

Surface Water Supply of Hawaii 1959-60

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GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1719

*Prepared in cooperation with the
State of Hawaii*



UNITED STATES DEPARTMENT OF THE INTERIOR

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PREFACE

This report was prepared by the Geological Survey in cooperation with the State of Hawaii by personnel of the Water Resources Division, L. B. Leopold, chief, under the general direction of E. L. Hendricks, chief, Surface Water Branch, and F. J. Flynn, chief, Basic Records Section.

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CONTENTS

	Page
Scope of work.....	1
Cooperation.....	1
Division of work.....	1
Definition of terms and abbreviations.....	1
Downstream order and station numbers.....	2
Explanation of data.....	3
Accuracy of field data and computed results.....	5
Publications.....	5
Records of discharge collected by agencies other than the Geological Survey.....	6
Gaging-station records.....	10
<u>Island of Kauai</u>	
Kawaikoi Stream (head of Waimea River) near Waimea.....	10
Mohihi Stream at altitude 3,500 ft, near Waimea.....	12
Kokee ditch near Waimea.....	14
Waimea River at altitude 890 ft, near Waimea.....	15
Koaie Stream at altitude 3,700 ft, near Waimea.....	18
Kekaha ditch at camp 1, near Waimea.....	22
Waimea ditch below wasteway, near Waimea.....	23
Waimea River near Waimea.....	24
Makaweli River near Waimea.....	25
Hanapepe River below Manuahi Stream, near Elelee.....	26
South Fork Wailua River near Lihue.....	28
North Fork Wailua River:	
North Wailua ditch near Lihue.....	30
Stable storm ditch near Lihue.....	31
North Fork Wailua River at altitude 650 ft, near Lihue.....	32
East Branch of North Fork Wailua River near Lihue.....	33
Wailua ditch near Kapaa.....	34
North Fork Wailua River near Kapaa.....	35
Opaikaa Stream:	
Left Branch Opaikaa Stream near Kapaa.....	36
Kapaa Stream:	
Makaleha Stream:	
Makaleha ditch near Kealia.....	37
Kapahi ditch near Kealia.....	38
Kapaa Stream at Kapahi ditch intake, near Kapaa.....	39
Anahola Stream:	
Anahola ditch:	
Anahola ditch wasteway near Kealia.....	40
Anahola ditch above Kaneha Reservoir, near Kealia.....	41
Anahola Stream near Kealia.....	42
Lower Anahola ditch near Kealia.....	44
Puu Ka Ele Stream (head of Kilauea Stream):	
Ka Loko ditch near Kilauea.....	45
Puu Ka Ele ditch near Kilauea.....	46
Ross ditch near Kilauea.....	47
Pohakuhonu Stream (head of Kahiliholo Stream):	
Kalihiwai ditch above wasteway, near Kilauea.....	48
Kalihiwai ditch near Kilauea.....	49
Pohakuhonu Stream near Kilauea.....	50
Halaulani Stream at altitude 400 ft, near Kilauea.....	51
Kalihiwai River:	
Hanalei ditch near Kilauea.....	52
Hanalei River:	
Hanalei tunnel outlet near Lihue.....	53
Wainiha River near Hanalei.....	54
<u>Island of Oahu</u>	
North Fork Kaukonahua Stream:	
Left Branch of North Fork Kaukonahua Stream near Wahiawa.....	55
Mauka ditch near Wahiawa.....	56
North Fork Kaukonahua Stream near Wahiawa.....	57
South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa.....	58
Right Branch of South Fork Kaukonahua Stream near Wahiawa.....	59
Kaukonahua Stream:	
Poamoho Stream:	
Poamoho tunnel near Wahiawa.....	60
Poamoho Stream near Wahiawa.....	61
Makaha Stream near Makaha.....	62
Waikele Stream:	
Kipapa Stream near Wahiawa.....	63
Waikele Stream at Waipahu.....	64
Pearl Harbor Springs at Waiawa, near Pearl City.....	65
Morikone pond outlet at Pearl City.....	66
Waiawa Stream near Pearl City.....	67
Hawaiian Electric Co. tunnel at Waiiau, near Pearl City.....	68
Waimalu Stream near Aiea.....	69
Pearl Harbor Springs at Kalauao, near Aiea.....	70
Kalauao Stream at Moanalua Road at Aiea.....	71
North Halawa Stream (head of Halawa Stream) near Aiea.....	72
Halawa Stream near Aiea.....	74
Moanalua Stream near Honolulu.....	75
Kalihi Stream near Honolulu.....	76
Nuuanu Stream below reservoir 2 wasteway, near Honolulu.....	79

Gaging-station records--Continued

	Page
Island of Oahu--Continued	
East Branch Manoa Stream near Honolulu.....	80
West Branch Manoa Stream near Honolulu.....	81
Manoa Stream:	
Pukele Stream (head of Palolo Stream) near Honolulu.....	82
Waiomao Stream above Pukele Stream, near Honolulu.....	84
Palolo Stream near Honolulu.....	85
Maunawili Stream:	
Maunawili ditch near Waimanalo.....	86
Makawao Stream near Kailua.....	87
Kamooalii Stream at Kaneohe.....	89
Haiku Stream (head of Heeiea Stream) near Heeiea.....	91
Iolekaa Stream mauka near Heeiea.....	94
Kahaluu Stream near Heeiea.....	95
Waihee Stream near Heeiea.....	99
Waiahole tunnel at Waianu, near Waiahole.....	101
Waiahole tunnel wasteway at intake 31, near Waiahole.....	102
Waiahole tunnel at north portal, near Waiahole.....	103
Waiahole tunnel at adit 8, near Waipahu.....	104
Waiahole Stream at altitude 250 ft, near Waiahole.....	105
Waikane Stream at altitude 75 ft, at Waikane.....	106
Kahana Stream at altitude 30 ft, near Kahana.....	107
Punaluu Stream:	
Punaluu ditch near Punaluu.....	109
Punaluu Stream near Punaluu.....	111
Waimea River:	
Kamananui Stream at Maunawai.....	112
Paukaulla Stream:	
Opaeula Stream near Wahiawa.....	114
<u>Island of Molokai</u>	
Halawa Stream near Halawa.....	115
Waikolu Stream at altitude 900 ft, near Kalaupapa.....	117
Waikolu Stream below pipeline crossing, near Kalaupapa.....	119
Waiatala Springs near Kalae.....	120
Kaunakakai Gulch at Kaunakakai.....	121
Kawela Gulch:	
Right Branch of East Fork Kawela Gulch near Kamalo.....	122
Punaula Gulch near Pukoo.....	125
<u>Island of Maui</u>	
Palikea Stream (head of Oheo Gulch) below diversion dam, near Kipahulu.....	126
Right Branch Hahalawe Stream near Kipahulu.....	129
Makapipi Stream:	
Makapipi ditch near Nahiku.....	130
Hanawi Stream near Nahiku.....	131
Kapaula Gulch near Nahiku.....	134
Koolau ditch at Nahiku weir, near Nahiku.....	135
Waiohue Gulch near Nahiku.....	136
West Wailuaiki Stream near Keanae.....	137
Palauhulu Stream:	
Taro patch feeder ditch at Keanae.....	138
Koolau ditch near Keanae.....	139
Honomanu Stream near Keanae.....	140
Haipuaena Stream:	
Kula diversion from Haipuaena Stream near Olinda.....	141
Haipuaena Stream at Kula pipeline intake, near Olinda.....	142
Haipuaena diversion ditch at Kolea Gulch, near Keanae.....	143
Haipuaena Stream above Spreckels ditch, near Huelo.....	144
Spreckels ditch at Haipuaena weir, near Huelo.....	146
Koolau ditch at Haipuaena, near Huelo.....	147
Manuel Luis ditch at Puohokamoa Gulch, near Huelo.....	148
Puohokamoa Stream above Spreckels ditch, near Huelo.....	156
Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda.....	158
Kaaiea Gulch near Huelo.....	159
Naililihaele Stream near Huelo.....	162
Hoolawanui Stream near Huelo.....	163
Honopou Stream near Huelo.....	164
Wailoa ditch at Honopou, near Huelo.....	165
New Hamakua ditch at Honopou, near Huelo.....	166
Old Hamakua ditch at Honopou, near Huelo.....	167
Lowrie ditch at Honopou Gulch, near Huelo.....	168
Haiku ditch at Honopou Gulch, near Kailua.....	169
Kahakulua Stream near Honokohau.....	170
Honokohau Stream near Honokohau.....	171
Honokowai Stream:	
Honokowai ditch near Lahaina.....	172
Olowalu Stream:	
Olowalu ditch near Olowalu.....	173
<u>Island of Hawaii</u>	
Waiakea Stream at middle flume house, near Mountain View.....	174
Waiakea Stream near Hilo.....	175
Wailuku River above Hilo Boarding School ditch intake, near Hilo.....	176
Kapehu Stream:	
Kapehu ditch:	
Kapehu ditch diversion near Hilo.....	177
Kapehu ditch near Hilo.....	178
Waimanu Stream:	
Waiilikahi Stream near Waimanu.....	179
Kukui Stream near Waimanu.....	180
Awini ditch at East Honokane Iki Gulch, near Niulii.....	181

Gaging-station records--Continued

Island of Hawaii--Continued	
Honokane Iki Stream:	
East Honokane Iki intake to Awini ditch at East Honokane Iki Gulch,	
near Niulii.....	182
Kohala ditch at Pololu, near Niulii.....	183
Kehena ditch near Kohala.....	184
Kohakohau Stream near Kamuela.....	185
Waikoloa Stream near Kamuela.....	186
Waikoloa Stream at Marine Dam, near Kamuela.....	187
Hauani Stream near Kamuela.....	188
Waiaha Stream near Holualoa.....	189
Kiilae Stream near Honaunau.....	190
Revisions of records for discontinued stations:	
Mohihi Stream near Waimea, Kauai.....	191
Waialae Stream near Waimea, Kauai.....	191
Hanapepe River at Koula, near Eleele, Kauai.....	192
Manuahi Stream at Koula, near Eleele, Kauai.....	193
Hanapepe River at makai siphon, near Eleele, Kauai.....	193
Kanaa ditch near Lihue, Kauai.....	194
Hanalei River at altitude 625 ft, near Hanalei, Kauai.....	195
Waioli Stream near Hanalei, Kauai.....	197
Lumalai River near Hanalei, Kauai.....	198
Kalalau Stream near Hanalei, Kauai.....	199
Hanawi Stream below Government Road, near Nahiku, Maui.....	200
Honomanu Stream at Haiku-uka boundary, near Kailiili, Maui.....	202
Waikamoi Stream near Huelo, Maui.....	202
Wailuku River at Pukamaui, near Hilo, Hawaii.....	203
Kapehu Stream at Piiponua, near Hilo, Hawaii.....	204
Discharge at partial-record stations and miscellaneous sites:	
Crest-stage partial-record stations.....	205
Measurements at miscellaneous sites.....	207
Index.....	209

SCOPE OF WORK

This volume contains records of daily flow of streams and ditches at 141 gaging stations in the State of Hawaii during the period July 1, 1959, to June 30, 1960. Since the beginning of stream-gaging work in Hawaii in 1910, records of flow of streams and ditches have been obtained at about 624 stations for periods ranging from a few months to 50 years. In addition, partial-record stations have been operated at many other points, and discharge measurements have been made at miscellaneous sites. The records for the fiscal year 1960 at gaging stations, partial-record stations, and miscellaneous sites are given in this report. Rather extensive studies of ground water have also been made on all the inhabited islands; most of the results of these studies have been published in bulletins of the Territorial Division of Hydrography.

COOPERATION

The work during the fiscal year 1960 was done under cooperative agreement with the State of Hawaii through the Department of Land and Natural Resources. Assistance in collecting records was rendered also on the island of Kauai by the Kekaha Sugar Co. Ltd., the McBryde Sugar Co. Ltd., the East Kauai Water Co. Ltd., the Kilauea Sugar Co. Ltd., and the Lihue Plantation Co. Ltd.; on the island of Oahu by the Waialua Agricultural Co. Ltd., Waihole Water Co. Ltd., and City and County of Honolulu Board of Water Supply; on the island of Maui by the Pioneer Mill Co. Ltd., the East Maui Irrigation Co. Ltd., the Maui County Engineer, Maui County Board of Water Works, and State of Hawaii Board of Agriculture and Forestry; and on the island of Hawaii by the Kohala Ditch Co. Ltd., Parker Ranch, and the Hawaii Board of Water Supply.

Acknowledgment of records collected by individuals or corporations is made in connection with the description of each station for which such records were furnished.

DIVISION OF WORK

The stream-gaging work was done by the Water Resources Division of the Geological Survey under the direction of personnel shown in the preface.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district office, Room 330, First Insurance Building, Honolulu. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may usually be obtained from the district office.

DEFINITION OF TERMS AND ABBREVIATIONS

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

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

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

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

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

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

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

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

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

In the State of Hawaii the unit most commonly used in measuring water is "million gallons." This is used with two meanings-- (1) to indicate a rate of flow and (2) to express an actual quantity of water. In the former sense "million gallons a day" is inferred, 1,000,000 gallons being taken as the unit of quantity and 24 hours as the unit of time. With this meaning the term is generally used in connection with pumping and irrigation. In the latter sense "million gallons" as an absolute quantity is used in the measurement of storage capacities of reservoirs.

The following convenient approximate relations exist between cubic feet per second, million gallons a day, and acre-feet: 1 cubic foot per second flowing 24 hours equals about 2 acre-feet; 1,000,000 gallons equals about 3 acre-feet; and 1,000,000 gallons a day equals about 1.55 cubic feet per second.

DOWNSTREAM ORDER AND STATION NUMBERS

Beginning with the report for the year ending June 30, 1950, the order of listing gaging-station records was changed. Proceeding in a downstream direction along the main stem, all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. Tributary streams are indicated by indentation. This downstream order and the system of indentation show which gaging stations are on tributaries between any two stations on a main stem.

The order of listing used in previous reports listed first all stations on the main stem from headwaters toward mouth, then all stations on the uppermost tributary to the main stem from the tributary's source to mouth.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and regular gaging stations, so that the station number for a

partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. In this report the station number is shown just to the left of the station name.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. All records of stage are obtained from water-stage recorders that give continuous records of fluctuations. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Occasionally discharge is determined from a weir or rating flume, using standard formulas.

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, and by other methods), velocity-area studies, and logarithmic plotting. For several stations the high-water ratings have been developed by the use of models. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is essentially the shifting-control method.

The data herein presented generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, general remarks, and notations of revisions of the previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Gage" are given the type of gage currently in use and 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 records available. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height and the minimum discharge. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that

have occurred outside the period of record are given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is given 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 reports. In order to make it easier to find such revised records, a paragraph headed "Revisions (fiscal 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 years for which figures are revised in that report. In listing the fiscal years only one number is given; for instance, 1933 stands for the fiscal year July 1, 1932, to June 30, 1933. If no daily, monthly, or annual figures of discharge are concerned in the revision, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given.

Skeleton rating tables are published for all stations except for ditch or spring stations.

The daily table gives, in general, the discharge corresponding to the daily mean gage height. For stations subject to sudden or rapid diurnal fluctuation, the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day.

Records of daily discharge are published on the basis of Hawaiian standard time.

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

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures in million gallons. The mean for the month is given both in terms of million gallons a day (line headed "mgd") and in cubic feet per second (line headed "cfs"). The line headed "Ac-ft" gives the discharge for the month in acre-feet.

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

Peak discharges and the times of their occurrence and corresponding gage heights of most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for canals, ditches, springs, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record or by other effects that reduce the degree of accuracy of the records.

Data collected at partial-record stations and at miscellaneous sites are given at the end of each report. Partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in a third table.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

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

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

Computations are carried to not more than three significant figures, except that monthly and yearly total discharge (million gallons and acre-feet) above 10,000 are carried to four significant figures.

PUBLICATIONS

The following table lists, by years and numbers, the papers on the surface-water supply of Hawaii published during the period 1903-60 and, used in conjunction with the list of stations maintained, which is given in Water-Supply Paper 795, provides a convenient index for finding the data for any station. Except as indicated, the year or years covered by each report begin July 1 and end on June 30. The data for any particular station will be found in the reports covering the years during which that station was maintained, unless, owing to undeveloped rating curves, publication was postponed. Occasionally data are revised and republished in later papers. Discharge measurements made during any year at points other than regular gaging stations are included in the data published for that year.

Numbers of water-supply papers containing data on the surface water supply of Hawaii, 1903-60

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1903	77	1920-21	535	1930-31	725	1940-41	935	1950-51	1219
1909-11*	318	1921-22	555	1931-32	740	1941-42	965	1951-52	1249
1912†	338	1922-23	575	1932-33	755	1942-43	985	1952-53	1289
1913*	373	1923-24	595	1933-34	770	1943-44	1015	1953-54	1349
1913-15	430	1924-25	615	1934-35	795	1944-45	1045	1954-55	1399
1915-16	445	1925-26	635	1935-36	815	1945-46	1065	1955-56	1449
1916-17	465	1926-27	655	1936-37	835	1946-47	1095	1956-58	1569
1917-18	485	1927-28	675	1937-38	865	1947-48	1125	1958-59	1639
1918-19	515	1928-29	695	1938-39	885	1948-49	1155	1959-60	1719
1919-20	516	1929-30	710	1939-40	905	1949-50	1185		

* This paper, entitled "Water resources of Molokai," by Waldemar Lindgren, contains data on both the surface and ground-water supplies of the island named.

† Calendar years. Data for the last half of the calendar year 1913 appears not only in Water-Supply Paper 373 but also in Water-Supply Paper 430, the first of the reports covering a year ending June 30.

A compilation of records for Hawaii through June 1950 has been published as Water-Supply Paper 1319. That report contains a summary of monthly and annual discharges 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.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The following table lists the gaging stations in the State of Hawaii at which records of discharge were collected during the fiscal year July 1959 to June 1960 by agencies other than the Geological Survey. The records for these stations are not contained in the publications of the Geological Survey, and, except as indicated, have not been published elsewhere.

Records of discharge collected by agencies other than the Geological Survey			
Stream	Location	Period	Operated by
Island of Kauai			
Hanamaulu ditch.....	Lat 22°01'39", long 159°25'25", 3,500 ft below intake and 4.5 miles northwest of Lihue, at altitude 450 ft.	1927-60	Lihue Plantation Co.
Kealia ditch.....	Lat 22°07'48", long 159°22'24", 500 ft west of Kaneha Reservoir, 4,000 ft below intake, and 4.7 miles northwest of Kealia, at altitude 800 ft.	1940-60	Do.
Kealia River.....	Lat 22°07'37", long 159°22'52", 2,000 ft west of Kaneha Reser- voir and 5.3 miles northwest of Kealia, at altitude 800 ft.	1936-60	Do.
Koloa ditch.....	Lat 21°58'32", long 159°28'25", 3 miles below intake and 6.4 miles west of Lihue, at altitude 700 ft.	1927-60	Do.
Lower Lihue ditch.....	Lat 22°01'20", long 159°25'18", 2,000 ft below Upper Lihue ditch and 4 miles northwest of Lihue, at altitude 500 ft.	1927-60	Do.
Upper Lihue ditch.....	Lat 22°01'30", long 159°25'24", 1.7 miles below intake and 4.3 miles northwest of Lihue, at altitude 525 ft.	1927-60	Do.
Waimea Valley ditch.....	Lat 22°02'33", long 159°39'32", 6.2 miles northwest of Waimea and 6.8 miles northwest of Kekaha, at altitude 525 ft.	1903-60	Kekaha Sugar Co., Ltd.
Island of Oahu			
Alewa Heights Springs...	Lat 21°21'05", long 157°49'33", 3.8 miles northeast of Honolulu Post Office and 4.4 miles east of Tripler Hospital, at altitude 680 ft.	1932-60a	Board of Water Supply, City and County of Honolulu.
Booth Springs.....	Lat 21°20'10", long 157°49'42", 2.4 miles north of University of Hawaii and 2.9 miles north- east of Honolulu Post Office, at altitude 685 ft.	1929-60a	Do.
Haiku tunnel.....	Lat 21°24'39", long 157°50'08", 2.0 miles southwest of St. Ann's School and 2.6 miles west of Castle High School, at altitude 550 ft.	1941-60	Do.
Hering Springs.....	Lat 21°19'36", long 157°49'18", in Makiki valley, 2.9 miles northeast of Honolulu Post Office, at altitude 970 ft.	1925-60a	Do.
Kahaluu tunnel.....	Lat 21°26'18", long 157°51'32", 2.3 miles southwest of Kahaluu and 5.3 miles south of Waiahole School, at altitude 585 ft.	1947-60	Do.
Kahana development tunnel.	Lat 21°31'05", long 157°54'22", 6.3 miles south of Hauula School and 7.1 miles east of Leilehua High School, at altitude 800 ft.	1931-60	Waiahole Water Co., Ltd.
Kahuawai Springs.....	Lat 21°20'05", long 157°49'48", 2.8 miles northeast of Honolulu Post Office, at altitude 618 ft.	1925-60a	Board of Water Supply City and County of Honolulu.
Kalihi tunnels.....	Lat 21°22'20", long 157°50'03", 3.9 miles east of Tripler Hospital and 4.7 miles northeast of Honolulu Post Office at altitude 650 ft.	1926-60a	Do.
Kipapa ditch.....	Lat 21°25'15", long 158°00'50", 2.2 miles north of Waipahu Post Office and 3.0 miles southeast of Kipapa School, at altitude 370 ft.	1918-60	Waiahole Water Co., Ltd.
Kuou Springs.....	Lat 21°25'30", long 157°48'47", 1.5 miles southwest of Castle High School and 2.4 miles south of St. Ann's School, at altitude 230 ft.	1955-60	Board of Water Supply, City and County of Honolulu.

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

Records of discharge collected by agencies other than the Geological Survey--Continued

Stream	Location	Period	Operated by
Island of Oahu--Continued			
Luluku tunnels.....	Lat 21°23'40", long 157°49'17", 1.9 miles southwest of Castle High School and 2.3 miles south- west of St. Anns School, at altitude 570 ft.	1927-60	Do.
Makiki Springs.....	Lat 21°19'15", long 157°49'48", 2.3 miles northeast of Honolulu Post Office, at altitude 350 ft.	1926-60a	Do.
Manoa tunnels.....	Lat 21°19'59", long 157°47'33", 4.9 miles northeast of Honolulu Post Office, at altitude 800 ft.	1925-60a	Do.
McCandleless ditch.....	Lat 21°24'07", long 157°55'43", 1.4 miles north of Alea Post Office and 5 miles east of August Ahrens School, at altitude 550 ft.	1949-60	Waiahole Water Co., Ltd.
Nuuanu tunnels.....	Lat 21°21'06", 157°49'10", 3.5 miles north of University of Hawaii and 4.1 miles northeast of Honolulu Post Office, at altitude 780 ft.	1926-60a	Board of Water Supply, City and County of Honolulu.
Nuuanu tunnel No. 3.....	Lat 21°21'16", long 157°49'14", 2.7 miles north of University of Hawaii and 4.2 miles northeast of Honolulu Post Office, at altitude 830 ft.	1931-60a	Do.
Palolo tunnel.....	Lat 21°19'38", long 157°46'27", 3.1 miles northwest of Aiea Haina School and 3.7 miles southwest of Waimanalo village, at altitude 1,000 ft.	1926-60a	Do.
Uwau development tunnel.	Lat 21°29'29", long 157°53'16", 2.2 miles west of Waiahole School and 3.6 miles northwest of Kahaluu, at altitude 840 ft.	1934-60	Waiahole Water Co., Ltd.
Waianae tunnel.....	Lat 21°28'27", long 158°09'21", 2.6 miles northeast of Waianae School and 3.7 miles northeast of Maile.	1951-60	Board of Water Supply, City and County of Honolulu.
Waiawa ditch.....	Lat 21°26'55", long 157°57'30", 3.9 miles southeast of Kipapa School and 5.2 miles northeast of Waipahu Post Office, at altitude 680 ft.	1918-60	Waiahole Water Co., Ltd.
Waiawa Intake.....	Lat 21°27'45", long 157°55'29", 5.9 miles east of Kipapa School and 7.4 miles northeast of Waipahu Post Office, at altitude 750 ft.	1918-60	Do.
Waihee tunnel.....	Lat 21°26'59", long 157°51'42", 1.6 miles south of Waiahole School and 3.7 miles north- west of St. Anns School, at altitude 218 ft.	1956-60	Board of Water Supply, City and County of Honolulu.
Waikakalaua ditch.....	Lat 21°27'15", long 158°01'45", 2.5 miles east of Kunia School and 3.1 miles south of Wahiawa Post Office, at altitude 760 ft.	1918-60	Waiahole Water Co., Ltd.
Waikane No. 1 develop- ment tunnel.	Lat 21°30'16", long 157°53'25", 4.2 miles southwest of Kaaawa School, at altitude 780 ft.	1928-60	Do.
Waikane No. 2 develop- ment tunnel.	Lat 21°29'50", long 157°53'13", 2.1 miles west of Waikane and 2.2 miles northwest of Waiahole School, at altitude 780 ft.	1928-60	Do.
Waimanalo tunnel.....	Lat 21°20'13", long 157°45'01", 2.1 miles southwest of Waimanalo village and 3.8 miles north of Aiea Haina, at altitude 462 ft.	1940-60	Board of Water Supply, City and County of Honolulu.
Island of Maui			
Everett ditch.....	Lat 20°51'35", long 156°31'43", below intake, 2.6 miles south- west of Wailuku Post Office, at altitude 980 ft.	1935-60	Wailuku Sugar Co.
Haiku ditch.....	Lat 20°55'46", long 156°20'38", at Hamakua, 0.9 mile north of Maui High School and 2.3 miles northeast of Paia School, at altitude 250 ft.	1924-60	East Maui Irrigation Co.
Iao-Waikapu ditch.....	Lat 20°52'58", long 156°31'06", at tunnel outlet, 1 mile south- west of Wailuku Post Office and 2 miles northwest of Waikapu, at altitude 740 ft.	1923-60	Wailuku Sugar Co.
Kahoma tunnel.....	Lat 20°54'20", long 156°38'06", 2,000 ft above outlet and 2.0 miles northeast of Lahainaluna High School, at altitude 2,000 ft.	1920-60	Pioneer Mill Co.
Kaluanui ditch.....	Lat 20°53'38", long 156°18'20", at Ohia-Kula Gulch, 0.9 mile northwest of Kaupakulua School and 2.8 miles southeast of Haiku School, at altitude 960 ft.	1954-60	East Maui Irrigation Co.

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

Records of discharge collected by agencies other than the Geological Survey--Continued

Stream	Location	Period	Operated by
Island of Maui--Continued			
Kanaha ditch.....	Lat 20°53'45", long 156°39'37", at intake, 0.2 mile northeast of Lahainaluna High School, at altitude 520 ft.	1921-60	Pioneer Mill Co.
Kauaula tunnel.....	Lat 20°52'40", long 156°38'44", at outlet 1.5 miles southeast of Lahainaluna School and 2.9 miles east of Lahaina, at altitude 940 ft.	1920-60	Do.
Kauhikoa ditch.....	Lat 20°53'35", long 156°20'12", 0.45 mile northeast of Maunaloa College and 2.0 miles southeast of Pala School, at altitude 890 ft.	1928-60	East Maui Irrigation Co.
Launiupoko ditch.....	Lat 20°51'42", long 156°38'30", at outlet, 1.25 miles east of Launiupoko, at altitude 980 ft.	1921-60	Pioneer Mill Co.
Lowrie ditch.....	Lat 20°54'57", long 156°20'15", at Hamakuapoko, 0.9 mile east of Maui High and 1.8 miles north of Maunaloa College, at altitude 520 ft.	1949-60	East Maui Irrigation Co.
Mahinahina weir.....	Lat 20°57'10", long 156°39'29", on Honolua ditch, 2.1 miles east of Honokawai and 4.06 miles north of Lahainaluna High School, at altitude 710 ft.	1912-60	Baldwin Packers, Ltd.
Mailepai Stream.....	Lat 20°58'02", long 156°39'00", 2.1 miles southeast of Kahana Church and 2.7 miles south of Honokahua School, at altitude 780 ft.	1912-60	Do.
Manianla ditch.....	Lat 20°53'09", long 156°32'30", below intake, 2.4 miles southwest of Wailuku Post Office and 3 miles northwest of Waikapu, at altitude 800 ft.	1923-60	Wailuku Sugar Co.
North Waiehu Stream.....	Lat 20°54'44", long 156°31'24", 1.8 miles northwest of Wailuku Post Office and 2.7 miles northwest of KMVI Radio Station, at altitude 540 ft.	1922-60	Do.
Old Kaluanui ditch.....	Lat 20°53'32", long 156°19'59", at Hamakuapoko, 2.2 miles west of Kapakulua School and 2.8 miles south of Haiku School, at altitude 980 ft.	1924-60	East Maui Irrigation Co.
South Waikapu ditch.....	Lat 20°51'28", long 156°31'35", 1.4 miles west of Waikapu and 2.6 miles southwest of Wailuku Post Office, at altitude 1,100 ft.	1933-60	Wailuku Sugar Co.
Spreckels ditch.....	Lat 20°56'41", long 156°32'39", 1,000 ft below intake, 2 miles west of Waihee, and 5.0 miles northwest of Wailuku Post Office, at altitude 460 ft.	1931-60	Do.
Ukumehame ditch.....	Lat 20°48'56", long 156°35'24", 2.3 miles east of Olowalu, at altitude 200 ft.	1931-60	Pioneer Mill Co.
Waihee ditch.....	Lat 20°56'20", long 156°32'58", below intake, 4.35 miles northwest of Wailuku Post Office, at altitude 600 ft.	1931-60	Wailuku Sugar Co.
Do.....	Lat 20°52'56", long 156°30'05", at Waiale, 0.6 mile southeast of Wailuku Post Office, on Spreckels ditch, at altitude 240 ft.	1929-60	East Maui Irrigation Co.
Wailoa ditch	Lat 20°52'56", long 156°19'56", at Kamaole, 1.7 miles northwest of Kokomo and 3.4 miles south of Haiku School, at altitude 1,160 ft.	1924-60	Do.
Island of Hawaii			
Alili flume.....	Lat 19°13'45", long 155°30'56", 1.5 miles northwest of Pahala and 4.9 miles northeast of Honuapo, at altitude 2,680 ft.	1943-60	Hawaiian Agricultural Co.
Awini weir.....	Lat 20°08'21", long 155°43'55", at east branch Honokane Nui Stream, 6.0 miles south of Nulii, at altitude 1,840 ft.	1927-60	Kohala Sugar Co.
Keaiwa Reservoir.....	Lat 19°15'13", long 155°30'06", 2.1 miles northwest of Pahala and 5.8 miles northeast of Honuapo, at altitude 3,060 ft.	1943-60	Hawaiian Agricultural Co.
Lower Lyman Springs.....	Lat 19°42'10", long 155°10'20", 2.0 miles northwest of Kaunama and 5.7 miles southwest of Hilo, at altitude 1,622 ft.	1951-60	Board of Water Supply County of Hawaii.

Records of discharge collected by agencies other than the Geological Survey--Continued

Stream	Location	Period	Operated by
Island of Hawaii--Continued			
Main weir, Kohala ditch.	Lat 20°11'50", long 155°45'10", 1.75 miles south of Makapala village, at altitude 980 ft.	1942-60	Kohala Sugar Co.
Pahoehoe Springs.....	Lat 19°46'36", long 155°06'40", 1.2 miles southwest of Papaikou and 3.8 miles northwest of Hilo, at altitude 480 ft.	1953-60	Board of Water Supply County of Hawaii.
Puuokumau Inlet.....	Lat 20°11'47", long 155°49'47", 3.25 miles south of Hawi at the southeast corner of Puuokumau Reservoir, at alti- tude 1,820 ft.	1958-60	Kohala Sugar Co.
Puuokumau Outlet.....	Lat 20°11'50", long 155°50'22", 3 miles south of Hawi at the southwest corner of Puuokumau Reservoir, at altitude 1,800 ft.	1942-60	Do.
Weir No. 1, Lower Hamakua ditch.	Lat 20°07'10", long 155°34'50", 0.8 mile southwest of Kukui- haele and 8.1 miles from intake at Kawaihuli, at altitude 980 ft.	1910-60	Hawaiian Irrigation Co.
Weir No. 2, Lower Hamakua ditch.	Lat 20°05'06", long 155°28'35", 0.8 mile southwest of Haina and 1.0 mile northwest of Honokaa High School, at alti- tude 980 ft.	1910-60	Do.
Weir No. 3, Lower Hamakua ditch.	Lat 20°04'44", long 155°27'18", 0.8 mile east of Honokaa High School and 1.7 miles south- east of Haina, at altitude 910 ft.	1958-60	Do.

GAGING-STATION RECORDS

ISLAND OF KAUAI

100. Kawaikoi Stream near Waimea

Location.--Lat 22°08'00", long 159°37'15", on left bank at old trail crossing, 12.5 miles northeast of Waimea.

Drainage area.--4.1 sq mi, approximately.

Records available.--April 1909 to December 1916, July 1919 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--44 years (1911-12, 1913-15, 1919-60), 22.1 mgd (34.2 cfs).

Extremes.--Maximum discharge during year, 4,660 mgd (7,210 cfs) Aug. 6 (gage height, 12.86 ft), from rating curve extended above 300 mgd as explained below; minimum, 2.04 mgd (3.16 cfs) Oct. 21-23.

1909-16, 1919-60: Maximum discharge, 6,900 mgd (10,700 cfs) Dec. 18, 1916 (gage height, 15.2 ft), from rating curve extended above 300 mgd on basis of slope-area measurement at gage heights 12.12 and 13.43 ft; minimum, 0.74 mgd (1.15 cfs) Sept. 21, 22, 1953.

Remarks.--Records good.

Revisions (fiscal years).--WSP 555: 1920-21. WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M). Revised figures of discharge, in million gallons a day, for the fiscal years 1912, 1921-25, 1927-32, and 1936, superseding those published in WSP 318, 555, 575, 595, 615, 655, 675, 695, 710, 725, 740, and 815, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1911 July 4	27.8	1922-Con. Nov. 27	385	1926 Dec. 20	229	1928-Con. Nov. 5	462
1921 Jan. 5	523	1923 Jan. 10	499	1927 Mar. 5	340	1930 Feb. 27	411
14	1,374	11	871	22	185	Nov. 18	338
15	1,692	12	590	May 16	478	19	211
16	1,133	16	161	May 17	394		
		Dec. 10	298	Dec. 24	360	1931 Aug. 3	262
1922 Jan. 31	447	23	258				
Sept. 11	287	1924 Dec. 13	475	1928 Nov. 4	1,085	1935 Dec. 9	218

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
July 1911.....	-	47.2	4.6	12.2	18.8	1,160
Fiscal year 1911-12.....	-	263	2.6	20.4	31.5	22,860
January 1921.....	-	1,692	12.2	222	343	21,080
Fiscal year 1920-21.....	-	1,692	1.9	38.7	59.9	43,320
Calendar year 1921.....	-	1,692	1.4	33.7	52.1	37,780
January 1922.....	-	447	4.2	49.7	76.9	4,730
Fiscal year 1921-22.....	-	447	1.4	23.2	35.9	26,000
September 1922.....	-	287	5.9	27.0	41.8	2,480
November.....	-	385	4.6	41.6	64.4	3,830
Calendar year 1922.....	-	447	2.0	22.8	35.3	25,500
January 1923.....	-	871	3.9	126	195	12,000
Fiscal year 1922-23.....	-	871	2.0	27.7	42.9	30,860
December 1923.....	-	-	3.6	75.1	116	7,150
Calendar year 1923.....	-	-	2.5	32.1	49.7	35,930
Fiscal year 1923-24.....	-	-	2.5	22.6	35.0	25,420
December 1924.....	-	475	5.7	45.9	71.0	4,370
Calendar year 1924.....	-	-	2.1	19.8	30.6	22,200
Fiscal year 1924-25.....	-	475	2.1	23.6	36.5	26,490
December 1926.....	-	229	2.2	18.5	28.6	1,760
Calendar year 1926.....	-	229	1.6	10.0	15.5	11,260
March 1927.....	-	340	4.1	43.7	67.6	4,150
May.....	-	478	4.3	55.7	86.2	5,300
Fiscal year 1926-27.....	-	478	1.7	21.7	33.6	24,280
December 1927.....	-	360	4.0	30.7	47.5	2,920
Calendar year 1927.....	-	478	2.1	26.8	41.5	30,040
Fiscal year 1927-28.....	-	360	2.1	21.6	33.4	24,240
November 1928.....	-	1,085	2.1	110	170	10,110
Calendar year 1928.....	-	1,085	1.6	26.4	40.8	29,600
Fiscal year 1928-29.....	-	1,085	1.6	24.3	37.6	27,220
February 1930.....	-	411	4.9	35.0	54.2	3,010
Fiscal year 1929-30.....	-	411	1.6	27.2	42.1	30,490
November 1930.....	-	338	2.6	37.6	58.2	3,460
Calendar year 1930.....	-	411	2.0	23.3	36.1	26,120
Fiscal year 1930-31.....	-	338	2.0	15.2	23.5	16,970
August 1931.....	-	262	4.7	32.7	50.6	3,110
Calendar year 1931.....	-	262	2.4	19.8	30.6	22,140
Fiscal year 1931-32.....	-	262	2.4	26.1	40.4	29,270
December 1935.....	-	790.9	218	3.8	25.5	2,430
Calendar year 1935.....	-	6,195.7	222	1.7	17.0	19,020
Fiscal year 1935-36.....	-	7,524.6	324	2.0	20.6	23,080

100. Kawaikoi Stream near Waimea--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

2.0	1.95	3.8	115
2.2	4.10	4.2	195
2.4	7.40	4.6	275
2.7	15.4	5.0	355
3.0	27.5	6.0	620
3.4	55.5	7.0	970

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.9	2.80	7.28	3.14	249	*11.4	10.6	5.58	37.8	9.38	5.94	4.10
2	26.9	2.80	7.58	3.02	572	6.49	9.80	6.49	181	8.50	5.58	3.98
3	16.4	17.2	8.41	2.90	28.6	4.99	8.94	6.43	148	30.1	5.94	3.86
4	20.7	34.2	17.8	2.90	16.3	4.25	8.06	6.36	88.0	*36.1	6.49	3.74
5	102	132	167	2.80	15.7	3.98	7.62	5.43	28.8	20.5	5.76	3.62
6	46.5	788	26.7	2.80	15.5	6.24	7.04	4.84	26.6	35.5	5.14	3.50
7	*36.8	168	14.5	2.71	8.72	9.61	10.8	4.54	125	54.8	4.69	3.26
8	61.3	33.1	9.60	2.62	113	6.13	9.60	4.40	25.1	107	4.99	3.14
9	30.2	34.4	7.22	2.52	30.0	5.28	52.1	5.28	18.1	165	10.3	3.02
10	12.8	103	6.31	2.42	12.8	4.99	45.8	7.84	15.1	66.6	21.8	3.02
11	7.77	17.8	6.13	2.62	9.38	4.25	15.4	21.9	36.5	23.1	9.62	2.90
12	6.13	12.8	5.94	2.52	8.06	8.35	*12.5	16.6	19.6	16.1	7.86	3.02
13	5.14	10.9	7.27	3.14	7.04	5.80	13.8	27.2	17.1	23.8	11.0	3.26
14	4.84	9.16	7.56	2.90	6.31	17.0	16.4	17.2	15.1	32.8	24.9	3.50
15	5.40	8.06	5.76	2.62	5.76	41.1	15.7	15.8	12.8	18.3	12.9	6.57
16	7.04	7.62	7.00	2.52	5.43	208	15.4	215	11.2	35.5	*7.40	7.84
17	5.76	32.2	6.12	2.33	4.99	136	9.80	44.9	10.1	78.9	6.13	4.25
18	4.54	35.2	4.84	2.24	4.69	17.6	8.06	46.1	13.1	36.5	5.76	3.26
19	3.98	14.3	4.25	*2.14	4.40	57.2	9.73	a250	33.4	20.7	54.5	2.80
20	3.74	8.72	3.98	2.14	4.10	46.2	12.9	a25	15.8	13.8	35.2	2.71
21	3.62	7.04	4.25	2.04	4.10	119	8.28	a17	11.2	11.7	20.8	*2.80
22	3.66	6.49	4.25	2.04	3.98	67.4	6.85	a14	10.1	10.4	30.3	17.5
23	6.45	6.13	4.28	2.24	8.52	20.9	6.49	a17	50.1	18.6	13.4	11.9
24	4.10	5.58	7.13	3.14	6.77	16.1	5.94	a12	22.6	23.0	8.06	7.37
25	3.62	5.43	4.84	3.02	10.5	14.7	5.76	a11	29.9	13.2	6.67	9.11
26	3.98	5.28	3.98	2.90	11.7	97.6	5.58	*a9.2	68.1	9.60	5.76	8.41
27	3.62	6.12	3.62	2.90	7.48	25.8	6.13	9.86	44.8	8.06	5.28	54.1
28	3.26	7.99	3.50	3.02	5.14	14.8	16.4	9.38	21.3	7.22	4.84	85.7
29	3.14	7.96	3.38	2.62	4.25	11.9	8.28	158	14.4	6.67	4.89	11.6
30	3.02	12.2	3.26	2.33	11.3	11.2	7.22	-----	11.9	8.31	4.54	8.76
31	2.90	*13.5	-----	56.5	-----	11.7	6.51	-----	10.4	-----	4.40	-----
Total	460.41	1,555.98	373.74	117.75	1,196.52	1,015.96	382.89	995.33	1,171.0	947.74	360.64	292.60
Mean	14.9	50.2	12.5	3.80	39.9	32.8	12.4	34.3	37.8	31.6	11.6	9.75
mgd	23.1	77.7	19.3	5.88	61.7	50.7	19.2	53.1	58.5	48.9	17.9	15.1
cfs	1,410	4,780	1,150	361	3,670	3,120	1,180	3,050	3,590	2,910	1,110	898
Ac-ft												
Calendar year 1959: Max	788			Min	2.04	Mean(mgd)	23.8	Mean(cfs)	36.8	Ac-ft	26,680	
Fiscal year 1959-60: Max	788			Min	2.04	Mean(mgd)	24.2	Mean(cfs)	37.4	Ac-ft	27,230	

Peak discharge (base, 1,300 mgd).--Aug. 6 (8:30 p.m.) 4,660 mgd (7,210 cfs), 12.86 ft; Nov. 2 (6 a.m.) 3,130 mgd (4,840 cfs), 10.94 ft.

* Discharge measurement made on this day.

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

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

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

Drainage area.--1.6 sq mi, approximately.

Records available.--June 1920 to October 1926, October 1936 to June 1960. April 1909 to December 1911 (fragmentary), July 1947 to June 1952, published as Mohihi Stream near Waimea; records 1909-11 at site 2 miles downstream not equivalent owing to inflow.

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

Average discharge.--29 years (1920-26, 1937-60), 5.21 mgd (8.06 cfs).

Extremes.--Maximum discharge during year, 706 mgd (1,090 cfs) Aug. 6 (gage height, 5.86 ft), from rating curve extended above 50 mgd; minimum, 0.32 mgd (0.50 cfs) Aug. 2, 1920-26, 1936-60: Maximum discharge, 1,250 mgd (1,930 cfs) Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 50 mgd; minimum, 0.08 mgd (0.12 cfs) Sept. 21, 1953 (revised).

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

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1941 and 1953-54, superseding those published in WSP 935, 1289, 1319, and 1349, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1941		1953-Con.		1953-Con.		1953-Con.	
Apr. 26	0.28	July 22	0.33	Aug. 20	0.13	Sept. 18	0.10
27	.25	23	.29	21	.13	19	.09
28	.24	24	.26	22	.12	20	.09
29	.22	25	.24	23	.12	21	.08
30	.21	26	.24	24	.13	22	.09
May 1	.19	Aug. 1	.27	25	.17	23	.09
2	.18	2	.27	26	.17	Oct. 8	.21
3	.17	3	.33	27	.25	9	.29
4	.17	4	.40	28	.30	10	.24
5	.16	7	.21	Sept. 1	.13	11	.21
6	.18	8	.19	2	.12	12	.21
		9	.18	3	.11	13	.23
		10	.19	4	.12		
1952		11	.18	5	.11		
Oct. 9	.25	12	.18	11	.40		
10	.24	13	.17	12	.35		
		18	.14	16	.11		
1953		19	.13	17	.10		
July 21	.35						

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
April 1941.....	17.87	2.1	0.21	0.596	0.922	55
May.....	164.68	28	.16	5.31	8.22	505
Fiscal year 1940-41.....	994.76	91	.16	2.73	4.22	3,050
Calendar year 1941.....	995.03	53	.16	2.73	4.22	3,050
October 1952.....	168.82	30	.24	5.45	8.43	518
Calendar year 1952.....	-	127	.22	3.91	6.05	4,390
Fiscal year 1952-53.....	-	78	.22	2.88	4.46	3,230
July 1953.....	15.13	1.58	.24	.488	.755	46
August.....	6.49	.40	.12	.209	.323	20
September.....	4.94	.40	.08	.165	.256	15
October.....	18.57	3.35	.18	.599	.927	57
Calendar year 1953.....	-	78	.08	2.51	3.88	2,810
Fiscal year 1953-54.....	-	46	.08	3.61	5.59	4,040

130. Mohihi Stream at altitude 3,500 ft, near Waimea--Continued

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6

Aug. 7 to June 30

0.9	0.34	1.9	10.3	0.8	0.43	1.2	1.57
1.1	.90	2.1	15.3	.9	.55	1.4	3.04
1.3	1.94	2.5	31.5	1.0	.74	1.6	5.20
1.5	3.73	3.0	62.5	1.1	1.07	1.8	8.25
1.7	6.45	3.5	112				

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.43	0.42	2.18	0.68	34.5	*1.62	2.71	1.57	18.8	2.32	1.57	0.85
2	2.13	<u>1.36</u>	1.79	.66	<u>97.0</u>	1.52	2.39	1.52	23.8	2.12	1.46	.82
3	4.78	.94	1.74	.84	10.0	1.36	2.2	1.57	38.5	2.12	1.74	.79
4	4.11	5.82	1.68	.62	4.62	1.26	2.1	1.62	18.9	*6.07	1.98	.76
5	<u>16.3</u>	14.5	<u>41.3</u>	.62	3.67	<u>1.16</u>	2.0	1.52	9.52	4.24	1.68	.76
6	14.2	99.4	10.8	.60	5.35	1.36	1.9	1.36	8.59	6.11	1.46	.71
7	*10.7	83.4	4.66	.58	2.66	2.18	2.7	1.26	<u>55.3</u>	11.5	1.31	.68
8	6.34	17.2	2.62	.56	40.0	1.98	2.4	1.21	12.1	23.3	1.31	.64
9	8.55	9.36	1.79	.54	15.7	1.86	<u>17</u>	<u>1.16</u>	7.10	<u>25.3</u>	1.36	.64
10	3.17	30.8	1.46	.52	5.38	2.02	15	1.16	5.48	18.8	1.74	<u>.63</u>
11	1.74	6.98	1.36	.56	3.47	1.52	9.0	1.89	7.18	6.22	2.05	.63
12	1.22	4.48	1.31	.54	2.62	1.52	*6.0	4.35	6.37	4.00	1.68	.65
13	.99	3.62	1.26	.60	2.18	1.62	8.02	5.28	4.72	4.63	1.74	.71
14	.80	3.04	1.26	.58	1.92	8.65	11.4	3.42	4.12	14.7	<u>15.5</u>	.85
15	.80	2.54	1.11	.56	1.68	15.4	7.34	6.17	3.62	7.04	6.05	1.04
16	.87	2.32	1.21	.56	1.52	97.7	6.16	80.0	3.23	4.42	*2.54	1.60
17	.99	2.32	1.16	.54	1.41	50.5	3.42	15.5	2.80	15.8	1.85	1.03
18	.63	4.85	1.03	.52	1.31	8.45	2.62	16.6	2.71	10.0	1.52	.82
19	.67	4.06	.92	*.52	1.26	17.9	2.26	<u>86.1</u>	3.90	6.77	4.00	.71
20	.57	2.54	.85	.50	1.26	16.3	2.32	12.9	3.94	3.61	9.09	.68
21	.64	2.05	.85	<u>.48</u>	1.21	29.4	2.12	6.60	2.92	3.14	6.18	*1.02
22	.60	1.85	.82	<u>.48</u>	<u>1.16</u>	21.4	1.92	5.16	<u>2.47</u>	2.80	5.08	5.67
23	.70	1.79	.79	.50	1.41	7.26	1.74	6.60	6.24	2.62	3.30	2.97
24	.60	1.62	.85	.55	1.57	5.08	1.68	*4.36	4.86	4.09	2.05	1.74
25	.49	1.57	.82	.60	2.23	4.24	1.57	3.52	8.22	3.23	1.62	1.62
26	.44	1.57	.79	.56	4.51	23.5	1.52	3.14	10.5	2.39	1.36	1.57
27	.40	1.62	.76	.60	3.35	7.90	1.68	2.71	13.2	2.05	1.21	4.33
28	.38	2.12	.74	.63	1.79	4.48	2.26	2.62	6.32	1.92	1.03	<u>15.9</u>
29	<u>.36</u>	2.12	.71	.61	1.46	3.42	1.92	51.4	4.72	1.74	.95	3.85
30	<u>.56</u>	2.18	<u>.70</u>	.58	1.41	3.26	1.92	-----	3.33	<u>1.62</u>	.92	2.26
31	.45	*3.04	-----	<u>3.61</u>	-----	3.33	1.74	-----	2.62	-----	<u>.85</u>	-----
Total	85.67	320.48	89.32	20.70	257.61	349.13	129.01	332.27	306.08	204.87	86.18	56.91
Mean												
mgd	2.76	10.3	2.98	0.668	8.59	11.3	4.16	11.5	9.67	6.83	2.78	1.90
cfs	4.27	15.9	4.61	1.03	13.3	17.5	6.44	17.8	15.3	10.6	4.30	2.94
Ac-ft	263	984	274	64	791	1,070	396	1,020	939	629	264	175

Calendar year 1959 : Max 99.4 Min 0.28 Mean(mgd) 5.44 Mean(cfs) 8.42 Ac-ft 6,090
 Fiscal year 1959-60 : Max 99.4 Min 0.36 Mean(mgd) 6.12 Mean(cfs) 9.47 Ac-ft 6,870

Peak discharge (base, 200 mgd).--Aug. 6 (10 p.m.) 706 mgd (1,090 cfs), 5.86 ft; Sept. 5 (2:30 p.m.) 213 mgd (330 cfs), 4.17 ft; Nov. 2 (6:30 a.m.) 500 mgd (774 cfs), 5.27 ft; Nov. 8 (5 p.m.) 402 mgd (622 cfs), 4.98 ft; Dec. 16 (11 p.m.) 211 mgd (326 cfs), 4.16 ft; Feb. 16 (2 a.m.) 285 mgd (441 cfs), 4.53 ft; Feb. 19 (5:30 a.m.) 424 mgd (656 cfs), 5.05 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 30 to Oct. 19, Jan. 3-12; discharge estimated on basis of recorded range in stage and records for Kawaikoi Stream.

140. Kokee ditch near Waimea

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

Records available.--September 1926 to June 1960.

Gage.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (by barometer).

Average discharge.--33 years (1927-60), 15.9 mgd (24.6 cfs).

Extremes.--1926-60: Maximum daily discharge, 68 mgd (105 cfs) Dec. 2, 1929, Mar. 4, 1933; no flow occasionally.

Remarks.--Records good. Kokee ditch diverts water at altitude 3,400 ft from all streams tributary to Waimea River west of Mohihi Stream for irrigation near Kekaha. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.2	4.38	12.6	5.69	37.0	17.7	15.7	8.05	35.4	16.8	11.8	7.36
2	22.7	<u>3.70</u>	*10.8	5.37	<u>47.5</u>	10.4	14.6	9.84	29.8	15.7	11.3	7.18
3	17.9	13.8	13.3	5.21	33.7	*8.58	13.5	8.94	25.6	17.9	11.8	6.83
4	20.9	28.0	15.0	5.21	21.9	7.52	12.4	10.2	19.2	35.4	12.4	6.83
5	32.6	33.7	30.4	5.05	17.4	<u>7.00</u>	11.7	8.22	15.7	*26.0	11.3	6.66
6	33.7	<u>38.2</u>	<u>30.5</u>	5.05	20.4	7.92	11.1	7.88	11.7	30.0	10.5	6.32
7	29.0	24.3	22.6	4.92	12.0	13.3	14.6	7.35	25.1	40.5	9.94	6.15
8	29.6	21.9	15.7	4.78	23.2	9.48	13.9	<u>7.18</u>	<u>14.6</u>	<u>44.0</u>	10.1	5.98
9	*31.1	23.2	12.4	4.65	38.1	8.22	19.0	<u>7.70</u>	<u>8.58</u>	40.5	13.8	5.81
10	16.7	33.2	10.9	4.38	20.6	7.88	<u>35.4</u>	10.6	20.8	32.1	25.1	5.81
11	10.2	27.5	10.4	4.38	18.0	7.18	20.6	23.8	33.7	27.5	15.1	5.64
12	7.88	20.6	10.0	4.51	15.7	10.2	18.0	19.2	30.5	24.6	12.2	5.47
13	8.82	16.8	10.6	5.05	13.7	8.76	*18.0	29.0	27.5	29.0	17.5	5.81
14	6.17	15.7	11.7	4.92	12.4	15.5	20.0	21.9	24.6	32.1	26.6	6.32
15	6.49	14.6	9.48	4.65	11.3	28.0	20.6	13.5	23.2	26.0	21.6	8.47
16	7.88	14.6	10.2	4.38	10.4	41.1	20.6	44.0	23.2	25.0	12.8	11.1
17	7.18	21.0	10.0	4.10	9.84	<u>44.0</u>	13.7	40.5	21.9	24.6	*10.7	7.54
18	5.85	37.0	8.40	3.97	9.30	23.2	11.3	33.7	23.2	29.6	9.94	6.15
19	5.21	24.0	7.35	5.84	8.94	32.8	12.2	35.1	37.0	29.6	26.6	5.84
20	4.92	16.8	6.82	*3.84	8.40	36.8	14.6	18.0	27.5	22.5	<u>34.0</u>	5.30
21	4.65	13.7	7.18	3.70	8.22	40.5	10.6	15.7	21.9	20.0	25.2	<u>5.16</u>
22	4.65	12.4	7.35	3.70	<u>7.88</u>	38.8	9.30	21.5	19.2	17.5	30.3	17.1
23	6.97	12.0	6.82	<u>3.58</u>	12.3	26.0	8.58	32.1	<u>37.4</u>	22.0	19.4	16.3
24	5.21	11.1	9.30	4.51	12.2	21.9	8.05	26.0	30.5	28.1	13.0	10.5
25	4.51	10.6	7.52	4.51	13.4	20.6	<u>7.70</u>	21.9	30.2	21.2	11.1	12.8
26	4.65	10.2	7.00	4.10	18.0	40.6	7.70	19.2	25.0	16.3	9.94	11.1
27	4.38	10.4	6.33	4.38	13.1	32.1	8.38	16.8	30.5	14.9	9.18	29.3
28	<u>4.10</u>	13.3	6.17	4.24	9.66	21.9	20.1	16.8	26.0	13.7	8.62	<u>37.0</u>
29	<u>4.24</u>	11.9	6.01	3.65	8.22	18.0	11.1	<u>45.1</u>	24.6	12.8	6.08	18.8
30	4.24	16.8	<u>5.85</u>	3.70	11.0	16.8	10.0	-----	20.6	<u>12.2</u>	7.72	12.2
31	4.58	19.2	-----	<u>19.3</u>	-----	16.8	8.76	-----	18.0	-----	<u>7.54</u>	-----
Total	365.18	574.58	338.68	153.32	503.76	641.54	441.77	579.76	762.68	748.1	485.16	302.63
Mean:	11.8	18.5	11.3	4.95	16.8	20.7	14.3	20.0	24.6	24.9	15.0	10.1
cfs	18.3	28.6	17.5	7.68	26.0	32.0	22.1	30.9	38.1	38.5	23.2	15.6
Ac-ft	1,120	1,760	1,040	471	1,550	1,970	1,360	1,780	2,340	2,300	1,430	929

Calendar year 1959: Max 47.5 Min 3.58 Mean(mgd) 15.5 Mean(cfs) 24.0 Ac-ft 17,320
 Fiscal year 1959-60: Max 47.5 Min 3.58 Mean(mgd) 16.1 Mean(cfs) 24.9 Ac-ft 18,050

* Discharge measurement made on this day.

160. Waimea River at altitude 890 ft, near Waimea

Location.--Lat 22°04'45", long 159°39'15", on right bank in Waimea Canyon, 0.5 mile upstream from confluence with Koaie Stream and 8.8 miles north of Waimea.

Drainage area.--20.0 sq mi.

Records available.--February to October 1916, October 1917 to June 1918, May 1925 to June 1960. Prior to July 1, 1952, published as Waiahulu Stream near Waimea.

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

Average discharge.--32 years (1925-48, 1951-60), 32.0 mgd (49.5 cfs).

Extremes.--Maximum discharge during year, 11,600 mgd (17,900 cfs) Aug. 6 (gage height, 13.70 ft), from rating curve extended above 70 mgd on basis of slope-area measurement at gage height 11.45 ft; minimum, 9.05 mgd (14.0 cfs) Oct. 23-25, 28, 1916, 1917-18, 1925-60: Maximum discharge, 18,100 mgd (28,000 cfs) Aug. 17, 1950 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 320 mgd; minimum, 5.2 mgd (8.0 cfs) Nov. 4, 1927.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
485	1918	Apr. 18, 1918	4,500	6,960	8.71
635	1926	Jan. 31, 1926	835	1,290	4.63
655	1927	May 16, 1927	4,160	6,440	8.35
695	1929	Nov. 4, 1928	5,210	8,060	9.33
710	1930	Feb. 27, 1930	1,940	3,000	6.32
725	1931	Nov. 18, 1930	2,600	4,020	6.95
740	1932	Aug. 3, 1931	3,700	5,720	8.02
755	1933	Nov. 18, 1932	3,290	5,540	6.70
770	1934	Dec. 21, 1933	2,930	4,530	7.33
795	1935	Dec. 26, 1935	2,110	3,260	6.58
815	1936	Dec. 9, 1935	2,600	4,020	6.97
835	1937	Mar. 18, 1937	2,200	3,400	6.58
865	1938	Mar. 26, 1938	2,600	4,020	6.98
885	1939	May 11, 1939	2,200	3,400	6.63
905	1940	Jan. 7, 1940	2,390	3,700	6.82
935	1941	Oct. 2, 1940	2,690	4,000	9.74
965	1942	Feb. 19, 1942	2,200	3,400	6.60
985	1943	Mar. 9, 1943	3,490	5,400	6.95
1015	1944	Aug. 11, 1943	1,860	2,800	6.23
1045	1945	Apr. 27, 1945	3,815	5,910	8.10
1065	1946	Apr. 24, 1946	1,090	1,690	5.10

Maximum discharge for the fiscal year 1928, published in WSP 1319, was typed in error and is corrected to 5,950 mgd (9,210 cfs) Dec. 24, 1927.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Kokee ditch diverts water above station for irrigation near Kekaha (see p. 14).

Revisions (fiscal years).--WSP 1095: 1928(M). Revised figures of discharge, in million gallons a day, for the fiscal years 1927 and 1930-45, superseding those published in WSP 655, 675, 695, 710, 725, 740, 755, 770, 795, 815, 835, 865, 885, 905, 935, 965, 985, and 1015, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1926		1932		1936-Con.		1942	
Dec. 20	250	Feb. 5	207	Feb. 1	378	Feb. 19	434
21	242	12	361	2	690	Nov. 29	274
		17	534		780	30	397
1927		25	666	5	478	Dec. 5	221
Feb. 15	317	Nov. 17	280	29	118	6	627
Mar. 5	455	18	780			13	351
6	365	23	243	1937		20	540
22	321			Mar. 18	363	21	640
23	263			19	974	28	223
		1933		20	815		
1929		Mar. 3	558	Aug. 16	284	1943	
Nov. 4	381	4	454	17	433	Mar. 9	644
Dec. 1	65	6	727			10	435
2	689	Dec. 12	405	1938		Aug. 11	243
20	717	21	763	Jan. 28	344		
22	863			29	592	1944	
23	646	1934				Mar. 3	616
24	950	June 4	407	1939		8	495
		Nov. 11	406	May 11	656	9	921
1930				Nov. 27	327		
Feb. 27	694	1935		28	332	1945	
Mar. 10	255	Feb. 25	281			Apr. 6	479
11	427	26	468	1940		9	477
23	207	27	322	Jan. 7	834	23	532
Aug. 12	264	Dec. 9	105	Aug. 13	261	27	313
		10	529				
1931				1941			
Aug. 3	229	1936		Oct. 24	434		
4	422	Jan. 2	645				

160. Waimea River at altitude 890 ft, near Waimea--Continued

Revised figures of monthly discharge, in million gallons a day, 1927, 1930-45

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
December 1926.....	-	250	7.0	28.5	44.1	2,720
Calendar year 1926.....	-	266	5.9	15.9	24.6	17,820
February 1927.....	-	317	9.0	32.8	50.7	2,820
March.....	-	455	9.8	83.0	128	7,900
Fiscal year 1926-27.....	-	571	5.9	34.4	53.2	38,580
Calendar year 1927.....	-	-	-	34.6	53.5	38,770
November 1929.....	-	381	9.2	39.5	61.1	3,630
December.....	-	930	9.6	203	314	19,310
Calendar year 1929.....	-	930	7.2	34.9	54.0	39,130
February 1930.....	-	694	10.5	51.1	79.1	4,390
March.....	-	427	12.5	51.8	80.1	4,930
Fiscal year 1929-30.....	-	930	7.2	43.8	67.8	49,120
August 1930.....	-	264	8.7	25.9	40.1	2,460
Calendar year 1930.....	-	694	8.7	34.3	53.1	38,380
Fiscal year 1930-31.....	-	383	8.7	21.9	33.9	24,580
August 1931.....	-	422	9.6	42.6	65.9	4,050
Calendar year 1931.....	-	422	7.0	25.3	39.1	28,320
February 1932.....	-	666	16.5	149	231	13,240
Fiscal year 1931-32.....	-	666	7.0	40.4	62.5	45,360
November 1932.....	-	780	8.0	65.8	102	6,060
Calendar year 1932.....	-	780	8.0	34.6	53.5	38,850
March 1933.....	-	727	16	106	164	10,100
Fiscal year 1932-33.....	-	790	8.0	28.1	43.5	31,420
December 1933.....	-	763	7.6	63.3	97.9	6,020
Calendar year 1933.....	-	763	6.6	26.4	40.8	29,540
June 1934.....	-	407	9.4	34.0	52.6	3,130
Fiscal year 1933-34.....	-	763	6.6	21.5	33.3	23,790
November 1934.....	760.1	406	8.2	25.3	39.1	2,330
Calendar year 1934.....	7,086.6	407	7.9	19.4	30.0	21,760
February 1935.....	1,530	468	10	54.6	84.5	4,700
Fiscal year 1934-35.....	7,984	468	7.9	21.8	35.7	24,450
December 1935.....	1,127.1	529	10	36.4	56.3	3,460
Calendar year 1935.....	8,388.4	529	7.9	23.0	35.6	25,740
January 1936.....	1,646.5	645	11.9	53.1	82.2	5,050
February.....	3,790.2	780	14.5	131	203	11,630
Fiscal year 1935-36.....	12,937.9	780	7.9	35.3	54.6	39,700
Calendar year 1936.....	16,794.6	780	8.6	45.9	71.0	51,530
March 1937.....	4,062.0	974	19.0	131	203	12,470
Fiscal year 1936-37.....	17,146.5	974	8.6	47.0	72.7	52,610
August 1937.....	1,501.2	433	11.5	48.4	74.9	4,610
Calendar year 1937.....	15,407.6	974	9.5	42.2	65.3	47,280
January 1938.....	1,452.0	592	8.6	46.8	72.4	4,460
Fiscal year 1937-38.....	14,657.1	592	8.6	40.2	62.2	44,970
Calendar year 1938.....	12,473	592	8.6	34.2	52.9	38,280
May 1939.....	1,739.2	656	10.3	56.1	86.8	5,340
Fiscal year 1938-39.....	8,853.4	656	9.1	24.3	37.6	27,180
November 1939.....	1,077.4	332	8.5	35.9	55.5	3,310
Calendar year 1939.....	9,217.5	656	8.3	25.3	39.1	28,290
January 1940.....	2,394	834	13.5	77.2	119	7,350
Fiscal year 1939-40.....	9,150.3	834	8.3	25.0	38.7	28,090
August 1940.....	750.4	261	9.5	23.6	36.5	2,240
Calendar year 1940.....	8,820.8	834	8.0	24.1	37.3	27,070
Fiscal year 1940-41.....	6,084.1	337	7.5	16.7	25.8	18,660
October 1941.....	1,026.5	434	6.3	33.1	51.2	3,150
Calendar year 1941.....	5,890.5	434	6.1	16.1	24.9	18,080
February 1942.....	1,343.8	434	7.7	48.0	74.3	4,120
Fiscal year 1941-42.....	10,424.4	512	6.1	28.6	44.3	31,990
November 1942.....	908.9	397	6.9	30.3	46.9	2,730
December.....	4,642.0	640	30.5	150	232	14,250
Calendar year 1942.....	14,235.1	640	6.9	39.2	60.7	43,880
March 1943.....	1,785.9	644	11.2	57.6	89.1	5,480
Fiscal year 1942-43.....	15,057.6	644	6.9	41.3	63.9	46,210
August 1943.....	727.1	243	8.3	23.5	36.4	2,230
Calendar year 1943.....	11,333.3	644	8.3	31.1	48.1	34,760
March 1944.....	4,455.5	921	13	144	223	13,670
Fiscal year 1943-44.....	10,649.3	921	8.3	29.1	45.0	32,670
Calendar year 1944.....	9,497.4	921	7.2	25.9	40.1	29,150
April 1945.....	2,606.4	532	8.2	86.9	134	8,000
Fiscal year 1944-45.....	6,113.6	532	6.4	16.7	25.8	18,760
Calendar year 1945.....	6,675.9	532	6.4	18.3	28.3	20,490

160. Waimea River at altitude 890 ft, near Waimea--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.2	10.8	10	9.38	363	21	13.8	11.8	152	12.7	11.2	*9.25
2	13.6	9.80	10	9.38	460	11	13.2	12.1	201	12.4	11.2	9.25
3	14.7	10.8	11	9.38	100	10	13.0	12.1	292	12.1	11.5	9.25
4	15.0	17.9	20	9.38	25	10	12.7	12.4	146	39.2	11.5	9.50
5	89.3	89.4	245	9.38	24	10	12.7	11.8	45.0	15.4	11.5	9.50
6	43.0	1310	68.4	9.71	23	11	12.4	11.5	36.9	16.7	11.2	9.25
7	32.6	650	24.0	9.71	21	17	12.4	11.5	450	49.0	11.0	9.25
8	30.1	153	17	9.38	500	11	13.5	11.2	130	117	10.8	9.25
9	30.8	64.2	14	9.38	90	10	34.4	11.0	50	171	10.8	9.25
10	14.3	231	13	9.38	22	10	90.3	11.0	35	99.6	13.0	9.25
11	11.4	44.5	12.3	9.71	15	10	20.2	13.6	30	24.4	12.1	9.25
12	10.2	32.4	11.5	9.71	11	13	16.4	13.2	25	15.4	11.8	9.25
13	9.80	20	11.1	9.71	10	11	16.8	19.7	23	16.8	11.8	9.25
14	9.60	15	11.1	10.0	10	26	19.8	14.7	22	29.7	25.9	9.50
15	9.60	12	10.7	9.71	10	60	22.0	13.0	*21	24.4	21.6	9.75
16	9.60	11	10.7	9.38	10	300	17.5	324	18.7	17.9	13.5	10.8
17	9.60	40	*10.7	9.38	10	350	14.1	66.6	16.4	81.5	12.1	10.5
18	9.60	45.0	11.1	9.38	10	25	13.0	62.1	15.8	35.3	11.5	10.5
19	9.60	28.2	10.7	9.38	10	27	12.4	410	22.9	24.9	26.9	10.0
20	9.60	12	10.4	9.38	10	70	12.4	78.3	18.7	14.4	42.4	9.75
21	9.40	11	10.4	9.38	10	60	12.4	35.8	15.1	12.7	17.5	9.75
22	10.0	10	10.0	9.38	10	90	12.1	21.4	14.1	12.4	18.3	15.2
23	9.60	10	9.71	9.05	13	28.5	11.8	32.0	39.3	12.1	15.1	13.8
24	9.60	10	9.71	9.05	11	20.2	11.5	14.4	17.5	15.8	11.8	12.4
25	9.60	10	10.0	9.05	19	16.4	11.5	12.1	27.3	13.8	10.5	11.0
26	9.60	10	9.71	9.38	21	115	*11.5	11.5	41.8	*12.1	10.5	11.0
27	*9.60	10	9.71	*9.38	12	31.7	12.7	11.0	66.6	11.8	10.0	34.2
28	9.60	11	9.71	9.38	10	17.1	14.1	11.4	22.6	11.5	9.75	87.8
29	10.0	11	9.71	9.38	10	14.7	13.2	408	16.1	11.5	9.50	18.1
30	10.5	14	9.38	9.71	20	14.4	13.0	-----	14.1	11.5	9.50	11.0
31	10.8	16	-----	16.9	-----	14.4	12.4	-----	13.2	-----	9.25	-----
Total	500.50	2,910.00	640.74	300.24	1,670	1,435.4	529.2	1,689.2	2,039.1	955.0	435.00	415.80
Mean:	16.1	93.9	21.4	9.69	55.7	46.3	17.1	58.2	65.8	31.8	14.0	13.9
mgd	24.9	145	33.1	15.0	86.2	71.8	26.5	90.0	102	49.2	21.7	21.5
cfs	1,540	8,930	1,970	921	5,130	4,410	1,620	5,180	6,260	2,930	1,330	1,280
Ac-ft												

Calendar year 1959: Max 1,310 Min 9.05 Mean(mgd) 34.9 Mean(cfs) 54.0 Ac-ft 39,150
 Fiscal year 1959-60: Max 1,310 Min 9.05 Mean(mgd) 36.9 Mean(cfs) 57.1 Ac-ft 41,500

Peak discharge (base, 1,200 mgd).--Aug. 8 (9 p.m.) 11,600 mgd (17,900 cfs), 13.70 ft; Nov. 2 (7 a.m.) 2,930 mgd (4,530 cfs), 8.23 ft (recorded); Feb. 29 (5:30 p.m.) 1,820 mgd (2,820 cfs), 7.12 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 13-17, Aug. 20 to Sept. 4, Sept. 8-10, Nov. 2 to Dec. 22, Feb. 19, Mar. 7-15; discharge estimated on basis of records for Kawaikoi Stream and stations near Waimea.

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

Location.--Lat 22°06'40", long 159°34'00", on left bank 3 miles upstream from left branch, 6.5 miles east of Kokee Ranger Station, and 12.7 miles northeast of Waimea.

Drainage area.--3.33 sq mi.

Records available.--July 1919 to July 1932, June 1954 to June 1960.

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

Average discharge.--19 years (1919-32, 1954-60), 17.4 mgd (26.9 cfs).

Extremes.--Maximum and minimum discharges for the fiscal years 1955-60 are contained in the following table.

Fiscal year	Maximum				Minimum			
	Date	Discharge*		Gage height (feet)	Date	Discharge		Gage height (feet)
		(mgd)	(cfs)			(mgd)	(cfs)	
1955	Feb. 6, 1955	1,200	1,860	3.02	Nov. 21-25, 1954	1.42	2.20	0.44
1956	Nov. 11, 1955	3,490	5,400	5.28	Dec. 19, 1955	1.23	1.90	.46
1957	Oct. 23, 1956	4,210	6,510	5.88	Sept. 14, 26, 1956	.86	1.33	.47
1958	Dec. 1, 1957	3,810	5,890	5.55	Oct. 27-29, 1957	1.30	2.01	-
					June 3-6, 20-22, 1958			
1959	Jan. 17, 1959	1,040	1,610	2.82	May 2, 3, June 23-26, 1959	1.19	1.84	-
1960	Aug. 6, 1959	4,110	6,360	5.83	Oct. 20-23, 1959	.98	1.52	.44

* From rating curve extended above 350 mgd.

1919-32, 1954-60: Maximum discharge, 4,210 mgd (6,510 cfs) Oct. 23, 1956 (gage height, 5.88 ft), from rating curve extended above 350 mgd; minimum, 0.6 mgd (0.9 cfs) May 21, 22, 1959.

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

Discharge, in million gallons a day, 1954

June 11.....	6.30	June 21.....	7.00
12.....	5.35	22.....	5.35
13.....	4.52	23.....	*3.98
14.....	11.1	24.....	5.35
15.....	18.5	25.....	25.9
16.....	7.75	26.....	7.00
17.....	5.06	27.....	20.9
18.....	6.30	28.....	13.2
19.....	9.95	29.....	9.95
20.....	7.00	30.....	10.5

* Discharge measurement made on this day.

Discharge, in million gallons a day, fiscal year July 1954 to June 1955

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	38.0	5.35	2.55	2.09	10.5	16.6	33.4	2.55	4.79	40.1	6.30	9.57
2	15.8	5.85	2.23	2.09	4.79	138	24.8	*12.7	4.25	13.0	6.30	6.65
3	19.7	3.45	3.71	2.55	3.20	38.5	40.0	41.7	4.90	8.87	35.3	9.10
4	43.3	3.45	6.30	4.79	2.55	112	38.3	43.0	23.9	5.06	7.35	6.65
5	12.3	81.6	5.95	5.95	2.23	263	9.40	8.15	15.9	3.98	6.30	4.25
6	6.30	13.5	7.35	4.52	1.97	293	5.95	231	6.65	3.71	7.35	3.45
7	4.52	5.95	6.65	6.30	1.85	135	4.52	122	11.7	3.20	5.95	2.74
8	3.98	10.3	4.25	20.0	1.73	202	3.71	27.6	102	2.74	4.79	2.55
9	4.25	7.75	11.2	9.40	1.62	22.0	3.20	9.40	25.9	2.55	4.25	2.23
10	39.3	4.79	4.79	24.5	1.62	26.4	2.55	8.95	15.9	2.38	4.79	2.25
11	152	*5.35	2.74	54.1	1.52	20.7	22.8	8.71	36.0	2.23	6.30	2.09
12	51.7	8.50	2.58	22.5	1.52	50.7	252	75.4	67.5	1.97	7.00	2.09
13	169	4.79	7.35	7.00	1.52	16.8	14.9	27.2	17.2	2.23	5.65	2.55
14	11.1	3.45	5.95	4.79	1.62	54.8	15.4	16.8	8.82	11.9	5.06	4.25
15	6.30	4.79	3.20	3.45	4.25	29.7	13.6	16.6	69.9	42.6	5.06	4.79
16	5.65	6.30	5.95	2.74	4.52	64.0	7.75	9.72	*16.3	43.2	3.71	7.04
17	9.40	4.79	11.5	3.45	2.55	11.0	8.50	20.2	*31.5	5.20	5.06	5.06
18	54.3	29.1	12.3	12.3	*1.97	6.85	11.4	26.7	8.95	13.6	4.25	26.8
19	8.95	12.3	11.3	5.06	1.62	5.06	8.30	15.6	6.65	14.9	12.0	54.3
20	9.40	9.40	4.52	3.20	1.52	3.71	14.2	15.6	4.79	7.35	25.5	*46.3
21	7.75	52.1	2.95	3.71	1.52	*3.45	220	7.75	4.25	10.2	10.2	8.71
22	11.1	15.8	2.55	5.35	1.42	130	8.75	57.1	24.3	28.1	5.06	5.06
23	7.75	7.35	2.23	13.6	1.52	19.7	5.06	81.0	13.2	17.4	5.95	20.8
24	5.35	13.6	2.09	5.06	1.42	6.65	3.98	14.5	12.3	40.9	5.95	25.0
25	4.79	6.65	9.78	4.52	1.73	4.79	3.45	54.5	8.04	31.0	49.1	6.30
26	3.98	4.52	5.35	3.20	2.09	3.71	18.6	15.7	5.06	8.15	44.3	4.79
27	3.98	4.52	3.45	2.38	107	3.45	12.8	8.50	4.52	12.8	23.1	3.71
28	3.71	11.7	2.95	2.09	489	47.5	4.79	6.30	5.35	22.4	8.14	3.71
29	10.5	7.75	*2.74	2.38	29.8	61.7	3.71	-	5.06	125	7.03	5.20
30	9.40	4.52	2.55	7.16	151	35.5	2.95	-----	8.20	62	4.79	6.60
31	8.50	3.20	-----	37.0	-----	177	2.74	-----	19.4	-----	5.35	-----
Total	742.06	362.27	158.81	287.23	821.17	2,001.07	819.51	984.93	568.18	622.64	335.41	294.57
Mean:	23.9	11.7	5.29	9.27	27.4	64.6	26.4	35.2	18.3	20.8	10.8	9.82
cfs	37.0	18.1	8.18	14.3	42.4	100	40.8	54.5	28.3	32.2	16.7	15.2
Ac-ft	2,280	1,110	487	881	2,520	6,140	2,510	3,020	1,740	1,910	1,030	904

Calendar year 1954: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal year 1954-55: Max 489 Min 1.42 Mean (mgd) 21.9 Mean (cfs) 33.9 Ac-ft 24,530

Peak discharge (base, 900 mgd).--Nov. 28 (7:30 a.m.) 1,100 mgd (1,700 cfs), 2.90 ft; Jan. 21 (4 a.m.) 950 mgd (1,440 cfs), 2.68 ft; Feb. 6 (8:30 p.m.) 1,200 mgd (1,860 cfs), 3.02 ft.

* Discharge measurement made on this day.

170. Koale Stream at altitude 3,700 ft, near Waimea--Continued

Discharge, in million gallons a day, fiscal year July 1955 to June 1956

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.52	8.09	10.5	4.62	3.45	2.74	5.95	4.52	91.5	21.1	3.20	5.95
2	6.87	5.06	20.2	35.4	2.55	22.7	3.98	4.25	12.3	6.30	2.95	5.35
3	10.3	95.9	8.15	25.1	2.23	10.6	2.95	3.71	11.1	5.35	2.55	11.0
4	5.06	8.92	6.65	37.6	1.85	4.52	2.95	3.20	5.65	4.52	2.74	28.3
5	3.98	5.65	6.30	11.7	1.62	2.95	2.74	4.25	4.25	3.98	3.71	20.2
6	4.81	27.6	5.06	9.95	1.85	2.55	2.09	46.5	*5.98	3.71	6.30	12.9
7	4.52	7.00	3.98	9.40	1.52	2.09	1.97	13.6	4.79	4.79	27.2	12.9
8	3.20	14.3	3.45	11.7	115	1.97	1.85	9.35	11.6	5.95	14.3	7.73
9	2.55	18.3	3.20	7.75	130	1.85	1.85	5.06	13.9	31.4	12.1	5.65
10	2.38	18.1	3.20	5.65	28.2	1.85	1.73	14.6	7.00	12.6	6.30	19.3
11	2.38	15.3	3.20	5.06	264	2.95	227	8.99	5.35	7.35	44.3	27.9
12	3.82	6.65	2.95	4.25	441	2.38	322	128	4.25	9.32	7.35	26.6
13	11.7	7.78	4.52	3.71	21.6	1.97	103	77.5	3.45	11.3	5.65	17.8
14	32.2	40.8	5.65	3.20	14.4	1.73	13.3	110	2.95	6.65	7.35	38.9
15	67.9	53.7	4.52	3.45	30.3	1.52	95.2	154	2.95	10.4	14.4	20.7
16	48.8	14.9	7.78	20.3	33.1	1.42	30.5	795	15.3	8.68	7.00	39.6
17	19.4	*12.0	4.79	25.1	181	1.32	7.00	1090	28.3	5.06	4.79	8.95
18	36.9	35.8	3.45	*3.98	79.7	1.32	4.79	282	5.65	a5.3	3.45	8.55
19	7.35	27.8	2.74	3.20	39.6	298	3.71	46.8	3.98	a28	3.71	5.06
20	7.35	14.9	2.38	2.55	40.0	205	2.95	17.5	5.06	a27	7.00	3.98
21	5.35	9.87	7.87	2.38	86.6	2.92	2.74	12.2	9.87	a16	5.95	7.42
22	3.98	6.65	8.44	2.38	39.3	57.8	2.38	7.35	13.8	a11	12.5	12.3
23	4.28	5.06	7.75	2.23	29.3	7.35	2.09	89.5	6.65	a7.5	7.35	23.9
24	4.25	19.4	15.2	2.55	12.3	5.06	*2.09	431	38.2	*a5.0	5.06	12.9
25	4.79	85.7	6.30	4.52	7.00	3.98	131	636	13.1	3.45	3.98	7.32
26	13.4	13.4	4.25	5.95	5.35	2.95	112	695	49.2	2.95	3.45	4.79
27	30.8	13.6	3.98	3.45	4.52	2.74	66.2	189	33.7	15.2	3.71	4.52
28	56.4	18.5	3.98	3.45	5.98	2.38	7.98	67.1	10.6	12.2	21.9	4.79
29	25.6	19.6	7.78	3.20	2.09	6.26	14.6	6.65	4.79	51.3	3.20	3.20
30	11.3	11.7	3.71	25.6	*2.95	93.6	38.9	-----	10.8	3.71	7.87	2.55
31	16.6	12.3	-----	5.06	-----	10.8	7.22	-----	17.5	-----	22.1	-----
Total	442.54	634.33	178.13	299.01	1,667.47	1,052.18	1,216.37	4,958.58	455.38	298.76	331.52	411.01
Mean:												
mgd	14.3	20.5	5.94	9.65	55.6	33.9	39.2	171	14.7	9.96	10.7	13.7
cfs	22.1	31.7	9.19	14.9	86.0	52.5	60.7	265	22.7	15.4	16.6	21.2
Ac-ft	1,360	1,950	547	918	5,120	3,230	5,730	15,220	1,400	917	1,020	1,260

Calendar year 1955: Max 441 Min 1.32 Mean(mgd) 21.6 Mean(cfs) 33.4 Ac-ft 24,240
 Fiscal year 1955-56: Max 1,090 Min 1.32 Mean(mgd) 32.6 Mean(cfs) 50.4 Ac-ft 36,670
 Peak discharge (base, 900 mgd).--Nov. 11 (10:30 p.m.) 3,490 mgd (5,400 cfs), 5.28 ft; Dec. 19 (5:30 p.m.) 1,580 mgd (2,440 cfs), 3.45 ft; Jan. 11 (11 p.m.) 1,210 mgd (1,870 cfs), 3.03 ft; Feb. 17 (8:50 a.m.) 3,400 mgd (5,260 cfs), 5.21 ft; Feb. 25 (11:30 p.m.) 2,820 mgd (4,360 cfs), 4.71 ft.

* Discharge measurement made on this day.
 a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby stations.

Discharge, in million gallons a day, fiscal year July 1956 to June 1957

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.38	1.62	6.75	2.23	6.55	128	1.69	8.33	2.36	1.43	16.4	1.30
2	*2.38	1.52	2.95	2.74	4.58	37.1	1.56	40.4	2.17	1.69	7.50	1.30
3	1.97	3.13	2.95	3.57	3.60	14.4	1.43	174	1.83	3.09	5.70	1.30
4	1.85	37.6	2.38	72.5	42.5	7.50	1.43	344	1.83	22.1	4.58	1.30
5	1.62	5.65	3.45	11.5	20.4	4.94	1.43	137	3.39	4.73	3.91	1.30
6	1.52	3.45	9.21	3.71	7.00	111	24.5	53.8	2.59	4.22	4.22	1.19
7	1.52	*2.38	4.52	5.55	4.94	16.5	47.0	46.3	2.17	17.9	3.31	1.19
8	1.97	17.4	2.55	5.06	*3.60	11.9	115	40.2	1.83	23.8	3.05	1.19
9	5.83	8.60	1.62	12.5	2.59	20.1	41.6	13.5	1.83	5.70	2.59	1.19
10	6.06	15.1	1.32	5.06	2.36	50.0	10.6	17.7	1.83	3.60	*2.36	*1.19
11	5.35	4.79	1.14	3.45	2.36	9.60	37.0	*58.1	2.59	2.82	2.36	1.08
12	5.20	2.74	.93	3.45	4.84	4.94	10.8	23.2	7.90	2.36	2.82	1.08
13	25.1	2.23	.93	4.49	4.94	4.22	6.34	13.5	7.00	2.36	3.05	1.08
14	9.40	2.67	.93	76.4	4.22	3.91	19.5	11.6	17.8	2.59	10.8	1.08
15	7.95	10.1	3.47	30.9	39.7	13.9	78.2	6.10	8.66	6.03	8.52	1.30
16	16.1	3.71	4.08	57.4	13.5	16.4	6.55	4.58	4.94	51.0	3.31	1.83
17	7.94	11.5	3.70	116	10.8	13.5	200	5.42	26.3	50.1	2.36	4.22
18	4.79	29.8	1.85	17.1	7.00	6.48	256	9.42	11.5	13.7	2.00	4.58
19	5.35	6.06	1.32	7.49	7.50	4.22	21.3	4.58	4.94	9.96	1.83	18.2
20	3.71	3.45	1.00	5.65	6.35	*3.05	30.9	4.94	3.31	52.5	1.69	14.8
21	3.45	2.38	.93	27.5	9.68	2.59	222	4.58	2.82	6.55	1.69	12.5
22	3.45	1.85	.93	31.9	4.58	2.17	33.1	3.91	2.59	3.91	1.69	3.91
23	3.20	1.85	.93	435	3.31	2.00	19.5	4.22	2.17	52.9	1.69	2.36
24	2.55	2.38	.93	52.2	3.31	1.83	47.0	3.60	2.00	43.0	1.83	1.69
25	1.97	2.38	1.00	8.00	3.05	1.69	13.8	3.60	2.17	33.9	1.69	1.69
26	1.62	1.97	.93	7.60	2.59	1.56	5.30	3.05	*2.17	21.1	1.56	1.56
27	5.52	1.52	.93	5.70	3.05	1.69	3.91	2.59	2.17	20.8	1.43	1.56
28	3.98	1.32	*.93	5.70	3.60	2.59	3.31	2.59	1.83	31.9	1.30	1.69
29	2.74	1.32	1.14	6.55	3.60	4.22	183	-----	1.69	32.1	1.30	1.56
30	2.38	1.14	1.52	59.1	146	2.82	152	-----	1.69	29.6	1.30	2.00
31	1.97	10.3	-----	29.4	-----	2.17	7.00	-----	1.56	-----	1.30	-----
Total	146.67	201.91	67.22	1,115.40	582.10	506.99	1,602.55	1,050.61	139.63	644.28	109.14	92.22
Mean:												
mgd	4.73	6.51	2.24	36.0	12.7	16.4	51.7	37.5	4.50	21.5	3.52	3.07
cfs	7.32	10.1	3.47	55.7	19.6	25.4	80.0	58.0	6.96	33.3	5.45	4.75
Ac-ft	450	620	206	3,920	1,170	1,560	4,320	3,220	428	1,980	335	263

Calendar year 1956: Max 1,090 Min 0.93 Mean(mgd) 27.6 Mean(cfs) 42.7 Ac-ft 30,970
 Fiscal year 1956-57: Max 435 Min 0.93 Mean(mgd) 16.6 Mean(cfs) 25.7 Ac-ft 18,590
 Peak discharge (base, 900 mgd).--Oct. 23 (8 p.m.) 4,210 mgd (6,510 cfs), 5.88 ft; Jan. 18 (8 a.m.) 1,470 mgd (2,270 cfs), 3.32 ft; Jan. 29 (10 p.m.) 1,410 mgd (2,180 cfs), 3.26 ft.

* Discharge measurement made on this day.

170. Koale Stream at altitude 3,700 ft, near Waimea--Continued

Discharge, in million gallons a day, fiscal year July 1957 to June 1958

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.5	6.55	30.0	4.22	10.5	1.790	23.7	12.7	15.3	3.91	4.94	1.56
2	38.9	3.91	8.00	2.82	3.05	652	9.20	7.50	13.5	3.05	10.5	1.56
3	6.59	83.8	63.4	2.17	2.00	96.3	6.55	5.30	6.10	3.91	9.85	*1.43
4	3.05	43.6	*11.9	1.83	1.56	57.8	6.10	4.94	4.58	17.7	4.58	1.43
5	2.17	10.3	5.30	1.83	1.43	11.9	7.00	4.58	6.10	7.00	4.58	1.56
6	3.91	84.0	3.91	5.29	1.56	22.4	5.30	3.91	5.70	4.58	4.94	1.43
7	4.22	125	3.31	8.18	2.82	34.9	4.22	3.05	3.91	3.31	5.30	1.43
8	3.51	40.4	2.82	3.69	7.65	16.7	4.22	2.82	3.05	2.59	14.7	1.83
9	3.05	9.20	2.36	2.59	3.05	43.3	3.31	2.36	4.91	2.36	31.4	3.60
10	19.0	4.94	2.17	2.00	3.31	33.8	3.60	2.36	8.00	2.00	22.9	4.22
11	56.5	3.60	2.17	1.83	12.2	45.7	3.05	2.00	8.00	2.36	10.5	10.4
12	7.00	3.05	2.17	1.56	5.30	38.4	3.05	2.17	7.58	2.82	11.2	19.1
13	3.31	22.6	2.00	1.43	3.91	36.9	*3.05	2.00	9.20	13.9	14.2	4.94
14	3.05	9.85	2.00	1.43	2.36	32.3	3.05	3.60	4.58	15.7	5.30	2.82
15	3.05	14.4	1.83	2.82	1.83	50.1	2.82	5.70	3.91	9.85	14.1	2.00
16	3.05	8.00	1.83	*2.17	2.00	12.7	2.59	3.60	3.31	4.94	41.5	1.56
17	2.59	8.00	2.36	12.8	3.05	19.6	2.36	6.10	3.05	3.91	12.7	1.56
18	5.59	18.0	5.89	8.60	2.00	47.4	2.17	*6.55	3.05	6.10	7.00	1.56
19	4.94	8.00	3.91	3.91	1.56	52.0	2.17	3.46	2.82	7.00	5.30	1.43
20	7.89	6.10	2.82	3.05	126	22.8	2.00	26.5	2.59	9.13	3.91	1.43
21	4.58	4.22	2.17	2.59	31.2	20.8	2.36	7.00	2.59	9.20	3.31	1.30
22	2.82	3.31	2.00	1.83	9.85	11.9	12.4	10.5	3.05	4.58	3.31	1.43
23	*2.36	2.82	1.69	1.69	4.94	19.7	8.00	11.9	2.82	3.05	2.82	2.59
24	4.58	22.1	3.10	1.56	5.70	11.9	4.58	11.9	2.36	2.17	2.59	3.60
25	3.05	37.2	43.4	1.43	*9.17	21.7	3.05	7.50	4.08	1.83	2.36	7.00
26	2.59	27.5	15.3	1.43	16.4	62.6	2.36	4.58	8.00	1.69	2.82	12.7
27	8.29	9.20	8.00	1.30	15.3	20.8	2.00	14.1	35.0	1.83	2.59	9.40
28	22.5	9.85	11.6	1.30	13.5	41.5	40.6	33.5	22.7	1.69	2.36	46.4
29	9.20	20.8	6.10	1.30	97.3	39.3	91.0	-----	-----	1.56	2.00	30.7
30	14.60	11.9	4.22	1.43	269	21.8	123	-----	9.20	1.69	1.69	4.94
31	23.4	74.0	-----	3.91	-----	32.3	29.7	-----	5.30	-----	1.56	-----
Total	292.64	736.20	257.73	94.07	669.50	3,421.3	419.16	272.18	222.44	155.41	266.81	186.91
Mean:	9.44	23.7	8.59	3.03	22.3	110	13.5	9.72	7.18	5.18	8.61	6.23
mgd	14.6	36.7	13.3	4.69	34.5	170	20.9	15.0	11.1	8.01	13.3	9.64
cfs	898	2,260	791	289	2,050	10,500	1,290	835	683	477	819	574

Calendar year 1957: Max 1,790 Min 1.08 Mean(mgd) 25.0 Mean(cfs) 38.7 Ac-ft 27,950
 Fiscal year 1957-58: Max 1,790 Min 1.30 Mean(mgd) 19.2 Mean(cfs) 29.7 Ac-ft 21,470
 Peak discharge (base 900 mgd).--Nov. 20 (8:30 p.m.) 938 mgd (1,450 cfs), 2.69 ft; Dec. 1 (5 p.m.) 3,810 mgd (5,890 cfs), 5.55 ft.

* Discharge measurement made on this day.

Discharge, in million gallons a day, fiscal year July 1958 to June 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.12	3.31	7.00	2.82	4.22	3.31	8.20	7.50	3.60	97.2	1.43	1.83
2	6.55	135	14.2	2.59	3.60	2.82	4.94	7.00	3.31	29.4	1.30	1.69
3	7.10	76.3	9.45	2.59	4.22	*3.31	19.4	6.55	3.60	14.4	1.30	1.69
4	15.9	12.3	4.94	2.59	3.91	2.82	7.98	14.4	4.22	9.85	1.43	1.69
5	8.75	48.8	3.91	2.17	3.31	14.8	4.58	9.20	3.05	10.5	1.43	1.69
6	4.22	50.2	4.58	1.83	2.82	30.0	3.60	5.30	2.59	20.2	10.5	1.83
7	25.6	11.4	113	1.69	2.59	5.30	3.05	4.22	2.17	12.6	19.5	2.00
8	44.8	283	24.0	1.69	4.01	3.60	3.60	2.17	30.7	23.3	2.82	2.82
9	11.2	68.6	5.70	1.69	7.78	2.82	2.36	3.31	2.82	118	33.1	23.7
10	16.5	11.0	3.91	1.69	117	25.4	2.36	58.2	*3.60	79.6	15.3	7.71
11	18.4	6.10	3.31	8.99	38.6	11.6	2.17	24.9	3.31	11.8	14.4	3.91
12	14.9	4.94	2.82	4.85	9.35	4.58	25.7	15.8	6.75	7.00	9.85	10.9
13	11.2	4.94	2.82	*3.05	5.49	3.31	170	40.8	11.4	5.70	11.9	6.55
14	10.5	5.30	3.05	3.92	13.4	2.82	10.6	7.50	4.94	4.58	6.55	4.94
15	13.8	7.50	15.9	*59.9	6.55	2.36	9.20	9.62	3.31	3.60	13.9	3.05
16	15.3	12.7	25.8	27.0	4.58	2.17	5.70	7.00	2.59	3.05	53.8	2.36
17	*6.53	6.10	12.7	42.6	3.60	2.17	157	9.20	2.36	2.59	28.3	2.00
18	145	4.22	19.0	25.0	3.31	24.8	63.8	45.9	2.00	2.36	55.0	1.69
19	37.6	3.31	25.0	12.7	35.9	6.65	16.8	12.8	2.17	2.36	8.75	1.56
20	196	2.82	56.7	13.7	12.3	3.91	*6.55	10.5	2.00	2.17	5.70	1.43
21	19.9	38.8	63.1	28.3	18.9	3.05	5.30	118	1.69	*2.00	14.4	1.30
22	24.6	13.0	9.95	32.1	19.2	2.82	4.58	29.8	1.69	2.00	7.35	1.30
23	32.0	5.70	5.70	428	31.8	3.91	4.58	14.8	1.56	1.83	4.58	1.19
24	21.9	4.22	4.58	59.3	7.00	3.31	3.91	7.00	1.56	1.83	3.91	1.19
25	17.8	7.17	4.22	16.0	4.58	2.59	3.60	7.50	2.00	1.69	3.31	1.19
26	7.50	35.3	5.56	7.00	3.60	2.17	3.05	10.2	2.82	1.69	2.82	1.56
27	6.10	*11.9	5.70	5.70	3.31	1.83	2.59	5.70	2.82	1.56	2.59	2.36
28	4.94	5.70	3.91	22.6	2.82	26.6	2.59	4.22	2.17	1.56	2.36	1.83
29	4.22	3.91	3.05	11.2	2.36	159	2.36	-	2.17	1.56	2.17	1.69
30	3.60	7.39	2.59	7.50	2.36	33.3	2.36	-----	2.36	1.43	2.00	1.83
31	3.05	7.50	-----	5.70	-----	42.3	5.10	-----	6.32	-----	1.83	-----
Total	765.38	899.43	467.10	846.46	382.47	439.43	566.83	500.52	99.12	484.81	370.06	100.48
Mean:	24.7	29.0	15.6	27.3	12.7	14.2	18.3	17.9	3.20	16.2	11.9	3.35
mgd	38.2	44.9	24.1	42.2	19.6	22.0	28.3	27.7	4.95	25.1	18.4	5.18
cfs	2,350	2,760	1,430	2,600	1,170	1,350	1,740	1,540	304	1,490	1,140	308

Calendar year 1958: Max 428 Min 1.30 Mean(mgd) 14.6 Mean(cfs) 22.6 Ac-ft 16,340
 Fiscal year 1958-59: Max 428 Min 1.19 Mean(mgd) 16.2 Mean(cfs) 25.1 Ac-ft 18,180
 Peak discharge (base 900 mgd).--July 20 (9 a.m.) 960 mgd (1,490 cfs), 2.72 ft; Aug. 8 (11:30 a.m.) 998 mgd (1,540 cfs), 2.77 ft; Dec. 29 (1:30 a.m.) 968 mgd (1,500 cfs), 2.73 ft; Jan. 17 (4 p.m.) 1,040 mgd (1,610 cfs), 2.82 ft.

* Discharge measurement made on this day.

170. Koaie Stream at altitude 3,700 ft, near Waimea--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.52	1.83	*3.91	3.91	80.3	2.59	4.58	2.17	26.4	3.91	2.17	2.17
2	52.8	1.83	3.31	2.36	228	*3.31	3.60	2.17	62.5	3.05	2.00	2.00
3	56.2	8.76	3.91	2.00	11.3	3.05	2.82	1.83	75.9	3.54	8.42	1.83
4	21.8	33.0	4.58	2.00	5.30	2.36	3.80	1.83	29.7	*10.5	9.00	1.69
5	67.5	46.4	104	1.69	9.91	2.99	14.4	1.83	11.9	8.60	3.91	1.69
6	58.4	724	16.3	1.56	10.2	8.00	9.10	1.69	33.8	15.3	3.05	1.69
7	27.9	152	5.70	1.43	3.91	6.10	25.1	1.56	163	19.7	2.36	1.56
8	*14.4	31.9	3.91	1.30	95.9	7.00	9.20	1.43	12.8	46.3	2.36	1.43
9	16.2	36.3	2.82	1.19	21.7	23.1	64.6	1.43	6.10	67.4	2.59	1.30
10	7.00	63.7	2.36	1.19	6.55	8.60	52.4	1.56	4.58	33.2	8.61	1.30
11	4.58	7.50	2.82	.98	4.58	4.94	33.5	2.82	6.47	9.85	5.70	1.30
12	3.60	4.94	6.36	1.19	3.31	8.00	*47.7	10.7	4.94	7.00	5.79	1.43
13	2.82	4.22	6.10	1.83	2.59	9.75	68.7	11.8	4.22	9.85	21.0	1.69
14	2.59	4.22	5.70	1.69	2.17	60.0	34.3	6.10	4.22	114	166	5.99
15	3.05	3.60	4.22	1.56	2.00	55.2	10.1	12.0	3.31	16.4	23.9	18.0
16	12.9	2.82	10.4	1.30	1.83	194	8.00	220	2.82	28.3	*8.76	7.98
17	6.10	3.60	5.30	1.19	1.69	94.4	4.94	30.3	2.59	95.6	8.22	3.91
18	3.91	32.0	3.05	1.08	1.56	10.5	3.91	49.3	7.40	51.8	10.3	2.82
19	3.05	9.41	2.59	*.98	1.43	38.3	3.31	163	14.1	15.1	96.3	2.36
20	3.89	4.22	2.00	.98	1.43	24.4	3.05	12.4	6.10	7.50	60.0	4.85
21	4.58	3.05	2.36	.88	1.43	60.1	2.59	5.30	3.91	10.7	33.7	*44.0
22	2.82	2.36	2.00	.88	1.43	41.3	2.36	6.36	3.31	7.50	32.0	a15
23	2.17	2.00	2.17	.98	2.65	8.60	2.17	13.2	7.00	7.00	12.2	a7.5
24	1.83	1.83	5.70	.98	2.00	7.50	2.00	4.58	9.22	10.5	6.55	a7.0
25	1.83	2.17	9.02	1.08	4.38	8.50	1.83	*3.31	15.7	7.00	7.15	a6.6
26	1.69	3.05	3.60	3.23	8.54	88.1	1.83	2.82	47.0	4.22	4.58	a15
27	1.56	3.60	2.59	6.74	4.22	15.2	2.17	2.36	28.1	3.60	4.22	a65
28	1.43	4.94	2.00	7.23	2.82	7.00	3.60	2.17	25.9	3.05	3.31	a30
29	1.43	3.31	1.83	2.59	2.17	4.94	3.31	149	9.20	2.59	2.82	a10
30	1.56	3.91	2.79	1.69	2.17	4.96	3.05	-----	6.55	2.36	2.59	a7.5
31	1.59	6.10	-----	9.64	-----	8.00	2.59	-----	5.30	-----	2.36	-----
Total	395.80	1,212.57	233.40	67.33	527.47	820.79	434.61	725.02	642.04	625.42	559.92	274.59
Mean:	12.8	39.1	7.78	2.17	17.6	26.5	14.0	25.0	20.7	20.8	18.1	9.15
mgd	19.8	60.5	12.0	3.36	27.2	41.0	21.7	38.7	32.0	32.2	28.0	14.2
cfs	1,210	3,720	716	207	1,620	2,520	1,330	2,220	1,970	1,920	1,720	843
Ac-ft												

Calendar year 1959: Max 724 Min 0.88 Mean(mgd) 14.7 Mean(cfs) 22.7 Ac-ft 16,520

Fiscal year 1959-60: Max 724 Min 0.88 Mean(mgd) 17.8 Mean(cfs) 27.5 Ac-ft 20,000

Peak discharge (base, 900 mgd).--Aug. 6 (8 p.m.) 4,110 mgd (6,360 cfs), 5.83 ft; Nov. 2 (6 a.m.) 998 mgd (1,540 cfs), 2.78 ft.

* Discharge measurement made on this day.

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

220. Kekaha ditch at camp 1, near Waimea

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

Records available--November 1907 to June 1960. August 1932 to June 1933 monthly discharge only, published in WSP 1319; figures of discharge published in WSP 755 are unreliable. Published as Kekaha ditch at intake, near Waimea, January 1910 to December 1911, and as Kekaha ditch at flume No. 4, near Waimea, March 1916 to June 1917.

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

Average discharge--47 years (1910-15, 1916-17, 1918-24, 1925-60), 36.7 mgd (56.8 cfs); fiscal years 1911-15, and 1917 were omitted in error in computing averages for period prior to 1960.

Extremes--1907-60: Maximum daily discharge, 67 mgd (104 cfs) Jan. 6, Mar. 3, 6, 7, 17, 18, 24-26, 29-31, 1921; no flow at times.

Remarks--Records good except those for periods of fragmentary or no gage-height record, which are fair. Ditch diverts water from Waimea River, 1 mile downstream from mouth of Waialae Stream. Flow regulated by headgates. Water used for irrigation in vicinity of Kekaha.

Revisions--See Records available. Revised figures of monthly discharge, in million gallons a day, for the fiscal year 1933, superseding those published in WSP 755 are given herewith:

Month	Mgd-days	Mean	Runoff in acre-feet
August 1932.....	1,167	37.6	3,580
September.....	920	30.7	2,820
October.....	940	30.3	2,980
November.....	750	25.0	2,300
December.....	1,162	37.5	3,570
Calendar year 1932.....	12,959	35.5	39,760
January 1933.....	1,402	45.2	4,300
February.....	1,300	46.4	3,990
March.....	1,051	35.3	3,160
April.....	1,209	40.3	3,710
May.....	1,253	40.4	3,840
June.....	1,195	39.8	3,670
Fiscal year 1932-33.....	13,536	37.1	41,520

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	25.5	25.5	35.6	27.5	44.4	29.5	35.6	31.5	f32.1	40.0	29.5	*29.5
2	40.0	24.5	31.5	27.5	44.4	27.5	35.6	31.5	f5.74	37.8	29.5	27.5
3	46.2	29.5	31.5	25.5	46.6	27.5	33.5	31.5	f18.7	35.6	31.5	27.5
4	48.9	48.9	31.5	25.5	46.6	27.5	33.5	31.5	f23.5	46.6	44.4	27.5
5	48.9	48.9	42.2	25.5	40.0	27.5	44.4	29.5	f22.6	46.6	35.6	27.5
6	48.9	34.7	44.4	24.5	46.6	31.5	42.2	27.5	f13.1	46.6	31.5	27.5
7	48.9	15.6	44.4	24.5	40.0	35.6	46.6	27.5	f11.8	48.9	29.5	27.5
8	48.9	17.3	37.8	23.5	35.6	33.5	46.6	27.5	f.98	44.4	27.5	25.5
9	48.9	28.6	31.5	23.5	40.0	40.0	44.4	25.5	f.98	40.0	27.5	25.5
10	46.6	17.5	29.5	23.5	46.6	44.4	46.6	25.5	f1.05	42.2	35.6	25.5
11	35.6	53	29.5	23.5	46.6	33.5	48.9	f29.5	f30.2	48.9	37.8	25.5
12	31.5	6.79	31.5	23.5	44.4	35.6	48.9	f35.6	f40.0	46.6	31.5	25.5
13	29.5	42.2	35.6	24.5	37.8	37.8	48.9	f40.0	40.0	46.6	42.2	25.5
14	27.5	44.4	33.5	24.5	33.5	46.6	48.9	37.8	40.0	42.2	46.6	27.5
15	27.5	42.2	31.5	24.5	31.5	48.9	17.1	f35.6	37.8	31.5	48.9	37.8
16	31.5	37.8	35.6	23.5	29.5	48.9	18.1	f46.6	35.6	31.5	46.6	44.4
17	40.0	37.8	35.6	23.5	29.5	48.9	35.6	48.9	35.6	33.5	46.6	33.5
18	31.5	48.9	*29.5	23.5	27.5	44.4	35.6	f46.6	35.6	48.9	37.8	29.5
19	27.5	48.9	27.5	22.6	27.5	40.0	35.6	f40.0	33.5	48.9	42.2	27.5
20	27.5	42.2	27.5	22.6	27.5	42.2	33.5	f40.0	33.5	46.6	44.4	27.5
21	29.5	35.6	25.5	22.6	27.5	48.9	33.5	f42.2	44.4	46.6	35.6	45.4
22	27.5	33.5	27.5	22.6	27.5	*46.6	31.5	f48.9	42.2	42.2	37.8	48.9
23	27.5	31.5	25.5	22.6	27.5	44.4	29.5	f48.9	*46.6	35.6	48.9	48.9
24	25.5	31.5	27.5	22.6	29.5	37.8	29.5	f46.6	46.6	40.0	46.6	40.0
25	25.5	29.5	35.6	22.6	29.5	a35	29.5	f40.0	46.6	44.4	44.4	35.6
26	25.5	31.5	31.5	23.5	35.6	a35	29.5	f37.8	40.0	*37.8	37.8	35.6
27	*25.5	31.5	27.5	27.5	35.6	a35	31.5	f35.6	40.0	33.5	35.6	42.2
28	24.5	33.5	27.5	35.6	31.5	a35	37.8	f35.6	48.9	33.5	33.5	48.9
29	24.5	31.5	25.5	27.5	27.5	a35	35.6	f42.2	48.9	31.5	31.5	46.6
30	25.5	31.5	25.5	25.5	27.5	35.6	35.6	-----	46.6	31.5	29.5	42.2
31	25.5	35.6	-----	37.8	-----	35.6	33.5	-----	44.4	-----	29.5	-----
Total	1,048.2	999.42	956.3	777.6	1,065.3	1,173.1	1,137.1	1,067.4	987.55	1,250.5	1,155.3	1,009.5
Mean:												
mgd	33.8	32.2	31.9	25.1	35.5	37.8	36.7	36.8	31.9	41.0	37.3	33.6
cfs	52.3	49.8	49.4	38.8	54.9	58.5	56.8	56.9	49.4	63.4	57.7	52.0
Ac-ft	3,220	3,070	2,930	2,390	3,270	3,600	3,490	3,280	3,030	3,780	3,550	3,100

Calendar year 1959: Max 51.0 Min 0.53 Mean(mgd) 34.3 Mean(cfs) 53.1 Ac-ft 38,480
 Fiscal year 1959-60: Max 48.9 Min 0.53 Mean(mgd) 34.4 Mean(cfs) 53.2 Ac-ft 38,710

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of twice-daily ditchman's readings and records for nearby stations.

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

291. Waimea ditch below wasteway, near Waimea

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

Records available--February to June 1960.

Gage--Water-stage recorder and Parshall flume.

Extremes--1960: Maximum daily discharge, 8.02 mgd (12.4 cfs) June 22, 28, 29; no flow Mar. 16-21.

Remarks--Records good. Flow can be regulated by two wasteway gates between station and intake.

Discharge, in million gallons a day, February to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1								-	0.02	3.89	2.32	2.20
2								-	.22	3.33	2.26	*2.13
3								-	.14	2.98	2.38	2.02
4								-	.02	5.08	4.15	2.07
5								-	.01	5.06	4.40	2.13
6								-	.01	4.50	2.91	2.02
7								-	.20	5.62	2.51	1.96
8								-	.01	5.70	2.20	1.96
9								-	.01	6.15	2.07	1.91
10								-	.01	2.45	2.20	1.91
11								-	.01	4.13	3.68	1.91
12								-	.01	4.82	3.50	1.91
13								-	.01	4.42	4.10	1.91
14								-	.01	3.72	5.49	1.96
15								-	.01	4.06	3.47	3.14
16								-	0	7.08	5.75	5.62
17								-	0	3.01	5.46	3.94
18								-	0	5.70	4.50	2.70
19								*0.24	0	7.55	4.17	2.20
20								.59	0	7.08	3.93	2.07
21								.59	0	6.15	1.08	4.98
22								.51	1.69	3.97	2.37	8.02
23								.10	1.21	.88	4.34	7.55
24								.03	1.82	.81	5.29	5.00
25								.01	5.30	4.76	5.54	2.32
26								.01	3.62	*4.69	4.74	2.38
27								.01	.59	3.47	3.47	3.87
28								.01	4.51	2.98	2.34	8.02
29								.10	5.70	2.64	.92	8.02
30								-----	4.58	2.51	1.94	6.15
31								-----	4.10	-----	2.20	-----
Total								-	33.82	129.19	105.68	103.98
Mean								-	1.09	4.31	3.41	3.47
mgd								-	1.69	6.67	5.28	5.37
cfs								-	104	396	324	319
Ac-ft												
Calendar year		Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		
Fiscal year		Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		

* Discharge measurement made on this day.

310. Waimea River near Waimea

Location.--Lat 21°58'55", long 159°39'50", on right bank 1.2 miles upstream from confluence with Makaweli River and 1.8 miles north of Waimea.

Drainage area.--57.8 sq mi.

Records available.--July 1910 to October 1919, November 1943 to June 1960.

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

Average discharge.--23 years (1911-18, 1944-60), 86.7 mgd (134 cfs), fiscal years 1912-18 were omitted in error in computing averages for period prior to 1960.

Extremes.--Maximum discharge during year, 15,700 mgd (24,300 cfs) Aug. 6 (gage height, 15.66 ft), from rating curve extended above 3,800 mgd as explained below; minimum, 0.38 mgd (0.59 cfs) Nov. 23, 30, Dec. 1.

1910-19, 1943-60: Maximum discharge, 24,000 mgd (37,100 cfs) Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 3,800 mgd on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; no flow when all water was being diverted.

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

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6				Aug. 7 to June 30			
2.9	0.55	5.0	240	2.9	0.18	4.5	70.0
3.1	2.15	5.5	430	3.0	.45	5.0	180
3.3	5.60	6.0	695	3.2	1.90	5.5	365
3.5	12.0	7.0	1,420	3.4	4.10	6.0	640
3.8	28.0	8.0	2,380	3.6	8.00	7.0	1,400
4.1	56.0	9.0	3,500	4.0	22.2	8.0	2,380
4.5	115						

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.88	2.73	3.86	2.90	424	0.38	13.5	2.00	416	2.90	1.30	1.70
2	30.3	2.73	2.90	3.12	1,260	.50	8.62	1.70	381	2.60	.92	*1.60
3	104	2.58	2.40	2.80	85.7	.45	6.32	1.60	707	2.30	.74	1.50
4	41.4	32.1	2.40	3.26	19.6	*.58	2.86	1.80	282	14.9	1.84	1.30
5	143	74.2	245	2.80	6.72	.68	3.46	1.50	121	9.50	4.06	1.22
6	174	2410	124	2.70	16.9	.95	7.48	1.40	100	4.17	1.70	1.15
7	77.6	1,680	19.5	2.70	9.74	4.01	17.1	1.22	1,240	32.2	1.30	.80
8	21.8	325	6.14	2.90	522	3.77	20.9	.99	249	126	1.22	.58
9	53.8	125	3.62	2.70	280	3.75	33.1	.92	130	201	1.22	.58
10	14.2	410	3.02	2.90	55.1	21.0	243	.99	97.4	197	1.22	.58
11	2.70	97.4	2.70	3.14	23.0	4.94	50.6	.86	75.2	*40.3	2.15	.68
12	1.45	*67.4	2.60	2.90	12.0	2.95	68.7	*1.46	64.0	12.1	2.38	.68
13	1.15	30.8	3.91	3.02	8.00	5.76	105	13.5	41.0	7.13	2.68	.74
14	1.15	16.7	3.98	3.02	6.32	50.0	*93.6	12.8	34.3	152	299	.68
15	1.08	12.0	*3.86	2.82	5.36	136	74.8	6.64	30.6	86.6	89.4	.74
16	1.08	9.25	3.38	2.70	3.36	587	55.4	641	25.1	22.3	17.3	*7.63
17	3.62	8.00	7.23	2.80	2.10	703	17.6	126	19.8	220	5.78	1.59
18	2.29	31.4	4.13	2.70	1.60	64.3	9.09	118	*19.4	103	3.39	.92
19	1.45	47.1	3.38	2.40	1.50	73.4	4.52	*1080	34.9	58.2	41.6	.80
20	1.25	13.5	3.02	2.20	.99	125	3.02	147	35.0	13.2	164	.74
21	1.75	7.45	2.80	2.10	1.07	184	2.15	57.0	14.4	4.88	111	30.0
22	2.88	5.18	2.90	2.00	.99	261	1.34	30.0	8.98	7.43	62.2	88.4
23	3.02	4.28	2.90	*1.90	.68	47.9	1.40	41.0	21.0	11.4	38.2	15.0
24	2.73	3.50	2.90	2.30	.75	22.8	1.22	21.2	16.3	11.4	11.4	4.78
25	2.44	3.02	4.13	2.30	.88	26.3	.82	9.73	19.7	8.00	3.92	3.68
26	2.44	3.02	6.84	1.80	1.50	227	.74	7.58	41.7	*2.32	2.81	3.26
27	2.73	3.38	3.98	2.09	7.68	83.3	.86	6.11	143	1.30	3.01	23.0
28	2.88	2.94	3.50	4.44	2.67	30.5	2.08	5.54	45.2	1.22	3.14	223
29	2.73	3.14	3.26	4.91	1.15	17.1	4.20	1070	22.5	1.15	3.74	56.4
30	2.73	2.60	3.14	2.35	.54	12.6	3.26	-----	8.20	1.40	2.21	5.85
31	2.73	2.80	-----	6.27	-----	13.7	2.90	-----	4.10	-----	1.70	-----
Total	707.28	5,449.20	487.38	86.94	2,761.90	2,714.62	859.64	5,409.34	4,447.98	1,357.90	886.53	461.58
Mean:	22.8	176	16.2	2.87	92.1	87.6	27.7	118	143	45.3	28.6	15.4
cfs	35.3	272	25.1	4.44	142	136	42.9	183	221	70.1	44.3	23.8
Ac-ft	2,170	16,720	1,500	273	8,480	8,330	2,640	10,460	13,650	4,170	2,720	1,420

Calendar year 1959: Max 2,410 Min 0.38 Mean(mgd) 56.8 Mean(cfs) 87.9 Ac-ft 63,650
Fiscal year 1959-60: Max 2,410 Min 0.38 Mean(mgd) 64.6 Mean(cfs) 100 Ac-ft 72,530

Peak discharge (base, 5,600 mgd).--Aug. 6 (10 p.m.) 15,700 mgd (24,300 cfs), 15.66 ft.

* Discharge measurement made on this day.

360. Makaweli River near Waimea

Location.--Lat 21°58'15", long 159°38'55", on left bank 0.7 mile upstream from mouth and 1.9 miles northeast of Waimea.

Drainage area.--25.0 sq mi.

Records available.--July 1943 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 29 ft (by hand levels from estuary at confluence with Waimea River). July 27, 1943, to June 15, 1959, at datum 1.0 ft higher.

Average discharge.--16 years (1944-60), 51.4 mgd (79.5 cfs).

Extremes.--Maximum discharge during year, 7,500 mgd (11,600 cfs) Aug. 6 (gage height, 10.65 ft), from rating curve extended above 430 mgd on basis of slope-area measurement of peak flow; minimum daily, 4.5 mgd (7.0 cfs) Oct. 14, 17-23.
1943-60: Maximum discharge, 8,800 mgd (13,600 cfs) Jan. 19, 1952 (gage height, 11.19 ft), from rating curve extended above 1,300 mgd on basis of slope-area measurement at gage height 9.46 ft; minimum recorded, 2.05 mgd (3.15 cfs) July 19, 1951.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Olokele ditch diverts all water at low flow from Olokele Stream 9 miles above station for irrigation near Makaweli.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24.6	4.76	7.0	8.2	36.8	8.0	10	9.59	159	7.85	9.59	7.85
2	110	5.10	7.2	7.0	170	8.4	9.8	10.0	79.8	7.43	10.0	*7.43
3	178	12.0	7.0	5.6	17	8.4	9.4	10.0	163	7.43	32.1	7.43
4	53.6	52.7	28	5.8	11	*8.4	15	10.9	72.2	7.43	44.3	7.43
5	160	24.8	120	5.6	22	9.4	32	10.5	47.9	7.85	12.7	7.02
6	150	280	28	5.0	17	11	31	9.16	140	7.85	10.5	6.21
7	37.8	768	7.2	5.0	11	9.0	45	8.28	*853	7.43	9.59	5.84
8	20.8	272	6.4	5.0	250	9.0	17	7.85	133	15.0	9.16	5.47
9	17.8	160	6.0	4.8	52	40	161	7.43	59.8	35.2	9.59	5.47
10	15.2	169	5.6	4.8	40	20	169	7.02	39.0	38.2	10.9	6.21
11	11.3	44.8	6.4	4.8	40	10	136	6.21	29.6	*13.7	10.0	6.21
12	9.59	*27.3	7.4	4.7	18	9.6	292	*6.61	20.6	16.0	10.5	7.02
13	8.72	22.8	8.2	4.7	14	15	426	9.16	16.8	14.6	66.4	7.02
14	7.85	17.6	7.6	4.5	13	160	*321	8.28	15.8	313	288	17.1
15	8.28	13.7	*7.4	4.8	12	170	60.2	7.43	14.8	50.8	138	32.9
16	28.1	12.7	21.5	4.7	11	130	40.8	162	13.7	69.1	93.1	*11.4
17	12.2	13.2	7.4	4.5	10	110	44.0	59.5	13.2	314	36.6	7.02
18	10.2	51.1	6.4	4.5	9.0	18	37.1	130	16.8	208	17.3	5.84
19	7.85	24.7	6.4	4.5	8.4	25	33.5	*120	13.7	44.8	132	5.84
20	31.6	13.7	5.6	4.5	8.4	19	35.6	36.0	12.7	17.8	203	5.84
21	11.9	10.9	6.4	4.5	8.4	22	29.9	21.2	11.8	40.1	175	69.8
22	6.61	11.9	5.6	4.5	8.4	33	22.5	16.8	10.0	17.1	110	223
23	5.47	9.59	10	*4.5	8.4	14	15.6	19.1	9.16	13.2	40.3	23.2
24	5.10	8.72	50	5.47	8.2	13	26.6	14.8	8.72	21.8	22.1	10.3
25	4.76	16.7	52	5.47	8.2	17	30.0	13.2	9.16	13.9	20.0	10.6
26	5.47	10.5	7.4	24.2	8.2	100	37.1	12.2	42.7	*10.5	25.7	7.58
27	4.76	8.72	25	38.2	8.0	40	39.4	11.3	38.5	9.59	14.4	45.3
28	4.76	8.0	7.4	19.7	8.0	17	57.1	11.8	96.0	9.59	10.0	261
29	4.76	7.4	5.6	6.61	8.4	14	36.7	644	19.0	9.59	10.5	36.4
30	6.61	8.0	45	5.84	9.0	12	13.7	-----	13.7	9.59	8.28	18.8
31	5.10	7.6	-----	13.8	-----	11	11.3	-----	9.88	-----	7.85	-----
Total	968.79	3,097.99	521.1	235.79	853.8	1,091.2	2,245.3	1,400.32	2,183.02	1,358.43	1,597.46	878.53
Mean	31.3	99.9	17.4	7.61	28.5	35.2	72.4	48.3	70.4	45.3	51.5	29.3
cfs	48.4	155	26.9	11.8	44.1	54.5	112	74.7	109	70.1	79.7	45.3
Ac-ft	2,970	9,510	1,600	724	2,620	3,350	6,890	4,300	6,700	4,170	4,900	2,700

Calendar year 1959: Max 1,280 Min 4.5 Mean(mgd) 31.7 Mean(cfs) 49.0 Ac-ft 35,570
Fiscal year 1959-60: Max 1,280 Min 4.5 Mean(mgd) 44.9 Mean(cfs) 69.5 Ac-ft 50,450

Peak discharge (base, 1,300 mgd).--Aug. 6 (9 p.m.) 7,500 mgd (11,600 cfs), 10.65 ft; Feb. 29 (3 p.m.) 1,340 mgd (2,070 cfs), 5.25 ft; Mar. 7 (4 a.m.) 2,820 mgd (4,360 cfs), 6.87 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 28 to Sept. 15, Sept. 17 to Oct. 23, Nov. 3 to Jan. 8; discharge estimated on basis of recorded range in stage, 3 discharge measurements, and records for nearby stations.

490. Hanapepe River below Manuahi Stream, near Eleele

Location--Lat 21°57'20", long 159°33'15", on left bank just downstream from Manuahi Stream, 4 miles northeast of Eleele.

Drainage area--18.8 sq mi.

Records available--May 1917 to January 1921, December 1926 to June 1960. Prior to July 1952, published as "at Koula, near Eleele." August 1910 to December 1916 at site half a mile upstream; records not equivalent due to inflow.

Gage--Water-stage recorder. Altitude of gage is 150 ft (by barometer). Prior to Dec. 15, 1926, staff gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

Average discharge--36 years (1917-20, 1927-60), 53.9 mgd (83.4 cfs).

Extremes--Maximum discharge during year, 4,490 mgd (6,950 cfs) Aug. 6 (gage height, 8.63 ft), from rating curve extended above 2,400 mgd by test on model of station site; minimum, 6.40 mgd (9.90 cfs) Nov. 26-28, Dec. 1.

1910-21, 1926-60: Maximum discharge, 10,400 mgd (16,100 cfs) Dec. 17, 1949 (gage height, 11.74 ft), from rating curve extended above 2,400 mgd by test on model of station site; minimum, 3.3 mgd (5.1 cfs) May 21, 1954.

Revisions--The figures of maximum discharge for some fiscal years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
485	1918	Mar. 11, 1918	3,100	4,800	9.0
515	1919	Nov. 25, 1918	2,000	3,090	7.0
516	1920	Jan. 15, 1920	3,250	5,030	8.90
535	1921	Jan. 17, 1921	4,300	6,650	10.5
655	1927	Dec. 22, 1926	1,950	3,020	7.25
675	1928	Dec. 24, 1927	2,850	4,410	8.70
695	1929	Dec. 16, 1928	2,080	3,220	5.23
710	1930	July 26, 1929	2,730	4,220	5.92
740	1931	July 31, 1930	2,150	3,330	5.43

Remarks--Records good. Hanapepe ditch diverts water from river 3 miles above station for irrigation in vicinity of Makaweli.

Revisions (fiscal years)--WSP 740: 1931. Revised figures of discharge, in million gallons a day, for fiscal years 1918, 1920, and 1930, superseding those published in WSP 485, 516, and 710, are given herewith:

1918	1919-Con.
Jan. 19..... 1,500	Dec. 9..... 1,450
Mar. 10..... 1,650	
11..... 2,200	1920
16..... 1,450	Jan. 15..... 2,300
	16..... 2,250
1919	1929
Dec. 2..... 1,350	July 26..... 695
3..... 3,000	

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
January 1918.....	1,500	14	110	170	10,400
March.....	2,200	16	265	410	25,200
Fiscal year 1917-18.....	2,200	11	82.9	128	92,700
Calendar year 1918.....	2,200	11	98.6	153	110,600
December 1919.....	3,000	16.2	232	359	22,100
Calendar year 1919.....	3,000	13.2	50.2	77.7	56,200
January 1920.....	2,300	14.4	191	296	18,200
Fiscal year 1919-20.....	3,000	7.6	74.2	115	83,400
Calendar year 1920.....	2,300	7.6	74.3	115	83,600
July 1929.....	695	10.5	50.2	77.7	4,780
Calendar year 1929.....	695	8.8	30.3	46.9	33,960
Fiscal year 1929-30.....	695	10.5	32.8	50.7	36,740

490. Hanapepe River below Manuahi Stream, near Eleele--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	30.9	7.38	8.25	10.3	10.6	<u>6.40</u>	8.04	8.25	120	8.50	8.25	9.02
2	99.7	<u>7.16</u>	8.50	8.04	72.4	8.61	7.64	9.02	70	8.25	8.25	8.76
3	150	12.6	8.25	7.43	11.3	6.61	<u>7.43</u>	8.25	130	8.25	24.3	8.25
4	52.6	*30.6	16.0	7.64	8.76	6.61	10.4	8.25	50	8.04	23.8	8.25
5	<u>176</u>	20.1	<u>91.8</u>	7.43	14.5	7.22	22.9	8.04	35	7.64	9.27	8.25
6	109	<u>1,040</u>	16.4	7.22	11.7	8.84	22.0	7.84	100	7.43	7.84	8.25
7	29.4	489	8.50	7.22	8.76	*7.02	45.5	7.84	*500	<u>7.22</u>	7.22	7.84
8	15.2	237	7.84	7.22	<u>87.9</u>	7.02	12.6	7.64	48.1	11.3	7.22	7.84
9	12.8	109	7.64	7.02	75.0	38.4	187	7.64	20.7	19.9	7.22	7.84
10	10.5	113	<u>7.43</u>	7.02	36.0	15.0	150	7.84	16.0	14.5	7.43	7.84
11	9.05	26.9	*7.84	7.02	26.0	7.64	163	7.43	14.5	*9.61	<u>7.02</u>	7.64
12	8.76	18.2	8.76	6.82	12.3	7.43	40.5	7.22	12.6	16.0	7.02	7.84
13	8.18	21.8	10.0	6.82	10.3	11.1	786	7.22	11.7	10.4	24.2	8.50
14	8.18	14.2	8.50	<u>6.61</u>	9.52	119	385	7.43	11.1	230	<u>151</u>	10.5
15	8.47	12.6	8.25	7.02	9.02	<u>127</u>	*78.4	7.43	10.5	39.4	74.7	35.6
16	15.9	12.0	12.3	6.82	8.76	88.2	35.9	24.4	10.0	52.1	60.1	9.95
17	8.76	12.3	8.50	6.61	8.50	76.1	22.5	*9.47	13.1	269	26.2	7.84
18	8.47	36.2	7.84	6.61	7.64	12.3	16.3	72.5	12.7	181	*13.5	<u>7.43</u>
19	8.18	14.6	7.84	6.61	6.82	18.6	12.6	21.1	10.0	46.9	110	7.84
20	30.00	11.1	7.64	6.61	6.82	13.2	12.6	9.78	9.78	19.9	120	7.84
21	9.54	10.5	7.84	6.61	6.82	16.2	10.8	8.04	9.52	28.0	114	48.0
22	7.89	12.5	7.64	6.61	6.82	24.2	10.8	7.6	9.02	14.3	99.7	200
23	7.89	11.4	12.9	7.02	6.82	10.0	10.5	8.0	8.76	12.4	46.6	25.2
24	7.60	10.5	27.7	7.64	6.61	9.27	10.3	7.4	8.25	16.2	43.2	*11.9
25	9.11	18.1	29.3	7.22	6.61	11.8	10.0	7.2	<u>8.04</u>	10.3	31.3	11.5
26	8.47	12.0	8.50	17.9	6.61	71.8	9.52	7.1	22.7	9.52	28.9	10.3
27	<u>7.60</u>	11.1	15.9	<u>32.5</u>	<u>6.40</u>	29.2	9.27	<u>6.9</u>	15.5	9.02	15.1	25.6
28	7.60	9.78	8.50	11.9	6.40	12.0	9.52	7.0	173	8.50	11.4	197
29	10.4	8.50	7.64	*7.43	6.61	10.0	8.76	<u>350</u>	23.4	8.50	10.3	33.0
30	11.2	9.78	26.6	7.43	6.82	8.76	8.76	-----	10.0	8.50	9.52	20.4
31	7.60	9.27	-----	10.3	-----	8.50	8.50	-----	9.27	-----	9.52	-----
Total	894.95	2,371.17	420.60	266.65	507.12	802.03	2,133.04	663.83	1,501.24	1,100.58	1,124.08	776.02
Mean:												
mgd	28.9	76.5	14.0	8.60	16.9	25.9	68.8	22.9	48.4	36.7	36.3	25.9
cfs	44.7	118	21.7	13.3	26.1	40.1	106	35.4	74.9	56.8	56.2	40.1
Ac-ft	2,750	7,280	1,290	818	1,560	2,460	6,550	2,040	4,610	3,380	3,450	2,380
Calendar year 1959:	Max	1,040	Min	4.9	Mean(mgd)	24.5	Mean(cfs)	37.9	Ac-ft	27,420		
Fiscal year 1959-60:	Max	1,040	Min	6.40	Mean(mgd)	34.3	Mean(cfs)	53.1	Ac-ft	38,570		

Peak discharge (base, 2,300 mgd).--Aug. 6 (8 p.m.) 4,490 mgd (6,950 cfs), 8.63 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 22 to Mar. 7; discharge estimated on basis of recorded range in stage and records for Makaweli River near Waimea.

