 cfs Oct. 15, 16, 1967.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 34 | 4.2 | 3.4 | 5.9 | 37 | 11 | 9.9 | 6.1 | 30 | 43 | 8.0 | 9.2 |
| 2 | 9.6 | 4.1 | 3.6 | 3.9 | 20 | 32 | 9.3 | 6.1 | 39 | 36 | 7.7 | 9.2 |
| 3 | 7.6 | 4.1 | 3.9 | 3.4 | 13 | 18 | 9.2 | 6.1 | 220 | 32 | 7.5 | 11 |
| 4 | 6.9 | 4.0 | 3.6 | 3.3 | 73 | 16 | 18 | 5.6 | 47 | 36 | 14 | 8.8 |
| 5 | 6.5 | 4.1 | 3.7 | 4.2 | 23 | 14 | 15 | 5.4 | 370 | 28 | 9.1 | 8.4 |
| 6 | 6.2 | 5.4 | 3.4 | 4.2 | 16 | 12 | 11 | 5.6 | 198 | 26 | 8.7 | 7.9 |
| 7 | 7.2 | 4.9 | 3.3 | 3.4 | 13 | 11 | 9.9 | 5.5 | 69 | 40 | 7.5 | 7.5 |
| 8 | 6.2 | 11 | 3.3 | 3.3 | 11 | 47 | 21 | 12 | 134 | 24 | 11 | 7.8 |
| 9 | 6.0 | 29 | 3.3 | 3.2 | 9.7 | 24 | 12 | 241 | 191 | 22 | 9.3 | 99 |
| 10 | 7.0 | 6.0 | 3.4 | 3.2 | 9.2 | 76 | 11 | 25 | 79 | 20 | 7.9 | 36 |
| 11 | 7.2 | 4.8 | 3.5 | 3.2 | 8.6 | 198 | 10 | 15 | 56 | 19 | 7.0 | 123 |
| 12 | 6.0 | 4.5 | 15 | 3.4 | 7.9 | 64 | 9.6 | 13 | 49 | 18 | 6.6 | 39 |
| 13 | 5.5 | 4.3 | 4.9 | 3.3 | 7.4 | 35 | 9.2 | 309 | 210 | 17 | 6.2 | 21 |
| 14 | 5.4 | 4.1 | 4.1 | 6.6 | 7.8 | 27 | 8.8 | 152 | 67 | 16 | 6.0 | 18 |
| 15 | 5.2 | 4.0 | 4.0 | 11 | 6.9 | 23 | 8.6 | 63 | 49 | 16 | 5.8 | 16 |
| 16 | 5.1 | 3.9 | 3.5 | 12 | 6.6 | 20 | 8.7 | 35 | 41 | 16 | 5.7 | 14 |
| 17 | 5.1 | 3.8 | 3.3 | 34 | 6.6 | 18 | 9.7 | 33 | 35 | 16 | 5.6 | 13 |
| 18 | 4.9 | 3.7 | 4.2 | 7.2 | 10 | 17 | 8.0 | 25 | 32 | 14 | 5.5 | 12 |
| 19 | 4.8 | 3.7 | 4.8 | 6.3 | 7.6 | 16 | 7.6 | 24 | 231 | 14 | 9.0 | 11 |
| 20 | 4.7 | 3.7 | 3.5 | 6.2 | 6.6 | 14 | 7.5 | 62 | 168 | 13 | 719 | 10 |
| 21 | 5.4 | 3.7 | 3.3 | 5.0 | 6.3 | 16 | 7.4 | 45 | 195 | 13 | 80 | 10 |
| 22 | 5.0 | 3.7 | 4.4 | 4.5 | 6.4 | 13 | 7.9 | 30 | 110 | 13 | 29 | 9.5 |
| 23 | 4.8 | 3.7 | 3.7 | 4.2 | 6.5 | 12 | 7.1 | 264 | 105 | 12 | 21 | 9.2 |
| 24 | 4.5 | 3.6 | 3.4 | 4.1 | 22 | 12 | 6.9 | 83 | 195 | 11 | 18 | 8.9 |
| 25 | 4.3 | 4.2 | 3.3 | 3.9 | 15 | 15 | 6.8 | 53 | 95 | 11 | 16 | 8.9 |
| 26 | 4.3 | 3.7 | 3.3 | 4.4 | 19 | 12 | 6.6 | 42 | 68 | 11 | 14 | 8.5 |
| 27 | 4.3 | 3.5 | 3.3 | 4.3 | 14 | 11 | 7.1 | 155 | 397 | 11 | 14 | 8.1 |
| 28 | 4.3 | 3.6 | 3.3 | 4.1 | 14 | 29 | 6.4 | 57 | 115 | 11 | 12 | 7.7 |
| 29 | 4.6 | 3.4 | 3.3 | 35 | ------ | 13 | 6.2 | 44 | 80 | 10 | 11 | 7.6 |
| 30 | 4.3 | 3.4 | 3.4 | 12 | ------ | 11 | 6.1 | 42 | 56 | 9.9 | 10 | 7.4 |
| 31 | 4.2 | ------ | 3.5 | 77 | ------ | 11 | ------ | 35 | ------ | 8.4 | 9.6 | ------ |
| TOTAL | 201.1 | 153.8 | 123.9 | 289.7 | 404.1 | 848 | 282.5 | 1,899.4 | 3,731 | 587.3 | 1,101.7 | 567.6 |
| MEAN | 6.49 | 5.13 | 4.00 | 9.35 | 14.4 | 27.4 | 9.42 | 61.3 | 124 | 18.9 | 35.5 | 18.9 |
| MAX | 34 | 29 | 15 | 77 | 73 | 198 | 21 | 309 | 397 | 43 | 719 | 123 |
| MIN | 4.2 | 3.4 | 3.3 | 3.2 | 6.3 | 11 | 6.1 | 5.4 | 30 | 8.4 | 5.5 | 7.4 |
| AC-FT | 399 | 305 | 246 | 575 | 802 | 1,680 | 560 | 3,770 | 7,400 | 1,160 | 2,190 | 1,130 |

CAL YR 1968: TOTAL 5,108.5 MEAN 14.0 MAX 350 MIN 3.3 AC-FT 10,130
WTR YR 1969: TOTAL 10,190.1 MEAN 27.9 MAX 719 MIN 3.2 AC-FT 20,210

PEAK DISCHARGE (BASE, 1,800 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 6- 5 | 1930 | 8.25 | 3,120 | 8-20 | 1300 | 8.25 | 3,120 |
| 6-27 | 0900 | 8.43 | 3,340 | 9-12 | 2100 | 7.00 | 1,820 |

## 16-8755. Yona-gawa at Yona

LOCATION.--Lat 26°45'10" N., long 128°13'18" E., Okinawa, on left bank 0.9 mile southeast of Yona and 2.7 miles east of Hentona School.

DRAINAGE AREA.--1.7 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 1,510 cfs May 9 (gage height, 5.22 ft), from rating curve extended above 350 cfs; minimum, 1.4 cfs Jan. 13, 14.
Period of record: Maximum discharge, 1,550 cfs May 12, 1966 (gage height, 5.27 ft), from rating curve extended above 350 cfs; minimum, 1.4 cfs Oct. 15, 16, 1967, Jan. 13, 14, 1969.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11 | 2.2 | 1.9 | 2.4 | 17 | 6.8 | 4.8 | 3.0 | 16 | 16 | 3.6 | 5.1 |
| 2 | 4.6 | 2.1 | 1.9 | 1.7 | 10 | 16 | 4.6 | 3.0 | 28 | 14 | 3.4 | 4.6 |
| 3 | 3.8 | 2.1 | 2.1 | 1.6 | 6.5 | 9.1 | 4.4 | 2.8 | 103 | 13 | 3.4 | 4.8 |
| 4 | 3.6 | 2.1 | 1.9 | 1.6 | 33 | 7.9 | 11 | 2.8 | 28 | 15 | 7.3 | 4.4 |
| 5 | 3.4 | 2.2 | 2.1 | 2.1 | 14 | 6.5 | 7.9 | 2.6 | 129 | 11 | 4.6 | 4.1 |
| 6 | 3.4 | 2.8 | 1.9 | 1.9 | 9.5 | 5.9 | 5.6 | 2.8 | 70 | 10 | 5.1 | 3.6 |
| 7 | 3.4 | 2.4 | 1.7 | 1.7 | 7.9 | 5.6 | 5.1 | 2.6 | 31 | 11 | 4.1 | 3.6 |
| 8 | 4.4 | 5.6 | 1.7 | 1.6 | 6.5 | 14 | 20 | 6.6 | 54 | 9.1 | 5.6 | 3.6 |
| 9 | 3.4 | 9.1 | 1.7 | 1.6 | 5.6 | 17 | 8.3 | 135 | 62 | 7.9 | 4.8 | 15 |
| 10 | 3.8 | 2.8 | 1.7 | 1.6 | 5.1 | 14 | 6.8 | 19 | 34 | 7.2 | 3.8 | 8.3 |
| 11 | 3.4 | 2.4 | 1.9 | 1.6 | 4.8 | 58 | 5.9 | 11 | 26 | 6.8 | 3.4 | 28 |
| 12 | 3.2 | 2.2 | 7.6 | 1.6 | 4.4 | 28 | 5.4 | 8.7 | 25 | 6.5 | 3.0 | 12 |
| 13 | 2.8 | 2.4 | 2.4 | 1.4 | 4.1 | 16 | 5.1 | 141 | 83 | 6.2 | 2.8 | 7.6 |
| 14 | 2.8 | 2.2 | 2.2 | 2.4 | 4.6 | 12 | 4.8 | 67 | 31 | 5.9 | 2.6 | 6.2 |
| 15 | 2.6 | 2.2 | 2.1 | 3.6 | 3.8 | 9.5 | 4.6 | 35 | 22 | 5.6 | 2.6 | 5.6 |
| 16 | 2.6 | 2.2 | 1.9 | 2.8 | 3.8 | 8.3 | 4.8 | 21 | 18 | 5.6 | 2.4 | 5.1 |
| 17 | 2.6 | 2.2 | 1.7 | 5.8 | 4.1 | 7.6 | 5.4 | 19 | 16 | 6.2 | 2.4 | 4.8 |
| 18 | 2.4 | 2.2 | 2.6 | 2.4 | 4.6 | 6.8 | 4.1 | 14 | 14 | 5.6 | 2.2 | 4.6 |
| 19 | 2.4 | 2.1 | 2.7 | 3.4 | 4.1 | 6.2 | 4.1 | 14 | 108 | 5.1 | 3.8 | 4.4 |
| 20 | 2.4 | 2.1 | 1.9 | 3.2 | 3.8 | 5.9 | 3.6 | 40 | 106 | 4.8 | 252 | 4.4 |
| 21 | 3.0 | 2.1 | 1.7 | 2.4 | 3.6 | 6.8 | 3.6 | 26 | 78 | 4.6 | 44 | 4.1 |
| 22 | 2.8 | 2.2 | 2.2 | 2.1 | 4.6 | 5.4 | 3.6 | 18 | 51 | 4.6 | 16 | 3.8 |
| 23 | 2.6 | 2.1 | 1.9 | 2.1 | 3.8 | 5.1 | 3.4 | 90 | 49 | 4.6 | 12 | 3.8 |
| 24 | 2.4 | 2.1 | 1.7 | 1.9 | 12 | 4.8 | 3.2 | 35 | 81 | 4.4 | 9.1 | 3.6 |
| 25 | 2.2 | 2.2 | 1.7 | 1.9 | 7.9 | 6.5 | 3.0 | 24 | 44 | 4.1 | 7.9 | 3.8 |
| 26 | 2.2 | 2.1 | 1.7 | 2.1 | 15 | 5.1 | 3.0 | 18 | 30 | 4.5 | 7.2 | 3.4 |
| 27 | 2.2 | 2.1 | 1.7 | 2.1 | 9.5 | 4.6 | 3.4 | 75 | 125 | 4.4 | 7.6 | 3.2 |
| 28 | 2.2 | 2.1 | 1.7 | 2.1 | 8.3 | 19 | 3.0 | 33 | 36 | 4.6 | 5.9 | 3.2 |
| 29 | 2.2 | 1.9 | 1.6 | 21 | ------ | 6.8 | 2.8 | 25 | 25 | 4.4 | 5.4 | 3.2 |
| 30 | 2.2 | 1.9 | 1.7 | 6.5 | ------ | 5.6 | 2.8 | 23 | 20 | 4.4 | 5.1 | 3.0 |
| 31 | 2.1 | ------ | 1.6 | 20 | ------ | 5.1 | ------ | 19 | ------ | 3.8 | 4.8 | ------ |
| TOTAL | 98.1 | 76.4 | 64.8 | 110.2 | 221.9 | 335.9 | 158.1 | 936.9 | 1,543 | 220.9 | 447.9 | 174.9 |
| MEAN | 3.16 | 2.55 | 2.09 | 3.55 | 7.92 | 10.8 | 5.27 | 30.2 | 51.4 | 7.13 | 14.4 | 5.83 |
| MAX | 11 | 9.1 | 7.6 | 21 | 33 | 58 | 20 | 141 | 129 | 16 | 252 | 28 |
| MIN | 2.1 | 1.9 | 1.6 | 1.4 | 3.6 | 4.6 | 2.8 | 2.6 | 14 | 3.8 | 2.2 | 3.0 |
| AC-FT | 195 | 152 | 129 | 219 | 440 | 666 | 314 | 1,860 | 3,060 | 438 | 888 | 347 |

CAL YR 1968: TOTAL 2,247.0 MEAN 6.14 MAX 130 MIN 1.6 AC-FT 4,460
WTR YR 1969: TOTAL 4,389.0 MEAN 12.0 MAX 252 MIN 1.4 AC-FT 8,710

PEAK DISCHARGE (BASE, 900 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5- 9 | 1200 | 5.22 | 1,510 | 6-27 | 0800 | 4.80 | 1,250 |
| 6- 5 | 1830 | 4.25 | 928 | 8-20 | 1200 | 4.80 | 1,250 |
| 6-20 | 2230 | 4.25 | 928 | | | | |

## 16-8762. Takazato-gawa near Hama

LOCATION.--Lat 26°41'10" N., long 128°10'48" E., Okinawa, on right bank 2.3 miles southeast of Hama and 3.0 miles south of Okuma.

DRAINAGE AREA.--0.9 sq mi, approximately.

PERIOD OF RECORD.--December 1963 to September 1969 (discontinued as a continuous-record station; converted to a low-flow partial-record station).

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

EXTREMES.--Current year: Maximum discharge, 818 cfs June 5 (gage height, 5.32 ft), from rating curve extended as explained below; minimum, 0.58 cfs Jan. 7-14.
Period of record: Maximum discharge, 1,150 cfs June 16, 1964 (gage height, 6.10 ft), from rating curve extended above 44 cfs on basis of slope-area measurement at gage height 5.45 ft; minimum, 0.58 cfs Jan. 7-14, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.7 | .91 | .73 | 1.3 | 6.0 | 3.5 | 3.1 | 1.3 | 14 | 8.8 | 1.1 | 2.1 |
| 2 | 1.8 | .91 | .91 | .91 | 4.6 | 7.7 | 3.1 | 1.1 | 16 | 7.2 | .91 | 2.1 |
| 3 | 1.6 | .91 | .91 | .73 | 3.1 | 4.9 | 2.7 | 1.1 | 45 | 6.0 | .91 | 2.1 |
| 4 | 1.6 | .91 | .73 | .73 | 9.1 | 4.2 | 4.6 | 1.1 | 19 | 5.3 | 1.3 | 2.1 |
| 5 | 1.3 | 1.1 | .73 | .91 | 5.6 | 3.8 | 3.8 | .91 | 55 | 4.6 | 1.1 | 2.1 |
| 6 | 1.3 | 1.8 | .73 | .73 | 4.2 | 3.5 | 2.7 | 1.1 | 32 | 4.2 | 1.1 | 1.8 |
| 7 | 1.3 | 1.3 | .73 | .73 | 3.5 | 3.5 | 2.4 | .91 | 19 | 4.2 | .91 | 1.8 |
| 8 | 3.8 | 3.2 | .73 | .58 | 2.7 | 8.3 | 4.5 | 3.0 | 22 | 3.5 | 1.6 | 1.8 |
| 9 | 2.1 | 3.7 | .73 | .58 | 2.4 | 12 | 2.7 | 35 | 24 | 3.1 | 1.6 | 7.6 |
| 10 | 2.1 | 1.6 | .73 | .58 | 2.1 | 8.4 | 2.4 | 8.0 | 16 | 2.7 | 1.3 | 4.9 |
| 11 | 1.6 | 1.3 | .73 | .58 | 2.1 | 16 | 2.4 | 12 | 13 | 2.4 | 1.1 | 5.3 |
| 12 | 1.6 | 1.1 | 2.5 | .73 | 1.8 | 11 | 2.1 | 5.3 | 13 | 2.4 | 1.1 | 4.2 |
| 13 | 1.6 | 1.1 | 1.1 | .58 | 1.6 | 8.0 | 2.1 | 66 | 25 | 2.1 | .91 | 3.1 |
| 14 | 1.6 | 1.1 | 1.3 | .91 | 2.1 | 6.8 | 2.1 | 30 | 16 | 2.1 | .91 | 3.1 |
| 15 | 1.3 | .91 | 1.1 | 1.1 | 1.8 | 5.6 | 2.1 | 19 | 13 | 1.8 | .73 | 3.1 |
| 16 | 1.3 | .91 | .91 | .73 | 1.6 | 5.3 | 2.4 | 15 | 11 | 2.4 | .73 | 2.4 |
| 17 | 1.3 | .91 | .73 | 1.1 | 1.6 | 4.6 | 2.1 | 15 | 9.6 | 2.4 | .73 | 2.1 |
| 18 | 1.3 | .91 | 1.2 | .73 | 2.7 | 3.8 | 1.6 | 12 | 8.0 | 1.8 | .73 | 2.1 |
| 19 | 1.1 | .91 | 1.1 | 3.4 | 1.8 | 3.5 | 1.6 | 12 | 36 | 1.6 | 1.4 | 1.8 |
| 20 | 1.1 | .91 | .91 | 2.1 | 1.8 | 3.5 | 1.3 | 25 | 42 | 2.1 | 43 | 1.6 |
| 21 | 1.6 | .91 | .73 | 1.3 | 1.6 | 3.8 | 1.3 | 16 | 37 | 1.6 | 19 | 1.6 |
| 22 | 1.6 | .91 | 1.8 | 1.1 | 1.8 | 3.1 | 1.3 | 11 | 28 | 1.3 | 10 | 1.6 |
| 23 | 1.3 | .91 | .91 | .91 | 1.6 | 2.7 | 1.3 | 24 | 26 | 1.3 | 6.8 | 1.3 |
| 24 | 1.1 | .91 | .91 | .91 | 4.2 | 2.4 | 1.3 | 16 | 35 | 1.3 | 5.6 | 1.3 |
| 25 | 1.1 | .91 | .73 | .91 | 3.8 | 3.8 | 1.1 | 12 | 24 | 1.3 | 4.9 | 1.3 |
| 26 | 1.1 | .73 | .73 | 1.1 | 5.5 | 3.1 | 1.1 | 9.6 | 19 | 1.3 | 4.6 | 1.3 |
| 27 | .91 | .73 | .73 | .91 | 4.2 | 2.4 | 1.6 | 37 | 32 | 1.3 | 3.8 | 1.3 |
| 28 | .91 | .73 | .73 | 1.3 | 3.8 | 10 | 1.3 | 21 | 17 | 1.8 | 3.5 | 1.3 |
| 29 | 1.1 | .73 | .73 | 10 | ------ | 4.9 | 1.3 | 18 | 13 | 1.8 | 3.1 | 1.3 |
| 30 | .91 | .73 | 1.1 | 3.5 | ------ | 3.8 | 1.6 | 17 | 11 | 1.3 | 2.7 | 1.1 |
| 31 | .91 | ------ | .73 | 4.9 | ------ | 3.5 | ------ | 16 | ------ | 1.3 | 2.4 | ------ |
| TOTAL | 45.94 | 34.60 | 29.07 | 46.58 | 88.7 | 171.4 | 65.0 | 462.42 | 690.6 | 86.3 | 129.57 | 70.6 |
| MEAN | 1.48 | 1.15 | .94 | 1.50 | 3.17 | 5.53 | 2.17 | 14.9 | 23.0 | 2.78 | 4.18 | 2.35 |
| MAX | 3.8 | 3.7 | 2.5 | 10 | 9.1 | 16 | 4.6 | 66 | 55 | 8.8 | 43 | 7.6 |
| MIN | .91 | .73 | .73 | .58 | 1.6 | 2.4 | 1.1 | .91 | 8.0 | 1.3 | .73 | 1.1 |
| AC-FT | 91 | 69 | 58 | 92 | 176 | 340 | 129 | 917 | 1,370 | 171 | 257 | 140 |

CAL YR 1968: TOTAL 1,081.71 MEAN 2.96 MAX 28 MIN .73 AC-FT 2,150
WTR YR 1969: TOTAL 1,920.78 MEAN 5.26 MAX 66 MIN .58 AC-FT 3,810

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5- 9 | 1130 | 5.30 | 810 | 6- 3 | 0100 | 4.73 | 606 |
| 5-13 | 1830 | 3.92 | 360 | 6- 5 | 1800 | 5.32 | 818 |
| 5-27 | 1200 | 4.60 | 560 | 6-20 | 2200 | 4.42 | 501 |

## 16-8770. Right Branch of South Fork Henan-gawa near Tsuha

LOCATION.--Lat 26°37'42" N., long 128°05'52" E., Okinawa, on right bank 1.6 miles upstream from Henan-gawa bridge at Highway 1 and 1.6 miles south of Tsuha.

DRAINAGE AREA.--0.7 sq mi, approximately.

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

GAGE.--Water-stage recorder. Concrete control since May 14, 1965. Altitude of gage is 50 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,620 cfs June 5 (gage height, 5.60 ft), from rating curve extended as explained below; minimum, 0.32 cfs Dec. 25-31, Jan. 1-5, 13, 14.
Period of record: Maximum discharge, 1,620 cfs June 5, 1969 (gage height, 5.60 ft), from rating curve extended above 150 cfs on basis of slope-area measurement at gage height 5.46 ft; minimum, 0.32 cfs Dec. 25-31, 1968, Jan. 1-5, 13, 14, 1969.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .88 | .54 | .44 | .49 | 3.2 | 1.2 | 1.0 | .64 | 5.2 | 6.0 | 1.4 | 1.4 |
| 2 | .88 | .54 | .54 | .36 | 1.5 | 6.1 | .94 | .69 | 25 | 5.2 | 1.4 | 1.3 |
| 3 | .81 | .54 | .54 | .32 | .94 | 1.8 | .94 | .59 | 28 | 5.0 | 1.4 | 1.4 |
| 4 | .81 | .49 | .49 | .32 | 5.2 | 1.4 | 3.1 | .54 | 7.4 | 4.6 | 1.7 | 1.3 |
| 5 | .81 | .54 | .49 | .59 | 1.7 | 1.2 | 1.7 | .54 | 55 | 4.0 | 1.4 | 1.2 |
| 6 | .88 | .81 | .49 | .44 | 1.1 | 1.1 | 1.2 | .59 | 17 | 3.9 | 1.4 | 1.1 |
| 7 | .81 | .69 | .44 | .40 | .94 | 1.1 | 1.1 | .59 | 8.0 | 4.0 | 1.3 | 1.1 |
| 8 | 1.6 | .87 | .44 | .36 | .75 | 6.5 | 2.0 | 1.9 | 17 | 3.4 | 1.5 | 1.1 |
| 9 | 1.0 | 1.3 | .44 | .36 | .69 | 7.6 | 1.3 | 9.9 | 21 | 3.2 | 1.7 | 5.5 |
| 10 | .81 | .59 | .40 | .36 | .75 | 2.8 | 1.1 | 2.3 | 8.8 | 3.1 | 1.8 | 2.6 |
| 11 | .81 | .54 | .54 | .40 | .64 | 17 | 1.1 | 1.4 | 6.9 | 3.9 | 1.2 | 1.8 |
| 12 | .75 | .49 | 1.2 | .40 | .59 | 4.8 | 1.0 | 1.3 | 6.6 | 2.9 | 1.1 | 1.5 |
| 13 | .69 | .49 | .49 | .32 | .54 | 2.9 | 1.0 | 57 | 21 | 2.7 | 1.1 | 1.3 |
| 14 | .69 | .49 | .49 | .76 | .69 | 2.2 | .94 | 12 | 7.7 | 2.6 | 1.1 | 1.2 |
| 15 | .69 | .44 | .44 | .75 | .59 | 1.8 | .94 | 7.3 | 6.0 | 2.4 | 1.1 | 1.1 |
| 16 | .69 | .44 | .40 | .43 | .64 | 1.6 | 1.0 | 4.4 | 5.2 | 2.6 | 1.0 | 1.0 |
| 17 | .64 | .44 | .36 | 1.4 | .64 | 1.4 | 1.1 | 6.5 | 4.6 | 2.4 | 1.0 | .94 |
| 18 | .64 | .44 | .44 | .49 | 1.7 | 1.3 | .88 | 3.9 | 4.4 | 2.3 | 1.0 | .94 |
| 19 | .59 | .44 | .44 | 6.6 | 1.1 | 1.2 | .81 | 4.2 | 38 | 2.1 | 1.7 | .94 |
| 20 | .59 | .44 | .36 | 1.3 | .75 | 1.1 | .81 | 26 | 49 | 2.2 | 50 | .94 |
| 21 | .69 | .49 | .36 | .64 | .69 | 1.3 | .75 | 8.8 | 23 | 2.0 | 8.7 | .94 |
| 22 | .69 | .44 | .49 | .54 | .69 | 1.0 | .81 | 5.2 | 20 | 2.0 | 3.9 | .94 |
| 23 | .64 | .44 | .36 | .49 | .64 | 1.0 | .75 | 17 | 18 | 1.8 | 2.9 | .94 |
| 24 | .59 | .44 | .36 | .44 | 2.4 | 1.0 | .69 | 9.5 | 25 | 1.7 | 2.7 | .88 |
| 25 | .54 | .49 | .32 | .44 | 2.0 | 1.6 | .69 | 6.0 | 13 | 1.7 | 2.4 | .88 |
| 26 | .59 | .44 | .32 | .49 | 6.9 | 1.1 | .69 | 4.6 | 12 | 1.6 | 2.2 | .94 |
| 27 | .59 | .44 | .32 | .49 | 1.7 | .88 | .75 | 27 | 29 | 1.7 | 2.1 | .94 |
| 28 | .59 | .44 | .32 | .54 | 1.3 | 9.3 | .69 | 9.2 | 11 | 2.6 | 1.9 | .94 |
| 29 | .59 | .44 | .32 | 6.0 | ------ | 1.7 | .64 | 10 | 8.4 | 1.8 | 1.7 | .88 |
| 30 | .59 | .44 | .36 | 1.5 | ------ | 1.3 | .64 | 11 | 7.2 | 1.8 | 1.5 | .81 |
| 31 | .59 | ------ | .36 | 1.3 | ------ | 1.1 | ------ | 6.8 | ------ | 1.5 | 1.4 | ------ |
| TOTAL | 22.76 | 16.06 | 13.76 | 29.72 | 40.97 | 87.38 | 31.06 | 257.38 | 508.4 | 88.7 | 106.7 | 38.75 |
| MEAN | .73 | .54 | .44 | .96 | 1.46 | 2.82 | 1.04 | 8.30 | 16.9 | 2.86 | 3.44 | 1.29 |
| MAX | 1.6 | 1.3 | 1.2 | 6.6 | 6.9 | 17 | 3.1 | 57 | 55 | 6.0 | 50 | 5.5 |
| MIN | .54 | .44 | .32 | .32 | .54 | .88 | .64 | .54 | 4.4 | 1.5 | 1.0 | .81 |
| AC-FT | 45 | 32 | 27 | 59 | 81 | 173 | 62 | 510 | 1010 | 176 | 212 | 77 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 523.01 | MEAN | 1.43 | MAX | 42 | MIN | .32 | AC-FT | 1,040 |
| WTR YR 1969: | TOTAL | 1,241.64 | MEAN | 3.40 | MAX | 57 | MIN | .32 | AC-FT | 2,460 |

PEAK DISCHARGE (BASE, 300 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 0700 | 3.57 | 463 | 6- 2 | 2300 | 3.71 | 520 |
| 5-20 | 0830 | 3.37 | 383 | 6- 5 | 1730 | 5.60 | 1,620 |
| 5-27 | 1200 | 3.44 | 411 | 6-20 | 2230 | 4.18 | 744 |

## 16-8782. Hanechi-okawa at Kawakami

LOCATION.--Lat 26°36'28" N., long 128°01'16" E., Okinawa, on left bank 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.

DRAINAGE AREA.--4.4 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 50 ft (from topographic map). Prior to May 3, 1965, at datum 1.00 ft lower.

EXTREMES.--Current year: Maximum discharge, 3,350 cfs June 20 (gage height, 4.40 ft), from rating curve extended above 950 cfs; minimum, 1.6 cfs Nov. 29, 30.
Period of record: Maximum discharge, 7,840 cfs June 16, 1964 (gage height, 6.03 ft, present datum), from rating curve extended above 950 cfs; minimum, 0.88 cfs Oct. 15, 16, 1967.
A discharge of 0.40 cfs was measured Oct. 21, 1963.

REMARKS.--Records good. No diversion above station. Records include small diversion from gage pool for irrigation below station. Recording rain gage located at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.6 | 2.4 | 1.8 | 4.5 | 18 | 9.2 | 7.2 | 4.0 | 53 | 37 | 5.6 | 9.4 |
| 2 | 4.6 | 2.3 | 2.0 | 2.8 | 18 | 56 | 6.5 | 5.3 | 67 | 33 | 5.2 | 8.7 |
| 3 | 4.1 | 2.3 | 2.8 | 2.2 | 10 | 22 | 6.3 | 4.1 | 296 | 27 | 5.1 | 8.7 |
| 4 | 3.7 | 2.2 | 2.3 | 1.9 | 25 | 14 | 21 | 3.7 | 76 | 27 | 8.2 | 8.4 |
| 5 | 6.5 | 2.5 | 2.5 | 3.2 | 16 | 11 | 14 | 3.5 | 335 | 22 | 6.3 | 8.7 |
| 6 | 4.7 | 4.7 | 1.9 | 3.1 | 11 | 9.7 | 10 | 3.8 | 168 | 22 | 6.7 | 7.2 |
| 7 | 16 | 4.3 | 1.8 | 2.2 | 9.4 | 9.0 | 8.4 | 3.7 | 76 | 16 | 5.4 | 6.7 |
| 8 | 9.1 | 5.8 | 1.8 | 2.0 | 7.6 | 27 | 15 | 14 | 95 | 14 | 7.1 | 6.2 |
| 9 | 5.8 | 13 | 1.8 | 1.9 | 6.7 | 77 | 11 | 30 | 144 | 12 | 9.0 | 29 |
| 10 | 4.8 | 4.1 | 1.9 | 1.9 | 6.9 | 40 | 9.0 | 12 | 76 | 12 | 8.4 | 20 |
| 11 | 4.3 | 3.1 | 2.4 | 2.0 | 6.0 | 100 | 8.0 | 8.0 | 58 | 12 | 6.0 | 9.2 |
| 12 | 4.0 | 2.7 | 8.0 | 2.3 | 5.4 | 63 | 7.4 | 7.2 | 55 | 11 | 5.1 | 8.0 |
| 13 | 3.8 | 2.6 | 3.2 | 1.8 | 5.0 | 35 | 7.1 | 406 | 136 | 10 | 4.8 | 7.4 |
| 14 | 3.8 | 2.5 | 2.7 | 3.5 | 6.8 | 25 | 6.5 | 137 | 71 | 9.4 | 4.6 | 7.2 |
| 15 | 3.5 | 2.3 | 2.8 | 5.8 | 6.0 | 20 | 6.3 | 110 | 53 | 9.0 | 4.4 | 6.9 |
| 16 | 3.3 | 2.2 | 2.3 | 5.1 | 5.8 | 15 | 6.3 | 44 | 46 | 8.4 | 4.2 | 6.3 |
| 17 | 3.3 | 2.1 | 1.9 | 16 | 5.6 | 13 | 7.4 | 40 | 40 | 10 | 4.1 | 6.0 |
| 18 | 3.1 | 2.1 | 2.7 | 5.0 | 6.0 | 12 | 5.7 | 29 | 37 | 12 | 4.0 | 5.6 |
| 19 | 2.9 | 2.1 | 3.7 | 44 | 5.4 | 11 | 5.4 | 29 | 236 | 10 | 6.9 | 5.2 |
| 20 | 2.8 | 2.1 | 2.4 | 14 | 5.0 | 10 | 5.2 | 146 | 418 | 9.4 | 457 | 4.8 |
| 21 | 3.0 | 2.2 | 2.1 | 7.2 | 4.7 | 10 | 5.2 | 79 | 280 | 8.7 | 81 | 4.7 |
| 22 | 3.2 | 2.2 | 3.4 | 5.6 | 4.4 | 8.7 | 5.2 | 44 | 157 | 9.6 | 46 | 4.6 |
| 23 | 3.0 | 2.4 | 2.6 | 4.6 | 4.1 | 8.2 | 5.0 | 93 | 175 | 7.8 | 33 | 5.0 |
| 24 | 2.8 | 2.2 | 2.1 | 4.0 | 12 | 8.0 | 4.7 | 77 | 203 | 7.1 | 24 | 4.6 |
| 25 | 2.4 | 2.6 | 1.9 | 3.6 | 10 | 12 | 4.6 | 55 | 109 | 7.1 | 20 | 4.3 |
| 26 | 2.3 | 2.2 | 1.9 | 4.0 | 31 | 9.7 | 4.6 | 37 | 104 | 6.9 | 15 | 4.3 |
| 27 | 2.4 | 1.9 | 1.9 | 4.0 | 12 | 7.8 | 4.8 | 87 | 292 | 7.7 | 14 | 4.2 |
| 28 | 2.4 | 1.9 | 2.1 | 4.8 | 10 | 20 | 4.4 | 72 | 98 | 7.1 | 12 | 4.0 |
| 29 | 2.4 | 1.7 | 1.8 | 26 | ------ | 11 | 4.2 | 78 | 65 | 7.2 | 11 | 4.0 |
| 30 | 2.3 | 1.7 | 2.1 | 14 | ------ | 9.0 | 4.1 | 140 | 48 | 6.9 | 10 | 3.7 |
| 31 | 2.3 | ------ | 2.2 | 10 | ------ | 8.0 | ------ | 79 | ------ | 6.0 | 9.4 | ------ |
| TOTAL | 127.2 | 88.4 | 76.8 | 213.0 | 273.8 | 691.3 | 220.5 | 1,881.3 | 4,067 | 405.3 | 843.5 | 223.0 |
| MEAN | 4.10 | 2.95 | 2.48 | 6.87 | 9.78 | 22.3 | 7.35 | 60.7 | 136 | 13.1 | 27.2 | 7.45 |
| MAX | 16 | 13 | 8.0 | 44 | 31 | 100 | 21 | 406 | 418 | 37 | 457 | 29 |
| MIN | 2.3 | 1.7 | 1.8 | 1.8 | 4.1 | 7.8 | 4.1 | 3.5 | 37 | 6.0 | 4.0 | 3.7 |
| AC-FT | 252 | 175 | 152 | 422 | 543 | 1,370 | 437 | 3,730 | 8,070 | 804 | 1,670 | 443 |

CAL YR 1968: TOTAL 3,282.2 MEAN 8.97 MAX 185 MIN 1.7 AC-FT 6,510
WTR YR 1969: TOTAL 9,111.1 MEAN 25.0 MAX 457 MIN 1.7 AC-FT 18,070

PEAK DISCHARGE (BASE, 900 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 2100 | 3.70 | 2,040 | 6-20 | 2300 | 4.40 | 3,350 |
| 6- 3 | 0030 | 3.48 | 1,690 | 8-20 | 1030 | 3.55 | 1,800 |
| 6- 5 | 1930 | 3.77 | 2,150 | | | | |

## 16-8785. Oi-kawa at Jingusuku

LOCATION.--Lat 26°39'07" N., long 127°57'24" E., Okinawa, on left bank 0.1 mile west of Jingusuku, 0.8 mile west of Gogayama, and 2.5 miles east of Manna.

DRAINAGE AREA.--3.1 sq mi, approximately.

PERIOD OF RECORD.--March 1964 to September 1969 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,070 cfs June 20 (gage height, 8.43 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 2,480 cfs May 7, 1966 (gage height, 10.30 ft), from rating curve extended above 160 cfs on basis of slope-area measurements at gage heights 7.40 and 8.50 ft; no flow at times each year.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | .03 | 0 | 0 | 9.0 | 6.4 | 1.7 | .34 | 7.5 | 19 | 2.8 | 2.4 |
| 2 | 1.0 | .04 | 0 | 0 | 6.5 | 13 | 1.6 | .34 | 17 | 16 | 2.6 | 2.2 |
| 3 | .84 | .01 | 0 | 0 | 3.8 | 7.9 | 1.4 | .30 | 53 | 14 | 2.5 | 2.6 |
| 4 | .69 | .04 | 0 | 0 | 12 | 6.1 | 7.8 | .22 | 14 | 13 | 2.4 | 2.2 |
| 5 | .69 | .04 | 0 | 0 | 7.5 | 4.9 | 4.7 | .18 | 105 | 12 | 2.3 | 2.0 |
| 6 | .62 | .06 | 0 | 0 | 4.4 | 4.2 | 3.2 | .22 | 48 | 10 | 2.2 | 1.8 |
| 7 | .56 | .06 | 0 | 0 | 3.4 | 4.1 | 2.6 | .18 | 19 | 9.3 | 2.1 | 1.7 |
| 8 | .50 | .14 | 0 | 0 | 2.4 | 15 | 8.6 | 1.6 | 32 | 9.0 | 2.0 | 1.6 |
| 9 | .44 | .41 | 0 | 0 | 2.0 | 20 | 4.4 | 7.1 | 47 | 8.3 | 2.1 | 12 |
| 10 | .44 | .04 | 0 | 0 | 1.7 | 9.0 | 3.2 | 3.0 | 21 | 7.5 | 3.0 | 6.6 |
| 11 | .34 | 0 | 0 | 0 | 1.4 | 42 | 2.6 | 1.2 | 15 | 6.8 | 2.5 | 4.5 |
| 12 | .34 | 0 | .40 | 0 | 1.1 | 20 | 2.4 | 1.1 | 17 | 6.1 | 2.1 | 3.5 |
| 13 | .30 | 0 | 0 | 0 | 1.0 | 10 | 2.1 | 257 | 42 | 5.8 | 1.9 | 3.1 |
| 14 | .30 | 0 | 0 | 0 | 1.2 | 7.0 | 2.0 | 40 | 19 | 5.5 | 1.8 | 2.8 |
| 15 | .26 | 0 | 0 | 0 | .92 | 5.0 | 1.6 | 19 | 14 | 5.5 | 1.7 | 2.5 |
| 16 | .22 | 0 | 0 | 0 | .92 | 4.0 | 1.7 | 12 | 11 | 5.2 | 1.6 | 2.2 |
| 17 | .18 | 0 | 0 | .04 | .69 | 3.5 | 1.5 | 9.3 | 9.3 | 6.7 | 1.5 | 2.1 |
| 18 | .15 | 0 | 0 | 0 | 3.1 | 3.0 | 1.3 | 7.2 | 9.8 | 7.7 | 1.4 | 2.0 |
| 19 | .15 | 0 | 0 | 6.8 | 1.7 | 2.7 | 1.1 | 6.1 | 189 | 5.5 | 4.5 | 1.9 |
| 20 | .12 | 0 | 0 | 1.7 | 1.4 | 2.5 | .92 | 19 | 299 | 4.4 | 100 | 1.8 |
| 21 | .15 | 0 | 0 | .22 | 1.1 | 3.2 | .92 | 15 | 92 | 4.2 | 20 | 1.7 |
| 22 | .15 | 0 | 0 | .08 | 1.3 | 2.5 | .92 | 9.0 | 53 | 4.2 | 11 | 1.6 |
| 23 | .10 | 0 | 0 | 0 | 1.0 | 2.2 | .84 | 32 | 49 | 3.8 | 8.0 | 1.5 |
| 24 | .10 | 0 | 0 | 0 | 10 | 2.0 | .76 | 16 | 97 | 4.0 | 6.0 | 1.4 |
| 25 | .06 | 0 | 0 | 0 | 6.1 | 5.0 | .69 | 11 | 38 | 3.8 | 5.0 | 1.4 |
| 26 | .06 | 0 | 0 | 0 | 12 | 3.5 | .69 | 8.3 | 36 | 3.4 | 4.2 | 1.3 |
| 27 | .04 | 0 | 0 | 0 | 5.8 | 2.4 | .62 | 17 | 186 | 3.5 | 3.7 | 1.2 |
| 28 | .08 | 0 | 0 | 0 | 4.7 | 4.4 | .56 | 11 | 38 | 3.6 | 3.3 | 1.2 |
| 29 | .03 | 0 | 0 | 11 | ------ | 3.2 | .50 | 9.3 | 27 | 3.4 | 3.1 | 1.1 |
| 30 | .08 | 0 | 0 | 4.4 | ------ | 2.4 | .44 | 11 | 21 | 3.2 | 2.8 | 1.1 |
| 31 | .06 | ------ | 0 | 3.4 | ------ | 2.0 | ------ | 10 | ------ | 3.0 | 2.6 | ------ |
| TOTAL | 10.15 | .87 | .40 | 27.64 | 108.13 | 223.1 | 63.36 | 534.98 | 1,625.6 | 217.4 | 212.7 | 75.0 |
| MEAN | .33 | .029 | .013 | .89 | 3.86 | 7.20 | 2.11 | 17.3 | 54.2 | 7.01 | 6.86 | 2.50 |
| MAX | 1.1 | .41 | .40 | 11 | 12 | 42 | 8.6 | 257 | 299 | 19 | 100 | 12 |
| MIN | .03 | 0 | 0 | 0 | .69 | 2.0 | .44 | .18 | 7.5 | 3.0 | 1.4 | 1.1 |
| AC-FT | 20 | 1.7 | .8 | 55 | 214 | 443 | 126 | 1,060 | 3,220 | 431 | 422 | 149 |

CAL YR 1968: TOTAL 1,040.17 MEAN 2.84 MAX 251 MIN 0 AC-FT 2,060
WTR YR 1969: TOTAL 3,099.33 MEAN 8.49 MAX 299 MIN 0 AC-FT 6,150

PEAK DISCHARGE (BASE, 750 CFS)

NOTE.--No gage-height record Aug. 1 to Sept. 30.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 1830 | 8.35 | 2,050 | 6-20 | 2130 | 8.43 | 2,070 |
| 6-5 | 1900 | 4.54 | 866 | 6-27 | 0700 | 6.10 | 1,430 |
| 6-19 | 0200 | 4.85 | 990 | 8-20 | (time and discharge unknown) | | |

## 16-8799. Yonabaru-gawa below Zukeyama Dam

LOCATION.--Lat 26°23'00" N., long 127°48'25" E., Okinawa, on right bank 0.2 mile downstream from Zukeyama Dam, 1.5 miles northwest of Noborikawa, and 3.5 miles northeast of Kadena Circle.

DRAINAGE AREA.--1.9 sq mi, approximately.

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

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

EXTREMES.--Current year: Maximum discharge, 960 cfs Aug. 20 (gage height, 10.00 ft), from rating curve extended above 42 cfs; minimum, 0.14 cfs Jan. 7, 8.
Period of record: Maximum discharge, 960 cfs Aug. 20, 1969 (gage height, 10.00 ft), from rating curve extended above 42 cfs; minimum, 0.14 cfs Jan. 7, 8, 1969.

REMARKS.--Records good except those above 90 cfs, which are fair. Flow regulated by Zukeyama Reservoir (capacity, 2,070 acre-ft). No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 12 | 10 | 5.0 | .40 | .30 | .29 | .31 | 10 | 8.5 | 1.6 | 2.1 |
| 2 | 2.8 | 12 | 10 | 3.8 | .31 | 1.4 | .29 | .31 | 42 | 8.2 | 1.5 | 1.7 |
| 3 | 1.7 | 12 | 9.5 | 1.6 | .24 | .34 | .29 | .31 | 151 | 7.9 | 1.6 | 1.6 |
| 4 | 1.3 | 13 | 11 | .16 | .58 | .29 | .57 | .31 | 18 | 7.9 | 2.2 | 1.6 |
| 5 | 1.1 | 14 | 11 | .22 | .34 | .27 | .40 | .31 | 44 | 7.9 | 2.6 | 1.4 |
| 6 | 1.0 | 13 | 11 | .18 | .27 | .24 | .34 | .33 | 47 | 7.5 | 2.1 | 1.3 |
| 7 | 1.3 | 7.0 | 12 | .16 | .24 | .24 | .31 | .27 | 12 | 7.5 | 1.4 | 1.2 |
| 8 | 1.3 | 3.9 | 12 | .16 | .22 | .50 | .67 | 1.8 | 29 | 7.5 | 1.5 | 1.0 |
| 9 | 1.0 | .42 | 12 | 2.9 | .22 | .47 | .37 | 12 | 59 | 7.2 | 3.9 | 36 |
| 10 | 1.0 | .27 | 13 | 4.8 | .22 | .43 | .34 | 8.8 | 15 | 7.0 | 5.3 | 28 |
| 11 | 2.1 | .27 | 13 | 5.6 | .22 | .94 | .34 | 4.6 | 11 | 6.7 | 2.5 | 6.0 |
| 12 | 3.4 | 2.7 | 3.8 | 7.2 | .20 | .49 | .34 | 3.1 | 17 | 5.8 | 1.6 | 3.9 |
| 13 | 3.4 | 6.7 | .20 | 7.2 | .18 | .37 | .34 | 25 | 33 | 5.5 | 1.2 | 3.1 |
| 14 | 3.4 | 9.2 | .18 | 4.8 | .20 | .34 | .31 | 60 | 21 | 4.6 | 1.2 | 2.4 |
| 15 | 3.4 | 10 | .18 | .20 | .20 | .31 | .31 | 56 | 11 | 4.4 | 1.2 | 2.2 |
| 16 | 3.4 | 10 | .18 | .18 | .18 | .29 | .36 | 8.8 | 9.8 | 4.6 | 1.1 | 30 |
| 17 | 3.4 | 10 | .16 | .18 | .18 | .29 | .36 | 8.0 | 9.2 | 7.5 | .82 | 13 |
| 18 | 3.4 | 10 | 2.2 | .16 | .18 | .27 | .31 | 5.8 | 8.8 | 5.0 | .49 | 4.8 |
| 19 | 3.4 | 10 | 3.6 | .90 | .18 | .27 | .31 | 19 | 104 | 4.1 | 9.3 | 2.8 |
| 20 | 3.4 | 11 | 3.6 | .43 | .18 | .27 | .31 | 108 | 87 | 2.9 | 389 | 2.1 |
| 21 | 4.1 | 12 | 3.6 | .24 | .18 | .31 | .31 | 26 | 72 | 2.5 | 37 | 1.8 |
| 22 | 5.5 | 12 | 3.6 | .22 | .20 | .27 | .31 | 9.5 | 51 | 4.4 | 10 | 1.6 |
| 23 | 6.2 | 12 | 3.6 | .22 | .18 | .27 | .31 | 11 | 105 | 7.0 | 5.8 | 1.5 |
| 24 | 7.9 | 12 | 3.6 | .20 | .43 | .29 | .31 | 13 | 62 | 3.8 | 3.9 | 1.5 |
| 25 | 9.5 | 12 | 3.6 | .20 | .24 | .55 | .31 | 8.5 | 24 | 2.4 | 3.1 | 2.5 |
| 26 | 10 | 12 | 3.6 | .27 | .30 | .34 | .31 | 5.0 | 30 | 2.0 | 2.6 | 1.1 |
| 27 | 10 | 11 | 4.6 | .24 | .24 | .31 | .31 | 41 | 86 | 2.5 | 2.3 | .68 |
| 28 | 10 | 10 | 5.0 | .24 | .24 | .44 | .31 | 29 | 21 | 2.6 | 2.1 | .81 |
| 29 | 10 | 10 | 5.0 | .34 | ------ | .34 | .31 | 19 | 12 | 2.1 | 1.8 | .97 |
| 30 | 10 | 9.8 | 5.0 | .29 | ------ | .31 | .31 | 61 | 9.8 | 2.0 | 1.7 | .97 |
| 31 | 11 | ------ | 5.0 | .24 | ------ | .31 | ------ | 18 | ------ | 1.7 | 1.6 | ------ |
| TOTAL | 141.4 | 280.26 | 184.80 | 48.53 | 6.95 | 12.06 | 10.26 | 564.05 | 1,211.6 | 161.2 | 504.01 | 159.63 |
| MEAN | 4.56 | 9.34 | 5.96 | 1.57 | .25 | .39 | .34 | 18.2 | 40.4 | 5.20 | 16.3 | 5.32 |
| MAX | 11 | 14 | 13 | 7.2 | .58 | 1.4 | .67 | 108 | 151 | 8.5 | 389 | 36 |
| MIN | 1.0 | .27 | .16 | .16 | .18 | .24 | .29 | .27 | 8.8 | 1.7 | .49 | .68 |
| AC-FT | 280 | 556 | 367 | 96 | 14 | 24 | 20 | 1,120 | 2,400 | 320 | 1,000 | 317 |

CAL YR 1968: TOTAL 1,261.63 MEAN 3.45 MAX 14 MIN .16 AC-FT 2,500
WTR YR 1969: TOTAL 3,284.75 MEAN 9.00 MAX 389 MIN .16 AC-FT 6,520

## 16-8803. Bishi-gawa at Kadena

LOCATION.--Lat 26°21'54" N., long 127°45'59" E., Okinawa, on left bank at Bishi-gawa Pumping Station, 0.6 mile northeast of Kadena Circle, and 3.1 miles west of Chibana.

DRAINAGE AREA.--14 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 4,480 cfs Aug. 20 (gage height, 12.65 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 4,480 cfs Aug. 20, 1969 (gage height, 12.65 ft), from rating curve extended above 44 cfs on basis of theoretical rating for the artificial control; no flow at times each year.

REMARKS.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Pumping station diverts water from the gage pool for domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.4 | 0 | .08 | .49 | 27 | 19 | 3.9 | 0 | 54 | 34 | 15 | 17 |
| 2 | 13 | 0 | 3.1 | .38 | 20 | 402 | 3.3 | .02 | 100 | 44 | 14 | 12 |
| 3 | .45 | .04 | 2.1 | .54 | 7.1 | 22 | 7.0 | .15 | 1,200 | 44 | 15 | 15 |
| 4 | .01 | .30 | .05 | .03 | 58 | 18 | 52 | .05 | 100 | 39 | 15 | 25 |
| 5 | 0 | .53 | 3.3 | 6.2 | 24 | 12 | 28 | .02 | 270 | 40 | 19 | 11 |
| 6 | 0 | 14 | 0 | .52 | 18 | 7.5 | 15 | .70 | 400 | 46 | 18 | 14 |
| 7 | 0 | 14 | 0 | 0 | 11 | 5.9 | 8.4 | .52 | 90 | 44 | 14 | 5.0 |
| 8 | .47 | 30 | 0 | 0 | 9.0 | 36 | 92 | 200 | 200 | 40 | 18 | 5.2 |
| 9 | 1.1 | 26 | 0 | 0 | 5.2 | 91 | 24 | 150 | 450 | 38 | 34 | 178 |
| 10 | .18 | 7.6 | .03 | 0 | 5.2 | 27 | 14 | 40 | 110 | 34 | 35 | 196 |
| 11 | 1.3 | .75 | .03 | 0 | 8.2 | 174 | 6.6 | 25 | 80 | 34 | 21 | 20 |
| 12 | .20 | 0 | 23 | 0 | 2.4 | 106 | 4.5 | 20 | 170 | 30 | 14 | 22 |
| 13 | .40 | 0 | 2.4 | 0 | 2.9 | 32 | 6.6 | 150 | 200 | 29 | 12 | 20 |
| 14 | .10 | 0 | .81 | 15 | 3.6 | 23 | 3.9 | 300 | 130 | 29 | 8.2 | 22 |
| 15 | 0 | 1.2 | 0 | 4.9 | 6.5 | 21 | 2.2 | 150 | 72 | 27 | 9.0 | 15 |
| 16 | 0 | 3.7 | 0 | 0 | 1.1 | 17 | 1.5 | 50 | 64 | 27 | 8.2 | 21 |
| 17 | 0 | 1.7 | 0 | 0 | .62 | 7.4 | 20 | 54 | 60 | 36 | 8.2 | 45 |
| 18 | 0 | 1.6 | 0 | 0 | 1.3 | 8.7 | 2.6 | 40 | 64 | 28 | 9.8 | 18 |
| 19 | 0 | 1.6 | .05 | 79 | 1.1 | 7.4 | 2.5 | 130 | 580 | 26 | 74 | 14 |
| 20 | 0 | 1.4 | .18 | 62 | .11 | 6.4 | 1.2 | 500 | 504 | 28 | 2470 | 14 |
| 21 | 0 | .90 | 0 | 15 | .58 | 16 | .76 | 200 | 508 | 26 | 260 | 11 |
| 22 | 0 | 3.2 | .01 | 1.8 | .54 | 9.3 | .23 | 56 | 349 | 39 | 74 | 11 |
| 23 | 0 | .45 | 0 | .56 | .43 | 8.2 | .02 | 60 | 808 | 29 | 33 | 14 |
| 24 | 0 | .32 | 0 | .50 | 25 | 8.2 | .13 | 70 | 449 | 26 | 30 | 9.0 |
| 25 | 0 | 2.5 | .02 | 0 | 15 | 26 | 0 | 50 | 144 | 26 | 22 | 9.8 |
| 26 | 0 | 2.4 | .32 | 35 | 23 | 14 | 0 | 35 | 169 | 20 | 20 | 8.2 |
| 27 | 1.0 | .32 | 0 | 31 | 13 | 6.5 | 0 | 260 | 652 | 29 | 16 | 9.8 |
| 28 | .19 | .38 | .01 | 21 | 12 | 27 | .01 | 190 | 154 | 22 | 17 | 9.0 |
| 29 | .82 | .27 | 0 | 22 | ------ | 16 | 0 | 150 | 90 | 21 | 15 | 5.9 |
| 30 | 2.9 | .30 | .32 | 19 | ------ | 12 | 0 | 400 | 52 | 20 | 14 | 5.9 |
| 31 | 0 | ------ | 2.3 | 6.6 | ------ | 9.6 | ------ | 70 | ------ | 16 | 12 | ------ |
| TOTAL | 24.52 | 115.46 | 38.11 | 321.92 | 301.88 | 1,196.1 | 300.35 | 3,351.46 | 8,273 | 971 | 3,344.4 | 782.8 |
| MEAN | .79 | 3.85 | 1.23 | 10.4 | 10.8 | 38.6 | 10.0 | 108 | 276 | 31.3 | 108 | 26.1 |
| MAX | 13 | 30 | 23 | 79 | 58 | 402 | 92 | 500 | 1,200 | 46 | 2470 | 196 |
| MIN | 0 | 0 | 0 | 0 | .11 | 5.9 | 0 | 0 | 52 | 16 | 8.2 | 5.0 |
| AC-FT | 49 | 229 | 76 | 639 | 599 | 2370 | 596 | 6,650 | 16,410 | 1,930 | 6,630 | 1,550 |

CAL YR 1968: TOTAL 4,737.08 MEAN 12.9 MAX 487 MIN 0 AC-FT 9,400
WTR YR 1969: TOTAL 19,021.00 MEAN 52.1 MAX 2,470 MIN 0 AC-FT 37,730

PEAK DISCHARGE (BASE, 1,900 CFS).--June 3 (about 0200) about 2,000 cfs; Aug. 20 (0900) 4,480 cfs (12.65 ft).

