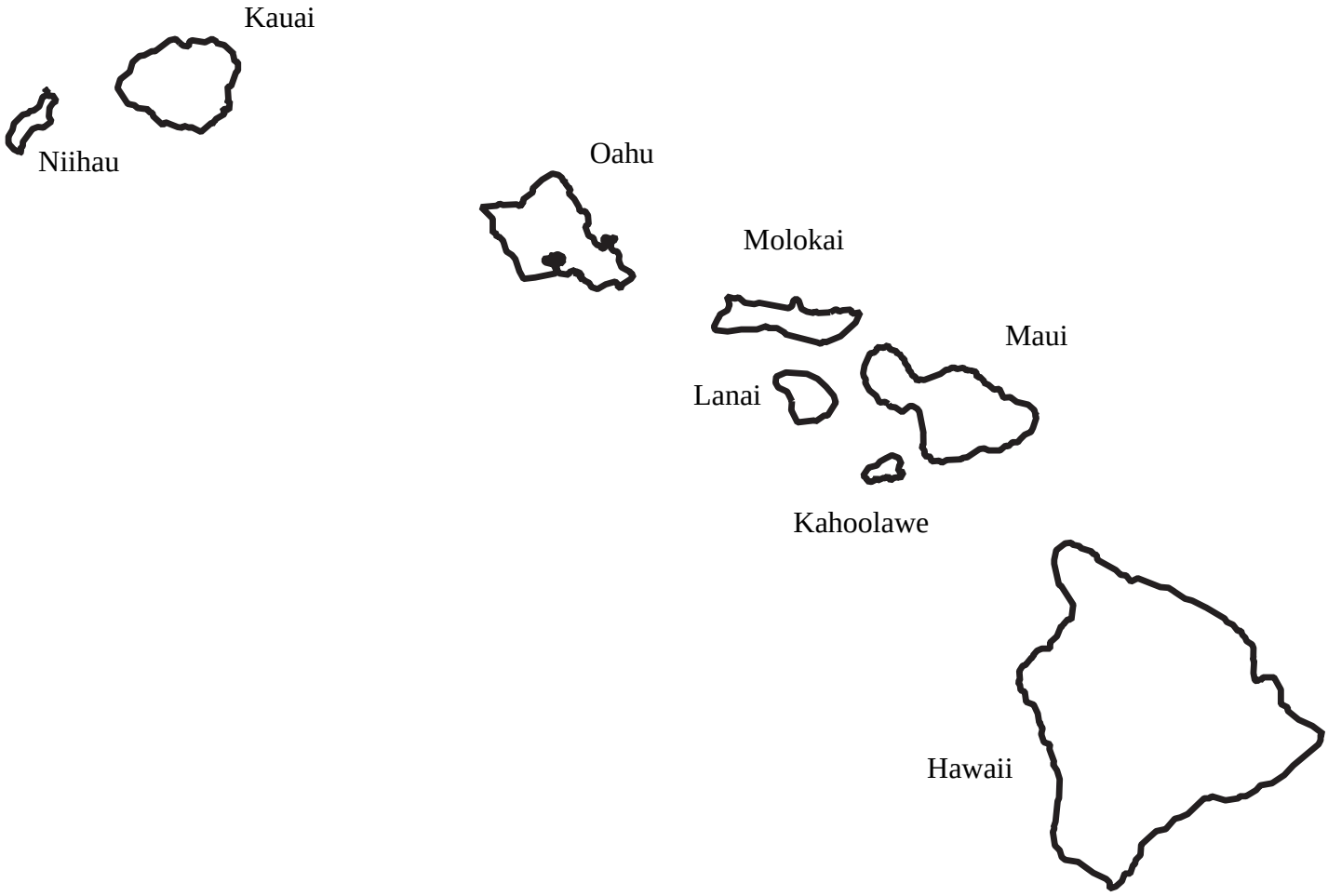
Water Resources Data
Hawaii and other Pacific Areas
Water Year 2004

Volume 1. Hawaii
Water-Data Report HI-04-1



U.S. Department of the Interior
U.S. Geological Survey

Calendar for Water Year 2004

2003

October

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

November

S	M	T	W	T	F	S
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23	24	25	26	27	28	29
30						

December

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7	8	9	10	11	12	13
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28	29	30	31			

2004

January

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

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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29						

March

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	1	2	3	4	5	6
7	8	9	10	11	12	13
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21	22	23	24	25	26	27
28	29	30	31			

April

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

May

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9	10	11	12	13	14	15
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23	24	25	26	27	28	29
30	31					

June

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27	28	29	30			

July

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

August

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

September

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

Water Resources Data
Hawaii and other Pacific Areas
Water Year 2004

By B.H. Shimizu, D.C. Nishimoto, R.I. Taogoshi and P.C. Teeters

Volume 1. Hawaii

Water-Data Report HI-04-1

Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Commission on Water Resource Management and with other agencies.

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
Charles G. Groat, Director

2005

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PREFACE

This annual hydrologic data report of Hawaii is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface and ground-water data collection networks in each State, Puerto Rico, American Virgin Islands, selected islands in the Caribbean, Commonwealth of the Northern Mariana Islands, Guam, American Samoa, Republic of Palau, and selected islands in the Pacific. These records of streamflow, ground-water levels, rainfall, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report contains hydrologic data for Hawaii. It is the culmination of a concerted effort by personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines, the Hawaii discipline specialists, Stephen Anthony, Richard Fontaine, and Stephen Gingerich, reviewed and verified the data, and the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Island of Kauai
- Clayton H. Yoshida

Island of Hawaii
- Gary A. Sanchez

Islands of Maui and Molokai
- Matt A.T. Wong

Island of Oahu
- Vaughn E. Kunishige
- Jill D. Nishimura
- Marcael T.J. Ball
- Stacie T.M. Young
- Heather A. Jeppesen
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This report was prepared in cooperation with the State of Hawaii, and with other local and Federal agencies under the general supervision of Gordon Tribble, Pacific Islands Water Science Center, Hawaii.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 2004 water year for Hawaii consist of records of stage, discharge, and water quality of streams and springs; water levels and quality of water wells; and rainfall totals.

- Water discharge for 66 gaging stations on streams, springs, and ditches.
- Water-quality data for 4 streams, and 1 well.
- Water levels for 42 observation wells.
- Rainfall data for 37 rainfall stations.

These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating Federal, State, and other local agencies in Hawaii.

*Hawaii, *Hydrologic data, *Surface water, *Water quality, *Ground water, Gaging stations, Flow rate, Chemical

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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

NOTE.--Data for partial-record and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

Letters after station name designate type of data: (d) discharge, (c) chemical, (m) microbiological, (t) water temperature, and (s) sediment.

	Station number
ISLAND OF KAUAI	
Kawaikoi Stream (head of Waimea River) near Waimea (d)	16010000
Waimea River:	
Waialae Stream at altitude 3,820 ft, near Waimea (d)	16019000
Makaweli River near Waimea (d)	16036000
Hanapepe River below Manuahi Stream, near Eleele (d)	16049000
Wailua River:	
South Fork Wailua River near Lihue (d)	16060000
North Fork Wailua River:	
East Branch of North Fork Wailua River near Lihue (d)	16068000
Opaekaa Stream:	
Left Branch Opaekaa Stream near Kapaa (d)	16071500
Kilauea Stream:	
Halaulani Stream at altitude 400 ft, near Kilauea (d)	16097500
Hanalei River near Hanalei (d)	16103000
Wainiha River near Hanalei (d)	16108000
Limahuli Stream near Wainiha (d)	16114000
ISLAND OF OAHU	
Kaukonahua Stream (head of Kiikii Stream):	
North Fork Kaukonahua Stream above Right Branch, near Wahiawa (d)	16200000
South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa (d)	16208000
Makaha Stream near Makaha (d)	16211600
Waikele Stream:	
Kipapa Stream near Wahiawa (d)	16212800
Waikele Stream at Waipahu (d)	16213000
Waiawa Stream near Pearl City (d)	16216000
Halawa Stream:	
North Halawa Stream near Aiea (d)	16226000
North Halawa Valley Highway Storm drain C near Aiea (d)	212353157533001
North Halawa Stream near Honolulu (d)	16226200
North Halawa Stream near Quarantine Station at Halawa(d)	16226400
Kalihi Stream:	
Near Honolulu (d)	16229000
At Kalihi (d)	16229300
Waiakeakua Stream (head of Manoa Stream) at Honolulu (d)	16240500
Manoa Stream at Kanewai Field (d)	16242500
Pukele Stream near Honolulu (d)	16244000
Manoa-Palolo Drainage Canal (d)	16247100

Station number

ISLAND OF OAHU--Continued

Maunawili Stream:
Makawao Stream near Kailua (d) 16254000
Kaneohe Stream:
Kamooalii Stream below Luluku Stream, near Kaneohe (d) 16272200
Haiku Stream near Heeia (d) 16275000
Kahaluu Stream near Ahuimanu (d) 16283200
Waihee Stream near Kahaluu (d) 16284200
Waiahole Tunnel above Kamehameha Highway (d) 16294100
Waikane Stream at altitude 75 ft, at Waikane (d) 16294900
Hakipuu Stream near Waikane (d) 16295300
Kahana Stream at altitude 30 ft, near Kahana (d) 16296500
Punaluu Stream:
Punaluu ditch near Punaluu (d) 16302000
Punaluu Stream near Punaluu (d) 16303000
Kaluanui Stream near Punaluu (d) 16304200
Waimea River:
Kamananui Stream at Maunawai (d) 16330000
Paukauila Stream:
Opaeula Stream near Wahiawa (d) 16345000

ISLAND OF MOLOKAI

Halawa Stream near Halawa (d) 16400000
Waikolu Stream:
Molokai tunnel at west portal (d) 16405300
Kaunakakai Gulch at 75 ft (d) 16414200
Papio Gulch at Halawa (d) 16419500

ISLAND OF MAUI

Oheo Gulch at Dam near Kipahulu (d) 16501200
Hanawi Stream:
near Nahiku (d) 16508000
West Wailuaiki Stream near Keanae (d) 16518000
Honopou Stream near Huelo (d) 16587000
Kakipi Gulch:
Opana Gulch:
Opana tunnel at Kailiili (d) 16599500
Iao Stream at Kepaniwai Park, near Wailuku (d) 16604500
Waihee River at dam, near Waihee (d) 16614000
Kahakuloa Stream near Honokohau (d) 16618000
Honokohau Stream near Honokohau (d) 16620000

ISLAND OF HAWAII

Wwaiakea Stream at Hoaka Road 16700600
Wwaiakea Stream at Hilo 16701300
Wailuku River at Piihonua (d) 16704000
Honolii Stream near Papaikou (d) 16717000
Kawainui Stream (head of Wailoa Stream) near Kamuela (d) 16720000

	Station number
ISLAND OF HAWAII--Continued	
Waipio Stream (continuation of Kawainui Stream):	
Alakahi Stream near Kamuela (d)	16725000
Upper Hamakua ditch above Waimea Reservoir diversion, near Kamuela (d)	16726000
Lower Hamakua Ditch above main weir (d)	16732800
Kohakohau Stream below DWS intake, near Kamuela (d)	16756100
Waikoloa Stream at Marine Dam, near Kamuela (d)	16758000
Hauani Gulch (head of Lanimaumau Stream) near Kamuela (d)	16759000
Paauau Gulch at Pahala (d)	16770500

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after well number designate type of data: (c) chemical, (t) water temperature, (w) water level

HAWAII

ISLAND OF KAUAI

(2-0021-01)	220057159210301	(w)
(2-0022-01)	220013159224001	(w)
(2-0023-01)	220051159231801	(w)
(2-0044-14)	220019159444801	(w)
(2-0124-01)	220133159242001	(w)
(2-0126-01)	220126159261501	(w)
(2-0320-03)	220354159205602	(w)
(2-0818-03)	220825159185301	(w)
(2-1020-03)	221038159203801	(w)
(2-1126-01)	221150159264501	(w)
(2-1232-01)	221247159324801	(w)
(2-1333-01)	221318159335901	(w)
(2-5426-03)	215434159263301	(w)
(2-5427-01)	215454159274201	(w)
(2-5534-03)	215522159342601	(w)
(2-5534-06)	215509159340401	(w)
(2-5626-01)	215630159265101	(w)
(2-5634-01)	215607159344301	(w)
(2-5824-02)	215856159243201	(w)
(2-5824-08)	215858159243601	(w)
(2-5840-01)	215803159401201	(w)
(2-5843-01)	215857159430101	(w)
(2-5921-01)	215958159214301	(w)
(2-5923-01)	215901159235301)	(w)
(2-5923-07)	215901159235201	(w)
(2-5923-08)	215950159231601	(w)
(2-5939-01)	215906159395601	(w)

ISLAND OF MOLOKAI

(4-0448-02)	210425156483001	(w)
(4-0449-01)	210402156495801	(w)
(4-0457-01)	210419156570501	(w)
(4-0601-01)	210605157012001	(w)
(4-0800-01)	201825157004301	(ct)

ISLAND OF MAUI

(6-3925-01)	203912156255901	(w)
(6-4824-01)	204827156242201	(w)
(6-5130-01)	205140156304501	(w)
(6-5130-02)	205154156303801	(w)
(6-5330-05)	205305156304401	(w)
(6-5330-09)	205329156305502	(w)
(6-5332-04)	205312156321402	(w)
(6-5418-01)	205433156184101	(w)
(6-5430-03)	205419156304401	(w)
(6-5430-05)	205405156305401	(w)
(6-5431-01)	205437156310501	(w)
(6-5631-01)	205617156311101	(w)
(6-5731-05	205705156312401	(w)
(6-5840-01)	205856156400101	(w)

RAINFALL STATIONS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

Letters after station number designate type of station: (r) recording, and (n) non-recording

HAWAII

ISLAND OF KAUAI

(1042.0)	220523159341201	(r)
(1045.0)	220504159321401	(r)
(1047.0)	220427159300201	(r)
(1051.0)	220356159281401	(r)
(1068.0)	220443159235601	(r)
(1080.0)	220817159374401	(r)
(1082.0)	220739159373001	(r)
(1083.0)	220713159361201	(r)
(1084.0)	220927159355001	(r)
(1085.0)	220703159351201	(r)
(1131.7)	221101159280801	(r)

ISLAND OF OAHU

(711.6)	211747157485601	(r)
(771.9)	212304157542201	(r)
(771.11)	212428157511201	(r)
(772.1)	212346157533701	(r)
(772.3)	212359157502601	(r)
(773.3)	212029157523601	(r)
(794.3)	212114157435001	(r)
(832.2)	212813157574001	(r)
(842.1)	213016158105901	(r)
(882.3)	213205157571001	(n)
(882.4)	213211157562400	(r)
(883.12)	213215157552800	(r)
(886.4)	213237157530701	(r)
(886.6)	213000157515401	(r)
(897.1)	213725158010401	(r)
(897.9)	213608158011101	(r)

ISLAND OF MOLOKAI

(551.5)	211039157123101	(r)

ISLAND OF MAUI

(255.0)	203721156151601	(r)
(280.1)	204017156031701	(r)
(297.0)	204923156371501	(r)
(311.3)	204606156270301	(r)
(348.5)	204916156083701	(r)

ISLAND OF HAWAII

(83.0)	194117155174801	(r)
(92.5)	194945155534402	(r)
(185.7)	200518155405801	(r)
(190.4)	200148155420501	(n)

INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with State, local, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Hawaii each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the U.S. Geological Survey, the data are published annually in this report series entitled “Water Resources Data - Hawaii.”

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 66 stream-gaging stations; (2) water-quality records for 4 streamflow-gaging stations; (3) water-level records for 42 observation wells; (4) water-quality records for 1 observation well; and (5) accumulated rainfall records for 37 rainfall stations.

This series of annual reports for Hawaii began with the 1961 fiscal year (State of Hawaii) with a report that contained only data relating to the quantities of surface water. For the 1964 fiscal year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to include, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels. Beginning with the 1993 water year, accumulated rainfall data were included in the report.

Prior to introduction of this series (through June 30, 1960, for Hawaii) and for several water years concurrent with it, water-resources data for Hawaii were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities in the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Branch of Information Services, Box 25286, Denver, Colorado 80225-0286. For further ordering information, telephone (303) 202-4700.

Publications similar to this report are published annually by the U.S. Geological Survey for all states. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as “U.S. Geological Survey Water-Data Report HI-04-1.” For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. For further ordering information, the Customer Inquires telephone number is (703) 487-4650.