600. South Fork Waialua River near Lihue

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

Drainage area.--22.4 sq mi.

Records available.--December 1911 to June 1960. Published as "South Fork Waialua River above Walehu Falls" 1912-13. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 230 ft (by barometer). Prior to Nov. 18, 1918, at site 0.3 mile upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft downstream from present site at datum 2.48 ft higher. July 1, 1957, to June 23, 1958, at site 10 ft downstream at present datum.

Average discharge.--44 years (1912-18, 1919-20, 1921-24, 1925-57, 1958-60), 75.3 mgd (117 cfs).

Extremes.--Maximum discharge during year, 9,020 mgd (14,000 cfs) Aug. 6 (gage height, 17.80 ft); minimum, 1.42 mgd (2.20 cfs) Oct. 21-23, 30, 31. 1911-60: Maximum discharge, 30,200 mgd (46,700 cfs) Nov. 12, 1955 (gage height, 11.52 ft, datum then in use), from rating curve extended above 4,200 mgd by logarithmic plotting; minimum, 1.09 mgd (1.69 cfs) Sept. 21, 1953.

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

Revisions (fiscal years).--WSP 1249: 1941-47(M), 1948-51(P). Revised figures of discharge, in million gallons a day, for high-water periods in the fiscal years 1943-49, superseding those published in WSP 985, 1015, 1045, 1065, 1125, and 1155, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge
1943		1944-Con.		1946-Con.	
Jan. 2	1,040	Feb. 29	2,000	Nov. 14	1,520
3	775			15	455
4	2,080	1945			
12	676	Apr. 6	1,150	1947	
13	497	9	1,150	Nov. 12	1,350
June 2	1,230	25	432	14	707
		Oct. 25	1,110		
1944				1949	
Feb. 26	312	1946		Feb. 7	3,150
		Nov. 13	621	8	1,480

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
January 1943.....	7,884	2,080	36.5	254	393	24,200
June.....	2,843.6	1,230	7.8	94.8	147	8,730
Fiscal year 1942-43.....	30,534.2	2,080	1.95	83.7	130	93,710
Calendar year 1943.....	21,071.85	2,080	2.4	57.7	89.3	64,680
February 1944.....	3,038.45	2,000	2.05	105	162	9,320
Fiscal year 1943-44.....	16,301.65	2,000	2.05	44.5	68.9	50,030
Calendar year 1944.....	15,559.31	2,000	1.22	42.0	65.0	47,130
April 1945.....	6,502	1,150	42	217	336	19,950
Fiscal year 1944-45.....	13,399.11	1,150	1.22	36.7	56.8	4,120
October 1945.....	1,650.49	1,110	1.58	53.2	82.3	5,070
Calendar year 1945.....	16,389.99	1,150	1.58	44.9	69.5	50,320
Fiscal year 1945-46.....	20,692.29	1,110	1.58	56.7	87.7	63,520
November 1946.....	4,262.3	1,520	6.2	142	220	13,080
Calendar year 1946.....	30,862.95	1,520	2.4	84.6	131	94,720
Fiscal year 1946-47.....	19,250.91	1,520	1.22	52.7	81.5	59,070
November 1947.....	4,375.45	1,350	2.25	146	226	13,430
Calendar year 1947.....	16,081.56	1,350	1.22	44.1	68.2	49,350
Fiscal year 1947-48.....	32,480.85	1,350	2.05	88.7	137	99,680
February 1949.....	8,205.5	3,150	37.5	293	453	25,180
Fiscal year 1948-49.....	44,531.95	3,150	2.9	122	189	136,700
Calendar year 1949.....	28,409.92	3,150	1.56	77.8	120	87,180

600. South Fork Waialua River near Lihue--Continued

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6					Aug. 6 to June 30				
1.48	2.00	4.0	140		1.59	1.42	3.0	54.0	
1.5	2.20	6.0	426		1.6	1.55	4.0	132	
1.8	6.60	8.0	875		1.8	5.75	5.0	245	
2.1	14.0	10.0	1,620		2.0	10.1	6.0	420	
2.5	28.0	12.0	2,750		2.2	14.5	8.0	875	
3.0	56.0				2.5	24.7	10.0	1,620	

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.25	2.10	16.3	8.00	12.4	3.75	41.0	6.61	117	*10.3	27.1	5.75
2	13.6	2.00	5.96	4.00	211	3.25	23.6	5.96	221	9.00	21.1	4.75
3	25.0	2.44	6.19	3.25	55.3	3.50	6.61	*8.75	364	9.73	25.9	4.50
4	7.53	3.79	18.3	2.65	53.1	3.25	6.61	4.50	146	14.7	42.0	4.75
5	35.2	3.28	333	2.45	61.2	3.50	9.44	4.25	698	8.34	11.8	5.00
6	56.2	1.630	141	2.45	59.7	6.01	6.61	3.50	859	8.12	7.04	10.2
7	19.0	987	72.8	2.65	26.1	12.6	28.6	3.50	688	7.68	13.4	4.75
8	5.27	696	31.1	2.45	56.9	6.35	16.0	3.75	*184	10.4	15.1	3.75
9	5.33	205	8.56	2.29	144	22.9	176	3.50	123	24.3	7.95	3.05
10	5.02	165	7.47	2.13	107	7.00	207	3.05	94.0	68.0	*10.7	2.85
11	4.76	86.0	7.04	2.13	101	3.75	190	2.65	86.0	35.1	7.32	3.05
12	12.6	68.0	19.4	1.97	122	3.05	419	2.65	78.5	59.8	37.4	3.05
13	5.42	103	32.2	2.45	*89.0	3.05	556	3.05	68.0	42.1	173	3.25
14	3.16	64.5	14.0	2.65	85.4	106	650	3.25	43.2	148	197	*4.00
15	3.04	54.0	6.18	2.29	41.0	125	201	4.00	19.2	87.0	136	9.30
16	4.96	54.0	6.18	2.13	31.7	193	110	34.9	10.4	97.6	116	6.68
17	4.61	50.8	5.00	1.82	24.7	247	82.7	6.82	13.6	330	46.2	4.25
18	3.04	92.3	4.00	1.82	18.7	82.0	57.5	36.8	15.8	227	20.0	2.85
19	2.68	32.7	4.00	1.82	19.7	85.3	30.2	77.4	28.1	76.9	64.4	2.45
20	12.4	12.5	3.50	1.55	19.0	71.5	10.5	27.5	27.6	23.6	131	2.85
21	5.98	16.4	3.25	1.55	17.6	61.0	8.56	6.82	32.3	26.0	142	25.6
22	3.40	28.1	3.25	1.42	14.5	60.3	7.26	9.08	9.88	15.5	138	153
23	3.16	17.7	3.25	1.55	11.4	41.0	7.77	16.0	9.66	28.6	76.6	6.07
24	2.92	9.88	8.34	1.97	8.56	47.5	6.82	8.39	8.12	57.5	239	4.00
25	2.56	18.7	*31.7	1.82	7.04	61.2	6.82	a6.0	7.68	23.7	118	4.25
26	2.32	16.7	4.50	5.12	5.75	207	6.82	a5.5	19.7	8.78	80.7	4.00
27	2.10	30.6	23.4	27.5	5.25	118	7.04	a5.0	53.6	8.12	50.2	4.76
28	2.10	29.5	11.3	18.9	4.00	*64.5	6.82	a7.0	714	7.47	47.5	129
29	*2.32	25.2	4.50	2.29	3.75	47.5	6.82	a200	145	7.47	36.9	10.8
30	2.80	25.7	13.0	1.55	4.50	41.0	6.82	-----	15.1	7.68	13.4	4.75
31	2.68	24.3	-----	2.13	-----	50.8	6.61	-----	12.3	-----	9.52	-----
Total	266.41	4,557.19	848.66	118.75	1,419.05	1,791.56	2,906.53	507.18	4,911.74	1,488.49	2,062.23	417.31
Mean:	8.59	147	28.3	3.83	47.3	57.8	93.8	17.5	158	49.6	66.5	13.9
mgd	13.3	227	43.8	5.93	73.2	89.4	145	27.1	244	76.7	103	21.5
cfs	818	13,990	2,600	564	4,350	5,500	8,920	1,560	15,070	4,570	6,330	1,280
Ac-ft												

Calendar year 1959: Max 1,630 Min 1.42 Mean(mgd) 37.9 Mean(cfs) 58.6 Ac-ft 42,460
Fiscal year 1959-60: Max 1,630 Min 1.42 Mean(mgd) 58.2 Mean(cfs) 90.0 Ac-ft 65,350

Peak discharge (base, 3,700 mgd).--Aug. 6 (9 p.m.) 9,020 mgd (14,000 cfs), 17.80 ft; Mar. 5 (7 p.m.) 4,610 mgd (7,130 cfs), 14.28 ft.

* Discharge measurement made on this day.

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

610. North Wailua ditch near Lihue

Location.--Lat 22°03'40", long 159°27'55", on left bank 300 ft downstream from intake diversion dam on North Fork Wailua River, 8 miles west of Wailua, and 8.5 miles northwest of Lihue.

Records available.--July 1932 to June 1960 in reports of Geological Survey. October 1925 to June 1932 in files of Lihue Plantation Co.

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

Average discharge.--28 years (1932-60), 12.1 mgd (18.7 cfs).

Extremes.--1932-60: Maximum daily discharge, 38 mgd (59 cfs) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

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

Revisions (fiscal years).--WSP 770: 1933.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.3	13.1	10.9	12.8	16.8	10.5	11.3	10.2	8.00	12.5	11.9	11.3
2	16.4	12.8	13.4	11.8	16.8	11.3	11.0	11.0	9.60	12.2	11.9	11.3
3	16.8	14.2	12.1	12.6	11.8	11.6	10.7	11.0	9.30	13.1	14.6	11.6
4	14.7	14.7	*14.7	11.5	12.1	9.80	13.7	10.2	9.30	13.4	12.8	11.6
5	16.4	15.1	17.0	10.9	14.1	11.6	12.8	9.90	10.5	14.0	12.8	11.3
6	15.8	15.8	15.4	10.9	12.4	12.5	*13.1	9.60	10.7	13.7	12.2	11.3
7	14.4	8.82	14.7	10.6	12.4	12.2	13.1	9.30	9.90	13.4	11.6	11.0
8	14.4	6.62	12.4	10.6	14.7	11.9	12.2	9.30	8.80	14.6	11.6	10.7
9	15.1	5.19	12.1	10.6	*13.8	14.0	14.3	9.30	8.50	14.9	12.5	10.7
10	13.8	7.55	12.6	10.3	13.9	12.5	14.3	*9.60	8.80	14.0	14.0	10.7
11	13.4	12.1	13.8	10.0	13.1	11.9	11.7	9.90	8.80	14.9	12.5	10.7
12	13.1	12.1	15.1	11.5	12.4	12.2	10.2	11.0	8.80	14.3	14.0	11.0
13	12.4	13.4	14.4	11.8	13.8	12.8	10.5	10.5	8.80	13.4	14.6	11.3
14	12.4	12.1	13.4	10.6	12.8	14.3	9.90	11.9	*8.50	16.2	14.9	13.1
15	13.1	12.1	12.8	12.3	12.1	14.0	9.90	10.7	9.30	14.0	13.7	13.7
16	14.7	11.5	14.1	10.6	11.5	14.9	9.60	15.4	11.9	14.9	13.7	12.2
17	14.1	12.4	12.1	10.3	11.2	12.8	9.60	13.1	12.5	16.2	10.7	11.6
18	14.1	15.1	11.5	10.0	11.2	11.6	9.30	12.1	12.2	16.2	10.5	11.3
19	13.8	12.8	11.5	9.70	10.9	12.2	9.30	10.2	13.1	13.7	11.3	11.9
20	16.1	11.8	10.9	9.70	11.5	11.9	9.30	8.50	13.4	13.7	11.3	12.5
21	13.8	12.1	11.8	10.3	11.2	12.2	10.2	8.50	12.5	*12.5	11.3	14.9
22	13.9	11.2	10.9	9.70	10.6	11.3	11.9	12.8	12.8	11.6	11.3	11.2
23	13.1	10.9	12.5	11.8	10.6	11.9	11.6	13.6	12.8	11.6	12.2	11.0
24	12.4	11.8	15.6	10.9	10.3	12.8	11.3	11.9	12.8	11.9	12.1	11.9
25	12.1	12.8	14.1	11.2	7.98	12.5	11.3	11.3	12.5	11.3	10.7	12.2
26	12.1	12.4	11.8	13.8	10.2	15.3	11.0	11.0	14.9	11.0	*10.7	12.2
27	13.4	12.4	15.5	14.8	9.60	12.8	11.2	10.7	14.3	11.0	11.0	12.8
28	12.1	12.1	12.8	12.8	9.60	12.5	11.9	12.2	13.8	11.6	12.2	14.9
29	14.5	11.8	12.4	11.5	9.60	11.9	11.3	15.3	11.3	12.2	11.6	12.8
30	14.1	13.1	15.4	11.2	10.7	11.9	11.0	-----	11.6	12.5	11.6	*12.8
31	12.4	11.8	-----	13.1	-----	11.9	10.5	-----	11.0	-----	11.3	-----
Total	433.2	371.66	397.7	350.20	359.68	383.60	349.00	320.00	341.00	400.5	379.1	357.5
Mean:												
mgd	14.0	12.0	13.3	11.3	12.0	12.4	11.3	11.0	11.0	13.4	12.2	11.9
cfs	21.7	18.6	20.6	17.5	18.6	19.2	17.5	17.0	17.0	20.7	18.9	18.4
Ac-ft	1,330	1,140	1,220	1,070	1,100	1,180	1,070	982	1,050	1,230	1,160	1,100
Calendar year 1959: Max	18.2			Min	5.19	Mean(mgd)	12.6	Mean(cfs)	19.5	Ac-ft	14,050	
Fiscal year 1959-60: Max	17.0			Min	5.19	Mean(mgd)	12.1	Mean(cfs)	18.7	Ac-ft	13,630	

* Discharge measurement made on this day.

620. Stable storm ditch near Lihue

Location--Lat 22°04'00", long 159°26'45", on left bank 100 ft downstream from intake, 7.8 miles northwest of Lihue, and 8.2 miles west of Kapaa.

Records available--December 1936 to June 1960.

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

Average discharge--23 years (1937-60), 7.46 mgd (11.5 cfs).

Extremes--1936-60: Maximum daily discharge, 46 mgd (71 cfs) Apr. 3, 1948; no flow at times each year.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	29.0	23.7	6.91	12.9	36.4	13.2	0.12	18.7	0.07	0.19	24.8	0
2	35.4	24.2	16.2	19	14.8	21.3	.12	19.7	.07	.12	25.4	12.9
3	40.4	29.4	12.7	.26	.12	23.7	.12	19.4	a.20	.12	32.6	24.4
4	12.7	10.6	*19.6	.07	.07	18.4	.12	18.1	a.10	.12	28.9	23.7
5	.43	.26	7.82	16.6	.07	23.7	.12	17.8	a.10	.12	27.2	23.7
6	.34	18.3	.07	23.7	.02	27.2	.12	17.5	a.20	.12	23.7	22.0
7	.26	.26	.02	22.0	.02	27.2	.07	17.2	a.10	.12	8.64	22.0
8	.19	.30	.07	22.0	0	25.4	.07	17.5	a.10	.12	.26	21.3
9	.12	.19	.02	22.0	0	13.9	.02	17.2	a.10	.19	19.8	21.0
10	.12	.12	0	21.3	0	.26	.02	*17.8	a.10	.19	25.4	20.7
11	.12	.02	0	22.0	0	.19	.07	19.7	a0	.26	21.7	20.4
12	.07	.07	0	25.4	0	.19	.07	20.0	a0	.19	23.7	21.3
13	.02	.02	0	28.9	.02	.19	.02	19.7	a0	.12	6.12	21.3
14	16.3	0	0	22.0	.02	.19	.02	22.0	a0	.19	.26	25.4
15	25.4	0	0	27.2	.02	.19	.02	20.0	0	.12	.19	25.4
16	30.8	0	0	21.3	.02	.19	.02	35.0	0	.19	.19	23.7
17	7.58	0	0	20.4	.02	.12	.02	28.9	0	.12	.12	21.3
18	.34	0	0	20.0	0	.07	.02	10.9	0	.12	.12	20.4
19	.34	0	0	19.7	0	.07	.02	.19	0	.12	.07	20.0
20	.34	0	0	19.0	0	.07	.02	.07	0	.12	.07	21.0
21	.26	0	6.76	19.7	0	.07	0	.07	0	.12	.07	28.9
22	22.2	0	7.70	*16.7	0	.07	0	.02	0	.12	.07	10.9
23	27.2	0	11.1	23.7	0	.02	0	.02	0	.12	.07	.19
24	14.1	0	21.4	21.3	0	.02	0	0	14.5	.07	.07	.12
25	.26	.10	30.8	21.0	0	.12	14.4	0	18.7	0	.07	16.7
26	.26	.12	27.2	28.9	0	.12	21.3	0	25.4	0	.07	22.0
27	19.3	.12	32.6	28.9	0	.12	21.7	0	25.4	0	.02	28.9
28	22.0	.12	28.9	28.9	0	.12	23.7	0	10.0	22.0	.02	10.0
29	28.3	.12	27.2	21.7	0	.19	21.0	.02	.34	26.1	0	.26
30	30.8	.12	32.6	19.7	0	.19	20.7	-----	.26	28.9	0	.12
31	23.7	.07	-----	28.9	-----	.19	18.7	-----	.19	-----	0	-----
Total	391.65	108.21	289.67	628.51	51.60	196.96	142.70	357.49	95.93	82.39	269.70	529.99
Mean:	12.6	3.49	9.66	20.3	1.72	6.35	4.60	12.3	3.09	2.75	8.70	17.7
mgd	19.5	5.40	14.9	31.4	2.66	9.82	7.12	19.0	4.78	4.25	13.5	27.4
cfs	1,200	332	889	1,930	158	604	438	1,100	294	253	828	1,630
Ac-ft												
Calendar year 1959: Max	40.4			Min 0		Mean(mgd)	10.9	Mean(cfs)	16.9	Ac-ft	12,240	
Fiscal year 1959-60: Max	40.4			Min 0		Mean(mgd)	8.59	Mean(cfs)	13.3	Ac-ft	9,660	

* Discharge measurement made on this day.

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

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

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

Drainage area.--6.6 sq mi, approximately.

Records available.--September 1914 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--44 years (1915-18, 1919-60), 47.0 mgd (72.7 cfs), fiscal years 1916-18 was completed by compilation.

Extremes.--Maximum discharge during year, 4,520 mgd (6,990 cfs) Aug. 6 (gage height, 10.65 ft), from rating curve extended above 470 mgd on basis of slope-area measurement of peak flow; minimum daily, 0.42 mgd (0.65 cfs) July 1.

1914-60: Maximum discharge, 8,550 mgd (13,200 cfs) Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 470 mgd as explained above; minimum, 0.22 mgd (0.34 cfs) Oct. 27, 1953.

Remarks.--Records good. Since 1925 Hanalei tunnel (see p. 53) has discharged its water into river, and North Wailua and Stable storm ditches have diverted water above station for irrigation in vicinity of Lihue.

Revisions (fiscal years).--WSP 555: 1921. WSP 1569: 1915-27, 1943-47(M), 1948-56(P).

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6					Aug. 7 to June 30				
1.2	0.51	3.0	94.0		1.0	0.58	1.8	13.4	
1.4	2.05	3.5	160		1.2	1.76	2.2	31.2	
1.6	5.00	4.0	245		1.4	3.70	2.6	58.0	
1.9	12.5	5.0	490		1.6	7.50	3.0	94.0	
2.2	24.2	6.0	870						
2.6	54.0								

Note.--Same as preceding table above 3.0 ft.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.5	0.67	5.87	18.0	66.4	9.09	29.1	0.85	70.6	28.1	1.33	30.7
2	30.2	5.56	1.76	28.1	*269	1.42	27.6	.85	172	23.2	1.25	16.8
3	43.9	3.14	1.12	34.2	81.4	2.49	26.5	.96	132	37.1	58.0	1.70
4	27.8	33.9	2.61	27.6	50.0	.90	60.8	.85	102	37.1	9.30	1.57
5	77.1	45.8	103	9.76	59.9	4.46	51.6	.74	305	40.6	4.46	1.50
6	69.1	*535	41.7	1.31	40.0	9.65	50.0	.69	338	33.8	1.07	1.44
7	46.0	263	29.0	1.25	35.4	6.96	49.8	.63	246	30.2	14.8	1.31
8	36.5	240	17.4	1.18	88.8	4.02	35.7	.58	*77.2	49.2	23.0	1.25
9	52.6	100	15.2	1.12	57.0	64.5	128	.63	58.0	56.0	13.6	1.18
10	32.0	85.4	15.0	1.12	54.7	38.7	91.3	.63	43.2	44.3	23.4	1.12
11	26.8	39.4	21.0	1.12	46.6	26.5	144	.63	45.3	53.3	7.46	1.12
12	25.3	33.4	27.8	3.75	41.3	30.9	228	.63	34.6	47.3	31.6	1.12
13	23.8	56.0	20.8	2.34	92.1	38.1	316	.74	30.7	24.1	74.5	1.31
14	8.57	28.1	17.2	1.01	47.5	109	253	.90	28.1	101	76.7	7.97
15	1.04	24.1	13.4	2.47	36.8	64.6	89.0	1.05	25.1	32.3	53.2	21.4
16	15.9	21.3	22.5	.90	32.9	190	62.0	114	20.0	49.8	129	2.47
17	21.9	23.4	12.4	.85	30.7	111	50.0	20.3	24.4	157	65.0	1.31
18	34.8	65.0	10.8	.85	29.6	50.0	42.6	113	20.0	130	52.3	1.12
19	28.9	26.5	10.4	.85	29.6	62.3	39.7	152	25.2	43.1	87.2	1.18
20	83.3	20.4	9.32	.85	29.6	52.0	42.2	44.7	27.0	*37.4	86.9	1.25
21	34.4	18.3	4.99	.85	28.1	56.6	32.9	32.3	21.0	68.9	86.8	26.1
22	13.6	16.3	1.12	.90	27.6	45.2	*28.1	28.4	22.5	45.8	88.6	59.9
23	.97	15.2	1.16	2.04	28.1	34.0	26.5	27.2	30.1	50.0	53.0	36.7
24	9.13	15.2	*36.5	1.25	25.5	38.0	25.1	20.0	7.02	55.9	125	30.9
25	22.4	28.9	16.9	1.31	27.7	34.7	9.78	19.2	1.31	41.9	*72.4	12.0
26	21.6	20.8	1.18	17.9	24.6	134	1.18	17.9	19.5	36.2	74.1	1.50
27	10.6	19.4	26.8	39.8	23.2	51.1	1.07	17.4	5.48	35.7	46.6	7.86
28	.66	19.0	2.23	4.36	23.2	39.4	1.25	24.6	205	12.1	39.2	86.6
29	6.63	16.3	1.12	1.63	22.7	33.4	1.07	290	58.3	1.72	36.2	*33.8
30	6.94	21.8	19.9	1.50	26.5	33.7	1.01	-----	56.2	4.28	34.0	27.7
31	.58	16.6	-----	2.81	-----	32.9	.96	-----	40.0	-----	32.3	-----
Total	824.50	1,850.87	510.38	212.98	1,476.51	1,409.59	1,945.82	932.36	2,290.81	1,407.40	1,482.27	451.88
Mean:	26.6	59.7	17.0	6.87	49.2	45.5	62.8	32.2	73.9	46.9	47.8	15.1
cfs	41.2	92.4	26.3	10.6	76.1	70.4	97.2	49.8	114	72.5	74.0	23.4
Ac-ft	2,530	5,680	1,570	654	4,530	4,330	5,970	2,860	7,030	4,320	4,550	1,390
Calendar year 1959:	Max	535	Min	0.38	Mean(mgd)	27.9	Mean(cfs)	43.2	Ac-ft	31,280		
Fiscal year 1959-60:	Max	535	Min	0.56	Mean(mgd)	40.4	Mean(cfs)	62.5	Ac-ft	45,410		

Peak discharge (base, 1,200 mgd).--Aug. 6 (7:30 p.m.) 4,520 mgd (6,990 cfs), 10.65 ft.

* Discharge measurement made on this day.

680. East Branch of North Fork Wailua River near Lihue

Location.--Lat 22°04'10", long 159°25'05", on right bank 1,200 ft upstream from mouth and 7.5 miles northwest of Lihue.

Drainage area.--6.2 sq mi, approximately.

Records available.--July 1912 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--45 years (1913-14, 1915-18, 1919-60), 30.8 mgd (47.7 cfs).

Extremes.--Maximum discharge during year, 4,650 mgd (7,190 cfs) Aug. 6 (gage height, 9.66 ft), from rating curve extended above 600 mgd; minimum, 8.3 mgd (12.8 cfs) July 28, 29, 31.

1912-60: Maximum gage height, 14.7 ft, from floodmarks, Nov. 12, 1955 (discharge not determined); minimum discharge, 4.4 mgd (6.8 cfs) July 3, 13, 1926.

Remarks.--Records good except those above 600 mgd, which are fair.

Revisions (fiscal years).--WSP 770: 1932-33. Revised figures of discharge, in million gallons a day, for the fiscal year 1916, superseding those published in WSP 445, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1916		1916-Con.		1916-Con.		1916-Con.	
Mar. 14	27	Mar. 25	28	Apr. 5	22	Apr. 16	21
15	38	26	25	6	21	17	21
16	50	27	23	7	20	18	25
17	28	28	23	8	19	19	35
18	23	29	23	9	19	20	27
19	22	30	23	10	19	21	24
20	22	31	23	11	19	22	22
21	23	1	22	12	19	23	21
22	23	2	21	13	15	24	21
23	23	3	20	14	23		
24	26	4	21	15	23		

Month	Maximum	Minimum	Mean		Runoff in
			(mgd)	(cfs)	acre-feet
March 1916.....	470	22	78.9	122	7,500
April.....	110	19	32.7	50.6	3,010
Fiscal year 1915-16.....	470	16	55.2	85.4	62,000
Calendar year 1916.....	470	8.5	45.5	70.4	51,100

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.0	8.90	14.2	14.2	66.2	12.6	20.0	13.4	45.3	26.0	17.5	17.0
2	19.2	9.70	19.4	12.2	232	12.6	18.0	13.0	139	23.0	17.0	16.5
3	19.8	12.8	15.5	13.7	77.1	13.4	17.0	13.0	131	26.1	19.5	15.5
4	16.4	20.1	21.7	13.0	37.0	12.2	19.5	12.2	*94.0	27.5	17.5	15.0
5	32.5	20.8	90.9	11.8	34.6	14.2	19.5	11.8	182	26.0	15.5	14.2
6	35.7	538	36.7	11.0	*26.0	17.3	22.2	11.4	195	23.6	14.6	13.8
7	23.9	131	24.2	11.0	21.2	18.4	21.8	11.0	147	27.2	14.2	13.0
8	16.0	173	19.0	11.0	38.8	14.6	18.0	11.0	73.0	*58.2	13.8	12.2
9	23.2	64.1	17.5	10.7	54.0	19.8	55.6	10.7	49.8	55.8	14.4	11.8
10	14.7	72.6	16.5	10.7	37.7	16.5	48.7	10.7	38.6	48.9	28.1	11.4
11	12.6	34.6	17.0	11.0	30.9	13.0	53.9	11.8	45.3	33.0	15.5	11.0
12	11.9	28.8	18.5	12.8	28.1	12.6	53.1	11.4	30.9	29.5	25.9	10.7
13	*10.6	30.9	18.5	14.7	79.8	14.2	77.4	13.0	26.0	24.8	40.5	10.7
14	10.3	24.2	16.5	11.4	42.3	38.9	87.1	14.7	23.6	31.4	25.8	11.4
15	11.2	22.4	14.6	11.8	27.4	34.7	43.2	11.8	21.8	27.6	20.2	16.3
16	12.6	20.6	18.4	10.4	24.2	116	32.3	64.3	20.6	33.0	26.4	11.8
17	10.6	21.2	14.2	10.1	21.8	*76.4	27.4	28.8	19.5	70.1	23.0	10.1
18	11.9	42.0	13.8	9.84	20.6	30.2	24.8	51.7	19.9	80.6	20.6	9.55
19	10.9	23.0	10.0	9.55	20.0	42.4	23.6	11.1	21.9	37.8	34.0	9.55
20	18.5	19.5	12.6	9.26	18.5	30.9	23.6	28.6	19.5	30.9	30.2	9.55
21	12.3	18.0	13.4	9.26	18.0	31.3	20.0	20.0	18.5	31.6	28.1	15.9
22	10.9	16.0	12.6	9.26	17.0	28.6	*19.0	18.0	17.5	26.0	35.4	41.5
23	10.0	14.6	*12.6	9.84	19.6	20.6	18.0	16.5	23.1	26.0	27.9	16.0
24	9.20	14.6	19.5	10.1	15.5	24.8	17.5	15.0	18.5	28.1	37.4	13.0
25	8.90	18.5	23.8	9.84	14.6	21.5	16.5	14.2	20.0	23.6	*27.4	13.4
26	8.90	17.0	13.8	13.6	14.2	98.4	16.0	13.8	38.0	21.2	28.9	12.6
27	9.40	16.0	16.7	17.3	13.4	37.4	15.5	13.4	30.1	20.0	22.4	20.9
28	8.60	17.0	13.8	13.0	12.6	26.7	15.0	13.7	209	19.0	20.6	61.1
29	9.20	15.0	13.0	10.1	12.6	23.0	14.2	137	70.8	18.5	19.5	*24.2
30	10.6	16.0	18.0	9.84	12.6	21.8	13.8	-----	39.4	18.8	18.5	20.6
31	8.60	15.5	-----	15.8	-----	25.6	13.4	-----	34.5	-----	17.5	-----
Total	444.10	1,496.40	589.9	358.09	1,088.3	920.6	885.6	726.9	1,863.0	973.8	717.8	488.25
Mean:	mgd	14.3	48.3	19.7	11.6	36.3	29.7	28.6	25.1	60.1	32.5	16.3
cfs	22.1	74.7	30.5	17.9	56.2	46.0	44.3	38.8	95.0	50.3	35.9	25.2
Ac-ft	1,360	4,590	1,810	1,100	3,340	2,830	2,720	2,230	5,720	2,990	2,200	1,500

Calendar year 1959: Max 538 Min 8.30 Mean(mgd) 24.2 Mean(cfs) 37.4 Ac-ft 27,150
 Fiscal year 1959-60: Max 538 Min 8.60 Mean(mgd) 28.8 Mean(cfs) 44.6 Ac-ft 32,390

Peak discharge (base, 1,000 mgd).--Aug. 6 (8:30 p.m.) 4,650 mgd (7,190 cfs), 9.66 ft; Nov. 2 (10 a.m.) 1,220 mgd (1,890 cfs), 5.80 ft.

* Discharge measurement made on this day.

690. Wailua ditch near Kapaa

Location.--Lat 22°04'25", long 159°24'05", on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 miles west of Kapaa, and 7 miles north of Lihue.

Records available.--November 1936 to June 1960 in reports of Geological Survey. April 1932 to November 1936 in files of East Kauai Water Co.

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

Average discharge.--23 years (1937-60), 10.6 mgd (16.4 cfs).

Extremes.--1936-60: Maximum daily discharge, 41 mgd (63 cfs) June 4, 1937; no flow at times.

Remarks.--Records good. Ditch diverts water from North Fork Wailua River to reservoir 2,000 ft above station and thence to fields for irrigation of sugarcane. Flow regulated by gates at reservoir.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.8	18.2	21.6	0.35	15.4	2.33	0.94	16.4	1.37	4.73	7.80	8.30
2	18.2	17.1	20.2	.35	5.60	4.00	1.00	10.4	1.49	4.73	7.80	8.30
3	20.4	17.1	21.6	8.42	.09	2.03	.89	10.4	1.62	4.73	8.30	8.30
4	14.7	14.5	12.3	12.8	0	1.90	*7.66	8.80	1.43	4.73	8.30	8.30
5	11.8	11.8	.35	12.8	.22	1.90	20.2	8.30	1.43	4.73	8.30	8.30
6	11.3	4.87	.35	12.8	.35	1.96	23.0	8.30	1.37	4.89	8.30	8.30
7	11.3	0	6.81	12.8	.30	2.03	15.7	8.30	1.49	4.81	8.30	8.30
8	11.3	0	18.8	12.8	.30	2.10	8.80	12.2	1.49	4.81	8.30	14.0
9	10.8	0	20.2	12.8	.30	9.26	8.80	*18.8	1.55	4.89	8.30	21.6
10	11.8	0	21.6	12.8	.25	16.1	8.30	23.0	1.62	4.89	14.0	24.4
11	12.8	.46	23.0	12.2	.25	7.80	8.30	21.6	1.37	4.89	16.8	17.4
12	13.3	.62	24.4	12.2	.21	.67	7.80	20.2	1.18	7.80	16.8	14.2
13	*17.1	.56	23.0	17.4	.17	.51	7.80	12.5	1.18	9.30	9.66	14.2
14	18.2	4.48	23.0	23.0	.17	.45	7.80	8.30	1.24	5.66	3.30	14.2
15	18.2	11.6	23.0	30.2	.13	.40	7.30	8.80	1.31	.51	1.62	14.8
16	18.2	12.8	23.0	30.2	.17	.40	6.80	15.3	1.55	.51	1.62	15.4
17	18.2	9.30	23.0	24.4	.17	.93	6.80	20.2	*1.62	.45	1.62	15.4
18	20.4	9.30	14.1	21.6	.17	1.12	11.6	20.2	1.62	3.76	1.62	14.8
19	21.5	6.50	9.80	18.8	.17	1.18	24.4	7.77	9.70	7.80	1.55	14.8
20	21.5	.51	9.80	17.4	.13	1.12	27.2	3.04	14.8	5.04	1.62	10.8
21	20.4	.40	9.80	15.4	.13	1.06	17.2	4.58	14.2	5.59	1.62	7.80
22	19.3	.35	15.0	12.8	.17	1.00	12.2	4.58	14.8	*7.30	1.62	7.80
23	19.3	1.42	*21.6	11.6	.17	.94	12.2	5.20	8.19	7.30	2.60	7.80
24	18.2	10.9	21.6	12.2	.17	.94	12.2	5.98	4.65	7.80	3.16	7.80
25	18.2	14.2	11.2	11.0	.17	.89	12.2	5.59	4.73	7.80	3.16	2.77
26	18.2	14.2	.51	16.1	.17	.94	15.4	5.59	4.73	7.80	5.33	.13
27	20.4	13.5	.45	18.1	.17	1.00	20.2	5.59	4.73	7.80	7.80	1.03
28	21.5	16.1	.40	23.0	.13	1.00	21.6	5.59	4.81	7.80	7.80	1.43
29	20.4	16.8	.35	21.6	.17	1.00	21.6	2.96	4.89	7.80	7.80	4.72
30	20.4	16.8	.35	20.2	.17	.94	20.2	-----	4.81	7.80	7.80	8.30
31	19.3	20.2	-----	18.8	-----	1.00	20.2	-----	4.65	-----	*7.80	-----
Total	532.4	264.57	421.17	486.92	26.17	68.90	396.29	308.47	125.62	166.35	200.40	513.68
Mean:												
mgd	17.2	8.53	14.0	15.7	0.872	2.22	12.8	10.6	4.05	5.54	6.46	10.5
cfs	26.6	13.2	21.7	24.3	1.35	3.43	19.8	16.4	6.27	8.57	10.0	16.2
Ac-ft	1,630	812	1,290	1,490	80	211	1,220	947	386	511	615	963
Calendar year 1959:	Max	30.2	Min	0	Mean(mgd)	9.00	Mean(cfs)	13.9	Ac-ft	10,070		
Fiscal year 1959-60:	Max	30.2	Min	0	Mean(mgd)	9.05	Mean(cfs)	14.0	Ac-ft	10,160		

* Discharge measurement made on this day.

710. North Fork Wailua River near Kapaa

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

Drainage area.--18.7 sq mi.

Records available.--July 1952 to June 1960.

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

Average discharge.--8 years (1952-60), 74.0 mgd (114 cfs).

Extremes.--Maximum discharge during year, 11,800 mgd (18,300 cfs) Aug. 6 (gage height, 12.86 ft), from rating curve extended above 2,400 mgd as explained below; minimum, 3.05 mgd (4.72 cfs) July 24, 25.

1952-60: Maximum discharge, 34,400 mgd (53,200 cfs) Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft from floodmarks), from rating curve extended above 930 mgd on basis of slope-area measurement of peak flow; minimum, 1.37 mgd (2.12 cfs) Oct. 28, 1953.

Remarks.--Records good except those for periods of doubtful or fragmentary gage-height record, which are fair. Wailua ditch diverts water between this station and station at altitude 650 ft.

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used July 23 to Aug. 3)

July 1 to Mar. 5					Mar. 6 to June 30				
1.1	2.90	3.0	195		1.2	2.95	2.5	94.0	
1.3	7.20	3.5	328		1.3	4.95	3.0	185	
1.5	14.1	4.0	500		1.5	11.5	3.5	310	
1.8	30.5	5.0	1,000		1.8	26.0	4.0	480	
2.1	54.5	6.0	1,730		2.1	48.0	5.0	1,000	
2.5	103								

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.50	3.52	17.2	35.4	55.9	44.6	66.1	5.45	238	58.0	15.5	44.4
2	4.70	3.52	13.4	48.2	576	26.0	60.8	5.45	466	48.0	6.83	38.4
3	13.6	3.69	7.82	51.4	221	27.2	47.8	5.20	550	53.1	29.6	17.4
4	22.4	25.0	8.13	48.9	116	24.0	67.2	5.20	*300	74.8	28.8	17.0
5	91.9	62.0	225	26.9	110	27.6	48.9	4.95	614	66.8	16.2	15.6
6	123	1,280	143	8.44	*83.0	f37.2	34.8	4.95	726	55.5	11.6	15.1
7	74.9	591	75.5	8.44	65.0	36.5	69.3	4.70	539	60.0	14.6	15.1
8	56.6	519	53.6	9.68	126	f36.6	73.3	4.95	195	*103	29.6	13.2
9	84.4	185	31.4	9.99	150	f78.8	194	4.70	145	110	23.8	d7.33
10	55.3	213	8.44	10.3	103	f68.5	174	4.95	117	103	58.1	d4.55
11	29.9	103	9.46	11.4	102	f44.3	200	4.95	118	83.6	17.2	d3.95
12	18.2	85.8	28.0	10.3	96.0	54.5	326	4.21	85.6	91.0	29.7	d3.75
13	14.6	109	32.7	11.4	200	f62.2	409	4.21	74.0	60.2	120	d3.75
14	13.0	57.0	27.3	12.2	153	f146	398	4.70	67.0	132	118	*d3.96
15	12.9	30.5	19.5	12.2	89.0	f124	172	5.20	45.1	66.2	88.1	17.6
16	11.2	24.6	24.7	11.1	77.3	f345	118	118	19.5	86.3	165	6.03
17	6.39	33.6	16.4	11.1	70.5	*f188	103	31.0	31.7	222	102	3.35
18	25.6	116	17.7	9.06	67.2	103	53.2	132	50.3	229	*85.6	3.35
19	18.5	62.9	21.3	8.75	65.0	129	19.9	367	55.0	106	130	3.35
20	98.8	57.6	21.8	9.37	62.9	110	50.4	144	48.7	78.8	135	3.35
21	57.2	50.9	21.8	9.68	61.8	103	d39.9	89.0	36.7	108	132	18.5
22	27.2	43.9	16.1	9.37	59.8	90.5	*37.5	55.0	13.0	75.9	131	127
23	3.36	36.3	8.13	9.68	62.9	69.4	39.1	25.4	54.4	72.8	89.8	57.5
24	3.05	11.4	*15.0	9.99	57.6	72.7	39.1	22.7	29.8	76.3	160	40.8
25	3.20	40.8	48.4	9.99	57.6	69.4	41.5	43.1	22.9	60.0	116	37.6
26	3.52	36.8	24.6	10.7	55.6	240	24.0	44.7	49.5	49.0	112	22.4
27	4.21	32.6	45.0	24.9	54.5	112	6.95	44.7	43.1	44.4	77.6	44.1
28	3.69	31.3	29.9	13.4	52.7	81.2	7.20	47.3	512	32.8	61.0	163
29	*3.69	28.6	30.5	7.20	51.8	71.6	7.20	517	157	18.7	59.0	81.8
30	3.69	51.9	43.2	7.52	52.7	69.4	5.70	-----	94.0	22.4	51.0	60.0
31	3.69	26.3	8.20	-----	-----	73.8	5.70	-----	80.3	-----	46.2	-----
Total	896.89	3,934.53	1,084.98	481.15	3,155.8	2,764.0	2,939.55	1,754.67	5,577.6	2,447.6	2,240.63	895.22
Mean:	28.9	127	36.2	15.5	105	89.2	94.8	60.5	180	81.6	72.3	29.8
mgd	44.7	196	56.0	24.0	162	138	147	93.6	279	126	112	46.1
cfs	2,750	12,070	3,350	1,480	9,680	8,480	9,020	5,380	17,120	7,510	6,880	2,740
Ac-ft												

Calendar year 1959: Max 1,280 Min 3.05 Mean(mgd) 56.7 Mean(cfs) 87.7 Ac-ft 63,520

Fiscal year 1959-60: Max 1,280 Min 3.05 Mean(mgd) 77.0 Mean(cfs) 119 Ac-ft 86,440

Peak discharge (base, 2,500 mgd).--Aug. 6 (8:30 p.m.) 11,800 mgd (18,300 cfs), 12.86 ft.

* Discharge measurement made on this day.

d Doubtful gage-height record; discharge computed from reconstructed gage-height graph.

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

715. Left Branch Opaikaa Stream near Kapaa

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

Drainage area.--0.7 sq mi, approximately.

Records available.--May to June 1960.

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

Extremes.--1960: Maximum discharge during period May to June, 3.94 mgd (6.10 cfs) June 28 (gage height, 1.16 ft); minimum, 0.65 mgd (1.01 cfs) June 26.

Remarks.--Records good.

Rating table, May 13 to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

0.8	0.56
.9	1.10
1.0	1.97
1.1	3.10

Discharge, in million gallons a day, May to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1											-	0.96
2											-	.96
3											-	.91
4											-	.91
5											-	.83
6											-	.83
7											-	.83
8											-	.83
9											-	.83
10											-	.83
11											-	.83
12											-	.83
13											1.58	.83
14											1.52	.83
15											1.19	.91
16											*1.36	.83
17											1.19	.70
18											1.19	.70
19											1.27	.70
20											1.19	.70
21											1.19	.76
22											1.27	1.14
23											1.19	.76
24											1.27	.70
25											1.19	.70
26											1.27	.70
27											1.10	.91
28											1.10	2.09
29											1.10	1.19
30											1.02	.91
31											*1.02	-----
Total											-	26.44
Mean:											-	0.881
mgd											-	1.56
cfs											-	.81
Ac-ft												
Calendar year		: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		
Fiscal year		: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		

* Discharge measurement made on this day.

770. Makaleha ditch near Kealia

Location.--Lat 22°06'55", long 159°22'05", on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 miles northwest of Kealia and 4.1 miles northwest of Kapaa.

Records available.--December 1936 to June 1960 in reports of Geological Survey. July 1925 to November 1936 in files of East Kauai Water Co.

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

Average discharge.--23 years (1937-60), 4.31 mgd (6.67 cfs).

Extremes.--1936-60: Maximum daily discharge, 19.2 mgd (29.7 cfs) Nov. 1, 1959; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.80	5.20	4.64	6.00	19.2	0.03	0.12	3.95	1.15	6.90	5.92	7.35
2	13.4	5.44	10.4	5.09	12.8	.03	1.0	4.25	5.29	5.76	5.28	5.92
3	13.4	8.81	7.14	5.44	1.28	.05	1.22	4.25	4.48	9.78	5.52	5.60
4	8.61	10.8	12.0	5.04	6.68	.03	5.28	4.25	4.04	12.0	5.84	5.44
5	14.0	14.2	17.9	4.58	.53	.03	*5.36	4.02	1.40	13.1	5.60	5.36
6	13.3	13.1	13.8	4.40	.42	0	5.36	3.95	.75	12.6	5.04	5.20
7	11.9	3.22	9.35	4.32	.34	0	5.44	3.88	.72	13.6	4.96	4.96
8	9.80	1.73	7.35	4.25	.34	0	5.36	*5.88	.36	15.4	5.12	4.96
9	13.5	.86	*5.84	4.18	.59	0	9.35	3.88	.20	15.4	7.78	4.96
10	7.35	1.43	5.68	3.95	.53	0	12.6	4.10	.18	14.2	14.8	4.96
11	5.84	.75	8.42	4.58	1.42	0	12.0	6.86	.10	12.6	7.80	5.20
12	5.76	.49	7.35	6.31	2.12	0	13.1	5.80	.22	11.4	14.0	5.36
13	5.04	.34	9.12	8.15	1.10	0	13.1	6.50	.22	9.30	14.8	5.36
14	4.80	.28	7.35	4.96	.88	0	13.1	8.47	.10	11.8	11.4	6.45
15	7.20	.22	5.95	6.17	.53	0	9.80	6.70	.10	10.9	10.1	10.8
16	8.20	.20	9.52	4.40	.36	.06	6.45	10.9	3.08	13.1	13.0	7.35
17	5.70	.17	5.76	4.10	.31	.17	5.68	10.4	4.80	14.2	11.5	5.52
18	8.27	.22	5.34	4.10	.22	.10	5.20	12.6	5.76	14.8	9.80	5.36
19	5.68	.17	5.04	3.88	.20	.08	6.50	6.96	10.4	10.4	15.4	5.52
20	11.3	.12	4.72	3.80	.17	.08	7.22	1.10	10.9	7.80	13.6	5.36
21	7.85	.08	7.37	3.80	.14	.08	4.88	6.8	6.90	7.80	13.6	9.89
22	7.01	.08	5.44	3.80	.12	.08	4.56	5.19	8.37	*6.90	16.6	13.8
23	5.52	.06	5.36	5.91	.12	.06	4.18	8.45	11.4	7.99	12.0	9.62
24	4.88	.06	11.1	5.44	.10	.08	4.25	5.04	8.30	10.0	15.4	8.80
25	4.56	.08	12.5	5.52	.06	.08	4.25	4.88	8.30	7.35	13.1	9.30
26	4.56	.10	6.00	9.97	.05	.27	4.25	4.01	11.8	6.00	13.1	7.80
27	5.70	4.07	11.4	10.6	.05	.34	4.18	4.56	12.0	5.76	*8.80	11.7
28	4.48	8.10	6.90	7.16	.05	.22	4.40	5.77	13.1	5.68	7.80	17.6
29	5.37	5.68	7.35	4.96	.05	.17	4.25	11.5	10.9	5.60	7.35	12.0
30	7.03	5.68	8.62	4.48	.05	.12	4.10	-----	9.30	8.73	6.45	9.30
31	4.64	5.20	-----	12.5	-----	.12	4.02	-----	9.87	-----	6.00	-----
Total	244.45	96.94	244.71	171.80	44.81	2.30	190.16	164.78	162.49	304.65	307.46	226.80
Mean:												
mgd	7.89	3.13	8.16	5.54	1.49	0.074	6.13	5.68	5.24	10.2	9.92	7.56
cfs	12.2	4.84	12.6	8.57	2.31	0.114	9.48	8.79	8.11	15.8	15.3	11.7
Ac-ft	750	297	751	527	136	7.1	584	506	499	955	944	696
Calendar year 1959:	Max	19.2	Min	0	Mean(mgd)	4.58	Mean(cfs)	7.09	Ac-ft	5,130		
Fiscal year 1959-60:	Max	19.2	Min	0	Mean(mgd)	5.91	Mean(cfs)	9.14	Ac-ft	6,640		

* Discharge measurement made on this day.

790. Kapahi ditch near Kealia

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

Records available.--April 1909 to May 1914, May 1915 to June 1960.

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

Average discharge.--42 years (1917-20, 1921-60), 4.85 mgd (7.50 cfs).

Extremes.--1909-60: Maximum daily discharge, 89.2 mgd (138 cfs) Feb. 6, 1913; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.06	1.85	2.6	3.03	21.3	1.09	4.92	2.53	0.13	4.22	2.9	3.38
2	7.55	2.01	4.51	2.60	.43	.90	4.92	2.53	1.50	3.52	3.1	2.91
3	8.03	2.63	3.7	1.20	.10	.59	4.04	2.53	.85	4.83	2.72	2.72
4	3.36	4.04	4.1	.31	.02	.54	*7.76	2.44	.63	6.88	2.72	2.62
5	6.76	2.73	.2	1.82	.02	.49	6.52	2.44	.95	6.32	2.62	2.53
6	.93	1.21	.4	2.29	.10	.49	6.60	2.39	.56	6.46	2.53	2.44
7	2.48	.27	1.0	2.29	.10	.59	5.57	2.34	.36	7.60	2.44	2.53
8	3.58	.27	1.4	2.29	.13	5.97	1.99	*2.34	.16	3.03	2.53	2.44
9	4.88	.19	*3.8	2.29	.10	11.2	1.16	2.34	.13	.40	3.87	2.44
10	3.93	.23	3.6	2.20	.07	10.9	1.02	2.34	.13	.40	12.0	2.24
11	2.71	.16	3.9	2.29	.18	8.35	.96	3.65	.13	7.93	3.94	2.34
12	2.49	.16	2.28	2.89	.16	2.56	.90	2.44	.10	7.93	13.1	2.34
13	2.20	8.53	1.74	3.58	.16	.16	.90	2.62	.10	6.04	6.68	2.34
14	2.01	11.8	1.55	2.60	.13	.13	2.84	4.08	.10	4.30	1.16	2.53
15	2.38	11	1.38	2.60	.13	.10	3.66	3.24	.10	.90	.83	6.21
16	2.49	10	1.22	2.29	.10	.20	3.66	5.20	2.25	.83	5.36	2.72
17	2.20	5.5	1.14	2.20	.10	.07	3.66	5.19	4.36	.83	5.62	2.24
18	2.46	.4	1.14	2.20	2.36	.04	4.01	6.97	2.98	9.47	4.92	2.15
19	2.01	.4	1.00	2.10	1.85	.07	4.57	1.03	.52	4.79	11.5	2.15
20	4.99	.4	.62	2.10	.70	.10	5.11	.13	.19	1.07	6.77	1.25
21	2.82	.4	2.94	2.10	.54	.07	3.52	.10	2.72	.49	4.57	.97
22	2.58	.4	2.49	2.10	.40	.07	1.19	3.91	4.18	.2	4.50	.23
23	2.10	5.0	2.49	2.49	4.02	.07	.23	4.22	2.24	.2	5.34	.16
24	1.74	10	4.03	2.60	7.60	.10	.19	3.24	.13	.2	7.30	2.36
25	1.74	10	4.75	2.49	6.60	.10	1.14	2.82	.13	.2	3.78	3.24
26	1.74	7.5	3.03	6.10	5.06	.16	2.11	3.32	1.60	1.8	1.43	2.72
27	1.74	3.7	4.28	9.72	5.06	.02	2.72	2.72	2.72	2.9	*2.81	4.37
28	1.74	4.6	3.58	3.76	2.29	.02	2.82	2.72	2.72	2.9	3.94	6.69
29	1.85	4.0	2.92	2.49	.07	.04	2.82	2.61	2.62	2.9	3.38	5.90
30	2.10	3.5	3.93	2.20	2.35	2.60	2.62	-----	2.62	2.9	3.00	3.94
31	1.83	3.0	-----	7.53	-----	5.06	2.53	-----	3.91	-----	2.82	-----
Total	95.26	115.86	75.72	88.75	62.23	52.85	96.66	84.43	41.82	102.44	140.16	83.10
Mean:												
mgd	3.07	3.74	2.52	2.86	2.07	1.70	3.12	2.91	1.35	3.41	4.52	2.77
cfs	4.75	5.79	3.90	4.43	3.20	2.63	4.63	4.50	2.09	5.28	6.99	4.29
Ac-ft	292	356	232	272	191	162	297	259	128	314	430	255

Calendar year 1959: Max 21.3 Min 0.02 Mean(mgd) 2.31 Mean(cfs) 3.57 Ac-ft 2,590
 Fiscal year 1959-60: Max 21.3 Min 0.02 Mean(mgd) 2.84 Mean(cfs) 4.39 Ac-ft 3,190

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 15 to Sept. 1, Sept. 3-11, Apr. 22 to May 2; discharge estimated on basis of recorded range in stage, ditchman's readings, 1 discharge measurement, and records for nearby stations.

800. Kapaa Stream at Kapahi ditch intake, near Kapaa

Location.--Lat 22°06'05", long 159°22'30", on right bank 4 miles northwest of Kapaa and 4.5 miles northwest of Wailua.

Drainage area.--3.3 sq mi, approximately.

Records available.--July 1936 to June 1960. Prior to July 1958 published as Kapaa River at Kapaa ditch intake, near Kapaa.

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

Average discharge.--24 years, 13.3 mgd (20.6 cfs).

Extremes.--Maximum discharge during year, 3,160 mgd (4,890 cfs) Aug. 6 (gage height, 4.37 ft), from rating curve extended above 330 mgd by logarithmic plotting; no flow many times.

1936-60: Maximum discharge, 4,960 mgd (7,670 cfs) Jan. 25, 1956 (gage height, 5.34 ft), from rating curve extended above 330 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good except those for period of no gage-height record and those above 330 mgd, which are fair. Entire low flow is diverted into several ditches above station. Records do not include flow of Kapahi ditch (see preceding page).

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

-0.03	0	1.0	90.5
0.0	1.0	1.2	140
.2	2.57	1.5	235
.4	11.5	1.8	365
.6	28.4	2.1	530
.8	54.2		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	0	0	42.0	6.48	6.10	0	26.0	0	0	0
2	0	0	0	0	259	8.00	3.74	0	269	0	0	0
3	0	0	0	1.39	40.0	8.55	2.04	0	126	7.56	0	0
4	0	1.39	2.17	2.07	17.3	7.00	2.90	0	97.3	4.18	0	0
5	5.77	5.59	49.7	.56	21.1	7.50	.21	0	197	3.75	0	0
6	11.6	413	10.6	0	13.6	12.0	2.13	0	102	2.56	0	0
7	3.40	83.1	5.22	0	19.3	14.8	3.66	0	56.2	4.28	0	0
8	0	78.7	3.33	0	45.6	4.22	3.42	0	20.8	33.5	0	0
9	5.32	31.2	0.00	0	34.7	7.30	19.2	0	18.8	30.2	2.15	0
10	0	48.1	0	0	25.0	1.34	12.2	0	14.3	17.6	10.9	0
11	0	15.0	0	0	32.5	0	11.7	.08	22.6	1.03	0	0
12	0	12.9	1.53	.17	*23.2	6.03	12.9	0	15.0	0	24.6	0
13	0	10.7	2.31	0	34.8	11.4	17.3	0	12.9	0	10.3	0
14	0	.19	2.31	0	19.4	29.4	18.2	1.02	*10.3	5.89	6.05	0
15	0	0	1.85	0	12.9	18.9	4.00	.27	9.70	5.75	5.01	0
16	0	0	3.55	0	10.9	63.2	2.07	3.80	4.26	7.07	3.52	0
17	0	8.21	2.07	0	10.3	26.7	1.14	2.75	0	13.0	.01	0
18	0	19.0	1.65	0	6.55	11.5	3.43	6.68	1.51	19.4	0	0
19	0	10.9	1.85	0	7.00	23.6	.05	106	6.50	2.64	1.20	0
20	3.36	9.70	1.85	0	8.55	14.3	0	14.2	5.22	4.44	.78	.88
21	0	8.00	.27	0	8.55	15.0	0	9.70	1.81	4.44	2.28	2.25
22	0	7.50	0	0	8.00	12.3	1.74	3.04	2.87	*4.08	9.12	21.4
23	0	5.59	0	0	7.94	8.55	2.84	0	9.97	4.08	2.24	3.42
24	0	0	5.33	0	.66	16.0	2.84	0	4.82	5.34	10.9	.92
25	0	1.59	1.39	0	.96	14.3	1.78	0	4.82	4.08	3.88	0
26	0	.72	0	0	2.31	68.0	.83	.09	16.1	1.17	6.52	0
27	0	0	3.62	0	2.07	20.7	0	0	7.68	0	1.67	.88
28	0	0	0	0	4.28	12.2	0	0	36.3	0	0	17.4
29	0	0	0	0	6.55	9.70	0	102	6.85	0	0	.28
30	0	0	.22	0	5.28	6.45	0	-----	2.84	.11	0	0
31	0	0	-----	0	-----	12.6	0	-----	3.28	-----	-----	-----
Total	29.45	771.08	100.82	4.19	730.30	478.02	136.42	249.63	1,112.73	186.15	101.13	47.43
Mean:												
mgd	0.950	24.9	3.36	0.135	24.3	15.4	4.40	8.61	35.9	6.20	3.26	1.58
cfs	1.47	38.5	5.20	0.209	37.6	23.8	6.81	13.3	55.5	9.59	5.04	2.44
Ac-ft	90	2,370	309	13	2,240	1,470	419	766	3,410	571	310	146

Calendar year 1959: Max 413 Min 0 Mean(mgd) 9.29 Mean(cfs) 14.4 Ac-ft 10,410
 Fiscal year 1959-60: Max 413 Min 0 Mean(mgd) 10.8 Mean(cfs) 16.7 Ac-ft 12,110

Peak discharge (base, 1,400 mgd).--Aug. 6 (8:30 p.m.) 3,160 mgd (4,890 cfs), 4.37 ft; Nov. 2 (11:30 a.m.) 1,870 mgd (2,890 cfs), 3.52 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 14 to Nov. 1; discharge estimated on basis of recorded range in stage and records for nearby stations.

870. Anahola ditch wasteway near Kealia

Location.--Lat 22°08'10", long 159°22'30", on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft north of Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles northwest of Kealia.

Records available.--July 1936 to June 1960.

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

Average discharge.--24 years (1936-60), 3.35 mgd (5.18 cfs).

Extremes.--1936-60: Maximum daily discharge, 54 mgd (84 cfs) Nov. 12, 1955; no flow at times.

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

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.17	0.17	0.30	0.11	0.17	0.46	0.66	0.17	3.04	0.30	0.23	0.11
2	.17	.17	.30	.11	8.28	.46	.46	.17	26.1	.30	.23	.11
3	.17	.17	1.29	.11	2.94	.46	.38	.17	15.4	.30	.23	.11
4	.11	.17	2.94	.11	1.85	.38	.38	.17	6.50	.30	.23	.11
5	.17	.23	.17	.17	2.32	.66	.38	.17	7.74	.30	.23	.11
6	.17	16.6	.17	.11	1.39	.76	.46	.17	5.74	.30	.23	.11
7	.17	2.02	.17	.11	.99	.76	.46	.17	4.92	.30	.17	.11
8	.17	.99	1.91	.11	2.28	.56	.46	.23	3.24	6.99	.17	.11
9	.17	.76	3.78	.11	1.85	.66	.66	.23	2.94	10.2	.23	.11
10	1.44	.87	3.40	.11	1.39	.38	.56	.23	2.47	8.46	.30	.11
11	2.62	.56	4.73	.11	3.18	.38	.56	.17	2.86	7.50	.23	.11
12	2.32	.56	4.35	.17	2.44	.38	.56	.11	2.32	6.23	.23	.11
13	1.19	.56	3.09	.17	1.97	.38	.76	.17	2.16	6.81	.23	.11
14	.17	.46	2.94	.11	1.39	.87	.76	.23	2.00	2.43	.23	.11
15	.17	.38	2.62	.11	1.12	.76	.56	.17	.84	.30	.23	.11
16	.17	.38	*3.74	.11	.87	1.92	.56	.23	.30	.30	.30	.11
17	.17	.38	.70	.11	.76	1.21	.56	.17	.30	.30	.23	.11
18	.17	.56	.17	.11	.66	.56	.56	.23	.23	.38	.23	.11
19	.17	.46	.17	.11	.66	.99	.46	1.44	.23	.30	.23	.11
20	.17	.46	.23	.11	.56	.76	.46	.07	.23	.30	.23	.17
21	.17	.38	.30	.11	.56	.66	.46	.07	.23	.30	.17	.11
22	.17	.38	.17	.11	.56	.66	.46	.07	.23	.23	.17	.11
23	.17	.38	.17	.11	.56	.56	.38	.07	.30	.23	.17	.07
24	.11	.38	.23	.11	*.46	.66	.38	.11	.23	.30	.11	.11
25	.17	.38	.17	.11	.46	.66	.38	.11	.23	.30	.11	.11
26	.11	.38	.17	.17	.46	2.16	.38	.11	.30	.30	.11	.11
27	.11	.38	.17	.17	.46	1.12	.30	.11	.23	.30	.11	.11
28	.11	.38	.17	.17	.46	.76	.30	.11	.30	.30	.11	.17
29	.17	.30	.11	.11	.46	.76	.23	6.66	.23	.23	.11	.17
30	.17	.30	.11	.11	.46	.76	.17	-----	.30	.17	.11	.11
31	.11	.30	-----	.17	-----	.99	.17	-----	.30	-----	.11	-----
Total	11.80	30.85	38.94	3.83	39.97	23.50	14.27	12.29	94.44	55.26	6.01	3.44
Mean:	0.361	0.995	1.30	0.124	1.33	0.758	0.460	0.424	3.05	1.84	0.194	0.115
mgd	0.589	1.54	2.01	0.192	2.06	1.17	0.712	0.656	4.72	2.65	0.300	0.178
cfs	36	95	120	12	123	72	44	38	290	170	18	11
Ac-ft												
Calendar year 1959:	Max 18.3	Min 0.11	Mean(mgd) 1.51	Mean(cfs) 2.34	Ac-ft 1,700							
Fiscal year 1959-60:	Max 26.1	Min 0.07	Mean(mgd) 0.914	Mean(cfs) 1.41	Ac-ft 1,030							

* Discharge measurement made on this day.

880. Anahola ditch above Kaneha Reservoir, near Kealia

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

Records available.--December 1921 to June 1960. May 1915 to December 1921 at site 0.3 mile upstream; records not equivalent owing to diversion.

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

Average discharge.--36 years (1922-25, 1927-60), 3.06 mgd (4.73 cfs).

Extremes.--1921-60: Maximum daily discharge, 40 mgd (62 cfs) Nov. 12, 1947; no flow at times.

Remarks.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted by Anahola ditch wasteway (see p. 40).

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.70	1.26	0.02	2.18	11.7	0	0.01	0.28	5.31	5.01	2.18	4.24
2	7.58	1.50	.02	1.82	2.07	0	.01	*.24	6.11	3.91	2.09	2.45
3	7.15	5.53	.02	1.91	.09	0	.01	.24	.37	6.20	2.09	*2.09
4	2.27	6.95	5.24	1.73	.06	0	.01	.20	.21	6.60	2.00	2.18
5	8.41	10.7	16.9	1.58	.06	0	.01	.20	.20	6.60	2.27	1.91
6	8.11	5.74	11.4	1.50	.06	0	0	.20	.12	5.01	1.73	1.82
7	8.64	.06	7.52	1.42	.06	0	0	.24	.06	6.17	1.73	1.64
8	8.26	.09	2.68	1.42	.06	0	.02	.71	.04	3.58	1.73	1.58
9	9.87	.09	.09	1.34	.06	0	.02	1.26	.02	.16	2.88	1.50
10	2.30	.09	.06	1.26	.09	0	.02	3.42	.02	.12	7.78	1.58
11	.09	.09	.06	1.26	.13	0	.02	2.75	.01	.09	2.67	1.42
12	.09	.06	.09	3.10	.09	0	.02	1.58	.01	.04	6.21	1.58
13	.75	.06	.09	4.67	.06	0	.02	3.50	.01	.04	8.65	2.09
14	1.50	.06	.09	1.91	.06	0	.02	4.67	.01	5.41	5.06	1.91
15	1.82	.06	.09	2.00	.09	0	.02	2.67	.87	6.33	4.51	3.84
16	3.06	.06	.09	1.42	.09	.04	.02	6.82	*1.26	7.31	5.34	2.18
17	1.73	.06	1.64	1.34	.06	.01	.02	4.51	1.18	8.58	5.71	1.50
18	3.00	.09	1.91	1.26	.06	0	.02	7.55	1.11	8.76	4.39	1.34
19	1.73	.09	1.82	1.18	.06	0	.02	13.2	1.34	6.33	6.52	1.34
20	7.81	.06	1.64	1.11	.06	0	.01	5.26	1.18	5.01	6.34	2.11
21	2.67	.06	5.22	1.11	.06	0	.01	3.33	1.04	5.01	7.17	4.43
22	2.09	.06	2.09	1.04	.06	0	.01	2.78	1.21	4.03	7.88	7.70
23	1.82	.06	2.00	2.45	.06	0	.01	2.36	2.19	5.20	5.79	4.33
24	1.42	.06	6.04	2.45	.02	0	.01	2.00	1.11	6.52	6.07	3.52
25	3.14	.06	7.18	2.00	.01	0	.01	1.91	1.04	4.03	4.82	4.58
26	1.75	.06	2.56	5.18	.01	.04	.01	1.75	2.65	3.22	6.15	2.36
27	1.42	.06	6.57	6.67	.01	.02	.01	1.64	1.85	*2.89	4.51	4.84
28	1.26	.04	2.78	5.31	0	.02	.01	2.13	3.14	2.67	3.33	8.41
29	2.41	.04	2.18	1.64	0	.02	.10	7.90	1.62	2.45	3.11	4.72
30	2.66	.04	2.78	1.79	0	.02	.24	-----	5.05	2.27	2.78	3.22
31	1.34	.04	-----	10.7	-----	.02	.28	-----	7.85	-----	2.56	-----
Total	109.85	33.28	90.87	73.75	15.30	0.19	1.00	85.28	48.19	129.55	136.85	88.41
Mean:												
mgd	3.54	1.07	3.03	2.38	0.510	0.006	0.032	2.94	1.55	4.32	4.41	2.95
cfs	5.48	1.66	4.69	3.68	0.789	0.009	0.050	4.55	2.40	6.68	6.82	4.56
Ac-ft	337	102	279	226	47	0.6	3.1	282	148	398	420	271

Calendar year 1959: Max 16.9 Min 0 Mean(mgd) 1.76 Mean(cfs) 2.72 Ac-ft 1,970
 Fiscal year 1959-60: Max 16.9 Min 0 Mean(mgd) 2.22 Mean(cfs) 3.43 Ac-ft 2,490

* Discharge measurement made on this day.

890. Anahola Stream near Kealia

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

Drainage area.--5.5 sq mi, approximately.

Records available.--August to November 1910, December 1910 to November 1912 (fragmentary), December 1912 to June 1960. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1958 published as Anahola River near Kealia.

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

Average discharge.--46 years (1913-18, 1919-60), 14.0 mgd (21.7 cfs).

Extremes.--Maximum discharge during year, 5,180 mgd (8,010 cfs) Aug. 6 (gage height, 9.07 ft), from rating curve extended above 430 mgd; minimum, 1.95 mgd (3.02 cfs) June 28.

1910, 1912-60: Maximum discharge, about 12,700 mgd (19,600 cfs) Jan. 25, 1956 (gage height, 14.6 ft, from floodmark), from rating curve extended above 380 mgd; minimum, 1.28 mgd (1.98 cfs) Oct. 27, 1953.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
430	1915	Sept. 26, 1914	3,200	4,950	12.9
445	1916	Mar. 4, 1916	1,800	2,790	9.7
465	1917	Mar. 20, 1917	1,300	2,010	8.35
485	1918	Mar. 16, 1918	1,000	1,550	7.40

Remarks.--Records fair. Anahola ditch diverts water 3 miles above station for irrigation in vicinity of Kealia (see p. 38).

Revisions.--Revised figures of discharge, in million gallons a day, for fiscal year 1915, superseding those published in WSP 430, are given herewith:

1914	1914-Con.	1915-Con.
Sept. 24..... 130	Dec. 3..... 135	Apr. 26..... 55
25..... 170	4..... 50	27..... 86
26..... 520	1915	30..... 40
27..... 190	Apr. 16..... 55	May 2..... 86

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
September 1914.....	520	10	53.0	82.0	4,880
December.....	135	4	14.0	21.7	1,330
Calendar year 1914....	520	3.0	18.7	28.9	20,980
April 1915.....	86	4	16.0	24.8	1,470
May.....	86	5	11.6	17.9	1,100
Fiscal year 1914-15...	520	2	14.0	21.7	15,700
Calendar year 1915....	130	2	11.9	18.4	13,320

890. Anahola Stream near Kealia--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.81	2.10	6.50	4.39	127	6.02	16.8	5.45	42.2	6.30	4.88	5.26
2	5.84	2.18	7.18	4.29	264	5.45	11.4	5.64	696	5.81	4.79	4.88
3	6.79	4.00	6.21	4.29	55.3	5.64	9.65	5.26	*378	15.9	4.79	*4.70
4	4.12	5.45	8.85	4.18	24.5	5.45	*13.2	4.88	198	8.08	4.70	4.61
5	8.19	9.60	97.8	4.07	31.3	6.20	12.4	4.88	222	6.80	4.70	4.52
6	8.31	481	22.2	3.85	18.7	16.4	10.8	4.69	139	5.81	4.61	4.52
7	5.28	111	9.55	3.64	12.2	11.8	15.1	4.50	83.0	5.64	4.52	4.43
8	6.48	66.1	7.20	3.54	51.6	7.20	9.10	4.39	44.7	69.3	4.52	4.34
9	15.0	37.0	6.40	3.43	28.4	9.50	23.7	4.18	40.3	66.8	4.88	4.34
10	4.89	33.9	6.21	3.27	18.7	7.20	18.7	4.75	30.8	26.5	17.3	4.34
11	3.80	11.8	6.90	3.27	59.5	5.45	15.0	*4.40	51.8	10.8	5.15	4.34
12	3.24	10.1	6.40	4.47	*58.4	5.07	22.1	4.18	25.1	8.80	64.2	4.34
13	2.90	11.2	5.64	6.90	28.4	5.64	25.7	4.18	19.6	9.20	39.2	4.34
14	*2.73	9.00	5.45	4.88	22.3	21.9	33.0	5.26	16.5	12.0	12.4	4.25
15	3.16	9.00	5.26	4.50	19.4	15.3	15.5	4.29	13.6	6.80	6.47	4.70
16	3.70	8.70	*5.45	3.64	14.3	49.9	10.0	7.66	*12.1	7.80	6.80	4.52
17	3.07	8.70	5.07	3.19	11.4	28.1	9.10	4.50	11.4	22.6	7.05	4.25
18	2.90	19.0	4.69	3.02	9.55	9.55	8.20	14.6	10.5	25.5	5.98	4.18
19	2.64	9.30	4.69	2.94	9.10	24.1	8.65	162	13.6	7.30	6.64	4.11
20	5.36	*9.00	4.50	2.86	8.20	16.5	13.0	15.8	11.4	6.30	7.05	4.34
21	3.97	9.00	7.32	2.78	7.85	13.7	7.50	10.0	9.70	6.14	10.6	4.88
22	3.24	9.00	4.88	2.70	7.50	12.5	6.90	8.65	13.3	5.81	9.20	26.6
23	3.24	9.00	4.69	3.99	8.20	7.50	6.65	7.85	42.4	6.30	6.47	4.52
24	2.49	9.00	9.18	4.88	6.90	8.65	6.40	7.85	7.60	9.82	6.47	4.25
25	2.92	9.00	9.75	4.88	6.65	8.20	6.21	7.50	7.55	5.98	6.30	4.43
26	3.14	9.00	5.07	7.99	6.40	70.1	6.02	7.20	41.7	5.48	6.72	4.11
27	2.33	9.70	6.02	5.48	6.02	26.9	6.02	7.20	24.9	*5.32	5.48	4.25
28	2.18	14.4	5.07	6.45	5.83	12.9	6.02	7.50	68.5	5.32	5.06	18.4
29	2.41	10.1	4.50	3.66	5.64	9.55	5.83	*172	15.5	5.06	4.97	4.97
30	3.24	12.4	4.50	3.48	6.02	9.04	5.64	-----	24.7	4.88	4.88	4.43
31	2.35	9.06	-----	26.2	-----	27.3	5.45	-----	14.0	-----	4.79	-----
Total	134.70	967.79	293.13	151.11	942.26	468.71	368.74	511.24	2,329.65	394.15	291.57	170.15
Mean:												
mgd	4.35	31.2	9.77	4.87	31.4	15.1	11.9	17.6	75.2	13.1	9.41	5.67
cfs	6.75	48.3	15.1	7.54	48.6	23.4	18.4	27.2	116	20.3	14.6	8.77
Ac-ft	413	2,970	900	464	2,890	1,440	1,130	1,570	7,150	1,210	895	522

Calendar year 1959: Max 481 Min 2.05 Mean(mgd) 12.0 Mean(cfs) 18.6 Ac-ft 13,460
 Fiscal year 1959-60: Max 696 Min 2.10 Mean(mgd) 19.2 Mean(cfs) 29.7 Ac-ft 21,550

Peak discharge (base, 900 mgd).--Aug. 6 (7 p.m.) 5,180 mgd (8,010 cfs), 9.07 ft; Feb. 19 (5 a.m.) 1,820 mgd (2,820 cfs), 6.01 ft; Mar. 2 (9 p.m.) 2,340 mgd (3,620 cfs), 6.54 ft.

* Discharge measurement made on this day.

910. Lower Anahola ditch near Kealia

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

Records available.--December 1936 to June 1960 in reports of Geological Survey. July 1925 to December 1936 in files of East Kauai Water Co.

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

Average discharge.--23 years (1937-60), 2.30 mgd (3.56 cfs).

Extremes.--1936-60: Maximum daily discharge, 12.0 mgd (18.6 cfs) June 1, 1938; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.53	1.80	1.59	3.71	4.52		0	3.55	0	3.92	0.04	0
2	3.32	1.80	1.51	2.09	1.40		0	4.15	.22	3.85	.02	0
3	2.13	2.28	.07	.04	.02		0	3.78	.05	3.85	.02	0
4	.05	2.65	.04	.04	.02		3.70	4.02	0	4.08	.02	0
5	.05	2.99	.04	2.62	0		*4.08	3.48	0	4.00	.92	0
6	.04	1.55	.04	3.62	0		4.75	3.40	0	3.85	2.22	1.05
7	2.17	0	.04	2.99	0		2.72	3.32	0	2.15	2.22	1.80
8	3.40	0	.04	2.92	0		1.63	*3.25	0	.44	2.16	1.75
9	4.15	0	.04	2.92	0		1.63	3.32	0	.04	2.16	1.75
10	2.30	0	.04	3.40	0		1.97	4.45	0	.02	2.66	1.86
11	.04	0	.04	3.40	0		3.95	4.45	0	2.75	2.72	1.86
12	.04	0	0	2.00	0		4.99	4.22	0	.98	3.07	1.86
13	.04	0	0	2.87	0		4.99	4.15	0	0	2.78	1.30
14	.92	0	0	3.32	0		5.31	4.15	0	0	.02	.04
15	2.40	0	0	3.12	0		1.83	3.32	0	0	.02	.04
16	2.47	0	0	3.17	0		.04	3.16	0	0	.02	.02
17	2.85	0	0	2.72	0		.04	3.25	0	0	0	.60
18	2.28	0	1.29	2.59	0		2.56	3.62	0	0	0	1.63
19	2.22	0	3.40	2.60	0		4.22	1.77	0	0	0	1.63
20	2.59	0	3.32	2.47	0		4.45	.04	0	0	0	1.63
21	2.79	0	2.44	2.40	0		4.15	.04	0	0	0	1.86
22	2.40	0	1.32	2.34	0		4.08	2.13	0	0	0	2.40
23	2.66	0	3.40	2.77	0		4.00	3.29	0	0	0	1.86
24	2.40	0	3.62	2.85	0		3.92	3.33	0	0	0	1.80
25	2.09	0	2.73	2.85	0		3.85	3.45	3.22	0	0	1.75
26	2.40	0	.04	2.99	0		3.65	3.52	4.00	0	0	1.75
27	2.09	0	.04	3.05	0		3.65	3.12	4.00	1.06	0	1.75
28	1.97	0	1.37	3.40	0		4.15	3.12	4.00	2.85	0	.94
29	2.19	0	3.69	2.79	0		3.63	1.45	4.08	3.72	0	.04
30	2.16	0	3.50	2.66	0		3.46	-----	4.52	1.96	0	.04
31	2.08	.06	-----	3.48	-----		3.25	-----	4.00	-----	0	-----
Total	61.22	13.33	33.65	84.19	5.96	0	95.29	92.32	28.09	39.54	21.05	33.01
Mean:												
mgd	1.97	0.430	1.12	2.72	0.199	0	3.07	3.18	0.906	1.32	0.679	1.10
cfs	3.05	0.665	1.73	4.21	0.308	0	4.75	4.92	1.40	2.04	1.05	1.70
Ac-ft	188	41	103	258	16	0	292	283	86	121	65	101

Calendar year 1959: Max 7.8 Min 0 Mean(mgd) 1.55 Mean(cfs) 2.40 Ac-ft 1,740
 Fiscal year 1959-60: Max 5.31 Min 0 Mean(mgd) 1.39 Mean(cfs) 2.15 Ac-ft 1,560

* Discharge measurement made on this day.

942. Ka Loko ditch near Kilauea

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

Records available.--August 1932 to June 1960.

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

Average discharge.--27 years (1933-60), 3.49 mgd (5.40 cfs).

Extremes.--1932-60: Maximum daily discharge, 63 mgd (98 cfs) Dec. 10, 1935; minimum daily, 0.11 mgd (0.17 cfs) Nov. 3, 4, 1959, Mar. 9, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Moloaa and Puu Ka Ele Streams, 0.5 mile southeast and 1.5 miles southwest of station, respectively. Water used for irrigation in vicinity of Kilauea. Flow regulated by wasteway gates.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.87	1.37	1.77	1.68	15.3	2.14	3.95	1.68	*11.3	2.80	2.83	3.30
2	2.49	1.37	2.73	1.68	7.45	2.14	3.06	1.96	20.5	3.40	2.85	2.60
3	5.90	1.84	2.23	1.68	.11	2.05	2.60	1.86	.50	4.32	*2.72	2.51
4	1.86	2.05	4.39	1.60	.11	1.96	3.12	1.77	.22	3.52	2.60	2.42
5	3.14	*3.64	16.0	1.60	3.11	1.96	2.83	1.68	.32	3.75	2.51	2.32
6	2.24	23.9	6.73	1.60	4.49	3.59	2.72	1.60	.22	*3.18	2.51	*2.32
7	1.60	10.1	3.54	1.60	3.54	2.51	5.02	1.52	.18	3.29	2.42	2.23
8	2.64	4.29	2.92	1.52	8.85	2.14	3.06	1.52	.14	13.7	2.42	2.14
9	4.25	2.96	2.60	1.52	7.32	1.99	6.63	1.60	.11	4.69	2.64	2.14
10	1.77	4.54	2.64	1.52	4.82	1.95	4.73	2.08	1.15	.36	5.51	2.05
11	1.45	4.01	3.48	1.52	14.4	1.52	4.03	1.77	4.73	1.87	2.51	2.05
12	1.37	3.89	3.17	1.55	13.5	1.77	4.45	1.52	4.59	4.14	14.3	2.23
13	1.37	4.77	2.51	2.02	7.10	1.77	5.32	1.60	4.17	4.91	11.6	2.14
14	1.37	3.12	*2.23	1.60	5.71	*3.36	6.19	2.27	3.75	5.01	5.71	2.05
15	1.37	3.02	2.23	1.60	6.89	4.21	3.78	1.68	3.18	5.22	3.40	3.26
16	*1.60	2.70	2.32	1.52	4.37	10.9	3.06	2.89	2.94	5.75	5.28	1.96
17	1.45	2.60	2.05	a1.5	5.77	5.28	2.72	1.86	2.72	8.73	5.64	1.68
18	1.45	5.47	1.86	a1.5	3.44	2.60	2.60	5.00	2.60	.36	3.64	1.68
19	1.37	3.02	1.77	a1.4	3.23	4.57	2.99	20.1	2.94	2.51	4.45	1.52
20	2.12	2.42	1.77	a1.4	3.02	3.29	*3.13	4.03	2.60	5.01	6.46	1.86
21	1.45	2.14	2.89	a1.3	2.81	3.20	2.42	2.72	2.32	4.87	7.41	3.70
22	1.37	2.05	1.96	a1.3	2.70	2.52	2.23	2.32	2.32	4.17	6.65	11.6
23	1.37	1.96	1.86	1.60	2.81	2.05	2.14	2.14	3.35	5.60	5.30	2.60
24	1.37	1.96	3.56	1.60	2.42	2.58	2.14	2.05	2.23	5.97	4.87	2.14
25	2.12	2.14	3.48	1.52	2.32	2.63	2.05	1.96	2.14	4.03	4.17	2.32
26	1.45	1.96	1.96	1.80	2.32	16.8	2.05	1.86	4.21	3.64	4.87	2.05
27	1.37	2.74	2.67	1.96	2.23	7.55	1.96	1.96	3.87	3.52	3.89	3.48
28	1.37	3.51	1.86	1.82	2.23	3.64	2.05	1.96	6.09	3.40	3.40	8.18
29	1.45	2.14	1.68	1.3	2.14	2.94	1.86	33.2	2.83	3.18	3.06	4.65
30	1.60	2.44	1.68	*1.1	2.23	2.88	1.77	-----	2.72	3.06	2.94	2.60
31	1.37	1.96	-----	3.52	-----	6.72	1.77	-----	2.52	-----	2.72	-----
Total	57.97	116.08	92.54	52.43	144.74	115.21	98.43	110.16	103.26	127.96	141.26	87.78
Mean:												
mgd	1.87	3.74	3.08	1.69	4.82	3.72	3.18	3.80	3.33	4.27	4.56	2.93
cfs	2.89	5.79	4.77	2.61	7.46	5.76	4.92	5.88	5.15	6.61	7.06	4.53
Ac-ft	178	356	284	161	444	354	302	358	317	393	434	269

Calendar year 1959: Max 23.9 Min 0.11 Mean(mgd) 2.70 Mean(cfs) 4.18 Ac-ft 3,030
 Fiscal year 1959-60: Max 33.2 Min 0.11 Mean(mgd) 3.41 Mean(cfs) 5.28 Ac-ft 3,830

* Discharge measurement made on this day.

No gage-height record; discharge estimated on basis of normal recession and appearance of recorder graph.

950. Puu Ka Ele ditch near Kilauea

Location.--Lat 22°11'05", long 159°24'20", on left bank 200 ft upstream from Puu Ka Ele Reservoir and 2 miles south of Kilauea.

Records available.--August 1932 to June 1960.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 430 ft (by barometer).

Average discharge.--27 years (1933-60), 2.74 mgd (4.24 cfs).

Extremes.--1932-60: Maximum daily discharge, 21 mgd (32 cfs) Sept. 2, 1943; no flow at times each year.

Remarks.--Records good. Ditch diverts water from Puu Ka Ele Stream 0.8 mile south of station. Water used for irrigation of sugarcane in vicinity of Kilauea. Flow regulated by wasteway gates.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.01	1.25	2.21	2.02	9.94	0	0	2.02	*6.02	4.13	2.68	2.78
2	2.64	1.31	3.08	1.92	4.95	0	0	2.31	11.6	3.36	2.58	2.68
3	4.43	1.73	2.50	2.02	.02	0	0	2.21	.12	3.58	*2.68	2.58
4	2.31	1.73	3.54	1.92	0	0	0	2.02	0	3.36	2.68	2.49
5	3.38	*2.21	9.71	1.83	*5.05	0	0	1.92	.97	3.58	2.58	2.40
6	2.64	5.87	8.13	1.73	5.72	0	0	1.83	0	3.16	2.49	*2.30
7	2.12	4.16	4.73	1.73	4.75	1.15	1.86	1.73	0	3.06	2.30	2.22
8	2.82	12.2	3.93	1.73	8.71	1.94	3.43	1.73	.37	7.25	2.30	2.15
9	3.46	10.6	3.43	1.73	8.77	2.27	6.10	1.64	6.63	7.15	2.40	2.15
10	2.40	8.41	3.42	1.73	6.76	2.31	5.72	1.73	9.35	5.10	3.16	2.15
11	2.02	4.87	3.79	1.73	8.49	1.92	5.00	1.54	7.00	4.48	2.49	2.07
12	1.92	4.80	3.79	1.83	9.28	1.83	5.29	1.47	4.48	4.13	5.71	2.15
13	1.73	5.29	3.20	2.12	7.22	1.83	5.87	1.47	4.13	3.91	5.91	2.15
14	1.73	4.20	*2.85	1.83	6.30	*5.15	7.59	1.73	3.58	3.91	4.22	2.15
15	1.73	4.20	2.62	1.92	7.42	5.09	5.72	1.29	3.25	3.91	3.16	2.79
16	*2.12	3.60	2.85	1.73	2.80	8.35	4.60	1.40	3.06	4.13	4.92	2.07
17	1.64	3.66	2.50	1.64	0	5.71	4.20	1.47	2.87	5.73	4.19	1.92
18	1.64	5.64	2.31	1.64	0	.80	3.66	3.65	2.68	.40	2.07	1.84
19	1.47	3.79	2.21	1.54	0	0	3.79	14.5	2.78	0	3.64	1.84
20	1.93	3.31	2.12	1.47	0	0	*3.75	4.68	2.58	0	4.77	2.07
21	1.47	3.08	3.04	1.47	0	0	3.08	3.43	2.30	0	5.19	2.98
22	1.39	2.85	2.40	1.47	0	0	2.85	2.96	2.84	1.68	4.98	7.38
23	1.31	2.73	2.31	1.73	0	0	2.73	2.85	6.06	4.02	4.48	2.49
24	1.25	2.73	2.95	1.64	0	0	2.50	2.62	3.69	4.13	4.02	2.07
25	1.39	2.96	3.45	1.64	0	0	2.50	2.50	3.36	3.47	3.69	2.00
26	1.23	2.73	2.40	1.83	0	.03	2.40	2.40	7.48	3.25	3.91	1.92
27	1.16	3.08	2.62	2.13	0	0	2.31	2.31	7.30	3.06	3.36	2.60
28	1.16	2.86	2.21	2.02	0	0	2.40	2.40	*11.1	3.06	3.16	6.89
29	1.31	2.62	2.12	1.64	0	0	2.21	10.7	6.44	2.87	3.06	4.62
30	1.54	2.62	2.31	1.64	0	0	2.21	-----	6.44	2.78	2.87	2.87
31	1.25	2.40	-----	4.31	-----	0	2.12	-----	5.10	-----	2.78	-----
Total	61.56	123.27	98.73	57.33	96.16	38.38	93.89	84.51	133.58	102.65	108.43	80.77
Mean:												
mgd	1.99	3.98	3.29	1.85	3.21	1.24	3.03	2.91	4.31	3.42	3.50	2.69
cfs	3.08	6.16	5.09	2.86	4.97	1.92	4.69	4.50	6.67	5.29	5.42	4.16
Ac-ft	189	378	303	176	295	118	288	259	410	315	333	248

Calendar year 1959: Max 12.2 Min 0 Mean(mgd) 2.31 Mean(cfs) 3.57 Ac-ft 2,590
 Fiscal year 1959-60: Max 14.5 Min 0 Mean(mgd) 2.95 Mean(cfs) 4.56 Ac-ft 3,310

* Discharge measurement made on this day.

952. Ross ditch near Kilauea

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

Records available.--October 1956 to June 1960.

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

Extremes.--1959-60: Maximum daily discharge, 10.6 mgd (16.4 cfs) Jan. 18, 1957; no flow Jan. 26, Jan. 31 to Feb. 3, Feb. 7-8, 1959.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.5	1.0	1.15	0.92	0.74	0.44	1.15	1.40	0.02	2.43	1.76	1.94
2	1.45	1.0	1.20	.88	3.34	.44	1.15	1.40	7.33	1.70	1.70	1.82
3	1.55	1.0	1.20	.88	5.20	.44	1.20	1.45	7.40	1.88	*1.82	1.65
4	1.50	1.1	1.20	.88	3.06	.41	1.25	1.40	5.20	1.88	1.70	1.80
5	1.45	*1.2	1.45	.83	*.63	.41	1.25	1.40	6.90	2.30	1.55	1.50
6	1.45	2.58	1.63	.83	.59	.41	1.25	1.35	6.40	1.76	1.50	*1.35
7	1.45	1.62	2.50	.79	.59	.37	1.25	1.30	4.32	1.60	1.45	1.30
8	1.45	1.60	1.88	.79	.56	.37	1.20	1.35	2.82	6.18	1.40	1.25
9	1.50	1.50	1.45	.79	.59	.37	1.25	1.40	3.13	6.90	1.55	1.15
10	1.45	2.5	1.40	.74	.52	.37	1.25	1.40	3.16	4.80	2.36	1.15
11	1.35	1.7	1.70	.74	.56	.23	1.30	.61	4.88	3.88	1.82	1.11
12	1.30	1.5	1.50	.74	.56	.11	1.40	.12	4.25	3.37	4.50	1.15
13	1.20	1.8	1.40	.74	.52	.11	1.40	.20	3.95	3.02	6.09	1.25
14	1.20	1.4	*1.20	.74	.48	*.14	1.45	.22	3.80	3.44	4.72	1.30
15	1.20	1.4	1.15	.74	.55	.12	1.40	.81	3.72	3.23	2.62	1.82
16	*1.40	1.3	1.20	.70	1.80	.14	1.40	1.23	3.88	3.58	4.79	1.30
17	1.35	1.3	1.15	.70	.52	.10	1.35	.97	4.10	6.99	6.45	1.11
18	1.35	1.7	1.15	.67	.48	.10	1.35	.86	3.88	8.25	4.96	1.02
19	1.20	1.4	1.15	.63	.48	.17	1.35	2.82	3.95	7.45	4.48	1.02
20	1.30	1.3	1.11	.63	.48	.14	*1.35	1.70	3.88	7.45	5.12	1.25
21	1.30	1.3	1.11	.63	.48	.12	1.35	.41	3.37	7.45	5.60	1.76
22	1.20	1.3	1.06	.59	.48	.29	1.35	.17	2.61	5.41	5.20	4.49
23	1.15	1.2	1.06	.59	.52	.60	1.35	.04	3.31	3.51	4.18	1.76
24	1.06	1.2	1.06	.59	.48	.79	1.35	.02	1.70	3.58	3.72	1.40
25	1.15	1.4	1.11	.59	.48	.83	1.35	.02	1.45	2.76	3.09	1.40
26	1.20	1.2	.97	.59	.48	1.84	1.35	.02	4.22	2.50	3.81	1.30
27	1.06	1.2	.83	.59	.48	1.06	1.35	.02	4.48	2.30	2.76	1.70
28	.97	1.2	.92	.59	.48	.97	1.35	.02	*6.40	2.30	2.36	4.36
29	1.06	1.20	.92	.56	.48	.92	1.35	.02	4.72	2.06	2.18	3.22
30	1.2	1.20	.92	.56	.44	.88	1.40	-----	4.40	1.88	2.00	2.06
31	1.0	1.20	-----	.56	-----	1.11	1.40	-----	3.23	-----	1.94	-----
Total	39.95	43.70	37.73	21.80	27.05	14.80	40.90	23.93	126.86	115.83	99.18	50.49
Mean												
mgd	1.29	1.41	1.26	0.703	0.902	0.477	1.32	0.825	4.09	3.86	3.20	1.68
cfs	2.00	2.18	1.95	1.09	1.40	0.738	2.04	1.28	6.33	5.97	4.95	2.60
Ac-ft	123	134	116	67	83	45	126	73	389	355	304	155

Calendar year 1959: Max 6.00 Min 0 Mean(mgd) 1.16 Mean(cfs) 1.79 Ac-ft 1,300
 Fiscal year 1959-60: Max 8.25 Min 0.02 Mean(mgd) 1.75 Mean(cfs) 2.71 Ac-ft 1,970

* Discharge measurement made on this day.

Note.--No gage-height record July 1, 30, 31, Aug. 1-4, 10-28, Feb. 24-29; discharge estimated on basis of recorded range in stage, ditchman's readings, appearance of recorder graph, and records for nearby stations.

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959. Kalihiwai ditch above wasteway near Kilauea

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

Records available.--April to June 1960.

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

Extremes.--1960: Maximum daily discharge during period April to June, 11.5 mgd (17.8 cfs) June 28; minimum daily, 2.14 mgd (3.31 cfs) June 10, 11, 19.

Remarks.--Records good. Flow can be regulated above station by Kilauea Sugar Co. Water passing station is used for domestic water supply and irrigation of sugarcane.

Discharge, in million gallons a day, April to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1										-	3.56	2.82
2										-	3.34	2.72
3										-	3.34	2.61
4										-	3.24	2.50
5										-	3.34	2.40
6										-	3.03	*2.31
7										-	2.92	2.23
8										-	2.92	2.23
9										-	5.23	2.23
10										-	4.60	2.14
11										-	3.14	2.14
12										-	9.57	2.23
13										-	9.13	2.31
14										-	6.62	2.61
15										-	4.26	4.00
16										-	5.98	2.82
17										-	4.89	2.92
18										-	4.14	2.23
19										-	6.25	2.14
20										-	6.68	2.40
21										-	6.16	4.85
22										-	5.77	8.92
23										-	4.86	4.02
24										-	4.60	3.03
25										-	4.02	2.82
26										-	4.14	2.72
27										-	3.56	5.42
28										4.26	3.34	11.5
29										*4.02	3.14	5.02
30										3.91	2.92	3.56
31										-	2.92	-
Total										-	139.61	101.85
Mean:										-	4.50	3.40
mgd										-	6.96	5.26
cfs										-	428	313
Ac-ft										-		
Calendar year		. Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		
Fiscal year		: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft		

* Discharge measurement made on this day.

960. Kalihiwai ditch near Kilauea

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

Records available.--June 1934 to June 1960.

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

Average discharge.--25 years (1934-42, 1943-60), 2.50 mgd (3.87 cfs).

Extremes.--1934-60: Maximum daily discharge, 29.5 mgd (45.6 cfs) July 16, 1937; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.27	0.64	0.88	0.82	14.5	0.21	0.17	0.70	3.05	2.14	0.25	0.29
2	2.95	.82	1.54	.82	28.3	.21	.17	.76	*17.0	1.87	1.17	.29
3	4.66	1.73	1.16	.95	8.00	.21	.11	.70	1.16	1.96	2.95	.29
4	2.95	1.21	1.54	.95	3.51	.21	.11	.64	.82	1.87	2.64	.29
5	4.11	2.41	15.6	.82	1.54	.21	.11	.64	.95	1.87	2.64	.25
6	3.70	15.1	5.17	.76	1.23	.25	.06	.64	.82	1.62	2.44	.79
7	2.64	3.86	3.05	.82	1.02	.25	.11	.64	.82	1.54	2.24	1.70
8	3.58	4.44	2.24	.76	5.51	.17	.14	.64	2.35	3.05	2.24	1.70
9	5.08	2.40	1.87	.76	1.99	.17	.17	.64	2.84	3.46	2.34	1.62
10	2.64	3.17	1.96	.82	.52	.17	.17	.70	6.41	2.54	4.04	1.70
11	1.96	1.62	2.24	1.02	.52	.11	.17	.70	7.95	2.24	2.34	1.87
12	1.70	1.46	2.34	1.16	.47	.11	.17	.70	6.22	2.05	8.77	2.05
13	1.46	1.46	2.34	1.38	.42	.08	.21	.88	5.54	1.96	10.0	1.96
14	1.38	1.09	1.70	1.09	.37	.11	.37	1.02	5.68	2.24	2.70	2.54
15	*1.54	.95	1.62	1.02	.33	.14	.29	.95	1.78	2.14	.47	3.48
16	2.44	.88	1.87	.95	.29	.21	.21	1.09	1.70	2.64	.47	2.64
17	1.54	1.02	1.46	.88	.21	.14	.17	1.02	1.62	4.60	.47	2.05
18	1.46	4.34	1.38	.82	1.19	.11	1.43	1.78	1.62	.70	.42	1.87
19	1.30	1.30	1.23	.82	1.46	.11	2.24	11.9	1.62	.52	.52	1.87
20	1.96	.88	1.30	.76	1.46	.11	2.14	2.64	1.62	.47	.47	2.05
21	1.06	.58	*1.62	.76	1.46	.14	*1.87	1.62	1.38	.42	.47	4.17
22	.25	.64	1.16	.70	1.38	.11	1.87	1.46	1.38	.21	.42	9.78
23	.21	.82	1.09	.82	1.02	.02	1.78	1.23	2.14	.17	.37	3.70
24	.17	.70	1.52	.88	1.38	0	1.70	1.09	1.46	.21	.33	2.74
25	3.15	.82	1.86	.88	1.38	0	1.54	.99	1.38	.14	.33	2.54
26	1.42	.70	1.16	1.02	1.30	.23	1.46	.95	2.58	.17	.29	2.54
27	.82	.82	1.16	1.16	1.23	.25	1.38	.88	3.03	.29	.25	5.05
28	.70	.70	1.02	1.09	1.23	.21	1.38	.82	7.09	.29	.25	12.2
29	.82	.70	.95	.88	1.16	.25	1.16	12.1	3.35	.29	.21	3.63
30	.88	.88	.88	*.88	.76	.21	.82	-----	3.40	.29	.25	.58
31	.64	.82	-----	3.65	-----	.21	.76	-----	2.84	-----	.25	-----
Total	62.44	58.96	64.91	30.90	85.14	4.92	24.44	50.46	99.42	43.96	53.00	78.23
Mean:												
mgd	2.01	1.90	2.16	0.997	2.84	0.159	0.788	1.74	3.21	1.47	1.71	2.61
cfs	3.11	2.94	3.34	1.54	4.39	0.246	1.22	2.69	4.97	2.27	2.65	4.04
Ac-ft	192	161	199	95	261	15	75	155	305	135	163	240
Calendar year 1959: Max				Min 0		Mean(mgd)	1.60	Mean(cfs)	2.48	Ac-ft	1,790	
Fiscal year 1959-60: Max			28.3	Min 0		Mean(mgd)	1.79	Mean(cfs)	2.77	Ac-ft	2,020	

* Discharge measurement made on this day.

970. Pohakuohonu Stream near Kilauea

Location.--Lat 22°10'55" (revised), long 159°25'35", on left bank 0.75 mile upstream from confluence with Halaulani Stream, 1.25 miles above stone dam, and 2.5 miles southwest of Kilauea.

Drainage area.--1.8 sq mi, approximately.

Records available.--October 1957 to June 1960.

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

Extremes.--Maximum discharge during year, 1,750 mgd (2,710 cfs) Aug. 6 (gage height, 7.23 ft, from floodmark in well), from rating curve extended above 410 mgd on basis of slope-area measurement at gage height 11.0 ft; minimum, 0.88 mgd (1.36 cfs) July 1, 1957-60; Maximum discharge, that of Aug. 6, 1959; minimum, 0.80 mgd (1.24 cfs) June 27-28, 1959.

Maximum stage known, 11.0 ft on Jan. 24, 1956 (corrected), from floodmark (discharge, 3,620 mgd, 5,600 cfs, from slope-area measurement of peak flow).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kalihiwai ditch diverts an average of about 3 mgd about 0.5 mile above station for domestic water supply and irrigation of sugarcane.

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 5			Aug. 6 to Mar. 2			Mar. 3 to June 30				
0.3	0.88		0.3	0.97	1.3	40.0	0.3	0.88	1.1	26.2
.5	3.20		.4	2.00	1.6	68.0	.5	3.20	1.3	40.0
.7	8.20		.5	3.50	2.0	117	.7	8.20	1.6	68.0
			.7	8.20	2.5	199	.9	15.5	2.0	117
			.9	15.5	3.0	300				
			1.1	26.2						

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*1.60	1.1	1.79	1.9	39.0	1.69	2.30	2.15	9.46	4.67	1.69	2.08
2	2.36	1.4	3.16	1.8	95.7	1.59	2.15	2.15	*267	4.04	1.58	1.94
3	2.75	2.6	2.45	1.8	*14.7	1.39	2.00	2.15	81.6	4.58	1.58	1.80
4	1.80	2.1	3.21	1.7	6.38	1.35	3.52	2.00	34.6	4.25	1.48	1.80
5	*2.23	4.6	50.0	1.7	7.68	1.38	2.60	2.00	46.2	4.46	1.38	1.69
6	1.94	220	9.33	1.7	5.18	2.23	2.60	2.00	41.4	3.62	1.38	*1.58
7	1.48	25	5.05	1.6	3.92	1.90	5.98	1.90	12.8	3.62	1.28	1.48
8	2.08	11	3.35	1.6	33.8	1.48	3.35	2.15	6.20	13.9	1.28	1.48
9	2.6	7.31	2.90	1.6	9.96	1.90	7.42	2.00	2.92	17.1	1.38	1.38
10	1.5	8.47	2.90	1.6	5.60	2.15	5.60	2.30	2.36	8.20	1.80	1.38
11	1.4	4.55	3.20	1.6	7.45	1.48	6.49	2.00	2.80	6.75	1.38	1.28
12	1.3	4.13	3.35	1.7	5.75	1.48	7.42	1.90	2.08	5.88	12.0	1.48
13	1.3	4.34	3.20	1.79	3.92	1.38	8.65	2.30	1.94	4.88	7.56	1.38
14	1.2	3.20	2.75	1.48	3.35	2.85	37.7	2.60	2.36	5.98	4.89	1.28
15	1.3	3.05	2.60	1.48	4.17	*4.10	7.92	2.30	3.06	5.30	3.83	1.69
16	2.5	2.75	2.75	1.38	2.90	9.10	5.18	2.75	2.92	7.52	7.90	1.38
17	1.3	2.90	2.30	1.28	2.75	4.44	4.13	2.75	2.78	40.3	5.85	1.28
18	1.4	9.66	2.15	1.28	2.60	2.60	3.50	5.89	2.64	17.8	4.46	1.19
19	1.2	4.76	2.00	1.28	2.45	3.64	3.35	66.8	2.78	8.53	6.87	1.19
20	2.5	3.35	1.90	1.28	2.30	2.90	3.20	4.76	2.78	6.75	7.79	1.28
21	1.4	2.90	*2.6	1.28	2.15	2.75	*2.60	3.35	2.50	7.91	7.61	2.35
22	1.3	2.60	2.1	1.28	2.15	2.30	2.45	2.90	2.36	8.53	6.75	9.56
23	1.2	2.45	2.0	1.38	2.30	2.00	2.30	2.75	4.35	9.52	5.09	2.08
24	1.1	2.30	3.9	1.38	2.00	2.82	2.15	2.60	2.50	10.2	5.24	1.58
25	1.5	2.45	4.1	1.38	1.90	2.75	2.00	2.45	*2.36	7.62	4.04	1.48
26	1.5	2.15	2.3	1.86	1.79	14.4	1.90	2.30	6.99	6.17	4.04	1.48
27	1.2	2.60	2.5	1.81	1.79	7.13	1.79	2.15	9.26	5.83	3.06	2.70
28	1.2	2.45	2.2	1.79	1.69	3.50	1.79	2.15	56.5	1.80	2.64	13.6
29	1.3	2.00	1.9	1.28	1.69	2.75	1.90	46.9	9.41	*1.80	2.50	5.66
30	1.4	2.15	2.1	1.18	1.79	2.75	2.30	-----	9.76	1.80	2.36	3.20
31	1.1	2.00	-----	6.22	-----	5.06	2.15	-----	7.01	-----	2.22	-----
Total	52.94	352.32	136.04	52.39	278.81	97.26	148.39	182.40	643.68	237.91	122.91	73.73
Mean:	1.71	11.4	4.53	1.69	9.29	3.14	4.79	6.29	20.8	7.93	3.97	2.46
mgd	2.65	17.6	7.01	2.61	14.4	4.88	7.41	9.73	32.2	12.3	6.14	3.81
cfs	162	1,080	417	161	856	298	455	560	1,990	750	377	226
Ac-ft												

Calendar year 1959: Max 220 Min 0.80 Mean(mgd) 3.96 Mean(cfs) 6.13 Ac-ft 4,440
Fiscal year 1959-60: Max 267 Min 1.1 Mean(mgd) 6.50 Mean(cfs) 10.1 Ac-ft 7,300

Peak discharge (base, 225 mgd).--Aug. 6 (time unknown) 1,750 mgd (2,710 cfs), 7.23 ft, from floodmark in well; Sept. 5 (2:30 p.m.) 255 mgd (395 cfs), 2.79 ft; Nov. 2 (4 a.m.) 402 mgd (622 cfs), 3.43 ft; Jan. 14 (3:30 p.m.) 425 mgd (658 cfs), 3.52 ft; Feb. 19 (4:30 a.m.) 757 mgd (1,170 cfs), 4.62 ft; Mar. 2 (9 p.m.) 788 mgd (1,220 cfs), 4.71 ft; Apr. 17 (7 a.m.) 538 mgd (523 cfs), 3.17 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 9 to Aug. 8, Sept. 21 to Oct. 12; discharge estimated on basis of recorded range in stage and records for Kalihiwai ditch near Kilauea and Halaulani Stream near Kilauea.

975. Halaulani Stream at altitude 400 ft, near Kilauea

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

Drainage area.--1.1 sq mi, approximately.

Records available.--November 1957 to June 1960.

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

Extremes.--Maximum discharge during fiscal year, 1,340 mgd (2,070 cfs) Aug. 6 (gage height, 8.30 ft), from rating curve extended above 130 mgd on basis of slope-area measurement of peak flow; minimum, 2.50 mgd (3.87 cfs) Oct. 22.
1957-60: Maximum discharge, that of Aug. 6, 1959; minimum, 2.35 mgd (3.64 cfs) June 28, 1959.

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

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6, Jan. 14 to June 30				Aug. 7 to Jan. 14			
0.8	2.02	1.6	18.5	0.8	2.28	1.6	19.2
.9	3.05	1.8	26.0	.9	3.40	1.8	27.2
1.0	4.30	2.1	44.0	1.0	4.80	2.0	37.0
1.1	5.80	2.5	77.0	1.1	6.50	2.2	52.0
1.2	7.70	3.0	136	1.2	8.50	2.4	68.0
1.4	12.2	3.5	207	1.4	13.1		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*4.78	2.74	3.40	3.40	37.2	3.2	5.48	2.95	*14.3	6.18	4.18	4.30
2	4.65	2.95	5.65	3.29	68.1	3.1	4.80	3.18	201	5.35	4.05	4.05
3	7.40	4.73	4.52	3.29	20.7	3.0	4.58	2.95	69.3	6.50	4.18	3.92
4	4.18	4.30	6.63	3.18	10.1	3.0	6.72	2.84	37.4	5.80	3.92	3.80
5	6.67	7.38	41.3	3.06	*11.6	3.0	5.31	2.84	47.6	5.80	3.92	3.55
6	5.50	*152	13.0	2.95	7.70	3.8	5.31	2.74	37.2	5.05	3.80	*3.55
7	4.30	28.0	7.70	2.84	5.99	3.4	9.81	2.74	17.3	4.98	3.68	3.42
8	5.35	21.9	5.82	2.84	35	3.1	6.16	2.95	10.0	18.6	3.68	3.30
9	7.50	12.5	4.97	2.84	16	3.4	11.6	2.74	7.70	20.5	4.21	3.30
10	4.30	13.8	4.97	2.84	10	3.6	9.58	3.56	6.56	11.4	*6.89	3.30
11	3.55	7.50	5.82	2.84	12	3.3	9.60	2.74	7.68	8.75	3.92	3.18
12	3.18	7.30	5.82	3.06	10	3.29	11.9	2.54	5.65	8.02	13.7	3.47
13	3.05	7.50	5.31	3.54	6.0	3.29	12.9	2.95	5.20	7.51	13.1	3.42
14	2.95	5.65	4.52	3.06	5.0	6.98	19.0	3.74	4.90	8.13	7.96	3.42
15	3.05	5.65	5.82	3.06	6.2	*9.03	8.86	3.13	4.60	8.05	5.50	5.12
16	4.18	4.97	4.66	2.84	4.5	15.5	6.37	3.99	4.30	10.2	10.4	3.68
17	3.05	5.31	3.96	2.73	4.4	9.62	5.50	3.42	4.18	30.6	7.79	3.18
18	3.18	11.3	3.82	2.73	4.2	5.48	4.90	8.05	4.05	18.1	6.18	3.05
19	2.95	6.50	3.54	2.62	4.0	7.48	5.05	53.4	4.18	10.0	8.66	2.95
20	4.12	5.48	3.40	2.62	3.8	6.16	4.90	6.37	4.30	8.12	9.80	3.30
21	3.18	4.80	4.70	2.62	3.7	5.82	*4.18	4.60	3.80	7.91	10.4	5.92
22	3.05	4.52	*3.68	2.50	3.7	4.97	3.92	4.05	3.73	6.37	9.59	14.7
23	2.95	4.24	3.54	2.84	3.9	4.24	3.80	3.68	8.29	7.70	7.32	5.20
24	2.74	4.10	6.05	2.84	3.5	5.48	3.68	3.42	4.05	9.13	10.4	4.18
25	6.15	4.24	6.38	2.84	3.4	5.39	3.55	3.30	3.80	6.18	6.56	4.05
26	3.80	3.96	3.96	3.86	3.3	23.6	3.42	3.18	10.8	5.50	6.94	3.92
27	2.95	4.66	4.38	3.94	3.3	12.5	3.30	3.18	11.4	5.20	5.50	7.33
28	2.84	4.52	3.82	3.64	3.2	7.30	3.30	3.30	28.7	4.90	5.05	16.8
29	3.05	3.82	3.40	2.84	3.2	5.82	3.18	45.5	10.5	4.60	4.60	8.48
30	3.18	4.38	3.54	2.73	3.3	5.63	3.05	-----	11.6	4.45	4.45	5.99
31	2.74	3.82	-----	10.1	-----	6.79	3.05	-----	9.08	-----	4.18	-----
Total	124.52	364.52	188.08	100.38	316.99	190.27	196.36	194.01	603.15	269.58	204.51	147.83
Mean:												
mgd	4.02	11.8	6.27	3.24	10.6	6.14	6.33	6.69	19.5	8.99	6.60	4.93
cfs	6.22	18.3	9.70	5.01	16.4	9.50	9.79	10.4	30.2	13.9	10.2	7.63
Ac-ft	382	1,120	577	308	973	584	603	595	1,850	827	628	454

Calendar year 1959: Max 152 Min 2.35 Mean(mgd) 6.11 Mean(cfs) 9.45 Ac-ft 6,850
Fiscal year 1959-60: Max 201 Min 2.50 Mean(mgd) 7.92 Mean(cfs) 12.3 Ac-ft 8,900

Peak discharge (base, 145 mgd).--Aug. 6 (8 p.m.) 1,340 mgd (2,070 cfs), 8.30 ft; Sept. 5 (2 p.m.) 178 mgd (275 cfs), 3.31 ft; Nov. 2 (1:30 p.m.) 218 mgd (337 cfs), 3.57 ft; Nov. 8 (3 p.m.) 157 mgd (245 cfs), 3.21 ft; Feb. 19 (5 a.m.) 552 mgd (854 cfs), 5.30 ft; Feb. 29 (6 p.m.) 163 mgd (252 cfs), 3.21 ft; Mar. 2 (8:30 p.m.) 567 mgd (877 cfs), 5.37 ft; Apr. 17 (6:30 a.m.) about 176 mgd (272 cfs), about 3.30 ft.

* Discharge measurement made on this day.

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

Note.--No gage-height record Nov. 8 to Dec. 11; discharge estimated on basis of recorded range in stage and records for nearby stations.

995. Hanalei ditch near Kilauea

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

Records available.--July 1956 to June 1960 in reports of Geological Survey. July 1951 to June 1956 in files of Kilauea Sugar Co.

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

Extremes.--1956-60: Maximum daily discharge, 19.3 mgd (29.9 cfs) Sept. 17, 1956; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.55	7.70	6.2	0							0	8.45
2	7.85	8.15	8.3	3.24							0	8.30
3	8.60	9.20	8.3	7.85							3.02	8.30
4	8.60	9.35	6.2	7.85							7.55	4.88
5	8.32	9.80	0	6.31							7.25	3.39
6	6.57	5.2	0	4.06							7.10	*8.00
7	8.30	0	0	3.94							7.10	8.00
8	8.00	0	0	6.11							7.25	7.85
9	4.44	0	0	6.97							7.40	7.70
10	0	0	0	6.70							7.70	7.55
11	0	0	0	6.70							7.55	7.25
12	0	0	0	6.84							7.55	7.40
13	2.85	0	0	8.00							7.25	7.65
14	8.84	0	4.5	7.40							4.07	8.15
15	*7.10	0	6.8	7.10							0	8.45
16	7.40	0	6.8	6.31							0	8.45
17	7.85	0	7.0	6.04							0	7.85
18	7.07	0	7.0	5.78							0	5.87
19	4.76	0	7.0	5.52							0	8.25
20	7.84	0	5.4	5.27							0	7.55
21	9.05	0	4.9	5.14							0	7.85
22	8.75	0	7.6	5.14							0	1.55
23	8.60	0	8.0	6.18							0	5.86
24	8.00	0	7.9	6.70							0	7.10
25	8.15	0	5.9	6.31							0	4.24
26	8.15	0	2.22	7.40							0	3.59
27	8.15	0	0	7.40							0	8.75
28	7.55	0	0	7.70							0	8.10
29	8.00	0	0	6.97							0	5.78
30	8.60	0	0	*6.44							0	6.93
31	8.00	0	-----	3.08				-----		-----	3.62	-----
Total	210.94	49.40	110.02	186.45	0	0	0	0	0	0	84.41	209.24
Mean:	6.80	1.59	3.67	6.01	0	0	0	0	0	0	2.72	6.97
cfs	10.5	2.46	5.68	9.30	0	0	0	0	0	0	4.21	10.8
Ac-ft	647	152	338	572	0	0	0	0	0	0	259	642

Calendar year 1959 : Max 10.0 Min 0 Mean(mgd) 3.55 Mean(cfs) 5.49 Ac-ft 3,980
 Fiscal year 1959-60 : Max 9.80 Min 0 Mean(mgd) 2.32 Mean(cfs) 3.59 Ac-ft 2,610

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 6 to Sept. 25; discharge estimated on basis of daily staff-gage readings and ditchman's report of gate openings.

1000. Hanalei tunnel outlet near Lihue

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

Records available.--July 1932 to June 1960 in reports of Geological Survey. October 1925 to June 1932 in files of Lihue Plantation Co.

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

Average discharge.--28 years (1932-60), 18.9 mgd (29.2 cfs).

Extremes.--1932-60: Maximum daily discharge, 64 mgd (99 cfs) Apr. 11, 25, 26, 1942; no flow at times.

Remarks.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River and empties into north branch of North Fork Waialua River, from which it is later diverted and used for irrigation in vicinity of Lihue and Kapaa. Flow regulated by spillway and headgates.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21.2	17.9	0.22	17.9	32.0	17.0	18.4	13.0	12.1	7.00	15.1	16.5
2	28.0	17.9	.14	16.5	39.5	17.9	17.9	13.9	20.5	6.36	17.0	16.5
3	29.5	20.3	.14	19.5	23.6	18.8	17.9	13.0	18.4	10.1	25.1	15.6
4	23.6	22.7	.22	17.0	18.8	16.1	26.6	13.0	16.5	8.60	20.3	16.1
5	27.0	24.1	.22	15.6	25.1	20.3	24.6	13.0	22.2	9.48	19.3	15.6
6	27.5	34.1	.22	15.6	17.9	24.1	*25.6	13.0	25.5	7.96	15.9	15.6
7	26.0	18.0	.22	14.8	17.0	23.2	26.5	13.0	19.4	8.28	17.4	15.2
8	23.2	12.3	.22	14.8	25.8	20.8	21.7	13.0	9.92	11.7	16.2	15.2
9	24.6	6.19	.14	14.8	*19.8	30.7	30.4	13.0	7.59	12.1	18.8	15.2
10	19.8	6.19	.14	14.3	19.3	22.2	32.0	*13.4	7.00	10.4	22.7	15.2
11	18.4	2.29	.14	15.2	17.9	18.8	37.0	14.3	8.42	9.48	18.8	15.2
12	17.9	1.91	.22	18.8	17.4	20.8	39.5	15.6	6.36	5.14	21.2	16.1
13	17.4	3.85	.22	18.8	23.2	22.7	42.0	15.6	6.36	3.55	23.6	16.1
14	17.4	1.91	.22	15.2	20.8	30.5	35.8	15.6	*6.04	6.67	26.0	18.8
15	19.3	1.91	.22	17.0	18.8	27.5	23.2	15.8	5.72	2.69	22.7	19.8
16	24.1	1.73	.22	14.3	17.9	42.0	18.8	25.1	5.72	2.05	27.0	16.5
17	20.8	.94	.22	13.9	17.4	32.0	17.9	16.5	7.11	5.15	24.6	16.1
18	21.2	.22	.22	13.9	17.0	23.6	16.5	23.6	6.36	6.08	22.2	15.6
19	20.8	.14	.22	13.4	17.4	29.5	17.0	24.3	7.96	.94	27.0	15.2
20	27.3	.22	.22	13.4	17.4	25.6	16.5	11.7	7.32	4.36	26.0	16.5
21	20.8	.14	.22	13.9	17.0	30.0	15.2	9.48	6.36	*10.4	25.6	21.2
22	20.3	.14	.22	13.0	17.0	24.3	14.3	10.4	7.02	12.6	25.1	19.3
23	18.4	.14	.14	16.5	17.9	20.8	14.3	9.89	8.13	21.2	20.3	15.2
24	17.4	.22	14.1	15.6	16.1	22.7	13.4	7.96	7.00	21.7	22.2	14.8
25	17.9	.22	24.6	15.6	17.0	21.7	13.4	7.96	7.00	20.3	20.3	14.3
26	17.9	.22	19.3	22.2	16.5	34.5	13.4	7.96	10.4	19.3	*21.7	13.9
27	20.8	.22	25.8	23.6	16.1	23.6	13.4	7.96	8.28	18.8	18.8	15.2
28	17.0	.22	20.3	17.9	15.6	21.2	13.9	9.01	17.2	18.8	16.0	19.8
29	21.2	.22	17.9	15.2	16.1	19.8	13.9	27.6	9.48	17.8	17.4	14.3
30	20.8	.22	25.1	14.8	18.4	20.8	13.4	-----	11.5	18.4	17.0	*13.9
31	17.0	.22	-----	19.3	-----	19.8	13.0	-----	8.60	-----	16.5	-----
Total	664.5	196.98	151.68	502.3	591.7	743.3	657.4	407.62	327.55	317.41	647.8	484.5
Mean:												
mgd	21.4	6.35	5.06	16.2	19.7	24.0	21.2	14.1	10.6	10.6	20.9	16.2
cfs	33.1	9.82	7.83	25.1	30.5	37.1	32.8	21.8	16.4	16.4	32.3	25.1
Ac-ft	2,040	605	465	1,540	1,820	2,280	2,020	1,250	1,010	974	1,990	1,490

Calendar year 1959: Max 42.0 Min 0.14 Mean(mgd) 17.0 Mean(cfs) 26.5 Ac-ft 19,060
 Fiscal year 1959-60: Max 42.0 Min 0.14 Mean(mgd) 15.6 Mean(cfs) 24.1 Ac-ft 17,480

* Discharge measurement made on this day.

1080. Wainiha River near Hanalei

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

Drainage area.--10.2 sq mi.

Records available.--August 1952 to February 1956, October 1957 to June 1960. July 1914 to June 1916 at site half a mile downstream; records not equivalent. Gage-height records collected in this vicinity from April 1923 to December 1940 are contained in files of McBryde Sugar Co.

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

Extremes.--Maximum discharge during year, 13,000 mgd (20,100 cfs) Aug. 6 (gage height, 8.19 ft), from rating curve extended above 660 mgd on basis of slope-area measurement at gage height, 7.72 ft; minimum, 29.0 mgd (44.9 cfs) Oct. 19-23, 1952-56, 1957-60: Maximum discharge recorded, that of Aug. 6, 1959; minimum, 22.5 mgd (34.8 cfs) Feb. 12, 1954. Flood of Feb. 17, 1956, reached a stage of about 14.1 ft (discharge not determined).

Remarks.--Records good except those for periods of fragmentary gage-height record, which are fair, and those for periods of no gage-height record, which are poor. Water passing station is used for power by McBryde Sugar Co.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.2	28.0	2.5	165
1.4	38.3	3.0	300
1.6	50.0	3.5	530
1.8	65.0	4.0	850
2.0	84.0	4.5	1,350

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	70.4	34.8	44.0	41.2	254	42.4	36.7	31.0	124	41.2	36.7	37.2
2	175	42.6	62.5	34.6	670	47.2	34.6	32.5	359	38.3	35.6	35.6
3	173	75.4	44.4	37.7	86.8	46.2	33.0	32.5	301	51.1	127	35.6
4	97.9	119	72.6	36.2	53.5	34.6	94.9	33.0	155	74.1	53.6	35.1
5	222	158	365	32.5	102	56.0	78.5	32.0	171	77.1	46.6	34.6
6	194	1,330	115	31.5	54.4	73.5	70.2	30.5	248	76.5	37.8	34.6
7	119	f451	66.9	31.0	41.2	62.4	99.4	30.5	383	96.0	35.6	33.5
8	83.0	f138	47.0	30.5	200	58.6	59.5	30.5	82.0	201	36.7	33.5
9	84.8	150	41.2	30.5	92.0	143	237	31.5	*53.5	251	49.0	33.0
10	49.5	f179	39.8	30.0	*53.2	63.1	180	33.0	44.0	158	82.0	33.0
11	38.3	a130	65.4	33.0	45.6	44.4	237	41.6	53.3	102	44.0	33.0
12	37.2	a100	71.4	41.7	41.2	61.4	354	65.2	47.0	86.2	49.8	37.9
13	34.1	a80	69.0	50.0	40.5	73.3	526	61.4	41.2	69.6	95.6	42.5
14	33.8	a70	57.8	34.6	38.3	194	225	54.3	38.3	476	266	86.3
15	48.1	a60	43.2	41.5	34.6	176	70.4	74.0	36.7	97.3	99.1	106
16	105	a50	73.8	32.0	33.5	570	57.0	595	35.6	167	148	51.1
17	47.5	a70	41.2	30.5	32.5	307	51.8	158	48.1	350	82.4	41.2
18	51.2	144	38.3	29.5	32.0	69.5	41.2	226	49.1	305	57.9	41.2
19	46.3	58.2	38.3	29.0	32.5	143	42.2	461	74.0	91.0	224	44.0
20	84.6	44.0	35.6	29.0	38.2	98.9	45.2	97.0	47.0	74.0	180	60.5
21	38.3	41.2	46.9	29.0	36.2	196	36.7	61.0	41.2	114	153	134
22	40.2	38.3	38.3	29.0	34.6	122	34.1	72.7	39.5	59.8	137	233
23	35.6	38.3	52.0	37.2	43.3	58.5	33.0	67.7	69.9	72.3	74.2	76.2
24	31.0	38.7	108	38.8	36.7	62.8	33.0	44.0	67.0	77.0	64.3	63.7
25	31.2	77.2	f72.6	41.5	45.4	61.7	31.5	38.3	75.2	53.5	53.5	56.6
26	31.0	53.6	a40	76.3	48.8	294	31.5	36.7	206	44.0	63.6	56.4
27	37.8	62.7	f54.3	101	38.3	82.3	33.0	35.6	127	41.2	44.0	97.4
28	30.5	50.0	a45	45.1	34.1	57.2	*39.7	35.2	180	38.3	44.0	276
29	51.6	49.2	*f34.6	34.1	34.1	45.0	371	74.2	371	37.8	41.2	74.1
30	47.7	60.4	76.7	31.5	47.8	45.3	35.6	-----	91.2	37.2	38.3	64.2
31	31.5	55.0	-----	53.6	-----	43.6	32.0	-----	48.5	-----	38.3	-----
Total	2,201.1	4,048.6	2,000.8	1,203.6	2,375.3	3,434.9	2,947.8	2,912.7	3,410.5	3,457.5	2,538.8	2,021.0
Mean:												
mgd	71.0	131	66.7	38.8	79.2	111	95.1	100	110	115	81.9	67.4
cfs	110	203	103	60.0	123	172	147	155	170	178	127	104
Ac-ft	6,750	12,420	6,140	3,690	7,290	10,540	9,050	8,940	10,470	10,610	7,790	6,200

Calendar year 1959: Max 1,330 Min 28 Mean(mgd) 75.5 Mean(cfs) 117 Ac-ft 84,570
Fiscal year 1959-60: Max 1,330 Min 29.0 Mean(mgd) 88.9 Mean(cfs) 138 Ac-ft 99,890

Peak discharge (base, 2,000 mgd).--Aug. 6 (8 p.m.) 13,000 mgd (20,100 cfs), 8.19 ft; Nov. 2 (11:30 a.m.) 2,000 mgd (3,090 cfs), 5.00 ft; Feb. 16 (2:30 a.m.) 2,660 mgd (4,150 cfs), 5.41 ft.

* Discharge measurement made on this day.

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

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

2000. Left Branch of North Fork Kaukonahua Stream near Wahiawa

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

Drainage area.--1.38 sq mi (revised).

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

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

Average discharge.--38 years (1913-24, 1926-53), 10.7 mgd (16.6 cfs).

Extremes.--1960: Maximum discharge during period April to June, 1,200 mgd (1,860 cfs) May 12 (gage height, 7.11 ft), from rating curve extended above 43 mgd by test on model of station site; minimum, 1.87 mgd (2.89 cfs) June 12, 13.
1913-53, 1960: Maximum discharge, 3,550 mgd (5,490 cfs) Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 15 mgd by test on model of station site; minimum, 0.08 mgd (0.12 cfs) Mar. 2, 13, 1941.

Remarks.--Records fair.

Revisions (fiscal years).--WSP 1219: 1931-33(M), 1935(M), 1937-38(M).