NOTE.--No gage-height record May 6 to June 16.

## 16-8805. Nagata-gawa at Kadena

LOCATION.--Lat 26°22'23" N., long 127°45'50" E., Okinawa, on left bank 1.0 mile northeast of Kadena Circle and 3.4 miles northwest of Chibana.

DRAINAGE AREA.--4.0 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 2,050 cfs Aug. 20 (gage height, 13.75 ft), from rating curve extended above 54 cfs; minimum, 1.2 cfs Oct. 12.
Period of record: Maximum discharge, 2,050 cfs Aug. 20, 1969 (gage height, 13.75 ft), from rating curve extended above 54 cfs; minimum, 0.95 cfs Aug. 26, 27, 1967.

REMARKS.--Records good except those above 150 cfs, which are fair. No diversion above station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.5 | 1.4 | 1.5 | 2.8 | 13 | 5.4 | 4.3 | 2.1 | 18 | 28 | 6.9 | 7.4 |
| 2 | 4.5 | 1.4 | 1.7 | 2.4 | 8.6 | 116 | 3.7 | 2.3 | 74 | 26 | 6.9 | 7.2 |
| 3 | 3.4 | 1.5 | 2.1 | 1.9 | 4.5 | 9.1 | 3.5 | 2.1 | 385 | 25 | 6.6 | 7.2 |
| 4 | 2.9 | 1.7 | 1.9 | 1.7 | 12 | 5.7 | 18 | 1.7 | 26 | 24 | 6.4 | 7.4 |
| 5 | 2.6 | 1.9 | 2.4 | 4.1 | 9.1 | 4.3 | 11 | 2.1 | 108 | 23 | 6.4 | 6.9 |
| 6 | 2.5 | 4.0 | 1.9 | 3.2 | 4.8 | 3.7 | 5.4 | 4.2 | 88 | 22 | 6.6 | 6.9 |
| 7 | 2.4 | 5.4 | 1.7 | 2.0 | 3.9 | 3.7 | 4.1 | 3.1 | 23 | 20 | 6.1 | 6.4 |
| 8 | 2.4 | 11 | 1.7 | 1.8 | 3.2 | 32 | 16 | 187 | 67 | 20 | 7.4 | 6.1 |
| 9 | 2.4 | 12 | 1.7 | 1.6 | 2.9 | 18 | 6.4 | 57 | 93 | 18 | 11 | 56 |
| 10 | 2.4 | 3.7 | 1.6 | 1.6 | 3.1 | 11 | 4.8 | 12 | 26 | 18 | 10 | 37 |
| 11 | 2.3 | 2.6 | 1.6 | 1.6 | 3.2 | 57 | 4.1 | 6.1 | 23 | 17 | 6.6 | 10 |
| 12 | 1.8 | 2.3 | 7.5 | 1.8 | 2.9 | 23 | 3.7 | 5.4 | 31 | 16 | 5.9 | 8.3 |
| 13 | 1.9 | 2.0 | 3.4 | 1.7 | 2.6 | 8.3 | 3.7 | 83 | 52 | 15 | 5.7 | 8.0 |
| 14 | 2.1 | 1.9 | 3.2 | 3.7 | 2.6 | 6.4 | 3.5 | 140 | 31 | 14 | 5.4 | 8.0 |
| 15 | 1.9 | 1.8 | 2.7 | 4.3 | 2.6 | 5.4 | 3.5 | 147 | 23 | 14 | 5.4 | 7.2 |
| 16 | 1.9 | 1.7 | 2.4 | 2.5 | 2.4 | 4.8 | 3.9 | 13 | 20 | 14 | 5.2 | 34 |
| 17 | 1.8 | 1.7 | 2.2 | 2.1 | 2.3 | 4.3 | 7.1 | 14 | 20 | 15 | 5.2 | 12 |
| 18 | 1.8 | 1.7 | 2.1 | 1.9 | 2.3 | 3.9 | 3.7 | 10 | 21 | 13 | 5.0 | 7.4 |
| 19 | 1.7 | 1.7 | 1.9 | 53 | 2.3 | 3.9 | 3.4 | 46 | 240 | 12 | 24 | 6.9 |
| 20 | 1.6 | 1.7 | 1.8 | 49 | 2.1 | 3.7 | 3.2 | 290 | 216 | 12 | 865 | 6.4 |
| 21 | 1.6 | 1.7 | 1.8 | 5.9 | 2.1 | 4.5 | 3.2 | 32 | 154 | 11 | 39 | 5.9 |
| 22 | 1.7 | 2.0 | 1.7 | 3.7 | 2.3 | 4.1 | 3.1 | 15 | 130 | 59 | 16 | 5.7 |
| 23 | 1.7 | 1.9 | 1.7 | 3.1 | 2.1 | 3.7 | 2.9 | 17 | 251 | 15 | 12 | 5.7 |
| 24 | 1.5 | 1.8 | 1.6 | 2.6 | 15 | 3.9 | 2.8 | 21 | 116 | 11 | 10 | 5.4 |
| 25 | 1.4 | 1.8 | 1.5 | 2.4 | 6.9 | 21 | 2.6 | 15 | 43 | 10 | 9.4 | 5.4 |
| 26 | 1.3 | 1.7 | 1.5 | 4.5 | 8.2 | 8.8 | 2.5 | 11 | 76 | 9.7 | 8.8 | 5.4 |
| 27 | 1.3 | 1.7 | 1.5 | 5.7 | 5.0 | 5.4 | 2.6 | 93 | 226 | 11 | 8.3 | 5.2 |
| 28 | 1.4 | 1.6 | 1.5 | 5.0 | 4.8 | 13 | 2.5 | 38 | 42 | 10 | 8.0 | 5.0 |
| 29 | 1.4 | 1.5 | 1.5 | 8.7 | ------ | 7.2 | 2.5 | 33 | 34 | 8.6 | 7.7 | 5.0 |
| 30 | 1.5 | 1.5 | 1.6 | 7.4 | ------ | 5.0 | 2.3 | 120 | 30 | 8.0 | 7.7 | 4.8 |
| 31 | 1.7 | ------ | 2.4 | 5.8 | ------ | 4.8 | ------ | 26 | ------ | 7.4 | 7.4 | ------ |
| TOTAL | 64.3 | 80.3 | 65.3 | 199.5 | 136.8 | 411.0 | 144.0 | 1,449.1 | 2,687 | 526.7 | 1,142.0 | 310.2 |
| MEAN | 2.07 | 2.68 | 2.11 | 6.44 | 4.89 | 13.3 | 4.80 | 46.7 | 89.6 | 17.0 | 36.8 | 10.3 |
| MAX | 4.5 | 12 | 7.5 | 53 | 15 | 116 | 18 | 290 | 385 | 59 | 865 | 56 |
| MIN | 1.3 | 1.4 | 1.5 | 1.6 | 2.1 | 3.7 | 2.3 | 1.7 | 18 | 7.4 | 5.0 | 4.8 |
| AC-FT | 128 | 159 | 130 | 396 | 271 | 815 | 286 | 2,870 | 5,330 | 1,040 | 2,270 | 615 |

CAL YR 1968: TOTAL 2,089.8 MEAN 5.71 MAX 248 MIN 1.3 AC-FT 4,150
WTR YR 1969: TOTAL 7,216.2 MEAN 19.8 MAX 865 MIN 1.3 AC-FT 14,310

PEAK DISCHARGE (BASE, 1,200 CFS).--June 3 (0200) 1,550 cfs (11.24 ft); Aug. 20 (0800) 2,050 cfs (13.75 ft).

## 16-8806. Hiza-gawa at Kadena

LOCATION.--Lat 26°21'49" N., long 127°45'23" E., Okinawa, on left bank 600 ft downstream from Highway 1, 0.3 mile northwest of Kadena Circle, and 3.7 miles west of Chibana.

DRAINAGE AREA.--19 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 12 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 7,550 cfs Aug. 20 (gage height, 8.60 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 7,550 cfs Aug. 20, 1969 (gage height, 8.60 ft), from rating curve extended above 240 cfs on basis of theoretical rating for the artificial control; no flow at times each year.

REMARKS.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Upstream pumping stations on both Bishi-gawa and Nagata-gawa divert water for domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.1 | 0 | 0 | 0 | 56 | 24 | 5.9 | 0 | 85 | 117 | 34 | 30 |
| 2 | 15 | 0 | 0 | 0 | 39 | 516 | 5.9 | 0 | 159 | 107 | 32 | 26 |
| 3 | 3.9 | 0 | .60 | 0 | 13 | 56 | 8.3 | 0 | 1,660 | 104 | 30 | 28 |
| 4 | .87 | .46 | .08 | 0 | 91 | 16 | 74 | 0 | 140 | 101 | 30 | 44 |
| 5 | 1.3 | .87 | 11 | 1.9 | 56 | 7.0 | 54 | 0 | 359 | 97 | 34 | 30 |
| 6 | .32 | 14 | .16 | 3.4 | 26 | 2.4 | 24 | 5.6 | 534 | 91 | 34 | 34 |
| 7 | .87 | 13 | 0 | 0 | 18 | 6.9 | 15 | 3.9 | 120 | 88 | 30 | 32 |
| 8 | 1.3 | 41 | 0 | 0 | 7.0 | 87 | 130 | 353 | 254 | 82 | 36 | 24 |
| 9 | 1.8 | 56 | 0 | 0 | 5.9 | 147 | 44 | 201 | 552 | 79 | 56 | 281 |
| 10 | 1.3 | 8.3 | 0 | 0 | 14 | 74 | 22 | 76 | 144 | 74 | 65 | 293 |
| 11 | 1.0 | 1.8 | 0 | 0 | 11 | 231 | 9.8 | 36 | 104 | 74 | 39 | 59 |
| 12 | .03 | 1.8 | 31 | 0 | 3.1 | 136 | 7.0 | 22 | 211 | 71 | 32 | 41 |
| 13 | .87 | 1.3 | 5.9 | 0 | 3.1 | 39 | 11 | 178 | 243 | 65 | 28 | 36 |
| 14 | 1.3 | 0 | .95 | 14 | 2.9 | 24 | 5.9 | 353 | 177 | 62 | 24 | 39 |
| 15 | 0 | 0 | 0 | 12 | 7.0 | 20 | 4.8 | 287 | 107 | 56 | 18 | 32 |
| 16 | 0 | .11 | .28 | 0 | .80 | 20 | 5.8 | 58 | 97 | 58 | 20 | 65 |
| 17 | 0 | .25 | 0 | 0 | .05 | 18 | 26 | 97 | 94 | 68 | 18 | 68 |
| 18 | 0 | 0 | 0 | 0 | 3.9 | 18 | 7.0 | 68 | 93 | 54 | 22 | 36 |
| 19 | 0 | 0 | 0 | 53 | 2.1 | 13 | 7.0 | 174 | 824 | 49 | 108 | 30 |
| 20 | 0 | 0 | 0 | 109 | 0 | 11 | 3.9 | 752 | 713 | 51 | 3,870 | 28 |
| 21 | 0 | 0 | 0 | 16 | .05 | 20 | 3.1 | 207 | 736 | 49 | 337 | 24 |
| 22 | 0 | 0 | 0 | 15 | .55 | 9.8 | 2.4 | 74 | 468 | 123 | 120 | 26 |
| 23 | 0 | 0 | 0 | 5.9 | 1.3 | 9.8 | 2.4 | 82 | 1,160 | 56 | 59 | 32 |
| 24 | 0 | 0 | 0 | 0 | 61 | 13 | 3.1 | 90 | 576 | 44 | 49 | 22 |
| 25 | 0 | 0 | 0 | 0 | 34 | 57 | .87 | 71 | 223 | 46 | 41 | 26 |
| 26 | 0 | .21 | 0 | 38 | 42 | 26 | .32 | 44 | 329 | 44 | 39 | 16 |
| 27 | 0 | 0 | 0 | 63 | 18 | 11 | .32 | 342 | 917 | 54 | 34 | 22 |
| 28 | 0 | 0 | 0 | 26 | 13 | 37 | .55 | 253 | 223 | 46 | 34 | 16 |
| 29 | 0 | 0 | 0 | 39 | ------ | 22 | .16 | 218 | 158 | 44 | 30 | 16 |
| 30 | 0 | 0 | 0 | 32 | ------ | 15 | .01 | 519 | 130 | 41 | 28 | 16 |
| 31 | 0 | ------ | 0 | 11 | ------ | 13 | ------ | 140 | ------ | 36 | 26 | ------ |
| TOTAL | 32.96 | 139.10 | 49.97 | 439.2 | 529.75 | 1,699.9 | 484.53 | 4,704.5 | 11,590 | 2,131 | 5,357 | 1,472 |
| MEAN | 1.06 | 4.64 | 1.61 | 14.2 | 18.9 | 54.8 | 16.2 | 152 | 386 | 68.7 | 173 | 49.1 |
| MAX | 15 | 56 | 31 | 109 | 91 | 516 | 130 | 752 | 1,660 | 123 | 3,870 | 293 |
| MIN | 0 | 0 | 0 | 0 | 0 | 2.4 | .01 | 0 | 85 | 36 | 18 | 16 |
| AC-FT | 65 | 276 | 99 | 871 | 1,050 | 3,370 | 961 | 9,330 | 22,990 | 4,230 | 10,630 | 2,920 |

CAL YR 1968: TOTAL 7,443.05 MEAN 20.3 MAX 745 MIN 0 AC-FT 14,760
WTR YR 1969: TOTAL 28,629.91 MEAN 78.4 MAX 3,870 MIN 0 AC-FT 56,790

PEAK DISCHARGE (BASE, 3,000 CFS).--June 3 (0230) 3,880 cfs (5.95 ft); Aug. 20 (0900) 7,550 cfs (8.60 ft).

## 16-8809. Machinato-gawa near Ojana

LOCATION.--Lat 26°14'43" N., long 127°44'16" E., Okinawa, on right bank at upstream side of bridge on dirt road, 1.4 miles south of Ojana, and 2.4 miles northeast of Shuri.

DRAINAGE AREA.--1.7 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,260 cfs Aug. 20 (gage height, 9.65 ft), from rating curve extended above 550 cfs; no flow many days.
Period of record: Maximum discharge, 2,040 cfs Aug. 5, 1965 (gage height, 12.90 ft), from rating curve extended above 550 cfs; no flow many days each year.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .14 | 0 | 0 | .12 | 16 | 5.7 | 1.6 | 0 | 5.6 | 2.0 | 0 | .24 |
| 2 | .96 | 0 | 0 | .12 | 9.7 | 94 | 1.1 | 0 | 42 | 1.3 | 0 | .24 |
| 3 | .33 | 0 | 0 | .12 | 4.8 | 8.5 | .92 | 0 | 122 | 1.1 | 0 | .24 |
| 4 | .19 | 0 | .15 | .16 | 21 | 4.8 | 6.1 | 0 | 8.2 | 1.1 | 0 | .27 |
| 5 | .12 | 0 | .30 | .30 | 12 | 3.2 | 9.3 | 0 | 27 | .83 | 1.4 | .18 |
| 6 | .01 | .01 | .14 | .37 | 5.3 | 2.3 | 4.0 | 0 | 37 | .50 | .14 | .14 |
| 7 | 0 | .05 | .07 | .30 | 3.4 | 2.0 | 2.6 | 0 | 7.1 | .45 | .04 | .02 |
| 8 | 0 | .09 | .06 | .21 | 2.3 | 15 | 17 | 47 | 27 | .33 | .04 | 0 |
| 9 | 0 | .78 | .01 | .18 | 1.8 | 23 | 6.5 | 44 | 49 | .30 | .83 | 2.9 |
| 10 | 0 | .24 | 0 | .18 | 2.0 | 12 | 3.8 | 10 | 10 | .24 | 2.9 | 4.5 |
| 11 | 0 | .10 | 0 | .18 | 2.6 | 50 | 2.6 | 6.5 | 5.3 | .18 | .55 | 1.2 |
| 12 | 0 | .06 | 2.4 | .18 | 2.0 | 22 | 1.8 | 4.0 | 21 | .14 | .24 | .83 |
| 13 | 0 | .06 | .83 | .21 | 1.4 | 7.1 | 1.4 | 22 | 38 | .08 | .14 | .61 |
| 14 | 0 | 0 | 2.3 | 1.4 | 1.7 | 4.2 | 1.0 | 62 | 15 | .03 | .07 | .55 |
| 15 | 0 | 0 | 1.8 | 2.1 | 1.8 | 2.8 | .83 | 10 | 6.2 | 0 | .02 | .37 |
| 16 | 0 | 0 | .92 | 1.1 | 1.3 | 3.2 | .79 | 4.8 | 4.2 | 0 | 0 | .30 |
| 17 | 0 | 0 | .61 | .92 | 1.2 | 3.8 | 1.8 | 12 | 3.8 | .08 | 0 | .24 |
| 18 | 0 | 0 | .41 | .55 | 1.4 | 3.0 | .83 | 7.8 | 3.0 | .15 | 0 | .21 |
| 19 | 0 | 0 | .33 | 1.4 | 1.6 | 2.6 | .50 | 49 | 37 | .05 | 4.6 | .18 |
| 20 | 0 | 0 | .27 | 6.2 | 1.1 | 2.8 | .33 | 34 | 108 | 0 | 382 | .14 |
| 21 | 0 | 0 | .21 | 2.8 | .92 | 3.8 | .33 | 12 | 33 | .05 | 32 | .10 |
| 22 | 0 | 0 | .18 | 1.8 | 1.2 | 3.4 | .30 | 5.3 | 56 | .01 | 8.5 | .06 |
| 23 | 0 | 0 | .16 | 1.3 | 1.1 | 2.4 | .24 | 6.5 | 111 | 0 | 3.4 | .08 |
| 24 | 0 | 0 | .14 | .92 | 3.1 | 2.1 | .19 | 9.3 | 68 | 0 | 1.8 | .07 |
| 25 | 0 | .05 | .08 | .68 | 3.8 | 2.4 | .09 | 6.5 | 11 | 0 | 1.1 | .07 |
| 26 | 0 | 0 | .07 | 3.4 | 23 | 2.4 | .12 | 3.6 | 6.4 | 0 | .75 | .10 |
| 27 | 0 | 0 | .07 | 4.2 | 7.4 | 1.8 | .12 | 67 | 12 | 0 | .50 | .12 |
| 28 | 0 | 0 | .06 | 4.2 | 5.6 | 12 | .12 | 30 | 6.8 | 0 | .37 | .09 |
| 29 | 0 | 0 | .03 | 16 | ------ | 5.0 | .07 | 24 | 4.2 | 0 | .30 | 0 |
| 30 | 0 | 0 | .02 | 9.7 | ------ | 2.8 | .18 | 43 | 2.8 | 0 | .27 | 0 |
| 31 | 0 | ------ | .12 | 7.3 | ------ | 2.1 | ------ | 13 | ------ | 0 | .18 | ------ |
| TOTAL | 1.75 | 1.44 | 11.74 | 68.60 | 140.52 | 312.2 | 66.56 | 533.3 | 887.6 | 8.92 | 442.14 | 14.05 |
| MEAN | .056 | .048 | .38 | 2.21 | 5.02 | 10.1 | 2.22 | 17.2 | 29.6 | .29 | 14.3 | .47 |
| MAX | .96 | .78 | 2.4 | 16 | 23 | 94 | 17 | 67 | 122 | 2.0 | 382 | 4.5 |
| MIN | 0 | 0 | 0 | .12 | .92 | 1.8 | .07 | 0 | 2.8 | 0 | 0 | 0 |
| AC-FT | 3.5 | 2.9 | 23 | 136 | 279 | 619 | 132 | 1,060 | 1,760 | 18 | 877 | 28 |

CAL YR 1968: TOTAL 1,102.49 MEAN 3.01 MAX 148 MIN 0 AC-FT 2,190
WTR YR 1969: TOTAL 2,488.82 MEAN 6.82 MAX 382 MIN 0 AC-FT 4,940

PEAK DISCHARGE (BASE, 650 CFS).--June 3 (0030) 952 cfs (8.16 ft); Aug. 20 (0600) 1,260 cfs (9.65 ft).

## 16-8820.5. Tengan Reservoir at Yamashiro

LOCATION.--Lat 26°24'23" N., long 127°48'46" E., Okinawa, in control tower at Tengan Dam, 0.4 mile west of Yamashiro, and 1.8 miles northwest of Enobi.

DRAINAGE AREA.--1.0 sq mi, approximately.

PERIOD OF RECORD.--September 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is at Okinawa datum, which is 3.76 ft below mean sea level (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum contents, 1,030 acre-ft Aug. 20 (gage height, 201.72 ft); minimum, 11 acre-ft Nov. 30, Dec. 1 (gage height, 133.3 ft).
Period of record: Maximum contents, 1,030 acre-ft Aug. 20, 1969 (gage height, 201.72 ft); no usable contents for several days during the period Nov. 22, 1968, to Feb. 15, 1969.

REMARKS.--Reservoir is formed by earthfill dam with ungated concrete spillway and concrete outlet tunnel controlled by two 7-ft by 7-ft regulating gates. Storage began Mar. 29, 1968; dam completed Nov. 22, 1968. During the period Sept. 30, 1967, to Mar. 29, 1968, water was stored and released several times to test dam structures. Usable capacity, 967 acre-ft between gage heights 130.00 ft (invert of outlet tunnel) and 199.72 ft (crest of spillway). Dead storage below gage height 130.00 ft, about 21 acre-ft. Diversion from reservoir of about 0.5 cfs for local irrigation and domestic use. Spillway flow (see sta 16-8820.7) bypasses station below dam (see sta 16-8821). Reservoir is used to store water for controlled release down Tengan-gawa for pickup at Kawasaki pumping station for domestic water supply. Figures given herein represent usable contents.

COOPERATION.--Capacity curve furnished by Corps of Engineers.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| Date | Gage height (feet) | Contents (acre-feet) | Change in contents (acre-feet) |
|---|---|---|---|
| Sept. 30 | 157.85 | 172 | - |
| Oct. 31 | a150.7 | 111 | -61 |
| Nov. 30 | a133.3 | 11 | -100 |
| Dec. 31 | a134.7 | 18 | +7 |
| CAL YR 1968 | - | - | +8 |
| Jan. 31 | 151.86 | 120 | +102 |
| Feb. 28 | 156.03 | 154 | +34 |
| Mar. 31 | 174.18 | 370 | +216 |
| Apr. 30 | 178.22 | 438 | +68 |
| May 31 | 195.44 | 836 | +398 |
| June 30 | a199.7 | 967 | +131 |
| July 31 | 199.83 | 971 | +4 |
| Aug. 31 | 199.85 | 971 | 0 |
| Sept. 30 | 199.83 | 971 | 0 |
| WTR YR 1969 | - | - | +799 |

a Based on once-daily staff-gage readings.

## 16-8820.7. Tengan Dam spillway at Yamashiro

LOCATION.--Lat 26°24'23" N., long 127°48'46" E., Okinawa, in control tower at Tengan Dam, 0.4 mile west of Yamashiro, and 1.8 miles northwest of Enobi.

DRAINAGE AREA.--1.0 sq mi, approximately.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and concrete spillway. Datum of gage is at Okinawa datum, which is 3.76 ft below mean sea level (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum discharge, 966 cfs Aug. 20 (gage height, 201.72 ft), from rating curve extended as explained below; no flow most of time.
Period of record: Maximum discharge, 966 cfs Aug. 20, 1969 (gage height, 201.72 ft), from rating curve extended above 11 cfs on basis of theoretical rating for artificial control; no flow prior to June 1969.

REMARKS.--Records fair except those for period June 19 to July 30, which are poor. Spillway flow begins at gage height 199.72 ft, bypasses station below dam (see sta 16-8821), and re-enters Tengan-gawa 0.3 mile below that station. Controlled releases from reservoir are through outlet tunnel in base of dam. Records represent only flow over spillway.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | 0 | 0 | 4.6 | 6.0 |
| 2 | | | | | | | | | 0 | 3.0 | 4.6 | 6.0 |
| 3 | | | | | | | | | .16 | 3.0 | 4.6 | 6.0 |
| 4 | | | | | | | | | 0 | 3.0 | 5.3 | 6.8 |
| 5 | | | | | | | | | 0 | 3.0 | 6.0 | 6.0 |
| 6 | | | | | | | | | 0 | 3.0 | 6.8 | 5.3 |
| 7 | | | | | | | | | 0 | 3.0 | 6.0 | 4.6 |
| 8 | | | | | | | | | 0 | 3.0 | 6.0 | 4.6 |
| 9 | | | | | | | | | 0 | 3.0 | 7.7 | 25 |
| 10 | | | | | | | | | 0 | 3.0 | 7.7 | 16 |
| 11 | | | | | | | | | 0 | 3.0 | 6.0 | 6.8 |
| 12 | | | | | | | | | 0 | 3.0 | 4.6 | 7.7 |
| 13 | | | | | | | | | 0 | 3.0 | 4.0 | 6.0 |
| 14 | | | | | | | | | 0 | 3.0 | 4.0 | 5.3 |
| 15 | | | | | | | | | 0 | 3.0 | 3.5 | 5.3 |
| 16 | | | | | | | | | 0 | 3.0 | 3.0 | 37 |
| 17 | | | | | | | | | 0 | 3.0 | 2.6 | 9.8 |
| 18 | | | | | | | | | 0 | 3.0 | 2.2 | 6.8 |
| 19 | | | | | | | | | 11 | 3.0 | 7.4 | 6.0 |
| 20 | | | | | | | | | 29 | 3.0 | 279 | 6.8 |
| 21 | | | | | | | | | 3.0 | 3.0 | 21 | 6.8 |
| 22 | | | | | | | | | 3.0 | 3.0 | 9.8 | 6.8 |
| 23 | | | | | | | | | 29 | 3.0 | 6.0 | 6.8 |
| 24 | | | | | | | | | 11 | 3.0 | 6.0 | 6.8 |
| 25 | | | | | | | | | 3.0 | 3.0 | 6.0 | 4.6 |
| 26 | | | | | | | | | 3.0 | 3.0 | 6.0 | 4.6 |
| 27 | | | | | | | | | 11 | 3.0 | 6.0 | 4.6 |
| 28 | | | | | | | | | 3.0 | 3.0 | 6.0 | 5.3 |
| 29 | | | | | ------ | | | | 3.0 | 3.0 | 6.0 | 5.3 |
| 30 | | | | | ------ | | | | 3.0 | 3.0 | 6.0 | 5.3 |
| 31 | | ------ | | | ------ | | ------ | | ------ | 5.3 | 6.0 | ------ |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 112.16 | 92.3 | 460.4 | 240.7 |
| MEAN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.74 | 2.98 | 14.9 | 8.02 |
| MAX | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 5.3 | 279 | 37 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 4.6 |
| AC-FT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 222 | 183 | 913 | 477 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 0 | MEAN | 0 | MAX | 0 | MIN | 0 | AC-FT | 0 |
| WTR YR 1969: | TOTAL | 905.56 | MEAN | 2.48 | MAX | 279 | MIN | 0 | AC-FT | 1,800 |

## 16-8821. Tengan-gawa below Tengan Dam

LOCATION.--Lat 26°24'21" N., long 127°48'58" E., Okinawa, on right bank 800 ft downstream from Tengan Dam at Yamashiro, 0.7 mile south of Iha, and 0.8 mile west of Higashi-onna.

DRAINAGE AREA.--1.1 sq mi, approximately.

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 241 cfs May 20 (gage height, 5.31 ft), from rating curve extended above 99 cfs; minimum daily, 0.09 cfs Jan. 11, Sept. 27.
Period of record: Maximum discharge, 241 cfs May 20, 1969 (gage height, 5.31 ft), from rating curve extended above 99 cfs; minimum daily, 0.09 cfs Dec. 5, 1967, Jan. 11, Sept. 27, 1969.

REMARKS.--Records fair. Flow regulated by Tengan Reservoir 800 ft upstream. (See sta 16-8820.5). Diversion from reservoir of about 0.5 cfs for local irrigation and domestic use and any flow over reservoir spillway (see sta 16-8820.7) will by-pass station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .92 | 1.7 | .15 | .22 | .32 | .32 | .30 | .73 | 16 | .45 | .42 | .17 |
| 2 | .92 | 2.8 | .15 | .22 | .30 | .65 | .28 | 1.0 | 13 | .45 | .40 | .15 |
| 3 | .92 | 2.9 | .15 | .22 | .30 | .24 | .30 | 1.0 | 82 | .45 | .45 | .11 |
| 4 | 1.0 | 2.9 | .19 | .22 | 1.3 | .22 | .52 | 1.0 | 46 | .42 | .42 | .11 |
| 5 | 1.0 | 3.4 | .19 | .34 | 82 | .37 | .34 | 1.1 | 36 | .40 | .42 | .11 |
| 6 | 1.0 | 3.3 | .19 | .22 | .22 | .48 | .30 | .98 | 30 | .37 | .48 | .11 |
| 7 | 1.2 | 1.6 | .19 | .11 | .22 | .45 | .28 | .30 | 9.7 | .40 | .69 | .15 |
| 8 | 1.0 | 2.2 | .19 | .11 | .24 | .69 | .46 | 2.7 | 22 | .40 | .79 | .17 |
| 9 | .92 | .51 | .19 | .11 | .24 | .73 | .28 | 2.0 | 33 | .40 | .79 | 1.9 |
| 10 | .92 | .51 | .19 | .11 | .26 | .57 | .28 | .28 | 3.0 | .37 | .51 | 3.2 |
| 11 | .92 | .40 | .19 | .09 | .26 | .59 | .26 | .20 | 2.8 | .34 | .45 | 2.2 |
| 12 | .92 | 1.4 | .24 | .42 | .28 | .32 | .26 | .28 | 3.4 | .34 | .45 | 1.6 |
| 13 | .92 | 3.6 | .20 | 1.3 | .28 | .32 | .26 | 1.9 | 3.7 | .34 | .45 | .54 |
| 14 | .92 | 3.3 | .20 | .72 | .30 | .34 | .26 | 3.8 | 2.9 | .34 | .45 | .54 |
| 15 | .92 | 3.0 | .20 | .95 | .32 | .32 | .26 | 23 | 2.9 | .40 | .45 | .42 |
| 16 | .84 | 2.5 | .15 | 1.1 | .34 | .40 | .29 | 9.4 | 2.8 | .42 | .49 | .69 |
| 17 | .84 | 2.8 | .77 | 1.2 | 5.1 | .32 | .28 | 10 | 2.0 | .45 | .40 | 1.4 |
| 18 | .84 | 2.9 | 1.5 | 1.1 | 1.1 | .28 | .30 | 7.4 | .63 | .37 | .43 | 1.6 |
| 19 | .77 | 3.4 | 1.2 | 2.1 | 1.1 | .28 | .28 | 13 | 4.5 | .32 | .86 | 2.0 |
| 20 | .57 | 3.3 | 1.2 | .94 | 1.0 | .28 | .28 | 85 | 4.7 | .30 | 9.0 | .19 |
| 21 | 1.4 | 3.6 | 1.2 | .19 | 1.0 | .28 | .28 | 13 | 3.5 | .30 | 1.8 | .15 |
| 22 | 2.0 | 3.6 | 1.4 | .19 | 1.0 | .28 | .28 | 2.2 | 4.6 | .32 | .32 | .17 |
| 23 | 2.2 | 3.6 | 1.4 | .19 | 1.0 | .28 | .26 | 2.2 | 5.0 | .32 | .33 | .26 |
| 24 | 2.2 | 2.8 | .70 | .19 | 1.8 | .30 | .30 | 1.9 | 4.0 | .34 | .54 | .19 |
| 25 | 2.2 | 2.7 | .28 | .19 | 1.2 | .46 | .28 | 1.1 | 2.9 | .40 | .57 | .64 |
| 26 | 2.2 | .57 | .22 | .19 | .73 | .30 | .28 | 1.1 | 3.9 | .40 | .26 | .70 |
| 27 | 2.4 | .11 | .22 | .19 | .69 | .28 | .28 | 3.1 | 2.9 | .42 | .17 | .09 |
| 28 | 2.4 | .19 | .22 | .22 | .44 | .34 | .30 | 1.5 | .69 | .40 | .17 | .29 |
| 29 | 1.9 | .19 | .17 | .43 | ------ | .28 | 1.1 | 5.4 | .57 | .40 | .19 | 2.2 |
| 30 | 1.8 | .19 | .17 | .19 | ------ | .30 | 1.7 | 17 | .48 | .42 | .17 | .52 |
| 31 | 1.7 | ------ | .22 | .26 | ------ | .30 | ------ | 20 | ------ | .42 | .32 | ------ |
| TOTAL | 40.66 | 65.97 | 13.83 | 14.23 | 22.16 | 11.57 | 11.13 | 233.57 | 349.57 | 11.87 | 23.64 | 22.57 |
| MEAN | 1.31 | 2.20 | .45 | .46 | .79 | .37 | .37 | 7.53 | 11.7 | .38 | .76 | .75 |
| MAX | 2.4 | 3.6 | 1.5 | 2.1 | 5.1 | .73 | 1.7 | 85 | 82 | .45 | 9.0 | 3.2 |
| MIN | .57 | .11 | .15 | .09 | .22 | .22 | .26 | .20 | .48 | .30 | .17 | .09 |
| AC-FT | 81 | 131 | 27 | 28 | 44 | 23 | 22 | 463 | 693 | 24 | 47 | 45 |

CAL YR 1968: TOTAL 617.94 MEAN 1.69 MAX 34 MIN .11 AC-FT 1,230
WTR YR 1969: TOTAL 820.77 MEAN 2.25 MAX 85 MIN .09 AC-FT 1,630

## 16-8824. Tengan-gawa at Tengan

LOCATION.--Lat 26°22'54" N., long 127°51'39" E., Okinawa, on right bank at upstream side of bridge on Highway 24, 0.2 mile south of Tengan, and 3.4 miles northeast of Chibana.

DRAINAGE AREA.--10 sq mi, approxiamtely.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 4,500 cfs Aug. 20 (gage height, 16.33 ft), from rating curve extended above 1,200 cfs; no flow part of each day Dec. 21, 23, and probably Dec. 24-30, Jan. 9, 10.
Period of record: Maximum discharge, 4,500 cfs Aug. 20, 1969 (gage height, 16.33 ft), from rating curve extended above 1,200 cfs; no flow part of each day Jan. 15, 21, Feb. 1, Dec. 21, 23, 1968, and probably Dec. 24-30, 1968, Jan. 9, 10, 1969.

REMARKS.--Records good. Slight regulation by Tengan Reservoir 5 miles upstream. (See sta 16-8820.5). Upstream pumping stations divert water for domestic use. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.8 | 1.7 | .15 | 1.0 | 10 | 5.3 | 5.5 | 2.2 | 49 | 85 | 19 | 24 |
| 2 | 4.5 | 1.3 | 1.0 | .70 | 8.8 | 203 | 5.0 | 2.0 | 109 | 79 | 18 | 20 |
| 3 | 3.3 | 2.9 | .70 | .45 | 3.3 | 14 | 5.0 | 2.1 | 845 | 73 | 22 | 20 |
| 4 | 2.6 | 1.1 | .40 | .30 | 25 | 7.8 | 23 | 2.1 | 118 | 67 | 21 | 21 |
| 5 | 2.7 | 1.1 | .80 | 1.5 | 19 | 5.4 | 18 | 2.0 | 257 | 60 | 18 | 20 |
| 6 | 3.6 | 2.5 | .71 | 1.0 | 5.8 | 4.6 | 9.2 | 3.2 | 260 | 56 | 20 | 17 |
| 7 | 14 | 2.8 | .87 | .50 | 3.4 | 4.1 | 6.3 | 2.9 | 67 | 53 | 16 | 17 |
| 8 | 10 | 5.2 | .46 | .25 | 3.0 | 19 | 41 | 157 | 142 | 49 | 19 | 13 |
| 9 | 4.5 | 11 | .20 | .10 | 2.5 | 37 | 13 | 76 | 293 | 48 | 28 | 163 |
| 10 | 2.6 | 2.4 | .39 | .10 | 3.9 | 21 | 7.8 | 21 | 77 | 43 | 24 | 118 |
| 11 | 2.4 | .94 | .40 | .20 | 4.2 | 104 | 6.4 | 9.2 | 59 | 40 | 17 | 27 |
| 12 | 1.8 | .56 | 4.1 | .30 | 2.8 | 49 | 5.8 | 6.5 | 83 | 38 | 14 | 23 |
| 13 | 2.4 | .56 | 2.8 | .30 | 1.6 | 15 | 5.1 | 54 | 123 | 36 | 15 | 20 |
| 14 | 2.4 | .73 | 2.3 | 3.9 | .60 | 11 | 5.3 | 131 | 78 | 36 | 12 | 19 |
| 15 | 2.1 | .35 | .70 | 3.0 | .77 | 9.5 | 5.4 | 128 | 53 | 35 | 12 | 19 |
| 16 | 3.9 | .47 | .50 | .25 | .85 | 9.0 | 4.7 | 25 | 48 | 34 | 11 | 30 |
| 17 | 2.2 | .46 | .25 | .70 | 4.3 | 9.4 | 9.8 | 29 | 45 | 35 | 9.9 | 23 |
| 18 | .80 | .63 | .66 | .25 | 1.5 | 7.6 | 6.4 | 22 | 43 | 32 | 9.7 | 16 |
| 19 | 1.2 | .42 | .61 | 33 | 1.2 | 7.6 | 6.4 | 74 | 374 | 30 | 26 | 14 |
| 20 | 1.1 | .50 | .10 | 63 | .88 | 7.0 | 7.4 | 415 | 351 | 30 | 1,900 | 13 |
| 21 | 1.6 | .50 | .25 | 4.4 | .90 | 8.5 | 6.2 | 95 | 416 | 28 | 137 | 13 |
| 22 | 1.8 | .83 | .20 | 2.3 | 1.3 | 7.1 | 5.1 | 30 | 260 | 28 | 50 | 12 |
| 23 | 2.3 | .87 | .35 | 1.8 | 1.8 | 5.9 | 4.5 | 35 | 568 | 29 | 37 | 12 |
| 24 | .78 | .88 | .16 | 1.0 | 16 | 7.8 | 3.9 | 36 | 325 | 28 | 29 | 11 |
| 25 | .78 | .50 | .12 | .90 | 11 | 30 | 3.1 | 28 | 161 | 26 | 27 | 12 |
| 26 | .53 | .41 | .10 | 5.7 | 9.6 | 12 | 4.6 | 22 | 201 | 25 | 26 | 13 |
| 27 | .66 | .39 | .08 | 14 | 5.3 | 7.0 | 3.9 | 134 | 589 | 26 | 24 | 9.9 |
| 28 | .86 | .82 | .06 | 3.8 | 5.5 | 14 | 3.5 | 90 | 142 | 24 | 23 | 8.7 |
| 29 | 1.5 | .39 | .04 | 13 | ------ | 9.8 | 4.5 | 99 | 112 | 24 | 22 | 8.7 |
| 30 | 1.4 | .20 | .05 | 9.9 | ------ | 5.8 | 5.3 | 255 | 95 | 20 | 22 | 8.0 |
| 31 | 1.7 | ------ | .35 | 3.2 | ------ | 6.2 | ------ | 71 | ------ | 20 | 24 | ------ |
| TOTAL | 85.81 | 43.41 | 19.86 | 170.80 | 154.80 | 664.4 | 241.1 | 2059.2 | 6343 | 1237 | 2,652.6 | 745.3 |
| MEAN | 2.77 | 1.45 | .64 | 5.51 | 5.53 | 21.4 | 8.04 | 66.4 | 211 | 39.9 | 85.6 | 24.8 |
| MAX | 14 | 11 | 4.1 | 63 | 25 | 203 | 41 | 415 | 845 | 85 | 1,900 | 163 |
| MIN | .53 | .20 | .04 | .10 | .60 | 4.1 | 3.1 | 2.0 | 43 | 20 | 9.7 | 8.0 |
| AC-FT | 170 | 86 | 39 | 339 | 307 | 1,320 | 478 | 4,080 | 12,580 | 2,450 | 5,260 | 1,480 |

CAL YR 1968: TOTAL 3,510.03 MEAN 9.59 MAX 308 MIN .04 AC-FT 6,960
WTR YR 1969: TOTAL 14,417.28 MEAN 39.5 MAX 1,900 MIN .04 AC-FT 28,600

PEAK DISCHARGE (BASE, 2,500 CFS).--June 3 (0230) 3,200 cfs (12.00 ft); Aug. 20 (1030) 4,500 cfs (16.33 ft).

## 16-8826. Okukubi-gawa at Kin, Okinawa

LOCATION.--Lat 26°27'40" N., long 127°56'03" E., Okinawa, on right bank 250 ft downstream from Hansen Dam, 0.7 mile northeast of Kin, and 1.8 miles southwest of Kanna.

DRAINAGE AREA.--5.0 sq mi, approximately.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 0.74 ft above mean sea level or 4.50 ft above Okinawa datum (Corps of Engineers bench mark).

EXTREMES.--Current year: Maximum discharge, 3,150 cfs Aug. 20 (gage height, 10.80 ft), from rating curve extended above 120 cfs; minimum daily, 0.20 cfs Feb. 18-20.
Period of record: Maximum discharge, 3,150 cfs Aug. 20, 1969 (gage height, 10.80 ft), from rating curve extended above 120 cfs; minimum daily, 0.10 cfs Mar. 17-20, 1968.

REMARKS.--Records fair except those above 240 cfs, which are poor. Flow regulated by Hansen Reservoir 250 ft upstream (capacity, 421 acre-ft). Diversion from Hansen Reservoir for irrigation and domestic use.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .45 | .29 | .39 | .29 | 8.9 | 5.9 | 4.0 | .29 | 30 | 28 | 2.0 | 8.0 |
| 2 | .52 | .29 | .34 | .29 | 7.8 | 126 | 2.6 | .29 | 160 | 23 | 1.4 | 7.0 |
| 3 | .45 | .29 | .34 | .29 | 4.0 | 13 | .52 | .29 | 100 | 23 | 6.0 | 7.6 |
| 4 | .39 | .29 | .29 | .24 | 37 | 6.8 | 17 | .34 | 40 | 23 | 82 | 7.2 |
| 5 | .39 | .29 | .34 | .34 | 20 | 3.8 | 12 | .34 | 200 | 18 | 43 | 7.0 |
| 6 | .45 | .29 | .29 | .34 | 5.1 | 1.2 | 5.1 | .39 | 60 | 19 | 13 | 6.6 |
| 7 | .45 | .29 | .29 | .29 | 3.2 | .34 | 1.9 | .39 | 40 | 18 | 6.2 | 6.2 |
| 8 | .45 | .29 | .24 | .29 | 2.3 | 13 | 21 | 2.1 | 80 | 15 | 4.5 | 5.9 |
| 9 | .52 | .29 | .24 | .29 | .75 | 47 | 9.3 | 32 | 90 | 13 | 11 | 107 |
| 10 | .52 | .29 | .24 | .24 | 1.6 | 13 | 5.1 | 14 | 40 | 12 | 14 | 41 |
| 11 | .45 | .29 | .24 | .24 | 1.4 | 111 | 3.8 | 16 | 35 | 13 | 7.5 | 11 |
| 12 | .45 | .34 | .39 | .29 | .29 | 46 | 3.4 | 12 | 45 | 11 | 4.3 | 6.8 |
| 13 | .45 | .34 | .29 | .24 | .24 | 8.2 | 2.4 | 308 | 60 | 9.7 | 4.0 | 5.9 |
| 14 | .45 | .34 | .29 | .29 | .29 | 5.3 | .52 | 286 | 40 | 8.6 | 4.0 | 5.6 |
| 15 | .45 | .34 | .24 | .34 | .24 | 4.4 | .34 | 251 | 30 | 7.8 | 3.4 | 6.5 |
| 16 | .45 | .34 | .24 | .34 | .24 | 1.5 | .39 | 14 | 28 | 7.8 | .93 | 7.2 |
| 17 | .45 | .29 | .24 | .39 | .24 | .34 | 2.8 | 10 | 26 | 12 | .59 | 6.5 |
| 18 | .45 | .29 | .24 | .29 | .20 | .29 | 1.1 | 12 | 30 | 12 | .52 | 5.6 |
| 19 | .45 | .29 | .24 | .34 | .20 | .34 | .34 | 51 | 170 | 8.6 | 21 | 2.6 |
| 20 | .39 | .29 | .24 | 9.6 | .20 | 1.2 | .29 | 342 | 250 | 8.2 | 1,070 | 1.6 |
| 21 | .39 | .29 | .24 | 5.9 | .24 | 4.6 | .29 | 55 | 100 | 8.9 | 51 | 1.8 |
| 22 | .34 | .29 | .29 | 3.8 | .24 | 1.9 | .34 | 24 | 130 | 8.9 | 18 | 4.0 |
| 23 | .39 | .34 | .24 | 2.8 | .24 | .67 | .34 | 71 | 110 | 6.8 | 10 | 1.9 |
| 24 | .34 | .39 | .24 | 1.8 | 6.4 | .34 | .34 | 60 | 150 | 4.5 | 7.2 | .59 |
| 25 | .34 | .45 | .29 | 1.2 | 11 | 33 | .34 | 30 | 70 | 3.1 | 5.9 | .59 |
| 26 | .34 | .39 | .39 | 1.2 | 10 | 12 | .52 | 23 | 100 | 3.1 | 4.3 | .59 |
| 27 | .34 | .39 | .39 | 3.2 | 4.0 | 4.5 | .39 | 100 | 170 | 8.6 | 8.0 | .52 |
| 28 | .34 | .39 | .45 | 4.0 | 3.0 | 9.1 | .39 | 45 | 54 | 9.6 | 7.4 | .52 |
| 29 | .39 | .39 | .45 | 17 | ------ | 5.9 | .34 | 80 | 44 | 8.2 | 7.0 | .59 |
| 30 | .34 | .39 | .39 | 16 | ------ | 3.4 | .29 | 130 | 34 | 5.9 | 8.0 | .59 |
| 31 | .34 | ------ | .29 | 6.5 | ------ | 4.3 | ------ | 40 | ------ | 3.2 | 7.0 | ------ |
| TOTAL | 12.92 | 9.76 | 9.31 | 78.66 | 129.31 | 488.32 | 97.48 | 2,010.43 | 2,516 | 361.5 | 1,433.14 | 274.49 |
| MEAN | .42 | .33 | .30 | 2.54 | 4.62 | 15.8 | 3.25 | 64.9 | 83.9 | 11.7 | 46.2 | 9.15 |
| MAX | .52 | .45 | .45 | 17 | 37 | 126 | 21 | 342 | 250 | 28 | 1,070 | 107 |
| MIN | .34 | .29 | .24 | .24 | .20 | .29 | .29 | .29 | 26 | 3.1 | .52 | .52 |
| AC-FT | 26 | 19 | 18 | 156 | 256 | 969 | 193 | 3,990 | 4,990 | 717 | 2,840 | 544 |

CAL YR 1968: TOTAL 1,048.22 MEAN 2.86 MAX 161 MIN .10 AC-FT 2,080
WTR YR 1969: TOTAL 7,421.32 MEAN 20.3 MAX 1,070 MIN .20 AC-FT 14,720

NOTE.--No gage-height record May 24 to June 28.

## 16-8828. Kanna-gawa near Kanna

LOCATION.--Lat 26°29'20" N., long 127°56'46" E., Okinawa, on left bank 1.6 miles northwest of Kanna-shogakko (elementary school), 1.7 miles upstream from bridge at mouth, and 2.6 miles northeast of Kin.

DRAINAGE AREA.--0.9 sq mi, approximately.

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

GAGE.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 70 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.40 ft higher.

EXTREMES.--Current year: Maximum discharge, 1,300 cfs June 20 (gage height, 6.62 ft), from rating curve extended as explained below; minimum, 0.50 cfs probably Oct. 25, 26.
Period of record: Maximum discharge, 1,390 cfs Aug. 5, 1965 (gage height, 6.80 ft, from floodmarks), from rating curve extended above 43 cfs on basis of theoretical rating for artificial control; minimum, 0.12 cfs July 24, 26, 27, 1963.