Additional information, including current prices, for ordering specific reports may be obtained from the District office at the address given on the back of the title page or by telephone at (808) 587-2400.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii (and formerly the Territory of Hawaii) have had cooperative agreements for the systematic collection of streamflow and ground water-level records since 1909, and for water-quality records since 1967. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the USGS are:

Hawaii Department of Land and Natural Resources, Commission on Water Resource Management, Dean NaKeno, Acting Deputy Director.
Hawaii Department of Land and Natural Resources, Engineering Division, Eric Hirano, Chief Engineer.
Hawaii Department of Land and Natural Resources, Land Division, Dierdre Mamiya, Administrator.
Hawaii Department of Transportation, Rodney Haraga, Director.
Hawaii Department of Agriculture, Agricultural Resources Division, Brian Kau, Administrator.
City and County of Honolulu, Board of Water Supply, Clifford Jamile, Manager and Chief Engineer.
City and County of Honolulu, Department of Planning and Permitting, Eric Crispin, Director and Chief Engineer.
City and County of Honolulu, Department of Environmental Services, Frank Doyle, Director.
National Tropical Botanical Garden, Charles Wichman Jr., Assistant Director.
Maui County Board of Water Supply, George Tengan, Director.
Kauai County Department of Water, Edward Tschupp, Director.
Hawaii County Department of Water Supply, Milton Pavao, P.E., Manager.
Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers, U.S. Army Hawaii Garrison, National Weather Service, and Hawaii County Department of Public Works.

SUMMARY OF HYDROLOGIC CONDITIONS

In general, the 2004 water year experienced more rainfall than the previous year. Conditions were wetter than normal in most areas, and particularly on the island of Oahu. Flooding in December, 2003, caused substantial damage in the Mapunapuna area of Honolulu.

Surface Water

Substantial variations of stream flow during the 2004 water year were recorded at four index stations (figure 1). These stations are all on streams that are undiverted or unregulated, so that increase or decreases in stream flow can be considered primarily the result of rainfall fluctuations. Annual mean discharges for the 2004 water year at stations 16068000, 16229000, 16587000 and 16717000 were 106 percent, 189 percent, 121 percent and 88 percent of the long-term (1961-2000 water years for all stations except 16717000; 1967-2000 for station 16717000) median annual mean discharges at these stations respectively (figure 1).

Between December, 2003, and May, 2004, monthly mean stream flows were frequently in the upper 25% of long-term flows at all four index stations. Monthly mean flows at the index stations were mostly in the lower 50% of long-term records in October and November, 2003, and from July to September, 2004. Instantaneous peak flows at the index stations were much lower than the peak flows for the period of record at these stations (table 1).

Table 1.—Comparison of peak discharge for 2003 water year with the peak discharge for the period of record at four representative stations.

	WY04		POR	
Station	date	peak	date	peak
16068000	Feb. 27	2,540	11/12/55	18,400
16229000	Nov. 29	1,100	11/18/30	12,400
16587000	Mar. 22	2,980	11/18/30	5,710
16717000	Mar. 14	8,790	5/23/78	22,600

Ground Water

Ground-water level are affected by several factors, including rainfall, pumping, evapotranspiration, and, in coastal areas, tides. Ground water levels at three continuously monitored observation wells in Hawaii fluctuated throughout the year.

Water levels at well 2-5634-01 (station number 215607159344301) near Hanapepe on Kauai were slightly above water levels recorded the previous year. Water levels at this well were lowest in October and highest in July. Water levels at well 3-2256-10 (station number 212238157561101) near Pearl Harbor on Oahu increased during the year. Water levels at this

well were lowest in November and highest in September. Water levels at well 6-5431-01 (station number 205437156310501) near Wailuku, Maui increased rapidly in January and declined in June. Water levels at this well peaked in April, and the lowest recorded water levels were measured in October.

Rainfall

The Hawaiian Islands have extreme variability in annual rainfall amounts owing to strong orographic effects. The wettest location in Hawaii is considered to be Mount Waialeale on Kauai, with an average rainfall of approximately 433 inches per year. Areas of very low rainfall are found on the leeward side of the larger islands, particularly Maui and Hawaii.

In water year 2004, rainfall amounts were close to long-term normal amounts. Rainfall at the USGS-National Weather Service gage on Mount Waialeale totaled 408.85 inches or about 94 percent of the mean annual rainfall of 433 inches per year. The Kepuni Gulch rain gage on the leeward side of Haleakala on Maui recorded 37.69 inches, about 126 percent of the mean annual rainfall of approximately 30 inches.

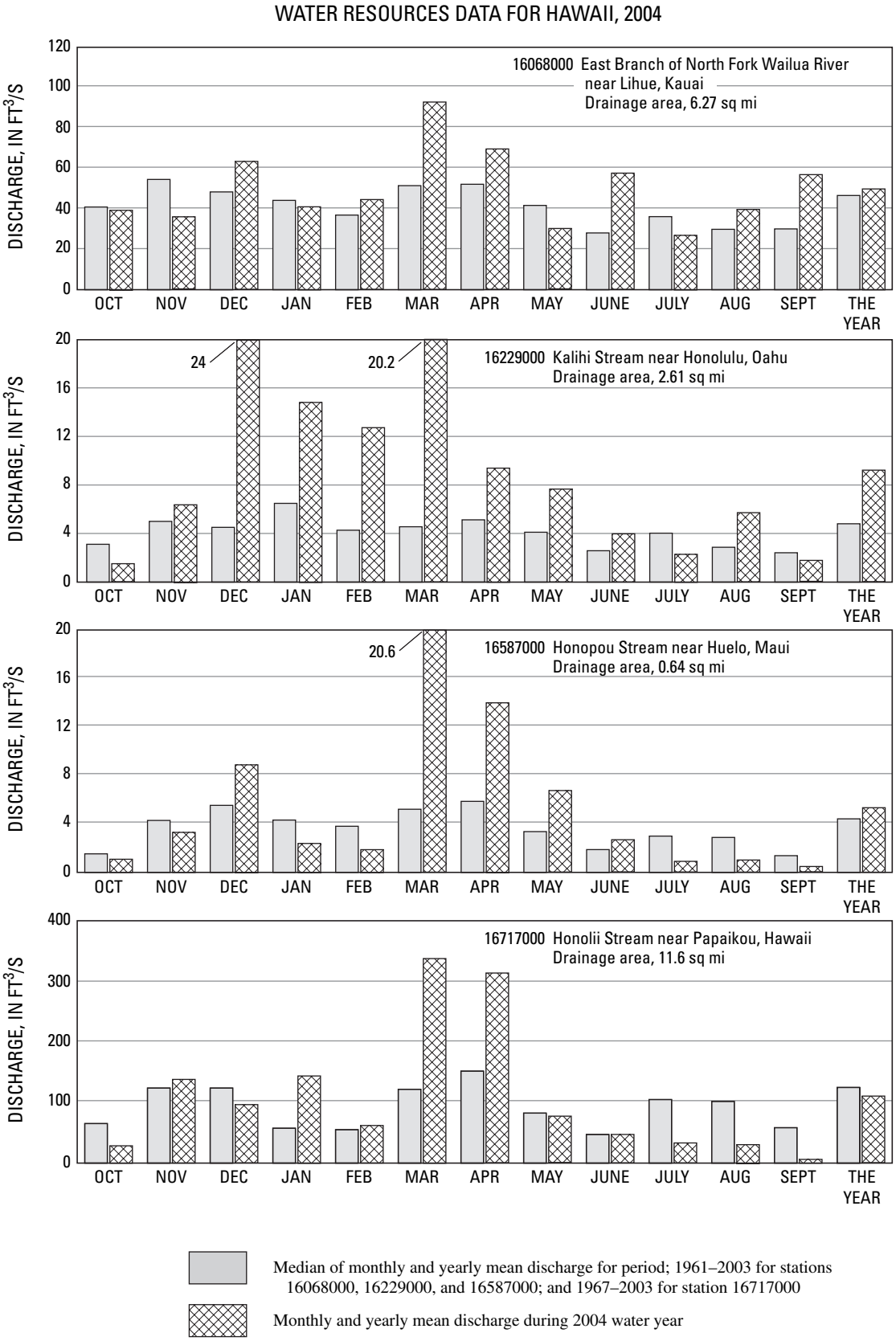


Figure 1. Discharge during 2004 water year compared with median discharge for four representative gaging stations.

DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, hydrologic-station records in USGS reports have been listed in order of downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary entering between two main-stream stations is listed between those stations. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is located with respect to the stream to which it is immediately tributary is indicated by an indention in that list of stations in the front of this report. Each indentation represents one rank. This downstream order and system of indentation indicates which stations are on tributaries between any two stations and the rank of the tributary on which each station is located.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These station numbers are in the same downstream order used in this report. In assigning a station number, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list composed of both types of stations. Gaps are consecutive. The complete 8-digit (or 10-digit) number for each station such as 09004100, which appears just to the left of the station name, includes a 2-digit part number “09” plus the 6-digit (or 8-digit) downstream order number “004100.” In areas of high station density, an additional two digits may be added to the station identification number to yield a 10-digit number. The stations are numbered in downstream order as described above between stations of consecutive 8-digit numbers.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The USGS well and miscellaneous site-numbering system is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, and the next 7 digits denote degrees, minutes, and seconds of longitude; the last 2 digits are a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and miscellaneous site are the same, a sequential number such as “01,” “02,” and so forth, would be assigned as one would for wells (see fig. 2). The 8-digit, downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

In addition to the latitude-longitude based site identification number, wells in the State of Hawaii are assigned local well numbers. Beginning in 1971, the local well-numbering system was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00’ of latitude, and 60 was added to the minutes of latitude in areas more than 20°00’ of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00’ of longitude, and 60 was added to the minutes of longitudes more than 156°00’ longitude (see figures 3 and 4).

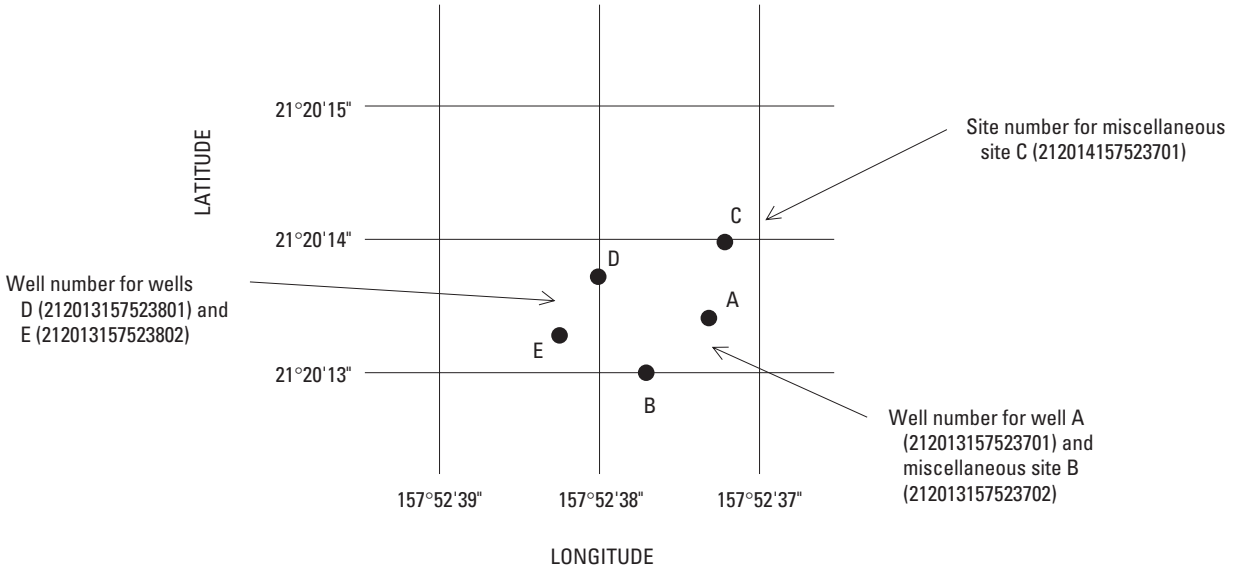


Figure 2. System for numbering wells and miscellaneous sites.

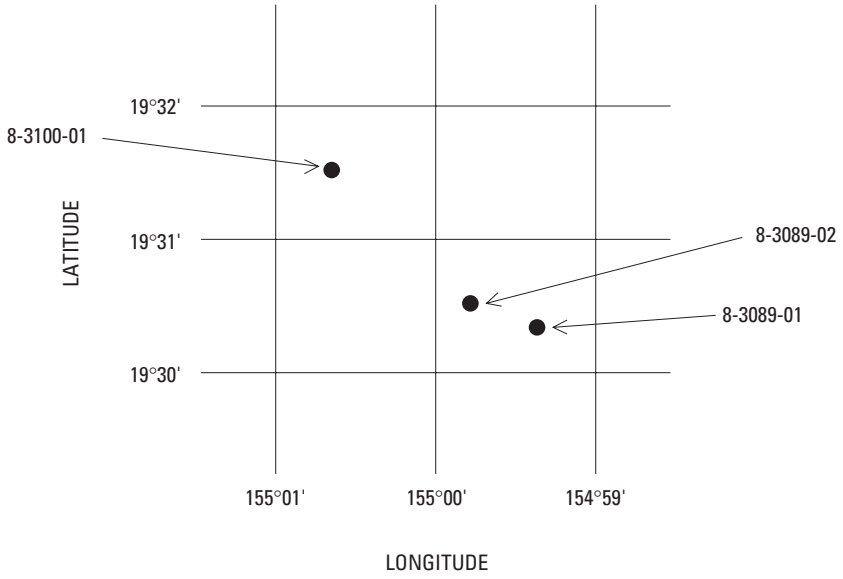


Figure 3. Local well numbering system.

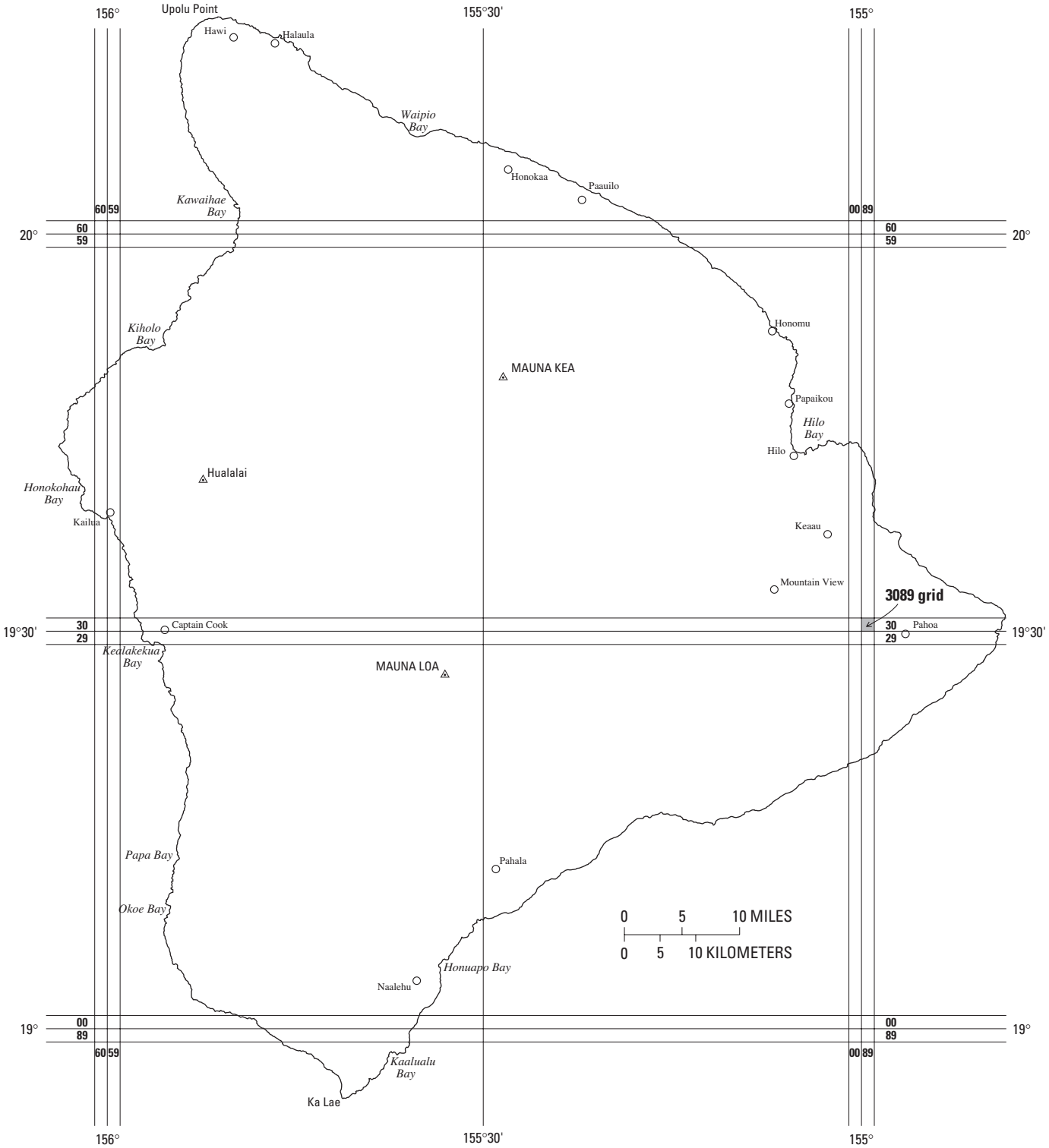


Figure 4. Map of Hawaii showing system for determining local well number.