Rating table, Apr. 25 to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

1.8	1.45	2.8	27.5
1.9	2.15	3.1	52.0
2.1	4.30	3.5	100
2.3	7.90	4.0	185
2.5	13.4		

Discharge, in million gallons a day, April to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1										-	3.00	3.70
2										-	3.00	3.35
3										-	5.70	3.00
4										-	5.72	2.80
5										-	3.10	2.60
6										-	2.55	2.45
7										-	2.25	2.25
8										-	2.25	2.15
9										-	4.94	2.00
10										-	39.0	6.41
11										-	3.95	2.45
12										-	158	2.00
13										-	52.8	2.00
14										-	40.0	2.80
15										-	10.4	23.0
16										-	15.1	6.47
17										-	11.7	2.90
18										-	7.50	5.68
19										-	16.5	5.71
20										-	*19.0	3.45
21										-	9.85	14.4
22										-	22.0	16.6
23										-	9.87	22.7
24										-	6.90	13.7
25										5.30	12.5	10.6
26										4.60	11.3	12.5
27										4.10	6.50	13.8
28										3.70	5.10	60.1
29										3.45	4.80	12.9
30										3.45	4.10	7.30
31										-----	4.50	-----
Total										-	503.88	273.77
Mean:										-	16.3	9.13
mgd										-	25.2	14.1
cfs										-	1,550	840
Ac-ft												
Calendar year		Max	Min			Mean(mgd)		Mean(cfs)		Ac-ft		
Fiscal year		Max	Min			Mean(mgd)		Mean(cfs)		Ac-ft		

Peak discharge (base, 700 mgd).--May 12 (7 a.m.) 1,200 mgd (1,860 cfs), 7.11 ft.

* Discharge measurement made on this day.

2030. Mauka ditch near Wahiawa

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

Records available.--March 1947 to June 1960. Prior to July 1958, published as Kaukonahua ditch near Wahiawa.

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

Average discharge.--13 years, 3.15 mgd (4.87 cfs).

Extremes.--1947-60: Maximum daily discharge, 10.1 mgd (15.6 cfs) Jan. 27, 1948; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.89	3.52	2.79	3.98	4.10	1.20	1.69	3.30	2.39	6.13	4.3	4.96
2	4.96	3.72	2.79	3.62	5.38	2.21	1.46	3.19	5.66	5.61	4.2	4.83
3	5.22	3.30	2.79	3.50	4.46	2.34	1.50	2.99	5.48	5.22	6.0	4.58
4	3.98	2.99	3.40	3.40	3.74	3.33	4.46	2.79	6.00	5.61	6.0	4.34
5	4.89	3.78	4.22	3.30	5.40	3.74	3.40	2.68	*6.00	5.30	5.5	4.22
6	3.86	6.11	3.74	3.30	3.86	4.83	4.53	2.58	6.26	4.96	4.8	3.98
7	3.30	5.35	3.74	3.19	3.74	*2.94	5.55	2.39	7.43	5.5	4.6	3.86
8	2.89	4.46	3.30	3.30	5.74	1.85	3.74	2.21	5.74	4.2	4.5	3.74
9	2.58	5.48	3.09	3.19	4.10	3.73	4.92	2.03	6.21	6.0	5.0	3.50
10	2.21	4.70	3.09	2.99	3.50	3.09	5.61	2.12	5.22	6.0	6.0	5.00
11	2.62	3.98	3.48	3.30	3.30	2.30	5.61	3.24	4.83	6.5	5.5	4.10
12	3.09	3.74	4.34	3.62	3.09	3.66	5.74	2.79	4.46	6.0	7.5	3.50
13	2.79	3.50	3.74	3.74	2.89	4.43	5.09	2.79	4.22	5.5	7.0	3.50
14	2.12	3.30	*4.05	3.19	2.68	5.74	6.09	3.76	3.74	6.5	7.0	3.88
15	1.85	3.50	3.50	3.09	2.30	4.46	5.36	5.22	3.50	5.87	7.0	6.02
16	3.50	3.19	3.30	2.79	2.12	3.50	6.00	6.65	3.30	7.30	6.5	5.72
17	3.09	3.19	3.19	2.48	1.94	4.83	5.74	5.87	3.09	6.91	6.5	4.46
18	3.19	4.46	3.19	2.30	1.85	3.40	5.61	6.91	2.89	6.52	6.5	4.83
19	2.68	4.10	2.99	2.03	1.85	2.79	5.35	6.13	4.50	5.74	7.0	5.22
20	3.30	3.74	2.79	1.85	1.61	2.39	*5.32	5.48	6.26	5.61	*7.0	4.58
21	2.99	3.50	2.79	1.77	1.61	2.58	5.09	4.83	4.70	6.00	6.13	6.36
22	2.30	3.30	3.37	1.69	1.46	2.79	4.96	4.34	3.98	5.61	7.27	6.70
23	1.94	3.19	3.09	*3.15	1.58	2.21	4.83	4.34	4.58	5.35	6.52	6.78
24	1.77	3.19	3.35	2.21	2.32	3.47	4.58	*3.68	4.96	5.22	5.87	*6.0
25	1.53	4.58	4.10	2.60	1.39	3.40	4.22	3.30	4.58	4.96	6.13	6.0
26	1.61	3.86	3.62	4.30	1.25	2.68	3.74	3.09	6.35	4.83	6.13	6.0
27	2.45	3.40	4.22	4.43	1.12	2.68	4.10	2.89	6.00	4.6	5.74	6.5
28	1.46	3.40	3.50	3.86	1.18	2.68	4.22	2.68	6.13	4.6	5.35	7.0
29	*3.56	3.30	3.65	2.79	1.32	2.30	3.74	2.48	5.09	4.5	5.35	6.5
30	3.19	3.19	4.58	2.30	1.18	2.39	3.74	-----	6.26	4.5	5.22	6.0
31	2.58	2.99	-----	2.89	-----	2.03	3.50	-----	6.26	-----	5.35	-----
Total	91.39	118.01	103.79	94.15	82.06	95.77	139.49	106.75	156.07	167.15	183.46	152.76
Mean	2.95	3.81	3.46	3.04	2.74	3.09	4.50	3.68	5.03	5.57	5.92	5.09
cfs	4.56	5.89	5.35	4.70	4.24	4.78	6.96	5.69	7.78	8.62	9.16	7.88
Ac-ft	280	362	319	289	252	294	428	328	479	513	563	469

Calendar year 1959: Max 7.1 Min 0.68 Mean(mgd) 2.88 Mean(cfs) 4.46 Ac-ft 3,220
 Fiscal year 1959-60: Max 7.5 Min 1.12 Mean(mgd) 4.07 Mean(cfs) 6.30 Ac-ft 4,580

* Discharge measurement made on this day.

Note.--No gage-height record Apr. 7-14, Apr. 27 to May 20, June 24-30; discharge estimated on basis of records for nearby stations.

2040. North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'55", long 157°59'20", on left bank 3 miles northeast of Wahiawa and 8.6 miles north of Pearl City.

Drainage area.--4.86 sq mi.

Records available.--September 1946 to June 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from topographic map).

Average discharge.--13 years (1947-60), 21.2 mgd (32.8 cfs).

Extremes.--Maximum discharge during year, 1,240 mgd (1,920 cfs) May 12 (gage height, 9.25 ft, from floodmark in well), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; minimum, 0.22 mgd (0.34 cfs) Nov. 26, 27.

1946-60: Maximum discharge, 2,200 mgd (3,400 cfs) Nov. 28, 1954 (gage height, 15.55 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; no flow at times in 1953.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Poamoho tunnel diverts water from Poamoho Stream into North Fork Kaukonahua Stream about 1 mile above station. Mauka ditch diverts water 2.6 miles above station for domestic use in Wahiawa (see p. 56).

Revisions (fiscal years).--WSP 1289: 1947-52. WSP 1569: 1955(M), drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.15	1.3	20.0
.3	.39	1.6	37.5
.4	.80	2.0	74.0
.5	1.45	2.4	131
.6	2.35	3.0	245
.8	5.00	4.0	424
1.0	9.10	5.0	584

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.5	12.3	0.93	16.3	6.11	0.29	0.55	2.5	0.93	37.2	4.20	6.78
2	34.0	9.20	.76	7.30	89.8	.39	.39	2.1	17.7	6.83	4.10	4.60
3	35.9	4.22	.68	4.80	5.56	.80	.34	1.9	11.0	3.95	32.3	4.20
4	6.81	2.48	5.19	3.50	2.15	3.15	31.1	1.7	22.5	17.8	15.1	3.50
5	43.0	14.6	57.6	2.70	26.6	4.26	8.71	1.6	22.0	*10.2	7.92	3.15
6	6.85	191	9.50	2.15	3.55	26.9	46.1	1.5	61.9	5.83	4.60	2.80
7	3.15	30.9	9.16	1.72	1.63	*2.63	50.0	1.3	*11.1	6.48	3.50	2.60
8	1.99	8.40	3.65	1.63	33.8	.64	6.95	1.2	17.3	2.70	3.0	2.35
9	1.28	29.1	1.72	1.90	4.07	7.99	46.0	1.2	33.7	54.6	4.5	2.15
10	.93	9.20	1.19	1.00	1.99	2.80	50.1	1.0	8.82	18.6	80	8.87
11	2.13	4.60	2.67	1.32	1.26	.80	69.0	2.4	4.70	65.9	3.6	5.02
12	4.51	5.60	29.0	7.82	1.00	3.87	19.3	2.7	3.50	54.8	460	2.15
13	1.90	4.42	17.1	12.0	.80	13.5	235	2.2	2.60	14.1	260	2.15
14	.93	2.60	*20.3	3.28	.64	69.2	497	3.3	2.35	103	170	2.25
15	.72	4.16	4.37	1.45	.51	11.0	123	6.0	1.99	65.4	40	38.0
16	34.7	3.43	2.15	.93	.51	2.90	38.6	28	1.72	188	22	16.9
17	2.81	2.60	1.63	.55	.43	19.6	24.5	19	1.63	117	12	5.00
18	2.93	93.4	1.63	.39	.37	4.19	21.5	75	1.54	96.2	8.5	6.55
19	1.32	30.1	1.45	.32	.34	1.63	14.6	30	14.9	27.0	34.1	9.75
20	3.89	6.62	.80	.29	.32	.80	*14.0	8.0	41.0	22.8	76.0	4.20
21	2.54	3.80	.72	.29	.34	.80	10.0	4.0	5.24	44.0	32.9	45.9
22	.72	2.90	3.33	.27	.66	1.72	8.00	2.5	2.25	23.7	50.0	53.6
23	.51	2.25	2.54	.74	1.63	1.12	6.00	3.0	3.77	15.7	29.1	51.1
24	.43	2.10	27.0	1.00	2.15	8.94	5.90	*2.0	9.69	15.3	20.0	*18.6
25	.37	43.6	22.6	.43	2.15	6.48	5.40	1.4	5.60	10.6	34.5	30.4
26	.37	13.0	2.98	13.6	1.12	1.99	4.80	1.12	11.6	8.60	29.5	23.2
27	.39	4.93	30.0	*22.6	.29	2.15	3.95	1.00	27.5	7.30	15.7	36.8
28	.37	3.15	4.09	5.23	.47	2.35	4.10	.93	27.0	6.40	11.5	124
29	*15.5	2.70	99.0	1.45	.64	1.00	3.65	.86	7.13	5.50	10.0	23.0
30	4.20	2.60	105	.68	.32	1.71	3.15	-----	57.5	5.20	7.30	15.0
31	1.48	2.01	-----	.76	-----	.93	2.8	-----	80.8	-----	9.10	-----
Total	230.11	551.97	468.74	118.40	191.21	206.53	1,355.29	209.41	621.06	1,060.89	1,495.02	554.57
Mean:												
mgd	7.42	17.8	15.6	3.82	6.37	6.66	43.7	7.22	20.0	35.4	48.2	18.5
cfs	11.5	27.5	24.1	5.91	9.86	10.3	67.6	11.2	30.8	54.8	74.6	28.6
Ac-ft	706	1,690	1,440	363	597	634	4,160	643	1,910	3,260	4,590	1,700

Calendar year 1959: Max 500 Min 0.27 Mean(mgd) 11.5 Mean(cfs) 17.8 Ac-ft 12,890
Fiscal year 1959-60: Max 497 Min 0.27 Mean(mgd) 19.3 Mean(cfs) 29.9 Ac-ft 21,680

Peak discharge (base, 1,100 mgd).--Aug. 6 (3:30 p.m.) 1,200 mgd (1,860 cfs), 9.00 ft; Jan. 14 (8:30 p.m.), 1,230 mgd (1,900 cfs), 9.18 ft; May 12 (time unknown), 1,240 mgd (1,920 cfs), 9.25 ft, from floodmark in well.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 31 to Feb. 25, May 8-18; discharge estimated on basis of records for nearby stations.

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

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

Drainage area--4.04 sq mi.

Records available--July 1957 to June 1960.

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

Extremes--Maximum discharge during year, 724 mgd (1,120 cfs) Aug. 6 (gage height, 5.10 ft); minimum, 0.73 mgd (1.13 cfs) July 28.
1957-60: Maximum discharge, 1,270 mgd (1,960 cfs) Feb. 21, 1959 (gage height, 6.40 ft); minimum, 0.46 mgd (0.71 cfs) June 19, 1959.
Flood of Feb. 25, 1956, is the highest known since 1946 and reached a stage of 8.85 ft (effected by backwater from Wahiawa Reservoir).

Remarks--Records fair. Koolau ditch diverts water into Koolau Reservoir (capacity, 43,000,000 gal), and Ku Tree Reservoir (capacity, 293,000,000 gal) located on tributary

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.8	2.88	4.60	15.8	4.68	5.20	1.32	2.00	2.48	12.3	4.60	3.91
2	11.8	12.3	3.91	5.00	58.1	3.66	1.15	1.90	11.4	5.20	4.25	3.60
3	6.97	5.65	3.91	3.60	5.69	1.32	1.00	1.90	10.8	3.75	4.45	3.75
4	5.60	4.80	4.82	2.90	2.90	.88	4.52	1.80	21.4	14.1	3.91	3.31
5	41.0	12.0	35.4	2.48	10.5	1.00	3.02	1.80	15.1	*6.95	4.60	3.00
6	7.76	106	13.3	2.12	3.94	18.2	2.48	1.80	32.6	5.73	3.75	2.90
7	4.25	19.6	5.77	2.00	2.23	*3.83	38.5	1.69	*32.6	7.95	3.31	2.62
8	3.00	6.00	3.75	2.75	21.7	1.69	5.89	1.69	32.8	4.60	3.45	2.48
9	2.00	15.9	2.90	3.45	4.43	1.37	24.0	1.69	34.2	77.2	3.60	2.36
10	1.69	10.1	2.62	2.23	2.75	2.12	39.4	1.80	11.4	23.0	55.9	2.36
11	1.50	4.60	3.31	2.36	2.00	1.15	10.2	2.48	6.45	22.2	6.69	2.62
12	2.23	8.15	17.2	4.42	1.80	2.43	21.9	2.90	5.20	14.5	109	2.62
13	1.60	4.80	8.69	9.28	2.98	2.12	43.0	2.62	4.25	8.55	97.0	2.69
14	1.24	3.16	7.34	4.10	4.10	37.5	116	9.34	3.91	27.2	52.5	2.62
15	1.15	13.8	4.24	3.16	3.91	20.80	65.6	31.3	3.45	11.7	14.4	17.5
16	3.79	5.08	2.90	2.23	3.60	3.45	15.5	78.3	3.16	71.2	11.3	8.37
17	2.48	5.00	2.62	1.60	3.91	10.9	9.70	9.70	3.16	80.8	*12.3	3.60
18	1.50	37.7	2.62	1.41	4.45	4.12	12.1	28.7	2.75	41.2	7.10	2.75
19	1.41	9.51	2.36	1.32	5.00	2.00	6.85	30.5	8.82	15.0	12.8	3.60
20	1.15	5.00	2.00	1.32	5.00	1.41	6.60	9.98	30.5	11.8	13.5	2.62
21	1.50	4.80	1.90	1.24	4.80	1.41	5.20	5.00	7.45	12.2	10.4	5.32
22	1.24	3.31	1.69	*1.09	4.80	2.80	4.25	3.91	3.91	9.70	26.8	21.6
23	1.00	2.90	1.80	1.32	5.00	1.90	3.75	3.91	3.73	16.0	18.3	*70.7
24	.93	2.75	7.11	1.60	5.20	6.41	3.45	3.31	5.56	13.8	8.30	32.7
25	.90	34.9	12.0	1.41	4.60	6.94	3.16	*2.90	7.21	8.00	7.70	21.6
26	.80	14.6	2.90	4.36	3.60	2.48	3.00	2.75	3.16	6.60	9.62	16.2
27	.84	6.20	12.9	6.41	3.60	3.72	2.75	2.62	30.7	6.00	6.85	18.4
28	.80	5.39	3.60	4.15	4.25	2.12	2.90	2.48	15.6	5.39	5.39	80.6
29	7.51	5.39	15.9	1.80	5.20	1.50	2.62	2.48	7.52	5.00	5.00	24.6
30	*3.15	6.20	61.7	1.32	5.39	1.80	2.36	-----	12.0	5.20	4.45	14.0
31	1.41	5.60	-----	1.32	-----	1.50	2.12	-----	10.1	-----	4.25	-----
Total	135.00	384.07	255.76	99.55	200.11	157.73	464.29	253.35	383.37	552.82	534.47	385.00
Mean	4.35	12.4	8.53	3.21	6.67	5.09	15.0	8.74	12.4	18.4	17.2	12.8
mgd	6.73	19.2	13.2	4.97	10.3	7.88	23.2	13.5	19.2	28.5	26.6	19.8
cfs	414	1,180	785	306	614	484	1,420	778	1,780	1,700	1,640	1,180
Ac-ft												

Calendar year 1959: Max 309 Min 0.51 Mean(mgd) 8.29 Mean(cfs) 12.8 Ac-ft 9,290
Fiscal year 1959-60: Max 116 Min 0.80 Mean(mgd) 10.4 Mean(cfs) 16.1 Ac-ft 12,280

Peak discharge (base, 450 mgd)--Aug. 6 (3 p.m.) 724 mgd (1,120 cfs), 5.10 ft; Nov. 2 (8:30 a.m.) 488 mgd (755 cfs), 4.43 ft; Apr. 17 (12:30 a.m.) 453 mgd (701 cfs), 4.32 ft.

* Discharge measurement made on this day.

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

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

Drainage area.--0.86 sq mi.

Records available.--August 1957 to June 1960.

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

Extremes.--Maximum discharge during year, 30.1 mgd (46.6 cfs) Aug. 25 (gage height, 2.56 ft); no flow at times.
1957-60: Maximum discharge, 498 mgd (771 cfs) Mar. 5, 1958 (gage height, 5.34 ft), from rating curve extended above 110 mgd by logarithmic plotting; no flow at times.

Remarks.--Records fair.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.06	0	0.9	1.85
.1	.02	1.2	3.80
.2	.09	1.5	6.60
.3	.20	1.7	9.15
.5	.51	1.9	12.5
.7	1.00		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.04	0.01	0.05	0.05	0.01	0.01	0.02	0.03	0.01	0.05	0	0.04
2	.08	.01	.04	.03	.06	.01	.02	.03	.01	.04	0	.04
3	.09	.01	.05	.02	.01	.01	.02	.03	.03	.03	0	.05
4	.11	.02	.05	.03	.03	.01	.03	.03	.01	.02	0	.04
5	8.79	.04	.06	.04	.03	.01	.04	.02	.01	.02	0	.05
6	1.18	4.34	.04	.05	0	.01	.06	.02	.08	.01	0	.05
7	.45	3.16	.04	.02	0	0	.17	.02	.56	.01	0	.04
8	.15	.39	.04	.03	.01	0	.04	.02	.06	.01	.01	.04
9	.05	2.54	.04	.03	.01	0	.25	.03	7.68	.01	.01	.05
10	.05	.78	.04	.03	.01	0	.16	.03	1.57	.01	.01	.03
11	.04	.14	.05	.03	.01	.01	.03	.02	.51	.01	.01	.04
12	.03	.05	.05	.02	.01	.02	.03	.01	.20	.01	.02	.04
13	.03	.10	.05	.01	.01	.01	.09	.03	.11	.01	.06	.04
14	.03	.05	.05	.01	0	.12	.50	.13	.11	.02	.22	.05
15	.03	.05	.04	.02	0	.08	2.61	.11	.11	.03	.03	.07
16	.03	.04	.02	.03	0	.01	.38	.16	.11	.03	.01	.09
17	.03	.04	.02	.02	.01	.03	.18	.08	.16	.05	.01	.08
18	.03	1.86	.02	.03	.01	.01	.13	.10	.12	.03	0	.07
19	.03	.56	.02	.03	0	.01	.12	.05	.12	.02	.10	.08
20	.02	.07	.01	.03	0	0	*.11	.02	.12	.02	.10	.08
21	.02	.03	.01	.04	0	.01	.10	.01	.11	.03	.03	.09
22	.02	.03	.02	.03	0	.03	.09	.01	.11	.04	.24	.17
23	.02	.03	.02	.01	0	.01	.08	.01	.11	.17	.10	.15
24	.02	.05	.02	.01	.01	.03	.08	.01	.10	.05	.04	.11
25	.02	11.5	.03	.01	.01	.04	.07	*.01	.09	.02	.04	.11
26	.02	1.72	.03	.01	.01	.05	.06	.01	.08	.01	.03	.13
27	.01	.56	.03	.01	.01	.05	.05	.01	.08	.01	.03	1.78
28	.01	.21	.03	.01	.01	.05	.05	.01	.07	0	.05	11.1
29	.01	.11	.04	.01	.01	.05	.05	.01	.07	0	.04	*2.05
30	.01	.07	.03	.01	.01	.03	.06	-----	.05	0	.04	1.80
31	0	.06	-----	.02	-----	.02	.04	-----	.05	-----	.03	-----
Total	11.45	28.63	1.04	0.73	0.29	0.73	5.72	1.04	12.61	0.77	1.24	18.56
Mean:												
mgd	0.369	0.924	0.035	0.024	0.010	0.024	0.195	0.036	0.407	0.026	0.040	0.619
cfs	0.571	1.45	0.054	0.037	0.016	0.037	0.286	0.056	0.630	0.040	0.062	0.958
Ac-ft	35	88	3.2	2.2	0.9	2.2	18	3.2	59	2.4	3.8	57

Calendar year 1959: Max 42.0 Min 0 Mean(mgd) 0.552 Mean(cfs) 0.854 Ac-ft 618
Fiscal year 1959-60: Max 11.5 Min 0 Mean(mgd) 0.226 Mean(cfs) 0.350 Ac-ft 255

* Discharge measurement made on this day.

2109. Poamoho tunnel near Wahiawa

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

Records available.--July 1958 to June 1960.

Gage.--Water-stage recorder and 7-foot concrete flume. Altitude of gage is 1,120 ft (from topographic map).

Extremes.--1958-60: Maximum daily discharge, 116 mgd (179 cfs) Aug. 8, 1958; no flow at times.

Remarks.--Records good. Water from Poamoho Stream basin is diverted by Poamoho tunnel to Kaukonahua Stream basin.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.62	0	0.03	0.03	0.06	0	0.15	0.69	0.06	0.21	1.36	0.82
2	4.01	0	.03	.03	1.78	0	.10	.65	.05	.03	1.69	.03
3	5.62	0	.03	.03	.03	0	.07	.59	.06	.03	16.1	.03
4	.03	0	.02	.04	.02	0	9.26	.56	.50	1.58	6.22	.03
5	3.55	2.58	7.08	.04	.02	.79	3.94	.53	.47	.06	2.55	.03
6	.03	46.3	.07	.03	0	.34	12.3	.50	7.37	.06	1.74	.03
7	.02	7.82	.24	.01	0	.02	6.01	.44	39.7	.07	1.42	.03
8	.02	1.59	.03	0	.19	.01	1.36	.42	2.28	.07	1.24	.03
9	.02	4.23	.03	0	.02	0	5.57	.36	1.92	9.89	1.49	.03
10	.01	2.11	.03	0	0	0	6.33	.40	.22	.06	19.7	.03
11	0	.82	.03	0	0	0	12.8	1.05	.15	9.78	2.55	.03
12	0	.86	.03	0	0	0	59.3	1.05	.14	1.69	33.4	.03
13	0	.56	.02	.13	0	0	82.5	.73	.14	1.82	51.3	.03
14	0	.40	.01	.04	0	1.35	100	1.63	.14	22.0	66.3	.03
15	0	1.24	0	.03	0	.38	18.8	2.58	.14	13.1	13.7	.22
16	2.77	.72	0	.03	0	.11	7.90	9.11	.13	35.8	9.22	.03
17	.02	.71	0	.03	0	6.89	5.32	1.83	.14	26.8	6.23	.03
18	.01	31.8	0	0	0	.82	4.62	13.9	.14	14.0	*4.28	.03
19	0	7.58	0	0	0	.22	3.40	2.15	1.19	2.26	5.22	.03
20	0	1.81	0	0	0	.08	*3.02	.16	7.52	4.00	14.5	.03
21	0	1.24	0	0	0	.18	2.48	.11	.15	15.6	5.35	3.89
22	0	.95	0	0	0	.36	2.16	.10	.34	4.92	5.63	3.72
23	0	.77	0	0	0	.18	1.88	.09	.41	3.90	4.54	2.94
24	0	.69	1.59	0	0	1.08	1.67	.08	3.20	3.50	4.40	.20
25	0	2.23	.71	0	0	1.17	1.48	.07	.92	2.57	7.63	2.38
26	0	1.86	.03	0	0	.40	1.30	.07	1.46	2.16	7.33	.03
27	0	1.00	.28	2.74	0	.32	1.18	.06	4.52	2.02	3.27	.76
28	0	.73	.03	.02	0	.40	1.36	.06	4.01	1.81	2.57	*8.14
29	0	.65	3.73	0	0	.23	1.06	.06	.63	1.60	2.23	.04
30	0	1.20	4.60	0	0	.37	.91	-----	22.4	1.48	2.09	.04
31	0	.47	-----	0	-----	.19	.82	-----	15.8	-----	2.56	-----
Total	16.73	122.72	16.65	3.23	2.12	15.89	339.05	40.03	114.30	182.87	307.81	23.74
Mean:												
mgd	0.540	3.96	0.622	0.104	0.071	0.512	10.9	1.39	3.69	6.10	9.93	0.791
cfs	0.836	6.13	0.962	0.161	0.110	0.792	16.9	2.14	5.71	9.44	15.4	1.22
Ac-ft	51	377	57	10	6.5	49	1,040	123	351	561	945	73

Calendar year 1959: Max 93 Min 0 Mean(mgd) 1.71 Mean(cfs) 2.65 Ac-ft 1,940
 Fiscal year 1959-60: Max 100 Min 0 Mean(mgd) 3.24 Mean(cfs) 5.01 Ac-ft 3,640

* Discharge measurement made on this day.

2110. Poamoho Stream near Wahiawa

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

Drainage area.--1.79 sq mi.

Records available.--January 1947 to June 1960.

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

Average discharge.--13 years, 2.57 mgd (3.98 cfs).

Extremes.--Maximum discharge during year, 330 mgd (511 cfs) May 14 (gage height, 3.38 ft), from rating curve extended above 48 mgd by test on model of station site; no flow at times.
1947-60: Maximum discharge, 1,000 mgd (1,550 cfs) Oct. 23, 1958 (gage height, 6.06 ft), from rating curve extended above 48 mgd by test on model of station site; no flow at times.

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

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.07	0	0.6	2.83
.08	.01	.8	5.75
.1	.02	1.0	10.0
.2	.20	1.2	16.2
.4	.99		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.25	0.38	0.69	3.13	3.56	0.18	0.23	0.03	0.60	3.85	0.26	1.43
2	3.30	2.87	.64	1.25	10.9	.70	.20	.01	3.50	2.46	.23	1.97
3	4.15	1.38	.80	.94	2.20	.45	.20	0	4.64	1.77	.32	1.77
4	1.60	.94	1.64	.79	1.11	*2.04	.26	0	6.62	3.04	.32	1.68
5	2.77	8.51	7.77	.64	2.70	2.60	.35	0	6.97	2.82	.35	1.41
6	1.75	15.7	4.02	.56	1.59	8.66	.45	0	8.23	*2.28	.32	1.33
7	.94	1.41	4.42	.49	2.28	1.55	.35	0	11.2	2.35	.29	1.25
8	.69	1.33	1.50	.45	11.0	.69	.32	0	4.93	1.69	.26	1.25
9	.52	1.11	1.04	.49	1.93	3.10	.29	0	5.10	9.88	.23	1.25
10	.42	.85	.88	.38	1.04	2.36	.32	.01	3.15	6.90	.29	2.18
11	.38	.74	.94	.42	.83	.79	.29	0	2.46	10.9	.26	1.85
12	.64	.69	1.50	.49	.74	1.28	.45	0	1.97	8.77	.39	1.18
13	.64	.60	1.18	2.84	.69	3.18	.56	0	1.68	2.04	.73	1.18
14	.42	.52	2.45	.97	.52	10.5	6.50	0	1.41	.60	11.1	1.25
15	.32	.45	*1.14	.64	.45	2.89	.16	0	1.33	.52	.02	4.98
16	8.07	.38	.79	.49	.42	1.18	.13	0	1.25	.77	.02	3.01
17	1.10	.35	.64	.32	.35	.79	.11	3.31	1.11	.42	.02	1.50
18	.74	1.41	.60	.26	.32	.64	.09	11.6	1.04	.42	.01	1.33
19	.52	.38	.56	.20	.29	.60	.07	8.62	3.17	.52	.01	1.25
20	.49	.32	.45	.18	.23	.56	.06	3.43	7.23	.60	.02	1.56
21	.74	.29	.45	.16	.26	.45	.05	1.41	2.43	.45	0	4.71
22	*.58	.26	.68	.13	.23	.45	.03	1.04	1.33	.38	0	7.36
23	.29	.23	.82	*.33	.20	.38	.03	1.33	1.98	.42	0	8.39
24	.26	.23	1.77	.45	.52	.35	.02	.99	2.77	.38	0	4.26
25	.23	.20	4.23	.38	.38	.29	.02	.88	2.36	.38	0	7.67
26	.20	.18	.88	1.99	.23	.29	.02	.79	1.61	.35	0	3.93
27	.38	.16	5.17	3.43	.18	.29	.01	.69	3.85	.26	0	5.73
28	.38	.13	1.11	1.65	.16	.26	.01	.69	3.97	.26	0	*7.92
29	3.99	.11	2.14	.64	.33	.26	.01	.58	2.63	.26	0	4.05
30	1.09	.09	7.22	.45	.18	.26	.01	-----	4.04	.23	.01	3.21
31	.49	.59	-----	.89	-----	.23	.05	-----	4.98	-----	.01	-----
Total	40.14	42.77	57.90	26.43	45.62	47.68	11.65	35.41	109.52	65.97	15.47	91.82
Mean	1.29	1.38	1.93	0.853	1.52	1.54	0.365	1.22	3.53	2.20	0.499	3.06
mgd	2.00	2.14	2.99	1.32	2.35	2.38	0.582	1.89	5.46	3.40	0.772	4.73
cfs	123	131	178	81	140	146	36	109	336	202	47	282

Calendar year 1959: Max 15.7 Min 0.01 Mean(mgd) 1.08 Mean(cfs) 1.67 Ac-ft 1,210
Fiscal year 1959-60: Max 15.7 Min 0 Mean(mgd) 1.61 Mean(cfs) 2.49 Ac-ft 1,810

Peak discharge (base, 150 mgd).--Aug. 6 (1:30 p.m.) 209 mgd (323 cfs), 2.87 ft; May 14 (4:30 a.m.) 330 mgd (511 cfs), 3.58 ft.

* Discharge measurement made on this day.

2116. Makaha Stream near Makaha

Location.--Lat 21°30'18", long 158°10'58", on right bank 1.5 miles northeast of Kaneaki Heiau and 3.4 miles northeast of Makaha.

Drainage area.--2.13 sq mi.

Records available.--July 1959 to June 1960.

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

Extremes.--Maximum discharge during year, 122 mgd (189 cfs) Feb. 22 (gage height, 3.27 ft), from rating curve extended above 32 mgd by logarithmic plotting; minimum, 0.01 mgd (0.02 cfs) Oct. 24.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. A 1½-inch pipe 1,200 ft above station occasionally diverts water for use in siphoning water from a well.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.0	0	1.6	2.58
1.1	.02	1.8	5.95
1.2	.11	2.0	11.3
1.4	.80	2.2	19.2

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.04	0.05	0.07	0.05	0.04	0.11	0.07	0.29	4.57	0.65	0.26	0.14
2	.04	.05	.08	.05	2.51	.11	.08	.24	4.62	.50	.26	.14
3	.04	.04	.08	.04	.42	*.09	.08	.21	15.6	.55	.24	.12
4	.04	.04	.09	.04	.29	.08	.07	.21	12.7	3.08	.24	.12
5	.04	.05	.21	.04	.24	.08	.07	.18	5.95	1.20	.21	.11
6	.04	*12.8	.50	.04	.21	.07	.07	.16	3.53	1.20	.18	.11
7	.04	*7.71	.35	.04	.21	.07	.08	.16	7.15	*1.13	.16	.11
8	.04	1.90	.29	.04	.35	.07	.08	.32	4.59	1.16	.16	.09
9	.04	1.12	.21	.03	.38	.06	.49	.24	2.72	2.54	.15	.09
10	.04	.75	.16	.03	.29	.06	1.93	.26	2.10	1.90	1.49	.09
11	.04	.50	.14	.03	.26	.05	.60	2.51	2.10	1.20	.70	.09
12	.04	.38	.11	.03	.21	.05	.46	.80	1.90	1.00	.55	.08
13	.04	.29	.09	.03	.21	.05	.50	.50	1.45	.80	1.21	.08
14	.04	.24	.08	.03	.18	.07	2.76	.89	1.20	.80	.80	.07
15	.04	.21	.08	.03	.16	.07	.98	1.96	1.00	.80	.50	.07
16	.04	.16	.07	.03	.12	.16	.46	3.97	1.06	.70	.38	.07
17	.04	.16	.07	.02	.11	.83	.35	1.45	.80	.60	.29	.06
18	.03	.16	.07	.02	.08	.46	.26	.92	.75	.86	.26	.06
19	.05	.14	.06	.02	.07	.29	.21	7.82	5.06	.70	.54	.06
20	.03	.14	.06	.02	.07	.24	.18	2.60	2.71	.60	.86	0.05
21	.03	.12	.06	*.02	.06	.16	.16	1.54	1.61	.55	.55	.05
22	.02	.12	.05	.02	.05	.11	*.16	4.58	1.28	.46	.55	.06
23	.02	.11	.05	.02	1.71	.09	.14	4.79	10.7	.42	*.59	.06
24	.06	.11	.06	.01	.75	.09	.12	1.70	3.70	.60	.35	.08
25	.05	.11	.08	.02	.42	.09	.11	1.12	2.33	.46	.32	.11
26	.07	*.10	.09	.02	.32	.14	.11	*.86	1.81	.38	.24	.11
27	.06	.11	.04	.02	.26	.14	.11	.70	1.61	.35	.21	.41
28	.05	.09	.05	.02	.24	.12	.60	.60	1.28	.29	.18	.42
29	.05	.09	.05	.02	.18	.11	.42	.55	1.06	.26	.16	.29
30	.05	.08	.05	.02	.14	.08	.50	-----	.86	.26	.16	*.21
31	.05	.08	-----	.04	-----	.08	.58	-----	.75	-----	.14	-----
Total	1.30	28.01	3.46	0.89	10.54	4.28	12.59	42.13	108.55	26.10	12.90	3.61
Mean:												
mgd	0.042	0.904	0.115	0.029	0.351	0.138	0.406	1.45	3.50	0.870	0.416	0.120
cfs	0.065	1.40	0.178	0.050	0.543	0.214	0.632	2.24	5.42	1.35	6.44	0.186
Ac-ft	4.0	86	11	2.7	32	13	59	129	333	80	40	11

Calendar year 1959: Max - Min Mean(mgd) - Mean(cfs) - Ac-ft -
Fiscal year 1959-60: Max 15.6 Min 0.01 Mean(mgd) - 0.695 Mean(cfs) - 1.08 Ac-ft 781

Peak discharge (base, 100 mgd).--Feb. 22 (10:30 p.m.), 122 mgd (189 cfs), 3.27 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 1-16, Oct. 9-20; discharge estimated on basis of rainfall records.

2128. Kipapa Stream near Wahiawa

Location--Lat 21°28'15", long 157°57'50", on left bank 1,700 ft downstream from Forest Reserve Boundary, 4.9 miles southeast of Wahiawa Post Office, and 6.3 miles northeast of Waipahu.

Drainage area--4.29 sq mi.

Records available--January 1957 to June 1960.

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

Extremes--Maximum discharge during year, 1,130 mgd (1,750 cfs) Apr. 16 (gage height, 8.57 ft), from rating curve extended above 190 mgd on basis of slope-area measurement at gage height 7.96 ft; no flow on many days.
1957-60: Maximum discharge, 1,520 mgd (2,350 cfs) Dec. 6, 1957 (gage height, 9.57 ft), from rating curve extended above 190 mgd on basis of slope-area measurement at gage height 7.96 ft; no flow for many days.

Remarks--Records good.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

2.0	0	3.0	10.8
2.2	.17	3.2	18.4
2.4	.87	3.6	42.0
2.6	2.55	4.0	76.0
2.8	5.70	4.5	135

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.56	0.16	0.21	*10.2	2.44	*0.12	0.27	*0.33	*0.67	3.25	3.00	1.34
2	6.56	1.23	*.19	2.51	40.5	.14	.23	.30	4.60	2.15	1.75	1.20
3	3.54	1.23	.21	1.34	3.08	.13	.17	.27	6.09	1.65	2.43	1.06
4	1.24	.88	.95	.87	1.13	.10	8.34	.27	19.2	11.7	1.84	.99
5	4.84	.59	25.3	.67	7.19	.80	2.38	.27	27.4	3.93	2.80	.87
6	2.24	82.9	4.83	.50	1.47	11.8	1.34	.25	53.8	2.83	1.20	.77
7	.67	12.5	3.71	.46	5.58	1.62	8.84	.23	34.8	4.66	.93	.72
8	.33	3.32	1.48	.42	35.5	.50	2.05	.21	30.7	*1.68	1.13	.67
9	.15	5.17	.62	.42	3.50	1.46	5.96	.16	6.62	16.5	1.13	.62
10	.10	2.50	.33	.33	1.65	1.31	11.3	.21	3.95	7.43	31.7	.87
11	0	1.06	.30	.33	.99	.36	4.51	.39	2.97	41.3	6.15	.87
12	.05	1.40	5.56	.67	.82	.80	18.0	.67	2.15	12.7	103	.67
13	0	.77	2.42	2.46	.67	1.38	38.0	.42	1.65	4.63	73.4	.62
14	0	.42	1.06	1.44	.46	20.7	27.7	1.14	1.41	20.9	67.1	.62
15	0	.53	.87	.46	.33	4.82	14.5	8.72	1.20	11.1	12.2	4.12
16	0	.88	.36	.27	.30	1.75	6.00	21.9	.99	71.6	6.62	2.05
17	.23	.50	.25	.19	.25	5.82	3.67	4.75	1.54	44.1	*5.58	.82
18	.07	36.9	.27	.16	.23	2.45	3.39	82.1	1.13	29.7	3.81	.58
19	0	8.57	.30	.16	.23	.93	2.35	30.3	15.8	8.28	5.50	.50
20	0	3.13	.23	.14	.16	.50	1.85	8.02	43.5	5.70	6.39	.50
21	0	1.55	.21	.12	.15	.54	1.41	3.46	4.63	5.52	3.95	.80
22	0	1.06	.17	.12	.13	.93	1.20	2.35	2.35	3.95	5.39	3.60
23	0	.72	.21	.16	.12	.54	.93	2.15	2.31	3.39	5.82	18.2
24	0	.54	7.47	.17	.74	5.85	.77	1.41	9.67	5.04	3.53	5.16
25	0	2.08	6.63	.16	.30	3.98	.72	1.06	3.92	2.97	7.03	6.63
26	0	3.93	.99	.58	.16	1.75	.62	.87	13.6	2.25	6.91	3.22
27	0	1.84	15.8	3.87	.12	2.26	.54	.72	9.14	2.05	2.97	10.2
28	0	.77	1.76	2.87	.10	*1.13	.62	.62	5.7	1.85	2.15	34.8
29	6.64	.46	2.37	.90	.15	.58	.54	.58	3.77	1.65	1.75	11.5
30	1.46	.42	17.0	.32	.13	.30	.42	-----	36.4	1.75	1.55	5.66
31	.25	.33	-----	.36	-----	.25	.39	-----	6.17	-----	1.55	-----
Total	29.73	178.34	102.04	33.63	108.58	75.60	169.01	174.13	357.83	336.41	380.06	118.23
Mean:												
mgd	0.959	5.75	3.40	1.08	3.62	2.44	5.45	6.00	11.5	11.2	12.3	3.94
cfs	1.48	8.90	5.26	1.67	5.60	3.78	8.43	9.28	17.8	17.3	19.0	6.10
Ac-ft	91	547	313	103	333	232	519	534	1,100	1,030	1,170	363

Calendar year 1959: Max 102 Min 0 Mean(mgd) 3.04 Mean(cfs) 4.70 Ac-ft 3,400
Fiscal year 1959-60: Max 103 Min 0 Mean(mgd) 5.64 Mean(cfs) 8.73 Ac-ft 6,320

Peak discharge (base, 200 mgd).--Aug. 6 (2:30 p.m.) 905 mgd (1,400 cfs), 7.93 ft; Aug. 18 (12:30 p.m.) 216 mgd (334 cfs), 5.04 ft; Nov. 2 (7 a.m.) 394 mgd (610 cfs), 6.02 ft; Feb. 18 (8:30 p.m.) 841 mgd (1,300 cfs), 7.72 ft; Mar. 7 (2 a.m.) 241 mgd (373 cfs), 5.20 ft; Mar. 30 (12 m.) 282 mgd (405 cfs), 5.33 ft; Apr. 16 (11 p.m.) 1,130 mgd (1,750 cfs), 8.57 ft; May 12 (2 a.m.) 1,110 mgd (1,720 cfs), 8.52 ft; May 14 (4:30 a.m.) 340 mgd (526 cfs), 5.75 ft.

* Discharge measurement made on this day.

2130. Waikele Stream at Waipahu

Location.--Lat 21°23'10", long 158°00'50", on left bank at Farrington Highway bridge, 0.3 mile south of Waipahu and 2.5 miles west of Pearl City.

Drainage area.--44.9 sq mi.

Records available.--June 1951 to March 1952 (fragmentary), April 1952 to October 1959.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2.67 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1952-59), 25.7 mgd (39.8 cfs).

Extremes.--1951-59: Maximum discharge, 8,790 mgd (13,600 cfs) Nov. 28, 1954 (gage height, 14.82 ft), from rating curve extended above 470 mgd on basis of slope-area measurement of peak flow; minimum recorded, 6.4 mgd (9.9 cfs) Sept. 28-30, 1953.

Remarks.--Records fair. Flow is regulated by plantation operation.

Revisions (fiscal years).--WSP 1569: Drainage area. WSP 1639: 1955(M).

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.9	6.7	2.5	31.0
2.1	11.3	2.7	52.0
2.3	17.9	3.1	119

Discharge, in million gallons a day, July to October 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.86	11.0	8.90	10.8								
2	9.86	13.0	8.68	8.46								
3	10.6	11.1	8.46	10.1								
4	14.1	9.86	8.46	13.3								
5	16.0	9.86	14.6	13.5								
6	13.3	10.9	15.2	13.3								
7	12.4	76.3	13.3	13.5								
8	12.1	21.9	11.0	15.6								
9	11.3	17.1	9.86	15.2								
10	11.6	17.5	9.14	12.1								
11	11.9	18.2	9.14	9.86								
12	12.7	17.1	11.3	8.46								
13	10.8	16.4	12.7	8.46								
14	10.6	16.8	10.1	8.46								
15	12.0	17.9	9.14	-								
16	11.7	17.9	8.90	-								
17	10.3	14.9	8.90	-								
18	12.0	29.8	9.14	-								
19	13.5	25.5	10.4	-								
20	12.7	15.6	11.9	-								
21	13.3	14.9	9.58	-								
22	13.3	14.1	8.46	-								
23	12.7	13.3	8.46	-								
24	12.7	12.4	8.24	-								
25	15.6	12.7	8.24	-								
26	13.3	12.4	10.8	-								
27	10.4	11.1	13.1	-								
28	9.62	11.1	9.14	-								
29	9.38	12.4	9.38	-								
30	9.38	12.4	9.06	-								
31	9.62	11.2	-----	-								
Total	368.62	624.72	303.68	-								
Mean:												
mgd	11.9	20.2	10.1	-								
cfs	18.4	31.3	15.6	-								
Ac-ft	1,130	1,920	932	-								
Calendar year	Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft							
Fiscal year	Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft							

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

2140. Pearl Harbor Springs at Waiawa, near Pearl City

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

Records available.--March 1931 to June 1934, July 1937 to June 1960.

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

Average discharge.--26 years (1931-34, 1937-60), 11.9 mgd (18.4 cfs), unadjusted for pumpage.

Extremes.--1931-34, 1937-60: Maximum daily discharge, 18.7 mgd (28.9 cfs) Feb. 27, 1949; minimum daily, 6.0 mgd (9.3 cfs) for several days in 1941 and 1947.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.97	8.26	9.13	8.84	9.42	6.83	9.71	7.97	7.68	8.55	10.0	7.39
2	7.97	10.6	9.42	8.55	9.13	6.83	10.0	7.68	7.10	10.0	7.68	7.39
3	9.13	7.97	9.42	10.0	9.71	6.56	10.0	7.68	7.39	10.0	7.39	7.68
4	9.13	7.97	9.42	10.0	9.71	6.56	7.68	7.68	8.55	*7.97	6.83	10.6
5	10.9	7.68	9.42	*7.68	9.71	10.0	7.39	7.68	10.0	8.26	6.56	10.6
6	9.42	10.6	10.3	8.84	9.71	10.0	6.83	9.71	10.0	10.0	7.39	8.55
7	8.84	10.6	10.3	8.84	9.71	7.68	7.39	9.71	9.71	9.71	9.71	7.97
8	10.0	10.6	9.71	9.13	9.71	9.13	7.10	7.39	10.0	7.39	10.0	7.68
9	10.3	10.6	9.71	8.55	10.0	7.39	9.71	7.10	10.0	10.0	7.68	7.10
10	7.97	10.6	7.97	8.26	8.26	7.39	9.71	7.10	9.71	10.3	7.68	7.68
11	10.6	10.6	7.97	8.26	7.68	6.83	7.10	7.10	9.71	8.55	6.83	10.6
12	10.9	10.6	10.0	8.26	8.84	9.71	6.29	7.10	10.0	9.42	7.39	10.6
13	9.71	10.6	10.3	6.83	7.97	9.71	6.56	9.71	10.0	10.3	10.3	7.68
14	7.97	10.9	8.55	6.83	10.3	7.39	8.26	9.71	10.0	10.3	10.9	7.68
15	8.26	10.6	8.84	6.29	10.3	7.39	9.13	7.39	7.39	10.3	10.9	7.10
16	7.97	10.6	8.26	6.29	8.55	7.10	9.71	9.42	7.39	10.6	10.9	7.10
17	8.26	10.6	7.97	7.39	7.97	6.83	10.0	10.0	7.39	10.6	10.9	7.39
18	9.13	7.97	7.39	9.42	7.97	6.83	*7.68	*7.97	7.97	10.6	10.9	9.71
19	10.6	7.10	9.71	6.83	7.39	10.0	7.39	8.84	9.71	9.71	10.9	9.71
20	7.97	7.68	9.71	6.29	7.39	10.0	7.39	9.71	9.71	8.26	10.9	6.83
21	7.68	6.83	7.10	6.83	10.0	7.39	6.83	10.0	7.97	7.68	10.9	*6.29
22	9.13	9.71	6.29	7.39	9.71	7.39	7.39	9.42	8.26	7.68	10.9	6.29
23	10.6	9.71	6.29	7.10	6.56	7.10	10.3	9.71	7.68	10.3	10.3	6.29
24	10.6	*7.68	6.29	9.42	6.56	7.68	10.3	10.0	8.84	10.6	8.84	6.56
25	10.9	7.97	6.29	9.42	*7.68	9.71	7.68	10.0	7.68	8.55	8.55	9.42
26	10.9	7.97	8.26	7.10	10.3	9.71	7.39	8.55	9.71	7.97	7.68	9.71
27	9.71	7.68	9.71	8.26	10.6	10.0	9.71	10.0	9.71	7.68	8.55	7.10
28	8.84	7.68	7.39	9.13	10.6	7.68	10.0	10.0	7.39	7.68	10.9	6.83
29	8.84	8.26	7.10	7.10	10.6	7.68	10.0	7.97	7.68	7.68	10.9	6.83
30	8.26	10.3	8.55	7.10	7.68	7.97	10.0	-----	8.55	10.0	8.26	7.10
31	8.26	8.26	-----	8.84	-----	7.97	10.0	-----	8.84	-----	7.68	-----
Total	286.72	284.78	256.77	249.07	269.72	250.44	264.63	252.30	271.72	276.64	285.20	239.46
Mean	9.25	9.19	8.56	8.03	8.99	8.08	8.54	8.70	8.77	9.22	9.20	7.98
cfs	14.3	14.2	13.2	12.4	13.9	12.5	13.2	13.5	13.6	14.3	14.2	12.3
Ac-ft	680	874	768	764	828	769	812	774	834	849	875	735

Calendar year 1959: Max 13.4 Min 6.29 Mean(mgd) 10.0 Mean(cfs) 15.5 Ac-ft 11,200
 Fiscal year 1959-60: Max 10.9 Min 6.29 Mean(mgd) 8.71 Mean(cfs) 13.5 Ac-ft 9,780

* Discharge measurement made on this day.

2150. Morikone pond outlet at Pearl City

Location--Lat 21°23'30", long 157°59'10", on left bank of Waiawa Springs flow, 0.7 mile west of Pearl City, 1.5 miles east of Waipahu, and 9.8 miles northwest of Honolulu.

Records available--August 1951 to July 1960 (discontinued).

Gage--Water-stage recorder and submerged orifice control.

Average discharge--8 years (1952-60), 1.00 mgd (1.55 cfs).

Extremes--1951-60: Maximum daily discharge, 2.1 mgd (3.2 cfs) Jan. 12, 1956; no flow on Aug. 31, 1952, June 30, July 2, 1960.

Remarks--Records poor. Surface runoff from floods not included in figures of discharge given below.

Revisions (fiscal years)--WSP 1399: 1952-53.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.11	1.39	1.67	1.68	1.51	1.28	1.28	1.38	1.28	1.28	1.38	0.76
2	1.15	1.51	1.89	1.65	1.46	1.27	1.22	1.38	1.28	1.28	1.28	.71
3	1.26	1.47	1.56	1.67	1.46	1.25	1.17	1.38	1.28	1.28	1.28	.91
4	1.29	1.41	1.59	1.64	1.42	1.17	1.17	1.38	1.28	1.28	1.17	.96
5	1.33	1.50	1.56	1.46	1.39	1.05	1.05	1.28	1.28	1.28	1.17	.86
6	1.18	1.61	1.67	1.45	1.32	1.17	1.05	1.38	1.38	1.28	1.28	.88
7	1.21	1.54	1.69	1.36	1.28	1.17	1.17	1.38	1.47	1.28	1.28	1.05
8	1.22	1.48	1.58	1.40	1.28	1.17	1.17	1.28	1.38	1.28	1.28	1.17
9	1.22	1.40	1.80	1.40	1.28	1.17	1.17	1.38	1.47	1.28	1.28	.96
10	1.02	1.36	1.52	1.32	1.17	1.17	1.28	1.28	1.47	1.38	1.00	.88
11	1.02	1.23	1.51	1.35	1.17	1.17	1.17	1.28	1.46	1.28	.47	.98
12	1.13	1.41	1.67	1.28	1.17	1.30	1.05	1.28	1.38	1.28	.20	.91
13	.99	1.50	1.63	1.26	1.17	1.38	1.17	1.47	1.28	1.38	.59	.85
14	1.19	1.32	1.59	1.28	1.33	1.28	1.28	1.38	1.45	1.38	1.78	.76
15	1.27	1.38	1.65	1.28	1.41	1.29	1.28	1.38	1.38	1.28	.75	.76
16	1.39	1.50	1.59	1.28	1.28	1.17	1.17	1.38	1.38	1.28	.51	.76
17	1.45	1.45	1.45	1.36	1.17	1.17	1.10	1.38	1.28	1.80	.22	.91
18	1.52	1.36	1.44	1.39	1.17	1.17	1.05	1.32	1.28	1.47	.26	.85
19	1.61	1.28	1.49	1.32	1.17	1.38	1.17	1.28	1.28	1.38	.59	.85
20	1.50	1.20	1.50	1.28	1.17	1.28	1.05	1.28	1.38	1.38	.62	.76
21	1.53	1.80	1.38	1.28	1.28	1.05	1.17	1.38	1.38	1.28	.76	.76
22	1.48	1.40	1.28	1.28	1.28	1.05	1.17	1.28	1.38	1.28	.76	.26
23	1.47	1.26	1.28	1.28	1.17	1.05	1.17	1.38	1.28	1.28	.96	.23
24	1.50	1.29	1.28	1.17	1.05	1.05	1.38	1.47	1.28	1.28	.38	.42
25	1.28	1.35	1.38	1.28	1.04	1.17	1.38	1.47	1.28	1.17	.39	1.32
26	1.28	1.44	1.44	1.17	1.17	1.31	1.42	1.38	1.28	1.28	.48	.40
27	1.05	1.44	1.55	1.17	1.12	1.43	1.56	1.38	1.17	1.38	1.05	.22
28	1.05	1.43	1.59	1.28	1.16	1.28	1.38	1.28	1.17	1.38	.70	.19
29	1.28	1.57	1.66	1.28	1.32	1.46	1.52	1.17	1.17	1.28	.91	.10
30	1.28	1.74	1.64	1.28	1.33	1.34	1.50	-----	1.17	1.38	.76	0
31	1.33	1.60	-----	1.41	-----	1.26	1.47	-----	1.17	-----	.91	-----
Total	39.59	44.12	46.13	41.99	37.70	37.91	38.34	39.12	40.85	39.80	26.25	21.43
Mean	1.28	1.42	1.54	1.35	1.26	1.22	1.24	1.35	1.32	1.33	0.85	0.71
mgd	1.98	2.20	2.38	2.09	1.95	1.89	1.92	2.09	2.04	2.06	1.32	1.10
cfs	121	135	142	129	116	116	118	120	125	122	81	66
Ac-ft												
Calendar year 1959: Max	1.74			Min	0.59	Mean(mgd)	1.20	Mean(cfs)	1.86	Ac-ft	1,350	
Fiscal year 1959-60: Max	1.80			Min	0	Mean(mgd)	1.24	Mean(cfs)	1.92	Ac-ft	1,390	

Discharge, in million gallons a day, 1960

July 1	0.30	July 7	0.59
2	0	8	.86
3	.59	9	.77
4	.76	10	.54
5	.82	11	.49
6	.46		

2160. Waiawa Stream near Pearl City

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

Drainage area--26.4 sq mi.

Records available.--June 1952 to June 1960.

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

Average discharge.--8 years, 15.9 mgd (24.6 cfs).

Extremes.--Maximum discharge during year, 7,450 mgd (11,500 cfs) May 14 (gage height, 16.03 ft, from floodmark), from rating curve extended above 700 mgd on basis of slope-area measurement at gage height 17.1 ft; minimum, 2.40 mgd (3.71 cfs) Oct. 17, Nov. 16, 18.

1952-60: Maximum discharge, 10,900 mgd (16,900 cfs) Nov. 28, 1954 (gage height, 19.27 ft), from rating curve extended above 700 mgd on basis of slope-area measurement at gage height 17.1 ft; minimum, 1.67 mgd (2.58 cfs) June 8, 1957.

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

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.5	1.92	3.0	75.0
1.6	2.90	3.5	151
1.8	5.50	4.0	263
2.0	9.27	5.0	493
2.2	15.2	6.0	730
2.5	30.3		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.20	3.10	3.20	2.6	4.11	2.80	3.41	3.45	3.57	7.63	3.57	5.50
2	2.90	3.00	3.00	2.6	92.8	3.10	3.20	3.69	3.80	5.21	3.69	5.84
3	2.90	2.80	2.90	2.7	8.53	*3.20	3.20	3.80	4.35	4.06	4.75	5.36
4	3.20	2.90	2.80	2.6	3.80	*3.69	3.20	4.06	9.15	6.94	5.36	4.78
5	3.10	3.10	28.9	*2.6	3.30	3.31	3.57	3.80	36.2	9.61	5.50	4.35
6	2.90	93.6	17.8	2.70	3.93	2.90	4.49	3.80	101	5.07	5.67	4.35
7	2.90	31.3	4.35	2.70	3.10	2.90	3.93	3.45	61.3	4.35	4.64	4.92
8	2.90	7.63	2.7	2.70	46.2	2.80	3.93	3.50	23.9	3.93	3.80	6.88
9	2.90	4.35	2.7	2.70	9.86	2.90	3.57	3.50	10.8	16.2	3.93	6.53
10	2.90	3.45	2.6	2.70	4.78	2.80	8.85	3.69	9.98	20.3	61.7	6.53
11	2.90	3.10	2.7	2.70	3.30	2.80	7.63	3.80	6.70	65.8	13.1	5.67
12	2.90	3.00	2.7	2.70	3.00	2.80	14.6	3.80	5.07	26.6	182	4.78
13	3.00	3.10	2.6	2.90	2.70	2.90	32.9	3.45	4.06	13.0	184	5.07
14	3.10	3.00	3.4	3.10	2.70	2.90	42.7	3.50	5.69	23.4	668	6.05
15	3.20	2.90	3.1	3.10	2.70	3.10	45.1	3.20	3.69	24.2	63.6	5.36
16	3.30	2.90	2.6	3.00	2.60	3.30	15.1	13.8	3.93	127	*26.6	5.07
17	3.45	2.90	2.6	3.00	2.60	3.69	8.24	9.32	4.49	315	17.7	5.21
18	3.45	39.5	2.6	3.10	2.60	3.80	6.70	*178	4.92	54.3	12.3	4.49
19	3.30	21.2	2.6	3.10	2.70	3.80	6.53	79.5	7.45	24.2	8.86	3.93
20	3.10	6.88	2.8	3.10	2.80	3.69	5.50	21.9	69.6	13.8	10.3	4.06
21	3.00	3.93	2.6	3.00	3.00	3.45	*5.07	9.06	15.2	11.0	9.27	3.93
22	2.90	3.10	2.6	2.80	2.90	3.69	4.06	5.67	8.04	9.78	8.04	3.69
23	2.90	3.00	2.6	2.80	3.10	3.93	3.69	4.35	6.62	6.88	11.0	3.80
24	2.90	2.90	2.6	2.70	3.10	4.20	3.30	3.80	7.93	6.36	10.0	7.63
25	2.90	2.80	2.6	2.70	3.10	4.20	3.20	3.57	10.1	6.70	9.27	4.78
26	2.90	3.00	2.6	*2.70	3.20	3.69	3.30	3.69	5.67	4.92	7.63	3.89
27	2.90	3.00	2.6	2.60	3.10	3.30	3.45	3.69	9.75	4.35	8.04	6.34
28	2.90	3.20	2.5	2.60	3.00	3.20	3.45	3.45	5.84	4.06	5.84	5.35
29	3.10	3.69	2.7	2.70	2.90	3.57	3.30	3.45	6.70	4.64	4.92	24.4
30	2.90	3.30	3.1	2.70	2.80	3.33	3.30	-----	70.6	4.06	4.78	17.0
31	2.90	3.20	-----	3.00	-----	3.37	3.20	-----	*17.6	-----	5.07	-----
Total	93.70	278.83	125.15	86.70	238.31	103.11	265.67	597.14	541.68	833.35	1,372.93	233.49
Mean	3.02	8.99	4.17	2.80	7.94	3.33	8.57	13.7	17.5	27.8	44.3	7.78
cfs	4.67	13.9	6.45	4.33	12.3	5.15	13.3	21.2	27.1	43.0	68.5	12.0
Ac-ft	288	856	384	266	731	316	815	1,220	1,660	2,560	4,210	717

Calendar year 1959: Max 329 Min 2.4 Mean(mgd) 6.60 Mean(cfs) 10.2 Ac-ft 7,380

Fiscal year 1959-60: Max 668 Min 2.5 Mean(mgd) 12.5 Mean(cfs) 19.3 Ac-ft 14,020

Peak discharge (base, 800 mgd).--Aug. 6 (5 p.m.) 1,170 mgd (1,810 cfs), 7.43 ft; Nov. 2 (8:30 a.m.) 990 mgd (1,530 cfs), 6.90 ft; Feb. 18 (8:30 p.m.) 1,420 mgd (2,200 cfs), 8.05 ft; Apr. 16 (12 p.m.) about 5,150 mgd (7,970 cfs); May 14 (4 a.m.) 7,450 mgd (11,500 cfs), 16.03 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 8 to Oct. 5; discharge estimated on basis of records for nearby stations.

2190. Hawaiian Electric Co. tunnel at Wai'au, near Pearl City

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

Records available.--October 1939 to December 1945, July 1952 to June 1960.

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

Average discharge.--10 years (1940-41, 1944-45, 1952-60), 10.5 mgd (16.2 cfs).

Extremes.--1939-45, 1952-60: Maximum daily discharge, 17.3 mgd (26.8 cfs) Mar. 26, 27, 1940; minimum daily, 6.0 mgd (9.3 cfs) Aug. 3, 1941.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.4	10.4	10.4	10.4	9.90	10.4	10.4	9.90	9.90	10.4	9.90	9.35
2	10.4	10.4	10.4	10.4	9.90	10.4	10.4	9.90	9.90	9.90	9.90	9.35
3	10.4	10.4	*10.4	9.90	9.90	10.4	10.4	9.90	9.90	9.90	9.90	9.35
4	10.4	10.4	10.4	9.90	9.90	10.4	10.4	9.90	10.4	10.4	9.90	9.90
5	10.4	11.0	10.4	10.4	10.4	10.4	10.4	9.90	9.90	9.90	9.90	9.90
6	11.0	11.6	10.4	*10.4	10.4	10.4	10.4	9.90	9.90	9.90	9.90	9.90
7	11.0	11.0	11.0	10.4	10.4	10.4	10.4	9.90	10.4	9.90	9.90	9.35
8	11.0	11.0	11.0	10.4	10.4	*10.4	10.4	9.90	9.90	9.90	9.90	9.90
9	11.0	11.0	10.4	10.4	10.4	10.4	9.90	9.90	10.4	9.90	*9.90	9.35
10	11.0	11.0	11.0	9.90	10.4	10.4	9.90	9.90	10.4	9.90	9.35	9.35
11	11.0	11.0	11.0	9.90	10.4	10.4	9.90	9.90	10.4	10.4	9.35	9.35
12	11.0	11.0	11.0	10.4	10.4	10.4	9.90	9.90	10.4	9.90	9.35	9.35
13	11.0	11.0	11.0	10.4	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
14	11.0	11.0	11.0	10.4	10.4	10.4	9.90	9.90	10.4	9.90	10.4	9.35
15	11.0	11.0	10.4	10.4	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
16	*11.0	11.0	10.4	10.4	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
17	11.0	11.0	10.4	9.90	10.4	10.4	9.90	*9.90	10.4	9.90	9.90	9.35
18	10.4	11.6	11.0	9.90	9.90	10.4	*10.4	9.90	10.4	9.90	9.90	9.35
19	10.4	11.6	11.0	9.90	9.90	10.4	10.4	9.90	10.4	9.90	9.90	9.35
20	11.0	11.6	11.0	9.90	9.90	10.4	9.90	9.90	10.4	9.90	9.90	9.35
21	11.0	11.6	10.4	9.90	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
22	11.0	11.0	10.4	9.90	10.4	10.4	9.90	9.90	9.90	9.90	9.90	*9.35
23	10.4	11.0	10.4	9.90	9.90	10.4	9.90	9.90	10.4	9.90	9.90	9.35
24	10.4	11.0	10.4	9.90	9.90	10.4	9.90	9.90	9.90	9.90	9.90	9.35
25	10.4	11.0	10.4	9.90	9.90	10.4	10.4	9.35	10.4	9.90	9.90	9.35
26	10.4	10.4	10.4	9.90	10.4	10.4	9.90	9.35	9.90	9.90	9.90	9.35
27	10.4	10.4	9.90	9.90	10.4	10.4	9.90	9.90	9.90	9.90	9.90	9.35
28	11.0	10.4	10.4	9.90	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
29	11.0	11.0	10.4	9.90	10.4	10.4	9.90	9.90	10.4	9.90	9.90	9.35
30	10.4	11.0	10.4	9.90	10.4	10.4	9.90	-----	10.4	9.90	9.90	9.35
31	10.4	10.4	-----	9.90	-----	10.4	9.90	-----	*10.4	-----	9.90	-----
Total	332.6	339.2	317.50	312.90	307.00	322.4	312.40	286.00	317.40	298.50	305.75	282.70
Mean:	10.7	10.9	10.6	10.1	10.2	10.4	10.1	9.86	10.2	9.95	9.86	9.42
mgd	16.6	16.9	16.4	15.6	15.8	16.1	15.6	15.3	15.8	15.4	15.3	14.6
cfs	1,020	1,040	974	960	942	969	959	878	974	916	938	868
Ac-ft												
Calendar year 1959: Max	12.8			Min	9.90	Mean(mgd)	11.1	Mean(cfs)	17.2		Ac-ft	12,460
Fiscal year 1959-60: Max	11.6			Min	9.35	Mean(mgd)	10.2	Mean(cfs)	15.8		Ac-ft	11,460

* Discharge measurement made on this day.

2230. Waimalu Stream near Alea

Location--Lat 21°23'35", long 157°57'00", on right bank of stream just downstream from bridge on Moanalua Highway, 1.5 miles northwest of Alea and 1.6 miles east of Pearl City.

Drainage area--6.07 sq mi.

Records available--January 1952 to June 1960.

Gage--Water-stage recorder and concrete control. Altitude of gage is 0.1 ft based on tide level. Prior to Jan. 30, 1957, at same site at datum 3.5 ft higher.

Average discharge--8 years, 4.78 mgd (7.40 cfs).

Extremes--Maximum discharge during year, 2,790 mgd (4,310 cfs) May 14 (gage height, 9.49 ft, from floodmark in well), from rating curve extended above 380 mgd on basis of slope-area measurement of peak flow; minimum daily, 0.26 mgd (0.40 cfs) several days.

1952-60: Maximum discharge, that of May 14, 1960; no flow Sept. 25, Sept. 28 to Oct. 1, 1958.

Remarks--Records fair except those after Apr. 27, which are poor. Small quantities of water diverted for irrigation.

Revisions--WSP 1569: Drainage area.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.59	0.68	0.51	2.96	0.47	0.38	0.82	0.55	0.72	1.70	0.33	1.00
2	.51	.63	.29	.89	22.8	.29	.63	.76	1.03	.99	.28	1.18
3	.47	.63	.26	.42	2.48	.29	.55	.93	2.03	.55	.34	1.08
4	.34	.59	.26	.42	1.08	.29	.51	1.68	17.5	*3.63	.72	.90
5	.38	.63	41.6	.34	.76	.29	.63	1.42	28.5	2.72	.45	.80
6	.34	37.6	7.91	.31	.76	.26	.59	1.22	49.8	1.51	.36	.62
7	.47	8.51	1.97	.31	.51	.26	.51	.99	9.45	2.26	.37	.68
8	.59	1.73	1.43	.31	10.3	.26	.66	.87	*4.50	1.04	.34	.66
9	.55	.87	.63	.29	2.50	.26	.68	.99	1.93	9.86	*.29	.60
10	.47	1.54	.47	.26	.93	.26	2.02	1.10	1.33	7.54	46.0	.75
11	.47	.68	.51	.79	.59	1.12	1.69	.99	1.10	17.9	6.98	.50
12	.38	.42	7.68	.99	.47	.72	4.50	.87	.82	7.28	98.1	.62
13	.72	.34	2.92	.87	.55	.47	9.67	.82	.55	3.50	113	.90
14	.99	.29	.34	.76	.63	.47	11.9	.95	.68	10.2	*356	.99
15	.87	.29	.43	.76	.72	.38	13.7	.76	.63	10.5	16.6	.60
16	.93	.29	.61	.72	.68	.31	3.99	2.11	.68	79.7	7.60	.65
17	.76	.34	.47	.72	.68	.42	3.23	*2.23	.76	56.7	5.63	.84
18	.59	11.6	.38	.68	.68	9.00	2.07	23.6	.87	14.2	3.90	.94
19	.57	6.19	.38	.63	.87	1.07	*1.80	22.1	2.36	5.12	3.26	.96
20	.42	1.50	.29	.51	1.60	.31	1.33	5.82	33.3	2.67	3.60	1.11
21	.38	.88	.34	.47	1.16	.47	.99	2.67	5.20	2.07	2.86	*.72
22	.31	.47	.47	.42	.87	.55	.76	1.42	2.00	1.51	2.35	.52
23	.29	.47	1.02	.34	.76	.63	.82	1.04	4.90	1.10	3.13	.37
24	.26	.47	1.43	.31	.68	.72	.93	.82	11.2	.93	2.49	.42
25	.26	.42	1.16	.29	*.68	1.46	.59	.82	4.9	1.04	1.62	.43
26	.31	.38	1.39	.31	.59	.76	.76	.59	1.70	.63	1.41	.41
27	.47	.47	1.27	1.00	.51	.55	.82	.55	1.33	.34	1.34	1.05
28	1.00	.51	.99	.82	.51	.59	.72	.42	3.96	.31	.80	8.54
29	1.22	.47	.63	.59	.42	.68	.72	.42	3.40	1.85	1.06	4.81
30	.87	.38	4.94	.47	.38	1.51	.72	-----	14.9	.61	1.01	3.77
31	.68	.31	-----	.47	-----	.99	.68	-----	4.88	-----	.94	-----
Total	17.46	80.58	82.78	19.43	56.62	26.02	69.99	79.49	216.91	249.96	665.16	37.22
Mean:												
mgd	0.563	2.60	2.76	0.627	1.89	0.839	2.26	2.74	7.00	8.33	21.4	1.24
cfs	0.871	4.02	4.27	0.970	2.92	1.30	3.50	4.24	10.8	12.9	33.1	1.82
Ac-ft	54	247	254	60	174	80	215	244	666	767	2,040	114

Calendar year 1959: Max 198 Min 0.18 Mean(mgd) 2.36 Mean(cfs) 3.65 Ac-ft 2,650
 Fiscal year 1959-60: Max 336 Min 0.26 Mean(mgd) 4.37 Mean(cfs) 6.76 Ac-ft 4,920

Peak discharge (base, 250 mgd)--Aug. 6 (3 p.m.) 400 mgd (619 cfs), 4.60 ft; Sept. 5 (10 a.m.) 307 mgd (475 cfs), 4.23 ft; Mar. 6 (4 a.m.) 290 mgd (449 cfs), 4.16 ft; Apr. 16 (11:30 p.m.) 2,630 mgd (4,070 cfs), 8.74 ft; May 12 (3 a.m.) 858 mgd (1,330 cfs), 5.87 ft; May 14 (4 a.m.) 2,790 mgd (4,320 cfs), 9.49 ft (from floodmark in well).

* Discharge measurement made on this day.

2240. Pearl Harbor Springs at Kalauao, near Alea

Location.--Lat 21°23'05", long 157°56'45", on left bank 900 ft downstream from Oahu Sugar Co.'s pump 6, 1.1 miles west of Alea, and 7.6 miles northwest of Honolulu.

Records available.--March 1931 to June 1960.

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

Average discharge.--29 years, 15.9 mgd (24.6 cfs), unadjusted for pumpage.

Extremes.--1931-60: Maximum daily discharge, 25 mgd (39 cfs) Feb. 17-26, 1938; Feb. 23, 24, 1955; minimum daily, 7.2 mgd (11.1 cfs) Aug. 25, Sept. 2, 1947.

Remarks.--Records good. When water is needed for irrigation of sugarcane, Oahu Sugar Co.'s pump 6 diverts about 7 mgd as a high-lift pump or 9 mgd as a low-lift pump. Surface runoff from floods not included in figures of discharge given below.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.82	16.3	8.75	8.06	13.3	8.75	16.3	9.46	12.1	11.0	14.6	13.3
2	9.82	14.6	8.40	8.06	15.4	8.40	16.3	9.10	12.5	15.4	14.6	13.3
3	11.7	8.75	8.40	8.06	15.9	*8.40	13.8	8.75	13.8	15.4	10.2	13.3
4	17.2	8.75	8.75	8.06	15.9	10.2	9.10	11.0	15.9	11.7	11.7	15.9
5	14.6	9.10	8.75	8.40	15.9	15.4	9.10	11.3	15.9	12.5	14.6	15.9
6	9.46	11.3	11.0	8.06	15.9	12.9	8.75	16.7	16.3	12.5	14.6	13.8
7	10.6	17.2	16.7	8.40	15.9	8.06	9.10	16.7	16.3	13.8	14.6	15.9
8	11.7	16.7	16.3	8.40	15.9	8.06	10.6	12.1	15.9	15.0	14.6	12.5
9	9.82	16.7	8.75	8.40	16.3	8.06	16.7	13.8	16.3	15.4	14.6	9.10
10	11.7	17.2	8.75	8.40	15.4	8.06	15.9	13.8	13.3	15.4	11.3	10.2
11	17.6	17.2	8.75	8.40	9.46	9.82	11.0	15.9	14.6	15.4	11.7	15.4
12	14.2	16.7	8.75	8.40	11.3	15.4	12.5	15.9	16.7	15.4	12.5	15.0
13	9.82	13.3	9.46	8.40	10.6	13.3	12.5	16.3	16.7	15.0	15.4	10.2
14	9.46	11.3	8.75	8.40	15.9	8.75	10.6	16.7	15.4	12.9	15.9	9.82
15	9.46	16.7	8.75	8.06	13.8	8.75	16.7	16.3	13.8	15.4	15.9	13.3
16	9.46	16.7	8.75	8.40	8.75	8.40	16.7	16.3	16.3	15.4	15.9	15.0
17	9.46	16.7	8.75	10.2	8.75	8.75	16.7	16.3	16.3	15.4	15.9	15.0
18	9.46	16.7	10.6	13.3	8.75	10.6	14.2	16.3	15.9	15.4	15.9	15.4
19	9.46	16.7	8.40	8.06	8.75	15.9	*13.3	16.3	16.3	12.9	15.9	13.3
20	9.46	16.7	8.40	8.06	10.6	13.3	9.82	16.3	15.9	15.4	15.9	7.72
21	9.10	13.3	8.40	8.06	15.9	8.40	11.3	16.3	15.9	15.0	15.9	10.6
22	9.10	13.3	8.40	8.06	13.8	8.40	13.3	14.6	13.8	15.0	14.6	13.3
23	9.46	15.9	8.40	10.2	8.75	*8.40	16.7	11.3	12.9	15.0	12.5	10.6
24	10.2	15.9	8.75	15.4	8.75	10.2	14.6	12.5	15.9	15.4	13.3	14.6
25	16.7	*15.9	8.75	12.5	9.82	15.9	9.46	12.5	15.9	15.0	15.9	14.6
26	13.3	15.0	8.75	8.06	15.9	16.3	9.46	15.9	16.3	15.0	15.9	14.6
27	8.75	8.40	8.75	8.06	16.3	13.8	9.46	15.9	16.3	14.6	15.9	9.10
28	8.40	10.6	8.40	8.06	16.3	9.10	9.46	15.4	13.3	14.6	15.9	9.82
29	8.75	11.3	8.40	8.06	13.8	9.10	11.7	11.3	11.0	14.6	15.9	14.6
30	8.40	14.6	8.40	10.2	8.75	8.75	16.7	-----	10.2	14.6	11.0	14.6
31	10.2	8.75	-----	15.2	-----	11.0	15.4	-----	*11.3	-----	11.7	-----
Total	336.62	438.25	279.31	284.54	390.53	328.61	397.21	411.01	459.0	435.5	444.8	389.76
Mean:	10.9	14.1	9.31	9.18	13.0	10.6	12.8	14.2	14.8	14.5	14.3	13.0
mgd	16.9	21.8	14.4	14.2	20.1	16.4	19.8	22.0	22.9	22.4	22.1	20.1
cfs	1,030	1,340	857	873	1,200	1,010	1,220	1,260	1,410	1,340	1,360	1,200
Ac-ft												
Calendar year 1959: Max	21.0	Min	8.06	Mean(mgd)	13.4	Mean(cfs)	20.7	Ac-ft	15,010			
Fiscal year 1959-60: Max	17.6	Min	7.72	Mean(mgd)	12.6	Mean(cfs)	19.5	Ac-ft	14,100			

* Discharge measurement made on this day.

2245. Kaluaao Stream at Moanalua Road at Alea

Location--lat 21°23'07", long 157°56'22", on left bank of stream at Moanalua Road Bridge, 0.4 mile northwest of Alea Post Office, and 2.3 miles southeast of Pearl City Post Office.

Drainage area--2.59 sq mi.

Records available--July 1957 to June 1960.

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

Extremes--Maximum discharge during year, 1,160 mgd (1,790 cfs) May 14 (gage height, 6.29 ft), from rating curve extended above 60 mgd on basis of slope-area measurement of peak flow; minimum daily, 0.02 mgd (0.03 cfs) Sept. 28.

1953-60: Maximum discharge, that of May 14, 1960.

1957-60: Minimum daily discharge, that of Sept. 28, 1959.

Remarks--Records good except those for periods of no gage-height record, which are poor. Some return of irrigation water.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.02	1.4	11.8
.5	.25	1.8	21.5
.6	.62	2.4	40.4
.7	1.14	3.0	65.0
.8	1.96	3.5	95.0
.9	3.09	4.0	140
1.1	6.10		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Da\	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*0.12	0.12	0.10	0.04	0.10	0.10	0.08	0.26	0.12	0.25	0.10	0.12
2	.10	.12	.10	.04	*4.23	.08	.10	.24	.14	.17	.10	.12
3	.10	.20	.10	.08	.22	.08	.10	.17	.22	.14	.10	.12
4	.12	.12	.08	.06	.17	.08	.10	.12	7.44	*1.66	.12	.12
5	.12	.12	9.06	.06	.17	.08	.10	.12	8.97	.81	.12	.10
6	.12	*11.5	1.71	.08	.14	.08	.08	.12	10.6	.38	.10	.10
7	.12	*3.83	.14	.08	.14	.08	.08	.12	3.71	1.17	.10	.08
8	.12	.22	.08	.08	2.60	.08	.08	.10	*1.54	.25	.10	.08
9	.12	.12	.08	.08	.28	.08	.08	.10	.54	3.59	.08	a.08
10	.10	.12	.06	.08	.14	.06	.13	.08	.25	2.60	8.49	a.08
11	.12	.10	.08	.08	.14	.06	.08	.08	.17	4.69	.83	a.08
12	.12	.10	.06	.14	.14	.08	1.12	.08	.17	1.91	24.8	a.10
13	.12	.10	.16	.23	.14	.08	3.24	.08	.17	.76	32.4	a.12
14	*.12	.08	.08	.12	.14	.12	4.80	.10	.17	2.35	*95.5	a.12
15	.12	.10	.04	.08	.12	.14	3.79	.08	.12	2.81	7.35	a.12
16	.19	.10	.04	.08	.12	.10	.66	.73	.14	3.85	2.72	a.12
17	.20	.12	.04	.08	.12	.12	.08	*.28	.12	17.8	2.19	a.12
18	.12	.93	.04	.08	.10	.08	*.14	3.61	.14	5.17	.91	a.12
19	.12	.80	.04	.08	.10	.10	.17	6.85	.34	1.96	.50	a.12
20	.12	.10	.04	.08	.10	.08	.17	1.41	8.52	.81	.76	a.12
21	.12	.08	.04	.08	.10	.08	.17	.35	1.01	a.60	.62	*.08
22	.12	.08	.06	.08	.10	.08	.17	.17	.28	a.40	.28	.08
23	.12	.08	.04	.08	.24	.08	.14	.14	3.77	a.25	.42	.08
24	.12	.08	.04	.08	.12	.08	.14	.12	5.15	a.25	.46	.08
25	.14	*.10	.04	.08	.10	.08	.14	.12	1.44	a.22	.25	.08
26	.14	.10	.04	.08	.10	.08	.12	.10	.38	.25	.31	.08
27	.12	.14	.04	.08	.10	.08	.12	.10	.22	.15	.38	.35
28	.12	.14	.02	.14	.10	.08	.12	.14	.20	.10	.17	2.17
29	.12	.10	.06	.12	.10	.08	.21	.12	.62	.10	.14	1.15
30	.12	.10	.14	.08	.10	.08	.14	-----	3.20	.10	.12	.74
31	.18	.16	-----	.10	-----	.16	.14	-----	1.22	-----	.12	-----
Total	3.91	20.16	12.65	2.73	10.57	2.72	16.79	16.09	61.08	55.57	180.64	7.03
Mean:												
mgd	0.126	0.650	0.422	0.088	0.352	0.088	0.542	0.555	1.97	1.85	5.83	0.234
cfs	0.195	1.01	0.653	0.136	0.545	0.136	0.839	0.859	3.05	2.86	9.02	0.362
Ac-ft	12	62	39	8.4	32	8.3	52	49	187	171	554	22

Calendar year 1959: Max 30.0 Min 0.02 Mean(mgd) 0.454 Mean(cfs) 0.702 Ac-ft 507

Fiscal year 1959-60: Max 95.5 Min 0.02 Mean(mgd) 1.07 Mean(cfs) 1.66 Ac-ft 1,200

Peak discharge (base, 150 mgd).--Apr. 16 (12 p.m.) 382 mgd (591 cfs), 5.15 ft; May 14 (3:30 a.m.) 1,160 mgd (1,790 cfs), 6.29 ft.

* Discharge measurement made on this day.

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

2260. North Halawa Stream near Aiea

Location.--Lat 21°23'45", long 157°53'35", on left bank 2.7 miles above confluence with South Halawa Stream and 2.7 miles northeast of Aiea Post Office.

Drainage area.--3.45 sq mi.

Records available.--August 1929 to June 1933, July 1953 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge.--9 years (1931-33, 1953-60), 4.53 mgd (7.01 cfs).

Extremes.--Maximum discharge during year, 1,970 mgd (3,050 cfs) May 14 (gage height, 13.04 ft), from rating curve extended above 60 mgd on basis of slope-area measurements at gage heights 10.3 and 13.04 ft; no flow at times.

1929-33, 1953-60: Maximum discharge, 4,300 mgd (6,650 cfs) Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 270 mgd; no flow several times each year.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
1449	1954	Apr. 29, 1954	530	820	9.72
1449	1955	Nov. 28, 1954	1,730	2,680	12.64
1449	1956	Feb. 25, 1956	892	1,380	10.88
1569	1957	Dec. 6, 1956	410	634	9.24
1569	1958	Mar. 5, 1958	1,280	1,980	11.77
1639	1959	Oct. 23, 1958	1,160	1,790	11.51

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

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1954-59 (revised peaks only, for 1954-55, 1957), superseding those published in WSP 1449, 1569 and 1639, are given herewith:

1956	1958-Con.
Feb. 25..... 188	Mar. 6..... 125
	Oct. 23..... 113
1958	Oct. 29..... 128
Mar. 5..... 332	

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
February 1956.....	587.45	188	2.0	20.3	31.4	1,800
Fiscal year 1955-56.....	-	188	0	4.63	7.16	5,200
Calendar year 1956.....	-	188	0	4.40	6.81	4,940
March 1958.....	510.89	332	0	16.5	25.5	1,570
Fiscal year 1957-58.....	-	332	0	2.58	3.99	2,890
October 1958.....	326.91	128	0	10.5	16.2	1,000
Calendar year 1958.....	-	332	0	5.09	7.88	5,700
Fiscal year 1958-59.....	-	128	0	4.08	6.51	4,570

Revised peak discharge.--1953-54: Jan. 1 (5:30 a.m.) 368 mgd (569 cfs), 9.04 ft; Apr. 29 (1 p.m.) 530 mgd (820 cfs), 9.72 ft; May 31 (2:30 a.m.) 448 mgd (693 cfs), 9.39 ft.
 1954-55: July 29 (11 a.m.) 388 mgd (600 cfs), 9.14 ft; Nov. 28 (about 6 p.m.) 1,730 mgd (2,680 cfs), 12.64 ft; Jan. 21 (9:30 a.m.) 718 mgd (1,110 cfs), 10.36 ft; Feb. 7 (12 m.) 396 mgd (613 cfs), 9.18 ft; Feb. 12 (3:30 a.m.) 348 mgd (536 cfs), 8.94 ft; Feb. 23 (5:30 p.m.) 634 mgd (981 cfs), 10.08 ft.
 1955-56: Dec. 19 (12 m.) 545 mgd (843 cfs), 9.78 ft; Feb. 7 (4:30 a.m.) 320 mgd (495 cfs), 8.80 ft; Feb. 12 (8 p.m.) 314 mgd (486 cfs), 8.77 ft; May 7 (5:30 a.m.) 362 mgd (560 cfs), 9.01 ft.
 1956-57: Dec. 6 (10 p.m.) 410 mgd (634 cfs), 9.24 ft.
 1957-58: Dec. 6 (6:30 p.m.) 344 mgd (532 cfs), 8.92 ft; Feb. 28 (7 a.m.) 452 mgd (699 cfs), 9.41 ft; Mar. 5 (10:30 p.m.) 1,280 mgd (1,980 cfs), 11.77 ft.
 1958-59: July 3 (12 m.) 520 mgd (805 cfs), 9.68 ft; Aug. 2 (5:30 a.m.) 392 mgd (607 cfs), 9.16 ft; Aug. 8 (5 p.m.) 592 mgd (916 cfs), 9.94 ft; Oct. 23 (12 m.) 1,160 mgd (1,790 cfs), 11.51 ft; Apr. 9 (7:30 a.m.) 667 mgd (1,030 cfs), 10.19 ft.

2260. North Halawa Stream near Aiea--Continued

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to May 11

May 12 to June 30

4.1	0	4.8	1.31	4.08	0	5.2	9.40
4.2	.01	5.0	2.98	4.09	.01	5.5	17.5
4.3	.04	5.2	5.67	4.1	.01	6.0	38.5
4.4	.10	5.4	9.70	4.2	.06	6.5	71.0
4.5	.23	5.7	18.2	4.4	.43	7.0	114
4.6	.45	6.0	30.0	4.6	1.35	8.0	233
4.7	.81	6.4	52.5	4.9	4.19	9.0	397

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1		0	0	0.28	0	0	0	0	0.02	1.31	0.22	*0.37	
2		0	0	.12	11.6	0	0	0	.90	.65	.15	.32	
3		0	0	.09	1.91	0	0	0	2.96	.40	.23	2.76	
4		0	0	.04	.36	0	.02	0	22.8	7.34	.38	.94	
5		0	21.0	0	1.05	0	.04	0	26.1	2.81	.82	.35	
6		34.3	4.15	0	.19	0	.04	0	36.7	4.45	.31	.23	
7		8.55	.80	0	.80	0	.06	0	18.7	3.89	.19	.12	
8		1.31	.33	0	12.7	0	.04	0	5.60	1.56	a.17	.06	
9		1.11	.20	0	1.36	0	.02	0	2.39	12.9	a.23	.04	
10		.65	.12	0	.33	0	1.95	0	1.51	7.44	a17	.03	
11		.27	.09	0	.20	0	1.05	0	.86	16.7	*a3.5	.02	
12		.16	.06	0	.12	0	*8.08	0	.55	7.04	*117	.01	
13		.10	.01	0	.08	0	12.9	0	.38	3.21	127	.01	
14		.06	0	0	.04	.76	21.2	0	.27	8.27	*226	.01	
15		.02	0	0	0	.04	*11.4	0	.19	7.41	15.1	.01	
16		0	0	0	0	0	3.04	11.4	.12	*48.8	*6.64	.01	
17		0	0	0	0	0	1.26	3.20	.09	34.3	6.05	.01	
18		6.99	0	0	0	0	.65	22.2	.06	16.2	2.85	0	
19		2.24	0	0	0	0	.43	16.5	5.10	7.02	1.91	0	
20		.45	0	0	0	0	.31	4.01	17.0	3.92	*1.68	0	
21		.23	0	0	0	0	.20	1.40	2.49	3.10	1.35	0	
22		.14	0	0	0	0	.12	.62	.77	2.49	1.22	0	
23		.09	0	0	0	0	.09	*.38	13.0	1.65	1.28	1.51	
24		.05	0	0	0	0	.06	.25	12.5	1.95	.95	.58	
25		.02	0	0	0	.25	.04	.16	3.75	1.44	.76	.96	
26		0	0	0	0	.33	0	.10	1.72	.99	1.72	.68	
27		0	0	0	0	.12	0	.07	1.71	.72	.96	7.07	
28		0	0	0	0	.09	0	.05	2.06	.55	.60	8.10	
29		0	0	0	0	.06	0	.03	.99	.40	.49	6.05	
30		0	2.48	0	0	.02	0	-----	*15.1	.33	.40	2.77	
31		0	-----	0	-----	0	0	-----	3.30	-----	.37	-----	
Total		0	56.74	29.24	0.53	30.74	1.67	63.00	60.77	199.49	209.24	537.53	33.02
Mean		0	1.83	0.975	0.017	1.02	2.054	2.03	2.10	6.44	6.97	17.3	1.10
cfs		0	2.83	1.51	0.026	1.58	0.084	3.14	3.25	9.96	10.8	26.8	1.70
Ac-ft		0	174	90	1.6	94	5.1	193	186	612	642	1,650	101

Calendar year 1959: Max 118 Min 0 Mean(mgd) 1.12 Mean(cfs) 1.73 Ac-ft 1,250

Fiscal year 1959-60: Max 226 Min 0 Mean(mgd) 3.34 Mean(cfs) 5.17 Ac-ft 3,750

Peak discharge (base, 300 mgd)--Aug. 6 (2 p.m.) 316 mgd (489 cfs), 8.58 ft; Apr. 16 (11 p.m.) 704 mgd (1,090 cfs), 10.31 ft; May 14 (3 a.m.) 1,970 mgd (3,050 cfs), 13.04 ft.

* Discharge measurement made on this day.

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

2270. Halawa Stream near Aiea

Location.--Lat 21°22'25", long 157°55'40", on right bank 0.7 mile southeast of Aiea Post Office and 6.2 miles northeast of Honolulu Post Office.

Drainage area.--8.78 sq mi.

Records available.--April 1953 to June 1960.

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

Average discharge.--7 years, 7.51 mgd (11.6 cfs).

Extremes.--Maximum discharge during year, 2,400 mgd (3,710 cfs) May 14 (gage height, 10.8 ft); minimum, 0.50 mgd (0.77 cfs) Aug. 18.

1953-60: Maximum discharge, that of May 14, 1960; no flow at times.

Remarks.--Records good. At times, the Oahu Sugar Co. installs flashboards on the control diverting the entire flow for irrigation.

Revisions (fiscal years).--WSP 1449: 1955(M). WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.2	0.20	3.0	89
1.4	2.03	3.5	142
1.6	5.97	4.0	209
1.9	15.3	4.5	290
2.2	29.0	5.0	380
2.5	47.5	6.0	610

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.18	1.88	1.22	4.12	2.68	1.88	2.03	1.60	2.50	4.20	1.73	1.34
2	2.50	5.95	1.47	4.09	15.2	*2.18	1.60	1.73	3.03	3.21	1.60	1.34
3	2.50	11.1	1.80	2.03	4.14	2.50	1.22	3.24	4.95	2.35	2.18	2.50
4	2.38	5.02	1.47	2.35	2.68	2.55	1.60	3.40	25.5	6.85	2.18	2.52
5	2.35	3.81	22.1	3.03	2.03	2.03	1.88	2.35	28.5	5.25	2.35	1.34
6	2.18	45.3	6.60	2.35	1.88	1.88	2.03	1.88	57.1	5.68	3.03	1.22
7	2.50	26.6	2.35	2.68	1.34	1.60	2.85	1.73	57.4	7.31	2.35	1.73
8	2.50	4.17	1.60	2.18	16.4	1.73	3.40	2.19	16.9	4.40	1.73	1.47
9	2.35	2.35	1.47	2.68	7.10	1.73	2.50	2.32	5.51	11.8	2.18	1.47
10	1.88	2.11	1.47	3.80	1.34	2.35	1.88	1.88	3.21	10.1	24.0	1.73
11	1.73	1.47	1.73	3.03	1.10	2.50	1.73	1.73	2.18	18.6	24.0	1.47
12	1.73	1.22	1.80	2.68	1.22	2.03	4.70	2.35	1.60	12.5	128	1.10
13	1.73	1.10	1.88	3.40	1.88	1.60	12.8	1.73	1.34	8.25	202	.90
14	1.60	.81	1.88	3.80	1.60	1.60	30.2	1.22	1.22	10.9	516	1.34
15	*1.78	.72	2.50	2.50	1.88	2.68	*26.6	1.90	1.73	10.2	51.2	1.34
16	*2.63	.84	2.50	2.68	2.03	2.35	8.41	9.00	1.88	26.4	21.0	1.47
17	2.50	.57	2.68	2.18	2.03	3.40	4.20	*4.87	2.35	91.2	15.2	1.60
18	2.50	5.85	2.85	2.35	1.88	3.21	2.50	21.9	2.85	25.8	8.07	1.60
19	2.68	4.29	2.35	2.82	1.60	2.50	2.18	30.0	2.50	13.2	5.70	1.47
20	2.68	1.73	3.40	*3.03	1.60	1.73	2.03	8.41	23.4	7.81	4.80	1.47
21	2.03	1.47	2.68	3.21	1.73	1.73	1.88	3.40	5.46	6.23	4.20	2.03
22	2.03	1.34	2.50	2.50	2.03	2.35	1.60	2.35	4.94	5.46	3.60	*2.18
23	1.88	1.22	2.50	2.50	1.73	2.97	1.34	2.54	17.0	4.20	3.40	2.35
24	2.28	1.10	2.85	2.68	2.50	2.50	1.10	2.35	16.6	5.21	2.85	2.35
25	2.35	1.10	2.68	2.35	3.03	2.18	1.00	2.50	8.44	5.21	2.50	2.50
26	2.56	1.83	2.18	2.35	3.21	1.60	.81	3.03	4.40	3.03	3.40	2.03
27	1.88	2.18	1.73	3.40	2.68	1.34	1.69	2.68	3.60	2.68	2.35	7.30
28	2.45	*1.73	1.73	2.85	1.83	1.22	2.33	1.88	3.40	2.50	1.73	12.0
29	1.88	1.60	2.68	3.21	2.17	1.34	2.35	2.03	3.40	3.03	1.47	10.4
30	2.28	1.60	3.21	3.21	2.03	1.60	2.03	-----	17.5	2.50	1.47	10.8
31	1.88	1.60	-----	3.37	-----	2.35	1.47	-----	*7.19	-----	1.34	-----
Total	68.36	139.67	89.66	89.41	94.55	65.01	133.94	127.99	337.38	312.06	1,047.61	84.36
Mean:												
mgd	2.21	4.51	2.99	2.88	3.15	2.10	4.32	4.41	10.9	10.4	33.8	2.81
cfs	3.42	6.98	4.63	4.46	4.87	3.25	6.68	6.82	16.9	16.1	52.3	4.35
Ac-ft	210	429	275	274	290	200	411	593	1,040	958	3,210	259

Calendar year 1959: Max 165 Min 0.40 Mean(mgd) 3.28 Mean(cfs) 5.07 Ac-ft 3,670
Fiscal year 1959-60: Max 516 Min 0.57 Mean(mgd) 7.08 Mean(cfs) 11.0 Ac-ft 7,950

Peak discharge (base, 300 mgd).--Apr. 16 (12 p.m.) 509 mgd (788 cfs), 5.60 ft; May 14 (4:30 a.m.) 2,400 mgd (3,710 cfs), 10.8 ft.

* Discharge measurement made on this day.

2280. Moanalua Stream near Honolulu

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

Drainage area.--2.73 sq mi.

Records available.--June 1926 to June 1960.

Gage.--Water-stage recorder and concrete weir. Datum of gage is 339.12 ft above mean sea level (city and county of Honolulu bench mark).

Average discharge.--34 years, 2.07 mgd (3.20 cfs).

Extremes.--Maximum discharge during year, 1,230 mgd (1,900 cfs) May 14 (gage height, 8.80 ft), from rating curve extended above 42 mgd by test on model of station site and on basis of culvert computation at 8.8 ft gage height; no flow for many days.
1926-60: Maximum discharge, 2,960 mgd (4,580 cfs) Nov. 18, 1930 (gage height, 11.58 ft), from rating curve extended above 80 mgd by test on model of station site; no flow at times each year.

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

Revisions (fiscal years).--WSP 935: 1931(M). WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

-0.2	0	1.1	13.0
0.0	.03	1.5	27.1
.2	.30	2.0	55.0
.4	1.13	3.0	144
.6	2.85	4.0	282
.8	5.70		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0	0		4.53		0	0	0	0.32	0.02	0.02
2		0	0		.01		0	0	0	.05	.01	0
3		0	0				0	0	0	.02	.01	0
4		0	0				0	0	3.86	.61	0	0
5		0	7.05		0		0	0	21.0	.36	0	0
6		20.8	1.02		0		0	0	36.4	.07	0	0
7		4.42	.02		0		0	0	14.8	.07	0	0
8		.11	0		4.36		0	0	3.62	.04	0	0
9		.10	0		.13		0	0	1.41	2.39	0	0
10		.05	0		0		0	0	.59	2.07	*5.17	0
11		.01	0		0		0	0	.33	8.58	.70	0
12		0	0		0		0	0	.09	3.82	*35.0	0
13		0	0		0		.98	0	.03	1.55	133	0
14		0	0		0		10.9	0	.02	5.12	*191	0
15		0	0		0		7.24	0	.02	3.56	16.2	0
16		0	0		0		1.57	.63	.01	17.2	6.35	0
17		0	0		0		.50	.06	0	21.0	3.72	0
18		1.72	0		0		.15	5.59	0	13.0	3.60	0
19		.21	0		0		.04	8.51	0	5.10	1.62	0
20		.01	0		0		.02	1.66	4.93	2.75	1.27	0
21		0	0		0		.01	.35	.56	1.96	.76	0
22		0	0		0		0	.05	.06	1.07	.63	0
23		0	0		0		0	0	3.27	.76	.55	0
24		0	0		0		0	.02	5.51	.63	.44	0
25		0	0		0		0	.02	1.28	.38	.30	0
26		0	0		0		0	0	.30	.21	.15	0
27		0	0		0		0	0	.08	.09	.07	2.34
28		0	0		0		0	0	.03	.04	.04	3.74
29		0	0		0		0	0	.02	.03	.03	.96
30		0	0		0		0	0	4.46	.02	.02	.35
31		0	0		0		0	0	1.45	0	.02	0
Total	0	27.43	8.09	0	9.03	0	21.41	16.89	104.13	92.87	400.68	7.31
Mean:	0	0.885	0.270	0	0.301	0	0.691	0.582	3.36	3.10	12.9	0.244
mgd	0	1.37	0.418	0	0.466	0	1.07	0.900	5.20	4.80	20.0	0.378
cfs	0	1.37	0.418	0	0.466	0	1.07	0.900	5.20	4.80	20.0	0.378
Ac-ft	0	84	25	0	28	0	66	52	320	285	1,230	22

Calendar year 1959: Max 79 Min 0 Mean(mgd) 0.487 Mean(cfs) 0.754 Ac-ft 547
Fiscal year 1959-60: Max 191 Min 0 Mean(mgd) 1.88 Mean(cfs) 2.91 Ac-ft 2,110

Peak discharge (base, 150 mgd).--Mar. 6 (2 a.m.) 160 mgd (248 cfs), 3.12 ft; May 14 (2 a.m.) 1,230 mgd (1,900 cfs), 8.80 ft.

* Discharge measurement made on this day.

2290. Kalihi Stream near Honolulu

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

Drainage area.--2.61 sq mi.

Records available.--September 1913 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft above mean sea level, datum of 1929. Prior to Oct. 12, 1923, water-stage recorder at same site at datum 2.00 ft lower.

Average discharge.--46 years (1914-60), 4.63 mgd (7.16 cfs).

Extremes.--Maximum discharge during year, 2,820 mgd (4,360 cfs) May 13 (gage height, 11.27 ft), from critical depth measurement of peak flow; minimum, 0.26 mgd (0.40 cfs) July 25, 1913-60. Maximum discharge, about 8,000 mgd (about 12,400 cfs), revised, Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 200 mgd on basis of indirect measurements at gage heights 8.9 and 11.27 ft; minimum, 0.06 mgd (0.09 cfs) Oct. 22, 1933.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
535	1921	Jan. 16, 1921	4,100	6,340	*12.00
555	1922	Oct. 3, 1921	1,240	1,920	*9.47
575	1923	Jan. 19, 1923	3,920	6,070	*11.90
595	1924	Dec. 30, 1923	3,670	5,680	11.76
615	1925	Oct. 10, 1924	690	1,070	8.36
635	1926	Nov. 4, 1925	972	1,500	8.95
655	1927	May 16, 1927	1,560	2,410	9.90
675	1928	Nov. 18, 1927	3,810	5,890	11.84
695	1929	Nov. 4, 1928	1,760	2,760	8.60
710	1930	Apr. 11, 1930	1,690	2,610	10.06
725	1931	Nov. 18, 1930	8,000	12,400	13.81
740	1932	Feb. 13, 1932	4,210	6,510	12.06
795	1935	Feb. 27, 1935	2,570	3,980	11.02
835	1937	Jan. 1, 1937	2,550	3,950	11.00
865	1938	Sept. 28, 1937	926	1,430	8.84
885	1939	Feb. 28, 1939	1,800	2,790	10.18
985	1943	Jan. 13, 1943	972	1,500	8.95
1125	1948	Nov. 14, 1947	930	1,440	8.85
1155	1949	Jan. 16, 1949	1,640	2,540	10.0
1185	1950	May 16, 1950	1,850	2,860	10.23
1219	1951	Mar. 26, 1951	2,320	3,590	10.75
1249	1952	Mar. 26, 1952	1,270	1,960	9.52
1399	1955	Feb. 23, 1955	1,210	1,870	9.42
1449	1956	Jan. 24, 1956	870	1,350	8.70
1569	1957	Jan. 21, 1957	264	408	6.41
1569	1958	Mar. 5, 1958	324	501	6.81
1639	1959	Oct. 23, 1958	802	1,240	8.52

* Present datum.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Water for domestic use diverted from stream above station.

Revisions.--WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1923-24, 1927-28, 1935, 1937, 1955-56, and 1959, superseding those published in WSP 575, 595, 655, 675, 795, 835, 1319, 1399, 1449 and 1639, are given herewith. Revised peak discharges for the fiscal years 1948-54 and 1957-58, superseding those published in previous water-supply papers, are also given.

Date	Discharge	Date	Discharge	Date	Discharge
1922		1937		1955-Con.	
Sept. 11	94	Jan. 1	163	Dec. 19	55
1923		Apr. 30	28.5	20	117
Jan. 14	180	1954		21	57
19	615	Nov. 28	83	1956	
Dec. 30	85	29	66	Jan. 25	45
1927		1955		Feb. 25	87
Mar. 27	51	Feb. 7	105	1958	
Nov. 19	115	22	34	Oct. 23	60
		23	169	24	95
1935		24	70	1959	
Feb. 27	260	25	45	Apr. 9	109

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
September 1922.....	-	94	1.7	8.78	13.6	808
Calendar year 1922.....	-	94	.9	4.97	7.69	5,670
January 1923.....	-	615	1.3	42.5	68.5	4,040
Fiscal year 1922-23.....	-	615	.9	9.11	14.1	10,200
December 1923.....	-	85	1.0	12.4	19.4	1,180
Calendar year 1923.....	-	615	.9	8.71	13.5	9,760
Fiscal year 1923-24.....	-	-	.1	4.43	6.85	4,990
March 1927.....	-	51	3.2	11.8	18.3	1,120
Fiscal year 1926-27.....	-	-	.5	7.28	11.3	8,150
November 1927.....	-	172	1.8	22.7	35.1	2,090
Calendar year 1927.....	-	-	.5	10.4	16.1	11,700
Fiscal year 1927-28.....	-	172	1.1	6.79	10.5	7,630

2290. Kalihi Stream near Honolulu--Continued

Revised figures of monthly discharge, in million gallons a day, 1923-24, 1927-28, 1935
1937, 1955-56, 1959--Continued

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
February 1935.....	407.38	260	1.46	14.5	22.4	1,250
Fiscal year 1934-35.....	2,035.21	260	1.13	5.58	8.63	6,250
Calendar year 1935.....	1,767.35	260	1.0	4.83	7.47	5,400
January 1937.....	503.75	163	3.25	16.2	25.1	1,550
April.....	160.50	28.5	2.1	5.35	8.28	493
Fiscal year 1936-37.....	3,118.35	163	1.37	8.54	13.2	9,580
Calendar year 1937.....	2,869.35	163	1.46	7.86	12.2	8,810
November 1954.....	185.34	83	.79	6.18	9.56	569
Calendar year 1954.....	-	83	.45	4.24	6.56	4,750
February 1955.....	644.1	169	2.5	23.0	35.6	1,980
Fiscal year 1954-55.....	-	169	.79	6.54	10.1	7,330
December 1955.....	311.24	117	.72	10.0	15.5	955
Calendar year 1955.....	-	169	.52	5.07	7.84	5,680
January 1956.....	232.91	45	1.78	7.51	11.6	715
February.....	427.2	87	4.4	14.7	22.7	1,310
Fiscal year 1955-56.....	-	117	.52	5.14	7.95	5,770
Calendar year 1956.....	-	87	1.0	4.45	6.89	5,000
October 1958.....	276.97	95	1.09	8.93	13.8	850
Calendar year 1958.....	-	130	.66	5.30	8.20	5,940
April 1959.....	185.81	109	.70	6.19	9.58	570
Fiscal year 1958-59.....	-	130	.38	5.11	7.91	5,720

Revised peak discharge.--1947-48: Nov. 14 (12:30 p.m.) 930 mgd (1,440 cfs), 8.85 ft;
Apr. 3 (9 p.m.) 417 mgd (645 cfs), 7.28 ft.
1948-49: Jan. 16 (8 p.m.) 1,640 mgd (2,540 cfs), 10.0 ft.
1949-50: May 16 (6 p.m.) 1,850 mgd (2,860 cfs), 10.23 ft.
1950-51: Dec. 3 (5 p.m.) 2,300 mgd (3,560 cfs), 10.73 ft; Mar. 11 (7:30 a.m.) 1,150
mgd (1,780 cfs), 9.31 ft; Mar. 26 (7:30 a.m.) 2,320 mgd (3,590 cfs), 10.75 ft.
1951-52: Jan. 19 (12:30 p.m.) 405 mgd (627 cfs), 7.23 ft; Mar. 26 (8 p.m.) 1,270 mgd
(1,960 cfs), 9.52 ft.
1952-53: No peak above base.
1953-54: No peak above base.
1954-55: Nov. 28 (9 p.m.) 832 mgd (1,290 cfs), 8.60 ft; Feb. 7 (9 a.m.) 548 mgd
(848 cfs), 7.76 ft; Feb. 23 (7:30 p.m.) 1,210 mgd (1,870 cfs), 9.42 ft.
1955-56: Dec. 20 (4 a.m.) 530 mgd (820 cfs), 7.70 ft; Jan. 24 (12 p.m.) 870 mgd
(1,350 cfs), 8.70 ft; Feb. 16 (12 m.) 403 mgd (624 cfs), 7.22 ft; Feb. 25 (6 a.m.)
548 mgd (848 cfs), 7.76 ft.
1956-57: No peak above base.
1957-58: No peak above base.
1958-59: Oct. 23 (11:30 p.m.) 802 mgd (1,240 cfs), 8.52 ft; Apr. 9 (6 a.m.) 596 mgd
(922 cfs), 7.92 ft.

2290. Kalihi Stream near Honolulu--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

2.08	0.32	3.0	19.2
2.1	.45	3.5	38.0
2.2	1.28	4.0	62.0
2.3	2.38	4.5	92.0
2.5	5.80	5.0	126
2.7	10.4		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.91	0.91	0.66	1.38	1.38	0.66	0.59	0.74	1.74	3.09	2.14	2.52
2	1.38	.82	.66	1.09	16.8	.66	.66	.74	2.60	2.66	2.02	2.38
3	.82	.66	.66	.91	2.48	.66	.66	.74	2.26	2.52	1.91	2.14
4	.66	.66	1.11	.74	1.58	.66	2.06	.74	13.1	3.91	2.14	2.14
5	1.00	3.91	2.4.3	.66	2.02	1.36	1.28	.74	38.1	2.80	3.90	2.14
6	.66	41.1	4.33	.66	1.28	1.09	1.00	.66	48.8	2.66	3.40	1.91
7	.66	*8.57	2.80	.66	2.68	.66	1.00	.66	11.7	2.26	2.94	1.80
8	.59	2.94	2.02	.66	12.4	.59	.66	.66	6.68	2.63	2.80	1.69
9	.52	3.02	1.58	.66	3.09	.66	.74	.59	4.61	9.02	2.52	1.58
10	.45	2.02	1.38	.59	2.14	.59	1.38	.59	3.73	4.74	16.0	2.39
11	.52	1.80	1.65	.66	1.69	.66	1.00	.74	3.24	13.6	4.80	1.80
12	.52	1.48	1.38	.66	1.58	.59	3.60	.66	2.80	6.37	*38.0	1.58
13	.52	1.28	1.09	1.77	1.38	.66	5.25	.66	2.38	4.43	*125	1.48
14	*.52	1.09	1.18	.82	1.28	2.19	*18.9	.74	2.26	7.88	109	1.58
15	.52	1.53	1.09	.66	1.09	1.54	9.90	1.28	2.02	26.5	21.2	1.80
16	1.07	1.09	.91	.59	1.09	.82	4.07	3.09	1.80	16.0	11.2	1.80
17	.59	1.68	.91	.59	1.00	1.00	3.40	1.80	1.91	13.2	8.48	1.38
18	.66	8.13	.82	.52	.82	.66	2.32	1.91	1.69	19.2	6.48	1.28
19	.45	2.80	.74	.52	.82	.59	2.02	10.4	3.89	6.24	5.60	1.18
20	.74	1.91	.91	.45	.82	.52	1.69	4.80	8.25	4.80	5.60	1.09
21	.52	1.48	.82	*.52	.74	.52	1.48	2.38	4.61	13.2	4.80	1.18
22	.38	1.18	.74	.59	.82	.66	1.28	1.80	3.90	4.80	5.40	1.48
23	.38	1.09	.74	.66	1.29	.38	1.18	1.48	7.12	5.20	4.80	2.14
24	.38	1.00	1.58	.66	.82	2.64	1.09	1.28	6.90	5.20	4.25	1.48
25	.32	1.68	1.19	.74	.74	1.48	1.09	1.09	*4.80	3.90	4.25	2.02
26	1.56	1.38	1.45	.66	.66	.91	1.09	1.00	3.24	3.40	3.73	1.91
27	.59	1.09	2.46	1.24	.66	.82	1.09	.92	3.09	2.94	3.40	5.72
28	.45	1.00	1.09	.91	.66	.66	.96	.74	3.79	2.80	3.09	4.88
29	3.87	.74	1.63	.66	.66	.66	.91	.59	*3.40	2.52	2.80	3.40
30	1.00	.74	2.04	.66	*.66	.66	.82	-----	5.15	2.26	2.66	*2.39
31	.74	.66	-----	1.18	-----	.74	.82	-----	3.56	-----	2.66	-----
Total	23.95	99.44	63.92	23.73	65.13	26.95	74.59	44.22	213.12	200.73	416.95	62.26
Mean:												
mgd	0.773	3.21	2.13	0.765	2.17	0.869	2.41	1.52	6.87	6.69	13.4	2.08
cfs	1.20	4.97	3.30	1.18	3.36	1.34	3.73	2.35	10.6	10.4	20.7	3.22
Ac-ft	73	305	196	73	200	83	229	136	654	616	1,280	191

Calendar year 1959: Max 109 Min 0.32 Mean(mgd) 2.13 Mean(cfs) 3.30 Ac-ft 2,380
 Fiscal year 1959-60: Max 125 Min 0.32 Mean(mgd) 3.59 Mean(cfs) 5.55 Ac-ft 4,040

Peak discharge (base, 400 mgd).--May 13 (11 a.m.) 2,820 mgd (4,360 cfs), 11.27 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 6-29, Apr. 16 to May 12; discharge estimated on basis of records for nearby stations.

2320. Nuuanu Stream below reservoir 2 wasteway, near Honolulu

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

Drainage area.--3.35 sq mi.

Records available.--October 1913 to June 1960.

Gage.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1915, staff gage at same site at datum 0.03 ft lower. Sept. 7, 1915, to Apr. 4, 1918, staff gage at same site and datum.

Average discharge.--43 years (1914-16, 1917-20, 1922-60), 4.90 mgd (7.58 cfs).

Extremes.--Maximum discharge during year, 1,790 mgd (2,770 cfs) May 13 (gage height, 6.69 ft, from floodmark), from rating curve extended above 300 mgd on basis of slope-area measurement of peak flow; minimum, 0.34 mgd (0.53 cfs) Aug. 3.

1913-60: Maximum discharge, 4,520 mgd (6,930 cfs) Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 300 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Sept. 10, 11, 1925.

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

Revisions (fiscal years).--WSP 1639: 1930-31, 1934-35.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Jan. 12, 13, Feb. 19-26, May 16, 17, 1960)

0.2	0.39	1.0	4.20
.3	.71	1.5	16.2
.4	1.08	2.0	37.4
.6	1.95	2.5	64.0
.8	2.97	3.5	134

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.12	0.95	1.12	1.41	1.00	0.93	1.24	1.33	1.24	3.02	3.1	4.13
2	1.34	.85	1.12	1.28	7.07	1.00	1.24	1.28	1.33	2.92	3.0	3.97
3	1.04	.85	1.20	1.20	1.63	.96	1.45	1.28	1.37	2.92	2.9	3.85
4	.96	.61	1.75	1.16	1.36	.97	1.72	1.24	2.32	2.97	3.1	3.71
5	1.04	5.04	10.2	1.16	1.81	2.65	1.37	1.20	7.84	2.87	3.5	3.64
6	.89	27.5	2.69	1.12	1.63	1.64	1.37	1.20	8.42	2.76	3.3	3.70
7	.89	4.93	2.10	1.12	2.20	1.16	1.41	1.24	8.92	2.71	3.2	3.47
8	.89	3.39	2.00	1.12	5.05	1.16	1.33	1.16	3.92	3.04	3.1	3.34
9	.85	3.50	1.86	1.08	1.33	1.24	1.84	1.16	3.45	6.96	3.0	3.46
10	.81	3.39	1.86	1.08	1.12	1.12	1.72	1.12	3.34	3.85	16	3.50
11	.89	3.57	2.05	1.12	1.08	1.16	2.46	1.33	4.29	8.58	4.9	3.24
12	.81	3.34	1.90	1.04	1.04	1.16	8.52	1.16	3.29	5.65	46	3.24
13	.78	3.08	1.81	1.30	1.00	1.32	9.0	1.20	3.02	4.45	*100	3.13
14	.76	3.08	1.93	1.08	.96	4.13	*18	1.33	2.81	5.45	*100	3.24
15	.74	3.43	1.58	1.00	.93	1.96	6.68	1.54	2.71	7.68	70	3.13
16	.81	3.08	1.58	.96	.93	1.44	3.08	2.45	2.66	9.31	12	3.13
17	.78	3.28	1.54	.96	.96	1.55	2.40	1.81	2.66	13	9.70	2.97
18	.71	5.07	1.54	.93	.89	1.16	2.50	4.67	2.61	19	8.51	2.92
19	.67	2.87	1.54	.89	.93	1.08	2.05	5.60	3.62	9.0	7.45	2.76
20	.81	2.71	1.77	.89	.93	1.12	2.05	2.26	4.16	6.0	7.25	2.76
21	.67	2.81	1.67	.89	.93	1.45	1.81	1.67	2.97	4.8	6.65	2.87
22	.64	2.81	1.63	.93	.93	1.37	1.72	1.54	2.87	5.0	6.65	2.97
23	.64	2.55	1.77	.93	1.28	1.37	1.63	1.25	5.22	5.0	6.45	2.97
24	.64	1.62	2.26	1.00	*.92	2.55	1.58	.89	4.33	4.5	6.45	2.87
25	.64	1.45	1.65	.96	.94	1.54	1.49	1.12	3.45	4.1	5.75	2.71
26	1.26	1.41	1.33	.89	.93	1.37	1.49	1.14	3.39	3.9	5.45	2.71
27	.67	1.20	1.63	1.33	.96	1.37	1.45	1.12	3.45	3.7	5.05	3.82
28	.64	1.20	1.24	1.00	.96	1.24	1.54	1.12	3.78	3.5	5.08	3.13
29	2.28	1.16	1.57	.89	.96	1.28	1.41	1.08	3.34	3.3	4.82	3.02
30	.81	1.16	1.92	.89	.93	1.37	1.41	-----	4.42	3.2	4.58	*2.71
31	.87	1.12	-----	1.16	-----	1.28	1.37	-----	3.24	-----	4.47	-----
Total	27.35	102.79	60.21	32.77	43.59	45.08	88.13	46.49	114.44	163.14	471.41	97.07
Mean:												
mgd	0.88	3.32	2.01	1.06	1.45	1.45	2.84	1.60	3.69	5.44	15.2	3.24
cfs	1.36	5.14	3.11	1.64	2.24	2.24	4.39	2.48	5.71	8.42	23.5	5.01
Ac-ft	84	315	185	101	134	138	270	143	351	501	1,450	298

Calendar year 1959: Max 77 Min 0.61 Mean(mgd) 2.18 Mean(cfs) 3.37 Ac-ft 2,440

Fiscal year 1959-60: Max 100 Min 0.61 Mean(mgd) 3.53 Mean(cfs) 5.46 Ac-ft 3,970

Peak discharge (base, 150 mgd).--Jan. 14 (7 p.m.) 168 mgd (260 cfs), 3.82 ft; May 13 (time unknown) 1,790 mgd (2,770 cfs), 6.69 ft.

* Discharge measurement made on this day.

Note.--No gage-height record for Jan. 13, 14, Apr. 17 to May 16; discharge estimated on basis of records for stations on nearby streams.

2390. East Branch Manoa Stream near Honolulu

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

Drainage area.--1.06 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1960.

Gage.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, staff gage at site 200 ft upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 50 ft upstream at different datum. Aug. 18, 1925, to Oct. 18, 1933, water-stage recorder at present site at datum 0.41 ft higher.

Average discharge.--41 years (1913-20, 1926-60), 3.17 mgd (4.90 cfs).

Extremes.--Maximum discharge during year, 776 mgd (1,200 cfs) May 12 (gage height, 4.98 ft), from rating curve extended above 90 mgd by test on model of station site; minimum, 0.93 mgd (1.44 cfs) Feb. 28.

1913-21, 1925-60: Maximum gage height, 10.4 ft Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,000 mgd or 3,090 cfs, estimated from rating curve extended above 37 mgd); minimum discharge, 0.4 mgd (0.6 cfs) June 7, 8, 1926.

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

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet and discharge, in million gallons a day)
(Shifting-control method used Sept. 21-26, Oct. 4-6)

0.2	0.61	2.2	11.5
.3	1.15	1.4	18.3
.4	1.85	1.6	26.5
.6	3.50	2.0	47.0
.8	5.60	2.4	81.0
1.0	7.90		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.36	1.64	1.15	2.25	2.25	1.64	1.36	1.15	2.36	2.09	1.93	2.73
2	1.52	1.64	1.22	1.78	10.9	1.64	1.36	1.15	2.40	1.64	2.09	2.85
3	1.29	1.97	1.29	1.64	2.57	1.57	1.84	1.15	1.97	1.64	2.17	2.57
4	1.22	1.64	2.14	1.78	2.74	1.71	2.58	1.15	7.73	4.04	3.32	2.41
5	2.36	4.70	13.5	1.71	3.62	3.69	1.64	1.15	21.4	2.09	2.09	2.25
6	1.57	*27.7	3.60	1.71	2.33	2.37	1.64	1.15	12.3	2.01	1.85	2.09
7	1.50	5.06	3.00	*1.71	4.90	1.57	1.64	1.15	6.74	1.85	1.85	2.09
8	1.43	2.41	2.33	2.01	8.91	1.36	1.50	1.09	2.82	3.31	2.09	2.01
9	1.36	2.49	2.17	1.78	2.82	1.64	2.21	1.09	2.09	14.3	4.31	2.01
10	1.36	2.01	2.25	1.78	2.57	1.36	1.40	1.09	1.93	3.90	11.0	2.57
11	1.50	3.18	2.46	1.85	2.57	1.36	1.57	1.29	2.77	8.03	3.13	2.09
12	1.50	2.41	2.25	2.43	2.41	1.29	3.80	1.15	1.78	3.80	53.2	2.09
13	*1.43	1.78	2.09	3.41	2.33	1.58	1.71	1.29	1.64	2.82	29.6	2.01
14	1.50	1.64	2.52	2.17	2.46	4.61	*6.77	1.50	1.50	3.44	17.9	2.09
15	1.50	2.33	2.09	1.93	2.33	2.77	2.73	3.18	1.50	4.84	6.94	2.73
16	1.57	1.78	2.01	1.85	2.33	1.57	1.93	*5.39	1.43	4.71	*6.12	2.01
17	1.57	2.09	1.93	1.78	2.33	1.71	1.64	1.64	1.36	6.75	4.72	1.93
18	1.57	3.83	1.93	1.78	2.33	1.43	1.89	10.0	1.29	6.32	3.90	1.93
19	1.50	2.09	1.93	1.78	2.25	1.29	1.48	8.22	5.56	3.50	3.60	1.78
20	1.96	1.75	1.98	1.78	2.17	1.29	1.89	2.25	6.55	2.90	3.60	1.78
21	1.57	1.50	1.93	1.78	2.01	1.29	1.36	1.36	2.09	4.26	3.24	*1.85
22	1.50	1.50	1.85	1.85	1.71	1.29	1.29	1.29	1.71	2.90	3.60	2.45
23	1.50	1.36	2.01	2.17	2.30	1.22	1.29	1.36	5.86	2.90	3.33	2.82
24	1.50	1.36	2.67	2.35	*1.64	4.65	1.29	1.09	5.56	2.90	3.33	2.41
25	1.43	1.43	1.85	2.27	1.57	2.09	1.22	.98	2.25	2.41	3.24	2.25
26	2.88	1.56	3.76	2.38	1.54	1.71	1.22	.98	2.09	2.25	3.24	2.25
27	1.50	1.36	4.84	4.14	1.50	1.57	1.22	1.04	2.17	2.17	2.99	4.13
28	1.50	1.29	1.93	2.49	1.36	1.50	1.29	1.04	*2.09	2.09	2.99	3.73
29	5.43	1.29	2.17	2.01	1.50	1.36	1.22	.98	1.71	2.09	2.82	4.12
30	1.64	1.22	3.49	1.93	1.57	1.36	1.22	-----	3.23	2.01	2.73	2.73
31	1.43	*1.22	2.17	2.17	-----	1.36	1.15	-----	2.01	-----	3.07	-----
Total	52.45	89.23	80.34	64.45	83.82	56.85	56.35	57.35	117.89	109.96	200.19	72.56
Mean:												
mgd	1.69	2.88	2.68	2.08	2.79	1.83	1.82	1.98	3.80	3.67	6.46	2.42
cfs	2.62	4.45	4.14	3.22	4.32	2.84	2.81	3.06	5.88	5.67	9.99	3.74
Ac-ft	161	274	247	198	257	174	173	176	362	337	614	223
Calendar year 1959:	Max 63.0		Min 1.15		Mean(mgd) 2.57		Mean(cfs) 3.98		Ac-ft 2,880			
Fiscal year 1959-60:	Max 53.2		Min 0.98		Mean(mgd) 2.85		Mean(cfs) 4.40		Ac-ft 3,200			
Peak discharge (base, 200 mgd).--	May 12 (1:30 a.m.) 776 mgd (1,200 cfs), 4.98 ft; May 13 (10 a.m.) 330 mgd (511 cfs), 3.78 ft.											

* Discharge measurement made on this day.

2400. West Branch Manoa Stream near Honolulu

Location.--Lat 21°19'55", long 157°48'10", on left bank 100 ft upstream from highway bridge and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.14 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1960.

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

Average discharge.--41 years (1913-20, 1926-60), 2.46 mgd (3.81 cfs).

Extremes.--Maximum discharge during year, 820 mgd (1,270 cfs) May 12 (gage height, 5.18 ft), from rating curve extended above 73 mgd by test on model of station site; minimum, 0.19 mgd (0.29 cfs) July 23, 24, 25, 28.

1913-21, 1925-60: Maximum gage height, 10.4 ft Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,100 mgd or 3,250 cfs, estimated from rating curve extended above 40 mgd; minimum discharge, about 0.05 mgd (0.08 cfs) at times in 1913, 1915, 1926.

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

Revisions (fiscal years).--WSP 1569: 1930-32(M), drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Aug. 14-17)

0.07	0.19	0.7	4.50
.08	.23	.8	6.20
.1	.32	1.0	10.6
.2	.82	1.3	20.7
.3	1.42	1.6	36.0
.5	2.85	2.0	65.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	0.58	0.36	0.71	0.50	0.36	0.41	0.60	2.54	2.05	0.99	1.17
2	.76	.63	.41	.46	6.34	.36	.41	.55	1.40	1.11	1.17	1.05
3	.41	.77	.46	.36	1.17	.36	.62	.55	1.09	.93	1.23	.99
4	.36	.46	1.63	.28	.91	.28	1.72	.50	3.21	1.71	1.82	.93
5	1.36	4.10	12.0	.28	1.91	2.10	.76	.50	9.06	1.05	1.05	.82
6	.55	*23.6	2.58	.32	.93	1.38	.71	.50	9.25	.99	.93	.76
7	.41	*5.76	1.46	.36	2.82	.66	.71	.60	6.08	.87	.82	.71
8	.36	2.32	.87	.57	5.73	.41	.76	.50	2.40	1.50	.99	.71
9	.32	1.85	.66	.41	1.68	.66	1.91	.50	1.68	9.91	1.46	.66
10	.28	1.36	.66	.41	1.11	.41	1.53	.50	1.29	3.14	7.65	1.17
11	.49	1.85	.82	.55	.99	.36	1.05	.60	1.87	6.03	1.82	.71
12	.36	1.55	.66	1.13	.82	.36	6.21	.50	1.17	3.30	61.3	.66
13	.36	1.39	.46	1.68	.66	.72	3.38	.55	.99	2.10	47.4	.60
14	.28	.99	.87	.67	.60	3.94	*14.4	.85	.99	3.37	28.1	.66
15	.32	1.62	.50	.60	.50	2.91	4.27	1.36	.93	4.71	11.1	1.31
16	.36	1.42	.46	.46	.50	1.05	2.32	*3.36	.82	4.94	*7.48	.76
17	.36	1.68	.41	.41	.46	1.20	1.63	1.49	.71	6.12	4.65	.60
18	.32	2.23	.41	.32	.50	.66	1.93	4.75	.71	9.33	3.65	.60
19	.28	1.21	.41	.28	.46	.50	1.29	5.13	2.25	3.33	3.17	.55
20	.56	.82	.46	.28	.36	.41	1.48	1.92	3.26	2.47	3.17	.50
21	.28	.76	.36	.28	.36	.46	1.05	1.17	1.11	5.02	2.62	.50
22	.23	.71	.36	.36	.36	.50	.93	.93	.87	2.32	3.77	*1.09
23	.19	.66	.46	.50	.82	.41	.87	.67	2.85	2.32	2.77	1.42
24	.19	.60	1.28	.62	*.41	3.38	.82	.66	2.71	2.40	2.40	1.24
25	.19	.86	.45	.60	.36	1.69	.76	.60	1.23	1.82	2.02	.99
26	1.05	1.15	.76	.68	.41	.99	.71	.55	1.05	1.62	1.95	.93
27	.36	.71	2.73	1.82	.41	1.05	.66	.50	1.20	1.42	1.62	2.37
28	.23	.71	.55	.71	.32	.50	.76	.95	*2.27	1.29	1.49	2.31
29	3.61	.58	.74	.71	.32	.55	.66	2.17	1.05	1.23	1.29	2.67
30	.55	.55	1.69	.41	.32	.50	.60	2.15	1.11	1.11	1.23	1.62
31	.41	*.41	-----	.46	-----	.50	.60	-----	1.42	-----	1.62	-----
Total	16.34	63.89	56.13	17.69	33.04	29.72	55.97	34.81	69.57	89.51	212.73	32.26
Mean	0.527	2.06	1.20	0.571	1.10	0.959	1.81	1.20	2.24	2.98	6.86	1.08
cfs	0.815	3.19	1.86	0.883	1.70	1.48	2.79	1.86	3.47	4.62	10.6	1.66
Ac-ft	50.0	196	111	54.0	101	91.0	172	107	214	275	653	99.0

Calendar year 1959: Max 60.0 Min 0.19 Mean(mgd) 1.27 Mean(cfs) 1.96 Ac-ft 1,420
Fiscal year 1959-60: Max 61.3 Min 0.19 Mean(mgd) 1.89 Mean(cfs) 2.92 Ac-ft 2,120

Peak discharge (base, 200 mgd).--May 12 (2 a.m.) 820 mgd (1,270 cfs), 5.18 ft; May 13 (10 a.m.) 604 mgd (935 cfs), 4.73 ft.