REMARKS.--Records good. No diversion above station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.3 | .66 | .63 | .80 | 2.1 | 1.5 | 1.4 | 1.3 | 8.2 | 11 | 2.5 | 3.9 |
| 2 | 1.3 | .66 | .82 | .66 | 1.5 | 2.0 | 1.3 | 1.3 | 44 | 9.4 | 2.4 | 3.2 |
| 3 | 1.1 | .66 | .90 | .63 | .98 | 2.2 | 1.3 | 1.3 | 29 | 8.5 | 4.9 | 3.7 |
| 4 | 1.0 | .66 | .75 | .60 | 4.8 | 1.8 | 3.1 | 1.4 | 10 | 8.2 | 11 | 3.2 |
| 5 | 1.1 | .72 | 1.0 | 1.3 | 2.1 | 2.2 | 2.1 | 1.4 | 59 | 6.8 | 4.8 | 3.0 |
| 6 | 1.0 | 1.3 | .69 | .77 | 1.3 | 1.9 | 1.6 | 2.1 | 17 | 6.8 | 4.1 | 3.0 |
| 7 | 1.0 | 1.3 | .66 | .60 | 1.2 | 1.5 | 1.4 | 1.4 | 9.8 | 6.1 | 2.9 | 2.9 |
| 8 | 1.0 | 2.0 | .66 | .58 | 1.0 | 6.1 | 3.6 | 8.4 | 22 | 5.4 | 3.0 | 2.9 |
| 9 | .98 | 1.9 | .66 | .58 | .94 | 11 | 1.9 | 4.9 | 22 | 5.1 | 3.3 | 8.3 |
| 10 | .98 | .90 | .66 | .60 | 1.1 | 3.3 | 1.6 | 2.6 | 11 | 5.0 | 3.2 | 3.7 |
| 11 | .94 | .77 | .68 | .60 | 1.0 | 25 | 1.5 | 1.9 | 9.4 | 4.8 | 2.6 | 2.9 |
| 12 | .86 | .74 | 3.6 | .63 | .87 | 5.8 | 1.5 | 3.0 | 12 | 4.7 | 2.4 | 2.6 |
| 13 | .80 | .74 | 1.1 | .58 | .84 | 2.9 | 1.4 | 54 | 15 | 4.5 | 2.3 | 2.5 |
| 14 | .74 | .72 | .80 | 1.0 | 1.4 | 2.4 | 1.4 | 33 | 9.8 | 4.2 | 2.3 | 2.4 |
| 15 | .74 | .72 | .72 | .91 | 1.0 | 2.2 | 1.4 | 12 | 8.2 | 4.0 | 2.2 | 2.3 |
| 16 | .70 | .69 | .66 | .78 | .87 | 2.0 | 1.5 | 4.7 | 7.5 | 3.9 | 2.2 | 2.3 |
| 17 | .70 | .66 | .63 | 1.4 | .80 | 1.9 | 1.9 | 4.7 | 7.1 | 4.7 | 2.1 | 2.3 |
| 18 | .70 | .66 | .69 | .72 | .90 | 1.8 | 1.3 | 3.6 | 7.5 | 4.4 | 2.3 | 2.2 |
| 19 | .70 | .66 | .83 | 2.6 | .87 | 1.7 | 1.3 | 14 | 48 | 3.6 | 9.5 | 2.1 |
| 20 | .76 | .66 | .63 | 2.0 | .90 | 1.6 | 1.3 | 95 | 75 | 3.4 | 191 | 2.0 |
| 21 | .70 | .72 | .60 | .94 | .84 | 2.0 | 1.3 | 11 | 24 | 3.3 | 11 | 1.9 |
| 22 | .72 | .74 | 1.0 | .80 | .84 | 1.6 | 1.3 | 6.8 | 34 | 3.4 | 6.5 | 1.9 |
| 23 | .70 | .72 | .90 | .74 | .77 | 1.5 | 1.2 | 20 | 33 | 3.2 | 5.4 | 2.1 |
| 24 | .68 | .66 | .87 | .66 | 5.3 | 1.6 | 1.2 | 16 | 45 | 3.0 | 4.6 | 2.0 |
| 25 | .66 | 1.10 | .87 | .66 | 1.8 | 4.2 | 1.2 | 7.8 | 17 | 3.2 | 4.4 | 2.0 |
| 26 | .66 | .72 | .84 | .94 | 2.5 | 2.0 | 1.2 | 6.1 | 30 | 3.3 | 3.9 | 1.9 |
| 27 | .66 | .66 | .84 | .96 | 1.6 | 1.6 | 1.3 | 27 | 43 | 3.2 | 3.7 | 1.9 |
| 28 | .66 | .63 | .84 | 1.3 | 1.4 | 2.7 | 1.2 | 9.8 | 17 | 3.4 | 3.5 | 1.9 |
| 29 | .66 | .63 | .84 | 4.2 | ------ | 1.8 | 1.2 | 22 | 14 | 3.0 | 3.4 | 2.1 |
| 30 | .66 | .63 | .78 | 2.0 | ------ | 1.6 | 1.3 | 31 | 12 | 2.9 | 3.8 | 1.9 |
| 31 | .66 | ------ | .77 | 1.2 | ------ | 1.6 | ------ | 11 | ------ | 2.6 | 3.2 | ------ |
| TOTAL | 25.82 | 24.99 | 26.92 | 32.74 | 41.52 | 103.0 | 46.2 | 420.5 | 700.5 | 149.0 | 314.4 | 81.0 |
| MEAN | .83 | .83 | .87 | 1.06 | 1.48 | 3.32 | 1.54 | 13.6 | 23.4 | 4.81 | 10.1 | 2.70 |
| MAX | 1.3 | 2.0 | 3.6 | 4.2 | 5.3 | 25 | 3.6 | 95 | 75 | 11 | 191 | 8.3 |
| MIN | .66 | .63 | .60 | .58 | .77 | 1.5 | 1.2 | 1.3 | 7.1 | 2.6 | 2.1 | 1.9 |
| AC-FT | 51 | 50 | 53 | 65 | 82 | 204 | 92 | 834 | 1,390 | 296 | 624 | 161 |

CAL YR 1968: TOTAL 556.58 MEAN 1.52 MAX 34 MIN .47 AC-FT 1,100
WTR YR 1969: TOTAL 1,966.59 MEAN 5.39 MAX 191 MIN .58 AC-FT 3,900

PEAK DISCHARGE (BASE, 400 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 1900 | 5.38 | 722 | 6-20 | 2200 | 6.62 | 1,300 |
| 5-20 | 0700 | 5.02 | 587 | 6-26 | 2400 | 4.96 | 566 |
| 6- 2 | 2300 | 5.38 | 722 | 8-20 | 0800 | 5.77 | 878 |
| 6- 5 | 1800 | 5.90 | 940 | | | | |

## 16-8833. Left Fork O-kawa near Kushi

LOCATION.--Lat 26°31'18" N., long 127°59'50"E., Okinawa, on left bank 1.1 miles northwest of Kushi and 1.1 miles north of Katabaru.

DRAINAGE AREA.--0.3 sq mi, approximately.

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

GAGE.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 60 ft (from topographic map). Prior to Nov. 20, 1963, at datum 0.40 ft higher.

EXTREMES.--Current year: Maximum discharge, 302 cfs June 20 (gage height, 4.50 ft), from rating curve extended as explained below; minimum, 0.12 cfs Jan. 3, 4, 7-10, 13, 14.
Period of record: Maximum discharge, 438 cfs Aug. 5, 1965 (gage height, 5.19 ft), from rating curve extended above 23 cfs on basis of theoretical rating for the artificial control; minimum, 0.05 cfs July 17-27, 29, Oct. 23, 1963.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .27 | .18 | .13 | .15 | .44 | .27 | .18 | .15 | 1.9 | 2.7 | .60 | .80 |
| 2 | .25 | .20 | .20 | .13 | .28 | 3.1 | .17 | .14 | 13 | 2.3 | .60 | .63 |
| 3 | .22 | .21 | .17 | .13 | .17 | .37 | .17 | .14 | 4.9 | 2.1 | .68 | .68 |
| 4 | .21 | .21 | .15 | .13 | 1.3 | .25 | .69 | .14 | 2.3 | 1.9 | 1.7 | .60 |
| 5 | .22 | .25 | .20 | .24 | .36 | .20 | .37 | .13 | 9.2 | 1.6 | 1.0 | .60 |
| 6 | .24 | .42 | .14 | .15 | .21 | .18 | .24 | .17 | 4.3 | 1.6 | .91 | .55 |
| 7 | .22 | .35 | .14 | .13 | .18 | .17 | .20 | .15 | 2.4 | 1.4 | .65 | .55 |
| 8 | .21 | .73 | .14 | .12 | .16 | .93 | .70 | 1.1 | 5.4 | 1.3 | .68 | .58 |
| 9 | .29 | .45 | .14 | .12 | .15 | 2.5 | .32 | .95 | 6.4 | 1.2 | .77 | 1.2 |
| 10 | .22 | .20 | .14 | .15 | .20 | .62 | .24 | .44 | 2.9 | 1.1 | .72 | .71 |
| 11 | .20 | .17 | .20 | .14 | .16 | 2.8 | .21 | .24 | 2.2 | 1.1 | .58 | .58 |
| 12 | .18 | .16 | .70 | .14 | .15 | 1.2 | .20 | .67 | 2.2 | .97 | .55 | .53 |
| 13 | .16 | .16 | .17 | .13 | .14 | .47 | .18 | 12 | 3.5 | .94 | .53 | .55 |
| 14 | .15 | .16 | .22 | .19 | .30 | .35 | .17 | 4.0 | 2.2 | .91 | .51 | .60 |
| 15 | .16 | .15 | .16 | .16 | .18 | .30 | .17 | 3.3 | 1.8 | .88 | .51 | .53 |
| 16 | .15 | .15 | .14 | .20 | .15 | .27 | .21 | .97 | 1.6 | .95 | .51 | .51 |
| 17 | .15 | .15 | .13 | .63 | .14 | .24 | .25 | .83 | 1.5 | 1.2 | .51 | .56 |
| 18 | .16 | .15 | .19 | .16 | .17 | .22 | .16 | .63 | 1.5 | 1.4 | .51 | .49 |
| 19 | .15 | .14 | .17 | .45 | .15 | .21 | .16 | 2.5 | 9.3 | .97 | 2.7 | .47 |
| 20 | .18 | .14 | .14 | .32 | .15 | .21 | .15 | 20 | 9.7 | .88 | 25 | .47 |
| 21 | .16 | .15 | .13 | .17 | .14 | .25 | .16 | 2.2 | 9.0 | .82 | 2.6 | .45 |
| 22 | .17 | .15 | .16 | .16 | .14 | .20 | .16 | 1.2 | 7.4 | .82 | 1.4 | .43 |
| 23 | .16 | .17 | .14 | .15 | .14 | .18 | .15 | 3.5 | 6.6 | .80 | 1.1 | .47 |
| 24 | .15 | .14 | .13 | .14 | .61 | .18 | .15 | 2.5 | 9.8 | .77 | 1.0 | .43 |
| 25 | .14 | .30 | .13 | .14 | .29 | .56 | .15 | 1.6 | 4.7 | .80 | .91 | .43 |
| 26 | .14 | .14 | .13 | .21 | 1.7 | .25 | .16 | 1.2 | 11 | .85 | .85 | .43 |
| 27 | .15 | .13 | .13 | .20 | .30 | .20 | .17 | 6.3 | 13 | .80 | .82 | .41 |
| 28 | .15 | .13 | .13 | .29 | .22 | .51 | .15 | 2.4 | 5.2 | 1.0 | .77 | .39 |
| 29 | .15 | .13 | .13 | .78 | ------ | .27 | .14 | 5.0 | 3.9 | .82 | .71 | .45 |
| 30 | .15 | .13 | .15 | .33 | ------ | .22 | .15 | 8.0 | 3.2 | .68 | .74 | .39 |
| 31 | .15 | ------ | .17 | .21 | ------ | .20 | ------ | 2.7 | ------ | .65 | .65 | ------ |
| TOTAL | 5.66 | 6.30 | 5.30 | 6.75 | 8.68 | 17.88 | 6.68 | 85.25 | 162.0 | 36.21 | 51.77 | 16.47 |
| MEAN | .18 | .21 | .17 | .22 | .31 | .58 | .22 | 2.75 | 5.40 | 1.17 | 1.67 | .55 |
| MAX | .29 | .73 | .70 | .78 | 1.7 | 3.1 | .70 | 20 | 13 | 2.7 | 25 | 1.2 |
| MIN | .14 | .13 | .13 | .12 | .14 | .17 | .14 | .13 | 1.5 | .65 | .51 | .39 |
| AC-FT | 11 | 12 | 11 | 13 | 17 | 35 | 13 | 169 | 321 | 72 | 103 | 33 |

CAL YR 1968: TOTAL 134.42 MEAN .37 MAX 8.5 MIN .13 AC-FT 267
WTR YR 1969: TOTAL 408.95 MEAN 1.12 MAX 25 MIN .12 AC-FT 811

PEAK DISCHARGE (BASE, 80 CFS) / About.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 1900 | 3.63 | 150 | 6-20 | 2300 | 4.50 | 302 |
| 5-20 | /0700 | - | /100 | 6-26 | 2400 | 3.48 | 130 |
| 6- 2 | 2100 | 3.66 | 154 | 8-20 | 0730 | 3.56 | 140 |
| 6- 5 | 1600 | 3.92 | 196 | | | | |

## 16-8835.5. Oura-gawa at Okawa

LOCATION.--Lat 26°34'10" N., long 128°02'23" E., Okinawa, on left bank 0.4 mile north of Okawa and 1.8 miles northwest of Sedake.

DRAINAGE AREA.--1.9 sq mi, approximately.

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

GAGE.--Water-stage recorder. Concrete control since Mar. 10, 1967. Altitude of gage is 30 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 1,120 cfs June 20 (gage height, 7.83 ft), from rating curve extended above 67 cfs; no flow many days.
Period of record: Maximum discharge, 1,120 cfs June 20, 1969 (gage height, 7.83 ft), from rating curve extended above 67 cfs; no flow at times each year.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .55 | .07 | 0 | 0 | 11 | 3.6 | 2.1 | .62 | 22 | 17 | 1.5 | 3.0 |
| 2 | .62 | .05 | 0 | .07 | 7.5 | 25 | 1.8 | .55 | 34 | 15 | 1.3 | 2.6 |
| 3 | .55 | .04 | 0 | 0 | 4.0 | 8.8 | 1.7 | .55 | 116 | 13 | 1.3 | 2.6 |
| 4 | .42 | .03 | 0 | 0 | 12 | 6.5 | 7.3 | .48 | 27 | 10 | 4.1 | 2.4 |
| 5 | 2.7 | .04 | 0 | 0 | 7.8 | 4.8 | 4.5 | .42 | 125 | 9.6 | 1.3 | 2.8 |
| 6 | .97 | .27 | 0 | 0 | 4.8 | 3.8 | 3.2 | .42 | 58 | 9.7 | 1.2 | 2.1 |
| 7 | 57 | 1.5 | 0 | 0 | 3.6 | 3.2 | 2.6 | .55 | 28 | 11 | 1.2 | 1.8 |
| 8 | 12 | 1.7 | 0 | 0 | 2.6 | 13 | 5.5 | 4.6 | 40 | 7.8 | 1.2 | 1.7 |
| 9 | 5.0 | 5.0 | 0 | 0 | 2.1 | 30 | 3.4 | 10 | 66 | 6.2 | 2.3 | 11 |
| 10 | 3.0 | .62 | 0 | 0 | 2.3 | 13 | 2.4 | 5.0 | 32 | 5.9 | 3.5 | 6.2 |
| 11 | 2.0 | .27 | 0 | 0 | 1.7 | 39 | 2.1 | 7.0 | 23 | 13 | 1.1 | 2.8 |
| 12 | 1.5 | .13 | .28 | 0 | 1.3 | 23 | 2.0 | 4.0 | 21 | 6.5 | .97 | 2.3 |
| 13 | 1.3 | .04 | .42 | 0 | 1.1 | 14 | 1.7 | 136 | 67 | 5.6 | .97 | 2.1 |
| 14 | 1.2 | .02 | .02 | 0 | 1.8 | 11 | 1.4 | 52 | 33 | 4.8 | .97 | 2.0 |
| 15 | .87 | 0 | 0 | .12 | 1.3 | 8.5 | 1.4 | 37 | 22 | 4.5 | .97 | 1.8 |
| 16 | .70 | 0 | 0 | .49 | .87 | 6.8 | 1.7 | 17 | 17 | 4.3 | .87 | 1.7 |
| 17 | .62 | 0 | 0 | 7.8 | .78 | 5.9 | 2.0 | 15 | 15 | 4.0 | .78 | 1.4 |
| 18 | .55 | 0 | 0 | 1.1 | 1.4 | 4.3 | .97 | 10 | 13 | 4.9 | .70 | 1.3 |
| 19 | .48 | 0 | 0 | 19 | 1.3 | 3.8 | .87 | 11 | 69 | 3.2 | 1.7 | 1.2 |
| 20 | .55 | 0 | 0 | 5.5 | .97 | 3.2 | .87 | 69 | 123 | 3.0 | 158 | .97 |
| 21 | .70 | 0 | 0 | 2.3 | .78 | 3.2 | .87 | 28 | 81 | 2.8 | 29 | .97 |
| 22 | .97 | 0 | .06 | 1.3 | .70 | 2.6 | .87 | 17 | 55 | 2.8 | 16 | .87 |
| 23 | 1.2 | 0 | .36 | 1.1 | .70 | 2.4 | .82 | 39 | 65 | 2.6 | 11 | 1.1 |
| 24 | .87 | 0 | .05 | .78 | 3.0 | 2.1 | .78 | 32 | 76 | 2.6 | 8.5 | .97 |
| 25 | .62 | 0 | 0 | .55 | 2.8 | 4.3 | .78 | 22 | 44 | 2.4 | 6.8 | .78 |
| 26 | .23 | 0 | 0 | .48 | 24 | 2.4 | .67 | 16 | 45 | 2.4 | 5.9 | .70 |
| 27 | .11 | 0 | 0 | .55 | 5.6 | 1.8 | .87 | 52 | 92 | 2.3 | 5.3 | .62 |
| 28 | .09 | 0 | 0 | .78 | 4.0 | 11 | .87 | 33 | 41 | 2.1 | 4.5 | .55 |
| 29 | .07 | 0 | 0 | 7.1 | ------ | 4.3 | .70 | 32 | 27 | 2.0 | 4.0 | .48 |
| 30 | .07 | 0 | 0 | 5.2 | ------ | 3.2 | .62 | 62 | 22 | 2.0 | 3.6 | .42 |
| 31 | .07 | ------ | 0 | 2.8 | ------ | 2.6 | ------ | 34 | ------ | 1.8 | 3.2 | ------ |
| TOTAL | 97.58 | 9.78 | 1.19 | 57.02 | 111.80 | 271.1 | 57.56 | 748.19 | 1,499 | 184.8 | 283.73 | 61.23 |
| MEAN | 3.15 | .33 | .038 | 1.84 | 3.99 | 8.75 | 1.92 | 2.41 | 50.0 | 5.96 | 9.15 | 2.04 |
| MAX | 57 | 5.0 | .42 | 19 | 24 | 39 | 7.3 | 136 | 125 | 17 | 158 | 11 |
| MIN | .07 | 0 | 0 | 0 | .70 | 1.8 | .62 | .42 | 13 | 1.8 | .70 | .42 |
| AC-FT | 194 | 19 | 2.4 | 113 | 222 | 538 | 114 | 1,480 | 2970 | 367 | 563 | 121 |

CAL YR 1968: TOTAL 1,025.42 MEAN 2.80 MAX 67 MIN 0 AC-FT 2,030
WTR YR 1969: TOTAL 3,382.98 MEAN 9.27 MAX 158 MIN 0 AC-FT 6,710

PEAK DISCHARGE (BASE, 500 CFS) / About.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10- 7 | 1830 | 5.75 | 737 | 6- 5 | 1930 | 7.20 | 992 |
| 5-13 | 1930 | 6.65 | 898 | 6-20 | 2230 | 7.83 | 1,120 |
| 5-20 | 0730 | 5.15 | 629 | 8-20 | /0930 | - | /900 |
| 6- 3 | 0100 | 6.76 | 917 | | | | |

## 16-8841. Fukuji-gawa near Yubaru

LOCATION.--Lat 26°38'32" N., long 128°13'00" E., Okinawa, on left bank 1.1 miles north of Yubaru and 2.4 miles northeast of Miyaji.

DRAINAGE AREA.--5.8 sq mi, approximately.

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

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 9,350 cfs June 20 (gage height, 15.56 ft), from rating curve extended as explained below; minimum, 2.2 cfs Jan. 9, 10.
Period of record: Maximum discharge, 10,400 cfs Aug. 5, 1965 (gage height, 17.20 ft), from rating curve extended above 2,600 cfs on basis of slope-area measurement of peak flow; minimum, 2.2 cfs Jan. 9, 10, 1969.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9.4 | 4.1 | 3.2 | 3.2 | 21 | 8.0 | 8.7 | 5.3 | 24 | 50 | 9.1 | 7.1 |
| 2 | 9.0 | 4.1 | 3.5 | 3.2 | 13 | 106 | 7.6 | 5.0 | 38 | 43 | 8.6 | 6.6 |
| 3 | 8.4 | 4.1 | 3.8 | 2.7 | 7.3 | 15 | 7.3 | 5.0 | 477 | 36 | 8.6 | 6.6 |
| 4 | 7.8 | 4.1 | 3.5 | 2.5 | 32 | 11 | 20 | 4.7 | 50 | 32 | 9.2 | 7.1 |
| 5 | 7.6 | 4.1 | 3.5 | 3.5 | 17 | 9.0 | 14 | 4.4 | 700 | 30 | 9.1 | 6.2 |
| 6 | 7.3 | 6.6 | 3.2 | 4.1 | 8.7 | 7.8 | 8.7 | 4.7 | 170 | 28 | 9.1 | 5.8 |
| 7 | 7.3 | 6.6 | 3.2 | 3.0 | 7.0 | 7.4 | 7.6 | 4.7 | 62 | 27 | 7.6 | 5.8 |
| 8 | 7.6 | 25 | 3.2 | 2.5 | 5.6 | 35 | 25 | 22 | 140 | 25 | 11 | 5.8 |
| 9 | 6.6 | 23 | 3.2 | 2.2 | 5.0 | 80 | 12 | 199 | 250 | 23 | 9.6 | 27 |
| 10 | 10 | 7.0 | 3.2 | 2.5 | 5.3 | 18 | 9.0 | 47 | 62 | 21 | 8.6 | 15 |
| 11 | 7.6 | 5.3 | 3.2 | 8.6 | 5.0 | 217 | 8.7 | 85 | 49 | 21 | 7.6 | 13 |
| 12 | 6.6 | 4.7 | 7.7 | 3.2 | 4.7 | 53 | 8.0 | 42 | 44 | 19 | 6.6 | 11 |
| 13 | 6.3 | 4.4 | 4.4 | 2.7 | 4.4 | 21 | 7.6 | 587 | 350 | 18 | 6.6 | 7.1 |
| 14 | 6.3 | 4.4 | 3.8 | 3.8 | 5.3 | 17 | 7.3 | 104 | 57 | 16 | 6.2 | 6.6 |
| 15 | 5.9 | 4.4 | 4.4 | 7.0 | 5.3 | 14 | 7.0 | 67 | 45 | 15 | 6.2 | 6.2 |
| 16 | 5.9 | 4.1 | 3.8 | 3.8 | 4.4 | 13 | 7.3 | 26 | 38 | 15 | 6.2 | 6.2 |
| 17 | 5.6 | 4.1 | 3.2 | 8.0 | 4.1 | 11 | 8.7 | 30 | 34 | 18 | 5.8 | 5.8 |
| 18 | 5.6 | 4.1 | 3.3 | 4.1 | 11 | 9.8 | 6.3 | 22 | 30 | 14 | 5.8 | 5.8 |
| 19 | 5.3 | 4.1 | 5.9 | 47 | 8.0 | 9.8 | 6.3 | 22 | 511 | 12 | 13 | 5.4 |
| 20 | 5.0 | 3.8 | 3.5 | 17 | 5.3 | 9.4 | 6.3 | 405 | 814 | 15 | 672 | 5.4 |
| 21 | 5.9 | 3.8 | 3.2 | 5.3 | 4.7 | 9.0 | 6.3 | 63 | 208 | 12 | 48 | 5.0 |
| 22 | 6.6 | 3.8 | 4.4 | 4.4 | 4.7 | 8.0 | 6.3 | 34 | 149 | 12 | 16 | 4.6 |
| 23 | 5.9 | 4.1 | 4.4 | 4.1 | 4.1 | 7.3 | 5.9 | 336 | 136 | 11 | 11 | 5.0 |
| 24 | 5.3 | 3.8 | 3.2 | 3.8 | 12 | 7.6 | 5.6 | 107 | 320 | 11 | 10 | 4.6 |
| 25 | 4.4 | 4.1 | 3.0 | 3.5 | 12 | 17 | 5.3 | 53 | 77 | 12 | 9.1 | 4.6 |
| 26 | 4.4 | 3.8 | 3.0 | 4.1 | 100 | 12 | 5.3 | 38 | 70 | 12 | 8.6 | 4.2 |
| 27 | 4.4 | 3.5 | 3.0 | 4.7 | 15 | 7.6 | 5.6 | 423 | 500 | 11 | 8.1 | 4.2 |
| 28 | 4.4 | 3.5 | 3.0 | 4.7 | 11 | 98 | 5.3 | 60 | 120 | 15 | 7.6 | 3.8 |
| 29 | 4.4 | 3.2 | 3.0 | 56 | ------ | 19 | 5.3 | 78 | 80 | 15 | 7.1 | 3.8 |
| 30 | 4.4 | 3.2 | 3.8 | 17 | ------ | 11 | 5.3 | 127 | 60 | 11 | 7.1 | 3.8 |
| 31 | 4.1 | ------ | 3.5 | 14 | ------ | 9.8 | ------ | 38 | ------ | 9.6 | 6.6 | ------ |
| TOTAL | 195.3 | 168.9 | 114.2 | 256.2 | 342.9 | 378.5 | 249.6 | 3,048.8 | 5,665 | 609.6 | 965.7 | 209.1 |
| MEAN | 6.30 | 5.63 | 3.68 | 8.26 | 12.2 | 28.3 | 8.32 | 98.3 | 189 | 19.7 | 31.2 | 6.97 |
| MAX | 10 | 25 | 7.7 | 56 | 100 | 217 | 25 | 587 | 814 | 50 | 672 | 27 |
| MIN | 4.1 | 3.2 | 3.0 | 2.2 | 4.1 | 7.3 | 5.3 | 4.4 | 24 | 9.6 | 5.8 | 3.8 |
| AC-FT | 387 | 335 | 227 | 508 | 680 | 1,740 | 495 | 6,050 | 11,240 | 1,210 | 1,920 | 415 |

CAL YR 1968: TOTAL 6,320.0 MEAN 17.3 MAX 559 MIN 3.0 AC-FT 12,540
WTR YR 1969: TOTAL 12,703.8 MEAN 34.8 MAX 814 MIN 2.2 AC-FT 25,200

PEAK DISCHARGE (BASE, 2,500 CFS)

/ From floodmarks.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 1930 | 8.85 | 4,440 | 6- 5 | Unknown | /12.6 | 7,280 |
| 5-20 | 0830 | 8.00 | 3,760 | 6-20 | 2300 | 15.56 | 9,350 |
| 5-27 | 1230 | 9.25 | 4,760 | 6-27 | (time and discharge unknown) | | |
| 6- 3 | 0100 | 9.25 | 4,760 | 8-20 | 1130 | 7.52 | 3,380 |

## 16-8842. Fukuji-gawa at Fukuji

LOCATION.--Lat 26°38'16" N., long 128°10'13" E., Okinawa, on left bank at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.

DRAINAGE AREA.--12 sq mi, approximately.

PERIOD OF RECORD.--January 1964 to September 1969 (discontinued as a continuous-record station; converted to a low-flow and crest-stage partial-record station).

GAGE.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Mar. 7, 1967, at datum 1.00 ft higher.

EXTREMES.--Current year: Maximum discharge, 14,100 cfs June 20 (gage height, 14.70 ft), from rating curve extended above 1,000 cfs on basis of slope-area measurements at gage heights 11.00 and 12.10 ft; minimum, 5.0 cfs Jan. 10, 11.

Period of record: Maximum discharge, 18,300 cfs Aug. 5, 1965 (gage height, 16.97 ft, present datum), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 9.37, 11.48 and 16.97 ft; minimum, 5.0 cfs Jan. 10, 11, 1969.

Flood of Oct. 14, 1959, reached a stage of 18.9 ft, present datum, from information by local residents (discharge, 23,000 cfs). A discharge of 2.57 cfs was measured Oct. 22, 1963.

REMARKS.--Records fair. No diversion above station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19 | 9.7 | 6.9 | 6.2 | 40 | 20 | 19 | 11 | 58 | 112 | 21 | 16 |
| 2 | 18 | 9.7 | 7.3 | 6.2 | 29 | 162 | 17 | 10 | 78 | 98 | 20 | 15 |
| 3 | 16 | 9.7 | 8.5 | 5.9 | 18 | 30 | 16 | 10 | 800 | 84 | 20 | 15 |
| 4 | 15 | 9.7 | 7.7 | 5.9 | 58 | 20 | 45 | 9.4 | 122 | 74 | 20 | 15 |
| 5 | 15 | 9.7 | 7.7 | 7.3 | 38 | 18 | 31 | 9.4 | 1,380 | 66 | 19 | 14 |
| 6 | 16 | 13 | 7.3 | 8.1 | 21 | 17 | 27 | 9.4 | 409 | 63 | 19 | 13 |
| 7 | 15 | 15 | 6.9 | 6.2 | 17 | 16 | 25 | 9.4 | 130 | 58 | 17 | 13 |
| 8 | 16 | 32 | 6.9 | 5.6 | 15 | 79 | 45 | 46 | 262 | 52 | 21 | 12 |
| 9 | 16 | 35 | 6.9 | 5.3 | 12 | 195 | 26 | 474 | 490 | 48 | 20 | 45 |
| 10 | 17 | 14 | 6.5 | 5.0 | 12 | 62 | 22 | 67 | 130 | 46 | 19 | 33 |
| 11 | 16 | 10 | 6.5 | 9.0 | 12 | 502 | 19 | 138 | 104 | 45 | 16 | 33 |
| 12 | 14 | 9.7 | 12 | 6.2 | 12 | 134 | 18 | 51 | 91 | 42 | 15 | 24 |
| 13 | 13 | 8.9 | 8.9 | 5.6 | 11 | 52 | 17 | 1,470 | 628 | 40 | 15 | 18 |
| 14 | 13 | 8.5 | 7.7 | 6.2 | 11 | 40 | 16 | 276 | 138 | 37 | 15 | 16 |
| 15 | 12 | 8.5 | 8.5 | 10 | 11 | 28 | 15 | 152 | 91 | 35 | 14 | 15 |
| 16 | 12 | 8.5 | 6.9 | 7.3 | 11 | 26 | 17 | 76 | 76 | 35 | 13 | 14 |
| 17 | 11 | 7.7 | 6.2 | 11 | 10 | 23 | 18 | 75 | 64 | 39 | 13 | 13 |
| 18 | 11 | 7.3 | 6.2 | 7.3 | 22 | 21 | 15 | 58 | 51 | 33 | 13 | 13 |
| 19 | 10 | 7.3 | 9.7 | 56 | 18 | 19 | 14 | 51 | 966 | 30 | 18 | 12 |
| 20 | 10 | 7.3 | 6.5 | 38 | 12 | 18 | 14 | 915 | 1,590 | 35 | 1,280 | 12 |
| 21 | 11 | 7.3 | 6.2 | 12 | 11 | 19 | 14 | 188 | 648 | 30 | 147 | 11 |
| 22 | 13 | 7.3 | 8.9 | 8.9 | 11 | 18 | 13 | 93 | 463 | 27 | 51 | 10 |
| 23 | 12 | 7.7 | 8.5 | 8.9 | 10 | 18 | 13 | 623 | 432 | 25 | 33 | 11 |
| 24 | 11 | 7.3 | 6.5 | 8.5 | 20 | 17 | 12 | 250 | 819 | 24 | 27 | 10 |
| 25 | 10 | 8.1 | 5.9 | 8.1 | 24 | 31 | 11 | 122 | 298 | 25 | 24 | 10 |
| 26 | 9.7 | 7.7 | 5.9 | 8.5 | 170 | 28 | 12 | 76 | 249 | 25 | 22 | 9.4 |
| 27 | 9.7 | 6.9 | 5.9 | 9.7 | 33 | 20 | 11 | 951 | 900 | 24 | 20 | 9.0 |
| 28 | 9.7 | 6.9 | 5.6 | 9.7 | 25 | 231 | 11 | 193 | 233 | 29 | 19 | 8.6 |
| 29 | 10 | 6.9 | 5.6 | 86 | ------ | 47 | 12 | 150 | 163 | 29 | 18 | 8.4 |
| 30 | 9.7 | 6.9 | 6.5 | 39 | ------ | 29 | 11 | 270 | 132 | 24 | 18 | 8.2 |
| 31 | 9.7 | ------ | 6.2 | 26 | ------ | 22 | ------ | 80 | ------ | 24 | 17 | ------ |
| TOTAL | 400.5 | 314.2 | 223.4 | 443.6 | 694 | 1,962 | 556 | 6,913.6 | 11,995 | 1,358 | 2,004 | 456.6 |
| MEAN | 12.9 | 10.5 | 7.21 | 14.3 | 24.8 | 63.3 | 18.5 | 223 | 400 | 43.8 | 64.6 | 15.2 |
| MAX | 19 | 35 | 12 | 86 | 170 | 502 | 45 | 1,470 | 1,590 | 112 | 1,280 | 45 |
| MIN | 9.7 | 6.9 | 5.6 | 5.0 | 10 | 16 | 11 | 9.4 | 51 | 24 | 13 | 8.2 |
| AC-FT | 794 | 623 | 443 | 880 | 1,380 | 3,890 | 1,100 | 13,710 | 23,790 | 2,690 | 3,970 | 906 |

CAL YR 1968: TOTAL 13,968.1 MEAN 38.2 MAX 1,530 MIN 5.6 AC-FT 27,710
WTR YR 1969: TOTAL 27,320.9 MEAN 74.8 MAX 1,590 MIN 5.0 AC-FT 54,190

PEAK DISCHARGE (BASE, 4,000 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-13 | 1930 | 10.40 | 8,060 | 6- 5 | 2030 | 13.07 | 11,800 |
| 5-20 | 0900 | 8.85 | 6,120 | 6-20 | 2200 | 14.70 | 14,100 |
| 5-27 | 1330 | 9.80 | 7,260 | 6-27 | 0930 | 7.80 | 4,860 |
| 6- 3 | (time and discharge unknown) | | | 8-20 | 1300 | 8.12 | 5,240 |

## 16-8846. Aha-gawa at Aha

LOCATION.--Lat 26°42'41" N., long 128°16'55" E., Okinawa, on right bank 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.

DRAINAGE AREA.--9.5 sq mi, approximately.

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

GAGE.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Oct. 13, 1966, at datum 1.00 ft higher.

EXTREMES.--Current year: Maximum discharge, 12,100 cfs June 20 (gage height, 11.10 ft), from rating curve extended above 180 cfs on basis of slope-area measurement at gage height 9.72 ft; minimum, 6.7 cfs Jan. 4, 8-10.

Period of record: Maximum discharge, 12,700 cfs June 16, 1964 (gage height, 11.60 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 9.35 and 10.5 ft; minimum, 6.7 cfs Jan. 4, 8-10, 1969.

A discharge of 5.08 cfs was measured Oct. 22, 1963.

REMARKS.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 8.5 | 8.0 | 9.0 | 50 | 25 | 40 | 16 | 74 | 92 | 17 | 24 |
| 2 | 17 | 8.0 | 8.5 | 8.0 | 35 | 200 | 35 | 16 | 110 | 79 | 16 | 16 |
| 3 | 16 | 8.0 | 10 | 7.1 | 30 | 53 | 32 | 16 | 500 | 68 | 16 | 16 |
| 4 | 16 | 8.5 | 8.5 | 6.7 | 110 | 45 | 70 | 16 | 110 | 65 | 70 | 16 |
| 5 | 15 | 8.5 | 9.0 | 11 | 52 | 36 | 50 | 15 | 1,000 | 57 | 20 | 14 |
| 6 | 16 | 13 | 8.0 | 9.5 | 35 | 32 | 42 | 16 | 250 | 52 | 20 | 14 |
| 7 | 15 | 10 | 7.5 | 7.1 | 28 | 30 | 38 | 15 | 115 | 50 | 16 | 13 |
| 8 | 16 | 21 | 8.0 | 6.7 | 25 | 96 | 80 | 42 | 380 | 44 | 21 | 13 |
| 9 | 17 | 46 | 8.0 | 6.7 | 23 | 141 | 40 | 889 | 470 | 40 | 19 | 103 |
| 10 | 18 | 20 | 8.5 | 13 | 22 | 92 | 36 | 80 | 150 | 38 | 16 | 46 |
| 11 | 16 | 14 | 10 | 9.0 | 20 | 423 | 31 | 100 | 130 | 35 | 14 | 84 |
| 12 | 15 | 13 | 33 | 7.6 | 19 | 130 | 29 | 40 | 120 | 34 | 13 | 62 |
| 13 | 15 | 12 | 13 | 7.0 | 18 | 90 | 27 | 1,000 | 670 | 31 | 12 | 29 |
| 14 | 14 | 12 | 10 | 8.0 | 21 | 66 | 25 | 200 | 160 | 30 | 12 | 26 |
| 15 | 14 | 12 | 10 | 13 | 18 | 54 | 25 | 100 | 120 | 28 | 12 | 23 |
| 16 | 13 | 11 | 9.0 | 9.0 | 17 | 45 | 24 | 75 | 100 | 28 | 12 | 22 |
| 17 | 13 | 10 | 7.5 | 14 | 16 | 40 | 27 | 90 | 83 | 31 | 11 | 19 |
| 18 | 12 | 10 | 12 | 9.0 | 30 | 36 | 23 | 70 | 200 | 29 | 11 | 18 |
| 19 | 12 | 9.5 | 16 | 70 | 20 | 33 | 22 | 58 | 700 | 25 | 17 | 16 |
| 20 | 12 | 9.0 | 8.0 | 35 | 17 | 31 | 20 | 400 | 790 | 24 | 1,830 | 16 |
| 21 | 13 | 9.0 | 7.5 | 15 | 15 | 29 | 20 | 130 | 330 | 23 | 257 | 15 |
| 22 | 13 | 9.0 | 16 | 12 | 14 | 27 | 20 | 84 | 280 | 23 | 73 | 14 |
| 23 | 12 | 8.5 | 10 | 11 | 13 | 25 | 19 | 560 | 250 | 23 | 47 | 14 |
| 24 | 10 | 8.5 | 8.0 | 10 | 30 | 24 | 18 | 160 | 600 | 21 | 36 | 14 |
| 25 | 9.5 | 9.5 | 7.5 | 9.2 | 21 | 40 | 18 | 100 | 210 | 20 | 30 | 14 |
| 26 | 9.5 | 8.5 | 7.1 | 15 | 130 | 35 | 18 | 84 | 155 | 21 | 26 | 14 |
| 27 | 9.5 | 8.5 | 7.5 | 13 | 50 | 27 | 19 | 560 | 800 | 22 | 25 | 13 |
| 28 | 9.5 | 8.5 | 7.5 | 12 | 30 | 350 | 18 | 130 | 150 | 22 | 22 | 12 |
| 29 | 9.5 | 8.0 | 7.1 | 150 | ------ | 86 | 16 | 120 | 120 | 20 | 20 | 13 |
| 30 | 9.0 | 8.0 | 8.5 | 40 | ------ | 60 | 16 | 100 | 100 | 21 | 18 | 12 |
| 31 | 8.5 | ------ | 7.5 | 32 | ------ | 45 | ------ | 84 | ------ | 18 | 16 | ------ |
| TOTAL | 413.0 | 350.0 | 306.7 | 585.6 | 909 | 2,446 | 898 | 5,366 | 9,227 | 1,114 | 2,745 | 725 |
| MEAN | 13.3 | 11.7 | 9.89 | 18.9 | 32.5 | 78.9 | 29.9 | 173 | 308 | 35.9 | 88.5 | 24.2 |
| MAX | 18 | 46 | 33 | 150 | 130 | 423 | 80 | 1,000 | 1,000 | 92 | 1,830 | 103 |
| MIN | 8.5 | 8.0 | 7.1 | 6.7 | 13 | 24 | 16 | 15 | 74 | 18 | 11 | 12 |
| AC-FT | 819 | 694 | 608 | 1,160 | 1,800 | 4,850 | 1,780 | 10,640 | 18,300 | 2,210 | 5,440 | 1,440 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | 12,581.6 | MEAN | 34.4 | MAX | 876 | MIN | 7.1 | AC-FT 24,960 |
| WTR YR 1969: | TOTAL | 25,085.3 | MEAN | 68.6 | MAX | 1,830 | MIN | 6.7 | AC-FT 49,760 |

PEAK DISCHARGE (BASE, 4,500 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-9 | 1200 | 9.93 | 9,070 | 6-5 | 1930 | 9.75 | 8,640 |
| 5-13 | 1700 | 8.02 | 4,840 | 6-20 | 2300 | 11.10 | 12,100 |
| 5-27 | 1200 | 8.70 | 6,280 | 6-27 | 0830 | 8.46 | 5,750 |
| 6-3 | 0100 | 9.31 | 7,620 | 8-20 | 1200 | 10.10 | 9,480 |

NOTE.--No gage-height record Jan. 11 to Mar. 6, May 10 to June 30.

## 16-8848. Fun-gawa near Aha

LOCATION.--Lat 26°44'33" N., long 128°16'53" E., Okinawa, on right bank 50 ft downstream from bridge, 2.0 miles north of Aha School, and 2.2 miles west of Ada.

DRAINAGE AREA.--3.3 sq mi, approximately.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 380 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 3,320 cfs May 9 (gage height, 12.70 ft), from rating curve extended as explained below; minimum, 2.2 cfs Jan. 4, 5, 8-10, 14.

Period of record: Maximum discharge, 5,860 cfs May 12, 1966 (gage height, 17.91 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft; minimum, 2.2 cfs Oct. 15, 16, 1967, Jan. 4, 5, 8-10, 14, 1969.

Flood of Oct. 25, 1963, reached a stage of 18.1 ft, from floodmarks, and that of Dec. 2, 1963, a stage of 21.5 ft, from floodmarks (discharge, 5,950 and 7,650 cfs, respectively, from rating curve extended as explained above).

REMARKS.--Records good. No diversion above station. Records of suspended sediment loads for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 49 | 3.7 | 2.8 | 4.1 | 28 | 10 | 8.8 | 5.9 | 26 | 30 | 6.1 | 7.1 |
| 2 | 8.8 | 3.5 | 3.0 | 3.0 | 14 | 63 | 8.5 | 6.1 | 45 | 27 | 5.9 | 6.8 |
| 3 | 6.6 | 3.3 | 3.5 | 2.4 | 9.0 | 20 | 7.9 | 5.9 | 227 | 24 | 5.9 | 9.9 |
| 4 | 5.9 | 3.5 | 3.0 | 2.2 | 89 | 16 | 23 | 5.6 | 36 | 26 | 56 | 6.8 |
| 5 | 5.6 | 3.5 | 3.3 | 3.9 | 20 | 13 | 14 | 5.4 | 343 | 20 | 9.0 | 6.3 |
| 6 | 5.4 | 5.2 | 2.8 | 3.3 | 13 | 12 | 9.6 | 5.6 | 91 | 19 | 8.2 | 6.1 |
| 7 | 6.1 | 4.1 | 2.8 | 2.6 | 9.9 | 11 | 9.0 | 5.4 | 40 | 18 | 6.3 | 6.1 |
| 8 | 5.4 | 14 | 2.6 | 2.2 | 8.5 | 37 | 51 | 17 | 129 | 16 | 9.4 | 6.3 |
| 9 | 5.2 | 31 | 2.8 | 2.2 | 7.6 | 28 | 14 | 491 | 162 | 15 | 7.6 | 127 |
| 10 | 6.3 | 5.2 | 2.8 | 2.6 | 7.4 | 85 | 11 | 28 | 54 | 14 | 6.6 | 34 |
| 11 | 5.4 | 4.1 | 2.8 | 2.6 | 6.6 | 232 | 10 | 16 | 44 | 13 | 5.9 | 130 |
| 12 | 4.9 | 3.9 | 16 | 2.8 | 6.1 | 50 | 9.3 | 13 | 43 | 12 | 5.4 | 35 |
| 13 | 4.5 | 3.9 | 4.3 | 2.4 | 5.4 | 28 | 9.0 | 361 | 226 | 12 | 5.4 | 17 |
| 14 | 4.5 | 3.7 | 3.3 | 6.2 | 5.9 | 22 | 8.5 | 86 | 53 | 11 | 4.9 | 14 |
| 15 | 4.3 | 3.5 | 3.1 | 9.3 | 5.4 | 19 | 8.5 | 41 | 40 | 11 | 4.7 | 12 |
| 16 | 4.1 | 3.5 | 2.8 | 8.4 | 4.9 | 16 | 8.6 | 26 | 34 | 11 | 4.7 | 12 |
| 17 | 4.1 | 3.5 | 2.6 | 23 | 4.9 | 15 | 8.8 | 30 | 30 | 11 | 4.7 | 10 |
| 18 | 3.9 | 3.3 | 4.0 | 5.2 | 8.4 | 13 | 7.6 | 20 | 27 | 9.9 | 4.9 | 9.3 |
| 19 | 3.9 | 3.3 | 4.5 | 6.2 | 5.9 | 13 | 7.1 | 24 | 259 | 9.3 | 8.5 | 8.8 |
| 20 | 3.9 | 3.3 | 2.8 | 6.1 | 5.2 | 12 | 6.8 | 127 | 275 | 9.0 | 688 | 8.2 |
| 21 | 3.9 | 3.3 | 2.6 | 4.1 | 4.9 | 13 | 6.8 | 47 | 119 | 8.8 | 101 | 7.6 |
| 22 | 3.9 | 3.3 | 4.7 | 3.7 | 4.9 | 9.9 | 7.4 | 29 | 99 | 8.8 | 22 | 7.6 |
| 23 | 3.9 | 3.3 | 3.1 | 3.3 | 4.9 | 9.6 | 6.6 | 314 | 85 | 8.5 | 16 | 7.4 |
| 24 | 3.7 | 3.3 | 2.8 | 3.1 | 27 | 9.3 | 6.3 | 60 | 204 | 7.9 | 13 | 6.8 |
| 25 | 3.7 | 3.9 | 2.6 | 3.0 | 13 | 13 | 6.3 | 37 | 69 | 7.6 | 11 | 7.1 |
| 26 | 3.7 | 3.1 | 2.4 | 3.7 | 41 | 9.3 | 6.1 | 29 | 52 | 7.9 | 9.6 | 6.8 |
| 27 | 3.7 | 3.1 | 2.4 | 3.5 | 14 | 8.5 | 6.6 | 184 | 275 | 7.6 | 11 | 6.6 |
| 28 | 3.7 | 3.1 | 2.4 | 4.1 | 13 | 77 | 6.3 | 46 | 57 | 7.4 | 8.5 | 6.3 |
| 29 | 3.9 | 2.8 | 2.4 | 48 | ------ | 13 | 6.1 | 41 | 43 | 7.1 | 7.9 | 6.1 |
| 30 | 3.7 | 2.8 | 2.4 | 11 | ------ | 11 | 5.9 | 41 | 36 | 7.1 | 7.4 | 6.1 |
| 31 | 3.5 | ------ | 2.6 | 36 | ------ | 9.6 | ------ | 31 | ------ | 6.6 | 7.1 | ------ |
| TOTAL | 189.1 | 145.0 | 106.0 | 224.2 | 387.8 | 898.2 | 305.4 | 2178.9 | 3,223 | 403.5 | 1,072.6 | 541.1 |
| MEAN | 6.10 | 4.83 | 3.42 | 7.23 | 13.8 | 29.0 | 10.2 | 70.3 | 107 | 13.0 | 34.6 | 18.0 |
| MAX | 49 | 31 | 16 | 48 | 89 | 232 | 51 | 498 | 343 | 30 | 688 | 130 |
| MIN | 3.5 | 2.8 | 2.4 | 2.2 | 4.9 | 8.5 | 5.9 | 5.4 | 26 | 6.6 | 4.7 | 6.1 |
| AC-FT | 375 | 288 | 210 | 445 | 769 | 1,780 | 606 | 4,320 | 6,390 | 800 | 2,130 | 1,070 |

CAL YR 1968: TOTAL 4,590.9 MEAN 12.5 MAX 324 MIN 2.4 AC-FT 9,110
WTR YR 1969: TOTAL 9,674.8 MEAN 26.5 MAX 688 MIN 2.2 AC-FT 19,190

PEAK DISCHARGE (BASE, 2,700 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 5-9 | 1200 | 12.70 | 3,320 | 6-27 | 0730 | 12.26 | 3,120 |
| 6-5 | 1800 | 12.14 | 3,060 | 8-20 | 1300 | 12.59 | 3,270 |
| 6-20 | 2230 | 11.77 | 2,900 | | | | |

## 16-8924. Aringel Stream, Yap

LOCATION.--Lat 9°31'01" N., long 138°05'11" E., Yap, on right bank at Aringel and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.24 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 35 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 376 cfs July 13 (gage height, 6.14 ft), from rating curve extended above 20 cfs; no flow for many days.
Period of record: Maximum discharge, 376 cfs July 13, 1969 (gage height, 6.14 ft), from rating curve extended above 20 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .07 | .01 | 3.3 | .02 | | | 0 | 0 | .26 | 2.8 | 2.4 | .28 |
| 2 | .05 | .01 | .72 | 0 | | | 0 | 0 | .61 | .68 | 4.5 | .64 |
| 3 | .05 | 0 | 2.7 | .02 | | | 0 | .02 | 13 | .26 | .76 | 1.6 |
| 4 | .03 | 0 | 1.3 | .02 | | | 0 | 0 | 1.4 | .12 | 12 | .88 |
| 5 | .03 | 0 | .49 | .01 | | | 0 | .21 | .60 | 11 | 21 | .46 |
| 6 | .02 | 0 | .34 | 0 | | | 0 | .86 | .92 | 1.1 | .96 | .26 |
| 7 | .01 | .03 | 2.9 | 0 | | | 0 | .28 | .96 | .49 | .37 | .53 |
| 8 | .01 | .11 | .30 | 0 | | | 0 | 1.0 | .32 | .28 | .20 | 13 |
| 9 | .01 | .88 | .15 | 0 | | | 0 | .20 | .32 | .19 | .26 | 2.5 |
| 10 | .01 | .64 | .08 | 0 | | | 0 | .10 | .34 | .15 | .46 | 12 |
| 11 | .01 | .19 | .05 | .25 | | | 0 | .09 | 1.5 | 2.1 | .80 | 2.3 |
| 12 | .02 | .09 | .03 | .05 | | | 0 | .07 | 1.3 | 6.3 | .64 | 1.7 |
| 13 | 14 | .06 | .02 | .50 | | | 0 | .09 | 1.1 | 20 | .46 | .56 |
| 14 | 9.4 | .03 | .03 | .20 | | | 0 | .09 | .32 | 5.3 | .24 | .32 |
| 15 | 5.6 | .07 | .02 | .10 | | | 0 | .08 | .16 | .64 | .76 | .22 |
| 16 | 13 | .07 | .02 | .06 | | | 0 | 1.3 | .11 | .26 | 6.5 | .15 |
| 17 | 8.9 | .04 | .03 | .05 | | | 0 | 1.4 | .07 | .17 | .52 | .13 |
| 18 | 4.4 | .03 | .66 | .03 | | | 0 | .34 | .07 | .19 | .26 | 3.1 |
| 19 | 2.0 | .02 | .19 | .03 | | | .01 | .72 | .05 | .15 | .30 | .60 |
| 20 | .37 | .03 | .09 | .02 | | | .01 | .88 | .03 | .13 | .30 | .26 |
| 21 | 1.2 | .04 | .05 | .01 | | | 0 | 1.3 | .03 | .62 | .17 | .17 |
| 22 | .46 | .03 | .07 | 0 | | | 0 | .76 | .15 | 2.7 | .11 | .13 |
| 23 | .19 | .02 | .08 | 0 | | | 0 | .52 | 3.3 | 32 | .09 | .11 |
| 24 | .11 | .02 | .05 | 0 | | | 0 | .26 | 7.3 | 1.2 | .08 | 4.1 |
| 25 | .08 | 0 | .65 | 0 | | | 0 | .15 | 1.4 | 6.8 | .07 | .56 |
| 26 | .05 | 0 | .28 | 0 | | | 0 | .10 | .34 | 1.4 | .05 | 3.2 |
| 27 | .05 | 0 | .11 | 0 | | | 0 | .07 | .17 | 4.7 | .07 | 2.6 |
| 28 | .04 | 0 | .07 | 0 | | | 0 | .05 | .12 | 14 | .05 | 1.6 |
| 29 | .03 | 0 | .04 | 0 | ------ | | 0 | .04 | .09 | 20 | 1.5 | 7.1 |
| 30 | .02 | 0 | .05 | 0 | ------ | | 0 | .05 | .08 | 15 | .68 | .43 |
| 31 | .01 | ------ | .05 | 0 | ------ | | ------ | .15 | ------ | 1.5 | .68 | ------ |
| TOTAL | 60.23 | 2.42 | 14.92 | 1.37 | 0 | 0 | .02 | 11.18 | 36.42 | 152.23 | 57.24 | 61.49 |
| MEAN | 1.94 | .081 | .48 | .044 | 0 | 0 | .001 | .36 | 1.21 | 4.91 | 1.85 | 2.05 |
| MAX | 14 | .88 | 3.3 | .50 | 0 | 0 | .01 | 1.4 | 13 | 32 | 21 | 13 |
| MIN | .01 | 0 | .02 | 0 | 0 | 0 | 0 | 0 | .03 | .12 | .05 | .11 |
| AC-FT | 119 | 4.8 | 30 | 2.7 | 0 | 0 | .04 | 22 | 72 | 302 | 114 | 122 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 397.52 | MEAN | 1.09 | MAX | 32 | MIN | 0 | AC-FT | 788 |

PEAK DISCHARGE (BASE, 200 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 7-13 | 0030 | 6.14 | 376 | 8- 5 | 0700 | 5.80 | 325 |
| 7-23 | 0500 | 5.72 | 313 | 9-10 | 0330 | 5.02 | 212 |
| 7-29 | 0630 | 4.98 | 208 | | | | |

## 16-8928. Dalolab Stream, Yap

LOCATION.--Lat 9°31'04" N., long 138°06'04" E., Yap, on left bank at Talagu and 0.9 mile upstream from mouth.

DRAINAGE AREA.--0.09 sq mi.