To distinguish wells within a minute grid, two digits are added following the 4-digit minute-grid numbers with a dash separator. These two-digit numbers are assigned with the oldest well constructed within the grid as 01 and increase chronologically, with few exceptions, to the latest.

Since it is possible for wells on different islands to have the same 6-digit number, another digit distinguishing each of the islands is added in front of the 6-digit number with a dash separator.

Local Rainfall State Key Numbering System

In addition to the latitude-longitude based site identification number, rainfall stations in the State of Hawaii are assigned State key numbers. The numbering system was devised in 1948 by the authors of "A Key to Rain Gages in Hawaii." The numbers run from 1 to 1145, proceeding from south to north up the island chain. However, within each five-minute latitude band, numbers proceed from west to east. Following are the blocks of numbers assigned to each island.

Island	State Key Number
Hawaii	1-223
Maui	248-497
Molokai	500-563
Lanai	650-696
Oahu	700-912
Kauai	925-1145

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 61 sites in small drainage basins in 39 States that was established in 1963 to provide consistent streamflow data representative of undeveloped watersheds nationwide, and from which data could be analyzed on a continuing basis for use in comparison and contrast with conditions observed in basins more obviously affected by human activities. At selected sites, water-quality information is being gathered on major ions and nutrients, primarily to assess the effects of acid deposition on stream chemistry. Additional information on the Hydrologic Benchmark Program may be accessed from *http://water.usgs.gov/hbn/*.

National Stream-Quality Accounting Network (NASQAN) is a network of sites used to monitor the water quality of large rivers within the Nation's largest river basins. From 1995 through 1999, a network of approximately 40 stations was operated in the Mississippi, Columbia, Colorado, and Rio Grande River basins. For the period 2000 through 2004, sampling was reduced to a few index stations on the Colorado and Columbia Rivers so that a network of 5 stations could be implemented on the Yukon River. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major

ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment (NAWQA) Program; (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals. Additional information about the NASQAN Program may be accessed from *http://water.usgs.gov/nasqan/*.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) is a network of monitoring sites that provides continuous measurement and assessment of the chemical constituents in precipitation throughout the United States. As the lead Federal agency, the USGS works together with over 100 organizations to provide a long-term, spatial and temporal record of atmospheric deposition generated from this network of 250 precipitation-chemistry monitoring sites. The USGS supports 74 of these 250 sites. This long-term, nationally consistent monitoring program, coupled with ecosystem research, provides critical information toward a national scorecard to evaluate the effectiveness of ongoing and future regulations intended to reduce atmospheric emissions and subsequent impacts to the Nation's land and water resources. Reports and other information on the NADP/NTN Program, as well as data from the individual sites, may be accessed from *http://bqs.usgs.gov/acidrain/*.

The USGS National Water-Quality Assessment (NAWQA) Program is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; to provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and to provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 42 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents is measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for water-resources managers to use in making decisions and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and Federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key Federal, State, and local water-resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies. Additional information about the NAWQA Program may be accessed from *http://water.usgs.gov/nawqa/*.

The USGS National Streamflow Information Program (NSIP) is a long-term program with goals to provide framework streamflow data across the Nation. Included in the program are creation of a permanent Federally funded streamflow network, research on the nature of streamflow, regional assessments of streamflow data and databases, and upgrades in the streamflow information delivery systems. Additional information about NSIP may be accessed from *http://water.usgs.gov/nsip/*.

EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS

Data Collection and Computation

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and volume of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that is either downloaded electronically in the field to a laptop computer or similar device or is transmitted using telemetry such as GOES satellite, land-line or cellular-phone modems, or by radio transmission. Measurements of discharge are made with a current meter or acoustic Doppler current profiler, using the general methods adopted by the USGS. These methods are described in standard textbooks, USGS Water-Supply Paper 2175, and the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRIs), Book 3, Chapters A1 through A19 and Book 8, Chapters A2 and B2, which may be accessed from *http://water.usgs.gov/pubs/twri/*. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standardization (ISO).

For stream-gaging stations, discharge-rating tables for any stage are prepared from stage-discharge curves. If extensions to the rating curves are necessary to express discharge greater than measured, the extensions are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams and weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features of the stream channel, the daily mean discharge is computed by the shifting-control method in which correction factors based on individual discharge measurements and notes by engineers and observers are used when 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 controlling section, the daily mean discharge is computed by the shifting-control method.

The stage-discharge relation at some stream-gaging stations is affected by backwater from reservoirs, tributary streams, or other sources. Such an occurrence necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage at some distance from the base gage.

An index velocity is measured using ultrasonic or acoustic instruments at some stream-gaging stations and this index velocity is used to calculate an average velocity for the flow in the stream. This average velocity along with a stage-area relation is then used to calculate average discharge.

At some stations, stage-discharge relation is affected by changing stage. At these stations, the rate of change in stage is used as a factor in computing discharge.

At some stream-gaging stations in the northern United States, the stage-discharge relation is affected by ice in the winter; therefore, computation of the discharge in the usual manner is impossible. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter-discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge from other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the volume or contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes are computed.

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

For some stream-gaging stations, periods of time occur when no gage-height record is obtained or the recorded gage height is faulty and cannot be used to compute daily discharge or contents. Such a situation can happen when the recorder stops or otherwise fails to operate properly, the intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records from other stations in the same or nearby basins. Likewise, lake or reservoir volumes may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

Data Presentation

The records published for each continuous-record surface-water discharge station (stream-gaging station) consist of five parts: (1) the station manuscript or description; (2) the data table of daily mean values of discharge for the current water year with summary data; (3) a tabular statistical summary of monthly mean flow data for a designated period, by water year; (4) a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and (5) a hydrograph of discharge.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments follow that clarify information presented under the various headings of the station description.

LOCATION.—Location information is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.—Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.—This term indicates the time period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that its flow reasonably can be considered equivalent to flow at the present station.

REVISED RECORDS.—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

GAGE.—The type of gage in current use, the datum of the current gage referred to a standard datum, and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.—All periods of estimated daily discharge either will be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily discharge table. (See section titled Identifying Estimated Daily Discharge.) Information is presented relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, the outlet works and spillway, and the purpose and use of the reservoir.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.—Information here documents major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the USGS.

REVISIONS.—Records are revised if errors in published records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (*http://water.usgs.gov/nwis/nwis*). Users are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent data updates. Updates to NWISWeb are made on an annual basis.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because no current or, possibly, future station manuscript would be published for these stations to document the revision in a REVISED RECORDS entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were revised after the station was discontinued. If, however, the data for a discontinued station were obtained by computer retrieval, the data would be current. Any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the REMARKS and in the inclusion of a stage-capacity table when daily volumes are given.

Peak Discharge Greater than Base Discharge

Tables of peak discharge above base discharge are included for some stations where secondary instantaneous peak discharge data are used in flood-frequency studies of highway and bridge design, flood-control structures, and other flood-related projects. The base discharge value is selected so an average of three peaks a year will be reported. This base discharge value has a recurrence interval of approximately 1.1 years or a 91-percent chance of exceedence in any 1 year.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed TOTAL gives the sum of the daily figures for each month; the line headed MEAN gives the arithmetic average flow in cubic feet per second for the month; and the lines headed MAX and MIN give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month is expressed in cubic feet per second per square mile (line headed CFSM); or in inches (line headed IN); or in acre-feet (line headed AC-FT). Values for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if extensive regulation or diversion is in effect or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir volumes are given. These values are identified by a symbol and a corresponding footnote.

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed MEAN), maximum (MAX), and minimum (MIN) of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those values. The designated period will be expressed as FOR WATER YEARS __-__, BY WATER YEAR (WY), and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. The designated period will consist of all of the station record within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled SUMMARY STATISTICS follows the statistics of monthly mean data tabulation. This table consists of four columns with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, WATER YEARS __-__, will consist of all of the station records within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When the dates of occurrence do not fall within the selected water years listed in the heading, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration-curve statistics and runoff data also are given. Runoff data may be omitted if extensive regulation or diversion of flow is in effect in the drainage basin.

The following summary statistics data are provided with each continuous record of discharge. Comments that follow clarify information presented under the various line headings of the SUMMARY STATISTICS table.

ANNUAL TOTAL.—The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.—The arithmetic mean for the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.—The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.—The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.—The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.—The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.—The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. This value should not be confused with the 7-day 10-year low-flow statistic.

MAXIMUM PEAK FLOW.—The maximum instantaneous peak discharge occurring for the water year or designated period. Occasionally the maximum flow for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak flow is given in the table and the maximum flow may be reported in a footnote or in the REMARKS paragraph in the manuscript.

MAXIMUM PEAK STAGE.—The maximum instantaneous peak stage occurring for the water year or designated period. Occasionally the maximum stage for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak stage is given in the table and the maximum stage may be reported in the REMARKS paragraph in the manuscript or in a footnote. If the dates of occurrence of the maximum peak stage and maximum peak flow are different, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.—The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.—Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

> Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.
>
> Cubic feet per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicate the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.—The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.—The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.—The discharge that has been exceeded 90 percent of the time for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first table lists annual maximum stage and discharge at crest-stage stations, and the second table lists discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are often made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for a special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified. This identification is shown either by flagging individual daily values with the letter “e” and noting in a table footnote, “e–Estimated,” or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

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 interpretations of records.

The degree of accuracy of the records is stated in the REMARKS in the station description. “Excellent” indicates that about 95 percent of the daily discharges are within 5 percent of the true value; “good” within 10 percent; and “fair,” within 15 percent. “Poor” indicates that daily discharges have less than “fair” accuracy. Different accuracies may be attributed to different parts of a given record.

Values of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft^3/s; to the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 significant figures above 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharge values listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a

reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Data Records Available

Information of a more detailed nature than that published for most of the stream-gaging stations such as discharge measurements, gage-height records, and rating tables is available from the District office. Also, most stream-gaging station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the District office (see address that is shown on the back of the title page of this report).

EXPLANATION OF PRECIPITATION RECORDS

Data Collection and Computation

Rainfall data generally are collected using electronic data loggers that measure the rainfall in 0.01-inch increments every 15 minutes using either a tipping-bucket rain gage or a collection well gage. Twenty-four hour rainfall totals are tabulated and presented. A 24-hour period extends from just past midnight of the previous day to midnight of the current day. Snowfall-affected data can result during cold weather when snow fills the rain-gage funnel and then melts as temperatures rise. Snowfall-affected data are subject to errors. Missing values are indicated by this symbol "---" in the table.

Data Presentation

Precipitation records collected at surface-water gaging stations are identified with the same station number and name as the stream-gaging station. Where a surface-water daily-record station is not available, the precipitation record is published with its own name and latitude-longitude identification number.

Information pertinent to the history of a precipitation station is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, period of record, and general remarks.

The following information is provided with each precipitation station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

INSTRUMENTATION.—Information on the type of rainfall collection system is given.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of records.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and Examination of Data

Surface-water samples for analysis usually are collected at or near stream-gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, water temperature, sediment discharge, and so forth); extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, sampling date, or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water Analysis

Most of the methods used for collecting and analyzing water samples are described in the TWRIs, which may be accessed from *http://water.usgs.gov/pubs/twri/*.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross-section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum and minimum values (and sometimes mean or median values) for each constituent measured, and are based on 15-minute or 1-hour intervals of recorded data beginning at 0000 hours and ending at 2400 hours for the day of record.

SURFACE-WATER-QUALITY RECORDS

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because discharge data are useful in the interpretation of surface-water quality. Records of surface-water quality in this report involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A *continuous-record station* is a site where data are collected on a regularly scheduled basis. Frequency may be one or

more times daily, weekly, monthly, or quarterly. A *partial-record station* is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A *miscellaneous sampling site* is a location other than a continuous- or partial-record station, where samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between *continuous records* as used in this report and *continuous recordings* that refer to a continuous graph or a series of discrete values recorded at short intervals. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figures 5-9.

Accuracy of the Records

One of four accuracy classifications is applied for measured physical properties at continuous-record stations on a scale ranging from poor to excellent. The accuracy rating is based on data values recorded before any shifts or corrections are made. Additional consideration also is given to the amount of publishable record and to the amount of data that have been corrected or shifted.

Rating classifications for continuous water-quality records

[≤, less than or equal to; ±, plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured physical property	Rating			
	Excellent	Good	Fair	Poor
Water temperature	≤ ±0.2 °C	> ±0.2 to 0.5 °C	> ±0.5 to 0.8 °C	> ±0.8 °C
Specific conductance	≤ ±3%	> ±3 to 10%	> ±10 to 15%	> ±15%
Dissolved oxygen	≤ ±0.3 mg/L	> ±0.3 to 0.5 mg/L	> ±0.5 to 0.8 mg/L	> ±0.8 mg/L
pH	≤ ±0.2 unit	> ±0.2 to 0.5 unit	> ±0.5 to 0.8 unit	> ±0.8 unit
Turbidity	≤ ±5%	> ±5 to 10%	> ±10 to 15%	> ±15%

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern is assuring that the data obtained represent the naturally occurring quality of the water. To ensure this, certain measurements, such as water temperature, pH, and dissolved oxygen, must be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the naturally occurring water, carefully prescribed procedures must

be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1-A9. **Most of the methods used for collecting and analyzing water samples are described in the TWRIs, which may be accessed from *http://water.usgs.gov/pubs/twri/***. Also, detailed information on collecting, treating, and shipping samples can be obtained from the USGS District office (see address that is shown on the back of title page in this report).

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may be collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

Laboratory Measurements

Samples for biochemical oxygen demand (BOD) and indicator bacteria are analyzed locally. All other samples are analyzed in the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods

used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the USGS laboratories are given in the TWRIs, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. The TWRI publications may be accessed from *http://water.usgs.gov/pubs/twri/*. These methods are consistent with ASTM standards and generally follow ISO standards.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

DRAINAGE AREA.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—This indicates the time periods for which published water-quality records for the station are available. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.—Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES.—Maximums and minimums are given only for parameters measured daily or more frequently. For parameters measured weekly or less frequently, true maximums or minimums may not have been obtained. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.—Records are revised if errors in published water-quality records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (*http://waterdata.usgs.gov/nwis*). Users of USGS water-quality

data are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent updates. Updates to the NWISWeb are made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this section:

Printed Output	Remark
E	Value is estimated.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
M	Presence of material verified, but not quantified.
N	Presumptive evidence of presence of material.
U	Material specifically analyzed for, but not detected.
A	Value is an average.
V	Analyte was detected in both the environmental sample and the associated blanks.
S	Most probable value.

Water-Quality Control Data

The USGS National Water Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDLs) and laboratory reporting levels (LRLs). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. Falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as less than LRL for samples in which the analyte was either not detected or did not pass identification. Analytes detected at concentrations between the LT-MDL and the LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of “E.” These data should be used with the understanding that their uncertainty is greater than that of data reported without the E remark code.

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this District office are described in the following section. Procedures have been established for the storage of water-quality-control data within the

USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples. These data are not presented in this report but are available from the District office.

Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated in the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. Many types of blank samples are possible; each is designed to segregate a different part of the overall data-collection process. The types of blank samples collected in this district are:

Field blank—A blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank—A blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

Equipment blank—A blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

Sampler blank—A blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank—A blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank—A blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank—A blank solution that is treated with the sampler preservatives used for an environmental sample.

Reference Samples

Reference material is a solution or material prepared by a laboratory. The reference material composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the

amount of variability in the data contributed by some part of the collection and analytical process. Many types of replicate samples are possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are:

Concurrent samples—A type of replicate sample in which the samples are collected simultaneously with two or more samplers or by using one sampler and alternating the collection of samples into two or more compositing containers.

Sequential samples—A type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample—A type of replicate sample in which a sample is split into subsamples, each subsample contemporaneous in time and space.

Spike Samples

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

EXPLANATION OF GROUND-WATER-LEVEL RECORDS

Generally, only ground-water-level data from selected wells with continuous recorders from a basic network of observation wells are published in this report. This basic network contains observation wells located so that the most significant data are obtained from the fewest wells in the most important aquifers.

Site Identification Numbers

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is produced for local needs. Data Collection and Computation

Measurements are made in many types of wells, under varying conditions of access and at different temperatures; hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Most methods for collecting and analyzing water samples are described in the TWRIs referred to in the On-site Measurements and Sample Collection and the Laboratory Measurements sections in this report. In addition, TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected unstable constituents. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1 through A9. The TWRI publications may be accessed from *http://water.usgs.gov/pubs/twri/*. The values in this report represent water-quality conditions at the time of sampling, as much as possible, and that are consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. Trained personnel collected all samples. The wells sampled were pumped long enough to ensure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum above sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth of water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Data Presentation

Water-level data are presented in alphabetical order by county. The primary identification number for a given well is the 15-digit site identification number that appears in the upper left corner of the table. The secondary identification number is the local or county well number. Well locations are shown in figures 16-20; each well is identified on the map by its local well or county well number.