* Discharge measurement made on this day.

2440. Pukele Stream near Honolulu

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

Drainage area.--1.18 sq mi.

Records available.--June 1926 to June 1960. Records for April to December 1912, published in WSP 336 have been found unreliable and should not be used.

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

Average discharge.--34 years (1926-60), 1.26 mgd (1.95 cfs).

Extremes.--Maximum discharge during year, 461 mgd (713 cfs) May 12 (gage height, 5.38 ft), from rating curve extended above 30 mgd on basis of slope-area measurement at gage height 6.15 ft; minimum, 0.18 mgd (0.28 cfs) on many days.

1926-60: Maximum discharge, 1,680 mgd (2,600 cfs) Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 62 mgd by test on model of station site; minimum, 0.05 mgd (0.08 cfs) Oct. 31, 1929.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers as indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
795	1935	Feb. 27, 1935	249	385	4.48
835	1937	Oct. 28, 1936	289	447	4.68
865	1938	Apr. 9, 1938	295	456	4.71
885	1939	Oct. 15, 1938	263	407	4.55
905	1940	Oct. 22, 1939	263	407	4.55
965	1942	Mar. 11, 1942	316	489	4.81
1125	1948	Jan. 24, 1948	105	162	3.46
1219	1951	Mar. 26, 1951	719	1,110	6.15
1249	1952	Jan. 19, 1952	240	371	4.43
1349	1954	Feb. 22, 1954	96	149	3.37
1449	1956	Dec. 19, 1955	283	438	4.65
1569	1957	Oct. 14, 1956	273	422	4.60

Remarks.--Records fair. A 2-inch pipe diverts water.

Revisions (fiscal years).--WSP 1639: 1926-29(M), 1930-34(M). The figures of peak discharge for the fiscal years 1948-59 have been revised as shown below, superseding those published in WSP 1125, 1155, 1185, 1219, 1249, 1289, 1349, 1399, 1449, 1569, and 1639.

Revised peak discharge.--1947-48: Jan. 24 (7 p.m.) 105 mgd (162 cfs), 3.46 ft; Jan. 27 (3:30 a.m.) 93 mgd (144 cfs), 3.34 ft.

1948-49: Nov. 17 (3 p.m.) 614 mgd (950 cfs), 5.86 ft; Jan. 16 (8 p.m.) 545 mgd (843 cfs), 5.66 ft.

1949-50: Apr. 22 (10 p.m.) 167 mgd (258 cfs), 3.97 ft.

1950-51: Nov. 26 (9 p.m.) 112 mgd (173 cfs), 3.52 ft; Dec. 3 (5:30 p.m.) 371 mgd (574 cfs), 5.04 ft; Mar. 11 (7 a.m.) 244 mgd (378 cfs), 4.45 ft; Mar. 26 (7:30 a.m.) 719 mgd (1,110 cfs), 6.15 ft.

1951-52: Dec. 31 (4:30 a.m.) 105 mgd (162 cfs), 3.46 ft; Jan. 19 (11:30 a.m.) 240 mgd (371 cfs), 4.43 ft.

1952-53: Nov. 19 (2 p.m.) 146 mgd (226 cfs), 3.81 ft; Jan. 12 (10 p.m.) 359 mgd (555 cfs), 4.99 ft; Mar. 3 (3:30 a.m.) 101 mgd (156 cfs), 3.42 ft.

1953-54: Feb. 22 (5 p.m.) 96 mgd (149 cfs), 3.37 ft.

1954-55: July 28 (7 a.m.) 131 mgd (203 cfs), 3.68 ft; Nov. 29 (4 a.m.) 561 mgd (868 cfs), 5.71 ft; Dec. 29 (7:30 p.m.) 103 mgd (159 cfs), 3.44 ft; Jan. 21 (9 a.m.) 141 mgd (218 cfs), 3.77 ft; Feb. 7 (10 a.m.) 125 mgd (193 cfs), 3.63 ft; Feb. 23 (6 p.m.) 235 mgd (364 cfs), 4.40 ft; Mar. 22 (8 p.m.) 117 mgd (181 cfs), 3.56 ft.

1955-56: Dec. 19 (10 p.m.) 283 mgd (438 cfs), 4.65 ft; Apr. 21 (1:30 a.m.) 187 mgd (289 cfs), 4.11 ft.

1956-57: Oct. 14 (9 p.m.) 273 mgd (422 cfs), 4.60 ft; Dec. 6 (7:30 a.m.) 171 mgd (265 cfs), 4.00 ft; Jan. 20 (8:30 p.m.) 112 mgd (173 cfs), 3.52 ft.

1957-58: Dec. 6 (7 p.m.) 110 mgd (170 cfs), 3.50 ft; Mar. 5 (7:30 a.m.) 624 mgd (965 cfs), 5.89 ft.

1958-59: Aug. 2 (4 a.m.) 240 mgd (371 cfs), 4.43 ft; Aug. 8 (7 a.m.) 146 mgd (226 cfs), 3.81 ft; Dec. 29 (2 p.m.) 95 mgd (147 cfs), 3.36 ft; Apr. 9 (8 a.m.) 351 mgd (543 cfs), 4.96 ft.

2440. Pukele Stream near Honolulu--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and
discharge, in million gallons a day)
(Shifting-control method used Aug. 3-6)

0.9	0.18	1.8	10.2
1.0	.43	2.0	15.2
1.1	.87	2.3	25.6
1.2	1.50	2.6	40.5
1.4	3.39	2.9	58.0
1.6	6.20	3.2	82.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.24	0.18	0.28	0.24	0.18	0.24	0.26	0.28	0.50	0.72	0.67	0.67
2	.24	.18	.28	.24	1.37	.22	.26	.28	1.20	.67	.67	.82
3	.24	.21	.26	.24	.24	.22	.26	.28	.69	.62	.58	.58
4	.24	.31	.26	.24	.24	.22	.26	.28	4.74	1.96	.78	.58
5	.24	.43	1.07	.24	.22	.22	.26	.26	11.2	.58	.54	.46
6	.22	13.9	.31	.24	.22	.24	.26	.26	6.24	.58	.50	.43
7	.22	2.44	.28	.24	.22	.24	.26	.24	3.04	.54	.50	.43
8	.22	.47	.28	.24	1.63	.22	.26	.24	1.22	.77	1.50	.40
9	.22	.40	.28	.24	.28	.22	.26	.24	.87	8.59	1.30	.40
10	.20	.40	.28	.22	.28	.22	.26	.24	.82	2.88	5.56	.40
11	.20	.48	.28	.22	.28	.22	.26	.24	1.05	3.47	.96	.40
12	.20	.43	.28	.22	.28	.22	.58	.22	.82	2.38	59.8	.40
13	*.20	.43	.28	.22	.28	.22	*.27	.22	.77	1.29	18.7	.43
14	.22	.40	.28	.22	.28	.46	2.00	.22	.77	1.60	8.64	.43
15	.22	.43	.28	.22	.28	.52	.59	.32	.72	2.86	3.78	.43
16	.24	.40	.28	.22	.28	.26	.31	*4.21	.67	2.06	2.24	.43
17	.24	.40	.28	.22	.28	.26	.31	.74	.62	3.52	*1.79	.40
18	.22	.37	.28	.20	.28	.26	.39	2.68	.54	3.33	1.58	.40
19	.22	.37	.28	.20	.28	.26	.37	5.98	3.16	1.74	1.50	.40
20	.22	.37	.28	*.20	.28	.26	.40	.95	5.81	1.29	1.50	.37
21	.22	.37	.26	.18	.28	.26	.40	.54	1.03	1.22	1.50	*.42
22	.22	.34	.26	.18	.26	.26	.40	.54	.62	1.22	1.50	.43
23	.22	.34	.26	.18	*.31	.26	.40	.54	4.08	1.22	1.50	.46
24	.22	.34	.26	.18	.28	.28	.40	.54	3.50	1.16	1.50	.50
25	.22	.34	.26	.18	.28	.28	.40	.54	1.22	1.04	1.50	.43
26	.20	.34	.24	.18	.26	.28	.37	.54	.87	.98	1.43	.43
27	.20	.34	.24	.18	.26	.28	.37	.50	.87	.92	1.23	.46
28	.18	.31	.24	.18	.24	.28	.37	.50	*.82	.87	.82	.50
29	.18	.28	.24	.18	.24	.28	.34	.46	.77	.82	.82	.50
30	.18	.28	.24	.18	.24	.28	.31	-----	.96	.77	.77	.43
31	.18	*.28	-----	.18	-----	.28	.31	-----	.72	-----	.72	-----
Total	6.68	26.56	8.88	6.50	10.33	8.22	12.15	23.08	60.91	51.67	125.38	13.62
Mean:												
mgd	0.215	0.857	0.296	0.210	0.344	0.265	0.392	0.796	1.96	1.72	4.04	0.454
cfs	0.333	1.33	0.459	0.325	0.532	0.410	0.607	1.23	3.03	2.66	6.25	0.702
Ac-ft	20	82	27	20	32	25	37	71	187	159	385	42

Calendar year 1959: Max 41.0 Min 0.18 Mean(mgd) 0.649 Mean(cfs) 1.00 Ac-ft 726
Fiscal year 1959-60: Max 59.8 Min 0.18 Mean(mgd) 0.967 Mean(cfs) 1.50 Ac-ft 1,090

Peak discharge (base, 90 mgd).--Aug. 6 (2:30 p.m.) 118 mgd (183 cfs), 3.57 ft; May 12 (4:30 a.m.) 461 mgd (713 cfs), 5.38 ft.

* Discharge measurement made on this day.

2460. Waiomao Stream above Pukele Stream, near Honolulu

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

Drainage area.--1.04 sq mi.

Records available.--April 1911 to December 1912, June 1926 to June 1960.

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

Average discharge.--34 years (1926-60), 1.16 mgd (1.79 cfs).

Extremes.--Maximum discharge during year, 313 mgd (484 cfs) May 12 (gage height, 4.76 ft), from rating curve extended above 58 mgd on basis of slope-area measurement at gage height 4.74 ft; no flow on many days.
1911-12, 1926-60: Maximum discharge, 1,000 mgd (1,550 cfs) Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 58 mgd on basis of slope-area measurement at gage height 4.74 ft; no flow at times.

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

Revisions (fiscal years).--WSP 1319: 1929-30, 1931-32. WSP 1639: 1926-28(M), 1929-30(M), 1931-32(M).

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 5

Nov. 6 to June 30

0.87	0	1.7	5.40
.9	.01	1.9	8.60
1.1	.26	2.1	13.3
1.3	1.12	2.4	24.4
1.5	2.75	2.7	39.0

0.8	0.02	1.9	10.5
.9	.10	2.1	15.5
1.1	.62	2.3	22.0
1.3	1.76	2.6	34.5
1.5	3.70	3.0	58.0
1.7	6.60		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0.20	0.02	0.07	0.40	0.04	0.08	0.06	0.49	0.62	0.21	0.15
2	.06	.40	.02	.05	4.00	.06	.10	.05	4.01	.33	.15	.15
3	.04	.30	.02	.04	.60	.06	.15	.04	2.13	.21	.23	.11
4	.03	.05	.01	.02	.60	.04	.33	.04	8.48	3.82	1.13	.10
5	.02	.80	.08	0	.50	.38	.21	.04	26.4	.94	.43	.07
6	.15	28.0	.03	0	*.60	.73	.14	.03	17.0	.58	.19	.06
7	.11	6.00	.01	0	1.27	.23	.14	.02	4.60	.58	.14	.05
8	*.07	2.00	0	0	4.82	.10	.10	.02	*1.72	.71	.30	.04
9	.05	1.30	0	0	1.10	.12	.25	.02	.84	.94	1.26	.04
10	.02	.60	0	0	.42	.08	.51	.02	.58	2.73	7.55	.15
11	.02	1.20	.01	0	.33	.07	.23	.04	1.40	4.60	1.51	.10
12	.02	.70	.02	.01	.39	.06	1.95	.06	.66	2.76	45.0	.07
13	*.01	.50	.01	.03	.23	.11	*.94	.06	.30	1.36	15.0	.06
14	.01	.30	.03	.02	.15	1.83	2.40	.17	.21	1.98	4.92	.05
15	0	.70	.03	.02	.11	1.59	1.07	.57	.17	3.47	2.75	.12
16	0	.20	.02	.01	.10	.39	.54	*6.74	.12	1.94	1.85	.06
17	.03	.15	.02	0	.07	.38	.39	1.68	.11	3.94	1.62	.04
18	.04	.15	.02	0	.06	.21	1.04	5.21	.08	3.38	.89	.03
19	.05	.15	.02	0	.06	.11	.36	10.0	2.66	1.36	.62	.02
20	.07	.06	.02	.02	.05	.06	.79	2.34	7.91	.94	.62	.02
21	.04	.03	.02	.01	.04	.06	.28	.94	1.50	.89	.50	.02
22	.07	.03	.02	.01	.03	.06	.19	.54	.74	.58	.46	.02
23	.03	.02	.04	.05	.05	.14	.42	6.88	.96	.50	.07	
24	.02	.01	.01	.15	*.25	1.58	.12	2.8	5.01	.89	.73	.05
25	.02	.01	.02	.15	.18	.70	.10	.21	1.69	.58	.66	.06
26	.04	.03	.04	.25	.11	.42	.08	.15	.94	.36	.58	.06
27	.08	.04	.35	.45	.10	.25	.07	.14	1.05	.30	.39	.78
28	.05	.01	.07	.20	.05	.14	.12	.11	*.84	.25	.21	.92
29	1.00	.01	.05	.15	.04	.15	.11	.07	.54	.21	.17	.93
30	.60	.01	.08	.10	.04	.10	.10	-----	1.59	.17	.14	.54
31	.35	*.01	-----	.35	-----	.11	.07	-----	.70	-----	.21	-----
Total	3.13	43.96	1.07	2.15	17.35	10.23	13.10	30.07	102.15	51.48	90.92	4.94
Mean:												
mgd	0.101	1.42	0.036	0.069	0.578	0.330	0.423	1.04	3.30	1.72	2.93	0.165
cfs	0.156	2.20	0.056	0.107	0.894	0.511	0.654	1.61	5.11	2.66	4.53	0.255
Ac-ft	9.6	135	3.3	6.6	53	31	40	92	313	158	279	15

Calendar year 1959: Max 28 Min 0 Mean(mgd) 0.549 Mean(cfs) 0.849 Ac-ft 615
Fiscal year 1959-60: Max 45 Min 0 Mean(mgd) 1.01 Mean(cfs) 1.56 Ac-ft 1,140

Peak discharge (base, 70 mgd).--Aug. 6 (about 2 p.m.) about 102 mgd (158 cfs), about 3.65 ft; Mar. 5 (3 p.m.) 159 mgd (246 cfs), 3.96 ft; May 12 (3 a.m.) 313 mgd (484 cfs), 4.76 ft.

* Discharge measurement made on this day.

Note.--Faulty gage-height record July 1-8 and no gage-height record July 18 to Aug. 18, Sept. 1 to Nov. 6; discharge estimated on basis of records for nearby stations.

2470. Palolo Stream near Honolulu

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

Drainage area.--3.63 sq mi.

Records available.--April 1952 to June 1960.

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

Average discharge.--8 years, 3.51 mgd (5.43 cfs).

Extremes.--Maximum discharge during year, 810 mgd (1,250 cfs) May 12 (gage height, 3.35 ft), from rating curve extended above 450 mgd as explained below; minimum daily, 0.24 mgd (0.37 cfs) several days in September and October.
1952-60: Maximum discharge, 2,100 mgd (3,250 cfs) Mar. 5, 1958 (gage height, 5.33 ft), from rating curve extended above 450 mgd by test on model of station site; minimum daily, 0.03 mgd (0.05 cfs) June 23-25, 1958.

Remarks.--Records fair.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Aug. 25-31, Sept. 5-14, Sept. 27 to Oct. 19, Oct. 23-28, May 24 to June 30)

1.1	0.18	1.8	9.00
1.2	.34	2.0	28.0
1.3	.55	2.2	69.0
1.4	.85	2.4	150
1.5	1.29	2.6	298
1.6	2.20		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.42	0.54	0.34	0.51	0.79	0.37	0.39	0.43	1.53	1.62	1.77	0.72
2	.48	.62	.34	.37	8.43	.34	.39	.41	4.65	1.24	1.70	.69
3	.39	.56	.34	.34	2.02	.32	.54	.41	3.12	1.14	1.54	.66
4	.36	.39	.32	.30	1.40	.32	1.09	.39	1.52	4.97	1.77	.66
5	.93	1.74	1.14	.25	1.47	.47	.95	.39	43.8	1.70	1.70	.66
6	.68	49.1	.60	.25	1.09	1.54	.87	.41	20.9	1.47	1.54	.63
7	.58	9.28	.30	.24	1.57	.72	.78	.40	10.9	1.40	1.47	.63
8	.48	2.92	.27	.25	8.78	.48	.63	.36	3.90	1.89	1.70	.60
9	.43	1.85	.24	.25	1.70	.47	1.16	.37	2.40	19.4	1.76	.60
10	.37	1.47	.24	.25	1.29	.41	1.32	.34	2.05	7.50	11.0	.72
11	.37	1.74	.27	.28	1.24	.41	1.24	.58	3.15	6.56	3.90	.66
12	.34	1.33	.30	.26	1.29	.41	2.40	.60	1.85	4.90	237	.69
13	*.30	1.00	.25	.34	1.10	.48	1.47	.50	1.47	2.20	39.7	.69
14	.42	.78	.35	.32	.66	2.05	5.29	.91	1.14	3.60	27.6	.66
15	.32	1.15	.37	.28	.50	3.31	2.28	2.02	1.09	5.10	7.10	.63
16	.32	.89	.34	.27	.48	.95	1.31	17.6	1.04	4.50	5.10	.60
17	.30	.91	.32	.25	.46	1.44	1.04	3.29	.92	5.90	*4.28	.50
18	.30	.92	.32	.25	.43	.66	1.77	6.77	.82	6.30	3.20	.50
19	.30	.92	.32	*.25	.41	.43	1.09	15.1	5.17	2.90	3.20	.50
20	.34	.68	.34	.28	.47	.32	1.47	2.90	13.2	2.40	3.20	.48
21	.32	.58	.32	.27	.41	.57	.96	1.47	3.20	2.20	2.60	*.48
22	.34	.43	.32	.28	.42	.53	.78	1.24	2.90	2.05	2.60	.60
23	.30	.43	.30	.39	1.62	.44	.72	1.24	15.0	2.05	2.40	.78
24	.30	.41	.28	.46	.74	1.70	.66	1.19	6.32	3.20	2.26	.66
25	.30	.43	.32	.46	.46	1.29	.60	1.04	1.59	2.20	1.00	.60
26	.35	.41	.44	.60	.41	.96	.55	.89	1.34	2.05	.92	.75
27	.37	.58	1.14	.66	.42	.77	.53	.95	1.34	1.85	.85	1.00
28	.30	.41	.53	.53	.41	.53	.96	.78	1.34	1.85	.82	1.19
29	2.01	.55	.39	.50	.34	.48	.76	.72	*1.40	1.85	.82	1.09
30	.94	.34	.59	.39	.32	.43	.58	-----	2.29	1.77	.75	.82
31	.63	.34	-----	.70	-----	.43	.48	-----	1.77	-----	.75	-----
Total	14.59	83.70	11.94	11.23	41.13	24.03	35.06	63.60	163.11	107.76	376.00	20.45
Mean												
mgd	0.471	2.70	0.398	0.362	1.37	0.775	1.13	2.19	5.26	3.59	12.1	0.682
cfs	0.729	4.18	0.616	0.560	2.12	1.20	1.75	3.39	8.14	5.55	18.7	1.06
Ac-ft	45	257	37	34	126	74	108	195	501	331	1,150	63

Calendar year 1959: Max	82	Min	0.24	Mean(mgd)	1.55	Mean(cfs)	2.40	Ac-ft	1,740
Fiscal year 1959-60: Max	237	Min	0.24	Mean(mgd)	2.60	Mean(cfs)	4.02	Ac-ft	2,920

Peak discharge (base, 220 mgd).--Aug. 6 (2 p.m.) 264 mgd (408 cfs), 2.56 ft; Feb. 16 (5 a.m.) 229 mgd (354 cfs), 2.52 ft; Mar. 5 (2:30 p.m.) 221 mgd (342 cfs), 2.51 ft; May 12 (5 a.m.) 810 mgd (1,250 cfs), 3.35 ft.

* Discharge measurement made on this day.

2500. Maunawili ditch near Waimanalo

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

Records available--March 1954 to June 1960.

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

Average discharge--6 years, 1.96 mgd (3.03 cfs).

Extremes--1954-60: Maximum daily discharge, 7.0 mgd (10.8 cfs) Mar. 5, 1958; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.88	1.70	1.76	2.06	2.18	2.00	1.0	1.30	1.00	0.43	2.06	3.13
2	1.82	1.70	2.12	2.00	2.65	2.00	1.0	1.30	.71	.47	2.12	2.97
3	1.76	1.76	2.12	2.00	2.37	2.00	1.0	1.25	.47	.47	2.12	2.97
4	1.70	1.70	2.15	2.00	1.67	2.00	1.0	1.25	.55	.51	2.12	2.89
5	1.88	1.88	2.65	2.00	1.46	2.06	1.2	1.25	2.68	*.47	2.06	2.81
6	1.76	2.48	2.30	2.00	1.40	2.06	1.5	1.20	.58	.59	2.06	2.81
7	1.70	2.96	2.30	2.00	1.46	2.00	1.5	1.20	.30	.80	2.00	2.89
8	1.76	3.21	2.30	2.06	2.18	1.94	1.5	1.20	.09	.85	2.00	2.81
9	1.70	2.65	2.24	2.00	1.88	1.94	1.5	1.15	.06	.90	2.12	2.81
10	1.70	2.37	2.18	2.00	1.70	1.94	1.5	1.15	.03	.90	2.24	2.81
11	1.76	2.24	2.24	2.06	1.76	1.88	*1.5	1.15	.06	.95	2.06	2.73
12	1.70	2.06	2.18	2.06	1.70	1.88	1.45	1.15	0	.95	2.79	2.39
13	1.76	2.00	2.12	2.12	1.64	1.82	1.46	1.15	0	.90	*3.67	2.00
14	1.70	2.00	2.12	2.00	1.58	1.88	1.58	1.10	0	.90	3.77	1.82
15	1.64	2.00	2.06	2.00	1.52	1.82	1.58	.91	0	.90	3.21	2.51
16	1.64	2.00	2.06	*2.00	1.94	1.76	1.52	.99	0	.95	2.89	2.44
17	1.84	2.06	2.00	2.00	2.30	1.8	1.52	1.08	0	1.38	2.73	2.30
18	1.70	2.30	2.00	2.06	2.30	1.8	1.52	.92	.18	1.05	2.58	2.18
19	1.76	2.12	2.00	2.06	2.24	1.8	1.45	1.19	.51	.76	.97	2.18
20	1.76	2.06	2.00	2.06	2.24	1.8	1.46	1.00	.90	.76	.86	*2.18
21	1.58	2.12	2.00	2.00	2.24	1.8	1.40	1.00	.72	1.00	2.08	2.24
22	1.64	2.06	2.00	2.00	2.30	1.8	1.40	.95	.59	1.10	1.40	2.51
23	*1.74	2.00	2.00	2.00	2.30	1.8	1.40	*.78	1.10	1.10	1.40	2.51
24	1.70	2.00	2.00	2.00	2.24	1.8	1.40	1.00	1.01	1.05	2.00	2.58
25	1.70	2.06	2.00	2.00	*2.18	1.8	1.40	1.00	.90	1.05	3.77	2.51
26	1.82	2.12	2.24	2.00	2.12	1.2	1.40	1.00	.80	1.05	1.02	2.51
27	1.70	*2.00	2.18	2.06	2.12	1.0	1.35	1.00	.72	1.00	1.28	2.65
28	1.70	2.12	2.00	2.00	2.06	1.0	1.40	1.00	.63	1.00	2.97	2.51
29	1.96	2.18	2.00	2.00	2.06	1.0	1.40	1.00	.59	1.00	2.73	2.51
30	1.70	2.12	2.12	2.00	2.06	1.0	1.35	-----	.51	1.55	2.73	2.44
31	1.70	1.88	-----	2.06	-----	1.0	1.30	-----	.47	-----	2.81	-----
Total	53.66	65.91	63.47	62.66	59.85	53.38	42.96	31.62	16.16	26.79	70.62	76.60
Mean:												
mgd	1.73	2.13	2.12	2.02	2.00	1.72	1.39	1.09	0.52	0.89	2.28	2.55
cfs	2.68	3.30	3.28	3.13	3.09	2.66	2.15	1.69	0.80	1.38	3.53	3.95
Ac-ft	165	202	195	192	184	164	132	97	50	82	217	235

Calendar year 1959: Max 3.25 Min 0 Mean(mgd) 1.82 Mean(cfs) 2.82 Ac-ft 2,040
 Fiscal year 1959-60: Max 3.77 Min 0 Mean(mgd) 1.70 Mean(cfs) 2.63 Ac-ft 1,920

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 17 to Jan. 11; discharge estimated on basis of records for Makawao Stream.

2540. Makawao Stream near Kailua

Location.--Lat 21°21'50", long 157°46'05", on left bank 650 ft upstream from mouth, 2.7 miles southwest of Kailua, and 4.3 miles southeast of Kaneohe Courthouse.

Drainage area.--2.44 sq mi.

Records available.--November 1912 to June 1916, January 1958 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 75 ft (from topographic map). Prior to Jan. 13, 1958, staff gages at site approximately 200 ft upstream at different datums.

Average discharge.--5 years (1913-16, 1958-60), 3.35 mgd (5.18 cfs).

Extremes.--1958: Maximum discharge during period January to June, 1,380 mgd (2,140 cfs) Mar. 5 (gage height, 9.08 ft), from rating curve extended above 300 mgd by logarithmic plotting; minimum, 0.90 mgd (1.39 cfs) June 30.

1958-59: Maximum discharge during fiscal year, 206 mgd (319 cfs) Jan. 17 (gage height, 4.57 ft), from rating curve extended above 300 mgd by logarithmic plotting; minimum, 0.65 mgd (1.01 cfs) June 1.

1959-60: Maximum discharge during fiscal year, 440 mgd (681 cfs) Mar. 5 (gage height, 5.95 ft), from rating curve extended above 300 mgd by logarithmic plotting; minimum, 0.62 mgd (0.96 cfs) July 22, 23, Aug. 1.

1912-16, 1958-60: Maximum discharge, that of Mar. 5, 1958; minimum, 0.62 mgd (0.96 cfs) July 22, 23, Aug. 1, 1959.

Remarks.--Records good except those for period of no gage-height record, which are poor. Maunawili ditch diverts water from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo. Intake to the irrigation ditch about 100 ft above present site is no longer used.

Rating tables, Jan. 1, 1958, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

Jan. 1, 1958, to June 1, 1959				June 2, 1959, to June 30, 1960			
1.4	0.43	2.5	24.0	1.3	0.28	1.9	5.97
1.5	1.05	3.0	50.0	1.4	.72	2.1	10.5
1.6	1.95	3.5	87.0	1.5	1.30	2.3	16.5
1.7	3.18	4.0	135	1.6	2.05	2.5	24.0
1.9	6.50	5.0	270	1.7	2.98		
2.2	13.8						

Note.--Same as preceding table above 2.5 ft.

Discharge, in million gallons a day, January to June 1958

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1							1.9	2.16	3.44	2.52	1.76	1.76
2							1.9	1.95	2.65	2.65	2.06	1.76
3							1.9	1.95	2.28	3.44	5.52	1.56
4							1.9	2.45	2.91	3.04	2.65	1.56
5							1.9	2.28	*2.12	2.91	2.16	1.56
6							1.9	2.06	*98.5	2.91	2.06	1.56
7							1.9	2.06	27.2	3.04	2.06	1.46
8							1.9	1.95	16.8	2.91	1.95	1.46
9							1.9	1.95	13.2	2.91	1.86	1.46
10							1.9	*1.86	10.8	*3.18	1.95	1.46
11							1.9	1.86	9.08	2.78	1.86	1.46
12							1.9	1.76	7.76	2.28	1.66	1.28
13							1.9	1.56	7.13	2.28	1.66	1.28
14							1.95	1.46	6.71	2.78	1.56	1.28
15							1.95	1.56	6.13	2.28	1.76	1.20
16							1.95	1.46	5.94	2.78	2.37	1.12
17							1.86	1.46	5.39	2.16	3.46	1.28
18							2.06	1.28	5.20	2.16	2.82	1.12
19							1.95	1.20	5.02	1.95	2.52	1.20
20							1.95	1.20	4.84	2.28	2.16	1.12
21							1.86	1.20	4.47	1.86	2.52	1.12
22							1.95	1.20	3.86	1.86	*1.95	1.12
23							2.16	1.37	3.58	1.86	1.95	1.12
24							1.95	*1.20	3.44	1.86	1.86	1.12
25							1.95	1.12	3.04	2.16	1.86	1.12
26							1.95	1.12	2.91	2.40	1.86	1.05
27							1.86	1.20	2.91	2.16	1.66	1.05
28							1.95	*8.29	2.72	1.95	1.66	1.12
29							2.28	2.28	2.91	1.86	1.76	.98
30							2.91	-----	2.65	1.76	1.66	.98
31							2.52	-----	2.65	-----	1.66	-----
Total							61.71	52.17	488.12	72.97	66.26	38.72
Mean							1.99	1.86	15.7	2.43	2.14	1.20
mgd							3.08	2.88	24.3	3.76	3.31	2.00
cfs							189	160	1,500	224	203	119
Ac-ft												

Calendar year : Max Min Mean(mgd) Mean(cfs) Ac-ft
Fiscal year : Max Min Mean(mgd) Mean(cfs) Ac-ft

Peak discharge (base, 70 mgd).--Mar. 5 (8 a.m.) 1,380 mgd (2,140 cfs), 9.08 ft.

* Discharge measurement made on this day.

2540. Makawao Stream near Kailua--Continued

Discharge, in million gallons a day, fiscal year July 1958 to June 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.98	1.76	2.28	1.76	4.00	2.52	2.06	2.40	1.76	1.20	1.05	0.90
2	*1.73	15.1	2.40	1.76	3.86	2.52	1.95	3.30	1.76	1.20	1.05	.93
3	10.5	4.47	2.16	2.06	3.86	*2.52	2.06	4.00	*1.66	1.20	1.05	.93
4	2.60	4.00	2.16	1.76	3.72	2.40	1.95	3.72	1.66	1.20	1.05	.93
5	1.66	7.98	4.17	1.56	3.58	4.73	1.95	3.86	1.56	1.12	1.05	.93
6	1.46	4.30	4.66	1.46	3.44	4.00	1.86	3.18	1.95	2.08	1.05	.93
7	1.46	3.86	4.00	1.46	3.44	2.78	2.78	2.28	2.91	1.46	1.05	.93
8	1.56	20.9	3.04	1.46	3.30	2.52	3.86	2.28	2.91	1.28	1.05	.93
9	1.37	13.2	2.65	1.66	3.18	2.40	3.86	2.91	2.91	4.54	1.05	*.93
10	1.28	9.80	2.65	1.46	3.30	2.16	3.86	3.58	2.40	1.95	.90	.93
11	1.12	6.71	2.40	1.46	3.18	1.95	3.86	3.72	1.46	1.95	.90	.93
12	1.12	5.02	2.52	1.37	3.18	1.76	3.86	10.6	1.66	2.06	.84	.99
13	1.46	4.30	2.40	1.46	3.44	1.46	*5.59	9.25	1.66	1.66	.84	.99
14	1.20	4.15	2.40	1.37	3.30	1.46	4.15	3.72	1.95	1.56	.84	.93
15	1.37	4.00	2.28	1.28	3.04	1.66	3.86	3.44	1.56	*1.40	.84	.93
16	1.28	3.72	2.28	1.28	2.91	1.56	2.78	3.44	1.46	1.28	.90	.93
17	1.37	3.58	2.18	1.20	2.91	1.56	17.0	2.78	1.46	1.20	.98	.93
18	1.86	3.30	2.16	1.20	2.91	1.56	29.0	2.65	1.46	1.28	.84	.93
19	1.95	3.30	2.28	1.20	2.91	1.76	6.71	2.28	1.46	1.28	1.05	.88
20	1.86	3.18	2.16	1.20	2.91	1.46	6.50	2.28	1.37	1.20	1.05	.88
21	1.66	3.04	2.06	1.20	2.78	1.46	5.94	2.16	1.37	1.28	1.60	.93
22	1.56	3.39	1.95	2.80	2.65	1.66	5.76	2.16	1.28	1.20	1.28	.93
23	1.37	2.78	1.95	10.8	2.65	1.46	4.47	2.06	1.20	1.12	1.05	.88
24	1.86	2.65	1.86	24.7	2.52	1.46	3.18	1.95	1.28	1.12	.98	.88
25	1.95	4.31	*1.76	8.18	2.52	1.56	3.04	1.95	1.28	1.12	1.12	.88
26	2.93	3.30	1.76	6.32	2.52	1.56	4.00	1.95	1.20	1.12	1.05	.88
27	2.16	2.91	1.76	4.47	2.52	1.56	4.84	1.86	1.20	1.12	.98	.83
28	1.76	2.52	1.66	*7.51	2.52	1.46	4.65	1.86	1.12	1.20	.90	.78
29	1.86	2.40	1.56	6.32	2.52	10.8	4.47	-	1.12	1.12	.90	.83
30	*1.79	2.40	1.56	4.65	2.52	3.04	3.72	-----	1.20	1.20	.90	.93
31	1.66	2.28	-----	4.15	-----	2.28	2.52	-----	1.20	-----	.90	-----
Total	59.75	158.61	71.09	110.52	92.22	73.04	156.09	91.62	50.43	43.70	32.09	27.40
Mean:												
mgd	1.93	5.12	2.37	3.57	3.07	2.36	5.04	3.27	1.63	1.46	1.04	0.913
cfs	2.99	7.92	3.67	5.52	4.75	3.65	7.80	5.06	2.52	2.28	1.61	1.43
Ac-ft	183	487	218	339	283	224	479	281	155	134	98	84

Calendar year 1958: Max 212 Min 0.98 Mean(mgd) 3.69 Mean(cfs) 5.71 Ac-ft 4,130
 Fiscal year 1958-59: Max 29.0 Min 0.83 Mean(mgd) 2.65 Mean(cfs) 4.10 Ac-ft 2,960

Peak discharge (base, 70 mgd).--July 3 (1 p.m.) 102 mgd (158 cfs), 3.67 ft; Aug. 2 (4:30 a.m.) 80.7 mgd (125 cfs), 3.43 ft; Oct. 23 (8:30 p.m.) 92.4 mgd (143 cfs), 3.56 ft; Dec. 29 (1:30 p.m.) 128 mgd (198 cfs), 3.94 ft; Jan. 17 (7 p.m.) 206 mgd (319 cfs), 4.57 ft.

* Discharge measurement made on this day.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.88	0.72	0.99	0.99	1.17	1.10	2.12	1.30	2.20	3.79	2.20	1.95
2	.88	.72	1.05	.99	2.58	1.10	2.12	1.43	2.77	3.79	2.28	1.87
3	.88	.78	1.10	.99	1.36	1.10	2.20	1.36	3.30	3.91	2.28	1.87
4	.83	.67	1.17	.93	1.17	1.10	2.20	1.36	9.83	*3.91	2.28	1.87
5	.88	.72	1.89	.93	1.10	1.44	1.64	1.36	103	3.67	2.20	1.80
6	.83	15.2	1.30	.93	.99	1.43	1.50	1.30	55.4	3.43	2.20	1.57
7	.78	7.74	1.30	.93	1.10	1.17	1.24	1.43	24.6	3.08	2.20	1.57
8	.78	2.12	1.17	.93	2.28	1.10	1.17	1.43	13.3	3.19	2.20	1.50
9	.78	1.71	1.17	a.97	1.57	1.10	1.24	1.43	10.5	3.67	2.30	1.50
10	.78	1.36	1.10	a.91	1.30	1.10	1.24	1.50	8.75	3.19	2.66	1.57
11	.83	1.30	1.17	a.91	1.50	1.20	*1.10	1.50	8.75	3.30	2.28	1.50
12	.83	1.24	1.17	a.91	1.36	1.10	1.17	1.43	7.40	3.30	9.98	1.57
13	.78	1.17	1.10	a.91	1.30	1.10	1.10	1.43	6.55	3.08	*7.24	1.57
14	.83	1.10	1.05	a.91	1.17	1.36	1.65	1.43	6.20	2.98	2.88	1.50
15	.83	1.10	1.05	a.85	1.17	1.24	1.30	*1.80	5.75	3.08	2.48	1.50
16	.83	1.05	.99	*a.85	1.10	1.05	1.24	2.05	5.35	3.88	2.20	1.50
17	.83	1.10	.99	.83	1.10	1.05	1.17	1.80	5.76	7.03	2.12	1.50
18	.78	1.24	.99	.83	1.10	.99	1.17	2.11	5.00	3.19	2.05	1.43
19	.72	1.05	.99	.83	1.10	.99	1.17	15.1	5.28	2.66	2.88	1.43
20	.83	.99	.99	.83	1.10	.93	1.30	2.66	6.20	2.57	3.30	*1.36
21	.78	.99	.99	.83	1.10	.99	1.24	1.95	4.67	2.28	2.12	1.30
22	.72	1.05	.99	.83	1.10	1.10	1.24	1.80	4.40	2.12	2.05	1.36
23	.72	.93	.99	.88	1.17	1.17	1.24	1.80	11.3	2.20	1.95	1.36
24	*.72	.93	.99	.88	*1.10	1.64	1.24	1.64	10.3	2.77	1.95	1.36
25	.72	.93	.99	.88	1.05	1.50	1.24	1.80	5.97	2.28	2.05	1.30
26	.78	.93	1.10	.83	.99	1.64	1.24	1.80	5.15	1.95	2.98	1.36
27	.72	*.99	1.10	.93	1.05	2.05	1.24	1.80	4.67	1.95	3.30	1.50
28	.72	1.05	.99	.88	1.05	2.05	1.43	4.40	1.87	1.95	1.95	1.43
29	1.17	.99	.99	.83	1.10	2.05	1.43	1.95	4.08	2.28	1.87	1.43
30	.83	.99	.99	.83	1.10	2.05	1.36	-----	3.91	2.66	1.87	1.36
31	.78	.99	-----	.99	-----	2.12	1.30	-----	3.79	-----	1.87	-----
Total	25.05	53.85	32.85	27.75	37.43	41.01	43.24	61.62	358.53	93.14	84.17	45.69
Mean:												
mgd	0.808	1.74	1.10	0.895	1.25	1.32	1.39	2.12	11.6	3.10	2.72	1.52
cfs	1.25	2.69	1.70	1.38	1.93	2.04	2.15	3.28	17.9	4.80	4.21	2.35
Ac-ft	77	165	101	85	115	126	133	189	1,100	286	258	140

Calendar year 1959: Max 29.0 Min 0.67 Mean(mgd) 1.70 Mean(cfs) 2.63 Ac-ft 1,900
 Fiscal year 1959-60: Max 103 Min 0.67 Mean(mgd) 2.47 Mean(cfs) 3.82 Ac-ft 2,780

Peak discharge (base, 70 mgd).--Feb. 19 (9 a.m.) 161 mgd (249 cfs), 4.22 ft; Mar. 5 (3 p.m.) 440 mgd (681 cfs), 5.95 ft; Apr. 17 (11:30 a.m.) 107 mgd (166 cfs), 3.72 ft.

* Discharge measurement made on this day.

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

2739. Kamooalii Stream at Kaneohe

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

Drainage area--4.34 sq mi.

Records available--January 1959 to June 1960.

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

Extremes--1959: Maximum discharge during period January to June, 486 mgd (752 cfs) Apr. 9 (gage height, 5.21 ft), from rating curve extended above 82 mgd as explained below: minimum, 4.20 mgd (6.50 cfs) June 19.
1959-60: Maximum discharge during fiscal year, 1,230 mgd (1,900 cfs) May 13 (gage height, 6.16 ft), from rating curve extended above 82 mgd on basis of slope-area measurement at gage height 5.69 ft and logarithmic plotting above; minimum, 3.30 mgd (5.11 cfs) July 8, 9.
Flood of Oct. 23, 1958, reached a stage of 8.3 ft (discharge, about 4,270 mgd, 6,610 cfs, from rating curve extended above 82 mgd as explained above).

Remarks--Records fair except those for period of no gage-height record, which are poor. Many diversions upstream used for irrigation. Continuous rainfall record collected at this site.

Rating table, Jan. 24, 1959, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

3.6	3.05	4.1	54.3
3.7	6.40	4.2	75.5
3.8	12.5	4.3	100
3.9	23.2	4.4	127
4.0	37.0	4.5	159

Discharge, in million gallons a day, January to June 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1							-	10.1	8.35	7.35	6.85	6.00
2							-	9.50	7.80	6.40	6.85	6.00
3							-	9.50	7.80	6.40	7.35	6.00
4							-	10.1	*7.80	6.85	6.85	6.00
5							-	10.1	7.35	6.85	7.35	5.60
6							-	10.1	7.35	10.2	7.35	5.60
7							-	10.8	6.85	7.80	7.35	5.60
8							-	11.7	6.85	7.35	6.85	*5.60
9							-	11.7	6.85	*53.6	7.35	5.60
10							-	12.5	7.35	*11.7	6.85	5.60
11							-	20.1	7.35	10.1	7.35	5.20
12							-	44.9	7.80	10.1	7.35	5.20
13							-	25.7	8.35	8.90	7.80	5.60
14							-	12.5	13.6	8.90	7.80	5.20
15							-	12.5	8.90	8.90	7.35	5.20
16							-	11.7	7.80	8.90	7.35	*5.20
17							-	11.7	7.80	8.90	6.85	5.20
18							-	10.8	7.80	8.90	9.79	5.20
19							-	10.8	7.80	9.50	7.35	4.85
20							-	11.7	7.80	*8.35	7.35	4.85
21							-	12.5	7.80	7.35	10.0	4.85
22							-	12.5	7.35	7.80	8.90	4.85
23							-	10.1	6.85	7.80	7.35	4.85
24							10.1	10.1	7.35	7.80	7.35	4.85
25							10.1	10.1	7.35	6.85	7.35	5.20
26							10.1	10.1	6.85	6.40	7.35	5.20
27							9.93	9.35	6.85	6.85	6.85	5.20
28							*8.90	8.30	6.85	7.35	6.40	5.20
29							9.50	-	6.40	6.40	6.40	5.60
30							9.50	-----	6.40	6.40	6.85	6.00
31							9.50	-----	6.40	-----	6.40	-----
Total							-	359.15	235.80	286.95	228.54	161.10
Mean:							-	12.8	7.61	9.56	7.37	5.37
mgd							-	19.8	11.8	14.8	11.4	8.31
cfs							-	1,100	724	881	701	494
Ac-ft												

Calendar year : Max Min Mean(mgd) Mean(cfs) Ac-ft
Fiscal year : Max Min Mean(mgd) Mean(cfs) Ac-ft

Peak discharge (base, 500 mgd).--No peak above base.

* Discharge measurement made on this day.

2739. Kamooalii Stream at Kaneohe--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.60	4.85	4.85	6.00	6.00	4.20	5.60	3.90	7.35	10.1	6.40	8.0
2	5.60	4.85	5.20	5.60	11.8	4.20	6.00	4.20	7.35	8.90	6.40	7.0
3	5.60	5.20	5.20	5.20	6.40	4.20	6.00	4.20	7.80	7.80	6.85	6.0
4	5.60	4.85	5.60	5.20	5.60	4.20	6.85	4.20	14.4	*8.35	6.00	9.0
5	5.60	5.20	19.0	5.20	6.00	4.50	6.00	4.20	153	8.90	5.20	8.5
6	5.20	41.9	7.80	5.20	5.60	4.85	6.00	3.90	88.9	8.35	5.20	9.0
7	4.50	13.5	6.00	5.20	5.60	4.50	5.60	4.20	28.3	7.80	6.85	8.0
8	5.90	7.80	6.00	5.20	13.4	4.50	5.20	4.20	15.5	7.80	7.35	5.0
9	4.50	7.80	5.60	4.85	5.40	4.50	5.60	3.90	15.0	8.90	6.40	5.0
10	4.50	6.40	5.60	4.85	6.00	4.20	5.60	4.20	12.5	7.80	10.1	5.0
11	4.85	6.40	*5.60	4.85	6.40	4.20	5.60	4.50	10.8	9.50	7.35	5.0
12	5.20	6.40	5.60	5.20	6.40	4.20	6.00	4.20	9.50	8.90	61.3	4.5
13	4.50	6.00	5.20	*6.40	6.00	4.50	5.60	4.20	9.50	8.35	115	5.5
14	4.50	5.60	5.20	5.20	5.60	5.60	10.1	4.50	8.90	8.90	24.3	6.0
15	4.50	6.00	5.20	5.20	5.20	4.85	7.80	5.60	8.90	8.90	11.7	6.0
16	4.85	5.60	5.20	4.85	5.20	4.50	6.00	5.20	8.35	11.0	9.50	6.0
17	4.85	5.60	5.20	4.85	5.20	4.85	5.20	4.50	10.6	20.3	8.35	5.5
18	4.85	8.35	5.20	4.50	5.20	4.50	5.20	8.17	10.1	13.5	7.80	6.0
19	4.50	6.00	4.85	4.50	5.20	4.20	4.85	42.9	10.1	10.8	8.90	6.0
20	4.85	5.60	5.20	4.50	5.20	4.20	4.85	9.50	16.8	10.8	6.25	5.0
21	4.50	5.60	5.20	4.85	5.20	4.20	4.50	7.80	10.1	11.7	6.0	4.5
22	4.50	5.60	5.20	4.85	5.60	4.50	4.50	6.40	9.50	13.5	5.0	5.0
23	4.50	5.20	5.20	4.85	*5.60	4.20	4.50	*6.40	28.6	11.7	5.0	6.0
24	*4.20	5.20	5.20	4.50	5.20	6.85	4.20	6.40	17.0	8.90	6.0	6.0
25	4.50	5.60	5.20	4.85	5.20	6.00	4.20	6.40	11.7	8.35	6.0	6.0
26	4.85	5.20	5.60	4.50	5.20	4.85	4.20	6.40	11.7	8.35	7.0	5.5
27	4.50	5.20	6.40	5.20	5.20	5.60	3.90	6.40	11.7	8.35	6.0	6.5
28	4.20	4.85	5.20	5.20	5.20	4.50	6.00	6.00	10.8	9.50	6.0	*6.0
29	7.35	5.20	5.60	5.20	5.20	6.00	4.50	6.40	10.1	9.50	6.0	8.90
30	4.85	4.85	6.00	4.85	4.85	5.60	4.20	-----	11.7	8.90	7.0	8.35
31	4.85	4.50	-----	5.60	-----	5.60	4.20	-----	10.1	-----	7.0	-----
Total	150.85	220.90	178.10	157.00	180.85	148.05	167.05	192.97	596.65	294.40	394.20	188.75
Mean	4.87	7.13	5.94	5.06	6.03	4.78	5.39	6.65	19.2	9.81	12.7	6.29
mgd	7.54	11.0	9.19	7.83	9.33	7.40	8.34	10.3	29.7	15.2	19.6	9.73
cfs	463	678	547	482	555	454	513	592	1,830	903	1,210	579
Ac-ft												

Calendar year 1959: Max - Min - Mean(mgd) - Mean(cfs) - Ac-ft -
 Fiscal year 1959-60: Max 153 Min 3.90 Mean(mgd) 7.84 Mean(cfs) 12.1 Ac-ft 8,810

Peak discharge (base, 500 mgd).--Mar. 5(3:30 p.m.) 930 mgd (1,440 cfs), 5.83 ft; May 13 (11:30 a.m.) 1,230 mgd (1,900 cfs), 6.16 ft.

* Discharge measurement made on this day.
 Note.--No gage-height record May 21 to June 28; discharge estimated on basis of records for nearby stations.

2750. Haiku Stream near Heeia

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

Drainage area.--0.97 sq mi.

Records available.--January 1914 to October 1919, July 1939 to June 1960.

Gage.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, staff gage and Apr. 29, 1914, to Oct. 25, 1919, water-stage recorder at same site at different datum.

Average discharge.--17 years (1943-60), 1.30 mgd (2.01 cfs), unadjusted for diversions.

Extremes.--Maximum discharge during year, 395 mgd (611 cfs) May 12 (gage height, 3.47 ft), from rating curve extended above 37 mgd as explained below; minimum daily, 0.24 mgd (0.37 cfs) July 25, 27, 28.

1914-19, 1939-60: Maximum discharge, 2,730 mgd (4,220 cfs) Mar. 26, 1951 (gage height, 5.39 ft), from rating curve extended above 37 mgd on basis of slope-area measurement at gage height 3.87 ft; minimum daily, 0.19 mgd (0.29 cfs) July 13, Oct. 17, 19-21, 23-26, 1945, Sept. 18-20, 1946.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
905	1940	May 9, 1940	614	950	3.82
935	1941	Nov. 20, 1940	254	393	3.16
965	1942	June 17, 1942	742	1,150	3.98
985	1943	Jan. 13, 1943	1,960	3,030	4.99
1015	1944	Dec. 5, 1943	177	274	2.93
1045	1945	Apr. 16, 1945	154	238	2.85
1065	1946	Jan. 25, 1946	46.9	72.5	2.26
1095	1947	Mar. 29, 1947	796	1,230	4.04
1125	1948	Feb. 29, 1948	360	557	3.40
1155	1949	Jan. 16, 1949	976	1,510	4.24
1185	1950	Jan. 22, 1950	345	534	3.37
1219	1951	Mar. 26, 1951	2,730	4,220	5.39
1249	1952	Oct. 27, 1951	236	365	3.11
1289	1953	Mar. 13, 1953	168	260	2.90
1349	1954	Apr. 29, 1954	34.8	53.8	2.15
1399	1955	Feb. 23, 1955	688	1,060	3.92
1449	1956	Dec. 20, 1955	614	950	3.82
1519	1957	Dec. 6, 1956	1,100	1,700	4.37
1569	1958	Mar. 5, 1958	1,330	2,060	4.56
1639	1959	Oct. 23, 1958	1,480	2,290	4.67

Remarks.--Records good. Suburban Water System diverts ground water from tunnel in drainage area.

Revisions (fiscal years).--WSP 935: 1940. WSP 1569: Drainage area. WSP 1319: 1914-19(M). Revised figures of discharge, in million gallons a day, for the fiscal years 1942, 1943, 1947-53, and 1955-59, superseding those published in WSP 965, 985, 1095, 1125, 1155, 1185, 1219, 1249, 1289, 1349, 1399, 1449, 1519, 1569, and 1639, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge
1942		1949		1955-Con.	
June 17	33.5	Jan. 16	97	Feb. 22	18.8
18	15			23	54
Sept. 14	26.5	1951			
Dec. 13	27.5	Mar. 11	24.5	1956	
		26	125	Dec. 6	17.2
1943		27	57.0		
Jan. 13	46			1958	
		1954		Mar. 5	194
1947		Nov. 28	43.0	6	51
Mar. 29	22.5			July 3	28.5
30	41.0	1955		Oct. 23	141
		Feb. 7	37		

2750. Haiku Stream near Hee1a--Continued

Revised figures of monthly discharge, in million gallons a day,
1942-43, 1947, 1949, 1951, 1955, 1957-59

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
June 1942.....	106.76	33.5	1.77	3.56	5.51	328
Fiscal year 1941-42.....	1,026.76	33.5	1.20	2.81	4.35	3,150
September 1942.....	83.48	26.5	1.29	2.78	4.30	257
December.....	95.05	27.5	1.5	3.07	4.75	292
Calendar year 1942.....	941.33	33.5	1.29	2.58	3.99	2,890
January 1943.....	148.31	46	1.78	4.78	7.40	455
Fiscal year 1942-43.....	965.76	46	1.18	2.65	4.10	2,960
Calendar year 1943.....	752.37	46	.80	2.06	3.19	2,310
March 1947.....	152.64	41	.72	4.28	6.62	407
Fiscal year 1946-47.....	409.17	41	.19	1.12	1.75	1,280
Calendar year 1947.....	554.83	41	.72	1.52	2.35	1,700
January 1949.....	194.26	97	1.08	6.27	9.70	596
Fiscal year 1948-49.....	554.98	97	.50	1.52	2.35	1,700
Calendar year 1949.....	504.49	97	.50	1.38	2.14	1,550
March 1951.....	294.67	125	.88	9.51	14.7	904
Fiscal year 1950-51.....	-	125	.66	1.90	2.94	2,120
Calendar year 1951.....	-	125	.66	2.01	3.11	2,250
November 1954.....	80.14	43	.35	2.67	4.13	246
Calendar year 1954.....	-	43	.23	1.07	1.66	1,200
February 1955.....	194.57	54	1.23	6.95	10.8	597
Fiscal year 1954-55.....	-	54	.31	1.77	2.74	1,990
Calendar year 1955.....	-	54	.35	1.82	2.82	2,030
December 1956.....	57.04	17.2	.99	1.84	2.85	175
Calendar year 1956.....	-	17.2	.35	1.62	2.51	1,820
Fiscal year 1956-57.....	-	35.5	.35	1.38	2.14	1,550
March 1958.....	283.67	194	.64	9.15	14.2	871
Fiscal year 1957-58.....	-	194	.25	1.75	2.68	1,940
July 1958.....	57.36	28.5	.46	1.85	2.86	176
October.....	202.82	141	.64	6.54	10.1	622
Calendar year 1958.....	-	194	.37	2.35	3.64	2,630
Fiscal year 1958-59.....	-	141	.40	1.75	2.71	1,960

Revised peak discharge.--1947-48: Sept. 6 (5 a.m.) 232 mgd (359 cfs), 3.10 ft; Nov. 10 (3 p.m.) 290 mgd (449 cfs), 3.25 ft; Nov. 14 (8:30 p.m.) 180 mgd (279 cfs), 2.94 ft; Jan. 27 (5 a.m.) 225 mgd (348 cfs), 3.08 ft; Feb. 29 (2 p.m.) 360 mgd (557 cfs), 3.40 ft; Apr. 3 (time unknown) 163 mgd (252 cfs), 2.88 ft.
 1948-49: Nov. 17 (time unknown) 198 mgd (306 cfs), 3.00 ft; Jan. 8 (6 a.m.) 112 mgd (173 cfs), 2.67 ft; Jan. 16 (8:30 p.m.) 976 mgd (1,510 cfs), 4.24 ft; Jan. 25 (7 p.m.) 174 mgd (269 cfs), 2.92 ft; Feb. 7 (9 p.m.) 125 mgd (193 cfs), 2.73 ft.
 1949-50: Jan. 22 (4 p.m.) 345 mgd (534 cfs), 3.37 ft; May 16 (4 p.m.) 240 mgd (371 cfs), 3.12 ft.
 1950-51: Aug. 3 (12:30 a.m.) 163 mgd (252 cfs), 2.88 ft; Dec. 3 (5:30 p.m.) 129 mgd (200 cfs), 2.75 ft (estimated); Mar. 12 (12 p.m.) 518 mgd (801 cfs), 3.68 ft; Mar. 21 (9 p.m.) 256 mgd (365 cfs), 3.11 ft; Mar. 26 (4 a.m.) 2,730 mgd (4,220 cfs), 5.39 ft; Apr. 10 (11 a.m.) 470 mgd (727 cfs), 3.60 ft.
 1951-52: Oct. 27 (3 p.m.) 236 mgd (365 cfs), 3.11 ft; Dec. 12 (7:30 a.m.) 174 mgd (269 cfs), 2.92 ft; Dec. 31 (3 a.m.) 108 mgd (167 cfs), 2.65 ft; Jan. 19 (12 m.) 205 mgd (317 cfs), 3.02 ft.
 1952-53: Mar. 13 (5 p.m.) 168 mgd (260 cfs), 2.90 ft.
 1953-54: No peak above base.
 1954-55: Nov. 28 (10 p.m.) 593 mgd (918 cfs), 3.79 ft; Dec. 16 (4 a.m.) 120 mgd (186 cfs), 2.71 ft; Jan. 21 (9:30 a.m.) 251 mgd (388 cfs), 3.15 ft; Feb. 7 (1 p.m.) 482 mgd (746 cfs), 3.62 ft; Feb. 23 (4:30 p.m.) 688 mgd (1,060 cfs), 3.92 ft; Mar. 22 (6 p.m.) 125 mgd (193 cfs), 2.73 ft.
 1955-56: Aug. 20 (2 a.m.) 125 mgd (193 cfs), 2.73 ft; Dec. 20 (4 a.m.) 614 mgd (950 cfs), 3.82 ft; Feb. 12 (7:30 p.m.) 157 mgd (243 cfs), 2.86 ft; Feb. 25 (6:30 a.m.) 298 mgd (461 cfs), 3.27 ft; May 7 (5 a.m.) 127 mgd (196 cfs), 2.74 ft; May 27 (7:30 p.m.) 118 mgd (183 cfs), 2.70 ft.
 1956-57: Aug. 8 (10:30 p.m.) 189 mgd (292 cfs), 2.97 ft; Oct. 14 (7:30 p.m.) 157 mgd (243 cfs), 2.84 ft; Nov. 27 (8 p.m.) 146 mgd (226 cfs), 2.82 ft; Nov. 30 (6:30 p.m.) 240 mgd (371 cfs), 3.12 ft; Dec. 6 (8 p.m.) 1,100 mgd (1,700 cfs), 4.37 ft; Jan. 21 (7 a.m.) 189 mgd (292 cfs), 2.97 ft; Apr. 17 (4 p.m.) 174 mgd (269 cfs), 2.92 ft.
 1957-58: Nov. 21 (1 a.m.) 500 mgd (774 cfs), 3.65 ft; Dec. 1 (6 p.m.) 262 mgd (405 cfs), 3.18 ft; Dec. 6 (6 p.m.) 1,080 mgd (1,670 cfs), 4.35 ft; Feb. 28 (6 a.m.) 302 mgd (467 cfs), 3.28 ft; Mar. 5 (4:30 p.m.) 1,330 mgd (2,060 cfs), 4.56 ft.
 1958-59: July 3 (1 p.m.) 476 mgd (736 cfs), 3.61 ft; Aug. 8 (1 p.m.) 259 mgd (401 cfs), 3.17 ft; Sept. 6 (2 p.m.) 198 mgd (306 cfs), 3.00 ft; Oct. 23 (9:30 p.m.) 1,480 mgd (2,290 cfs), 4.67 ft; Apr. 9 (time and gage height unknown) about 215 mgd (333 cfs).

2750. Haiku Stream near Heeia--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.9	0.21	1.8	11.3
1.0	.46	2.0	21.0
1.2	1.52	2.1	29.5
1.5	5.00		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.40	0.73	0.68	0.43	0.43	0.40	0.64	0.43	0.49	1.17	0.73	0.82
2	.43	.73	.68	.40	2.22	.40	.73	.43	.46	.88	.73	.77
3	.43	.61	.73	.37	.73	.40	.73	.43	.60	.88	.82	.73
4	.40	.34	.77	.34	.53	.43	.88	.43	4.86	*.96	.73	1.05
5	.49	.37	3.90	.34	.49	.43	.82	.40	*16.8	.93	.73	.99
6	.46	4.76	1.99	.31	.46	.46	.77	.40	15.4	.88	.68	.93
7	.37	2.10	1.23	.37	.53	.40	.73	.40	5.68	.82	.68	.88
8	.34	.99	1.11	.64	2.48	.40	*.61	.37	2.79	.77	.64	.43
9	.34	.93	.99	.56	.82	.40	.43	.40	1.99	.88	.68	.43
10	.31	.73	*.99	.68	.56	.37	.46	.77	1.71	.82	1.32	.43
11	.34	.56	.99	.68	.53	.37	.56	.77	1.37	1.05	.93	.43
12	.34	.56	.99	.64	.49	.37	.82	.60	1.37	.99	*22.8	.40
13	.34	.53	.99	*.42	.46	.37	.64	.34	1.37	.82	21.9	.52
14	.34	.53	.99	.37	.43	.40	4.10	.34	1.30	.82	5.19	.56
15	.34	.53	.99	.40	.40	.37	1.44	.43	1.30	.82	2.27	.73
16	.40	.53	.64	.31	.40	.37	.73	.53	1.30	2.69	1.52	.73
17	.40	.56	.43	.31	.40	.43	.56	.49	1.34	2.45	1.37	.68
18	.40	.77	.43	.29	.40	.37	.49	1.61	1.23	1.61	1.05	.73
19	.34	.73	.43	.43	.40	.34	.46	*3.20	1.53	1.23	.73	.73
20	.34	.64	.43	.64	.40	.34	.46	1.04	4.57	1.05	.73	.60
21	.31	.60	.40	.56	.40	.37	.43	.60	1.80	.99	.68	.37
22	.29	.56	.40	.31	.37	.37	.40	.49	1.45	.93	.64	.40
23	.27	.56	.37	.46	*.40	.34	.40	.46	4.95	.86	.64	.46
24	*.27	.53	.43	.31	.37	.49	.40	.43	3.60	.88	.73	.46
25	.24	.53	.43	.29	.37	.43	.40	.43	2.18	.82	.73	.46
26	.27	.46	.46	.29	.40	.43	.40	.40	1.61	.82	.77	.43
27	.24	.46	.46	.31	.40	.43	.40	.40	1.45	.77	.73	.60
28	.24	.51	.43	.31	.43	.40	.46	.37	1.23	.77	.73	*.56
29	.37	.73	.43	.31	.43	.40	.46	.37	.99	.77	.77	.64
30	.34	.68	.43	.31	.43	.56	.46	-----	1.54	.73	.77	.60
31	.33	.68	-----	.40	-----	.68	.43	-----	1.52	-----	.77	-----
Total	10.72	24.53	24.62	12.79	17.56	12.72	21.70	17.76	89.78	30.88	74.19	18.55
Mean:												
mgd	0.346	0.791	0.821	0.413	0.585	0.410	0.700	0.612	2.90	1.03	2.39	0.618
cfs	0.535	1.22	1.27	0.639	0.905	0.634	1.08	0.947	4.49	1.59	3.70	0.956
Ac-ft	33	75	76	39	54	39	67	54	276	95	228	57

Calendar year 1959: Max 16.5 Min 0.24 Mean(mgd) 0.793 Mean(cfs) 1.23 Ac-ft 888
 Fiscal year 1959-60: Max 22.8 Min 0.24 Mean(mgd) 0.972 Mean(cfs) 1.50 Ac-ft 1,090

Peak discharge (base, 100 mgd).--May 12 (7:30 a.m.) 395 mgd (611 cfs), 3.47 ft.

* Discharge measurement made on this day.

2780. Iolekaa Stream mauka near Heeia

Location.--Lat 21°25'15", long 157°49'50", on left bank 0.7 mile upstream from confluence with Haiku Stream, 1.5 miles southwest of Heeia, and 1.8 miles west of Kaneohe Post Office.

Drainage area.--0.28 sq mi.

Records available.--March 1940 to June 1960.

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

Average discharge.--19 years (1940-42, 1943-60), 0.398 mgd (0.616 cfs).

Extremes.--Maximum discharge during year, 19.9 mgd (30.8 cfs) May 12 (gage height, 1.67 ft), from rating curve extended above 4.0 mgd by rating for Columbus-type control and test on model of station site; minimum, 0.21 mgd (0.32 cfs) Feb. 29, 1940-60: Maximum discharge, 71 mgd (110 cfs) Oct. 23, 1958 (gage height, 2.43 ft), from rating curve extended above 4.0 mgd by rating for Columbus-type control and test on model of station site; minimum daily, 0.10 mgd (0.16 cfs) Oct. 31 to Nov. 9, Nov. 24, 27, 1946.

Remarks.--Records good.

Revisions (fiscal years).--WSP 935: 1940. WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.5	0.20	0.9	1.75
.6	.36	1.0	2.70
.7	.64	1.1	4.00
.8	1.06	1.2	5.80

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.38	0.34	0.34	0.36	0.43	0.30	0.28	0.26	0.30	0.30	0.28	0.34
2	.41	.36	.34	.36	1.05	.30	.28	.28	.30	.30	.28	.34
3	.38	.36	.34	.36	.46	.30	.30	.26	.46	.30	.30	.34
4	.38	.36	.41	.36	.38	.30	.43	.26	2.89	.37	.30	.32
5	.38	.38	2.74	.36	.43	.32	.28	.26	5.63	.28	.28	.32
6	.38	2.54	.74	.36	.56	.30	.28	.26	3.59	.34	.28	.32
7	.38	.75	.51	.36	.46	.30	.26	.28	1.91	.30	.28	.32
8	.36	.43	.43	.36	1.56	.30	*.26	.26	.82	.30	.28	.30
9	.36	.43	.38	.34	.46	.28	.28	.26	.57	.38	.30	.30
10	.36	.38	*.38	.34	.34	.30	.28	.28	.49	.32	.56	.32
11	.36	.36	.38	.36	.32	.30	.28	.28	.46	.44	.28	.30
12	.36	.36	.38	.41	.30	.30	.28	.28	.46	.32	*5.17	.30
13	.34	.36	.38	*.38	.30	.30	.28	.30	.46	.28	3.07	.28
14	.36	.36	.38	.34	.28	.38	1.38	.30	.46	.32	1.07	.28
15	.36	.36	*.36	.34	.28	.30	.67	.32	.43	.30	.54	.28
16	.36	.36	.36	.32	.28	.32	.43	.67	.43	1.13	.41	.28
17	.36	.38	.36	.32	.28	.34	.34	.26	.43	1.04	.34	.28
18	.36	.68	.36	.34	.28	.30	.32	.88	.43	.64	.32	.28
19	.36	.38	.36	.34	.28	.30	.32	1.46	.78	.41	.30	.28
20	.36	.36	.38	.34	.28	.32	.30	.51	1.55	.36	.30	.28
21	.36	.34	.38	.34	.28	.32	.30	.36	.46	.32	.28	.28
22	.36	.34	.38	.34	.28	.32	.30	.30	.36	.32	.28	.30
23	.36	.34	.38	.34	*.36	.32	.30	*.28	2.18	.32	.28	.30
24	*.34	.34	.38	.34	.32	.43	.30	.26	1.15	.32	.30	.28
25	.34	.34	.38	.34	.32	.34	.28	.25	.57	.30	.32	.30
26	.34	.34	.41	.34	.30	.30	.28	.23	.43	.30	.32	.30
27	.32	.34	.41	.36	.30	.30	.28	.23	.41	.30	.32	*.36
28	.32	.34	.36	.34	.30	.30	.30	.28	.38	.30	.32	.32
29	.43	.34	.36	.34	.30	.30	.28	.23	.34	.30	.32	.32
30	.34	.34	.36	.34	.30	.32	.28	-----	.45	.28	.32	.28
31	.34	.34	-----	.38	-----	.30	.26	-----	*.34	-----	.34	-----
Total	11.20	14.03	14.11	10.85	11.87	9.71	10.69	10.26	29.92	11.49	18.34	9.10
Mean:												
mgd	0.361	0.452	0.470	0.350	0.396	0.313	0.345	0.354	0.965	0.383	0.592	0.303
cfs	0.559	0.699	0.727	0.542	0.613	0.484	0.534	0.548	1.49	0.593	0.916	0.469
Ac-ft	34	43	43	33	36	30	33	31	92	35	56	28

Calendar year 1959: Max 3.85 Min 0.28 Mean(mgd) 0.467 Mean(cfs) 0.723 Ac-ft 521

Fiscal year 1959-60: Max 5.63 Min 0.22 Mean(mgd) 0.441 Mean(cfs) 0.682 Ac-ft 494

Peak discharge (base, 15 mgd).--Jan. 14 (6 p.m.) 16.0 mgd (24.8 cfs), 1.57 ft; Mar. 5 (2:30 p.m.) 17.8 mgd (27.5 cfs), 1.62 ft; Apr. 16 (10 p.m.) 16.6 mgd (25.7 cfs), 1.59 ft; May 12 (7 a.m.) 19.9 mgd (30.8 cfs) 1.67 ft.

* Discharge measurement made on this day.

2830. Kahaluu Stream near Heeia

Location.--Lat 21°26'20", long 157°51'20", on left bank 40 ft upstream from intake of Libby ditch, 0.5 mile upstream from forest-reserve boundary, and 3.0 miles northwest of Heeia.

Drainage area.--0.28 sq mi.

Records available.--October 1935 to June 1960.

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

Extremes.--Maximum discharge during year, 83.3 mgd (129 cfs) Apr. 16 (gage height, 3.46 ft), from rating curve extended above 9 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) May 21, 22.
1935-60: Maximum discharge, 290 mgd (449 cfs) Sept. 27, 1937 (gage height, 5.47 ft, control then in use), from rating curve computed from 11 to 240 mgd by Parshall flume formula and extended above; minimum, 0.03 mgd (0.05 cfs) June 25, 1958.

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

Revisions.--WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1937-39 and 1943-44, superseding those published in WSP 835, 865, 885, 985, 1015 and 1319, are given herein.

Discharge, in million gallons a day, fiscal year July 1936 to June 1937

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*3.05	3.1	3.5	3.35	3.9	4.0	8.8	3.85	4.5	*4.0	6.9	4.9
2	3.05	3.1	3.5	3.35	3.5	3.85	3.85	4.2	4.3	4.2	7.4	5.0
3	3.1	3.1	*3.7	3.35	3.5	3.85	3.7	4.0	4.3	4.2	6.7	5.0
4	3.1	3.1	3.5	3.35	3.6	3.85	3.7	4.0	4.5	4.2	5.2	5.0
5	3.2	3.1	4.2	3.35	3.6	3.85	3.7	4.7	4.5	4.2	22.5	5.0
6	3.3	3.1	3.3	3.35	3.4	3.85	3.7	11.5	4.9	4.2	8.4	5.0
7	3.6	3.05	3.2	3.9	3.4	3.85	3.85	4.7	6.6	4.2	8.8	5.0
8	3.4	3.05	4.5	3.4	3.4	3.85	3.85	4.2	4.3	4.2	4.7	5.0
9	3.4	3.05	3.2	3.4	3.5	3.85	3.85	4.0	4.3	4.2	4.9	5.0
10	4.0	3.05	3.2	3.4	3.5	3.85	3.85	4.2	4.3	4.3	4.9	4.7
11	3.5	3.05	3.2	3.4	3.5	3.85	4.0	4.2	4.3	4.3	4.5	4.7
12	3.3	9.0	3.2	3.4	3.5	3.85	4.0	4.2	4.3	4.3	4.3	4.3
13	3.3	3.5	3.2	3.4	3.5	3.85	3.85	4.2	4.3	4.3	4.5	4.3
14	3.4	3.1	3.3	3.4	3.8	*3.85	3.7	4.3	4.3	4.3	4.5	4.3
15	3.3	3.1	3.5	3.4	3.6	3.85	3.7	4.3	4.3	4.3	4.5	4.3
16	3.2	3.1	3.6	3.5	3.6	3.85	4.1	4.3	4.3	4.3	4.7	4.3
17	3.2	3.1	3.8	3.4	3.9	3.85	4.3	4.3	4.5	4.3	4.7	4.3
18	3.1	3.1	3.8	3.4	3.7	3.85	5.5	4.7	5.5	4.5	4.9	4.5
19	3.1	3.1	3.8	3.4	*3.7	3.85	4.0	4.2	6.3	5.0	5.0	4.5
20	3.1	4.0	3.8	3.4	3.8	3.7	3.85	4.2	5.2	4.3	5.0	*4.5
21	3.1	3.5	3.8	3.85	3.8	3.7	3.7	4.2	4.7	4.3	5.2	4.5
22	3.1	3.5	3.8	5.2	3.8	3.7	3.7	4.5	4.3	4.3	5.2	4.5
23	3.1	3.5	3.8	3.9	5.0	3.7	3.7	4.2	4.2	4.3	5.2	4.5
24	3.3	3.5	3.8	3.4	3.85	3.7	4.0	4.2	4.2	4.3	5.8	4.5
25	3.7	4.5	6.0	3.5	3.85	3.7	3.85	4.2	4.2	4.3	5.0	4.5
26	3.3	3.5	7.2	6.0	3.85	3.7	4.0	4.2	4.7	4.3	5.0	4.5
27	3.2	3.5	7.2	4.2	4.0	3.7	3.85	4.3	4.7	4.3	4.9	4.5
28	3.4	3.5	4.0	7.8	4.0	6.7	4.5	4.3	4.3	10.7	4.9	4.5
29	3.5	3.5	4.2	12.3	4.0	4.2	4.0	-	4.3	7.0	4.9	4.7
30	3.3	3.5	3.7	4.3	4.0	3.85	8.6	-----	4.3	7.3	4.9	4.7
31	3.2	3.5	-----	4.0	-----	4.2	4.2	-----	4.3	-----	4.9	-----
Total	101.90	108.45	118.5	126.75	112.05	121.85	131.95	126.35	142.0	140.9	182.9	139.0
Mean:												
mgd	3.29	3.50	3.95	4.09	3.74	3.93	4.26	4.51	4.58	4.70	5.90	4.63
cfs	5.09	5.42	6.11	6.33	5.79	6.08	6.59	6.98	7.09	7.27	9.13	7.16
Ac-ft	313	333	364	389	344	374	405	388	436	432	561	427
Calendar year 1936: Max	12.3		Min	2.5		Mean(mgd)	3.50		Mean(cfs)	5.42	Ac-ft	3,950
Fiscal year 1936-37: Max	22.5		Min	3.05		Mean(mgd)	4.25		Mean(cfs)	6.58	Ac-ft	4,770

* Discharge measurement made on this day.

Note.--No gage-height record July 3 to Aug. 6, Aug. 12 to Sept. 3, Nov. 16-19; discharge estimated on basis of records for stations on nearby streams.

2830. Kahaluu Stream near Heeia--Continued

Discharge, in million gallons a day, fiscal year July 1937 to June 1938

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.7	*4.3	4.5	4.2	5.2	*4.2	4.3	8.6	4.3	4.3	4.2	5.0
2	4.7	4.7	4.5	4.2	5.0	4.2	4.3	9.3	4.3	4.2	4.5	5.2
3	4.7	4.5	4.5	4.2	4.2	4.3	a4.3	10.0	4.3	4.2	4.2	4.7
4	4.7	4.5	4.7	4.2	4.5	4.2	a4.3	5.0	4.3	4.2	4.2	4.7
5	4.5	4.5	4.5	4.3	4.3	4.2	a4.3	5.6	5.1	4.2	4.2	4.7
6	4.5	4.5	4.5	4.2	5.3	4.2	a4.3	4.5	6.3	7.2	4.2	4.7
7	4.7	4.4	4.5	4.2	4.2	4.2	a4.3	4.5	5.2	4.3	4.0	4.7
8	4.5	4.4	4.5	4.2	4.2	4.2	a4.3	4.5	4.7	4.2	4.0	4.5
9	4.5	4.4	4.5	4.2	4.2	4.2	*a4.3	4.5	4.3	12.4	4.6	4.5
10	4.5	4.4	4.5	4.2	4.2	4.2	4.3	4.5	4.3	11.9	4.2	5.0
11	4.5	4.4	4.7	4.2	4.2	4.5	4.3	6.4	4.3	4.7	4.0	11.1
12	4.5	4.5	4.9	4.3	4.2	13.1	4.3	5.0	4.3	4.3	4.2	5.2
13	4.4	4.5	4.5	4.5	4.2	4.5	4.5	*6.0	4.3	4.3	4.0	4.5
14	4.4	4.5	4.5	4.5	4.2	4.4	4.5	4.5	4.3	4.3	5.8	4.5
15	4.5	4.5	4.4	4.3	4.2	4.4	4.5	4.3	4.3	4.2	4.2	4.5
16	4.3	6.0	*4.3	4.3	4.2	4.3	4.5	4.3	4.3	4.2	4.0	4.5
17	9.4	5.7	4.3	4.4	4.2	4.3	4.5	4.3	4.7	4.2	4.0	4.5
18	4.3	4.5	4.3	4.5	4.2	4.5	4.5	4.3	5.0	4.2	a4.0	4.5
19	4.2	4.5	4.3	4.3	4.2	4.5	4.5	4.3	4.7	4.2	a4.0	4.5
20	4.3	4.5	4.3	4.3	4.2	4.7	4.5	4.3	4.3	4.2	*a8.0	4.5
21	4.5	4.5	4.3	4.3	4.2	4.7	4.5	4.3	4.3	4.2	15.6	4.5
22	4.3	4.5	4.3	4.5	4.2	4.7	4.5	4.3	4.3	4.2	4.7	4.7
23	4.2	4.5	4.5	4.7	4.2	7.4	4.5	4.3	4.3	4.2	4.5	*4.5
24	4.3	4.5	4.2	5.7	4.3	4.7	4.5	4.5	4.3	4.2	4.3	5.0
25	4.5	4.5	4.3	4.5	5.7	4.8	4.5	4.5	4.3	4.2	5.7	4.5
26	4.5	4.5	9.5	4.3	4.2	4.5	4.5	4.3	4.3	4.3	5.0	4.5
27	4.9	4.5	12.1	4.3	4.2	4.2	4.5	4.3	10.0	4.2	4.5	4.5
28	4.5	4.5	9.3	4.3	4.2	4.9	7.1	4.5	6.6	4.2	4.5	4.5
29	4.4	4.5	4.3	4.3	4.2	7.2	4.5	-	4.9	4.2	4.5	4.7
30	4.3	5.7	4.2	4.3	4.2	6.1	4.9	-	5.1	4.2	5.2	4.7
31	4.3	4.5	-----	4.3	-----	4.9	4.5	-----	4.9	-----	4.9	-----
Total	143.3	142.9	150.7	135.8	130.9	153.3	140.1	143.5	148.9	146.0	151.9	146.1
Mean:												
mgd	4.62	4.61	5.02	4.38	4.36	4.95	4.52	5.12	4.80	4.87	4.90	4.87
cfs	7.15	7.13	7.77	6.78	6.75	7.66	6.99	7.92	7.43	7.54	7.58	7.54
Ac-ft	440	439	462	417	402	470	430	440	457	448	466	448
Calendar year 1937: Max	22.5				3.7							
Fiscal year 1937-38: Max	15.6				4.0							
Mean(mgd)	4.71					4.75			7.29		5,280	
Mean(cfs)	7.35								7.35		5,320	
Ac-ft												

* Discharge measurement made on this day.

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

Discharge, in million gallons a day, fiscal year July 1938 to June 1939

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.7	4.5	4.5	4.5	4.5	4.2	4.2	4.3	4.2	3.55	3.5	3.5
2	4.7	4.5	4.5	4.3	4.5	4.2	4.2	4.8	5.4	3.55	3.5	*3.6
3	4.7	4.5	4.5	4.3	4.3	4.2	4.2	4.2	3.85	6.5	3.5	3.6
4	4.7	5.7	5.0	4.3	4.2	4.2	4.2	4.2	4.6	6.4	3.5	3.6
5	4.7	4.8	4.5	4.3	4.2	4.2	4.2	5.6	9.4	3.85	3.5	3.6
6	4.7	4.7	4.5	4.3	4.2	4.2	4.5	4.5	4.2	5.3	3.5	3.7
7	4.7	4.5	*4.5	4.3	4.2	4.2	4.2	5.2	3.85	9.7	3.5	3.6
8	4.7	4.7	4.5	4.3	4.2	4.2	4.1	4.5	3.85	8.8	3.5	3.6
9	4.7	4.7	4.5	4.3	4.2	4.2	4.0	4.5	3.85	3.95	3.8	3.6
10	4.7	8.1	4.5	4.3	4.2	4.2	4.0	4.5	3.85	5.0	4.0	3.6
11	4.7	5.0	4.5	4.3	4.2	4.2	4.0	4.5	3.85	3.7	3.6	3.6
12	4.9	4.7	4.5	4.3	4.7	4.2	4.0	4.3	3.85	3.55	3.6	3.7
13	4.7	4.5	4.5	4.5	4.3	4.2	4.0	4.3	3.85	3.5	3.6	3.6
14	4.7	4.9	4.5	4.5	4.2	4.2	3.85	4.2	3.85	3.5	3.6	3.7
15	4.7	4.5	4.5	4.5	7.4	4.2	*4.2	3.85	4.2	3.85	3.5	3.6
16	4.7	4.5	4.5	4.7	*4.2	4.2	5.0	4.2	3.85	3.5	3.6	3.7
17	4.7	4.5	4.5	4.3	4.2	4.2	5.2	4.2	3.85	3.5	3.6	3.7
18	4.7	5.4	4.5	4.3	4.2	4.2	6.0	4.2	4.2	3.7	3.6	3.7
19	4.7	5.4	4.7	4.3	4.2	4.2	4.5	4.2	4.0	3.7	3.6	3.7
20	4.7	4.7	4.7	4.3	4.2	4.2	4.3	4.2	3.85	3.85	3.5	3.7
21	4.8	4.5	4.5	4.3	4.2	4.2	4.1	*4.0	3.85	3.5	3.5	3.7
22	4.7	4.5	4.5	4.3	4.2	4.2	4.1	3.85	3.85	3.5	3.5	3.7
23	4.5	4.5	4.5	4.3	4.2	4.2	5.2	3.85	3.85	3.5	3.5	3.9
24	4.5	4.5	4.5	4.2	4.2	4.2	4.5	3.85	4.2	3.5	3.5	4.9
25	4.7	4.5	4.5	4.2	4.2	4.2	4.2	3.85	3.7	*3.65	3.5	3.7
26	*4.5	4.5	4.5	4.2	4.2	4.2	4.1	3.85	3.55	4.2	3.5	3.8
27	4.5	4.5	4.5	4.2	4.2	4.2	4.1	3.85	3.55	3.7	3.5	3.8
28	4.5	4.5	4.5	5.2	4.2	4.2	4.5	10.8	3.55	3.7	3.5	3.7
29	4.5	4.5	4.5	4.3	4.2	4.2	4.4	4.0	-	3.55	3.6	3.6
30	4.5	4.5	4.5	4.3	4.2	4.2	4.3	4.0	-----	3.55	3.5	3.6
31	4.5	4.5	-----	4.2	-----	4.2	4.6	-----	3.55	-----	3.5	-----
Total	144.4	150.1	135.9	137.8	127.3	135.6	133.50	126.70	126.80	127.95	110.2	111.3
Mean:												
mgd	4.66	4.84	4.53	4.45	4.24	4.37	4.31	4.52	4.09	4.26	3.55	3.71
cfs	7.21	7.49	7.01	6.89	6.05	6.76	6.67	6.99	6.33	6.59	5.49	5.74
Ac-ft	443	461	417	423	391	416	410	389	389	393	338	342
Calendar year 1938: Max	15.6				3.5							
Fiscal year 1938-39: Max	10.8				4.0							
Mean(mgd)	4.68					4.29			7.24		5,240	
Mean(cfs)	6.64								6.64		5,410	
Ac-ft												

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 28 to Jan. 11, Jan. 16 to Feb. 21; discharge estimated on basis of records for stations on nearby streams.

2830. Kahaluu Stream near Heeia--Continued

Discharge, in million gallons a day, fiscal year July 1942 to June 1943

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.0	<u>2.8</u>	2.8	3.0	2.7	<u>7.0</u>	2.55	2.4	2.45	2.4	2.4	2.7
2	2.9	2.8	2.8	2.9	2.8	3.45	3.2	2.4	2.45	2.4	2.3	2.4
3	2.9	<u>12.0</u>	2.8	2.8	2.7	2.9	4.5	2.4	2.6	2.4	2.3	2.3
4	2.9	2.2	3.2	2.8	2.7	3.0	5.2	2.4	*3.05	<u>3.4</u>	2.3	2.65
5	2.9	3.0	2.8	2.8	2.7	2.8	5.6	2.45	2.55	2.45	2.4	2.45
6	2.9	2.9	2.8	2.8	2.8	5.1	3.1	2.4	2.4	2.4	2.3	2.4
7	5.2	2.9	2.8	2.8	2.7	3.0	2.9	2.4	<u>2.3</u>	2.4	5.3	2.4
8	2.8	2.9	2.8	2.9	2.7	6.2	2.9	2.4	3.15	2.4	<u>9.8</u>	2.4
9	2.6	*2.9	2.8	2.8	2.7	3.0	2.8	2.4	<u>7.9</u>	2.4	2.55	2.4
10	2.6	2.9	*2.8	2.8	2.7	2.9	2.8	2.4	2.4	2.4	2.45	*2.4
11	2.55	3.0	<u>2.6</u>	2.8	2.7	2.9	2.8	2.4	2.3	2.45	2.45	2.4
12	2.55	3.0	<u>2.6</u>	2.8	2.7	2.9	2.8	2.4	2.3	3.25	6.2	2.4
13	<u>2.45</u>	3.5	2.9	2.9	2.7	7.0	<u>11.9</u>	2.4	2.3	2.9	2.45	2.4
14	2.45	3.0	<u>7.0</u>	2.9	2.7	3.4	2.8	2.4	2.3	2.4	4.2	2.3
15	2.45	3.4	<u>4.0</u>	2.8	2.8	<u>6.5</u>	3.15	2.8	2.4	2.3	2.45	2.3
16	2.45	3.1	3.3	2.8	4.2	*3.0	2.8	2.4	2.3	2.55	2.3	2.3
17	3.35	2.9	3.0	2.8	<u>2.6</u>	2.9	2.8	<u>2.3</u>	2.3	2.4	2.3	2.3
18	3.65	3.8	2.9	2.8	<u>2.7</u>	2.8	2.7	<u>2.3</u>	3.55	<u>2.3</u>	2.3	2.3
19	2.8	3.1	2.8	*2.8	2.7	2.7	2.7	2.4	2.7	2.3	2.3	2.3
20	2.8	2.8	3.4	2.8	2.8	2.7	2.6	2.4	2.4	2.3	2.4	<u>2.25</u>
21	2.7	2.8	3.0	2.8	2.8	2.7	2.6	2.4	2.4	2.3	2.4	2.25
22	2.7	3.0	2.9	2.7	2.7	2.55	2.55	2.45	2.3	2.4	2.4	2.25
23	3.5	3.2	2.8	2.8	2.7	2.7	2.55	2.45	2.7	2.4	2.4	2.25
24	<u>6.7</u>	2.9	2.7	2.8	2.7	2.7	*2.45	<u>2.85</u>	f2.55	*2.4	2.45	2.25
25	<u>3.1</u>	2.9	2.7	2.8	2.8	2.6	2.45	2.45	2.55	2.4	2.45	2.3
26	2.9	2.8	3.3	2.8	2.9	2.6	2.45	2.45	2.55	2.4	3.7	2.3
27	2.9	2.8	3.1	<u>2.7</u>	2.9	2.6	2.45	2.45	2.55	2.4	3.95	2.3
28	2.8	2.8	2.9	<u>2.7</u>	2.8	2.7	2.45	2.45	2.45	2.4	2.4	2.3
29	2.7	2.8	2.9	<u>4.3</u>	2.7	2.8	<u>2.4</u>	-	2.45	2.4	2.3	2.3
30	2.7	2.9	2.9	<u>4.2</u>	2.4	2.6	2.4	-	2.4	2.4	2.3	2.3
31	2.8	2.8	-----	2.7	-----	<u>2.55</u>	2.45	-----	2.4	-----	2.3	-----
Total	93.70	104.5	92.1	90.1	88.9	102.05	99.45	67.80	83.30	74.25	91.45	70.55
Mean:												
mgd	3.02	3.37	3.07	2.91	2.96	3.29	3.21	2.42	2.69	2.48	2.95	2.35
cfs	4.67	5.21	4.75	4.50	4.58	5.09	4.97	3.74	4.16	3.84	4.56	3.64
Ac-ft	288	321	283	277	273	313	305	208	256	228	281	217

Calendar year 1942: Max 12.5 Min 2.45 Mean(mgd) 2.99 Mean(cfs) 4.63 Ac-ft 3,350
 Fiscal year 1942-43: Max 12.0 Min 2.25 Mean(mgd) 2.90 Mean(cfs) 4.49 Ac-ft 3,250

* Discharge measurement made on this day.
 † Fragmentary gage-height record; discharge computed from partly estimated gage heights and on basis of records for stations on nearby streams.
 Note.--No gage-height record Aug. 2, 3, Aug. 5 to Oct. 20, Mar. 19-23; discharge estimated on basis of records for nearby streams.

Discharge, in million gallons a day, fiscal year July 1943 to June 1944

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	<u>2.25</u>	2.55	2.7	2.55	<u>2.45</u>	2.45	2.3	2.3	2.8	<u>3.1</u>	2.25	<u>2.15</u>
2	2.3	2.55	2.7	2.55	<u>2.45</u>	2.45	2.3	2.3	2.4	2.45	2.25	2.15
3	2.3	*2.55	2.7	2.55	2.45	2.55	2.3	2.3	3.35	2.3	2.25	2.15
4	2.4	2.8	2.6	<u>2.8</u>	2.45	2.7	2.3	2.3	<u>3.6</u>	2.3	2.25	2.15
5	2.45	2.55	2.6	2.55	2.45	3.5	2.3	2.3	2.55	2.3	2.25	2.05
6	2.45	2.6	2.6	2.55	2.45	3.2	2.3	2.3	2.45	2.3	2.25	2.05
7	2.4	2.6	2.6	2.55	2.45	2.55	<u>2.25</u>	2.3	2.7	2.3	<u>2.3</u>	2.05
8	2.4	2.6	2.6	2.55	2.45	2.6	2.25	2.3	2.9	2.3	*2.3	2.05
9	2.4	2.7	2.6	2.55	2.45	a2.55	2.25	2.3	2.45	2.3	2.25	2.05
10	2.4	2.7	2.6	2.55	2.45	*a2.4	2.25	2.3	2.3	2.3	2.25	2.05
11	2.4	<u>2.85</u>	2.6	2.55	<u>2.4</u>	a2.4	2.25	2.4	2.3	2.3	2.25	2.05
12	2.4	2.7	2.6	2.55	<u>2.4</u>	a2.4	2.25	2.3	<u>2.25</u>	2.3	2.25	2.05
13	<u>2.55</u>	*2.7	2.6	2.55	2.4	a2.4	2.25	2.3	<u>2.25</u>	2.25	<u>2.15</u>	2.05
14	<u>2.45</u>	2.7	2.6	2.55	2.4	a2.4	2.25	2.3	2.25	2.25	2.15	1.99
15	2.4	2.7	2.6	2.55	2.4	a2.6	2.25	2.3	2.25	2.25	2.15	2.05
16	2.4	2.7	2.6	2.55	2.4	a3.8	2.3	<u>2.25</u>	2.25	2.25	2.15	2.15
17	2.4	2.7	2.6	2.55	2.4	<u>2.6</u>	2.3	<u>2.25</u>	2.25	2.25	2.15	1.99
18	2.4	2.7	*2.6	2.55	2.4	2.45	2.3	2.25	2.25	<u>2.15</u>	2.25	1.99
19	2.4	2.7	2.6	2.55	2.4	<u>2.4</u>	2.3	2.25	2.25	2.25	2.15	<u>1.91</u>
20	2.4	2.7	2.6	*2.55	2.4	<u>2.3</u>	<u>2.4</u>	2.3	2.75	2.15	2.15	1.99
21	2.4	2.7	2.6	<u>2.45</u>	2.45	2.3	2.4	2.45	2.3	2.15	2.15	1.99
22	2.4	2.85	2.6	<u>2.45</u>	2.45	2.3	2.4	2.3	2.3	2.15	2.15	2.05
23	2.4	2.7	2.6	2.45	2.45	2.3	2.4	2.3	2.3	2.15	2.15	2.05
24	2.45	2.7	2.6	2.45	2.45	2.3	2.4	2.3	2.3	2.25	2.15	*2.05
25	2.45	2.7	2.6	2.45	2.45	2.3	2.4	2.3	2.3	2.25	2.15	2.05
26	2.45	2.7	2.6	2.45	2.45	2.3	2.4	2.3	2.3	2.25	2.15	2.05
27	2.45	2.7	2.6	2.55	2.45	3.0	2.4	2.9	2.25	2.25	2.15	2.05
28	2.55	2.7	<u>2.85</u>	2.55	2.45	2.55	2.3	3.05	2.25	2.25	2.15	1.99
29	2.45	2.8	<u>2.6</u>	2.45	2.45	2.3	2.3	<u>3.15</u>	2.45	2.25	2.15	1.99
30	2.55	2.8	<u>2.55</u>	2.45	2.45	2.3	2.3	-----	3.3	2.25	2.15	1.99
31	2.55	2.7	-----	2.45	-----	2.3	2.3	-----	2.55	-----	2.15	-----
Total	75.00	83.40	78.50	78.40	73.00	78.95	71.65	68.95	77.15	68.55	68.15	61.38
Mean:												
mgd	2.42	2.69	2.62	2.53	2.43	2.55	2.31	2.38	2.49	2.28	2.20	2.05
cfs	3.74	4.16	4.05	3.91	3.76	3.95	3.57	3.68	3.85	3.53	3.40	3.17
Ac-ft	230	256	241	241	224	242	220	212	237	210	209	186

Calendar year 1943: Max 11.9 Min 2.25 Mean(mgd) 2.61 Mean(cfs) 4.04 Ac-ft 2,930
 Fiscal year 1943-44: Max 3.8 Min 1.91 Mean(mgd) 2.41 Mean(cfs) 3.73 Ac-ft 2,710

* Discharge measurement made on this day.
 a No gage-height record; discharge estimated on basis of records for Waihee Stream.

2830. Kahaluu Stream near Heeia--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.06	0.06	0.5	2.09
.1	.13	.7	3.88
.2	.43	.9	6.15
.3	.84	1.0	7.45

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.26	0.17	0.11	0.23	0.20	0.13	0.13	0.13	0.13	0.13	0.07	0.07
2	.32	.15	.11	.15	1.70	.13	.17	.11	.15	.13	.07	.07
3	.32	.13	.13	.13	.32	.13	.17	.11	.20	.13	.07	.12
4	.26	.13	.17	.13	.20	.13	.23	.11	2.09	.15	.07	.11
5	.32	.17	4.18	.13	.20	.15	.17	.09	7.02	.13	.07	.09
6	.32	2.19	.45	.13	.17	.15	.15	.11	2.26	.13	.07	.17
7	.23	.35	.35	.13	.26	.15	.15	.11	.55	.13	.07	.07
8	.23	.15	.26	.13	1.18	.13	*.11	.07	.29	.15	.07	.07
9	.23	.17	*.20	.13	.29	.13	.13	.09	.23	.20	.09	.07
10	.20	.17	.17	.13	.23	.13	.13	.09	.23	.15	.23	.07
11	.23	.17	.17	.13	.20	.13	.13	.07	.20	.53	.11	.07
12	.26	.15	.17	.17	.20	.13	.13	.07	.20	.23	2.88	.07
13	.23	.13	.17	.15	.20	.13	.13	.09	.20	.15	3.84	.07
14	.20	.13	.17	.13	.20	.17	.28	.09	.17	.25	.58	.07
15	.20	.13	.15	*.13	.20	.15	.32	.15	.17	.20	.13	.09
16	.20	.15	.15	.13	.20	.17	.17	.15	.17	3.16	.09	.09
17	.20	.17	.15	.13	.20	.17	.13	.15	.41	.55	.09	.09
18	.17	1.97	.15	.13	.20	.15	.13	*1.32	.29	.17	.07	.09
19	.20	.42	.15	.13	.17	.13	.13	1.34	1.09	.11	.07	.09
20	.20	.26	.13	.13	*.15	.13	.13	.29	2.31	.11	.07	.11
21	.17	.23	.13	.13	.13	.13	.13	.17	.35	.13	.06	.11
22	*.13	.20	.13	.13	.13	.13	.13	.15	.23	.11	.06	.11
23	.13	.17	.13	.13	.13	.13	.13	.13	.60	.11	.07	.13
24	.13	.17	.13	.13	.13	.26	.13	.13	1.02	.11	.07	.13
25	.13	.17	.13	.13	.13	.20	.13	.13	.35	.09	.09	.13
26	.13	.20	.17	.13	.13	.17	.11	.13	.23	.09	.07	.13
27	.13	.17	.26	.15	.13	.15	.11	.13	.20	.09	.07	.09
28	.13	.17	.15	.13	.13	.17	.13	.11	.20	.09	.07	.15
29	.20	.15	.13	.15	.15	.15	.11	.11	.17	.07	.07	.09
30	.15	.15	.54	.13	.13	.15	.13	-----	.32	.07	.07	.07
31	.15	.13	-----	.17	-----	.15	.13	-----	*.18	-----	.07	-----
Total	6.36	9.37	9.59	4.29	7.99	4.61	4.59	5.91	22.21	7.85	9.38	2.79
Mean:												
mgd	0.205	0.302	0.320	0.138	0.266	0.149	0.148	0.204	0.716	0.262	0.302	0.093
cfs	0.317	0.467	0.495	0.214	0.412	0.231	0.229	0.316	1.11	0.405	0.467	0.144
Ac-ft	20	29	29	13	25	14	14	18	68	24	29	8.6

Calendar year 1959: Max 5.90 Min 0.11 Mean(mgd) 0.638 Mean(cfs) 0.987 Ac-ft 716

Fiscal year 1959-60: Max 7.02 Min 0.06 Mean(mgd) 0.259 Mean(cfs) 0.401 Ac-ft 292

Peak discharge (base, 30 mgd).--Apr. 16 (9:30 p.m.) 83.3 mgd (129 cfs), 3.46 ft; May 13 (12:30 p.m.) 30.2 mgd (46.7 cfs), 2.07 ft.

* Discharge measurement made on this day.

2840. Waihee Stream near Heeia

Location.--Lat 21°27'00", long 157°51'40", on left bank 70 ft upstream from intake of Kihe ditch, 120 ft downstream from forest-reserve boundary, 3.5 miles northwest of Heeia, and 4.4 miles northwest of Kaneohe.

Drainage area.--0.93 sq mi.

Records available.--December 1935 to June 1960.

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

Average discharge.--24 years (1936-60), 6.42 mgd (9.93 cfs).

Extremes.--Maximum discharge during year, 91.8 mgd (142 cfs) Mar. 5 (gage height, 3.28 ft), from rating curve extended above 50 mgd; minimum, 4.40 mgd (6.81 cfs) part of many days. 1935-60: Maximum discharge, 466 mgd (721 cfs) Oct. 23, 1958 (gage height, 5.69 ft), from rating curve extended above 50 mgd; minimum, 2.75 mgd (4.25 cfs) Sept. 6, Oct. 31 to Nov. 2, 1955.

Remarks.--Records good except those for periods of fragmentary gage-height record, which are poor. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area.

Revisions.--WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1956-57, superseding those published in WSP 1449 and 1569, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1956		1956-Con.		1956-Con.		1956-Con.	
Apr. 23	6.0	May 19	5.7	June 21	6.1	July 17	5.7
24	6.0	20	5.5	22	6.1	18	6.7
25	6.0	21	5.7	23	6.4	19	6.4
26	6.5	22	6.0	24	6.1	20	6.0
27	6.0	23	6.3	25	6.0	21	6.0
28	6.0	24	5.7	26	6.1	22	6.0
29	5.8	25	5.5	27	6.1	23	5.8
30	6.0	26	5.5	28	6.0	24	5.8
May 1	5.7	27	6.6	29	6.0	25	5.8
2	5.8	28	7.0	30	6.0	26	5.7
3	6.3	29	6.3	July 1	6.0	27	5.7
4	6.1	30	6.0	2	6.0	28	5.7
5	6.1	31	7.1	3	6.0	29	5.7
6	6.3	June 1	6.6	4	5.8	30	5.7
7	12.7	2	6.1	5	5.8	31	5.7
8	6.3	10	5.5	6	5.8	Aug. 1	5.7
9	5.8	11	5.8	7	6.0	2	5.5
10	6.0	12	6.0	8	6.0	3	5.7
11	6.1	13	6.0	9	6.0	4	5.7
12	5.8	14	6.1	10	5.7	5	5.8
13	5.7	15	6.0	11	5.7	6	5.5
14	5.7	16	6.0	12	5.7	7	6.0
15	5.7	17	6.1	13	5.8	8	13.6
16	5.5	18	6.0	14	5.8		
17	5.5	19	6.0	15	5.8		
18	5.8	20	6.0	16	5.7		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
April 1956.....	201.3	16.0	5.8	6.71	10.4	618
May.....	191.8	12.7	5.5	6.19	9.58	589
June.....	182.5	7.3	5.5	6.08	9.41	560
Fiscal year 1955-56.....	-	33	2.75	6.91	10.7	7,760
July 1956.....	182.0	6.7	5.7	5.87	9.08	559
August.....	215.4	15.7	5.5	6.95	10.8	661
Calendar year 1956.....	-	17.1	4.4	6.34	9.81	7,120
Fiscal year 1956-57.....	-	38	5.4	6.43	9.95	7,200

2840. Waihee Stream near Heeia--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.7	3.80	1.4	16.0
.8	5.00	1.6	21.0
1.0	8.00	2.0	33.0
1.2	11.6		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.70	5.28	5.00	5.00	4.76	4.76	4.76	4.64	5.14	5.84	5.98	5.56
2	5.70	5.28	5.00	4.76	12.0	4.76	4.76	4.64	5.28	5.84	5.98	5.56
3	5.56	5.14	5.00	4.76	5.84	4.76	4.76	4.64	5.42	5.84	5.98	5.84
4	5.56	5.14	5.14	4.76	5.28	4.76	5.14	4.64	9.60	5.84	5.84	5.42
5	5.70	5.28	13.5	4.76	5.28	4.88	*4.76	4.64	27.1	5.70	5.84	5.42
6	5.42	f10.3	7.20	4.76	5.00	4.88	4.76	4.64	21.7	5.70	5.84	5.42
7	5.42	6.72	5.98	4.76	6.31	4.88	4.64	4.64	9.53	5.56	5.84	5.42
8	5.42	5.70	5.42	4.76	9.49	4.76	4.64	4.64	7.04	5.70	5.84	5.42
9	5.42	5.42	*5.42	4.76	5.98	4.76	4.64	4.64	6.56	5.84	5.98	5.14
10	5.42	5.28	5.56	4.52	5.42	4.76	4.76	4.64	5.98	5.70	7.02	5.56
11	5.42	5.28	5.56	4.76	5.28	4.76	4.76	4.64	5.84	7.58	*6.47	4.88
12	5.42	5.28	5.56	4.88	5.28	4.76	4.76	4.64	5.56	6.26	f16.6	4.70
13	5.42	5.14	5.56	4.88	5.14	4.76	4.76	4.64	5.42	5.84	f25.1	4.52
14	5.42	5.14	5.42	4.76	5.00	5.00	5.28	4.64	5.42	5.98	12.0	4.64
15	5.42	5.14	5.28	*4.76	5.00	4.76	5.14	5.00	5.28	5.98	7.52	4.64
16	5.42	5.14	5.28	4.76	5.00	4.76	5.00	5.42	5.28	f13.5	6.72	4.70
17	5.42	5.28	5.28	4.76	5.00	5.00	5.00	4.76	5.71	9.51	6.40	4.76
18	5.28	9.72	5.28	4.76	5.00	4.76	4.88	f8.98	5.28	8.90	6.12	4.64
19	5.28	6.12	5.14	4.76	5.00	4.76	4.88	11.1	7.37	7.04	6.12	4.88
20	5.28	5.42	5.14	4.64	4.88	4.76	4.88	6.40	14.6	6.56	5.98	4.64
21	5.28	5.28	5.00	4.64	4.88	4.64	4.88	5.42	6.88	6.26	5.84	4.69
22	*5.42	5.28	5.00	4.64	4.88	4.64	4.88	5.28	5.98	6.26	5.84	4.64
23	*5.42	5.14	5.00	4.64	4.88	4.64	4.76	5.14	6.26	6.40	5.70	*4.64
24	5.56	5.14	5.14	4.64	*4.88	5.42	4.76	5.00	7.36	6.26	5.70	4.64
25	5.56	5.14	5.00	4.64	4.88	5.00	4.76	5.00	6.26	5.98	5.70	4.76
26	5.42	5.28	5.28	4.64	4.76	4.76	4.76	5.00	5.98	5.98	5.70	5.14
27	5.42	5.28	5.42	4.76	4.76	4.76	4.76	5.00	5.84	5.98	5.56	5.42
28	5.28	5.00	5.00	4.64	4.76	4.76	4.76	5.00	5.84	5.98	5.56	6.12
29	5.98	5.00	5.00	4.64	4.76	4.76	4.76	5.00	5.70	5.98	5.56	5.70
30	5.42	5.00	5.60	4.64	4.76	4.76	4.76	-----	*7.47	5.98	5.42	5.42
31	5.28	5.00	-----	4.76	-----	4.76	4.64	-----	6.26	-----	5.42	-----
Total	169.14	173.74	168.16	146.60	164.14	148.94	149.44	152.46	238.94	195.77	221.17	152.53
Mean:												
mgd	5.46	5.60	5.61	4.73	5.47	4.80	4.82	5.26	7.71	6.53	7.13	5.08
cfs	8.45	8.66	8.68	7.32	8.46	7.43	7.46	8.14	11.9	10.1	11.0	7.86
Ac-ft	519	533	516	450	504	457	459	468	733	601	679	468

Calendar year 1959: Max 26.0 Min 4.52 Mean(mgd) 6.31 Mean(cfs) 9.76 Ac-ft 7,060
 Fiscal year 1959-60: Max 27.1 Min 4.48 Mean(mgd) 5.69 Mean(cfs) 8.80 Ac-ft 6,390

Peak discharge (base, 90 mgd).--Mar. 5 (4:30 p.m.) 91.8 mgd (142 cfs), 3.28 ft.

* Discharge measurement made on this day.

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

2850. Waiahole tunnel at Wai'anu, near Waiahole

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

Records available.--December 1950 to June 1960 in reports of Geological Survey. June 1916 to November 1950 in files of Waiahole Water Co.

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

Average discharge.--9 years (1951-60), 24.4 mgd (37.8 cfs).

Extremes.--1950-60: Maximum daily discharge, 74.0 mgd (114 cfs) July 28, 1954; minimum daily, 16.0 mgd (24.8 cfs) Jan. 24-29, 1952.

Remarks.--Records excellent. Tunnel diverts water from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Water may be diverted at various intakes above station.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21.6	20.3	19.3	24.4	19.3	18.4	18.2	*18.6	20.2	28.0	22.0	26.4
2	21.4	21.2	19.3	20.5	36.5	18.4	18.0	18.6	22.2	22.2	22.4	26.5
3	21.4	20.5	19.5	20.1	21.6	18.4	18.2	18.4	22.0	21.8	22.6	26.0
4	20.9	20.1	20.9	19.9	20.3	18.6	22.0	18.2	41.8	30.4	25.8	26.0
5	24.4	20.7	37.7	19.7	22.9	21.7	18.6	18.2	52.0	24.4	24.9	25.6
6	21.2	30.1	21.4	19.5	19.5	20.1	18.8	18.0	50.0	23.1	24.2	25.6
7	20.7	23.3	21.4	19.5	25.2	18.4	18.8	18.0	33.9	22.6	24.0	25.3
8	20.5	21.2	20.1	19.3	31.3	18.2	18.0	18.0	35.2	23.8	24.0	25.3
9	20.5	21.8	19.9	19.3	20.7	18.6	20.1	18.0	22.2	33.3	25.9	25.1
10	20.5	20.9	19.5	19.0	19.7	18.0	20.1	17.8	21.2	24.6	47.6	25.3
11	20.7	21.6	19.5	19.3	19.5	18.2	20.1	17.8	20.5	33.5	28.4	25.1
12	20.5	21.2	20.5	19.7	19.3	18.2	22.4	17.8	20.1	27.8	60.8	24.9
13	20.3	20.7	19.5	20.3	19.3	18.2	26.6	17.8	20.1	23.5	57.9	24.6
14	20.1	20.5	19.9	19.3	19.0	19.9	28.1	18.4	19.9	27.0	28.8	24.6
15	19.9	20.9	19.3	19.0	18.8	18.4	21.4	23.5	19.9	26.9	21.4	26.5
16	22.5	20.7	19.0	19.0	18.8	18.0	19.5	20.7	19.7	36.3	21.8	24.6
17	20.1	20.5	19.0	19.0	18.8	18.6	19.0	19.0	19.7	33.5	21.8	24.4
18	19.9	28.4	19.0	19.0	18.6	18.0	19.0	30.1	19.7	31.7	21.2	24.4
19	19.7	22.9	18.8	18.8	18.6	18.0	18.8	30.4	31.6	24.9	21.6	24.2
20	20.1	21.4	18.8	18.8	18.6	18.0	18.8	20.7	37.4	24.0	22.0	24.2
21	19.7	20.7	18.8	18.8	18.6	18.0	18.8	19.0	22.4	23.7	22.6	24.6
22	19.7	20.5	20.1	18.8	18.6	17.8	18.6	18.8	20.9	23.3	23.5	25.3
23	19.7	20.3	18.8	18.8	18.8	18.0	18.6	18.6	23.3	23.3	25.3	26.0
24	19.7	20.1	27.4	18.8	18.6	19.7	18.6	18.4	26.5	23.5	26.2	26.7
25	19.9	20.7	20.1	19.3	18.6	18.6	18.6	18.2	22.4	23.1	30.0	26.9
26	20.1	20.5	20.9	19.0	18.6	18.4	18.6	18.2	28.9	22.9	27.8	25.6
27	20.1	19.9	28.4	21.2	18.6	18.4	18.6	18.0	28.5	20.3	25.6	24.9
28	19.9	19.7	19.7	19.0	18.6	18.2	18.6	18.0	37.6	17.8	25.3	37.0
29	25.0	19.5	33.9	18.6	18.6	19.0	18.6	18.0	24.0	18.4	25.1	28.6
30	20.1	19.5	34.3	18.6	18.4	18.4	18.6	-----	24.0	25.3	24.9	25.3
31	19.9	19.3	-----	18.8	-----	18.4	18.6	-----	24.2	-----	24.9	-----
Total	640.7	659.6	652.7	603.1	612.3	575.2	609.3	563.2	828.0	764.9	850.3	775.5
Mean:	20.7	21.3	21.8	19.5	20.4	18.6	19.7	19.4	26.7	25.5	27.4	25.8
mgd	32.0	33.0	33.7	30.2	31.6	28.8	30.5	30.0	41.3	39.5	42.4	39.9
cfs	1,970	2,020	2,000	1,850	1,880	1,770	1,870	1,730	2,540	2,350	2,610	2,380
Ac-ft												
Calendar year 1959:	Max	63.2	Min	17.8	Mean(mgd)	22.6	Mean(cfs)	35.0	Ac-ft	25,330		
Fiscal year 1959-60:	Max	60.8	Min	17.8	Mean(mgd)	22.2	Mean(cfs)	34.3	Ac-ft	24,970		

* Discharge measurement made on this day.

2860. Waiahole tunnel wasteway at intake 31, near Waiahole

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

Records available--January 1951 to June 1960.

Gage--Water-stage recorder and Parshall flume.

Average discharge--9 years, 0.902 mgd (1.40 cfs).

Extremes--1951-60: Maximum daily discharge, 62.1 mgd (96.1 cfs) Dec. 1, 1957; no flow most of time.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0	0		0	0	0	0	0	0	0	
2		0	0		0	0	0	0	0	0	0	
3		0	0		0	0	0	0	0	0	0	
4		0	0		0	0	0	0	0	0	0	
5		0	.05		0	.02	.03	0	.11	0	0	
6		4.94	0		0	0	0	0	.05	0	0	
7		6.16	0		0	0	0	0	0	0	0	
8		0	0		0	0	0	0	0	0	0	
9		0	0		0	0	0	0	0	0	0	
10		0	0		0	0	0	0	0	0	.08	
11		0	0		0	0	0	0	0	.03	0	
12		0	0		0	0	0	0	0	0	.83	
13		0	0		0	0	0	0	0	0	.12	
14		0	0		0	0	0	0	0	0	4.03	
15		0	0		0	0	0	0	0	0	1.96	
16		0	0		0	0	0	0	0	1.11	0	
17		0	0		0	0	0	0	0	.02	0	
18		.02	0		0	0	0	.37	0	.01	0	
19		0	0		0	0	0	.14	.03	.01	0	
20		0	0		0	0	0	0	.06	0	0	
21		0	0		0	0	0	0	0	0	0	
22		0	0		0	0	0	0	0	0	0	
23		0	0		0	0	0	0	0	0	0	
24		0	0		0	0	0	0	0	0	0	
25		0	0		0	0	0	0	0	0	.02	
26		0	0		0	0	0	0	.01	0	0	
27		0	0		0	0	0	0	0	0	0	
28		0	0		0	0	0	0	.01	0	0	
29		0	0		0	0	0	0	0	0	0	
30		0	0		0	0	0	0	0	0	0	
31		0	0		0	0	0	0	0	.83	0	
Total	0	11.12	0.05	0	0.62	0.02	0.03	0.51	0.33	2.00	7.04	0
Mean:												
mgd	0	0.359	0.002	0	0.021	0.001	0.001	0.018	0.011	0.067	0.227	0
cfs	0	0.555	0.003	0	0.032	0.001	0.001	0.028	0.017	0.104	0.351	0
Ac-ft	0	34	0.2	0	1.9	0.1	0.1	1.6	1.0	6.1	22	0
Calendar year 1959 : Max		6.16		Min	0	Mean(mgd)	0.060	Mean(cfs)	0.093	Ac-ft	68	
Fiscal year 1959-60 : Max		6.16		Min	0	Mean(mgd)	0.059	Mean(cfs)	0.091	Ac-ft	67	

2870. Waiahole tunnel at north portal, near Waiahole

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

Records available.--January 1951 to June 1960 in reports of Geological Survey. May 1916 to December 1950 in files of Waiahole Water Co.

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

Average discharge.--9 years (1951-60), 26.0 mgd (40.2 cfs).

Extremes.--1951-60: Maximum daily discharge, 81.0 mgd (125 cfs) July 28, 1954; minimum daily, 1.48 mgd (2.29 cfs) Dec. 9, 1956.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24.6	23.2	22.0	*28.4	22.3	21.5	22.3	*21.2	23.0	31.9	25.5	30.2
2	24.8	24.0	22.3	23.8	40.5	21.5	22.3	21.1	26.2	25.8	26.2	30.8
3	24.2	23.5	22.5	23.0	25.2	21.5	22.3	20.8	25.5	25.0	26.0	30.2
4	23.0	23.2	23.5	22.8	23.0	21.5	26.4	20.8	46.7	34.5	29.2	30.2
5	26.5	23.8	43.4	22.5	27.5	23.3	22.5	20.8	60.8	28.0	28.2	30.0
6	24.0	29.1	25.2	22.5	22.5	23.3	23.0	20.3	58.6	26.5	27.8	29.8
7	23.8	18.4	24.8	22.5	28.9	21.5	23.0	19.9	37.6	26.0	27.0	29.8
8	23.8	22.3	23.5	22.5	38.4	22.0	22.0	20.6	38.5	27.0	26.8	29.5
9	23.5	22.8	22.8	22.3	24.5	22.5	25.0	20.6	25.2	36.6	29.2	29.5
10	23.5	22.0	22.5	22.3	23.2	21.8	24.2	20.6	24.5	28.2	52.8	29.8
11	23.8	22.5	22.8	22.5	23.2	22.3	24.0	20.3	24.5	38.5	31.0	29.5
12	23.5	22.0	23.5	22.5	23.0	22.3	26.8	20.3	23.8	31.8	66.6	29.2
13	23.5	21.5	22.5	23.5	22.8	21.8	31.2	19.9	23.8	27.2	63.0	29.2
14	23.2	21.3	23.0	22.3	21.1	24.5	33.2	20.8	23.8	31.0	27.9	29.2
15	23.2	21.8	22.5	22.3	21.8	22.8	25.8	26.7	23.8	30.8	20.8	31.0
16	25.5	21.3	22.3	22.0	22.3	22.3	23.2	24.0	23.8	39.4	23.5	29.2
17	22.8	22.3	22.3	21.8	22.0	22.8	22.8	21.8	24.2	38.9	23.5	29.2
18	23.2	32.1	22.0	21.5	22.0	22.3	22.8	34.0	23.8	35.3	22.8	29.2
19	23.2	25.0	22.0	21.5	22.0	22.0	22.5	35.8	37.8	28.8	23.5	29.0
20	23.5	23.8	22.0	21.1	22.0	22.0	22.5	24.2	44.6	27.8	23.8	29.0
21	23.0	23.0	21.8	21.5	22.0	21.8	22.3	22.3	25.5	27.4	24.5	29.2
22	23.0	22.8	23.2	21.3	22.0	21.8	22.0	21.8	24.2	27.0	25.2	30.8
23	22.5	22.8	22.0	21.5	22.0	21.3	22.0	21.5	27.5	26.8	28.5	31.2
24	22.8	22.5	30.0	21.5	21.8	24.0	22.0	21.3	32.5	27.0	29.8	31.8
25	22.8	23.0	23.8	21.8	21.8	22.8	21.5	21.3	26.8	26.8	34.0	32.0
26	23.0	23.0	23.5	22.0	21.8	22.5	21.5	21.1	31.8	26.8	31.2	30.5
27	22.8	22.5	30.7	24.5	21.8	22.3	21.5	21.1	30.8	23.8	29.2	30.2
28	22.8	22.0	22.8	22.0	21.8	22.0	21.5	20.8	40.9	21.1	29.0	42.9
29	28.0	22.0	37.4	21.5	21.8	23.0	21.5	20.8	28.0	21.8	28.8	33.0
30	23.0	21.8	37.9	21.3	21.5	22.3	21.5	-----	30.0	28.0	28.5	30.8
31	22.8	21.8	-----	21.5	-----	22.5	21.3	-----	29.0	-----	28.5	-----
Total	733.6	713.1	750.5	694.0	716.5	691.8	726.4	646.5	967.5	875.5	942.3	915.9
Mean:												
mgd	23.7	23.0	25.0	22.4	23.9	22.3	23.4	22.3	31.2	29.2	30.4	30.5
cfs	36.7	35.6	38.7	34.7	37.0	34.5	36.2	34.5	45.3	45.2	47.0	47.2
Ac-ft	2,250	2,190	2,300	2,130	2,200	2,120	2,230	1,980	2,970	2,690	2,890	2,810
Calendar year 1959:	Max 72.1			Min 18.4		Mean(mgd) 25.7		Mean(cfs) 39.8		Ac-ft 28,790		
Fiscal year 1959-60:	Max 66.6			Min 18.4		Mean(mgd) 25.6		Mean(cfs) 39.6		Ac-ft 28,760		

* Discharge measurement made on this day.

2872. Waiahole tunnel at adit 8, near Waipahu

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

Records available.--August 1956 to June 1960 in reports of Geological Survey. May 1916 to July 1956 in files of Waiahole Water Co.

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

Extremes.--1956-60: Maximum daily discharge, 97.4 mgd (151 cfs) Oct. 23, 1958; minimum daily, 6.0 mgd (9.3 cfs) Dec. 9, 1956.

Remarks.--Records good.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	28.4	27.4	25.9	32.6	25.9	*24.7	*25.0	*24.7	*25.1	*35.2	29.3	*34.7
2	28.6	28.0	26.2	28.6	*43.0	24.7	25.0	24.7	29.9	29.9	30.2	35.7
3	28.6	27.4	26.5	28.0	28.9	24.7	25.0	24.7	28.3	29.3	30.2	35.4
4	27.4	26.5	27.4	27.7	26.8	24.7	28.1	24.7	47.0	36.7	33.1	35.4
5	30.5	26.8	45.9	27.4	29.9	24.9	25.6	24.7	57.7	32.1	32.8	35.0
6	28.6	40.6	29.9	27.1	26.5	27.5	25.9	24.7	60.5	30.5	31.8	35.0
7	28.3	24.4	29.6	26.8	30.9	24.5	26.5	24.2	39.6	30.2	31.2	35.0
8	28.0	26.5	28.0	26.5	40.4	24.7	25.3	24.7	41.7	30.2	30.9	35.0
9	27.7	27.4	27.4	26.5	28.3	25.3	27.1	24.7	29.3	39.3	32.1	34.7
10	27.7	26.2	27.1	26.5	25.6	24.7	27.7	24.7	28.6	32.1	59.6	35.0
11	28.0	26.8	27.1	26.8	26.8	24.7	27.1	24.7	28.3	40.6	36.0	34.7
12	27.7	26.2	27.7	26.8	26.8	25.0	29.6	24.7	28.0	34.7	75.2	34.7
13	27.7	25.9	27.1	27.7	26.5	24.7	32.8	24.5	27.7	31.2	72.7	34.7
14	27.7	25.6	27.1	26.5	25.3	26.8	34.5	24.7	27.4	36.0	40.1	34.7
15	27.4	25.9	26.8	26.5	25.3	25.6	30.6	28.4	27.1	34.7	29.6	36.4
16	29.6	25.6	26.8	26.2	25.9	25.0	27.1	29.3	27.1	44.6	30.5	35.0
17	27.1	26.5	26.5	26.2	25.9	25.3	26.5	25.3	27.4	48.5	30.2	34.7
18	27.4	35.8	26.5	26.2	25.6	25.0	26.5	34.8	26.8	41.3	28.9	34.7
19	27.4	30.2	26.5	26.2	25.6	24.7	26.2	39.5	37.4	35.0	29.6	34.7
20	27.4	27.7	26.5	25.9	25.6	24.7	26.2	28.6	46.0	32.8	29.9	34.7
21	27.1	27.1	26.2	25.9	25.6	24.7	25.9	26.5	29.3	32.5	30.5	35.0
22	27.1	26.8	27.7	25.9	25.6	24.7	25.6	25.9	27.7	31.8	30.9	36.4
23	26.8	26.5	26.5	25.9	25.6	24.5	25.6	25.6	30.5	31.2	33.4	38.0
24	26.8	26.5	32.8	25.9	25.3	26.5	25.6	25.3	34.0	31.8	34.7	37.0
25	26.8	27.1	29.0	25.9	25.3	25.6	25.3	25.3	30.2	30.9	39.6	38.7
26	27.1	26.8	27.7	25.9	25.3	25.3	25.3	25.0	33.7	30.5	36.7	36.4
27	26.8	26.5	34.4	27.7	25.3	25.3	25.3	25.0	33.7	28.3	34.7	37.3
28	26.8	26.2	27.4	25.9	25.3	25.0	25.3	24.7	43.0	25.6	34.1	50.6
29	31.7	26.2	38.9	25.6	25.3	25.9	25.0	24.7	31.2	25.9	34.1	39.0
30	27.4	26.2	41.0	25.3	25.3	25.3	25.0		32.5	51.8	35.7	37.0
31	27.1	25.9		25.3		25.3	24.7		32.1		33.7	
Total	862.7	849.2	873.8	827.9	819.4	780.0	826.9	759.0	1,048.8	1,005.2	1,120.0	1,085.3
Mean:												
mgd	27.8	27.4	29.1	26.7	27.3	25.2	26.7	26.2	33.8	33.5	36.1	36.2
cfs	43.0	42.4	45.0	41.3	42.2	39.0	41.3	40.5	52.3	51.8	55.9	56.0
Ac-ft	2,650	2,610	2,680	2,540	2,510	2,390	2,540	2,330	3,220	3,080	3,440	3,330
Calendar year 1959: Max	74.7			Min 24.4	Mean(mgd)	29.2	Mean(cfs)	45.2	Ac-ft	33,900		
Fiscal year 1959-60: Max	75.2			Min 24.2	Mean(mgd)	29.7	Mean(cfs)	46.0	Ac-ft	33,320		

* Discharge measurement made on this day.

2910. Waiahole Stream at altitude 250 ft, near Waiahole

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

Drainage area.--0.99 sq mi.

Records available.--July 1955 to June 1960.

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

Average discharge.--5 years (1955-60), 5.27 mgd (8.15 cfs).

Extremes.--Maximum discharge during year, 625 mgd (967 cfs) Apr. 16 (gage height, 4.32 ft), from rating curve extended above 75 mgd on basis of field estimate of flow at gage height 4.23 ft; minimum daily, 1.90 mgd (2.94 cfs) for many days.
1955-60: Maximum discharge, that of Apr. 16, 1960; minimum daily, 1.71 mgd (2.65 cfs) Sept. 9, 10, 16, 1957.

Remarks.--Records fair. An average of 1.4 million gallons were pumped daily upstream from station into Waiahole tunnel for irrigation in Central Oahu.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.5	1.72	1.1	12.5
.6	2.73	1.3	19.5
.7	4.00	1.5	28.5
.9	7.50		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.10	1.90	*2.00	2.30	2.30	2.20	2.20	2.40	2.62	3.09	3.35	3.22
2	2.20	2.00	2.10	2.20	2.40	2.20	2.30	2.40	2.73	2.97	3.35	3.09
3	2.40	1.90	2.10	2.00	2.73	2.30	2.30	2.40	2.85	2.97	3.35	3.09
4	2.85	1.90	2.20	2.00	2.30	2.51	2.97	2.40	4.68	3.09	3.35	2.97
5	2.51	1.90	7.46	2.00	2.30	3.74	2.51	2.40	22.7	3.09	3.22	2.97
6	2.10	14.0	3.87	2.00	2.51	3.61	2.40	2.73	20.5	2.97	3.22	2.97
7	2.10	12.2	2.73	2.00	3.12	2.97	*2.20	2.97	9.97	2.97	3.61	2.97
8	2.10	3.74	2.40	2.00	6.33	2.30	2.10	2.30	5.98	2.97	3.74	2.97
9	2.00	3.61	2.20	2.00	3.09	2.40	2.20	2.40	4.96	3.09	*3.17	2.97
10	2.10	3.35	2.10	2.00	2.51	2.30	2.20	2.40	3.61	2.97	5.53	2.97
11	2.10	3.35	2.10	2.00	2.40	2.30	2.10	2.43	3.09	5.87	3.87	2.97
12	2.10	3.35	2.10	2.00	2.20	2.30	2.20	2.10	2.97	4.25	21.4	2.97
13	2.10	3.35	2.00	2.10	2.20	2.62	2.20	2.51	2.97	3.22	15.8	2.97
14	2.10	3.32	2.00	2.10	3.35	2.40	3.22	2.62	2.97	3.22	10.2	2.97
15	2.10	3.35	2.00	2.00	2.51	2.20	3.09	2.40	2.97	3.22	7.15	2.97
16	2.10	3.35	2.00	2.00	2.20	2.20	2.51	3.09	2.97	25.6	5.28	2.97
17	2.51	2.40	2.00	2.00	2.20	2.20	2.30	2.51	3.67	10.0	4.96	2.97
18	2.00	4.62	2.00	2.00	2.20	2.20	2.30	8.20	3.48	5.70	4.80	2.85
19	2.00	2.71	2.00	2.00	2.10	2.20	2.30	10.6	5.95	4.16	4.80	2.85
20	2.10	2.30	2.00	2.30	*2.10	2.10	2.20	3.97	12.9	3.74	4.80	2.85
21	2.00	2.20	2.00	2.00	2.20	2.20	2.20	2.97	4.96	3.61	4.80	2.85
22	*1.90	2.10	2.00	2.00	2.20	2.10	2.20	2.85	4.00	3.48	4.80	2.73
23	2.00	2.10	2.00	2.00	2.40	2.40	2.20	2.73	3.22	3.35	3.74	2.97
24	1.90	2.00	2.20	2.00	2.20	2.51	2.20	2.62	3.48	3.48	3.74	2.85
25	1.90	2.00	2.00	2.00	2.20	2.51	2.20	2.62	3.22	3.35	4.00	2.85
26	1.90	2.20	2.20	2.00	2.20	2.62	2.30	2.51	3.35	3.35	3.61	2.97
27	1.90	2.00	2.20	2.20	2.20	2.51	2.30	2.62	3.35	3.35	3.48	3.09
28	1.90	2.00	2.00	2.20	2.20	2.62	2.40	2.51	3.48	3.48	3.35	4.55
29	2.20	2.10	2.10	2.10	2.20	2.40	2.40	2.51	*4.08	3.35	3.35	3.74
30	2.00	2.10	2.20	2.00	2.20	2.30	2.40	2.40	3.79	3.76	3.35	3.09
31	1.90	2.10	-----	2.30	-----	2.20	2.40	-----	3.09	-----	3.35	-----
Total	65.17	101.50	70.26	63.80	82.25	75.62	73.00	89.17	164.56	133.72	160.52	91.32
Mean:												
mgd	2.10	3.27	2.34	2.06	2.74	2.44	2.35	3.07	5.31	4.46	5.18	3.04
cfs	3.25	5.06	3.62	3.19	4.24	3.78	3.64	4.75	8.22	6.90	8.01	4.70
Ac-ft	200	311	218	196	252	232	224	274	505	410	493	280

Calendar year 1959: Max 17.6 Min 1.90 Mean(mgd) 3.36 Mean(cfs) 5.20 Ac-ft 3,770
Fiscal year 1959-60: Max 25.6 Min 1.90 Mean(mgd) 3.20 Mean(cfs) 4.95 Ac-ft 3,590

Peak discharge (base, 100 mgd).--Aug. 6 (2 p.m.) 191 mgd (296 cfs), 2.98 ft; Nov. 2 (6 a.m.) 140 mgd (217 cfs), 2.67 ft; Feb. 19 (8:30 a.m.) 105 mgd (162 cfs), 2.43 ft; Apr. 16 (9:30 p.m.) 625 mgd (967 cfs), 4.32 ft; May 12 (1:30 a.m.) 150 mgd (232 cfs), 2.74 ft.