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

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

EXTREMES.--Current year: Maximum discharge, 119 cfs July 23 (gage height, 4.14 ft), from rating curve extended above 17 cfs; no flow for many days.
Period of record: Maximum discharge, 119 cfs July 23, 1969 (gage height, 4.14 ft), from rating curve extended above 17 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | .60 | 0 | | | | 0 | .04 | 1.1 | 1.0 | .05 |
| 2 | 0 | 0 | .08 | 0 | | | | 0 | .15 | .15 | 2.0 | .05 |
| 3 | 0 | 0 | .65 | .10 | | | | .05 | 3.4 | .03 | .40 | 1.0 |
| 4 | 0 | 0 | .15 | .02 | | | | 0 | .70 | .01 | 4.0 | 1.0 |
| 5 | 0 | 0 | .04 | .01 | | | | 0 | .10 | 3.0 | 7.0 | .20 |
| 6 | 0 | 0 | .26 | 0 | | | | .10 | .12 | .26 | .50 | .04 |
| 7 | 0 | 0 | .88 | 0 | | | | .01 | .22 | .06 | .10 | .43 |
| 8 | 0 | .03 | .03 | 0 | | | | .04 | .03 | .03 | .05 | 4.6 |
| 9 | 0 | .35 | .01 | 0 | | | | .01 | .04 | .02 | .15 | .82 |
| 10 | 0 | .10 | 0 | 0 | | | | 0 | .04 | .03 | .10 | 4.0 |
| 11 | 0 | .02 | 0 | .10 | | | | 0 | .30 | .46 | .15 | .95 |
| 12 | 0 | .01 | 0 | .01 | | | | 0 | .65 | 2.0 | .60 | .70 |
| 13 | 5.3 | .01 | 0 | .02 | | | | .01 | .35 | 5.4 | .15 | .12 |
| 14 | 3.0 | 0 | 0 | .01 | | | | .01 | .04 | 1.9 | .05 | .05 |
| 15 | 2.1 | .01 | 0 | 0 | | | | .01 | .01 | .12 | .10 | .04 |
| 16 | 4.4 | 0 | 0 | 0 | | | | .62 | .01 | .02 | 2.0 | .01 |
| 17 | 3.2 | 0 | 0 | 0 | | | | .35 | 0 | .02 | .10 | .02 |
| 18 | 1.2 | 0 | .05 | 0 | | | | .03 | 0 | .02 | .05 | .88 |
| 19 | .85 | 0 | .01 | 0 | | | | .05 | 0 | .02 | .05 | .18 |
| 20 | .06 | 0 | 0 | 0 | | | | .22 | 0 | .01 | .05 | .04 |
| 21 | .99 | 0 | 0 | 0 | | | | .35 | 0 | .05 | .01 | .03 |
| 22 | .15 | 0 | 0 | 0 | | | | .10 | .14 | 1.0 | 0 | .02 |
| 23 | .02 | 0 | 0 | 0 | | | | .10 | 1.2 | 11 | 0 | .02 |
| 24 | .01 | 0 | 0 | 0 | | | | .02 | 2.9 | .46 | 0 | 2.0 |
| 25 | 0 | 0 | .05 | 0 | | | | .01 | .52 | 2.7 | 0 | .15 |
| 26 | 0 | 0 | .01 | 0 | | | | 0 | .06 | .52 | 0 | .71 |
| 27 | 0 | 0 | 0 | 0 | | | | 0 | .02 | 2.1 | .05 | .86 |
| 28 | 0 | 0 | 0 | 0 | | | | 0 | .01 | 3.8 | .01 | .52 |
| 29 | 0 | 0 | 0 | 0 | ------ | | | 0 | 0 | 5.5 | 1.5 | 2.3 |
| 30 | 0 | 0 | 0 | 0 | ------ | | | 0 | 0 | 6.0 | .40 | .10 |
| 31 | 0 | ------ | 0 | 0 | ------ | | ------ | .05 | ------ | .50 | .20 | ------ |
| TOTAL | 21.28 | .53 | 2.82 | .27 | 0 | 0 | 0 | 2.14 | 11.05 | 48.29 | 20.77 | 21.89 |
| MEAN | .69 | .018 | .091 | .009 | 0 | 0 | 0 | .069 | .37 | 1.56 | .67 | .73 |
| MAX | 5.3 | .35 | .88 | .10 | 0 | 0 | 0 | .62 | 3.4 | 11 | 7.0 | 4.6 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | 0 | .01 |
| AC-FT | 42 | 1.1 | 5.6 | .5 | 0 | 0 | 0 | 4.2 | 22 | 96 | 41 | 43 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 129.04 | MEAN | .35 | MAX | 11 | MIN | 0 | AC-FT | 256 |

PEAK DISCHARGE (BASE, 75 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 6-24 | 1800 | 3.71 | 88 | 7-28 | 0200 | 3.56 | 78 |
| 7-13 | 0100 | 3.64 | 83 | 8- 5 | 0700 | 3.86 | 98 |
| 7-23 | 0530 | 4.14 | 119 | | | | |

NOTE.--No gage-height record July 30 to Sept. 5.

## 16-8929. Pengpy Stream, Yap

LOCATION.--Lat 9°31'07" N., long 138°06'18" E., Yap, on right bank at Talagu, 100 ft upstream from Talagu Stream, and 0.8 mile upstream from mouth.

DRAINAGE AREA.--0.17 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 161 cfs July 23 (gage height, 4.06 ft), from rating curve extended above 5.0 cfs; no flow for many days.
Period of record: Maximum discharge, 161 cfs July 23, 1969 (gage height, 4.06 ft), from rating curve extended above 5.0 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .02 | .01 | .56 | 0 | .01 | | | 0 | .07 | .30 | 1.8 | .16 |
| 2 | .01 | .01 | .10 | 0 | .01 | | | .01 | .26 | .23 | 3.4 | .23 |
| 3 | .01 | .01 | .56 | .50 | .01 | | | .02 | 3.3 | .12 | .44 | 3.3 |
| 4 | .01 | 0 | .20 | .10 | .01 | | | .02 | 1.0 | .06 | 5.7 | 2.1 |
| 5 | .01 | 0 | .09 | .06 | .01 | | | 0 | .20 | 4.6 | 10 | .34 |
| 6 | .02 | 0 | .09 | .04 | 0 | | | .21 | .14 | .71 | .56 | .16 |
| 7 | .02 | .05 | 1.0 | .02 | 0 | | | .07 | .20 | .16 | .14 | .20 |
| 8 | .02 | .10 | .09 | .01 | 0 | | | .20 | .08 | .09 | .08 | 6.0 |
| 9 | .02 | .30 | .06 | .01 | 0 | | | .04 | .07 | .07 | .07 | 1.4 |
| 10 | .02 | .15 | .05 | .01 | 0 | | | .02 | .08 | .14 | .07 | 5.7 |
| 11 | .05 | .05 | .05 | .50 | 0 | | | .06 | .20 | 1.8 | .09 | 1.6 |
| 12 | .05 | .02 | .04 | .25 | 0 | | | .06 | .90 | 4.8 | 1.0 | 1.6 |
| 13 | 7.0 | .02 | .03 | .10 | 0 | | | .08 | .56 | 7.0 | .50 | .34 |
| 14 | 4.0 | .01 | .03 | .07 | 0 | | | .20 | .10 | 3.6 | .12 | .16 |
| 15 | 2.7 | .01 | .04 | .05 | 0 | | | .08 | .06 | .34 | .18 | .10 |
| 16 | 5.7 | .01 | .04 | .03 | 0 | | | .89 | .04 | .09 | 3.2 | .08 |
| 17 | 4.2 | .01 | .05 | .02 | 0 | | | .39 | .03 | .08 | .26 | .10 |
| 18 | .92 | 0 | .23 | .02 | 0 | | | .07 | .03 | .08 | .10 | .39 |
| 19 | .71 | 0 | .08 | .01 | 0 | | | .07 | .02 | .06 | .09 | .26 |
| 20 | .10 | 0 | .06 | .01 | 0 | | | .14 | .02 | .05 | .09 | .10 |
| 21 | .71 | 0 | .04 | .01 | 0 | | | .30 | .01 | .08 | .07 | .09 |
| 22 | .18 | 0 | .06 | .01 | 0 | | | .18 | .12 | 1.8 | .06 | .07 |
| 23 | .07 | 0 | .10 | .01 | 0 | | | .18 | 1.8 | 17 | .05 | .07 |
| 24 | .06 | 0 | .06 | .02 | 0 | | | .08 | 2.9 | 1.2 | .06 | 3.3 |
| 25 | .04 | 0 | .30 | .01 | 0 | | | .01 | 1.0 | 4.0 | .06 | .39 |
| 26 | .04 | 0 | .10 | .01 | 0 | | | 0 | .12 | 1.5 | .06 | .56 |
| 27 | .04 | 0 | .06 | .01 | 0 | | | 0 | .06 | 2.7 | .06 | 1.0 |
| 28 | .03 | .01 | .06 | .01 | 0 | | | 0 | .05 | 7.2 | .04 | .92 |
| 29 | .02 | .01 | .04 | .01 | ------ | | | 0 | .04 | 6.6 | 2.2 | 3.7 |
| 30 | .02 | .01 | .01 | .01 | ------ | | | 0 | .04 | 7.8 | .63 | .26 |
| 31 | .02 | ------ | 0 | .01 | ------ | | ------ | .08 | ------ | 1.0 | .50 | ------ |
| TOTAL | 26.82 | .79 | 4.28 | 1.93 | .05 | 0 | 0 | 3.46 | 13.50 | 75.26 | 31.68 | 34.68 |
| MEAN | .87 | .026 | .14 | .062 | .002 | 0 | 0 | .11 | .45 | 2.43 | 1.02 | 1.16 |
| MAX | 7.0 | .30 | 1.0 | .50 | .01 | 0 | 0 | .89 | 3.3 | 17 | 10 | 6.0 |
| MIN | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .05 | .04 | .07 |
| AC-FT | 53 | 1.6 | 8.5 | 3.8 | .1 | 0 | 0 | 6.9 | 27 | 149 | 63 | 69 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 192.45 | MEAN | .53 | MAX | 17 | MIN | 0 | AC-FT | 382 |

PEAK DISCHARGE (BASE, 70 CFS).--July 23 (0500) 161 cfs (4.06 ft); Aug. 5 (0630) 104 cfs (3.45 ft).

## 16-8930. Talagu Stream, Yap

LOCATION.--Lat 9°31'08" N., long 138°06'13" E., Yap, on left bank at Talagu, 300 ft upstream from mouth, and 0.9 mile upstream from mouth of Pemgoy Stream.

DRAINAGE AREA.--0.07 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 137 cfs July 23 (gage height, 3.22 ft), from rating curve extended above 4.1 cfs; no flow for many days.
Period of record: Maximum discharge, 137 cfs July 23, 1969 (gage height, 3.22 ft), from rating curve extended above 4.1 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | .96 | 0 | | | | 0 | .05 | .59 | 1.2 | .06 |
| 2 | 0 | 0 | .13 | 0 | | | | 0 | .20 | .10 | 2.1 | .06 |
| 3 | 0 | 0 | 1.0 | .31 | | | | 0 | 2.0 | 03 | .38 | 1.0 |
| 4 | 0 | 0 | .38 | .06 | | | | 0 | .75 | 0 | 3.8 | 1.2 |
| 5 | 0 | 0 | .13 | .04 | | | | 0 | .15 | 28 | 7.0 | .17 |
| 6 | 0 | 0 | .17 | .02 | | | | .60 | .10 | .29 | .63 | .06 |
| 7 | 0 | .02 | 2.1 | .01 | | | | .04 | .15 | .05 | .10 | .08 |
| 8 | 0 | .06 | .10 | .01 | | | | .42 | .05 | .03 | .04 | 3.9 |
| 9 | 0 | .29 | .05 | 0 | | | | .01 | .05 | .02 | .17 | .89 |
| 10 | 0 | .13 | .02 | 0 | | | | 0 | .05 | .03 | .08 | 3.9 |
| 11 | 0 | .03 | 0 | .48 | | | | 0 | .15 | .63 | .13 | 1.2 |
| 12 | 0 | .01 | 0 | .22 | | | | 0 | .50 | 2.7 | .63 | .89 |
| 13 | 4.7 | 0 | 0 | .10 | | | | .01 | .25 | 5.3 | .22 | .13 |
| 14 | 3.4 | 0 | 0 | .06 | | | | .13 | .10 | 2.3 | .04 | .05 |
| 15 | 2.6 | 0 | 0 | .03 | | | | 05 | .05 | .17 | .08 | .03 |
| 16 | 4.7 | 0 | 0 | .02 | | | | 1.0 | .02 | .03 | 2.1 | .01 |
| 17 | 4.0 | 0 | 0 | .01 | | | | .63 | .01 | .02 | .10 | .03 |
| 18 | 1.4 | 0 | .29 | 0 | | | | .02 | .01 | .03 | .03 | .82 |
| 19 | 1.3 | 0 | .06 | 0 | | | | .04 | .01 | .01 | 06 | .13 |
| 20 | .13 | 0 | .04 | 0 | | | | .29 | 0 | 0 | .08 | .04 |
| 21 | 1.7 | 0 | .02 | 0 | | | | .38 | 0 | .03 | .01 | .01 |
| 22 | .38 | 0 | .03 | 0 | | | | .08 | .05 | 1.0 | 0 | .01 |
| 23 | .06 | 0 | .08 | 0 | | | | .08 | 1.0 | 12 | 0 | .01 |
| 24 | .03 | 0 | .04 | 0 | | | | .01 | 2.0 | .63 | 0 | 2.2 |
| 25 | .01 | 0 | .29 | 0 | | | | 0 | .70 | 2.5 | 0 | .17 |
| 26 | 0 | 0 | .13 | 0 | | | | 0 | .10 | .76 | .01 | .22 |
| 27 | 0 | 0 | .06 | 0 | | | | 0 | .04 | 1.8 | .04 | .89 |
| 28 | 0 | 0 | .02 | 0 | | | | 0 | .01 | 4.5 | 0 | .76 |
| 29 | 0 | 0 | .01 | 0 | ------ | | | 0 | 0 | 3.9 | 1.5 | 2.7 |
| 30 | 0 | 0 | 0 | 0 | ------ | | | 0 | 0 | 5.2 | .38 | .10 |
| 31 | 0 | ------ | 0 | 0 | ------ | | ------ | .05 | ------ | .63 | .22 | ------ |
| TOTAL | 24.41 | .54 | 6.11 | 1.37 | 0 | 0 | 0 | 3.84 | 8.55 | 48.08 | 21.13 | 21.72 |
| MEAN | .79 | .018 | .20 | .044 | 0 | 0 | 0 | .12 | .28 | 1.55 | .68 | .72 |
| MAX | 4.7 | .29 | 2.1 | .48 | 0 | 0 | 0 | 1.0 | 2.0 | 12 | 7.0 | 3.9 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| AC-FT | 48 | 1.1 | 12 | 2.7 | 0 | 0 | 0 | 7.6 | 17 | 95 | 42 | 43 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 135.75 | MEAN | .37 | MAX | 12 | MIN | 0 | AC-FT | 269 | | |

PEAK DISCHARGE (BASE, 50 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 7-13 | 0100 | 2.18 | 55 | 8- 5 | 0700 | 2.62 | 85 |
| 7-23 | 0500 | 3.22 | 137 | | | | |

NOTE.--No gage-height record May 27 to June 28.

## 16-8931. Burong Stream, Yap

LOCATION.--Lat 9°31'59" N., long 138°07'05" E., Yap, on left bank at Dugor and 0.1 mile upstream from mouth.

DRAINAGE AREA.--0.29 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 162 cfs July 23 (gage height, 4.18 ft), from rating curve extended above 15 cfs; no flow for many days.
Period of record: Maximum discharge, 162 cfs July 23, 1969 (gage height, 4.18 ft), from rating curve extended above 15 cfs; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 2.5 | 0 | | | | 0 | 0 | .45 | 1.0 | .38 |
| 2 | 0 | 0 | .28 | 0 | | | | 0 | .22 | 1.1 | 4.8 | .63 |
| 3 | 0 | 0 | 10 | .08 | | | | 0 | 3.7 | .52 | .90 | 4.1 |
| 4 | 0 | 0 | .35 | .02 | | | | 0 | 1.6 | .17 | 7.1 | 3.0 |
| 5 | 0 | 0 | .21 | .01 | | | | 0 | .63 | 8.9 | 17 | .70 |
| 6 | 0 | 0 | .90 | 0 | | | | 2.0 | 1.8 | 1.2 | 1.2 | .42 |
| 7 | 0 | .07 | 3.3 | 0 | | | | .12 | .75 | .33 | .49 | .46 |
| 8 | 0 | .24 | .30 | .01 | | | | .52 | .21 | .17 | .30 | 9.7 |
| 9 | 0 | .46 | .12 | .01 | | | | .02 | .12 | .06 | .30 | 1.2 |
| 10 | 0 | .17 | .04 | 0 | | | | 0 | .17 | .30 | 1.1 | 6.8 |
| 11 | 0 | .04 | .01 | .13 | | | | 0 | .60 | 1.0 | .63 | 1.8 |
| 12 | 0 | .01 | 0 | .10 | | | | 0 | .86 | 6.4 | .60 | 2.1 |
| 13 | 11 | .01 | 0 | .05 | | | | 0 | 1.0 | 7.3 | .56 | .85 |
| 14 | 6.2 | 0 | 0 | .02 | | | | 0 | .26 | 5.8 | .33 | .42 |
| 15 | 5.4 | 0 | 0 | .01 | | | | 0 | .06 | .75 | .28 | .28 |
| 16 | 11 | 0 | 0 | .01 | | | | 1.4 | .02 | .26 | 4.8 | .24 |
| 17 | 8.9 | 0 | 0 | 0 | | | | 1.1 | 0 | .14 | .66 | .17 |
| 18 | 3.1 | 0 | .49 | 0 | | | | .14 | 0 | .10 | .38 | .12 |
| 19 | 2.7 | 0 | .12 | 0 | | | | .02 | 0 | .06 | .30 | .14 |
| 20 | .46 | 0 | .03 | 0 | | | | .49 | 0 | .04 | .30 | .26 |
| 21 | 3.4 | 0 | .01 | 0 | | | | .70 | 0 | .82 | .17 | .30 |
| 22 | .52 | 0 | .37 | 0 | | | | .30 | .88 | 3.2 | .08 | .17 |
| 23 | .21 | 0 | .30 | 0 | | | | .35 | 2.0 | 25 | .08 | .12 |
| 24 | .08 | 0 | .10 | 0 | | | | .12 | 3.0 | 1.9 | .06 | 3.2 |
| 25 | .03 | 0 | .38 | 0 | | | | .01 | 1.6 | 5.0 | .19 | .70 |
| 26 | .02 | 0 | .26 | 0 | | | | 0 | .38 | 2.3 | .24 | .91 |
| 27 | .02 | 0 | .08 | 0 | | | | 0 | .14 | 1.1 | .26 | 1.0 |
| 28 | .01 | 0 | .03 | 0 | | | | 0 | .03 | 12 | .21 | .90 |
| 29 | 0 | 0 | .01 | 0 | ------ | | | 0 | 0 | 8.6 | 3.5 | 3.8 |
| 30 | 0 | 0 | .01 | 0 | ------ | | | 0 | 0 | 13 | 1.2 | .75 |
| 31 | 0 | ------ | 0 | 0 | ------ | | ------ | 0 | ------ | 1.5 | .70 | ------ |
| TOTAL | 53.05 | 1.00 | 11.20 | .45 | 0 | 0 | 0 | 7.29 | 20.03 | 109.47 | 49.72 | 45.62 |
| MEAN | 1.71 | .033 | .36 | .015 | 0 | 0 | 0 | .24 | .67 | 3.53 | 1.60 | 1.52 |
| MAX | 11 | .46 | 3.3 | .13 | 0 | 0 | 0 | 2.0 | 3.7 | 25 | 17 | 9.7 |
| MIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .04 | .06 | .12 |
| AC-FT | 105 | 2.0 | 22 | .9 | 0 | 0 | 0 | 14 | 40 | 217 | 99 | 90 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 297.83 | MEAN | .82 | MAX | 25 | MIN | 0 | AC-FT | 591 |

PEAK DISCHARGE (BASE, 75 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-13 | 1300 | 3.32 | 78 | 8- 5 | 0700 | 3.66 | 107 |
| 7-23 | 0500 | 4.18 | 162 | | | | |

## 16-8933. Bileiy Spring, Gagil-Tomil

LOCATION.--Lat 9°32'19" N., long 138°10'59" E., Gagil-Tomil, on right bank at Binau, 200 ft downstream from main spring, and 0.6 mile upstream from mouth.

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

GAGE.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map).

EXTREMES.--Period of record: Maximum daily discharge, 1.4 cfs Aug. 5, 1969; no flow for many days each year.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .11 | .17 | .13 | .01 | | | | 0 | .01 | .02 | .46 | .11 |
| 2 | .09 | .17 | .05 | .01 | | | | 0 | .01 | .02 | .46 | .11 |
| 3 | .11 | .15 | .06 | .01 | | | | 0 | .05 | .01 | .39 | .11 |
| 4 | .09 | .13 | .06 | .01 | | | | 0 | .02 | .02 | .42 | .09 |
| 5 | .09 | .13 | .06 | .01 | | | | 0 | .01 | .15 | 1.4 | .09 |
| 6 | .11 | .13 | .06 | 0 | | | | .02 | .02 | .09 | .90 | .09 |
| 7 | .08 | .13 | .06 | 0 | | | | 0 | .01 | .08 | .70 | .09 |
| 8 | .08 | .11 | .06 | 0 | | | | 0 | .01 | .06 | .58 | .19 |
| 9 | .08 | .11 | .06 | 0 | | | | 0 | .01 | .05 | .54 | .17 |
| 10 | .08 | .09 | .06 | 0 | | | | 0 | .01 | .06 | .46 | .36 |
| 11 | .08 | .08 | .06 | 0 | | | | 0 | .01 | .03 | .46 | .33 |
| 12 | .11 | .08 | .06 | 0 | | | | 0 | .02 | .11 | .42 | .33 |
| 13 | .74 | .08 | .06 | 0 | | | | 0 | .01 | .30 | .36 | .33 |
| 14 | .66 | .06 | .05 | 0 | | | | 0 | .01 | .30 | .30 | .30 |
| 15 | .78 | .06 | .05 | 0 | | | | 0 | .02 | .21 | .30 | .27 |
| 16 | .96 | .05 | .05 | 0 | | | | .02 | .05 | .21 | .42 | .24 |
| 17 | .82 | .05 | .05 | 0 | | | | .02 | .03 | .19 | .39 | .21 |
| 18 | .82 | .05 | .05 | 0 | | | | .01 | .05 | .17 | .36 | .19 |
| 19 | .86 | .05 | .03 | 0 | | | | 0 | .03 | .15 | .33 | .17 |
| 20 | .42 | .05 | .03 | 0 | | | | .01 | .01 | .13 | .30 | .16 |
| 21 | .36 | .03 | .03 | 0 | | | | .02 | .01 | .25 | .27 | .14 |
| 22 | .33 | .03 | .02 | 0 | | | | .01 | .03 | .50 | .24 | .14 |
| 23 | .30 | .03 | .02 | 0 | | | | .03 | .02 | 1.0 | .19 | .13 |
| 24 | .27 | .03 | .02 | 0 | | | | .01 | .03 | .50 | .17 | .22 |
| 25 | .24 | .03 | .02 | 0 | | | | .01 | .05 | .50 | .15 | .19 |
| 26 | .24 | .02 | .02 | 0 | | | | 0 | .02 | .30 | .15 | .22 |
| 27 | .21 | .02 | .01 | 0 | | | | 0 | .02 | .20 | .13 | .24 |
| 28 | .20 | .02 | .01 | 0 | | | | 0 | .01 | .70 | .13 | .22 |
| 29 | .19 | .02 | .01 | 0 | ------ | | | 0 | .01 | .50 | .13 | .24 |
| 30 | .17 | .02 | .01 | 0 | ------ | | | 0 | .02 | .90 | .11 | .24 |
| 31 | .17 | ------ | .01 | 0 | ------ | | ------ | 0 | ------ | .50 | .11 | ------ |
| TOTAL | 9.85 | 2.18 | 1.33 | .05 | 0 | 0 | 0 | .16 | .62 | 8.21 | 11.73 | 5.92 |
| MEAN | .32 | .073 | .043 | .002 | 0 | 0 | 0 | .005 | .021 | .26 | .38 | .20 |
| MAX | .96 | .17 | .13 | .01 | 0 | 0 | 0 | .03 | .05 | 1.0 | 1.4 | .36 |
| MIN | .08 | .02 | .01 | 0 | 0 | 0 | 0 | 0 | .01 | .01 | .11 | .09 |
| AC-FT | 20 | 4.3 | 2.6 | .1 | 0 | 0 | 0 | .3 | 1.2 | 16 | 23 | 12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 40.05 | MEAN | .11 | MAX | 1.4 | MIN | 0 | AC-FT | 79 |

## 16-8937. Wichen River at altitude 55 m, Moen

LOCATION.--Lat 7°26'45" N., long 151°52'02" E., Moen, on left bank at Peniesence, 1.0 mile upstream from mouth, and 1.6 miles west of Saint Xaviers Academy.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 95 cfs Dec. 19 (gage height, 2.90 ft), from rating curve extended above 13 cfs; minimum, 0.01 cfs Mar. 29-31.
Period of record: Maximum discharge, 95 cfs Dec. 19, 1968 (gage height, 2.90 ft), from rating curve extended above 13 cfs; minimum, 0.01 cfs Mar. 29-31, 1969.

REMARKS.--Records poor prior to August and good thereafter. No diversion above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.0 | 2.5 | .29 | .54 | .05 | .03 | .05 | .18 | 3.0 | 1.0 | .48 | .56 |
| 2 | 1.5 | .94 | .21 | .43 | .07 | .03 | .04 | .11 | 2.4 | .60 | .64 | .48 |
| 3 | 1.1 | .60 | .18 | .33 | .07 | .03 | .04 | .11 | 1.6 | 3.9 | 1.1 | .44 |
| 4 | .90 | .43 | .21 | .29 | .04 | .11 | .03 | .18 | 1.2 | 2.0 | 2.8 | .60 |
| 5 | .80 | .38 | .29 | .25 | .04 | .05 | .04 | .18 | .94 | 3.7 | 2.0 | .56 |
| 6 | .60 | .38 | .21 | .25 | .04 | .04 | .25 | .13 | .67 | 1.8 | .92 | 4.4 |
| 7 | .70 | .33 | .87 | .21 | .05 | .04 | .25 | .11 | .60 | 1.2 | 1.1 | 1.1 |
| 8 | .70 | .38 | .38 | .21 | .05 | .04 | .11 | .11 | 2.6 | 1.3 | .74 | 6.4 |
| 9 | .54 | .48 | 8.5 | .18 | .04 | .07 | .07 | .11 | 1.3 | 2.6 | .64 | 1.5 |
| 10 | .43 | .43 | 1.3 | .18 | .04 | .07 | .04 | .15 | .84 | 1.9 | .60 | 3.4 |
| 11 | .38 | .29 | .54 | .18 | .04 | .04 | .04 | .21 | .67 | 1.2 | .56 | 1.2 |
| 12 | .38 | .25 | .38 | .15 | .04 | .03 | .13 | .43 | .75 | .75 | .52 | .79 |
| 13 | .29 | .21 | .29 | .15 | .03 | .07 | .09 | 7.3 | .54 | .67 | 5.6 | .69 |
| 14 | .25 | .21 | .25 | .13 | .03 | .04 | .48 | 2.5 | .38 | .67 | 7.1 | 1.2 |
| 15 | .21 | .21 | 84 | .13 | .03 | .07 | .25 | 1.3 | .38 | .75 | 1.3 | .79 |
| 16 | .21 | 1.3 | .33 | .13 | .04 | .04 | .67 | 2.2 | .29 | .94 | .85 | .64 |
| 17 | .18 | 1.5 | .29 | .11 | .03 | .04 | .29 | 1.3 | .21 | 1.0 | .69 | .64 |
| 18 | .15 | 1.6 | .29 | .11 | .04 | .03 | .15 | 2.2 | .54 | .67 | .64 | 1.2 |
| 19 | .15 | .54 | 9.4 | .11 | .04 | .03 | .11 | 2.2 | 7.2 | .54 | 4.0 | .79 |
| 20 | .13 | .92 | 2.8 | .11 | .04 | .04 | .09 | 2.2 | 2.0 | .48 | 1.0 | .64 |
| 21 | .21 | .75 | 4.0 | .11 | .04 | .04 | .09 | 3.5 | 3.7 | 5.1 | .74 | .60 |
| 22 | .18 | .60 | 4.6 | .13 | .05 | .03 | .09 | 2.0 | 3.9 | 9.3 | .85 | 1.5 |
| 23 | .13 | .67 | 10 | .13 | .07 | .03 | .07 | 2.0 | 1.8 | 4.0 | .56 | .85 |
| 24 | .11 | .67 | 12 | .11 | .05 | .03 | .54 | 1.2 | 2.5 | 1.8 | .52 | .69 |
| 25 | .13 | .38 | 7.0 | .09 | .03 | .02 | .21 | 1.0 | 2.2 | 1.2 | .48 | .69 |
| 26 | .15 | 1.4 | 10 | .11 | .03 | .02 | .13 | 4.6 | 1.4 | .92 | .44 | .69 |
| 27 | .15 | .75 | 2.5 | .09 | .03 | .02 | .09 | 1.8 | .94 | .74 | .56 | .60 |
| 28 | .13 | .43 | 1.6 | .07 | .03 | .02 | .09 | 1.2 | 84 | .60 | .48 | .52 |
| 29 | .13 | .33 | 1.0 | .07 | ------ | .02 | .25 | .75 | .54 | .64 | .56 | .44 |
| 30 | 2.3 | .29 | .67 | .05 | ------ | .02 | .21 | 1.6 | .54 | .64 | .52 | .56 |
| 31 | 13 | ------ | .54 | 05 | ------ | .02 | ------ | 1.8 | ------ | .52 | .48 | ------ |
| TOTAL | 31.22 | 20.15 | 81.46 | 5.19 | 1.18 | 1.21 | 4.99 | 44.66 | 46.47 | 53.13 | 39.47 | 35.16 |
| MEAN | 1.01 | .67 | 2.63 | .17 | .042 | .039 | .17 | 1.44 | 1.55 | 1.71 | 1.27 | 1.17 |
| MAX | 13 | 2.5 | 12 | .54 | .07 | .11 | .67 | 7.3 | 7.2 | 9.3 | 7.1 | 6.4 |
| MIN | .11 | .21 | .18 | .05 | .03 | .02 | .03 | .11 | .21 | .48 | .44 | .44 |
| AC-FT | 62 | 40 | 162 | 10 | 2.3 | 2.4 | 9.9 | 89 | 92 | 105 | 78 | 70 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - |
| WTR YR 1969: | TOTAL | 364.29 | MEAN | 1.00 | MAX | 13 | MIN | .02 | AC-FT | 723 |

PEAK DISCHARGE (BASE, 70 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 12- 9 | 0130 | 2.86 | 92 | 12-24 | 1800 | 2.53 | 71 |
| 12-19 | 1500 | 2.90 | 95 | | | | |

## 16-8938. Wichen River at altitude 18 m, Moen

LOCATION.--Lat 7°27'05" N., long 151°52'18" E., Moen, on left bank at Peniesence and 0.5 mile upstream from mouth.

DRAINAGE AREA.--0.60 sq mi.

PERIOD OF RECORD.--April 1955 to March 1956 (published as "at Peniesence"), May 1968 to current year. All figures of discharge above 3 cfs (2 mgd) prior to April 1956 are unreliable and should not be used.

GAGE.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map). Prior to Apr. 1, 1956, non-recording gage at site 100 ft downstream at different datum.

EXTREMES.--Current year: Maximum discharge, 508 cfs Dec. 19 (gage height, 4.42 ft), from rating curve extended above 4.7 cfs; minimum, 0.03 cfs Mar. 31.
Period of record: Maximum discharge, 508 cfs Dec. 19, 1968 (gage height, 4.42 ft), from rating curve extended above 4.7 cfs; minimum, 0.03 cfs Mar. 31, 1969.

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

REVISIONS.--WRD Hawaii 1968: Drainage area. See also PERIOD OF RECORD.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 9.4 | 5.0 | .46 | 1.1 | .09 | .08 | .08 | .26 | 6.0 | 2.3 | .90 | .75 |
| 2 | 2.7 | 1.9 | .34 | .70 | .08 | .08 | .06 | .14 | 4.7 | 1.7 | 1.4 | .55 |
| 3 | 1.8 | 1.1 | .28 | .50 | .06 | .08 | .06 | .11 | 3.3 | 7.3 | 2.7 | .47 |
| 4 | 1.2 | .64 | .32 | .44 | .05 | .19 | .04 | .17 | 2.6 | 4.2 | 4.9 | .80 |
| 5 | 1.1 | .58 | .46 | .38 | .06 | .09 | .04 | .20 | 2.2 | 6.3 | 4.7 | .90 |
| 6 | .88 | .58 | .34 | .32 | .06 | .07 | .42 | .17 | 1.7 | 3.7 | 2.8 | 5.4 |
| 7 | .94 | .52 | 1.6 | .29 | .05 | .06 | .41 | .13 | 1.5 | 2.6 | 3.2 | 2.6 |
| 8 | .94 | .52 | .66 | .26 | .05 | .17 | .17 | .10 | 5.3 | 2.8 | 2.3 | 9.3 |
| 9 | .70 | .82 | 20 | .26 | .05 | .07 | .08 | .08 | 2.9 | 5.1 | 1.8 | 3.3 |
| 10 | .70 | .52 | 2.4 | .25 | .05 | .08 | .04 | .08 | 2.0 | 3.7 | 1.4 | 4.7 |
| 11 | .70 | .34 | 1.2 | .20 | .05 | .09 | .04 | .29 | 1.5 | 2.6 | 1.5 | 2.7 |
| 12 | .58 | .34 | .70 | .20 | .05 | .09 | .13 | .73 | 1.7 | 2.0 | 1.5 | 1.8 |
| 13 | .40 | .32 | .40 | .20 | .05 | .14 | .14 | 12 | 1.2 | 1.7 | 8.1 | 1.3 |
| 14 | .34 | .28 | .38 | .15 | .05 | .09 | 1.1 | 5.7 | .90 | 1.8 | 9.7 | 2.8 |
| 15 | .30 | .28 | 1.9 | .15 | .06 | .13 | .48 | 2.8 | .70 | 1.8 | 3.2 | 2.0 |
| 16 | .32 | 2.6 | .52 | .15 | .09 | .07 | 1.5 | 4.1 | .60 | 2.8 | 2.2 | 1.4 |
| 17 | .24 | 3.4 | .40 | .12 | .07 | .09 | .60 | 2.8 | .70 | 2.6 | 1.7 | 1.3 |
| 18 | .22 | 4.0 | .40 | .12 | .07 | .06 | .19 | 3.9 | .95 | 1.7 | 1.6 | 2.9 |
| 19 | .18 | 1.7 | 26 | .12 | .08 | .07 | .12 | 4.3 | 12 | 1.4 | 5.4 | 2.2 |
| 20 | .16 | 1.6 | 6.0 | .12 | .07 | .06 | .09 | 4.2 | 4.1 | 1.1 | 2.3 | 1.6 |
| 21 | .36 | 1.6 | 7.7 | .12 | .08 | .06 | .08 | 5.5 | 7.0 | 7.6 | 1.7 | 1.2 |
| 22 | .32 | 1.3 | 8.1 | .15 | .09 | .05 | .05 | 4.1 | 6.7 | 11 | 1.7 | 3.0 |
| 23 | .18 | 1.5 | 14 | .15 | .06 | .05 | .05 | 4.1 | 3.7 | 5.3 | 1.1 | 2.2 |
| 24 | .15 | 1.4 | 16 | .12 | .06 | .05 | 1.1 | 2.7 | 4.7 | 3.3 | 1.0 | 1.7 |
| 25 | .15 | .94 | 11 | .10 | .04 | .05 | .48 | 2.5 | 4.2 | 2.5 | .80 | 1.7 |
| 26 | .15 | 1.5 | 15 | .12 | .04 | .05 | .17 | 8.6 | 3.0 | 2.1 | .75 | 1.7 |
| 27 | .20 | 1.4 | 4.3 | .08 | .05 | .04 | .09 | 3.7 | 2.2 | 1.5 | .90 | 1.3 |
| 28 | .19 | .76 | 2.9 | .09 | .06 | .04 | .10 | 2.8 | 2.0 | 1.3 | .70 | 1.1 |
| 29 | .16 | .52 | 2.1 | .08 | ------ | .04 | .32 | 2.0 | 1.4 | 1.4 | 1.0 | .95 |
| 30 | 4.2 | .40 | 1.5 | .07 | ------ | .04 | .48 | 3.4 | 1.4 | 1.4 | .95 | 1.2 |
| 31 | 34 | ------ | 1.2 | .07 | ------ | .03 | ------ | 3.9 | ------ | 1.1 | .75 | ------ |
| TOTAL | 63.86 | 38.36 | 148.56 | 7.18 | 1.72 | 2.35 | 8.71 | 85.56 | 92.85 | 97.7 | 74.65 | 64.82 |
| MEAN | 2.06 | 1.28 | 4.79 | .23 | .061 | .076 | .29 | 2.76 | 3.10 | 3.15 | 2.41 | 2.16 |
| MAX | 34 | 5.0 | 26 | 1.1 | .09 | .18 | 1.5 | 12 | 12 | 11 | 9.7 | 9.3 |
| MIN | .15 | .28 | .28 | .07 | .04 | .03 | .04 | .08 | .60 | 1.1 | .70 | .47 |
| AC-FT | 127 | 76 | 294 | 14 | 3.4 | 4.7 | 17 | 170 | 184 | 194 | 148 | 129 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 686.32 | MEAN | 1.88 | MAX | 34 | MIN | .03 | AC-FT | 1,360 | | |

PEAK DISCHARGE (BASE, 170 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-31 | 1430 | 3.40 | 190 | 12-19 | 1500 | 4.42 | 508 |
| 12- 9 | 0030 | 3.95 | 335 | | | | |

## 16-8942. Nachiponong Stream, Moen

LOCATION.--Lat 7°25'45" N., long 151°51'31" E., Moen, on left bank at Wichap, 300 ft downstream from dam site, and 0.2 mile upstream from mouth.

DRAINAGE AREA.--0.16 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 33 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 13 cfs Dec. 19 (gage height, 3.10 ft, from floodmark in well), from rating curve extended above 0.19 cfs; no flow Mar. 26-31.
Period of record: Maximum discharge, 13 cfs Dec. 19, 1968 (gage height, 3.10 ft, floodmark in well), from rating curve extended above 0.19 cfs; no flow Mar. 26-31, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .30 | .56 | .18 | .29 | .02 | .01 | .06 | .08 | .78 | .53 | .24 | .30 |
| 2 | .18 | .38 | .14 | .22 | .03 | .01 | .02 | .02 | .65 | .23 | .35 | .23 |
| 3 | .18 | .32 | .12 | .19 | .03 | .01 | .02 | .02 | .54 | .82 | .50 | .24 |
| 4 | .20 | .28 | .17 | .18 | .03 | .06 | .01 | .11 | .49 | .65 | .80 | .29 |
| 5 | .20 | .23 | .20 | .16 | .03 | .04 | .01 | .10 | .48 | .83 | .70 | .21 |
| 6 | .18 | .23 | .13 | .14 | .03 | .03 | .20 | .06 | .38 | .56 | .50 | .76 |
| 7 | .20 | .20 | .21 | .12 | .03 | .02 | .21 | .06 | .44 | .48 | .60 | .48 |
| 8 | .17 | .20 | .14 | .12 | .03 | .02 | .11 | .04 | .92 | .49 | .40 | .95 |
| 9 | .19 | .24 | 1.0 | .11 | .03 | .01 | .02 | .04 | .49 | 1.2 | .35 | .49 |
| 10 | .16 | .20 | .50 | .10 | .02 | .01 | .01 | .03 | .44 | .69 | .33 | .91 |
| 11 | .15 | .15 | .30 | .08 | .02 | .01 | .01 | .11 | .43 | .53 | .30 | .54 |
| 12 | .13 | .16 | .25 | .08 | .02 | .01 | .08 | .29 | .46 | .46 | .36 | .48 |
| 13 | .11 | .14 | .18 | .08 | .02 | .06 | .06 | 1.2 | .33 | .44 | .92 | .42 |
| 14 | .09 | .12 | .18 | .06 | .02 | .03 | .29 | .72 | .28 | .40 | 1.2 | .40 |
| 15 | .08 | .19 | .33 | .05 | .02 | .04 | .12 | .46 | .24 | .42 | .54 | .30 |
| 16 | .15 | .24 | .17 | .05 | .02 | .02 | .36 | .83 | .24 | .48 | .42 | .31 |
| 17 | .11 | .19 | .14 | .04 | .02 | .02 | .13 | .49 | .28 | .33 | .37 | .28 |
| 18 | .09 | .53 | .15 | .04 | .02 | .01 | .06 | .62 | .27 | .29 | .37 | .48 |
| 19 | .09 | .28 | 1.3 | .04 | .01 | .01 | .04 | .76 | .84 | .28 | .81 | .33 |
| 20 | .09 | .37 | .78 | .04 | .01 | .01 | .03 | .76 | .32 | .30 | .30 | .27 |
| 21 | .16 | .33 | 1.0 | .04 | .02 | .01 | .04 | .99 | .55 | 1.0 | .29 | .27 |
| 22 | .15 | .27 | .90 | .05 | .03 | .01 | .02 | .54 | .54 | 1.4 | .30 | .55 |
| 23 | .12 | .23 | 1.8 | .04 | .01 | .01 | .01 | .51 | .40 | .91 | .26 | .33 |
| 24 | .12 | .25 | 2.3 | .04 | .01 | .01 | .23 | .49 | .72 | .76 | .23 | .29 |
| 25 | .15 | .20 | 1.5 | .03 | .01 | .01 | .11 | .61 | .37 | .60 | .19 | .29 |
| 26 | .14 | .50 | 2.0 | .04 | .01 | 0 | .06 | .91 | .34 | .53 | .22 | .37 |
| 27 | .15 | .30 | .75 | .02 | .01 | 0 | .04 | .54 | .29 | .42 | .34 | .36 |
| 28 | .10 | .22 | .50 | .02 | .01 | 0 | .04 | .48 | .29 | .34 | .30 | .33 |
| 29 | .09 | .20 | .38 | .04 | ------ | 0 | .12 | .43 | .20 | .33 | .26 | .33 |
| 30 | .37 | .18 | .33 | .02 | ------ | 0 | .16 | .73 | .21 | .33 | .24 | .44 |
| 31 | 2.2 | ------ | .28 | .02 | ------ | 0 | ------ | .54 | ------ | .27 | .26 | ------ |
| TOTAL | 6.80 | 7.89 | 18.31 | 2.55 | .57 | .49 | 2.68 | 13.57 | 13.21 | 17.30 | 13.25 | 12.23 |
| MEAN | .22 | .26 | .59 | .082 | .020 | .016 | .089 | .44 | .44 | .56 | .43 | .41 |
| MAX | 2.2 | .56 | 2.3 | .29 | .03 | .06 | .36 | 1.2 | .92 | 1.4 | 1.2 | .95 |
| MIN | .08 | .12 | .12 | .02 | .01 | 0 | .01 | .02 | .20 | .23 | .19 | .21 |
| AC-FT | 13 | 16 | 36 | 5.1 | 1.1 | 1.0 | 5.3 | 27 | 26 | 34 | 26 | 24 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 108.85 | MEAN | .30 | MAX | 2.3 | MIN | 0 | AC-FT | 216 | | |

PEAK DISCHARGE (BASE, 5.0 CFS)

/ From floodmark in well.

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-31 | 1600 | 2.28 | 5.9 | 7-21 | 1200 | 2.28 | 5.9 |
| 12-19 | 1430 | /3.10 | 13 | 8-13 | 2300 | 2.29 | 5.9 |
| 12-23 | 2200 | 2.54 | 7.6 | | | | |

## 16-8950. Echapachik Stream, Tol

LOCATION.--Lat 7°20'57" N., long 151°37'26" E., Tol, on right bank 0.2 mile upstream from mouth and 0.6 mile north of Mount Tumuital.

DRAINAGE AREA.--0.15 sq mi.

PERIOD OF RECORD.--April 1955 to March 1957 (published as "at Fasan"), May 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Apr. 1, 1957, non-recording gage at same site at different datum.

EXTREMES.--Current year: Maximum discharge, 28 cfs Dec. 21 (gage height, 3.05 ft), from rating curve extended above 0.22 cfs; no flow for many days.
Period of record: Maximum discharge recorded, 28 cfs Dec. 21, 1968 (gage height, 3.05 ft), from rating curve extended above 0.22 cfs; maximum daily, 7.4 cfs Dec. 30, 1955; no flow Mar. 24, 25, 1957 and for many days in 1969.

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

REVISIONS.--WRD Hawaii 1968: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .14 | .54 | .20 | .15 | .01 | 0 | .10 | .02 | .44 | .13 | .05 | .15 |
| 2 | .17 | .35 | .20 | .12 | .01 | 0 | .05 | .01 | .29 | .08 | .06 | .10 |
| 3 | .15 | .39 | .15 | .10 | .01 | 0 | .03 | .02 | .16 | .45 | .07 | .08 |
| 4 | .12 | .39 | .15 | .09 | .01 | .01 | .01 | .05 | .09 | .29 | .20 | .08 |
| 5 | .13 | .32 | .30 | .08 | .01 | .01 | .01 | .02 | .09 | .29 | .10 | .07 |
| 6 | .13 | .30 | .28 | .07 | .01 | .01 | .05 | .01 | .09 | .23 | .07 | .16 |
| 7 | .09 | .46 | .22 | .07 | .01 | 0 | .05 | 0 | .09 | .14 | .10 | .14 |
| 8 | .12 | .33 | .35 | .06 | .01 | 0 | .02 | 0 | .41 | .09 | .20 | 1.1 |
| 9 | .16 | .32 | 1.6 | .06 | .01 | 0 | .02 | .01 | .32 | .42 | .10 | 1.1 |
| 10 | .16 | .32 | .33 | .06 | .01 | 0 | .01 | .01 | .23 | .34 | 3.7 | 2.0 |
| 11 | .13 | .30 | .22 | .05 | .01 | 0 | .01 | .01 | .18 | .18 | 3.3 | 1.2 |
| 12 | .11 | .28 | .15 | .05 | .01 | 0 | .01 | .01 | .14 | .10 | 4.1 | .53 |
| 13 | .10 | .29 | .12 | .05 | .01 | .02 | .01 | .01 | .10 | .06 | 2.9 | .23 |
| 14 | .09 | .29 | .10 | .05 | .01 | .05 | .05 | .01 | .10 | .06 | 4.9 | .32 |
| 15 | .09 | .32 | .09 | .05 | .01 | .10 | .02 | .10 | .09 | .11 | 1.9 | .44 |
| 16 | .09 | .39 | .07 | .05 | .01 | .05 | .10 | .28 | .08 | .54 | 1.1 | .32 |
| 17 | .09 | .38 | .06 | .06 | 0 | .01 | .01 | .24 | .08 | .34 | .72 | .89 |
| 18 | .09 | .36 | .06 | .10 | 0 | 0 | .01 | .40 | .10 | .17 | .41 | 4.5 |
| 19 | .09 | .34 | .56 | .20 | .01 | 0 | .01 | .38 | .79 | .11 | .26 | 1.2 |
| 20 | .08 | .32 | .20 | .25 | 0 | 0 | .01 | .16 | .28 | .10 | .22 | .56 |
| 21 | .08 | .38 | 2.3 | .15 | 0 | 0 | .20 | .23 | .16 | .46 | .22 | .50 |
| 22 | .13 | .32 | .49 | .10 | 0 | 0 | .10 | .19 | .11 | .47 | .20 | .56 |
| 23 | .09 | .36 | .65 | .06 | 0 | 0 | .05 | .19 | .10 | .28 | .15 | .53 |
| 24 | .09 | .30 | .53 | .04 | 0 | 0 | .03 | .14 | .09 | .14 | .12 | .34 |
| 25 | .06 | .27 | .79 | .03 | 0 | 0 | .02 | .08 | .12 | .08 | .10 | .29 |
| 26 | .06 | .26 | 1.6 | .03 | 0 | 0 | .01 | .07 | .11 | .06 | .08 | .24 |
| 27 | .05 | .28 | .40 | .02 | 0 | .01 | .01 | .06 | .20 | .06 | .15 | .22 |
| 28 | .05 | .26 | .27 | .02 | 0 | .03 | .01 | .06 | .16 | .06 | .12 | .19 |
| 29 | .05 | .25 | .19 | .01 | ------ | .05 | .05 | .06 | .11 | .05 | .09 | .16 |
| 30 | .06 | .24 | .15 | .01 | ------ | .02 | .03 | .08 | .08 | .05 | .17 | .15 |
| 31 | 1.6 | ------ | .12 | .01 | ------ | 0 | ------ | .10 | ------ | .05 | .17 | ------ |
| TOTAL | 4.65 | 9.91 | 12.90 | 2.25 | .17 | .37 | 1.10 | 3.01 | 5.39 | 5.99 | 26.03 | 18.35 |
| MEAN | .15 | .33 | .42 | .073 | .006 | .012 | .037 | .097 | .18 | .19 | .84 | .61 |
| MAX | 1.6 | .54 | 2.3 | .25 | .01 | .10 | .20 | .40 | .79 | .54 | 4.9 | 4.5 |
| MIN | .05 | .24 | .06 | .01 | 0 | 0 | .01 | 0 | .08 | .05 | .05 | .07 |
| AC-FT | 9.2 | 20 | 26 | 4.5 | .3 | .7 | 2.2 | 6.0 | 11 | 12 | 52 | 36 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 90.12 | MEAN | .25 | MAX | 4.9 | MIN | 0 | AC-FT | 179 | | |

PEAK DISCHARGE (BASE, 10 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-31 | 0600 | 2.28 | 12 | 12-21 | 2100 | 3.05 | 28 |
| 12- 8 | 2400 | 2.90 | 26 | 8-14 | 0100 | 1.80 | 12 |

NOTE.--No gage-height record Mar. 7 to May 15.

## 16-8968. Chun Stream, Dublon Island

LOCATION.--Lat 7°22'36" N., long 151°52'13" E., Dublon Island, on right bank at Chun, 0.4 mile upstream from mouth, and 1.8 miles west of Penienuk.

DRAINAGE AREA.--0.09 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 18 cfs Dec. 23 (gage height, 2.04 ft), from rating curve extended above 0.56 cfs; minimum, 0.01 cfs on many days February to April.
Period of record: Maximum discharge, 36 cfs June 21, 1968 (gage height, 2.43 ft), from rating curve extended above 0.16 cfs; minimum, 0.01 cfs May 16, 1968 and on many days February to April, 1969.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.0 | 1.3 | .24 | .38 | .09 | .03 | .19 | .03 | .41 | .21 | .15 | .30 |
| 2 | .24 | .78 | .28 | .26 | .10 | .02 | .04 | .03 | .32 | .19 | .20 | .28 |
| 3 | .19 | .59 | .28 | .21 | .10 | .02 | .03 | .06 | .21 | .38 | .50 | .30 |
| 4 | .11 | .45 | .28 | .21 | .10 | .03 | .02 | .11 | .15 | .24 | .70 | .38 |
| 5 | .11 | .34 | .32 | .21 | .09 | .02 | .02 | .06 | .17 | .70 | .50 | .45 |
| 6 | .13 | .34 | .32 | .21 | .09 | .02 | .06 | .05 | .26 | .34 | .30 | .82 |
| 7 | .17 | .28 | .32 | .21 | .08 | .02 | .06 | .08 | .59 | .28 | .52 | .80 |
| 8 | .15 | .28 | .34 | .21 | .08 | .02 | .03 | .08 | 1.6 | .34 | .48 | 1.5 |
| 9 | .17 | .34 | .66 | .19 | .08 | .02 | .02 | .07 | .34 | .34 | .52 | .70 |
| 10 | .13 | .30 | .41 | .19 | .07 | .02 | .02 | .10 | .21 | .32 | .56 | 1.1 |
| 11 | .15 | .30 | .38 | .17 | .06 | .02 | .02 | .17 | .17 | .26 | .45 | .7 |
| 12 | .15 | .30 | .34 | .19 | .06 | .02 | .03 | .87 | .30 | .21 | .51 | .56 |
| 13 | .15 | .34 | .32 | .19 | .06 | .04 | .02 | 1.4 | .17 | .21 | 1.0 | .48 |
| 14 | .13 | .48 | .30 | .17 | .04 | .03 | .05 | 1.1 | .13 | .19 | 1.3 | .70 |
| 15 | .13 | .34 | .52 | .17 | .04 | .09 | .03 | .78 | .13 | .30 | .70 | .56 |
| 16 | .13 | .38 | .34 | .19 | .05 | .04 | .06 | .82 | .13 | .40 | .56 | .48 |
| 17 | .10 | .90 | .34 | .19 | .04 | .03 | .02 | .63 | .13 | .30 | .56 | .52 |
| 18 | .10 | .70 | .41 | .26 | .09 | .03 | .02 | .83 | .19 | .25 | .59 | .78 |
| 19 | .10 | .45 | 1.6 | .30 | .05 | .02 | .02 | .66 | 1.1 | .20 | .66 | .56 |
| 20 | .11 | .34 | .76 | .28 | .03 | .03 | .02 | .54 | .38 | .25 | .59 | .48 |
| 21 | .15 | .30 | 1.1 | .19 | .03 | .02 | .02 | .66 | .34 | .40 | .56 | .52 |
| 22 | .19 | .30 | 1.0 | .19 | .04 | .02 | .02 | .34 | .41 | .70 | .52 | .74 |
| 23 | .21 | .26 | 2.0 | .17 | .03 | .02 | .02 | .26 | .34 | .50 | .48 | .56 |
| 24 | .21 | .26 | 1.1 | .13 | .03 | .02 | .03 | .17 | .71 | .40 | .45 | .45 |
| 25 | .26 | .26 | .97 | .11 | .02 | .02 | .02 | .13 | .41 | .30 | .41 | .41 |
| 26 | .28 | .26 | 1.5 | .12 | .02 | .02 | .02 | .21 | .28 | .25 | .38 | .38 |
| 27 | .21 | .26 | .66 | .10 | .02 | .02 | .03 | .12 | .26 | .20 | .38 | .34 |
| 28 | .21 | .24 | .48 | .10 | .02 | .02 | .05 | .10 | .24 | .20 | .34 | .32 |
| 29 | .21 | .26 | .38 | .10 | ------ | .02 | .07 | .08 | .19 | .20 | .34 | .30 |
| 30 | 1.1 | .24 | .32 | .09 | ------ | .02 | .06 | .21 | .17 | .15 | .32 | .30 |
| 31 | 3.3 | ------ | .30 | .09 | ------ | .02 | ------ | .21 | ------ | .15 | .32 | ------ |
| TOTAL | 9.98 | 12.17 | 18.57 | 5.78 | 1.61 | .79 | 1.12 | 10.96 | 10.44 | 9.36 | 15.85 | 16.77 |
| MEAN | .32 | .41 | .60 | .19 | .058 | .025 | .037 | .35 | .35 | .30 | .51 | .56 |
| MAX | 3.3 | 1.3 | 2.0 | .38 | .10 | .09 | .19 | 1.4 | 1.6 | .70 | 1.3 | 1.5 |
| MIN | .10 | .24 | .24 | .09 | .02 | .02 | .02 | .03 | .13 | .15 | .15 | .28 |
| AC-FT | 20 | 24 | 37 | 11 | 3.2 | 1.6 | 2.2 | 22 | 21 | 19 | 31 | 33 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 113.40 | MEAN | .31 | MAX | 3.3 | MIN | .02 | AC-FT | 225 | | |

PEAK DISCHARGE (BASE, 10 CFS).--Dec. 23 (1500) 18 cfs (2.04 ft); June 8 (0500) 10 cfs (2.00 ft).