Each well record consists of three parts: the well description, the data table of water levels observed during the water year, and, for most wells, a hydrograph following the data table. Well descriptions are presented in the headings preceding the tabular data.

The following comments clarify information presented in these various headings.

LOCATION.—This paragraph follows the well-identification number and reports the hydrologic-unit number and a geographic point of reference. Latitudes and longitudes used in this report are reported as North American Datum of 1927 unless otherwise specified.

AQUIFER.—This entry designates by name and geologic age the aquifer that the well taps.

WELL CHARACTERISTICS.—This entry describes the well in terms of depth, casing diameter and depth or screened interval, method of construction, use, and changes since construction.

INSTRUMENTATION.—This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on continuous, monthly, or some other frequency of measurement.

DATUM.—This entry describes both the measuring point and the land-surface elevation at the well. The altitude of the land-surface datum is described in feet above the altitude datum; it is reported with a precision depending on the method of determination. The measuring point is described physically (such as top of casing, top of instrument shelf, and so forth), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above National Geodetic Vertical Datum of 1929 (NGVD 29); it is reported with a precision depending on the method of determination.

REMARKS.—This entry describes factors that may influence the water level in a well or the measurement of the water level, when various methods of measurement were begun, and the network (climatic, terrane, local, or areal effects) or the special project to which the well belongs.

PERIOD OF RECORD.—This entry indicates the time period for which records are published for the well, the month and year at the start of publication of water-level records by the USGS, and the words "to current year" if the records are to be continued into the following year. Time periods for which water-level records are available, but are not published by the USGS, may be noted.

EXTREMES FOR PERIOD OF RECORD.—This entry contains the highest and lowest instantaneously recorded or measured water levels of the period of published record, with respect to land-surface datum or sea level, and the dates of occurrence.

Water-Level Tables

A table of water levels follows the well description for each well. Water-level measurements in this report are given in feet with reference to either sea level or land-surface datum (lsd). Missing records are indicated by dashes in place of the water-level value.

For wells not equipped with recorders, water-level measurements were obtained periodically by steel or electric tape. Tables of periodic water-level measurements in these wells show the date of measurement and the measured water-level value.

Hydrographs

Hydrographs are a graphic display of water-level fluctuations over a period of time. In this report, current water year and, when appropriate, period-of-record hydrographs are shown. Hydrographs that display periodic water-level measurements show points that may be connected with a dashed line from one measurement to the next. Hydrographs that display recorder data show a solid line representing the mean water level recorded for each day. Missing data are indicated by a blank space or break in a hydrograph. Missing data may occur as a result of recorder malfunctions, battery failures, or mechanical problems related to the response of the recorder's float mechanism to water-level fluctuations in a well.

GROUND-WATER-QUALITY DATA

Data Collection and Computation

The ground-water-quality data in this report were obtained as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some wells within a county but not for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality Statewide.

Most methods for collecting and analyzing water samples are described in the TWRIs, which may be accessed from *http://water.usgs.gov/pubs/twri/*. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRI, Book 1, Chapter D2; Book 5, Chapters A1, A3, and A4 and Book 9, Chapters A1-A6. Also, detailed information on collecting, treating, and shipping samples may be obtained from the USGS District office (see address shown on back of title page in this report).Laboratory Measurements

Analysis for sulfide and measurement of alkalinity, pH, water temperature, specific conductance, and dissolved oxygen are performed on site. All other sample analyses are performed at the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used by the USGS laboratory are given in TWRI, Book 1, Chapter D2; and Book 5, Chapters A1, A3, and A4, which may be accessed from *http://water.usgs.gov/pubs/twri/*.

ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily mean and peak-flow discharge data for most current or discontinued gaging stations through the World Wide Web (WWW). These data may be accessed from *http://water.usgs.gov*.

Water-quality data and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on various media. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each Water Discipline District Office (See address that is shown on the back of the title page of this report.)

DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, may be accessed from *http://water.usgs.gov/ADR_Defs_2004.pdf*. Terms such as algae, water level, and precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units. Other glossaries that also define water-related terms are accessible from *http://water.usgs.gov/glossaries.html*.

Surface-Water Station Records for Kauai

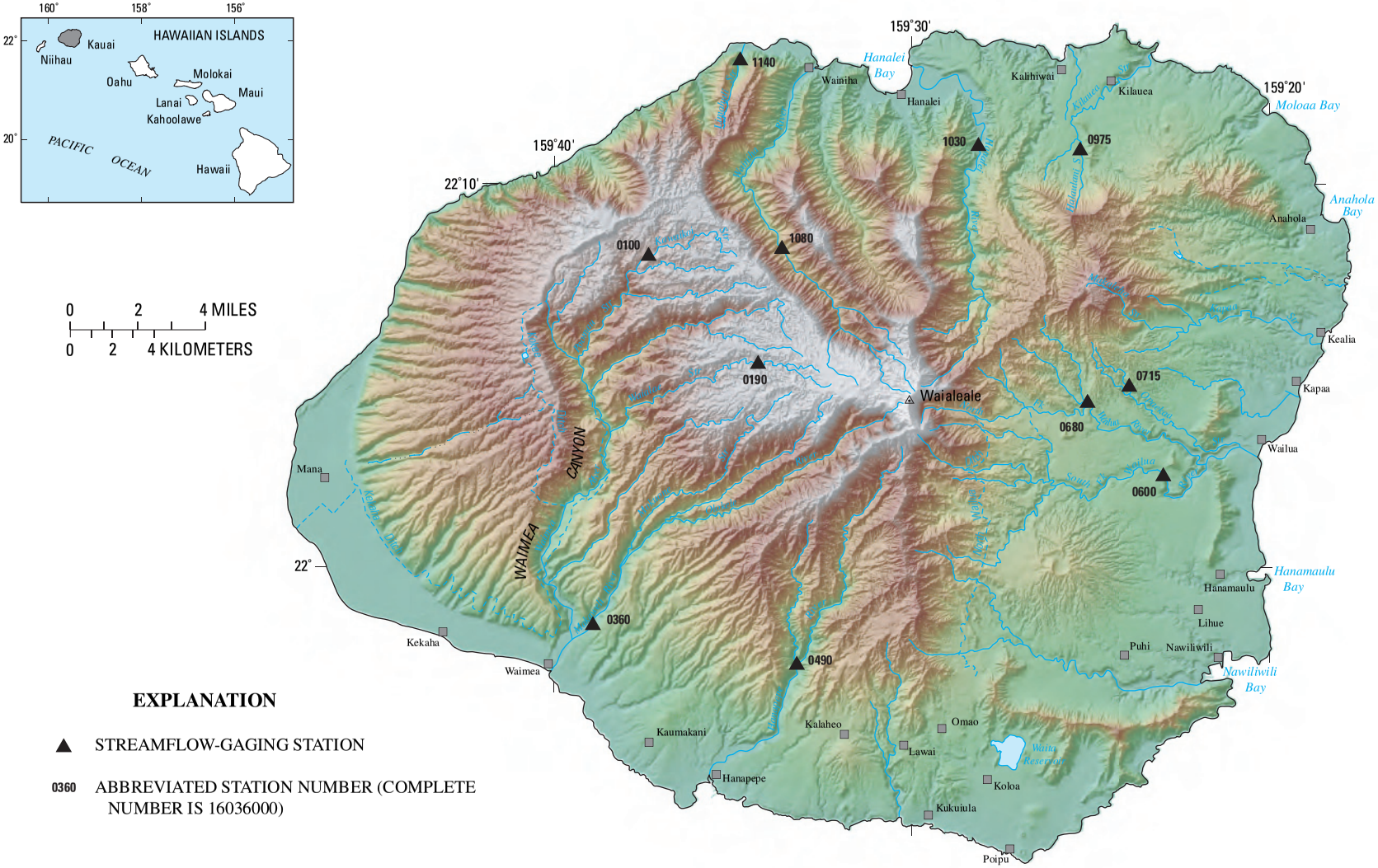


Figure 5. Locations of streamflow-gaging stations on Kauai.

16010000 KAWAIKOI STREAM NEAR WAIMEA

LOCATION.--Lat 22°08'09", long 159°37'22", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 0.2 mi upstream from Kokee-Mohihi Road crossing, 2.5 mi east of Kokee Lodge, and 12.5 mi north of Waimea.

DRAINAGE AREA.--3.95 mi^2.

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

REVISED RECORDS.--WSP 555: 1920-21. WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M). WSP 1719: 1912, 1921-25, 1927-32, 1936. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,420 ft above mean sea level, by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft downstream at different datum.

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--87 years (water years 1912, 1914, 1920-2004), 34.2 ft^3/s (24,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s, January 13, 1967, gage height, 15.33 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurements at gage heights 12.12 ft and 13.43 ft; minimum, 1.14 ft^3/s, September 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 27	0515	*2,720	*8.59	No other peak greater than base discharge.			

Minimum discharge, 1.9 ft^3/s, Oct. 1, 2, gage height, 1.83 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	15	198	171	12	273	83	23	10	25	6.1	8.6
2	4.1	9.9	234	26	10	287	239	17	9.3	19	22	8.7
3	16	8.1	114	18	9.2	44	357	15	14	17	65	8.5
4	22	7.1	68	14	13	99	240	33	10	15	98	6.8
5	20	6.7	38	12	65	50	106	71	11	12	15	108
6	6.0	6.2	26	11	21	24	50	20	20	18	9.2	66
7	43	7.1	52	9.9	19	212	36	20	27	17	7.4	21
8	27	7.5	122	9.8	24	280	31	21	132	10	7.0	11
9	62	6.0	63	9.1	11	38	176	31	96	9.2	6.6	9.5
10	13	5.2	58	8.5	10	69	47	32	100	8.6	6.6	12
11	7.4	5.3	43	8.1	9.1	37	34	17	79	8.4	31	12
12	8.1	5.9	21	19	8.9	24	26	40	61	7.9	50	67
13	22	32	18	10	8.2	694	31	32	78	7.9	22	37
14	10	45	16	490	7.5	87	26	97	47	7.9	11	54
15	51	43	13	30	27	37	31	58	21	41	8.1	17
16	40	18	12	19	16	52	102	38	30	26	7.1	13
17	9.8	13	40	15	8.7	55	36	25	56	11	6.6	23
18	6.5	9.7	16	13	7.6	41	25	19	83	21	6.2	40
19	5.2	35	13	11	6.9	29	20	17	256	21	5.8	76
20	9.0	18	11	11	6.5	348	21	15	69	10	5.3	37
21	16	29	9.6	11	6.3	124	43	15	39	7.9	10	26
22	8.0	74	8.9	106	6.0	334	28	15	68	7.0	11	27
23	5.9	146	8.4	107	5.8	450	20	12	60	6.5	15	30
24	4.6	40	8.3	20	5.6	694	17	11	28	6.3	19	28
25	4.7	21	7.8	15	5.5	230	145	11	20	6.1	55	31
26	4.1	17	7.4	40	12	70	295	10	17	6.5	20	18
27	4.1	15	17	18	756	44	34	14	15	21	16	13
28	250	11	79	15	155	420	43	30	13	14	23	11
29	63	9.7	21	13	30	175	24	18	22	9.7	22	9.5
30	36	8.8	109	16	---	71	21	11	20	7.0	49	8.9
31	15	---	32	11	---	43	---	9.5	---	6.1	12	---
TOTAL	795.4	675.2	1,484.4	1,287.4	1,282.8	5,435	2,387	797.5	1,511.3	411.0	648.0	838.5
MEAN	25.7	22.5	47.9	41.5	44.2	175	79.6	25.7	50.4	13.3	20.9	27.9
MAX	250	146	234	490	756	694	357	97	256	41	98	108
MIN	1.9	5.2	7.4	8.1	5.5	24	17	9.5	9.3	6.1	5.3	6.8
AC-FT	1,580	1,340	2,940	2,550	2,540	10,780	4,730	1,580	3,000	815	1,290	1,660

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2004, BY WATER YEAR (WY)

MEAN	21.4	44.7	52.6	53.1	41.6	49.4	46.2	27.0	17.4	23.0	21.2	14.4
MAX	60.3	170	176	343	165	175	115	86.2	68.7	94.7	195	58.1
(WY)	(1917)	(1929)	(1968)	(1921)	(1956)	(2004)	(1980)	(1927)	(1978)	(1989)	(1950)	(1992)
MIN	3.34	4.16	11.9	3.23	4.26	6.15	5.74	3.38	3.58	5.18	2.54	1.86
(WY)	(1985)	(1964)	(2003)	(1945)	(1945)	(1926)	(1992)	(1966)	(1951)	(1922)	(1984)	(1953)

16010000 KAWAIKOI STREAM NEAR WAIMEA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1911 - 2004	
ANNUAL TOTAL	8,213.2		17,553.5			
ANNUAL MEAN	22.5		48.0		34.2	
HIGHEST ANNUAL MEAN					60.7	1982
LOWEST ANNUAL MEAN					15.3	1945
HIGHEST DAILY MEAN	365	Feb 13	756	Feb 27	2,620	Jan 15, 1921
LOWEST DAILY MEAN	1.9	Sep 30	1.9	Oct 1	1.1	Sep 21, 1953
ANNUAL SEVEN-DAY MINIMUM	2.4	Sep 18	6.1	Feb 19	1.2	Sep 17, 1953
ANNUAL RUNOFF (AC-FT)	16,290		34,820		24,790	
10 PERCENT EXCEEDS	43		103		74	
50 PERCENT EXCEEDS	9.7		19		13	
90 PERCENT EXCEEDS	3.6		7.0		4.3	

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA

LOCATION.--Lat 22°05'20", long 159°34'18", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 5.0 mi northeast of mouth, 6.4 mi southeast of Kokee Lodge, and 11 mi northeast of Waimea.

DRAINAGE AREA.--1.79 mi^2.

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

REVISED RECORDS.--WSP 1937: 1921, 1922-32(M), 1953(M), 1954. WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--63 years (water years 1921-31, 1953-2004), 21.3 ft^3/s (15,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s, January 16, 1921, gage height, 8.44 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 ft^3/s, May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 26	0215	*1,300	*4.54	No other peak greater than base discharge.			

Minimum discharge, 1.6 ft^3/s, Oct. 1, gage height, 0.77 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	15	40	254	5.0	16	11	6.2	6.5	22	4.8	4.6
2	1.9	8.6	46	21	4.9	40	16	5.5	5.8	12	21	12
3	3.8	7.4	18	16	4.4	12	42	5.0	5.1	11	40	6.4
4	8.9	8.8	24	9.6	4.0	9.2	46	5.0	4.6	9.5	119	4.3
5	4.6	14	20	7.0	4.4	11	25	11	4.8	7.4	12	52
6	3.4	8.9	24	6.0	21	7.6	12	7.9	5.6	6.0	6.7	44
7	26	23	13	5.2	42	42	9.1	17	13	5.2	5.2	11
8	24	11	150	4.9	16	144	7.6	12	81	4.7	4.4	6.6
9	59	7.1	69	4.5	7.2	14	18	7.6	79	4.3	4.0	14
10	14	5.4	55	4.2	6.3	37	11	12	58	4.0	7.2	12
11	25	14	45	3.9	5.2	18	7.9	7.6	56	3.9	35	6.8
12	30	11	16	14	4.5	9.9	6.7	73	77	4.0	62	22
13	108	28	11	6.7	4.0	142	16	17	111	4.7	28	40
14	12	21	9.5	276	3.8	28	20	110	67	5.0	9.7	24
15	16	21	8.1	17	3.7	12	22	51	17	4.1	6.9	14
16	27	15	7.1	9.5	3.4	9.2	102	24	11	7.0	5.6	10
17	7.9	24	10	7.3	3.3	10	18	12	13	5.9	4.6	13
18	5.1	11	8.9	6.2	3.4	10	11	8.8	27	4.5	4.0	21
19	4.0	15	6.7	5.7	3.2	9.2	8.2	7.2	84	6.0	3.7	64
20	3.9	13	5.6	6.2	3.1	39	42	7.3	27	4.4	3.4	42
21	4.5	15	5.0	7.6	2.9	36	50	11	30	3.5	4.0	66
22	7.2	35	4.5	87	2.8	84	20	9.7	43	3.1	5.3	55
23	4.8	48	4.2	145	2.7	84	11	7.2	41	2.9	4.3	36
24	3.5	18	4.1	14	2.7	129	8.5	7.6	17	2.7	4.8	19
25	6.9	9.7	3.9	9.0	2.5	71	7.6	20	11	2.6	21	19
26	6.1	7.5	3.7	7.4	42	189	36	12	15	2.7	13	12
27	16	6.3	4.7	6.4	476	28	12	12	15	3.7	9.5	8.3
28	175	5.4	4.9	5.7	25	69	10	21	8.7	59	10	7.5
29	93	5.2	5.1	5.2	11	50	8.6	14	16	8.3	7.8	7.5
30	30	45	82	5.0	---	27	7.0	13	12	4.5	16	6.8
31	15	---	25	4.7	---	15	---	8.3	---	3.6	6.4	---
TOTAL	748.2	477.3	734.0	981.9	720.4	1,402.1	622.2	542.9	962.1	232.2	489.3	660.8
MEAN	24.1	15.9	23.7	31.7	24.8	45.2	20.7	17.5	32.1	7.49	15.8	22.0
MAX	175	48	150	276	476	189	102	110	111	59	119	66
MIN	1.7	5.2	3.7	3.9	2.5	7.6	6.7	5.0	4.6	2.6	3.4	4.3
AC-FT	1,480	947	1,460	1,950	1,430	2,780	1,230	1,080	1,910	461	971	1,310

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 2004, BY WATER YEAR (WY)

MEAN	15.8	32.2	33.5	33.0	26.7	27.5	25.0	13.4	10.4	15.2	12.2	10.8
MAX	52.1	105	106	166	155	106	92.4	45.3	39.4	58.0	44.9	56.0
(WY)	(1995)	(1965)	(1968)	(1921)	(1956)	(1982)	(1974)	(1965)	(1978)	(1989)	(1959)	(1922)
MIN	2.49	5.58	4.16	3.63	2.44	2.15	1.87	1.81	1.89	2.56	2.86	1.67
(WY)	(1927)	(1927)	(1923)	(2001)	(1983)	(1926)	(1966)	(1966)	(1975)	(1984)	(1952)	(1975)

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1920 - 2004	
ANNUAL TOTAL	5,770.8		8,573.4			
ANNUAL MEAN	15.8		23.4		21.3	
HIGHEST ANNUAL MEAN					40.9	1982
LOWEST ANNUAL MEAN					8.94	1926
HIGHEST DAILY MEAN	460	Apr 12	476	Feb 27	1,440	Dec 1, 1957
LOWEST DAILY MEAN	1.7	Oct 1	1.7	Oct 1	0.99	May 17, 1966
ANNUAL SEVEN-DAY MINIMUM	1.9	Sep 17	2.8	Feb 19	1.1	May 26, 1966
ANNUAL RUNOFF (AC-FT)	11,450		17,010		15,420	
10 PERCENT EXCEEDS	34		55		45	
50 PERCENT EXCEEDS	5.8		10		6.6	
90 PERCENT EXCEEDS	2.3		4.0		2.6	

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58'31", long 159°38'55", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 0.7 mi upstream from mouth, and 1.9 mi northeast of Waimea.