* Discharge measurement made on this day.

2949. Waikane Stream at altitude 75 ft, at Waikane

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

Drainage area.--2.25 sq mi.

Records available.--December 1959 to June 1960.

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

Extremes.--Maximum discharge during period, 1,530 mgd (2,370 cfs) May 12 (gage height, 7.45 ft), from rating curve extended above 74 mgd by logarithmic plotting; minimum, 1.15 mgd (1.78 cfs) Dec. 23.

Remarks.--Records good except those above 74 mgd, which are fair.

Rating table, Dec. 23, 1959, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

1.4	1.07	2.2	30.0
1.5	2.13	2.4	45.5
1.6	3.70	2.6	63.0
1.8	9.10	3.0	106
2.0	18.0	3.3	148

Discharge, in million gallons a day, December 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						-	1.54	1.54	3.28	7.86	4.85	3.70
2						-	1.54	1.54	5.77	5.77	3.93	3.36
3						-	1.54	1.54	5.66	5.31	3.53	3.02
4						-	4.15	1.43	36.7	11.7	3.70	3.19
5						-	*2.00	1.33	76.0	7.55	3.19	2.85
6						-	1.75	1.33	90.0	6.31	3.02	2.71
7						-	1.54	1.33	40.2	5.54	2.85	2.71
8						-	1.33	1.33	27.8	6.16	3.02	2.56
9						-	1.75	1.25	*16.5	9.49	*3.92	2.42
10						-	1.87	a1.4	12.2	6.31	22.5	2.56
11						-	1.54	a1.4	9.88	7.56	16.7	2.42
12						-	1.43	a1.4	8.17	6.93	14.6	2.13
13						-	1.75	a1.5	7.24	5.54	65.3	2.13
14						-	*5.68	a1.8	6.31	5.54	28.6	2.13
15						-	4.05	a2.3	5.77	5.08	16.5	2.13
16						-	2.56	a4.7	5.08	22.4	12.2	2.00
17						-	2.13	*a2.2	6.42	17.8	9.88	2.00
18						-	1.87	16.2	6.00	11.0	8.17	1.75
19						-	*1.87	*17.4	21.1	7.55	7.24	1.75
20						-	2.00	6.00	34.6	6.62	6.31	1.87
21						-	1.75	3.70	11.4	6.00	5.54	2.00
22						-	1.75	3.02	8.79	5.31	5.54	2.00
23						1.15	1.75	2.85	14.2	4.85	5.08	1.87
24						1.87	1.75	2.42	17.6	4.85	5.08	2.60
25						1.87	1.64	2.13	11.8	4.39	5.08	2.85
26							1.87	1.54	2.13	13.0	4.16	2.56
27							1.87	1.54	2.13	11.8	3.70	2.13
28							1.54	1.64	2.13	11.0	3.70	3.93
29							2.13	1.64	2.00	*8.79	3.53	3.70
30							1.64	1.64	-----	7.55	19.3	3.53
31							1.87	1.54	-----	6.93	-----	3.36
Total						-	62.07	91.43	547.54	227.81	422.18	77.45
Mean:						-						
mgd						-	2.00	3.15	17.7	7.59	13.6	2.58
cfs						-	3.09	4.87	27.4	11.7	21.0	3.99
Ac-ft						-	190	281	1,680	699	1,300	238

Calendar year	Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft
Fiscal year	Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft

Peak discharge (base, 300 mgd).--Mar. 6 (4 a.m.) 440 mgd (681 cfs), 4.72 ft; Apr. 16 (10:30 p.m.) 315 mgd (487 cfs), 4.22 ft; May 12 (1 a.m.) 1,530 mgd (2,370 cfs), 7.45 ft.

* Discharge measurement made on this day.

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

2965. Kahana Stream at altitude 30 ft, near Kahana

Location--Lat 21°32'38", long 157°53'07", on right bank 600 ft upstream from East Branch Kahana Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Kaaawa Post Office.

Drainage area--3.74 sq mi.

Records available--December 1958 to June 1960.

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

Extremes--1959: Maximum discharge during period December to June, 1,490 mgd (2,310 cfs) Feb. 21 (gage height, 4.21 ft), from rating curve extended above 350 mgd by logarithmic plotting; minimum, 8.15 mgd (12.6 cfs) Mar. 28.
1959-60: Maximum discharge during fiscal year, 2,600 mgd (4,020 cfs) May 12 (gage height, 4.73 ft), from rating curve extended above 350 mgd by logarithmic plotting; minimum, 7.15 mgd (11.1 cfs) Feb. 8.

Remarks--Records fair. Approximately 6 mgd are diverted by Waiahole Water Co. at 800 ft elevation, 2.3 miles above station.

Rating table, Dec. 13, 1958, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

1.6	6.80	2.2	45.4
1.7	10.5	2.5	91.4
1.8	15.1	3.0	265
2.0	27.8	3.5	600

Discharge, in million gallons a day, December 1958 to June 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						-	16.6	11.6	13.1	9.65	9.30	13.0
2						-	16.6	11.6	13.1	9.65	10.9	12.5
3						-	15.6	11.2	12.6	9.65	18.6	12.5
4						-	14.6	11.2	12.6	14.2	10.6	12.2
5						-	13.6	11.2	12.1	10.0	*10.3	12.2
6						-	13.6	10.8	11.6	10.0	10.0	12.2
7						-	13.6	10.5	11.6	9.25	*10.4	12.2
8						-	13.1	10.8	11.2	25.5	*10.5	12.2
9						-	12.6	10.8	11.6	267	11.2	11.8
10						-	12.1	13.1	11.6	32.9	10.5	11.4
11						-	12.1	77.2	11.2	27.9	10.5	11.4
12						-	12.1	38.0	14.1	20.2	10.0	13.3
13						15.1	15.1	29.9	13.1	17.2	10.5	13.7
14						14.6	12.6	17.2	56.9	15.6	10.0	12.2
15						14.6	*11.6	15.6	16.6	14.6	10.8	11.4
16						14.8	11.6	14.1	13.6	*13.0	14.1	11.4
17						13.6	21.3	13.6	12.6	13.3	12.6	11.0
18						19.0	54.5	14.6	12.1	12.2	*13.2	11.0
19						15.1	19.6	12.1	11.6	11.0	22.7	10.6
20						13.6	16.6	13.1	11.2	10.3	19.7	10.6
21						12.6	15.6	106	10.8	10.3	19.7	11.4
22						14.1	15.1	27.6	9.65	9.85	17.6	10.6
23						12.6	14.1	19.0	10.8	9.30	15.6	10.6
24						14.1	13.6	16.6	9.25	9.65	15.1	10.3
25						13.1	14.1	*15.1	9.25	9.30	14.6	10.3
26						13.1	13.6	14.6	9.25	9.65	14.1	11.4
27						31.4	14.1	14.1	8.50	9.95	13.7	10.3
28					*13.4	17.2	13.6	13.6	8.15	12.2	13.7	9.95
29						26.6	13.6	8.50	8.50	9.00	13.5	9.95
30						20.8	13.6	-----	10.2	9.30	15.1	12.2
31						21.5	13.1	-----	8.85	-----	13.3	-----
Total						-	483.2	585.8	397.30	651.40	531.00	345.80
Mean:						-	-	-	-	-	-	-
mgd						-	15.6	20.9	12.8	21.7	17.1	11.5
cfs						-	24.1	32.3	19.8	33.6	26.5	17.8
Ac-ft						-	1,480	1,800	1,220	2,000	1,630	1,060

Calendar year : Max Min Mean(mgd) Mean(cfs) Ac-ft
Fiscal year : Max Min Mean(mgd) Mean(cfs) Ac-ft
Peak discharge (base, 800 mgd).--Feb. 11 (7 p.m.) 984 mgd (1,520 cfs), 3.86 ft; Feb. 21 (6:30 p.m.) 1,490 mgd (2,310 cfs), 4.21 ft; Apr. 9 (3 a.m.) 1,240 mgd (1,920 cfs), 4.05 ft.

* Discharge measurement made on this day.

† Result of discharge measurement.

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

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	13.7	11.0	9.65	29.2	13.1	8.50	10.8	9.25	12.1	33.6	15.1	17.7
2	13.7	13.7	9.95	20.2	*94.6	8.85	10.8	8.50	17.8	22.9	14.1	16.6
3	12.5	12.2	10.3	18.4	20.4	9.25	10.8	8.50	19.6	20.8	15.1	16.1
4	11.4	11.0	14.1	16.2	14.1	9.65	21.6	8.50	35.4	27.8	17.8	16.6
5	16.7	12.5	70.7	15.1	22.0	18.2	14.1	8.15	72.1	22.9	15.1	14.6
6	13.0	82.5	19.9	14.1	13.6	19.5	*13.6	7.80	*194	19.6	13.6	14.1
7	11.8	25.3	20.8	13.1	25.7	10.5	14.1	7.45	53.1	18.4	13.1	13.6
8	11.0	17.1	*14.5	13.1	36.9	9.25	11.6	7.45	59.5	18.4	12.6	13.1
9	10.6	18.0	12.1	12.1	19.0	11.2	18.2	7.45	30.3	27.8	13.6	12.7
10	10.3	14.6	11.6	11.6	16.6	9.25	20.6	7.80	25.0	19.6	*52.7	14.1
11	10.6	14.6	11.2	12.1	16.2	9.25	17.8	7.80	21.5	62.0	21.5	13.6
12	10.6	14.1	12.6	*12.7	14.6	10.8	27.1	7.45	19.0	36.0	390	12.7
13	9.95	13.0	11.2	15.8	13.6	10.0	50.4	7.45	17.2	25.0	188	11.3
14	9.30	12.5	11.6	11.6	12.6	12.1	114	10.0	16.6	30.3	55.8	12.7
15	8.70	12.5	10.5	11.2	11.6	11.2	48.6	15.3	15.6	31.1	37.5	16.6
16	14.2	11.8	10.5	10.5	11.6	9.65	23.6	*15.0	14.1	74.2	32.6	12.3
17	10.3	11.8	10.0	10.5	10.8	11.6	19.6	9.25	16.6	40.0	31.8	11.5
18	9.65	31.4	9.65	10.0	10.5	9.65	18.4	86.6	14.1	41.2	25.1	11.2
19	9.65	21.5	9.25	9.65	*10.5	9.25	16.2	41.2	30.6	26.4	25.1	10.8
20	10.3	16.1	9.25	9.65	9.65	8.85	15.6	18.4	41.2	23.6	23.0	11.2
21	*9.00	14.1	9.25	10.0	9.65	8.50	14.1	14.1	22.2	22.9	21.1	12.0
22	8.45	13.7	14.0	9.25	9.65	8.50	13.1	12.6	19.0	20.8	22.3	14.6
23	8.45	13.0	10.5	9.65	10.0	8.50	12.6	12.6	30.3	19.0	20.5	14.6
24	8.45	12.2	34.6	9.25	9.65	13.4	11.6	11.2	37.5	19.0	22.3	16.7
25	8.45	12.5	18.9	9.65	9.25	11.6	11.6	10.8	25.0	17.2	36.7	18.5
26	9.95	13.7	18.4	10.8	9.25	10.0	11.2	10.5	30.8	15.6	27.9	15.6
27	9.65	11.4	31.0	17.2	8.50	10.0	10.5	10.0	28.6	15.1	21.1	12.7
28	8.70	11.0	16.2	11.2	8.85	9.25	11.2	10.0	*243	14.6	19.3	38.0
29	24.4	10.6	64.4	9.65	8.50	29.5	10.5	9.65	38.8	14.1	19.3	*20.4
30	11.8	10.3	62.8	8.85	8.50	13.6	10.0	-----	34.4	26.2	18.1	15.1
31	10.6	9.95	-----	10.8	-----	12.6	9.65	-----	*41.3	-----	17.7	-----
Total	347.85	509.65	579.40	393.10	489.45	351.95	623.55	400.75	1,276.3	806.1	1,259.5	451.3
Mean:	11.2	16.4	19.3	12.7	16.3	11.4	20.1	13.8	41.2	26.9	40.6	15.0
cfs	17.3	25.4	29.9	19.6	25.2	17.6	31.1	21.4	63.7	41.6	62.8	23.2
Ac-ft	1,070	1,560	1,780	1,210	1,500	1,080	1,910	1,230	3,920	2,470	3,870	1,360

Calendar year 1959: Max 267 Min 8.15 Mean(mgd) 15.5 Mean(cfs) 24.0 Ac-ft 17,390
 Fiscal year 1959-60: Max 390 Min 7.45 Mean(mgd) 20.5 Mean(cfs) 31.7 Ac-ft 22,980

Peak discharge (base, 800 mgd).--Aug. 6 (2:30 p.m.) 1,250 mgd (1,930 cfs), 4.06 ft; Nov. 2 (7 a.m.) 948 mgd (1,470 cfs), 3.83 ft; Jan. 14 (8 p.m.) 1,390 mgd (2,150 cfs), 4.15 ft; Feb. 18 (8 p.m.) 1,390 mgd (2,150 cfs), 4.15 ft; Mar. 6 (5 a.m.) 2,010 mgd (3,110 cfs), 4.48 ft; Mar. 28 (12 m.) 2,500 mgd (3,870 cfs), 4.69 ft; May 12 (2 a.m.) 2,800 mgd (4,020 cfs), 4.73 ft.

* Discharge measurement made on this day.

3020. Punaluu ditch near Punaluu

Location.--Lat 21°33'40", long 157°54'10", on right bank of ditch 800 ft downstream from intake, 1.7 miles southwest of highway bridge at Punaluu, and 3.3 miles southeast of Hauula Post Office.

Records available.--May 1953 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map).

Average discharge.--7 years, 7.08 mgd (11.0 cfs).

Extremes.--1953-60: Maximum daily discharge, 21.6 mgd (33.4 cfs) Jan. 14, 1960; minimum daily, 0.02 mgd (0.03 cfs) Jan. 9, 14, 1955, Nov. 8, 9, 1957.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Punaluu Stream for irrigation of sugarcane in the Punaluu district.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1954-55, superseding those published in WSP 1349 and 1399, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1953		1953-Con.		1953-Con.		1953-Con.	
July 26	8.8	Aug. 29	8.5	Sept. 18	8.9	Oct. 12	7.2
27	8.8	30	8.4	19	8.9	15	3.6
28	9.0	31	8.4	20	8.7	16	3.6
Aug. 12	9.1	Sept. 1	8.5	21	8.7	17	3.6
13	9.7	2	8.5	22	8.7	18	3.5
14	9.5	3	8.5	23	9.0		
15	9.3	4	8.5	24	9.1	1954	
16	9.4	5	8.5	25	9.2	Apr. 8	8.5
17	9.4	6	8.6	26	9.2	9	8.5
18	9.4	7	8.5	27	9.2	10	8.4
19	9.4	8	8.5	28	9.1	June 25	1.73
20	9.2	9	8.4	29	9.4	July 7	6.6
21	9.4	10	10.7	Oct. 4	7.8	8	9.9
22	9.4	11	9.0	5	7.6	9	9.8
23	9.2	12	8.9	6	7.5	10	10.4
24	8.9	13	8.9	7	7.6	11	11.4
25	8.5	14	9.0	8	7.6	12	11.2
26	8.5	15	9.0	9	7.7	13	11.1
27	8.5	16	9.0	10	7.6	14	11.0
28	8.5	17	9.0	11	7.5		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
July 1953.....	280.2	9.7	8.8	9.04	14.0	860
August.....	289.6	14.1	8.4	9.34	14.5	889
September.....	270.4	12.3	8.4	9.01	13.9	830
October.....	161.5	8.7	3.5	5.21	8.06	496
April 1954.....	278.3	16.0	8.4	9.28	14.4	854
June.....	242.24	12.8	1.67	8.07	12.5	743
Fiscal year 1953-54.....	-	16.0	1.67	6.44	9.96	7,220
July 1954.....	244.76	12.0	.11	7.90	12.2	751
Calendar year 1954.....	-	16.0	.04	5.68	8.79	6,370
Fiscal year 1954-55.....	-	16.2	.02	5.60	8.66	6,270

3020. Punaluu ditch near Punaluu--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.60	9.60	9.60	11.9	8.20	8.90	8.76	9.0	5.48	10.3	2.04	12.7
2	10.3	10.3	9.60	11.2	8.90	8.90	8.76	9.0	3.27	9.60	2.04	12.7
3	9.60	9.60	9.60	11.2	8.34	8.90	8.62	9.0	3.27	11.2	1.97	12.7
4	9.60	9.90	10.3	10.3	8.06	8.90	11.9	8.7	3.42	14.5	4.81	12.7
5	10.3	9.60	14.6	10.3	8.06	9.60	9.60	8.7	3.50	14.5	6.04	12.7
6	9.60	15.4	12.7	10.3	7.92	11.2	*9.95	8.7	.99	13.6	6.04	12.7
7	9.60	11.9	12.7	10.3	6.60	9.60	9.60	8.7	.18	13.6	6.04	12.7
8	9.60	10.3	*11.5	10.3	5.01	8.90	9.60	8.7	.14	13.6	6.04	11.9
9	9.60	9.60	11.2	10.3	4.74	9.60	10.3	8.7	.12	14.5	10.3	11.2
10	9.60	9.60	11.2	9.60	4.74	8.90	11.2	8.7	.11	13.6	15.9	11.2
11	9.60	9.60	11.2	9.60	5.70	8.90	11.9	6.0	.11	18.3	14.5	11.2
12	9.60	8.90	11.2	10.3	6.62	8.90	13.6	3.0	.11	17.3	18.3	11.2
13	9.60	8.90	10.3	10.3	5.48	8.90	15.4	3.0	.38	15.4	7.02	11.9
14	9.60	8.90	10.3	9.60	4.54	8.90	21.6	3.5	.53	15.4	.09	12.7
15	9.60	8.90	10.3	9.60	6.67	8.90	18.3	4.0	.53	16.4	.08	12.7
16	9.60	8.76	10.3	9.60	9.60	8.76	15.4	*3.5	.53	16.4	.07	12.7
17	9.60	8.90	10.3	9.60	9.60	9.60	13.6	3.0	.49	17.3	.07	11.9
18	8.90	13.9	10.3	9.60	9.60	8.90	11.9	14.5	.46	16.4	.20	11.9
19	8.90	13.6	10.3	9.60	9.60	8.76	11.9	12	.40	8.73	.37	11.9
20	8.90	11.2	9.60	9.60	9.60	8.62	11.9	7.0	4.34	.18	.37	11.9
21	*8.90	10.3	9.60	9.60	9.60	8.76	11.2	11	11.9	.16	3.04	11.9
22	8.90	10.3	10.3	9.60	9.60	8.62	11.2	10	11.2	.14	7.04	11.9
23	8.90	9.60	9.60	9.60	9.60	8.48	11.2	6.0	11.9	.18	14.5	12.7
24	8.90	9.60	11.3	8.90	9.60	8.90	10.3	*5.0	11.9	.18	14.5	*12.7
25	8.90	9.60	11.2	9.60	8.90	8.90	10.2	10.3	11.9	.16	15.4	13.6
26	9.60	9.60	10.3	9.60	8.90	8.76	10.0	9.60	11.9	.16	15.4	12.7
27	8.90	9.60	11.2	11.2	8.90	8.76	9.6	9.60	11.2	.16	14.5	12.7
28	8.90	9.60	10.3	9.60	8.90	8.62	9.5	9.60	12.6	1.31	13.6	14.5
29	10.3	9.60	11.9	9.60	8.90	10.3	9.3	9.60	11.9	1.97	13.6	12.7
30	9.60	9.60	12.7	8.34	8.90	9.60	9.2	-----	11.9	1.97	12.7	12.7
31	9.60	9.60	-----	8.20	-----	9.60	9.0	-----	11.2	-----	12.7	-----
Total	292.70	313.36	325.50	306.94	239.38	281.84	354.49	228.10	157.86	277.20	239.27	371.3
Mean:	9.44	10.1	10.8	9.90	7.98	9.09	11.4	7.87	5.09	9.24	7.72	12.4
mgd	14.6	15.6	16.7	15.3	12.3	14.1	17.6	12.2	7.88	14.3	11.9	19.2
cfs	898	962	999	942	735	865	1,090	700	484	851	734	1,140
Ac-ft												
Calendar year 1959: Max	16.0			Min 0.14	Mean(mgd)	8.12	Mean(cfs)	12.6	Ac-ft	9,100		
Fiscal year 1959-60: Max	21.6			Min 0.07	Mean(mgd)	9.26	Mean(cfs)	14.3	Ac-ft	10,400		

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 25 to Feb. 24; discharge estimated on basis of records for stations on nearby streams.

3030. Punaluu Stream near Punaluu

Location.--Lat 21°33'35", long 157°54'05", on left bank at diversion dam, 1.8 miles southwest of Punaluu and 3.5 miles southeast of Hauula.

Drainage area.--2.78 sq mi.

Records available.--May 1953 to June 1960.

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

Average discharge.--7 years, 8.85 mgd (13.7 cfs).

Extremes.--Maximum discharge during fiscal year, 580 mgd (897 cfs) May 13 (gage height, 3.10 ft), from rating curve extended above 110 mgd; no flow on many days.
1953-60: Maximum discharge, 1,760 mgd (2,720 cfs) Aug. 20, 1955 (gage height, 5.03 ft), from rating curve extended above 110 mgd; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Records do not include flow of Punaluu ditch.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0	0	0.8	10.2
.1	.13	1.0	21.0
.2	.55	1.2	39.0
.3	1.27	1.5	82.0
.4	2.35	2.0	195
.6	5.40		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	0.03	0.44	0.94	4.00	0	0	0.01	4.12	10.9	10.2	1.02
2	.67	.19	.35	.61	16.0	0	0	.01	7.00	8.15	10.2	.94
3	.50	.08	.26	.44	4.50	0	0	0	9.05	5.29	11.8	.87
4	.39	.06	.39	.35	3.00	.01	1.86	0	19.1	4.64	9.04	1.02
5	.88	.13	21.3	.30	6.00	1.61	.06	0	37.7	2.70	6.60	.80
6	.50	23.1	4.12	.26	3.00	.84	.04	0	90.5	2.10	6.40	.67
7	.39	3.52	3.26	.22	6.50	.06	.02	0	*57.5	1.77	6.20	.67
8	.30	1.47	*1.42	.26	11.0	.02	0	0	26.1	2.23	6.20	1.11
9	.22	1.47	1.11	.16	7.30	.08	.38	0	19.7	4.23	3.93	1.77
10	.16	1.20	.87	.13	5.60	.01	.70	0	16.5	2.30	*16.7	1.88
11	.22	1.02	.80	.13	4.30	.06	1.08	4.14	14.8	20.4	4.18	1.77
12	.19	.94	.80	*.26	3.60	.13	3.33	6.40	13.0	7.66	59.9	1.77
13	.16	.87	.61	.39	4.50	.08	10.9	6.40	11.9	3.56	109	1.34
14	.13	.73	.55	.13	5.50	.19	31.5	6.80	11.3	4.14	42.2	.55
15	.10	.80	.44	.08	3.00	.13	7.90	7.20	10.9	4.83	27.8	.67
16	.30	.80	.39	.08	.20	.08	2.70	*7.68	10.5	8.91	22.7	.55
17	.13	.87	.35	.06	.20	.44	1.66	7.00	11.3	9.11	19.1	.44
18	.10	23.7	.30	.19	.10	.08	1.11	23.3	10.5	6.50	17.2	.44
19	.08	5.24	.22	.20	.10	.04	.73	23.3	29.0	8.75	15.9	.44
20	.10	2.00	.10	.20	.08	.03	.55	7.85	34.4	17.2	15.4	.55
21	.06	1.47	.10	.20	.08	.02	.39	.97	7.68	17.2	13.6	.67
22	.04	1.27	.22	.20	.06	0	.30	.39	5.24	15.9	7.88	.73
23	.04	1.02	.10	.20	.10	0	.26	3.73	17.0	15.4	1.47	1.27
24	.04	.94	1.95	.20	.03	.08	.22	4.64	20.1	14.8	1.65	*.95
25	.04	.94	.54	.20	.02	.01	.13	0	9.20	13.6	2.19	4.29
26	.08	1.02	.44	.20	.01	0	.10	0	7.90	13.0	2.35	1.24
27	.03	.73	.87	.90	0	0	.08	0	7.97	13.0	1.27	.73
28	.02	.50	.30	.20	0	0	.19	0	*28.1	11.3	1.20	4.14
29	.68	.50	2.30	.20	0	.52	.06	0	10.9	10.9	1.11	1.11
30	.08	.50	2.35	.66	0	.02	.04	-----	39.4	10.9	1.11	.87
31	.04	.44	-----	2.00	-----	.01	.03	-----	29.8	-----	1.02	-----
Total	7.22	77.55	47.25	10.55	88.78	4.55	66.32	109.82	628.16	271.37	455.50	35.27
Mean:												
mgd	0.233	2.50	1.58	0.340	2.96	0.147	2.14	3.79	20.3	9.05	14.7	1.18
cfs	0.361	3.87	2.44	0.526	4.58	0.227	3.31	5.86	31.4	14.0	22.7	1.83
Ac-ft	22	238	145	32	272	14	204	337	1,930	833	1,400	108

Calendar year 1959: Max 80.0 Min 0 Mean(mgd) 4.32 Mean(cfs) 6.68 Ac-ft 4,840
Fiscal year 1959-60: Max 109 Min 0 Mean(mgd) 4.92 Mean(cfs) 7.61 Ac-ft 5,540
Peak discharge (base, 500 mgd).--Mar. 6 (4:30 a.m.) 512 mgd (792 cfs), 2.93 ft; May 13 (1 p.m.) 580 mgd (897 cfs), 3.10 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 19 to Nov. 19; discharge estimated on basis of records for Punaluu ditch at Kahana Stream.

3300. Kamananui Stream at Maunawai

Location.--Lat 21°38'20", long 158°03'27", on right bank 25 ft above confluence with Elenaha Stream at Maunawai.

Drainage area.--9.79 sq mi.

Records available.--February 1958 to June 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Extremes.--1958: Maximum discharge during period February to June, 570 mgd (882 cfs) Mar. 5 (gage height, 7.35 ft, from floodmark in well), from rating curve extended above 180 mgd by logarithmic plotting; minimum, 0.20 mgd (0.31 cfs) Apr. 26, 27.
1958-59: Maximum discharge during fiscal year, 612 mgd (947 cfs) Oct. 23 (gage height, 7.60 ft), from rating curve extended above 180 mgd by logarithmic plotting; no flow at times.
1959-60: Maximum discharge during fiscal year, 524 mgd (811 cfs) Mar. 30 (gage height, 7.08 ft), from rating curve extended above 180 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Rating table, Feb. 15, 1958, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

1.04	0	2.5	28.3
1.1	.02	3.0	62.5
1.3	.33	3.5	100
1.5	1.37	4.0	140
1.7	3.56	5.5	300
2.0	9.40		

Discharge, in million gallons a day, February to June 1958

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1								-	a12	*1.16	1.97	0.74
2								-	a3.9	.90	1.61	.96
3								-	a2.3	.79	4.84	1.30
4								-	a1.7	.85	2.66	.90
5								-	a240	1.09	1.97	2.26
6								-	*a190	1.16	1.54	2.07
7								-	*a40.4	.90	1.78	1.09
8								-	18.4	.69	2.07	.85
9								-	11.8	.59	2.40	3.79
10								-	8.20	.47	2.17	4.64
11								-	6.24	.39	9.23	4.79
12								-	5.10	.39	3.30	5.86
13								-	4.33	.33	2.07	3.13
14								-	3.56	.27	1.54	1.61
15								0.51	3.17	.27	1.23	1.16
16								.51	2.66	.30	52.9	.85
17								.59	2.40	.30	20.1	.64
18								.74	2.40	.24	6.69	.59
19								.64	2.27	.27	*3.87	.51
20								.61	1.88	4.26	4.95	.43
21								.51	1.78	8.94	3.17	.39
22								.51	1.61	2.27	2.17	.43
23								.43	1.70	1.03	1.78	.64
24								.43	1.54	.64	1.54	1.03
25								.43	1.45	.39	1.37	.90
26								.39	1.16	.27	1.45	.90
27								.27	1.37	48.4	1.61	2.36
28								98.6	4.08	36.7	1.16	7.95
29								-	2.07	7.11	.96	4.69
30								-----	3.54	3.17	.85	1.97
31								-----	1.78	-----	.79	-----
Total								-	584.79	124.54	145.74	59.43
Mean:								-	18.9	4.15	4.70	1.98
mgd								-	29.2	6.42	7.27	3.06
cfs								-	1,790	382	447	182
Ac-ft												

Calendar year . Max Min Mean(mgd) Mean(cfs) Ac-ft
Fiscal year . Max Min Mean(mgd) Mean(cfs) Ac-ft

Peak discharge (base, 300 mgd).--Feb. 28 (7 a.m.) 310 mgd (480 cfs), 5.58 ft; Mar. 5 (time unknown) 570 mgd (882 cfs), 7.35 ft.

* Discharge measurement made on this day.

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

3300. Kamananui Stream at Maunawai--Continued

Discharge, in million gallons a day, fiscal year July 1958 to June 1959.

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.23	9.78	5.10	2.27	8.44	1.97	2.92	2.72	2.40	2.56	0.85	0.39
2	2.49	160	4.95	3.56	7.24	1.97	2.92	1.78	2.07	9.04	.74	.24
3	117	86.1	5.48	3.30	6.62	1.70	1.97	1.37	1.88	4.70	1.58	.20
4	142	*28.8	4.79	3.30	6.43	1.70	1.54	1.23	1.70	3.18	5.29	.18
5	22.9	79.2	15.4	2.53	5.48	33.2	1.37	1.16	1.61	4.12	1.54	.16
6	10.2	54.2	31.2	2.07	*4.79	60.1	1.23	1.09	1.45	2.07	1.16	.14
7	7.72	25.9	27.8	2.37	4.64	6.89	1.16	1.03	1.37	4.87	.96	.14
8	7.72	186	9.48	3.04	4.33	3.71	1.09	1.03	1.23	2.66	.85	.14
9	*8.81	120	6.05	2.07	4.18	2.92	1.16	1.16	1.16	164	.79	.24
10	5.48	43.6	5.10	5.68	7.00	2.53	1.03	1.98	1.09	*35.9	.74	*.24
11	3.87	24.5	4.64	3.30	8.90	3.17	.90	8.54	1.03	10.8	.74	.24
12	3.43	20.5	4.18	2.66	7.48	8.60	.90	11.2	1.93	6.62	.69	.18
13	15.9	22.2	4.02	2.33	5.48	4.37	13.4	*34.2	4.48	4.48	.51	.46
14	8.69	20.9	3.87	3.17	7.62	2.66	9.57	8.48	25.1	3.30	.39	.69
15	15.9	24.8	8.36	4.71	6.14	2.17	3.13	4.76	8.37	2.92	.47	.74
16	11.3	28.7	5.67	7.16	3.56	*1.97	1.97	4.75	3.04	2.53	.69	.39
17	11.0	14.7	4.02	3.30	3.17	1.97	42.5	2.66	1.97	2.17	1.88	.18
18	111	11.6	4.81	1.97	2.79	14.8	110	7.20	1.61	1.97	66.1	.08
19	27.4	9.67	7.39	1.70	17.3	12.8	*15.5	8.10	1.54	1.87	7.80	.10
20	30.6	8.68	24.1	1.54	6.90	3.87	7.00	4.36	1.61	1.70	2.92	.02
21	18.4	12.7	15.8	1.54	7.70	2.66	4.64	72.0	1.45	1.54	1.88	0
22	12.1	8.68	7.12	6.90	4.97	2.40	3.56	27.2	1.61	1.61	1.91	0
23	10.2	7.00	4.64	288	4.64	2.79	3.30	11.6	1.37	1.37	2.07	0
24	14.0	6.24	3.71	196	4.02	3.04	2.66	6.43	1.23	*1.23	1.16	0
25	15.7	29.1	3.30	69.6	3.04	2.92	2.27	4.18	1.16	1.16	.85	0
26	31.2	36.1	*3.71	25.9	2.53	2.17	2.07	3.17	.96	1.09	.64	0
27	12.1	12.7	4.33	18.0	2.27	2.07	1.97	3.56	.79	1.03	.64	.69
28	7.72	8.68	3.17	52.1	2.07	2.92	1.88	2.92	.69	1.16	.59	.43
29	6.62	6.62	2.66	24.1	2.07	*5.19	1.70	-	.64	1.30	.39	.16
30	7.48	6.05	2.27	12.7	1.97	8.12	1.61	-----	.59	1.03	.33	.08
31	6.43	5.67	-----	9.94	-----	3.56	1.61	-----	.64	-----	.43	-----
Total	706.59	1,119.37	237.12	766.81	163.77	211.01	247.68	239.86	77.77	283.99	105.96	6.42
Mean:	22.8	36.1	7.90	24.7	5.46	6.81	7.99	8.57	2.51	9.47	3.42	0.214
mgd	35.3	55.9	12.2	38.2	8.45	10.5	12.4	15.3	3.98	14.7	5.29	0.331
cfs	2,170	3,440	728	2,950	503	648	760	736	239	872	325	20
Ac-ft	2,170	3,440	728	2,950	503	648	760	736	239	872	325	20

Calendar year 1958: Max 288 Min 0 Mean(mgd) 11.4 Mean(cfs) 17.6 Ac-ft 12,790
 Fiscal year 1958-59: Max 288 Min 0 Mean(mgd) 11.4 Mean(cfs) 17.6 Ac-ft 12,790

Peak discharge (base, 300 mgd).--July 4 (7:30 a.m.) 340 mgd (526 cfs), 5.83 ft; Aug. 2 (8:30 a.m.) 372 mgd (578 cfs), 6.08 ft; Aug. 8 (8:30 p.m.) 428 mgd (659 cfs), 6.44 ft; Oct. 23 (9:30 p.m.) 612 mgd (947 cfs), 7.60 ft; Apr. 9 (3:30 p.m.) 320 mgd (495 cfs), 5.67 ft.

* Discharge measurement made on this day.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.47	0.58	0.27	4.52	8.94	0.02	0.12	0.27	0.39	15.3	4.18	3.04
2	4.12	.18	.16	2.66	46.8	.02	.08	.24	23.0	10.9	4.18	2.92
3	3.56	1.32	.09	1.37	7.11	.01	.04	.20	15.5	8.44	4.18	2.66
4	2.07	1.52	.08	.90	3.04	.01	.23	.20	44.9	49.2	4.02	2.40
5	9.37	.79	48.2	.64	1.97	.01	3.80	.16	32.9	17.4	3.56	2.27
6	6.11	43.7	21.2	.47	1.78	.60	1.45	.10	*96.2	*12.4	3.30	2.07
7	1.81	17.9	46.8	.36	1.23	1.61	2.41	.07	38.0	8.88	2.92	1.97
8	.90	5.94	5.48	.27	3.40	*.86	2.27	.05	15.8	7.00	2.79	1.78
9	.51	2.07	2.92	.27	3.95	.39	1.09	.03	7.72	46.6	2.66	1.70
10	.22	3.82	1.97	.33	1.45	.22	8.61	.03	5.67	24.2	36.6	1.88
11	.10	2.63	1.61	.27	.90	.61	4.07	.02	4.48	47.6	5.47	1.97
12	.05	1.37	2.79	.36	.64	.36	4.65	.29	4.48	20.4	23.0	1.70
13	.02	.96	3.87	1.22	.51	.30	21.0	.64	3.56	11.8	115	1.78
14	.01	.64	2.40	3.34	.36	7.25	21.0	.36	2.92	46.4	41.5	1.54
15	0	.51	3.17	1.30	.27	5.77	17.3	.39	2.53	21.7	18.7	6.39
16	0	.66	1.61	.69	.20	2.27	4.35	13.3	2.17	40.5	10.5	4.79
17	.58	1.03	1.03	.39	.14	1.45	2.53	4.78	7.23	68.0	8.44	2.53
18	.51	24.5	.79	.22	.10	3.22	1.88	16.9	9.34	51.5	6.24	1.78
19	.18	16.2	.69	.14	.08	1.30	1.61	27.4	74.0	20.9	6.14	1.45
20	.05	3.61	.55	.08	.06	.59	1.30	10.7	76.6	14.3	9.67	1.37
21	.02	1.61	.47	.05	.04	.36	1.23	3.25	14.9	14.3	7.72	1.54
22	.01	1.03	.58	.02	.03	.24	*.96	1.88	7.72	11.8	6.95	6.47
23	0	.74	.39	.01	.03	.16	.69	1.88	37.8	9.94	12.6	10.8
24	0	.51	.69	.01	.02	.16	.55	1.61	32.3	10.2	6.43	5.29
25	0	.51	7.85	.01	.36	.28	.47	*1.04	15.9	7.72	7.00	3.91
26	0	*.81	2.96	.08	.30	1.09	.39	.79	8.68	6.43	6.62	3.87
27	0	.90	5.05	1.77	.14	.69	.33	.64	19.4	5.67	5.48	3.17
28	0	.79	3.48	4.40	.07	.47	.43	.51	21.5	5.10	4.18	32.0
29	0	.55	1.45	1.40	.04	.36	.64	.43	9.40	4.79	3.56	8.22
30	1.26	.47	5.80	.64	.02	.64	.43	-----	137.8	4.48	3.30	3.87
31	.96	.33	-----	1.72	-----	.24	.39	-----	36.1	-----	3.17	-----
Total	33.89	136.16	172.18	29.91	83.98	31.15	106.69	88.16	808.09	623.55	380.06	126.93
Mean:	1.09	4.39	5.74	0.965	2.80	1.00	3.44	3.04	26.1	20.8	12.3	4.23
mgd	1.69	6.79	8.88	1.49	4.33	1.55	5.32	4.70	40.4	32.2	19.0	6.54
Ac-ft	104	418	528	92	258	96	327	271	2,480	1,910	1,170	390

Calendar year 1959: Max 164 Min 0 Mean(mgd) 3.97 Mean(cfs) 6.14 Ac-ft 4,450
 Fiscal year 1959-60: Max 137 Min 0 Mean(mgd) 7.16 Mean(cfs) 11.1 Ac-ft 8,040

Peak discharge (base, 300 mgd).--Sept. 6 (11:30 p.m.) 349 mgd (540 cfs), 5.91 ft; Mar. 6 (6:30 a.m.) 322 mgd (498 cfs), 5.68 ft; Mar. 30 (1 p.m.) 524 mgd (811 cfs), 7.08 ft; May 13 (3:30 p.m.) 366 mgd (566 cfs), 6.04 ft.

* Discharge measurement made on this day.

3450. Opaepa Stream near Wahiawa

Location.--Lat 21°33'55", long 158°00'10", on left bank 8.1 miles east of Waialua School and 4.3 miles northeast of Leileihua High School in Wahiawa.

Drainage area.--2.98 sq mi.

Records available.--August 1959 to June 1960.

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

Extremes.--Maximum discharge during period August 1959 to June 1960, 1,820 mgd (2,820 cfs) Mar. 30 (gage height, 6.82 ft), from rating curve extended above 45 mgd by logarithmic plotting; minimum, 0.24 mgd (0.37 cfs) Oct. 22, 23.

Remarks.--Records good.

Rating table, Aug. 13, 1959, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

1.2	0.14	2.6	21.0
1.3	.26	3.0	46.0
1.4	.45	3.5	100
1.6	1.09	4.0	190
1.9	3.20	4.5	320
2.2	8.10		

Discharge, in million gallons a day, August 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		-	0.90	4.67	9.90	0.45	0.94	0.98	0.62	6.96	2.94	2.52
2		-	.60	2.44	50.4	.50	.85	.72	16.2	4.84	2.20	1.82
3		-	.52	1.24	5.69	.50	.55	.57	12.3	3.72	9.00	1.68
4		-	.52	.90	2.35	1.48	16.0	.52	49.4	27.7	5.36	1.45
5		-	72.7	.72	3.20	2.73	4.84	.50	26.5	9.79	6.20	1.29
6		-	9.32	.60	3.20	11.3	1.98	.47	63.6	*8.76	2.69	1.14
7		-	13.3	.52	5.00	3.85	5.57	.43	90.6	8.46	1.98	1.05
8		-	3.46	.47	23.4	*1.56	3.03	.41	9.86	4.24	1.82	.98
9		-	1.75	.45	4.50	3.06	10.4	.39	5.35	55.8	1.98	.94
10		-	1.19	.50	1.75	4.76	22.0	.59	14.5	24.2	73.2	.90
11		-	1.05	.55	1.19	1.68	7.73	2.36	11.2	59.6	17.6	.98
12		-	5.75	.47	1.24	2.32	24.2	4.02	7.15	16.2	47.2	1.02
13		3.03	5.91	8.18	1.82	2.60	31.6	1.50	3.46	7.91	120	.98
14		1.60	3.22	3.59	.90	9.77	33.0	3.34	2.86	24.2	33.5	1.02
15		1.45	3.58	1.68	.65	8.10	15.1	12.9	2.35	16.6	12.6	5.64
16		2.79	1.30	1.68	.55	2.78	5.18	20.2	1.82	20.5	10.5	4.08
17		1.60	.94	.79	.47	21.9	3.46	7.34	1.60	38.0	7.72	2.52
18		69.6	.79	.50	.43	4.67	5.85	30.7	1.50	25.4	5.18	1.45
19		20.3	.72	.39	.39	1.82	3.20	*44.1	36.0	9.06	*7.69	1.02
20		4.50	.62	.31	.33	1.09	2.78	13.4	54.4	6.77	14.3	.87
21		2.86	.55	.28	.31	1.24	2.44	3.72	7.39	18.0	8.10	1.46
22		1.75	.50	*.24	.30	2.42	1.50	2.20	3.59	10.0	6.36	8.43
23		1.34	1.73	.25	5.19	1.29	1.24	4.31	15.8	6.20	8.82	17.2
24		1.09	1.14	.26	7.65	4.77	1.14	2.52	31.0	8.58	4.50	5.35
25		1.24	13.7	.66	1.55	6.96	*1.02	*1.31	9.29	5.35	3.72	27.2
26		1.98	2.44	3.31	.79	2.60	.94	1.02	5.39	3.98	5.41	8.38
27		1.90	12.2	8.77	.50	2.33	.87	.83	19.7	3.46	4.67	9.06
28		1.24	3.59	5.47	.43	2.60	1.05	.72	20.3	2.94	2.94	42.2
29		1.29	1.55	1.55	.39	1.29	1.68	.65	9.14	2.69	2.44	7.15
30		1.14	14.5	.90	.35	.63	1.40	-----	22.1	3.54	2.12	7.15
31		1.24	-----	.79	-----	.76	.98	-----	21.2	-----	2.05	-----
Total		-	180.14	53.13	134.82	114.01	212.50	162.52	775.07	441.45	435.39	166.93
Mean:		-	6.00	1.71	4.49	3.68	6.85	5.60	25.0	14.7	14.0	5.56
mgd		-	9.28	2.65	6.95	5.69	10.6	8.66	38.7	22.7	21.7	8.60
cfs		-	553	163	414	350	652	4.99	2,360	1,350	1,340	512
Ac-ft		-										

Calendar year : Max Min Mean(mgd) Mean(cfs) Ac-ft

Fiscal year : Max Min Mean(mgd) Mean(cfs) Ac-ft

Peak discharge (base, 600 mgd).--Aug. 18 (9 p.m. 650 mgd (1,010 cfs), 5.28 ft; Mar. 7 (4 a.m.) 890 mgd (1,380 cfs), 5.79 ft; Mar. 30 (11 a.m.) 1,820 mgd (2,820 cfs), 6.82 ft; May 13 (3 p.m.) 645 mgd (998 cfs), 5.27 ft.

4000. Halawa Stream near Halawa

Location--Lat 21°09'30", long 156°45'53", on right bank 600 ft downstream from confluence of two main branches, 1.5 miles west of Halawa, and 6.0 miles northeast of Pukoo.

Drainage area--4.62 sq mi.

Records available--August 1917 to July 1932, November 1937 to June 1960.

Gage--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to June 25, 1923, at site 350 ft upstream at different datum.

Average discharge--37 years (1917-32, 1938-60), 19.1 mgd (29.6 cfs); fiscal year 1918 was omitted in error in computing averages prior to 1959.

Extremes--Maximum discharge during year, 1,700 mgd (2,630 cfs) Aug. 18, Mar. 5, from rating curve extended above 45 mgd as explained below; maximum gage height 7.57 ft Aug. 18; minimum, 2.30 mgd (3.56 cfs) Feb. 9, 10.
1917-32, 1937-60: Maximum discharge, 6,320 mgd (9,780 cfs) Apr. 2, 1948 (gage height, 12.30 ft), from rating curve extended above 45 mgd on basis of slope-area measurement at gage height 6.7 ft; minimum, 0.7 mgd (1.0 cfs) Oct. 26, 27, 1917.

Remarks--Records fair except those for period of no gage-height record, which are poor. A 2-inch pipeline diverts water about a quarter of a mile above station for domestic use of Halawa village.

Revisions (fiscal years)--WSP 1569: 1948(M). Drainage area and location. Revised figures of discharge, in million gallons a day, for fiscal year 1954, superseding those published in WSP 1349, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge
1954		1954-Con.		1954-Con.	
Jan. 28	2.7	Feb. 4	2.2	Feb. 11	2.1
29	2.7	5	2.3	15	2.6
30	2.6	6	2.6	16	2.6
31	2.5	7	2.2	17	2.4
Feb. 1	2.4	8	2.0	18	2.3
2	2.3	9	1.9	19	2.5
3	2.2	10	1.9		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
January 1954.....	279.60	51	2.5	9.02	14.0	858
February.....	261.15	35.5	1.9	9.33	14.4	801
Fiscal year 1953-54.....	-	155	1.9	13.5	20.9	15,140
Calendar year 1954.....	-	384	1.9	18.5	28.6	20,710

4000. Halawa Stream near Halawa--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.9	2.30	2.0	48.0
1.0	3.20	2.5	86.0
1.2	6.30	3.0	134
1.4	12.4	3.5	201
1.6	22.6	4.0	294
1.8	34.5		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.4	4.20	5.18	16.1	73.8	24.7	5.16	3.09	3.54	24.4	4.99	14.2
2	16.8	3.79	4.20	11.3	45.3	*11.0	4.82	2.99	3.54	11.4	4.82	27.1
3	14.7	3.54	4.06	5.90	46.7	6.52	7.72	2.89	15.7	7.52	6.10	8.06
4	10.5	6.08	19.6	4.99	28.9	20.9	26.0	2.79	110	28.3	8.06	6.10
5	23.4	9.96	68.5	4.50	19.6	34.5	6.30	2.61	335	23.2	5.34	5.52
6	7.78	8.06	13.3	4.06	16.4	34.4	34.8	2.53	122	27.5	4.50	4.99
7	8.06	5.34	19.5	3.92	101	12.9	14.4	2.53	28.5	25.1	4.66	4.82
8	6.10	4.20	9.35	7.82	135	8.06	11.7	2.45	15.6	9.95	4.66	4.66
9	4.62	9.54	5.34	4.99	28.8	16.3	23.6	2.37	11.0	66.2	*8.20	4.35
10	4.20	5.52	4.99	3.92	33.9	9.42	26.2	18.7	8.06	31.3	69.7	20.0
11	10.8	30.6	30.8	3.42	20.9	9.25	17.2	41.7	38.9	42.2	30.7	7.13
12	9.26	9.60	20.8	12.0	15.2	8.06	38.2	13.3	17.1	20.9	44.1	6.10
13	9.67	5.71	7.00	19.9	11.0	22.8	28.7	21.6	8.62	13.3	15.6	9.25
14	4.99	4.35	24.1	16.6	8.06	61.0	51.4	33.0	7.26	26.9	19.6	9.25
15	7.60	33.3	6.76	5.71	6.76	14.2	15.3	20.8	6.30	18.1	12.9	17.7
16	5.71	10.5	5.16	4.20	5.90	8.90	14.2	121	33.5	76.7	11.4	12.9
17	10.2	23.4	4.50	3.79	5.71	21.2	14.4	19.8	46.6	31.9	9.25	12.9
18	7.26	129	4.20	3.54	5.90	20.5	22.2	86.6	24.7	52.9	8.06	5.71
19	4.50	13.6	3.79	3.20	5.52	7.52	7.26	103	33.3	16.1	9.38	4.82
20	7.61	7.00	3.66	2.99	4.82	5.71	11.4	22.0	56.3	18.2	11.0	4.20
21	4.66	5.90	a3.6	40.1	5.90	5.71	5.90	9.95	20.1	17.6	11.0	9.04
22	4.06	5.71	a3.5	5.34	5.16	6.52	4.99	7.00	11.7	15.2	34.1	41.8
23	3.54	4.35	a3.5	12.5	37.7	5.34	4.66	9.60	194	16.1	14.2	46.8
24	3.42	4.06	a4.2	37.1	16.2	38.4	4.20	5.71	68.7	17.0	22.0	22.5
25	3.20	5.19	a12	15.9	7.00	17.7	4.06	4.82	20.4	11.0	23.7	25.1
26	6.77	9.27	a35	11.7	7.26	23.8	3.79	4.35	14.2	8.90	17.0	38.7
27	4.06	9.04	a40	21.2	4.82	11.7	3.54	4.20	15.2	7.26	12.0	30.9
28	3.20	6.06	a22	13.7	4.66	12.7	*5.15	3.92	28.3	6.10	8.06	33.2
29	28.3	8.19	a24	10.6	7.00	22.7	6.30	4.06	15.6	8.71	7.26	15.2
30	*5.64	6.30	a30	9.99	5.52	7.52	3.79	-----	16.7	5.52	6.52	13.3
31	4.06	4.20	-----	80.9	-----	5.90	3.42	-----	10.6	-----	8.34	-----
Total	260.67	397.56	480.39	401.88	718.39	515.83	428.76	579.56	1,341.02	686.46	457.20	466.30
Mean												
mgd	8.41	12.8	16.0	13.0	23.9	16.6	13.8	20.0	43.3	22.9	14.7	15.5
cfs	13.0	19.8	24.8	20.1	37.0	25.7	21.4	30.9	67.0	35.4	22.7	24.0
Ac-ft	800	1,220	1,470	1,230	2,200	1,580	1,320	1,780	4,120	2,110	1,400	1,430

Calendar year 1959: Max 152 Min 2.99 Mean(mgd) 16.4 Mean(cfs) 25.4 Ac-ft 18,320
 Fiscal year 1959-60: Max 335 Min 2.37 Mean(mgd) 18.4 Mean(cfs) 28.5 Ac-ft 20,660

Peak discharge (base, 950 mgd)--Aug. 18 (8:30 a.m.) 1,700 mgd (2,630 cfs), 7.57 ft; Nov. 8 (1 p.m.) 1,570 mgd (2,430 cfs), 7.35 ft; Feb. 18 (11 p.m.) 1,160 mgd (1,790 cfs), 6.57 ft; Mar. 5 (9 p.m.) 1,700 mgd (2,630 cfs), 7.56 ft.

* Discharge measurement made on this day.

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

4055. Waikolu Stream at altitude 900 ft, near Kalaupapa

Location.--Lat 21°08'43", long 156°55'17", on right bank 2.3 miles from mouth and 5.3 miles southeast of Kalaupapa Post Office.

Drainage area.--1.99 sq mi.

Records available.--May 1956 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map).

Extremes.--1958-59: Maximum discharge during fiscal year, 790 mgd (1,220 cfs) Dec. 29 (gage height, 6.60 ft), from rating curve extended above 20 mgd on basis of shape of control section; minimum, 2.35 mgd (3.64 cfs) July 6.
1959-60: Maximum discharge during fiscal year, 340 mgd (526 cfs) Feb. 16 (gage height, 4.41 ft), from rating curve extended above 20 mgd on basis of shape of control section; minimum, 2.29 mgd (3.54 cfs) Nov. 17, 21, 22.
1956-60: Maximum discharge, that of Dec. 29, 1958; minimum, 1.40 mgd (2.17 cfs) Oct. 10, 1957.

Remarks.--Records fair.

Revisions.--Revised figures of discharge in million gallons a day for the 1958-59 fiscal year, superseding those published in WSP 1639 are given herein.

Rating tables, July 1, 1958, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

July to Dec. 29, 1958					Dec. 29, 1958, to June 30, 1960				
0.6	1.61	1.4	19.5		0.3	1.84	1.2	13.0	
.7	2.70	1.7	33.5		.4	2.34	1.4	18.4	
.9	5.80	2.0	21.5		.5	2.95	1.6	25.3	
1.1	10.1	2.5	93.0		.7	4.60	2.0	45.0	
					.8	5.80	2.5	82.5	
					.9	7.20	3.0	135	
					1.0	8.80			

Discharge, in million gallons a day, fiscal year July 1958 to June 1959

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.8	37	5.0	3.4	4.1	5.4	a7.2	11.6	4.8	70	3.95	3.0
2	11.7	86	12.2	3.4	3.8	*5.6	a5.7	5.6	4.4	52	3.9	2.95
3	5.8	10.6	11.9	3.1	3.7	3.8	a5.2	4.8	4.2	11.4	3.9	2.95
4	3.25	7.3	5.4	2.85	3.8	3.4	a5.2	5.8	4.2	6.6	3.9	2.95
5	2.6	16.8	6.6	2.85	3.7	37	a5.2	5.4	3.95	4.5	3.9	3.2
6	2.45	11.2	6.0	2.85	3.4	38	a5.1	4.3	3.95	20.5	6.2	3.3
7	2.6	48	5.3	2.85	3.4	8.5	a5.2	4.4	3.95	25	20.5	4.1
8	14.7	42	4.1	*2.7	3.4	5.0	a5.0	4.5	3.9	20.5	19.1	3.9
9	13.9	14.7	3.55	2.7	8.4	8.2	a4.8	4.2	3.9	14.8	9.2	3.5
10	20	5.8	4.3	2.7	24.5	24	a4.6	3.95	3.9	13.8	7.4	3.25
11	9.4	5.0	5.0	2.7	11.1	31.5	a4.4	3.95	3.9	8.3	4.6	3.0
12	11.1	4.6	3.95	3.0	5.3	53	a4.3	11.4	4.4	5.4	5.9	3.4
13	15.5	*4.4	4.3	3.7	5.3	10.2	70	48	5.4	4.4	5.1	7.2
14	11.4	5.3	3.55	5.0	6.8	5.5	7.7	7.2	6.1	4.2	7.8	4.6
15	21.5	8.7	3.4	14.2	5.0	4.6	a6.6	16.1	4.7	3.95	11.2	3.4
16	45	5.6	3.55	16.6	3.7	6.6	a5.2	11.4	4.1	3.95	7.2	3.9
17	28.5	4.6	3.95	5.6	5.0	8.3	55	6.2	4.4	3.9	4.2	3.3
18	25.5	4.3	7.9	5.5	22	15.0	113	17	4.3	5.6	7.4	3.0
19	9.7	4.1	4.3	4.6	41	11.6	a9.0	18.4	6.5	13	4.4	2.95
20	10.3	4.6	3.95	5.6	5.8	5.3	a4.5	16.7	15.8	7.5	3.9	2.95
21	6.5	20	4.6	10.6	40	4.3	a4.3	10.7	5.4	5.6	4.8	2.95
22	4.1	6.4	3.55	52	8.6	4.1	a4.3	8.8	4.3	4.4	9.8	2.9
23	4.8	4.4	3.1	30	7.9	4.3	a4.7	6.9	4.2	4.1	4.7	2.9
24	14.1	4.4	3.1	33	8.6	5.5	a4.1	7.4	*4.1	3.95	3.7	2.85
25	12.9	11.0	3.1	7.0	4.3	5.3	a3.9	6.1	6.1	4.1	3.4	2.9
26	9.5	10.6	3.1	6.5	3.7	4.4	a3.7	5.8	7.3	4.2	*3.25	2.85
27	4.3	12.0	3.1	5.8	3.4	4.1	*a3.8	6.9	5.9	5.2	3.2	2.75
28	5.7	8.3	3.0	68	3.4	5.95	3.8	5.4	4.4	5.2	2.1	2.75
29	17.9	4.3	3.0	19.6	3.25	52	3.8	-	13	5.2	3.25	2.75
30	5.9	3.6	2.85	5.8	3.25	24	3.7	-	6.1	4.3	3.2	2.95
31	5.0	3.7	4.6	-----	-----	15.5	35	-----	12.8	-----	3.1	-----
Total	359.40	419.5	140.70	338.80	259.60	417.95	408.0	268.90	174.35	343.55	189.15	99.35
Mean:	11.6	13.5	4.69	10.9	8.65	13.5	13.2	9.60	5.62	11.5	6.10	3.31
mgd	17.9	20.9	7.25	16.9	13.4	20.9	20.4	14.9	8.70	17.8	9.44	5.12
cfs	1,100	1,290	432	1,040	797	1,280	1,250	825	535	1,050	580	305
Ac-ft												
Calendar year 1958: Max	86	Min	2.25	Mean(mgd)	8.94	Mean(cfs)	13.8	Ac-ft	10,010			
Fiscal year 1958-59: Max	113	Min	2.45	Mean(mgd)	9.37	Mean(cfs)	14.5	Ac-ft	10,480			

Peak discharge (base, 250 mgd).--Aug. 2 (1 a.m.) 399 mgd (617 cfs), 4.86 ft; Dec. 29 (4 p.m.) 790 mgd (1,220 cfs), 6.60 ft; Jan. 13 (8 a.m.) 354 mgd (548 cfs), 4.50 ft; Jan. 17 (9:30 p.m.) 566 mgd (876 cfs), 5.68 ft; Feb. 13 (4 a.m.) 304 mgd (470 cfs), 4.19 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of nearby streams and partial gage-heights at high stages.

4055. Waikolu Stream at altitude 900 ft, near Kalaupapa--Continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.60	2.4	3.2	2.52	19.4	*20.4	2.71	2.64	2.77	3.40	3.40	2.77
2	5.94	2.8	2.6	2.46	8.99	8.00	2.64	2.58	2.71	3.40	3.32	3.97
3	11.2	2.8	2.6	2.46	3.97	4.24	2.71	2.58	12.5	3.97	3.32	3.55
4	8.50	3.8	2.64	2.46	3.10	3.02	3.18	2.52	39.4	16.4	3.25	2.77
5	6.36	17	3.10	2.46	3.79	3.02	3.25	2.52	27.4	6.36	3.25	2.64
6	4.33	20	3.02	2.40	2.95	8.80	7.20	2.52	12.5	17.2	3.18	2.52
7	6.78	4.0	2.71	2.40	2.89	6.08	10.1	2.58	6.08	20.0	3.18	2.52
8	3.40	3.4	2.64	2.40	13.5	4.15	12.5	2.52	3.88	5.80	*3.40	2.46
9	2.77	3.4	2.64	2.40	4.84	4.72	13.0	2.46	3.25	25.5	3.62	2.46
10	2.64	3.4	2.64	2.40	2.89	3.40	15.5	2.52	3.02	16.7	7.94	2.71
11	2.58	11	3.32	2.34	2.64	3.62	8.00	48.3	9.94	9.56	6.08	2.77
12	2.52	8.0	4.06	2.34	2.52	2.89	20.7	78.2	5.94	5.32	6.78	3.10
13	2.52	3.7	3.10	2.34	2.40	7.20	21.0	66.0	3.97	4.24	8.16	3.88
14	2.46	3.0	3.32	2.34	2.34	19.1	10.9	21.4	3.62	14.5	8.64	5.32
15	2.46	24	3.02	2.34	2.34	7.06	5.56	7.36	*3.40	7.36	5.56	7.20
16	2.46	11	2.71	2.34	2.34	5.94	5.68	74.0	3.32	19.4	3.97	6.64
17	2.46	8.0	2.64	2.34	2.29	62.2	9.56	10.5	4.03	13.2	3.79	4.33
18	2.46	13	2.58	2.34	2.34	23.5	4.72	8.00	5.08	14.5	4.51	3.40
19	2.40	4.6	2.58	2.34	2.34	4.96	3.25	27.4	8.32	5.44	5.20	3.02
20	2.46	3.4	2.58	2.34	2.34	3.70	3.18	11.6	11.2	5.68	6.36	2.89
21	2.46	4.4	2.52	2.34	2.29	10.7	2.83	4.15	4.06	6.22	7.52	*2.83
22	2.46	3.9	2.52	2.34	2.29	12.3	2.71	3.48	5.18	4.60	14.2	6.92
23	2.46	3.4	2.46	2.34	16.7	5.44	2.58	11.8	48.5	8.48	7.20	13.2
24	2.46	3.5	2.52	2.40	9.56	7.52	2.52	3.97	16.1	6.78	3.88	7.06
25	2.46	8.9	3.55	2.52	8.90	5.56	2.52	3.25	5.56	4.24	3.25	5.56
26	2.40	5.0	3.10	2.52	6.92	11.2	*2.46	3.02	4.42	4.15	2.95	3.48
27	2.40	4.0	3.62	2.71	3.32	4.15	2.52	2.89	4.60	3.79	2.83	8.64
28	*2.4	4.0	2.83	2.71	8.32	3.32	3.18	2.83	4.15	3.62	2.71	11.8
29	2.4	3.5	*2.64	2.46	6.92	3.02	3.10	2.77	3.70	3.55	2.64	5.20
30	2.4	3.2	2.52	2.34	4.96	2.83	2.77	-----	3.62	3.40	2.58	4.33
31	2.4	3.4	-----	20.4	-----	2.77	2.64	-----	3.48	-----	2.58	-----
Total	106.00	199.9	85.98	92.84	160.29	274.81	195.17	416.36	273.50	266.56	149.15	139.94
Mean:												
mgd	3.42	6.45	2.87	2.99	5.34	8.86	6.30	14.4	8.92	8.89	4.81	4.66
cfs	5.29	9.98	4.44	4.63	8.26	13.7	9.75	22.3	13.6	13.8	7.44	7.21
Ac-ft	325	613	264	285	492	843	599	1,280	839	818	458	429

Calendar year 1959: Max 113 Min 2.29 Mean(mgd) 6.58 Mean(cfs) 10.2 Ac-ft 7,370
 Fiscal year 1959-60: Max 78.2 Min 2.29 Mean(mgd) 6.45 Mean(cfs) 9.98 Ac-ft 7,240

Peak discharge (base, 250 mgd).--Dec. 17 (9 p.m.) 256 mgd (396 cfs), 3.87 ft; Feb. 12 (12:30 p.m.) 284 mgd (439 cfs), 4.06 ft; Feb. 16 (4:30 a.m.) 340 mgd (526 cfs), 4.41 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 28 to Sept. 3; discharge estimated on basis of recorded range in stage and records for nearby streams.

4080. Waikolu Stream below pipeline crossing, near Kalaupapa

Location.--Lat 21°09'45", long 156°55'54", on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Kalaupapa Lighthouse.

Drainage area.--3.68 sq mi.

Records available.--June 1919 to July 1932, September 1937 to June 1960. Prior to November 1930, published as Waikolu Stream at pipeline crossing.

Gage.--Water-stage recorder and concrete control. Datum of gage is 253 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 18, 1930, water-stage recorder at site 500 ft upstream at different datum. Sept. 20, 1937, to July 1948, water-stage recorder at present site, at datum 0.49 ft higher.

Average discharge.--31 years (1919-30, 1938-47, 1949-60), 12.1 mgd (18.7 cfs); fiscal year 1930 was omitted in error in computation of averages in previous years.

Extremes.--Maximum discharge during year, 776 mgd (1,200 cfs) Feb. 16 (gage height, 5.54 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 5.65 mgd (8.74 cfs) Oct. 8, 29.

1919-32, 1937-60: Maximum discharge, 3,700 mgd (5,720 cfs) Jan. 26, 1948 (gage height, about 10.25 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 1.3 mgd (2.0 cfs) Nov. 1, 2, 1925, June 5, 1926.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Kalaupapa water-supply system diverts water above station.

Revisions (fiscal years).--WSP 1155: 1932(M), 1938-48(M). WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.7	4.82	2.3	32.5
1.8	7.70	2.5	49.0
1.9	11.2	2.7	69.0
2.0	15.4	3.0	105
2.1	20.4	3.3	150

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.76	7.70	8.72	7.70	34.3	*29.8	7.10	6.80	7.70	8.04	8.38	8.04
2	10.5	8.04	8.38	7.70	15.5	14.1	7.10	6.80	7.70	7.70	8.38	8.72
3	15.1	8.04	8.38	7.70	10.1	9.76	7.70	6.80	21.7	8.04	8.38	8.72
4	11.2	8.38	8.38	7.70	8.72	8.38	7.70	6.80	79.9	32.7	8.38	8.04
5	10.9	23.9	8.72	7.70	9.06	8.04	7.70	6.50	48.0	12.0	8.38	7.70
6	9.76	27.4	9.06	7.70	8.38	13.3	10.8	6.50	25.1	27.7	8.04	7.40
7	11.2	10.8	8.38	7.40	8.38	10.8	13.7	6.50	13.3	38.4	8.38	7.40
8	9.06	9.40	8.38	6.50	18.2	9.40	16.9	6.50	10.1	12.5	*8.38	7.40
9	8.38	9.76	8.04	6.80	10.1	9.40	14.7	6.50	9.40	62.1	8.72	7.40
10	8.04	9.76	8.04	6.80	8.04	8.38	21.2	6.80	9.06	37.4	15.70	7.70
11	8.04	14.8	9.06	6.80	7.70	8.38	9.76	71.4	17.7	16.9	12.0	7.70
12	8.04	13.8	9.76	6.80	7.40	7.70	22.9	136	11.2	11.2	12.5	a8.0
13	7.70	9.76	8.72	6.80	7.10	10.8	24.7	97.3	9.40	10.1	14.1	a8.5
14	7.70	9.70	8.72	6.50	7.10	25.3	13.9	35.3	9.06	19.9	13.3	all
15	7.70	30.3	8.72	6.50	7.10	11.2	8.38	12.5	*8.72	12.5	10.8	a14
16	7.70	12.9	8.38	6.50	7.10	10.8	8.94	138	8.38	33.7	9.76	a13
17	7.70	10.5	8.04	6.50	7.10	91.4	12.7	17.7	9.40	21.6	9.40	a9.5
18	7.70	19.0	8.04	6.50	7.10	26.2	9.40	12.5	10.8	22.8	10.1	a9.0
19	7.70	10.5	7.70	6.50	7.10	10.5	7.70	47.1	22.4	11.6	10.1	a8.5
20	7.70	9.40	7.70	6.80	6.80	8.72	7.70	22.0	19.6	10.8	11.6	a8.0
21	7.70	9.76	7.70	6.80	6.80	14.1	7.40	10.1	9.40	11.2	12.0	*a7.5
22	7.40	9.40	7.70	6.80	6.80	18.5	7.10	9.06	8.04	10.5	19.0	13.3
23	7.40	8.72	7.70	6.80	32.2	10.1	6.80	17.5	134	13.7	12.0	21.3
24	7.40	8.72	7.70	7.40	16.7	11.6	6.80	9.76	35.6	12.0	9.40	15.0
25	7.40	12.3	9.06	7.10	13.5	10.1	6.80	8.72	12.5	9.76	8.72	12.9
26	7.70	10.1	8.72	7.10	12.5	13.7	*6.50	8.38	9.76	9.40	8.38	10.1
27	7.70	9.76	9.06	7.40	8.38	9.06	6.50	8.04	9.40	8.72	8.38	16.0
28	*7.70	10.1	8.38	6.80	13.2	8.04	7.40	8.04	9.06	8.72	8.04	22.0
29	7.70	9.06	*7.70	6.50	11.6	7.40	7.40	7.70	8.38	8.72	8.04	11.6
30	7.70	8.72	7.70	6.80	10.1	7.40	7.10	-----	8.38	8.38	7.70	10.8
31	7.70	8.72	-----	38.4	-----	7.10	6.80	-----	8.04	-----	7.70	-----
Total	265.08	369.20	250.74	247.80	334.16	449.48	317.28	723.60	611.18	518.78	314.14	316.22
Mean:												
mgd	8.55	11.9	8.36	7.99	11.1	14.5	10.2	25.0	19.7	17.3	10.1	10.5
cfs	13.2	18.4	12.9	12.4	17.2	22.4	15.8	38.7	30.5	26.8	15.6	16.2
Ac-ft	813	1,130	769	760	1,030	1,380	974	2,220	1,870	1,590	964	970

Calendar year 1959 : Max 206 Min 6.50 Mean(mgd) 14.5 Mean(cfs) 22.4 Ac-ft 16,300
Fiscal year 1959-60 : Max 138 Min 6.50 Mean(mgd) 12.9 Mean(cfs) 20.0 Ac-ft 14,490

Peak discharge (base, 450 mgd).--Feb. 16 (5:30 a.m.) 776 mgd (1,200 cfs), 5.54 ft; Mar. 23 (10:30 a.m.) 556 mgd (880 cfs), 4.93 ft.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby stations.

4110. Waialala Springs near Kalae

Location--Lat 21°10'20", long 157°00'05", on left bank on highway from Kalae to Kalaupapa Fall, 0.8 mile northeast of Kalae and 5.7 miles northeast of Kaunakakai Post Office.

Records available--September 1940 to January 1960 (discontinued).

Gage--Water-stage recorder and sharp-crested V-notch weir. Altitude of gage is 1,600 ft (from topographic map).

Average discharge--18 years (1941-59), 0.016 mgd (0.025 cfs).

Extremes--1940-59: Maximum daily discharge, 0.275 mgd (0.425 cfs) Mar. 11, 1942; minimum daily, 0.001 mgd (0.002 cfs) Feb. 8-16, 1956.

Remarks--Records good. Maui County Water Work, diverts entire flow for domestic supply, from tail bay at station.

Discharge, in million gallons a day, July 1959 to January 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.013	0.012	0.011	0.011	0.011	0.009	0.009					
2	.013	.012	.011	.011	.011	.009	.009					
3	.013	.012	.011	.011	.011	.009	.009					
4	.013	.012	.011	.011	.010	.009	.009					
5	.013	.012	.011	.011	.010	.009	.009					
6	.013	.012	.011	.011	.010	.009	.009					
7	.013	.012	.011	.011	.010	.009	.009					
8	.013	.012	.011	.011	.010	.009	.008					
9	.013	.012	.011	.011	.010	.009	.008					
10	.013	.012	.011	.011	.010	.009	.008					
11	.013	.012	.011	.011	.010	.009	.008					
12	.013	.012	.011	.011	.010	.009	.008					
13	.013	.012	.011	.011	.010	.009	.008					
14	.013	.012	.011	.011	.010	.009	.008					
15	.013	.012	.011	.011	.010	.009	.008					
16	.013	.012	.011	.011	.010	.009	.009					
17	.013	.012	.011	.011	.010	.009	.009					
18	.013	.012	.011	.011	.010	.009	.009					
19	.013	.012	.011	.011	.010	.009	.008					
20	.013	.012	.011	.011	.010	.009	.008					
21	.013	.012	.011	.010	.010	.009	.008					
22	.013	.012	.011	.010	.010	.009	.008					
23	.013	.012	.011	.010	.010	.009	.008					
24	.013	.012	.011	.010	.009	.009	.008					
25	.013	.012	.011	.010	.009	.009	-					
26	.013	.012	.011	.010	.010	.009	-					
27	.013	.012	.011	.010	.010	.009	-					
28	.013	.012	.011	.010	.010	.009	-					
29	.012	.011	.011	.010	.010	.009	-					
30	.012	.011	.011	.010	.010	.009	-					
31	.012	.011	-----	.010	-----	.009	-					
Total	0.400	0.369	0.330	0.330	0.301	0.279	-					
Mean:												
mgd	0.013	0.012	0.011	0.011	0.010	0.009	-					
cfs	0.020	0.019	0.017	0.017	0.016	0.014	-					
Ac-ft	1.2	1.1	1.0	1.0	0.9	0.9	-					
Calendar year 1959: Max			0.017	Min	0.002	Mean(mgd)	0.011	Mean(cfs)	0.017	Ac-ft	12	
Fiscal year 1959-60: Max			-	Min	-	Mean(mgd)	-	Mean(cfs)	-	Ac-ft	-	

4140. Kaunakakai Gulch at Kaunakakai

Location--Lat 21°06'21", long 157°00'34", on left bank 0.6 mile upstream from Molokai Ranch pipeline crossing, 1.3 miles northeast of Kaunakakai Post Office, and 1.7 miles upstream from mouth.

Drainage area--6.57 sq mi.

Records available--Decmeber 1949 to June 1960. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

Gage--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

Average discharge--10 years (1950-60), 100 mgd (1.55 cfs).

Extremes--Maximum discharge during year, 304 mgd (470 cfs) Feb. 16 (gage height, 4.87 ft); no flow most of time.
1949-60: Maximum discharge, 1,120 mgd (1,730 cfs) Mar. 13, 1951 (gage height, 7.10 ft), from rating curve extended above 180 mgd; no flow most of time.

Remarks--Records fair.

Revisions (fiscal years)--WSP 1289: 1950-51. WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.7	0	2.4	4.90
1.8	.32	2.7	9.50
1.9	.96	3.0	18.0
2.0	1.60	3.3	30.0
2.1	2.15	3.5	43.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						0		0	0			
2						0		0	0			
3						0		0	0			
4						0		0	2.02			
5						0		0	.41			
6						0		0	4.42			
7						0		0	0			
8						0		0	0			
9						0		0	0			
10						0		0	0			
11						0		3.50	0			
12						0		8.78	0			
13						0		27.7	0			
14						0		3.09	0			
15						0		.12	0			
16						0		35.8	0			
17						6.25		4.61	0			
18						6.52		.05	0			
19						0		0	0			
20						0		5.79	0			
21						0		0	0			
22						0		0	0			
23						0		0	.67			
24						0		0	.74			
25						0		0	0			
26						0		0	0			
27						0		0	0			
28						0		0	0			
29						0		0	0			
30						0		-	0			
31						0		0	0			
Total	0	0	0	0	0	12.77	0	89.44	8.26	0	0	0
Mean:												
mgd	0	0	0	0	0	0.412	0	3.08	0.266	0	0	0
cfs	0	0	0	0	0	0.637	0	4.77	0.412	0	0	0
Ac-ft	0	0	0	0	0	39	0	274	25	0	0	0

Calendar year 1959: Max 119 Min 0 Mean(mgd) 0.580 Mean(cfs) 0.897 Ac-ft 650
Fiscal year 1959-60: Max 35.8 Min 0 Mean(mgd) 0.302 Mean(cfs) 0.467 Ac-ft 338

Peak discharge (base, 500 mgd)--No peak above base.

4150. Right Branch of East Fork Kawela Gulch near Kamalo

Location.--Lat 21°06'46", long 156°54'23", on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo and 7.6 miles east of Kaunakakai.

Drainage area.--0.45 sq mi.

Records available.--September 1946 to June 1960. Prior to July 1958, published as Right Branch of East Fork Kawela Stream near Kamalo.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

Average discharge.--13 years (1947-60), 1.53 mgd (2.37 cfs).

Extremes.--1947: Maximum discharge during period September to June, 117 mgd (181 cfs) Oct. 10 (gage height, 4.32 ft), from rating curve extended above 38 mgd by test on model of station site; no flow for many days.

1947-48: Maximum discharge during fiscal year, 882 mgd (1,360 cfs) Jan. 26 (gage height, 7.97 ft), from rating curve extended above 38 mgd as explained above; no flow for many days.

1948-49: Maximum discharge during fiscal year, 142 mgd (220 cfs) Feb. 8 (gage height, 4.48 ft), from rating curve extended above 38 mgd as explained above; no flow for many days.

1959-60: Maximum discharge during fiscal year, 142 mgd (220 cfs) Feb. 16 (gage height, 4.50 ft), from rating curve extended above 38 mgd as explained above; no flow for many days.

1946-60: Maximum discharge, 882 mgd (1,360 cfs) Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 38 mgd as explained above; no flow for many days.

Remarks.--Records fair. Molokai Ranch diverts low flow from gage pool.

Revisions.--WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for fiscal years 1947-49, superseding those published in WSP 1125 and 1155, are given herein.

Discharge, in million gallons a day, September 1946 to June 1947

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1			-	1.42	0.15	9.3	1.58	0	0	0	4.6	0.06
2			-	1.48	0	8.7	23	0	3.15	0	27.5	.06
3			-	.01	.49	1.38	1.68	0	.99	0	17.0	.31
4			-	1.81	9.1	1.24	1.78	0	.04	.12	14.7	.28
5			-	.06	12.3	.29	1.14	0	0	.32	2.6	.06
6			-	0	2.5	5.6	.56	0	.05	2.4	.79	0
7			-	0	.46	11.9	1.89	0	2.0	5.4	.23	0
8			-	.64	.50	1.32	4.3	0	1.56	2.0	.18	0
9			-	9.1	.50	.16	1.30	12.0	.10	.74	.02	0
10			-	19.0	.84	1.64	.36	1.16	0	.18	.50	0
11			-	1.87	.82	.44	.40	.10	0	1.32	1.41	0
12			-	.18	.46	.02	.21	.01	0	5.9	5.1	2.15
13			-	0	.12	0	.30	0	.20	.48	2.35	1.69
14			-	0	.03	0	1.01	0	3.3	.04	.15	.30
15			-	0	6.3	.81	.07	0	.28	0	0	0
16			-	0	.18	2.65	0	0	2.15	0	0	0
17			-	0	0	10.6	0	0	5.8	0	0	0
18			-	0	0	6.7	0	0	.14	0	0	.33
19			-	0	0	2.2	0	0	0	0	0	.07
20			-	0	0	29.5	0	0	0	0	0	1.86
21			-	0	0	28.0	0	0	0	0	8.6	.47
22			-	.03	.18	2.5	0	0	0	0	4.1	1.19
23			-	1.9	.12	3.8	0	0	.23	.01	.46	.58
24			-	1.28	0	19.1	0	0	.62	.01	.11	.28
25			-	.03	0	1.33	0	0	1.12	0	.14	1.43
26			-	3.05	0	.36	0	1.15	.77	0	.18	3.7
27			-	1.66	0	.08	.81	2.85	.69	.45	.34	7.0
28			-	.24	1.05	17.1	.01	1.04	.26	2.9	.08	4.5
29			-	1.60	.27	9.9	0	.12	-	6.2	0	.67
30			-	1.28	2.95	3.15	.84	0	-----	1.1	.05	7.4
31			-	-----	1.38	-----	1.48	0	-----	.11	-----	-----
Total			-	47.17	65.20	151.95	41.55	17.53	33.70	27.50	96.25	34.02
Mean			-	1.52	2.17	4.90	1.34	0.626	1.09	0.917	3.10	1.13
mgd			-	2.35	3.36	7.58	2.07	0.969	1.69	1.42	4.80	1.75
cfs			-	145	200	466	128	54	103	84	295	104
Calendar year	Max			Min								
Fiscal year	Max			Min								

ISLAND OF MOLOKAI

123

4150. Right Branch of East Fork Kawela Gulch near Kamalo--Continued

Discharge, in million gallons a day, fiscal year July 1947 to June 1948

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.13	0	0.27	0.50	2.15	0	1.17	0.90	1.27	4.4	0.82	2.5
2	<u>4.7</u>	0	.42	.15	.18	0	8.0	.77	.16	<u>14.0</u>	.08	1.25
3	.55	0	4.3	0	.24	.87	11.1	1.54	3.8	.93	0	2.0
4	.82	0	<u>6.9</u>	0	.04	2.2	3.7	.34	.89	1.12	0	1.20
5	.34	0	1.91	.45	0	.29	1.47	.70	.08	.30	.73	0
6	2.5	0	.33	.20	0	2.25	.46	.20	0	.08	.05	.79
7	1.85	0	.01	0	0	1.74	.21	.11	.10	0	.30	0
8	.13	0	0	0	0	2.2	.01	.03	.20	2.7	.27	0
9	0	0	0	0	0	.40	0	.36	.08	.64	2.2	0
10	1.53	.05	1.48	0	0	1.35	0	.02	1.25	.20	3.7	0
11	.26	.03	1.42	.02	.29	.16	0	0	1.99	.17	.40	0
12	0	2.5	1.37	.15	1.10	10.7	.89	0	3.3	1.41	5.7	0
13	0	.46	.21	.54	5.4	3.55	.22	0	3.7	.83	6.7	0
14	0	3.55	.23	.99	1.92	1.45	0	0	1.22	.19	1.54	1.98
15	0	.18	0	.79	1.30	1.41	0	0	3.55	6.3	.10	.81
16	0	.05	0	.13	.84	2.1	0	0	8.1	2.3	.02	.03
17	0	2.9	.26	0	.49	3.7	0	0	<u>10.8</u>	.42	<u>7.0</u>	0
18	0	.22	0	0	0	<u>16.9</u>	0	0	3.4	.03	4.9	0
19	0	0	0	0	0	7.3	0	0	.85	.09	4.9	0
20	.52	0	0	0	0	1.91	0	0	2.2	1.05	2.35	.41
21	.10	0	0	0	0	.68	0	0	.74	.57	.3	.30
22	.06	0	0	.04	0	1.85	0	.30	3.05	.20	.3	0
23	.41	0	2.95	0	0	3.7	22	.01	6.3	0	.3	.43
24	.01	.63	.81	0	1.00	1.77	24.5	.38	1.47	1.34	.3	.16
25	0	<u>12.1</u>	0	12.0	2.45	.38	78	1.74	1.15	.44	.3	.05
26	1.41	4.0	0	<u>27.5</u>	.50	4.2	<u>130</u>	<u>15.3</u>	2.45	2.1	.3	0
27	.85	.35	0	1.54	0	5.1	7.5	2.9	1.56	1.80	.3	0
28	.36	.39	.01	.32	0	1.49	10.3	1.04	2.55	1.21	.3	<u>4.1</u>
29	.04	.06	1.31	.04	0	2.2	2.85	4.3	9.1	1.68	.3	1.29
30	0	2.55	4.6	0	0	.56	1.67	-----	4.9	2.35	.13	.21
31	0	.65	-----	2.9	-----	.08	7.9	-----	2.75	-----	1.13	-----
Total	17.57	30.67	28.79	48.26	17.91	82.49	311.95	30.94	82.96	48.83	45.72	17.51
Mean:												
mgd	0.567	0.989	0.960	1.56	0.597	2.66	10.1	1.07	2.68	1.63	1.47	0.584
cfs	0.877	1.53	1.49	2.41	0.924	4.12	15.6	1.68	4.15	2.52	2.27	0.904
Ac-ft	54	94	88	148	55	253	957	95	255	150	140	54
Calendar year 1947: Max	27.5	Min	0	Mean(mgd)	1.30	Mean(cfs)	2.01	Ac-ft	1,460			
Fiscal year 1947-48: Max	130	Min	0	Mean(mgd)	2.09	Mean(cfs)	3.23	Ac-ft	2,340			

Peak discharge (base, 100 mgd).--Oct. 25 (7 p.m.) 113 mgd (175 cfs), 4.29 ft; Jan. 23 (12:30 p.m.) 114 mgd (176 cfs), 4.3 ft; Jan. 26 (6 p.m.) 882 mgd (1,360 cfs), 7.97 ft; Feb. 26 (12 m.) 117 mgd (181 cfs), 4.32 ft; Apr. 2 (8 a.m.) 208 mgd (322 cfs), 4.92 ft.

Note.--Faulty or no gage-height record Dec. 13-17, Jan. 12, 13, Jan. 23 to Feb. 8, May 21-29; discharge computed on basis of recorded range in stage and records for stations on nearby streams.

Discharge, in million gallons a day, fiscal year July 1948 to June 1949

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.20	0.02	0	1.50	1.42	2.65	0.85	0	0	1.84	0.05	0.86
2	3.0	<u>4.3</u>	0	.24	3.4	1.21	.68	0	.04	.43	0	2.6
3	5.6	.66	0	.26	.27	1.14	1.21	0	.25	.18	0	2.65
4	2.25	.01	0	.06	.01	1.81	.32	.74	.01	.13	.08	.76
5	2.6	0	0	2.0	0	1.53	.12	.52	0	2.2	.40	.19
6	1.25	.44	0	.19	0	3.45	.60	.06	0	.40	.03	0
7	1.19	.19	.03	0	2.35	.95	.58	.01	0	.30	.86	0
8	1.09	0	0	.02	<u>4.5</u>	4.75	3.85	26	.62	1.69	.02	0
9	.16	0	0	0	.24	3.2	3.6	1.18	.17	.19	0	0
10	.25	0	0	0	.06	6.5	2.2	.46	0	.01	0	0
11	5.95	.26	0	1.7	.32	1.82	2.35	.16	.12	5.1	0	.60
12	2.55	0	.12	.66	2.35	4.35	1.48	0	4.35	1.38	0	1.11
13	.19	0	.07	.66	.92	7.6	.23	1.40	<u>8.6</u>	.17	.65	.04
14	0	0	0	.16	2.95	.12	1.13	.53	.53	0	.28	0
15	1.45	.10	0	0	.68	2.4	2.7	1.11	.62	0	0	0
16	.42	0	0	0	3.6	3.9	9.6	2.1	0	.07	0	0
17	<u>7.9</u>	0	0	0	1.71	2.45	22	.29	0	0	0	0
18	3.65	0	0	0	.66	2.65	3.3	.01	0	.08	0	0
19	.48	0	0	0	.04	1.41	4.3	0	0	.18	0	0
20	.03	0	0	2.75	0	3.35	.83	0	0	.09	0	0
21	0	0	0	1.90	0	8.3	.34	0	0	.06	0	0
22	0	1.31	0	2.45	.87	9.9	.12	0	1.49	2.75	0	0
23	0	.94	.33	1.19	3.5	6.1	.03	0	1.54	3.55	0	.50
24	0	.68	.20	.69	2.8	<u>17.3</u>	0	0	1.32	<u>5.3</u>	.09	.52
25	0	.10	0	1.92	.65	4.2	0	0	.96	.33	.80	.26
26	0	0	0	2.45	1.62	6.0	0	0	1.68	5.2	.14	0
27	.69	0	<u>5.6</u>	1.81	4.4	3.3	3.3	0	.12	3.1	0	0
28	.56	0	4.7	3.0	1.37	7.9	1.48	.77	1.49	.35	2.15	.46
29	2.25	0	.80	<u>3.9</u>	3.0	5.0	.07	-	1.55	.04	<u>2.25</u>	.87
30	.81	.07	.85	2.4	.83	8.4	0	-----	3.9	.55	.12	<u>2.75</u>
31	.32	.08	-----	3.55	-----	5.4	0	-----	2.3	-----	0	-----
Total	44.74	9.16	12.50	35.10	41.73	141.87	66.26	35.94	31.66	35.67	7.92	14.17
Mean:												
mgd	1.44	0.295	0.417	1.13	1.39	4.58	2.14	1.28	1.02	1.19	0.255	0.472
cfs	2.23	0.456	0.645	1.75	2.15	7.09	3.31	1.98	1.58	1.84	0.395	0.730
Ac-ft	137	28	38	108	128	435	203	110	97	109	24	43
Calendar year 1948: Max	130	Min	0	Mean(mgd)	2.25	Mean(cfs)	3.48	Ac-ft	2,520			
Fiscal year 1948-49: Max	26	Min	0	Mean(mgd)	1.31	Mean(cfs)	2.03	Ac-ft	1,460			

Peak discharge (base, 100 mgd).--Sept. 27 (11 p.m.) 101 mgd (156 cfs); Jan. 17 (4:30 a.m.) 121 mgd (187 cfs); Feb. 8 (11:50 a.m.) 142 mgd (220 cfs).

Note.--Faulty or no gage-height record July 1-18, Aug. 11-24; discharge computed on basis of partly or wholly estimated gage-height record for Punaula Stream.

4150. Right Branch of East Fork Kawela Gulch near Kamalo--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

2.31	0.00	3.1	5.10
2.4	.04	3.3	12.5
2.6	.46	3.5	25.5
2.8	1.43	3.7	44.0
2.9	2.15		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.35	0	0	0	3.69	6.00	0	0	0	0	0	0
2	2.12	.85	0	0	1.81	2.05	0	0	0	0	0	1.25
3	3.75	.17	0	0	.79	.62	0	0	6.05	0	0	1.00
4	2.39	.81	0	0	.31	.06	.42	0	7.76	.96	0	.15
5	2.84	9.86	.70	0	1.04	.65	.48	0	10.1	1.02	0	.01
6	1.34	6.03	.12	0	.64	3.49	2.63	0	4.52	3.29	0	0
7	3.55	.90	0	0	.64	2.24	4.48	0	1.95	6.68	0	0
8	.54	.15	0	0	5.39	.95	5.34	0	.41	.69	.06	0
9	.05	1.68	0	0	1.19	1.47	8.66	0	.04	7.17	.69	0
10	0	.72	0	0	.07	.69	5.86	0	0	4.45	2.30	.28
11	.01	2.80	.96	0	0	.88	2.44	8.04	1.55	2.39	1.53	.07
12	0	.90	1.20	0	0	.40	9.33	18.9	1.10	.72	1.02	.55
13	0	.43	.18	0	0	4.08	7.50	30.2	.13	.52	1.97	1.10
14	0	0	1.05	0	0	7.63	5.05	9.33	0	5.23	2.24	2.21
15	0	2.25	.18	0	0	2.72	1.41	2.22	0	1.69	1.41	3.88
16	0	.84	0	0	0	2.04	1.98	26.4	0	4.22	.40	3.87
17	0	.15	0	0	0	30.9	3.05	2.96	.04	4.34	.40	1.63
18	0	2.13	0	0	0	6.19	1.76	2.15	.13	5.31	1.09	.39
19	0	.25	0	0	0	.54	.43	2.51	.33	.84	2.75	.12
20	.02	0	0	0	0	.13	.26	2.11	1.34	1.67	1.81	.02
21	0	1.20	0	0	0	2.77	.15	.30	.22	1.58	2.74	.43
22	0	.56	0	0	0	3.42	.07	.03	0	.68	7.41	4.41
23	0	0	0	0	.97	.96	.04	1.68	5.45	2.24	2.25	5.22
24	0	0	.82	0	1.63	2.68	.02	.36	4.23	1.98	.43	1.17
25	0	5.38	1.29	0	1.62	.91	0	.04	.71	.49	.08	1.06
26	0	1.57	.15	.10	1.47	1.95	0	0	.15	.08	0	1.14
27	0	.43	.76	.66	.19	.56	0	0	.50	0	.06	3.46
28	0	.26	.04	.38	.74	.17	0	0	.13	0	0	6.11
29	.12	.03	0	0	1.52	0	.07	0	0	0	0	1.75
30	0	0	0	0	*1.66	0	0	0	0	0	0	1.41
31	0	0	-----	4.28	-----	0	0	-----	0	-----	0	-----
Total	19.08	40.35	7.45	5.42	25.37	87.15	61.43	107.23	46.84	58.24	30.64	42.79
Mean:												
mgd	0.615	1.30	0.248	0.175	0.846	2.81	1.98	3.70	1.51	1.94	0.988	1.43
cfs	0.952	2.01	0.384	0.271	1.31	4.35	3.06	5.72	2.34	3.00	1.53	2.21
Ac-ft	59	124	23	17	78	267	189	329	144	179	94	151

Calendar year 1959: Max 43.0 Min 0 Mean(mgd) 1.37 Mean(cfs) 2.12 Ac-ft 1,550

Fiscal year 1959-60: Max 30.9 Min 0 Mean(mgd) 1.45 Mean(cfs) 2.24 Ac-ft 1,630

Peak discharge (base, 100 mgd).--Feb. 16 (6:30 a.m.) 142 mgd (220 cfs), 4.50 ft.

* Discharge measurement made on this day.

4160. Punaula Gulch near Pukoo

Location.--Lat 21°05'50", long 156°48'48", on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

Drainage area.--0.24 sq mi.

Records available.--March 1947 to June 1960. Prior to July 1958 published as Punaula Stream near Pukoo.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--13 years, 0.809 mgd (1.25 cfs).

Extremes.--Maximum discharge during year, 240 mgd (371 cfs) Feb. 16 (gage height, 4.97 ft), from rating curve extended above 3.3 mgd by test on model of station site; minimum, 0.04 mgd (0.06 cfs) Feb. 5, 6, 8.
1947-60: Maximum discharge, 330 mgd (511 cfs) Apr. 2, 1948 (gage height, 6.35 ft), from rating curve extended above 3.3 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) Mar. 13, 1947, Feb. 19, 1954.

Remarks.--Records fair.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.45	0.03	1.2	5.80
.6	.18	1.4	9.80
.8	.81	1.6	14.7
1.0	2.60	1.8	20.7

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	0.09	0.13	*0.49	2.38	1.09	0.11	0.06	0.07	0.15	0.09	0.15
2	.10	.08	.11	.50	2.02	*.46	.10	.06	.08	1.75	.09	.13
3	.74	.06	.10	.18	2.40	.21	.12	.06	1.89	.21	.11	.10
4	.50	.11	.74	.11	.79	.44	.93	.05	3.84	1.01	.22	.09
5	2.12	.23	3.92	.10	.45	1.60	.25	.04	19.0	.81	.11	.08
6	.35	.23	.38	.09	.35	1.75	.87	.04	2.42	1.93	.09	.07
7	.23	.18	.83	.09	3.52	.71	.47	.05	.77	2.34	*.09	.07
8	.13	.09	.39	.15	6.29	.35	.54	.04	.27	.35	.13	.07
9	.09	.26	.15	.09	.86	.46	1.63	.05	.15	4.78	.35	.06
10	.07	.13	.15	.08	.61	.25	1.12	.05	.11	1.60	2.37	1.71
11	.31	1.46	1.70	.06	1.03	.35	.62	1.93	1.05	2.02	.67	.23
12	.19	.32	.97	.09	.58	.25	1.82	.97	.50	.66	1.04	.13
13	.16	.13	.27	.38	.35	1.59	1.49	1.51	.15	.30	.41	.49
14	.10	.08	1.04	.35	.21	4.26	1.38	2.15	.11	.47	1.31	.56
15	.13	2.84	.23	.13	.15	.83	.44	1.54	.09	.41	1.09	1.48
16	.13	.48	.15	.08	.12	.44	.46	12.5	*.08	4.47	.41	.50
17	.19	.74	.11	.07	.11	2.88	.74	.75	.09	1.12	.23	.75
18	.16	3.35	.10	.06	.13	1.61	1.12	4.36	.13	2.63	.16	.21
19	.09	.45	.09	.05	.11	.32	.23	1.95	1.90	.47	.31	.13
20	.18	.18	.08	.05	.10	.19	.35	.82	1.47	.62	.35	.08
21	.11	.13	.08	1.22	.20	.38	.16	.23	.41	.50	.32	.15
22	.08	.11	.09	.15	.12	.55	.11	.15	.40	.82	1.96	1.71
23	.06	.09	.09	.40	.51	.35	.10	.21	3.18	.50	.58	3.33
24	.06	.08	2.42	2.50	.53	2.49	.09	.13	2.25	.62	1.44	1.05
25	.06	.18	.50	.80	.37	.44	.07	.10	.32	.30	.82	.70
26	.06	.41	2.02	.49	.33	1.14	.06	.08	.18	.21	.44	2.90
27	.06	.25	2.43	.75	.13	.41	*.06	.07	.21	.18	.23	2.28
28	.05	.47	.86	.38	.10	.27	.11	.06	.36	.13	.18	2.87
29	.94	.65	.97	.18	.19	.32	.15	.06	.32	.12	.15	.71
30	.15	.23	.97	.13	.16	.19	.08	-----	.40	1.10	.11	.50
31	.06	.13	-----	1.46	-----	.15	.07	-----	.18	-----	.12	-----
Total	8.21	14.22	22.07	11.46	25.20	26.73	15.85	30.07	42.38	31.36	15.98	23.89
Mean	0.265	0.459	0.736	0.370	0.840	0.862	0.511	1.04	1.37	1.05	0.515	0.796
cfs	0.410	0.710	1.14	0.572	1.30	1.33	0.791	1.61	2.12	1.62	0.797	1.23
Ac-ft	25	44	68	35	77	82	49	92	130	96	49	73

Calendar year 1959: Max 11.7 Min 0.05 Mean(mgd) 0.676 Mean(cfs) 1.05 Ac-ft 757
Fiscal year 1959-60: Max 19.0 Min 0.04 Mean(mgd) 0.731 Mean(cfs) 1.13 Ac-ft 820

Peak discharge (base, 70 mgd).--Feb. 16 (6:30 a.m.) 240 mgd (371 cfs), 4.97 ft; Mar. 5 (9 p.m.) 187 mgd (289 cfs), 4.33 ft.

* Discharge measurement made on this day.

5010. Palikea Stream below diversion dam, near Kipahulu

Location.--Lat 20°41'05", long 156°04'10", on left bank just downstream from old diversion dam, 2 miles northwest of Kipahulu and 2.1 miles (revised) upstream from mouth.

Drainage area.--66.29 sq mi.

Records available.--February 1927 to September 1929, December 1931 to June 1960. Published as Oheo Stream at elevation 1,550 ft, near Kipahulu, 1927-29. Published as Oheo Stream below diversion dam, near Kipahulu, 1930-56.

Gage.--Water-stage recorder. Datum of gage is 1,546 ft above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft upstream at different datum.

Average discharge.--25 years (1927-29, 1932-35, 1940-60), 36.3 mgd (56.2 cfs).

Extremes.--Maximum discharge during year, 2,300 mgd (3,560 cfs) Apr. 16 (gage height, 9.75 ft), from rating curve extended above 2,100 mgd by critical-depth measurement of gage height 17.5 ft; minimum, 0.02 mgd (0.03 cfs) June 27, 28.
1927-29, 1931-60: Maximum discharge, 9,100 mgd (14,100 cfs) Dec. 20, 1955 (gage height, 17.5 ft, from floodmark), from rating curve extended above 2,100 mgd by critical-depth measurement of peak flow; no flow at times.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
1155	1932	Feb. 13, 1932	2,450	3,790	10.00
1155	1933	Jan. 4, 1933	3,760	5,820	11.95
1155	1934	Dec. 22, 24, 1933	2,450	3,790	10.00
1155	1935	July 6, 1934	2,420	3,740	10.59
1155	1937	Dec. 29, 1936	2,260	3,500	10.30
1155	1938	Jan. 20, 1938	3,510	5,430	12.40
1155	1940	Sept. 3, 1939	2,310	3,570	9.76
935	1941	Oct. 22, 1940	2,290	3,540	9.74
965	1942	June 18, 1942	2,320	3,590	9.79
985	1943	Dec. 14, 1942	2,750	4,250	10.50
1015	1944	Mar. 4, 1944	2,570	3,980	10.20
1045	1945	Apr. 7, 1945	2,250	3,480	9.65
1065	1946	Feb. 7, 1946	2,250	3,480	9.66
1095	1947	Dec. 8, 1946	4,450	6,690	12.93
1125	1948	Oct. 26, 1947	3,510	5,430	11.58
1155	1949	Dec. 1, 1948	2,330	3,610	9.80
1185	1950	Dec. 17, 1949	2,260	3,500	9.68
1249	1952	Mar. 4, 1952	2,330	3,610	9.80
1289	1953	Feb. 28, 1953	2,270	3,510	9.70
1349	1954	Mar. 1, 1954	1,770	2,740	8.72
1569	1957	Oct. 15, 1956	2,400	3,710	9.92
1569	1958	Aug. 24, 1957	2,370	3,670	9.87

Remarks.--Records good except those for period of no gage-height record, which are poor. Small diversion below station for domestic water supply and livestock.

Revisions (fiscal years).--WSP 1155: 1932-35(M), 1937-40(M). WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1932, 1933, 1934, 1937-40, 1948, and 1951, superseding those published in WSP 740, 755, 770, 835, 865, 885, 905, 1125, and 1219, and revised peak discharge for the fiscal years 1949-50, 1952-54, and 1956-58, superseding figures published in WSP 1155, 1185, 1249, 1289, 1349, 1449, 1519, and 1569, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1932		1932-Con.		1933-Con.		1936	
Jan. 1	136	Apr. 30	682	Feb. 21	170	Dec. 29	1,080
2	175	Dec. 2	127	26	223	30	544
9	194	24	102	27	172		
10	186	25	110	28	404	1937	
11	140	28	119	Mar. 4	325	Jan. 13	530
13	169	29	71	6	138	Feb. 18	938
18	123	31	409	7	536	Mar. 18	837
19	394			Nov. 25	126	19	729
20	236	1933		26	120	Apr. 29	518
21	153	Jan. 1	652	Dec. 22	663	Aug. 2	562
Feb. 4	800	3	565	23	451		
9	342	4	879	24	268	1938	
10	451	5	271			Aug. 24	435
11	748	6	77	1934		Dec. 20	710
12	618	16	158	Jan. 2	142		
13	579	17	188	20	102	1939	
14	178	18	160	23	165	Sept. 3	214
17	182	19	151	24	132		
21	243	20	131	25	184	1947	
22	788	24	102	Apr. 25	718	Oct. 26	800
27	114	30	125	May 14	215		
28	364	31	426	15	166	1948	
29	367	Feb. 11	162	June 4	204	Jan. 25	800
Apr. 1	204	12	118	19	160		
6	142	16	179	20	190	1950	
23	70	19	137			Dec. 3	277
24	137	20	138			4	180

5010. Palikea Stream below diversion dam, near Kipahulu--Continued

Revised figures of monthly discharge, in million gallons a day, 1932-34,
1937-40, 1948, 1951

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
January 1932.....	-	394	0.33	92.8	144	8,830
February.....	-	800	3.3	260	402	23,100
April.....	-	682	.72	71.1	110	6,550
December 1932.....	-	409	.50	39.9	61.7	3,790
Calendar year 1932.....	-	800	.02	54.6	84.5	61,290
January 1933.....	-	879	-	148	229	14,110
February.....	-	404	-	75.3	117	6,470
March.....	-	536	.18	51.6	79.8	4,910
Fiscal year 1932-33.....	-	879	.02	44.5	68.9	49,820
November 1933.....	-	126	.01	8.37	13.0	771
December.....	-	663	.02	49.8	77.1	4,740
Calendar year 1933.....	-	879	.01	37.8	58.5	42,350
January 1934.....	-	184	.19	33.8	52.3	3,210
April.....	-	718	0	33.3	51.5	3,070
May.....	-	235	.46	26.4	40.8	2,510
June.....	-	204	.73	50.1	77.5	4,610
Fiscal year 1933-34.....	-	718	0	18.7	28.9	21,000
Calendar year 1934.....	-	718	0	28.5	44.1	33,920
December 1936.....	-	1,080	.07	138	214	13,150
January 1937.....	2,877.04	530	.64	92.8	144	8,830
February.....	2,737.38	938	1.35	97.8	151	8,400
March.....	2,627.51	857	.76	84.8	131	8,060
April.....	1,993.86	518	.26	66.5	103	6,120
August 1937.....	2,066.96	623	.12	66.7	103	6,340
August 1938.....	1,546.90	435	.20	49.9	77.2	4,750
September 1939.....	851.75	202	.48	28.4	43.9	2,610
October 1947.....	953.67	800	.03	30.8	47.7	2,930
Calendar year 1947.....	11,544.94	800	.02	31.6	48.9	34,530
January 1948.....	2,107.96	800	.07	70.0	108	6,470
Calendar year 1948.....	19,612.63	800	.04	53.6	82.9	60,200
Fiscal year 1947-48.....	17,368.43	800	.03	47.5	73.8	53,310
December 1950.....	765.22	277	.10	24.7	38.2	2,350
Calendar year 1950.....	-	609	.02	35.9	55.5	40,210
Fiscal year 1950-51.....	-	785	.02	39.5	61.1	44,270

Revised peak discharge.--1947-48: Oct. 26 (11 a.m.) 3,520 mgd (5,450 cfs); Nov. 15 (5 a.m.) 1,690 mgd (2,610 cfs); Jan. 25 (9 p.m.) 2,390 mgd (3,700 cfs); Feb. 24 (12 p.m.) 2,100 mgd (3,250 cfs); Apr. 4 (1:30 p.m.) 2,330 mgd (3,610 cfs).
1948-49: Aug. 16 (9 a.m.) 2,270 mgd (3,510 cfs); Nov. 27 (10:30 p.m.) 1,900 mgd (2,940 cfs); Dec. 1 (2 a.m.) 2,330 mgd (3,610 cfs); Feb. 8 (6 a.m.) 1,690 mgd (2,610 cfs).
1949-50: Dec. 17 (10 p.m.) 2,260 mgd (3,500 cfs), 9.68 ft; Jan. 11 (10 a.m.) 1,750 mgd (2,680 cfs), 8.63 ft; Feb. 22 (2 a.m.) 2,050 mgd (3,170 cfs), 9.30 ft; Apr. 27 (4 p.m.) 2,020 mgd (3,130 cfs), 9.25 ft.
1950-51: Aug. 24 (1 p.m.) 1,700 mgd (2,630 cfs), 8.55 ft; Nov. 15 (2 p.m.) 2,310 mgd (3,570 cfs), 9.76 ft; Dec. 3 (11 p.m.) 5,740 mgd (8,890 cfs), 14.85 ft; Feb. 19 (5 a.m.) 2,110 mgd (3,260 cfs), 9.42 ft; Mar. 5 (10 p.m.) 1,630 mgd (2,520 cfs), 8.40 ft; Mar. 13 (11 p.m.) 2,040 mgd (3,160 cfs), 9.29 ft; Mar. 22 (9 a.m.) 1,820 mgd (2,820 cfs), 9.03 ft.
1951-52: Aug. 7 (2 a.m.) 2,190 mgd (3,390 cfs), 9.56 ft; Oct. 25 (8 p.m.) 1,820 mgd (2,820 cfs), 8.82 ft; Oct. 30 (7 p.m.) 2,140 mgd (3,310 cfs), 9.49 ft; Dec. 12 (1 a.m.) 1,660 mgd (2,570 cfs), 8.46 ft; Dec. 31 (1 p.m.) 2,270 mgd (3,510 cfs), 9.70 ft; Jan. 19 (11 p.m.) 1,770 mgd (2,740 cfs), 8.71 ft; Mar. 4 (3:30 p.m.) 2,330 mgd (3,610 cfs), 9.80 ft.
1952-53: Nov. 21 (12:30 a.m.) 2,250 mgd (3,480 cfs), 9.67 ft; Feb. 28 (7 p.m.) 2,270 mgd (3,510 cfs), 9.70 ft; Mar. 4 (5:30 p.m.) 2,080 mgd (3,220 cfs), 9.37 ft; Mar. 13 (1 a.m.) 1,780 mgd (2,750 cfs), 8.73 ft.
1953-54: Mar. 1 (10 p.m.) 1,770 mgd (2,740 cfs), 8.72 ft.
1955-56: Dec. 20 (3 a.m.) 9,100 mgd (14,100 cfs), 17.5 ft; Feb. 18 (2:30 p.m.) 1,620 mgd (2,510 cfs), 8.38 ft; Feb. 25 (6:30 p.m.) 2,330 mgd (3,610 cfs), 9.80 ft.
1956-57: Oct. 15 (1:30 p.m.) 2,400 mgd (3,710 cfs), 9.92 ft; Dec. 6 (10:30 a.m.) 1,800 mgd (2,790 cfs), 8.98 ft; Feb. 5 (1 p.m.) 1,870 mgd (2,890 cfs), 8.94 ft.
1957-58: Aug. 24 (7 a.m.) 2,370 mgd (3,670 cfs), 9.87 ft; Dec. 3 (time unknown) 2,100 mgd (3,250 cfs), 9.40 ft (from floodmark); Feb. 27 (4 p.m.) 2,270 mgd (3,510 cfs), 9.70 ft; Mar. 6 (12:30 p.m.) 1,760 mgd (2,720 cfs), 8.70 ft.

5010. Palikea Stream below diversion dam, near Kipahulu--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.0	0	1.3	18.5
.1	.05	1.6	30.5
.2	.22	2.0	52.0
.3	.57	2.5	90.0
.4	1.14	3.0	140
.5	1.85	4.0	275
.6	3.00	5.0	470
.8	5.90	6.0	720
1.0	10.0		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Da.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.71	6.44	0.86	1.85	160	20.7	0.77	0.09	0.23	161	0.22	0.54
2	4.15	21.0	.31	.65	187	31.3	.62	.07	.09	4.76	.24	1.62
3	51.5	5.50	.25	.37	134	4.95	35.0	.05	.80	.93	52.6	.87
4	31.0	5.36	2.93	.25	22.0	20.9	205	.04	.37	.53	53.0	.31
5	<u>82.3</u>	<u>461</u>	13.8	.15	21.8	264	32.5	.03	34.2	.37	2.26	.22
6	32.8	316	1.42	.11	17.8	154	282	.02	21.3	.31	.45	.19
7	27.9	67.5	.37	.08	171	56.8	188	.02	1.88	.70	.54	.11
8	1.06	7.17	.31	.26	89.9	29.4	154	.02	.37	.51	.28	.08
9	.17	3.04	*.14	.13	5.86	66.0	223	.02	.19	4.42	.19	.05
10	.09	7.11	<u>.09</u>	.09	25.6	36.1	302	.02	.15	57.9	10.3	5.05
11	6.30	3.70	27.1	a6.0	37.5	14.0	328	.03	.19	99.3	1.36	.28
12	.30	.90	31.5	a2.0	10.0	<u>1.28</u>	446	403	.19	34.1	192	.29
13	.05	.37	1.86	a.5	29.2	50.5	540	<u>550</u>	.08	95.4	106	4.50
14	.04	.22	16.2	a3.0	2.89	150	<u>654</u>	374	.04	582	214	41.6
15	27.2	111	.72	a.6	1.14	24.7	306	105	<u>.03</u>	161	<u>260</u>	23.9
16	8.26	4.09	.22	a.2	.62	31.7	131	517	.24	<u>591</u>	15.7	27.5
17	.32	.84	.28	a.09	.45	<u>302</u>	69.3	65.8	.08	200	16.0	20.6
18	8.42	93.6	.22	a.04	.53	107	65.3	57.6	.04	147	10.9	1.30
19	.11	3.36	.11	a.03	.31	20.5	4.63	13.4	.07	10.8	5.08	.44
20	.11	.53	.11	a5.0	.57	11.8	1.86	2.76	17.2	85.6	72.0	.19
21	.04	.37	.09	a8.0	1.33	30.8	1.42	.82	3.48	73.6	9.60	9.57
22	.04	.28	.19	a.1	.37	52.8	1.00	.53	13.9	12.2	38.8	52.3
23	.03	.15	.24	.04	.15	12.2	.72	.37	.73	21.3	19.4	101
24	<u>.02</u>	<u>.50</u>	<u>102</u>	.17	.08	9.47	.62	.28	.31	75.3	42.1	34.4
25	.02	48.8	12.9	.07	.05	4.01	.53	.19	.17	7.46	8.18	10.2
26	.31	23.8	17.3	.05	.05	7.67	*.41	.13	.09	1.40	22.9	31.3
27	.07	2.74	23.2	1.56	.05	69.0	.34	.08	.45	*.76	16.3	53.9
28	.04	11.9	5.89	15.7	.05	19.6	.31	.09	9.03	.53	2.38	291
29	15.2	8.97	52.2	20.8	5.04	154	.31	.46	4.84	.37	.88	67.6
30	.25	12.6	17.0	10.3	2.23	6.30	.19	-----	<u>83.3</u>	.31	.62	18.7
31	.07	3.17	-----	2.18	-----	1.35	<u>.13</u>	-----	56.9	-----	.78	-----
Total	301.88	1,227.01	329.41	80.37	925.57	1,764.83	3,984.96	2,091.92	250.94	2,250.86	1,175.06	799.61
Mean:												
mgd	9.74	39.6	11.0	2.59	30.8	56.9	128	72.1	8.09	75.0	37.9	26.6
cfs	15.1	61.3	17.0	4.01	47.7	88.0	198	112	12.5	116	58.6	41.2
Ac-ft	926	3,770	1,010	247	2,840	5,420	12,230	6,420	770	6,910	3,610	2,450
Calendar year 1959: Max	700			Min	0.02		Mean(mgd)	27.4	Mean(cfs)	42.4	Ac-ft	30,650
Fiscal year 1959-60: Max	664			Min	0.02		Mean(mgd)	41.5	Mean(cfs)	64.2	Ac-ft	46,600

Peak discharge (base, 1,600 mgd).--Aug. 5 (9 p.m.) 1,660 mgd (2,570 cfs), 8.46 ft; Feb. 13 (10 a.m.) 1,730 mgd (2,680 cfs), 8.62 ft; Apr. 16 (3 a.m.) 2,500 mgd (3,560 cfs), 9.75 ft; May 12 (8 a.m.) 1,840 mgd (2,850 cfs), 8.86 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Hahalawe Stream near Kipahulu.

5020. Right Branch Hahalawe Stream near Kipahulu

Location.--Lat 20°40'54", long 156°02'50", on left bank at old ditch intake, 0.7 mile upstream from mouth and 1.8 miles northeast of Kipahulu Church.

Drainage area.--0.43 sq mi.

Records available.--February 1927 to April 1937, April 1938 to June 1960. Prior to July 1956, published as Right Branch Kahalowe Stream near Kipahulu.

Gage.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to Apr. 21, 1938, at same site at datum 8 ft lower.

Average discharge.--30 years (1927-34, 1935-36, 1938-60), 3.52 mgd (5.45 cfs).

Extremes.--Maximum discharge during year, 295 mgd (456 cfs) Apr. 16 (gage height, 3.30 ft), from rating curve extended above 54 mgd by test on model of station site; minimum, 0.55 mgd (0.85 cfs) Feb. 10, 11, 1927-37, 1938-60; Maximum discharge, 2,300 mgd (3,560 cfs) Apr. 29, 1937 (gage height, 15.74 ft, datum then in use), from rating curve extended above 54 mgd by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Dec. 18, 1929.

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

Revisions (fiscal years).--WSP 1219: 1935(M), 1937(M).

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.8	0.35	1.5	6.80
.9	.62	1.7	12.4
1.0	1.01	2.0	28.7
1.1	1.54	2.3	54.0
1.3	3.30		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.11	2.71	1.80	2.75	6.37	4.30	1.8	0.83	1.40	2.68	1.01	1.54
2	1.52	4.06	1.47	2.20	20.3	2.05	1.5	.75	.92	1.80	1.05	4.66
3	1.67	1.60	1.41	1.80	13.2	1.35	2.5	.75	1.67	1.25	4.84	2.23
4	2.01	2.76	3.38	1.54	3.30	2.96	9.0	.71	1.10	1.05	6.54	1.47
5	4.29	2.39	3.74	1.60	2.40	19.1	3.5	.68	11.0	1.25	1.30	1.60
6	1.66	9.52	2.94	1.41	3.08	11.0	14.0	.68	5.54	2.15	1.10	1.66
7	1.86	9.83	1.80	1.30	18.4	3.30	8.0	.65	1.87	6.01	1.10	1.30
8	1.25	2.17	1.54	1.73	6.12	1.87	4.0	.62	1.30	1.66	.97	1.15
9	1.01	1.66	*1.30	1.47	2.45	2.56	7.0	.58	1.05	4.12	.92	1.01
10	.83	1.83	1.30	1.25	1.35	2.89	10.0	.55	.92	4.05	8.28	5.38
11	3.62	4.49	4.31	3.83	18.9	1.8	12	.90	2.48	6.39	2.20	1.25
12	1.15	1.73	4.39	2.17	4.49	1.2	15	6.18	1.15	2.55	12.0	1.82
13	1.01	1.47	1.87	1.54	7.05	1.9	18	14.0	.83	3.97	1.80	2.58
14	.83	1.30	4.81	2.47	2.45	7.0	35	9.68	.75	5.74	5.76	*1.98
15	1.95	13.4	1.66	1.35	2.05	3.0	15	5.05	.78	6.86	6.84	4.15
16	1.77	1.95	1.35	1.10	1.66	2.3	9.0	27.5	3.86	30.0	2.10	4.70
17	2.42	1.82	1.30	1.15	1.54	15.0	6.0	3.72	.87	4.80	1.80	2.32
18	3.06	6.32	1.30	1.01	1.73	6.0	5.0	3.09	.79	4.78	1.87	1.66
19	1.25	1.80	1.20	.92	1.47	3.0	2.5	4.88	2.20	2.20	1.41	1.54
20	1.30	1.47	1.20	7.29	2.30	2.0	2.0	1.87	5.80	2.40	1.80	1.35
21	*1.01	1.30	1.10	8.02	1.87	3.0	1.8	1.47	2.14	2.40	1.60	1.68
22	.87	1.20	2.07	*1.47	1.80	5.0	1.6	1.20	10.5	1.95	6.17	6.59
23	.79	1.10	1.98	1.54	1.30	3.5	1.4	1.05	1.73	1.87	2.58	13.5
24	.71	1.50	14.4	4.05	1.10	2.5	1.2	.97	1.30	4.08	6.18	5.79
25	.68	4.59	2.69	1.54	1.01	2.0	1.2	.92	1.10	1.80	2.56	2.40
26	2.06	3.98	7.32	1.41	.92	2.5	*1.1	.83	.92	1.60	3.20	3.62
27	.87	1.80	12.4	3.47	.87	5.0	1.10	.79	1.58	1.41	2.10	3.52
28	.84	2.93	4.62	2.14	.87	3.0	1.10	.83	3.93	1.25	1.60	12.8
29	4.30	3.35	10.6	3.04	1.15	7.0	1.05	3.16	3.14	1.15	1.60	7.19
30	1.55	5.52	5.26	2.01	1.54	3.5	.92	-----	2.64	1.08	1.47	2.55
31	1.05	1.60	-----	1.54	-----	2.5	.87	-----	2.00	-----	1.73	-----
Total	54.30	101.15	106.41	70.11	145.49	134.08	194.14	94.89	77.26	114.27	95.48	104.99
Mean:												
mgd	1.75	3.26	3.55	2.26	4.85	4.35	6.26	3.27	2.49	3.81	3.08	3.50
cfs	2.71	5.04	5.49	3.50	7.50	6.70	9.69	5.06	3.85	5.89	4.77	5.42
Ac-ft	167	310	327	215	446	411	596	291	237	351	293	322

Calendar year 1959: Max 45.0 Min 0.68 Mean(mgd) 3.16 Mean(cfs) 4.89 Ac-ft 3,540
 Fiscal year 1959-60: Max 35.0 Min 0.55 Mean(mgd) 3.53 Mean(cfs) 5.46 Ac-ft 3,970

Peak discharge (base, 200 mgd).--Nov. 2 (3 a.m.) 236 mgd (365 cfs), 3.11 ft; Feb. 16 (4:30 a.m.) 203 mgd (314 cfs), 3.00 ft; Apr. 16 (2:30 a.m.) 295 mgd (456 cfs), 3.30 ft.

* Discharge measurement made on this day.
 Note.--No gage-height record Dec. 11 to Jan. 26; discharge estimated on basis of record for Palikea Stream.

5060. Makapipi ditch near Nahiku

Location--Lat 20°48'17", long 156°06'25", on right bank at entrance to tunnel No. 1, 1.8 miles south of Nahiku and 4.7 miles southeast of Keanae.

Records available--July 1948 to June 1960.

Gage--Water-stage recorder and Parshall flume. Datum of gage is 1,300 ft above mean sea level (by vertical angles).

Average discharge--12 years, 2.95 mgd (4.56 cfs).

Extremes--1948-60: Maximum daily discharge, 7.8 mgd (12.1 cfs) Nov. 21, 1951; minimum daily, 0.42 mgd (0.65 cfs) Mar. 22, 23, 25, Apr. 13, 14, 1958.

Remarks--Records good.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*1.38	1.55	2.78	1.66	2.74	3.98	3.36	1.76	2.21	4.14	3.00	2.28
2	1.31	2.26	2.85	1.60	2.85	3.58	3.14	1.71	2.10	4.06	2.78	2.15
3	1.31	1.76	2.85	1.55	2.28	2.72	3.00	1.60	1.93	3.98	2.59	2.10
4	1.31	2.50	2.92	1.50	2.15	2.65	3.36	1.55	2.26	3.90	2.46	1.98
5	1.71	4.18	2.85	1.50	1.98	3.40	3.00	1.50	3.09	4.06	2.28	1.88
6	1.66	3.66	2.78	1.46	1.88	5.15	3.14	1.46	3.21	4.14	2.15	1.76
7	2.42	4.06	2.72	1.41	1.98	5.33	3.58	1.41	2.85	4.56	2.04	1.71
8	1.76	3.98	2.59	1.36	2.10	4.98	3.90	1.36	2.65	4.98	1.93	1.66
9	1.71	3.98	2.46	1.36	2.10	4.38	4.14	1.31	2.46	4.90	1.94	1.60
10	1.66	3.98	2.34	1.31	2.04	3.99	4.30	1.26	2.34	4.81	3.14	1.55
11	1.71	4.06	2.34	1.26	1.93	3.90	4.56	2.01	2.21	5.15	3.43	1.50
12	1.71	3.90	2.34	1.22	1.82	3.50	4.98	3.08	2.10	5.15	3.98	1.46
13	1.66	3.50	2.21	1.22	1.71	3.50	5.60	3.37	1.93	4.98	4.22	1.41
14	1.66	3.21	2.28	1.17	1.66	4.06	5.96	3.58	1.82	4.81	4.30	1.36
15	3.20	4.06	2.21	1.12	1.50	4.14	5.87	4.06	1.71	5.33	4.30	*1.36
16	2.53	4.06	2.21	1.12	1.55	4.47	5.33	5.33	1.71	6.50	4.30	1.36
17	2.28	3.90	2.15	1.08	1.46	4.64	4.90	5.60	1.60	7.00	4.14	1.36
18	2.34	4.30	2.04	1.04	1.41	4.14	4.56	5.24	1.60	6.50	3.98	1.31
19	2.34	4.38	1.98	1.04	1.36	4.22	4.22	4.81	2.45	5.78	3.90	1.26
20	2.34	4.06	1.88	1.00	1.31	4.14	3.98	4.38	2.72	5.24	3.82	1.22
21	2.28	3.66	1.82	*.96	1.26	4.14	3.66	3.98	2.65	4.72	3.74	1.22
22	*2.15	3.43	1.76	.96	1.22	4.06	3.36	3.82	2.53	4.47	3.66	1.53
23	2.10	3.21	1.71	.92	1.26	3.98	3.21	3.58	3.03	4.22	3.58	3.21
24	1.98	3.00	1.71	.92	1.26	3.90	3.00	3.43	3.74	4.14	3.50	3.21
25	1.88	2.78	1.66	.92	1.17	3.82	2.72	3.21	3.82	3.98	3.36	2.92
26	1.76	2.59	1.71	.92	1.12	3.90	2.53	3.00	3.82	3.90	3.21	3.14
27	1.66	2.46	1.82	.88	1.12	3.98	*2.40	2.72	3.66	3.74	3.07	3.50
28	1.60	2.76	1.82	.88	1.17	4.06	2.28	2.40	3.82	3.64	2.85	4.14
29	1.66	2.78	1.76	.92	1.17	4.06	2.15	2.34	4.06	3.45	2.72	4.38
30	1.55	2.65	1.71	.92	1.48	3.90	1.98	-----	4.14	3.28	2.59	4.64
31	1.50	2.72	-----	1.84	-----	3.58	1.88	-----	4.14	-----	2.46	-----
Total	58.12	103.38	66.26	37.02	50.14	124.25	114.05	84.86	84.36	139.49	99.42	64.16
Mean	1.87	3.33	2.21	1.19	1.67	4.01	3.68	2.93	2.72	4.65	3.21	2.14
cfs	2.89	5.15	3.42	1.84	2.58	6.20	5.69	4.53	4.21	7.19	4.97	3.31
Ac-ft	178	317	203	114	154	381	350	260	259	428	305	197

Calendar year 1959: Max 5.33 Min 0.88 Mean(mgd) 2.61 Mean(cfs) 4.04 Ac-ft 2,920
 Fiscal year 1959-60: Max 7.00 Min 0.88 Mean(mgd) 2.80 Mean(cfs) 4.33 Ac-ft 3,150

* Discharge measurement made on this day.

5080. Hanawi Stream near Nahiku

Location.--Lat 20°48'35", long 156°07'00", on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

Drainage area.--3.49 sq mi.

Records available.--January 1914 to January 1916, November 1921 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Jan. 9, 1914, to Jan. 6, 1916, at site 50 ft downstream in same pool at datum 0.12 ft lower.

Average discharge.--39 years (1914-15, 1922-60), 14.7 mgd (22.7 cfs).

Extremes.--Maximum discharge during year, 2,180 mgd (3,370 cfs) Apr. 16 (gage height, 9.20 ft, from floodmark in well), from rating curve extended above 260 mgd by test on model of station site; minimum, 1.34 mgd (2.07 cfs) Oct. 23, 26, Nov. 19, 20.

1914-16, 1921-60: Maximum discharge, about 3,600 mgd (5,570 cfs) Jan. 18, 1916 (gage height, 11.6 ft, at present site), from rating curve extended above 260 mgd by test on model of station site; minimum, 1.1 mgd (1.7 cfs) Feb. 19, 20, 1944.

Revisions.--The maximum discharge for the fiscal year 1915 has been revised to 1,300 mgd (2,010 cfs) Dec. 4, 1914 (gage height, 7.5 ft), superseding figure published in WSP 430.