## 16-8972. Tumunu Stream, Dublon Island

LOCATION.--Lat 7°22'42" N., long 151°52'51" E., Dublon Island, on left bank at Roro, 0.1 mile upstream from mouth, and 1.1 miles west of Penienuk.

DRAINAGE AREA.--0.26 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 48 cfs Dec. 23 (gage height, 3.00 ft), from rating curve extended above 3.5 cfs; minimum, 0.02 cfs Mar. 1, 2.
Period of record: Maximum discharge, 48 cfs Dec. 23, 1968 (gage height, 3.00 ft), from rating curve extended above 3.5 ft; minimum, 0.02 cfs Mar. 1, 2, 1969.
REVISIONS.--The maximum discharge for the water year 1968 has been revised to 34 cfs June 21, 1968 (gage height, 2.63 ft), superseding figure published in WRD Hawaii, 1968.

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

REVISIONS.--The figures of peak discharge for the water year 1968 have been revised as shown in the following table. They supersede figures published in WRD Hawaii, 1968.
REVISED PEAK DISCHARGE.--June 21 (2100) 34 cfs (2.63 ft); Aug. 2 (1200) 31 cfs (2.56 ft).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.9 | 3.9 | .38 | 1.2 | .12 | .04 | .39 | .04 | .86 | .35 | .25 | .40 |
| 2 | .30 | 2.6 | .35 | .95 | .10 | .04 | .14 | .04 | .82 | .28 | .30 | .40 |
| 3 | .25 | 2.1 | .30 | .86 | .08 | .04 | .06 | .04 | .48 | .70 | 1.0 | .48 |
| 4 | .28 | 1.6 | .28 | .78 | .06 | .16 | .05 | .12 | .32 | .50 | 2.0 | .74 |
| 5 | .20 | 1.7 | .42 | .70 | .06 | .10 | .04 | .04 | .28 | .90 | 1.0 | 1.0 |
| 6 | .19 | 1.5 | .30 | .66 | .06 | .06 | .19 | .04 | .30 | .62 | .80 | 1.8 |
| 7 | .17 | 1.2 | .30 | .66 | .06 | .06 | .21 | .04 | 1.1 | .48 | 1.5 | 1.8 |
| 8 | .19 | 1.4 | .28 | .62 | .06 | .06 | .06 | .05 | 3.2 | .62 | 1.4 | 2.5 |
| 9 | .14 | 1.1 | 1.1 | .54 | .06 | .12 | .04 | .06 | .86 | .62 | 1.5 | 1.5 |
| 10 | .12 | .90 | .66 | .50 | .05 | .05 | .04 | .12 | .50 | .54 | 1.4 | 2.1 |
| 11 | .18 | .74 | .42 | .45 | .05 | .04 | .04 | .12 | .40 | .45 | 1.2 | 1.4 |
| 12 | .18 | .70 | .32 | .42 | .05 | .05 | .06 | 1.2 | .66 | .38 | 1.2 | 1.1 |
| 13 | .18 | .62 | .28 | .42 | .05 | .14 | .04 | 3.0 | .38 | .32 | 2.1 | 1.0 |
| 14 | .17 | .66 | .28 | .42 | .05 | .06 | .06 | 2.1 | .28 | .25 | 2.8 | 1.2 |
| 15 | .16 | 1.2 | .48 | .38 | .06 | .28 | .04 | 1.8 | .23 | .38 | 1.8 | 1.0 |
| 16 | .21 | .70 | .32 | .38 | .12 | .06 | .17 | 1.9 | .23 | .71 | 1.5 | .78 |
| 17 | .19 | 2.7 | .30 | .32 | .06 | .06 | .06 | .78 | .23 | .45 | 1.5 | .74 |
| 18 | .19 | 1.6 | .32 | .30 | .10 | .06 | .06 | .82 | .28 | .35 | 1.5 | 1.1 |
| 19 | .18 | 1.2 | 2.2 | .32 | .12 | .04 | .04 | 2.2 | 1.6 | .28 | 1.6 | 1.0 |
| 20 | .17 | .95 | 2.2 | .35 | .06 | .04 | .04 | 2.2 | .58 | .35 | 1.4 | .86 |
| 21 | .20 | 1.0 | 3.2 | .32 | .10 | .04 | .04 | 1.9 | .54 | .66 | 1.2 | 1.1 |
| 22 | .22 | .95 | 3.3 | .35 | .16 | .04 | .04 | 1.6 | .58 | 1.2 | 1.0 | 1.2 |
| 23 | .17 | .82 | 7.4 | .25 | .12 | .04 | .04 | 1.1 | .48 | .78 | 1.0 | 1.2 |
| 24 | .14 | .70 | 4.2 | .21 | .08 | .04 | .04 | .66 | 1.0 | .54 | .90 | 1.1 |
| 25 | .15 | .66 | 3.5 | .17 | .06 | .04 | .04 | .40 | .78 | .42 | .78 | 1.0 |
| 26 | .21 | .66 | 7.5 | .16 | .06 | .04 | .04 | .62 | .58 | .38 | .70 | 1.0 |
| 27 | .16 | .58 | 2.6 | .12 | .05 | .04 | .04 | .30 | .54 | .28 | .74 | 1.0 |
| 28 | .18 | .48 | 1.9 | .12 | .04 | .04 | .04 | .23 | .40 | .30 | .62 | .90 |
| 29 | .14 | .48 | 1.6 | .12 | ------ | .04 | .10 | .17 | .32 | .30 | .58 | .82 |
| 30 | 2.7 | .42 | 1.3 | .10 | ------ | .04 | .05 | .50 | .28 | .25 | .50 | .82 |
| 31 | 13 | ------ | 1.2 | .12 | ------ | .04 | ------ | .32 | ------ | .25 | .45 | ------ |
| TOTAL | 26.82 | 36.02 | 49.19 | 13.27 | 2.10 | 2.00 | 2.30 | 24.51 | 19.09 | 14.89 | 36.22 | 33.04 |
| MEAN | .87 | 1.20 | 1.59 | .43 | .075 | .065 | .077 | .79 | .64 | .48 | 1.17 | 1.10 |
| MAX | 13 | 3.9 | 7.5 | 1.2 | .16 | .28 | .39 | 3.0 | 3.2 | 1.2 | 2.8 | 2.5 |
| MIN | .12 | .42 | .28 | .10 | .04 | .04 | .04 | .04 | .23 | .25 | .25 | .40 |
| AC-FT | 53 | 71 | 98 | 26 | 4.2 | 4.0 | 4.6 | 49 | 38 | 30 | 72 | 66 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1968: | TOTAL | - | MEAN | - | MAX | - | MIN | - | AC-FT | - | | |
| WTR YR 1969: | TOTAL | 259.45 | MEAN | .71 | MAX | 13 | MIN | .04 | AC-FT | 515 | | |

PEAK DISCHARGE (BASE, 30 CFS, REVISED)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-31 | 1200 | 2.88 | 43 | 12-26 | 0200 | 2.61 | 33 |
| 12-23 | 1500 | 3.00 | 48 | | | | |

## 16-9060. Vaitolu Stream at Aoa

LOCATION.--Lat 14°16'19" S., long 170°35'32" W., Tutuila, on left bank 0.5 mile upstream from mouth and 0.7 mile southwest of Aoa.

DRAINAGE AREA.--0.18 sq mi (revised).

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as "near Aoa."

GAGE.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 249 cfs Apr. 25 (gage height, 4.47 ft), from rating curve extended above 3.3 cfs; minimum, 0.01 cfs many days.
Period of record: Maximum discharge, 804 cfs (revised) Dec. 19, 1962 (gage height, 6.16 ft), from rating curve extended above 3.3 cfs; no flow at times in 1964-66.
REVISIONS.--The maximum discharge for the water year 1963 has been revised to 804 cfs Dec. 19, 1962 (gage height, 6.16 ft), superseding figure published in WSP 1937.

REMARKS.--Records poor. Samll diversion above station for domestic use since Sept. 14, 1964. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .02 | .25 | .05 | .02 | 1.1 | 1.2 | 2.7 | .46 | .15 | .05 | .05 | .56 |
| 2 | .02 | .14 | .04 | .02 | .52 | .92 | .70 | .37 | .14 | .05 | .04 | .50 |
| 3 | .03 | .12 | .07 | .03 | .30 | .87 | .46 | .37 | .12 | .08 | .04 | .42 |
| 4 | .30 | .09 | .06 | .03 | .15 | .82 | .31 | .40 | .11 | .09 | .05 | .25 |
| 5 | .95 | .13 | .04 | .16 | .13 | .92 | .27 | .27 | .13 | .13 | .04 | .21 |
| 6 | .02 | .08 | .03 | .03 | .10 | 1.3 | .25 | .43 | .13 | .61 | .04 | .17 |
| 7 | .03 | .21 | .03 | .02 | .06 | 2.4 | .19 | .37 | .09 | .10 | .03 | .17 |
| 8 | .21 | .17 | .03 | .02 | .13 | .52 | .29 | .46 | .10 | .05 | .04 | .14 |
| 9 | .02 | .18 | .04 | 2.6 | .32 | .27 | .23 | .43 | .09 | .04 | .04 | .13 |
| 10 | .01 | .10 | .03 | .82 | .13 | .19 | .15 | .43 | .10 | .04 | .03 | .11 |
| 11 | .01 | .08 | .06 | 2.9 | .08 | .21 | 1.2 | .49 | .10 | .04 | .03 | .10 |
| 12 | 2.7 | .40 | .14 | 1.5 | .29 | .15 | .70 | .29 | .08 | .02 | .04 | .09 |
| 13 | .29 | .13 | .06 | 1.8 | .64 | .13 | .78 | .29 | .14 | .78 | .05 | .08 |
| 14 | .03 | .10 | .04 | 1.2 | .34 | .13 | .29 | .35 | .10 | .05 | .14 | .08 |
| 15 | .02 | .08 | .03 | .49 | .21 | .31 | .23 | 1.3 | .10 | .08 | .60 | .09 |
| 16 | .88 | .07 | .03 | .33 | .22 | .23 | .51 | .66 | .10 | .12 | .19 | .07 |
| 17 | .07 | .10 | .11 | .15 | .85 | .19 | .40 | .37 | .10 | .96 | .24 | .02 |
| 18 | .02 | .15 | .03 | .12 | .25 | .15 | .33 | .29 | .26 | .70 | .35 | .02 |
| 19 | .01 | .10 | .04 | 2.7 | .12 | .15 | .29 | .27 | .17 | .29 | .21 | .02 |
| 20 | .02 | .08 | .04 | 2.3 | .31 | .18 | .25 | .25 | .12 | .11 | .19 | .02 |
| 21 | .02 | .07 | .03 | .76 | .38 | .34 | .81 | .18 | .09 | .41 | .17 | .02 |
| 22 | 3.9 | .06 | .20 | 1.3 | 1.8 | .25 | 1.6 | .10 | .09 | .17 | .15 | .04 |
| 23 | 1.7 | .06 | .07 | .12 | 1.7 | .84 | 1.4 | .08 | .28 | .09 | .24 | .01 |
| 24 | 2.4 | .07 | .03 | .97 | 1.3 | .33 | .97 | .10 | .14 | .08 | .11 | .01 |
| 25 | 2.5 | .06 | .02 | .70 | 1.2 | .23 | 9.6 | .12 | .14 | .08 | .09 | .01 |
| 26 | 5.4 | .07 | .02 | .58 | 1.3 | 1.0 | 1.3 | .12 | .08 | .07 | .08 | .04 |
| 27 | 8.6 | .06 | .02 | .55 | 2.1 | .52 | 1.0 | .11 | .07 | .05 | .10 | .04 |
| 28 | 1.5 | .10 | .02 | .68 | 1.3 | .25 | .66 | .12 | .07 | .05 | .25 | .04 |
| 29 | .66 | .07 | .02 | .46 | ------ | .17 | .66 | .14 | .25 | .05 | .58 | .04 |
| 30 | .33 | .05 | .02 | .58 | ------ | .66 | .64 | .13 | .13 | .05 | .52 | .06 |
| 31 | .31 | ------ | .02 | .52 | ------ | .61 | ------ | .14 | ------ | .05 | .17 | ------ |
| TOTAL | 32.98 | 3.43 | 1.47 | 24.46 | 17.33 | 16.44 | 29.17 | 9.89 | 3.77 | 5.54 | 4.90 | 3.56 |
| MEAN | 1.06 | .11 | .047 | .79 | .62 | .53 | .97 | .32 | .13 | .18 | .16 | .12 |
| MAX | 8.6 | .40 | .20 | 2.9 | 2.1 | 2.4 | 9.6 | 1.3 | .28 | .96 | .60 | .56 |
| MIN | .01 | .05 | .02 | .02 | .06 | .13 | .15 | .08 | .07 | .02 | .03 | .01 |
| AC-FT | 65 | 6.8 | 2.9 | 49 | 34 | 33 | 58 | 20 | 7.5 | 11 | 9.7 | 7.1 |

CAL YR 1968: TOTAL 105.71 MEAN .29 MAX 8.6 MIN .01 AC-FT 210
WTR YR 1969: TOTAL 152.94 MEAN .42 MAX 9.6 MIN .01 AC-FT 303

PEAK DISCHARGE (BASE, 150 CFS, REVISED).--Apr. 11 (1800) 153 cfs (3.96 ft); Apr. 25 (0600) 249 cfs (4.47 ft).

## 16-9120. Pago Stream at Afono

LOCATION.--Lat 14°16'03" S., long 170°39'02" W., Tutuila, on left bank 0.2 mile south of Afono and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.60 sq mi.

PERIOD OF RECORD.--October 1958 to current year. Prior to July 1960, published as Afono Stream at Afono.

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

EXTREMES.--Current year: Maximum discharge, 1,350 cfs July 5 (gage height, 5.49 ft), from rating curve extended above 22 cfs; minimum, 0.33 cfs Oct. 1.
Period of record: Maximum discharge, 1,350 cfs July 5, 1969 (gage height, 5.49 ft), from rating curve extended above 22 cfs; minimum, 0.25 cfs at times in 1961 and 1968.

REMARKS.--Records fair. About 0.06 cfs is diverted above station for domestic use in Afono.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .43 | 7.7 | .95 | .43 | 2.6 | 2.7 | 16 | 2.0 | .95 | .79 | .87 | 11 |
| 2 | .43 | 4.0 | .95 | .54 | 2.0 | 2.0 | 3.1 | 1.7 | .87 | .66 | .79 | 4.6 |
| 3 | .54 | 2.9 | .95 | .54 | 1.7 | 1.7 | 2.0 | 1.6 | .87 | .95 | .72 | 4.2 |
| 4 | .79 | 2.4 | 1.0 | .66 | 1.5 | 1.6 | 1.7 | 1.6 | .79 | 1.5 | .72 | 2.5 |
| 5 | .79 | 3.8 | .87 | .60 | 1.5 | 1.5 | 1.5 | 1.6 | .95 | 86 | .72 | 2.0 |
| 6 | .60 | 2.7 | .72 | .48 | 1.3 | 1.7 | 1.5 | 1.9 | .87 | 31 | .72 | 2.2 |
| 7 | 1.2 | 3.3 | .87 | .48 | 1.2 | 1.4 | 1.3 | 1.5 | .79 | 5.0 | .72 | 1.8 |
| 8 | 3.4 | 6.3 | .72 | .48 | 1.4 | 1.2 | 1.3 | 1.3 | .79 | 2.6 | .72 | 1.5 |
| 9 | 1.1 | 3.4 | .79 | 3.6 | 2.6 | 1.1 | 1.3 | 1.2 | .72 | 1.8 | .79 | 1.3 |
| 10 | .72 | 2.4 | .87 | 3.1 | 3.4 | 1.2 | 1.2 | 1.1 | .72 | 1.6 | .79 | 1.1 |
| 11 | .60 | 1.9 | .87 | 9.2 | 2.0 | 1.3 | 4.9 | 1.2 | .70 | 1.4 | .72 | 1.0 |
| 12 | .87 | 2.7 | 1.0 | 3.4 | 2.7 | 1.2 | 2.5 | 1.5 | .62 | 1.2 | .60 | .90 |
| 13 | .66 | 2.1 | .87 | 3.2 | 3.4 | 1.3 | 2.0 | 2.3 | .70 | 4.4 | .72 | .80 |
| 14 | .60 | 2.1 | .87 | 2.7 | 2.3 | 1.3 | 1.8 | 7.3 | .64 | 9.3 | 1.3 | .70 |
| 15 | 31 | 1.7 | .72 | 1.9 | 1.6 | 1.3 | 1.6 | 15 | .60 | 8.9 | 15 | .80 |
| 16 | 35 | 1.7 | .60 | 1.5 | 1.4 | 1.2 | 2.9 | 9.3 | .70 | 8.2 | 3.4 | .70 |
| 17 | 4.0 | 3.4 | .60 | 1.2 | 1.4 | 1.0 | 3.6 | 3.2 | .60 | 29 | 1.7 | .66 |
| 18 | 2.3 | 5.4 | .60 | 1.1 | 1.2 | .87 | 2.9 | 3.2 | 3.5 | 16 | 3.1 | .64 |
| 19 | 1.7 | 4.0 | .60 | 9.0 | 1.1 | .87 | 1.9 | 2.6 | .80 | 7.7 | 1.8 | .62 |
| 20 | 1.5 | 2.3 | .60 | 8.7 | 1.1 | .79 | 1.6 | 2.0 | .70 | 4.4 | 1.2 | .60 |
| 21 | 4.4 | 1.8 | .54 | 2.7 | 1.2 | 9.1 | 1.7 | 1.6 | .60 | 5.0 | 1.0 | .58 |
| 22 | 53 | 1.6 | .66 | 4.7 | 3.6 | 10 | 2.4 | 1.5 | .56 | 3.2 | .87 | .56 |
| 23 | 36 | 1.5 | .66 | 4.4 | 6.3 | 4.0 | 3.8 | 1.4 | 2.0 | 2.1 | 1.1 | .54 |
| 24 | 18 | 1.3 | .66 | 2.4 | 5.8 | 2.6 | 3.6 | 1.2 | .70 | 1.7 | .79 | .52 |
| 25 | 14 | 1.2 | .79 | 1.8 | 3.1 | 1.9 | 25 | 1.2 | .80 | 1.5 | .79 | .52 |
| 26 | 30 | 1.1 | .66 | 1.8 | 3.2 | 1.7 | 8.4 | 1.1 | .74 | 1.3 | .72 | .50 |
| 27 | 51 | 1.0 | .54 | 1.8 | 5.8 | 1.4 | 4.2 | 1.0 | .66 | 1.1 | 3.7 | .50 |
| 28 | 14 | 1.1 | .48 | 2.3 | 4.4 | 1.2 | 3.1 | 1.0 | .54 | 1.1 | 11 | .60 |
| 29 | 6.8 | .95 | .54 | 1.9 | ------ | 1.1 | 2.6 | .95 | 2.2 | 1.0 | 13 | .50 |
| 30 | 4.6 | .95 | .48 | 19 | ------ | 2.0 | 2.1 | .95 | 1.3 | 1.0 | 9.2 | .70 |
| 31 | 5.6 | ------ | .48 | 4.4 | ------ | 2.0 | ------ | .95 | ------ | .95 | 2.6 | ------ |
| TOTAL | 325.63 | 78.70 | 22.51 | 100.01 | 70.8 | 64.23 | 113.5 | 75.95 | 27.98 | 242.35 | 81.87 | 45.14 |
| MEAN | 10.5 | 2.62 | .73 | 3.23 | 2.53 | 2.07 | 3.78 | 2.45 | .93 | 7.82 | 2.64 | 1.50 |
| MAX | 53 | 7.7 | 1.0 | 19 | 6.3 | 10 | 25 | 15 | 3.5 | 86 | 15 | 11 |
| MIN | .43 | .95 | .48 | .43 | 1.1 | .79 | 1.2 | .95 | .54 | .66 | .72 | .50 |
| AC-FT | 646 | 156 | 45 | 198 | 140 | 127 | 225 | 151 | 55 | 481 | 162 | 90 |

CAL YR 1968: TOTAL 1,180.44 MEAN 3.23 MAX 70 MIN .29 AC-FT 2,340
WTR YR 1969: TOTAL 1,248.67 MEAN 3.42 MAX 86 MIN .43 AC-FT 2,480

PEAK DISCHARGE (BASE, 210 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-15 | 2230 | 4.10 | 440 | 1-30 | 1200 | 3.64 | 269 |
| 10-22 | 2300 | 4.50 | 635 | 7- 5 | 2100 | 5.49 | 1,350 |

## 16-9175. Leele Stream at mouth, at Fagasa

LOCATION.--Lat 14°17'28" S., long 170°43'09" W., Tutuila, on left bank at Fagasa and 200 ft upstream from mouth.

DRAINAGE AREA.--0.23 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 193 cfs Oct. 22 (gage height, 3.38 ft, from recorded range in stage), from rating curve extended as explained below; minimum, 0.19 cfs Oct. 1-3.
Period of record: Maximum discharge, 285 cfs Oct. 9, 1967 (gage height, 3.61 ft), from rating curve extended above 8.5 cfs on basis of slope-area measurement of peak flow; minimum, 0.11 cfs July 15, 1968.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .22 | 2.1 | .41 | .23 | 1.1 | .98 | 3.3 | .69 | 82 | .32 | .63 | 1.9 |
| 2 | .22 | 1.2 | .63 | .25 | .75 | .75 | 1.4 | .57 | .51 | .28 | .51 | 1.4 |
| 3 | .22 | .90 | .46 | .30 | .63 | .63 | .98 | .63 | .46 | .41 | .51 | 1.1 |
| 4 | 3.5 | .75 | .46 | .40 | .63 | .57 | .98 | 1.4 | .41 | .57 | .51 | .82 |
| 5 | 1.2 | 1.3 | .36 | .30 | .57 | .95 | 1.1 | .98 | .57 | 9.9 | .46 | .69 |
| 6 | .51 | .82 | .32 | .25 | .57 | .90 | 2.1 | 2.4 | .51 | 7.7 | .41 | .63 |
| 7 | .95 | 2.1 | .41 | .22 | .57 | 3.4 | 1.1 | .90 | .41 | 1.7 | .41 | .57 |
| 8 | 4.9 | 3.9 | .32 | .36 | 4.7 | 2.1 | 4.0 | .98 | .41 | .90 | .41 | .69 |
| 9 | .90 | 1.4 | .32 | 4.6 | 3.5 | 1.1 | 1.8 | .69 | .36 | .63 | .69 | .46 |
| 10 | .51 | .82 | .76 | 2.4 | 6.5 | .75 | .98 | .57 | .36 | .51 | .51 | .51 |
| 11 | .41 | .69 | .46 | 4.6 | 1.9 | 1.4 | 1.6 | 1.2 | .36 | .51 | .51 | .41 |
| 12 | .41 | 1.8 | .51 | 3.7 | 1.6 | 2.6 | 1.1 | 2.2 | .41 | .41 | .46 | .41 |
| 13 | .46 | 1.6 | .41 | 2.7 | 2.3 | .98 | 2.0 | 3.1 | .32 | 4.8 | .90 | .41 |
| 14 | .63 | 3.2 | .32 | 1.4 | 4.0 | .75 | 1.7 | 6.6 | .32 | 6.7 | 5.7 | .41 |
| 15 | 5.6 | 1.2 | .32 | .82 | 1.8 | .75 | .98 | 7.7 | .32 | 5.4 | 27 | .46 |
| 16 | 26 | .98 | .25 | .63 | 1.6 | .63 | .75 | 4.6 | .28 | 9.4 | 4.6 | .41 |
| 17 | 2.5 | 1.8 | .32 | .51 | 1.4 | .51 | .69 | 1.8 | .28 | 27 | 2.5 | .39 |
| 18 | 1.2 | 1.4 | .28 | .46 | .90 | .51 | .63 | 3.5 | .36 | 16 | 3.5 | .37 |
| 19 | .75 | .98 | .28 | 6.1 | .75 | .57 | .51 | 1.7 | .51 | 4.8 | 1.4 | .36 |
| 20 | .90 | .75 | .25 | 4.6 | .75 | .46 | .51 | 1.1 | .41 | 2.5 | .98 | .35 |
| 21 | 2.0 | .63 | .22 | 1.2 | .69 | 2.2 | 1.2 | .82 | .28 | 6.1 | .82 | .34 |
| 22 | 15 | .57 | .32 | 4.4 | 2.0 | 3.5 | 2.3 | .69 | .41 | 2.2 | .69 | .33 |
| 23 | 8.8 | .63 | .28 | 2.7 | 4.1 | 4.2 | 2.5 | .69 | 1.6 | 1.2 | 1.4 | .32 |
| 24 | 7.8 | .51 | .32 | 1.1 | 3.1 | 1.4 | 1.2 | .63 | .69 | .98 | .98 | .31 |
| 25 | 5.7 | .51 | .41 | .82 | 2.1 | .90 | 7.7 | .69 | .57 | .90 | .90 | .31 |
| 26 | 10 | .46 | .25 | .75 | 1.2 | .75 | 3.1 | .57 | .41 | .82 | .82 | .31 |
| 27 | 14 | .41 | .28 | .69 | .90 | .75 | 1.6 | .57 | .32 | .69 | 2.9 | .30 |
| 28 | 5.1 | .46 | .28 | 1.2 | 1.9 | .63 | .98 | .51 | .32 | .63 | 8.4 | .35 |
| 29 | 2.2 | .63 | .22 | .82 | ------ | .63 | .82 | .51 | .87 | .98 | 6.2 | .30 |
| 30 | 1.4 | .63 | .25 | 6.6 | ------ | 3.2 | .82 | .51 | .63 | 1.4 | 4.1 | .35 |
| 31 | 1.4 | ------ | .24 | 2.4 | ------ | 2.6 | ------ | .51 | ------ | .75 | 2.2 | ------ |
| TOTAL | 125.39 | 35.13 | 10.92 | 57.51 | 52.51 | 42.05 | 50.43 | 50.01 | 14.49 | 117.09 | 82.01 | 15.97 |
| MEAN | 4.04 | 1.17 | .35 | 1.86 | 1.88 | 1.36 | 1.68 | 1.61 | .48 | 3.78 | 2.65 | .53 |
| MAX | 26 | 3.9 | .76 | 6.6 | 6.5 | 4.2 | 7.7 | 7.7 | 1.6 | 27 | 27 | 1.9 |
| MIN | .22 | .41 | .22 | .22 | .57 | .46 | .51 | .51 | .28 | .32 | .41 | .30 |
| AC-FT | 249 | 70 | 22 | 114 | 104 | 83 | 100 | 99 | 29 | 232 | 163 | 32 |

CAL YR 1968: TOTAL 534.72 MEAN 1.46 MAX 26 MIN .15 AC-FT 1,060
WTR YR 1969: TOTAL 653.51 MEAN 1.79 MAX 27 MIN .22 AC-FT 1,300

PEAK DISCHARGE (BASE, 78 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-16 | 0930 | 3.07 | 99 | 7- 5 | 2200 | 3.11 | 109 |
| 10-22 | /2230 | 3.38 | 193 | 7-18 | 0600 | 3.00 | 83 |

/ About.
NOTE.--No gage-height record Oct. 21-23.

SAMOA ISLANDS, ISLAND OF TUTUILA

16-9205. Aasu Stream at Aasu

LOCATION.--Lat 14°17'51" S., long 170°45'30" W., Tutuila, on right bank at Aasu and 200 ft upstream from mouth.

DRAINAGE AREA.--1.03 sq mi.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

EXTREMES.--Current year: Maximum discharge, 336 cfs Oct. 22 (gage height, 4.44 ft), from rating curve extended as explained below; minimum, 0.94 cfs Jan. 1.
Period of record: Maximum discharge, 392 cfs Aug. 10, 1962 (gage height, 4.72 ft), from rating curve extended above 18 cfs on basis of slope-area measurement at gage height 4.57 ft; minimum, 0.50 cfs Sept. 29 to Oct. 1, 1961.

REMARKS.--Records good except those for period of no gage-height record, which are poor. Samll diversion above station for domestic use. Recording rain gage located at station.

REVISIONS.--WSP 1937: Drainage area. Published records for high-water periods in the water years 1959-66 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.4 | 11 | 1.8 | 1.1 | 6.7 | 8.0 | 20 | 7.0 | 1.9 | 1.6 | 3.8 | 11 |
| 2 | 1.2 | 9.0 | 3.7 | 1.2 | 5.8 | 7.3 | 10 | 6.0 | 1.8 | 1.5 | 3.3 | 8.3 |
| 3 | 2.3 | 8.0 | 2.2 | 3.4 | 5.2 | 6.4 | 6.0 | 5.0 | 1.7 | 2.0 | 3.1 | 7.3 |
| 4 | 21 | 7.0 | 2.4 | 1.5 | 5.0 | 6.1 | 5.0 | 4.5 | 1.6 | 1.6 | 2.9 | 6.4 |
| 5 | 7.0 | 8.8 | 1.6 | 3.1 | 5.2 | 8.1 | 4.5 | 4.5 | 2.0 | 4.2 | 2.7 | 6.1 |
| 6 | 4.7 | 6.7 | 1.5 | 2.6 | 4.5 | 7.7 | 4.0 | 5.0 | 1.8 | 8.6 | 2.4 | 6.4 |
| 7 | 4.8 | 6.1 | 4.8 | 1.8 | 3.8 | 5.5 | 3.5 | 4.0 | 1.7 | 4.7 | 2.2 | 5.5 |
| 8 | 8.1 | 6.7 | 2.4 | 1.8 | 10 | 4.0 | 3.0 | 3.5 | 1.6 | 3.3 | 2.2 | 5.8 |
| 9 | 4.7 | 5.2 | 2.0 | 3.3 | 10 | 3.0 | 2.5 | 3.0 | 1.5 | 2.9 | 2.7 | 4.7 |
| 10 | 4.0 | 4.5 | 4.5 | 4.0 | 9.0 | 2.5 | 2.0 | 2.5 | 1.4 | 2.7 | 2.2 | 4.2 |
| 11 | 3.5 | 4.0 | 3.3 | 13 | 7.7 | 5.0 | 7.0 | 3.0 | 1.3 | 2.7 | 2.0 | 4.0 |
| 12 | 3.3 | 6.8 | 3.8 | 9.3 | 13 | 4.0 | 3.5 | 4.0 | 1.2 | 3.1 | 1.8 | 3.5 |
| 13 | 3.5 | 4.7 | 2.7 | 9.0 | 10 | 3.0 | 2.5 | 6.0 | 1.4 | 7.8 | 2.6 | 3.3 |
| 14 | 4.3 | 6.5 | 2.2 | 8.3 | 12 | 2.8 | 2.0 | 10 | 1.3 | 12 | 5.0 | 3.1 |
| 15 | 8.9 | 4.2 | 1.8 | 7.3 | 9.6 | 2.6 | 1.8 | 20 | 1.2 | 13 | 30 | 3.3 |
| 16 | 35 | 3.8 | 1.4 | 6.4 | 7.7 | 2.4 | 5.0 | 10 | 1.5 | 16 | 23 | 2.9 |
| 17 | 12 | 6.1 | 1.6 | 5.5 | 7.3 | 2.2 | 7.0 | 8.0 | 1.3 | 47 | 17 | 2.6 |
| 18 | 8.6 | 5.0 | 1.8 | 5.0 | 7.0 | 2.0 | 5.0 | 7.0 | 5.0 | 34 | 16 | 2.6 |
| 19 | 7.7 | 4.0 | 1.5 | 15 | 6.4 | 10 | 4.5 | 6.0 | 2.0 | 25 | 12 | 2.4 |
| 20 | 8.0 | 3.3 | 1.4 | 17 | 5.8 | 4.0 | 4.0 | 5.0 | 1.4 | 18 | 10 | 2.2 |
| 21 | 23 | 2.9 | 1.2 | 9.3 | 6.1 | 10 | 4.5 | 4.5 | 1.3 | 17 | 9.0 | 2.0 |
| 22 | 38 | 2.6 | 1.4 | 11 | 8.6 | 15 | 5.0 | 4.0 | 1.2 | 13 | 8.0 | 2.0 |
| 23 | 38 | 2.4 | 1.2 | 9.3 | 12 | 10 | 6.0 | 3.5 | 2.5 | 11 | 8.3 | 1.8 |
| 24 | 30 | 2.4 | 1.5 | 7.7 | 17 | 7.0 | 5.0 | 3.0 | 2.0 | 9.0 | 6.7 | 1.6 |
| 25 | 27 | 2.2 | 1.5 | 6.7 | 12 | 6.0 | 40 | 2.5 | 1.6 | 8.3 | 6.1 | 1.6 |
| 26 | 29 | 2.0 | 1.2 | 6.1 | 10 | 5.0 | 20 | 2.3 | 1.3 | 7.7 | 6.1 | 1.5 |
| 27 | 44 | 1.8 | 1.2 | 5.5 | 9.3 | 4.5 | 15 | 2.2 | 1.2 | 6.7 | 8.0 | 1.4 |
| 28 | 27 | 1.8 | 1.2 | 6.7 | 9.0 | 4.0 | 10 | 2.1 | 1.2 | 5.8 | 12 | 1.5 |
| 29 | 19 | 2.2 | 1.2 | 5.2 | ------ | 3.5 | 9.0 | 2.0 | 3.2 | 5.5 | 7.7 | 1.4 |
| 30 | 15 | 2.0 | 1.2 | 12 | ------ | 4.0 | 8.0 | 2.0 | 2.6 | 5.8 | 7.7 | 1.6 |
| 31 | 13 | ------ | 1.1 | 8.6 | ------ | 5.0 | ------ | 2.0 | ------ | 4.5 | 7.0 | ------ |
| TOTAL | 457.0 | 143.7 | 62.3 | 207.7 | 235.7 | 170.6 | 225.3 | 154.1 | 52.7 | 306.0 | 233.5 | 112.0 |
| MEAN | 14.7 | 4.79 | 2.01 | 6.70 | 8.42 | 5.50 | 7.51 | 4.97 | 1.76 | 9.87 | 7.53 | 3.73 |
| MAX | 44 | 11 | 4.8 | 17 | 17 | 15 | 40 | 20 | 5.0 | 47 | 30 | 11 |
| MIN | 1.2 | 1.8 | 1.1 | 1.1 | 3.8 | 2.0 | 1.8 | 2.0 | 1.2 | 1.5 | 1.8 | 1.4 |
| AC-FT | 906 | 285 | 124 | 412 | 468 | 338 | 447 | 306 | 105 | 607 | 463 | 222 |

CAL YR 1968: TOTAL 2,247.27 MEAN 6.14 MAX 60 MIN .70 AC-FT 4,460
WTR YR 1969: TOTAL 2,360.6 MEAN 6.47 MAX 47 MIN 1.1 AC-FT 4,680

PEAK DISCHARGE (BASE, 120 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-16 | 0630 | 3.63 | 200 | 4-25 | /0800 | //3.36 | 159 |
| 10-22 | 2230 | 4.44 | 336 | 7-17 | 1100 | 3.57 | 190 |

/ About.
// From recorded range in stage.
NOTE.--No gage-height record Mar. 8 to June 26.

## 16-9310. Atauloma Stream at Afao

LOCATION.--Lat 14°20'10" S., long 170°48'02" W., Tutuila, on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

DRAINAGE AREA.--0.24 sq mi.

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

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

EXTREMES.--Current year: Maximum discharge, 254 cfs Mar. 18 (gage height, 3.02 ft), from rating curve extended above 9.2 cfs; minimum, 0.29 cfs Oct. 1-3.
Period of record: Maximum discharge, 605 cfs Aug. 10, 1967 (gage height, 3.99 ft), from rating curve extended above 9.2 cfs; minimum, 0.06 cfs Oct. 21, 1963.

REMARKS.--Records good except those for period of no gage-height record, which are poor. About 10,000 gal per day diverted above station for use at Atauloma School. Recording rain gage located at station. Records of chemical analyses for the water year 1969 are published in Part 2 of this report.

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .29 | 1.7 | .43 | .35 | 1.3 | 1.4 | 5.0 | 2.5 | 1.2 | .60 | .60 | 3.8 |
| 2 | .29 | 1.4 | .60 | .40 | 1.1 | 1.3 | 3.0 | 2.0 | .65 | .51 | .60 | 1.9 |
| 3 | .77 | 1.3 | .47 | .50 | .94 | 1.2 | 2.5 | 1.8 | .60 | .80 | .55 | 1.3 |
| 4 | 4.8 | 1.2 | .43 | .90 | .94 | 1.1 | 2.0 | 1.6 | .60 | .70 | .55 | 1.3 |
| 5 | 1.3 | 2.0 | .39 | .60 | 82 | 1.9 | 1.8 | 1.5 | .65 | .75 | .55 | 1.0 |
| 6 | .76 | 1.3 | .39 | .50 | .76 | 1.3 | 1.6 | 2.0 | .65 | 1.6 | .51 | 1.1 |
| 7 | 1.1 | 1.2 | .47 | .60 | .70 | 1.9 | 1.5 | 1.0 | .70 | .82 | .51 | .88 |
| 8 | 4.5 | 1.1 | .47 | .56 | 3.6 | 1.5 | 1.3 | .94 | .76 | .55 | .51 | 1.0 |
| 9 | 1.3 | .88 | .43 | 6.0 | 2.6 | 1.2 | 1.2 | .88 | .88 | .47 | .55 | .76 |
| 10 | .88 | .88 | 2.3 | 2.2 | 2.1 | 1.0 | 1.1 | .82 | .88 | .43 | .51 | .70 |
| 11 | .76 | .82 | .94 | 5.1 | 1.8 | 1.8 | 4.5 | .94 | 1.0 | .47 | .47 | .60 |
| 12 | .65 | 1.6 | .94 | 2.8 | 2.3 | 1.2 | 3.0 | 1.0 | 1.0 | .47 | .47 | .60 |
| 13 | .70 | .94 | .55 | 2.7 | 3.2 | 1.0 | 2.5 | 1.2 | 1.6 | 1.7 | .55 | .55 |
| 14 | .60 | 1.5 | .51 | 1.7 | 3.9 | 1.6 | 2.0 | 2.1 | 1.6 | 1.5 | 1.5 | .55 |
| 15 | 3.1 | .94 | .47 | 1.2 | 2.3 | 2.5 | 1.8 | 3.3 | 1.7 | 1.7 | 15 | .67 |
| 16 | 12 | 1.0 | .43 | 1.1 | 1.8 | 1.5 | 3.0 | 2.2 | 1.6 | 5.1 | 3.0 | .51 |
| 17 | 2.3 | 1.7 | .64 | 1.0 | 1.7 | 1.5 | 4.0 | 1.4 | 1.5 | 15 | 1.7 | .43 |
| 18 | 1.5 | 1.3 | .75 | .84 | 8.3 | 14 | 3.0 | 1.8 | 1.9 | 8.5 | 1.8 | .43 |
| 19 | 1.4 | .94 | .47 | 16 | 2.0 | 3.0 | 2.0 | 4.2 | .98 | 3.6 | 1.3 | .43 |
| 20 | 2.5 | .82 | .43 | 5.6 | 1.5 | 1.9 | 1.5 | 1.5 | .55 | 2.1 | 1.0 | .43 |
| 21 | 11 | .76 | .39 | 2.1 | 1.7 | 1.6 | 2.0 | 1.1 | .51 | 2.1 | .82 | .43 |
| 22 | 9.7 | .65 | .43 | 2.1 | 4.1 | 2.6 | 3.0 | .94 | .75 | 1.5 | .76 | .43 |
| 23 | 5.5 | .60 | .35 | 1.9 | 4.3 | 1.6 | 4.5 | .82 | 1.0 | 1.2 | .88 | .43 |
| 24 | 7.5 | .60 | .43 | 1.3 | 3.6 | 1.3 | 4.0 | .82 | .70 | 1.1 | .70 | .39 |
| 25 | 6.5 | .60 | .47 | 1.1 | 4.3 | 1.2 | 15 | .76 | .65 | .94 | .65 | .39 |
| 26 | 7.0 | .55 | .39 | 1.1 | 2.1 | 1.1 | 8.0 | .70 | .55 | .88 | 1.2 | .39 |
| 27 | 12 | .51 | .35 | .88 | 2.1 | 2.8 | 6.0 | .65 | .51 | .76 | 2.4 | .39 |
| 28 | 5.3 | .47 | .52 | 3.0 | 1.9 | 3.7 | 4.5 | .60 | .47 | .70 | 1.7 | .43 |
| 29 | 3.3 | .51 | .61 | 1.3 | ------ | 1.7 | 3.5 | .60 | .93 | .70 | 1.8 | .39 |
| 30 | 2.2 | .47 | .47 | 4.0 | ------ | 2.0 | 3.0 | .60 | .76 | .76 | 1.9 | .39 |
| 31 | 2.0 | ------ | .40 | 2.1 | ------ | 2.5 | ------ | .60 | ------ | .65 | 2.1 | ------ |
| TOTAL | 113.50 | 30.24 | 17.32 | 71.53 | 67.76 | 65.9 | 101.8 | 42.87 | 27.83 | 58.66 | 47.14 | 23.00 |
| MEAN | 3.66 | 1.01 | .56 | 2.31 | 2.42 | 2.13 | 3.39 | 1.38 | .93 | 1.89 | 1.52 | .77 |
| MAX | 12 | 2.0 | 2.3 | 16 | 8.3 | 14 | 15 | 4.2 | 1.9 | 15 | 15 | 3.8 |
| MIN | .29 | .47 | .35 | .35 | .70 | 1.0 | 1.1 | .60 | .47 | .43 | .47 | .39 |
| AC-FT | 225 | 60 | 34 | 142 | 134 | 131 | 202 | 85 | 55 | 116 | 94 | 46 |

CAL YR 1968: TOTAL 519.25 MEAN 1.42 MAX 14 MIN .20 AC-FT 1,030
WTR YR 1969: TOTAL 667.55 MEAN 1.83 MAX 16 MIN .29 AC-FT 1,320

PEAK DISCHARGE (BASE, 110 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 1-19 | 1800 | 2.63 | 163 | 7-17 | 0700 | 2.43 | 127 |
| 3-18 | 1300 | 3.02 | 254 | | | | |

NOTE.--No gage-height record Mar. 30 to May 6.

SAMOA ISLANDS, ISLAND OF TUTUILA

16-9442. Papa Stream at Nuuuli

LOCATION.--Lat 14°18'48" S., long 170°42'33" W., Tutuila, on right bank 500 ft downstream from Tauese Stream and 0.8 mile northwest of Nuuuli.

DRAINAGE AREA.--0.78 sq mi.

PERIOD OF RECORD.--June 1966 to September 1967, November 1968 to current year.

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

EXTREMES.--Maximum discharge during period November 1968 to September 1969, 258 cfs July 17 (gage height, 2.76 ft), from rating curve extended as explained below; no flow many days.
Period of record: Maximum discharge, 465 cfs Aug. 10, 1967 (gage height, 3.31 ft), from rating curve extended as explained below; no flow many days each year.
Flood of Oct. 9, 1967, reached a stage of 3.32 ft, from floodmarks (discharge, 470 cfs, from rating curve extended above 66 cfs on basis of flow-over-road measurement of peak flow).

REMARKS.--Records poor. Diversion by frequent pumping from gage pool for domestic use in the Nuuuli area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 8.0 | 0 | 0 | 1.6 | 3.0 | 12 | 3.0 | .50 | 0 | .25 | 8.8 |
| 2 | | 5.0 | .64 | 0 | .48 | .98 | 4.7 | 1.8 | 0 | 0 | 0 | 3.0 |
| 3 | | 3.3 | 0 | 0 | .53 | .40 | 2.8 | 2.2 | 0 | .31 | 0 | 1.7 |
| 4 | | 2.8 | .65 | 0 | .15 | .53 | 1.8 | 1.8 | 0 | .34 | 0 | 1.5 |
| 5 | | 6.2 | 0 | 0 | 0 | 5.3 | 1.9 | 1.8 | .40 | 16 | 0 | 1.5 |
| 6 | | 4.8 | 0 | 0 | .17 | 4.0 | 3.7 | 5.3 | 0 | 6.6 | 0 | 1.6 |
| 7 | | 6.0 | .40 | 0 | .27 | 7.1 | 1.5 | 2.8 | 0 | 1.3 | 0 | 1.4 |
| 8 | | 8.2 | 0 | 0 | 8.1 | 6.2 | 7.5 | 2.0 | 0 | 0 | 0 | 1.2 |
| 9 | | 5.6 | 0 | 13 | 4.5 | 4.2 | 4.5 | .98 | 0 | 0 | 0 | 1.2 |
| 10 | | 4.5 | 11 | 6.5 | 17 | 3.8 | 2.0 | .67 | 0 | 0 | 0 | 1.4 |
| 11 | | 3.0 | 2.0 | 15 | 4.1 | 3.5 | 2.3 | .81 | 0 | 0 | 0 | 1.0 |
| 12 | | 7.6 | 3.0 | 14 | 3.0 | 6.2 | 1.8 | 2.0 | 0 | 0 | 0 | .96 |
| 13 | | 5.9 | 2.0 | 7.8 | 5.6 | 4.0 | 3.0 | 3.1 | 0 | 1.9 | 0 | .71 |
| 14 | | 10 | .69 | 4.5 | 5.4 | 2.8 | 2.2 | 5.0 | 0 | 2.4 | .35 | .64 |
| 15 | | 4.8 | 0 | 3.0 | 3.3 | 3.3 | 2.6 | 11 | 0 | 1.8 | 8.0 | .64 |
| 16 | | 4.9 | 0 | .84 | 3.7 | 1.7 | 2.8 | 6.8 | 0 | 12 | 1.5 | .29 |
| 17 | | 10 | 0 | 0 | 6.2 | .98 | 2.8 | 3.8 | 0 | 42 | .70 | .03 |
| 18 | | 7.5 | 0 | 0 | 4.0 | .82 | 3.0 | 6.1 | 1.1 | 14 | .80 | 0 |
| 19 | | 5.6 | 0 | 17 | 2.2 | 1.2 | 2.6 | 4.2 | .66 | 3.0 | .70 | 0 |
| 20 | | 4.8 | 0 | 9.3 | 2.0 | .67 | 2.2 | 2.6 | 0 | .55 | .57 | 0 |
| 21 | | 4.5 | 0 | 2.6 | 1.0 | 5.7 | 8.9 | 1.5 | 0 | .59 | .57 | 0 |
| 22 | | 4.0 | .68 | 9.6 | 4.1 | 9.5 | 12 | 1.2 | 0 | 0 | .50 | 0 |
| 23 | | 2.8 | 0 | 4.6 | 12 | 9.4 | 9.7 | 1.3 | 3.0 | 0 | 1.4 | 0 |
| 24 | /8.4 | 2.4 | .24 | 1.7 | 12 | 5.0 | 4.5 | .98 | 0 | 0 | .87 | 0 |
| 25 | | 2.6 | .12 | 1.2 | 7.0 | 5.6 | 26 | .67 | 0 | 0 | .87 | 0 |
| 26 | | 2.2 | 0 | .40 | 4.2 | 5.5 | 13 | .26 | 0 | 0 | .96 | 0 |
| 27 | | .77 | 0 | .27 | 4.0 | 5.8 | 7.8 | .15 | 0 | 0 | 6.1 | 0 |
| 28 | | 0 | .38 | 1.1 | 4.2 | 5.3 | 4.8 | .53 | 0 | 0 | 13 | 0 |
| 29 | | 1.3 | 0 | 0 | ------ | 2.2 | 3.5 | .26 | .87 | .98 | 16 | 0 |
| 30 | | .34 | 0 | 17 | ------ | 11 | 2.8 | 0 | 0 | 1.3 | 4.5 | 0 |
| 31 | | ------ | 0 | 6.8 | ------ | 9.0 | ------ | 0 | ------ | .50 | 2.4 | ------ |
| TOTAL | | 139.41 | 21.80 | 136.21 | 120.80 | 134.68 | 160.7 | 75.61 | 6.53 | 105.57 | 60.04 | 27.57 |
| MEAN | | 4.65 | .70 | 4.39 | 4.31 | 4.34 | 5.36 | 2.44 | .22 | 3.41 | 1.94 | .92 |
| MAX | | 10 | 11 | 17 | 17 | 11 | 26 | 11 | 3.0 | 42 | 16 | 8.8 |
| MIN | | 0 | 0 | 0 | 0 | .40 | 1.5 | 0 | 0 | 0 | 0 | 0 |
| AC-FT | | 277 | 43 | 270 | 240 | 267 | 319 | 150 | 13 | 209 | 119 | 55 |

CAL YR 1968: TOTAL - MEAN - MAX - MIN - AC-FT -
WTR YR 1969: TOTAL - MEAN - MAX - MIN - AC-FT -

PEAK DISCHARGE (BASE, 180 CFS).--July 17 (1030) 258 cfs (2.76 ft); Aug. 29 (1930) 255 cfs (2.75 ft).

/ Result of discharge measurement.

## 16-9480. Afuelo Stream at Matuu

LOCATION.--Lat 14°18'07" S., long 170°41'07" W., Tutuila, on left bank 0.2 mile northwest of Matuu and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.25 sq mi.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as Matuu Stream at Matuu.

GAGE.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 174 cfs Oct. 22 (gage height, 3.19 ft), from rating curve extended as explained below; minimum, 0.14 cfs Oct. 2, 3.
Period of record: Maximum discharge, 490 cfs Oct. 9, 1967 (gage height, 4.55 ft), from rating curve extended above 8.4 cfs on basis of slope-area measurement of peak flow; minimum, 0.09 cfs Oct. 14, 15, 1965.