DRAINAGE AREA.--26.0 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area. WRD HI-01-01 1991-2000 (P)

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft^3/s capacity ditch diverts water 0.1 mi upstream of station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--61 years (water years 1944-2004), 84.3 ft^3/s (61,060 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s, January 31, 1975, gage height, 15.51 ft, from rating curve extended above 3,200 ft^3/s on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 ft^3/s, July 19, 1951; minimum daily 4.3 ft^3/s, July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	0630	*3,990	*8.60

Minimum instantaneous discharge, 8.8 ft^3/s, Oct. 1, July 22, 23, 24, 25, gage height, 2.58 ft.
Minimum daily discharge, 9.1 ft^3/s, July 24, 2004..

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	74	80	1,090	29	68	42	18	24	55	14	15
2	11	80	54	190	22	88	43	17	20	28	76	46
3	12	43	30	109	20	48	71	16	19	26	96	22
4	13	37	54	50	20	31	89	21	18	23	509	16
5	13	40	109	37	19	28	55	26	17	20	94	20
6	11	30	66	30	52	24	47	68	24	18	23	68
7	44	105	113	25	105	22	33	57	32	17	22	22
8	53	53	500	23	54	223	29	32	150	16	19	17
9	168	26	250	21	22	80	27	18	229	15	25	54
10	30	21	158	20	20	90	24	24	211	14	19	33
11	54	55	177	19	18	86	21	19	227	16	99	15
12	182	27	72	62	17	68	19	162	229	14	221	37
13	318	50	54	28	17	346	78	82	426	21	125	68
14	50	39	32	576	16	75	62	288	329	14	50	40
15	29	53	24	133	16	31	49	178	83	12	38	41
16	66	36	22	51	15	25	259	78	44	18	24	28
17	22	124	21	38	15	24	62	46	39	14	17	24
18	15	33	20	33	17	22	32	36	77	12	15	62
19	13	41	18	30	17	21	25	29	273	14	14	216
20	13	24	17	28	15	37	180	30	56	11	13	148
21	13	21	16	28	14	51	59	52	63	9.8	18	166
22	30	27	15	164	13	270	50	52	142	9.5	21	159
23	13	38	14	632	13	104	28	35	110	9.3	12	139
24	12	30	15	121	14	189	27	35	45	9.1	13	62
25	19	23	14	64	13	191	23	70	29	9.2	34	51
26	18	19	14	52	52	888	40	41	80	9.3	24	35
27	39	17	14	46	1,990	207	24	27	55	11	22	25
28	546	16	22	37	309	133	20	84	26	120	16	21
29	362	66	17	28	93	152	19	51	59	22	16	27
30	218	61	175	26	---	186	18	35	32	14	36	26
31	70	---	74	26	---	55	---	24	---	11	15	---
TOTAL	2,466.3	1,309	2,261	3,817	3,037	3,863	1,555	1,751	3,168	612.2	1,740	1,703
MEAN	79.6	43.6	72.9	123	105	125	51.8	56.5	106	19.7	56.1	56.8
MAX	546	124	500	1,090	1,990	888	259	288	426	120	509	216
MIN	9.3	16	14	19	13	21	18	16	17	9.1	12	15
AC-FT	4,890	2,600	4,480	7,570	6,020	7,660	3,080	3,470	6,280	1,210	3,450	3,380

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2004, BY WATER YEAR (WY)

MEAN	58.6	120	137	128	113	124	98.1	56.8	39.7	51.5	49.9	36.1
MAX	311	491	577	441	774	609	419	283	106	222	328	204
(WY)	(1995)	(1991)	(1993)	(1989)	(1956)	(1982)	(1963)	(1965)	(2004)	(1989)	(1950)	(1994)
MIN	11.7	15.2	17.6	9.49	12.0	10.6	11.6	13.2	9.56	10.0	14.2	9.54
(WY)	(1960)	(1951)	(2003)	(1945)	(1978)	(1959)	(1992)	(2000)	(1951)	(1984)	(1944)	(1962)

16036000 MAKAWELI RIVER NEAR WAIMEA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1943 - 2004	
ANNUAL TOTAL	19,894.5		27,282.5			
ANNUAL MEAN	54.5		74.5		84.3	
HIGHEST ANNUAL MEAN					204	1982
LOWEST ANNUAL MEAN					31.1	1984
HIGHEST DAILY MEAN	1,680	Apr 12	1,990	Feb 27	5,170	Dec 1, 1957
LOWEST DAILY MEAN	8.4	Aug 9	9.1	Jul 24	4.3	Jul 19, 1951
ANNUAL SEVEN-DAY MINIMUM	9.4	Aug 4	9.6	Jul 20	5.7	Oct 21, 1944
ANNUAL RUNOFF (AC-FT)	39,460		54,110		61,060	
10 PERCENT EXCEEDS	121		176		169	
50 PERCENT EXCEEDS	20		30		26	
90 PERCENT EXCEEDS	10		14		12	

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57'29", long 159°33'13", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 200 ft downstream from Manuahi Stream and 4.0 mi northeast of Eleele.

DRAINAGE AREA.--18.5 mi^2.

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

REVISED RECORDS.--WSP 740: 1931. WSP 1719: 1929-31(M). WSP 1937: 1918, 1919(M), 1920, 1921(M), 1927-28(M), 1930, 1936-37(M), 1941(P), 1943-46(P), 1947(M), 1948-52(P), 1955(M), 1956-57(P), 1958(M), 1960(M). WSP 2137: Drainage area.

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Koula ditch diverts water 3.0 mi upstream of station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--80 years (water years 1918-20, 1928-2004), 82.8 ft^3/s (59,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s, April 15, 1963, gage height, 14.87 ft, from rating curve extended above 7,600 ft^3/s on basis of slope-area measurement of peak flow; minimum, 5.1 ft^3/s, May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 1	0645	4,620	6.66
Feb 27	0245	*6,160	*7.38
Mar 27	1345	4,800	6.75

Minimum discharge, 12 ft^3/s, on several days, gage height, 1.15 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	38	59	823	21	88	46	14	16	81	17	15
2	14	44	25	92	18	78	28	14	15	48	63	74
3	13	28	19	62	17	64	20	13	17	46	55	19
4	13	30	46	42	17	60	22	18	14	37	628	16
5	15	31	282	34	18	60	23	19	14	37	57	15
6	13	28	131	30	47	56	18	105	22	32	19	34
7	28	110	249	28	194	57	16	44	28	30	31	17
8	51	152	578	27	39	68	15	19	146	24	39	20
9	122	34	199	26	18	17	15	15	224	18	50	52
10	22	20	158	25	16	17	14	15	247	17	33	35
11	85	69	175	24	15	16	14	14	236	18	134	16
12	194	27	60	51	14	15	14	29	201	21	201	96
13	265	37	35	26	14	103	59	20	383	31	118	76
14	29	26	27	195	13	18	54	49	359	18	41	32
15	33	50	22	44	13	15	52	92	99	17	28	26
16	42	31	19	26	13	14	185	56	67	22	20	22
17	16	207	18	23	13	14	44	38	52	17	19	20
18	14	54	17	22	13	14	21	16	125	18	18	53
19	14	41	16	22	13	14	22	15	300	18	17	192
20	14	19	15	22	13	14	362	17	73	16	16	157
21	25	17	15	19	12	16	62	23	67	15	34	199
22	59	16	14	189	12	142	31	19	185	15	21	222
23	15	15	14	327	12	30	23	18	156	14	16	234
24	14	15	15	94	25	77	19	30	72	14	18	133
25	41	15	14	73	31	175	35	20	48	15	36	110
26	23	14	14	77	76	1,020	23	19	92	16	22	82
27	68	14	15	56	1,630	496	16	17	68	27	19	45
28	353	14	16	31	193	143	15	63	50	41	19	24
29	409	19	18	25	102	132	15	42	77	16	17	22
30	180	68	125	19	---	311	14	31	49	16	23	24
31	91	---	55	20	---	94	---	18	---	15	17	---
TOTAL	2,287	1,283	2,465	2,574	2,632	3,438	1,297	922	3,502	770	1,846	2,082
MEAN	73.8	42.8	79.5	83.0	90.8	111	43.2	29.7	117	24.8	59.5	69.4
MAX	409	207	578	823	1,630	1,020	362	105	383	81	628	234
MIN	12	14	14	19	12	14	14	13	14	14	16	15
AC-FT	4,540	2,540	4,890	5,110	5,220	6,820	2,570	1,830	6,950	1,530	3,660	4,130

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2004, BY WATER YEAR (WY)

MEAN	60.5	102	113	108	96.8	111	93.2	66.5	53.2	70.5	69.5	51.8
MAX	240	430	720	578	657	803	470	249	175	202	222	190
(WY)	(1995)	(1991)	(1920)	(1920)	(1932)	(1918)	(1963)	(2002)	(1978)	(1989)	(1931)	(1994)
MIN	11.5	15.3	13.0	11.7	15.0	8.84	13.2	12.9	12.1	13.6	18.4	11.7
(WY)	(1954)	(1977)	(1986)	(1986)	(1986)	(1959)	(1941)	(1958)	(1959)	(1953)	(1953)	(1953)

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1917 - 2004	
ANNUAL TOTAL	19,165		25,098			
ANNUAL MEAN	52.5		68.6		82.8	
HIGHEST ANNUAL MEAN					182	1918
LOWEST ANNUAL MEAN					30.6	1953
HIGHEST DAILY MEAN	991	Apr 12	1,630	Feb 27	10,900	Dec 3, 1919
LOWEST DAILY MEAN	12	Sep 2	12	Oct 1	5.3	May 21, 1954
ANNUAL SEVEN-DAY MINIMUM	13	Sep 26	13	Feb 17	6.4	May 10, 1954
ANNUAL RUNOFF (AC-FT)	38,010		49,780		59,990	
10 PERCENT EXCEEDS	136		176		170	
50 PERCENT EXCEEDS	17		26		29	
90 PERCENT EXCEEDS	13		14		15	

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02'24", long 159°22'58", Old Hawaiian Datum, Hydrologic Unit 20070000, on right bank 0.2 mi upstream from Wailua Falls and 4.3 mi north of Lihue.

DRAINAGE AREA.--22.4 mi^2.

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

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

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Lihue and Hanamaulu ditches divert water upstream of station for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--87 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-2004), 118 ft^3/s (85,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,800 ft^3/s, April 15, 1963, gage height, 23.10 ft, from rating curve extended above 13,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft^3/s, August 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 5	1715	6,060	14.62	Feb 27	0345	*12,200	*16.45

Minimum discharge, 13 ft^3/s, Feb. 24, gage height, 1.94 ft.

REVISIONS.--The maximum discharge and some peaks above base of 5,800 ft have been revised as shown in the following table. They supercede figures published in Water Data Reports 1963-2003. The maximum gage height for the April 15, 1963 peak of record has been changed to 23.10 ft.

Water Year	Date	Discharge (ft^3/s)	Gage height (ft)
1963	04/15/63	68,800	23.10
1971	11/26/70	32,500	19.78
1975	01/31/75	36,200	20.21
1983	10/30/82	26,000	18.93
1991	11/18/90	38,600	20.47
1992	12/14/91	25,900	18.92
1996	11/03/95	26,600	19.02

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	156	181	855	64	147	270	76	108	216	91	101
2	32	162	150	171	53	142	248	67	87	155	135	212
3	37	129	136	124	48	96	249	81	102	152	198	137
4	39	119	310	93	47	84	284	100	83	135	1,140	103
5	61	108	1,560	79	49	82	265	119	76	147	250	97
6	36	88	587	67	88	73	198	148	98	130	140	179
7	69	180	596	63	404	92	166	332	113	116	165	123
8	91	399	716	61	157	209	147	154	145	107	230	202
9	196	150	397	58	84	87	148	112	281	101	199	243
10	84	116	292	56	69	73	129	117	261	97	144	215
11	160	174	299	54	59	68	128	104	342	103	255	138
12	334	121	196	84	53	63	137	234	348	126	321	215
13	370	114	167	46	49	364	223	149	425	152	261	223
14	116	107	146	447	46	152	166	182	523	100	186	168
15	99	124	130	98	44	98	182	262	278	88	178	195
16	157	98	116	71	44	87	288	177	218	104	142	167
17	93	297	113	63	43	90	175	113	194	85	127	153
18	77	148	101	59	48	77	132	97	299	101	118	206
19	69	137	94	50	44	74	114	88	535	138	108	385
20	69	99	89	44	40	115	1,040	89	231	88	100	323
21	73	86	84	41	37	164	374	97	215	78	140	394
22	173	84	80	205	37	297	303	87	346	74	141	346
23	76	84	77	669	33	174	218	94	278	74	101	423
24	63	86	91	137	20	245	184	129	204	74	100	304
25	103	84	76	98	37	293	192	128	170	85	121	271
26	74	64	71	96	53	1,010	283	116	191	77	88	248
27	159	59	68	79	2,950	511	161	93	208	113	97	185
28	611	58	74	76	321	392	117	151	171	162	87	164
29	654	88	97	63	174	425	86	159	212	88	82	147
30	362	212	136	56	---	682	81	137	168	85	129	164
31	203	---	133	59	---	436	---	107	---	72	91	---
TOTAL	4,769	3,931	7,363	4,222	5,195	6,902	6,688	4,099	6,910	3,423	5,665	6,431
MEAN	154	131	238	136	179	223	223	132	230	110	183	214
MAX	654	399	1,560	855	2,950	1,010	1,040	332	535	216	1,140	423
MIN	29	58	68	41	20	63	81	67	76	72	82	97
AC-FT	9,460	7,800	14,600	8,370	10,300	13,690	13,270	8,130	13,710	6,790	11,240	12,760

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2004, BY WATER YEAR (WY)

MEAN	93.3	171	171	173	126	149	137	102	61.7	78.3	85.0	77.6
MAX	339	866	696	1,485	716	830	673	467	271	281	321	650
(WY)	(1983)	(1991)	(1917)	(1921)	(1932)	(1982)	(1963)	(1927)	(1914)	(1989)	(1948)	(1914)
MIN	2.58	3.13	6.61	4.66	3.15	3.46	3.84	3.29	2.82	3.27	4.76	2.59
(WY)	(1954)	(1934)	(1977)	(1986)	(1947)	(1934)	(1931)	(1926)	(1957)	(1953)	(1973)	(1953)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1912 - 2004	
ANNUAL TOTAL	47,058.6		65,598			
ANNUAL MEAN	129		179		118	
HIGHEST ANNUAL MEAN					284	1982
LOWEST ANNUAL MEAN					17.3	1984
HIGHEST DAILY MEAN	1,560	Dec 5	2,950	Feb 27	13,800	Jan 16, 1921
LOWEST DAILY MEAN	8.4	Aug 11	20	Feb 24	1.8	Sep 17, 1953
ANNUAL SEVEN-DAY MINIMUM	12	Aug 9	35	Feb 19	1.8	Sep 16, 1953
ANNUAL RUNOFF (AC-FT)	93,340		130,100		85,220	
10 PERCENT EXCEEDS	294		333		266	
50 PERCENT EXCEEDS	80		125		43	
90 PERCENT EXCEEDS	35		59		4.8	

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°04'19", long 159°25'05", Old Hawaiian Datum, Hydrologic Unit 20070000, on right bank 1,200 ft upstream from mouth and 7.2 mi northwest of Lihue.