Remarks.--Records fair except those for periods of fragmentary gage-height record, which are poor. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1045: 1922-43(M). WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, and 1942-43, superseding those published in WSP 555, 595, 615, 655, 710, 725, 740, 755, 770, 795, 835, 885, 905, 965 and 985, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1921		1924-Con.		1932-Con.		1937-Con.	
Nov. 19	58	Feb. 13	248	Feb. 12	139	Feb. 14	129
20	91	14	175	13	239	16	178
21	244	Oct. 16	211	14	102	18	346
22	283	Nov. 21	524	27	239		
25	96	22	98			1939	
26	222			1933		Feb. 27	521
Dec. 12	239	1926		Mar. 6	80	28	144
13	705	Nov. 14	173	7	321	Mar. 2	105
24	271			8	108	4	273
		1929		Nov. 25	279	Sept. 3	82
1922		Nov. 17	102	26	101		
Jan. 4	68	25	62			1941	
19	147	Dec. 16	82	1934		Oct. 6	171
21	102	18	205	Apr. 5	64	7	82
27	128	19	262	24	44	8	190
30	343	20	102	25	640	9	364
31	629	27	82	July 6	145	11	101
Feb. 1	284	30	119			23	153
2	148			1935			
28	245	1930		Feb. 25	606	1942	
		Jan. 3	93	26	408	Mar. 8	254
1923		30	283	27	325	9	700
Oct. 27	153	Nov. 17	127	Mar. 12	207	10	494
28	78	18	327			11	187
29	112	19	102	1936		12	216
Dec. 7	59			Dec. 22	144	13	219
15	162	1931		28	150	14	449
16	129	Nov. 14	72	29	424	27	133
18	261	15	96	30	289	Dec. 13	24.5
19	83			31	233	14	281
1924		1932				18	135
Feb. 12	68	Feb. 10	140	1937		29	45
		11	199	Feb. 13	107		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
November 1921.....	-	283	-	48.6	75.2	4,470
December.....	-	705	8.8	70.8	110	6,740
Calendar year 1921.....	-	-	-	-	-	-
January 1922.....	-	629	6.7	65.0	101	6,190
February.....	-	-	5.8	50.4	78.0	4,330
Fiscal year 1921-22.....	-	-	-	-	-	-
Calendar year 1922.....	-	-	1.6	18.2	28.2	20,420
October 1923.....	-	153	2.4	16.1	24.9	1,530
December.....	-	261	3.9	37.3	57.7	3,550
Calendar year 1923.....	-	-	-	14.9	23.1	16,670
February 1924.....	-	248	2.2	24.7	38.2	2,200
Fiscal year 1923-24.....	-	261	2.1	12.4	19.2	13,950
October 1924.....	-	211	2.5	14.9	23.1	1,420
November.....	-	524	3.0	†28.1	†43.5	2,590
Calendar year 1924.....	-	524	-	†11.2	†17.3	12,560
Fiscal year 1924-25.....	-	524	-	†13.3	†20.6	14,900

† Published in error in WSP 1319.

5080. Hanawi Stream near Nahiku--Continued

Revised figures of monthly discharge, in million gallons a day, 1922, 1924-25, 1927, 1930-35, 1937, 1939-40 and 1942-43--Continued

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
November 1926.....	-	173	2.0	8.42	13.0	775
Calendar year 1926.....	-	173	1.4	4.50	6.96	5,040
Fiscal year 1926-27.....	-	173	1.4	8.26	12.8	9,240
November 1929.....	-	102	1.8	12.1	18.7	1,110
December.....	-	262	3.9	44.7	69.2	4,250
Calendar year 1929.....	-	262	1.8	14.4	22.3	16,120
January 1930.....	-	283	4.4	22.7	35.1	2,160
Fiscal year 1929-30.....	-	283	1.8	18.5	28.6	20,680
November 1930.....	-	327	2.5	25.8	39.9	2,380
Calendar year 1930.....	-	327	2.5	18.3	28.3	20,500
Fiscal year 1930-31.....	-	327	2.4	10.4	16.1	11,670
November 1931.....	-	96	5.5	21.3	33.0	1,960
Calendar year 1931.....	-	158	2.4	12.0	18.6	13,430
February 1932.....	-	239	9.6	62.5	96.7	5,560
Fiscal year 1931-32.....	-	239	2.8	19.7	30.5	22,090
Calendar year 1932.....	-	239	1.6	15.6	24.1	17,520
March 1933.....	-	321	4.4	26.2	40.5	2,500
Fiscal year 1932-33.....	-	321	1.6	9.49	14.7	10,640
November 1933.....	-	279	-	14.3	22.1	1,320
Calendar year 1933.....	-	-	-	8.07	12.5	9,050
April 1934.....	-	640	3.8	37.0	57.2	3,410
Fiscal year 1933-34.....	-	640	-	10.6	16.4	11,850
July 1934.....	446.6	143	5.1	14.4	22.3	1,370
Calendar year 1934.....	5,091.05	640	-	13.9	21.5	15,620
February 1935.....	1,690.1	606	2.7	60.4	93.5	5,190
March.....	457.4	207	3.9	14.8	22.9	1,400
Fiscal year 1934-35.....	5,909.95	606	2.2	16.2	25.1	18,140
Calendar year 1935.....	4,807.9	606	1.7	13.2	20.4	14,760
December 1936.....	2,249.5	424	3.5	72.6	112	6,900
Calendar year 1936.....	5,853.7	424	1.2	16.0	24.8	17,970
February 1937.....	1,265.5	346	6.6	45.2	69.9	3,880
Fiscal year 1936-37.....	9,338.1	424	2.7	25.6	39.6	28,650
Calendar year 1937.....	8,632.2	346	3.0	23.6	36.5	26,480
February 1939.....	974.5	521	4.1	34.8	53.8	2,990
March.....	826.7	273	5.4	26.7	41.3	2,540
Fiscal year 1938-39.....	5,993.3	521	2.2	16.4	25.4	18,400
September 1939.....	270.7	82	3.0	9.02	14.0	831
Calendar year 1939.....	6,095.6	521	2.3	16.7	25.8	18,710
Fiscal year 1939-40.....	2,497.4	110	1.4	6.82	10.6	7,660
October 1941.....	2,017.7	364	7.7	65.1	101	6,190
Calendar year 1941.....	6,497.45	364	1.7	17.8	27.5	19,930
March 1942.....	3,852.1	700	5.0	124	182	11,820
Fiscal year 1941-42.....	10,037.45	700	1.6	27.5	42.5	30,790
December 1942.....	553.35	281	1.5	17.8	27.5	1,700
Calendar year 1942.....	7,559.7	700	1.6	20.7	32.0	23,200
Fiscal year 1942-43.....	3,596.1	281	1.5	9.85	15.2	11,030

5080. Hanawi Stream near Nahiku--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.2	1.38	2.5	56.0
.3	1.94	3.0	85.0
.4	2.60	3.5	125
.5	3.35	4.0	176
.7	5.30	4.5	250
1.0	10.1	5.0	370
1.3	15.3	5.5	600
1.6	21.5	6.0	990
2.0	34.0		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.36	<u>2.61</u>	6.92	2.34	11.2	61.6	3.78	3.12	3.20	5.76	4.53	3.05
2	2.86	19.4	4.31	2.27	10.3	14.8	3.69	2.98	3.12	4.98	4.31	2.90
3	5.51	3.61	3.60	2.20	4.07	4.59	4.20	2.90	3.05	<u>4.66</u>	4.20	2.75
4	5.40	22.9	6.13	2.07	2.82	<u>2.98</u>	13.0	2.82	21.3	<u>13.9</u>	4.31	2.68
5	14.4	<u>207</u>	5.21	2.01	2.34	25.1	4.42	2.75	<u>74.6</u>	12.2	3.86	2.60
6	12.3	46.9	3.52	1.94	2.75	31.5	15.6	2.60	15.4	26.2	3.60	2.53
7	23.4	6.38	3.20	1.89	5.08	19.3	65.1	2.53	6.03	72.4	3.60	2.47
8	4.63	4.03	2.90	1.83	3.19	*23.5	80.9	2.47	4.20	11.1	4.32	2.40
9	2.82	4.80	2.75	1.77	2.40	6.42	50.2	<u>2.40</u>	3.69	39.8	14.9	2.40
10	2.47	14.4	2.64	1.72	2.07	5.89	<u>83.1</u>	<u>2.57</u>	3.44	57.3	96.0	2.75
11	3.47	14.0	5.20	1.83	1.94	5.02	26.0	101	3.52	30.9	30.8	2.34
12	2.75	4.64	<u>8.81</u>	1.72	1.83	3.12	19.1	<u>612</u>	3.28	11.0	<u>141</u>	2.53
13	2.34	3.57	4.64	1.88	1.72	4.56	56.1	468	2.98	54.0	23.3	*2.90
14	2.27	3.05	5.16	2.20	1.60	12.7	56.8	191	2.82	95.7	59.0	3.28
15	<u>42.5</u>	75.3	3.35	1.66	1.55	19.3	13.4	33.8	2.75	42.7	106	3.77
16	5.01	7.53	2.98	1.66	1.49	56.9	10.2	268	*2.60	<u>f470</u>	11.3	5.36
17	3.20	4.95	2.82	1.72	1.49	<u>239</u>	19.4	48.0	2.47	<u>f206</u>	7.18	3.87
18	4.91	26.7	2.82	1.55	1.49	<u>143</u>	14.4	15.8	6.47	23.8	6.84	2.68
19	3.17	5.81	2.60	1.49	1.38	55.3	6.28	53.9	41.4	11.8	7.49	2.47
20	2.90	4.03	2.53	1.44	1.60	25.2	5.30	11.4	47.4	33.3	16.8	<u>2.27</u>
21	2.47	3.35	2.53	1.44	1.66	47.4	4.85	5.72	7.28	20.7	6.56	2.34
22	*2.30	3.05	2.47	1.38	1.60	57.6	4.53	4.42	3.94	11.5	8.18	12.4
23	2.20	2.75	2.47	*1.38	2.15	15.9	4.20	4.03	67.8	24.1	5.86	35.5
24	2.14	2.75	3.11	1.72	2.95	9.09	4.03	3.69	34.4	60.5	4.86	27.2
25	2.07	5.30	2.66	1.44	1.72	5.67	*3.86	3.60	19.3	13.8	4.20	8.39
26	2.01	7.63	3.40	1.38	1.83	37.3	3.78	3.60	5.72	10.4	4.20	13.3
27	<u>1.89</u>	5.03	4.41	1.60	1.94	18.2	3.60	3.44	10.1	7.02	4.03	25.9
28	<u>2.37</u>	13.3	2.75	1.94	9.67	6.42	3.69	3.35	27.2	*5.44	3.94	57.7
29	5.37	7.35	2.53	1.83	6.72	5.30	3.60	3.28	15.5	5.19	3.60	26.0
30	2.34	7.70	<u>2.40</u>	1.55	<u>13.3</u>	4.53	3.35	-----	16.3	4.97	3.35	15.8
31	1.94	7.38	-----	<u>18.1</u>	-----	4.03	<u>3.20</u>	-----	6.61	-----	<u>3.28</u>	-----
Total	176.76	547.20	110.82	70.94	105.85	971.02	591.66	1,865.17	467.87	1,391.12	605.40	282.53
Mean:												
mgd	5.70	17.7	3.69	2.29	3.53	31.3	19.1	64.3	15.1	46.4	19.5	9.42
cfs	8.82	27.4	5.71	3.54	5.46	48.4	29.6	99.5	23.4	71.8	30.2	14.6
Ac-ft	542	1,680	340	218	325	2,980	1,820	5,720	1,440	4,270	1,860	867
Calendar year 1959: Max	398			Min	1.38	Mean(mgd)	16.1	Mean(cfs)	24.9	Ac-ft	18,030	
Fiscal year 1959-60: Max	612			Min	1.38	Mean(mgd)	19.6	Mean(cfs)	30.3	Ac-ft	22,060	

Peak discharge (base, 850 mgd).--Dec. 17 (3:30 p.m.) 885 mgd (1,370 cfs), 5.85 ft; Feb. 13 (3 a.m.) 1,470 mgd (2,270 cfs), 7.53 ft; Feb. 16 (7:30 a.m.) 1,240 mgd (1,920 cfs), 6.85 ft; Feb. 19 (1:30 p.m.) 1,150 mgd (1,750 cfs), 6.49 ft; Apr. 16 (time unknown) 2,180 mgd (3,370 cfs), 8.20 ft; May 12 (7 a.m.) 1,260 mgd (1,950 cfs), 6.96 ft.

* Discharge measurement made on this day.

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

5100. Kapaula Gulch near Nahiku

Location.--Lat 20°48'45", long 156°07'05", on right bank 40 ft upstream from intake to Koolau ditch, 300 ft upstream from ditch trail, 1.9 miles southwest of Nahiku, and 4 miles southeast of Keanae.

Drainage area.--0.69 sq mi.

Records available.--November 1921 to June 1960. Prior to July 1958, published as Kapaula Stream near Nahiku.

Gage.--Water-stage recorder. Datum of gage is 1,346 ft above mean sea level (by vertical angles).

Average discharge.--38 years (1922-60), 10.8 mgd (16.7 cfs).

Extremes.--Maximum discharge during year, 1,320 mgd (2,040 cfs) Apr. 16 (gage height, 7.15 ft), from rating curve extended above 220 mgd by logarithmic plotting; minimum, 0.45 mgd (0.70 cfs) Oct. 23.

1921-60: Maximum discharge, 1,780 mgd (2,750 cfs) Apr. 6, 1938 (gage height, 8.40 ft), from rating curve extended above 220 mgd by logarithmic plotting; minimum, 0.2 mgd (0.3 cfs) Nov. 23-25, 1933, Oct. 2-5, 1938.

Remarks.--Records fair. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1319: 1922-28(M).

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Dec. 6-8, Mar. 23-25, Apr. 17-28)

0.4	0.38	2.0	44.0
.5	1.08	2.5	83.0
.7	3.35	3.0	140
.9	6.50	3.5	218
1.2	13.4	4.0	320
1.5	16.8		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.36	2.28	5.92	1.19	13.4	54.4	2.09	1.30	1.50	4.75	2.54	1.64
2	2.11	17.3	3.14	1.08	9.18	14.7	1.86	1.19	1.19	3.46	2.32	1.53
3	4.11	4.13	2.32	1.08	3.24	3.88	2.43	1.08	1.19	3.08	2.43	1.42
4	5.05	23.4	5.03	1.01	1.98	2.32	8.92	1.08	22.5	15.3	2.54	1.30
5	16.0	128	3.99	.94	1.19	25.5	3.00	1.08	62.8	11.6	1.98	1.19
6	15.8	27.7	2.32	.87	2.10	19.8	8.70	1.01	15.7	20.8	1.75	1.08
7	21.9	4.86	1.75	.80	4.80	15.0	51.4	1.01	4.02	65.3	1.86	1.08
8	4.81	2.89	1.53	.80	2.43	16.9	3.4	2.20	8.95	2.32	1.08	
9	2.43	3.30	1.19	.73	1.30	6.41	39.5	.87	1.75	28.3	9.51	1.01
10	1.64	10.2	*1.14	.73	.94	5.26	56.1	1.29	1.53	45.5	77.2	1.64
11	3.01	11.6	3.92	.87	.87	4.62	17.7	76.9	1.78	27.4	25.2	1.08
12	2.38	4.80	7.05	.73	.73	2.43	13.4	275	1.75	6.46	79.0	1.53
13	1.53	3.00	3.50	1.01	.66	3.87	36.7	186	1.42	39.6	12.9	*1.98
14	1.30	2.32	4.30	1.53	.59	9.92	25.5	108	1.19	70.0	34.4	2.32
15	35.4	59.8	2.32	.87	.59	15.8	8.04	29.9	1.08	22.8	58.5	5.13
16	5.11	7.07	1.75	.80	.59	35.7	5.97	140	*1.01	228	6.88	4.11
17	2.73	2.83	1.64	.94	.59	136	13.4	31.6	1.45	51.4	4.08	2.91
18	3.83	21.7	1.53	.73	.52	57.4	10.2	14.0	6.41	14.6	4.18	1.75
19	2.66	4.93	1.30	.66	.52	40.1	3.93	39.5	36.4	13.3	5.13	1.30
20	2.20	2.89	1.19	.66	.73	18.6	3.12	12.4	39.2	18.2	12.1	1.08
21	1.64	2.20	1.30	.59	.80	37.5	2.66	3.76	6.20	16.2	4.66	1.42
22	1.36	1.86	1.19	.59	.94	42.6	2.43	2.66	2.54	12.8	5.87	9.28
23	1.19	1.53	1.19	.55	1.34	12.8	2.09	2.43	*48.4	17.1	3.93	53.2
24	1.08	1.55	2.14	.94	2.58	7.66	1.98	2.09	24.3	25.1	3.35	23.6
25	1.08	4.18	1.86	.59	.94	4.66	1.86	1.98	11.7	9.80	2.78	9.07
26	1.01	6.46	3.01	.59	3.84	29.9	1.75	1.86	4.20	7.55	2.78	11.8
27	.94	4.44	4.05	.94	5.72	13.7	1.64	1.64	5.85	5.65	2.78	21.0
28	1.43	8.89	2.09	1.19	11.6	5.26	1.75	1.53	21.2	3.46	2.66	45.0
29	4.57	7.02	1.53	1.29	8.62	3.64	1.75	1.42	12.7	3.35	2.32	22.4
30	2.09	6.34	1.42	.80	11.9	2.89	1.53	-----	14.1	3.00	2.09	13.7
31	1.30	5.44	-----	23.7	-----	2.43	1.42	-----	4.49	-----	2.09	-----
Total	154.10	394.90	76.61	49.80	95.23	649.65	393.82	943.52	362.55	800.81	382.13	224.63
Mean												
mgd	4.97	12.7	2.55	1.61	3.11	21.0	12.7	32.5	11.7	26.7	12.3	7.49
cfs	7.69	19.6	3.95	2.49	4.81	32.5	19.6	50.3	18.1	41.3	19.0	11.6
Ac-ft	473	1,210	235	153	286	1,990	1,210	2,900	1,110	2,460	1,170	689
Calendar year 1959: Max	145			Min	0.52	Mean(mgd)	10.9	Mean(cfs)	16.9	Ac-ft	12,200	
Fiscal year 1959-60: Max	275			Min	0.52	Mean(mgd)	12.4	Mean(cfs)	19.2	Ac-ft	13,890	

Peak discharge (base, 450 mgd).--Feb. 12 (12 p.m.) 809 mgd (1,250 cfs), 5.68 ft; Feb. 16 (9 a.m.) 761 mgd (1,180 cfs), 5.53 ft; Feb. 19 (1:30 p.m.) 722 mgd (1,120 cfs), 5.41 ft; Mar. 5 (4 p.m.) 473 mgd (732 cfs), 4.59 ft; Apr. 16 (5 a.m.) 1,320 mgd (2,040 cfs), 7.15 ft; May 12 (7 a.m.) 675 mgd (1,040 cfs), 5.26 ft.

* Discharge measurement made on this day.

5120. Koolau ditch at Nahiku weir, near Nahiku

Location--Lat 20°48'55", long 156°07'15", on right bank between Kapaula and Waiohuae Gulches, 1.8 miles southwest of Nahiku and 3.8 miles southeast of Keanae.

Records available--February 1919 to June 1960. Gage-height records collected in this vicinity since 1904 are contained in the files of East Maui Irrigation Co.

Gage--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level, datum of 1929. Prior to Apr. 28, 1922, staff gage at same site and datum.

Average discharge--41 years, 22.0 mgd (34.0 cfs).

Extremes--1919-60: Maximum daily discharge, 60 mgd (93 cfs) Feb. 18, 24, 1956; no flow at times.

Remarks--Records good except those for periods of no gage-height record, which are poor. Flow regulated by spillways and gates. Ditch diverts water from nearly all streams from the Makapipi west to the Alo. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.4	12.4	27.5	11.5	39.5	54.5	17.2	12.7	13.4	36	18.3	14.4
2	11.8	38.1	21.0	11.2	32.9	47.0	16.1	12.1	12.7	30	18.0	13.4
3	18.7	17.2	19.0	10.5	20.5	23.5	17.2	11.5	12.7	27	18.0	13.0
4	18.9	43.2	23.5	9.90	15.8	18.3	34.8	11.2	33.5	35	18.0	12.4
5	31.7	57.0	22.5	9.60	13.0	37.5	19.8	10.5	49.5	47	15.8	11.9
6	35.1	52.0	17.2	9.30	14.4	54.5	32.0	10.5	42.0	50	15.1	11.5
7	39.5	34.5	15.4	8.80	23.0	47.0	52.0	9.90	23.5	52	14.7	10.8
8	19.8	25.0	14.4	8.50	16.1	47.0	52.0	9.90	18.0	49	16.1	10.5
9	14.4	24.0	13.4	8.20	12.7	51.5	49.5	9.60	15.8	47	20.3	10.2
10	12.7	32.8	12.9	8.20	11.2	28.7	52.0	10.6	14.4	52	52.0	11.5
11	16.1	39.3	20.6	8.50	9.90	26.0	49.5	38.3	14.7	54	47.0	9.60
12	13.7	*24.5	29.2	8.20	9.60	19.4	49.5	54.5	13.7	46	47.0	10.8
13	12.1	20.5	19.1	8.50	9.30	23.0	52.0	52.0	12.7	50	42.0	*11.8
14	11.2	18.0	22.5	9.90	8.80	37.0	52.0	52.0	11.8	52	47.0	13.0
15	44.3	53.1	16.5	8.20	8.50	37.0	47.0	49.5	11.2	52	47.0	14.7
16	24.5	34.5	14.7	7.60	8.20	52.0	42.0	52.0	11.2	50	37.0	18.0
17	17.6	25.0	14.1	8.20	7.90	54.5	47.0	49.5	11.5	36	30.0	15.4
18	21.5	49.5	13.4	7.60	7.60	52.0	44.5	47.0	19.4	29	29.5	11.5
19	16.5	31.0	12.7	7.40	7.40	49.5	30.0	39.5	44.6	25	29.1	10.5
20	15.4	23.5	12.1	7.10	7.90	49.5	26.5	39.5	52.0	50	42.0	9.60
21	13.4	20.0	12.1	6.80	7.60	49.5	23.5	26.5	31.0	52	27.5	9.90
22	12.7	17.6	11.5	6.60	8.20	49.5	21.5	22.0	19.8	45	31.0	21.5
23	11.5	15.8	11.2	*6.30	10.1	42.0	19.4	20.5	*37.4	48	26.0	44.5
24	11.2	14.7	14.4	7.60	11.8	34.5	18.3	19.1	52.0	50	23.5	47.0
25	10.5	21.5	12.7	6.80	8.20	25.7	*16.9	18.0	39.5	38	20.5	34.8
26	9.60	26.1	16.5	6.60	12.0	49.5	16.1	16.8	30	33	19.8	37.0
27	9.30	20.5	20.0	7.40	10.8	44.5	15.1	15.4	25	27.0	19.4	39.5
28	10.9	34.5	14.4	8.50	28.0	30.0	15.4	14.7	36	23.0	18.3	44.5
29	18.7	29.0	12.7	9.27	22.8	26.0	14.7	14.1	45	21.5	17.2	44.5
30	12.1	30.0	12.1	7.60	26.1	22.0	13.7	-----	40	20.5	16.1	42.0
31	10.2	26.0	-----	25.3	-----	19.4	12.7	-----	34	-----	16.1	-----
Total	538.00	910.8	498.3	275.67	429.80	1,182.0	969.9	749.40	828.0	1,227.0	839.3	609.60
Mean:												
mgd	17.4	29.4	16.6	8.89	14.3	38.1	31.3	25.8	26.7	40.9	27.1	20.3
cfs	26.9	45.5	25.7	13.8	22.1	59.9	49.4	39.9	41.3	63.3	41.9	31.4
Ac-ft	1,650	2,800	1,530	846	1,320	3,630	2,980	2,300	2,540	3,770	2,570	1,870
Calendar year 1959: Max	57.0			Min 6.30	Mean(mgd)	22.6	Mean(cfs)	35.0	Ac-ft	25,320		
Fiscal year 1959-60: Max	57.0			Min 6.30	Mean(mgd)	24.7	Mean(cfs)	38.2	Ac-ft	27,810		

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 26 to Apr. 26; discharge estimated on basis of records for ditch stations at Keanae.

5150. Waiohue Gulch near Nahiku

Location.--Lat 20°49'05", long 156°07'45", on left bank 200 ft upstream from intake to Koolau ditch, 300 ft upstream from ditch trail, 2.4 miles southwest of Nahiku, and 3.5 miles southeast of Keaneae.

Drainage area.--0.32 sq mi.

Records available.--October 1921 to June 1960. Prior to July 1958 published as Waiohue Stream near Nahiku.

Gage.--Water-stage recorder. Datum of gage is 1,316.2 ft above mean sea level (by stadia traverse).

Average discharge.--38 years (1922-60), 7.55 mgd (11.7 cfs).

Extremes.--Maximum discharge during year, 702 mgd (1,090 cfs) Apr. 16 (gage height, 6.24 ft), from rating curve extended above 95 mgd on basis of slope-area measurements at gage heights 4.57 and 5.60 ft; minimum, 1.80 mgd (2.79 cfs) Oct. 22, 23, 25, Nov. 19. 1921-60: Maximum discharge, that of Apr. 16, 1960; maximum gage height, 6.24 ft Apr. 7, 1938, Apr. 16, 1960; minimum, 1.36 mgd (2.10 cfs) Oct. 9, 10, 1953.

Remarks.--Records good. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1319: 1922(M). WSP 1569: 1923-47(M), 1948(P), 1951(M), 1952-53(P), 1954-55(M), drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.5	1.61	1.6	24.0
.6	2.23	1.8	33.5
.8	4.10	2.0	43.5
1.0	7.00	2.5	76.0
1.2	11.1	3.0	117
1.4	16.5		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.15	2.89	5.12	2.65	7.14	23.1	3.25	2.65	2.50	5.30	3.25	2.80
2	2.88	7.28	3.70	2.55	5.88	7.88	3.05	2.55	2.40	3.70	3.15	2.70
3	4.65	3.58	3.15	2.50	3.25	3.35	3.55	2.55	2.40	3.45	3.05	2.65
4	3.78	11.4	5.67	2.40	2.55	2.90	7.84	2.50	10.9	13.0	3.25	2.55
5	8.37	47.0	4.10	2.30	2.40	15.0	3.35	2.40	30.9	7.07	2.90	2.50
6	8.70	11.4	3.25	2.23	2.63	10.7	9.38	2.40	5.28	11.4	2.80	2.40
7	10.1	3.80	3.05	2.17	4.80	7.97	20.5	2.30	3.15	27.2	2.80	2.30
8	3.63	3.35	*2.90	2.17	2.80	9.15	21.8	2.30	2.70	5.10	3.05	2.23
9	2.80	3.55	2.90	2.11	2.30	4.80	16.4	2.23	2.65	16.2	7.07	2.23
10	2.65	5.51	2.80	2.04	2.23	4.83	20.9	2.29	2.55	18.0	42.2	2.84
11	4.22	7.93	5.31	2.23	2.11	3.90	10.3	32.6	2.81	14.8	14.0	2.23
12	3.25	4.37	6.71	2.04	2.04	3.35	10.2	108	2.65	5.34	33.2	2.69
13	2.70	3.55	3.80	2.39	2.04	3.90	18.8	57.8	2.40	16.1	8.95	2.70
14	2.65	3.23	4.80	2.78	1.92	7.00	12.0	40.5	2.30	28.6	16.8	2.90
15	17.5	26.0	3.25	2.11	1.92	7.68	5.70	16.8	2.23	15.7	21.3	*3.55
16	3.84	4.50	2.95	2.04	1.86	15.3	5.40	58.7	*2.23	117	5.20	3.55
17	3.34	4.07	2.90	2.23	1.86	49.4	8.40	13.1	2.67	29.2	4.40	3.12
18	4.07	12.9	2.90	1.98	1.92	19.3	7.61	6.25	5.40	10.6	4.40	2.55
19	3.36	4.40	2.70	1.92	1.80	15.2	4.20	14.8	16.7	6.88	4.86	2.40
20	*3.07	3.55	2.65	1.92	2.04	9.20	3.90	5.30	18.1	11.4	8.69	2.23
21	2.70	3.35	2.80	1.86	2.04	15.4	3.55	3.55	3.78	12.0	4.20	2.56
22	2.65	3.05	2.80	1.80	2.01	16.4	3.35	3.15	2.80	6.34	5.32	5.80
23	2.50	2.95	2.70	1.80	3.04	6.97	3.25	3.05	*27.2	9.78	4.20	14.5
24	2.50	3.05	3.64	2.23	2.65	5.30	3.05	2.90	13.3	16.3	3.90	12.2
25	2.40	4.47	2.90	1.80	2.04	5.77	3.05	2.80	7.04	6.50	3.45	4.70
26	2.30	4.80	4.84	1.92	2.34	14.9	2.95	2.70	3.25	5.31	3.55	7.05
27	2.23	3.70	4.70	2.23	2.50	9.30	*2.90	2.65	5.10	4.50	3.70	10.2
28	2.97	5.64	3.05	2.30	7.13	4.60	3.13	2.55	14.1	3.90	3.45	18.2
29	4.06	4.90	2.80	2.40	3.66	4.10	2.95	2.55	8.25	*3.80	3.15	10.2
30	2.72	4.40	2.70	1.92	7.29	3.70	2.80	-----	9.56	3.55	2.95	6.40
31	2.40	4.00	-----	17.9	-----	3.35	2.70	-----	3.70	-----	3.05	-----
Total	128.14	218.57	107.54	82.92	90.19	314.20	230.41	403.92	221.00	438.02	236.24	144.93
Mean:	4.13	7.05	3.58	2.67	3.01	10.1	7.43	13.9	7.13	14.6	7.62	4.83
mgd	6.39	10.9	5.54	4.13	4.66	15.6	11.5	21.5	11.0	22.6	11.8	7.47
cfs	593	671	550	254	277	964	707	1,240	678	1,340	725	445

Calendar year 1959: Max 78.0 Min 1.80 Mean(mgd) 6.36 Mean(cfs) 9.84 Ac-ft 7,130
Fiscal year 1959-60: Max 117 Min 1.80 Mean(mgd) 7.15 Mean(cfs) 11.1 Ac-ft 8,020

Peak discharge (base, 300 mgd).--Feb. 12 (11 p.m.) 317 mgd (490 cfs), 4.58 ft; Feb. 16 (7 a.m.) 330 mgd (511 cfs), 4.65 ft; Apr. 16 (4 a.m.) 702 mgd (1,090 cfs), 6.24 ft.

* Discharge measurement made on this day.

5180. West Wailuaiki Stream near Keanae

Location.--Lat 20°49'15", long 156°08'37", on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

Drainage area.--3.66 sq mi.

Records available.--January 1914 to October 1917, November 1921 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,344 ft above mean sea level (by vertical angles).

Average discharge.--40 years (1914-15, 1916-17, 1922-60), 24.3 mgd (37.6 cfs).

Extremes.--Maximum discharge during year, 2,680 mgd (4,150 cfs) Apr. 16 (gage height, 10.25 ft), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 1.23 mgd (1.90 cfs) Oct. 23.

1914-17, 1921-60: Maximum discharge, 4,500 mgd (6,960 cfs) Jan. 14, 1923 (gage height, about 13.5 ft, from floodmarks), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 0.3 mgd (0.5 cfs) July 26, 1922.

Remarks.--Records good except those for period of no gage-height record, which are poor. Water used for irrigation in central Maui.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.3	1.06	2.0	39.5
.4	1.60	2.5	73.0
.5	2.25	3.0	121
.6	3.05	3.5	185
.8	5.00	4.0	270
1.0	7.60	5.0	510
1.3	12.9	6.0	815
1.6	21.0	6.5	990

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.71	5.45	9.82	3.05	28.1	106	5.96	a2.89	4.06	7.46	8.20	3.68
2	4.35	30.5	7.04	3.32	15.7	25.5	5.36	a2.65	3.95	7.47	5.72	3.77
3	8.03	8.27	5.72	2.57	5.84	8.70	5.96	a2.33	3.95	6.34	5.48	3.68
4	10.4	46.0	11.0	2.33	3.95	6.48	14.9	a2.18	28.8	25.7	5.48	3.50
5	28.9	161	8.02	2.25	3.23	47.0	5.84	2.18	139	15.2	4.68	3.50
6	27.7	33.5	5.48	2.18	5.73	42.0	11.8	2.12	23.3	40.4	4.37	3.23
7	39.6	9.85	4.97	1.99	7.90	29.6	74.4	1.99	9.22	35.7	4.47	3.05
8	8.28	7.32	*4.37	1.92	4.65	38.8	109	1.92	6.48	15.3	6.29	2.81
9	5.36	8.24	3.95	1.80	3.23	11.5	61.0	1.88	5.24	57.4	21.1	2.73
10	4.79	14.1	3.95	1.73	2.81	*11.2	83.2	1.99	4.68	80.1	120	4.84
11	6.61	17.8	9.52	2.75	2.49	8.93	19.7	132	5.78	35.2	53.7	2.81
12	4.26	8.20	16.4	2.12	2.49	6.62	13.9	972	4.90	15.9	77.7	4.44
13	3.50	6.20	8.62	2.52	2.25	7.60	39.3	706	3.86	64.3	15.7	4.58
14	3.32	5.72	7.71	3.38	2.06	13.0	15.1	240	3.59	93.5	28.3	4.16
15	50.7	121	5.00	1.86	1.86	29.3	9.64	59.3	5.68	63.7	118	*4.99
16	8.45	11.0	4.37	1.73	1.73	69.7	9.55	389	4.26	442	12.8	7.18
17	5.85	8.91	4.16	2.03	1.92	402	19.5	70.2	9.87	213	9.10	4.68
18	9.47	22.1	4.06	1.54	1.99	159	15.5	20.5	*24.9	24.7	8.20	3.14
19	5.36	10.5	3.50	1.43	1.80	72.8	7.90	78.1	66.6	15.1	9.46	2.97
20	*4.90	6.76	3.50	1.33	4.55	47.6	7.11	17.9	65.0	31.1	14.4	2.57
21	4.16	5.96	3.41	*1.33	3.05	97.3	6.34	9.46	13.4	20.8	7.60	2.78
22	3.68	5.36	3.32	1.28	2.06	102	5.72	7.60	7.75	14.9	8.79	18.2
23	3.32	4.58	3.23	1.33	3.71	35.6	5.12	6.90	116	25.9	6.90	56.6
24	4.65	4.95	4.17	2.60	7.76	16.2	4.90	5.96	54.5	48.0	6.63	40.8
25	5.17	9.64	3.32	1.54	3.68	15.1	4.47	5.60	28.5	17.2	6.20	13.2
26	3.50	13.7	5.82	1.49	24.0	53.7	4.16	5.48	10.5	*12.7	5.72	19.0
27	2.89	6.90	6.56	2.12	17.1	21.5	*3.77	4.68	12.8	10.2	5.36	30.4
28	6.55	14.5	3.68	2.72	36.0	10.9	4.20	4.37	27.8	8.35	5.48	63.0
29	11.7	9.67	3.14	2.04	15.6	8.80	4.47	4.06	20.5	8.05	4.79	34.6
30	3.95	10.1	5.32	1.43	31.6	7.60	3.50	-----	20.2	7.04	4.26	24.4
31	3.32	10.9	-----	44.8	-----	6.62	a3.23	-----	8.05	-----	4.16	-----
Total	309.43	638.68	169.23	106.51	248.84	1,518.65	584.50	2,761.22	741.12	1,520.71	595.04	379.29
Mean:												
mgd	9.98	20.6	5.64	3.44	8.29	49.0	18.9	95.2	23.9	50.7	19.2	12.6
cfs	15.3	31.9	8.73	5.32	12.8	75.8	29.2	147	37.0	78.4	29.7	19.5
Ac-ft	950	1,960	519	327	764	4,660	1,790	8,470	2,270	4,670	1,830	1,160
Calendar year 1959 : Max			425	Min	1.28	Mean(mgd)	23.0	Mean(cfs)	35.6	Ac-ft	25,800	
Fiscal year 1959-60 : Max			972	Min	1.28	Mean(mgd)	26.2	Mean(cfs)	40.5	Ac-ft	29,370	

Peak discharge (base, 1,200 mgd).--Dec. 17 (6:30 p.m.) 1,540 mgd (2,380 cfs), 7.90 ft; Feb. 12 (12 p.m.) 2,460 mgd (3,810 cfs), 9.81 ft; Feb. 16 (7:30 a.m.) 1,810 mgd (2,800 cfs), 8.56 ft; Feb. 19 (1 p.m.) 1,400 mgd (2,170 cfs), 7.55 ft; Apr. 16 (11:30 p.m.) 2,680 mgd (4,150 cfs), 10.25 ft.

* Discharge measurement made on this day.

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

5220. Taro patch feeder ditch at Keanae

Location.--Lat 20°51'40", long 156°09'00", on left bank 80 ft downstream from intake, 500 ft downstream from highway bridge over Palauhulu Stream at Keanae, 4.2 miles north-west of Nahiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to June 1960.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 51 ft (from topographic map).

Average discharge.--25 years (1935-60), 2.33 mgd (3.61 cfs).

Extremes.--1934-60: Maximum daily discharge, 7.9 mgd (12.2 cfs) June 30, 1941, Feb. 10, 1955; minimum daily, 0.05 mgd (0.08 cfs) Mar. 5, 1939.

Remarks.--Records good. Ditch diverts water from Palauhulu Stream, 80 ft above station, for irrigation of taro at Keanae.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.40	<u>2.34</u>	2.88	2.34	<u>3.37</u>	4.35	2.60	<u>2.34</u>	2.71	3.21	1.90	2.19
2	2.55	<u>3.15</u>	2.82	2.29	<u>2.88</u>	2.98	2.55	<u>2.34</u>	2.66	3.21	1.85	2.19
3	2.60	2.55	2.71	2.29	2.45	2.43	2.55	2.34	2.66	3.15	1.85	2.19
4	2.68	<u>3.30</u>	2.93	2.29	2.22	<u>2.19</u>	2.96	<u>2.34</u>	<u>3.32</u>	3.66	1.85	2.14
5	3.15	<u>5.32</u>	2.98	2.29	2.19	<u>3.08</u>	2.60	<u>2.29</u>	<u>4.52</u>	3.32	<u>1.75</u>	2.14
6	3.15	<u>3.44</u>	2.78	2.24	2.19	<u>3.44</u>	2.88	2.29	2.08	3.85	1.75	2.14
7	3.58	2.95	2.71	2.24	2.34	3.04	4.16	2.29	2.88	5.00	2.00	2.14
8	2.82	<u>2.82</u>	2.66	2.24	2.29	<u>3.28</u>	<u>4.65</u>	2.40	2.78	3.52	2.45	2.19
9	2.66	<u>2.82</u>	2.60	2.24	2.19	2.66	<u>3.46</u>	2.60	2.76	3.92	2.77	2.19
10	2.60	2.95	2.60	2.19	2.19	2.60	<u>4.29</u>	2.60	2.71	4.82	<u>*4.61</u>	2.24
11	2.60	3.15	2.82	2.19	2.19	2.60	2.95	<u>4.47</u>	2.82	3.97	3.53	2.19
12	2.50	2.88	<u>3.23</u>	2.19	2.14	2.50	2.95	<u>7.80</u>	2.76	3.44	3.89	2.19
13	2.34	2.82	<u>2.82</u>	2.19	2.14	2.45	3.61	5.22	2.66	4.20	2.82	2.19
14	2.34	2.76	2.76	2.19	2.14	2.60	2.98	4.27	2.60	<u>5.32</u>	3.16	2.14
15	<u>3.70</u>	<u>4.48</u>	2.71	2.19	2.14	2.88	2.88	2.34	2.60	<u>4.06</u>	3.91	2.19
16	2.88	3.04	2.60	2.19	<u>2.09</u>	3.26	2.82	5.55	2.60	5.31	2.71	2.14
17	2.66	2.95	2.55	2.14	<u>2.09</u>	<u>5.21</u>	2.98	3.22	2.55	1.45	2.55	2.04
18	2.88	3.82	2.50	2.14	2.09	<u>*4.48</u>	3.04	3.15	3.06	<u>1.26</u>	2.60	1.99
19	2.60	3.04	2.45	2.14	2.14	3.55	2.82	3.54	4.16	<u>1.90</u>	2.55	1.99
20	2.60	2.95	2.34	2.14	2.19	3.26	2.76	3.15	4.10	2.19	2.66	<u>1.95</u>
21	2.45	2.88	<u>2.34</u>	2.14	2.14	3.89	2.71	2.95	2.88	2.34	2.50	1.95
22	2.32	2.82	<u>*2.29</u>	2.14	2.09	3.69	2.66	2.95	2.71	2.60	2.45	2.15
23	<u>2.24</u>	2.76	<u>2.34</u>	2.14	2.09	2.98	2.66	2.95	4.20	2.88	2.45	<u>3.04</u>
24	<u>2.24</u>	2.76	2.34	2.14	2.45	2.66	2.60	2.95	2.78	3.10	2.40	<u>2.98</u>
25	<u>2.24</u>	2.88	2.40	<u>2.09</u>	2.09	2.66	2.60	2.88	<u>1.66</u>	2.55	2.34	2.29
26	2.29	2.98	2.34	2.09	2.29	3.67	2.60	2.82	2.09	2.40	2.29	2.29
27	2.29	2.82	2.45	2.14	2.09	3.10	2.55	2.76	2.95	2.24	2.29	2.56
28	2.45	3.04	2.82	2.14	2.60	2.76	2.55	2.76	3.44	2.09	2.29	2.98
29	3.04	2.88	2.55	2.09	2.40	2.66	2.50	2.71	3.49	2.04	2.24	2.55
30	2.45	2.95	2.40	2.09	2.73	2.60	2.45	-----	<u>*3.55</u>	1.99	2.24	2.45
31	2.29	2.95	-----	<u>2.99</u>	-----	2.60	<u>2.40</u>	-----	3.15	-----	2.24	-----
Total	81.59	95.13	78.70	68.54	68.63	96.09	90.74	92.19	91.85	94.59	78.89	68.00
Mean:	2.63	3.07	2.62	2.21	2.29	3.10	2.95	3.18	2.96	3.15	2.54	2.27
mgd	4.07	4.75	4.05	3.42	3.54	4.80	4.53	4.92	4.58	4.87	3.93	3.51
cfs	250	292	242	210	211	295	278	283	282	290	242	209
Ac-ft												

Calendar year 1959 : Max 7.40 Min 1.73 Mean(mgd) 2.81 Mean(cfs) 4.35 Ac-ft 3,150
 Fiscal year 1959-60 : Max 7.80 Min 1.26 Mean(mgd) 2.75 Mean(cfs) 4.25 Ac-ft 3,080

* Discharge measurement made on this day.

5230. Koolau ditch near Keanae

Location--Lat 20°49'53", long 156°10'30", on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office and 5.1 miles southeast of Kailua.

Records available--January 1910 to December 1912, November 1917 to June 1960. Gage-height records collected in this vicinity since 1904 are contained in files of East Maui Irrigation Co.

Gage--Water-stage recorder. Altitude of gage is 1,238 ft (from topographic map). Jan. 1, 1910, to Dec. 31, 1912, staff gage at same site and datum.

Average discharge--42 years (1918-60), 67.1 mgd (104 cfs).

Extremes--1910-12, 1917-60: Maximum daily discharge, 172 mgd (266 cfs) Apr. 19, 1935; no flow at times.

Remarks--Records good except those for period Nov. 4-13, which are fair. Flow regulated by gates and spillways. Ditch diverts water at altitude 1,200 ft from nearly all streams from Makapipi west to the Alo for power and irrigation in central Maui. No diversion above station except from several spillways.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	55.3	45.0	98.1	31.2	133	131	49.0	33.0	35.0	89.1	49.0	37.0
2	39.3	115	63.0	31.2	103	137	47.0	31.2	33.0	73.3	47.0	37.0
3	81.2	57.5	49.0	27.8	53.0	77.0	51.0	29.5	33.0	63.7	45.0	35.0
4	90.0	123	96.7	26.0	g39	55.0	98.7	29.5	97.5	92.6	47.0	33.0
5	97.8	127	77.9	24.5	g51	104	53.0	27.8	131	134	41.0	33.0
6	122	136	49.0	24.5	g43	136	83.8	26.0	121	125	39.0	31.2
7	126	95.3	43.0	23.0	g68	134	125	26.0	72.3	120	39.0	29.5
8	69.0	67.0	39.0	23.0	g46	132	125	24.5	51.0	132	52.3	29.5
9	43.0	72.0	37.0	23.0	g33	103	136	24.5	43.0	124	63.8	27.8
10	39.0	97.4	37.0	21.5	g50	91.9	134	27.6	39.0	120	*120	43.2
11	62.8	114	90.6	26.0	g28	84.1	139	96.5	51.2	129	137	27.8
12	43.0	79.0	104	23.0	g26	55.5	136	120	43.0	120	123	40.0
13	33.0	58.0	61.2	26.0	g25	71.0	136	136	35.0	128	115	41.0
14	31.0	47.0	78.7	35.2	23.0	103	136	136	33.0	116	130	41.0
15	116	136	45.0	23.0	21.5	109	114	124	33.0	120	136	51.0
16	76.1	103	39.0	21.5	21.5	142	99.7	133	33.0	84.3	114	69.0
17	48.7	77.2	39.0	24.5	21.5	127	126	101	50.4	17.6	86.8	48.2
18	80.8	133	37.0	20.0	23.0	*133	121	110	64.0	16.5	82.7	33.0
19	49.0	97.5	33.0	18.7	21.5	135	79.0	121	126	85.8	87.4	31.2
20	45.0	63.0	33.0	18.7	34.0	142	67.0	123	125	136	128	27.8
21	37.0	53.0	32.4	18.7	27.8	137	58.0	79.0	102	136	77.7	29.5
22	33.0	47.0	*32.9	18.7	23.4	137	53.0	63.0	58.0	113	95.5	69.7
23	31.2	41.0	31.2	18.7	41.7	140	49.0	55.5	91.2	132	71.0	140
24	35.0	41.0	45.8	26.0	53.7	118	45.0	49.0	125	135	67.0	140
25	35.0	84.6	35.0	20.0	27.8	96.1	43.0	47.0	96.1	120	55.5	112
26	29.5	96.4	57.2	18.7	75.8	137	41.0	45.0	85.0	102	55.5	118
27	26.0	60.5	74.2	24.5	74.4	130	39.0	41.0	118	79.0	53.0	115
28	41.8	103	39.0	29.3	98.5	96.5	41.0	39.0	101	67.0	53.0	127
29	84.9	91.1	33.0	27.7	92.2	79.0	43.0	37.0	123	63.0	47.0	136
30	37.0	95.2	33.0	20.0	87.2	67.0	35.0	-----	122	55.5	43.0	127
31	29.5	89.8	-----	56.9	-----	55.5	33.0	-----	85.0	-----	43.0	-----
Total	1,757.9	2,651.5	1,563.9	771.5	1,426.5	3,393.6	2,536.2	1,935.6	2,353.7	3,029.4	2,344.2	1,860.4
Mean:	mgd	56.7	85.5	52.1	24.9	47.6	109	81.8	66.7	75.9	101	75.6
	cfs	87.7	132	80.6	38.5	73.6	169	127	103	118	157	117
Ac-ft	5,390	8,140	4,800	2,370	4,380	10,410	7,780	5,940	7,220	9,300	7,190	5,710
Calendar year 1959: Max	142	142	142	142	142	142	142	142	142	142	142	142
Fiscal year 1959-60: Max	142	142	142	142	142	142	142	142	142	142	142	142
Calendar year 1959: Min	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7
Fiscal year 1959-60: Min	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Calendar year 1959: Mean(mgd)	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3
Fiscal year 1959-60: Mean(mgd)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Calendar year 1959: Mean(cfs)	103	103	103	103	103	103	103	103	103	103	103	103
Fiscal year 1959-60: Mean(cfs)	108	108	108	108	108	108	108	108	108	108	108	108
Calendar year 1959: Ac-ft	74,300	74,300	74,300	74,300	74,300	74,300	74,300	74,300	74,300	74,300	74,300	74,300
Fiscal year 1959-60: Ac-ft	78,630	78,630	78,630	78,630	78,630	78,630	78,630	78,630	78,630	78,630	78,630	78,630

* Discharge measurement made on this day.

g Discharge computed from twice-daily staff-gage readings.

5270. Honomanu Stream near Keanae

Location.--Lat 20°50'05", long 156°11'20", on left bank at Spreckels ditch intake, 8.3 miles southwest of Keanae School and 4.5 miles southeast of Kailua.

Drainage area.--3.17 sq mi.

Records available.--November 1913 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder, orifice and concrete control. November 1913 to Apr. 14, 1950, at site 500 ft upstream at different datum.

Average discharge.--46 years (1914-60), 15.3 mgd (23.7 cfs).

Extremes.--Maximum discharge during year, 2,150 mgd (3,330 cfs) Feb. 12 (gage height, 10.50 ft), from rating curve extended above 13 mgd by computation of flow through orifice and over dam; minimum, 0.51 mgd (0.79 cfs) Oct. 22.
1913-60: Maximum discharge, 2,310 mgd (3,570 cfs) Feb. 25, 1956 (gage height, 10.73 ft), from rating curve extended above 13 mgd by computation of flow through orifice and over dam; minimum, 0.08 mgd (0.12 cfs) Mar. 24, 1928.

Remarks.--Records good except those for periods of no gage-height record and those above 15 mgd, which are poor. Water used for irrigation in central Maui.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.6	0.25	3.0	13.4
.7	.69	4.0	16.0
.8	1.25	5.0	18.5
1.0	2.68	5.5	21.2
1.2	4.45	6.0	50.0
1.4	6.40	6.5	120
1.6	8.20	7.0	258
2.0	10.3	8.0	580
2.5	11.9		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.70	2.46	8.63	2.45	35.4	61.0	2.68	1.64	1.25	3.98	2.68	4.67
2	3.09	20.9	4.45	2.45	10.3	12.5	2.60	1.51	1.32	3.98	2.60	3.98
3	6.68	5.00	3.09	1.51	5.11	4.45	2.68	1.44	1.38	3.50	2.45	3.09
4	8.02	30.8	10.6	1.19	3.09	3.50	11.2	1.38	14.6	11.5	3.98	2.45
5	20.8	59.9	5.64	1.14	2.06	38.2	3.50	1.25	75.8	12.7	*2.83	2.60
6	16.6	14.4	3.50	1.08	3.64	32.8	7.58	1.25	14.0	21.1	2.29	3.09
7	22.4	*4.51	2.68	.97	11.6	20.9	48.0	1.14	3.98	47.6	2.29	2.73
8	3.98	3.98	2.52	.86	4.35	22.1	63.3	*1.02	2.45	7.79	4.01	2.45
9	2.52	5.58	2.06	.86	2.06	5.40	30.2	.91	1.98	31.4	11.0	1.84
10	2.06	7.83	2.06	.91	2.06	5.97	42.6	1.43	1.77	44.6	66.2	5.45
11	4.08	14.2	10.9	1.67	3.09	4.92	7.40	76.2	5.22	17.4	32.2	2.33
12	2.06	4.92	20.3	1.38	2.13	3.50	4.92	530	3.80	7.56	33.2	3.94
13	1.51	3.50	4.45	1.58	1.44	3.98	18.9	324	1.90	35.3	9.90	3.50
14	1.38	3.09	6.83	2.45	1.19	9.00	5.40	186	1.64	52.6	12.5	2.68
15	34.5	85.9	3.50	1.38	1.14	21.4	4.45	62.8	1.84	22.7	67.7	4.00
16	4.45	6.47	2.45	1.14	1.08	42.0	4.50	a160	1.58	124	6.16	5.40
17	2.68	4.45	2.06	1.14	1.14	187	10.1	a40	1.44	138	4.45	4.45
18	8.85	19.7	1.90	.91	1.14	101	10.4	a25	9.78	32.0	4.45	2.52
19	3.09	5.95	1.70	.80	1.14	39.1	3.98	a29	29.5	a10	5.73	2.29
20	2.57	3.09	1.58	.75	3.09	36.7	3.50	a15	34.7	a15	9.78	1.94
21	1.90	3.09	1.51	.65	2.06	66.8	3.09	a7.0	8.48	a17	4.45	2.01
22	1.64	3.09	1.51	.65	1.70	62.1	2.60	a3.5	3.50	a11	4.92	*16.6
23	1.44	2.13	1.38	.91	6.12	21.6	2.45	a3.0	49.9	16.2	3.98	55.7
24	4.59	2.29	1.90	2.86	8.63	9.19	2.29	a25	32.0	27.4	8.18	25.0
25	2.54	6.40	1.90	1.64	3.98	5.78	2.13	a2.2	16.9	9.50	6.40	9.34
26	1.70	9.26	9.32	1.38	24.2	23.0	2.06	a2.1	4.45	6.40	4.45	9.55
27	1.32	3.98	9.42	1.25	12.0	11.2	1.90	1.77	5.40	5.40	3.98	15.7
28	6.15	6.14	2.68	1.14	21.2	4.92	3.20	1.64	29.9	3.98	3.50	37.2
29	14.7	5.00	4.04	.91	8.92	3.98	3.09	1.44	*12.6	3.50	2.68	19.2
30	3.09	5.39	3.50	.69	24.7	3.50	1.98	-----	9.12	3.09	2.52	13.0
31	1.77	6.70	-----	41.9	-----	3.09	1.77	-----	4.45	-----	2.37	-----
Total	197.74	360.08	158.06	80.60	207.76	870.58	314.45	1,466.12	386.63	746.18	333.83	268.60
Mean:	6.38	11.6	4.60	2.60	6.92	28.1	10.1	50.6	12.5	24.9	10.8	8.95
cfs	9.87	17.9	7.12	4.02	10.7	43.5	15.6	78.3	19.3	38.5	16.7	13.8
Ac-ft	607	1,100	424	247	638	2,670	965	4,500	1,190	2,290	1,020	824

Calendar year 1959: Max 187 Min 0.65 Mean(mgd) 12.6 Mean(cfs) 19.5 Ac-ft 14,090
Fiscal year 1959-60: Max 510 Min 0.65 Mean(mgd) 14.7 Mean(cfs) 22.7 Ac-ft 16,480

Peak discharge (base, 600 mgd).--Feb. 12 (12 p.m.) 2,150 mgd (3,330 cfs), 10.5 ft; Apr. 16 (12 p.m.) 1,530 mgd (2,370 cfs), 9.68 ft.

* Discharge measurement made on this day.

a No gage-height record Feb. 16-26, Apr. 19-22; discharge estimated on basis of records for stations on nearby streams.

5310. Kula diversion from Haipuaena Stream near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank 3.4 miles east of Olinda and 6.2 miles south of Kailua.

Records available.--July 1945 to June 1960.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--14 years (1946-60), 0.447 mgd (0.692 cfs).

Extremes.--1945-60: Maximum daily discharge, 2.05 mgd (3.17 cfs) Mar. 20, 1948; minimum daily, 0.01 mgd (0.02 cfs) for several days in 1953, 1954, 1955.

Remarks.--Records good except those for period of no gage-height record, which are fair. Kula diversion flume diverts water from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.27	0.19	0.60	0.36	1.15	1.30	0.1	0.04	0.07	0.40	0.13	0.51
2	.23	1.18	.44	.34	.87	.82	.09	.03	.07	.36	.11	.43
3	.25	.59	.21	.18	.78	.40	.08	.03	.07	.31	.37	.28
4	.83	1.46	.30	.12	.47	.28	.6	.03	.58	.67	.62	.18
5	.90	.76	.75	.09	.35	1.12	.3	.03	.94	.92	.28	.14
6	1.26	.62	.56	.07	.51	.46	.4	.03	.60	1.06	.16	.12
7	1.35	.46	.33	.06	1.04	.45	.7	.03	.46	1.58	.12	.11
8	.50	.33	.34	.04	.92	.45	1.3	.03	.28	.78	.11	.10
9	.26	.52	.19	.04	.50	.48	1.0	.03	.19	.92	.29	.07
10	.16	.89	.16	.03	.30	.43	.8	.03	.14	1.08	1.36	.44
11	.12	1.04	*.56	.05	.27	*.40	1.1	.83	.33	.87	1.08	.15
12	.10	.54	.85	.07	.20	.24	.6	1.10	.43	.71	1.08	.11
13	.07	.30	.53	.09	.14	.18	.9	.19	.21	1.58	.64	.14
14	.05	.22	.71	.18	.11	.35	.7	.12	.14	1.40	.53	.14
15	1.08	1.65	.34	.13	.08	1.00	.5	.88	.11	1.04	.49	.13
16	.60	.81	.19	.07	.06	1.00	.35	1.19	.09	.56	.65	*.40
17	.26	.40	.14	.05	.05	1.0	.8	.66	*.07	.28	.56	.34
18	.46	.78	.11	.04	.03	.8	.6	1.08	.10	.23	.31	.15
19	.21	.68	.08	.03	.03	.9	.4	1.27	.76	.35	.23	.10
20	.14	.38	.07	.03	.06	.8	.3	.94	1.16	.88	.20	.07
21	.10	.34	.06	.03	.07	1.5	.25	.46	.74	.89	.16	.07
22	.07	.32	.04	.03	.06	1.1	.2	.28	.33	.92	.14	.55
23	.05	.18	.04	.03	.23	1.0	.15	.23	.95	1.02	.14	1.36
24	.67	.14	.03	.12	.68	.8	.1	.18	1.08	1.21	.16	1.19
25	.61	.60	.06	.14	.74	.6	.07	.16	.92	.78	.34	1.00
26	.32	.94	.58	*.10	1.36	1.0	.06	.15	.52	.48	.31	1.07
27	.18	.46	.72	.07	.92	.6	.05	.13	.40	.38	.24	.94
28	.31	.47	.34	.06	.96	.4	.07	.10	.77	.27	.15	1.07
29	1.08	.48	.58	.04	.80	.25	.08	.08	.78	.21	.11	.92
30	.42	.56	.59	.03	.82	.2	.07	-----	.64	1.16	.08	.80
31	.20	.40	-----	.53	-----	.15	.05	-----	.53	-----	.07	-----
Total	13.11	18.69	10.50	3.25	14.56	20.46	12.77	10.34	14.46	22.30	11.22	13.08
Mean	0.423	0.603	0.350	0.105	0.485	0.660	0.412	0.357	0.466	0.743	0.362	0.436
cfs	0.654	0.933	0.542	0.162	0.750	1.02	0.637	0.552	0.721	1.15	0.560	0.675
Ac-ft	40	57	32	10	45	63	39	32	44	68	34	40

Calendar year 1959: Max 1.83 Min 0.02 Mean(mgd) 0.435 Mean(cfs) 0.673 Ac-ft 486
 Fiscal year 1959-60: Max 1.65 Min 0.03 Mean(mgd) 0.450 Mean(cfs) 0.696 Ac-ft 504

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 17 to Jan. 28; discharge estimated on basis of records for Walkamoi Stream above reservoir at Kula pipeline intake near Olinda.

5311. Haipuaena Stream at Kula pipeline intake, near Olinda

Location--Lat 20°48'24", long 156°13'27", on left bank, at Kula pipeline intake, 3.4 miles east of Maui County Olinda Reservoir and 6.2 miles south of Kailua.

Drainage area--0.26 sq mi.

Records available--January to April 1946 (fragmentary), May 1946 to June 1960.

Gage--Water-stage recorder and concrete control. Altitude of gage is 4,320 ft (from topographic map).

Average discharge--14 years, 0.541 mgd (0.837 cfs).

Extremes--Maximum discharge during year, 62.0 mgd (95.9 cfs) Feb. 12 (gage height, 3.30 ft), from rating curve extended above 1.3 mgd; no flow many times.
1946-60: Maximum discharge, 87 mgd (135 cfs) between Jan. 23 and Feb. 9, 1948 (gage height, 3.72 ft), from rating curve extended above 1.3 mgd; no flow at times each year.

Remarks--Records fair except those for period of no gage-height record, which are poor. Kula pipeline diverts all water from Haipuaena Stream at low stages.

Revisions--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.85	0	1.4	2.45
1.0	.03	1.6	4.70
1.1	.16	1.9	9.50
1.2	.52	2.3	17.8
1.2	.98	2.7	33.0
1.3	1.60	3.0	47.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0		0.01	0	1.86	1.63	0	0	0	0	0	0.09
2	0	.68	0	0	.38	.16	0	0	0	0	0	0
3	0	.10	0	0	.02	0	0	0	0	0	.29	0
4	.08	1.96	0	0	0	0	.03	0	.05	.17	.03	0
5	1.18	2.26	.19	0	0	2.61	0	0	3.76	.08	0	0
6	.64	.62	.01	0	0	1.72	.06	0	.72	.37	0	0
7	.77	.04	0	0	.98	1.47	1.57	0	.08	1.45	0	0
8	0	0	0	0	.34	1.05	2.07	0	0	.05	0	0
9	0	.09	0	0	0	1.34	0	0	0	2.32	.03	0
10	0	.16	0	0	0	0	1.72	0	0	1.66	1.42	0
11	0	.19	.58	0	0	0	.16	7.72	0	.35	.55	0
12	0	0	.31	0	0	0	.04	39.0	0	.10	.82	0
13	0	0	.02	0	0	0	.32	16.5	0	1.64	.04	0
14	0	0	.04	0	0	.23	.05	12.2	0	2.07	.65	0
15	.91	6.28	0	0	0	2.08	0	2.20	0	1.75	3.5	0
16	0	.05	0	0	0	3.99	.03	9.19	0	6.72	.3	0
17	0	0	0	0	0	19.0	.41	1.59	0	3.68	.1	0
18	0	2.16	0	0	0	6.56	.12	.74	0	.57	0	0
19	0	.27	0	0	0	3.58	0	1.50	.39	.13	0	0
20	0	0	0	0	0	4.05	0	.17	1.37	.02	0	0
21	0	0	0	0	0	5.32	0	0	.14	.39	0	0
22	0	0	0	0	0	3.78	0	0	0	.13	0	.76
23	0	0	0	0	.05	.71	0	0	3.36	.32	0	1.72
24	.40	0	0	0	.06	.06	0	0	.84	1.78	0	.46
25	.04	.01	0	0	.06	0	0	0	.81	.07	0	.22
26	0	.23	.21	0	1.95	.51	0	0	.01	0	0	.51
27	0	0	.05	0	.51	.01	0	0	0	0	0	.53
28	.03	0	0	0	1.11	0	0	0	2.28	0	0	2.04
29	.28	0	.50	0	.28	0	0	0	.22	0	0	1.06
30	0	0	.04	0	.81	0	0	0	.01	0	0	.20
31	0	0	-----	2.69	-----	0	0	-----	0	-----	0	-----
Total	4.33	15.10	1.96	2.69	8.41	58.66	7.92	90.91	14.04	25.82	7.73	7.61
Mean:												
mgd	0.140	0.487	0.065	0.087	0.280	1.89	0.255	3.13	0.453	0.861	0.249	0.254
cfs	0.217	0.754	0.101	0.135	0.433	2.92	0.395	4.84	0.701	1.33	0.385	0.393
Ac-ft	13	46	6.0	8.3	26	180	24	279	43	79	24	23

Calendar year 1959: Max 19.0 Min 0 Mean(mgd) 0.588 Mean(cfs) 0.910 Ac-ft 659

Fiscal year 1959-60: Max 39.0 Min 0 Mean(mgd) 0.670 Mean(cfs) 1.04 Ac-ft 751

Peak discharge (base, 44 mgd)--Feb. 12 (10 p.m.) 62.0 mgd (95.9 cfs), 3.30 ft.

* Discharge measurement made on this day.

Note.--No gage-height record May 15 to June 16; discharge estimated on basis of records for nearby stations.

5350. Haipuaena diversion ditch at Kolea Gulch, near Keanae

Location.--Lat 20°50'37", long 156°11'46", on right bank 15 ft downstream from end of tunnel in Kolea Gulch, 3.3 miles southwest of Keanae, and 3.7 miles southeast of Kailua.

Records available.--March 1938 to June 1960.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 1,866 ft (from plane-table survey).

Average discharge.--22 years, 1.95 mgd (3.02 cfs).

Extremes.--1938-60: Maximum daily discharge, 11.4 mgd (17.6 cfs) Aug. 14, 1950; minimum daily, 0.02 mgd (0.03 cfs) for several days in 1956 and 1960.

Remarks.--Records good except those for periods affected by backwater, which are fair.

Ditch diverts water from Haipuaena Stream for East Maui Irrigation Co.'s hydroelectric plant about 1 mile downstream from where it discharges into Koolau ditch for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.69	1.42	1.90	1.36	2.55	3.09	1.56	1.31	1.13	1.49	0.23	0.13
2	1.56	2.26	1.69	1.36	1.96	2.18	1.56	1.25	1.13	1.49	.21	.11
3	1.83	1.76	1.56	1.31	1.69	1.83	1.56	1.19	1.19	1.42	.21	.11
4	1.83	2.44	1.97	1.25	1.49	1.76	1.98	1.13	1.56	1.76	.19	.11
5	2.12	3.01	1.76	1.19	1.36	2.48	1.62	1.07	2.04	1.83	.16	.13
6	2.10	2.25	1.62	1.19	1.56	2.64	1.81	1.02	1.56	2.03	.16	.14
7	2.18	1.76	1.56	1.13	1.90	2.32	3.04	1.02	1.36	2.55	.16	.14
8	1.69	1.62	1.49	1.13	1.69	2.40	3.10	*.96	1.25	1.76	.16	.16
9	1.42	1.69	1.42	1.07	*1.45	1.90	2.48	1.19	1.19	2.02	.17	.16
10	1.42	1.83	1.42	1.07	1.42	1.83	2.72	1.11	1.19	2.40	.10	.16
11	1.62	2.03	1.99	1.25	1.49	1.76	1.96	3.02	1.38	2.10	.05	.16
12	1.42	1.76	2.21	1.19	1.42	1.69	1.83	3.78	1.25	1.76	.08	.17
13	1.42	1.56	1.76	1.25	1.36	1.69	2.32	2.75	1.19	2.32	.04	.17
14	1.36	1.56	1.83	1.36	1.36	1.90	1.90	2.56	1.19	2.62	.07	.17
15	2.45	2.99	1.56	1.19	1.31	2.06	1.76	1.98	1.19	2.31	.11	.19
16	1.69	1.83	1.42	1.07	1.31	2.55	1.76	2.52	1.13	3.11	.09	.19
17	1.49	1.69	1.40	1.13	1.31	3.62	2.10	1.83	1.13	.18	.09	.17
18	1.83	2.10	1.36	.96	1.25	2.99	2.10	1.62	1.30	.02	.09	.17
19	1.49	1.83	1.31	.90	1.19	2.55	1.76	1.68	1.56	.03	.09	.17
20	1.42	1.56	1.31	.85	1.49	2.48	1.62	1.49	1.25	.04	.10	.17
21	1.42	1.49	1.31	.85	1.42	2.85	1.62	1.31	1.02	.03	.10	.19
22	1.36	1.49	1.31	.80	1.41	2.70	1.56	1.25	.90	.03	.11	*.18
23	1.36	1.42	1.25	.90	1.76	2.18	1.56	1.25	1.79	.05	.11	.04
24	1.60	1.42	1.36	1.48	1.95	1.96	1.49	1.19	1.96	.04	.09	.02
25	1.49	1.83	1.36	1.25	1.62	1.90	1.49	1.19	1.69	.04	.04	.02
26	1.36	1.99	1.76	1.13	2.24	2.32	1.42	1.25	1.42	.04	.06	.02
27	1.25	1.62	1.96	1.19	2.03	2.10	1.42	1.19	1.49	.16	.07	.02
28	1.53	1.76	1.56	1.19	2.10	1.83	1.56	1.19	1.87	.21	.09	.03
29	2.00	1.69	1.56	1.07	1.96	1.76	1.49	1.19	*1.85	.23	.10	.02
30	1.49	1.76	1.49	.90	2.30	1.69	1.42	-----	1.86	.23	.10	.02
31	1.42	1.76	-----	2.22	-----	1.62	1.36	-----	1.49	-----	.11	-----
Total	50.31	57.18	47.46	36.19	49.35	68.63	56.93	45.26	43.51	34.30	3.54	3.64
Mean:	1.62	1.84	1.58	1.17	1.64	2.21	1.84	1.56	1.40	1.14	0.114	0.121
mgd	2.51	2.85	2.44	1.81	2.54	3.42	2.85	2.41	2.17	1.76	0.176	0.187
cfs	154	175	146	111	151	211	175	139	134	105	11	11
Ac-ft												
Calendar year 1959: Max	4.30				0.80		1.70		Mean(cfs)	2.63	Ac-ft	1,900
Fiscal year 1959-60: Max	3.78				0.02		1.36		Mean(cfs)	2.10	Ac-ft	1,520

* Discharge measurement made on this day.

Note.--Backwater from debris May 30 to June 22.

5360. Haipuaena Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'04", long 156°11'28", on left bank 200 ft upstream from Spreckels ditch, 2.8 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.7 miles southeast of Huelo.

Drainage area.--1.19 sq mi.

Records available.--October 1913 to June 1960. Prior to July 1954, published as Haipuaena Stream near Huelo. December 1910 to September 1913 at site 600 ft downstream; records not equivalent owing to inflow from Spreckels ditch. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Concrete control since Feb. 8, 1951. Datum of gage is 1,512.22 ft above mean sea level (East Maui Irrigation Co. bench mark).

Average discharge.--46 years (1914-60), 9.92 mgd (15.3 cfs).

Extremes.--Maximum discharge during year, 1,260 mgd (1,950 cfs) Apr. 16 (gage height, 7.03 ft), from rating curve extended above 150 mgd; minimum daily, 0.18 mgd (0.28 cfs) for several days.

1913-60: Maximum discharge, 1,750 mgd (2,710 cfs), revised, Aug. 12, 1940 (gage height, 6.91 ft), from rating curve extended above 150 mgd; minimum, slightly less than 0.1 mgd (about 0.2 cfs) several days during January, February, May, June 1945 and October 1953.

Remarks.--Records good. Haipuaena diversion ditch and Kula pipeline divert water above station.

Revisions (fiscal years).--WSP 1319: 1923-25(M), 1927(M), 1929-35(M), 1937-39(M), 1941-50(M). WSP 1569: Drainage area. The figures of peak discharge for the fiscal years 1948-50 have been revised, and the peak discharge base has been lowered from 750 to 350 mgd for the fiscal years 1950-58 as shown below, superseding those published in WSP 1125, 1155, 1185, 1219, 1249, 1289, 1349, 1399, 1449 and 1569.

Revised peak discharge.--1947-48: Aug. 3 (6 p.m.) 369 mgd (571 cfs), 3.81 ft; Oct. 25 (6 p.m.) 800 mgd (1,240 cfs), 5.05 ft; Nov. 13 (2 p.m.) 409 mgd (633 cfs), 3.93 ft; Dec. 18 (7 p.m.) 464 mgd (718 cfs), 4.13 ft; Jan. 25 (5 p.m.) 1,090 mgd (1,690 cfs), 5.68 ft; Mar. 3 (7 p.m.) 732 mgd (1,130 cfs), 4.80 ft; Mar. 29 (1 p.m.) 440 mgd (681 cfs), 4.05 ft; Apr. 1 (2 p.m.) 383 mgd (593 cfs), 3.86 ft; Apr. 3 (6:30 p.m.) 378 mgd (585 cfs), 3.84 ft.

1948-49: Aug. 15 (6 p.m.) 491 mgd (760 cfs), 4.22 ft; Sept. 27 (9 p.m.) 700 mgd (1,080 cfs), 4.80 ft; Dec. 24 (2 p.m.) 494 mgd (764 cfs), 4.23 ft; Mar. 13 (6 p.m.) 401 mgd (620 cfs), 3.92 ft.

1949-50: July 26 (4:30 a.m.) 372 mgd (576 cfs), 3.82 ft; Nov. 12 (10:30 a.m.) 360 mgd (557 cfs), 3.78 ft; Feb. 18 (1:30 a.m.) 536 mgd (829 cfs), 4.36 ft; Feb. 22 (3:30 a.m.) 506 mgd (783 cfs), 4.27 ft; Mar. 21 (2 a.m.) 704 mgd (1,090 cfs), 4.81 ft; Mar. 29 (12 m.) 416 mgd (644 cfs), 3.98 ft; Apr. 19 (1:30 p.m.) 540 mgd (836 cfs), 4.37 ft; Apr. 23 (7 a.m.) 557 mgd (862 cfs), 4.42 ft; Apr. 27 (2:30 a.m.) 1,460 mgd (2,260 cfs), 6.37 ft.

1950-51: No peak above base.
1951-52: Dec. 12 (1:30 a.m.) 375 mgd (580 cfs), 4.90 ft; Feb. 19 (7:30 p.m.) 680 mgd (1,050 cfs), 5.86 ft.

1952-53: Mar. 4 (3:30 p.m.) 500 mgd (774 cfs), 5.30 ft.

1953-54: No peak above base.

1954-55: Dec. 10 (7:30 a.m.) 470 mgd (727 cfs), 5.25 ft; Feb. 11 (1 a.m.) 360 mgd (557 cfs), 4.85 ft.

1955-56: Feb. 25 (8 p.m.) 1,110 mgd (1,690 cfs), 6.95 ft.

1956-57: Oct. 17 (9 a.m.) 420 mgd (650 cfs), 4.90 ft.

1957-58: Aug. 24 (9 a.m.) 620 mgd (959 cfs), 5.48 ft; Aug. 29 (9:30 a.m.) 550 mgd (851 cfs), 5.27 ft; Nov. 22 (3 p.m.) 560 mgd (866 cfs), 5.30 ft.

5360. Haipuaena Stream above Spreckels ditch, near Huelo--Continued

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.4	0.18	2.5	20.2
1.5	.49	3.0	53.0
1.6	1.00	3.5	107
1.7	1.75	4.0	185
1.8	2.86	4.5	300
2.0	5.60		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.89	<u>1.28</u>	6.24	1.07	<u>22.3</u>	48.1	1.59	0.32	<u>0.78</u>	5.06	2.88	2.75
2	1.78	14.8	3.12	1.07	<u>8.39</u>	10.8	1.28	.29	.78	3.69	2.65	*3.00
3	<u>4.94</u>	2.84	1.84	.68	3.74	4.00	1.51	.26	.83	<u>3.11</u>	*2.61	2.32
4	5.13	22.6	7.77	.49	1.93	2.88	8.89	.23	10.1	9.94	3.89	1.84
5	14.7	59.9	4.43	.41	1.21	37.6	1.67	.20	<u>65.1</u>	9.36	2.12	1.75
6	11.1	13.4	2.52	.38	2.27	20.5	7.66	.20	8.98	17.6	<u>1.84</u>	2.02
7	15.4	4.40	1.67	.32	7.65	13.1	40.1	.20	3.22	47.2	<u>1.93</u>	1.93
8	3.09	3.26	1.43	.29	3.40	16.0	<u>55.0</u>	.18	1.84	7.11	3.49	1.75
9	1.75	3.70	1.14	.23	1.51	5.23	<u>20.9</u>	.18	1.43	28.0	<u>9.73</u>	<u>1.51</u>
10	1.35	5.92	1.00	.23	1.14	4.75	34.5	.73	1.21	36.6	<u>60.1</u>	4.66
11	3.39	11.4	7.13	.57	1.59	3.76	6.45	68.8	6.32	17.6	24.0	1.84
12	1.59	4.18	<u>13.6</u>	.35	1.14	2.54	4.48	<u>27.9</u>	3.19	6.10	34.0	3.13
13	1.00	2.55	3.35	.52	.73	2.76	16.7	167	1.43	25.8	8.69	2.88
14	.88	1.93	*4.78	1.38	.58	6.71	5.28	101	1.14	51.3	12.0	2.52
15	<u>27.9</u>	<u>61.9</u>	1.93	.41	.41	13.4	3.63	33.4	1.07	25.8	42.1	3.71
16	3.67	5.49	1.43	.29	<u>.38</u>	22.1	2.84	106	1.00	<u>136</u>	7.08	4.80
17	1.97	3.60	1.28	.41	.41	<u>113</u>	7.35	19.0	.78	128	4.96	3.69
18	5.89	14.3	1.14	.26	.41	52.6	9.06	12.5	4.78	15.1	4.69	2.22
19	2.02	5.27	.88	.23	.38	20.5	3.01	<u>14.4</u>	23.8	9.06	5.89	2.12
20	1.67	2.43	.78	.20	1.42	18.3	2.22	6.44	29.1	15.1	9.74	*1.59
21	1.21	1.93	.86	.20	.88	31.7	1.75	3.01	6.93	16.8	4.80	1.72
22	.94	1.67	.87	<u>.18</u>	1.14	30.4	1.51	2.22	3.13	10.9	5.84	11.2
23	.78	1.28	<u>.63</u>	.18	4.10	10.4	1.21	2.12	43.1	17.1	4.32	<u>32.0</u>
24	2.86	1.28	1.30	1.17	5.02	5.59	1.00	1.67	22.4	20.7	9.23	20.5
25	1.64	5.01	1.03	.48	1.75	4.76	.88	1.51	9.73	9.66	6.17	9.26
26	.73	6.38	5.45	.32	11.0	14.0	.73	1.67	3.63	7.36	4.48	10.1
27	<u>.49</u>	2.74	7.44	.32	6.54	9.93	.63	1.21	5.39	5.64	3.75	13.1
28	2.17	4.42	2.61	*.47	10.7	4.32	1.46	1.07	22.8	4.32	3.85	26.4
29	11.5	2.97	1.99	.38	6.02	3.13	*1.54	1.00	15.4	3.75	3.01	15.4
30	1.67	3.50	2.10	.23	16.8	2.43	.58	-----	14.1	3.38	2.54	11.4
31	.88	4.33	-----	<u>48.5</u>	-----	<u>1.93</u>	<u>.38</u>	-----	4.06	-----	2.43	-----
Total	136.98	280.66	91.74	62.22	124.94	537.22	245.79	825.81	317.54	697.14	294.81	203.11
Mean:												
mgd	4.42	9.05	3.06	2.01	4.16	17.3	7.93	28.5	10.2	23.2	9.51	6.77
cfs	6.84	14.0	4.73	3.11	6.44	26.8	12.3	44.1	15.8	35.9	14.7	10.5
Ac-ft	420	861	282	191	363	1,650	754	2,530	974	2,140	905	623

Calendar year 1959: Max 166 Min 0.18 Mean(mgd) 8.52 Mean(cfs) 13.2 Ac-ft 9,550
 Fiscal year 1959-60: Max 279 Min 0.18 Mean(mgd) 10.4 Mean(cfs) 16.1 Ac-ft 11,710

Peak discharge (base, 350 mgd).--Feb. 12 (11:30 p.m.) 833 mgd (1,290 cfs), 6.08 ft; Feb. 16 (7 a.m.) 550 mgd (851 cfs), 5.27 ft; Mar. 5 (9 p.m.) 448 mgd (693 cfs), 4.98 ft; Apr. 16 (12 p.m.) 1,260 mgd (1,950 cfs), 7.03 ft.

* Discharge measurement made on this day.

5380. Spreckels ditch at Haipuaena weir, near Huelo

Location.--Lat 20°51'15", long 156°11'25", on left bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo.

Records available.--April 1922 to June 1960. May 1919 to April 1922 in files of East Maui Irrigation Co.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft upstream at different datum.

Average discharge.--37 years (1922-29, 1930-60), 13.4 mgd (20.7 cfs).

Extremes.--1922-60: Maximum daily discharge, 97 mgd (150 cfs) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

Remarks.--Records good. Flow regulated by gates and spillways. Spreckels ditch diverts water from all streams between Nuua'ilua and Kailua Streams, above Koolau ditch east of Puohokamoa and below Koolau ditch west of Puohokamoa. About 4 mgd is diverted from Spreckels ditch to East Maui Irrigation Co.'s hydroelectric plant at Kolea Gulch. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 770: 1932-33.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12.5	6.37	18.3	3.76	32.2	44.0	5.30	0.98	5.10	16.7	9.62	11.4
2	*8.65	31.2	12.1	3.95	18.6	26.0	4.38	.72	5.10	13.9	8.81	11.6
3	20.9	*11.0	8.00	1.75	10.7	12.6	5.30	.46	5.30	13.3	*8.69	9.81
4	19.5	23.9	24.2	1.12	6.83	9.08	19.9	.30	25.8	22.2	11.4	7.78
5	26.1	44.0	17.5	.78	3.90	28.7	6.87	.26	40.8	20.2	8.27	8.00
6	27.5	32.7	9.76	.42	8.58	35.0	16.7	.26	15.6	32.3	7.32	8.81
7	30.1	15.5	7.32	.34	22.0	28.5	41.0	.23	8.54	57.0	7.32	8.01
8	12.8	11.3	6.42	.30	10.8	31.0	41.0	.23	8.00	23.5	10.3	7.43
9	6.88	14.8	4.90	.26	4.52	16.1	33.1	.20	8.00	33.2	12.3	6.00
10	5.30	19.4	4.55	.23	3.47	15.4	35.2	2.87	7.55	41.5	63.8	18.2
11	14.3	28.7	22.5	1.47	5.85	12.6	19.8	30.0	17.1	31.9	31.3	7.21
12	7.37	16.6	27.4	.64	3.54	8.27	15.4	47.0	14.2	18.2	39.8	14.0
13	4.21	11.0	13.4	2.02	1.65	9.64	27.0	23.4	8.00	35.7	12.6	11.5
14	3.34	8.00	*18.5	6.05	1.05	*16.6	17.7	19.8	6.88	57.6	13.6	11.2
15	31.7	39.3	8.22	1.06	.66	24.0	11.6	19.3	7.14	34.8	35.1	17.0
16	13.6	19.6	6.00	.38	.46	32.4	10.4	25.2	7.10	47.8	9.08	20.3
17	7.93	12.1	5.10	1.46	.66	44.0	19.2	26.0	6.65	.44	7.32	14.8
18	17.8	30.9	4.55	.26	.81	36.0	21.2	22.9	14.9	.15	10.9	8.95
19	8.64	19.5	3.76	.23	.51	31.7	9.89	22.2	40.3	4.13	14.5	8.65
20	6.64	9.89	3.34	.20	5.82	33.5	7.78	19.8	45.0	16.1	23.8	6.62
21	4.72	7.78	3.22	.20	3.45	41.0	6.20	15.4	*20.4	13.2	16.9	6.92
22	3.76	7.55	2.74	.20	2.89	36.0	4.90	11.0	13.1	14.6	21.4	25.0
23	2.92	5.30	1.59	.20	10.7	25.6	4.21	9.89	39.2	22.5	15.1	48.7
24	7.89	5.78	5.09	5.46	14.8	18.4	3.62	8.00	33.3	25.5	21.7	40.4
25	5.89	19.9	3.55	1.36	6.68	15.5	3.06	7.78	24.2	14.3	20.4	27.0
26	3.06	22.4	13.9	.77	23.0	29.9	2.52	8.27	16.2	15.5	16.6	28.7
27	2.06	12.8	22.9	1.50	17.0	24.0	2.17	6.65	23.2	16.2	13.9	29.7
28	8.24	18.6	9.09	2.36	21.2	13.9	5.88	6.20	34.7	13.6	14.2	45.3
29	24.4	13.0	6.24	1.46	16.6	10.4	*6.01	5.75	33.3	12.3	10.4	35.2
30	6.35	14.9	6.96	.34	22.8	8.00	1.95	-----	27.7	10.7	9.08	30.6
31	3.20	15.3	-----	19.5	-----	6.65	1.28	-----	13.9	-----	9.59	-----
Total	358.25	549.07	301.10	60.03	281.73	724.44	410.52	341.05	574.26	679.02	515.10	534.79
Mean:	11.6	17.7	10.0	1.94	9.39	23.4	13.2	11.8	18.5	22.6	16.6	17.8
mgd	17.9	27.4	15.5	3.00	14.5	36.2	20.4	18.3	28.6	35.0	25.7	27.5
cfs	1,100	1,690	924	184	865	2,220	1,260	1,050	1,760	2,080	1,580	1,640
Ac-ft												
Calendar year 1959: Max	75.0			Min	0.20	Mean(mgd)	13.3	Mean(cfs)	20.6	Ac-ft	14,930	
Fiscal year 1959-60: Max	63.8			Min	0.15	Mean(mgd)	14.6	Mean(cfs)	22.6	Ac-ft	16,350	

* Discharge measurement made on this day.

5410. Koolau ditch at Haipuaena, near Huelo

Location--Lat 20°51'17", long 156°11'19", on right bank 1,000 ft upstream from intake at Puohokamao Stream, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo Church.

Records available--April 1932 to June 1960.

Gage--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (from topographic map). Prior to Mar. 21, 1933, at datum 1.94 ft lower and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower than present datum.

Average discharge--28 years, 79.9 mgd (124 cfs).

Extremes--1932-60: Maximum daily discharge, 193 mgd (299 cfs) Jan. 17, 1946; no flow Feb. 14-28, Mar. 7-18, 1933, Feb. 26 to Mar. 22, 1935.

Remarks--Records good. Flow regulated by floodgates. Water used for domestic supply and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	59.2	48.3	113	35.5	174	166	59.0	37.0	34.0	98.8	52.0	41.0
2	44.5	133	67.5	35.5	119	141	52.0	35.5	34.0	77.0	48.0	37.0
3	88.1	63.2	55.0	32.5	63.0	80.5	59.0	34.0	34.0	68.2	48.0	37.0
4	86.3	152	114	31.0	44.0	59.0	118	*33.2	122	123	52.0	34.0
5	119	183	84.6	29.5	37.5	131	59.0	31.0	169	162	41.0	34.0
6	137	155	55.0	28.0	51.5	169	105	31.0	146	163	39.0	32.5
7	138	96.5	48.0	28.0	95.8	154	190	29.5	83.7	183	41.0	31.0
8	71.7	72.0	44.0	26.5	54.0	158	183	28.0	55.0	140	59.0	29.5
9	48.0	76.0	42.0	25.0	39.0	107	175	28.0	44.0	145	76.4	29.5
10	42.0	*104	41.0	25.0	34.0	101	176	31.5	41.0	176	167	45.8
11	69.2	143	105	31.0	32.5	87.5	149	135	63.3	176	*164	29.5
12	48.0	80.0	119	26.5	31.0	59.0	143	190	47.0	127	160	40.2
13	37.0	63.0	65.5	31.0	29.5	76.0	168	143	35.5	176	130	42.0
14	35.5	52.0	83.1	41.0	28.0	113	143	137	32.5	190	145	42.0
15	145	171	72.0	26.5	26.5	121	119	125	34.0	183	166	53.7
16	77.7	115	44.0	25.0	26.5	162	102	137	34.0	120	126	67.5
17	54.8	78.4	*43.3	28.0	26.5	183	142	106	48.9	45.6	93.0	50.5
18	89.8	150	42.0	23.5	26.5	176	144	120	67.3	36.0	86.7	34.0
19	55.0	101	37.0	22.0	25.0	169	85.0	144	159	87.7	89.4	31.0
20	50.0	67.0	37.0	22.0	39.2	169	76.0	141	183	137	134	28.0
21	42.0	59.0	37.0	20.5	32.5	176	63.0	80.0	111	137	125	29.5
22	37.0	52.0	37.0	20.5	28.0	176	59.0	63.0	59.0	116	93.5	78.2
23	35.5	48.0	35.5	20.5	45.4	161	55.0	59.0	118	155	72.0	162
24	38.5	48.0	49.0	31.0	68.4	131	52.0	52.0	162	158	72.0	162
25	39.0	91.2	40.8	23.5	32.5	101	50.0	48.0	121	143	59.0	116
26	32.5	105	70.2	22.0	84.8	172	46.0	46.0	85.0	110	59.0	126
27	31.0	67.0	87.4	28.0	85.2	150	44.0	41.0	119	85.0	55.0	126
28	46.3	111	44.0	34.0	110	103	48.7	39.0	127	67.0	55.0	155
29	101	95.7	39.0	32.5	103	85.0	48.0	37.0	158	63.0	48.0	149
30	41.0	95.0	39.0	23.5	107	72.0	41.0	-----	150	59.0	44.0	135
31	34.0	97.0	-----	84.1	-----	63.0	39.0	-----	85.0	-----	44.0	-----
Total	1,973.6	2,972.3	1,790.9	913.1	1,699.8	3,972.0	2,992.7	2,161.7	2,762.2	3,707.3	2,644.0	2,008.4
Mean:	63.7	95.9	59.7	29.4	56.7	128	96.5	74.5	89.1	124	85.3	66.9
mgd	98.6	148	92.4	45.5	87.7	198	149	115	138	192	132	104
cfs	6,060	9,120	5,500	2,800	5,220	12,190	9,180	6,650	8,480	11,580	8,110	6,160
Ac-ft	6,060	9,120	5,500	2,800	5,220	12,190	9,180	6,650	8,480	11,580	8,110	6,160
Calendar year 1959: Max	183	Min	20.5	Mean(mgd)	76.7	Mean(cfs)	119	Ac-ft	85,950			
Fiscal year 1959-60: Max	190	Min	20.5	Mean(mgd)	80.9	Mean(cfs)	125	Ac-ft	90,830			

* Discharge measurement made on this day.

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo

Location.--Lat 20°51'48", long 156°11'00", on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 miles west of Keanae, 3 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Records available.--December 1917 to June 1960.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

Average discharge.--41 years (1918-24, 1925-60), 5.86 mgd (9.07 cfs).

Extremes.--1917-60: Maximum daily discharge, 92 mgd (142 cfs), revised, Jan. 3, 1927; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch is extension of Center ditch and picks up water from streams between the Kolea and Waikamoi Streams. Flow regulated by gates. Water used for irrigation in central Maui.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1918-30, superseding those published in WSP 485, 515, 516, 535, 555, 575, 595, 615, 635, 655, 675, 695, and 710 are given herein.

Discharge, in million gallons a day, December 1917 to June 1918

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						-	2.5	2.4	10.9	32	3.0	1.8
2						-	1.1	2.0	36	72	2.3	1.4
3						-	2.0	1.5	56	72	3.4	1.3
4						-	2.6	1.4	41	32	18.0	1.1
5						-	1.6	1.3	18.9	32	15.8	1.1
6						-	1.4	3.5	3.8	64	8.1	.9
7						-	1.2	3.4	12.5	38	5.6	.9
8						-	2.7	3.4	8.4	43	4.3	.9
9						-	6.9	76	18.9	72	2.6	.9
10						-	1.6	43	32	90	15.8	7.6
11						-	24	32	72	48	5.3	7.4
12						-	2.9	36	50	23	5.3	27
13						-	2.1	10.2	17.0	18.9	18.0	6.4
14						-	1.6	9.2	12.5	29	3.3	3.0
15						2.4	2.3	10.2	6.9	29	9.0	22
16						.55	6.9	8.3	48	13.4	6.6	14.2
17						.55	2.1	18.9	25	9.0	3.4	9.9
18						.55	1.7	9.2	5.4	6.4	2.2	3.0
19						.55	1.6	21	3.0	5.4	1.9	2.1
20						5.5	1.9	68	2.2	8.7	1.6	1.8
21						4.2	1.4	34	2.3	14.2	1.7	1.9
22						11.3	3.8	8.8	1.6	17.9	2.1	3.5
23						2.9	2.2	5.5	1.4	6.0	4.0	2.2
24						1.7	3.4	3.7	5.3	2.2	6.7	1.5
25						1.2	4.6	2.6	64	1.1	5.0	1.9
26						1.0	2.6	2.6	18.9	1.3	1.8	1.8
27						.8	2.3	2.4	4.4	2.3	6.3	1.9
28						.9	1.9	23	2.7	20	2.0	1.3
29						1.0	1.9	-	1.8	3.0	4.0	1.6
30						.9	8.2	-----	5.8	7.3	2.5	2.1
31						.9	2.8	-----	13.4	-----	1.9	-----
Total						-	105.8	443.5	602.0	795.8	191.5	134.4
Mean						-	3.41	15.8	19.4	26.5	6.18	4.88
mgd						-	5.28	24.4	30.0	41.0	9.56	6.93
cfs						-	325	1,360	1,850	2,440	588	412
Ac-ft						-						

Calendar year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft
Fiscal year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1918 to June 1919

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.6	19.9	6.0	0.6	6.2	1.2	0.6	1.3	0.9	0.7	9.4	0.6
2	7.6	5.6	2.6	.5	7.8	13.0	.7	1.5	1.1	.7	1.1	.5
3	9.6	7.4	.8	.5	2.2	31	.7	1.2	1.3	.7	.9	.5
4	2.6	1.9	.7	.5	12.0	6.9	1.6	.7	.9	.6	1.3	.5
5	3.8	3.1	.6	.4	6.2	20		.5	2.7	.5	13.0	.5
6	1.3	5.7	.6	.6	3.7	29		.5	13.2	.5	5.9	.4
7	3.5	3.5	.5	.4	1.1	20		.5	13.6	.5	1.7	.4
8	3.7	4.2	.5	.4	.9	16.8		.5	9.4	.5	1.6	.3
9	7.9	1.2	.5	.3	.9	4.5		11.7	16.5	.5	6.9	.3
10	4.3	1.2	.5	.3	.8	10.1	.5	1.6	28	.5	1.4	.4
11	5.6	1.6	.4	.3	17.7	8.7		.9	10.8	.5	1.1	.4
12	2.3	8.7	.4	.3	30	2.2		4.6	10.8	.4	1.1	.3
13	4.0	15.7	.4	.3	15.0	1.5		.9	8.1	.5	1.0	.3
14	4.0	17.9	.4	.3	5.2	11.5		.9	3.2	.4	.9	.3
15	5.2	3.1	.3	.3	1.3	8.9		.7	2.2	.4	.9	.4
16	2.0	4.5	.3	.3	1.2	3.7		.7	5.5	3.6	.8	.4
17	1.1	41	.3	.3	1.0	5.7	.4	.6	8.7	4.3	3.1	.3
18	.9	32	.4	.3	.9	1.7	.4	.6	2.0		12.6	.6
19	.9	17.0	4.6	.2	.9	4.4	.4	.6	1.6	1.4	.9	.4
20	2.8	38	.4	1.7	.9	5.2	.3	8.1	1.5		.9	.3
21	12.3	24	.3	.3	.8	8.7	.3	1.6	1.3	2.1	1.6	.3
22	4.6	12.5	.3	.4	.7	2.5	.3	2.7	28	12.3	.9	.3
23	22	5.6	.5	.3	.7	1.9	.4	1.7	14.0	11.4	.9	.3
24	29	3.1	.6	.3	.6	2.8	2.8	1.7	6.8	8.1	.9	.3
25	36	1.6	1.6	.2	.6	1.3	2.1	2.3	2.9	5.6	.7	.3
26	17.0	1.2	.6	4.2	.6	1.0	.5	1.1	2.0	5.6	.6	.3
27	21	1.1	.5	2.8	.6	.8	4.0	1.0	1.6	3.0	.7	.5
28	41	13.6	.5	.4	1.9	.7	5.7	1.4	1.5	1.6	.6	.7
29	28	13.4	1.3	.4	8.8	.6	6.4	-	1.2	1.1	.6	.6
30	8.3	3.5	1.6	9.8	1.5	4.7	.8	-----	1.0	1.3	.6	.5
31	17.9	5.0	-----	.9	-----	1.8	5.9	-----	.9	-----	.6	-----
Total	352.5	359.3	29.0	28.8	132.7	232.8	40.3	51.6	203.1	72.0	75.2	12.2
Mean:	mgd 11.4	11.6	0.97	0.93	4.42	7.51	1.30	1.84	6.55	2.40	2.43	0.41
cfs	17.6	17.9	1.50	1.44	6.84	11.6	2.01	2.85	10.1	3.71	3.76	0.63
Ac-ft	1,080	1,100	89	88	407	714	124	158	623	221	231	37

Calendar year 1918: Max	90	Min	0.2	Mean(mgd)	9.31	Mean(cfs)	14.4	Ac-ft	10,450
Fiscal year 1918-19: Max	45	Min	0.2	Mean(mgd)	4.35	Mean(cfs)	6.73	Ac-ft	4,870

Note.--No gage-height record Jan. 5-16, Apr. 18-20.

Discharge, in million gallons a day, fiscal year July 1919 to June 1920

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.3	1.1	12.2	0.3	0.3	0.3	2.4	0.3	0.3	6.6	0.4	0.9
2	12.8	.9	6.3	.6	.3	.3	2.1	.3	.2	5.9	.4	.6
3	.7	1.0	30	.6	.3	.2	1.3	.3	.2	3.0	.4	.8
4	.4	5.0	8.0	.7	.3	.3	1.0	.3	.2	2.3	.4	.3
5	.4	15.4	4.0	10.9	.3	.3	1.0	.3	.2	9.1	.4	.2
6	.3	7.9	2.1	29	.3	.3	.7	.3	.2	8.1	.4	.2
7	.3	17.8	1.6	5.9	.3	.3	.7	.3	.2	7.2	.4	.2
8	.3	7.7	3.3	2.0	.3	.3	.7	.3	.4	2.7	.3	.2
9	.3	3.0	1.6	.9	.3	.3	.6	.3	.4	1.6	.3	.2
10	.3	2.0	4.1	.7	.3	.3	.6	.4	.4	1.3	.3	.2
11	a.5	1.6	1.3	.7	7.4	.3	.9	.5	.3	1.3	.3	.2
12	a8	1.5	.9	.6	.9	.3	.9	.3	8.3	1.2	.3	.2
13	a8	7.0	.7	.6	.8	.3	.6	.3	2.7	1.6	.3	.5
14	8.8	2.0	.7	.5	.6	.2	.5	.6	.4	1.1	.3	.3
15	13.7	14.5	.6	.6	.9	.3	.4	.2	.4	.9	.3	.8
16	2.0	7.2	.5	.6	.6	.3	.4	.2	.4	.7	.3	.3
17	.7	7.0	.5	.6	.5	.3	.6	.3	.3	.7	.3	.3
18	.6	3.4	.5	.5	.4	.3	.6	.6	14.4	.6	.3	.3
19	.6	3.9	.5	.5	.3	.3	.5	.3	37	.6	.2	.3
20	.5	1.3	.5	.5	.3	.2	.4	.2	64	.6	.2	.2
21	1.9	1.2	.4	.5	.3	.2	.4	.2	60	.5	.2	.2
22	1.9	1.1	.3	.5	.3	.2	1.3	.2	76	.5	.2	.2
23	.6	.9	.3	.4	.3	4.4	.5	.4	45	1.7	.2	.2
24	.6	.8	.3	.4	.3	.6	.4	.2	53	.8	.2	.2
25	3.2	.7	.3	.4	.3	.3	.4	.2	78	.6	.2	.2
26	1.1	.7	.3	.4	.3	.3	.3	.2	35	.6	.2	.2
27	11.0	.6	.3	.5	.3	.3	.3	.3	8.8	.5	.2	.2
28	11.0	.8	.3	.4	.3	4.4	.3	.2	3.0	.4	.2	.2
29	3.8	1.6	.3	.4	.3	26	.3	.4	2.1	.4	.2	.2
30	1.7	6.3	.3	.4	.3	24	.3	-----	9.3	.4	.2	.2
31	1.3	29	-----	.3	-----	28	.3	-----	4.6	-----	.2	-----
Total	97.6	154.7	83.0	61.9	18.9	94.4	21.7	8.5	505.9	63.5	8.7	9.2
Mean:	mgd 3.15	4.99	2.77	2.00	0.63	3.05	0.70	0.29	16.3	2.12	0.28	0.31
cfs	4.87	7.72	4.29	3.09	0.98	4.72	1.08	0.45	25.2	3.28	0.43	0.48
Ac-ft	300	475	255	190	58	290	67	26	1,550	195	27	28

Calendar year 1919: Max	30	Min	0.2	Mean(mgd)	2.64	Mean(cfs)	4.08	Ac-ft	2,960
Fiscal year 1919-20: Max	78	Min	0.2	Mean(mgd)	3.08	Mean(cfs)	4.77	Ac-ft	3,460

a No gage-height record.

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1920 to June 1921

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.2	0.5	1.1	0.7	0.9	11.5	1.5	3.4	0.5	6.1	1.2	0.5
2	.2	.4	.9	.5	2.3	7.6	1.5	1.9	22	5.5	1.6	.5
3	.1	.9	.9	.6	4.9	4.7	5.7	3.6	4.6	4.0	1.7	.5
4	.1	1.1	.7	.6	1.6	3.0	7.6	1.7	.8	2.3	1.1	.5
5	.1	.5	.9	.5	.9	2.9	24	1.5	.6	1.6	1.5	.5
6	.1	.4	5.8	.4	.7	10.6	53	1.3	.5	28	1.1	.4
7	.1	.4	10.9	.5	.7	6.6	52	1.2	.5	51	.8	.4
8	.1	.4	5.0	.4	37	22	15.6	1.1	.4	31	.7	.4
9	.1	.3	6.5	.4	25	21	14.2	1.0	.4	24	.6	.4
10	.1	.3	3.0	.4	10.8	21	7.7	.9	.4	6.7	.6	.4
11	.1	.4	17.9	8.9	8.8	9.4	7.4	.7	.4	6.7	.6	.4
12	.1	.7	8.6	5.7	5.6	7.7	11.0	.7	.4	11.5	.7	.3
13	.1	8.5	8.1	.9	2.0		8.2	.6	.3	14.4	.6	.3
14	.1	8.0	3.5	.5	1.5		11.1	.6	.3	6.2	.5	.3
15	.4	1.2	2.4	15.0	1.1	a24	64	1.6	.3	6.8	.5	.3
16	.2	.9	1.7	13.1	.9		56	1.3	.3	19.2	.5	.3
17	.6	.8	1.6	6.1	.7	3.8	76	.7	.2	6.7	.5	.3
18	.3	.7	1.2	9.1	.6	2.2	38	2.3	.8	3.4	5.2	.3
19	.2	.6	1.0	3.7	.6	1.9	16	.9	.6	2.2	2.1	.5
20	.7	1.2	.9	2.7	13.5	1.6	11.5	.6	.3	5.8	4.3	.3
21	2.4	4.4	.7	1.7	24	1.3	11.5	.6	.8	2.6	1.6	.3
22	8.4	1.0	.7	1.3	16.6	1.2	6.3	.5	.4	6.1	.7	.3
23	6.4	1.6	.7	1.0	9.4	6.4	2.6	.5	.3	13.7	.7	.3
24	3.6	1.2	.6	1.7	6.3	11.8	2.2	.5	11.4	6.1	8.6	.2
25	.9	2.1	.6	12.2	4.0	31	22	.5	3.1	3.7	1.8	.2
26	.5	2.8	.6	5.3	10.8	4.2	47	.5	6.6	5.3	.8	.2
27	.4	12.8	.5	2.0	4.5	3.8	13.4	.4	18.5	2.6	.7	1.2
28	.5	3.0	.9	1.6	3.2	2.3	8.3	.4	8.0	1.8	.7	16.0
29	.6	1.5	.5	1.1	8.7	1.9	4.6	-	11.4	1.5	.6	4.7
30	.7	1.3	1.7	1.1	32	1.6	2.9	-----	34	2.6	.6	.4
31	.5	1.3	-----	.9	-----	1.4	2.9	-----	15.1	-----	.6	-----
Total	28.9	60.2	89.7	100.6	237.6	300.4	603.7	31.5	144.2	291.1	43.8	31.6
Mean	0.93	1.94	2.99	3.25	7.92	9.69	19.5	1.12	4.65	9.70	1.41	1.05
mgd	1.44	3.00	4.63	5.03	12.3	15.0	30.2	1.73	7.19	15.0	2.18	1.62
cfs	89	185	275	309	729	922	1,850	97	443	893	134	97
Ac-ft												

Calendar year 1920 : Max	78	Min	0.1	Mean(mgd)	3.92	Mean(cfs)	6.07	Ac-ft	4,400
Fiscal year 1920-21 : Max	76	Min	0.1	Mean(mgd)	5.38	Mean(cfs)	8.32	Ac-ft	6,020

a No gage-height record; discharge estimated by comparison with flow of Haipuna Stream.

Discharge, in million gallons a day, fiscal year July 1921 to June 1922

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		6.8	0.8	1.6	10.1	9.3	4.1	64	30	0.6	2.7	0.6
2	3.0	20	.7	15.4	12.3	3.7	2.1	54	24	.9	3.5	.6
3		10.8	.6	3.7	32	37	2.5	38	38	5.3	8.1	.5
4	4.9	3.3	.6	1.7	16	48	19.5	12.2	25	5.5	20	.5
5	.7	3.8	.9	1.3	6.2	28	19.7	6.3	58		18.5	.5
6	.5	3.0	.9	1.1	3.1	27	10.4	4.0	64	13	8.9	.4
7	.4	5.7	.7	1.1	1.7	8.6	2.6	3.2	64		4.9	.4
8	3.0	2.1	.6	1.3	5.1	4.6	5.7	1.8	68		12.9	.4
9	.6	1.3	4.3	.9		3.0	2.7	22	56		2.6	.5
10	.4	1.2	4.3	.9		3.2	1.5	44	68		3.4	.5
11	.4	5.6	.8	.8	1.0							
12	.4	23	.7	.7		2.6	1.8	11.2	52		3.2	.4
13	.4	4.2	.6	.7		30	2.5	19.7	39	6.0	1.6	.9
14	.4	2.4	.6	.6	1.8	85	13.9	4.6	34		1.1	1.2
15	7.2	1.4	5.6	.6	.9	46	6.0	2.0	17.0		.9	.5
16	12.2	1.2	5.6	1.0	.9	2.9	1.8	1.3	8.6		.7	.4
17	17.1	1.1	3.7	.7	.8	26	1.8	1.2	18.0		.6	.3
18	29	1.0	1.4	.6	.7	54	7.3	1.1	7.6	3.0	.6	.3
19	29	15.7	.9	.5	35	19.9	26	1.1	5.0	2.4	.6	.3
20	20	2.5	.8	.5	60	8.1	30	.9	3.6	4.2	2.4	.3
21	4.4	2.0	2.0	.5	72	4.0	48	18.8	3.2	4.6	.7	.3
22	2.0	2.3	15.3	.4	72	2.6	36	12.1	2.1	4.9	.6	.3
23	1.6	1.1	13.7	7.2	56	17.5	25	4.5	1.6	2.1	.8	.3
24	1.2	.9	6.9	33	56	68	17.0	12.0	1.8	2.9	1.1	.3
25	1.1	.9	2.4	29	60	56	25	5.4	1.1	6.0	.9	.2
26	1.0	.9	1.5	27	72	50	38	5.5	1.5	1.7	15.2	.2
27	10.0	.8	2.8	13.0	39	24	52	8.5	1.3	1.1	10.2	.2
28	2.4	.7	2.1	14.3	21	15.1	56	64	1.1	22	12.7	.2
29	22	.7	1.1	21	11.5	16.0	29	-	1.0	24	4.4	.2
30	14.0	1.6	1.1	19.5	10.1	5.6	62	-----	-----	6.2	.9	.2
31	5.3	2.1	-----	21	-----	5.6	82	-----	.7	-----	.7	-----
Total	200.6	130.1	84.3	221.4	662.7	717.3	634.0	399.2	706.9	196.4	146.2	12.3
Mean	6.47	4.20	2.81	7.14	22.1	23.1	20.5	14.3	22.8	6.55	4.72	0.41
mgd	10.0	6.50	4.35	11.0	34.2	35.7	31.7	22.1	35.3	10.1	7.30	0.63
cfs	616	399	259	679	2,030	2,200	1,950	1,230	2,170	603	449	38
Ac-ft												

Calendar year 1921: Max	85	Min	-	Mean(mgd)	8.66	Mean(cfs)	13.4	Ac-ft	9,700
Fiscal year 1921-22: Max	85	Min	0.2	Mean(mgd)	11.3	Mean(cfs)	17.5	Ac-ft	12,620

Note.--No gage-height record; Nov. 9-12, Apr. 5-17; discharge estimated from records of Haipuna Stream.

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1924 to June 1925

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.2	14.2	0.6	1.2	1.6		-	0.3	0.4	16.7	21	1.5
2	.3	14.7	.6	.9	1.3		2.5	.3	.4	16.4	20	1.7
3	.3	3.9	.6	.8	1.1		.6	.3	4.6	6.7	6.3	25
4	.3	22	.5	7.2	1.0		.6	.3	1.8	9.0	4.4	41
5	.2	16.0	.4	1.4	.9		1.1	.3	.6	32	17.2	30
6	.2	2.6	.4	.7	.7		4.7	.2	.4	23	6.6	21
7	.2	2.1	.6	.7	.7		6.2	.3	.5	45	4.5	6.6
8	.5	17.3	.5	.6	.7		41	.3	.5	20	3.2	3.1
9	.4	21	.3	1.1	.7		42	9.4	.4	17.0	7.0	2.8
10	.2	25	.3	.7	.6		36	36	1.4	38	13.8	2.1
11	.2	26	.3	6.4	.6		24	10.2	11.4	39	8.8	1.7
12	1.6	12.1	.3	1.5	.6		5.3	5.4	1.1	33	6.0	6.8
13	1.6	3.3	.3	1.0	.5		1.4	5.9	.5	30	5.4	6.2
14	.3	2.1	.3	.7	.4		1.0	19.9	.4	18.3	1.6	15.6
15	13.5	4.4	.3	2.2	.4		1.1	9.1	.4	33	2.0	39
16	34	19.0	.2	65	.4		.7	1.9	.4	46	1.5	11.1
17	14.2	31	.2	12.8	.3		.6	1.2	.4	63	7.7	5.2
18	14.2	23	.2	22	.3		.6	.9	13.8	45	27	9.1
19	6.8	10.9	.2	25	.3		2.7	.9	33.8	38	18.7	17.0
20	17.8	3.1	.2	8.8	-		1.3	-	45	29	4.0	8.5
21	50	4.0	.4	20	-		1.2	.7	58	26	3.0	2.6
22	30	1.9	.3	30	-		.6	.6	39	30	29	1.6
23	6.8	1.5	.2	45	-		1.7	.6	16.0	14.0	23	1.3
24	2.4	1.3	4.4	56	-		.7	.6	5.4	4.3	7.5	1.1
25	1.8	1.2	30	41	-		.5	.5	2.1	2.4	4.3	1.0
26	1.6	1.0	78	20	-		.5	.5	39	7.9	3.4	6.2
27	8.3	1.3	36	12.5	-		.4	.5	68	2.1	1.9	16.0
28	5.1	.9	15.1	3.4	-		.5	.4	38	1.8	7.7	41
29	3.2	.8	3.3	6.3	-		.6	-	58	20	2.4	12.6
30	23	.7	1.6	4.5	-		.4	-	45	4.8	2.8	39
31	3.6	.6	-	2.2	-		.4	-	11.8	-	3.4	-
Total	242.8	288.9	176.6	401.6	-	-	-	108.2	497.7	711.4	275.1	377.4
Mean:												
mgd	7.83	9.32	5.89	13.0	-	-	-	3.86	16.1	23.7	8.87	12.6
cfs	12.1	14.4	9.11	20.1	-	-	-	5.97	24.9	36.7	13.7	19.5
Ac-ft	745	887	542	1,230	-	-	-	332	1,530	2,180	844	1,160

Calendar year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft
Fiscal year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft

Note.--No gage-height record Nov. 20 to Jan. 1.

Discharge, in million gallons a day, fiscal year July 1925 to June 1926

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14.1	14.2	29	1.7	0.5	1.0	15.8	1.8	0.5	5.2	0.3	0.5
2	5.6	22	21	.6	.6	.9	.8	.6	.5	.4	.5	.3
3	2.7	4.2	13.2	7.0	.9	.8	.6	.5	.5	.3	.3	.3
4	2.1	10.9	6.1	.6	2.2	.7	5.5	.6	.5	.3	.3	.3
5	1.6	43	4.5	.8	14.7	.7	.9	.5	.5	.2	.3	.2
6	1.4	36	3.3	2.4	6.7	.7	.6	.5	.4	.6	.4	.2
7	12.6	29	2.2	5.7	32	.7	.6	.5	.4	.4	7.3	.2
8	3.2	15.1	1.9	2.5	41	.6	.5	.5	.4	.3	12.9	.2
9	1.1	7.6	7.2	6.4	38	.6	.5	.7	.4	.2	.7	.2
10	.9	3.6	5.0	6.7	32	.5	.6	6.4	.4	.2	.4	.4
11	7.6	2.1	13.7	2.2	9.3	.5	1.9	4.3	.4	.1	4.6	6.9
12	1.6	1.9	23	1.0	1.5	.5	.5	.5	.4	3.8	11.1	45
13	1.0	1.3	14.6	.9	15.3	.5	.5	.4	.3	2.2	.6	38
14	.8	1.3	14.2	1.6	17.0	.5	.4	.3	.3	.4	.4	25
15	.7	1.1	4.2	.7	33	.5	.5	.4	.3	.3	.4	1.7
16	.6	12.0	2.0		24	.5	.8	.4	.4	.5	.3	1.0
17	1.2	1.3	1.7		34	.4	.8	19.4	.3	17.0	.3	.9
18	1.5	1.0	7.2		24	.5	.4	27	.3	1.0	.3	.7
19	.6	18.9	14.3		25	3.6	.4	3.6	.3	.9	.3	.7
20	7.1	2.4	6.0	.8	10.6	.6	.4	1.3	.3	1.7	.3	.6
21	13.8	2.1	14.6		2.8	.4	28	1.5	.2	.6	.3	.6
22	.9	21	3.0		1.4	.4	9.6	.9	4.2	.5	.3	.5
23	.7	18.9	1.8		1.3	.4	.9	.8	.3	1.5	.3	.5
24	.7	2.1	1.3		12.3	.4	.7	1.5	.3	11.3	.2	.5
25	1.3	10.0	.9		5.0	.4	.6	.9	.2	3.3	.4	.5
26	.6	48	.7	10	1.6	.4	.5	.7	.2	.6	.3	.5
27	12.7	65	.6		1.7	.4	.5	.7	.2	.4	.3	.5
28	15.8	36	.5		1.1	.4	.5	.6	.2	.4	.3	.4
29	21	39	2.3	.8	1.1	.3	.8	.8	.2	.3	2.2	.4
30	2.8	32	27		1.3	.3	8.8	.2	.2	.3	18.4	.3
31	18.2	39		.5	-	5.3	1.5	-	.3	-	1.3	-
Total	156.7	546.0	247.0	90.1	391.9	24.4	91.5	77.9	14.9	55.2	66.1	128.0
Mean:												
mgd	5.05	17.6	8.23	2.91	13.1	0.79	2.95	2.78	0.48	1.84	2.13	4.27
cfs	7.81	27.2	12.7	4.50	20.3	1.22	4.56	4.30	0.74	2.95	3.30	6.61
Ac-ft	481	1,680	758	277	1,200	75	281	239	46	169	203	393

Calendar year 1925 : Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft
Fiscal year 1925-26 : Max	65	0.1	5.18	8.01

Note.--No gage-height record Oct. 16-30; discharge estimated on basis of records for Honomahu Stream near Keanae, Maui.

5415. Manuel Luis ditch at Puohokamos Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1926 to June 1927

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.5	2.4	1.3	1.0	0.5	0.6	0.6	1.6	29	16.8	6.8	1.1
2	.5	38	1.0	.8	.4	.6	3.6	1.3	20	3.5	3.7	1.0
3	.5	39	.9	.7	.4	.6	92	1.1	46	3.0	.7	4.5
4	.4	2.2	.8	.7	.4	.5	45	1.0	36	1.7	1.5	.7
5	.4	35	.7	16.1	.5	.5	16.2	.9	22	1.9	6.6	.9
6	.4	5.5	.7	26	.5	1.5	18.4	.8	30	1.2	7.4	18.3
7	.9	1.8	1.0	6.9	.5	1.4	27	.6	34	1.1	32	17.8
8	.5	1.5	.9	1.3	.5	.6	38	.6	23	1.0	37	1.6
9	1.2	1.3	.6	4.5	.5	.5	9.8	.6	13.4	2.0	27	2.1
10	.7	1.3	.5	2.0	.5	.4	2.0	.5	2.9	1.5	33	1.5
11	.6	1.0	.5	1.3	.5	.4	1.6	.5	1.1	16.6	13.0	1.1
12	.5	.9	.5	1.1	.7	.5	49	.5	1.0	11.0	2.2	.9
13	.7	5.7	15.7	1.0	.7	.5	7.7	.9	1.0	3.9	5.2	.8
14	.5	28	2.3	.9	45	.4	5.7	.9	34	5.0	.8	.9
15	.7	3.9	.9	.8	13.2	.4	2.6	.7	32	31	.8	.8
16	.5	1.8	.9	.8	2.2	.5	1.9	.9	38	52	8.2	.8
17	3.5	29	.7	2.0	5.2	.4	1.6	.7	41	28	7.4	.8
18	1.4	6.9	.7	3.5	1.4	.5	1.3	2.8	34	17	1.0	.8
19	.4	1.8	9.6	1.6	1.3	2.2	1.1	.3	7	41	9.8	.8
20	.5	13.3	2.0	.7	1.2	.5	1.0	.3	.6	55	2.2	.8
21	.5	52	1.2	.6	1.6	1.6	16.3	.4	.5	39	1.3	.7
22	4.8	32	1.1	.6	1.0	.6	19.2	.3	1.0	39	1.2	.6
23	.7	10.8	1.0	.7	.9	6.6	2.4	.3	1.3	31	1.0	.6
24	.6	2.6	1.2	.7	.8	1.4	1.7	6.3	.7	36	.9	.6
25	.9	7.5	5.0	.6	1.2	17.4	21	48	.6	30	.7	.6
26	.5	1.6	1.1	.5	1.1	25	27	29	2.4	32	.6	.6
27	3.0	1.5	3.0	.6	.7	12.0	3.9	1.9	.9	30	.7	.5
28	2.0	2.7	17.4	1.4	.7	1.1	2.8	9.8	.7	21	.9	.5
29	.7	5.1	1.6	.7	.7	.8	3.5	.8	15.5	1.2	.5	.5
30	.6	8.7	1.1	.5	.6	.7	2.0	-----	.8	6.3	1.2	.5
31	1.4	4.2	-----	.5	-----	.7	1.6	-----	8.4	-----	.7	-----
Total	31.0	349.0	75.9	81.1	85.5	81.2	425.5	110.2	284.8	620.0	331.5	77.9
Mean	1.00	11.3	2.53	2.62	2.85	2.62	13.7	3.94	9.19	20.7	10.7	2.60
cfs	1.55	17.5	3.91	4.05	4.41	4.05	21.2	6.10	14.2	32.0	16.6	4.02
Ac-ft	95	1,070	233	249	262	249	1,310	338	874	1,900	1,020	239

Calendar year 1926: Max 52 Min 0.1 Mean(mgd) 3.12 Mean(cfs) 4.83 Ac-ft 3,490
 Fiscal year 1926-27: Max 92 Min - Mean(mgd) 7.00 Mean(cfs) 10.8 Ac-ft 7,840

Note.--No gage-height record July 30, 31, May 16-19; discharge estimated on basis of records for Center ditch below Kolea Reservoir.

Discharge, in million gallons a day, fiscal year July 1927 to June 1928

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.5	4.7		1.2		7.6	1.6	33	0.6	14.8	2.8	0.8
2	.5	16.1	3.1	2.0		5.5	1.3	31	.6	3.8	1.4	.8
3	.5	9.3		1.2		19.8	1.2	30	.5	.8	23	.7
4	.5	4.0		1.1	0.8	1.8	1.2	22	.5	.7	24	.7
5	1.2	1.1		1.1		1.5	1.6	13.1	.5	.7	25	.7
6	.6	1.0		1.0		7.5	1.0	4.4	.5	17	19.4	8.2
7	.5	5.4	44	1.0		35	.8	1.6	.5	52	2.6	.8
8	29	30		11.0	5	54	1.3	4.0	.3	30	2.4	.6
9	38	13.0		8.2		22	.9	1.0	.4	3.7	1.5	.5
10	45	24	17	1.2		3.0	.7	1.0	.4	2.0	5.1	.5
11	34	33		1.0		6.1	1.2	.8	.5	1.5	18.4	.6
12	38	29		7.2		12.9	3.0	.5	1.3	45	1.2	.5
13	16.7	22		1.2	1.6	15.4	18	11.1	.4	1.2	68	.5
14	9.0			1.1		2.2		28	.4	44	3.6	.5
15	1.5		8.5	1.0		1.6	10.2	2.1	.3	18.6	22	.8
16	1.3			1.0		1.9	51	1.0	.3	1.7	9.2	.5
17	1.1	17		.9		2.2	28	.8	.3	1.3	2.8	.4
18	1.2			.9	28	2.3	32	2.6	.3	1.2	1.5	20
19	.9			.8		24	30	1.0	.3	1.4	1.3	2.4
20	.8			9.7	10.4	27	20	.8	.3	2.3	1.2	.7
21	3.0		1.8	1.2	9.3	8.9	33	.7	.3	2.3	1.0	.8
22	2.8	6.6		1.1	11.0	43	7.9	.7	.3	.8	.8	.8
23	9.6			.5	6.4	19.7	27	.7	.3	.7	.8	.6
24	1.1	24		.4	9.1	6.7	7.2	7.5	.4	.7	.7	6.1
25	.9			6.5	27	37	1.7	4.5	1.4	.6	7.7	20
26	40		10	6.5	36	23	1.4	.8	50	.5	32	36
27	31			25	40	27	.7	.7	43	.7	23	29
28	20			11.1	46	21	.6	.6	13.8	.6	3.2	25
29	24	12		.9	2.6	12.6	34	.6	.8	.6	1.5	22
30	3.3			1.9	2.6	38	-----	-----	9.9	34	1.1	28
31	1.3			-----	-----	1.9	31	-----	22	-----	1.0	-----
Total	359.8	479.2	309.9	74.5	261.4	494.7	486.7	206.4	150.7	241.5	385.4	210.2
Mean	11.6	15.5	10.3	2.40	8.71	16.0	15.1	7.12	4.86	8.05	12.4	7.01
cfs	17.9	24.0	15.9	3.71	13.5	24.8	23.4	11.0	7.52	12.5	19.2	10.8
Ac-ft	1,100	1,470	951	229	802	1,520	1,430	633	462	741	1,180	645

Calendar year 1927: Max - Min - Mean(mgd) 10.5 Mean(cfs) 16.2 Ac-ft 11,750
 Fiscal year 1928-29: Max - Min - Mean(mgd) 9.95 Mean(cfs) 15.4 Ac-ft 11,160

5415. Manuel Luis ditch at Puohokamos Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1928 to June 1929

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	36	19.4	0.9	5.2	1.1	0.5	17	0.8	36	0.5	0.8	0.3
2	22	11.6	21	9.8	.9	.5		.8	29	.5	.5	.4
3	16	13.6	19.0	1.2	.7	.5		.7	29	.6	.5	.3
4	4.7	13.2	17.7	1.5	2.7	.7		.7	33	.6	.4	8.6
5	1.7	12.8	12.3	9.8	6.4	29.4		.6	39	.5	.4	13.5
6	1.4	2.7	5.8	1.6	1.0	38	2.5	6.8	32	.4	2.5	1.5
7	22	1.9	12.7	1.1	36	18.0		13.3	39	1.2	3.1	.6
8	31	1.1	8.2	1.0	14.7	8.6		1.1	39	19.4	2.7	.4
9	12.0	1.0	14.2	.8	21	32		.9	52	.7	.6	.3
10	18.2	14.5	28	.8	29			.8	39	30	1.0	.3
11	17.2	9.5	22	.7	48	22	1.5	1.2	41	52	12.4	.8
12	2.3	9.2	11.6	.7	24	30		24	29	58	8.1	1.1
13	4.6	8.1	4.1	.6	25	28		5.7	21	30	26	3.3
14	20	3.2	1.6	1.0	31	43		16.5	23	19.9	23	.8
15	11.9	5.7	1.5	5.0	25	30		39	30	21	9.4	17.5
16	31	23	1.5	.7	15.3	32	1.8	50	17.0	3.1	.7	.8
17	34	35	1.1	.6	3.7	17		48	8.0	4.5	.5	.5
18	24	22	1.3	.7	19.8	19.9		30	2.2	28	.5	.5
19	21	10.9	28	.9	13.6			24	1.5	4.9	.5	.4
20	5.8	16.4	3.0	.5	12.7			33	1.3	1.4	.4	.4
21	1.4	12.0	1.0	.5	23	9	24	22	1.2	1.1	.4	.3
22	17.8	10.4	.9	.8	7.8			37	1.0	1.0	.5	.3
23	14.2	14.8	.8	.5	2.0			7.7	.9	1.0	1.3	.3
24	34	18.6	.8	.5	1.8			14.1	.8	1.2	.8	.4
25	43	7.1	.7	.4	.8			9.4	.8	.9	.5	.4
26	55	1.3	.7	.4	.8	12	1.8	10.0	.7	.7	.4	.4
27	35	1.7	.6	19.3	.7			23	.7	.7	6.9	.3
28	18	9.4	.7	13.2	.7			43	.6	.7	1.5	.2
29	13.1	1.2	7.7	.8	.7			1.3	-	.6	.6	.2
30	10.8	1.0	.6	2.1	.8			1.0	-----	.5	.4	.2
31	8.2	.9	-----	.8	-----	3.8		.9	-----	.6	.4	-----
Total	587.3	313.2	230.0	83.5	372.7	497.0	194.1	464.1	549.4	283.6	107.7	55.0
Mean	18.9	10.1	7.67	2.69	12.4	16.0	6.26	16.6	17.7	9.45	3.47	1.83
mgd	29.2	15.6	11.9	4.16	19.2	24.8	9.69	25.7	27.4	14.6	5.37	2.83
cfs	1,800	961	706	256	1,140	1,530	596	1,420	1,690	870	331	169
Ac-ft												

Calendar year 1928: Max 66 Min 0.3 Mean(mgd) 10.2 Mean(cfs) 15.8 Ac-ft 11,480
 Fiscal year 1928-29: Max 58 Min 0.2 Mean(mgd) 10.2 Mean(cfs) 15.8 Ac-ft 11,470

Discharge, in million gallons a day, fiscal year July 1929 to June 1930

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.3	0.7	0.4	0.7	0.6	15	14	2.3	20	24	25	1.3
2	.4	.6	.4	12	.6	20	10	1.5	27	33	21	3.2
3	.3	4.7	.4	.6	.6	17	23	1.3	29	28	14	12.5
4	.2	19	.3	.5	.8	3.3	18.5	1.2	29	9.6	11.5	24
5	.2	13.5	.3	.4	.8	3.2	8.5	1.2	25	14.3	26	5.9
6		9.9	.3	.4	.8	6.6	9.6	1.7	29	34	22	4.4
7	.2	1.6	.2	.5	.7	21	5.3	1.5	26	34	21	1.0
8	.2	6.6	2.4	17	.7	7.6	2.2	1.0	14	34	25	.9
9	.2	2.0	.3	28	.7	3.6	1.8	.9	25	34	15.5	.9
10	6.3	23	.2	18.5	.7	1.9	1.9	.8	26	34	8.1	1.0
11	.8	24	.3	1.7	.6	1.5	1.7	.8	29	34	2.4	2.7
12	.3	4.3	.2	1.2	.5	1.5	1.2	.8	16.5	34	15	23
13	.2	1.4	.2	1.1	.5	1.1	5.1	.7	6.0	24	7.2	16
14	.2	1.1	.2	1.0	.5	1.0	1.3	.7	9.8	11.5	18.5	6.0
15	2.3	1.1	.3	.8	.5	.9	1.0	.7	18	15.7	22	1.0
16	28	1.0	a.3	.8	.5	16.5	.9	.6	7.4	25	11.5	17
17	2.4	1.6	a.2	.8	15.5	15.5	.8	1.1	3.4	17.9	25	11
18	.5	.8	a.2	.8	27	24	5.7	.8	1.8	14	23	1.2
19	.4	.7	2.0	1.0	8.4	27	5.0	.7	1.8	24	23	1.0
20	.4	.7	.2	.8	2.4	26	11.5	.6	1.7	26	12.5	.9
21	.5	5.8	.2	.8	1.8	15.5	1.5	1.3	1.6	30	14	1.1
22	9.7	1.3	.2	.8	1.3	6.6	6.9	29	1.5	30	18.5	1.3
23	.7	.5	.3	.7	20	8.8	6.5	29	1.4	28	18	20
24	4.1	.5	.3	.8	23	26	1.1	21	1.2	16	3.6	27
25	26	.5	.3	.7	7.5	20	21	14	2.8	18.9	2.0	27
26	15	.5	1.2	.8	21	18	6.8	22	5.6	11.5	15	28
27	7.2	.4	6.0	.8	4.7	25	1.6	27	23	9.1	1.4	24
28	1.2	.4	13.5	.7	24	15.5	1.5	24	5.6	14	2.5	18.5
29	1.0	.4	7.5	.7	20	27	1.3	-	1.3	11.5	1.0	28
30	.8	.4	.5	.7	14	27	16.5	-----	1.2	24	1.1	27
31	.8	.4	-----	.7	-----	20	9.8	-----	1.1	-----	.8	-----
Total	111.0	129.4	37.5	96.8	200.7	423.4	203.5	188.2	387.7	698.0	425.1	336.8
Mean	3.58	4.17	1.25	3.12	6.69	13.7	6.56	6.72	12.5	23.3	13.7	11.2
mgd	5.54	6.45	1.93	4.83	10.4	21.2	10.1	10.4	19.3	36.1	21.2	17.3
cfs	341	397	115	297	616	1,300	625	578	1,190	2,140	1,300	1,030
Ac-ft												

Calendar year 1929: Max 56 Min 0.2 Mean(mgd) 7.27 Mean(cfs) 11.2 Ac-ft 8,140
 Fiscal year 1929-30: Max 34 Min 0.2 Mean(mgd) 8.87 Mean(cfs) 13.7 Ac-ft 9,330

a No gage-height record.