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

REVISIONS.--WSP 1937: Drainage area. Published records for high-water periods in the water year 1958-66 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .16 | 2.1 | .36 | .30 | 1.3 | 1.3 | 8.0 | .80 | .42 | .33 | .46 | 7.9 |
| 2 | .14 | 1.1 | .42 | .36 | 1.0 | .98 | 3.0 | .70 | .39 | .30 | .39 | 3.0 |
| 3 | .16 | .92 | .39 | .36 | .86 | .81 | 1.5 | .66 | .36 | .66 | .36 | 1.5 |
| 4 | 1.4 | .86 | .71 | .68 | .76 | .66 | 1.0 | .64 | .36 | .99 | .36 | 1.2 |
| 5 | .93 | 1.7 | .36 | .53 | .92 | 2.8 | .80 | .62 | .55 | 9.6 | .36 | .98 |
| 6 | .39 | 1.1 | .30 | .46 | .62 | 2.0 | .70 | 1.2 | .50 | 4.9 | .33 | .86 |
| 7 | 1.3 | .98 | .36 | .57 | .58 | 1.2 | .60 | .90 | .36 | 1.2 | .30 | .81 |
| 8 | 4.7 | 2.0 | .30 | .54 | 3.9 | 1.2 | .54 | .80 | .36 | .71 | .27 | .58 |
| 9 | .76 | 1.1 | .24 | 6.4 | 3.4 | .86 | .50 | .70 | .36 | .54 | .33 | .54 |
| 10 | .42 | .81 | 5.1 | 3.1 | 5.5 | .71 | .48 | .60 | .33 | .42 | .33 | .54 |
| 11 | .33 | .58 | .98 | 5.9 | 1.9 | 1.3 | 2.5 | .70 | .30 | .36 | .21 | .46 |
| 12 | .57 | 1.6 | 1.6 | 4.3 | 1.6 | 2.3 | 1.5 | .90 | .27 | .33 | .24 | .42 |
| 13 | .63 | 1.0 | 1.0 | 3.4 | 2.3 | .98 | 1.0 | 1.5 | .27 | 1.9 | .36 | .42 |
| 14 | .50 | 3.1 | .71 | 2.0 | 1.4 | .71 | .80 | 3.0 | .30 | 2.8 | 1.4 | .39 |
| 15 | 6.2 | 1.2 | .46 | 1.2 | 1.0 | .81 | .70 | 5.0 | .27 | 2.8 | 9.2 | .49 |
| 16 | 16 | 1.1 | .39 | 1.2 | 1.2 | .62 | 1.0 | 2.6 | .24 | 7.4 | 1.5 | .30 |
| 17 | 2.0 | 3.1 | .50 | 1.2 | 1.5 | .54 | 2.0 | 1.3 | .24 | 19 | .92 | .27 |
| 18 | 1.1 | 1.9 | .46 | .86 | 1.1 | .58 | 1.0 | 2.0 | .62 | 8.0 | 1.2 | .24 |
| 19 | .86 | 1.1 | .42 | 7.8 | .76 | .58 | .80 | 1.3 | .80 | 2.5 | .62 | .21 |
| 20 | .76 | .81 | .39 | 5.1 | .76 | .46 | .70 | .98 | .36 | 1.5 | .46 | .18 |
| 21 | 1.8 | .66 | .36 | 1.5 | 1.1 | 2.4 | .90 | .76 | .33 | 2.9 | .63 | .21 |
| 22 | 14 | .58 | .42 | 4.9 | 3.2 | 1.8 | 1.5 | .66 | .30 | 1.5 | .42 | .21 |
| 23 | 6.1 | .46 | .39 | 2.7 | 4.7 | 2.1 | 3.0 | .62 | 1.1 | .92 | 1.3 | .21 |
| 24 | 5.6 | .39 | .39 | 1.2 | 4.0 | 1.2 | 2.5 | .58 | .54 | .76 | .92 | .21 |
| 25 | 5.2 | .39 | .42 | .92 | 2.3 | 1.4 | 15 | .54 | .42 | .66 | .62 | .18 |
| 26 | 10 | .36 | .33 | .92 | 2.6 | 1.2 | 5.0 | .50 | .33 | .58 | .58 | .18 |
| 27 | 17 | .33 | .30 | .86 | 1.5 | .80 | 2.0 | .42 | .30 | .50 | 3.0 | .21 |
| 28 | 4.0 | .33 | .42 | 1.2 | 2.5 | .60 | 1.5 | .42 | .24 | .42 | 6.7 | .21 |
| 29 | 2.0 | .36 | .33 | .92 | ------ | .50 | 1.0 | .42 | .79 | .50 | 11 | .21 |
| 30 | 1.4 | .39 | .36 | 10 | ------ | .70 | .90 | .39 | .50 | .69 | 4.4 | .24 |
| 31 | 1.4 | ------ | .33 | 2.4 | ------ | 1.0 | ------ | .39 | ------ | .54 | 1.9 | ------ |
| TOTAL | 107.81 | 32.41 | 19.50 | 73.78 | 54.26 | 35.10 | 62.42 | 32.60 | 12.51 | 76.21 | 51.07 | 23.36 |
| MEAN | 3.48 | 1.08 | .63 | 2.38 | 1.94 | 1.13 | 2.08 | 1.05 | .42 | 2.46 | 1.65 | .78 |
| MAX | 17 | 3.1 | 5.1 | 10 | 5.5 | 2.8 | 15 | 5.0 | 1.1 | 19 | 11 | 7.9 |
| MIN | .14 | .33 | .24 | .30 | .58 | .46 | .48 | .39 | .24 | .30 | .21 | .18 |
| AC-FT | 214 | 64 | 39 | 146 | 108 | 70 | 124 | 65 | 25 | 151 | 101 | 46 |

CAL YR 1968: TOTAL 538.05 MEAN 1.47 MAX 28 MIN .14 AC-FT 1,070
WTR YR 1969: TOTAL 581.03 MEAN 1.59 MAX 19 MIN .14 AC-FT 1,150

PEAK DISCHARGE (BASE, 95 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-22 | 2130 | 3.19 | 174 | 7-5 | 2100 | 2.73 | 110 |
| 10-27 | 0300 | 2.61 | 96 | 8-29 | 2000 | 2.78 | 116 |

NOTE.--No gage-height record Mar. 27 to May 15.

## 16-9600. Alega Stream at Alega

LOCATION.--Lat 14°16'58" S., long 170°38'19" W., Tutuila, on left bank 300 ft upstream from unnamed tributary, 0.2 mile northwest of Alega, and 0.3 mile upstream from mouth.

DRAINAGE AREA.--0.19 sq mi.

PERIOD OF RECORD.--March 1958 to current year. Prior to July 1960, published as West Branch Alega Stream at Alega.

GAGE.--Water-stage recorder. Altitude of gage is 180 ft (from topographic map).

EXTREMES.--Current year: Maximum discharge, 109 cfs Oct. 22 (gage height, 3.42 ft), from rating curve extended above 5.3 cfs; minimum, 0.40 cfs Oct. 3, 6, 7.
Period of record: Maximum discharge, 132 cfs Aug. 11, 1967 (gage height, 3.65 ft), from rating curve extended above 5.3 cfs; minimum, 0.30 cfs Aug. 17, 1968.

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

REVISIONS.--WSP 1937: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .50 | 1.5 | .65 | .52 | 1.2 | 1.0 | 2.9 | 1.6 | .86 | .48 | .65 | 11 |
| 2 | .48 | 1.2 | .60 | .52 | .98 | .90 | 1.4 | 1.4 | .80 | .44 | .60 | 3.8 |
| 3 | .50 | 1.1 | .60 | .56 | .86 | .80 | 1.0 | 1.3 | .75 | .52 | .60 | 2.3 |
| 4 | .48 | 1.0 | .60 | .52 | .75 | .70 | .98 | 1.1 | .75 | .56 | .60 | 1.8 |
| 5 | .48 | .90 | .60 | .66 | .75 | .66 | .86 | 1.0 | .80 | 6.5 | .60 | 1.6 |
| 6 | .40 | 1.2 | .56 | .52 | .70 | .98 | .80 | .98 | .80 | 4.4 | .60 | 1.4 |
| 7 | .66 | 1.1 | .56 | .48 | .70 | .80 | .75 | .98 | .75 | 1.4 | .60 | 1.4 |
| 8 | .75 | 1.9 | .56 | .48 | .80 | .80 | .98 | .92 | .75 | 1.0 | .60 | 1.2 |
| 9 | .48 | 1.2 | .56 | 1.4 | 1.0 | .75 | .80 | .92 | .75 | .86 | .70 | 1.1 |
| 10 | .44 | .98 | .56 | 1.3 | 2.0 | .75 | .75 | .86 | .75 | .80 | .70 | 1.1 |
| 11 | .44 | .65 | .56 | 2.9 | 1.0 | .80 | 2.0 | .80 | .65 | .75 | .60 | 1.0 |
| 12 | .56 | 1.8 | .60 | 1.6 | 1.4 | .92 | 1.5 | .90 | .65 | .70 | .54 | 1.0 |
| 13 | .44 | 1.0 | .56 | 1.5 | 2.0 | .75 | 1.3 | 1.0 | .70 | 1.2 | .60 | 1.0 |
| 14 | .44 | .92 | .60 | 1.0 | 1.5 | .70 | 1.1 | 3.0 | .65 | 1.8 | 1.0 | .98 |
| 15 | 1.5 | .80 | .56 | .80 | 1.0 | .86 | .90 | 10 | .65 | 1.6 | 4.0 | .98 |
| 16 | 4.4 | .80 | .52 | .75 | .90 | .70 | .80 | 2.4 | .70 | 1.5 | 1.5 | .92 |
| 17 | 1.2 | 1.2 | .56 | .70 | .80 | .65 | 2.6 | 1.5 | .60 | 5.3 | .90 | .92 |
| 18 | .75 | 1.3 | .52 | .65 | .70 | .65 | 2.8 | 1.1 | .98 | 3.8 | .86 | .86 |
| 19 | .70 | 1.0 | .52 | 3.0 | .60 | .70 | 3.2 | 1.0 | .75 | 2.6 | .80 | .86 |
| 20 | .73 | .86 | .52 | 2.5 | .60 | .70 | 3.0 | 1.0 | .56 | 1.7 | .75 | .80 |
| 21 | .80 | .75 | .52 | 1.0 | .70 | 1.8 | 3.7 | .98 | .56 | 1.6 | .75 | .80 |
| 22 | 6.7 | .75 | .60 | 1.8 | 1.0 | 2.9 | 4.7 | .98 | .56 | 1.3 | .75 | .78 |
| 23 | 5.1 | .75 | .56 | 1.6 | 2.0 | 1.3 | 4.4 | .98 | .75 | 1.1 | .86 | .76 |
| 24 | 4.0 | .70 | .56 | .98 | 1.5 | 1.2 | 4.0 | .92 | .60 | .98 | .75 | .74 |
| 25 | 2.0 | .65 | .56 | .80 | 1.0 | .98 | 9.8 | .92 | .65 | .92 | .75 | .72 |
| 26 | 3.0 | .65 | .52 | .80 | 1.0 | 1.2 | 5.0 | .9 | .60 | .86 | .75 | .70 |
| 27 | 6.0 | .65 | .52 | .75 | 2.0 | .92 | 3.0 | .86 | .56 | .80 | 1.9 | .70 |
| 28 | 2.0 | .65 | .52 | .75 | 1.5 | .80 | 2.3 | .82 | .52 | .75 | 2.0 | .80 |
| 29 | 1.5 | .65 | .52 | .65 | ------ | .80 | 2.1 | .80 | .75 | .75 | 2.7 | .70 |
| 30 | 1.0 | .65 | .52 | 3.3 | ------ | 1.4 | 1.8 | .80 | .60 | .70 | 2.6 | .70 |
| 31 | 1.2 | ------ | .52 | 1.5 | ------ | 3.0 | ------ | .86 | ------ | .65 | 4.2 | ------ |
| TOTAL | 49.63 | 29.26 | 17.29 | 36.29 | 30.94 | 31.87 | 71.22 | 43.58 | 20.80 | 48.32 | 35.81 | 43.42 |
| MEAN | 1.60 | .98 | .56 | 1.17 | 1.10 | 1.03 | 2.37 | 1.41 | .69 | 1.56 | 1.16 | 1.45 |
| MAX | 6.7 | 1.9 | .65 | 3.3 | 2.0 | 3.0 | 9.8 | 10 | .98 | 6.5 | 4.2 | 11 |
| MIN | .40 | .65 | .52 | .48 | .60 | .65 | .75 | .80 | .52 | .44 | .54 | .70 |
| AC-FT | 98 | 58 | 34 | 72 | 61 | 63 | 141 | 86 | 41 | 96 | 71 | 86 |

CAL YR 1968: TOTAL 433.48 MEAN 1.18 MAX 14 MIN .30 AC-FT 860
WTR YR 1969: TOTAL 458.43 MEAN 1.26 MAX 11 MIN .40 AC-FT 909

PEAK DISCHARGE (BASE, 42 CFS)

| DATE | TIME | G.HT. | DISCHARGE | DATE | TIME | G.HT. | DISCHARGE |
|---|---|---|---|---|---|---|---|
| 10-22 | 2130 | 3.42 | 109 | 7- 5 | 2300 | 2.63 | 50 |
| 4-25 | 0900 | 2.71 | 55 | 8- 31 | 2330 | 2.84 | 63 |

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

## Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1969

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | **Hawaii, Island of Kauai** | | | | |
| 16-0110 | Waiakoali Stream near Waimea | Lat 22°07'25", long 159°37'25", Kauai, 0.3 mile upstream from mouth and 12 miles northeast of Waimea. | 1.7 | 1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-69 | 4-21-69 | 1.1 |
| 16-0120 | Kauaikinana Stream near Waimea | Lat 22°07'45", long 159°38'05", Kauai, 0.6 mile upstream from mouth and 12 miles northeast of Waimea. | 1.17 | 1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-69 | 4-21-69 | 1.8 |
| 16-0295 | Mokihana Stream near Waimea | Lat 21°59'35", long 159°40'03", Kauai, 500 ft upstream from mouth and 2.5 miles north of Waimea. | 4.77 | 1962, 1964-69 | 5- 1-69 | 1.7 |
| | | **Hawaii, Island of Oahu** | | | | |
| 16-2010 | Right Branch of North Fork Kaukonahua Stream near Wahiawa | Lat 21°31'10", long 157°56'52", Oahu, 200 ft upstream from mouth and 4.5 miles east of Leilehua High School in Wahiawa. | 1.17 | 1913-53≠, 1960-62, 1966, 1968-69 | 2-12-69<br>6-17-69<br>8- 7-69 | 5.6<br>1.2<br>3.7 |
| 16-2838 | Waihee Stream at altitude 260 ft, near Heeia | Lat 21°26'57", long 157°51'55", Oahu, 325 ft downstream from confluence of North and South Forks, 2.7 miles southwest of Waiahole School, and 3.7 miles northwest of Heeia. | .31 | 1961-66≠, 1969 | 11-21-68 | 3.8 |
| | | **Hawaii, Island of Molokai** | | | | |
| 16-4034 | Kapuhi Stream at altitude 1,000 ft, near Pelekunu | Lat 21°07'50", long 156°53'02", Molokai, 500 ft upstream from Kawailena Stream, 2.2 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo. | .51 | 1968-69 | 10-23-68<br>1-15-69<br>3-19-69<br>5-21-69<br>6-25-69<br>8-20-69 | .65<br>2.9<br>6.2<br>1.6<br>.92<br>1.5 |
| 16-4035 | Kawailena Stream near Pelekunu | Lat 21°07'52", long 156°53'05", Molokai, 800 ft upstream from mouth, 2.2 miles south of former village of Pelekunu, and 5.5 miles north of Kamalo. | .65 | 1968-69 | 10-23-68<br>1-15-69<br>3-19-69<br>5-21-69<br>6-25-69<br>8-20-69 | 1.3<br>3.7<br>5.7<br>2.3<br>1.9<br>2.1 |
| 16-4037 | Kawainui Stream at altitude 1,000 ft, near Pelekunu | Lat 21°07'46", long 156°52'31", Molokai, 400 ft upstream from Kawaipaka Stream, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo. | .79 | 1968-69 | 10-23-68<br>1-14-69<br>5-20-69<br>6-24-69<br>8-19-69 | 2.0<br>5.1<br>3.1<br>1.4<br>6.1 |

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | **Hawaii, Island of Molokai--Continued** | | | | |
| 16-4038 | Kawaipoka (formerly Kawaipaka) Stream near Pelekunu | Lat 21°07'48", long 156°52'30", Molokai, 300 ft upstream from mouth, 2.4 miles south of former village of Pelekunu, and 5.4 miles north of Kamalo. | 0.26 | 1968-69 | 10-23-68<br>1-14-69<br>5-20-69<br>6-24-69<br>8-19-69 | 0.47<br>1.1<br>.90<br>.28<br>3.2 |
| 16-4040 | Pelekunu Stream near Pelekunu | (a) Lat 21°08'12", long 156°52'46", Molokai, 0.4 mile upstream from Pilipililau Stream, 1.8 miles south of former village of Pelekunu, and 5.8 miles north of Kamalo. | 2.62 | 1920-29≠, 1937-57≠, 1968-69 | 1-31-68<br>2- 2-68<br>6-11-68<br>7- 9-68<br>7-18-68<br>10-24-68<br>5-22-69<br>6-24-69 | 12<br>9.2<br>5.3<br>4.6<br>4.8<br>5.2<br>10<br>5.4 |
| | | **Hawaii, Island of Maui** | | | | |
| 16-5320 | Haipuaena Stream at Haiku-uka boundary, near Kailiili | Lat 20°49'28", long 156°12'28", Maui, 350 ft downstream from Haiku-uka trail, 4.5 miles southeast of Kailiili, and 4.5 miles southwest of Keanae. | .63 | 1919-27≠, 1932-34≠, 1962-69 | 11-19-68 | .14 |
| 16-5420 | East Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili | Lat 20°49'36", long 156°12'39", Maui, 200 ft downstream from Haiku-uka trail, 4.3 miles east of Kailiili, and 4.6 miles southwest of Keanae. | .14 | 1920-27≠, 1932-33≠, 1963-69 | 11-19-68 | .04 |
| 16-5440 | West Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili | Lat 20°49'51", long 156°13'03", Maui, 150 ft downstream from Haiku-uka trail, 3.8 miles southeast of Kailiili, and 4.8 miles southwest of Keanae. | .45 | 1919-28≠, 1932-35≠, 1962-69 | 11-19-68 | .11 |
| 16-5540 | Waikamoi Stream at Haiku-uka boundary, near Kailiili | Lat 20°49'55", long 156°13'23", Maui, at Haiku-uka trail, 3.4 miles east of Kailiili, and 4.3 miles south of Kailua. | 3.46 | 1918-28≠, 1932-35≠, 1963-69 | 11-19-68 | .83 |
| 16-5545 | East Branch Waikamoi Stream at Haiku-uka boundary, near Kailiili | Lat 20°49'53", long 156°13'21", Maui, 150 ft upstream from Haiku-uka trail, 3.4 miles southeast of Kailiili, and 5.1 miles southwest of Keanae. | .07 | 1918-28≠, 1932-33≠, 1962-69 | 11-19-68 | .11 |
| 16-5691 | Nailiilihaele Stream near Kailiili | Lat 20°50'27", long 156°13'38", Maui, 200 ft downstream from lower Kula pipeline, 3.0 miles east of Kailiili, and 3.7 miles south of Kailua. | .11 | 1963-69 | 11-20-68 | 0 |
| 16-5697 | West Branch Nailiilihaele Stream near Kailiili | Lat 20°50'27", long 156°14'00", Maui, 3 ft upstream from lower Kula pipeline, 2.6 miles east of Kailiili, and 3.8 miles south of Kailua. | .04 | 1966-69 | 11-20-68 | .05 |
| 16-5762 | East Branch Kailua Stream near Kailiili | Lat 20°50'25", long 156°14'07", Maui, 40 ft downstream from lower Kula pipeline, 2.5 miles east of Kailiili, and 3.9 miles south of Kailua. | .35 | 1963-69 | 11-20-68 | .13 |
| | | **Mariana Islands, Island of Saipan** | | | | |
| 16-8005 | Hasngot Stream | Lat 15°12'44" N., long 145°46'23" E., Saipan, 750 ft upstream from unnamed tributary, 0.5 mile upstream from mouth, and 3.4 miles east of Garapan. | .43 | 1968-69 | 10- 2-68<br>11- 6-68<br>1-15-69<br>2-20-69<br>3- 6-69<br>4-16-69<br>5- 1-69<br>5-16-69<br>5-29-69<br>6-12-69<br>6-27-69<br>7-10-69<br>7-24-69<br>8- 7-69<br>8-21-69<br>9- 4-69<br>9-18-69 | .51<br>1.2<br>.25<br>.16<br>.12<br>.07<br>.07<br>.06<br>.07<br>.05<br>.05<br>.02<br>.04<br>.07<br>.05<br>.04<br>.04 |

≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Mariana Islands, Island of Saipan--Continued | | | | |
| 16-8018 | North Fork Talofofo Stream | Lat 15°13'07" N., long 145°46'41" E., Saipan, 300 ft upstream from confluence with South and Middle Forks and 2.3 miles southeast of Tanapag. | 0.45 | 1968-69 | 10- 2-68 | 0.18 |
| | | | | | 11- 6-68 | 1.1 |
| | | | | | 12-12-68 | .37 |
| | | | | | 11-15-69 | 0 |
| 16-8020 | Talofofo Stream | Lat 15°13'04" N., long 145°46'44" E., Saipan, 200 ft downstream from confluence of South, Middle and North Forks, 2.4 miles southeast of Tanapag, and 3.8 miles east of Garapan. | 1.56 | 1968-69 | 10- 2-68 | 2.0 |
| | | | | | 11- 6-68 | 7.4 |
| | | | | | 1-15-69 | .44 |
| | | | | | 2-20-69 | .32 |
| | | | | | 3- 6-69 | .17 |
| | | | | | 4-16-69 | .08 |
| | | | | | 5- 1-69 | .14 |
| | | | | | 5-16-69 | .03 |
| | | | | | 5-29-69 | .02 |
| | | | | | 6-12-69 | 0 |
| | | | | | 7-10-69 | 0 |
| | | | | | 8- 7-69 | .07 |
| | | | | | 8-21-69 | .01 |
| | | | | | 9- 4-69 | .03 |
| | | | | | 9-18-69 | 0 |
| 16-8025 | East Achugau Spring | Lat 15°14'06" N., long 145°46'43" E., Saipan, at spring 0.4 mile east of Mount Dogas and 2.0 miles east of Tanapag. | - | 1965, 1969 | 12-13-68 | .26 |
| | | | | | 1-16-69 | .11 |
| | | | | | 3- 6-69 | .10 |
| | | | | | 4-17-69 | .07 |
| | | | | | 5- 2-69 | .06 |
| | | | | | 5-17-69 | .03 |
| | | | | | 5-31-69 | .05 |
| | | | | | 6-13-69 | .04 |
| | | | | | 6-27-69 | .05 |
| | | | | | 7-12-69 | .04 |
| | | | | | 7-25-69 | .03 |
| | | | | | 8- 8-69 | .04 |
| | | | | | 8-22-69 | .04 |
| | | | | | 9- 5-69 | .05 |
| | | | | | 9-19-69 | .02 |
| 16-8040 | West Achugau Spring | Lat 15°14'10" N., long 145°46'10" E., Saipan, at spring 0.9 mile upstream from mouth of Achugau Stream and 1.3 miles east of Tanapag. | - | 1968-69 | 12-13-68 | .28 |
| | | | | | 1-15-69 | .08 |
| | | | | | 2-19-69 | .05 |
| | | | | | 3- 6-69 | .05 |
| | | | | | 4-17-69 | .03 |
| | | | | | 5- 1-69 | .03 |
| | | | | | 5-17-69 | .02 |
| | | | | | 5-29-69 | .04 |
| | | | | | 6-13-69 | .02 |
| | | | | | 6-27-69 | .04 |
| | | | | | 7-12-69 | .02 |
| | | | | | 7-25-69 | .03 |
| | | | | | 8- 8-69 | .02 |
| | | | | | 8-22-69 | .02 |
| | | | | | 9- 5-69 | .02 |
| | | | | | 9-19-69 | .01 |
| | | Mariana Islands, Island of Guam | | | | |
| 16-8073 | Fonte River at dam, near Nimitz Hill | (a) Lat 13°27'26" N., long 144°43'37" E., Guam, at old diversion dam, 0.4 mile south of Navy Headquarters building on Nimitz Hill, and 1.3 miles south of Coontz Junction at Adelup. | a.68 | 1961-69 | 3-20-69 | .11 |
| | | | | | 5-26-69 | .08 |
| | | | | | 6-30-69 | .06 |
| 16-8077 | Masso River at dam, near Piti | (a) Lat 13°27'21" N., long 144°41'33" E., Guam, at foot of spillway of old earthfill dam, 200 ft downstream from left-bank tributary, and 0.2 mile southeast of New Piti School. | a.67 | 1962, 1964-65, 1967-69 | 3-20-69 | .09 |
| | | | | | 5-15-69 | .05 |
| | | | | | 6-30-69 | .03 |
| 16-8080 | Santa Rita Spring at Santa Rita | Lat 13°23'04" N., long 144°40'23" E., Guam, 0.1 mile southeast of Santa Rita Catholic Church and 1.1 miles southeast of junction of Santa Rita Road and Marine Drive. | - | 1962, 1964-66, 1968-69 | 3-20-69 | .08 |
| | | | | | 6-30-69 | .07 |

a Revised.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Mariana Islands, Island of Guam--Continued | | | | |
| 16-8082 | Faata Springs at (formerly Spring near) Agat | (a) Lat 13°22'35" N., long 144°39'47" E., Guam, 0.7 mile south of Agat Junior High School and 0.8 mile southwest of Santa Rita Catholic Church. | - | 1963-69 | 3-20-69<br>5-15-69<br>6-17-69 | 0.20<br>.12<br>.12 |
| 16-8085 | Taleyfac River near Agat | (a) Lat 13°21'35" N., long 144°38'57" E., Guam, 800 ft upstream from bridge on Highway 2 at Biyae and 1.7 miles south of Mount Carmel School in Agat. | a1.94 | 1959-69 | 3-20-69<br>5-15-69<br>6-17-69 | .36<br>.22<br>.16 |
| 16-8092 | Cetti River above tributary (formerly Right Branch Cetti River), near Umatac | (a) Lat 13°18'59" N., long 144°39'24" E., Guam, 20 ft upstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.3 miles north of Sanchez School in Umatac. | .37 | 1961-62,<br>1964-66,<br>1969 | 3-21-69<br>4-24-69<br>6- 5-69 | .21<br>.15<br>.14 |
| 16-8094 | Cetti River near Umatac | (a) Lat 13°18'58" N., long 144°39'23" E., Guam, 30 ft downstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.3 miles north of Sanchez School in Umatac. | a.74 | 1960-67≠,<br>1968-69 | 5-14-68<br>3-21-69<br>4-24-69<br>6- 5-69 | .69<br>.26<br>.18<br>.15 |
| 16-8096 | La Sa Fua River near Umatac | (a) Lat 13°18'23" N., long 144°39'45" E., Guam, 0.6 mile north of Sanchez School in Umatac and 0.8 mile upstream from mouth. | a1.06 | 1953-60≠,<br>1961-63,<br>1966,<br>1969 | 3-20-69<br>4-24-69<br>6- 5-69 | .59<br>.34<br>.30 |
| 16-8120 | Madog (formerly Left Fork of Left Branch Umatac) River near Umatac | (a) Lat 13°17'24" N., long 144°40'30" E., Guam, 50 ft downstream from right-bank tributary and 1.1 miles southeast of Sanchez School in Umatac. | a.34 | 1960-69 | 3-21-69<br>4-24-69<br>6- 5-69 | .15<br>.09<br>.05 |
| 16-8130 | Piga Spring near Umatac | (a) Lat 13°17'56" N., long 144°40'49" E., Guam, on left bank of Astaban River right-bank tributary, 0.3 mile west of Mount Bolanos, and 1.3 miles east of Sanchez School in Umatac. | - | 1955,<br>1961-65,<br>1967-69 | 3-21-69<br>4-24-69<br>6- 5-69 | .14<br>.13<br>.14 |
| 16-8140 | Astaban (formerly Right Fork of Left Branch Umatac) River at Umatac | (a) Lat 13°17'41" N., long 144°40'15" E., Guam, 200 ft upstream from mouth and 0.7 mile southeast of Sanchez School in Umatac. | a.37 | 1960-69 | 3-21-69<br>4-24-69<br>6- 5-69 | .12<br>.06<br>b.02 |
| 16-8158 (formerly 16-8100) | Laelae (formerly Right Branch Umatac) River at Umatac | (a) Lat 13°17'50" N., long 144°39'51" E., Guam, 100 ft upstream from mouth and 0.2 mile east of Sanchez School in Umatac. | .95 | 1960-69 | 3-21-69<br>4-24-69<br>6- 5-69 | .58<br>.26<br>.24 |
| 16-8170 | Toguan River near Umatac | (a) Lat 13°17'03" N., long 144°39'36" E., Guam, at Highway 4 bridge, 100 ft upstream from mouth, and 0.9 mile south of Umatac. | a.47 | 1952,<br>1960-69 | 3-21-69<br>4-24-69<br>6- 5-69 | .08<br>.04<br>.02 |
| 16-8200 | Geus River above Siligin Spring tributary, near Merizo | (a) Lat 13°16'38" N., long 144°40'56" E., Guam, 100 ft upstream from Siligin Spring tributary, 0.1 mile upstream from dam, and 1.5 miles northeast of Merizo School. | .50 | 1960-69 | 3-21-69<br>5-16-69<br>7- 2-69 | .11<br>.08<br>.06 |
| 16-8205 | Siligin Spring near Merizo | (a) Lat 13°16'38" N., long 144°40'55" E., Guam, 120 ft upstream from mouth of Siligin Spring tributary, 0.1 mile upstream from diversion dam, and 1.5 miles northeast of Merizo School. | - | 1954,<br>1961-69 | 3-21-69<br>5-16-69<br>7- 2-69 | .06<br>.03<br>.03 |
| 16-8207 | Geus River below Siligin Spring tributary, near Merizo | (a) Lat 13°16'35" N., long 144°40'53" E., Guam, 100 ft upstream from diversion dam, 300 ft downstream from Siligin Spring tributary, and 1.4 miles northeast of Merizo School. | a.67 | 1962-69 | 3-21-69<br>5-16-69<br>7- 2-69 | .28<br>.21<br>.14 |

≠ Operated as a continuous-record gaging station.
a Revised.
b Estimated.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Mariana Islands, Island of Guam--Continued | | | | |
| 16-8250 | Ajayan River near Inarajan | (a) Lat 13°15'16" N., long 144°42'56" E., Guam, 0.4 mile upstream from mouth and 2.4 miles southwest of Inarajan Catholic Church. | a1.15 | 1962-69 | 3-25-69<br>5-16-69<br>7- 2-69 | 0.12<br>.05<br>.04 |
| 16-8280 | Agfayan River near Inarajan | (a) Lat 13°16'05" N., long 144°43'42" E., Guam, 0.6 mile upstream from mouth and 1.2 miles west of Inarajan Catholic Church. | a1.64 | 1962-65, 1967-69 | 3-25-69<br>5-16-69<br>7- 2-69 | .22<br>.13<br>.09 |
| 16-8300 | Pasamano (formerly Right Fork of Right Branch Inarajan) River near Inarajan | (a) Lat 13°16'59" N., long 144°43'26" E., Guam, 25 ft upstream from confluence with Yledigao River and 1.7 miles northwest of Inarajan Catholic Church. | 1.40 | 1960-69 | 3-25-69<br>5-16-69<br>7- 2-69 | .85<br>.57<br>.42 |
| 16-8310 | Yledigao (formerly Left Fork of Right Branch Inarajan) River near Inarajan | (a) Lat 13°17'00" N., long 144°43'26" E., Guam, 75 ft upstream from confluence with Pasamano River and 1.7 miles northwest of Inarajan Catholic Church. | a1.07 | 1960-69 | 3-25-69<br>5-16-69<br>7- 2-69 | .68<br>.57<br>.57 |
| 16-8330 | Fintasa (formerly Right Fork of Left Branch Inarajan) River near Inarajan | (a) Lat 13°17'18" N., long 144°43'54" E., Guam, 100 ft upstream from falls, 0.4 mile upstream from confluence with Fensol River, and 1.5 miles northwest of Inarajan Catholic Church. | a.79 | 1960-69 | 3-25-69<br>5-16-69<br>7- 2-69 | .68<br>.41<br>.39 |
| 16-8340 | Fensol (formerly Left Fork of Left Branch Inarajan) River near Inarajan | (a) Lat 13°17'09" N., long 144°44'08" E., Guam, 300 ft upstream from confluence with Fintasa River and 1.1 miles northwest of Inarajan Catholic Church. | a.40 | 1960-69 | 3-25-69<br>5-16-69<br>7- 2-69 | .17<br>.07<br>.06 |
| 16-8420 | Asalonso River near Talofofo | Lat 13°19'41" N., long 144°45'34" E., Guam, 300 ft downstream from highway bridge on Route 4 and 1.8 miles south of Talofofo School. | 1.50 | 1952, 1961-69 | 3-24-69<br>5-26-69<br>7- 9-69 | .38<br>.26<br>.23 |
| 16-8540 | Left Branch Ugum River near Talofofo | Lat 13°19'08" N., long 144°43'45" E., Guam, 50 ft upstream from confluence with Right Branch and 2.9 miles southwest of Talofofo School. | 2.91 | 1961-69 | 3-24-69<br>6- 4-69 | 3.1<br>2.1 |
| 16-8545 | Right Branch Ugum River near Talofofo | Lat 13°19'06" N., long 144°43'46" E., Guam, upstream from confluence with Left Branch and 2.9 miles southwest of Talofofo School. | 2.64 | 1961-69 | 3-24-69<br>6- 4-69 | 2.4<br>1.3 |
| 16-8590 | Manengon River (formerly Left Branch Ylig River above pumping station,) near Yona | (a) Lat 13°24'02" N., long 144°45'01" E., Guam, 200 ft downstream from left-bank tributary, 0.2 mile upstream from mouth, and 1.7 miles west of Saint Francis School at Yona. | a2.01 | 1960-62, 1964-66, 1968-69 | 3-24-69<br>5- 2-69<br>7-17-69 | .45<br>.18<br>.12 |
| 16-8670 | Janum Spring near Yigo | Lat 13°30'56" N., long 144°54'49" E., Guam, in small cave at sea level in limestone cliff on edge of reef, 2.2 miles southeast of Yigo. | - | 1953-56, 1958, 1960-62, 1964-65, 1967-69 | 4- 7-69<br>6- 4-69<br>7-11-69 | 3.2<br>3.8<br>3.6 |
| 16-8680 | Santa Rosa Spring near Yigo | Lat 13°31'49" N., long 144°54'43" E., Guam, 0.3 mile south of radar station at Mt. Santa Rosa and 1.4 miles east of Yigo. | - | 1962, 1964-66, 1969 | 4- 8-69 | b.01 |
| 16-8690 | Chunge Spring near Yigo | Lat 13°32'07" N., long 144°54'52" E., Guam, 300 ft northeast of intersection of Mt. Santa Rosa Road and and access road to FAA radar station and 1.6 miles east of Yigo School. | - | 1962, 1964-66, 1969 | 4- 8-69 | 0 |

a Revised.
b Estimated.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Ryukyu Islands, Island of Okinawa | | | | |
| 16-8757 | Hiji-gawa at Hiji | Lat 26°43'12" N., long 128°10'40" E., Okinawa, at Hiji, 0.4 mile upstream from Taihoza-gawa, and 1.1 miles east of Hama. | 3.3 | 1964-69 | 10-24-68<br>4-24-69 | 3.2<br>5.2 |
| 16-8758 | Taihoza-gawa at Hiji | Lat 26°43'21" N., long 128°10'55" E., Okinawa, 0.2 mile east of Hiji, 0.6 mile upstream from mouth, and 1.4 miles northeast of Hama. | 2.3 | 1964-69 | 10-24-68<br>4-24-69 | 1.1<br>1.5 |
| 16-8765 | Taiho-okawa at Taiho | Lat 26°39'01" N., long 128°08'37" E., Okinawa, 1.0 mile east of Taiho and 1.7 miles north of Taira. | 5.2 | 1964-69 | 10-16-68<br>12-27-68<br>4-25-69 | 5.6<br>3.1<br>7.2 |
| 16-8772 | North Fork Henan-gawa at Tsuha | Lat 26°38'28" N., long 128°05'47" E., Okinawa, 0.4 mile upstream from confluence with South Fork and 0.8 mile south of Tsuha. | 1.4 | 1964-69 | 10- 9-68<br>11- 1-68<br>4-21-69 | 1.4<br>.86<br>1.4 |
| 16-8777 | Genka-kawa at Genka | Lat 26°36'48" N., long 128°03'38" E., Okinawa, 0.9 mile southwest of Genka and 1.9 miles southeast of Nakaoshi. | 5.5 | 1964, 1966-69 | 10-22-68<br>4-21-69 | 6.0<br>9.0 |
| 16-8780 | Makiya-okawa at Makiya | Lat 26°37'10" N., long 128°02'18" E., Okinawa, 0.3 mile south of Makiya, 0.5 mile east of Nakaoshi, and 0.6 mile upstream from mouth. | 1.7 | 1964-69 | 10-22-68<br>4-22-69 | 1.1<br>2.0 |
| 16-8790 | Manna-gawa at Manna | Lat 26°39'12" N., long 127°55'06" E., Okinawa, at Manna, 0.5 mile east of Inoha-shogakko (elementary school), and 1.4 miles upstream from highway bridge at mouth. | 2.2 | 1964-69 | 10-21-68<br>4-22-69 | 2.7<br>3.6 |
| 16-8794 | Yofuke-gawa at Yofuke | Lat 26°34'02" N., long 127°59'43" E., Okinawa, 0.6 mile southeast of Yofuke and 0.6 mile northeast of Sukuta. | 1.2 | 1964-69 | 10-21-68<br>4-22-69 | .28<br>.79 |
| 16-8795 | Sukuta-kawa at Sukuta | Lat 26°33'33" N., long 127°59'23" E., Okinawa, 0.4 mile southeast of Sukuta, 0.6 mile upstream from mouth, and 0.8 mile south of Yofuke. | 1.1 | 1964-69 | 10-21-68<br>4-22-69 | .05<br>.17 |
| 16-8796 | Fukuchi-gawa at Kyoda | Lat 26°32'37" N., long 127°58'40" E., Okinawa, 0.7 mile southeast of Kyoda and 1.5 miles southwest of Sukuta. | 1.1 | 1964-69 | 10-21-68<br>4-22-69 | .20<br>.30 |
| 16-8832 | O-kawa at Kushi | Lat 26°30'50" N., long 127°59'50" E., Okinawa, 0.7 mile north of junction of Highways 13 and 108 and 0.7 mile west of Kushi. | 1.3 | 1964-69 | 10-29-68<br>4-26-69 | .36<br>.50 |
| 16-8835 | Suginda-gawa at Suginda | Lat 26°32'41" N., long 128°01'56" E., Okinawa, 0.1 mile west of Suginda and 0.4 mile south of Futami. | .9 | 1964-69 | 10-19-68<br>4-23-69 | .43<br>.75 |
| 16-8836 | Oura-gawa at Oura | Lat 26°33'32" N., long 128°02'35" E., Okinawa, 0.5 mile north of Oura and 1.0 mile northwest of Sedake. | 3.1 | 1964-69 | 10-19-68<br>1-22-69<br>4-23-69 | 2.9<br>4.9<br>3.7 |
| 16-8838 | Teema-gawa at Mihara | Lat 26°33'11" N., long 128°04'48" E., Okinawa, downstream from Mihara-gawa, 0.1 mile southeast of Mihara-sho-chugakko (school), and 0.9 mile east of Teema. | 3.2 | 1964-69 | 10-19-68<br>4-23-69 | 3.1<br>2.8 |
| | | Caroline Islands, Yap Islands | | | | |
| 16-8924.5 | Fara Swamp outlets, Yap | Lat 9°29'06" N., long 138°04'06" E. and lat 9°29'12" N., long 138°04'03" E., Yap, 0.9 mile northwest of Lamer and 4.1 miles southwest of Colonia. | .29 | 1968-69 | 9-20-69 | .48 |

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Caroline Islands, Yap Islands--Continued | | | | |
| 16-8924.6 | Gaingun Swamp outlet, Yap | Lat 9°29'02" N., long 138°04'23" E., Yap, 0.5 mile northwest of Lamer and 3.9 miles southwest of Colonia | 0.16 | 1968-69 | 10-15-68 | 1.2 |
| | | | | | 9-20-69 | .40 |
| 16-8925 | Tamaney Stream, Yap | Lat 9°29'45" N., long 138°05'34" E., Yap, at abandoned German dam, 0.5 mile northwest of Inuf, and 2.3 miles southwest of Colonia. | .21 | 1968-69 | 10-17-68 | 3.2 |
| | | | | | 9-19-69 | .45 |
| | | | | | 9-30-69 | .38 |
| 16-8926 | Ripu Stream, Yap | Lat 9°30'05" N., long 138°06'02" E., Yap, 1,000 ft upstream from mouth and 1.6 miles southwest of Colonia. | .24 | 1968-69 | 10-17-68 | 3.3 |
| | | | | | 12- 6-68 | .25 |
| | | | | | 6-14-69 | .50 |
| | | | | | 6-28-69 | .15 |
| | | | | | 9-19-69 | .43 |
| | | | | | 9-29-69 | 3.8 |
| 16-8927 | Thalomar Stream, Yap | Lat 9°30'27" N., long 138°06'05" E., Yap, 5 ft upstream from confluence with Dinay Stream and 1.4 miles southwest of Colonia. | .14 | 1965, 1968-69 | 10-17-68 | 5.6 |
| | | | | | 6-14-69 | .36 |
| | | | | | 6-27-69 | .12 |
| | | | | | 9-19-69 | .52 |
| | | | | | 9-30-69 | .64 |
| 16-8930.5 | Mabu Stream, Yap | Lat 9°31'07" N., long 138°06'52" E., Yap, 500 ft upstream from mouth and 0.4 mile northwest of Colonia. | .30 | 1968-69 | 10-16-68 | 27 |
| | | | | | 6-14-69 | .20 |
| | | | | | 9-18-69 | .14 |
| 16-8933.1 | Bileiy Stream, Gagil-Tomil | Lat 9°32'15" N., long 138°11'11" E., Gagil-Tomil, 0.3 mile downstream from Bileiy Spring, 0.4 mile upstream from mouth, and 0.4 mile south of Gatjapar. | .15 | 1968-69 | 10- 4-68 | .10 |
| | | | | | 10-23-68 | .25 |
| | | | | | 10-31-68 | .24 |
| | | | | | 11-19-68 | .16 |
| | | | | | 12- 3-68 | .31 |
| | | | | | 1- 7-69 | .10 |
| | | | | | 2-10-69 | 0 |
| | | | | | 6-13-69 | b.02 |
| | | | | | 9-19-69 | .36 |
| | | | | | 9-29-69 | .46 |
| 16-8933.5 | Yanbilang Stream, Gagil-Tomil | Lat 9°32'45" N., long 138°11'26" E., Gagil-Tomil, 500 ft upstream from mouth and 0.3 mile northeast of Gatjapar. | .03 | 1968-69 | 10-14-68 | 1.6 |
| | | | | | 11-19-68 | 0 |
| | | | | | 12- 3-68 | .51 |
| | | | | | 1- 7-69 | 0 |
| | | | | | 2-10-69 | 0 |
| | | | | | 4-18-69 | 0 |
| | | | | | 6-13-69 | b.01 |
| | | Caroline Islands, Truk Islands | | | | |
| 16-8939 | Pou Stream, Moen | (a) Lat 7°26'53" N., long 151°51'21" E., Moen, 0.6 mile north of Mount Teroken and 0.4 mile upstream from mouth. | a.17 | 1968-69 | 11-22-68 | .30 |
| | | | | | 12-28-68 | .13 |
| | | | | | 2- 2-69 | .02 |
| | | | | | 6- 6-69 | .12 |
| | | | | | 6-18-69 | .04 |
| | | | | | 8-26-69 | .24 |
| | | | | | 9-12-69 | .42 |
| | | | | | 9-25-69 | .39 |
| 16-8943 | Nefounumas Spring, Moen | Lat 7°25'50" N., long 151°51'35" E., Moen, 0.2 mile upstream from mouth of Nefounumas Stream and 0.6 mile southeast of Mount Teroken. | | 1969 | 11-23-68 | .30 |
| | | | | | 12-28-68 | .22 |
| | | | | | 1-23-69 | .14 |
| | | | | | 6- 3-69 | .09 |
| | | | | | 6-20-69 | .22 |
| | | | | | 9-12-69 | .15 |
| | | | | | 9-25-69 | .10 |
| 16-8951 | Afeibung Stream, Tol | Lat 7°20'55" N., long 151°37'22" E., Tol, 0.3 mile upstream from mouth and 0.6 mile northwest of Mount Tumuital. | .08 | 1968-69 | 12-17-68 | .24 |
| | | | | | 1-20-69 | .15 |
| | | | | | 1-29-69 | .02 |
| | | | | | 3-10-69 | 0 |
| | | | | | 5- 7-69 | 0 |
| | | | | | 6- 4-69 | .05 |
| | | | | | 8- 8-69 | .12 |
| | | | | | 8-29-69 | .05 |
| | | | | | 9- 9-69 | .23 |
| | | | | | 9-24-69 | .30 |

a Revised.
b Estimated.

Discharge measurements made at low-flow partial-record stations during water year 1969--Continued

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | Caroline Islands, Truk Islands--Continued | | | | |
| 16-8970 | Fansinifo Stream (formerly at Roro), Dublon Island | (a) Lat 7°22'39" N., long 151°52'44" E., Dublon Island, 700 ft upstream from mouth and 0.5 mile northeast of Mount Tolomen. | 0.06 | 1955-57≠, 1969 | 1-20-69<br>6- 5-69<br>8-18-69<br>9- 2-69<br>9-15-69<br>9-29-69 | 0.36<br>.08<br>.42<br>.09<br>.44<br>.29 |
| | | Samoa Islands, Island of Tutuila | | | | |
| 16-9340 | Leafu Stream near Leone | Lat 14°19'47" S., long 170°46'55" W., Tutuila, 30 ft upstream from reservoir, 0.9 mile upstream from mouth, and 1.0 mile north of Leone. | .69 | 1959-64, 1968 | 5- 9-68 | 4.4 |
| 16-9510 | Vaipito Stream at Pago Pago | Lat 14°16'57" S., long 170°42'16" W., Tutuila, 800 ft upstream from Pago Stream and 0.3 mile southwest of highway junction in Pago Pago. | .75 | 1966-67, 1969 | 8- 5-69<br>8- 5-69 | c1.2<br>d.44 |
| 16-9580 | Visa Stream at Alega | Lat 14°17'21" S., long 170°38'37" W., Tntuila, 0.2 mile upstream from mouth and 0.5 mile southwest of Alega. | .10 | 1959-61, 1963-65, 1967-69 | 10- 3-68 | .14 |
| 16-9585 | Visa Stream tributary at Aumi | Lat 14°17'24" S., long 170°38'35" W., Tutuila, 200 ft upstream from mouth and 0.3 mile northeast of Aumi. | .02 | 1959-61, 1963-65, 1967-69 | 10- 3-68 | .10 |
| 16-9590 | Visa Stream at Aumi | Lat 14°17'27" S., long 170°38'36" W., Tutuila, 100 ft upstream from highway bridge and 0.2 mile east of Aumi. | .16 | 1957-58≠, 1963-64, 1968-69 | 10- 3-68 | .19 |
| 16-9605 | Alega Stream tributary at Alega | Lat 14°16'57" S., long 170°38'16" W., Tutuila, 300 ft upstream from mouth and 0.2 mile north of Alega. | .04 | 1961, 1963-65, 1967-69 | 10- 3-68 | .05 |

≠ Operated as a continuous-record gaging station.
a Revised.
c Measured just upstream from pump.
d Measured just downstream from operating pump.

## Crest-stage partial-record stations

Crest-stage partial-record station records for the State of Hawaii are published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations not included in that report. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, and discharge measurements may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1969

| Station No. | Station name | Location | Drainage area (sq mi) | Period of record | Annual maximum | | |
|---|---|---|---|---|---|---|---|
| | | | | | Date | Gage height (feet) | Discharge (cfs) |
| | | Ryukyu Islands, Island of Okinawa | | | | | |
| 16-8808 | Hiya-gawa at Ojana | Lat 26°15'35" N., long 127°44'08" E., Okinawa, 0.1 mile south of Ojana and 0.6 mile upstream from mouth. | 2.2 | 1964-69# | 8-20-69 | 4.0 | (/) |
| 16-8812 | Kanegusuku-gawa at Kanegusuku | Lat 26°11'31" N., long 127°43'36" E., Okinawa, 0.2 mile northwest of Kanegusuku and 1.3 miles east of Kokubu. | 3.0 | 1964-69# | 8-20-69 | 9.9 | (/) |
| 16-8815 | Mukue-gawa near Itomancho | Lat 26°07'58" N., long 127°41'22" E., Okinawa, at highway bridge, 0.6 mile west of Yoza, and 0.9 mile northeast of Itomancho. | 6.4 | 1964-69# | 8-20-69 | 10.9 | (/) |

/ Discharge not determined.
# Gage heights only.

## Discharge measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1969

| Stream | Tributary to | Location | Drainage area (sq mi) | Measured previously (water years) | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | **Hawaii, Island of Oahu** | | | | |
| Waihee Stream | Kahaluu Stream | Lat 21°27'02", long 157°51'37", Oahu, 600 ft downstream from forest-reserve boundary and 1.8 miles southwest of Kahaluu. | | 1962, 1968 | 11-22-68 | 9.1 |
| | | **Hawaii, Island of Molokai** | | | | |
| Left-bank tributary | Pilipililau Stream | Lat 21°08'11", long 156°53'07", Molokai, 200 ft upstream from mouth, 1.9 miles south of former village of Pelekunu, and 5.8 miles north of Kamalo. | | | 10-22-68<br>1-15-69<br>3-18-69<br>5-21-69<br>6-25-69<br>8-20-69 | .13<br>.75<br>1.3<br>.42<br>.21<br>.20 |
| Waikolu Stream | Pacific Ocean | (a) Lat 21°08'54", long 156°55'25", Molokai, at altitude 780 ft, 0.4 mile northwest of Molokai tunnel east portal, and 5.4 miles southeast of lighthouse near Kalaupapa. | | 1960-61 | 6-27-69<br>8-22-69 | 3.0<br>2.5 |
| Waikolu Stream | Pacific Ocean | Lat 21°09'10", long 156°55'33", Molokai, at altitude 600 ft, 0.7 mile northwest of Molokai tunnel east portal, and 5.1 miles southeast of lighthouse near Kalaupapa. | | | 6-27-69<br>8-22-69 | 7.2<br>4.9 |
| | | **Hawaii, Island of Maui** | | | | |
| Palikea Stream | Oheo Gulch | Lat 20°40'23", long 156°03'24", Maui, 200 ft upstream from confluence with Pipiwai Stream and 1.1 miles north of Kipahulu. | | | 5-20-69 | .37 |
| Pipiwai Stream | Oheo Gulch | Lat 20°40'24", long 156°03'23", Maui, 150 ft upstream from confluence with Palikea Stream and 1.1 miles north of Kipahulu. | | | 5-20-69 | 4.4 |
| Oheo Gulch | Pacific Ocean | Lat 20°40'16", long 156°03'16", Maui, 75 ft downstream from lower dam, 0.7 mile upstream from Highway 31, and 0.9 mile north of Kipahulu. | | | 5-20-69 | 4.1 |
| Oheo Gulch | Pacific Ocean | Lat 20°40'01", long 156°02'46", Maui, 150 ft upstream from bridge on Highway 31 and 0.9 mile northeast of Kipahulu. | | | 5-20-69 | 4.0 |
| Hahalawe Gulch | Pacific Ocean | Lat 20°40'38", long 156°02'36", Maui, at bridge on Highway 31 and 1.6 miles northeast of Kipahulu. | | | 5-20-69 | 2.7 |
| Makapipi Stream | Pacific Ocean | Lat 20°49'43", long 156°05'47", Maui, 200 ft downstream from road bridge at Nahiku and 700 ft upstream from mouth. | | | 5-21-69 | 8.5 |
| Banana Spring | Waiokamilo Stream | Lat 20°49'55", long 156°09'22", Maui, 1.0 mile southwest of Keanae Valley Lookout Park and 2.0 miles south of Keanae. | | | 5-21-69 | 7.2 |
| Left-bank tributary | East Branch Kailua Stream | Lat 20°50'30", long 156°14'11", Maui, 40 ft downstream from lower Kula pipeline, 2.4 miles east of Kailiili, and 3.8 miles south of Kailua. | | | 5-22-69 | .[illegible] |

a Revised.