DRAINAGE AREA.--6.27 mi^2.

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

REVISED RECORDS.--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area.

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

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversion upstream.

AVERAGE DISCHARGE.--89 years (water years 1913-14, 1916-17, 1920-2004), 47.8 ft^3/s (34,650 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft^3/s, November 12, 1955, gage height, 14.7 ft, from floodmarks, from rating curve extended above 2,700 ft^3/s; minimum, 6.8 ft^3/s, July 3, 13, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 27	0245	*2,540	*5.89	No other peak greater than base discharge.			

Minimum discharge, 14 ft^3/s, Oct. 1, gage height, 1.00 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	33	64	175	27	105	65	35	28	42	21	36
2	37	34	90	34	20	115	100	32	23	33	52	37
3	26	29	102	28	19	47	127	30	27	35	68	28
4	22	27	154	25	20	48	132	36	22	31	224	23
5	25	33	279	23	20	41	87	37	21	29	50	54
6	19	30	157	22	24	33	60	30	30	29	33	59
7	32	44	123	21	117	128	57	44	28	28	34	30
8	31	42	131	20	38	173	47	32	59	26	32	159
9	53	28	99	20	26	52	76	31	58	25	42	76
10	27	25	74	19	29	50	47	30	75	24	29	57
11	38	29	69	19	25	39	44	29	96	28	46	35
12	85	27	52	19	22	35	45	40	83	28	54	61
13	107	29	46	18	21	235	82	30	86	34	45	42
14	40	28	41	246	20	72	45	39	134	25	34	48
15	36	25	37	36	20	47	48	35	49	24	36	43
16	41	24	35	27	19	45	83	33	41	24	30	37
17	29	45	46	24	19	41	45	28	43	22	28	40
18	26	32	32	22	18	39	39	26	113	29	26	49
19	24	52	30	21	17	32	37	25	106	32	24	105
20	23	30	28	20	17	93	175	24	52	23	23	60
21	22	26	27	19	17	92	114	25	47	21	33	83
22	29	28	26	97	17	136	64	23	95	20	27	72
23	21	40	25	102	16	118	49	24	64	20	23	109
24	20	54	25	32	16	109	45	27	45	19	22	68
25	23	37	24	27	16	105	48	29	38	21	38	82
26	20	29	23	25	40	122	150	25	76	20	25	56
27	22	26	22	25	506	85	48	22	43	26	23	45
28	101	25	23	24	72	210	42	27	41	42	22	39
29	108	64	22	22	47	173	37	31	48	22	20	36
30	65	96	23	21	---	144	37	35	37	22	31	35
31	40	---	26	21	---	88	---	26	---	20	22	---
TOTAL	1,206	1,071	1,955	1,254	1,285	2,852	2,075	940	1,708	824	1,217	1,704
MEAN	38.9	35.7	63.1	40.5	44.3	92.0	69.2	30.3	56.9	26.6	39.3	56.8
MAX	108	96	279	246	506	235	175	44	134	42	224	159
MIN	14	24	22	18	16	32	37	22	21	19	20	23
AC-FT	2,390	2,120	3,880	2,490	2,550	5,660	4,120	1,860	3,390	1,630	2,410	3,380

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2004, BY WATER YEAR (WY)

MEAN	41.0	59.9	59.3	58.4	47.7	55.9	56.5	46.7	33.4	38.3	39.2	36.8
MAX	94.6	226	157	392	197	270	173	144	84.9	78.4	111	112
(WY)	(1983)	(1991)	(1988)	(1921)	(1994)	(1982)	(1927)	(1967)	(1978)	(1980)	(1948)	(1994)
MIN	12.4	16.8	12.3	11.0	8.88	11.0	10.6	9.81	13.0	12.3	11.5	11.8
(WY)	(1954)	(1934)	(1964)	(1986)	(1986)	(1970)	(1926)	(1926)	(1969)	(1926)	(1984)	(1953)

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1912 - 2004	
ANNUAL TOTAL	13,339		18,091			
ANNUAL MEAN	36.5		49.4		47.8	
HIGHEST ANNUAL MEAN					95.5	1982
LOWEST ANNUAL MEAN					21.3	1984
HIGHEST DAILY MEAN	330	Apr 2	506	Feb 27	2,570	Feb 13, 1994
LOWEST DAILY MEAN	12	Jan 22	14	Oct 1	7.0	Jul 8, 1926
ANNUAL SEVEN-DAY MINIMUM	12	Feb 5	17	Feb 19	8.2	Mar 5, 1986
ANNUAL RUNOFF (AC-FT)	26,460		35,880		34,650	
10 PERCENT EXCEEDS	68		103		84	
50 PERCENT EXCEEDS	25		34		31	
90 PERCENT EXCEEDS	15		21		16	

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'44", long 159°23'55", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 0.4 mi upstream from mouth, 0.6 mi northeast of Wailua Reservoir, and 4.9 mi west of Kapaa.

DRAINAGE AREA.--0.65 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--44 years (water years 1961-2004), 2.50 ft^3/s (1,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft^3/s, December 14, 1991, gage height, 6.60 ft, from rating curve extended above 415 ft^3/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft^3/s, September 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 27	0300	*91	*2.52	No other peak greater than base discharge.			

Minimum discharge, 0.46 ft^3/s, Oct. 1, gage height, 0.76 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.46	0.92	2.9	3.1	1.4	2.7	6.6	2.4	1.5	2.2	1.2	2.1
2	1.2	0.85	2.6	1.5	1.3	3.0	8.4	2.2	1.3	2.0	1.4	1.6
3	0.67	0.80	2.1	1.3	1.2	2.3	5.0	2.0	1.3	1.9	2.1	1.3
4	0.61	0.75	3.3	1.2	1.2	2.2	5.1	2.0	1.2	1.9	11	1.2
5	0.54	0.75	6.4	1.2	1.1	2.1	4.3	2.0	1.2	1.8	2.4	1.3
6	0.53	0.75	5.0	1.1	1.2	2.1	3.7	1.9	1.2	1.9	1.7	1.6
7	0.72	0.80	4.9	1.1	2.3	3.5	3.6	2.0	1.2	1.8	1.5	1.3
8	0.63	0.94	4.6	1.1	1.4	4.7	3.4	1.9	1.4	1.7	1.6	6.0
9	0.87	0.74	4.7	1.1	1.2	2.8	3.4	1.8	2.0	1.8	1.5	2.6
10	0.68	0.68	3.8	1.0	1.2	2.5	3.1	1.8	1.8	1.6	1.4	2.1
11	0.69	0.67	3.3	1.0	1.1	2.3	3.0	1.7	3.4	1.8	1.5	1.8
12	1.0	0.67	2.8	1.0	1.1	2.3	3.3	5.1	2.9	1.8	1.7	2.1
13	2.4	0.68	2.6	1.00	1.1	4.6	3.2	2.0	2.5	1.8	1.7	2.1
14	1.2	0.71	2.5	4.1	1.1	3.1	3.1	3.0	6.1	1.5	1.5	1.9
15	1.0	0.64	2.3	1.4	1.0	2.7	2.8	2.3	2.6	1.5	1.5	1.9
16	1.0	0.61	2.2	1.2	0.96	2.8	3.1	2.1	2.3	1.5	1.3	2.0
17	0.91	0.63	2.2	1.2	0.95	2.6	2.5	1.9	2.1	1.4	1.3	1.9
18	0.85	0.60	1.9	1.1	0.95	2.8	2.4	1.8	2.8	1.6	1.2	1.7
19	0.80	0.66	1.7	1.1	0.92	2.7	2.3	1.7	3.1	1.8	1.2	4.1
20	0.80	0.59	1.6	1.1	0.87	3.3	3.3	1.6	2.4	1.4	1.2	2.5
21	0.79	0.59	1.5	1.0	0.87	3.7	3.5	1.6	2.4	1.3	1.4	3.0
22	0.90	0.59	1.5	3.2	0.87	3.8	3.1	1.6	3.5	1.3	1.3	2.9
23	0.77	0.62	1.4	9.7	0.87	3.5	2.7	1.6	2.9	1.3	1.2	3.1
24	0.75	1.2	1.4	3.1	0.83	4.1	2.6	1.5	2.5	1.2	1.2	2.7
25	0.85	1.1	1.3	2.4	0.82	4.1	2.5	1.5	2.3	1.3	1.4	2.7
26	0.70	0.71	1.3	2.1	1.4	5.2	4.6	1.5	3.3	1.2	1.2	2.6
27	0.63	0.64	1.3	2.1	27	4.9	2.9	1.4	2.4	1.6	1.1	2.5
28	1.7	0.64	1.3	1.8	5.2	5.9	2.7	1.5	2.4	1.7	1.2	2.4
29	1.2	0.70	1.2	1.6	3.3	6.1	2.6	1.7	2.3	1.3	1.1	2.2
30	1.5	10	1.3	1.5	---	8.4	2.5	1.5	2.1	1.3	1.5	2.1
31	1.1	---	1.3	1.5	---	8.1	---	1.4	---	1.2	1.2	---
TOTAL	28.45	31.23	78.2	57.90	64.71	114.9	105.3	60.0	70.4	49.4	53.7	69.3
MEAN	0.92	1.04	2.52	1.87	2.23	3.71	3.51	1.94	2.35	1.59	1.73	2.31
MAX	2.4	10	6.4	9.7	27	8.4	8.4	5.1	6.1	2.2	11	6.0
MIN	0.46	0.59	1.2	1.0	0.82	2.1	2.3	1.4	1.2	1.2	1.1	1.2
AC-FT	56	62	155	115	128	228	209	119	140	98	107	137

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2004, BY WATER YEAR (WY)

MEAN	2.10	3.65	3.58	3.07	2.49	2.77	3.12	2.71	1.80	1.63	1.57	1.51
MAX	8.29	14.3	11.0	12.4	10.8	14.7	11.8	9.66	5.68	3.80	4.24	4.67
(WY)	(1961)	(1966)	(1992)	(1989)	(1994)	(1982)	(1982)	(1965)	(1980)	(1989)	(1982)	(1980)
MIN	0.42	0.59	0.56	0.58	0.50	0.50	0.73	0.62	0.29	0.59	0.36	0.38
(WY)	(1985)	(1964)	(1963)	(1977)	(1986)	(1978)	(1998)	(1966)	(1968)	(1968)	(1984)	(1975)

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1960 - 2004	
ANNUAL TOTAL	551.89		783.49			
ANNUAL MEAN	1.51		2.14		2.50	
HIGHEST ANNUAL MEAN					5.72	1982
LOWEST ANNUAL MEAN					0.92	1984
HIGHEST DAILY MEAN	24	Apr 2	27	Feb 27	218	Dec 14, 1991
LOWEST DAILY MEAN	0.46	Feb 10	0.46	Oct 1	0.09	Sep 28, 1968
ANNUAL SEVEN-DAY MINIMUM	0.47	Feb 6	0.61	Nov 16	0.10	Jun 6, 1968
ANNUAL RUNOFF (AC-FT)	1,090		1,550		1,810	
10 PERCENT EXCEEDS	2.8		3.5		4.3	
50 PERCENT EXCEEDS	0.89		1.6		1.6	
90 PERCENT EXCEEDS	0.54		0.80		0.67	

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 0.5 mi upstream from confluence with Pohakuhono Stream, and 2.3 mi south of Kilauea.

DRAINAGE AREA.--1.19 mi^2

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

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-95-1: Drainage area.

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

REMARKS.--Records computed by Clayton Yoshida. Records good.

AVERAGE DISCHARGE.--46 years (water years 1959-2004), 11.7 ft^3/s (8,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,140 ft^3/s, February 13, 1994, gage height, 9.76 ft; minimum, 1.8 ft^3/s, September 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 1	1845	*935	*5.35	Mar 28	0315	590	4.44

Minimum discharge, 3.9 ft^3/s, Oct. 1, gage height, 0.77 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	4.8	30	45	5.9	116	14	11	8.2	12	6.5	6.8
2	25	4.8	28	7.1	4.8	38	45	9.9	7.7	9.2	17	12
3	9.3	4.7	28	5.9	4.6	11	87	8.1	14	8.7	16	6.8
4	6.8	4.6	100	5.5	4.8	50	61	11	8.1	8.2	25	6.4
5	8.8	5.0	67	5.2	5.9	24	33	9.7	7.6	8.0	9.3	6.7
6	5.7	4.9	34	5.0	6.4	11	17	21	8.5	7.7	7.6	8.5
7	7.2	5.4	29	5.0	9.9	23	13	16	9.8	7.5	9.0	7.3
8	6.8	7.7	34	4.9	6.3	27	11	9.9	23	7.3	7.6	12
9	10	5.2	27	4.8	5.3	10	9.6	29	17	8.6	9.9	14
10	7.1	4.8	15	4.7	5.1	9.3	9.8	14	22	7.3	8.2	11
11	11	5.0	12	4.6	4.9	7.7	9.1	12	30	7.4	9.3	7.8
12	15	5.0	9.2	4.6	4.7	7.0	9.3	25	33	7.4	14	11
13	19	5.2	8.0	4.6	4.6	54	26	13	30	7.9	9.7	16
14	8.7	6.3	7.3	5.0	4.5	13	10	14	44	7.2	9.1	11
15	8.1	5.0	6.9	4.5	7.3	8.4	23	19	15	6.9	8.7	14
16	8.1	4.8	6.5	4.4	5.5	8.4	31	12	16	6.8	7.8	11
17	6.4	5.6	6.5	4.4	4.6	7.7	12	9.7	15	6.6	7.4	11
18	5.9	5.1	6.0	4.3	4.4	9.3	9.5	8.7	44	7.3	6.9	11
19	5.6	7.9	5.8	4.3	4.3	7.0	9.2	8.1	37	8.0	6.6	23
20	5.3	5.2	5.7	4.2	4.2	16	20	18	21	6.6	6.4	14
21	5.2	4.8	5.5	4.9	4.2	25	20	10	17	6.4	7.7	18
22	6.6	4.8	5.4	22	4.2	86	13	7.9	31	6.3	6.7	17
23	5.2	6.0	5.3	15	4.1	54	11	7.8	23	6.2	6.5	22
24	4.9	6.1	5.2	5.8	4.1	38	9.5	7.9	14	6.2	6.3	14
25	4.9	5.3	5.1	5.1	4.1	37	9.5	7.9	13	6.3	8.1	22
26	4.6	4.8	5.0	6.2	7.7	35	19	7.2	17	6.5	8.1	13
27	4.5	4.7	5.0	5.3	81	21	9.2	7.4	11	7.2	8.1	9.4
28	6.0	4.5	5.5	5.2	12	74	8.7	8.9	12	8.1	7.1	8.8
29	8.1	4.9	5.1	5.0	8.1	77	7.7	8.3	11	6.4	6.6	7.7
30	6.7	35	5.4	4.8	---	47	19	9.5	11	6.4	10	7.5
31	5.3	---	5.5	4.9	---	21	---	8.4	---	6.3	6.8	---
TOTAL	245.7	187.9	523.9	222.2	237.5	972.8	586.1	370.3	570.9	228.9	284.0	360.7
MEAN	7.93	6.26	16.9	7.17	8.19	31.4	19.5	11.9	19.0	7.38	9.16	12.0
MAX	25	35	100	45	81	116	87	29	44	12	25	23
MIN	3.9	4.5	5.0	4.2	4.1	7.0	7.7	7.2	7.6	6.2	6.3	6.4
AC-FT	487	373	1,040	441	471	1,930	1,160	734	1,130	454	563	715

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2004, BY WATER YEAR (WY)

MEAN	10.0	15.8	13.8	11.6	11.3	13.5	14.9	12.0	8.69	10.9	10.1	8.30
MAX	24.6	49.7	43.1	28.4	54.8	42.7	35.1	22.5	29.1	27.1	23.7	15.7
(WY)	(1983)	(1996)	(1988)	(1989)	(1994)	(1982)	(1971)	(1965)	(1978)	(1989)	(1991)	(1994)
MIN	4.40	5.73	3.79	3.45	3.20	4.15	5.06	4.38	4.27	5.05	3.95	3.93
(WY)	(1985)	(1977)	(1986)	(1986)	(1986)	(1995)	(1992)	(2000)	(1959)	(1975)	(1973)	(1975)

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1958 - 2004	
ANNUAL TOTAL	3,471.3		4,790.9			
ANNUAL MEAN	9.51		13.1		11.7	
HIGHEST ANNUAL MEAN					19.6	1982
LOWEST ANNUAL MEAN					7.01	1984
HIGHEST DAILY MEAN	222	Feb 13	116	Mar 1	879	Feb 13, 1994
LOWEST DAILY MEAN	3.9	Sep 28	3.9	Oct 1	1.9	Sep 5, 1968
ANNUAL SEVEN-DAY MINIMUM	4.0	Sep 25	4.2	Feb 19	2.4	Sep 2, 1968
ANNUAL RUNOFF (AC-FT)	6,890		9,500		8,490	
10 PERCENT EXCEEDS	15		27		20	
50 PERCENT EXCEEDS	5.5		8.1		7.3	
90 PERCENT EXCEEDS	4.4		4.8		4.6	

16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11'01", long 159°28'08", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 2.3 mi southeast of Hanalei Bridge, and 5.5 mi upstream from the river mouth.