5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo--continued

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.09	0.54	2.69	0.54	15.9	39.3	1.07	0.54	0.54	8.54	0.78	0.48
2	.71	8.40	1.24	.48	7.29	13.1	.93	.48	.48	3.32	.72	.48
3	2.34	1.44	.78	.42	2.53	2.70	1.07	.42	.48	2.55	.78	.42
4	2.03	9.86	5.31	.37	1.54	1.45	7.12	.42	9.00	11.4	1.59	.37
5	7.75	50.4	3.02	.32	1.23	19.4	1.23	.42	29.0	5.95	.72	.37
6	5.26	9.94	1.00	.28	1.59	18.0	5.99	.42	8.58	10.3	.66	.32
7	7.54	2.96	.78	.28	5.58	7.50	23.7	.37	2.88	37.5	.60	.28
8	1.27	1.80	.66	.28	2.82	8.00	32.7	.37	1.99	5.52	.60	.28
9	.54	2.56	.60	.28	1.30	3.94	10.4	.32	a1.5	16.1	1.11	.28
10	.48	*3.36	.54	.28	1.23	3.58	23.3	1.09	a1.3	18.4	26.4	.93
11	2.18	11.2	3.72	.32	1.15	2.92	4.80	27.7	a6.4	13.6	*6.22	.42
12	.85	5.10	6.27	.28	.93	1.45	4.22	64.0	2.20	4.46	21.8	.48
13	.48	2.02	1.37	.37	.85	1.68	11.7	52.9	1.23	7.14	4.22	.48
14	.42	1.30	2.16	.72	.78	3.97	4.80	47.0	1.07	32.8	4.17	.48
15	20.6	35.4	.72	.32	.66	5.08	2.84	16.8	.93	13.9	14.9	.85
16	1.82	4.34	.54	.28	.60	7.68	2.36	42.6	.85	58.4	2.42	1.07
17	.72	5.31	.54	.42	.66	37.3	4.23	9.83	a2.78	50.6	1.70	.66
18	2.48	24.7	.48	.28	.66	24.6	5.40	7.02	a2.5	31.0	1.45	.37
19	.72	7.08	.48	.28	.60	8.39	1.99	9.62	a15	15.7	1.23	.42
20	.72	5.26	.42	.28	.93	5.72	1.53	4.73	a24	17.2	1.78	.28
21	.54	2.36	.60	.23	.72	10.5	1.23	1.72	a12	24.6	1.15	.32
22	.48	1.89	.72	.23	.62	10.3	1.00	1.23	a3.5	6.32	1.30	2.47
23	.37	1.38	.66	.23	2.47	*4.53	.93	1.30	a45	2.08	1.07	10.7
24	.60	1.07	1.23	.58	3.01	3.76	.85	.93	a40	2.22	1.11	2.80
25	.63	3.59	.73	.28	.78	3.69	.78	.78	a11	1.53	1.00	2.08
26	.37	3.46	3.57	.23	2.57	9.19	.72	.72	a5.0	1.30	.78	4.23
27	.32	1.51	5.85	.28	2.66	7.82	.60	.60	a12	1.23	.93	*3.70
28	1.34	2.65	1.48	.54	3.05	3.16	1.42	.54	a50	1.00	.66	5.56
29	8.64	1.80	.81	.60	3.17	2.08	1.45	.54	a35	.93	.60	3.26
30	.93	2.06	.78	.28	7.61	1.53	.66	-----	14.7	.85	.54	2.18
31	.60	1.62	-----	22.2	-----	1.23	.54	-----	2.99	-----	.54	-----
Total	74.82	210.36	49.75	32.76	75.49	273.55	161.56	295.41	331.90	409.44	103.13	47.02
Mean	2.41	6.79	1.66	1.06	2.52	8.82	5.21	10.2	10.7	13.6	3.33	1.57
cfs	3.73	10.5	2.57	1.64	3.90	13.6	8.06	15.8	16.6	21.0	5.15	2.43
Ac-ft	230	646	153	101	232	839	496	907	1,020	1,260	316	144
Calendar year 1959: Max	58.0			Min	0.23	Mean(mgd)	4.55	Mean(cfs)	7.04	Ac-ft	5,100	
Fiscal year 1959-60: Max	64.0			Min	0.23	Mean(mgd)	5.64	Mean(cfs)	8.73	Ac-ft	6,340	

* Discharge measurement made on this day.

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

5450. Puohokamoa Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'21", long 156°11'29", on right bank 150 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Drainage area.--2.31 sq mi.

Records available.--June 1913 to June 1960. Prior to July 1954, published as Puohokamoa Stream near Huelo, December 1910 to May 1913 at site 200 ft downstream; records not equivalent due to inflow of Spreckels ditch. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,322.04 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to May 31, 1934, water-stage recorder at site 130 ft downstream at different datum.

Average discharge.--47 years (1913-60), 21.7 mgd (33.6 cfs).

Extremes.--Maximum discharge during year, 2,360 mgd (3,650 cfs) Apr. 16 (gage height, 9.31 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 1.50 mgd (2.32 cfs) Oct. 22, 23, 30, 31.
1913-60: Maximum discharge, that of Apr. 16, 1960; minimum, 0.4 mgd (0.6 cfs) Oct. 26, 1917.

Remarks.--Records good. Kula pipeline diverts small amount of water above station, at altitude 4,300 ft, for domestic supply.

Revisions.--WSP 1639: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1920, 1930, and 1933, superseding those published in WSP 516, 710, 755, and 1319, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1919		1929		1929-Con.		1929-Con.		1932-Con.	
Dec. 2	1.0	Aug. 25	5.4	Sept. 18	1.3	Nov. 15	1.1	Oct. 31	1.8
3	1.0	26	5.0	19	1.3	16	1.0	Nov. 1	1.6
5	2.3	27	4.7	20	1.2			2	1.5
6	1.4	28	4.4	21	1.4	1932		3	1.9
7	1.1	29	4.2	22	1.3	Oct. 7	1.9	4	2.1
8	.9	30	6.0	23	1.3	8	1.9	5	1.5
9	.8	31	8.9	24	1.7	9	1.9	6	1.4
10	.7	Sept. 1	4.5	25	2.5	10	1.8	7	1.4
11	.7	2	4.5	Oct. 30	1.8	11	1.8	8	1.3
12	.7	3	3.5	31	1.7	12	1.8	9	1.3
13	.9	4	3.0	Nov. 1	1.6	13	1.7	10	1.3
14	1.0	5	2.7	2	1.5	14	1.7	11	1.7
15	1.0	6	2.5	3	1.7	15	1.5	12	2.6
16	1.1	7	2.7	4	2.2	16	1.8	13	1.7
17	1.3	8	2.5	5	1.7	17	1.9	15	1.2
18	1.3	9	2.3	6	1.6	18	1.8	16	2.0
19	1.1	10	2.1	7	1.5	23	2.9	17	1.6
20	1.0	11	2.3	8	1.6	24	2.2	18	1.3
21	1.0	12	2.0	9	1.5	25	1.9	19	1.2
22	1.0	13	1.8	10	1.3	26	1.7	20	1.2
24	7.6	14	1.7	11	1.7	27	1.7	21	1.1
25	4.1	15	1.6	12	1.3	28	1.5	22	1.1
26	3.2	16	1.5	13	1.2	29	1.7	23	1.2
		17	1.4	14	1.1	30	2.1		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
December 1919.....	125	0.7	13.7	21.2	1,300
Calendar year 1919.....	153	.7	12.6	19.5	14,090
Fiscal year 1919-20.....	379	.7	13.1	20.3	14,700
August 1929.....	103	3.9	12.7	19.6	1,210
September.....	18	1.2	3.58	5.54	330
October.....	165	1.7	10.5	16.2	995
November.....	153	1.0	18.9	29.2	1,740
Calendar year 1929.....	281	1.0	23.0	35.6	25,760
Fiscal year 1929-30.....	365	1.0	27.6	42.7	30,920
October 1932.....	2.9	1.5	1.97	3.05	188
November.....	111	1.1	11.1	17.2	1,020
Calendar year 1932.....	308	1.1	22.7	35.1	25,460
Fiscal year 1932-33.....	-	1.1	14.7	22.7	16,500

5450. Puohokamoa Stream above Spreckels ditch, near Huelo--Continued

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to May 15

May 16 to June 30

0.6	0.75	1.8	63.0
.7	1.75	2.2	115
.8	3.10	2.5	165
.9	5.10	3.0	252
1.0	7.90	3.5	340
1.2	15.5	4.0	440
1.4	28.0		

0.7	1.86	1.0	8.60
.8	3.44	1.2	17.0
.9	5.62	1.4	27.5

Note.--Same as preceding table above 1.5 ft.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.38	4.40	16.1	4.00	53.4	106	5.85	2.53	3.44	15.5	7.00	*4.48
2	6.31	34.6	10.5	3.62	21.3	28.8	5.10	2.27	3.26	10.3	6.10	5.62
3	14.6	*7.89	5.85	3.10	9.76	11.1	5.35	2.27	3.44	9.08	*5.32	4.62
4	14.2	49.6	18.8	2.81	6.10	7.60	23.5	2.14	24.1	26.0	7.25	3.79
5	51.4	125	11.5	2.67	4.40	65.4	6.10	2.01	117	26.2	4.85	3.60
6	26.9	35.2	7.00	2.40	6.08	51.2	19.2	2.01	22.9	45.1	4.20	3.99
7	34.2	12.5	5.35	2.27	17.2	30.0	85.3	1.88	10.8	112	4.20	3.60
8	9.48	9.20	4.85	2.27	9.16	38.3	123	1.75	7.30	20.4	6.34	3.60
9	5.35	10.4	4.20	2.14	4.85	14.3	46.2	1.62	6.10	62.0	21.4	3.06
10	4.40	14.6	4.00	2.01	4.00	13.1	81.9	2.47	5.60	70.7	129	10.4
11	8.82	28.9	19.5	2.67	4.40	10.7	17.2	117	19.9	49.0	43.7	3.99
12	5.10	11.4	34.1	2.27	3.80	7.00	12.2	370	10.5	18.5	75.4	6.19
13	3.62	7.60	9.83	2.81	3.10	7.60	39.5	247	5.85	62.4	16.0	5.91
14	3.26	5.85	*13.6	4.24	2.81	*16.8	13.4	180	5.35	130	25.4	5.10
15	57.8	103	6.40	2.40	2.53	26.4	9.90	80.0	4.60	64.9	78.7	7.97
16	10.4	15.2	5.10	2.14	2.40	38.8	8.39	192	4.00	293	14.8	11.6
17	5.86	10.6	4.40	2.67	2.53	172	17.7	46.0	3.62	170	11.3	3.72
18	15.8	31.0	4.00	2.01	2.53	84.6	24.0	30.3	13.8	33.2	9.64	4.62
19	6.10	14.1	3.62	1.75	2.27	39.7	8.20	33.4	58.0	20.0	11.3	4.20
20	5.10	7.90	5.44	1.75	4.43	36.3	6.40	17.7	61.5	33.6	20.8	*3.44
21	4.20	6.40	3.57	1.75	3.44	53.1	5.35	9.20	*16.8	39.5	9.92	3.60
22	3.62	5.85	3.62	1.62	3.03	55.8	4.85	7.00	8.50	31.1	11.9	25.4
23	3.26	5.10	3.26	1.50	9.91	25.8	4.40	6.70	88.8	37.0	8.60	69.6
24	5.22	5.35	4.80	3.75	14.3	16.6	4.00	5.60	54.1	36.4	14.0	45.2
25	4.87	14.4	4.11	2.53	5.35	14.3	3.62	5.35	25.0	21.0	11.3	20.8
26	3.10	17.7	13.4	2.40	19.6	33.2	3.44	5.10	11.6	15.8	*8.60	23.0
27	2.81	9.00	19.4	2.40	14.7	26.6	3.10	4.60	15.0	12.6	7.00	29.0
28	6.07	11.6	7.57	*2.68	22.3	12.6	4.59	4.20	52.1	10.2	7.00	61.1
29	28.4	8.24	4.60	2.27	15.8	9.55	*4.74	3.80	38.8	9.20	5.62	33.9
30	5.67	9.65	5.35	1.62	36.6	7.30	2.95	-----	33.5	7.90	4.85	28.1
31	3.62	11.7	-----	104	-----	6.40	2.67	-----	11.8	-----	4.85	-----
Total	347.92	641.93	261.82	178.52	312.08	1,066.95	601.90	1,385.90	747.06	1,494.58	596.94	443.20
Mean:	11.2	20.7	8.73	5.76	10.4	34.4	19.4	47.8	24.1	49.8	19.3	14.8
cfs	17.3	32.0	13.5	8.91	16.1	53.2	30.0	74.0	37.3	77.1	29.9	22.9
Ac-ft	1,070	1,970	803	548	958	3,270	1,850	4,250	2,290	4,590	1,830	1,360

Calendar year 1959: Max 322 Min 1.50 Mean(mgd) 19.3 Mean(cfs) 29.9 Ac-ft 21,620
 Fiscal year 1959-60: Max 370 Min 1.50 Mean(mgd) 22.1 Mean(cfs) 34.2 Ac-ft 24,790

Peak discharge (base, 750 mgd).--Feb. 13 (12:30 a.m.) 1,010 mgd (1,560 cfs), 6.14 ft; Feb. 16 (6:30 a.m.) 940 mgd (1,450 cfs), 5.90 ft; Mar. 5 (6 p.m.) 916 mgd (1,420 cfs), 5.82 ft; Apr. 16 (11:30 p.m.) 2,360 mgd (3,650 cfs), 9.31 ft.

* Discharge measurement made on this day.

5528. Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda

Location.--Lat 20°48'25", long 156°14'00", on left bank 1,500 ft upstream from Kula pipeline at Waikamoi intake and 3.0 miles east of Olinda.

Drainage area.--2.49 sq mi.

Records available.--July 1954 to June 1960. Prior to July 1956 published as Waiakamoi Stream above Reservoir at Kula pipeline intake, near Olinda.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,487 ft above mean sea level (levels by Maui County Waterworks).

Average discharge.--6 years, 1.93 mgd (2.99 cfs).

Extremes.--Maximum discharge during year, 1,260 mgd (1,950 cfs) Feb. 12 (gage height, 7.16 ft), from rating curve extended above 6.4 mgd on basis of computation of flow over dam; minimum, 0.02 mgd (0.03 cfs) on many days.

1953-60: Maximum discharge, 1,680 mgd (2,600 cfs) Dec. 10, 1954 (gage height, 8.16 ft), from rating curve extended above 6.4 mgd on basis of computation of flow over dam; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor, and those above 10 mgd, which are fair.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.1	0.01	1.5	25.0
.2	.05	2.0	56.0
.3	.14	2.5	100
.4	.28	3.0	160
.6	.74	3.5	235
.8	1.70	4.0	325
1.0	6.20		
1.2	12.5		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.09	0.06	0.11	0.09	3.53	0.23	0.04	0.02	0.02	0.15	0.03	0.09
2	.10	.83	.10	.08	1.06	.64	.04	.02	.02	.11	.03	.08
3	.10	.30	.06	.05	.35	.18	.04	.02	.02	.08	.25	.05
4	.27	2.24	.10	.04	.18	.11	.19	.02	.04	.16	.22	.04
5	.75	3.81	.23	.04	.10	4.05	.08	.02	4.0	.28	.11	.03
6	.68	.85	.27	.03	.13	2.55	.14	.02	2.0	.44	.05	.03
7	1.53	.30	.18	.03	1.29	1.47	1.60	.02	.5	2.19	.04	.02
8	.18	.15	.11	.03	1.12	1.05	4.22	.02	.2	.52	.04	.02
9	.08	.19	.07	.03	.34	.37	1.64	.02	.09	2.05	.06	.02
10	.05	.56	.06	.03	.12	.19	3.47	.02	.08	3.56	1.10	.04
11	.04	.54	*.20	.05	.08	.13	.57	8.09	.09	.71	1.10	.04
12	.03	.28	.43	.04	.05	.08	.43	270	.1	.45	1.19	.03
13	.03	.11	.25	.04	.04	.06	.77	90	.08	2.72	.53	.04
14	.02	.07	.22	.05	.04	.24	.52	40	.06	3.95	.19	.03
15	.77	8.34	.11	.03	.03	2.06	.33	20	.05	1.35	6.69	.04
16	.26	.76	.06	.03	.02	5.29	.19	60	.04	9.68	.57	*.11
17	.09	.26	.05	.02	.02	54.2	.81	25	.03	7.67	.34	.09
18	.16	2.56	.04	.02	.02	38.9	.46	9.0	.03	.60	.14	.04
19	.08	.75	.03	.02	.02	3.98	.18	11	.32	.30	.07	.03
20	.05	.21	.03	.03	.04	5.02	.09	3.0	1.30	.41	.05	.02
21	.04	.11	.03	.02	.03	15.2	.05	.5	.48	.62	.04	.03
22	.04	.08	.03	.02	.04	12.3	.04	.2	.12	.66	.04	.38
23	.03	.05	.03	.03	.09	2.96	.04	.09	4.16	.77	.03	1.93
24	.75	.05	.04	.04	.23	.80	.03	.05	2.05	2.82	.05	.65
25	.22	.18	.05	.03	.20	.55	.03	.03	1.31	2.46	.09	.64
26	.10	.36	.16	.03	2.21	.96	.03	.03	.31	.25	.07	.86
27	.06	.22	.17	.02	1.19	.48	.03	.03	.16	.14	.05	.81
28	.07	.13	.07	.03	1.62	.26	*.03	.03	2.45	.08	.04	2.81
29	.39	.12	.27	.02	.67	.15	.04	.03	.69	.05	.03	1.38
30	.12	.13	.16	.02	1.34	.08	.03		.34	.04	.02	.75
31	.07	.10		2.48		.05	.02		.30		.02	
Total	7.25	24.70	3.72	3.52	16.20	154.59	16.20	537.28	21.44	45.27	13.28	11.13
Mean:												
mgd	0.234	0.797	0.124	0.114	0.540	4.99	0.523	18.5	0.692	1.51	0.428	0.371
cfs	0.362	1.23	0.192	0.176	0.836	7.72	0.809	28.6	1.07	2.34	0.662	0.574
Ac-ft	22	76	11	11	50	474	50	1,650	66	139	41	34

Calendar year 1959: Max 164 Min 0.01 Mean(mgd) 1.80 Mean(cfs) 2.79 Ac-ft 2,020

Fiscal Year 1959-60: Max 270 Min 0.02 Mean(mgd) 2.33 Mean(cfs) 3.61 Ac-ft 2,620

Peak discharge (base, 130 mgd).--Dec. 17 (12 p.m.) 195 mgd (302 cfs), 3.24 ft; Feb. 12 (12:30 p.m.) 1,260 mgd (1,950 cfs), 7.16 ft.

* Discharge measurement made on this day.

Note.--No gage-height records Feb. 12 to Mar. 17; discharge estimated on basis of records for nearby streams.

5650. Kaaiea Gulch near Huelo

Location.--Lat 20°52'02", long 156°12'17", on left bank 700 ft upstream from Hamakua ditch trail crossing, 2 miles southeast of Kailua, 3.2 miles southeast of Huelo, and 3.5 miles west of Keanae.

Drainage area.--0.58 sq mi.

Records available.--December 1921 to June 1960. Prior to July 1958, published as Kaaiea Stream near Huelo.

Gage.--Water-stage recorder and concrete weir. Altitude of gage is 1,310 ft (from topographic map). Prior to Aug. 1, 1934, water-stage recorder at site 40 ft downstream at different datum.

Average discharge.--38 years (1922-60), 4.43 mgd (6.85 cfs).

Extremes.--Maximum discharge during year, 766 mgd (1,190 cfs) Apr. 16 (gage height, 4.88 ft), from rating curve extended above 130 mgd; minimum, 0.42 mgd (0.65 cfs) Feb. 9, 10.

1921-60: Maximum discharge, 2,300 mgd (3,560 cfs) Nov. 18, 1930 (gage height, 7.93 ft, site and datum then in use), from rating curve extended above 50 mgd; minimum, 0.22 mgd (0.34 cfs) June 1, 1945.

Revisions.--The figures of maximum discharge for some fiscal years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
675	1922	Jan. 31, 1922	753	1,170	4.92
675	1928	Dec. 8, 1927	338	523	3.51
695	1929	Dec. 13, 1928	340	526	3.52
710	1930	Dec. 18, 1929	355	549	3.58

Remarks.--Records good. Water used for irrigation in central Maui.

Revisions.--WSP 1569: Drainage area. Revised figures of discharge, in million gallons a day, for the fiscal years 1922-30, superseding those published in WSP 675, 695, and 710, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1922		1923-Con.		1924-Con.		1926-Con.	
Jan. 4	11.3	Apr. 2	12.3	July 21	19.5	Feb. 17	18.4
19	23	7	13.2	Sept. 26	67	June 11	6.1
20	11.8	8	6.6	Oct. 4	10	12	14.8
21	14.6	17	6.2	16	3.4	13	18.7
27	22	22	6.5	18	44	14	7.3
28	31	26	10	22	6.9	Aug. 3	11.6
30	44	27	7.0	22	11.9	5	33
31	117	28	6.9	23	14.8	14	21
Feb. 1	56	Aug. 18	22	24	25	17	7.9
2	17.5	Sept. 12	21	25	10.4	20	8.6
3	11.5	13	5.8	Nov. 20	37	21	23
10	8.2	19	33	21	121	Sept. 19	9.0
21	8.1	20	14.4	22	14.3	28	5.6
28	38	Oct. 19	12.5	30	12.9	Nov. 14	64
Mar. 3	15.3	20	8.0				
4	15.6	21	9.8	1925		1927	
5	60	27	38	Feb. 9	6.9	Jan. 2	8.5
6	28	28	16.1	10	17.7	3	133
7	27	29	18.8	13	5.8	4	13.1
8	32	30	11.9	Mar. 18	13.1	7	9.9
9	20	Nov. 5	42	21	31	8	8.6
10	34	12	11.5	22	11.1	12	33
11	24	13	11.5	26	11.4	13	6.0
12	12	16	7.2	27	30	Feb. 25	18.2
Sept. 10	34	Dec. 2	3.6	29	28.5	Mar. 1	6.4
11	12.1	4	17.2	30	18.5	4	11.7
15	6.2	4	11.8	Apr. 1	7.0	6	7.5
Oct. 5	8.0	6	9.2	5	8.0	31	12.2
16	5.0	7	22	7	11.4	Apr. 1	9.4
22	33	10	11.8	16	10.5	11	7.1
23	11.4	11	6.2	17	25	14	17.8
Nov. 5	11.2	12	10.8	June 3	13.7	15	11.6
6	17.8	13	14.7	4	20	16	21
7	40	14	28	14	6.9	17	27
8	17.6	16	25	15	12.7	19	14.9
25	26	17	25	28	17.2	19	26
26	12.7	18	46	30	23	20	40
		19	18.9	July 27	10.5	21	13.1
1923		31	22	29	9.4	May 7	10.1
Jan. 11	3.1			Aug. 5	21	10	7.5
12	76	1924		6	13.9	15	24
13	29	Feb. 12	6.0	25	5.0	16	18
14	85	13	94	26	15.2	July 19	9.3
15	18.8	14	42	27	38	10	12.2
17	22	15	15.2	29	12.4	11	8.6
18	53	26	4.4	31	15.1	12	11.3
19	26	27	9.5	Nov. 7	20	26	12.2
20	58	Apr. 14	6.8	8	12	29	9.8
Feb. 9	10.6	15	10.2	9	9.6	Aug. 8	16
10	24	26	12.1	16	10	9	7.8
19	30	30	27	17	15.7	10	12.9
19	9.9	36	14.2	24	7.2	20	12.8
21	10.9	May 1	6.9	Dec. 31	6.2	24	12.7
23	40	13	42			29	8.6
26	5.7	14	54	1926		Sept. 6	19.2
Mar. 3	8.3	16	10.8	Jan. 1	4.8	7	17.7
23	10.2	July 16	11.7	21	23	8	10.5
25	25	20	17.4	Feb. 10	4.0	24	5.0

5650. Kaaiea Gulch near Huelo--Continued

Revised figures of daily discharge, in million gallons a day, 1922-30--Continued							
Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1927-Con.		1928-Con.		1929-Con.		1929-Con.	
Nov. 17	38	Sept. 11	10.1	Feb. 21	11.1	Dec. 26	8.4
18	53	Oct. 19	22	22	17.8	27	23
19	8.8	Oct. 1	3.3	24	10.8	29	19.5
25	9.4	Nov. 27	18.2	27	4.1	30	25
Dec. 3	6.4	Nov. 4	2.3	28	18.4		
6	4.8	5	5.2	Mar. 1	12.3	1930	
7	8.8	7	20	3	10.8	Jan. 3	19
8	43	11	8.4	4	12	22	4.1
19	8.7	14	14.6	5	23	25	13
20	8.2	Dec. 5	24	7	11	30	12
22	16.7	8	5.0	8	11.8	Feb. 22	50
25	16.7	9	7.7	9	41	23	43
27	13.2	10	9.9	10	14.7	25	8.0
28	15.5	12	9.3	11	18.9	26	18
		13	25	15	15.5	27	10.5
1928		14	23	Apr. 10	22	Mar. 4	8.0
Jan. 13	8.6	16	15.4	11	28	5	7.6
16	31	18	6.9	12	22	6	16.5
21	9.2	25	19.3	18	15.5	7	12.5
July 1	8.3	26	7.3	July 10	4.6	9	8.6
8	7.2	28	5.0	15	1.9	10	16
16	17.3			16	21	11	22
22	7.2	1929		25	14	Apr. 6	17.5
24	15.4	Jan. 8	10.9	Aug. 10	10.5	7	35
25	17.1	22	38	11	10.8	8	47
26	29	23	8.2	Oct. 9	29	9	19.5
27	11.3	Feb. 6	5.4	10	6.9	11	37
Aug. 1	7.3	12	10.8	Nov. 17	28	15	9.5
16	15.1	14	9.8	18	11.5	19	14
17	25	15	19.9	Dec. 16	14.5	June 4	17
18	8.7	16	37	18	52	24	20
Sept. 2	16.9	17	36	19	37	25	16.5
7	6.2	18	25	20	17	26	18
9	7.6	19	15.3	23	8.7	29	24
10	23	20	21	24	16.5	30	23

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
January 1922.....	117	1.4	11.5	17.8	1,100
February.....	56	1.2	7.41	11.5	637
March.....	60	.6	10.3	15.9	984
Fiscal year 1921-22.....	117	.4	5.94	9.19	3,310
September 1922.....	34	.7	3.68	5.69	339
October.....	33	1.1	4.20	6.50	400
November.....	40	1.1	6.58	10.2	605
Calendar year 1922.....	117	.4	4.51	6.98	5,060
January 1923.....	85	.5	13.4	20.7	1,270
February.....	40	.6	5.92	9.16	509
March.....	25	.9	3.68	6.00	368
April.....	13.2	1.8	5.46	8.45	502
Fiscal year 1922-23.....	85	.4	4.31	6.67	4,820
August 1923.....	22	.8	2.79	4.32	266
September.....	33	.6	3.58	5.54	350
October.....	38	.6	4.82	7.46	458
November.....	42	.9	4.27	6.61	393
December.....	46	.7	10.0	15.5	952
Calendar year 1923.....	85	.5	5.27	8.15	5,900
February 1924.....	94	.4	7.12	11.0	633
April.....	30	.8	4.90	7.58	451
May.....	54	.8	5.28	8.17	503
Fiscal year 1923-24.....	94	.4	4.43	6.85	4,960
July 1924.....	19.5	.4	3.21	4.97	305
September.....	67	.5	3.54	5.48	326
October.....	44	.8	5.27	8.15	501
November.....	121	.6	7.30	11.3	672
Calendar year 1924.....	121	.4	3.87	5.99	4,350
February 1925.....	17.7	.5	1.98	3.06	170
March.....	31	.4	6.69	10.4	637
April.....	25	1.4	5.12	7.92	472
June.....	23	1.2	5.51	8.53	507
Fiscal year 1924-25.....	121	.4	4.03	6.24	4,520
July 1925.....	10.5	.8	2.20	3.40	210
August.....	38	1.1	6.62	10.2	630
November.....	20	.8	4.85	7.50	446
December.....	6.2	.4	.88	1.33	82
Calendar year 1925.....	38	.4	3.66	5.66	4,100
January 1926.....	23	.5	1.82	2.82	173
February.....	18.4	.5	1.89	2.92	162
June.....	18.7	.5	2.30	3.56	212
Fiscal year 1925-26.....	38	.4	2.48	3.84	2,780
August 1926.....	33	1.0	5.55	8.59	528
September.....	9.0	.7	1.81	2.80	166
November.....	64	.6	3.27	5.06	301
Calendar year 1926.....	64	.4	2.07	3.20	2,320
January 1927.....	133	.7	8.72	13.5	830
February.....	18.2	.4	1.80	2.79	155
March.....	12.2	.8	2.30	4.49	276
April.....	40	1.1	8.58	13.3	790
May.....	24	1.1	4.09	6.33	389
Fiscal year 1926-27.....	133	.4	3.56	5.51	3,980

5650. Kaaiea Gulch near Huelo--Continued

Revised figures of monthly discharge, in million gallons a day, 1922-30--Continued

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
July 1927.....	12.2	0.6	5.81	5.89	362
August.....	16	1.8	5.33	8.25	507
September.....	19.2	.7	3.54	5.48	326
November.....	53	.5	5.57	8.82	513
December.....	43	1.5	6.45	9.95	611
Calendar year 1927.....	133	.4	4.53	7.01	5,080
January 1928.....	31	.8	5.77	8.93	549
Fiscal year 1927-28.....	-	-	4.33	6.70	4,870
July 1928.....	29	1.5	6.03	9.33	573
August.....	25	1.5	4.64	7.18	442
September.....	23	1.0	4.60	7.12	424
October.....	18.2	.7	2.13	3.30	202
November.....	20	1.1	3.97	6.14	366
December.....	25	.9	7.39	11.4	705
Calendar year 1928.....	-	-	4.57	7.07	5,130
January 1929.....	38	1.1	4.36	6.75	415
February.....	37	.7	9.65	14.9	830
March.....	41	.7	7.30	11.3	695
April.....	48	.8	4.63	7.16	426
Fiscal year 1928-29.....	41	.6	4.85	7.50	5,440
July 1929.....	21	.4	2.51	3.88	238
August.....	18	.3	1.53	2.37	146
October.....	29	.5	2.18	3.37	207
November.....	28	.3	5.55	8.59	511
December.....	52	.9	12.1	18.7	1,150
Calendar year 1929.....	52	.3	4.50	6.96	5,040
January 1930.....	19	1.1	4.22	6.53	401
February.....	50	.6	5.93	9.18	510
March.....	22	.9	4.91	7.60	467
April.....	47	2.2	11.0	17.0	1,010
June.....	24	1.3	6.21	9.61	572
Fiscal year 1929-30.....	52	.3	5.02	7.77	5,620
Calendar year 1930.....	120	.6	5.44	8.42	6,090

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.27	1.0	15.3
.3	.63	1.2	24.5
.4	1.34	1.5	42.0
.5	2.45	2.0	79.0
.6	4.05	2.5	126
.8	8.65		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov. *	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.44	1.34	4.46	1.09	12.4	18.2	1.25	0.63	0.63	8.17	1.09	1.01
2	1.34	7.69	2.07	.94	6.90	7.40	1.09	*.58	.63	2.45	1.01	1.17
3	4.70	1.94	1.63	.87	2.73	2.73	1.25	.54	.68	1.95	1.01	1.01
4	2.96	*8.26	6.91	.80	1.73	2.07	6.08	.54	9.95	11.1	1.55	.80
5	5.86	31.0	3.27	.74	1.34	17.7	1.34	.50	28.2	5.79	.94	.74
6	6.66	10.7	1.73	.68	3.37	9.68	8.08	.50	4.39	10.7	*.80	.68
7	6.00	3.03	1.43	.63	5.28	4.66	20.2	.46	1.95	26.2	.80	.63
8	2.07	2.07	1.25	.63	2.19	6.40	18.4	.46	1.34	3.90	1.38	.58
9	1.34	2.85	1.17	.58	1.34	3.19	9.59	.42	1.17	13.1	4.02	.58
10	1.17	3.09	1.09	.54	1.34	3.53	14.7	.65	1.01	13.8	34.1	2.59
11	3.60	9.56	4.05	.68	1.17	2.59	3.87	17.1	7.68	14.0	8.12	.74
12	1.91	2.59	3.93	.63	.94	1.73	3.03	30.1	2.21	3.69	27.0	1.25
13	1.17	1.95	1.84	.80	.87	2.07	10.5	35.6	1.25	6.97	5.23	1.17
14	1.01	1.95	3.24	1.63	.80	5.08	3.52	25.3	1.01	25.2	5.58	1.34
15	11.3	18.3	*1.43	.74	.74	3.16	2.32	13.2	.94	20.6	11.7	2.49
16	2.21	3.02	1.25	.63	.68	3.30	2.19	36.9	.87	81.6	2.84	2.81
17	1.53	2.08	1.17	.94	.74	19.2	3.95	8.14	.74	49.7	2.04	1.63
18	4.01	11.2	1.09	.63	.80	7.84	6.24	3.74	.85	7.85	2.10	1.01
19	1.53	3.84	.94	.54	.74	5.09	2.07	2.45	15.7	3.87	1.87	1.17
20	1.43	2.19	.87	.54	1.58	4.05	1.63	2.32	16.3	6.68	5.81	.80
21	1.17	1.73	1.04	.50	1.09	4.46	1.34	1.43	2.69	11.8	2.09	.86
22	1.01	1.43	1.17	.46	.80	4.18	1.17	1.25	1.53	4.38	3.26	5.27
23	.94	1.25	.94	.46	3.30	3.19	1.17	1.17	22.4	4.99	1.95	*12.6
24	.87	1.25	2.20	1.30	2.20	2.73	1.01	1.01	11.0	4.96	3.94	8.51
25	.80	4.61	1.51	.68	1.17	2.44	.87	.94	2.69	2.88	2.40	3.84
26	.74	4.08	2.88	.58	1.34	7.94	.80	.87	1.73	2.45	1.84	6.77
27	2.47	5.54	.68	1.17	7.36	.80	.74	3.22	1.95	1.84	5.77	
28	2.45	3.64	2.55	1.09	2.71	2.59	1.37	.74	10.5	1.53	1.63	11.6
29	7.84	2.57	1.34	1.10	2.42	1.95	1.36	.68	18.2	1.34	1.34	6.54
30	1.34	2.66	1.25	.63	5.87	1.63	.80	-----	15.2	1.25	1.17	4.14
31	.94	2.80	-----	36.3	-----	1.34	.68	-----	2.59	-----	1.17	-----
Total	82.02	156.94	63.94	59.04	69.75	169.48	132.67	188.96	189.25	354.85	141.62	90.10
Mean:	2.65	5.06	2.13	1.90	2.32	5.47	4.28	6.52	6.10	11.8	4.57	3.00
cfs	4.10	7.83	3.30	2.94	3.59	8.46	6.62	10.1	9.44	18.3	7.07	4.64
Ac-ft	252	482	196	181	214	520	407	580	581	1,090	435	276

Calendar year 1959: Max 54.0 Min 0.46 Mean(mgd) 3.91 Mean(cfs) 6.05 Ac-ft 4,380
Fiscal year 1959-60: Max 81.6 Min 0.42 Mean(mgd) 4.64 Mean(cfs) 7.18 Ac-ft 5,210

Peak discharge (base, 250 mgd).--Oct. 31 (4 p.m.) 255 mgd (395 cfs), 3.37 ft; Feb. 13 (1 a.m.) 348 mgd (538 cfs), 3.73 ft; Mar. 5 (6 p.m.) 281 mgd (435 cfs), 3.48 ft; Apr. 16 (11 p.m.) 766 mgd (1,190 cfs), 4.88 ft.

* Discharge measurement made on this day.

5700. Nailililhaele Stream near Huelo

Location.--Lat 20°52'28", long 156°13'06", on left bank 200 ft upstream from Wailoa ditch intake, 1,000 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.4 miles southeast of Huelo Church.

Drainage area.--3.57 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August 1919 to June 1960. July to December 1912, at site 700 ft downstream; records not equivalent due to diversion. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,205 ft above mean sea level (by vertical angles). Dec. 9, 1910, to Dec. 31, 1911, staff gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, at present site at datum 0.50 ft higher.

Average discharge.--43 years (1914-18, 1920-24, 1925-60), 24.9 mgd (38.5 cfs).

Extremes.--Maximum discharge during year, 2,840 mgd (4,390 cfs) Apr. 16 (gage height, 9.92 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 2.59 mgd (4.01 cfs) Oct. 30, 31.
1910-18, 1919-60: Maximum discharge, 4,140 mgd (6,410 cfs) Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 400 mgd; minimum, 0.45 mgd (0.70 cfs) July 14, 1920.

Remarks.--Records good except those above 400 mgd, which are fair.

Revisions (fiscal years).--WSP 1569: 1925-56. WSP 1639: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method Apr. 17 to May 19)

1.8	1.50	3.0	70.0
1.9	2.90	3.5	135
2.0	4.90	4.0	215
2.2	10.6	4.5	315
2.4	19.2	5.0	445
2.7	40.0		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.76	6.20	21.6	5.40	80.7	122	8.70	4.50	5.20	38.5	8.40	6.60
2	7.65	48.0	11.4	4.90	35.5	37.8	8.00	4.30	4.90	12.9	7.40	6.90
3	22.8	10.2	9.00	4.70	13.3	14.5	8.40	4.30	5.20	11.0	7.20	6.20
4	18.3	*56.6	31.7	4.50	9.60	11.7	36.8	4.10	54.8	54.8	9.08	5.40
5	38.3	190	16.4	4.30	7.40	118	8.70	3.90	153	30.0	6.20	5.20
6	39.8	52.6	9.60	4.10	10.4	49.2	47.2	3.70	26.0	63.7	*5.75	4.90
7	35.9	16.8	8.70	3.90	25.7	32.7	137	3.50	11.4	148	5.60	4.50
8	11.0	13.3	7.70	3.90	11.1	52.0	142	3.30	8.40	22.2	6.98	4.30
9	8.00	15.7	7.20	3.70	7.40	17.3	64.5	3.10	7.20	76.1	27.3	4.10
10	6.90	18.6	6.90	3.70	6.90	19.4	96.7	4.15	6.40	93.8	173	11.9
11	17.2	52.2	26.2	4.30	6.90	14.5	22.1	115	40.4	78.2	39.5	4.70
12	9.00	15.0	34.3	3.90	5.60	11.0	19.3	302	13.7	20.9	109	6.90
13	6.40	11.8	11.8	4.71	5.20	12.2	63.5	233	7.40	58.4	25.5	6.90
14	5.90	9.60	17.4	7.57	4.70	32.7	18.3	186	6.40	168	34.4	7.20
15	73.5	124	*8.90	4.10	4.50	*24.5	13.3	103	5.90	113	75.6	11.4
16	12.0	17.8	7.40	3.50	4.30	28.6	13.8	227	5.60	358	15.4	13.7
17	9.40	12.5	7.20	4.60	4.30	162	25.5	55.9	5.20	285	12.9	9.60
18	20.8	57.7	6.60	3.50	4.50	69.0	40.6	30.0	10.4	46.6	12.2	6.20
19	8.70	18.9	6.20	3.10	4.30	38.0	11.8	23.2	80.6	28.5	14.9	4.00
20	7.70	12.2	5.90	2.90	8.18	33.2	10.0	18.8	91.7	41.8	36.1	5.20
21	6.40	10.3	6.20	2.90	5.60	39.0	9.00	11.4	15.2	76.4	13.7	5.68
22	5.90	9.00	6.20	2.74	4.30	44.7	8.00	9.60	9.30	28.1	17.7	30.6
23	5.40	8.00	5.40	2.74	20.6	24.4	7.40	9.00	130	40.7	12.6	*75.3
24	5.20	8.00	9.73	5.65	12.4	19.4	6.90	8.00	63.7	36.2	22.5	46.6
25	4.90	22.9	7.32	3.70	7.20	16.8	6.60	7.40	18.3	20.9	*13.1	19.4
26	4.70	22.3	13.8	3.50	10.0	46.5	5.90	7.20	11.4	17.3	11.0	32.1
27	4.50	12.9	25.0	3.90	10.1	47.9	5.60	6.40	15.9	14.1	10.0	31.0
28	11.0	15.0	9.37	4.70	22.1	15.9	8.58	6.20	61.8	11.8	9.60	72.5
29	42.9	11.9	6.60	4.78	14.4	12.6	8.50	5.40	74.2	10.3	8.00	36.3
30	7.40	13.5	6.20	2.90	63.1	10.8	5.40	-----	63.7	9.00	6.90	29.2
31	5.40	14.4	-----	220	-----	9.60	4.70	-----	13.7	-----	7.40	-----
Total	470.51	907.90	357.92	342.99	430.28	1,187.70	871.58	1,403.35	1,027.00	2,012.20	766.71	516.88
Mean:	15.2	29.3	11.9	11.1	14.3	38.3	28.1	48.4	33.1	67.1	24.7	17.2
mgd	23.5	45.3	18.4	17.2	22.1	59.3	43.5	74.9	51.2	104	38.2	26.6
cfs	1,440	2,790	1,100	1,050	1,320	3,640	2,670	4,310	3,150	6,180	2,350	1,590
Ac-ft												
Calendar year 1959: Max	311			Min	2.74	Mean(mgd)	24.4	Mean(cfs)	37.8	Ac-ft	27,310	
Fiscal year 1959-60: Max	358			Min	2.74	Mean(mgd)	28.1	Mean(cfs)	43.5	Ac-ft	31,590	

Peak discharge (base, 750 mgd).--Oct. 31 (4:30 p.m.) 1,030 mgd (1,590 cfs), 6.69 ft; Feb. 13 (12:30 a.m.) 1,380 mgd (2,140 cfs), 7.46 ft; Feb. 16 (6:30 a.m.) 1,020 mgd (1,580 cfs), 6.67 ft; Mar. 5 (6:30 p.m.) 1,510 mgd (2,340 cfs), 7.71 ft; Apr. 16 (11 p.m.) 2,840 mgd (4,390 cfs), 9.92 ft.

* Discharge measurement made on this day.

5850. Hoolawanui Stream near Huelo

Location--Lat 20°53'15", long 156°14'55", on right bank 250 ft upstream from intake of Wailoa ditch, 2 miles west of Kailua, and 2 miles southwest of Huelo.

Drainage area--1.34 sq mi.

Records available--December 1910 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to June 20, 1914, staff gage at site 180 ft downstream at different datum. June 20, 1914, to Oct. 24, 1933, water-stage recorder at site 80 ft downstream at datum 4.43 ft lower.

Average discharge--49 years (1911-60), 7.98 mgd (12.3 cfs).

Extremes--Maximum discharge during year, 2,820 mgd (4,360 cfs) Apr. 17 (gage height, 5.63 ft, from floodmark), from rating curve extended above 100 mgd by logarithmic plotting; minimum, 0.59 mgd (0.91 cfs) Oct. 30, 1910-60. Maximum discharge, 3,240 mgd (5,010 cfs) Apr. 27, 1950 (gage height, 5.94 ft, from rating curve extended above 100 mgd by logarithmic plotting; minimum, 0.15 mgd (0.23 cfs) Oct. 25, 1917.

Remarks--Records good except those for periods of no gage-height record, which are poor. Water used for irrigation in central Maui.

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Apr. 16					Apr. 17 to June 30				
0.3	0.59	1.0	19.0		0.3	1.04	1.2	36.7	
.4	1.36	1.2	31.0		.4	1.96	1.5	65.5	
.5	2.70	1.6	67.0		.5	3.57	1.8	105	
.6	4.50	2.0	131		.6	5.80	2.0	140	
.8	10.7				.7	8.75	2.5	260	
					.9	17.2	3.0	440	

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.39	1.39	3.35	1.10	20.7	20	3.5	1.97	5.02	7.06	4.05	2.53
2	1.49	7.24	2.54	1.10	7.35	8.5	3.4	1.97	2.86	4.75	3.78	2.24
3	2.82	1.97	2.10	1.02	3.52	4.5	3.4	1.84	5.02	4.50	3.57	2.10
4	2.77	7.13	4.53	.94	2.70	3.52	7.0	1.84	10.0	12.0	3.76	1.96
5	5.64	40.8	3.18	.94	2.24	20.2	3.1	1.84	39.6	7.50	2.85	1.85
6	7.19	11.8	2.24	.94	2.54	13.3	9.0	1.72	7.53	12.1	2.68	1.75
7	5.01	4.75	1.97	.94	4.10	*8.25	17	1.60	4.75	36.2	2.68	1.65
8	2.24	3.90	1.84	.94	2.86	11.6	20	1.60	3.70	9.10	3.28	1.85
9	1.72	4.10	1.72	.86	2.10	6.45	11	1.49	5.52	22.4	5.09	1.55
10	1.49	4.26	1.72	.86	1.97	5.50	26	1.72	3.18	24.3	45.3	*2.32
11	2.76	8.30	3.65	.94	1.84	5.00	11	21.1	16.5	17.6	10.8	1.55
12	1.72	3.90	3.76	.86	1.72	3.90	8.0	82.5	5.20	10.4	31.6	1.75
13	1.39	3.18	2.54	1.02	1.60	4.10	12	106	3.52	16.5	8.72	1.55
14	1.39	2.86	2.86	1.10	1.49	7.38	7.0	65.6	3.18	46.6	6.90	1.65
15	9.35	20.8	1.97	.86	1.39	5.5	5.5	50.3	3.02	33.8	21.0	2.10
16	2.72	4.99	1.72	.79	1.39	3.9	5.0	96.2	2.86	83.2	6.55	2.68
17	1.84	3.90	1.60	.86	1.39	26	7.0	20.2	2.70	266	5.80	1.96
18	3.69	9.95	1.60	.79	1.39	13	10	20.0	*27.3	24.0	5.05	1.45
19	1.84	4.90	1.49	.72	1.29	8.0	4.6	14.1	13.6	14.5	5.12	1.45
20	1.72	3.70	1.39	*.72	1.84	7.0	4.1	11.4	14.3	16.3	9.00	1.27
21	1.60	3.35	1.39	.72	1.49	6.5	3.70	8.14	5.00	25.8	4.80	1.43
22	1.49	3.02	1.29	.72	1.19	6.0	3.52	6.45	3.70	12.6	5.57	3.60
23	1.39	2.70	1.29	.72	3.80	5.3	3.35	5.50	34.4	14.9	4.36	10.7
24	1.39	2.70	1.83	1.10	2.92	5.0	3.18	4.75	16.3	13.5	5.99	5.26
25	1.29	4.37	1.49	.79	1.72	7.5	2.86	4.50	7.50	10.3	4.05	3.34
26	1.19	3.90	1.72	.72	1.84	9.0	2.70	4.10	5.80	8.40	3.57	4.85
27	1.19	3.18	2.54	.79	1.84	13	2.54	3.70	5.25	7.10	3.28	5.10
28	1.76	3.02	1.49	.86	3.18	5.5	3.28	3.52	10.3	*6.05	3.20	12.5
29	5.05	2.70	1.19	.94	3.90	4.0	2.97	3.35	11.0	5.05	2.85	6.04
30	1.49	3.02	1.19	.72	7.0	3.8	2.24	10.3	4.57	2.53	2.53	6.08
31	1.29	3.18	-----	99.3	-----	3.7	2.10	-----	5.25	-----	2.68	-----
Total	79.31	188.96	63.29	126.28	94.90	255.10	210.04	529.00	263.59	777.08	230.44	95.91
Mean:	2.56	6.10	2.11	4.07	3.16	8.23	6.78	18.2	8.50	25.9	7.43	3.20
mgd	3.96	9.44	3.26	6.50	4.89	12.7	10.5	28.2	13.2	40.1	11.5	4.95
cfs	243	580	194	398	291	783	645	1,620	809	2,380	707	294
Ac-ft												

Calendar year 1959: Max 132 Min 0.72 Mean(mgd) 6.85 Mean(cfs) 10.6 Ac-ft 7,670
Fiscal year 1959-60: Max 266 Min 0.72 Mean(mgd) 7.96 Mean(cfs) 12.3 Ac-ft 8,930

Peak discharge (base, 400 mgd)--Oct. 31 (5 p.m.) 541 mgd (837 cfs), 3.22 ft; Feb. 13 (1 a.m.) 546 mgd (845 cfs), 3.23 ft; Feb. 16 (8 a.m.) 452 mgd (699 cfs), 3.03 ft; Mar. 5 (6 p.m.) 552 mgd (854 cfs), 3.24 ft; Apr. 17 (1 a.m.) 2,820 mgd (4,360 cfs), 5.63 ft (from floodmark in well).

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 30 to Dec. 3, Dec. 15 to Jan. 20; discharge estimated on basis of records for stations on nearby streams.

5870. Honopou Stream near Huelo

Location.--Lat 20°53'20", long 156°15'20", on left bank just upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo and 2.5 miles west of Kailua.

Drainage area.--0.64 sq mi.

Records available.--December 1910 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, staff gage at same site and datum.

Average discharge.--49 years (1911-60), 3.18 mgd (4.92 cfs).

Extremes.--Maximum discharge during year, 668 mgd (1,030 cfs) Apr. 17 (gage height, 4.03 ft), from rating curve extended above 70 mgd by model studies of station site; minimum, 0.25 mgd (0.39 cfs) Oct. 26.
1910-60: Maximum discharge, 3,690 mgd (5,710 cfs) Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 70 mgd by model studies of station site; minimum, 0.01 mgd (0.02 cfs) for several days in 1933, 1934.

Remarks.--Records good. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1219: 1913-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.03	1.1	8.10
.5	.48	1.4	14.5
.6	1.26	1.7	23.1
.7	2.29	2.0	35.0
.9	4.92	2.5	70.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*0.60	0.54	1.36	0.48	7.24	7.04	1.96	1.16	1.66	3.37	2.29	1.36
2	.54	2.51	1.16	.48	3.84	3.26	1.86	1.08	1.56	2.41	2.06	1.26
3	1.19	.92	1.00	.42	2.18	2.06	1.86	1.00	1.66	2.41	1.96	1.16
4	.92	1.98	1.76	.42	1.86	1.76	3.19	1.00	4.86	5.69	2.06	1.08
5	1.92	15.6	1.36	.42	1.66	6.95	1.66	1.00	11.6	3.26	1.76	1.08
6	2.13	6.25	1.00	.42	1.66	5.44	4.18	.92	3.30	4.43	1.66	1.00
7	1.08	2.90	.92	.42	2.18	3.26	6.45	.92	2.29	11.4	1.56	.92
8	.76	2.29	.84	.42	1.66	3.88	6.85	.84	2.06	4.64	1.66	.92
9	.60	2.18	.84	.36	1.26	2.77	5.29	.84	1.86	10.6	*1.73	.84
10	.54	2.06	.84	.36	1.26	2.65	8.79	.84	1.76	8.71	20.7	.92
11	1.22	3.54	1.54	.42	1.08	2.41	4.49	2.09	5.16	8.03	3.86	.84
12	.76	1.86	1.16	.42	1.08	2.06	3.78	10.0	2.36	5.23	13.8	.92
13	.54	1.76	.92	.48	1.00	2.06	5.27	13.0	1.86	5.93	4.71	.84
14	.48	1.56	1.00	.48	.92	3.64	3.50	12.4	1.76	13.9	3.93	.84
15	2.59	5.93	.84	.36	.84	2.73	3.02	10.1	1.66	13.6	5.36	.92
16	1.00	2.29	.76	.36	.84	2.06	2.90	25.1	1.66	25.7	3.14	1.08
17	.76	2.06	.76	.42	.84	*8.73	3.38	8.40	1.56	60.6	2.90	.92
18	.92	4.36	.68	.36	.84	4.73	3.86	6.14	1.46	11.1	2.65	.76
19	.68	2.29	.60	.30	.76	3.64	2.53	5.23	5.22	7.60	2.53	.68
20	.68	1.86	.60	.30	1.00	3.50	2.29	4.69	4.98	7.28	3.54	.60
21	.60	1.76	.60	.30	.84	3.26	2.06	3.64	2.18	10.4	2.29	.68
22	.54	1.66	.60	.30	.68	3.14	1.96	3.26	1.86	6.29	2.41	1.56
23	.54	1.56	.60	.30	2.18	2.77	1.86	2.90	14.4	5.88	2.06	3.67
24	.54	1.46	.76	.48	1.59	2.53	1.76	2.65	*6.95	5.30	2.63	1.65
25	.54	2.08	.60	.30	1.00	3.43	1.66	2.41	3.64	4.35	1.96	1.26
26	.54	1.76	.76	.30	.92	4.24	1.56	2.29	3.14	3.93	1.76	1.83
27	.48	1.46	1.26	.36	.76	4.47	1.46	2.06	2.90	3.50	1.66	2.14
28	.75	1.36	.68	.42	1.08	2.53	1.94	1.86	4.60	3.02	1.56	3.17
29	1.74	1.36	.54	.42	1.26	2.29	1.77	1.76	5.72	2.77	1.46	1.96
30	.60	1.46	.54	.30	1.86	2.18	1.26	-----	5.27	2.53	1.36	1.86
31	.54	1.36	-----	31.7	-----	2.06	1.16	-----	2.77	-----	1.36	-----
Total	27.32	82.02	26.88	43.28	46.17	107.53	95.55	129.58	113.72	263.86	104.37	38.72
Mean	0.881	2.65	0.896	1.40	1.54	3.47	3.08	4.47	3.67	8.80	3.37	1.29
mgd	1.36	4.10	1.39	2.17	2.38	5.37	4.77	6.92	5.68	13.6	5.21	2.00
cfs	84	252	82	133	142	330	293	398	349	810	320	119
Ac-ft												
Calendar year 1959: Max	39.0	Min	0.30	Mean(mgd)	2.70	Mean(cfs)	4.18	Ac-ft	3,030			
Fiscal year 1959-60: Max	60.6	Min	0.30	Mean(mgd)	2.95	Mean(cfs)	4.56	Ac-ft	3,310			

Peak discharge (base, 130 mgd)--Oct. 31 (4 p.m.) 206 mgd (319 cfs), 3.16 ft; May 5 (6 p.m.) 138 mgd (214 cfs), 2.93 ft; Apr. 17 (1:30 a.m.) 668 mgd (1,030 cfs), 4.03 ft.

* Discharge measurement made on this day.

5880. Wailoa ditch at Honopou, near Huelo

Location--Lat 20°53'20", long 156°15'19", on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, 2.2 miles southwest of Huelo, and 2.5 miles west of Kailua.

Records available--November 1922 to June 1960.

Gage--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

Average discharge--37 years (1923-60), 114 mgd (176 cfs).

Extremes--1922-60: Maximum daily discharge, 195 mgd (302 cfs) several days in 1954-56; no flow Jan. 24-27, 1923.

Remarks--Records good except those above 176 mgd, which are fair. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from Alo Stream west to Halehaku Gulch at altitude of about 1,200 ft. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	101	80.3	164	63.0	186	186	101	59.0	66.0	176	101	82.0
2	83.5	174	128	63.0	186	188	93.0	56.0	66.0	148	93.0	82.0
3	165	112	97.0	53.0	156	152	97.0	*54.8	66.0	134	90.0	76.0
4	158	186	154	53.0	98.5	116	160	53.0	152	163	111	69.0
5	156	186	152	50.0	76.0	172	104	50.0	188	188	82.0	66.0
6	181	188	104	47.0	96.8	188	135	47.0	188	188	79.0	66.0
7	186	174	90.0	44.0	172	188	186	47.0	144	186	76.0	63.0
8	134	140	82.0	44.0	122	188	186	44.0	108	188	105	59.0
9	86.0	147	76.0	41.0	79.0	180	186	44.0	90.0	188	*119	56.0
10	72.0	162	72.0	41.0	72.0	164	186	54.5	79.0	186	186	105
11	123	177	150	50.0	69.0	158	186	138	111	186	188	59.0
12	90.1	156	168	44.0	63.0	120	188	186	128	188	188	82.4
13	66.0	124	132	50.0	56.0	132	186	186	82.0	186	186	86.0
14	59.0	101	153	76.0	53.0	165	188	186	72.0	180	188	82.0
15	166	183	97.0	47.0	50.0	180	180	184	72.0	186	188	108
16	147	176	79.0	41.0	47.0	188	164	152	69.0	180	180	144
17	93.4	144	76.0	50.0	47.0	188	186	163	79.5	148	152	109
18	150	188	72.0	38.0	50.0	188	188	186	91.0	172	152	69.0
19	93.9	176	66.0	36.5	47.0	188	152	188	186	180	147	66.0
20	88.0	132	63.0	35.0	75.0	188	132	186	188	186	188	56.0
21	72.0	112	*64.7	33.5	59.0	188	116	156	176	186	152	59.0
22	66.0	101	85.0	32.0	49.1	188	104	124	120	188	164	125
23	59.0	86.0	59.0	32.0	93.8	188	93.0	116	147	186	140	188
24	69.1	86.0	84.1	58.2	126	180	86.0	101	188	188	148	188
25	69.0	164	76.3	41.0	72.0	160	82.0	93.0	186	188	141	180
26	56.0	168	107	38.0	140	186	76.0	90.0	156	180	124	183
27	50.0	132	168	44.0	148	188	72.0	79.0	180	160	116	180
28	69.1	164	96.5	56.0	140	168	87.0	76.0	163	156	112	186
29	154	148	72.0	54.2	164	144	97.8	72.0	188	124	97.0	188
30	79.0	156	76.0	36.5	144	124	69.0	-----	188	112	86.0	186
31	59.0	155	-----	107	-----	112	63.0	-----	160	-----	86.0	-----
Total	3,201.1	4,578.3	3,044.6	1,498.9	2,917.2	5,243	4,129.8	3,171.3	4,077.5	5,185	4,165.0	3,248.4
Mean:	103	148	101	48.4	97.2	169	133	109	132	173	134	108
mgd	159	229	156	74.9	150	261	206	169	204	268	207	167
cfs	9,820	14,050	9,340	4,600	8,950	16,090	12,670	9,730	12,510	15,910	12,780	9,970
Calendar year 1959:	Max 188		Min 29.0		Mean(mgd) 113		Mean(cfs) 175		Ac-ft 126,300			
Fiscal year 1959-60:	Max 188		Min 32.0		Mean(mgd) 121		Mean(cfs) 187		Ac-ft 136,400			

* Discharge measurement made on this day.

5890. New Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'28", long 156°15'22", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, 2.1 miles southwest of Huelo, and 2.5 miles west of Kailua.

Records available.--January 1918 to June 1960.

Gage.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 15, 1921, at site 300 ft upstream at different datum.

Average discharge.--42 years, 25.5 mgd (39.5 cfs).

Extremes.--1918-60: Maximum daily discharge, 116 mgd (179 cfs) Feb. 13, 14, 27, 1932; no flow at times.

Remarks.--Records good except those below 0.1 mgd, which are fair. Ditch diverts water from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches. Flow regulated by gates and spillways. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.41	0.51	19.5	0.79	97.0	97.0	2.61	1.02	1.59	48.5	1.68	0.79
2	.60	58.0	5.48	.69	77.5	87.3	1.60	.85	1.02	5.93	1.52	.69
3	8.75	2.53	.96	.64	8.00	18.4	1.76	.74	1.08	7.52	1.45	.69
4	10.5	58.3	25.9	.59	*3.50	1.52	15.5	.69	54.7	50.5	2.93	.64
5	45.0	95.0	23.0	.55	1.91	45.1	2.26	.69	54.3	95.0	1.37	.59
6	58.2	91.0	1.29	.51	2.13	99.0	8.32	.64	20.6	81.0	1.22	.51
7	54.4	26.5	.96	.47	34.1	91.0	8.20	.59	13.6	99.0	1.02	.39
8	2.03	5.63	.79	.47	19.4	91.0	.29	.55	2.76	78.4	1.22	.32
9	.39	6.19	.74	.43	1.91	41.7	.26	.51	2.17	55.3	4.50	.29
10	.32	36.4	.69	.39	1.84	19.0	.20	.47	1.99	99.0	91.0	5.49
11	8.98	*66.0	37.6	.47	1.52	19.6	.18	9.63	27.6	99.0	97.0	.43
12	.74	11.0	51.3	.59	1.29	2.07	.18	10.8	17.0	67.8	99.0	.55
13	.35	5.10	8.73	.69	1.08	2.07	5.82	.08	1.91	93.4	68.6	.55
14	.29	1.22	16.8	1.10	.90	27.1	10.5	2.44	1.60	54.1	63.5	.47
15	57.8	82.2	.96	.51	.85	31.6	10.5	10.9	1.37	18.4	95.0	1.02
16	15.9	48.0	.69	.39	.79	49.0	5.41	5.31	1.29	18.9	49.9	8.54
17	.51	3.49	.69	.55	.74	39.1	2.27	.85	1.22	17.8	12.0	1.48
18	21.2	80.3	.69	.39	.74	11.2	2.27	.85	7.07	16.3	9.98	.35
19	.55	41.5	.64	.32	.74	.11	3.00	.85	73.4	19.3	5.44	.29
20	.47	3.28	.59	.29	1.00	.10	1.91	.85	95.0	66.0	76.4	.29
21	.32	2.17	.71	.29	1.02	.10	1.99	.85	49.8	87.0	10.8	.29
22	.29	1.68	.79	.29	.74	.08	1.91	.85	2.83	58.8	18.3	12.5
23	.29	1.37	.69	.26	5.57	.08	1.52	.85	50.7	75.0	5.14	93.0
24	.26	1.29	3.18	.52	34.8	.08	1.45	.79	100	74.1	25.9	*89.0
25	.26	20.2	1.82	.39	1.22	.06	1.37	.79	65.8	45.4	9.99	60.0
26	.23	25.2	8.17	.29	17.2	.06	1.29	.79	12.7	27.5	1.45	63.0
27	.20	3.77	42.7	.39	33.4	.06	1.62	.79	37.6	10.9	1.45	58.5
28	.96	10.8	3.55	.93	33.0	11.4	1.67	.79	44.6	2.66	1.15	70.4
29	45.2	6.24	1.08	1.13	43.7	10.1	4.72	.79	83.2	2.39	.96	86.3
30	.68	12.2	1.02	.43	27.2	7.02	1.29	-----	84.4	1.91	1.02	81.4
31	.35	9.06	-----	45.7	-----	1.99	1.15	-----	15.6	-----	1.15	-----
Total	334.33	816.13	261.71	61.45	454.59	802.00	103.02	56.60	928.50	1,475.81	763.04	638.76
Mean:												
mgd	10.8	26.3	8.72	1.98	15.2	25.9	3.32	1.95	30.0	49.2	24.6	21.3
cfs	16.7	40.7	13.5	3.06	23.5	40.1	5.14	3.02	46.4	76.1	38.1	33.0
Ac-ft	1,030	2,500	803	189	1,400	2,460	316	174	2,850	4,530	2,340	1,960
Calendar year 1959:	Max	99.0	Min	0.01	Mean(mgd)	8.87	Mean(cfs)	13.7	Ac-ft	9,940		
Fiscal year 1959-60:	Max	100	Min	0.06	Mean(mgd)	18.3	Mean(cfs)	28.3	Ac-ft	20,550		

* Discharge measurement made on this day.

5900. Old Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'31", long 156°15'16", on right bank 400 ft downstream from Honopou Stream and Wailoa ditch trail crossing in Honopou Gulch, 2.0 miles southwest of Huelo, 2.5 miles west of Kailua, and 5.0 miles east of Haiku.

Records available.--January 1918 to June 1922, November 1936 to June 1960.

Gage.--Water-stage recorder and modified Parshall flume. Datum of gage is 1,117 ft above mean sea level (by vertical angles).

Average discharge.--27 years (1918-22, 1937-60), 2.24 mgd (3.47 cfs).

Extremes.--1918-22, 1936-60: Maximum daily discharge, 39.5 mgd (61.1 cfs) Apr. 7, 1938; no flow at times.

Remarks.--Records fair. Wailoa and New Hamakua ditches divert most of flow above this station. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.02	0.03	0.07	0.03	15.8	17.0	0.03	0.03	0.27	0.22	0.01	0.04
2	.02	2.27	.08	.03	2.93	3.18	.03	.03	.05	.12	.01	.04
3	.02	.06	.06	.03	.17	.13	.04	.03	.04	.08	.03	.04
4	.02	1.15	.41	.03	.08	.06	.04	.03	8.58	7.19	.06	.04
5	2.88	20.8	.26	.03	.06	7.42	.03	.03	.75	2.92	.04	.04
6	2.19	8.63	.07	.03	.06	7.12	.04	.03	.08	.25	.04	.04
7	1.27	.16	.04	.03	.16	4.13	.04	.02	.08	.24	.04	.04
8	.05	.06	.04	.02	.18	.47	.04	.02	.09	.17	.03	.04
9	.04	.04	.04	.02	.06	.20	.04	.03	.06	.16	.90	.04
10	.03	.05	.04	.02	.05	.10	.04	.03	.05	.07	25.7	.03
11	.04	*4.53	.14	.02	.04	.09	.04	.05	6.18	.08	7.96	.03
12	.03	.12	.57	.02	.04	.07	.04	.06	.20	.06	.13	.03
13	.03	.06	.12	.03	.04	.06	.04	.04	.06	.06	.04	.03
14	.03	.04	.07	.03	.04	3.64	.04	.04	.05	.08	.04	.03
15	5.26	11.2	.06	.02	.03	10.2	.04	.05	.04	.06	.04	.03
16	.12	.88	.04	.02	.03	22.6	.04	.10	.04	.10	.03	.03
17	.04	.08	.04	.02	.03	*26.0	.04	.04	.04	2.10	.03	.03
18	.04	7.81	.04	.01	.03	10.1	.05	.04	.04	.02	.03	.03
19	.04	.64	.04	.01	.03	.07	.04	.04	6.18	.01	.05	.03
20	.04	.08	.04	.01	.03	.06	.04	.04	17.2	.01	.56	.02
21	.03	.07	.04	.01	.02	.06	.03	.04	.41	.02	.08	.02
22	.03	.05	.02	.01	.02	.05	.03	.05	.07	.01	.06	.25
23	.02	.04	.02	.01	.08	.04	.03	.05	12.6	.01	.05	12.8
24	.02	.04	.03	.02	.85	.04	.03	.05	*6.05	.01	.32	*.82
25	.01	.05	.03	.01	.06	.04	.03	.05	.35	.01	.12	.43
26	.01	.06	.04	.01	.04	.04	.03	.04	.12	.01	.06	.79
27	.01	.07	.13	.03	.17	.05	.03	.04	.12	.01	.05	1.50
28	.02	.06	.05	.04	1.06	.04	.04	.04	6.55	.01	.04	10.8
29	1.11	.05	.04	.04	2.68	.04	.04	.17	8.08	.01	.04	2.11
30	.04	.05	.04	.03	3.19	.04	.04	-----	.22	.01	.04	2.05
31	.03	.07	-----	10.8	-----	.04	.03	-----	.14	-----	.04	-----
Total	13.54	59.30	2.71	11.47	28.06	109.48	1.14	1.31	74.77	14.11	36.67	32.25
Mean:												
mgd	0.437	1.91	0.090	0.370	0.935	3.53	0.037	0.045	2.41	0.470	1.18	1.06
cfs	0.676	2.96	0.139	0.572	1.45	5.46	0.057	0.070	3.73	0.727	1.83	1.67
Ac-ft	42	182	8.3	35	86	336	3.5	4.0	229	43	113	99
Calendar year 1959: Max	26.0			Min 0.01		Mean(mgd)	3.13		Mean(cfs)	4.84	Ac-ft	3,510
Fiscal year 1959-60: Max	26.0			Min 0.01		Mean(mgd)	1.05		Mean(cfs)	1.62	Ac-ft	1,180

* Discharge measurement made on this day.

5920. Lowrie ditch at Honopou Gulch, near Huelo

Location.--Lat 20°54'57", long 156°15'07", on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.7 miles northwest of Kailua.

Records available.--January 1910 to March 1927, February 1930 to June 1960. Published as at Upana weir¹ 1910-27.

Gage.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Average discharge.--46 years (1910-26, 1930-60), 27.7 mgd (42.9 cfs).

Extremes.--1910-27, 1930-60: Maximum daily discharge, 75 mgd (116 cfs) Oct. 31, 1921; no flow at times.

Remarks.--Records good. Lowrie ditch diverts water from all streams between Kailua Stream and Halehaku Gulch. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.58	5.20	23.3	10.8	49.9	52.4	13.7	8.62	10.8	48.2	13.2	9.72
2	*6.14	34.7	16.5	7.47	52.4	49.9	12.8	11.6	10.2	34.9	17.8	9.28
3	6.01	9.76	14.4	5.94	34.9	32.0	13.5	10.4	10.6	27.4	17.8	8.62
4	9.15	35.8	27.7	5.39	25.0	27.4	35.7	9.94	39.5	43.6	20.2	8.21
5	25.4	54.2	25.2	4.84	31.2	28.5	26.2	9.50	54.9	52.4	11.3	7.83
6	37.5	52.4	9.04	4.65	33.6	54.9	34.6	8.40	52.4	52.4	10.4	7.45
7	39.6	24.0	11.8	4.84	25.0	*50.9	57.4	7.07	42.4	57.4	9.94	7.07
8	9.68	9.50	10.4	6.13	23.5	52.4	57.4	6.89	29.9	52.4	10.2	6.88
9	10.2	12.0	12.3	4.85	19.0	35.7	57.4	6.40	23.8	42.4	15.2	6.50
10	13.0	15.4	11.6	4.50	16.6	28.3	30.8	6.64	22.6	54.9	56.1	*8.63
11	15.4	39.6	20.7	5.39	13.7	37.4	36.7	28.8	37.4	54.9	54.9	7.07
12	13.4	16.6	27.6	5.58	12.0	15.4	47.4	57.4	28.6	47.4	57.4	7.45
13	5.02	22.9	15.7	5.94	11.3	16.6	54.9	27.1	17.8	52.4	52.4	6.88
14	4.34	19.0	17.8	8.21	10.6	20.6	52.4	27.0	16.6	57.4	47.4	6.88
15	29.5	42.2	15.4	5.58	9.94	34.4	31.8	48.5	22.6	57.4	54.9	7.64
16	23.8	30.1	14.0	4.65	9.28	40.4	21.4	15.9	20.2	41.4	39.3	8.40
17	12.9	38.4	12.3	4.65	9.28	52.4	44.8	6.88	19.0	53.6	25.0	7.26
18	15.9	51.2	8.45	4.50	9.28	47.4	54.9	11.0	15.4	37.4	22.6	5.94
19	11.8	37.4	6.32	4.03	8.40	39.9	22.6	31.2	33.5	28.6	20.2	5.58
20	13.0	25.0	6.32	*4.18	9.06	42.4	17.8	47.4	54.9	32.4	30.1	5.20
21	11.9	19.0	7.26	3.72	8.40	42.4	16.6	34.9	41.2	37.4	19.0	5.20
22	4.18	15.4	6.50	3.41	7.45	42.4	16.6	22.6	23.8	15.9	17.8	7.83
23	3.88	14.2	6.89	3.41	9.95	49.9	14.2	20.2	46.2	11.5	16.6	47.4
24	3.88	17.8	8.61	5.39	21.5	34.1	11.6	17.8	*56.4	10.7	19.0	44.9
25	4.03	25.8	8.66	4.18	13.0	40.7	12.0	26.2	52.4	5.85	26.2	32.6
26	3.72	28.2	9.88	3.72	14.2	54.9	16.6	34.9	37.4	6.01	31.2	35.5
27	3.26	11.2	23.6	4.18	14.8	54.9	15.4	15.4	34.9	8.02	15.4	36.6
28	3.37	17.7	11.5	6.50	10.8	35.2	20.1	13.5	40.5	10.2	12.5	40.0
29	28.5	14.2	13.2	6.32	22.3	20.2	24.0	12.3	52.4	19.0	11.6	44.9
30	16.6	16.3	12.3	4.65	21.4	34.9	12.3	-----	54.9	15.4	10.6	43.3
31	13.4	21.2	-----	24.0	-----	21.9	9.06	-----	32.4	-----	10.4	-----
Total	404.04	776.36	415.03	181.40	557.64	1,188.8	892.66	584.24	1,035.6	1,068.88	776.64	486.72
Mean	13.0	25.0	13.8	5.85	18.6	38.3	28.8	20.1	33.4	35.6	25.1	16.2
cfs	20.1	38.7	21.4	9.05	28.8	59.3	44.6	31.1	51.7	55.1	38.8	25.1
Ac-ft	1,240	2,380	1,270	557	1,710	3,650	2,740	1,790	3,180	3,280	2,380	1,490
Calendar year 1959: Max	62.0	Min	0.56	Mean(mgd)	17.8	Mean(cfs)	27.5	Ac-ft	19,920			
Fiscal year 1959-60: Max	57.4	Min	3.26	Mean(mgd)	22.9	Mean(cfs)	35.4	Ac-ft	25,670			

* Discharge measurement made on this day.

5940. Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", on right bank of ditch and west side of Honopou Gulch, 160 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles east of Haiku.

Records available.--January 1910 to December 1928, February 1930 to June 1960. Published as "at Peahi weir" January 1910 to June 1919, as "at Manawai Gulch" July 1919 to December 1928, and as "at Kapalalaea Gulch" February 1930 to January 1940. Monthly discharge only for some periods published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Oct. 6, 1914, water-stage recorder at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, water-stage recorder at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, water-stage recorder at site 0.9 mile downstream at different datum.

Average discharge.--46 years (1910-12, 1913-14, 1915-28, 1930-60), 19.3 mgd (29.9 cfs), averages prior to 1960 includes incomplete fiscal years 1913 and 1915.

Extremes.--1910-28, 1930-60: Maximum daily discharge, 135 mgd (209 cfs) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

Remarks.--Records good. Haiku ditch diverts water from all streams between Kailua Stream and Maliko Gulch. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.54	0.07	1.42	0.06	63.4	60.1	1.85	1.85	1.94	30.6	2.53	1.71
2	.49	21.5	.54	.06	45.5	32.7	1.78	1.78	3.82	2.44	1.78	
3	.48	.22	.14	.05	4.66	2.66	1.94	1.71	1.85	3.20	2.53	1.71
4	.48	9.99	2.86	.05	3.60	1.50	26.1	1.64	34.4	26.5	3.74	1.57
5	19.6	69.8	5.78	.05	3.10	13.9	2.19	1.57	55.0	49.5	2.36	1.50
6	29.0	44.4	.24	.05	3.10	32.0	14.9	1.57	60.1	29.7	2.19	1.43
7	25.5	2.69	.14	.05	3.20	7.40	27.5	1.36	15.9	37.0	2.19	1.36
8	.32	.34	.09	.34	3.00	.48	3.87	1.15	4.90	23.1	2.10	1.29
9	.16	.30	.07	.75	2.53	.40	15.5	*1.12	4.18	10.0	2.02	1.29
10	.10	.24	.07	.75	2.44	2.37	6.48	1.05	3.70	39.0	64.3	*1.48
11	.22	27.8	2.07	.80	2.19	2.58	.62	21.2	21.6	39.0	53.5	1.29
12	.16	.69	8.94	.85	1.85	1.85	13.2	19.0	13.7	20.6	33.2	1.43
13	.10	.28	.91	.90	1.71	2.02	27.1	.75	3.30	30.8	20.3	1.29
14	.12	.20	.26	1.30	1.64	2.68	29.5	.54	2.90	53.5	13.1	1.29
15	35.5	47.5	.20	.90	1.57	19.3	10.6	11.8	2.70	63.4	36.0	1.29
16	6.00	11.8	.16	.85	1.50	31.2	3.20	7.67	2.70	43.1	7.76	1.36
17	.28	.70	.12	.80	1.43	56.8	20.6	4.42	2.62	44.8	3.70	1.10
18	.22	43.4	.09	.75	1.50	7.04	24.0	16.0	2.44	43.0	3.50	.85
19	.20	10.5	.08	.75	1.29	12.8	6.04	22.0	13.0	36.2	3.20	.80
20	.18	2.60	.08	.70	1.15	12.8	2.62	5.15	66.6	39.0	11.1	.80
21	.10	1.36	.15	.65	1.10	12.8	2.53	7.27	15.0	53.5	2.90	.80
22	.10	1.00	.05	.65	1.05	12.8	2.36	3.70	2.62	39.0	2.80	.95
23	.09	.65	.05	.65	1.24	29.5	2.28	3.20	28.3	60.1	2.62	60.6
24	.08	.75	.36	.90	1.60	25.0	2.28	2.90	*31.8	56.8	3.14	26.4
25	.07	2.54	.12	.65	1.15	6.24	1.94	2.70	25.9	53.5	2.74	16.2
26	.06	4.81	.24	.65	1.10	32.3	1.85	2.62	4.66	27.9	2.53	20.0
27	.05	.53	.45	.70	1.05	24.0	1.85	2.44	4.42	14.5	2.28	21.7
28	.06	.37	.14	.65	1.05	9.82	3.34	2.19	22.4	*10.7	2.10	38.0
29	15.8	.35	.12	.54	1.41	2.28	5.31	2.10	45.1	3.00	1.94	32.8
30	.06	.30	.08	.48	9.34	2.99	2.36	-----	35.3	2.70	1.85	30.6
31	.07	.24	-----	26.8	-----	2.10	2.02	-----	3.70	-----	1.85	-----
Total	136.19	308.12	26.05	44.13	170.45	462.41	267.71	148.45	534.51	987.52	298.31	274.67
Mean:	4.39	9.94	0.868	1.42	5.68	14.9	8.64	5.12	17.2	32.9	9.62	9.16
cfs	6.79	15.4	1.34	2.20	8.79	23.1	13.4	7.92	26.6	50.9	14.9	14.2
Ac-ft	418	946	80	135	523	1,420	822	456	1,640	3,030	915	843

Calendar year 1959: Max 69.8 Min 0.05 Mean(mgd) 9.01 Mean(cfs) 13.9 Ac-ft 10,090
 Fiscal year 1959-60: Max 69.8 Min 0.05 Mean(mgd) 10.0 Mean(cfs) 15.5 Ac-ft 11,230

* Discharge measurement made on this day.

6180. Kahakuloa Stream near Honokohau

Location.--Lat 20°58'54", long 156°33'26", on right bank 0.5 mile from Kapuna Stream, 1.3 miles south of Kahakuloa, 2 miles west of Puu Makawana, and 4.3 miles southeast of Honokohau.

Drainage area.--3.47 sq mi.

Records available.--July 1939 to August 1943, September 1947 to June 1960. Records for January 1913 to December 1914 (fragmentary), at site 1 mile upstream, not equivalent owing to difference in drainage area.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

Average discharge.--15 years (1940-43, 1948-60), 11.4 mgd (17.6 cfs).

Extremes.--Maximum discharge during year, 437 mgd (676 cfs) Mar. 5 (gage height, 6.03 ft), from rating curve extended above 90 mgd on basis of slope-area measurement at gage height 8.35 ft; minimum, 2.85 mgd (4.41 cfs) on several days.
1939-43, 1947-60: Maximum discharge, 1,990 mgd (3,080 cfs) Dec. 14, 1942 (gage height, 7.02 ft, control then in use), from rating curve extended above 55 mgd by test on model of station site; minimum, 1.95 mgd (3.02 cfs) Feb. 9-11, 1954.

Remarks.--Records good.

Revisions.--WSP 1569: Drainage area.

Rating tables, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Oct. 31

Nov. 1 to June 30

2.8	2.85	3.3	15.5	2.7	2.47	3.6	29.0
2.9	4.45	3.6	30.0	2.9	4.93	3.8	44.5
3.0	6.50	3.9	54.0	3.0	6.55	4.0	64.0
				3.2	11.0	4.5	125
				3.4	18.5		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.86	3.97	7.64	5.78	37.5	29.6	4.12	3.25	3.85	11.9	4.93	10.1
2	4.66	11.7	4.65	4.29	*26.4	7.55	3.98	*3.25	3.72	7.05	4.80	7.21
3	5.24	5.06	3.65	3.81	13.3	5.58	4.52	3.25	5.04	5.90	5.36	5.25
4	5.27	7.68	24.1	3.65	8.31	4.66	5.25	3.14	93.4	32.4	*18.1	4.66
5	7.51	10.3	13.3	3.49	6.48	36.1	4.52	3.14	103	30.5	5.42	4.52
6	6.59	*14.1	5.67	3.33	5.90	23.1	7.36	3.14	25.0	29.9	4.80	4.80
7	5.06	5.68	8.06	3.17	52.3	11.0	11.4	3.14	8.27	39.9	4.80	4.39
8	4.29	5.21	5.52	3.17	13.3	6.39	5.74	3.14	6.06	15.6	5.52	4.39
9	4.13	4.13	4.13	3.01	6.39	5.74	5.25	3.02	5.25	65.3	8.67	4.39
10	3.97	4.66	4.44	2.85	5.74	5.25	7.33	3.25	4.93	37.1	75.7	13.5
11	17.6	19.7	37.6	2.85	5.42	4.93	4.26	17.0	5.18	37.6	16.9	5.34
12	6.67	6.69	13.2	3.33	5.42	4.52	4.26	34.0	5.63	12.7	67.5	7.58
13	6.24	4.86	7.07	9.49	4.66	4.52	4.26	52.3	4.52	8.55	15.7	5.09
14	4.45	4.13	10.0	17.6	4.52	4.93	6.07	28.9	4.39	10.5	8.49	4.80
15	19.1	19.0	*4.79	4.67	4.39	5.42	4.66	10.9	4.26	7.95	8.29	5.25
16	5.98	6.50	4.13	3.49	4.26	*4.26	3.98	82.9	4.12	30.1	9.57	5.42
17	4.66	5.27	3.81	3.65	5.09	19.9	7.30	21.6	4.12	23.5	6.42	4.93
18	4.29	31.8	3.81	3.49	4.80	21.4	13.7	42.8	3.98	10.4	5.74	4.52
19	4.96	8.22	3.65	3.17	4.52	5.25	4.52	20.4	20.9	8.15	5.42	4.26
20	4.66	4.86	3.81	3.01	4.80	4.80	7.70	11.3	47.6	7.15	5.25	4.26
21	4.13	4.29	5.05	2.85	4.52	5.58	4.52	6.06	10.4	9.93	5.25	*4.12
22	3.81	3.97	8.05	2.85	4.12	5.25	3.98	5.09	*5.46	7.30	5.42	5.36
23	3.81	3.81	3.81	3.49	22.7	4.66	3.72	6.15	68.9	6.55	5.42	33.4
24	3.65	3.65	3.90	23.5	11.2	7.92	3.58	4.93	56.3	7.48	5.25	27.1
25	3.65	4.55	4.52	5.67	5.42	5.87	3.47	4.52	11.2	6.23	5.42	14.7
26	3.65	7.97	15.2	6.03	5.42	23.0	3.36	4.26	6.95	5.74	4.93	11.8
27	3.49	4.45	25.9	4.13	4.80	7.95	3.25	4.12	15.6	5.42	4.80	7.23
28	3.65	5.49	8.07	3.65	4.93	*15.9	4.58	3.98	30.5	5.25	4.66	9.30
29	24.1	4.45	5.27	12.9	7.12	7.44	3.52	3.98	24.1	5.09	4.66	6.72
30	6.59	3.81	6.29	5.02	16.5	4.80	3.36	-----	21.7	4.93	4.66	5.74
31	4.29	3.97	-----	4.76	-----	4.26	3.25	-----	11.0	-----	4.66	-----
Total	195.01	235.93	259.09	166.15	310.23	307.53	160.77	396.91	625.33	493.87	342.51	240.13
Mean:												
mgd	6.29	7.55	8.64	5.36	10.3	9.92	5.19	13.7	20.2	16.5	11.0	8.00
cfs	9.73	11.7	13.4	8.29	15.9	15.3	8.03	21.2	31.3	25.5	17.0	12.4
Ac-ft	598	718	795	510	952	944	493	1,220	1,920	1,520	1,050	737
Calendar year 1959: Max	138			Min	2.85	Mean(mgd)	10.2	Mean(cfs)	15.8	Ac-ft	11,390	
Fiscal year 1959-60: Max	103			Min	2.85	Mean(mgd)	10.2	Mean(cfs)	15.8	Ac-ft	11,460	

Peak discharge (base, 400 mgd).--Feb. 18 (4 p.m.) 414 mgd (641 cfs), 5.93 ft; Mar. 5 (5 p.m.) 437 mgd (676 cfs), 6.03 ft.

* Discharge measurement made on this day.

6200. Honokohau Stream near Honokohau

Location.--Lat 20°57'48", long 156°35'22", on right bank 1,000 ft upstream from intake of Honokohau ditch and 5 miles southeast of Honokohau.

Drainage area.--4.09 sq mi.

Records available.--March 1913 to September 1920, May 1922 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 950 ft (by barometer).

Average discharge.--45 years (1913-20, 1922-60), 26.4 mgd (40.8 cfs).

Extremes.--Maximum discharge during year, 984 mgd (1,520 cfs) May 12 (gage height, 6.02 ft), from rating curve extended above 120 mgd by logarithmic plotting; minimum, 7.86 mgd (12.2 cfs) Aug. 23, 24.
1913-20, 1922-60: Maximum discharge, 2,420 mgd (3,740 cfs) Dec. 14, 1942, Aug. 30, 1957, from rating curve extended above 120 mgd by logarithmic plotting; maximum gage height, 8.40 ft Dec. 14, 1942; minimum, 5.4 mgd (8.4 cfs) May 1, 1945, Jan. 5, 1946.

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

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.9	7.30	2.9	67.0
2.1	13.2	3.2	102
2.2	17.1	3.5	147
2.5	34.5	4.0	250

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	20.2	11.6	15.8	12.6	44.3	91.2	10.1	9.54	11.0	25.8	13.2	27.4
2	17.6	31.6	12.0	10.7	37.0	21.9	2.82	9.54	10.7	15.2	15.1	17.4
3	25.7	16.2	10.7	10.1	15.7	12.6	15.7	*9.26	19.8	13.6	51.8	15.2
4	18.5	23.9	41.2	10.1	33.4	10.4	15.9	9.26	39.6	31.9	51.2	13.8
5	27.9	90.8	21.5	9.82	14.5	75.3	14.8	9.26	96.8	35.2	15.2	13.6
6	23.1	35.0	12.0	9.82	15.0	51.0	33.8	8.98	23.3	46.8	14.0	13.2
7	17.7	13.2	15.5	9.82	56.5	21.3	60.4	8.98	12.2	85.1	16.3	13.2
8	13.2	13.8	13.5	9.82	21.4	15.1	52.4	8.98	10.4	25.5	20.6	13.2
9	12.9	14.4	10.7	9.54	12.6	15.7	29.7	8.98	10.1	110	22.8	*14.9
10	12.3	14.8	12.9	9.54	10.7	12.0	35.0	9.26	10.1	93.2	97.9	51.1
11	37.2	49.6	86.8	9.54	10.4	11.3	26.7	55.8	10.1	92.5	44.7	14.8
12	16.3	17.6	31.7	11.5	10.1	10.4	29.7	167	10.1	27.2	207	23.1
13	13.2	16.0	16.1	29.0	9.82	12.6	37.2	149	9.82	a22	69.9	15.6
14	12.6	12.3	28.0	23.5	9.82	15.8	29.6	138	9.82	a85	27.4	15.3
15	56.7	101	12.0	11.0	9.54	16.9	13.2	59.1	9.82	a65	43.8	24.5
16	15.2	16.7	*10.8	10.9	9.54	15.0	13.5	128	9.54	a200	41.5	21.8
17	14.7	12.9	10.4	11.6	10.4	92.0	37.1	29.4	9.54	a75	20.2	15.2
18	18.6	69.5	11.0	9.82	14.3	66.0	56.5	32.9	9.82	a42	20.4	13.2
19	15.8	18.6	10.4	9.54	10.1	14.3	12.3	24.9	27.5	a21	15.9	17.2
20	19.0	9.26	10.7	9.26	17.1	16.9	13.2	19.8	47.8	a20	18.6	13.2
21	12.6	8.42	11.4	8.98	11.3	27.5	11.0	13.2	16.0	a52	16.3	28.0
22	11.6	8.14	12.4	9.26	9.82	22.8	10.7	12.3	10.7	*a19	37.9	48.5
23	11.6	7.86	11.5	9.82	23.9	16.7	10.1	13.6	72.8	24.1	18.0	86.2
24	11.3	7.86	29.9	35.5	19.0	29.8	10.1	12.3	52.7	24.6	15.7	90.4
25	11.3	24.1	13.2	19.6	14.0	15.8	9.82	11.6	19.2	17.1	14.8	31.4
26	11.0	24.5	24.1	13.9	15.1	54.2	9.82	11.6	12.6	15.2	15.2	28.0
27	11.0	14.8	30.3	10.7	14.4	15.5	9.82	11.3	34.0	14.4	15.5	22.0
28	14.7	22.9	12.7	10.4	20.4	25.8	10.1	11.3	38.5	14.0	14.8	32.3
29	55.8	15.7	10.7	13.6	16.3	12.9	9.82	11.0	73.1	13.6	14.8	26.6
30	14.0	15.4	13.7	9.80	37.3	10.7	9.82	-----	144	13.6	14.8	17.7
31	11.8	22.4	-----	55.9	-----	10.4	9.82	-----	21.6	-----	15.2	-----
Total	584.9	759.84	563.6	444.88	553.74	839.7	655.54	1,004.14	863.06	1,339.4	1,020.5	777.6
Mean:	18.9	24.5	18.8	14.4	18.5	27.1	21.1	34.6	27.8	44.6	32.9	25.9
mgd	29.2	37.9	29.1	22.3	28.6	41.9	32.6	53.5	43.0	69.0	50.9	40.1
cfs	1,790	2,330	1,750	1,370	1,700	2,580	2,010	3,080	2,650	4,110	3,130	2,390

Calendar year 1959: Max 252 Min 7.86 Mean(mgd) 25.8 Mean(cfs) 39.9 Ac-ft 28,880
Fiscal year 1959-60: Max 207 Min 7.86 Mean(mgd) 25.7 Mean(cfs) 39.8 Ac-ft 28,870

Peak discharge (base, 700 mgd).--Feb. 13 (2 a.m.) 921 mgd (1,420 cfs), 5.98 ft; Apr. 16 (time unknown) 840 mgd (1,300 cfs), 5.70 ft (floodmark in well); May 12 (4 p.m.) 984 mgd (1,520 cfs), 6.02 ft.

* Discharge measurement made on this day.

No gage-height record Apr. 13-22; discharge estimated on basis of gage readings and record for stations on nearby stream.

6290. Honokowai ditch near Lahaina

Location.--Lat 20°55'57", long 156°37'31", on left bank just downstream from intake on Kapaloa Stream, 5.4 miles northeast of Lahaina Lighthouse.

Records available.--July 1912 to January 1958, June 1958 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Dec. 31, 1917, staff gage at site 0.5 mile downstream at different datum. Nov. 14, 1918, to May 27, 1921, water-stage recorder at site 1.5 miles downstream at different datum.

Average discharge.--44 years (1912-16, 1919-57, 1958-60), 5.86 mgd (9.07 cfs).

Extremes.--1912-60: Maximum daily discharge, 43 mgd (66 cfs) June 30, 1930; no flow at times.

Remarks.--Records good. Ditch diverts water for power and irrigation from Amalu and Kapaloa Streams just above station. Flow regulated by headgates at intake.

Cooperation.--Records of daily discharge since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.55	3.75	4.10	3.15	3.63	20.2	2.55	2.80	3.15	3.15	2.92	3.83
2	5.77	7.56	3.83	3.15	5.65	7.27	2.55	2.80	3.15	3.15	2.64	3.83
3	8.25	4.18	3.75	3.15	3.43	4.03	2.93	2.68	5.92	2.87	5.87	3.02
4	5.49	6.14	6.37	3.15	6.17	3.53	4.45	2.62	4.46	2.55	6.61	2.86
5	8.02	19.4	5.30	3.29	4.18	11.2	4.67	2.55	4.47	5.21	2.98	2.63
6	6.56	7.93	3.83	3.39	3.82	11.3	9.75	2.55	4.04	4.70	2.74	2.55
7	5.69	4.71	3.66	3.39	6.75	5.90	18.3	2.55	3.52	12.5	3.10	2.55
8	4.40	3.91	3.75	3.39	4.47	4.75	13.2	2.55	3.18	4.56	4.27	2.55
9	4.35	4.26	3.51	3.39	3.68	5.14	4.35	2.55	3.15	12.9	4.23	2.55
10	4.09	4.24	3.39	3.39	3.69	3.78	4.35	2.55	3.15	14.7	6.63	9.67
11	5.91	10.1	13.5	3.39	3.51	3.62	8.25	11.2	3.12	15.0	4.12	3.48
12	4.23	4.77	8.43	3.14	3.39	3.27	9.12	14.7	2.88	5.65	9.30	4.96
13	4.09	4.93	4.06	4.25	3.15	4.20	11.8	3.19	2.80	5.79	9.00	3.50
14	4.11	3.69	6.09	4.95	3.15	4.58	5.30	3.07	2.56	24.8	10.4	3.64
15	9.94	19.2	4.12	3.20	3.15	4.96	3.64	10.8	2.53	19.6	9.90	6.52
16	4.20	5.30	3.79	3.04	2.75	3.89	5.65	13.4	2.55	18.4	3.38	5.36
17	4.24	3.91	3.75	2.92	2.55	17.7	6.20	6.28	2.55	8.83	2.77	3.34
18	5.28	3.85	3.75	2.92	2.79	11.2	10.6	5.51	2.55	6.58	2.49	2.98
19	3.77	4.51	3.75	3.12	3.18	3.75	5.61	4.74	2.55	3.91	3.15	4.22
20	5.21	3.81	3.75	3.27	4.03	3.75	3.39	4.78	5.60	4.22	3.10	3.04
21	3.99	3.64	3.35	3.27	3.16	6.36	2.99	3.78	3.36	7.92	2.81	8.41
22	3.99	3.36	3.15	3.15	2.98	7.72	2.92	3.26	2.89	4.05	8.00	13.3
23	3.87	3.27	3.15	3.15	4.48	5.45	2.92	3.15	10.2	5.10	3.09	17.2
24	3.61	3.15	7.09	5.31	4.86	5.71	2.92	3.15	7.11	4.87	2.51	12.7
25	3.75	5.74	4.11	4.48	4.12	4.08	2.85	3.15	3.69	3.72	1.82	6.57
26	3.75	5.86	3.70	4.22	4.42	4.82	2.80	3.15	3.02	3.19	2.11	6.82
27	3.53	3.86	4.80	3.53	4.46	4.47	2.80	3.15	5.38	3.15	3.57	5.14
28	3.39	5.65	3.16	3.47	6.13	4.14	2.80	3.15	3.01	3.04	3.11	8.55
29	8.91	3.93	3.15	3.75	5.05	3.80	2.80	3.13	7.50	2.92	2.92	6.30
30	3.83	3.60	3.15	3.75	10.8	3.32	2.80	-----	14.8	2.92	2.80	4.23
31	3.75	*5.93	-----	3.68	-----	2.75	2.80	-----	3.56	-----	2.80	-----
Total	156.72	178.54	135.29	108.80	127.58	190.44	166.06	132.94	132.40	219.75	135.14	166.30
Mean:	5.06	5.76	4.51	3.51	4.25	6.14	5.36	4.58	4.27	7.32	4.36	5.54
mgd	7.83	8.91	6.98	5.43	6.58	9.50	8.29	7.09	6.61	11.3	6.75	8.57
cfs	461	548	415	334	392	584	510	408	406	674	415	510
Ac-ft	481	548	415	334	392	584	510	408	406	674	415	510
Calendar year 1959:	Max 24.5	Min 2.55	Mean (mgd)	5.52	Mean (cfs)	8.54	Ac-ft	6,180				
Fiscal year 1959-60:	Max 24.8	Min 1.82	Mean (mgd)	5.05	Mean (cfs)	7.81	Ac-ft	5,680				

* Discharge measurement made on this day.

6460. Olowalu ditch near Olowalu

Location.--Lat 20°49'33", long 156°36'47", on left bank 1.2 miles northeast of Olowalu and 5.5 miles southeast of Lahaina.

Records available.--August 1911 to January 1958, June 1958 to June 1960. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and Parshall flume. Prior to June 30, 1916, staff gage in tailrace of powerhouse 1,000 ft downstream at different datum. July 28, 1916, to June 8, 1919, staff gage and June 9, 1919, to June 21, 1932, water-stage recorder, at site 300 ft upstream at different datum. July 1, 1932, to Oct. 7, 1933, records obtained by combining flows of three stations about 1,000 ft downstream.

Average discharge.--44 years (1912-15, 1917-20, 1921-57, 1958-60), 4.86 mgd (7.52 cfs).

Extremes.--1911-60: Maximum daily discharge, 13.7 mgd (21.2 cfs) Apr. 17, 1935; no flow at times.

Remarks.--Records good. Ditch diverts water from Olowalu Stream at altitude of about 450 ft for power and irrigation. Regulated by headgates.

Cooperation.--Records of daily discharge since January 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.53	2.94	3.10	2.80	3.68	9.79	3.53	2.97	4.54	4.09	4.90	4.76
2	3.32	5.27	2.86	2.72	4.56	7.17	3.29	2.79	4.35	4.09	4.78	5.63
3	3.60	3.57	2.73	2.63	3.26	4.72	3.50	2.72	7.50	4.16	4.99	5.35
4	3.37	4.78	4.02	2.61	3.05	3.41	3.56	2.69	7.32	4.29	5.82	4.47
5	4.38	7.32	4.02	2.54	2.98	4.98	3.19	2.67	8.11	4.97	4.60	4.17
6	5.06	5.45	3.11	2.53	3.05	9.82	3.95	2.95	10.2	5.96	4.37	4.10
7	3.67	4.08	2.90	2.51	4.82	8.29	5.02	2.90	9.61	9.03	4.38	3.92
8	3.30	3.68	2.79	2.45	6.95	6.02	7.69	2.66	7.88	7.42	4.39	3.85
9	3.15	3.34	2.67	2.42	5.33	4.76	5.40	2.57	6.61	8.46	4.58	3.94
10	3.00	3.20	2.80	2.40	3.60	4.06	5.00	2.54	5.82	10.3	8.59	6.08
11	4.90	6.98	6.76	2.39	3.18	3.58	4.54	5.37	6.04	10.0	6.35	4.34
12	3.64	4.68	5.76	2.31	2.93	3.26	5.46	10.7	5.20	9.65	8.90	5.09
13	3.34	4.14	4.44	2.79	2.80	3.08	7.72	11.5	4.80	9.35	8.50	4.25
14	3.37	5.56	6.20	3.25	2.64	3.19	6.10	11.6	4.61	10.0	7.36	4.01
15	6.08	9.96	4.03	2.48	2.54	3.37	4.83	10.8	4.41	10.2	7.43	4.02
16	4.32	8.15	3.45	2.35	2.52	3.21	4.21	11.4	4.20	10.5	7.50	4.36
17	3.80	5.53	3.18	2.33	2.79	8.03	4.15	10.6	4.13	10.4	7.28	3.91
18	3.56	4.51	3.01	2.25	2.65	10.4	7.98	10.1	3.97	9.90	7.15	3.66
19	3.58	3.99	2.89	2.29	2.48	8.12	4.91	9.72	4.84	9.57	6.94	3.60
20	3.52	3.62	2.75	2.31	2.84	6.23	4.64	8.95	5.98	9.11	6.55	3.41
21	3.21	3.46	2.72	2.30	2.49	7.54	3.98	7.72	4.57	9.31	6.11	4.44
22	3.08	3.30	2.60	2.28	2.43	7.29	3.65	6.89	4.07	9.09	6.66	5.66
23	3.02	3.11	2.52	2.30	2.51	6.10	3.45	6.43	5.82	8.24	6.13	7.88
24	2.98	3.07	2.78	4.35	2.66	5.95	3.30	5.83	5.74	8.09	5.69	7.60
25	2.93	3.59	2.83	2.82	2.64	5.32	3.19	5.52	4.66	7.36	5.34	7.46
26	2.91	3.73	2.69	2.60	2.76	7.92	3.08	5.22	4.10	6.56	5.20	6.98
27	2.80	3.06	5.08	2.48	2.51	5.87	3.04	5.00	5.01	6.09	4.97	6.40
28	2.90	3.11	3.51	2.37	4.05	4.93	3.69	4.76	4.31	5.73	4.74	5.74
29	6.47	3.02	3.01	2.35	3.20	4.37	3.51	4.62	5.56	5.45	4.59	5.59
30	3.43	2.96	2.92	2.32	4.78	3.95	3.04	-----	6.47	5.21	4.49	5.05
31	3.13	*2.98	-----	2.48	-----	3.71	2.91	-----	4.09	-----	4.41	-----
Total	113.15	154.14	104.13	79.02	98.46	178.44	135.51	180.19	174.42	232.58	183.49	149.72
Mean	3.65	4.33	3.47	2.55	3.28	5.76	4.56	6.21	5.63	7.75	5.92	4.99
mgd	5.65	6.70	5.37	3.95	5.07	8.91	6.75	9.61	8.71	12.0	9.16	7.72
cfs	347	412	320	242	302	548	415	553	535	714	563	459
Ac-ft												

Calendar year 1959: Max 10.7 Min 2.25 Mean(mgd) 5.13 Mean(cfs) 7.94 Ac-ft 5,750
 Fiscal year 1959-60: Max 11.6 Min 2.25 Mean(mgd) 4.82 Mean(cfs) 7.46 Ac-ft 5,410

* Discharge measurement made on this day.

7000. Waiakea Stream at middle flume house, near Mountain View

Location.--Lat 19°38'25", long 155°10'35", on left bank at middle flume house, 800 ft upstream from Olaa Sugar Co.'s main flume and 7.5 miles northwest of Mountain View.

Records available.--September 1930 to June 1960.

Gage.--Water-stage recorder and combined Parshall flume and concrete weir. Altitude of gage is 1,820 ft (by barometer).

Average discharge.--29 years (1931-60), 7.55 mgd (11.7 cfs).

Extremes.--Maximum discharge during year, 98.0 mgd (152 cfs) May 14 (gage height, 3.79 ft), from rating curve extended above 40 mgd on basis of weir formulas; minimum, 0.94 mgd (1.45 cfs) July 3.
1930-60: Maximum discharge, 166 mgd (257 cfs) Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 40 mgd on basis of weir formulas; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Large part of flow comes from three tunnels.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.3	0.73	2.0	15.3
.4	1.16	2.5	24.0
.6	2.24	3.0	41.0
1.0	5.06	3.1	46.0
1.5	9.60		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.31	1.96	6.20	6.32	25.1	11.0	10.7	5.90	6.75	12.4	11.2	6.32
2	1.07	1.78	5.82	5.82	31.6	11.4	9.60	5.56	5.90	12.9	*10.7	5.90
3	1.07	1.62	5.31	5.31	21.0	9.60	9.21	4.98	5.65	14.1	10.2	5.48
4	1.33	8.11	4.90	4.83	20.0	9.10	10.7	4.59	5.23	13.5	9.60	4.98
5	1.21	14.5	4.75	6.46	18.3	10.4	9.10	4.20	4.83	12.9	8.60	4.59
6	2.62	10.7	4.44	5.90	17.5	11.2	10.7	3.98	4.44	12.4	8.15	4.28
7	3.29	10.7	4.75	5.48	20.6	13.1	16.7	3.60	4.51	12.4	7.22	4.06
8	2.24	10.7	4.36	5.31	17.5	14.4	19.4	3.33	4.20	11.8	6.75	3.76
9	2.01	10.7	4.33	4.90	16.0	14.1	21.0	3.98	4.30	11.5	6.75	3.53
10	1.90	10.2	3.98	4.59	14.7	15.3	28.3	2.93	3.83	14.3	6.75	3.33
11	1.78	9.60	5.23	4.59	14.1	15.3	28.5	4.04	3.60	17.2	12.4	3.13
12	1.62	9.10	4.51	4.28	12.9	15.3	32.0	20.0	3.46	16.7	10.7	2.93
13	1.52	8.15	4.44	4.06	11.8	14.7	38.5	26.4	3.33	17.5	12.3	2.86
14	1.47	7.22	5.73	3.83	11.2	13.5	34.0	22.7	3.20	28.5	22.6	2.67
15	4.38	10.5	5.14	3.60	10.2	12.9	a28	22.0	*5.15	44.0	16.7	2.35
16	2.99	9.10	4.83	3.40	9.10	15.3	a26	23.0	7.70	38.5	15.3	3.06
17	2.80	14.6	*4.75	3.20	8.15	21.8	a22	22.0	7.22	36.0	14.7	2.61
18	2.93	10.7	4.51	2.99	7.70	29.8	a24	20.0	6.32	32.0	14.7	3.76
19	2.61	10.2	4.28	2.86	*6.75	25.0	a19	18.3	6.32	26.0	14.7	3.13
20	2.55	8.60	4.06	2.80	7.22	26.0	a18	17.5	11.0	24.0	14.1	2.74
21	2.43	7.70	3.98	2.61	6.32	24.0	*a17	15.3	9.60	22.0	13.5	*4.33
22	2.43	7.22	3.83	2.49	5.90	22.0	15.3	13.5	10.2	21.0	12.9	4.83
23	2.36	6.75	3.53	2.30	5.56	20.0	13.5	12.4	10.2	19.2	11.8	5.65
24	2.24	6.32	3.76	2.18	5.06	18.3	12.4	11.2	13.5	18.3	11.8	5.31
25	*2.18	7.70	3.90	2.01	4.67	16.7	11.2	10.7	11.8	16.7	10.7	4.90
26	2.13	6.32	5.01	1.90	4.90	15.3	10.7	9.60	11.2	16.7	10.2	4.98
27	2.07	6.32	7.22	2.01	5.31	14.7	9.60	8.60	10.7	15.3	9.60	4.90
28	2.01	5.82	6.75	2.07	5.23	14.1	8.60	7.70	10.7	14.1	8.60	5.90
29	2.01	5.90	7.59	2.01	5.56	13.5	7.70	7.22	11.2	13.5	7.70	6.32
30	1.84	5.90	7.22	2.26	5.90	12.4	7.22	-----	11.0	12.4	7.22	7.22
31	1.78	5.90	-----	5.60	-----	11.8	6.75	-----	13.0	-----	6.75	-----
Total	66.18	250.59	148.91	117.97	355.83	492.00	535.38	334.36	229.72	577.8	344.89	131.01
Mean	2.13	8.06	4.96	3.81	11.9	15.9	17.3	11.5	7.41	19.3	11.1	4.37
cfs	3.30	12.5	7.67	5.89	18.4	24.6	26.8	17.8	11.5	29.9	17.2	6.76
Ac-ft	203	769	457	362	1,090	1,510	1,640	1,030	705	1,770	1,060	402
Calendar year 1959: Max	31.6			Min	0.54	Mean(mgd)	7.05	Mean(cfs)	10.9	Ac-ft	7,900	
Fiscal year 1959-60: Max	44.0			Min	1.07	Mean(mgd)	9.79	Mean(cfs)	15.1	Ac-ft	11,000	

Peak discharge (base, 50 mgd).--Aug. 17 (3:30 p.m.) 67.4 mgd (104 cfs), 3.42 ft; Nov. 2 (3:30 a.m.) 65.9 mgd (98.9 cfs), 3.37 ft; Dec. 18 (6:30 a.m.) 58.4 mgd (90.4 cfs), 3.29 ft; Feb. 12 (11:50 p.m.) 63.2 mgd (97.8 cfs), 3.35 ft; Apr. 15 (2:30 a.m.) 71.6 mgd (111 cfs), 3.48 ft; May 14 (7 p.m.) 98.0 mgd (152 cfs), 3.79 ft.

* Discharge measurement made on this day.

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

7012. Waiakea Stream near Hilo

Location.--Lat 19°41'35", long 155°05'55", on right bank 2.5 miles south of Hilo Post office.

Records available.--May 1957 to June 1960.

Drainage area.--97 sq mi, of which about 18 sq mi contribute directly to surface runoff.

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

Extremes.--Maximum discharge during year, 715 mgd (1,110 cfs) Nov. 2 (gage height, 5.73 ft), from rating curve extended above 100 mgd by logarithmic plotting; no flow at times.
1957-60: Maximum discharge, 790 mgd (1,220 cfs) Aug. 30, 1957 (gage height, 5.88 ft), from rating curve extended above 100 mgd by logarithmic plotting; no flow at times.

Remarks.--Records fair. Hawaii Board of Water Supply diverts water at 1,500-foot elevation at rate of about 25,000,000 gal per year.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.8	0	2.0	5.20
1.0	.05	2.5	16.5
1.2	.21	3.0	40.0
1.4	.64	3.5	81.0
1.6	1.50	4.0	150
1.8	3.00	5.0	390

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0		0	208	0	0	0	0	0.70	0	
2		0		0	267	2.22	0	0	0	0	0	
3		0		0	20.4	0	0	0	0	0	0	
4		0		0	13.0	0	1.48	0	0	0	0	
5		2.32		0	10.8	0	0	0	0	0	0	
6		0		0	3.30	0	.25	0	0	0	0	
7		0		0	59.6	.16	10.3	0	0	0	0	
8		0		0	8.34	0	17.1	0	0	0	0	
9		0		0	.95	0	12.6	0	0	0	0	
10		0		0	0	0	41.3	0	0	.01	0	
11		0		0	0	0	33.0	0	0	7.54	16.9	
12		0		0	0	0	45.3	20.7	0	0	1.30	
13		0		0	0	0	130	128	0	0	5.21	
14		0		0	0	0	88.5	48.1	0	90.7	57.6	
15		0		0	0	0	70.3	16.9	0	126	29.2	
16		0		0	0	0	58.0	39.1	0	66.1	4.25	
17		0		0	0	26.5	34.0	25.4	0	66.0	1.92	
18		0		0	0	107	34.7	13.0	0	58.0	4.31	
19		0		0	0	19.0	15.6	5.14	0	44.0	6.05	
20		0		0	0	22.0	8.55	1.26	.74	34.0	4.54	
21		0		0	0	23.1	*3.42	.03	0	27.5	.15	
22		0		0	0	15.7	.52	0	0	21.5	0	
23		0		0	0	8.23	0	0	0	12.2	0	
24		0		0	0	3.20	0	0	29.3	7.20	0	
25		0		0	0	.78	0	0	.19	3.38	0	
26		0		0	0	.02	0	0	0	5.42	0	
27		0		0	0	0	0	0	0	1.76	0	
28		0		0	0	0	0	0	0	.01	0	
29		0		0	0	.06	0	0	2.33	0	0	
30		0		0	0	0	0	0	0	0	0	
31		0		1.12	0	0	0	0	0	0	0	
Total	0	2.32	0	0.12	591.39	227.97	604.92	297.63	32.56	572.02	131.43	0
Mean	0	0.075	0	0.004	19.7	7.35	19.5	10.3	1.05	19.1	4.24	0
cfs	0	0.118	0	0.006	30.5	11.4	30.2	15.9	1.22	29.6	6.56	0
Ac-ft	0	7	0	0.4	1,810	700	1,860	913	100	1,760	403	0
Calendar year 1959: Max	267		Min	0		Mean(mgd)	2.75	Mean(cfs)	4.25	Ac-ft	3,080	
Fiscal year 1959-60 : Max	267		Min	0		Mean(mgd)	6.72	Mean(cfs)	10.4	Ac-ft	7,550	

Peak discharge (base, 200 mgd).--Nov. 2 (4 a.m.) 715 mgd (1,110 cfs), 5.73 ft; Dec. 18 (7:30 a.m.) 275 mgd (425 cfs), 4.58 ft; Jan. 15 (9:30 p.m.) 205 mgd (317 cfs), 4.30 ft; Feb. 13 (3 a.m.) 422 mgd (653 cfs), 5.08 ft; Apr. 14 (8 p.m.) 342 mgd (529 cfs), 4.84 ft; May 14 (9 p.m.) 560 mgd (866 cfs), 5.42 ft.

* Discharge measurement made on this day.

7040. Wailuku River above Hilo Boarding School ditch intake, near Hilo

Location.--Lat 19°42'55", long 155°09'10", on left bank 1,000 ft upstream from intake of Hilo Boarding School ditch, .8 mile west of reservoir 1, and 4 miles west of Hilo.

Drainage area.--125 sq mi.

Records available.--July 1928 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (by barometer).

Average discharge.--30 years (1928-40, 1941-47, 1948-60), 178 mgd (275 cfs).

Extremes.--Maximum discharge during year, 7,940 mgd (12,300 cfs) Dec. 18 (gage height, 16.9 ft), from rating curve extended above 3,400 mgd by logarithmic plotting; minimum, 4.98 mgd (7.71 cfs) July 3.

1928-60: Maximum discharge, 41,000 mgd (63,400 cfs) Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 3,400 mgd by logarithmic plotting; minimum, 0.16 mgd (0.25 cfs) Mar. 9, 1941.

Remarks.--Records good. Board of Water Supply, County of Hawaii, diverts about 1 mgd above station for domestic supply, and water passing station is used for power by Hilo Electric Light Co. Kapehu ditch diverts water from Kapehu Stream into Wailuku River above Pukamaui Falls.

Revisions (fiscal years).--WSP 865: 1929-36(M). WSP 965: 1941.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Aug. 10-14, 21-24, 28, 29, Sept. 3-26, Oct. 2-5, Oct. 7 to Nov. 26)

1.3	2.90	5.0	282
1.5	6.0	6.0	446
2.0	19.0	7.0	650
2.5	40.0	9.0	1,190
3.0	70.0	11.0	2,080
4.0	155	13.0	3,440

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.92	29.8	147	80.5	1,400	323	80.5	26.5	26.5	305	80.5	30.5
2	8.23	22.8	135	70.0	2,500	468	63.0	22.5	24.5	150	*63.0	28.5
3	6.00	13.8	70.0	57.0	600	201	108	21.8	21.1	100	77.0	30.5
4	19.9	259	57.0	48.0	350	126	730	20.0	20.4	70.0	80.5	32.8
5	19.7	*2,630	51.0	41.5	220	293	332	18.0	19.4	57.0	60.0	28.5
6	103	376	42.5	172	160	438	432	16.8	22.5	51.0	48.0	26.5
7	163	200	45.6	84.0	500	594	1,300	15.5	18.0	45.0	40.0	22.5
8	47.0	117	58.6	66.5	350	714	1,460	14.1	39.2	48.0	40.0	19.7
9	30.5	77.0	37.5	54.0	270	400	908	12.9	29.7	41.7	35.0	17.7
10	24.5	63.0	32.8	48.0	200	325	1,640	12.6	17.7	451	37.3	17.1
11	21.8	51.0	42.9	60.0	150	357	942	40.0	14.9	1,020	150	15.5
12	17.7	42.5	54.0	45.0	100	200	1,040	1,610	13.8	408	70	14.6
13	14.6	35.0	48.0	40	80	145	1,620	1,990	12.9	408	160	16.4
14	12.4	32.8	87.2	35	64	126	1,490	1,310	11.6	2,230	900	15.5
15	909	480	54.0	31	54	135	711	486	*14.7	2,340	500	13.8
16	202	157	*42.5	28	48	294	552	620	158	956	350	26.5
17	77.0	100	37.5	25	42	1,310	386	590	98.5	579	250	24.5
18	67.6	145	32.8	24	36	2,330	546	310	49.8	372	200	36.2
19	45.0	174	32.8	22	*30	574	282	200	37.5	340	200	36.8
20	35.0	77.0	35.0	20	163	446	200	145	158	484	160	20.4
21	26.5	63.0	28.5	18	66.5	389	155	104	117	522	130	*31.0
22	22.5	51.0	32.8	16	51.0	310	126	80.5	67.0	522	110	98.6
23	18.7	42.5	26.5	14	45.0	226	100	60.0	45.0	431	92.0	63.0
24	16.4	42.5	38.9	13	37.5	155	84.0	48.0	149	282	80.5	66.5
25	*15.2	152	59.0	12	32.8	126	70.0	42.5	67.0	200	63.0	60.0
26	15.5	92.0	47.8	11	35.0	108	54.0	37.5	117	213	54.0	96.8
27	14.4	77.0	135	32	72.8	118	48.0	30.5	100	177	51.0	147
28	13.2	60.0	104	20	62.8	294	40.0	28.5	48.0	135	57.0	185
29	14.4	57.0	182	18	113	294	35.0	26.5	70.0	108	42.5	244
30	12.9	77.0	141	35	77.0	170	30.5	-----	438	92.0	40.0	226
31	10.8	96.0	-----	150	-----	108	28.5	-----	562	-----	35.0	-----

Total 2,033.35 5,892.7 1,939.2 1,765.0 7,910.4 12,157 15,593.5 7,939.7 2,688.7 13,137.7 4,256.3 1,692.4

Mean: mgd 65.6 190 64.6 56.9 264 392 503 274 86.7 438 137 56.4
cfs 101 294 100 88.0 408 607 778 424 134 678 212 87.3
Ac-ft 6,240 16,080 5,950 5,420 24,280 37,310 47,850 24,370 8,250 40,320 13,060 5,190

Calendar year 1959: Max 2,630 Min 3.00 Mean(mgd) 143 Mean(cfs) 221 Ac-ft 160,300
Fiscal year 1959-60: Max 2,630 Min 6.00 Mean(mgd) 210 Mean(cfs) 325 Ac-ft 236,300

Peak discharge (base, 5,600 mgd).--Aug. 5 (4:30 a.m.) 6,400 mgd (9,900 cfs), 15.8 ft; Nov. 2 (time unknown) 7,380 mgd (11,400 cfs), 16.5 ft; Dec. 18 (6 a.m.) 7,940 mgd (12,300 cfs), 16.9 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 13 to Nov. 19, May 11-22; discharge estimated on basis of recorded range in stage and records for stations on nearby streams.

7070. Kapehu ditch diversion near Hilo

Location.--Lat 19°43'45", long 155°11'05", on left bank 40 ft downstream from gate on Kapehu ditch, 3.1 miles northwest of Pihoonua, and 6.2 miles west of Hilo.

Records available.--May 1954 to June 1960.

Gage.--Water-stage recorder and de Fabritis type-H flume.

Average discharge.--6 years, 1.51 mgd (2.34 cfs).

Extremes.--1954-60: Maximum daily discharge, 11.0 mgd (17.0 cfs) Apr. 25, 1957; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Ditch diverts water from Kapehu ditch for fluming of sugarcane near Hilo.

Revisions (fiscal years).--WSP 1449: 1954-55.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.59	0.02	0	0.01	0.06	0.02	0.01	0	1.7	1.94	2.02	2.21
2	1.56	0	0	0.01	0.14	0.01	0.01	0	1.6	1.86	*2.00	2.61
3	1.48	0	0	0.01	0	0	0.02	0	1.6	1.82	1.94	2.66
4	1.86	0.02	0	0.01	0	0	0.01	0	1.6	1.78	1.98	2.66
5	1.86	0.03	0	0.13	0.01	0.01	0.01	0	1.6	1.75	1.90	2.61
6	2.44	0	0	0	0	0.01	0.02	0	1.7	1.71	1.90	2.56
7	3.10	0	0	0	0.02	0.01	0.03	0	1.7	1.71	1.86	2.50
8	2.02	0	0	0	0	0.01	0.03	0	1.9	1.71	1.86	2.50
9	1.86	0	0	0	0	0	0.02	0	1.9	1.76	1.82	2.45
10	1.75	0	0	0	0	0	0.02	0	1.8	2.40	1.90	2.40
11	1.78	0	0	0	0	0	0.02	1.5	1.8	2.53	3.19	2.35
12	1.63	0	0	0	0	0	0.02	3.6	1.8	2.21	2.06	2.30
13	1.52	0	0	0	0	0	0.04	4.8	1.8	2.13	2.34	2.35
14	1.45	0.01	0.01	0	0	0	0.02	3.9	1.8	4.05	2.80	2.30
15	2.62	0.01	0	0	0	0	0.02	2.5	*1.82	4.70	2.30	2.30
16	2.09	0	0.01	0	0	0.01	0.01	2.0	1.94	2.98	2.02	2.50
17	2.00	0	0.01	0	0	0.01	0.02	2.0	1.82	2.56	2.02	2.45
18	2.14	0	0.01	0.01	0	0.03	0.02	1.9	1.78	2.30	2.16	2.61
19	1.48	0	0.01	0.01	0	0	0.01	1.9	1.78	2.40	2.41	2.40
20	0.03	0	0.01	0.01	0	0	0.01	1.9	2.13	2.50	2.09	2.25
21	0.02	0	0.01	0.01	0	0	0.01	1.8	1.94	2.95	1.94	*2.42
22	0.02	0	0.01	0.01	0	0	0.01	1.8	1.82	2.76	1.90	2.50
23	0.02	0	0.01	0.01	0	0	0.01	1.8	1.82	2.40	1.86	2.66
24	0.02	0.01	0.02	0.01	0	0	0	1.7	2.17	2.25	1.82	2.45
25	0.01	0	0.01	0.01	0	0	0	1.7	1.90	2.17	1.75	2.50
26	0.01	0	0.01	0.01	0	0	0	1.7	1.82	2.25	1.71	2.61
27	0.01	0	0.01	0.01	0.01	0.01	0	1.7	1.78	2.13	1.75	2.76
28	0.01	0	0.01	0.02	0.02	0.05	0	1.7	1.82	2.13	1.71	3.10
29	0.02	0	0.02	0.01	0.01	0.06	0	1.7	1.94	2.06	1.67	2.76
30	0	0	0.01	0.01	0.01	0.02	0	-----	2.28	2.06	1.67	3.15
31	0.01	0	-----	0.01	-----	0.01	0	-----	2.59	-----	1.63	-----
Total	35.61	0.10	0.18	0.32	0.28	0.33	0.40	41.6	57.45	69.96	61.98	75.88
Mean:	1.15	0.003	0.006	0.010	0.009	0.011	0.013	1.43	1.85	2.33	2.00	2.53
mgd	1.78	0.005	0.009	0.016	0.014	0.017	0.020	2.21	2.86	3.61	3.09	3.91
cfs	109	0.3	0.6	1.0	0.9	1.0	1.2	128	176	215	190	233
Ac-ft												
Calendar year 1959: Max	6.4			Min	0	Mean(mgd)	0.707	Mean(cfs)	1.09	Ac-ft	792	
Fiscal year 1959-60: Max	4.8			Min	0	Mean(mgd)	0.940	Mean(cfs)	1.45	Ac-ft	1,060	

* Discharge measurement made on this day.

Note.--No gage height record Jan. 20 to Mar. 15; discharge estimated on basis of records for nearby station.

7080. Kapehu ditch near Hilo

Location.--Lat 19°43'40", long 155°11'00", on left bank 0.9 mile downstream from intake, 3 miles west of Piinonua, and 6 miles west of Hilo.

Records available.--March 1938 to June 1941, July 1942 to June 1948, July 1953 to June 1960. September 1948 to April 1951; June 1951 to September 1952; November 1952 to February 1953; June 1953 (monthly discharge only).

Gage.--Water-stage recorder and de Fabritis flume. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--18 years (1938-41, 1942-48, 1949-50, 1951-52, 1953-60), 1.54 mgd (2.38 cfs).

Extremes.--1938-41, 1942-48, 1953-60: Maximum daily discharge, 7.56 mgd (11.7 cfs) Nov. 1, 1959; no flow at times.

Remarks.--Ditch diverts water from Kapehu Stream 0.6 mile northwest of station for domestic use in Hilo. Flow sometimes diverted into Kapehu diversion ditch.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	2.26	3.15	2.76	7.56	4.22	2.86	2.81	0.04	0.03	0.03	0.02
2	.03	1.74	2.76	2.66	6.20	3.62	2.76	2.76	.04	.03	.03	.03
3	.03	1.49	2.66	2.56	3.91	3.01	3.41	2.71	.04	.03	.02	.03
4	.03	3.24	2.56	2.47	3.17	2.96	3.66	2.66	.05	.03	.02	.03
5	.03	4.78	2.52	4.08	3.17	3.52	3.11	2.61	.04	.03	.02	.02
6	.03	2.52	2.47	2.86	2.76	3.38	3.81	2.52	.04	.03	.02	.02
7	.05	2.30	2.47	2.61	4.93	3.84	5.55	2.52	.04	.03	.02	.02
8	.02	2.22	2.47	2.52	3.33	4.14	5.55	2.39	.04	.04	.03	.02
9	.03	2.08	2.30	2.43	2.96	3.22	4.77	2.34	.04	.04	.03	.02
10	.03	2.05	2.26	2.43	2.91	3.17	5.41	2.30	.04	.04	.03	.02
11	.03	2.01	2.43	2.81	2.91	2.96	4.85	.83	.05	.04	.04	.03
12	.03	1.97	2.56	2.39	2.66	2.76	5.38	.22	.05	.04	.02	.03
13	.03	1.90	2.52	2.30	2.71	2.71	6.50	.55	.05	.04	.04	.03
14	.04	1.94	2.96	2.30	2.66	2.76	5.38	.14	.05	.13	.09	.03
15	.06	3.58	2.52	2.17	2.52	2.71	4.45	.05	.05	.12	.03	.03
16	.03	2.47	*2.47	2.09	2.43	3.58	3.96	.04	.04	.02	.03	.03
17	.03	2.43	2.39	2.09	2.39	4.39	3.84	.03	.04	.02	.03	.03
18	.03	2.59	2.30	2.01	2.39	5.93	4.14	.03	.04	.02	.03	.03
19	1.48	2.66	2.26	2.01	*2.69	3.44	3.49	.03	.04	.02	.03	.03
20	1.86	2.39	2.30	2.26	3.42	3.22	*3.38	.03	.04	.02	.02	.03
21	1.78	2.30	2.26	2.26	2.66	3.22	3.28	.03	.04	.03	.02	.04
22	1.70	2.22	2.30	2.01	2.52	3.11	3.22	.03	.04	.03	.02	.03
23	1.67	2.22	2.22	1.97	2.43	2.96	3.22	.03	.04	.03	.02	.03
24	1.63	2.42	2.59	1.90	2.39	2.91	3.17	.04	.04	.03	.02	.03
25	*1.52	3.10	2.47	1.90	2.30	2.66	3.11	.04	.04	.03	.02	.03
26	1.60	2.71	2.66	1.86	2.47	2.81	3.06	.04	.04	.03	.02	.03
27	1.52	2.61	3.22	1.82	2.71	3.00	3.01	.04	.05	.03	.02	.03
28	1.49	2.47	3.01	2.26	2.71	3.14	3.01	.03	.05	.03	.02	.05
29	1.60	2.52	3.48	2.30	2.86	4.15	2.96	.03	.05	.03	.02	.04
30	1.49	2.91	2.96	2.30	2.81	3.01	2.91	-----	.06	.03	.03	.04
31	1.45	2.91	-----	2.96	-----	2.91	2.86	-----	.05	-----	.02	-----
Total	21.38	77.02	77.50	73.35	93.54	103.62	120.07	27.88	1.36	1.10	0.84	0.88
Mean:	0.690	2.48	2.58	2.37	3.12	3.34	3.87	0.961	0.044	0.037	0.027	0.029
cfs	1.07	3.84	3.99	3.67	4.83	5.17	5.99	1.49	0.068	0.057	0.042	0.045
Ac-ft	66	236	238	225	287	318	368	86	4.2	3.4	2.6	2.7
Calendar year 1959: Max	7.56				Min 0.01	Mean(mgd)	1.94	Mean(cfs)	3.00	Ac-ft	2,180	
Fiscal year 1959-60: Max	7.56				Min 0.02	Mean(mgd)	1.64	Mean(cfs)	2.54	Ac-ft	1,840	

* Discharge measurement made on this day.

7370. Waililikahi Stream near Waimanu

Location.--Lat 20°07'40", long 155°39'55", on right bank 30 ft upstream from Waimanu trail bridge, 1.7 miles upstream from mouth, 1.9 miles southeast of head of Awini ditch, and 2.2 miles southwest of Waimanu.

Drainage area.--0.4 sq mi, approximately.

Records available.--March 1939 to January 1960 (discontinued). Prior to July 1941, published as Waimanulii111 Stream near Waimanu.

Gage.--Water-stage recorder. Altitude of gage is 2,740 ft (by barometer).

Average discharge.--20 years, 6.56 mgd (10.1 cfs).