Discharge measurements made at miscellaneous sites during water year 1969--Continued

| Stream | Tributary to | Location | Drainage area (sq mi) | Measured previously (water years) | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| | | **Hawaii, Island of Maui--Continued** | | | | |
| Kailua Stream | Pacific Ocean | (a) Lat 20°52'36", long 156°13'25", Maui, just upstream from Wailoa ditch intake, 1.3 miles south of Kailua, and 2.1 miles south of Huelo. | 2.41 | 1911-58≠ | 5-22-69 | 7.8 |
| Kailua Stream | Pacific Ocean | Lat 20°53'28", long 156°12'58", Maui, 10 ft downstream from bridge on Highway 36 and 0.2 mile south of Kailua. | | | 5-22-69 | .61 |
| | | **Hawaii, Island of Hawaii** | | | | |
| West Branch Honokane Iki Stream | Honokane Iki Stream | Lat 20°09'47", long 155°43'25", Hawaii, 30 ft downstream from trail crossing, 1.8 miles upstream from confluence with East Branch, and 4.5 miles south of Niulii. | | 1961-68 | 11-14-68<br>1-15-69<br>3-12-69<br>5- 6-69<br>7- 9-69<br>9-16-69 | b.01<br>.28<br>.74<br>.57<br>3.0<br>.12 |
| East Branch Honokane Nui Stream | Honokane Nui Stream | Lat 20°08'58", long 155°43'59", Hawaii, at trail crossing, 0.2 mile upstream from confluence with West Branch, and 5.3 miles south of Niulii. | | 1964-68 | 11-13-68<br>1-14-69<br>3-11-69<br>5- 6-69<br>7- 8-69<br>9-16-69 | 2.3<br>3.2<br>41<br>2.7<br>48<br>2.2 |
| Kawa Springs | Pacific Ocean | Lat 19°06'51", long 155°31'47", Hawaii, 0.2 mile southwest of Keeku Heiau and 2.0 miles northeast of sugar mill at Honuapo. | | 1964-68 | 1-20-69<br>3-19-69 | 19<br>12 |
| Ninole Springs | Pacific Ocean | Lat 19°07'57", long 155°30'54", Hawaii, 0.7 mile southwest of Punaluu and 3.6 miles northeast of Honuapo. | | 1963-68 | 1-20-69<br>3-19-69 | 30<br>31 |
| | | **Ryukyu Islands, Island of Okinawa** | | | | |
| Taiho-okawa | East China Sea | Lat 26°39'08" N., long 128°08'24" E., Okinawa, 300 ft upstream from Daikumata-gawa, 0.8 mile east of Taiho, and 1.9 miles northwest of Taira. | | | 10-10-68<br>12-27-68 | 7.3<br>2.8 |
| South Fork Henan-gawa | Henan-gawa | Lat 26°37'49" N., long 128°05'47" E., Okinawa, 15 ft downstream from confluence of Right and Left Branches and 1.6 miles south of Tsuha. | | 1968 | 10- 9-68<br>11- 1-68 | 2.3<br>1.4 |
| South Fork Henan-gawa | Henan-gawa | Lat 26°37'58" N., long 128°05'42" E., Okinawa, 0.8 mile upstream from confluence with North Fork and 1.4 miles south of Tsuha. | | | 10- 9-68 | 2.7 |
| South Fork Henan-gawa | Henan-gawa | Lat 26°38'32" N., long 128°05'30" E., Okinawa, 60 ft upstream from confluence with North Fork and 0.8 mile south of Tsuha. | | 1968 | 10- 9-68<br>11- 1-68<br>4-21-69 | 3.5<br>1.6<br>3.8 |
| Genka-kawa | East China Sea | Lat 26°36'43" N., long 128°03'47" E., Okinawa, 1.2 miles south of Genka and 2.1 miles southeast of Nakaoshi. | | 1964-66≠, 1967 | 4-21-69 | 5.6 |
| Miyagi-gawa | Pacific Ocean | Lat 26°37'33" N., long 128°11'08" E., Okinawa, 0.3 mile north of Miyagi, 0.7 mile upstream from Highway 13, and 1.1 miles east of Kawata. | | 1968 | 10-29-68<br>4-28-69<br>7-25-69<br>8-26-69<br>9-23-69<br>9-25-69 | 1.2<br>1.5<br>3.1<br>2.3<br>1.3<br>1.3 |

≠ Operated as a continuous-record gaging station.
a Revised.
b Estimated.

Discharge measurements made at miscellaneous sites during water year 1969--Continued

| Stream | Tributary to | Location | Drainage area (sq mi) | Measured previously (water years) | Measurements | |
|---|---|---|---|---|---|---|
| | | | | | Date | Discharge (cfs) |
| Ryukyu Islands, Island of Okinawa--Continued | | | | | | |
| Ara-kawa | Pacific Ocean | Lat 26°39'43" N., long 128°15'22" E., Okinawa, at Arakawa, 100 ft upstream from bridge on access road, 0.5 mile upstream from mouth, and 4.0 miles southwest of Aha. | | 1968 | 10-29-68 | 3.6 |
| | | | | | 12-20-68 | 2.6 |
| | | | | | 4-25-69 | 6.1 |
| | | | | | 7-25-69 | 6.4 |
| | | | | | 8-26-69 | 8.5 |
| | | | | | 9- 2-69 | 5.0 |
| | | | | | 9- 8-69 | 4.3 |
| | | | | | 9-25-69 | 4.3 |
| Left-bank tributary | Ara-kawa | Lat 26°39'43" N., long 128°15'25" E., Okinawa, 30 ft upstream from mouth, 450 ft northeast of Takae-sho-chugakko, and 0.2 mile east of Arakawa. | | 1968 | 10-29-68 | .49 |
| | | | | | 12-20-68 | .23 |
| | | | | | 4-25-69 | .54 |
| | | | | | 7-25-69 | 1.1 |
| | | | | | 8-26-69 | .75 |
| Samoa Islands, Island of Tutuila | | | | | | |
| Vaitolu | Pacific Ocean | Lat 14°16'18" S., long 170°35'34" W., Tutuila, upstream from village water-supply intake, 250 ft upstream from gaging station and right-bank tributary, and 0.7 mile southwest of Aoa. | | | 10- 9-68 | .05 |
| | | | | | 10-31-68 | .24 |
| | | | | | 12-10-68 | .17 |
| | | | | | 2- 7-69 | .13 |
| | | | | | 3-11-69 | .19 |
| | | | | | 6-30-69 | .11 |
| | | | | | 7-23-69 | .24 |
| | | | | | 9- 3-69 | .52 |
| | | | | | 9-30-69 | .14 |
| Right-bank tributary | Vaitolu Stream | Lat 14°16'20" S., long 170°35'32" W., Tutuila, 10 ft upstream from mouth which is at Vaitolu Stream gaging station and 0.7 mile southwest of Aoa. | | | 10-31-68 | .06 |
| | | | | | 2- 7-69 | .01 |
| | | | | | 3-11-69 | .02 |
| | | | | | 9- 3-69 | .07 |

# PART 2. WATER QUALITY RECORDS

## 16-8782. HANECHI-OKAWA AT KAWAKAMI

LOCATION.--Lat 26°36'28" N., long 128°01'10" E., Okinawa, at gaging station 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.
DRAINAGE AREA.--4.4 sq mi, approximately.
PERIOD OF RECORD.--Water temperatures: October 1966 to September 1969 (discontinued).
Sediment records: October 1966 to September 1969 (discontinued).
EXTREMES, 1968-69.--Water temperatures: Maximum, 30°C Oct. 5; minimum, 12°C Dec. 18.
Sediment concentrations: Maximum daily, 644 mg/l May 13; minimum daily, 1 mg/l on many days.
Sediment loads: Maximum daily, 1,480 tons June 3; minimum daily, 0.01 ton on many days.
EXTREMES, 1966-69.--Water temperatures: Maximum, 34°C Aug. 6, 1968; minimum, 10°C Dec. 14, 1967.
Sediment concentrations: Maximum daily, 718 mg/l June 13, 1967; minimum daily, 1 mg/l on many days each year.
Sediment loads: Maximum daily, 1,950 tons June 4, 1967; minimum daily, 0.01 ton on many days in 1968-69.
REMARKS.--Chemical analyses for this station on pages 274-275.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| MONTH | DAY 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | AVERAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCTOBER.. | 29 | 28 | 29 | 29 | 30 | 29 | 26 | 29 | 27 | 27 | 27 | 26 | 26 | 25 | 26 | 25 | 24 | 24 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | 26 | 24 | 24 | 24 | 26 | 24 | 26 |
| NOVEMBER. | 24 | 24 | 26 | 25 | 26 | 24 | 24 | 24 | 23 | 23 | 24 | 24 | 24 | 22 | 23 | 24 | 24 | 23 | 23 | 26 | 24 | 24 | 24 | 24 | 26 | 26 | 26 | 24 | 26 | 24 | -- | 24 |
| DECEMBER. | 24 | 24 | 26 | 24 | 24 | 26 | 26 | 25 | 24 | 24 | 24 | 24 | 22 | 18 | 19 | 14 | 13 | 12 | 18 | 14 | 13 | 13 | 16 | 16 | 16 | 17 | 16 | 17 | 16 | 16 | 18 | 19 |
| JANUARY.. | 16 | 14 | 14 | 13 | 14 | 13 | 14 | 13 | 18 | 18 | 19 | 16 | 15 | 15 | 15 | 15 | 17 | 17 | 18 | 19 | 18 | 18 | 18 | 22 | 23 | 22 | 21 | 22 | 24 | 22 | 22 | 18 |
| FEBRUARY. | 21 | 22 | 22 | 19 | 13 | -- | 16 | 18 | 18 | 16 | 18 | 21 | 21 | 21 | 18 | 21 | 21 | 22 | 21 | 21 | 18 | 19 | 21 | 19 | 21 | 21 | 17 | 18 | -- | -- | -- | 19 |
| MARCH.... | 17 | 18 | 16 | 15 | 16 | 19 | 18 | 19 | 19 | 20 | 21 | 15 | 15 | 16 | 17 | 18 | 18 | 18 | 19 | 19 | 18 | 19 | 19 | 20 | 18 | 19 | 20 | 18 | 19 | -- | 15 | 18 |
| APRIL.... | 18 | 19 | 20 | 21 | 16 | 16 | 18 | 21 | 19 | 21 | 21 | 23 | 22 | 22 | 24 | 22 | 22 | 24 | 24 | 24 | 24 | 21 | 24 | 25 | 26 | 24 | 26 | 24 | 20 | 20 | -- | 22 |
| MAY..... | 19 | 19 | 24 | 25 | 24 | 24 | -- | 26 | 26 | 26 | 26 | 24 | 24 | 26 | 24 | 24 | 24 | 24 | 24 | 26 | 26 | 24 | 24 | 24 | 23 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| JUNE..... | 26 | 26 | 26 | 24 | 23 | 24 | 24 | 23 | -- | 26 | 27 | -- | 26 | 26 | 22 | 27 | 26 | 26 | 22 | 24 | -- | 25 | 24 | 24 | 26 | 24 | 24 | 27 | 27 | 27 | -- | 25 |
| JULY..... | 27 | -- | 27 | 27 | 27 | 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 26 | 27 | 26 | 27 | 26 | 27 | 27 | 27 | 27 | 28 | 27 | 27 | 28 | 27 | 28 | -- |
| AUGUST... | 28 | 28 | 27 | 28 | 28 | 27 | 27 | 28 | 28 | 29 | 29 | 29 | 28 | 29 | 28 | 29 | 29 | 28 | 28 | -- | 27 | 27 | 27 | 27 | 26 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| SEPTEMBER | 28 | 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 4.6 | 2 | .02 | 2.4 | 2 | .01 | 1.8 | 1 | .01 |
| 2 | 4.6 | 2 | .02 | 2.3 | 2 | .01 | 2.0 | 3 | .02 |
| 3 | 4.1 | 1 | .01 | 2.3 | 2 | .01 | 2.8 | 4 | .03 |
| 4 | 3.7 | 1 | .01 | 2.2 | 2 | .01 | 2.3 | 3 | .02 |
| 5 | 6.5 | 8 | .30 | 2.5 | 4 | .03 | 2.5 | 4 | .03 |
| 6 | 4.7 | 4 | .10 | 4.7 | 10 | .10 | 1.9 | 3 | .02 |
| 7 | 16 | 10 | 1.4 | 4.3 | 4 | .05 | 1.8 | 2 | .01 |
| 8 | 9.1 | 8 | .20 | 5.8 | 13 | .20 | 1.8 | 2 | .01 |
| 9 | 5.8 | 4 | .10 | 13 | 16 | .60 | 1.8 | 2 | .01 |
| 10 | 4.8 | 3 | .04 | 4.1 | 4 | .04 | 1.9 | 2 | .01 |
| 11 | 4.3 | 3 | .03 | 3.1 | 3 | .03 | 2.4 | 6 | .04 |
| 12 | 4.0 | 2 | .02 | 2.7 | 2 | .01 | 8.0 | 24 | .50 |
| 13 | 3.8 | 2 | .02 | 2.6 | 2 | .01 | 3.2 | 4 | .03 |
| 14 | 3.8 | 2 | .02 | 2.5 | 2 | .01 | 2.7 | 2 | .01 |
| 15 | 3.5 | 2 | .02 | 2.3 | 2 | .01 | 2.8 | 2 | .02 |
| 16 | 3.3 | 2 | .02 | 2.2 | 2 | .01 | 2.3 | 2 | .01 |
| 17 | 3.3 | 2 | .02 | 2.1 | 2 | .01 | 1.9 | 2 | .01 |
| 18 | 3.1 | 2 | .02 | 2.1 | 2 | .01 | 2.7 | 10 | .10 |
| 19 | 2.9 | 2 | .02 | 2.1 | 2 | .01 | 3.7 | 5 | .05 |
| 20 | 2.8 | 2 | .02 | 2.1 | 2 | .01 | 2.4 | 2 | .01 |
| 21 | 3.0 | 2 | .02 | 2.2 | 2 | .01 | 2.1 | 2 | .01 |
| 22 | 3.2 | 2 | .02 | 2.2 | 2 | .01 | 3.4 | 6 | .10 |
| 23 | 3.0 | 2 | .02 | 2.4 | 3 | .02 | 2.6 | 3 | .02 |
| 24 | 2.8 | 2 | .02 | 2.2 | 2 | .01 | 2.1 | 2 | .01 |
| 25 | 2.4 | 2 | .01 | 2.6 | 3 | .02 | 1.9 | 2 | .01 |
| 26 | 2.3 | 2 | .01 | 2.2 | 2 | .01 | 1.9 | 1 | .01 |
| 27 | 2.4 | 2 | .01 | 1.9 | 2 | .01 | 1.9 | 1 | .01 |
| 28 | 2.4 | 2 | .01 | 1.9 | 1 | .01 | 2.1 | 1 | .01 |
| 29 | 2.4 | 2 | .01 | 1.7 | 1 | .01 | 1.8 | 1 | .01 |
| 30 | 2.3 | 2 | .01 | 1.7 | 1 | .01 | 2.1 | 2 | .01 |
| 31 | 2.3 | 2 | .01 | -- | -- | -- | 2.2 | 2 | .01 |
| TOTAL | -- | -- | -- | 88.4 | -- | 1.30 | 76.8 | -- | 1.16 |

16-8782. HANECHI-OKAWA AT KAWAKAMI--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 4.5 | 5 | .10 | 18 | 12 | .60 | 9.2 | 4 | .10 |
| 2 | 2.8 | 3 | .02 | 18 | 8 | .40 | 56 | 13 | 2.9 |
| 3 | 2.2 | 2 | .01 | 10 | 5 | .10 | 22 | 5 | .30 |
| 4 | 1.9 | 2 | .01 | 25 | 19 | 1.8 | 14 | 4 | .20 |
| 5 | 3.2 | 5 | .04 | 16 | 6 | .30 | 11 | 3 | .10 |
| 6 | 3.1 | 3 | .03 | 11 | 4 | .10 | 9.7 | 2 | .10 |
| 7 | 2.2 | 2 | .01 | 9.4 | 3 | .10 | 9.0 | 2 | .05 |
| 8 | 2.0 | 2 | .01 | 7.6 | 3 | .10 | 27 | 15 | 1.1 |
| 9 | 1.9 | 2 | .01 | 6.7 | 2 | .04 | 77 | 19 | 5.2 |
| 10 | 1.9 | 2 | .01 | 6.9 | 3 | .10 | 40 | 6 | .60 |
| 11 | 2.0 | 2 | .01 | 6.0 | 2 | .03 | 100 | 20 | 12 |
| 12 | 2.3 | 3 | .02 | 5.4 | 2 | .03 | 63 | 10 | 1.7 |
| 13 | 1.8 | 2 | .01 | 5.0 | 2 | .03 | 35 | 8 | .80 |
| 14 | 3.5 | 15 | .10 | 6.8 | 10 | .20 | 25 | 6 | .40 |
| 15 | 5.8 | 5 | .10 | 6.0 | 3 | .05 | 20 | 4 | .20 |
| 16 | 5.1 | 4 | .10 | 5.8 | 3 | .05 | 15 | 3 | .10 |
| 17 | 16 | 18 | 1.0 | 5.6 | 2 | .03 | 13 | 3 | .10 |
| 18 | 5.0 | 4 | .10 | 6.0 | 2 | .03 | 12 | 2 | .10 |
| 19 | 44 | 98 | 54 | 5.4 | 2 | .03 | 11 | 2 | .10 |
| 20 | 14 | 12 | .50 | 5.0 | 2 | .03 | 10 | 2 | .10 |
| 21 | 7.2 | 6 | .10 | 4.7 | 1 | .01 | 10 | 5 | .10 |
| 22 | 5.6 | 4 | .10 | 4.4 | 1 | .01 | 8.7 | 3 | .10 |
| 23 | 4.6 | 3 | .04 | 4.1 | 1 | .01 | 8.2 | 2 | .04 |
| 24 | 4.0 | 2 | .02 | 12 | 12 | .40 | 8.0 | 2 | .04 |
| 25 | 3.6 | 2 | .02 | 10 | 4 | .10 | 12 | 10 | .30 |
| 26 | 4.0 | 3 | .03 | 31 | 15 | 1.3 | 9.7 | 5 | .10 |
| 27 | 4.0 | 3 | .03 | 12 | 4 | .10 | 7.8 | 3 | .10 |
| 28 | 4.8 | 5 | .10 | 10 | 3 | .10 | 20 | 10 | .50 |
| 29 | 26 | 17 | 1.6 | -- | -- | -- | 11 | 5 | .10 |
| 30 | 14 | 10 | .40 | -- | -- | -- | 9.0 | 3 | .10 |
| 31 | 10 | 6 | .20 | -- | -- | -- | 8.0 | 2 | .04 |
| TOTAL | 213.0 | -- | 58.83 | 273.8 | -- | 6.18 | 691.3 | -- | 27.77 |

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 7.2 | 2 | .04 | 4.0 | 3 | .03 | 53 | 6 | .90 |
| 2 | 6.5 | 2 | .04 | 5.3 | 8 | .10 | 67 | 120 | 149 |
| 3 | 6.3 | 2 | .03 | 4.1 | 3 | .03 | 296 | 631 | 1480 |
| 4 | 21 | 13 | 1.1 | 3.7 | 3 | .03 | 76 | 16 | 3.3 |
| 5 | 14 | 6 | .20 | 3.5 | 3 | .03 | 335 | 375 | 1080 |
| 6 | 10 | 3 | .10 | 3.8 | 4 | .04 | 168 | 160 | 91 |
| 7 | 8.4 | 2 | .05 | 3.7 | 3 | .03 | 76 | 16 | 3.3 |
| 8 | 15 | 15 | .60 | 14 | 15 | 1.4 | 95 | 26 | 11 |
| 9 | 11 | 4 | .10 | 30 | 26 | 2.9 | 144 | 46 | 21 |
| 10 | 9.0 | 3 | .10 | 12 | 16 | .50 | 76 | 12 | 2.5 |
| 11 | 8.0 | 2 | .04 | 8.0 | 12 | .30 | 58 | 9 | 1.4 |
| 12 | 7.4 | 2 | .04 | 7.2 | 10 | .20 | 55 | 6 | .90 |
| 13 | 7.1 | 2 | .04 | 406 | 644 | 520 | 136 | 68 | 40 |
| 14 | 6.5 | 2 | .04 | 137 | 72 | 38 | 71 | 14 | 2.7 |
| 15 | 6.3 | 2 | .03 | 110 | 59 | 21 | 53 | 6 | .90 |
| 16 | 6.3 | 4 | .10 | 44 | 12 | 1.4 | 46 | 3 | .40 |
| 17 | 7.4 | 5 | .10 | 40 | 8 | .90 | 40 | 2 | .20 |
| 18 | 5.7 | 4 | .10 | 29 | 5 | .40 | 37 | 3 | .30 |
| 19 | 5.4 | 3 | .04 | 29 | 6 | .50 | 236 | 117 | 146 |
| 20 | 5.2 | 3 | .04 | 146 | 93 | 62 | 418 | 245 | 1080 |
| 21 | 5.2 | 3 | .04 | 79 | 30 | 6.4 | 280 | 47 | 64 |
| 22 | 5.2 | 3 | .04 | 44 | 10 | 1.2 | 157 | 53 | 31 |
| 23 | 5.0 | 3 | .04 | 93 | 66 | 23 | 175 | 34 | 16 |
| 24 | 4.7 | 2 | .03 | 77 | 30 | 6.2 | 203 | 60 | 38 |
| 25 | 4.6 | 2 | .02 | 55 | 14 | 2.1 | 109 | 12 | 3.5 |
| 26 | 4.6 | 3 | .04 | 37 | 8 | .80 | 104 | 25 | 11 |
| 27 | 4.8 | 4 | .10 | 87 | 42 | 17 | 292 | 256 | 281 |
| 28 | 4.4 | 3 | .04 | 72 | 12 | 2.3 | 98 | 25 | 6.6 |
| 29 | 4.2 | 3 | .03 | 78 | 28 | 7.4 | 65 | 8 | 1.4 |
| 30 | 4.1 | 3 | .03 | 140 | 32 | 14 | 48 | 6 | .80 |
| 31 | -- | -- | -- | 79 | 10 | 2.1 | -- | -- | -- |
| TOTAL | 220.5 | -- | 3.34 | 1881.3 | -- | 732.29 | 4067 | -- | 4568.10 |

16-8782. HANECHI-OKAWA AT KAWAKAMI--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 37 | 2 | .20 | 5.6 | 2 | .03 | 9.4 | 2 | .10 |
| 2 | 33 | 2 | .20 | 5.2 | 2 | .03 | 8.7 | 2 | .05 |
| 3 | 27 | 2 | .10 | 5.1 | 2 | .03 | 8.7 | 5 | .10 |
| 4 | 27 | 2 | .10 | 8.2 | 14 | .30 | 8.4 | 4 | .10 |
| 5 | 22 | 2 | .10 | 6.3 | 5 | .10 | 8.7 | 6 | .10 |
| 6 | 22 | 2 | .10 | 6.7 | 6 | .10 | 7.2 | 4 | .10 |
| 7 | 16 | 2 | .10 | 5.4 | 3 | .04 | 6.7 | 3 | .10 |
| 8 | 14 | 1 | .04 | 7.1 | 10 | .20 | 6.2 | 2 | .03 |
| 9 | 12 | 1 | .03 | 9.0 | 10 | .20 | 29 | 16 | 1.3 |
| 10 | 12 | 1 | .03 | 8.4 | 12 | .30 | 20 | 8 | .40 |
| 11 | 12 | 2 | .10 | 6.0 | 5 | .10 | 9.2 | 6 | .10 |
| 12 | 11 | 1 | .03 | 5.1 | 4 | .10 | 8.0 | 3 | .10 |
| 13 | 10 | 1 | .03 | 4.8 | 3 | .04 | 7.4 | 2 | .04 |
| 14 | 9.4 | 1 | .03 | 4.6 | 3 | .04 | 7.2 | 4 | .10 |
| 15 | 9.0 | 1 | .02 | 4.4 | 3 | .04 | 6.9 | 3 | .10 |
| 16 | 8.4 | 1 | .02 | 4.2 | 3 | .03 | 6.3 | 3 | .10 |
| 17 | 10 | 8 | .20 | 4.1 | 2 | .02 | 6.0 | 2 | .03 |
| 18 | 12 | 8 | .30 | 4.0 | 2 | .02 | 5.6 | 2 | .03 |
| 19 | 10 | 4 | .10 | 6.9 | 14 | .30 | 5.2 | 2 | .03 |
| 20 | 9.4 | 5 | .10 | 457 | 626 | 168 | 4.8 | 2 | .03 |
| 21 | 8.7 | 3 | .10 | 81 | 25 | 5.5 | 4.7 | 2 | .03 |
| 22 | 9.6 | 10 | .30 | 46 | 8 | 1.0 | 4.6 | 2 | .02 |
| 23 | 7.8 | 4 | .10 | 33 | 6 | .50 | 5.0 | 4 | .10 |
| 24 | 7.1 | 4 | .10 | 24 | 5 | .30 | 4.6 | 3 | .04 |
| 25 | 7.1 | 5 | .10 | 20 | 4 | .20 | 4.3 | 2 | .02 |
| 26 | 6.9 | 4 | .10 | 15 | 4 | .20 | 4.3 | 2 | .02 |
| 27 | 7.7 | 7 | .10 | 14 | 3 | .10 | 4.2 | 1 | .01 |
| 28 | 7.1 | 4 | .10 | 12 | 3 | .10 | 4.0 | 1 | .01 |
| 29 | 7.2 | 3 | .10 | 11 | 2 | .10 | 4.0 | 2 | .02 |
| 30 | 6.9 | 5 | .10 | 10 | 2 | .10 | 3.7 | 2 | .02 |
| 31 | 6.0 | 2 | .03 | 9.4 | 2 | .10 | -- | -- | -- |
| TOTAL | 405.3 | -- | 3.16 | 843.5 | -- | 178.22 | 223.0 | -- | 3.33 |

16-8842. FUKUJI-GAWA AT FUKUJI

LOCATION.--Lat 26°38'16" N., long 128°10'13" E., Okinawa, at gaging station at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.
DRAINAGE AREA.--12 sq mi, approximately.
PERIOD OF RECORD.--Water temperatures: May 1964 to September 1969 (discontinued).
Sediment records: May 1964 to September 1969 (discontinued).
EXTREMES, 1968-69.--Water temperatures: Maximum, 27°C on many days during July to September; minimum, 9°C Dec. 22.
Sediment concentrations: Maximum daily, 1,790 mg/l May 13; minimum daily, 1 mg/l Apr. 2, 3.
Sediment loads: Maximum daily, 34,000 tons June 20; minimum daily, 0.04 ton Apr. 2.
EXTREMES, 1964-69.--Water temperatures: Maximum, 31°C Aug. 16, 1967; minimum, 9°C Dec. 22, 1968.
Sediment concentrations: Maximum daily, 4,500 mg/l June 23, 1965; minimum daily, 1 mg/l on many days of most years.
Sediment loads: Maximum daily, 64,000 tons Aug. 5, 1965; minimum daily, 0.04 ton Apr. 2, 1969.
REMARKS.--Chemical analyses for this station on pages 274-275. The sediment concentrations and loads during the year were higher than normal because clearing and scraping of the watershed about 1 mile upstream from the station for dam construction resulted in more than usual amounts of sediment being carried downstream.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | DAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | AVER-AGE |
| OCTOBER.. | 25 | 25 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 22 | 22 | 21 | 21 | 19 | 19 | 19 | 21 | 21 | 19 | 17 | 17 | 17 | 18 | 17 | 17 | 17 | 21 |
| NOVEMBER. | 18 | 18 | 18 | 18 | 19 | 20 | 19 | 20 | 19 | 19 | 17 | 16 | 17 | 16 | 16 | 16 | 15 | 15 | 15 | 16 | 16 | 18 | 19 | 18 | 19 | 18 | 18 | 19 | 17 | 18 | -- | 18 |
| DECEMBER. | 17 | 19 | 20 | 19 | 20 | 18 | 17 | 18 | 18 | 18 | 18 | 19 | 17 | 17 | 16 | 19 | 13 | 14 | 13 | 14 | 14 | 9 | 11 | 12 | 13 | 13 | 14 | 16 | 16 | 17 | 17 | 16 |
| JANUARY.. | 16 | 14 | 13 | 12 | 14 | 14 | 13 | 13 | 14 | 14 | 16 | 17 | 14 | 14 | 14 | 14 | 16 | 14 | 16 | 16 | 18 | 18 | 18 | 18 | 18 | 19 | 20 | 20 | 21 | 18 | 20 | 16 |
| FEBRUARY. | 17 | 16 | 15 | 17 | 13 | 12 | 12 | 13 | 12 | 14 | 15 | 14 | 17 | 19 | 17 | 18 | 17 | 19 | 17 | 18 | 17 | 17 | 17 | 19 | 17 | 17 | 18 | 16 | -- | -- | -- | 16 |
| MARCH.... | 15 | 17 | 17 | 17 | 16 | 14 | 16 | 18 | 18 | 18 | 17 | 16 | 14 | 14 | 13 | 14 | 13 | 14 | 15 | 17 | 16 | 16 | 16 | 16 | 17 | 16 | 18 | 19 | 18 | 19 | 18 | 16 |
| APRIL.... | 16 | 16 | 18 | 19 | 14 | 19 | 14 | 17 | 16 | 17 | 17 | 19 | 19 | 19 | 21 | 22 | 21 | 20 | 18 | 19 | 19 | 21 | 21 | 22 | 22 | 22 | 22 | 21 | 21 | 22 | -- | 19 |
| MAY..... | 22 | 22 | 22 | 23 | 22 | 23 | 23 | 22 | 21 | 21 | -- | -- | 23 | 21 | 22 | 22 | 23 | 22 | 23 | 23 | 21 | 21 | 22 | -- | 20 | 20 | 22 | 20 | 21 | 21 | 20 | 22 |
| JUNE..... | 21 | 22 | 22 | 21 | 21 | 21 | 18 | 19 | 19 | 19 | 20 | 22 | 21 | 19 | 21 | 22 | 22 | 22 | 23 | 21 | 21 | 21 | 21 | 21 | 22 | 23 | 22 | 23 | 23 | 23 | -- | 21 |
| JULY..... | 24 | -- | -- | -- | -- | -- | -- | -- | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 27 | 27 | 26 | 26 | 26 | 26 | 26 | 27 | 26 | 26 | 26 | 27 | 26 | 26 | 27 | 27 | -- |
| AUGUST... | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 26 | 27 | 27 | 27 | 26 | 26 | 27 | 27 | 27 | 27 | 26 | 24 | 24 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 26 | 26 |
| SEPTEMBER | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 25 | 26 | 26 | 26 | 26 | 26 | 27 | 26 | 27 | 27 | 27 | -- | 27 |

16-8842. FUKUJI-GAWA AT FUKUJI--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 19 | 5 | .30 | 9.7 | 5 | .10 | 6.9 | 3 | .10 |
| 2 | 18 | 4 | .20 | 9.7 | 5 | .10 | 7.3 | 3 | .10 |
| 3 | 16 | 4 | .20 | 9.7 | 4 | .10 | 8.5 | 3 | .10 |
| 4 | 15 | 4 | .20 | 9.7 | 4 | .10 | 7.7 | 3 | .10 |
| 5 | 15 | 4 | .20 | 9.7 | 5 | .10 | 7.7 | 3 | .10 |
| 6 | 16 | 3 | .10 | 13 | 10 | .40 | 7.3 | 3 | .10 |
| 7 | 15 | 3 | .10 | 15 | 6 | .20 | 6.9 | 3 | .10 |
| 8 | 16 | 6 | .30 | 32 | 56 | 10 | 6.9 | 3 | .10 |
| 9 | 16 | 6 | .30 | 35 | 77 | 7.5 | 6.9 | 3 | .10 |
| 10 | 17 | 6 | .30 | 14 | 6 | .20 | 6.5 | 3 | .10 |
| 11 | 16 | 4 | .20 | 10 | 5 | .10 | 6.5 | 3 | .10 |
| 12 | 14 | 3 | .10 | 9.7 | 4 | .10 | 12 | 14 | .50 |
| 13 | 13 | 3 | .10 | 8.9 | 4 | .10 | 8.9 | 5 | .10 |
| 14 | 13 | 3 | .10 | 8.5 | 4 | .10 | 7.7 | 4 | .10 |
| 15 | 12 | 3 | .10 | 8.5 | 4 | .10 | 8.5 | 8 | .20 |
| 16 | 12 | 3 | .10 | 8.5 | 4 | .10 | 6.9 | 6 | .10 |
| 17 | 11 | 3 | .10 | 7.7 | 4 | .10 | 6.2 | 4 | .10 |
| 18 | 11 | 3 | .10 | 7.3 | 4 | .10 | 6.2 | 4 | .10 |
| 19 | 10 | 3 | .10 | 7.3 | 4 | .10 | 9.7 | 10 | .30 |
| 20 | 10 | 3 | .10 | 7.3 | 4 | .10 | 6.5 | 6 | .10 |
| 21 | 11 | 6 | .20 | 7.3 | 4 | .10 | 6.2 | 5 | .10 |
| 22 | 13 | 4 | .10 | 7.3 | 4 | .10 | 8.9 | 14 | .30 |
| 23 | 12 | 3 | .10 | 7.7 | 4 | .10 | 8.5 | 5 | .10 |
| 24 | 11 | 3 | .10 | 7.3 | 4 | .10 | 6.5 | 3 | .10 |
| 25 | 10 | 3 | .10 | 8.1 | 4 | .10 | 5.9 | 3 | .05 |
| 26 | 9.7 | 3 | .10 | 7.7 | 4 | .10 | 5.9 | 3 | .05 |
| 27 | 9.7 | 3 | .10 | 6.9 | 4 | .10 | 5.9 | 3 | .05 |
| 28 | 9.7 | 4 | .10 | 6.9 | 4 | .10 | 5.6 | 3 | .05 |
| 29 | 10 | 8 | .20 | 6.9 | 4 | .10 | 5.6 | 3 | .05 |
| 30 | 9.7 | 7 | .20 | 6.9 | 4 | .10 | 6.5 | 7 | .10 |
| 31 | 9.7 | 6 | .20 | -- | -- | -- | 6.2 | 6 | .10 |
| TOTAL | -- | -- | -- | 314.2 | -- | 20.80 | 223.4 | -- | 3.75 |

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 6.2 | 5 | .10 | 40 | 30 | 3.2 | 20 | 5 | .30 |
| 2 | 6.2 | 4 | .10 | 29 | 10 | .80 | 162 | 352 | 425 |
| 3 | 5.9 | 4 | .10 | 18 | 5 | .20 | 30 | 8 | .60 |
| 4 | 5.9 | 4 | .10 | 58 | 334 | 113 | 20 | 7 | .40 |
| 5 | 7.3 | 12 | .20 | 38 | 32 | 3.9 | 18 | 7 | .30 |
| 6 | 8.1 | 7 | .20 | 21 | 5 | .30 | 17 | 5 | .20 |
| 7 | 6.2 | 5 | .10 | 17 | 4 | .20 | 16 | 4 | .20 |
| 8 | 5.6 | 4 | .10 | 15 | 4 | .20 | 79 | 168 | 47 |
| 9 | 5.3 | 4 | .10 | 12 | 3 | .10 | 195 | 271 | 240 |
| 10 | 5.0 | 4 | .10 | 12 | 3 | .10 | 62 | 22 | 3.7 |
| 11 | 9.0 | 36 | 1.1 | 12 | 3 | .10 | 502 | 1090 | 5500 |
| 12 | 6.2 | 5 | .10 | 12 | 2 | .10 | 134 | 42 | 19 |
| 13 | 5.6 | 3 | .05 | 11 | 2 | .10 | 52 | 8 | 1.1 |
| 14 | 6.2 | 4 | .10 | 11 | 2 | .10 | 40 | 7 | .80 |
| 15 | 10 | 10 | .30 | 11 | 3 | .10 | 28 | 6 | .50 |
| 16 | 7.3 | 4 | .10 | 11 | 2 | .10 | 26 | 6 | .40 |
| 17 | 11 | 70 | 2.1 | 10 | 2 | .10 | 23 | 5 | .30 |
| 18 | 7.3 | 10 | 2.0 | 22 | 23 | 1.9 | 21 | 5 | .30 |
| 19 | 56 | 169 | 112 | 18 | 7 | .30 | 19 | 5 | .30 |
| 20 | 38 | 71 | 9.2 | 12 | 5 | .20 | 18 | 5 | .20 |
| 21 | 12 | 8 | .30 | 11 | 4 | .10 | 19 | 5 | .30 |
| 22 | 8.9 | 6 | .10 | 11 | 4 | .10 | 18 | 5 | .20 |
| 23 | 8.9 | 4 | .10 | 10 | 4 | .10 | 18 | 5 | .20 |
| 24 | 8.5 | 4 | .10 | 20 | 66 | 2.3 | 17 | 5 | .20 |
| 25 | 8.1 | 3 | .10 | 24 | 80 | 5.2 | 31 | 50 | 4.2 |
| 26 | 8.5 | 3 | .10 | 170 | 248 | 1180 | 28 | 12 | .90 |
| 27 | 9.7 | 3 | .10 | 33 | 12 | 1.1 | 20 | 4 | .20 |
| 28 | 9.7 | 3 | .10 | 25 | 8 | .50 | 231 | 918 | 1330 |
| 29 | 86 | 221 | 88 | -- | -- | -- | 47 | 12 | 1.5 |
| 30 | 39 | 20 | 2.1 | -- | -- | -- | 29 | 3 | .20 |
| 31 | 26 | 16 | 1.1 | -- | -- | -- | 22 | 2 | .10 |
| TOTAL | 443.6 | -- | 220.45 | 694 | -- | 1314.50 | 1962 | -- | 7578.60 |

16-8842. FUKUJI-GAWA AT FUKUJI--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 19 | 2 | .10 | 11 | 3 | .10 | 58 | 7 | 1.1 |
| 2 | 17 | 1 | .04 | 10 | 3 | .10 | 78 | -- | 200 |
| 3 | 16 | 1 | .05 | 10 | 3 | .10 | 800 | -- | 7000 |
| 4 | 45 | 60 | 7.3 | 9.4 | 3 | .10 | 122 | 12 | 4.0 |
| 5 | 31 | 10 | .80 | 9.4 | 3 | .10 | 1380 | 1310 | 19300 |
| 6 | 27 | 3 | .20 | 9.4 | 3 | .10 | 409 | 130 | 236 |
| 7 | 25 | 2 | .10 | 9.4 | 3 | .10 | 130 | 20 | 7.0 |
| 8 | 45 | 27 | 4.8 | 46 | 92 | 31 | 262 | 76 | 125 |
| 9 | 26 | 6 | .40 | 474 | 848 | 2960 | 490 | 78 | 144 |
| 10 | 22 | 3 | .20 | 67 | 22 | 5.2 | 130 | 5 | 1.8 |
| 11 | 19 | 3 | .20 | 138 | 266 | 205 | 104 | 4 | 1.1 |
| 12 | 18 | 3 | .10 | 51 | 12 | 1.7 | 91 | 4 | 1.0 |
| 13 | 17 | 3 | .10 | 1470 | 1790 | 15900 | 628 | 486 | 2380 |
| 14 | 16 | 3 | .10 | 276 | 136 | 147 | 138 | 10 | 3.7 |
| 15 | 15 | 3 | .10 | 152 | 40 | 16 | 91 | 6 | 1.5 |
| 16 | 17 | 3 | .10 | 76 | 10 | 2.1 | 76 | 3 | .60 |
| 17 | 18 | 3 | .10 | 75 | 16 | 3.4 | 64 | 3 | .50 |
| 18 | 15 | 3 | .10 | 58 | 8 | 1.3 | 51 | 3 | .40 |
| 19 | 14 | 3 | .10 | 51 | 10 | 1.4 | 966 | 817 | 4650 |
| 20 | 14 | 3 | .10 | 915 | 1030 | 6030 | 1590 | 1740 | 34600 |
| 21 | 14 | 3 | .10 | 188 | 36 | 18 | 648 | 162 | 635 |
| 22 | 13 | 3 | .10 | 93 | 8 | 2.0 | 463 | 44 | 77 |
| 23 | 13 | 3 | .10 | 623 | 595 | 1740 | 432 | 30 | 36 |
| 24 | 12 | 3 | .10 | 250 | 151 | 167 | 819 | 296 | 1140 |
| 25 | 11 | 3 | .10 | 122 | 11 | 3.6 | 298 | 12 | 9.7 |
| 26 | 12 | 3 | .10 | 76 | 4 | .80 | 249 | 29 | 32 |
| 27 | 11 | 3 | .10 | 951 | 1320 | 10300 | 900 | 758 | 4990 |
| 28 | 11 | 3 | .10 | 193 | 35 | 18 | 233 | 15 | 9.4 |
| 29 | 12 | 3 | .10 | 150 | -- | 180 | 163 | 5 | 2.2 |
| 30 | 11 | 3 | .10 | 270 | -- | 140 | 132 | 3 | 1.1 |
| 31 | -- | -- | -- | 80 | 12 | 2.6 | -- | -- | -- |
| TOTAL | 556 | -- | 16.09 | 6913.6 | -- | 37876.80 | 11995 | -- | 75590.10 |

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 112 | 3 | .90 | 21 | 3 | .20 | 16 | 3 | .10 |
| 2 | 98 | -- | 1.1 | 20 | 3 | .20 | 15 | 3 | .10 |
| 3 | 84 | -- | .90 | 20 | 3 | .20 | 15 | 3 | .10 |
| 4 | 74 | -- | .80 | 20 | 12 | .60 | 15 | 3 | .10 |
| 5 | 66 | -- | .70 | 19 | 14 | .70 | 14 | 3 | .10 |
| 6 | 63 | -- | .70 | 19 | 7 | .40 | 13 | 3 | .10 |
| 7 | 58 | -- | .60 | 17 | 5 | .20 | 13 | 3 | .10 |
| 8 | 52 | -- | .60 | 21 | 10 | .60 | 12 | 3 | .10 |
| 9 | 48 | 4 | .50 | 20 | 5 | .30 | 45 | 56 | 21 |
| 10 | 46 | 4 | .50 | 19 | 3 | .20 | 33 | 16 | 1.4 |
| 11 | 45 | 4 | .50 | 16 | 3 | .10 | 33 | 23 | 2.4 |
| 12 | 42 | 4 | .50 | 15 | 3 | .10 | 24 | 12 | .80 |
| 13 | 40 | 4 | .40 | 15 | 3 | .10 | 18 | 7 | .30 |
| 14 | 37 | 4 | .40 | 15 | 3 | .10 | 16 | 4 | .20 |
| 15 | 35 | 4 | .40 | 14 | 3 | .10 | 15 | 3 | .10 |
| 16 | 35 | 4 | .40 | 13 | 3 | .10 | 14 | 3 | .10 |
| 17 | 39 | 7 | .70 | 13 | 3 | .10 | 13 | 3 | .10 |
| 18 | 33 | 3 | .30 | 13 | 3 | .10 | 13 | 3 | .10 |
| 19 | 30 | 3 | .20 | 18 | 12 | .60 | 12 | 3 | .10 |
| 20 | 35 | 7 | .70 | 1280 | 1130 | 8910 | 12 | 3 | .10 |
| 21 | 30 | 3 | .20 | 147 | 70 | 2.8 | 11 | 3 | .10 |
| 22 | 27 | 3 | .20 | 51 | 10 | 1.4 | 10 | 3 | .10 |
| 23 | 25 | 3 | .20 | 33 | 8 | .70 | 11 | 3 | .10 |
| 24 | 24 | 3 | .20 | 27 | 6 | .40 | 10 | 3 | .10 |
| 25 | 25 | 3 | .20 | 24 | 4 | .30 | 10 | 3 | .10 |
| 26 | 25 | 3 | .20 | 22 | 3 | .20 | 9.4 | 3 | .10 |
| 27 | 24 | 3 | .20 | 20 | 3 | .20 | 9.0 | 3 | .10 |
| 28 | 29 | 14 | 1.1 | 19 | 3 | .20 | 8.6 | 3 | .10 |
| 29 | 29 | 10 | .80 | 18 | 3 | .10 | 8.4 | 3 | .10 |
| 30 | 24 | 6 | .40 | 18 | 3 | .10 | 8.2 | 3 | .10 |
| 31 | 24 | 3 | .20 | 17 | 3 | .10 | -- | -- | -- |
| TOTAL | 1358 | -- | 15.70 | 2004 | -- | 8921.50 | 456.6 | -- | 28.50 |

## 16-8846. AHA-GAWA AT AHA

LOCATION.--Lat 26°42'41 N., long 128°16'55" E., Okinawa, at gaging station 0.3 mile southwest of Aha School, and 1.4 miles upstream from mouth.
DRAINAGE AREA.--9.5 sq mi, approximately.
PERIOD OF RECORD.--Water temperatures: March 1968 to September 1969.
Sediment records: March 1968 to September 1969.
EXTREMES, 1968-69.--Water temperatures: Maximum, 30°C Aug. 27; minimum, 11°C on several days during December, January, and March.
Sediment concentrations: Maximum daily, 1,000 mg/l Aug. 20; minimum daily, 2 mg/l on many days.
Sediment loads: Maximum daily, 19,700 tons Aug. 20; minimum daily, 0.01 ton on many days.
EXTREMES, March 1968 to September 1969.--Water temperatures: Maximum, 31°C Aug. 17, 1968; minimum, 11°C on several days in 1968-69.
Sediment concentrations: Maximum daily, 1,900 mg/l Aug. 20, 1969; minimum daily, 1 mg/l on many days in 1968.
Sediment loads: Maximum daily, 19,700 tons Aug. 20, 1969; minimum daily, less than 0.05 ton on several days in 1968.
REMARKS.--Chemical analyses for this station on pages 274-275. The sediment concentrations and loads during the year were higher than normal because clearing and grading of the watershed just upstream from the station for a dirt road resulted in more than usual amounts of sediment being carried downstream.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| MONTH | DAY 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | AVERAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OCTOBER.. | 22 | 22 | 24 | 24 | 24 | 22 | 24 | 22 | 22 | 22 | 22 | 24 | 23 | 22 | 22 | 22 | 21 | 21 | 17 | 19 | 21 | 21 | 21 | 18 | 18 | 17 | 16 | 19 | 18 | 17 | 15 | 21 |
| NOVEMBER. | 15 | 16 | 19 | 20 | 19 | 18 | 21 | 18 | 18 | 17 | 17 | 19 | 19 | 21 | 16 | 20 | 15 | 19 | 17 | 17 | 16 | 16 | 17 | 18 | 17 | 17 | 17 | 17 | 16 | 16 | -- | 18 |
| DECEMBER. | 16 | 18 | 18 | 17 | 19 | 18 | 16 | 17 | 18 | 18 | 17 | 18 | 17 | 16 | 14 | 14 | 13 | 14 | 14 | 16 | 16 | 16 | 13 | 12 | 11 | 14 | 14 | 15 | 17 | 14 | 12 | 16 |
| JANUARY.. | 14 | 12 | 12 | 12 | 13 | 11 | 13 | 13 | 12 | 14 | 16 | 14 | 13 | 13 | 13 | 13 | 14 | 14 | 17 | 17 | 18 | 19 | 17 | 16 | 18 | 18 | 19 | 19 | 17 | 16 | 17 | 15 |
| FEBRUARY. | 16 | 15 | 14 | 16 | 12 | 13 | 12 | 14 | 12 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 16 | 14 | 16 | 14 | 15 | 16 | 16 | 15 | 15 | 15 | 13 | -- | -- | -- | 14 |
| MARCH.... | 11 | 14 | 14 | 13 | 13 | 13 | 13 | 16 | 16 | 15 | 16 | 14 | 11 | 12 | 11 | 11 | 13 | 13 | 13 | 14 | 17 | 14 | 13 | 14 | 16 | 14 | 15 | 15 | -- | -- | -- | 14 |
| APRIL.... | -- | -- | -- | 18 | 14 | 16 | 16 | 14 | 16 | 18 | 17 | -- | 19 | 18 | 21 | 22 | 24 | 18 | 22 | 18 | 19 | 21 | 22 | 22 | 22 | 21 | 19 | 21 | 22 | 21 | -- | 19 |
| MAY..... | 24 | 22 | 22 | 22 | 22 | 21 | 21 | 21 | 19 | 19 | 22 | 21 | 21 | 21 | 23 | 21 | 22 | 21 | 21 | 21 | 19 | 19 | 20 | 20 | 19 | 21 | 19 | -- | 19 | 19 | 20 | 21 |
| JUNE..... | 21 | 21 | 20 | 24 | 19 | 19 | 19 | 18 | 19 | 19 | 19 | 18 | 19 | 19 | -- | 21 | 21 | -- | 21 | 20 | 20 | 20 | 24 | 19 | 21 | 21 | 22 | 20 | 22 | 24 | -- | 20 |
| JULY..... | 23 | 24 | -- | 23 | 26 | 24 | 23 | 28 | 25 | 24 | 23 | 24 | 23 | 25 | 24 | 26 | 24 | 25 | 26 | 25 | 23 | 26 | 27 | 25 | 24 | 26 | 26 | 26 | 27 | 24 | 28 | 25 |
| AUGUST... | 27 | 24 | 26 | 25 | 26 | 24 | 26 | 24 | 24 | 27 | 26 | 24 | 25 | 24 | 23 | 24 | 24 | 26 | 26 | 22 | 22 | 24 | 24 | 26 | 24 | 25 | 30 | 28 | 26 | -- | 25 | 25 |
| SEPTEMBER | 23 | 26 | 26 | 25 | 26 | 26 | 26 | 25 | 23 | 25 | 25 | 26 | 26 | 25 | 26 | 26 | 26 | 23 | 24 | 26 | 24 | 24 | 23 | 24 | 26 | 24 | 26 | 24 | 25 | 25 | -- | 25 |

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 18 | 6 | .30 | 8.5 | 5 | .10 | 8.0 | 3 | .10 |
| 2 | 17 | 6 | .30 | 8.0 | 5 | .10 | 8.5 | 4 | .10 |
| 3 | 16 | 6 | .30 | 8.0 | 5 | .10 | 10 | 6 | .20 |
| 4 | 16 | 6 | .30 | 8.5 | 6 | .10 | 8.5 | 4 | .10 |
| 5 | 15 | 6 | .20 | 8.5 | 4 | .10 | 9.0 | 3 | .10 |
| 6 | 16 | 6 | .30 | 13 | 10 | .40 | 8.0 | 3 | .10 |
| 7 | 15 | 6 | .20 | 10 | 6 | .20 | 7.5 | 3 | .10 |
| 8 | 16 | 6 | .30 | 21 | 139 | 15 | 8.0 | 3 | .10 |
| 9 | 17 | 6 | .30 | 46 | 159 | 21 | 8.0 | 3 | .10 |
| 10 | 16 | 6 | .30 | 20 | 8 | .40 | 8.5 | 4 | .10 |
| 11 | 16 | 6 | .30 | 14 | 6 | .20 | 10 | 8 | .20 |
| 12 | 15 | 6 | .20 | 13 | 6 | .20 | 33 | 95 | 12 |
| 13 | 15 | 6 | .20 | 12 | 6 | .20 | 13 | 10 | .40 |
| 14 | 14 | 6 | .20 | 12 | 5 | .20 | 10 | 6 | .20 |
| 15 | 14 | 6 | .20 | 12 | 5 | .20 | 10 | 5 | .10 |
| 16 | 13 | 6 | .20 | 11 | 4 | .10 | 9.0 | 5 | .10 |
| 17 | 13 | 5 | .20 | 10 | 4 | .10 | 7.5 | 5 | .10 |
| 18 | 12 | 5 | .20 | 10 | 4 | .10 | 12 | 25 | 1.7 |
| 19 | 12 | 5 | .20 | 9.5 | 4 | .10 | 16 | 12 | .50 |
| 20 | 12 | 5 | .20 | 9.0 | 4 | .10 | 8.0 | 7 | .20 |
| 21 | 13 | 12 | .40 | 9.0 | 4 | .10 | 7.5 | 5 | .10 |
| 22 | 13 | 22 | .80 | 9.0 | 4 | .10 | 16 | 12 | .50 |
| 23 | 12 | 14 | .50 | 8.5 | 4 | .10 | 10 | 4 | .10 |
| 24 | 10 | 10 | .30 | 8.5 | 4 | .10 | 8.0 | 4 | .10 |
| 25 | 9.5 | 7 | .20 | 9.5 | 6 | .20 | 7.5 | 3 | .10 |
| 26 | 9.5 | 6 | .20 | 8.5 | 5 | .10 | 7.1 | 3 | .10 |
| 27 | 9.5 | 6 | .20 | 8.5 | 5 | .10 | 7.5 | 3 | .10 |
| 28 | 9.5 | 6 | .20 | 8.5 | 4 | .10 | 7.5 | 3 | .10 |
| 29 | 9.5 | 8 | .20 | 8.0 | 4 | .10 | 7.1 | 3 | .10 |
| 30 | 9.0 | 8 | .20 | 8.0 | 4 | .10 | 8.5 | 6 | .10 |
| 31 | 8.5 | 6 | .10 | -- | -- | -- | 7.5 | 3 | .10 |
| TOTAL | -- | -- | -- | 350.0 | -- | 40.10 | 306.7 | -- | 18.10 |