DRAINAGE AREA.--18.7 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P). WDR HI-77-1: 1970-76(M), 1975-76. WDR HI-00-1: Drainage area.

GAGE.--Water stage recorder and crest-stage gage. Datum of gage is 60.0 ft above mean sea level (from topographic map). January 1, 1912 to November 20, 1919, nonrecording gage at site 0.3 mi downstream at different datum. January 26 to December 26, 1962, crest-stage gage at site 0.5 mi downstream at different datum. Water-stage recorder and crest-stage at site 0.5 mi downstream at different datum from December 27, 1962 to May 10, 2000.

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversions upstream.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel ended).--12 years (water years 1993-2004), 204 ft^3/s (148,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,600 ft^3/s, November 3, 1995, gage height, 15.81 ft, from rating curve extended above 26,600 ft^3/s; minimum, 31 ft^3/s, September 30, October 1, 2, 5, 12, 13, November 3, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 27	0300	*7,310	*7.36

Minimum discharge, 67 ft^3/s, Oct. 1, gage height, 1.94 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	91	414	1,340	128	875	268	173	136	226	130	141
2	370	123	697	163	91	947	666	139	125	165	387	166
3	183	96	756	123	89	263	1,470	128	151	173	390	128
4	121	106	737	106	92	485	1,180	224	118	150	826	113
5	133	153	1,450	98	138	349	613	233	115	140	234	310
6	97	132	581	93	172	185	330	242	145	137	157	289
7	181	237	741	90	434	603	246	306	158	129	175	149
8	180	274	880	90	178	697	203	186	304	123	157	422
9	296	117	472	85	115	215	339	289	324	119	186	355
10	147	106	377	83	104	213	221	224	448	118	152	255
11	226	150	335	81	97	166	184	219	522	138	239	164
12	376	131	210	83	92	137	166	310	549	136	293	308
13	430	161	178	78	88	1,550	365	180	729	159	209	320
14	169	147	154	660	85	356	259	196	638	120	164	295
15	180	141	138	117	128	202	330	250	289	115	154	249
16	190	125	126	95	104	255	467	252	298	119	139	203
17	124	288	246	88	86	207	229	172	370	108	128	205
18	110	147	124	85	83	170	176	142	731	147	120	264
19	102	238	112	82	80	137	171	131	901	137	114	472
20	101	134	105	81	78	710	1,170	137	430	107	109	318
21	102	116	100	84	77	573	305	185	296	103	164	462
22	148	123	96	373	77	1,580	217	130	455	101	128	387
23	93	247	93	365	75	1,260	177	125	330	100	120	570
24	87	174	100	112	74	1,400	159	142	231	99	119	388
25	94	122	90	108	79	945	297	196	194	105	205	441
26	83	107	86	158	277	910	1,090	149	329	106	150	258
27	89	99	86	114	2,150	378	233	141	207	132	144	206
28	214	98	111	103	269	1,340	193	169	199	230	131	174
29	369	212	94	97	164	1,120	157	176	224	114	119	155
30	164	148	104	94	---	711	204	189	185	112	198	155
31	102	---	111	97	---	409	---	137	---	106	119	---
TOTAL	5,332	4,543	9,904	5,426	5,704	19,348	12,085	5,872	10,131	4,074	6,060	8,322
MEAN	172	151	319	175	197	624	403	189	338	131	195	277
MAX	430	288	1,450	1,340	2,150	1,580	1,470	310	901	230	826	570
MIN	71	91	86	78	74	137	157	125	115	99	109	113
AC-FT	10,580	9,010	19,640	10,760	11,310	38,380	23,970	11,650	20,090	8,080	12,020	16,510

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2004, BY WATER YEAR (WY)

MEAN	190	263	243	218	199	214	250	181	175	176	155	193
MAX	304	599	459	458	392	624	403	418	338	247	199	523
(WY)	(1995)	(1996)	(1993)	(2002)	(1994)	(2004)	(2004)	(1997)	(2004)	(2000)	(1995)	(1994)
MIN	96.9	143	133	80.9	79.8	88.0	76.6	84.6	71.5	127	103	77.5
(WY)	(2003)	(1993)	(2003)	(2001)	(2000)	(1993)	(1993)	(1995)	(1993)	(2002)	(2003)	(1993)

16103000 HANALEI RIVER NEAR HANALEI—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1993 - 2004	
ANNUAL TOTAL	61,050		96,801			
ANNUAL MEAN	167		264		204	
HIGHEST ANNUAL MEAN					264	2004
LOWEST ANNUAL MEAN					150	2003
HIGHEST DAILY MEAN	2,000	Feb 13	2,150	Feb 27	7,100	Nov 9, 1995
LOWEST DAILY MEAN	63	Sep 29	71	Oct 1	54	Jul 8, 1993
ANNUAL SEVEN-DAY MINIMUM	67	Sep 24	77	Feb 19	57	Jul 3, 1993
ANNUAL RUNOFF (AC-FT)	121,100		192,000		148,100	
10 PERCENT EXCEEDS	291		571		373	
50 PERCENT EXCEEDS	105		164		132	
90 PERCENT EXCEEDS	75		93		80	

HAWAII, ISLAND OF KAUAI
16103000 HANALEI RIVER NEAR HANALEI, KAUAI
WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 2003 to current year.

PERIOD OF DAILY RECORD.--SUSPENDED SEDIMENT DISCHARGE: October 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Sediment concentrations: maximum daily mean 117 mg/L, March 13, 2004; minimum 0 mg/L on February 11, 2004 and July 16, 2004. Sediment discharge: maximum daily, 1,060 tons, February 27, 2004; minimum 0.6 tons on February 11, 2004.

Suspended sediment concentration, milligrams per liter

Water Year October 2003 to September 2004

Daily Mean Values

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2	e3	e18	87	4	55	5	6	4	9	3	4
2	e16	e4	e31	9	2	48	13	3	3	7	43	5
3	e8	e3	e33	3	2	10	69	4	4	5	27	4
4	e6	e3	e33	2	2	25	50	13	5	2	36	3
5	e4	e5	e84	1	2	19	27	12	4	1	10	14
6	e2	e4	e28	2	6	2	7	11	4	1	5	19
7	e6	e11	e45	2	20	18	4	21	5	1	4	9
8	e12	e12	e41	3	7	42	2	7	15	1	4	20
9	e19	e3	e20	4	2	10	3	21	15	1	5	16
10	e5	e3	e10	3	1	7	2	13	23	1	6	10
11	e8	e3	e11	2	0.0	6	2	9	30	1	7	7
12	e18	e3	e8	1	1	5	3	22	29	2	12	14
13	e27	e5	e5	1	1	117	35	7	37	2	7	10
14	e6	e4	e4	55	2	20	18	6	30	1	5	8
15	e8	e5	e3	4	2	5	10	11	9	1	4	5
16	e9	e6	e3	1	3	11	25	9	6	0.0	4	4
17	e6	e17	e7	1	4	12	9	5	10	3	3	5
18	e3	e6	e2	2	3	4	3	4	14	8	3	8
19	e3	e12	e2	3	2	5	4	6	16	10	3	21
20	e4	e4	e2	2	2	36	50	3	6	7	4	14
21	e5	e3	e2	3	2	33	11	11	5	4	7	22
22	e6	e5	e2	17	2	81	7	5	14	2	7	25
23	e3	e7	e2	22	2	40	4	4	8	3	4	35
24	e2	e6	e2	4	1	41	5	3	5	6	5	18
25	e2	e4	e2	7	1	34	13	9	6	7	9	20
26	e2	e2	e2	11	18	31	53	5	25	5	6	11
27	e2	e2	e2	8	102	12	10	4	5	4	4	5
28	e10	e3	e2	4	5	55	5	5	4	22	4	4
29	e25	e10	e2	2	3	42	4	5	6	5	5	3
30	e5	e5	e2	2	---	19	8	6	8	4	9	2
31	e2	---	3	3	---	10	---	5	---	3	5	---
TOTAL	236	163	413	271	204.0	855	461	255	355	129.0	260	345
MEAN	8	5	13	9	7	28	15	8	12	4	8	12
MAX	27	17	84	87	102	117	69	22	37	22	43	35
MIN	2	2	2	1	0.0	2	2	3	3	0.0	3	2

e Estimated

Suspended sediment load, tons per day
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.40	e0.65	e29	783	1.5	363	3.7	2.7	1.4	5.8	1.2	1.6
2	e16	e1.2	e71	4.0	0.55	146	25	1.2	1.2	3.3	69	2.1
3	e3.8	e0.85	e115	1.1	0.40	7.4	348	1.3	1.8	2.2	37	1.5
4	e2.1	e0.77	e67	0.51	0.47	43	164	9.9	1.5	0.94	114	0.85
5	e1.6	e2.1	e544	0.33	0.64	21	49	9.4	1.3	0.38	6.9	33
6	e0.65	e1.5	e46	0.44	2.8	1.2	5.9	13	1.7	0.37	2.0	16
7	e3.7	e8.0	e204	0.60	33	81	2.4	20	2.0	0.35	2.0	3.7
8	e6.0	e11	e114	0.84	3.7	106	1.3	3.9	17	0.33	1.9	66
9	e18	e1.0	e26	0.81	0.48	5.9	2.6	22	14	0.32	2.7	17
10	e2.0	e0.91	e9.9	0.56	0.14	3.9	1.4	8.0	36	0.32	2.6	6.9
11	e5.6	e1.4	e10	0.38	0.06	2.8	1.1	5.7	62	0.46	4.4	3.1
12	e25	e1.0	e4.7	0.28	0.18	1.9	1.2	21	47	0.64	9.6	13
13	e57	e2.4	e2.5	0.31	0.30	804	43	3.3	83	0.75	4.0	8.9
14	e2.6	e1.7	e1.5	188	0.40	22	16	3.2	73	0.41	2.1	6.3
15	e3.9	e1.8	e1.1	1.3	0.90	2.8	9.2	7.4	7.1	0.24	1.8	3.5
16	e4.6	e2.0	e0.94	0.17	0.97	9.0	39	6.4	4.5	0.08	1.4	1.9
17	e2.0	e15	e7.3	0.17	0.81	7.3	6.1	2.3	9.9	0.78	1.1	2.8
18	e0.89	e2.4	e0.67	0.51	0.56	2.1	1.4	1.5	35	3.4	0.97	5.5
19	e0.78	e8.5	e0.60	0.61	0.43	2.0	2.2	2.0	46	3.6	0.92	29
20	e1.1	e1.3	e0.57	0.49	0.42	98	301	1.1	6.7	1.9	1.1	13
21	e1.5	e1.0	e0.54	0.76	0.42	54	9.2	8.2	4.2	1.1	3.7	31
22	e2.9	e1.7	e0.52	50	0.40	383	4.0	1.8	19	0.53	2.5	26
23	e0.66	e5.0	e0.50	35	0.35	150	1.9	1.4	7.5	0.73	1.4	59
24	e0.54	e2.9	e0.54	1.2	0.30	158	2.1	1.1	3.3	1.7	1.5	19
25	e0.52	e1.3	e0.48	2.2	0.27	95	24	5.4	3.0	2.0	5.1	24
26	e0.45	e0.63	e0.47	4.7	109	89	228	2.2	22	1.4	2.5	8.2
27	e0.48	e0.54	e0.47	2.3	1060	13	6.1	1.6	3.1	1.3	1.5	2.9
28	e10	e0.78	e0.60	1.0	4.1	247	2.4	2.2	2.4	18	1.4	1.8
29	e102	e6.3	e0.51	0.56	1.5	141	1.6	2.5	3.5	1.5	1.5	1.2
30	e2.7	e1.8	e0.64	0.59	---	37	4.3	2.9	4.0	1.1	5.2	0.92
31	e0.55	---	1.0	0.66	---	12	---	2.0	---	0.93	1.7	---
TOTAL	280.02	87.43	1262.05	1083.38	1225.05	3109.3	1307.1	176.6	524.1	56.86	294.69	409.67
MEAN	9.0	2.9	41	35	42	100	44	5.7	17	1.8	9.5	14
MAX	102	15	544	783	1060	804	348	22	83	18	114	66
MIN	0.40	0.54	0.47	0.17	0.06	1.2	1.1	1.1	1.2	0.08	0.92	0.85

e Estimated

16108000 WAINIHA RIVER NEAR HANALEI

LOCATION.--Lat 22°08'20", long 159°33'38", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank at Puwainui Falls, 1.5 mi upstream from Wainiha power plant intake, and 6.0 mi southwest of Hanalei.

DRAINAGE AREA.--10.2 mi^2.

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

REVISED RECORDS.--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area. WRD HI-00-1: 1953-99 (P).

GAGE.--Water-stage recorder. Elevation of gage is 960 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--49 years (water years 1953-55, 1959-2004), 137 ft^3/s (99,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft^3/s, April 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 31 ft^3/s, September 29, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 13	0045	*2,970	*5.13

Minimum discharge, 33 ft^3/s, Oct. 1, 2, gage height, 1.06 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	58	136	624	84	260	94	71	82	159	67	115
2	42	92	267	95	52	350	286	60	64	97	206	126
3	53	67	205	65	48	104	465	57	82	115	228	67
4	52	84	206	52	47	122	521	121	60	85	588	60
5	64	78	277	46	73	110	224	119	67	77	119	318
6	46	96	199	43	155	67	108	173	107	76	74	229
7	138	163	176	42	217	396	76	125	124	72	110	93
8	154	124	511	42	77	720	68	74	320	65	80	112
9	207	56	263	40	51	106	236	80	248	61	96	179
10	96	70	206	39	47	148	112	92	326	67	115	116
11	187	127	181	39	43	99	85	73	334	76	202	75
12	249	89	79	56	42	66	86	137	302	82	240	183
13	346	133	73	41	40	911	204	85	332	101	159	161
14	97	111	64	670	39	185	180	202	302	68	99	140
15	121	115	54	87	40	83	166	177	113	67	87	118
16	123	117	49	58	42	95	346	131	124	86	68	108
17	59	236	92	50	39	102	129	83	153	61	61	109
18	48	85	58	45	39	84	81	68	294	89	58	160
19	43	142	52	43	38	66	112	61	499	81	56	279
20	43	97	45	43	37	434	344	61	214	59	54	183
21	47	82	43	44	37	294	148	79	163	55	116	290
22	105	120	41	261	37	732	100	60	313	53	75	214
23	43	217	40	280	37	687	80	70	205	53	72	248
24	38	119	47	66	36	827	68	94	115	52	76	159
25	48	69	40	54	45	539	145	147	85	59	152	158
26	39	56	39	59	196	718	362	91	188	60	115	97
27	58	49	43	63	1,090	149	105	105	102	81	87	84
28	210	47	52	57	123	684	93	141	88	217	91	68
29	215	106	61	56	67	464	71	124	144	66	77	66
30	97	67	166	57	---	383	75	120	114	68	129	77
31	62	---	108	74	---	123	---	86	---	58	67	---
TOTAL	3,164	3,072	3,873	3,291	2,918	10,108	5,170	3,167	5,664	2,466	3,824	4,392
MEAN	102	102	125	106	101	326	172	102	189	79.5	123	146
MAX	346	236	511	670	1,090	911	521	202	499	217	588	318
MIN	34	47	39	39	36	66	68	57	60	52	54	60
AC-FT	6,280	6,090	7,680	6,530	5,790	20,050	10,250	6,280	11,230	4,890	7,580	8,710

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2004, BY WATER YEAR (WY)

MEAN	114	183	164	143	141	167	175	122	104	129	113	95.2
MAX	228	414	384	371	492	611	504	238	189	315	272	249
(WY)	(1983)	(1991)	(1968)	(1989)	(1969)	(1982)	(1971)	(1967)	(2004)	(1989)	(1982)	(1994)
MIN	42.8	72.7	54.1	44.6	36.5	52.2	52.8	51.9	53.1	50.4	62.9	44.0
(WY)	(1985)	(1964)	(1984)	(1986)	(1978)	(1970)	(1992)	(1966)	(1993)	(1984)	(1971)	(1993)

16108000 WAINIHA RIVER NEAR HANALEI—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1952 - 2004	
ANNUAL TOTAL	33,666		51,109			
ANNUAL MEAN	92.2		140		137	
HIGHEST ANNUAL MEAN					243	1982
LOWEST ANNUAL MEAN					84.8	1984
HIGHEST DAILY MEAN	1,120	Apr 12	1,090	Feb 27	3,650	Nov 21, 1974
LOWEST DAILY MEAN	34	Oct 1	34	Oct 1	32	Oct 22, 1984
ANNUAL SEVEN-DAY MINIMUM	37	Sep 26	37	Feb 18	33	Oct 16, 1984
ANNUAL RUNOFF (AC-FT)	66,780		101,400		99,370	
10 PERCENT EXCEEDS	181		287		260	
50 PERCENT EXCEEDS	60		91		79	
90 PERCENT EXCEEDS	40		44		49	

16114000 LIMAHULI STREAM NEAR WAINIHA

LOCATION.--Lat 22°13'15", long 159°34'48", Old Hawaiian Datum, Hydrologic Unit 20070000, on left bank 0.2 mi upstream from intersection with Kuhio Highway, and entrance to Haena State Park.