Extremes.--Maximum discharge during period July to January, 210 mgd (325 cfs) Dec. 18 (gage height, 3.70 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 0.48 mgd (0.74 cfs) Nov. 15.
1939-60: Maximum discharge, 544 mgd (842 cfs) Dec. 20, 1946 (gage height, 5.17 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Mar. 17, 18, 1944.

Remarks.--Records good.

Rating table, July 1, 1959, to Jan. 23, 1960 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.36	1.2	7.40
.5	.78	1.4	11.3
.6	1.33	1.6	17.4
.7	2.02	1.8	25.0
.8	2.84	2.2	46.0
1.0	4.86	2.6	75.0

Discharge, in million gallons a day, July 1959 to January 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.81	2.50	15.2	1.98	16.9	54.6	1.40					
2	2.00	2.90	4.07	1.61	4.47	13.9	1.21					
3	2.62	3.11	2.27	1.40	2.70	2.50	2.01					
4	3.34	52.2	3.97	1.21	1.64	1.74	3.10					
5	3.58	28.6	2.76	1.10	1.64	2.43	1.88					
6	8.15	4.63	3.34	.98	1.69	5.27	6.25					
7	6.63	3.42	2.10	.93	11.1	11.1	39.9					
8	2.98	2.51	2.39	.88	2.28	10.6	23.9					
9	1.74	1.81	2.08	.83	1.15	5.28	9.74					
10	2.20	9.30	2.38	.73	.93	4.72	19.2					
11	12.6	5.00	4.99	.73	1.10	4.09	4.08					
12	8.40	2.36	3.70	.68	.83	1.81	3.52					
13	2.33	1.61	6.28	6.54	.88	1.47	6.15					
14	1.74	1.49	14.7	9.19	.60	1.40	3.99					
15	10.9	30.1	2.90	1.82	.58	6.80	1.88					
16	4.08	6.60	3.07	1.28	.64	41.9	1.40					
17	6.96	6.33	2.27	1.82	1.43	58.4	2.07					
18	8.47	7.26	2.25	1.54	7.33	48.5	8.57					
19	2.35	6.04	11.2	1.28	3.28	13.5	2.28					
20	2.27	3.17	4.20	1.74	13.4	6.12	1.61					
21	2.16	1.88	2.59	1.10	1.70	26.5	1.33					
22	1.54	1.81	3.10	1.10	1.46	9.01	1.10					
23	1.21	1.27	1.81	3.40	*7.07	3.98	*.98					
24	.98	1.21	7.80	5.19	9.31	2.92	-					
25	.88	5.43	6.27	4.24	4.18	2.85	-					
26	.98	3.21	6.90	2.93	27.2	8.10	-					
27	1.85	1.95	13.3	1.60	15.0	8.43	-					
28	*9.76	1.95	4.35	2.38	14.9	10.3	-					
29	4.56	1.54	3.33	2.43	5.66	3.88	-					
30	2.83	1.81	2.75	1.40	10.6	1.95	-					
31	1.74	5.54	-----	10.5	-----	1.61	-					
Total	129.54	208.54	148.30	74.54	171.43	375.66	-					
Mean:												
mgd	4.18	6.73	4.94	2.40	5.71	12.1	-					
cfs	6.47	10.4	7.64	3.71	8.83	18.7	-					
Ac-ft	398	640	455	229	526	1,150	-					

Calendar year 1959: Max 68 Min 0.56 Mean(mgd) 6.41 Mean(cfs) 9.92 Ac-ft 7,180

Fiscal year 1959-60: Max - Min - Mean(mgd) - Mean(cfs) - Ac-ft -

Peak discharge (base, 150 mgd).--Dec. 18 (3 a.m.) 210 mgd (325 cfs), 3.70 ft; Dec. 21 (3 a.m.) 164 mgd (254 cfs), 3.45 ft.

* Discharge measurement made on this day.

7420. Kukui Stream near Waimanu

Location (revised).--Lat 20°09'14", long 155°40'15", on left bank 300 ft upstream from Waimanu trail crossing, 0.4 mile east from head of Awini ditch, and 2.2 miles west of Waimanu.

Drainage area.--0.21 sq mi (revised).

Records available.--February 1939 to July 1952, September 1959 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,940 ft (by barometer).

Average discharge.--13 years (1939-52), 1.29 mgd (2.00 cfs).

Extremes.--Maximum discharge during period September 1959 to June 1960, 80 mgd (124 cfs) Mar. 24 (gage height, 3.60 ft), from rating curve extended above 3 mgd on basis of shape of model rating; minimum, 0.13 mgd (0.48 cfs) Oct. 31, 1939-52: Maximum discharge, 116 mgd (179 cfs) Oct. 23, 1941 (gage height, 3.97 ft), from rating curve extended above 5 mgd by test on model of station site; minimum, 0.13 mgd (0.20 cfs) Oct. 25, 1945.

Remarks.--Records fair except those for period of no gage-height record, which are fair.

Rating table, Sept. 29, 1959, to June 30, 1960 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.33	1.2	7.50
.3	.64	1.6	15.5
.4	1.04	2.0	21.0
.6	2.06	2.5	32.0
.9	4.38		

Discharge, in million gallons a day, September 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1			-	0.55	4.22	14.1	0.58	0.39	0.48	0.96	0.80	0.78
2			-	.52	1.21	4.83	.55	.39	.45	.76	.76	.92
3			-	.45	.70	1.24	.58	.36	.48	1.87	.72	.52
4			-	.45	.55	.96	.64	.36	1.66	3.49	.72	.48
5			-	.42	.48	.98	.52	.36	3.62	2.64	.64	.61
6			-	.42	.48	.92	.68	.36	1.26	1.72	.61	.55
7			-	.42	2.34	2.26	9.31	.36	.64	4.47	.61	.45
8			-	.42	.68	2.12	4.39	.36	.55	1.93	5.10	.42
9			-	.42	.52	1.19	2.54	.36	.52	2.16	1.45	.39
10			-	.42	.45	.92	5.85	.36	*.48	7.27	4.70	.45
11			-	.39	.45	.90	1.25	14.5	.70	9.28	7.35	.42
12			-	.39	.42	.68	.88	14.9	1.24	2.85	2.11	1.02
13			-	1.24	.39	.61	.80	15.5	.55	2.19	1.13	1.08
14			-	1.18	.36	.61	.72	5.08	.45	7.71	.96	.42
15			-	.42	.56	1.10	.61	1.97	1.37	6.06	1.04	1.04
16			-	.36	.36	6.50	.55	5.64	.58	3.30	.88	*1.24
17			-	.45	.45	9.63	.55	2.78	.48	1.92	.76	.72
18			-	.48	2.26	6.65	1.78	6.41	.82	1.56	1.54	.64
19			-	.48	.53	2.75	.61	2.63	1.84	1.50	1.41	.45
20			-	.69	1.18	1.13	.55	1.77	7.29	2.90	.72	.42
21			-	.36	.42	3.26	.48	.96	1.24	8.16	.64	.42
22			-	.33	.46	1.31	.45	.80	.76	2.43	.61	a2.10
23			-	.48	4.02	.88	.42	.76	7.59	1.45	.61	a7.00
24			-	.94	2.99	.76	.42	.72	21.2	1.67	.58	a3.00
25			-	.55	*.79	.76	.39	.95	3.81	1.36	.55	a.90
26			-	.45	3.93	1.74	*.39	.84	1.32	3.75	.52	a.60
27			-	.52	2.03	2.39	.42	.61	1.00	1.42	.55	a.54
28			-	.42	2.45	1.97	.42	.55	1.98	*1.04	.52	a.68
29			*0.84	.42	1.19	.90	.39	.52	1.36	.92	.48	a1.50
30			.68	.36	2.32	.72	.39	-----	1.66	.88	.48	a1.30
31			-----	4.38	-----	.64	.39	-----	1.22	-----	.48	-----
Total			-	19.78	38.99	75.41	38.70	81.55	68.60	89.62	40.03	31.06
Mean			-	0.638	1.30	2.43	1.25	2.81	2.21	2.99	1.29	1.04
mgd			-	0.987	2.01	3.76	1.93	4.35	3.42	4.63	2.00	1.61
cfs			-	61	120	231	119	250	211	275	123	95
Ac-ft			-									

Calendar year : Max Min Mean(mgd) Mean(cfs) Ac-ft
 Fiscal year : Max Min Mean(mgd) Mean(cfs) Ac-ft

Peak discharge (base, 30.0 mgd).--Oct. 31 (11:30 p.m.) 59.0 mgd (91.3 cfs), 3.26 ft; Dec. 16 (10:50 p.m.) 56.5 mgd (87.4 cfs), 3.21 ft; Feb. 12 (7 p.m.) 56 mgd (86.6 cfs), 3.20 ft; Feb. 18 (7:30 p.m.) 60.0 mgd (92.8 cfs), 3.28 ft; Mar. 5 (7 p.m.) 41.2 mgd (63.7 cfs), 2.83 ft; Mar. 24 (12:30 a.m.) 80.0 mgd (124 cfs), 3.60 ft.

* Discharge measurement made on this day.

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

7430. Awini ditch at East Honokane Iki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'10", at flume across East Honokane Iki Gulch, 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1949, July 1950 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--30 years (1928-38, 1939-49, 1950-60), 12.0 mgd (18.6 cfs).

Extremes.--1927-49, 1950-60: Maximum daily discharge, 33 mgd (51 cfs) Jan. 8, 1935, Aug. 10, 1938; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Ditch diverts water of altitude 2,000 ft from all streams between the Waikalua and the Honokane. Flow regulated by gates and spillways. Water used for irrigation in vicinity of Kohola.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.2	9.29	14.0	8.00	19.5	26.2	3.1	3.09	2.38	8.17	9.60	8.11
2	9.65	13.7	11.9	6.50	14.4	20.2	2.9	2.96	2.56	6.50	9.00	16.5
3	7.70	9.60	9.00	5.60	9.90	11.9	2.6	2.65	3.22	11.0	8.50	9.90
4	14.4	23.9	10.2	5.04	7.00	9.60	4.0	2.67	12.7	16.7	10.1	6.50
5	14.4	21.0	9.60	4.56	6.50	10.5	2.7	2.56	16.9	15.8	9.00	6.00
6	20.4	13.1	9.60	4.12	6.50	14.4	4.9	2.50	15.0	12.5	7.50	6.50
7	22.7	11.9	9.60	3.84	17.5	16	22	2.38	7.00	20.2	7.00	5.60
8	14.5	9.00	7.50	3.56	11.1	20	20	2.28	4.96	17.5	21.0	5.04
9	8.50	7.50	6.00	3.29	7.00	16	15	2.56	*4.26	12.7	21.8	4.56
10	8.00	17.1	6.65	3.09	5.20	15	16	2.28	3.96	22.7	20.2	5.20
11	20.4	15.0	14.2	3.09	4.72	14	7.0	15.6	4.62	22.7	24.4	5.20
12	21.0	9.60	13.7	2.90	4.26	10	3.0	19.5	11.7	16.5	21.0	6.22
13	11.6	7.00	18.8	6.45	3.96	7.0	2.5	14.1	5.60	16.5	17.2	16.3
14	8.5	6.00	21.6	16.6	3.84	7.5	8.5	9.23	4.33	19.5	13.7	18.00
15	20.2	23.4	13.7	8.80	3.29	13	5.0	5.67	4.39	21.6	16.5	*11.7
16	18.0	17.0	13.2	5.20	3.22	20	4.2	10.7	4.33	18.8	14.4	20.2
17	14.5	11.5	11.3	6.50	3.93	24	5.0	8.55	3.63	15.8	12.2	15.1
18	21.0	13.5	9.00	6.00	15.5	22	13	7.35	3.68	20.2	18.8	12.8
19	11.9	17.4	16.4	4.26	7.43	18	6.0	6.08	16.7	12.5	20.4	7.00
20	10.1	10.7	16.3	5.60	17.5	10	4.3	7.60	22.8	15.6	13.7	5.20
21	9.00	7.50	10.0	3.98	8.50	17	3.5	4.19	15.8	20.2	10.1	5.37
22	7.00	6.00	14.2	3.22	6.50	12	3.3	3.50	9.60	16.6	8.50	13.7
23	6.50	5.20	9.00	5.41	10.6	5.5	5.2	3.16	10.7	12.5	8.50	16.0
24	5.20	4.88	11.9	13.8	17.5	4.2	3.2	3.22	22.7	13.1	7.50	11.9
25	4.56	11.8	16.8	11.6	*12.4	3.8	*3.2	4.25	16.5	16.8	6.50	11.3
26	4.26	10.7	16.5	11.6	22.7	6.5	3.29	5.04	9.60	19.5	6.50	9.00
27	6.52	7.00	21.8	9.46	20.4	9.0	3.77	3.36	7.00	*11.7	7.00	6.50
28	15.5	6.00	15.0	11.0	16.0	10	3.63	2.79	9.60	10.7	8.50	8.07
29	16.6	5.04	10.7	8.50	16.5	7.5	3.50	2.50	10.7	11.9	9.00	17.0
30	*12.5	5.04	10.7	6.00	14.8	3.3	3.29	-----	16.6	10.7	7.50	15.8
31	8.00	10.4	-----	8.36	-----	2.9	3.16	-----	13.0	-----	6.50	-----
Total	392.29	346.75	383.25	207.93	320.17	389.00	188.94	162.52	296.54	469.17	382.10	298.27
Mean	12.7	11.2	12.8	6.71	10.7	12.5	6.09	5.60	9.57	15.6	12.3	9.94
mgd	19.6	17.3	19.8	10.4	16.6	19.3	9.42	8.66	14.8	24.1	19.0	15.4
cfs	1,200	1,060	1,180	638	983	1,190	580	499	910	1,440	1,170	915
Ac-ft												
Calendar year 1959	Max	26.2	Min	2.90	Mean(mgd)	12.0	Mean(cfs)	18.6	Ac-ft	13,410		
Fiscal year 1959-60	Max	26.2	Min	2.28	Mean(mgd)	10.5	Mean(cfs)	16.2	Ac-ft	11,760		

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 7 to Jan. 25; discharge estimated on basis of records for Awini ditch at Honokane Gulch and records for East Honokane Iki intake to Awini ditch at East Honokane Iki Gulch.

7440. East Honokane Iki intake to Awini ditch at East Honokane Iki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokane Iki Gulch to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1938, July 1939 to June 1949, July 1951 to June 1960.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--27 years (1928-36, 1937-38, 1939-40, 1941-49, 1951-60), 1.20 mgd (1.86 cfs).

Extremes.--1927-38, 1939-49, 1951-60: Maximum daily discharge, 8.4 mgd (13.0 cfs) Aug. 6, 1957; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Intake diverts water from East Honokane Iki Gulch to Awini ditch for irrigation in vicinity of Kohala.

Revisions (fiscal years).--WSP 725: 1928-30.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.11	0.48	a2.0	0.26	0.41	4.21	0.51	0.20	0.29	1.11	0.55	0.57
2	.44	1.39	a1.1	.23	.26	2.74	.41	.17	.26	1.63	.51	2.41
3	.28	.48	a1.0	.20	.23	1.66	.50	.14	.26	1.22	.48	.69
4	1.08	4.08	a1.8	.14	.20	1.25	1.40	.14	2.55	2.19	.48	.32
5	1.26	.57	a1.4	.14	.20	1.28	.67	.12	2.14	2.31	.38	.26
6	3.40	.20	a1.4	.12	.20	1.90	.77	.12	1.90	1.66	.35	.23
7	3.79	.73	a1.4	.12	.29	2.56	3.99	.12	.55	3.97	.32	.17
8	1.07	.75	a.5	.12	.47	2.80	3.23	.12	.35	3.28	4.10	.17
9	.35	.67	a.5	.10	.48	1.94	2.36	.12	*.26	2.13	3.64	.14
10	.23	3.13	a.7	.10	.29	1.77	2.72	.12	.20	4.13	2.82	a.4
11	3.30	2.15	a1.8	.10	.26	1.74	1.59	1.55	.23	3.99	3.99	a.4
12	2.52	.86	a1.3	.10	.20	.96	2.16	.47	1.01	3.15	3.16	a.8
13	.57	.51	a3.2	.56	.14	.71	3.97	.38	.38	3.22	1.80	a2.7
14	.32	.41	a3.2	2.57	.14	.80	3.05	.20	.23	3.71	1.06	a1.0
15	3.15	4.91	a1.3	.43	.12	2.36	1.21	.14	.17	3.36	1.72	a1.3
16	1.97	2.47	a1.8	.23	.12	4.50	.83	.26	.14	3.02	1.24	3.37
17	1.27	.98	a1.7	.20	.12	3.34	1.25	2.10	.12	2.82	1.22	1.67
18	2.94	1.45	a1.0	.14	2.40	1.53	3.82	1.94	1.12	2.37	2.52	.96
19	.71	2.53	a3.6	.12	.45	.75	1.12	1.85	1.51	2.25	2.61	.38
20	.51	.91	a2.7	.12	3.10	.41	.71	3.15	4.07	2.76	1.18	.23
21	.38	.55	a1.0	.08	1.91	.57	.55	1.16	1.16	3.22	.67	.27
22	.32	.41	a1.8	.08	1.29	1.31	.44	.79	1.51	3.08	.48	1.71
23	.35	.58	a1.0	.08	1.54	1.72	.38	.59	1.36	2.95	.44	2.76
24	.23	.41	a1.1	.71	*2.64	1.20	.35	.63	3.92	3.25	.38	.87
25	.20	2.14	a5.2	.62	1.60	.96	*.31	.91	2.92	2.43	.35	.63
26	.17	1.09	a2.5	.69	3.85	2.44	.29	1.36	1.50	4.72	.35	.41
27	.37	.44	a3.2	.79	3.34	2.95	.26	.63	1.06	*2.09	.35	.29
28	2.14	a.5	a2.0	.78	2.78	2.79	.26	.41	1.11	1.11	.39	.88
29	1.79	a.4	a1.3	.29	2.38	1.60	.23	.35	1.11	.83	.41	2.61
30	*.68	a.4	a1.3	.14	1.98	.87	.23	-----	2.11	.67	.32	2.13
31	.35	a1.6	-----	1.30	-----	.59	.20	-----	1.45	-----	.29	-----
Total	38.25	37.98	51.8	11.66	32.39	56.21	39.77	20.24	34.95	77.63	38.55	30.73
Mean:												
mgd	1.23	1.22	1.73	0.376	1.08	1.81	1.28	0.698	1.13	2.59	1.24	1.02
cfs	1.91	1.89	2.68	0.582	1.67	2.80	1.98	1.08	1.74	4.00	1.92	1.53
Ac-ft	117	117	159	36.0	99.0	172	122	62.0	107	238	118	94

Calendar year 1959: Max 5.00 Min 0 Mean(mgd) 1.27 Mean(cfs) 1.96 Ac-ft 1,420
 Fiscal year 1959-60: Max 4.91 Min 0.08 Mean(mgd) 1.26 Mean(cfs) 1.98 Ac-ft 1,440

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Awini and Kohala ditches.

7510. Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'20", long 155°44'15" on right bank of open section of ditch in Pololu Valley just downstream from boundary between land of Honokane and land of Pololu, 2.8 miles upstream from mouth of Pololu Stream and 4 miles south of Niulii.

Records available.--August 1927 to June 1960.

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

Average discharge.--31 years (1928-38, 1939-60), 27.2 mgd (42.1 cfs).

Extremes.--1927-60: Maximum daily discharge, 65 mgd (101 cfs) July 16, 1958; no flow at times.

Remarks.--Records good. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,200 ft from Honokane and all streams west. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	40.8	24.2	31.2	24.2	48.6	54.1	18.9	18.9	19.7	29.4	18.1	26.2
2	28.4	31.5	35.0	22.3	40.8	48.6	18.9	18.9	19.7	23.2	17.4	39.6
3	22.3	25.2	26.2	20.6	29.3	36.0	19.7	18.9	20.6	27.7	19.4	31.6
4	31.5	49.4	26.2	19.7	24.2	29.3	25.2	18.1	37.4	38.4	27.2	23.2
5	36.0	51.3	26.2	18.9	22.3	29.3	22.3	18.1	43.3	40.8	25.2	22.3
6	40.8	36.0	25.2	18.9	22.3	36.0	21.8	18.1	40.8	33.7	25.2	24.2
7	43.3	33.7	26.2	18.1	37.7	45.9	51.3	18.1	26.2	43.4	25.2	22.3
8	36.0	27.2	24.2	18.1	33.7	48.6	51.3	18.1	23.2	45.9	44.4	21.4
9	26.2	25.2	22.3	17.4	24.2	40.8	45.9	18.1	21.4	35.7	45.9	21.4
10	23.2	40.8	22.3	17.4	21.4	38.4	48.6	17.4	21.4	51.3	43.3	21.4
11	36.9	40.8	30.1	17.4	20.6	40.8	40.8	43.3	*21.4	51.3	48.6	21.4
12	40.8	31.5	31.5	17.4	19.7	27.2	33.7	53.0	31.4	43.3	45.9	22.7
13	29.3	25.2	36.0	20.0	18.9	25.2	40.8	54.1	23.2	45.9	40.8	39.4
14	22.3	23.2	43.3	40.8	18.9	26.2	38.4	45.9	21.4	51.8	31.5	26.2
15	38.0	48.6	31.5	25.2	18.1	32.8	25.2	38.4	20.6	50.7	33.7	31.9
16	40.8	43.3	29.3	20.6	18.1	51.3	22.3	45.9	20.6	45.9	31.5	45.9
17	29.9	31.5	29.3	21.4	18.9	57.0	23.0	45.9	20.6	45.9	32.0	*58.4
18	43.3	31.5	25.2	20.6	33.0	54.1	43.3	36.0	19.7	43.3	43.3	33.9
19	29.3	38.4	34.0	18.9	24.2	45.9	26.2	34.1	35.3	40.8	45.9	24.2
20	25.2	29.3	38.4	19.7	44.7	45.9	23.2	43.3	48.0	45.9	38.4	22.3
21	23.2	25.2	*26.2	18.9	27.2	48.6	22.3	29.3	36.0	48.6	29.3	23.9
22	20.6	23.2	31.5	18.1	21.4	43.3	22.3	24.2	27.2	45.9	26.2	40.8
23	25.1	21.4	25.2	18.9	26.1	38.4	21.4	22.3	34.2	43.3	26.2	43.3
24	19.7	21.4	29.0	27.2	43.3	29.3	20.6	21.4	54.2	40.3	25.2	35.0
25	18.1	35.0	40.8	27.2	34	25.2	20.6	22.3	43.3	43.3	24.2	31.5
26	17.4	31.5	33.7	27.2	*45	33.0	20.6	26.2	33.7	45.9	25.2	27.2
27	20.6	24.2	43.3	24.2	48.6	40.8	*20.6	22.3	27.2	37.2	25.2	25.2
28	26.5	22.3	33.7	27.2	45.9	40.8	20.6	20.6	27.2	40.8	27.2	30.2
29	36.0	21.4	27.2	24.2	43.3	35.0	19.7	20.6	29.3	*27.2	27.2	43.3
30	27.2	20.6	27.2	20.6	36.0	24.2	19.7	-----	40.2	21.4	26.2	40.8
31	*22.6	26.2	-----	26.7	-----	21.4	18.9	-----	38.1	-----	24.2	-----
Total	921.3	960.2	911.4	678.0	910.4	1,193.4	868.1	841.8	926.5	1,228.2	969.2	901.1
Mean	29.7	31.0	30.4	21.9	30.3	38.5	28.0	29.0	29.9	40.9	31.3	30.0
cfs	46.0	48.0	47.0	33.9	46.9	59.6	43.3	44.9	46.3	63.3	48.4	46.4
Ac-ft	2,830	2,950	2,800	2,080	2,790	3,660	2,660	2,580	2,840	3,770	2,970	2,770

Calendar year 1959: Max 60.0 Min 17.4 Mean(mgd) 31.6 Mean(cfs) 48.9 Ac-ft 35,410
 Fiscal year 1959-60: Max 63.0 Min 17.4 Mean(mgd) 30.9 Mean(cfs) 47.8 Ac-ft 34,700

* Discharge measurement made on this day.

7550. Kehena ditch near Kohala

Location.--Lat 20°07'25", long 155°45'05", on right bank at old Honokane weir, near head of West Branch of Honokane Nui Stream, 8.5 miles southeast of Kohala.

Records available.--December 1917 to November 1919, April 1928 to June 1960.

Gage.--Water-stage recorder and artificial control. Altitude of gage is 3,850 ft (from topographic map). Prior to Apr. 26, 1928, water-stage recorder at same site at different datum.

Average discharge.--33 years (1918-19, 1928-60), 7.73 mgd (12.0 cfs).

Extremes.--1917-19, 1928-60: Maximum daily discharge, 54 mgd (84 cfs) Mar. 23, 1919; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Intake on Honokane Nui Stream 2 miles upstream from station at altitude of about 4,200 ft. Kahua Ranch diverts small quantity of water from ditch 2 miles above station for watering stock. Water used for irrigation in vicinity of Hawi.

Revisions (fiscal years).--WSP 740: 1930.

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.1	2.72	8.11	1.15	24.0	45.8	0.20	0.33	0.84	5.38	1.68	3.0
2	3.75	7.78	7.45	.70	9.97	23.4	.20	.23	.70	3.20	1.87	12
3	1.87	3.83	2.50	.56	4.22	8.48	.50	.23	.70	2.95	2.06	1.2
4	7.49	38.0	2.50	.23	2.06	3.68	2.0	.23	15.7	5.55	3.45	.90
5	12.0	30.4	3.20	.14	1.50	19.8	1.5	.14	9.22	9.22	2.28	.90
6	17.4	6.57	1.87	.08	1.50	11.0	1.0	.14	8.20	5.00	1.50	.90
7	17.1	3.68	1.32	.04	8.84	21.4	30	.14	3.68	16.4	1.15	.70
8	7.30	2.28	1.68	0	5.75	29.6	21	.14	2.50	16.3	17.5	.70
9	2.50	2.50	1.32	0	1.87	11.8	12	.14	1.68	8.74	15.9	.70
10	1.50	15.2	1.50	0	.84	9.97	20	.14	1.15	32.2	15.8	1.0
11	8.76	11.8	4.59	0	.56	11.2	3.0	27.7	.70	26.9	9.39	1.0
12	7.87	5.80	4.61	0	.23	4.72	10	46.4	*.70	13.0	9.0	1.5
13	2.87	2.72	6.89	0	.14	3.68	15	35.7	.44	20.9	4.5	11
14	1.50	1.68	11.8	.14	3.63	7.0	23.0	.33	34.9	2.5	4.5	
15	25.9	32.4	4.72	1.91	.04	15.3	2.7	5.26	.23	31.8	6.0	7.0
16	10.5	12.4	3.12	.70	0	44.6	1.5	17.4	.14	8.79	5.0	18
17	6.35	6.24	2.72	.23	0	49.4	2.0	15.8	.33	8.03	4.0	12
18	15.2	5.59	2.06	.14	4.26	38.8	15	2.95	.33	4.72	13	*8.0
19	4.57	4.45	*7.44	.08	2.49	26.4	3.0	12.6	.70	3.68	15	2.72
20	3.20	2.06	9.86	0	14.2	27.7	1.7	11.3	10.6	8.20	8.0	1.50
21	2.50	.84	2.50	0	5.12	30	1.1	2.72	6.28	5.92	4.5	3.01
22	7.65	.56	3.20	0	*2.28	10	1.0	1.50	3.20	3.95	3.0	11.4
23	8.33	.44	1.50	0	3.28	4.0	.90	.70	8.90	3.18	3.0	13.4
24	1.50	.23	4.71	1.48	17.8	2.5	.84	.70	13.4	3.17	2.5	7.22
25	.70	9.26	9.94	2.83	12.6	1.5	.70	.70	2.91	.23	1.5	5.59
26	.56	5.51	6.33	3.00	39.8	2.5	.70	.84	0	.23	1.5	4.20
27	*.56	2.50	11.8	1.79	29.6	5.0	.56	.70	0	0	1.5	3.76
28	1.65	1.68	4.68	4.05	25.3	10	.56	.44	1.67	0	3.0	14.0
29	6.40	1.32	2.28	1.50	12.2	6.0	.56	.56	4.72	2.1	3.5	15.6
30	3.20	1.50	2.06	.70	14.0	1.5	.44	-----	14.9	*1.8	2.8	12.6
31	1.68	5.66	-----	8.87	-----	.80	.33	-----	8.00	-----	2.0	-----
Total	203.46	227.60	138.26	37.69	244.59	484.16	156.99	208.83	122.85	286.44	168.38	180.00
Mean:												
mgd	6.56	7.34	4.61	1.22	8.15	15.6	5.06	7.20	3.96	9.55	5.43	6.00
cfs	10.1	11.4	7.13	1.89	12.6	24.1	7.83	11.1	6.13	14.8	8.40	9.28
Ac-ft	624	698	424	116	751	1,490	482	641	377	879	517	552

Calendar year 1959: Max 49.4 Min 0 Mean(mgd) 7.33 Mean(cfs) 11.3 Ac-ft 8,220
 Fiscal year 1959-60: Max 49.4 Min 0 Mean(mgd) 6.72 Mean(cfs) 10.4 Ac-ft 7,550

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 21 to Jan. 23, Apr. 27-30, May 12 to June 18; discharge estimated on basis of records for nearby stations.

7560. Kohakohau Stream near Kamuela

Location.--Lat 20°03'02", long 155°40'58", 0.2 mile below Kohala Forest Reserve Boundary and 2 miles northwest of Kamuela.

Drainage area.--2.34 sq mi.

Records available.--March 1956 to June 1960.

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

Extremes.--Maximum discharge during year, 1,270 mgd (1,960 cfs) Apr. 15 (gage height, 8.33 ft), from rating curve extended above 20 mgd by test on model of station site; minimum, 0.31 mgd (0.48 cfs) Feb. 10, 11.
1956-60: Maximum discharge, 2,510 mgd (3,880 cfs) Aug. 7, 1958 (gage height, 10.76 ft), from rating curve extended above 20 mgd by test on model of station site; minimum, 0.28 mgd (0.43 cfs) June 10, 11, 1957.

Remarks.--Records good except those above 20 mgd, which are fair. Parker Ranch pipeline diverts water above station.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.5	0.27	1.4	23.0
.6	.54	1.6	36.0
.7	1.14	2.0	66.0
.8	2.50	5.0	143
.9	4.50	4.0	232
1.0	7.20	5.0	345
1.2	13.8		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.06	0.84	9.54	1.06	12.2	60.8	0.98	0.38	0.54	3.02	0.62	1.24
2	1.71	.98	5.29	.91	3.43	25.5	.84	.38	.50	1.46	1.40	2.97
3	1.81	.99	1.58	.78	7.04	4.18	1.03	.35	.50	1.14	1.24	2.60
4	2.67	70.2	1.46	.67	2.44	1.86	2.50	.35	1.23	2.42	*1.46	1.14
5	4.57	37.2	1.86	.62	1.14	1.84	2.17	.35	2.38	6.04	.84	.98
6	6.63	23.5	1.24	.58	.91	5.03	1.97	.33	3.71	4.75	.62	1.14
7	7.74	5.27	15.0	.54	11.2	16.8	40.8	.33	1.35	16.8	.54	.84
8	2.52	2.17	4.85	.50	5.22	24.5	46.6	.33	.84	16.1	23.3	.72
9	1.24	1.86	1.86	.46	1.98	6.29	22.4	.33	.62	5.33	13.3	.67
10	1.14	14.9	1.99	.43	.98	3.66	18.3	.31	.54	45.0	6.75	1.06
11	11.1	11.8	4.32	.43	.84	4.90	8.32	44.1	.46	37.8	27.5	.72
12	7.67	2.79	3.70	.43	.67	1.86	3.73	359	.46	12.7	29.5	1.67
13	2.07	1.35	7.55	.53	.62	1.24	15.1	226	.43	15.8	8.92	8.41
14	1.46	1.11	18.6	4.71	.58	.98	5.23	28.0	*.38	36.8	5.00	2.17
15	19.1	54.5	*3.07	1.06	.46	6.24	2.01	8.65	.35	101	4.50	8.10
16	5.34	11.8	2.81	.72	.46	81.1	1.35	23.1	.35	17.9	3.40	21.3
17	3.65	5.43	1.71	.67	*.64	149	2.07	33.3	.33	13.0	3.70	8.61
18	11.5	21.3	1.14	.58	3.04	125	18.8	4.71	.33	9.23	9.64	5.73
19	2.17	8.90	8.39	.50	2.39	38.1	*2.78	2.93	.43	7.57	16.3	2.01
20	1.58	2.97	6.09	.46	12.5	51.4	1.58	3.98	5.30	10.7	4.25	*1.06
21	1.24	1.46	1.95	.43	2.07	53.6	1.06	1.86	3.40	17.3	2.01	3.72
22	*.72	.98	2.13	.40	.98	31.5	.84	1.14	1.35	22.9	1.58	10.8
23	.62	.78	1.14	.46	1.06	14.0	.72	.84	2.72	12.1	2.01	11.5
24	.50	.72	10.4	1.05	6.46	5.00	.67	.78	37.6	19.8	1.24	4.50
25	.46	5.63	10.7	1.23	3.89	3.98	.58	.84	19.5	11.9	1.06	3.40
26	.46	2.28	9.01	1.24	50.6	8.86	.50	1.58	3.56	20.1	1.35	2.17
27	.62	1.06	20.0	.72	35.5	8.60	.46	1.06	1.46	6.40	2.01	1.46
28	2.12	.84	5.63	.72	36.0	17.5	.45	.72	4.50	2.17	3.60	5.28
29	2.20	.72	2.17	.62	6.61	7.37	.40	.62	5.25	1.06	2.84	10.1
30	1.24	.72	1.58	.50	13.3	2.33	.40	-----	64.4	.78	1.86	8.13
31	.84	1.88	-----	2.82	-----	1.46	.40	-----	8.31	-----	1.58	-----
Total	114.75	296.93	166.76	26.83	225.11	766.68	205.02	746.65	173.08	479.07	183.92	134.20
Means												
mgd	3.70	9.58	5.56	0.865	7.50	24.7	6.61	25.7	5.58	16.0	5.93	4.47
cfs	5.73	14.8	8.60	1.34	11.6	38.3	10.2	39.8	8.64	24.7	9.18	6.92
Ac-ft	352	911	512	82.0	691	2,350	629	2,290	531	1,470	564	412

Calendar year 1959: Max 466 Min 0.33 Mean(mgd) 9.67 Mean(cfs) 15.0 Ac-ft 10,830
Fiscal year 1959-60: Max 359 Min 0.31 Mean(mgd) 9.61 Mean(cfs) 14.9 Ac-ft 10,800

Peak discharge (base, 200 mgd).--Aug. 6 (5 p.m.) 268 mgd (412 cfs), 4.34 ft; Sept. 7 (6 p.m.) 208 mgd (322 cfs), 3.75 ft; Dec. 18 (1 a.m.) 827 mgd (1,280 cfs), 7.09 ft; Feb. 12 (4:30 p.m.) 1,160 mgd (1,790 cfs), 8.03 ft; Mar. 30 (4:30 p.m.) 985 mgd (1,520 cfs), 7.58 ft; Apr. 15 (5 p.m.) 1,270 mgd (1,960 cfs), 8.33 ft.

* Discharge measurement made on this day.

7570. Waikoloa Stream near Kamuela

Location--Lat 20°03'17", long 155°40'02", on left bank 350 ft downstream from Parker Ranch boundary and 2.1 miles north of Kamuela.

Drainage area--0.78 sq mi.

Records available--May 1947 to June 1960.

Gage--Water-stage recorder and concrete control. Altitude of gage is 3,580 ft (from topographic map).

Average discharge--13 years, 5.09 mgd (7.88 cfs).

Extremes--Maximum discharge during year, 362 mgd (560 cfs) Dec. 17 (gage height, 4.77 ft), from rating curve extended above 19 mgd by logarithmic plotting; minimum, 1.24 mgd (1.92 cfs) on many days.

1947-60: Maximum discharge, 860 mgd (1,330 cfs) Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 19 mgd by logarithmic plotting; minimum, 0.79 mgd (1.22 cfs) June 9, 1957.

Remarks--Records good.

Revisions (fiscal years)--WSP 1155: 1948(M). WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.2	0.58	2.0	13.2
1.3	1.24	2.3	24.0
1.4	2.13	2.6	40.0
1.5	3.25	3.0	70.0
1.7	6.10	3.5	125

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.62	1.85	8.88	2.13	8.38	25.6	2.24	1.32	1.75	3.25	2.57	2.24
2	2.35	2.04	4.24	1.94	3.70	11.3	2.04	1.24	1.56	2.35	4.25	2.68
3	2.75	2.92	2.46	1.75	3.24	3.85	2.44	1.24	1.56	2.90	3.78	2.35
4	3.22	26.4	2.57	1.65	2.46	2.68	3.85	1.24	1.85	6.98	3.51	2.46
5	2.79	15.0	2.79	1.65	2.04	2.86	2.90	1.24	2.89	8.10	2.68	2.46
6	3.02	19.9	2.24	1.56	2.13	4.35	3.64	1.24	3.49	6.61	2.35	2.46
7	3.51	4.61	5.25	1.48	8.01	7.51	13.9	1.24	2.04	16.4	2.68	1.94
8	2.24	2.79	3.96	1.48	4.92	7.89	15.1	1.32	*1.65	10.1	13.8	1.85
9	1.85	2.57	2.80	1.48	2.57	4.90	7.95	1.24	1.48	7.54	8.40	1.75
10	2.18	6.61	3.14	1.48	1.94	3.95	5.95	1.24	1.40	22.8	9.16	2.57
11	8.76	5.90	4.10	1.48	2.13	3.60	4.18	32.0	1.56	18.5	19.6	2.04
12	6.48	2.90	4.35	1.48	1.85	2.35	3.13	123	1.48	10.0	15.3	2.49
13	2.46	2.24	8.63	1.80	1.65	2.13	6.65	74.7	1.40	7.17	7.51	5.77
14	1.85	2.26	10.9	2.46	1.65	1.94	3.74	10.8	1.40	15.9	5.36	*2.55
15	5.59	21.1	3.33	2.13	1.48	3.59	2.46	5.84	1.40	21.8	4.32	5.42
16	3.53	6.57	3.14	1.85	1.48	2.83	2.04	11.6	1.32	12.3	3.90	8.61
17	3.66	6.82	2.46	1.94	2.01	72.3	3.10	14.0	1.24	7.90	4.04	6.51
18	5.15	16.9	*2.24	1.75	4.46	57.9	6.53	4.04	1.24	6.61	5.33	4.66
19	2.35	6.72	5.55	1.65	3.51	17.0	3.22	3.82	1.75	6.13	5.93	2.46
20	2.46	3.85	4.17	1.56	6.79	18.4	2.24	4.83	9.08	6.27	3.13	1.94
21	2.24	2.46	2.48	1.56	*2.33	18.6	2.04	2.90	4.93	11.3	2.57	4.76
22	1.85	2.04	2.77	1.48	1.94	11.1	*1.80	2.35	2.46	12.2	2.35	6.96
23	1.65	1.85	2.04	1.75	3.19	6.37	1.65	2.04	4.18	6.99	2.57	5.63
24	1.56	1.94	5.89	3.09	7.56	4.74	1.56	2.04	24.3	8.80	2.24	4.32
25	1.48	3.91	6.40	3.19	5.71	4.32	1.56	2.58	12.7	9.07	2.13	3.51
26	*1.40	2.68	8.20	2.72	25.8	7.00	1.48	4.18	3.40	*16.3	2.68	2.68
27	1.65	2.04	12.0	1.94	14.9	6.42	1.40	2.57	2.46	7.32	3.02	2.13
28	4.58	1.94	5.46	1.94	14.6	10.9	1.40	2.04	5.65	4.04	3.77	2.47
29	3.71	1.75	2.90	1.75	4.11	5.16	1.40	1.85	6.14	3.13	3.02	4.32
30	2.46	1.75	2.57	1.65	10.7	3.02	1.32	-----	23.4	2.79	2.46	4.18
31	1.94	2.60	-----	2.92	-----	2.57	1.32	-----	5.29	-----	2.35	-----
Total	96.34	184.91	138.89	61.63	157.24	337.53	114.23	319.74	136.45	281.55	157.36	106.17
Mean												
mgd	3.11	5.96	4.63	1.99	5.24	10.9	3.68	11.0	4.40	9.38	5.08	3.54
cfs	4.81	9.22	7.16	3.08	8.11	16.9	5.69	17.0	6.81	14.5	7.86	5.48
Ac-ft	296	567	426	189	483	704	350	981	419	864	483	326
Calendar year 1959: Max	103			Min	1.32	Mean(mgd)	5.31	Mean(cfs)	8.22	Ac-ft	5,610	
Fiscal year 1959-60: Max	123			Min	1.24	Mean(mgd)	5.72	Mean(cfs)	8.85	Ac-ft	6,090	

Peak discharge (base, 100 mgd)--Aug. 6 (5:30 p.m.) 248 mgd (384 cfs), 4.24 ft; Aug. 18 (5 p.m.) 114 mgd (176 cfs), 3.43 ft; Dec. 17 (2:30 a.m.) 362 mgd (560 cfs), 4.77 ft; Feb. 13 (9 a.m.) 314 mgd (486 cfs), 4.57 ft; Mar. 30 (5:30 p.m.) 232 mgd (359 cfs), 4.18 ft.

* Discharge measurement made on this day.

7580. Waikoloa Stream at Marine Dam, near Kamuela

Location.--Lat 20°02'48", long 155°39'58", on right bank 160 ft upstream from Marine Dam and 1.5 miles north of Kamuela.

Drainage area.--1.18 sq mi.

Records available.--May 1947 to June 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,450 ft (from topographic map).

Average discharge.--13 years, 6.47 mgd (10.0 cfs).

Extremes.--Maximum discharge during year, 375 mgd (580 cfs) Dec. 17 (gage height, 4.72 ft), from rating curve extended above 14 mgd by logarithmic plotting; minimum, 1.22 mgd (1.89 cfs) Mar. 18.
1947-60: Maximum discharge, 1,180 mgd (1,830 cfs) Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 14 mgd by logarithmic plotting; minimum, 0.65 mgd (1.01 cfs) Dec. 1, 1954.

Remarks.--Records good except those for period of no gage-height record, which are poor. Diversion above station for stock and domestic use.

Revisions.--WSP 1569: Drainage area.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

1.5	1.15	2.2	14.5
1.6	2.00	2.4	24.0
1.7	3.05	2.6	36.5
1.8	4.50	3.0	71.0
1.9	6.40	3.5	129
2.0	8.60	4.0	209

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.71	2.00	11.2	2.30	11.6	44.8	2.50	1.50	1.66	3.57	2.61	a2.2
2	2.52	2.10	5.08	2.10	4.36	16.9	2.30	1.50	1.58	2.72	4.83	a3.0
3	2.56	2.25	2.40	1.74	3.84	4.81	2.77	1.50	1.66	3.31	4.19	a2.4
4	3.35	39.3	2.61	1.66	2.79	3.18	4.99	1.43	1.92	8.71	3.57	a2.6
5	2.85	22.2	2.83	1.58	2.10	3.38	3.44	1.43	3.11	11.3	2.83	a2.6
6	3.05	23.9	2.30	1.58	2.20	5.24	4.13	1.43	3.96	8.86	2.40	a2.6
7	3.86	5.89	5.68	1.50	10.0	10.6	20.8	1.43	2.30	25.2	2.20	a2.2
8	2.61	2.83	4.18	1.43	6.02	11.7	25.2	1.43	*1.74	14.7	19.1	a1.8
9	2.10	2.61	2.96	1.43	3.03	6.61	12.8	1.43	1.58	11.5	11.7	a1.7
10	2.30	7.66	3.17	1.36	2.20	5.05	8.60	1.43	1.50	37.4	12.7	a2.8
11	11.8	6.81	4.61	1.36	2.30	4.55	5.60	41.6	1.66	30.4	31.8	a2.2
12	8.75	2.83	4.77	1.36	2.00	2.94	3.70	139	1.58	15.3	24.5	a2.6
13	2.81	2.20	10.9	1.66	1.74	2.61	9.61	89.2	1.43	9.94	11.8	a6.5
14	2.10	2.48	16.1	6.22	1.66	2.40	5.02	15.2	1.36	24.3	7.03	*2.50
15	6.98	32.2	3.57	2.30	1.50	4.04	2.94	7.37	1.36	30.5	5.22	6.56
16	4.07	8.24	3.14	1.82	1.43	40.1	2.40	16.6	1.36	18.8	a4.6	11.6
17	4.58	8.44	2.50	2.00	2.04	89.7	3.58	22.1	1.29	10.9	a4.8	8.35
18	6.98	23.6	*2.30	1.74	4.95	72.0	9.39	5.07	1.29	9.12	a6.5	5.60
19	2.72	8.99	6.74	1.58	4.19	27.8	3.68	4.40	1.82	8.16	a10.0	2.61
20	2.72	4.24	4.83	1.50	9.09	31.6	2.72	5.61	14.9	7.94	a2.8	2.20
21	2.61	2.61	2.53	1.36	*2.72	30.2	2.40	3.31	5.99	43.7	a2.6	5.78
22	2.00	2.10	2.89	1.36	2.40	17.9	*2.10	2.61	2.72	16.4	a2.4	9.25
23	1.74	1.74	2.20	1.58	3.41	8.99	2.10	2.20	8.57	9.39	a2.8	7.32
24	1.58	1.80	7.40	2.88	12.0	6.02	2.00	2.20	37.9	12.3	a2.2	4.79
25	1.43	3.89	8.02	3.02	7.21	5.63	1.82	2.59	18.1	13.1	a2.0	3.70
26	*1.50	2.72	11.3	3.13	40.1	9.14	1.66	4.62	3.96	24.0	a2.8	2.83
27	1.74	2.10	17.9	2.10	28.1	8.90	1.66	2.83	2.83	9.88	a3.2	2.30
28	5.22	1.74	6.81	2.00	22.8	17.3	1.66	2.20	6.75	4.50	a4.2	2.52
29	4.20	1.66	3.05	1.74	5.50	7.69	1.58	1.82	7.72	3.44	a3.4	4.68
30	2.61	1.58	2.83	1.58	14.0	3.57	1.58	-----	27.0	2.94	a2.6	4.86
31	2.00	2.31	-----	3.33	-----	2.94	1.58	-----	6.69	-----	a2.4	-----
Total	112.03	234.82	166.80	62.30	217.28	508.29	156.31	385.24	177.19	432.28	205.78	122.65
Mean:												
mgd	3.61	7.57	5.56	2.01	7.24	16.4	5.04	13.3	5.72	14.4	6.64	4.09
cfs	5.59	11.7	8.60	3.11	11.2	25.4	7.80	20.6	8.84	22.3	10.3	6.33
Ac-ft	344	721	512	191	667	1,560	480	1,180	544	1,330	632	376

Calendar year 1959: Max 119 Min 1.29 Mean(mgd) 7.05 Mean(cfs) 10.9 Ac-ft 7,900
Fiscal year 1959-60: Max 139 Min 1.29 Mean(mgd) 7.60 Mean(cfs) 11.8 Ac-ft 8,540

Peak discharge (base, 100 mgd).--Aug. 6 (5 p.m.) 226 mgd (350 cfs), 4.09 ft; Aug. 18 (4 p.m.) 122 mgd (189 cfs), 3.45 ft; Nov. 26 (10 p.m.) 108 mgd (164 cfs), 3.32 ft; Dec. 17 (3 a.m.) 375 mgd (580 cfs), 4.72 ft; Feb. 13 (9:30 a.m.) 280 mgd (433 cfs), 4.34 ft; Mar. 30 (4 p.m.) 195 mgd (302 cfs), 3.92 ft; May 12 (4:30 p.m.) 117 mgd (181 cfs), 3.41 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Waikoloa Stream.

7590. Hauani Stream near Kamuela

Location.--Lat 20°02'28", long 155°39'05" on left bank 1,350 below Hawaii County pipeline intake and 1.8 miles northeast of Kamuela.

Drainage area.--0.47 sq mi.

Records available.--March 1956 to June 1960.

Gage.--Water-stage recorder. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark).

Extremes.--Maximum discharge during year, 222 mgd (343 cfs) Feb. 12 (gage height, 3.49 ft), from rating curve extended above 23 mgd by logarithmic plotting; minimum, 0.02 mgd (0.02 mgd (0.03 cfs) Oct. 21, 22, 1956-60: Maximum discharge, 325 mgd (503 cfs) Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 23 mgd by slope-conveyance study; minimum, 0.01 mgd (0.02 cfs) Apr. 3, 4, June 9, 10, 1957.

Remarks.--Records good.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.7	0	1.8	15.3
.8	.12	2.0	25.0
1.0	.74	2.2	37.0
1.2	1.86	2.4	52.0
1.4	4.04	2.6	74.0
1.6	8.40		

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.83	0.14	2.52	0.26	1.88	16.0	0.29	0.16	0.16	0.47	*0.38	0.29
2	.23	.21	.62	.21	.55	4.13	.26	.14	.14	.35	.53	.41
3	.31	.21	.29	.18	.86	.74	.42	.12	.18	.41	.44	.32
4	.35	*17.7	.29	.16	.36	.50	.71	.10	.21	1.14	.41	.26
5	.35	4.71	.29	.14	.23	.50	.35	.10	.35	1.79	.35	.26
6	.35	*2.40	.21	.10	.18	.60	.26	.10	.38	1.27	.29	.26
7	.50	.69	.30	.12	1.32	1.57	3.32	.10	.21	4.41	.26	.21
8	.26	.44	.35	.10	.59	1.66	4.85	.10	.18	2.92	3.46	.21
9	.18	.35	.29	.10	.32	4.54	1.70	.08	.16	2.05	1.59	.21
10	.16	1.06	.29	.08	.21	.54	.82	.08	.14	12.7	2.85	.29
11	1.58	.66	.63	.06	.21	.50	.47	9.30	.14	8.63	6.99	.21
12	1.16	.38	.49	.08	.16	.58	.35	65.6	.14	3.64	9.86	.26
13	.32	.32	1.33	.12	.14	.32	1.03	31.5	.12	1.95	5.64	.66
14	.21	.32	3.04	.44	.12	.29	.56	2.63	*.10	3.86	1.23	.26
15	.70	9.37	*.47	.16	.08	.95	.32	1.14	.10	6.64	.82	1.61
16	.39	1.49	.38	.10	.08	12.8	.26	4.02	.10	3.08	.62	1.50
17	1.26	.91	.29	.14	*.13	33.1	.45	5.08	.10	1.92	.60	1.08
18	1.00	9.03	.26	.12	.47	22.7	2.22	.74	.12	1.50	.86	.64
19	.35	1.61	.86	.08	.58	9.18	*.40	.58	.21	1.33	1.14	.35
20	.35	.58	.54	.06	1.18	7.56	.32	.86	1.68	1.01	.47	*.26
21	.29	.41	.27	.03	.23	8.22	.29	.44	.62	2.02	.38	1.20
22	*.17	.32	.32	.03	.21	3.34	.23	.35	.32	2.60	.35	1.21
23	.14	.29	.21	.08	.78	1.26	.21	.32	1.37	1.50	.35	.86
24	.12	.29	.66	.27	4.21	.78	.21	.32	9.92	1.46	.32	.50
25	.10	.44	.94	.32	3.88	.66	.18	.41	3.12	2.12	.29	.41
26	.10	.29	1.71	.28	12.5	.84	.18	.58	.60	4.94	.32	.35
27	.14	.23	3.18	.10	8.23	.98	.16	.35	.44	1.50	.35	.29
28	.90	.21	.90	.10	4.91	3.55	.16	.32	.74	.66	.41	.29
29	.45	.18	.41	.08	.86	1.04	.14	.23	.82	.50	.35	.47
30	.26	.18	.32	.04	5.86	.47	.14	-----	4.46	.41	.29	.50
31	.18	.21	-----	.32	-----	.35	.14	-----	1.08	-----	.29	-----
Total	13.69	54.83	22.66	4.46	51.32	140.15	21.40	125.85	28.41	78.58	40.49	15.83
Mean:												
mgd	0.442	1.77	0.755	0.144	1.71	4.52	0.690	4.34	0.916	2.62	1.31	0.528
cfs	0.684	2.74	1.17	0.223	2.65	6.99	1.07	6.71	1.42	4.05	2.03	0.817
Ac-ft	42	168	70	14	157	430	66	386	87	241	124	49

Calendar year 1959; Max 33.1 Min 0.03 Mean(mgd) 1.47 Mean(cfs) 2.27 Ac-ft 1,640
Fiscal year 1959-60; Max 65.6 Min 0.03 Mean(mgd) 1.63 Mean(cfs) 2.52 Ac-ft 1,830

Peak discharge (base, 50 mgd).--Aug. 18 (7:30 p.m.) 127 mgd (196 cfs), 3.00 ft; Nov. 26 (10 p.m.) 84.8 mgd (131 cfs), 2.67 ft; Dec. 17 (1:30 a.m.) 178 mgd (275 cfs), 3.29 ft; Feb. 12 (4 p.m.) 222 mgd (343 cfs), 3.49 ft; May 12 (2:30 p.m.) 170 mgd (263 cfs), 3.25 ft.

* Discharge measurement made on this day.

7595. Waiaha Stream near Holualoa

Location.--Lat 19°38'20", long 155°56'35", on left bank half a mile upstream from Board of Water Supply office, 1.2 miles north of Holualoa Post Office, and 3.5 miles east of Kailua, Kona.

Drainage area.--About 7.3 sq mi.

Records available.--December 1957 to June 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,940 ft (from topographic map).

Extremes.--Maximum discharge during fiscal year, 61.4 mgd (95.0 cfs) May 12 (gage height, 2.13 ft), from rating curve extended above 8.3 mgd by logarithmic plotting; no flow for many days.

1957-60: Maximum discharge, 558 mgd (863 cfs) Jan. 18 (gage height, 4.76 ft), from rating curve extended above 8.3 mgd by logarithmic plotting; no flow for many days.

Remarks.--Records good. Kona Inn has an offstream reservoir about 1 mile upstream from gage and diverts water from the stream.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.23	0	0.5	0.54
.24	.01	.7	2.18
.30	.02	.9	5.20
.40	.15	1.2	12.0

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0.04	0.01	0.06	0.12				0	0.12	0	0.05
2	.01	.02	.01	.01	2.32				0	.02	0	.03
3	.01	.01	.20	.01	.02				0	.01	0	.02
4	.02	.01	.31	.01	.02				0	.01	0	.01
5	.04	.01	.07	0	.01				0	.01	0	.10
6	.04	.01	.02	0	.01				0	.01	0	.55
7	.04	.01	.01	.01	.01				0	.01	0	.04
8	.04	.01	.01	.06	0				0	.02	0	.04
9	.03	.01	.01	.04	.31				0	.01	0	.04
10	.01	.01	.01	.01	.04				0	.01	0	.01
11	.01	.01	0	.01	.01				0	.01	.11	.01
12	.01	.01	0	.01	.01				0	.01	6.52	.01
13	.01	.02	0	.01	0				0	.01	.45	0
14	.02	.02	0	.01	0				0	.01	.04	0
15	.02	.02	0	0	0				0	.41	.01	0
16	.02	.02	0	0	0				0	.08	.01	0
17	.02	.02	0	0	0				0	.02	.01	0
18	.03	.01	0	0	0				0	.39	0	1.62
19	.02	.01	0	0	0				0	.85	.01	.29
20	.01	.01	0	0	0				0	.14	.01	.01
21	.01	.01	0	0	0				0	.02	.01	0
22	.33	.01	0	0	0				0	.01	.01	0
23	.11	.01	0	0	0				0	.01	.01	.18
24	.04	.01	0	0	0				0	.01	2.42	.26
25	.01	1.03	0	0	0				0	.01	.60	.01
26	.04	1.16	0	0	0				0	0	.02	.01
27	.21	1.67	0	0	0				0	0	.01	.01
28	.46	3.23	0	0	0				0	0	.01	.01
29	.25	.21	0	0	0				0	0	.01	0
30	.14	3.53	.26	0	0				0	0	.01	0
31	.27	.65	0	0	0				.41	0	.01	0
Total	2.29	11.81	0.92	0.25	2.88	0	0	0	0.41	2.22	10.29	3.31
Mean:												
mgd	0.074	0.381	0.031	0.008	0.096	0	0	0	0.013	0.074	0.332	0.110
cfs	0.114	0.589	0.048	0.012	0.149	0	0	0	0.020	0.114	0.514	0.170
Ac-ft	7.0	36	2.8	0.8	8.8	0	0	0	1.3	6.8	32	10

Calendar year 1959: Max 156 Min 0 Mean(mgd) 0.583 Mean(cfs) 0.902 Ac-ft 653

Fiscal year 1959-60: Max 6.52 Min 0 Mean(mgd) 0.094 Mean(cfs) 0.145 Ac-ft 106

Peak discharge (base, 100 mgd).--No peak above base.

7598. Kililae Stream near Honaunau

Location.--Lat 19°24'52", long 155°50'56", on right bank 2.3 miles east of Belt Road and 3.2 miles southeast of Honaunau cemetery.

Records available.--April 1958 to June 1960.

Gage.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

Extremes.--Maximum discharge during year, 54.9 mgd (84.9 cfs) Nov. 8 (gage height, 2.23 ft), from rating curve extended above 4 mgd by logarithmic plotting; no flow for many days.
1958-60: Maximum discharge, 67 mgd (104 cfs) Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 4 mgd by logarithmic plotting; no flow for many days.

Remarks.--Records good.

Rating table, fiscal year 1959-60 (gage height, in feet, and discharge, in million gallons a day)

0.5	0	0.9	0.40
.6	.03	1.0	.79
.7	.08	1.1	1.40
.8	.18	1.2	2.30

Discharge, in million gallons a day, fiscal year July 1959 to June 1960

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.43	0.12	0.08	1.11	0.70	0	0	0	0.03	0.13	0.08	0.38
2	.23	.22	.06	.10	.52	0	0	0	.03	.02	.03	.20
3	.29	.17	.08	.04	.57	0	0	0	.09	0	.01	.07
4	.32	.04	.10	.02	.17	0	0	0	.25	0	.13	.02
5	.11	.02	.51	.01	.12	0	0	0	.41	.03	.04	.08
6	.40	.02	.08	0	.10	0	0	0	.11	.14	.01	.12
7	.44	1.20	.03	.03	.02	0	0	0	.02	.27	.02	.09
8	.26	.60	.02	.32	2.30	0	0	0	.01	.05	0	.17
9	.35	.22	.04	.09	.10	0	.08	0	0	0	0	.08
10	.25	.07	.03	.02	.06	0	.21	.04	0	.07	.06	.03
11	.21	.31	.59	0	.02	0	.16	.08	0	.01	1.16	.02
12	.10	.32	.10	0	.01	0	.06	.10	.01	.03	1.63	.02
13	.02	.13	.08	0	.04	0	.01	.03	0	.03	1.05	*.02
14	.01	.15	*.09	0	.04	0	0	.02	0	0	.42	.02
15	0	.03	.15	.01	.01	0	.12	0	0	.40	.07	.03
16	.02	.13	.05	.02	*0	0	.04	.12	0	.18	.07	.15
17	.16	.43	.03	0	0	.02	.01	.05	.02	.18	.04	.04
18	.21	.06	.07	0	0	.01	0	.02	.01	.29	.03	.04
19	.03	.02	.03	0	0	0	0	.83	.01	.23	.10	.04
20	.04	.01	.03	0	0	0	0	.08	0	.06	.04	.02
21	*.01	.01	.02	0	0	0	0	.02	.05	.08	.05	.02
22	.09	.01	0	.02	0	0	0	0	.05	.50	.09	.02
23	.04	.03	0	.01	0	0	0	0	.01	.21	.05	.03
24	.03	.16	0	.02	0	0	0	0	0	.08	.06	.02
25	.83	.14	0	.02	0	0	0	0	.01	.03	.24	.02
26	.49	.12	0	0	0	0	0	0	0	.02	.40	.04
27	.86	.98	0	0	0	0	0	0	0	.03	.20	.03
28	.13	.60	0	0	0	0	0	0	0	.33	.08	.02
29	.72	1.39	0	0	0	0	0	0	0	.14	.08	.03
30	.26	.38	.28	0	0	0	0	0	0	.10	.06	.27
31	.27	.10	-----	.37	-----	0	0	-----	.58	-----	.23	-----
Total	7.61	8.19	2.55	2.21	4.78	0.03	0.69	1.39	1.70	3.64	6.53	2.14
Mean:												
mgd	0.245	0.264	0.085	0.071	0.159	0.001	0.022	0.048	0.055	0.121	0.211	0.071
cfs	0.379	0.408	0.132	0.110	0.246	0.002	0.034	0.074	0.085	0.187	0.326	0.110
Ac-ft	23	25	7.8	6.8	15	0.09	2.1	4.3	5.2	11	20	6.6

Calendar year 1959: Max 5.40 Min 0 Mean(mgd) 0.146 Mean(cfs) 0.226 Ac-ft 164

Fiscal year 1959-60: Max 2.30 Min 0 Mean(mgd) 0.113 Mean(cfs) 0.175 Ac-ft 127

Peak discharge (base, 20 mgd).--Nov. 8 (2:30 p.m.) 54.9 mgd (84.9 cfs), 2.23 ft.

* Discharge measurement or observation of no flow made on this day.

150. Mohihi Stream near Waimea, Kauai

Location.--Lat 22°06'55", long 159°37'00", at lower trail crossing just above upper falls, 12 miles north of Waimea.

Drainage area.--2.2 sq mi.

Records available.--April 1909 to June 1910, July 1910 to October 1911 (fragmentary), January 1912 to October 1917 (discharge measurements only), discontinued. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Staff gage. Altitude of gage is 3,400 ft (from topographic map).

Extremes.--1909-10: Maximum discharge, 582 mgd (900 cfs) Dec. 27, 1909 (gage height, 7.30 ft, from floodmark), from rating curve extended above 22 mgd; minimum observed, 0.39 mgd (0.6 cfs) Nov. 25, 1909.

Remarks.--No diversion above station.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal year 1910, superseding those published in WSP 318, are given herewith:

1910		1910-Con.	
May	18..... 5.2	May	29..... 9.0
	19..... 6.0		30..... 30
	20..... 6.8		31..... 18
	21..... 5.5		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
May 1910.....	30	3.0	4.30	6.65	409
Fiscal year 1909-10.....	230	.6	6.66	10.3	7,280
Calendar year 1910.....	-	-	-	-	-

200. Waialae Stream near Waimea, Kauai

Location.--Lat 22°05'05", long 159°35'15", 400 ft upstream from first trail crossing, 10 miles northeast of Waimea.

Drainage area.--3.5 sq mi (approximately).

Records available.--August 1910 to February 1911, March 1911 to October 1911 (fragmentary), November 1911 to January 1916 (discontinued). Monthly discharge only for some periods published in WSP 1319.

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

Extremes.--1910-16: Maximum discharge, 350 mgd (540 cfs) Jan. 17, 1916 (gage height, 5.1 ft); minimum, 1.4 mgd (2.2 cfs) several days in March and April 1915.

Remarks.--No diversion above station.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal year 1915, superseding those published in WSP 430, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1914		1914-Con.		1914-Con.		1915-Con.	
Oct. 17	8.0	Oct. 28	7.8	Dec. 28	30	Feb. 1	3.5
18	7.0	30	17.0	29	15	2	3.0
19	7.0	Dec. 19	30	30	11	3	3.5
20	7.0	20	25	31	8.0	4	4.0
21	6.4	21	15			5	6.0
22	6.0	22	9.0	1915		6	4.5
23	6.0	23	8.5	Jan. 1	6.2	7	6.0
24	5.5	24	15	2	5.2	8	5.4
25	5.0	25	13	27	4.5	9	3.0
26	5.0	26	13	28	3.0	10	3.0
27	9.0	27	20	29	2.9	11	3.0

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
October 1914.....	46	5.0	13.8	21.4	1,510
December.....	35	3.5	14.1	21.8	1,340
Calendar year 1914.....	151	2	13.6	21.0	15,230
January 1915.....	6.2	2.4	3.94	6.10	374
February.....	20	2.4	6.09	9.42	524
Fiscal year 1914-15.....	151	1.4	10.6	16.4	11,900
Calendar year 1915.....	148	1.4	12.1	18.7	13,500

470. Hanapepe River at Koula, near Eleele, Kauai

Location.--Lat 21°57'25", long 159°33'00", 200 ft above ford, half a mile above siphon at Koula, and 5 miles north of Eleele.

Drainage area.--12.6 sq mi.

Records available.--August 1910 to December 1916 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 300 ft (from topographic map).

Average discharge.--5 years (1911-16), 48.0 mgd (74.3 cfs).

Extremes.--1910-16: Maximum discharge, 5,450 mgd (8,430 cfs) Nov. 29, 1913 (gage height, 9.4 ft), from rating curve extended above 900 mgd; minimum, 7.1 mgd (11.0 cfs) Dec. 23-31, 1913.

Flood of unknown magnitude washed shelter away Dec. 18, 1916.

Remarks.--Hanapepe ditch diverts water 4 miles upstream for irrigation in vicinity of Makaweli.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1911-14, superseding those published in WSP 318, 336, 373 and 430, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1910		1911-Con.		1911-Con.		1912-Con.	
Oct. 13	396	Jan. 12	1,080	Sept. 21	696	Dec. 24	805
27	412	13	642	22	627	25	359
28	432	17	809	23	285		
Nov. 1	404	24	509	24	1,790	1913	
2	681	25	487	26	480	Jan. 13	681
4	255	27	286	Dec. 9	928	June 3	480
10	269	28	1,150			Oct. 8	627
Dec. 24	593	31	591	1912		Nov. 11	681
25	1,030	Feb. 1	866	Mar. 11	396	12	1,160
26	801	2	359	13	325	13	681
30	317	6	466	July 13	744	19	572
		9	234	Dec. 2	1,080	20	480
1911		10	436	3	1,550	25	480
Jan. 8	506	26	331	21	325	29	480
10	436	July	254	22	396		
11	526	28	240	23	325		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
October 1910.....	432	18	49.0	75.8	4,660
November.....	681	21	76.7	119	7,060
December.....	1,030	14	75.3	117	7,160
January 1911.....	1,130	24	198	306	18,820
February.....	866	34	125	193	10,770
July 1911.....	254	18	40.0	61.9	3,810
September.....	1,790	18	140	217	12,930
December.....	928	18	55.6	86.0	5,290
Calendar year 1911.....	1,790	14	71.2	110	79,800
March 1912.....	396	13.0	35.5	54.9	3,380
Fiscal year 1911-12.....	1,790	13.0	38.8	60.0	43,580
July 1912.....	774	14.0	43.8	67.8	4,170
December.....	1,550	17.5	125	193	11,920
Calendar year 1912.....	1,550	13.0	35.1	54.3	39,510
January 1913.....	681	16	54.1	83.7	5,150
June.....	480	14	36.8	56.9	3,390
Fiscal year 1912-13.....	1,550	13	40.1	62.0	44,990
October 1913.....	627	12	41.2	63.7	3,920
November.....	1,160	13	143	221	13,190
Calendar year 1913.....	1,160	11	38.4	59.4	43,090
Fiscal year 1913-14.....	750	7.1	37.3	57.7	41,720

480. Manuahi Stream at Koula, near Eleele, Kauai

Location.--Lat 21°57'25", long 159°33'10", 100 ft upstream from mouth and 5 miles north of Eleele.

Drainage area.--5.44 sq mi.

Records available.--May 1917 to December 1920 (discontinued). Monthly discharge only for some periods, published in WSP 1319.

Gage.--Staff gage. Altitude of gage is 250 ft (from topographic map).

Extremes.--1917-20: Maximum discharge, about 810 mgd (1,250 cfs) Jan. 15, 1920 (gage height, at least 6 ft), from rating curve extended above 30 mgd; minimum, 0.05 mgd (0.08 cfs) June 24, 1919.

Remarks.--No diversion above station.

Revisions.--Revised figures of discharge, in million gallons a day, for fiscal year 1918, superseding those published in WSP 485, are given herewith:

1917		1918-Con.	
Oct. 16.....	330	Feb. 21.....	276
Dec. 6.....	132	Mar. 11.....	350
		12.....	240
		13.....	140
		16.....	222
		Apr. 18.....	294
		19.....	180
1918			
Jan. 14.....	101		
19.....	222		
26.....	108		
Feb. 16.....	140		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
October 1917.....	330	0.5	15.4	23.8	1,470
December.....	132	1.3	10.4	16.1	985
Calendar year 1917.....	-	-	-	-	-
January 1918.....	222	.7	18.2	28.2	1,730
February.....	276	2.0	24.3	37.6	2,080
March.....	350	2.0	39.7	61.4	3,770
April.....	294	2.0	26.3	40.7	2,420
Fiscal year 1917-18.....	350	.3	12.6	19.5	14,100
Calendar year 1918.....	350	.5	13.0	20.1	14,590

510. Hanapepe River at makai siphon, near Eleele, Kauai

Location.--Lat 21°55'35", long 159°33'40", on right end of makai siphon bridge, 2 1/3 miles northeast of Eleele.

Drainage area.--20.5 sq mi.

Records available.--December 1929 to February 1932 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

Extremes.--1929-32: Maximum discharge, 6,440 mgd (9,960 cfs) Feb. 12, 1932; minimum, 11.5 mgd (17.8 cfs) Feb. 23, 1930, Apr. 26, 1931.

Remarks.--Hanapepe ditch and several small ditches divert water from stream above station.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1930-31, superseding those published in WSP 710 and 740, are given herewith:

1930		1930-Con.	
Jan. 26.....	219	Apr. 12.....	93
29.....	209	14.....	200
30.....	98	July 2.....	176
Feb. 27.....	341	3.....	139
Apr. 9.....	111	31.....	292
11.....	77		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
January 1930.....	219	12.5	39.0	60.3	3,710
February.....	341	12	29.3	45.3	2,520
April.....	200	14	33.4	51.7	3,070
Fiscal year 1929-30.....	-	-	-	-	-
July 1930.....	292	17.5	51.9	80.3	4,940
Calendar year 1930.....	658	12	50.0	77.4	56,000
Fiscal year 1930-31.....	658	-	42.1	65.1	47,130

640. Kanaha ditch near Lihue, Kauai

Location--Lat 22°03'50", long 159°25'30", on right bank 750 ft downstream from intake and 7 miles northwest of Lihue.

Records available--August 1910 to October 1955 (discontinued).

Gage--Water-stage recorder and sharp-crested weir. Altitude of gage is 540 ft (by barometer). Prior to May 28, 1913, staff gage at site 250 ft upstream at different datum. May 28, 1913, to July 24, 1921, staff gage at site 450 ft upstream at different datum. July 25, 1921, to Mar. 4, 1926, water-stage recorder at site 750 ft downstream at different datum. Mar 5, 1926, to Sept. 13, 1932, water-stage recorder at site 1,750 ft downstream at different datum.

Extremes--1912-55: Maximum daily discharge, 25.6 mgd (39.6 cfs) Aug. 8, 1918; no flow at times.

Remarks--Ditch diverted water from North Fork Wailua River for domestic use and irrigation of cane lands prior to 1941 and for domestic use only thereafter.

Revisions--Revised figures of discharge, in million gallons a day, for the fiscal year 1915, superseding those published in WSP 430, are given herewith:

1915	1915-Con.
Feb. 19..... 15	Mar. 18..... 14
28..... 14	19..... 15
Mar. 1..... 15	20..... 14
14..... 14	21..... 14
15..... 14	22..... 14
16..... 14	29..... 14
17..... 14	31..... 14

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
February 1915.....	19	8.1	14.5	22.4	1,250
March.....	17	14	15.0	23.2	1,430

1010. Hanalei River at altitude 625 ft, near Hanalei, Kauai

Location.--Lat 22°07'10", long 159°28'05", on right bank 0.4 mile downstream from Kaapoko Stream and 6.2 miles southeast of Hanalei.

Drainage area.--7.4 sq mi, approximately.

Records available.--January 1914 to January 1952, July 1952 to August 1955 (discontinued). Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 625 ft (from topographic map). Prior to Jan. 15, 1915, at site 300 ft downstream at datum 8.0 ft lower and Jan. 15, 1915, to July 19, 1921, at present datum.

Average discharge.--40 years (1914-51, 1952-55), 50.8 mgd (78.6 cfs).

Extremes.--1914-56: Maximum discharge observed, at least 9,200 mgd (14,200 cfs) Jan. 3, 1952 (gage height, at least 13.0 ft, from floodmark), from rating curve extended above 70 mgd on basis of slope-area determination at gage height 10.12 ft, but may have been greater on Nov. 12-13, 1955, when flood of undetermined magnitude destroyed station; minimum, 5.8 mgd (9.0 cfs) Apr. 28, May 1-3, 1926.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
430	1915	Sept. 26, 1914	5,300	8,200	*8.5
445	1916	Jan. 26, 1916	3,700	5,720	7.2
465	1917	Mar. 14, 1917	2,550	3,950	6.05
485	1918	Mar. 12, 1918	1,650	2,550	5.01
555	1919	Nov. 25, 1918	1,600	2,480	4.95
555	1920	Jan. 16, 1920	3,120	4,830	6.62
555	1921	Jan. 16, 1921	4,020	6,220	7.50
555	1922	Oct. 1, 1921	1,210	1,870	5.74
575	1923	Sept. 11, 1922	2,700	4,180	8.04
595	1924	Apr. 15, 1924	2,240	3,470	7.37
615	1925	Feb. 11, 1925	1,960	3,030	7.05
635,1319	1926	*Sept. 13, 1925	1,360	2,100	*6.05
655	1927	Jan. 20, 1927	2,970	4,600	8.28
675	1928	Dec. 24, 1927	3,250	5,030	8.62
695	1929	Nov. 4, 1928	1,960	3,030	7.04
710	1930	July 26, 1929	1,600	2,480	6.40
725	1931	Nov. 20, 1930	1,360	2,100	5.95
740	1932	Feb. 12, 1932	2,240	3,470	7.42
755	1933	Feb. 27, 1933	1,720	2,660	6.65
770	1934	Jan. 21, 1934	1,360	2,100	6.04
795	1935	July 27, 1934	1,260	1,950	5.80
815	1936	Dec. 9, 1935	1,360	2,100	6.00
835	1937	Mar. 19, 1937	5,380	8,320	10.52
865,1319	1938	*Nov. 25, 1937	1,780	2,750	*6.73
885	1939	Apr. 27, 1939	6,150	9,520	11.12
905	1940	Nov. 27, 1939	2,030	3,140	7.07
935	1941	Oct. 2, 1940	4,420	6,840	9.74
965	1942	Oct. 29, 1941	1,260	1,950	5.79
985	1943	Sept. 16, 1942	3,650	5,650	8.95
1015	1944	Feb. 29, 1944	3,060	4,730	8.37
1045	1945	Dec. 27, 1944	2,970	4,600	8.32
1065	1946	Feb. 4, 1946	4,090	6,330	9.33
1095	1947	Nov. 14, 1946	3,550	5,490	8.89
1155	1949	Jan. 19, 1949	3,650	5,650	9.03
1185	1950	Jan. 6, 1950	3,060	4,730	8.35
1219	1951	Mar. 28, 1951	3,060	4,730	8.43

* Revised.

Remarks.--Records good except those above 70 mgd, which are fair. Since 1925 Hanalei tunnel has been diverting water from Hanalei River and its tributary Kaapoko Stream at points about 2 miles above station, for irrigation in vicinity of Lihue.

Revisions (fiscal years).--WSP 1289: 1948(M). Revised figures of discharge, in million gallons a day, for the fiscal years 1915, 1917-18, 1937, 1939, 1943-44, and 1947-49, superseding those published in WSP 430, 465, 485, 675, 835, 885, 985, 1015, 1095, 1125, and 1155 and revised peak discharge for the fiscal years 1948-51, superseding those published in WSP 1125, 1155, 1185, and 1219, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1914		1914-Con.		1914-Con.		1917-Con.		1939	
Aug. 21	53	Aug. 12	146	Oct. 3	60	Feb. 20	50	Apr. 27	390
22	99	Sept. 13	290	4	60	21	60		
23	182	14	290	5	50	22	50	1942	
24	202	15	275	6	70	23	60	Sept. 16	407
25	129	16	129	7	56	Sept. 16	60		
26	89	17	106	8	80	18	100	1944	
27	79	18	121	9	110	19	50	Feb. 29	621
28	73	19	114	10	140	20	40		
29	114	20	137	11	100	21	35	1946	
30	154	22	200	12	80	22	33	Nov. 14	339
31	182	23	350	13	60	23	31		
Sept. 1	92	24	200	14	50	24	36	1947	
2	114	25	450	15	45	25	32	Nov. 12	468
3	89	26	800	16	50			14	503
4	77	27	300						
5	99	28	120	1915		1927		1949	
6	260	29	90	June 27	90	Dec. 24	994	Feb. 7	1,010
7	137	30	70			1937		8	548
8	106	Oct. 1	60	1917		Mar. 19	1,060		
11	86	2	90	Feb. 19	56				

1010. Hanalei River at altitude 625 ft, near Hanalei, Kauai--Continued

Revised figures of monthly discharge, in million gallons a day, 1915, 1917-18, 1937, 1939, 1943-44, 1947-49

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
August 1914.....	-	245	53	118	183	11,270
September.....	-	800	70	184	285	16,980
October.....	-	140	40	61.1	94.5	5,810
Calendar year 1914.....	-	-	-	-	-	-
June 1915.....	-	150	29	68.8	106	6,340
Fiscal year 1914-15.....	-	540	26	77.7	120	87,030
February 1917.....	-	158	48	62.8	97.2	5,390
Fiscal year 1916-17.....	-	935	24	101	156	113,000
September 1917.....	-	236	31	61.2	94.7	5,630
Calendar year 1917.....	-	935	21	82.5	128	92,450
Fiscal year 1917-18.....	-	860	14	82.7	128	92,700
December 1927.....	-	994	17.3	94.4	146	8,980
Calendar year 1927.....	-	994	11.1	58.4	90.4	65,380
Fiscal year 1927-28.....	-	994	10.8	39.0	60.3	43,830
March 1937.....	2,980.5	1,060	16.6	96.1	149	9,150
Fiscal year 1936-37.....	21,090.3	1,060	9.6	57.8	89.4	64,720
Calendar year 1937.....	18,794.9	1,060	9.5	51.5	79.7	57,670
April 1939.....	2,090.9	390	10.4	69.7	108	6,420
Fiscal year 1938-39.....	13,952.4	390	10.1	38.2	59.1	42,820
Calendar year 1939.....	13,191.8	398	9.6	36.1	55.9	40,490
September 1942.....	1,606.9	407	12.2	53.6	82.9	4,930
Calendar year 1942.....	14,516.5	800	9.6	39.8	61.6	44,540
Fiscal year 1942-43.....	15,402.5	1,000	9.1	42.2	65.3	47,270
February 1944.....	1,196.2	621	8.6	41.2	63.7	3,670
Fiscal year 1943-44.....	11,451.6	621	8.6	31.3	48.4	35,150
Calendar year 1944.....	10,223.4	621	8.3	27.9	43.2	31,370
November 1946.....	1,707.9	339	13.4	56.9	88.0	5,240
Calendar year 1946.....	17,042.6	451	9.5	46.7	72.3	52,290
Fiscal year 1946-47.....	13,155.4	451	7.2	36.0	55.7	40,360
November 1947.....	2,545.1	503	12.2	84.8	131	7,810
Calendar year 1947.....	13,407.2	503	7.2	36.7	56.8	41,130
Fiscal year 1947-48.....	23,802.8	590	9.8	65.0	101	73,050
February 1949.....	3,093.0	1,010	32.5	110	170	9,490
Fiscal year 1948-49.....	22,726.2	1,010	9.3	62.3	96.4	69,730
Calendar year 1949.....	17,798.2	1,010	8.6	48.8	75.5	54,590

Revised peak discharge.--1947-48: Nov. 14 (5 p.m.) 3,150 mgd (4,670 cfs); Mar. 21 (8 a.m.) 2,170 mgd (3,360 cfs); Mar. 24 (7:30 a.m.) 2,030 mgd (3,140 cfs); Apr. 1 (6:30 p.m.) 6,300 mgd (9,750 cfs).

1948-49: Jan. 19 (1 a.m.) 3,650 mgd (5,650 cfs); Feb. 7 (2 p.m.) 3,060 mgd (4,730 cfs).

1949-50: Dec. 16 (5 a.m.) 2,240 mgd (3,470 cfs), 7.39 ft; Jan. 6 (8:30 p.m.) 3,060 mgd (4,730 cfs), 8.35 ft; Apr. 28 (11 a.m.) 2,240 mgd (3,470 cfs), 7.38 ft; May 17 (1:30 a.m.) 2,100 mgd (3,250 cfs), 7.20 ft.

1950-51: Feb. 20 (12 p.m.) 2,100 mgd (3,250 cfs), 7.22 ft; Mar. 4 (5 a.m.) 2,100 mgd (3,250 cfs), 7.21 ft; Mar. 28 (9 a.m.) 3,060 mgd (4,730 cfs), 8.43 ft.

1050. Waioli Stream near Hanalei, Kauai

Location.--Lat 22°10'05", long 159°29'50", 2.5 miles south of Hanalei and 3 miles upstream from mouth.

Drainage area.--1.5 sq mi, approximately.

Records available.--July 1914 to October 1918. May 1919 to July 1932 (discontinued).
Monthly discharge only for some periods published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 550 ft (from topographic map).

Average discharge.--17 years (1914-18, 1919-32), 20.4 mgd (31.6 cfs).

Extremes.--1914-32: Maximum discharge, 1,100 mgd (1,700 cfs) Dec. 5, 1914 (gage height, 5.8 ft); minimum, 2.0 mgd (3.1 cfs) July 22, 1914.

Remarks.--No diversion above station.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal year 1916, superseding those published in WSP 445, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1916		1916-Con.		1916-Con.		1916-Con.	
May 8	30	May 22	19	June 5	31	June 19	45
9	35	23	21	6	32	20	37
10	40	24	24	7	30	21	32
11	20	25	19	8	37	22	32
12	14	26	15	9	30	23	26
13	13	27	13	10	23	24	20
14	13	28	15	11	23	25	23
15	15	29	15	12	19	26	20
16	13	30	15	13	17	27	16
17	13	31	18	14	17	28	14
18	18	June 1	21	15	15	29	13
19	24	2	21	16	24	30	23
20	24	3	21	17	20		
21	19	4	28	18	20		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
May 1916.....	194	13	42.4	65.6	4,030
June.....	45	13	24.3	37.6	2,240
Fiscal year 1915-16.....	194	5.6	22.1	34.2	24,820
Calendar year 1916.....	336	6.0	26.7	41.3	29,980

REVISIONS OF RECORDS FOR DISCONTINUED STATIONS

1060. Lumahai River near Hanalei, Kauai

Location--Lat 22°09'05", long 159°31'40", on right bank $4\frac{1}{2}$ miles southwest of Hanalei and 6 miles above mouth.

Drainage area--7.5 sq mi (revised), approximately.

Records available--May 1914 to October 1917. July 1920 to October 1933 (discontinued). Monthly discharge only for some periods, published in WSP 1319.

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

Average discharge--16 years (1914-17, 1920-33), 75.5 mgd (117 cfs).

Extremes--1914-17, 1920-33: Maximum discharge (revised), about 7,700 mgd (11,900 cfs) Sept. 11, 1922 (gage height, 9.41 ft), from rating curve extended above 1,000 mgd; minimum, 13.6 mgd (21.0 cfs) May 15, 17, 1926.

Revisions--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
555	1922	Jan. 31, 1922	2,250	3,480	5.20
575	1923	Sept. 11, 1922	7,700	11,900	9.41
615	1925	Mar. 28, 1925	2,100	3,250	5.40
655	1927	Apr. 15, 1927	3,200	4,950	6.49
695	1929	Nov. 4, 1928	3,800	5,880	6.99
710	1930	Feb. 27, 1930	3,200	4,950	6.50
755	1931	Nov. 18, 1930	4,620	7,150	7.60
755	1932	Feb. 12, 1932	3,980	6,160	7.12

Remarks--No diversion above station.

Revisions--Revised figures of discharge, in million gallons a day, for fiscal year 1917, superseding those published in WSP 465, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1916		1916-Con.		1916-Con.		1916-Con.	
Sept. 29	80	Oct. 8	38	Oct. 17	50	Nov. 13	55
30	60	9	43	18	80	14	50
Oct. 1	50	10	39	19	110	15	62
2	45	11	35	20	85	16	54
3	40	12	40	21	70	17	90
4	45	13	45	22	64	18	160
5	50	14	40	23	90	19	130
6	43	15	37	24	130	20	110
7	40	16	37	Nov. 12	62		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
September 1916.....	148	30	49.1	76.0	4,520
October.....	265	35	73.3	113	6,980
November.....	450	44	131	203	12,000
Calendar year 1916.....	790	30	99.8	154	112,000
Fiscal year 1916-17.....	790	30	90.7	140	101,700

1170. Kalalau Stream near Hanalei, Kauai

Location--Lat 22°09'50", long 159°38'15", on left bank 2 miles upstream from mouth and 9 miles southwest of Hanalei.

Drainage area--1.6 sq mi, approximately.

Records available--November 1931 to August 1955 (discontinued).

Gage--Water-stage recorder. Altitude of gage is 960 ft (by barometer).

Average discharge--23 years (1932-55), 4.61 mgd (7.13 cfs).

Extremes--1931-55: Maximum discharge, 665 mgd (1,030 cfs) Aug. 15, 1950 (gage height, 4.55 ft), from rating curve extended above 18 mgd; minimum, 1.73 mgd (2.68 cfs) June 2, 1945.

Revisions--The figures of maximum discharge for some fiscal years have been revised, as shown below. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
755	1933	Mar. 6, 1933	128	198	2.87
770	1934	June 4, 1934	202	313	3.26
795	1935	Nov. 28, 1934	182	282	3.17

Remarks--No diversion above station.

Revisions--Revised figures of discharge, in million gallons a day, for the fiscal years 1932, 1935, and 1937, superseding those published in WSP 740, 795, and 835, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1932		1937-Con.		1937-Con.		1937-Con.	
Feb. 25	67	Feb. 6	9.0	Feb. 14	8.0	Feb. 24	5.8
		7	7.6	16	13.0	25	5.4
1934		8	8.0	17	6.0	26	5.2
Nov. 28	33.2	9	7.6	18	6.4	27	4.8
		10	6.2	19	5.8	28	4.5
1937		11	6.0	20	13.0		
Feb. 4	8.0	12	6.2	22	12.0		
5	6.2	13	5.6	23	6.5		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
February 1932.....	-	67	3.9	10.4	16.1	925
Fiscal year 1931-32.....	-	67	2.4	4.30	6.65	4,830
Calendar year 1932.....	-	67	2.4	4.30	6.65	4,830
November 1934.....	157.05	33.5	2.4	5.24	8.11	482
Calendar year 1934.....	1,372.6	33.5	2.0	3.76	5.82	4,210
Fiscal year 1934-35.....	1,465.55	33.5	2.3	4.02	6.22	4,500
February 1937.....	265.0	33.5	4.4	9.46	14.6	813
Fiscal year 1936-37.....	2,281.85	74	3.05	6.25	9.67	7,000
Calendar year 1937.....	2,273.8	74	3.35	6.23	9.64	6,980

5090. Hanawi Stream below Government Road, near Nahiku, Maui

Location.--Lat 20°49'15", long 156°06'25", 0.8 mile southwest of Nahiku and 4 miles south-east of Keanae Post Office.

Drainage area.--5.03 sq mi (revised).

Records available.--July 1932 to July 1947 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (by barometer).

Average discharge.--15 years (1932-47), 27.1 mgd (41.9 cfs), revised.

Extremes.--1932-47: Maximum discharge; 7,180 mgd (11,100 cfs) Mar. 21, 1937 (gage height, 9.54 ft), from rating curve extended above 28 mgd; minimum, 8.2 mgd (12.7 cfs) Feb. 25, 1936.

Flood that destroyed shelter Apr. 6 or 7, 1938, probably reached a stage higher than 9.54 ft.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
795	1933	Dec. 31, 1932	2,360	3,650	6.42
795	1934	Apr. 25, 1934	2,090	3,230	6.17
865	1938	Apr. 6 or 7, 1938*	(a)	(a)	-
985	1943	Dec. 14, 1942	6,300	9,750	9.07
1015	1944	Aug. 21, 1943	3,980	6,160	7.66
1045	1945	Apr. 8, 1945	1,640	2,540	5.69
1065	1946	Jan. 17, 1946	2,320	3,590	6.38
1095	1947	Dec. 18, 1946	3,040	4,700	7.03

* Revised.

a Not determined.

Remarks.--Entire flow of stream up to 25 mgd is diverted above station into Koolau ditch, at altitude 1,300 ft.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1933-35, and 1943-47, superseding those published in WSP 795, 815, 985, 1015, 1045, 1065, and 1095, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1932		1934		1934-Con.		1943-Con.		1946-Con.	
July 22	172	Feb. 20	197	Dec. 23	103	Apr. 2	39.5	Jan. 22	74
23	64	Apr. 3	148	26	77	3	17.7	23	130
24	62	6	59	27	72	4	54	24	155
Dec. 29	34.5	21	31.5	28	44	10	28	25	24
31	573	24	142			11	19.2	26	97
		25	1,370	1935		13	66	27	42
		26	53	Jan. 7	563	14	132	28	24
1933		5	116	8	192	15	27.5	29	97
Jan. 1	177	May 5	129	9	110	4	60	30	50
2	28	6	95			5	39.5	31	304
3	134	7				14	16.1	Feb. 7	48
4	46	8	158	1942		15	37	16	55
15	69	9	311	Dec. 14	704	28	157	17	438
16	60	10	236	28	185	29	38	18	20.5
17	56.5	11	68	29	56			Mar. 19	144
31	35.5	12	73					20	17.6
Mar. 5	103	31	60	1943		1945		21	31
6	353	July 5	45	Jan. 2	39	Apr. 6	20.5	22	20
7	1,150	6	249	3	209	7	160	23	28
8	358	Nov. 5	50	4	74	8	27.4	27	102
9	36	12	76	5	29	9	18.3	28	92
10	45	13	102	Mar. 8	19.8	14	27	29	23.5
Nov. 2	68	21	69	9	209			30	62
3	157	22	52	10	40	1946		31	42
Nov. 25	208	23	187	18	38.5	Jan. 17	529	July 10	39.5
26	431	24	45	Apr. 1	77	18	46		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
July 1932.....	-	172	17	27.4	42.4	2,610
December.....	-	573	14.8	34.2	52.9	3,260
January 1933.....	-	177	15.4	32.3	50.0	3,070
March.....	-	1,150	13.9	79.4	123	7,560
April.....	-	157	13.6	21.4	33.1	1,970
Fiscal year 1932-33.....	-	1,150	13.3	26.2	40.5	29,290
November 1933.....	-	431	11.6	32.8	50.7	3,020
Calendar year 1933.....	-	1,150	11.4	23.6	36.5	26,420
February 1934.....	-	197	10.8	20.2	31.3	1,730
April.....	-	1,370	10.8	71.9	111	6,620
May.....	-	311	11.9	51.6	79.8	4,910
Fiscal year 1933-34.....	-	1,370	10.1	23.9	37.0	26,720
July 1934.....	*680.8	249	11.9	*22.0	*34.0	2,090
November.....	923.8	187	12.7	30.8	47.7	2,840
December.....	655.7	103	12.5	21.2	32.8	2,010
Calendar year 1934.....	9,045.6	1,370	10.1	24.8	36.4	27,780
January 1935.....	1,265.6	563	12.7	40.8	63.1	3,880
Fiscal year 1934-35.....	8,411.8	563	11.1	23.0	35.6	25,810
Calendar year 1935.....	7,525.3	563	9.5	20.6	31.9	23,080

* Revised compilation figures.

5090. Hanawi Stream below Government Road, near Nahiku, Maui--Continued

Revised figures of monthly discharge, in million gallons a day,
1933-35 and 1943-47--Continued

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
December 1942.....	1,294.4	704	12.2	41.8	64.7	3,970
Calendar year 1942.....	11,057.1	1,060	10.0	30.3	46.9	33,920
January 1943.....	710.6	209	12.6	22.9	35.4	2,180
March.....	682.6	209	11.9	22.0	34.0	2,090
April.....	761.2	132	12.6	25.4	39.3	2,340
Fiscal year 1942-43.....	7,189.6	704	11.9	19.7	30.5	22,050
December 1943.....	660.3	157	11.2	21.3	33.0	2,030
Calendar year 1943.....	6,428.9	209	11.2	17.6	27.2	19,730
Fiscal year 1943-44.....	5,491	157	10.9	15.0	23.2	16,860
April 1945.....	785.9	274	10.6	26.2	40.5	2,410
Fiscal year 1944-45.....	5,603.2	274	10	15.4	23.8	17,210
Calendar year 1945.....	5,581.4	274	10	15.3	23.7	17,130
January 1946.....	*1,779.0	529	10.6	*57.4	*88.8	5,460
February.....	885.6	438	11	31.6	48.9	2,720
March.....	1,008.7	144	11	32.5	50.3	3,100
Fiscal year 1945-46.....	*7,640.0	529	10.6	*20.9	*32.3	23,440
July 1946.....	718.7	141	12.6	23.2	35.9	2,210
December.....	3,248.8	720	11.9	105	162	9,970
Calendar year 1946.....	*10,927.5	720	10.6	*29.9	*46.3	33,540
March 1947.....	1,005.7	197	11.9	32.4	50.1	3,090
May.....	700.5	159	11.9	22.6	35.0	2,150
Fiscal year 1946-47.....	9,196.3	720	11.2	25.2	39.0	28,230

* Revised compilation figures.

5240. Honomanu Stream at Haiku-uka boundary, near Kailiili, Maui

Location--Lat 20°49'20", long 156°12'15", on left bank, at end of Haiku-uka trail, 4.5 miles (revised) southeast of Kailiili and 5 miles south of Kailua.

Drainage area--2.55 sq mi (revised).

Records available--October 1919 to February 1927, July 1932 to November 1934 (discontinued).

Gage--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

Average discharge--8 years (1920-26, 1932-34), 9.49 mgd (14.7 cfs).

Extremes--1919-27, 1932-34: Maximum discharge, 1,290 mgd (2,000 cfs) Jan. 14, 1923 (gage height, 9.93 ft), from rating curve extended above 75 mgd; minimum, 0.1 mgd (0.2 cfs) Oct. 7, 1932, Oct. 22, Nov. 25, 1933.

Revisions--The maximum discharge for the fiscal year 1921 has been revised to 1,100 mgd (1,700 cfs) Jan. 16, 1921 (gage height, 9.00 ft), superseding figure published in WSP 535.

Remarks--No diversion above station.

Revisions--Revised figures of discharge, in million gallons a day, for the fiscal years 1920-21, superseding those published in WSP 516 and 535, are given herewith:

1919		1921	
Dec. 31.....	72	Jan. 6.....	110
		7.....	76.8
1920		15.....	68
Nov. 8.....	168	16.....	142
Dec. 14.....	127	17.....	140
24.....	85	Apr. 6.....	136
25.....	132	7.....	216

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
December 1919.....	72	0.1	5.57	8.62	530
Calendar year 1919.....	-	-	-	-	-
Fiscal year 1919-20.....	-	-	-	-	-
November 1920.....	168	.5	15.7	24.3	1,440
December.....	132	.7	19.0	29.4	1,800
Calendar year 1920.....	-	-	6.53	10.1	7,330
January 1921.....	142	.8	35.7	55.2	3,390
April.....	216	.7	15.6	24.1	1,440
Fiscal year 1920-21.....	216	.07	8.93	13.8	10,000
Calendar year 1921.....	356	.07	13.8	21.4	15,500

5560. Waikamoi Stream near Huelo, Maui

Location--Lat 20°51'52", long 156°11'54", on left bank 50 ft upstream of trail crossing, 500 ft upstream from Spreckels ditch inflow, 2.4 miles southeast of Kailua, and 3.6 miles southeast of Huelo.

Drainage area--3.98 sq mi (revised).

Records available--December 1910 to February 1922.

Gage--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map). Prior to Oct. 14, 1913, staff gage at same site at different datum.

Average discharge--10 years (1911-21), 18.2 mgd (28.2 cfs).

Extremes--1910-22: Maximum discharge recorded (revised), 2,570 mgd (3,980 cfs), revised, Jan. 18, 1916 (gage height, 7.57 ft), from rating curve extended above 220 mgd; minimum discharge, 0.2 mgd (0.3 cfs) July 13, 14, 1920, Sept. 17-24, 1917.

Revisions--The maximum discharge for the fiscal year 1916 has been revised to 2,570 mgd (3,980 cfs) Jan. 18, 1916 (gage height, 7.57 ft), superseding figures published in WSP 516.

Remarks--Small amount of water diverted by Kula pipeline at altitude 4,300 ft.

Revisions--Revised figures of discharge, in million gallons a day, for the fiscal year 1915, superseding those published in WSP 430, are given herewith:

1914	
Aug. 20.....	49
21.....	52
Oct. 9.....	100

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
August 1914.....	366	14	52.8	81.7	5,020
October.....	100	3.2	24.9	38.5	2,370
Calendar year 1914.....	366	.65	30.5	47.2	34,150
Fiscal year 1914-15.....	366	1.3	27.2	42.1	30,420

7030. Wailuku River at Pukamaui, near Hilo, Hawaii

Location--Lat 19°42'45", long 155°09'25", three-quarters of a mile upstream from intake of Hilo Boarding School ditch and 4.5 miles west of Hilo.

Drainage area--97.2 sq mi.

Records available--April to July 1923, August 1923, October 1923, November to December 1923, January 1924 to September 1925, October 1925, May 1926 to March 1937, January 1938 to May 1940 (discontinued). Monthly discharge only for some periods, published in WSP 1319.

Gage--Water-stage recorder. Altitude of gage is 1,280 ft (by barometer).

Average discharge--11 years (1924-25, 1926-28, 1929-36, 1938-39), 60.3 mgd (93.3 cfs).

Extremes--1923-28, 1929-40: Maximum discharge, 8,980 mgd (13,900 cfs) Feb. 17, 1937 (gage height, 16.9 ft, from floodmarks), from rating curve extended above 900 mgd; no flow at times.

Remarks--Water is diverted from gage pool for domestic use of city of Hilo. Flow regulated by this diversion. Since March 1938, Kapehu ditch diverted water from Kapehu Stream into Wailuku River, a few hundred feet above gage.

Revisions--Revised figures of discharge, in million gallons a day, for the fiscal year 1936, superseding those published in WSP 815, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1935		1935-Con.		1935-Con.		1935-Con.	
Oct. 5	16.8	Oct. 11	14.6	Oct. 17	11.0	Oct. 23	11.3
6	22.5	12	108	18	10.4	24	11.0
7	16.8	13	59	19	11.2	25	11.3
8	14.0	14	22	20	46	26	9.5
9	12.6	15	15.2	21	23		
10	11.6	16	12.2	22	13.7		

Month	Mgd-days	Maximum	Minimum	Mean		Runoff in acre-feet
				(mgd)	(cfs)	
October 1935.....	635.8	108	8.7	20.5	31.7	1,950
Calendar year 1935.....	22,732.10	1,410	3.8	62.3	96.4	69,780
Fiscal year 1935-36.....	12,287.8	1,330	0	33.6	52.0	37,730

REVISIONS OF RECORDS FOR DISCONTINUED STATIONS

7090. Kapehu Stream at Piihonua, near Hilo, Hawaii

Location.--Lat 19°43'15", long 155°08'30", 1,300 ft upstream from mouth and 3.3 miles west of Hilo.

Drainage area.--4.84 sq mi.

Records available.--November 1928 to January 1937 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 950 ft (from topographic map). Prior to Jan. 3, 1931, at datum 6.0 ft lower.

Average discharge.--7 years (1929-36), 32.9 mgd (50.9 cfs).

Extremes.--1928-37: Maximum discharge, 3,640 mgd (5,630 cfs) Aug. 12, 1930 (gage height, 16.83 ft, revised, datum then in use), from rating curve extended above 400 mgd; minimum, 1.2 mgd (1.9 cfs) Feb. 17, 1931.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
710	1930	Mar. 14, 1930	2,400	3,710	15.28
740	1932	July 21, 1931	2,930	4,530	9.98
755	1933	Dec. 2, 1932	1,180	1,830	7.18

Remarks.--Small diversion above station.

Revisions.--Revised figures of discharge, in million gallons a day, for the fiscal years 1929-33, superseding those published in WSP 695, 710, 725, 740, and 755, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1929		1930-Con.		1930-Con.		1931-Con.	
Feb. 12	48	June 24	161	Sept. 22	96	Nov. 18	88
13	146	25	94	23	88		
14	253	29	290	24	284	1932	
15	460	30	153	25	217	Jan. 1	61
16	98	Aug. 5	177	26	103	18	144
1	131	6	168			19	222
2	135	9	109	1931		20	180
3	93	10	309	Feb. 25	184	21	88
9	100	11	670	26	131	25	154
10	135	12	615	27	98	26	110
11	274	13	162	July 21	421	27	154
12	113	14	178	22	116	28	351
18	159	15	140	Sept. 11	107	29	179
26	151	16	214	12	95	30	106
		17	204	17	111	Feb. 6	71
1930		18	151	18	229	7	204
Feb. 27	138	19	108	19	88	8	103
28	98	21	103	26	92	9	90
Apr. 8	148	22	103	29	144	10	228
9	252	25	88	30	749	11	194
10	103	29	90	9	152	12	170
11	97	Sept. 10	128	10	160	13	153
12	237	11	110	11	127	28	140
13	204	16	161	12	140	29	250
14	149	17	222	13	122	Dec. 1	93
30	144	18	136	14	112	2	536
June 3	112	19	110	15	278	3	159
4	190	20	102	16	116	28	90
5	101	21	106	17	122		

Month	Maximum	Minimum	Mean		Runoff in acre-feet
			(mgd)	(cfs)	
February 1929.....	460	4.5	53.6	82.9	4,600
March.....	274	13.8	57.2	88.5	5,440
Fiscal year 1929-29.....	-	-	-	-	-
November 1929.....	159	-	21.7	33.6	2,000
Calendar year 1929.....	460	-	*24.2	*37.4	27,150
February 1930.....	138	2.3	12.2	18.9	1,050
April.....	252	11.2	71.7	111	6,600
June.....	290	16.9	65.9	102	6,060
Fiscal year 1929-30.....	332	-	30.0	46.4	33,640
August 1930.....	670	23	139	215	13,200
September.....	284	27	90.5	140	8,530
Calendar year 1930.....	670	2.3	55.0	85.1	61,530
February 1931.....	184	1.4	18.8	29.1	1,620
Fiscal year 1930-31.....	670	1.4	36.8	56.9	41,260
July 1931.....	421	1.4	29.8	46.1	2,840
September.....	749	17	80.6	125	7,420
November.....	278	17	69.0	107	6,350
Calendar year 1931.....	749	-	27.3	42.2	30,640
January 1932.....	331	12.5	76.8	119	7,310
February.....	250	15	76.5	118	6,810
Fiscal year 1931-32.....	749	-	47.9	74.1	53,790
December 1932.....	536	11	54.2	83.9	5,160
Calendar year 1932.....	536	3.1	36.3	56.2	40,790
Fiscal year 1932-33.....	536	3.1	36.9	57.1	41,320

* Revised figures of compilation.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are generally presented in two tables. However, no records at low-flow partial-record stations are available in the 1960 fiscal year. A table of annual maximum discharge at crest-stage stations is given first, followed by a table of measurements made at miscellaneous sites for both low flow and high flow.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each fiscal year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent fiscal years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge ^a
Island of Kauai							
280	Waimea River below Kekaha ditch intake.	Lat 22°02'40", long 159°58'35", 500 ft below Kekaha ditch intake, 6.5 miles north of Waimea, and 6.9 miles northeast of Kekaha.	45.0	1922-55*, 1956-60	8-6-59	24.8	11,200 (17,300)
Island of Oahu							
2113	Makaleha Stream near Waiialua.	Lat 21°33'56", long 158°09'24", on left downstream wingwall of bridge on plantation road, 1.9 miles southwest of Sugar Mill, Waiialua.	4.24	1958-60	4-16-60	2.44	(+)
2115	Makua Stream at Makua.	Lat 21°32'05", long 158°13'25", 0.5 mile upstream from Farrington Highway and 0.55 mile northeast of Makua cemetery.	4.07	1958-60	2-16-60	1.97	(+)
2117	Kaupuni Stream near Waianae.	Lat 21°27'46", long 158°09'55", 1.8 miles northeast of Waianae cemetery and 2.0 miles northeast from junction of Waianae Valley Road and Farrington Highway.	4.39	1958-60	8-6-59	.41	(+)
2122	Mailiili Stream at Lualualei Naval Reservation near Waianae.	Lat 21°27'34", long 158°08'05", on right downstream wingwall of bridge, at Lualualei Naval Reservation, 3.4 miles east of Waianae cemetery.	1.76	1958-60	8-6-59	1.56	(+)
2124.01	Awanui Stream at Gilbert near Barbers Point Lighthouse.	Lat 21°19'54", long 158°06'05", on center pier of railroad bridge at Gilbert, 2.3 miles northeast of Barbers Point Lighthouse and 0.15 miles southeast of Gilbert.	2.64	1959-60	8-6-59	.61	(+)
2126.01	Waieke Stream at Wheeler Field.	Lat 21°28'42", long 158°03'08", on left bank of stream at culvert, 0.3 mile west of east-west runway at Wheeler Field.	5.93	1958-60	2-19-60	3.2	(+)
2127	Waikakalua Stream near Wahiawa.	Lat 21°27'50", long 158°01'38", on right bank, 2.4 miles southeast of Wahiawa Post Office.	7.14	1958-60	8-6-59	6.63	215 (334)
2165	Waimano flood channel at Pearl City.	Lat 21°23'55", long 157°58'16", 200 ft below a bridge on a residential street at Pearl City and 0.6 mile above mouth.	2.59	1956-60	1-15-60	1.15	(+)
2285	Moanalua Stream at altitude 100 ft. near Honolulu.	Lat 21°22'00", long 157°53'57", at left abutment of bridge in Moanalua Golf Course, 4.55 miles northwest of Honolulu Post Office.	4.16	1958-60	5-14-60	6.96	1,670 (2,580)
2295	Waolani Stream at Honolulu.	Lat 21°20'00", long 157°51'04", on right downstream wingwall of Wyllie Street Bridge at Honolulu, 1.8 miles northeast of Honolulu Post Office.	1.28	1958-60	5-14-60	3.58	1,200 (1,860)
2375	Pauoa Stream at Lusitana St. at Honolulu.	Lat 21°19'18", long 157°51'05", on upstream side of Lusitana Street Bridge at Honolulu.	1.52	1958-60	5-13-60	1.50	(+)

* Discharge not determined.

* Operated as a continuous-record gaging station.

^a Discharge figures opposite date are in million gallons a day; figures in parentheses are in cubic feet per second.

Annual maximum discharge at crest-stage partial-record stations--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge ^a
Island of Oahu--Continued							
2472	Waialae-Nui Gulch at Honolulu.	Lat 21°16'51", long 157°47'04", 75 ft downstream from Kalaniana'ole Highway at Honolulu.	1.75	1958-60	3- 5-60	2.84	105 (162)
2475	Wallupe Gulch at Aina Haina.	Lat 21°17'46", long 157°45'29", on Ani Street Bridge, 1.0 mile upstream from Kalaniana'ole Highway at Aina Haina.	2.35	1958-60	3- 5-60	3.68	853 (1,320)
2479	Kuliouou Stream at Kuliouou.	Lat 21°17'44", long 157°43'33", at footbridge, 0.4 mile upstream from Kalaniana'ole Highway bridge at Kuliouou.	1.21	1958-60	3- 5-60	.60	(+)
2488	Pacific Ocean tributary at Waimanalo.	Lat 21°20'31", long 157°42'39", 32 ft upstream from Hihimanu St. culvert, 0.8 mile northwest of Waimanalo Post Office.	1.21	1958-60	3- 5-58 2-13-59 3- 5-60	b6.00 1.77 1.84	384 (594) b58 (b90) 61 (94)
2605	Mauanawili Stream above Kailua Rd. near Kailua.	Lat 21°22'47", long 157°45'48", on upstream side of bridge on abandoned highway, 400 ft upstream from Kalaniana'ole Highway and 1.7 miles southwest of Kailua Post Office.	5.62	1958-60	3- 6-60	7.36	360 (557)
2744.99	Keaahala Stream at Kamehameha Highway at Kaneohe.	Lat 21°25'12", long 157°48'15", 36 ft upstream from bridge at Kamehameha Highway in Kaneohe.	.59	1958-60	2-19-60	2.37	(+)
2835	Kahaluu Stream at Kahaluu.	Lat 21°27'23", long 157°50'15", at a private road bridge, 0.45 mile above estuary and 0.5 mile south of Kahaluu.	3.70	1960	4-16-60	4.79	(+)
2952	Waikane Stream at Waikane.	Lat 21°29'36", long 157°51'10", 200 ft downstream from bridge on Kamehameha Highway and 0.3 mile south of Waikane.	2.60	1958-60	5-13-60	5.48	(+)
2959	Makaua Stream at Kaaawa.	Lat 21°33'36", long 157°51'24", on left downstream wingwall of Kamehameha Highway Bridge at Kaaawa.	.53	1958-60	5-13-60	1.94	(+)
3045	Kaluauui Stream near Hauula.	Lat 21°35'55", long 157°54'25", on left downstream wingwall of abandoned railroad bridge, 0.6 mile upstream from bridge on Kamehameha Highway and 1.2 miles southeast of Hauula cemetery.	2.12	1958-60	8- 6-59	4.19	930 (1,440)
3105.01	Malaekahana Stream at altitude 30 ft near Kahuku.	Lat 21°39'48", long 157°57'12", on right foundation and wing-wall of plantation railroad bridge, 1.3 miles south of Sugar Mill, Kahuku.	3.80	1959-60	9- 7-59	4.76	310 (480)
3110	Oio Stream near Kahuku.	Lat 21°41'32", long 157°59'48", 0.6 mile upstream from Kamehameha Highway Bridge and 3.1 miles west of Sugar Mill, Kahuku.	2.22	1958-60	5-14-60	2.68	90 (139)
3400	Anahulu River near Haleiwa.	Lat 21°35'28", long 158°04'45", 1.7 miles southeast from junction of Emerson Rd. and Kamehameha Highway and 2.5 miles east of Waialua School, Haleiwa.	11.9	1958-60	4-16-60	5.75	1,220 (1,860)
3500	Opaeha Stream near Haleiwa.	Lat 21°35'08", long 158°05'58", 0.6 mile upstream from Kamehameha Highway Bridge and 2.1 miles northeast of Waialua.	5.96	1956-60	8- 6-59	10.03	1,900 (2,940)
Island of Maui							
6070	Iao Stream at Wailuku.	Lat 20°53'38", long 156°30'27", 560 ft upstream from Market Street Bridge at Wailuku and 1.9 miles above mouth.	8.24	1952-60	12- 5-59	2.17	420 (650)

† Discharge not determined.

a Discharge figures opposite date are in million gallons a day; figures in parentheses are in cubic feet per second.

b Revised to present location.

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (†).

Discharge measurements made at miscellaneous sites during fiscal year 1960

Discharge measurements made at miscellaneous sites during fiscal year 1960						
Stream	Tributary to	Location	Measured previously (fiscal years)	Date	Million gallons a day	Cubic feet per second
Island of Kauai						
Kalalau Stream.	Pacific Ocean	Lat 22°09'45", long 159°38'10", 5.5 miles southwest of Kauai Electric Power House (drainage area, 1.6 sq mi, approximately).	1932-55*, 1956-59	7-18-59 6-18-60	2.93 2.92	4.53 4.52
Kalalau Stream tributary No. 3.	Kalalau Stream.	Lat 22°10'30", long 159°38'55", at mouth, 6.0 miles southwest of Kauai Electric Power House.	1946-49, 1956-59	7-18-57 6-18-60	1.54 1.64	2.38 2.54
Honopou Stream.	Pacific Ocean	Lat 22°10'00", long 159°40'25", at mouth, 10.9 miles northwest of Mana.	1957-59	7-18-59 6-18-60	2.06 2.43	3.19 3.76
Miloli'i Stream.	....do.....	Lat 22°08'55", long 159°43'30", at mouth, 8.3 miles northwest of Mana.	1946-48, 1951, 1954-59	7-19-59 6-19-60	1.53 1.45	2.37 2.24
Island of Oahu						
Kalihi Stream	Pacific Ocean	Lat 21°20'18", long 157°52'50", at Kalihiwaena School at Honolulu.		5-14-60	†4,100	†6,350
Maunawili Stream.	Kawainui Swamp.	Lat 21°22'50", long 157°45'48", at bridge on Kalaianalea Highway, 1.6 miles southwest of Kaliua Post Office.	1922, 1957-59	6-30-60	3.09	4.78
Kahanaiki Stream.	....do.....	Lat 21°22'49", long 157°46'06", at bridge, 1.85 miles southwest of Kaliua Post Office.	1957-59	6-30-60	.45	.70
Kawainui Stream.	Pacific Ocean	Lat 21°35'08", long 158°00'28", above Burma Rd., 50 ft above Kamananui ditch intake above Kawaihoa Camp.		7-14-59	.54	.84
Kaneohe Stream.	....do.....	Lat 21°24'54", long 157°47'35", near mouth, 0.6 mile southeast of Parker School.	1958-59	7-27-59	4.32	6.68
Kahaluu Stream tributary No. 1.	Kahaluu Stream.	Lat 21°26'21", long 157°51'10", near culvert, 3.2 miles southeast of Waihole School.	1958-59	7-22-59 1-8-60 6-27-60	.36 .30 .39	.56 .46 .60
Right Branch of Punaluu Stream tributary No. 1.	Punaluu Stream.	Lat 21°33'42", long 157°54'11", near gaging-station site, 3.35 miles southeast of Hauula School.	1958-59	7-21-59 6-24-60	.24 .45	.37 .70
Left Branch of Punaluu Stream tributary No. 1.	....do.....	Lat 21°33'44", long 157°54'12", at end of road, 3.3 miles southeast of Hauula School.	1958-59	6-24-60	.36	.56
Kaluani Stream.	Pacific Ocean	Lat 21°34'50", long 157°55'00", below Kaliuwa Falls, 2.0 miles south of Hauula School.	1958-59	7-24-59	.17	.26
Do.....	....do.....	Lat 21°35'38", long 157°54'25", 1.1 miles southeast of Hauula School.		7-24-59	.04	.05
Island of Molokai						
Waikolu Stream.	Pacific Ocean	Lat 21°10'19", long 156°55'58", at mouth above pipeline crossing, 9.75 miles northwest of Pukoo Post Office.		3-15-60 6-21-60	13.1 11.4	20.3 17.6
Island of Maui						
Makamakaole Stream (right branch).	Makamakaole Stream.	Lat 21°57'12", long 156°32'53", above Boy Scout Camp pipeline intake, 2.3 miles northwest of Waihee School and 5.1 miles northwest of Wailuku Post Office.		1-11-60	0.02	0.03
Do.....	....do.....	Lat 20°57'14", long 156°32'52", below Boy Scout Camp pipeline intake.		1-11-60	.04	.06
Do.....	....do.....	Lat 20°57'20", long 156°32'15", at Boy Scout Camp Maluhia pipeline at water tank, near Waihee.		1-11-60	.02	.03
Makamakaole Stream (left branch).	....do.....	Lat 20°57'40", long 156°33'45", above Marshall D River at old gaging station.		1-11-60	.68	1.05

† Peak flow.

* Operated as a continuous-record gaging station.

a Drainage area, 5.3 sq mi.

Discharge measurements made at miscellaneous sites during fiscal year 1960--Continued

Discharge measurements made at miscellaneous sites during fiscal year 1960--Continued						
Stream	Tributary to	Location	Measured previously (fiscal years)	Date	Discharge	
					Million gallons a day	Cubic feet per second
Island of Maui--Continued						
Kauauala Stream.	Pacific Ocean	Lat 20°52'09", long 156°39'13", 0.9 mile above mouth at altitude 230 ft, near Lahaina. ^b		5-13-60	†1,720	†2,660
Kahoma Stream	....do.....	Lat 20°53'28", long 156°40'15", 500 ft below confluence with Kanana Stream and 1.5 miles above mouth. ^c		5-13-60	†5,010	†7,750
Island of Hawaii						
Honolii Stream.	Pacific Ocean	Lat 19°45'36", long 155°05'50", above old belt road near Hilo.		7-24-59 11-19-59	9.37 19.3	14.5 29.9
Hanawi Stream	....do.....	Lat 19°48'30", long 155°06'15", above new highway bridge.		7-25-59 11-19-59	3.84 8.92	5.94 13.8
Kohakohau Stream.	Keamuiamano Stream.	Lat 20°01'45", long 155°42'05", at Waiaka, at bridge at junction of Kohala-Waimea and Kawaihae-Waimea roads, 2 miles west of Kamuela Post Office.	1955-59	7-22-59 11-17-59 3-14-60 5- 4-60	.72 .24 .21 1.27	1.12 .37 .33 1.96

† Peak flow.

^b Drainage area, 4.2 sq mi.^c Drainage area, 4.94 sq mi.

INDEX

	Page	Page
Accuracy of field data and computed results.....	5	Heeia, Waihee Stream near..... 99-100
Acre-foot, definition of.....	2	Hering Springs at altitude 970 ft..... 6
Agencies other than Geological Survey, records collected by.....	6-9	Hilo, Kapehu ditch near..... 178
Aiea, Halawa Stream near.....	74	Kapehu ditch diversion near..... 177
Kalaauo Stream at.....	71	Kapehu Stream near..... 204
North Halawa Stream near.....	72-73	Waiakea Stream near..... 175
Pearl Harbor Springs near.....	70	Wailuku River near..... 176, 203
Waimalu Stream near.....	69	Holualoa, Waiaha Stream near..... 189
Alewa Heights Springs near Honolulu.....	6	Honaunau, Kiilae Stream near..... 190
Alili flume near Pahala.....	8	Honokohau, Honokohau Stream near..... 171
Anahola ditch above Kaneha Reservoir, near Kealia.....	41	Kahakuloa Stream near..... 170
Anahola ditch wasteway near Kealia.....	40	Honokohau Stream near Honokohau..... 171
Anahola Stream near Kealia.....	42-43	Honokowai ditch near Lahaina..... 172
Awini ditch at East Honokane Iki Gulch, near Niulii.....	181	Honolulu, East Branch Manoa Stream near..... 80
Awini weir near Niulii.....	8	Kalihi Stream near..... 76-78
Booth Springs near Honolulu.....	6	Moanalua Stream near..... 75
Computations, accuracy of results of..	5	Nuuanu Stream near..... 79
Control, definition of.....	2	Palolo Stream near..... 85
Cooperation, record of.....	1	Pukele Stream near..... 82-83
Cubic foot per second, definition of..	2	Waioamao Stream near..... 84
		West Branch Manoa Stream near..... 81
Data, accuracy of.....	5	Honomanu Stream, at Haiku-uka boundary, near Kailiili..... 202
explanation of.....	3-5	near Keanae..... 140
Drainage area, definition of.....	2	Honopou Stream near Huelo..... 164
		Hoolawanui Stream near Huelo..... 163
East Honokane Iki intake to Awini ditch at East Honokane Iki Gulch, near Niulii.....	182	Huelo, Haipuaena Stream near..... 144-145
Eleele, Hanapepe River near..... 26-27, 192, 193		Honopou Stream near..... 164
Manuahi Stream near.....	193	Hoolawanui Stream near..... 163
Everett ditch near Wailuku.....	7	Kaalea Gulch near..... 159-161
Gaging station, definition of.....	1	Koolau ditch near..... 147
		Lowrie ditch near..... 168
Hahalawe Stream, Right Branch, near Kipahulu.....	129	Manuel Luis ditch near..... 148-155
Haiku ditch, at Hamakuapoko.....	7	Naillilihaele Stream near..... 162
at Honopou Gulch, near Kailua.....	169	New Hamakua ditch near..... 166
Haiku Stream near Heeia.....	91-93	Old Hamakua ditch near..... 167
Haiku tunnel at altitude 550 ft.....	6	Puohokamoa Stream near..... 156-157
Haipuaena diversion ditch at Kolea Gulch, near Keanae.....	143	Speckels ditch near..... 146
Haipuaena Stream, above Spreckels ditch, near Huelo.....	144-145	Waikamoi Stream near..... 202
at Kula pipeline intake, near Olinda	142	Wailoa ditch near..... 165
Halaulani Stream at altitude 400 ft, near Kilauea.....	51	Iao-Waikapu ditch near Wailuku..... 7
Halawa Stream (Island of Molokai) near Halawa.....	115-116	Iolekaa Stream mauka near Heeia..... 94
Halawa Stream (Island of Oahu) near Aiea.....	74	Ka Loko ditch near Kilauea..... 45
Hanalei, Hanalei River near.....	195-196	Kaalea Gulch near Huelo..... 159-161
Kalalau Stream near.....	199	Kahakuloa Stream near Honokohau..... 170
Lumaha'i River near.....	198	Kahaluu Stream near Heeia..... 95-98
Wai'aha River near.....	54	Kahaluu tunnel near Kahaluu..... 6
Waioli Stream near.....	197	Kahana development tunnel near Hauula.. 6
Hanalei ditch near Kilauea.....	52	Kahana Stream at altitude 30 ft, near Kahana..... 107-108
Hanalei River at altitude 625 ft, near Hanalei.....	195-196	Kahoma tunnel at altitude 2,000 ft..... 7
Hanalei tunnel outlet near Lihue.....	53	Kahuawai Springs near Honolulu..... 6
Hanamaulu ditch near Hanamaulu.....	6	Kailiili, Honomanu Stream near..... 202
Hanapepe River, at Koula, near Eleele.....	192	Kailua, Haiku ditch near..... 169
at makai siphon, near Eleele.....	193	Makawao Stream near..... 87-88
below Manuahi Stream, near Eleele.....	26-27	Kalae, Waialala Springs near..... 120
Hanawi Stream, below Government Road, near Nahiku.....	200-201	Kalalau Stream near Hanalei..... 199
near Nahiku.....	131-133	Kalaauo Stream at Moanalua Road at Aiea..... 71
Hauani Stream near Kamuela.....	188	Kalaupapa, Waikolu Stream near..... 117-118, 119
Hawaii, island of, gaging-station records on.....	174-190	Kalihi Stream near Honolulu..... 76-78
measurements at miscellaneous sites on.....	208	Kalihi tunnels near Honolulu..... 6
Hawaiian Electric Co. tunnel at Waiau, near Pearl City.....	68	Kalihiwai ditch, above wasteway, near Kilauea..... 48
Heeia, Haiku Stream near.....	91-93	near Kilauea..... 49
Iolekaa Stream mauka near.....	94	Kaluanui ditch at altitude 960 ft..... 7
Kahaluu Stream near.....	95-98	Kamalo, Right Branch of East Fork Kawela Gulch near..... 122-124
		Kamananui Stream at Maunawai..... 112-113
		Kamooalii Stream at Kaneohe..... 89-90
		Kamuela, Hauani Stream near..... 188
		Kohakohau Stream near..... 185
		Waikoloa Stream near..... 186, 187
		Kanaha ditch above Lahainaluna, Maui..... 8
		Kanaha ditch near Lihue, Kauai..... 194
		Kaneohe, Kamooalii Stream at..... 89-90
		Kapaa, Kapaa Stream near..... 39
		Left Branch Opaikaa Stream near..... 36
		North Fork Wailua River near..... 35
		Wailua ditch near..... 34

	Page		Page
Pearl Harbor Springs at Waiawa, near		Waiawa ditch at altitude 680 ft.....	7
Pearl City.....	65	Waiawa intake at altitude 750 ft.....	7
Poamoho Stream near Wahiawa.....	61	Waiawa Stream near Pearl City.....	67
Poamoho tunnel near Wahiawa.....	60	Waihee ditch, at altitude 600 ft.....	8
Pohakuhonu Stream near Kilauea.....	50	at altitude 240 ft.....	8
Publications on streamflow, by		Waihee Stream near Heeia.....	99-100
agencies other than Geological		Waihee tunnel at altitude 218 ft.....	7
Survey.....	6-9	Waiilikahi Stream near Waimanu.....	179
by the Geological Survey.....	5	Waikakalaua ditch at altitude 760 ft... ..	7
Pukele Stream near Honolulu.....	82-83	Waikamoi Stream, above reservoir at	
Pukoo, Punaula Gulch near.....	125	Kula pipeline intake, near	
Punaluu ditch near Punaluu.....	109-110	Olinda.....	158
Punaluu Stream near Punaluu.....	111	near Huelo.....	202
Punaula Gulch near Pukoo.....	125	Waikane development tunnels.....	7
Puohokamoa Stream above Spreckels		Waikane Stream at altitude 75 ft, at	
ditch, near Huelo.....	156-157	Waikane.....	106
Puu Ka Ele ditch near Kilauea.....	46	Waikele Stream at Waipahu.....	64
Puukumau Inlet near Hawi.....	9	Waikoloa Stream, at Marine Dam, near	
Puukumau Outlet near Hawi.....	9	Kamuela.....	187
		near Kamuela.....	186
Ross ditch near Kilauea.....	47	Waikolu Stream, at altitude 900 ft,	
		near Kalaupapa.....	117-118
South Waikapu ditch near Waikapu.....	8	below pipeline crossing, near	
Spreckels ditch, at Haipuaena weir,		Kalaupapa.....	119
near Huelo.....	146	Wailoa ditch, at Honopou, near Huelo....	165
near Waihee.....	8	at Kamaole.....	8
Stable storm ditch near Lihue.....	31	Wailua ditch near Kapaa.....	34
Stage-discharge relation, definition		Wailua River, North Fork, at altitude	
of.....	2	650 ft, near Lihue.....	32
Station numbers.....	2-3	North Fork near Kapaa.....	35
		East Branch of, near Lihue.....	33
Taro patch feeder ditch at Keanae.....	138	South Fork, near Lihue.....	28-29
Terms and abbreviations, definition of	1-2	Wailuku River, above Hilo Boarding	
		School ditch intake, near Hilo....	176
Ukumehame ditch near Olowalu.....	8	at Pukamau, near Hilo.....	203
Upper Lihue ditch near Lihue.....	6	Waimalu Stream near Aiea.....	69
Uwau development tunnel near Kahaluu..	7	Waimanalo, Maunawili ditch near.....	86
		Waimanalo tunnel.....	7
WSP, definition of.....	2	Waimanu, Kukui Stream near.....	180
Wahiawa, Kipapa Stream near.....	63	Waiilikahi Stream near.....	179
Left Branch of North Fork		Waimea, Kawaikoi Stream near.....	10-11
Kaukonahua Stream near.....	55	Kekaha ditch near.....	22
Mauka ditch near.....	56	Koae Stream near.....	18-21
North Fork Kaukonahua Stream near...	57	Kokee ditch near.....	14
Opaeula Stream near.....	114	Makaweli River near.....	25
Poamoho Stream near.....	61	Mohihi Stream near.....	12-13, 191
Poamoho tunnel near.....	60	Waialae Stream near.....	191
Right Branch of South Fork		Waimea ditch near.....	23
Kaukonahua Stream near.....	59	Waimea River near.....	15-17, 24
South Fork Kaukonahua Stream near...	58	Waimea ditch below wasteway, near	
Waiala Stream near Holualoa.....	189	Waimea.....	23
Waiahole Stream at altitude 250 ft,		Waimea River, at altitude 890 ft, near	
near Waiahole.....	105	Waimea.....	15-17
Waiahole tunnel, at adit 8, near		near Waimea.....	24
Waipahu.....	104	Waimea Valley ditch near Waimea.....	6
at north portal, near Waiahole.....	103	Wainiha River near Hanalei.....	54
at Waiuanu, near Waiahole.....	101	Waiohue Gulch near Nahiku.....	136
Waiahole tunnel wasteway at Intake 31,		Waioli Stream near Hanalei.....	197
near Waiahole.....	102	Waiomao Stream above Pukele Stream,	
Waiakea Stream at middle flume house,		near Honolulu.....	84
near Mountain View.....	174	Waipahu, Waiahole tunnel near.....	104
near Hilo.....	175	Waikele Stream at.....	64
Waialae Stream near Waimea.....	191	West Wailuaiki Stream near Keanae.....	137
Waialala Springs near Kalae.....	120	Work, division of.....	1
Waianae tunnel near Maile.....	7	scope of.....	1