18-8846. AHA-GAWA AT AHA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | JANUARY | | | FEBRUARY | | | MARCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 9.0 | 10 | .20 | 50 | 60 | 8.1 | 25 | 4 | .30 |
| 2 | 8.0 | 4 | .10 | 35 | 12 | 1.1 | 200 | -- | 89 |
| 3 | 7.1 | 3 | .10 | 30 | 8 | .60 | 53 | 12 | 1.7 |
| 4 | 6.7 | 3 | .10 | 110 | -- | 89 | 45 | 8 | 1.0 |
| 5 | 11 | 7 | .20 | 52 | 10 | 1.4 | 36 | 5 | .50 |
| 6 | 9.5 | 4 | .10 | 35 | 8 | .80 | 32 | 5 | .40 |
| 7 | 7.1 | 3 | .10 | 28 | 6 | .50 | 30 | 5 | .40 |
| 8 | 6.7 | 3 | .10 | 25 | 6 | .40 | 96 | 251 | 141 |
| 9 | 6.7 | 3 | .10 | 23 | 5 | .30 | 141 | 127 | 76 |
| 10 | 13 | 22 | 2.1 | 22 | 4 | .20 | 92 | 160 | 40 |
| 11 | 9.0 | 10 | .20 | 20 | 4 | .20 | 423 | 828 | 3450 |
| 12 | 7.6 | 5 | .10 | 19 | 4 | .20 | 130 | 20 | 7.0 |
| 13 | 7.0 | 4 | .10 | 18 | 4 | .20 | 90 | 7 | 1.7 |
| 14 | 8.0 | 6 | .10 | 21 | 3 | .20 | 66 | 5 | .90 |
| 15 | 13 | 18 | .60 | 18 | 3 | .10 | 54 | 4 | .60 |
| 16 | 9.0 | 12 | .30 | 17 | 3 | .10 | 45 | 3 | .40 |
| 17 | 14 | 22 | .80 | 16 | 3 | .10 | 40 | 3 | .30 |
| 18 | 9.0 | 6 | .10 | 30 | 10 | .80 | 36 | 3 | .30 |
| 19 | 70 | -- | 94 | 20 | 5 | .30 | 33 | 3 | .30 |
| 20 | 35 | 70 | 6.6 | 17 | 4 | .20 | 31 | 3 | .30 |
| 21 | 15 | 9 | .40 | 15 | 3 | .10 | 29 | 3 | .20 |
| 22 | 12 | 8 | .30 | 14 | 3 | .10 | 27 | 3 | .20 |
| 23 | 11 | 6 | .20 | 13 | 3 | .10 | 25 | 3 | .20 |
| 24 | 10 | 6 | .20 | 30 | 40 | 3.2 | 24 | 3 | .20 |
| 25 | 9.2 | 6 | .10 | 21 | 8 | .50 | 40 | 9 | 1.0 |
| 26 | 15 | 20 | .80 | 130 | -- | 105 | 35 | 9 | .90 |
| 27 | 13 | 20 | .70 | 50 | 8 | 1.1 | 27 | 5 | .40 |
| 28 | 12 | 18 | .60 | 30 | 6 | .50 | 350 | -- | 490 |
| 29 | 150 | -- | 360 | -- | -- | -- | 86 | 10 | 2.3 |
| 30 | 40 | 18 | 1.9 | -- | -- | -- | 60 | 6 | 1.0 |
| 31 | 32 | -- | 3.9 | -- | -- | -- | 45 | 5 | .60 |
| TOTAL | 585.6 | -- | 475.20 | 909 | -- | 215.40 | 2446 | -- | 4309.10 |

| | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 40 | 3 | .30 | 16 | 3 | .10 | 74 | 4 | .80 |
| 2 | 35 | 3 | .30 | 16 | 3 | .10 | 110 | -- | 37 |
| 3 | 32 | 3 | .30 | 16 | 3 | .10 | 500 | -- | 1280 |
| 4 | 70 | 81 | 15 | 16 | 3 | .10 | 110 | 6 | 1.8 |
| 5 | 50 | 10 | 1.4 | 15 | 3 | .10 | 1000 | -- | 1280 |
| 6 | 42 | 7 | .80 | 16 | 4 | .20 | 250 | 120 | 81 |
| 7 | 38 | 4 | .40 | 15 | 3 | .10 | 115 | 6 | 1.9 |
| 8 | 80 | 85 | 18 | 42 | 185 | 24 | 380 | 140 | 140 |
| 9 | 40 | 6 | .60 | 889 | 1440 | 7390 | 470 | 60 | 74 |
| 10 | 36 | 3 | .30 | 80 | 14 | 3.0 | 150 | 12 | 4.9 |
| 11 | 31 | 3 | .30 | 100 | -- | 54 | 130 | 7 | 2.5 |
| 12 | 29 | 3 | .20 | 40 | 10 | 1.1 | 120 | 16 | 5.2 |
| 13 | 27 | 3 | .20 | 1000 | 1340 | 3620 | 670 | 340 | 1200 |
| 14 | 25 | 3 | .20 | 200 | 35 | 19 | 160 | 15 | 6.5 |
| 15 | 25 | 3 | .20 | 100 | 25 | 6.8 | 120 | 8 | 2.6 |
| 16 | 24 | 3 | .20 | 75 | 10 | 2.0 | 100 | 5 | 1.4 |
| 17 | 27 | 6 | .40 | 90 | 25 | 6.1 | 83 | 4 | .90 |
| 18 | 23 | 3 | .20 | 70 | 16 | 3.0 | 200 | 5 | 2.7 |
| 19 | 22 | 3 | .20 | 58 | 10 | 1.6 | 700 | -- | 1100 |
| 20 | 20 | 3 | .20 | 400 | -- | 1400 | 790 | 750 | 1600 |
| 21 | 20 | 3 | .20 | 130 | 16 | 5.6 | 330 | 190 | 169 |
| 22 | 20 | 3 | .20 | 84 | 8 | 1.8 | 280 | 190 | 144 |
| 23 | 19 | 3 | .20 | 560 | 1290 | 2750 | 250 | 135 | 91 |
| 24 | 18 | 3 | .10 | 160 | 20 | 8.6 | 600 | 320 | 520 |
| 25 | 18 | 3 | .10 | 100 | 8 | 2.2 | 210 | 8 | 4.5 |
| 26 | 18 | 3 | .10 | 84 | 5 | 1.1 | 155 | 4 | 1.7 |
| 27 | 19 | 4 | .20 | 560 | -- | 1440 | 800 | -- | 600 |
| 28 | 18 | 3 | .10 | 130 | 20 | 7.0 | 150 | 12 | 4.9 |
| 29 | 16 | 3 | .10 | 120 | 40 | 13 | 120 | 9 | 2.9 |
| 30 | 16 | 3 | .10 | 100 | 18 | 4.9 | 100 | 7 | 1.9 |
| 31 | -- | -- | -- | 84 | 6 | 1.4 | -- | -- | -- |
| TOTAL | 898 | -- | 41.10 | 5366 | -- | 16767.00 | 9227 | -- | 8363.10 |

16-8846. AHA-GAWA AT AHA--Continued

DAILY SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) | MEAN DISCHARGE (CFS) | MEAN CONCEN-TRATION (MG/L) | LOAD (TONS) |
| 1 | 92 | 5 | 1.2 | 17 | 2 | .10 | 24 | 15 | 1.0 |
| 2 | 79 | 4 | .90 | 16 | 2 | .10 | 16 | 4 | .20 |
| 3 | 68 | 4 | .70 | 16 | 2 | .10 | 16 | 4 | .20 |
| 4 | 65 | 8 | 1.4 | 70 | -- | 150 | 16 | 4 | .20 |
| 5 | 57 | 4 | .60 | 20 | 18 | 1.0 | 14 | 4 | .20 |
| 6 | 52 | 3 | .40 | 20 | 15 | .80 | 14 | 4 | .20 |
| 7 | 50 | 3 | .40 | 16 | 5 | .20 | 13 | 4 | .10 |
| 8 | 44 | 3 | .40 | 21 | 10 | .60 | 13 | 4 | .10 |
| 9 | 40 | 3 | .30 | 19 | 4 | .20 | 103 | 120 | 57 |
| 10 | 38 | 2 | .20 | 16 | 3 | .10 | 46 | 8 | 1.0 |
| 11 | 35 | 2 | .20 | 14 | 3 | .10 | 84 | 235 | 229 |
| 12 | 34 | 2 | .20 | 13 | 2 | .10 | 62 | 12 | 2.0 |
| 13 | 31 | 2 | .20 | 12 | 2 | .10 | 29 | 5 | .40 |
| 14 | 30 | 2 | .20 | 12 | 2 | .10 | 26 | 3 | .20 |
| 15 | 28 | 2 | .20 | 12 | 2 | .10 | 23 | 3 | .20 |
| 16 | 28 | 2 | .20 | 12 | 2 | .10 | 22 | 3 | .20 |
| 17 | 31 | 4 | .30 | 11 | 2 | .10 | 19 | 3 | .20 |
| 18 | 29 | 5 | .40 | 11 | 2 | .10 | 18 | 3 | .10 |
| 19 | 25 | 3 | .20 | 17 | 8 | .40 | 16 | 3 | .10 |
| 20 | 24 | 2 | .10 | 1830 | 1900 | 19700 | 16 | 3 | .10 |
| 21 | 23 | 2 | .10 | 257 | 116 | 113 | 15 | 3 | .10 |
| 22 | 23 | 2 | .10 | 73 | 17 | 3.4 | 14 | 3 | .10 |
| 23 | 23 | 2 | .10 | 47 | 10 | 1.3 | 14 | 3 | .10 |
| 24 | 21 | 2 | .10 | 36 | 5 | .50 | 14 | 2 | .10 |
| 25 | 20 | 2 | .10 | 30 | 3 | .20 | 14 | 2 | .10 |
| 26 | 21 | 4 | .20 | 26 | 3 | .20 | 14 | 2 | .10 |
| 27 | 22 | 3 | .20 | 25 | 3 | .20 | 13 | 2 | .10 |
| 28 | 22 | 4 | .20 | 22 | 3 | .20 | 12 | 2 | .10 |
| 29 | 20 | 3 | .20 | 20 | 2 | .10 | 13 | 3 | .10 |
| 30 | 21 | 4 | .20 | 18 | 2 | .10 | 12 | 2 | .10 |
| 31 | 18 | 3 | .10 | 16 | 2 | .10 | -- | -- | -- |
| TOTAL | 1114 | -- | 10.30 | 2745 | -- | 19973.70 | 725 | -- | 293.70 |

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DATE | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | CAL-CIUM (CA) (MG/L) | MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | |
| 16-2130. WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48") | | | | | | | | | |
| JUNE, 1969 | | | | | | | | | |
| 18... | 34 | 21 | 54 | 12 | 10 | -- | -- | 80 | 0 |
| 16-2605. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48") | | | | | | | | | |
| DEC., 1968 | | | | | | | | | |
| 05... | 25 | 22 | -- | 11 | 8.4 | -- | -- | 73 | 0 |
| FEB., 1969 | | | | | | | | | |
| 24... | 30 | 21 | 29 | 10 | 8.0 | -- | -- | 70 | 0 |
| APR. | | | | | | | | | |
| 14... | 20 | 22 | 21 | 10 | 7.8 | -- | -- | 71 | 0 |
| MAY | | | | | | | | | |
| 24... | 9.3 | 23 | 27 | 11 | 8.9 | -- | -- | 80 | 0 |
| JULY | | | | | | | | | |
| 10... | 7.2 | 25 | 26 | 11 | 8.5 | 19 | .9 | 80 | 0 |
| AUG. | | | | | | | | | |
| 19... | 5.7 | 24 | 28 | 11 | 8.2 | 18 | 1.0 | 77 | 0 |
| 16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'26") | | | | | | | | | |
| JAN., 1969 | | | | | | | | | |
| 08... | 24 | 20 | 21 | 8.0 | 6.3 | -- | -- | 54 | 0 |
| FEB. | | | | | | | | | |
| 27... | 24 | 20 | 19 | 8.4 | 6.8 | -- | -- | 54 | 1 |
| 16-2739. KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12") | | | | | | | | | |
| JAN., 1969 | | | | | | | | | |
| 09... | 35 | 21 | 20 | 11 | 6.4 | -- | -- | 56 | 0 |
| FEB. | | | | | | | | | |
| 28... | 29 | 21 | 18 | 10 | 6.8 | -- | -- | 60 | 1 |
| APR. | | | | | | | | | |
| 23... | 20 | 22 | 20 | 10 | 7.3 | -- | -- | 64 | 0 |
| MAY | | | | | | | | | |
| 29... | 19 | 22 | 18 | 9.8 | 7.2 | -- | -- | 64 | 0 |
| JULY | | | | | | | | | |
| 11... | 7.7 | 29 | 22 | 9.1 | 6.6 | 15 | .8 | 63 | 0 |
| AUG. | | | | | | | | | |
| 21... | 12 | 31 | 22 | 9.2 | 6.6 | 15 | .8 | 62 | 0 |
| 16-2835. KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15") | | | | | | | | | |
| JAN., 1969 | | | | | | | | | |
| 13... | -- | 21 | 23 | 14 | 7.8 | -- | -- | 67 | 0 |
| APR. | | | | | | | | | |
| 24... | 9.0 | 26 | 26 | 15 | 7.4 | -- | -- | 82 | 0 |
| JUNE | | | | | | | | | |
| 28... | 7.4 | -- | 20 | 14 | 7.5 | -- | -- | 82 | 0 |
| JULY | | | | | | | | | |
| 14... | 5.0 | 28 | 20 | 14 | 7.8 | 18 | 1.1 | 83 | 0 |
| AUG. | | | | | | | | | |
| 26... | 2.8 | -- | 23 | 15 | 8.2 | 17 | 1.1 | 89 | 0 |
| 16-2845. WAIHEE STREAM AT KAHALHU (LAT 21°27'31", LONG 157°50'26") | | | | | | | | | |
| JAN., 1969 | | | | | | | | | |
| 13... | -- | 20 | 22 | 9.0 | 5.0 | -- | -- | 51 | 0 |
| MAR. | | | | | | | | | |
| 06... | -- | 21 | 23 | 8.6 | 5.2 | -- | -- | 53 | 0 |
| APR. | | | | | | | | | |
| 30... | -- | 20 | 25 | 9.2 | 5.4 | -- | -- | 54 | 0 |
| JUNE | | | | | | | | | |
| 02... | -- | -- | 26 | 8.8 | 5.4 | -- | -- | 54 | 0 |
| AUG. | | | | | | | | | |
| 26... | -- | 22 | 23 | 8.4 | 5.5 | 12 | 1.0 | 56 | 0 |

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DATE | CHLORIDE (CL) (MG/L) | FLUORIDE (F) (MG/L) | HARDNESS (CA,MG) (MG/L) | NON-CARBONATE HARDNESS (MG/L) | PERCENT SODIUM | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | |
| 16-2130. WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48") | | | | | | | | |
| JUNE, 1969 | | | | | | | | |
| 18... | 93 | -- | 72 | 6 | -- | -- | 495 | 7.2 |
| 16-2605. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 20°22'51", LONG 157°45'48") | | | | | | | | |
| DEC., 1968 | | | | | | | | |
| 05... | 20 | -- | 62 | 2 | -- | -- | 202 | 7.0 |
| FEB., 1969 | | | | | | | | |
| 24... | 21 | -- | 58 | 1 | -- | -- | 194 | 7.3 |
| APR. | | | | | | | | |
| 14... | 20 | -- | 57 | 0 | -- | -- | 190 | 7.1 |
| MAY | | | | | | | | |
| 24... | 22 | -- | 64 | 0 | -- | -- | 214 | 7.1 |
| JULY | | | | | | | | |
| 10... | 23 | .1 | 62 | 0 | 39 | 1.0 | 210 | 7.7 |
| AUG. | | | | | | | | |
| 19... | 22 | .1 | 61 | 0 | 39 | 1.0 | 204 | 7.4 |
| 16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'26") | | | | | | | | |
| JAN., 1969 | | | | | | | | |
| 08... | 18 | -- | 46 | 2 | -- | -- | 158 | 7.1 |
| FEB. | | | | | | | | |
| 27... | 20 | -- | 46 | 3 | -- | -- | 167 | 8.4 |
| 16-2739. KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12") | | | | | | | | |
| JAN., 1969 | | | | | | | | |
| 09... | 19 | -- | 54 | 8 | -- | -- | 177 | 6.3 |
| FEB. | | | | | | | | |
| 28... | 21 | -- | 53 | 2 | -- | -- | 178 | 8.4 |
| APR. | | | | | | | | |
| 23... | 21 | -- | 55 | 2 | -- | -- | 181 | 7.0 |
| MAY | | | | | | | | |
| 29... | 21 | -- | 54 | 2 | -- | -- | 178 | 7.1 |
| JULY | | | | | | | | |
| 11... | 20 | .1 | 50 | 0 | 39 | .9 | 174 | 7.8 |
| AUG. | | | | | | | | |
| 21... | 20 | .1 | 50 | 0 | 39 | .9 | 173 | 7.6 |
| 16-2835. KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15") | | | | | | | | |
| JAN., 1969 | | | | | | | | |
| 13... | 23 | -- | 67 | 12 | -- | -- | 218 | 6.5 |
| APR. | | | | | | | | |
| 24... | 24 | -- | 68 | 1 | -- | -- | 216 | 7.3 |
| JUNE | | | | | | | | |
| 28... | 22 | -- | 66 | 0 | -- | -- | 215 | 7.2 |
| JULY | | | | | | | | |
| 14... | 23 | .1 | 67 | 0 | 36 | 1.0 | 214 | 7.8 |
| AUG. | | | | | | | | |
| 26... | 22 | .1 | 71 | 0 | 34 | .9 | 222 | 7.4 |
| 16-2845. WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'26") | | | | | | | | |
| JAN., 1969 | | | | | | | | |
| 13... | 18 | -- | 43 | 1 | -- | -- | 152 | 6.9 |
| MAR. | | | | | | | | |
| 06... | 19 | -- | 43 | 0 | -- | -- | 153 | 7.1 |
| APR. | | | | | | | | |
| 30... | 19 | -- | 45 | 1 | -- | -- | 156 | 6.9 |
| JUNE | | | | | | | | |
| 02... | 18 | -- | 44 | 0 | -- | -- | 151 | 7.0 |
| AUG. | | | | | | | | |
| 26... | 18 | .1 | 44 | 0 | 37 | .8 | 150 | 7.1 |

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DATE | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | CAL-CIUM (CA) (MG/L) | MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| ISLAND OF HAWAII | | | | | | | | | | |
| 16-7170. HONOLII STREAM NEAR PAPAIKOU (LAT 19°46'00", LONG 155°09'16") (Hydrologic bench-mark station) | | | | | | | | | | |
| SEP., 1969 | | | | | | | | | | |
| 03... | 71 | 21 | 5.1 | 1.8 | 1.2 | 2.0 | .2 | 12 | 0 | 2.5 |

| DATE | MEAN DIS-CHARGE (CFS) | SILICA (SIO2) (MG/L) | DIS-SOLVED IRON (FE) (UG/L) | CAL-CIUM (CA) (MG/L) | MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | SULFATE (SO4) (MG/L) | CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RYUKYU ISLANDS, ISLAND OF OKINAWA | | | | | | | | | | | |
| 16-8782. HANECHI-OKAWA AT KAWAKAMI (LAT 26°36'28" N., LONG 128°01'16" E.) | | | | | | | | | | | |
| OCT. | | | | | | | | | | | |
| 25... | 2.4 | 14 | 100 | 8.0 | 4.8 | 18 | .0 | 39 | 0 | 11 | 24 |
| FEB. | | | | | | | | | | | |
| 25... | 10 | 13 | 200 | 10 | 6.0 | 18 | .6 | 44 | 0 | 13 | 26 |
| 16-8842. FUKUJI-GAWA AT FUKUJI (LAT 26°38'16" N., LONG 128°10'13" E.) | | | | | | | | | | | |
| NOV. | | | | | | | | | | | |
| 07... | 15 | 17 | 200 | 5.6 | 3.4 | 21 | 1.0 | 32 | 0 | 8.0 | 30 |
| MAR. | | | | | | | | | | | |
| 05... | 18 | 15 | -- | 3.2 | 3.4 | 16 | -- | 21 | 0 | 8.0 | 22 |
| JUNE | | | | | | | | | | | |
| 03... | 800 | 10 | -- | 2.0 | 1.7 | 10 | .0 | 10 | 0 | 6.0 | 16 |
| 16-8846. AHA-GAWA AT AHA (LAT 26°42'41" N., LONG 128°16'55" E.) | | | | | | | | | | | |
| FEB. | | | | | | | | | | | |
| 20... | 17 | 18 | 300 | 4.0 | 2.4 | 13 | .6 | 24 | 0 | 5.0 | 22 |
| MAR. | | | | | | | | | | | |
| 03... | 53 | 16 | 200 | 2.8 | 1.7 | 11 | -- | 12 | 0 | 5.0 | 21 |
| AUG. | | | | | | | | | | | |
| 11... | 14 | 18 | 80 | 5.6 | 2.4 | 18 | .8 | 28 | 1 | 5.0 | 23 |

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DATE | FLUO-RIDE (F) (MG/L) | DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | PERCENT SODIUM | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|
| **ISLAND OF HAWAII** | | | | | | | | | |
| **16-7170. HONOLII STREAM NEAR PAPAIKOU (LAT 19°46'00", LONG 155°09'16") (Hydrologic bench-mark station)** | | | | | | | | | |
| SEP., 1969 | | | | | | | | | |
| 03... | .1 | 24 | .03 | 10 | 0 | 31 | .3 | 27 | 6.9 |

| DATE | FLUO-RIDE (F) (MG/L) | NITRATE (NO3) (MG/L) | DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L) | DIS-SOLVED SOLIDS (TONS PER AC-FT) | HARD-NESS (CA,MG) (MG/L) | NON-CAR-BONATE HARD-NESS (MG/L) | PERCENT SODIUM | SODIUM AD-SORP-TION RATIO | SPECI-FIC COND-UCTANCE (MICRO-MHOS) | PH (UNITS) | COLOR (PLAT-INUM-COBALT UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RYUKYU ISLANDS, ISLAND OF OKINAWA** | | | | | | | | | | | |
| **16-8782. HANECHI-OKAWA AT KAWAKAMI (LAT 26°36'28" N., LONG 128°01'16" E.)** | | | | | | | | | | | |
| OCT. | | | | | | | | | | | |
| 25... | .0 | .0 | 99 | .13 | 40 | 8 | 40 | 1.0 | 120 | 7.0 | 10 |
| FEB. | | | | | | | | | | | |
| 25... | .0 | .9 | 110 | .15 | 50 | 14 | 60 | 1.6 | 150 | 7.6 | 2 |
| **16-8842. FUKUJI-GAWA AT FUKUJI (LAT 26°38'16" N.)** | | | | | | | | | | | |
| NOV. | | | | | | | | | | | |
| 07... | .1 | .0 | 102 | .14 | 28 | 2 | 61 | 1.7 | 135 | 7.4 | 10 |
| MAR. | | | | | | | | | | | |
| 05... | .0 | .4 | 78 | .11 | 22 | 5 | 61 | 1.5 | 110 | 7.2 | 10 |
| JUNE | | | | | | | | | | | |
| 03... | .0 | .2 | 51 | .07 | 12 | 4 | 64 | 1.3 | 70 | 7.5 | 7 |
| **16-8846. AHA-GAWA AT AHA (LAT 26°42'41" N., LONG 128°16'55" E.)** | | | | | | | | | | | |
| FEB. | | | | | | | | | | | |
| 20... | .0 | .0 | 73 | .10 | 20 | 1 | 48 | 1.0 | 95 | 7.6 | 10 |
| MAR. | | | | | | | | | | | |
| 03... | .0 | .0 | 64 | .09 | 14 | 4 | 63 | 1.3 | 80 | 7.4 | 10 |
| AUG. | | | | | | | | | | | |
| 11... | .0 | .0 | 88 | .12 | 24 | 1 | 61 | 1.6 | 100 | 8.7 | -- |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | | | | | | | | | |
| 16-2130. WAIKELE STREAM AT WAIPAHU (LAT 21°23'09", LONG 158°00'48") | | | | | | | | | | | | | | | | | |
| OCT 1, 1968 | 1315 | 26 | 54 | 147 | 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| OCT 1..... | 1415 | 26 | 75 | 243 | 49 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1215 | 26 | 67 | 108 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 13..... | 1610 | 21 | 194 | 74 | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 15, 1969 | 1010 | 22 | 56 | 13 | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 30..... | 0915 | 21 | 118 | 77 | 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1255 | 22 | 402 | 828 | 899 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1350 | 22 | 286 | 694 | 536 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 13..... | 0825 | 21 | 25 | 7 | .47 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 12..... | 0835 | 22 | 20 | 5 | .27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| SEP 10..... | 0830 | 24 | 22 | 5 | .30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-2293. KALIHI STREAM AT KALIHI (LAT 21°20'29", LONG 157°52'36") | | | | | | | | | | | | | | | | | |
| NOV 14, 1968 | 1500 | | 17 | 146 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 20..... | 1040 | 23 | 1.6 | 5 | .02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 28, 1969 | 1230 | 19 | 3.4 | 20 | .18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 9..... | 1450 | 24 | 9.3 | 6 | .15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 20..... | 0930 | 20 | 4.2 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| SEP 22..... | 1135 | 23 | 18 | 8 | .39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-2805. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48") | | | | | | | | | | | | | | | | | |
| OCT 8, 1968 | 0830 | 23 | 4.6 | 42 | .52 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| OCT 8..... | 1330 | 23 | 4.4 | 3 | .04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| OCT 16..... | 1510 | | 170 | H 4980 | 2290 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| OCT 16..... | 1540 | | 340 | H 3350 | 3080 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1040 | 24 | 17 | 179 | 8.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 25..... | 1445 | 24 | 4.8 | 5 | .06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1445 | | 176 | H 7140 | 3390 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1515 | | 638 | H 3040 | 5240 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1535 | | 755 | 2600 | 5300 | 32 | 42 | 56 | 72 | 81 | 89 | 96 | 98 | 99 | 100 | -- | VPWC |
| NOV 29..... | 1545 | | 740 | H 3020 | 6030 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1545 | | 740 | 1340 | 2680 | 18 | 32 | 46 | 58 | 75 | 84 | 93 | 97 | 99 | 100 | -- | VPWC |
| NOV 29..... | 1615 | | 638 | H 1620 | 2790 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1630 | | 588 | 650 | 1030 | 21 | 31 | -- | 63 | -- | 83 | 91 | 97 | 100 | -- | -- | VPWC |
| NOV 29..... | 1645 | | 500 | H 1680 | 2270 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1700 | | 500 | 663 | 895 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1710 | | 460 | 491 | 610 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1715 | | 420 | H 1060 | 1200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1720 | | 440 | 560 | 665 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1745 | | 358 | H 685 | 662 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1815 | | 300 | H 587 | 475 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1845 | | 300 | H 455 | 369 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1915 | | 268 | H 386 | 279 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1945 | | 252 | H 352 | 240 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 2015 | | 227 | H 1410 | 864 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 2045 | | 211 | H 209 | 119 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 2115 | | 211 | H 175 | 100 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 2145 | | 181 | H 161 | 79 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 30..... | 0835 | 25 | 110 | 27 | 8.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 0930 | 24 | 56 | 360 | 54 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 0945 | 24 | 59 | 407 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 0955 | 24 | 97 | 136 | 36 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1000 | 24 | 140 | 352 | 133 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1010 | 24 | 165 | 482 | 215 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1025 | 24 | 156 | 381 | 160 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1045 | 24 | 160 | 678 | 293 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1100 | 24 | 148 | 501 | 200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 1..... | 1700 | 24 | 70 | 60 | 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 2..... | 1020 | 23 | 33 | 9 | .80 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 2, 1969 | 1450 | 23 | 135 | 261 | 95 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 2..... | 1505 | 23 | 221 | 660 | 394 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

H Samples collected with automatic pumping sampler.

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (°C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **16-2805. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA--Continued** | | | | | | | | | | | | | | | | | |
| JAN 2..... | 1525 | 23 | 348 | 959 | 901 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 2..... | 1555 | 23 | 280 | 1030 | 779 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 2..... | 1640 | 23 | 218 | 549 | 323 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1340 | 23 | 410 | 1210 | 1340 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1345 | 23 | 380 | 1110 | 1140 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1355 | 23 | 340 | 1120 | 1030 | 40 | 52 | 71 | 86 | 94 | 96 | 98 | 99 | 100 | -- | -- | VPWC |
| JAN 30..... | 1410 | 23 | 295 | 1190 | 948 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1425 | 23 | 250 | 976 | 659 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1555 | 23 | 106 | 204 | 58 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1620 | 23 | 91 | 157 | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 31..... | 0715 | 22 | 25 | 14 | .95 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0710 | 22 | 340 | 1430 | 1310 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0720 | 22 | 320 | 1220 | 1050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0730 | 22 | 284 | 1230 | 943 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0745 | 22 | 242 | 891 | 582 | 32 | 46 | -- | 88 | -- | 93 | 99 | 100 | -- | -- | -- | VPWC |
| FEB 1..... | 1045 | 22 | 258 | 731 | 509 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1100 | 22 | 235 | 518 | 329 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1635 | 21 | 2030 | 1580 | 8660 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1645 | 21 | 1790 | 1180 | 5700 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1650 | 21 | 1730 | 1510 | 7050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1730 | 22 | 1040 | 907 | 2550 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1745 | 22 | 920 | 841 | 2090 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 2..... | 0945 | 22 | 114 | 41 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 24..... | 1155 | 21 | 30 | 8 | .65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 14..... | 1435 | 22 | 20 | 7 | .38 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0700 | 20 | 72 | 447 | 87 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0710 | 20 | 58 | 318 | 50 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0720 | 20 | 50 | 219 | 30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0735 | 20 | 45 | 170 | 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0745 | 20 | 42 | 133 | 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 26..... | 1345 | 23 | 9.3 | 5 | .13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 10..... | 1435 | 25 | 7.3 | 1 | .02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 19..... | 1310 | 24 | 5.8 | 5 | .08 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| SEP 22..... | 1110 | 22 | 11 | 5 | .15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| **16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'28")** | | | | | | | | | | | | | | | | | |
| OCT 1, 1968 | 0800 | 22 | 7.0 | 2 | .04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1105 | 22 | 31 | 50 | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 19..... | 1400 | 22 | 22 | 302 | 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 26..... | 1000 | 22 | 7.2 | 19 | .37 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1215 | 22 | 17 | 18 | .83 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 3, 1969 | 0825 | 23 | 77 | 63 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 8..... | 1130 | 21 | 24 | 13 | .84 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1400 | 21 | 80 | 204 | 44 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1455 | 23 | 41 | 120 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 30..... | 1535 | 23 | 34 | 42 | 3.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0800 | 22 | 550 | 885 | 1310 | 25 | 38 | -- | 63 | -- | 84 | 94 | 99 | 100 | -- | -- | VPWC |
| FEB 1..... | 0845 | 21 | 418 | 412 | 465 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0900 | 21 | 204 | 358 | 197 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0915 | 21 | 134 | 662 | 240 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 0940 | 20 | 178 | 760 | 365 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1130 | 22 | 490 | 312 | 413 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1210 | 22 | 580 | 785 | 1230 | 36 | 51 | -- | 81 | -- | 96 | 99 | 100 | -- | -- | -- | VPWC |
| FEB 1..... | 1215 | 22 | 680 | 463 | 850 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1230 | 22 | 720 | 668 | 1300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1240 | 22 | 692 | 491 | 917 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1305 | 22 | 541 | 476 | 695 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1408 | 22 | 3600 | D 2490 | 24200 | 24 | 33 | 46 | 58 | 77 | 80 | 93 | 97 | -- | -- | 100 | VPWC |
| FEB 1..... | 1415 | 22 | 3920 | D 2200 | 23300 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1420 | 22 | 4240 | D 2110 | 24200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1525 | 22 | 10400 | D 4130 | 116000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 1..... | 1530 | 22 | 10700 | D 4820 | 139000 | 22 | 30 | 40 | 53 | 68 | 72 | 86 | 92 | 93 | -- | 100 | VPWC |
| FEB 1..... | 1800 | 22 | 700 | 3020 | 5710 | 28 | 38 | 53 | 67 | 80 | 84 | 91 | 95 | -- | -- | 100 | VPWC |
| FEB 1..... | 1930 | 22 | 300 | 1360 | 1100 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 2..... | 1030 | 22 | 60 | 41 | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 27..... | 0850 | 20 | 24 | 10 | .65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

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INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE--Continued** | | | | | | | | | | | | | | | | | |
| APR 22..... | 1200 | 22 | 17 | 6 | .28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 23..... | 1110 | 22 | 18 | 118 | 5.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1110 | 21 | 28 | 41 | 3.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1150 | 21 | 24 | 32 | 2.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1240 | 21 | 22 | 22 | 1.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1315 | 21 | 20 | 19 | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 27..... | 1210 | 22 | 14 | 9 | .34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 27..... | 1215 | 22 | 14 | 11 | .42 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 8..... | 1045 | 23 | 10 | 1 | .03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 20..... | 1435 | 24 | 8.5 | 5 | .11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| SEP 22..... | 1140 | 21 | 10 | 3 | .08 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| **16-2739. KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12")** | | | | | | | | | | | | | | | | | |
| OCT 10, 1968 | 1145 | 26 | 9.4 | 4 | .10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1130 | | 48 | 259 | 34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 9, 1969 | 0845 | 21 | 39 | 3 | .32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 28..... | 1100 | 21 | 33 | 3 | .27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 29..... | 0725 | 22 | 19 | 15 | .77 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 21..... | 0800 | 23 | 12 | 17 | .55 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 21..... | 1315 | 30 | 11 | 16 | .48 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| **16-2835. KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15")** | | | | | | | | | | | | | | | | | |
| OCT 16, 1968 | 1145 | 24 | 4.2 | 40 | .45 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1255 | 23 | 94 | 70 | 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 1020 | 22 | 5.1 | 9 | .12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 3, 1969 | 1020 | 23 | 137 | 55 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 13..... | 1110 | 21 | 20 | 9 | .49 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 24..... | 1515 | 26 | 9.0 | 8 | .19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0930 | 21 | 67 | 191 | 35 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0945 | 21 | 61 | 133 | 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 1000 | 21 | 57 | 85 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 2..... | 1205 | 26 | 7.4 | 13 | .26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 14..... | 1325 | 28 | 5.0 | 22 | .30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| **16-2845. WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'26")** | | | | | | | | | | | | | | | | | |
| OCT 11, 1968 | 1430 | 24 | 10 | 12 | .32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 14..... | 1235 | 23 | 60 | 858 | 139 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| NOV 29..... | 0905 | 21 | 13 | 24 | .84 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 3, 1969 | 0850 | 23 | 180 | 507 | 246 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 3..... | 0940 | 23 | 130 | 407 | 143 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 13..... | 0920 | 20 | 19 | 13 | .67 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 6..... | 1015 | 21 | 14 | 30 | 1.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 30..... | 0805 | 20 | 13 | 15 | .53 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0830 | 20 | 56 | 210 | 32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0845 | 20 | 51 | 174 | 24 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0900 | 20 | 46 | 138 | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 2..... | 0915 | 20 | 42 | 121 | 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 2..... | 1030 | 23 | 11 | 21 | .62 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 26..... | 0940 | 22 | 11 | 9 | .27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| **ISLAND OF HAWAII** | | | | | | | | | | | | | | | | | |
| **16-7170. HONOLII STREAM NEAR PAPAIKOU (LAT 19°46'00", LONG 155°09'16")** (Hydrologic bench-mark station) | | | | | | | | | | | | | | | | | |
| SEP 3, 1969 | 1430 | 21 | 71 | 2 | .38 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE: PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RYUKYU ISLANDS, ISLAND OF OKINAWA | | | | | | | | | | | | | | | | | |
| 16-8752. BENOKI-GAWA AT BENOKI (LAT 26°47'06" N., LONG 128°14'59" E.) | | | | | | | | | | | | | | | | | |
| OCT 25, 1968 | 1030 | 17 | 4.3 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 4..... | 1040 | 19 | 3.5 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 1, 1969 | 1130 | 23 | 43 | 3 | .35 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8755. YONA-GAWA AT YONA (LAT 26°45'10" N., LONG 128°13'18" E.) | | | | | | | | | | | | | | | | | |
| OCT 25, 1968 | 1120 | 18 | 2.4 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 3..... | 1550 | 21 | 2.2 | 2 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 9, 1969 | 1510 | | 1.4 | 32 | .12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 5..... | 1235 | 13 | 14 | 5 | .19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 27..... | 1315 | 16 | 16 | 9 | .39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 11..... | 1700 | | 153 | G 1300 | 537 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 18..... | 1600 | 14 | 6.2 | 9 | .15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 1..... | 1550 | 21 | 2.8 | 13 | .10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 23..... | 1050 | | 358 | G 8650 | 8360 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 12..... | 1555 | | 24 | 5 | .32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 13..... | 0645 | | 153 | G 1550 | 640 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 1..... | 1445 | 25 | 16 | 3 | .13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 2..... | 1120 | 23 | 12 | 9 | .29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 20..... | 0840 | | 153 | G 2930 | 1210 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 20..... | 1020 | | 358 | G 4760 | 4600 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 20..... | 1045 | | 664 | G 4830 | 8660 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 20..... | 1140 | | 1040 | G11200 | 31400 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 22..... | 1445 | | 16 | 2 | .09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8770. RIGHT BRANCH OF SOUTH FORK HENAN-GAWA NEAR TSUHA (LAT 26°37'42" N., LONG 128°05'52" E.) | | | | | | | | | | | | | | | | | |
| MAR 8, 1969 | 1125 | 17 | .94 | 4 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 2..... | 1345 | | 5.2 | 3 | .04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 28..... | 1020 | 22 | 11 | 9 | .27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| AUG 29..... | 1400 | 25 | 1.6 | 1 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8785. OI-KAWA AT JINGUSUKU (LAT 26°39'07" N., LONG 127°57'24" E.) | | | | | | | | | | | | | | | | | |
| MAR 8, 1969 | 1440 | 16 | 80 | 5700 | 1230 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 26..... | 1415 | 21 | 3.6 | 10 | .10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8805. NAGATA-GAWA AT KADENA (LAT 26°22'23" N., LONG 127°45'50" E.) | | | | | | | | | | | | | | | | | |
| APR 10, 1969 | 1415 | | 5.0 | 2 | .03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 6..... | 1110 | 22 | 2.9 | 9 | .07 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 16..... | 1100 | | 22 | 33 | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8809. MACHINATO-GAWA NEAR OJANA (LAT 26°14'43" N., LONG 127°44'16" E.) | | | | | | | | | | | | | | | | | |
| APR 14, 1969 | 0850 | 19 | 1.0 | 24 | .06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 16..... | 0845 | | 4.2 | 53 | .60 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8824. TENGAN-GAWA AT TENGAN (LAT 26°22'54" N., LONG 127°51'39" E.) | | | | | | | | | | | | | | | | | |
| FEB 26, 1969 | 0945 | 19 | 11 | 43 | 1.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 17..... | 1000 | 16 | 8.0 | 4 | .09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 14..... | 1125 | 22 | 4.7 | 7 | .09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 8..... | 0930 | 20 | 2.3 | 8 | .05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 25..... | 1015 | 25 | 27 | 23 | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8828. KANNA-GAWA NEAR KANNA (LAT 26°28'20" N., LONG 127°56'46" E.) | | | | | | | | | | | | | | | | | |
| MAR 1, 1969 | 1445 | 16 | 1.8 | 2 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 15..... | 1440 | 14 | 2.1 | 3 | .02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 29..... | 1530 | 19 | 1.6 | 8 | .03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 12..... | 1245 | 20 | 1.5 | 6 | .02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 21..... | 0955 | 23 | 18 | 6 | .29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

G Samples collected with single-stage sampler.

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-8833. LEFT FORK O-KAWA NEAR KUSHI (LAT 26°31'18" N., LONG 127°59'50" E.) | | | | | | | | | | | | | | | | | |
| MAR 1, 1969 | 1020 | 14 | .32 | 3 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| APR 12..... | 1030 | 18 | .21 | 4 | 0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 21..... | 1130 | 22 | 5.5 | 6 | .09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8835.5. OURA-GAWA AT OKAWA (LAT 26°34'10" N., LONG 128°02'23" E.) | | | | | | | | | | | | | | | | | |
| FEB 26, 1969 | 1155 | 18 | 14 | 5 | .19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 1..... | 1155 | 16 | 4.3 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 15..... | 1155 | 15 | 8.5 | 4 | .09 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 14..... | 1240 | 20 | 39 | 7 | .74 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 14..... | 1440 | 20 | 35 | 8 | .76 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 1..... | 1320 | 22 | 56 | 12 | 1.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8841. FUKUJI-GAWA NEAR YUBARU (LAT 26°38'32" N., LONG 128°13'00" E.) | | | | | | | | | | | | | | | | | |
| MAR 12, 1969 | 1100 | 17 | 46 | 4 | .50 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 17..... | 1145 | 22 | 20 | 1 | .05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 23..... | 1145 | | 2640 | 342 | 2440 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 23..... | 1210 | | 2720 | 367 | 2700 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 23..... | 1230 | | 2000 | 247 | 1330 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 27..... | 1120 | | 60 | 62 | 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 27..... | 1135 | | 86 | 73 | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAY 27..... | 1200 | | 315 | 90 | 77 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 14..... | 1125 | | 57 | 2 | .31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 23..... | 1230 | | 114 | 12 | 3.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 23..... | 1355 | | 109 | 11 | 3.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUL 11..... | 1300 | | 20 | 10 | .54 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-8848. FUN-GAWA NEAR AHA (LAT 26°44'33" N., LONG 128°18'53" E.) | | | | | | | | | | | | | | | | | |
| OCT 24, 1968 | 1340 | 21 | 3.7 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| DEC 3..... | 1415 | 20 | 3.7 | 1 | .01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| FEB 3, 1969 | 1630 | 16 | 8.8 | 1 | .02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| MAR 7..... | 1305 | 17 | 12 | 6 | .19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JUN 26..... | 1030 | 22 | 51 | 4 | .55 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

PARTICLE SIZE OF BED MATERIAL, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

| DATE | TIME | WATER TEMPERATURE (C) | NUMBER OF SAMPLING POINTS | DISCHARGE (CFS) | PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .062 | .125 | .250 | .500 | 1.00 | 2.00 | 4.00 | 8.00 | 16.0 | 32.0 | 64.0 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | | | | | | | | |
| 16-2605. MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA (LAT 21°22'51", LONG 157°45'48") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 0900 | | | 6.4 | 1 | 1 | 3 | 11 | 26 | 40 | 50 | 61 | 73 | 85 | 100 | S |
| 16-2705. KAMOOALII STREAM BELOW KUOU STREAM, NEAR KANEOHE (LAT 21°23'42", LONG 157°48'26") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 1000 | | | 7.0 | 2 | 3 | 6 | 12 | 21 | 30 | 39 | 49 | 69 | 86 | 100 | S |
| 16-2730. KAMOOALII STREAM AT KANEOHE (LAT 21°24'51", LONG 157°48'12") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 1100 | | | 12 | 1 | 2 | 6 | 19 | 32 | 42 | 54 | 72 | 94 | 100 | -- | S |
| 16-2835. KAHALUU STREAM AT KAHALUU (LAT 21°27'23", LONG 157°50'15") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 1500 | | | 6.4 | -- | 2 | 7 | 22 | 41 | 58 | 70 | 92 | 96 | 100 | -- | S |
| 16-2845. WAIHEE STREAM AT KAHALUU (LAT 21°27'31", LONG 157°50'26") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 1300 | | | 13 | -- | 1 | 2 | 8 | 23 | 42 | 64 | 83 | -- | 87 | 100 | S |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

| DATE | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | CAL-CIUM (CA) (MG/L) | MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | |
| 16-2290. KALIHI STREAM NEAR HONOLULU (LAT 21°21'59", LONG 157°50'49") | | | | | | | | | |
| APR., 1969 | | | | | | | | | |
| 29... | 4.9 | 21 | 10 | 4.8 | 3.9 | -- | -- | 26 | 0 |
| MAY | | | | | | | | | |
| 27... | 4.0 | 21 | 10 | 5.0 | 3.8 | -- | -- | 28 | 0 |
| ISLAND OF MOLOKAI | | | | | | | | | |
| 16-4000. HALAWA STREAM NEAR HALAWA (LAT 21°09'31", LONG 156°45'53") | | | | | | | | | |
| JUNE, 1969 | | | | | | | | | |
| 28... | 3.6 | 22 | 8.6 | 1.6 | 1.2 | -- | -- | 10 | 0 |
| 16-4040. PELEKUNU STREAM NEAR PELEKUNU (LAT 21°08'12", LONG 156°52'46") | | | | | | | | | |
| JUNE, 1969 | | | | | | | | | |
| 24... | 5.4 | 23 | 25 | 10 | 3.2 | -- | -- | 42 | 0 |
| 16-4053. MOLOKAI TUNNEL AT WEST PORTAL (LAT 21°07'27", LONG 156°59'50") | | | | | | | | | |
| JUNE, 1969 | | | | | | | | | |
| 23... | 5.8 | 18 | -- | 6.6 | 3.0 | -- | -- | 41 | 0 |
| 16-4055. WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA (LAT 21°08'43", LONG 156°55'18") | | | | | | | | | |
| AUG., 1969 | | | | | | | | | |
| 22... | 1.4 | 20 | 29 | 6.0 | 3.4 | 9.2 | 1.5 | 27 | 7 |
| 16-4080. WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA (LAT 21°09'45", LONG 156°55'54") | | | | | | | | | |
| AUG., 1969 | | | | | | | | | |
| 22... | 11 | 19 | 31 | 6.5 | 3.8 | 9.8 | 1.3 | 44 | 0 |
| 16-4150. EAST FORK KAWELA GULCH NEAR KAMALO (LAT 21°06'46", LONG 156°54'23") | | | | | | | | | |
| AUG., 1969 | | | | | | | | | |
| 26... | 4.3 | 15 | 2.6 | .6 | .8 | 4.2 | .2 | 2 | 0 |
| 16-4160. PUNAULA GULCH NEAR PUKOO (LAT 21°05'50", LONG 156°48'48") | | | | | | | | | |
| AUG., 1969 | | | | | | | | | |
| 25... | 4.0 | 19 | 2.0 | .9 | .8 | 4.4 | .4 | 5 | 0 |

| DATE | DIS-CHARGE (CFS) | TEMP-ERATURE (DEG C) | SILICA (SIO2) (MG/L) | CAL-CIUM (CA) (MG/L) | MAG-NE-SIUM (MG) (MG/L) | SODIUM (NA) (MG/L) | PO-TAS-SIUM (K) (MG/L) | BICAR-BONATE (HCO3) (MG/L) | CAR-BONATE (CO3) (MG/L) | CHLO-RIDE (CL) (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| ISLAND OF HAWAII | | | | | | | | | | |
| 16-7550. KEHEHA DITCH NEAR KOHALA (LAT 20°07'25", LONG 155°45'05") | | | | | | | | | | |
| DEC., 1968 | | | | | | | | | | |
| 24... | -- | -- | 3.5 | .9 | .7 | -- | -- | 3 | 0 | 3.0 |

| DATE | CHLORIDE (CL) (MG/L) | FLUORIDE (F) (MG/L) | HARDNESS (CA,MG) (MG/L) | NON-CARBONATE HARDNESS (MG/L) | PERCENT SODIUM | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | |
| 16-2290. KALIHI STREAM NEAR HONOLULU (LAT 21°21'59", LONG 157°50'49") | | | | | | | | |
| APR., 1969 | | | | | | | | |
| 29... | 20 | -- | 28 | 5 | -- | -- | 124 | 7.0 |
| MAY | | | | | | | | |
| 27... | 19 | -- | 28 | 5 | -- | -- | 126 | 6.9 |
| ISLAND OF MOLOKAI | | | | | | | | |
| 16-4000. HALAWA STREAM NEAR HALAWA (LAT 21°09'31", LONG 156°45'53") | | | | | | | | |
| JUNE, 1969 | | | | | | | | |
| 28... | 12 | -- | 9 | 1 | -- | -- | 60 | 6.5 |
| 16-4040. PELEKUNU STREAM NEAR PELEKUNU (LAT 21°08'12", LONG 156°52'46") | | | | | | | | |
| JUNE, 1969 | | | | | | | | |
| 24... | 11 | -- | 38 | 4 | -- | -- | 127 | 7.1 |
| 16-4053. MOLOKAI TUNNEL AT WEST PORTAL (LAT 21°07'27", LONG 156°59'50") | | | | | | | | |
| JUNE, 1969 | | | | | | | | |
| 23... | 12 | -- | 29 | 0 | -- | -- | 110 | 7.0 |
| 16-4055. WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA (LAT 21°08'43", LONG 156°55'18") | | | | | | | | |
| AUG., 1969 | | | | | | | | |
| 22... | 12 | .1 | 29 | 0 | 39 | .7 | 106 | 9.3 |
| 16-4080. WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA (LAT 21°09'45", LONG 156°55'54") | | | | | | | | |
| AUG., 1969 | | | | | | | | |
| 22... | 13 | .2 | 32 | 0 | 39 | .8 | 114 | 7.1 |
| 16-4150. EAST FORK KAWELA GULCH NEAR KAMALO (LAT 21°06'46", LONG 156°54'23") | | | | | | | | |
| AUG., 1969 | | | | | | | | |
| 26... | 8.0 | -- | 5 | 4 | 64 | .8 | 37 | 5.1 |
| 16-4180. PUNAULA GULCH NEAR PUKOO (LAT 21°05'50", LONG 156°48'48") | | | | | | | | |
| AUG., 1969 | | | | | | | | |
| 25... | 7.0 | .1 | 6 | 2 | 61 | .8 | 36 | 6.3 |

| DATE | FLUORIDE (F) (MG/L) | DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) | DISSOLVED SOLIDS (TONS PER AC-FT) | HARDNESS (CA,MG) (MG/L) | NON-CARBONATE HARDNESS (MG/L) | PERCENT SODIUM | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|
| ISLAND OF HAWAII | | | | | | | | | |
| 16-7550. KEHENA DITCH NEAR KOHALA (LAT 20°07'25", LONG 155°45'05") | | | | | | | | | |
| DEC., 1968 | | | | | | | | | |
| 24... | -- | -- | -- | 5 | 2 | -- | -- | 27 | 5.3 |

| DATE | DISCHARGE (CFS) | TEMPERATURE (DEG C) | SILICA (SIO2) (MG/L) | CALCIUM (CA) (MG/L) | MAGNESIUM (MG) (MG/L) | BICARBONATE (HCO3) (MG/L) | CARBONATE (CO3) (MG/L) | CHLORIDE (CL) (MG/L) | HARDNESS (CA,MG) (MG/L) | NON-CARBONATE HARDNESS (MG/L) | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMOA ISLANDS, ISLAND OF TUTUILA | | | | | | | | | | | | |
| 16-9060. VAITOLU STREAM AT AOA (LAT 14°16'19" S., LONG 170°35'32" W.) | | | | | | | | | | | | |
| FEB., 1969 | | | | | | | | | | | | |
| 07... | .06 | -- | 26 | 5.3 | 7.7 | 52 | 0 | 20 | 45 | 3 | 148 | 7.1 |
| 16-9310. ATAULOMA STREAM AT AFAO (LAT 14°20'10" S., LONG 170°48'02" W.) | | | | | | | | | | | | |
| FEB., 1969 | | | | | | | | | | | | |
| 04... | .88 | 27 | 21 | 5.3 | 4.1 | 42 | 0 | 9.5 | 30 | 0 | 94 | 6.8 |

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHODS OF ANALYSIS: B, BOTTOM WITHDRAWAL TUBE; C, CHEMICALLY DISPERSED; N, IN NATIVE WATER; P, PIPET; S, SIEVE; V, VISUAL ACCUMULATION TUBE; W, IN DISTILLED WATER)

| DATE | TIME | WATER TEMPERATURE (C) | DISCHARGE (CFS) | CONCENTRATION (MG/L) | SUSPENDED SEDIMENT DISCHARGE (TONS/DAY) | PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .002 | .004 | .008 | .016 | .031 | .062 | .125 | .250 | .500 | 1.00 | 2.00 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | | | | | | | | | |
| 16-2116. MAKAHA STREAM NEAR MAKAHA (LAT 21°30'16", LONG 158°10'59") | | | | | | | | | | | | | | | | | |
| DEC 19, 1968 | 1540 | 21 | 27 | 23 | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| KALOI GULCH AT FARRINGTON HIGHWAY, NEAR HONOULIULI (LAT 21°22'05", LONG 158°03'25") | | | | | | | | | | | | | | | | | |
| OCT 1, 1968 | 1530 | | 15 | 16300 | 660 | 48 | 57 | 71 | 89 | 98 | 99 | 100 | -- | -- | -- | -- | VPWC |
| 16-2160. WAIAWA STREAM NEAR PEARL CITY (LAT 21°23'55", LONG 157°58'50") | | | | | | | | | | | | | | | | | |
| JAN 3, 1969 | 1225 | 24 | 1850 | 1160 | 5790 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-2282. MOANALUA STREAM NEAR AIEA (LAT 21°22'37", LONG 157°53'03") | | | | | | | | | | | | | | | | | |
| JAN 3, 1969 | 1030 | 21 | 113 | 44 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| JAN 3..... | 1405 | 22 | 71 | 17 | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 16-3290. KAIWIKOELE STREAM TRIBUTARY NEAR MAUNAWAI (LAT 21°36'48", LONG 158°01'23") | | | | | | | | | | | | | | | | | |
| JAN 3, 1969 | 1130 | 20 | 19 | 10 | .51 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

PARTICLE SIZE OF BED MATERIAL, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
(METHOD OF ANALYSIS: H, HYDROMETER; O, OPTICAL ANALYZER; S, SIEVE; V, VISUAL ACCUMULATION TUBE)

| DATE | TIME | WATER TEMPERATURE (C) | NUMBER OF SAMPLING POINTS | DISCHARGE (CFS) | PARTICLE SIZE PERCENT FINER THAN THE SIZE (IN MILLIMETERS) INDICATED .062 | .125 | .250 | .500 | 1.00 | 2.00 | 4.00 | 8.00 | 16.0 | 32.0 | 64.0 | METHOD OF ANALYSIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAWAII, ISLAND OF OAHU | | | | | | | | | | | | | | | | |
| 16-2840. WAIHEE STREAM NEAR HEEIA (LAT 21°27'00", LONG 157°51'40") | | | | | | | | | | | | | | | | |
| SEP 25, 1969 | 1400 | | | 5.5 | -- | 1 | 1 | 3 | 7 | 17 | 32 | 58 | 78 | 100 | -- | S |

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