DRAINAGE AREA.--1.36 mi^2.

PERIOD OF RECORD.--October 1994 to current year.

GAGE.--Water-stage recorders and natural control. Elevation of gage is 200 ft above mean sea level, by altimeter.

REMARKS.--Records computed by Clayton Yoshida. Records fair. Limahuli Gardens diverts water through a 4-inch pipe upstream of station.

AVERAGE DISCHARGE.--6 years (water years 1999-2004), 7.70 ft^3/s (5,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 985 ft^3/s, December 11, 2000, gage height, 5.24 ft; minimum, 3.4 ft^3/s, September 27-30, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 1	1845	373	3.40	Mar 13	0400	*468	*3.74

Minimum discharge, 3.5 ft^3/s, on several days, gage height, 0.35 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	4.3	21	8.2	4.5	78	9.1	8.4	4.9	6.0	5.0	6.1
2	21	4.0	26	5.9	4.2	53	42	6.7	7.2	5.4	22	5.5
3	6.1	3.9	31	4.9	4.1	11	107	5.8	7.1	5.3	12	5.3
4	5.6	3.8	27	4.3	4.0	90	69	5.9	5.6	5.1	11	5.1
5	5.7	3.7	12	4.0	4.3	30	28	6.5	5.3	5.0	7.0	5.4
6	4.4	3.6	8.0	3.9	4.6	10	14	16	5.7	5.2	5.9	6.3
7	6.5	3.7	16	3.8	4.3	14	9.7	10	5.9	5.1	5.5	5.4
8	6.0	3.7	27	3.8	4.1	17	8.1	13	14	4.9	5.3	5.2
9	10	3.6	22	3.6	3.9	8.4	8.2	22	12	4.8	5.1	5.6
10	6.1	3.6	12	3.9	6.0	7.4	7.7	13	20	4.8	5.1	5.3
11	5.2	3.7	9.9	3.6	4.7	6.3	6.8	8.2	25	4.8	5.1	5.2
12	5.8	3.7	7.1	10	4.6	5.6	6.3	8.6	43	4.8	5.6	6.9
13	8.4	4.2	6.0	4.9	4.2	81	21	7.7	32	4.9	5.5	10
14	5.3	4.6	5.3	15	4.0	13	9.7	7.8	22	4.8	5.0	9.6
15	6.5	4.5	5.0	6.1	16	8.3	7.9	22	11	4.8	4.9	7.8
16	6.5	4.2	4.8	5.0	7.5	11	18	12	10	4.8	4.9	6.3
17	4.9	4.1	7.6	4.6	5.2	8.6	9.7	8.2	13	4.7	4.8	7.0
18	4.4	3.8	4.7	4.3	4.6	7.4	7.1	6.7	33	5.4	4.8	8.1
19	4.2	7.1	4.3	4.1	4.2	6.4	7.1	6.0	38	5.3	4.8	12
20	4.0	4.5	4.1	4.3	4.0	21	6.2	5.7	17	4.8	4.7	11
21	4.0	4.2	4.0	4.7	3.9	24	8.7	5.7	11	4.7	6.7	10
22	4.1	4.1	3.9	7.2	3.8	42	6.7	5.3	16	4.7	5.3	10
23	3.8	7.9	3.8	9.6	3.8	54	5.9	5.2	15	4.7	5.1	12
24	3.8	6.3	3.8	5.3	3.7	38	5.5	5.3	9.4	4.7	5.0	9.7
25	3.7	9.1	3.6	4.7	3.6	26	9.8	5.1	7.6	4.6	6.6	9.2
26	3.6	6.1	3.6	31	4.0	17	26	5.0	7.0	5.6	7.9	7.6
27	3.6	5.1	8.3	8.7	47	12	7.5	5.2	6.2	5.8	7.0	6.4
28	6.7	4.5	14	5.9	17	18	6.3	5.4	5.9	5.8	5.9	5.9
29	6.1	4.2	7.8	5.2	8.7	47	5.7	5.1	5.7	5.0	5.6	5.7
30	6.0	4.0	8.1	5.3	---	31	9.3	4.9	5.6	4.9	7.9	5.6
31	4.9	---	6.6	4.6	---	13	---	4.8	---	4.9	5.7	---
TOTAL	181.6	137.8	328.3	200.4	198.5	809.4	494.0	257.2	421.1	156.1	202.7	221.2
MEAN	5.86	4.59	10.6	6.46	6.84	26.1	16.5	8.30	14.0	5.04	6.54	7.37
MAX	21	9.1	31	31	47	90	107	22	43	6.0	22	12
MIN	3.6	3.6	3.6	3.6	3.6	5.6	5.5	4.8	4.9	4.6	4.7	5.1
AC-FT	360	273	651	397	394	1,610	980	510	835	310	402	439

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2004, BY WATER YEAR (WY)

MEAN	5.49	8.01	10.4	8.12	9.29	9.71	11.7	6.38	6.66	5.67	5.95	5.08
MAX	6.04	10.4	14.5	11.2	14.2	26.1	16.5	9.14	14.0	9.12	7.72	7.37
(WY)	(1999)	(2003)	(2001)	(2000)	(2003)	(2004)	(2000)	(2002)	(2004)	(1999)	(2001)	(2004)
MIN	4.56	4.59	6.16	4.34	4.64	4.22	5.31	4.44	3.80	3.90	3.82	3.55
(WY)	(2003)	(2004)	(2003)	(2001)	(2000)	(2001)	(2002)	(2003)	(2003)	(2003)	(2003)	(2003)

16114000 LIMAHULI STREAM NEAR WAINIHA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1999 - 2004	
ANNUAL TOTAL	2,452.8		3,608.3			
ANNUAL MEAN	6.72		9.86		7.70	
HIGHEST ANNUAL MEAN					9.86	2004
LOWEST ANNUAL MEAN					6.65	2002
HIGHEST DAILY MEAN	130	Feb 13	107	Apr 3	183	Dec 11, 2000
LOWEST DAILY MEAN	3.4	Sep 27	3.6	Oct 26	3.4	Sep 27, 2003
ANNUAL SEVEN-DAY MINIMUM	3.4	Sep 24	3.7	Nov 5	3.4	Sep 24, 2003
ANNUAL RUNOFF (AC-FT)	4,870		7,160		5,580	
10 PERCENT EXCEEDS	10		21		12	
50 PERCENT EXCEEDS	4.2		5.9		5.4	
90 PERCENT EXCEEDS	3.6		4.0		3.9	

Surface-Water Station Records for Oahu

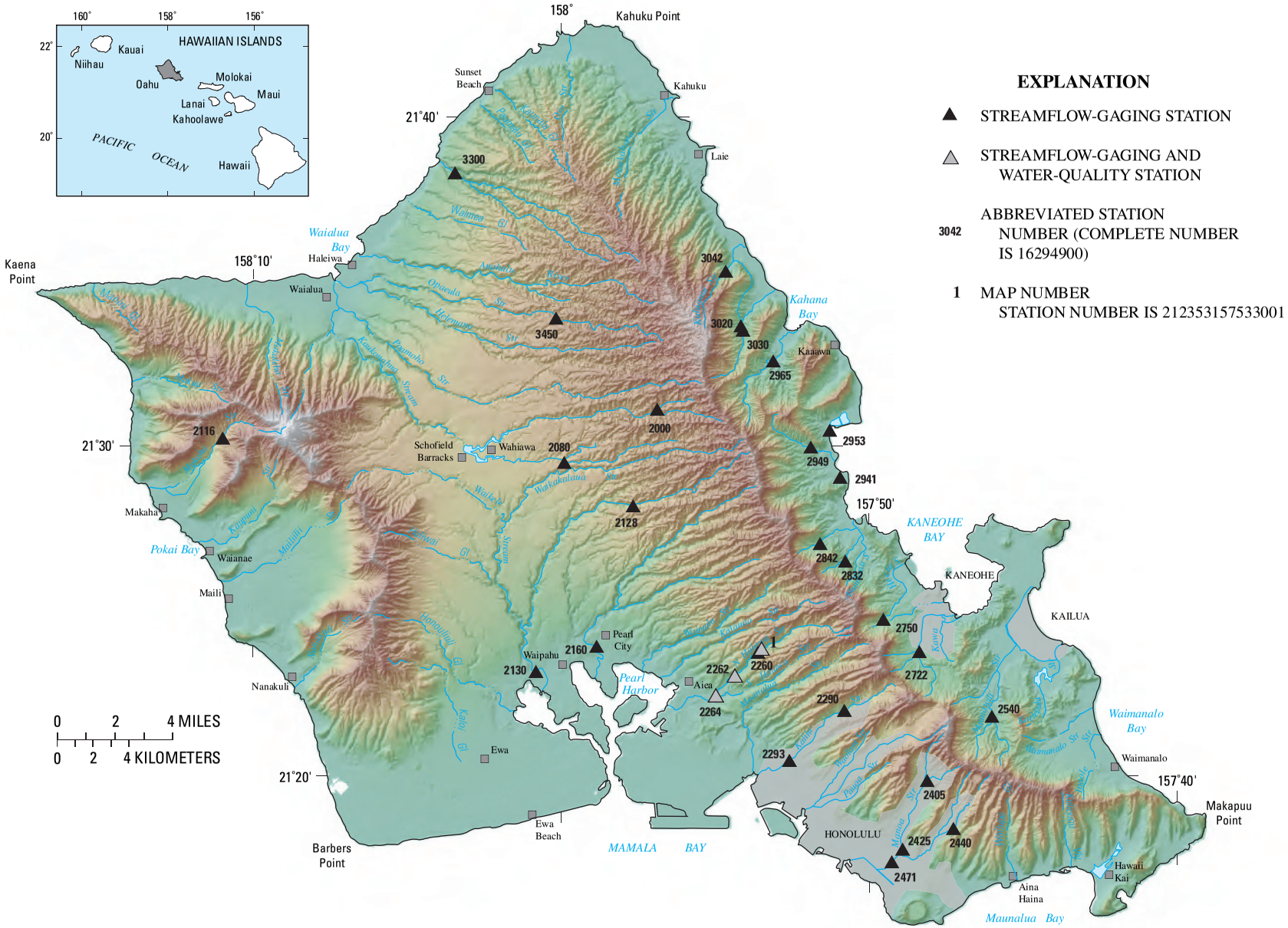


Figure 6. Locations of streamflow-gaging stations on Oahu.

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

LOCATION.--Lat 21°31'09", long 157°56'53", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 140 ft upstream from mauka ditch intake and Right Branch, and 4.5 mi northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi^2.

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

REVISED RECORDS.--WSP 1219: 1931-33(M), 1935(M), 1937-38(M). WSP 1319: 1914, 1917-18(M), 1920-23(M), 1925(M), 1927-30(M). WSP 1719: Drainage area. WDR HI-04-1: 1939-43(P), 1945-53(P), 1961-2002(P).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by H.A. Jeppesen. Records good, except for estimated days, which are fair.

AVERAGE DISCHARGE.--81 years (water years 1914-24, 1927-52, 1961-2004), 16.1 ft^3/s (11,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,400 ft^3/s (revised), October 28, 1981, gage height, 13.2 ft, from rating curve extended above 110 ft^3/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft^3/s, March 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	*2,990	*10.32	Feb 7	2115	1,710	8.29

Minimum discharge, 1.5 ft^3/s, Oct. 31, Nov. 1, 2, gage height, 1.61 ft.

REVISIONS.--The maximum annual discharges for water years 1939 to 2002 have been revised as shown in the following table. These figures supercede those published in Water Supply Papers, 1939-1953 and Annual Data Reports 1961-2002.

WATER YEAR	DATE	PEAK DISCHARGE (CFS)	GAGE HEIGHT (FT)
1939	Mar. 02, 1939	2260	9.23
1940	Aug. 12, 1940	3050	10.41
1941	Nov. 20, 1940	846	6.40
1942	Sep. 15, 1942	1080	7.00
1943	Nov. 15, 1942	511	5.35
1945	Nov. 08, 1944	1070	6.96
1946	Jul. 21, 1946	646	5.81
1947	Mar. 30, 1947	1220	7.31
1948	Apr. 03, 1948	1510	7.92
1949	Jan. 16, 1949	1110	7.07
1950	Jan. 22, 1950	1220	7.31
1951	Mar. 26, 1951	1080	7.00
1952	Mar. 04, 1952	2050	8.88
1953	Mar. 29, 1953	899	6.54
1961	Feb. 13, 1961	832	6.36
1962	Nov. 01, 1961	2120	9.01
	Mar. 12, 1962	1470	7.84
1963	Apr. 15, 1963	4710	12.46
	Mar. 18, 1963	1320	7.52
	May 14, 1963	2100	8.97
	Jun. 10, 1963	1580	8.06
1964	Mar. 23, 1964	1850	8.55
	Jul. 25, 1964	1380	7.65
1965	May 01, 1965	2060	8.90
	Dec. 15, 1964	1810	8.48
	Feb. 04, 1965	1940	8.69
	Apr. 04, 1965	980	6.75
	Apr. 06, 1965	980	6.75
	Jul. 21, 1965	2030	8.85
	Aug. 26, 1965	1590	8.08
1966	Oct. 13, 1965	1780	8.42
	Nov. 14, 1965	1480	7.86
	Jan. 19, 1966	1570	8.04
1967	Aug. 09, 1967	2240	9.20
	Nov. 05, 1966	1350	7.59
1968	Mar. 16, 1968	4080	11.73
1969	Feb. 01, 1969	3800	11.38
	Jan. 02, 1969	2030	8.85
1970	Jul. 25, 1970	2480	9.59
	Dec. 24, 1969	1490	7.88

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA—Continued

1971	Apr. 05, 1971	2680	9.88
	Nov. 25, 1970	2000	8.80
	Mar. 25, 1971	1410	7.72
	Apr. 23, 1971	1750	8.37
	Apr. 24, 1971	1650	8.18
1972	Jan. 22, 1972	3020	10.36
	Apr. 17, 1972	2400	9.45
1973	Oct. 03, 1972	659	5.85
1974	Jul. 17, 1974	3860	11.46
	Nov. 11, 1973	1430	7.76
	Apr. 19, 1974	3000	10.34
1975	Nov. 21, 1974	1940	8.70
1976	Oct. 19, 1975	832	6.36
1977	Apr. 20, 1977	1620	8.12
	Apr. 19, 1977	1330	7.55
1978	Jun. 28, 1978	857	6.43
1979	Feb. 10, 1979	1420	7.74
1980	Mar. 18, 1980	2270	9.25
	Jan. 08, 1980	1500	7.89
1981	Apr. 07, 1981	778	6.21
1982	Oct. 28, 1981	5400	13.20
	Jan. 06, 1982	1770	8.40
	Mar. 14, 1982	1820	8.50
	Aug. 01, 1982	1400	7.70
	Aug. 16, 1982	1500	7.90
	Sep. 01, 1982	2190	9.12
1983	Dec. 23, 1982	775	6.20
1984	Apr. 19, 1984	751	6.13
1985	Nov. 26, 1984	1420	7.73
1986	May 10, 1986	2570	9.72
	Sep. 29, 1986	1990	8.79
1987	Mar. 24, 1987	850	6.41
1988	Dec. 31, 1987	2970	10.29
1989	Jan. 12, 1989	1110	7.07
1990	Oct. 03, 1989	1400	7.70
1991	Nov. 20, 1990	2960	10.28
	Mar. 1991	1960	8.74
1992	Sep. 03, 1992	1500	7.89
1993	Jul. 22, 1993	2340	9.37
1994	Sep. 18, 1994	1820	8.49
	Feb. 12, 1994	1590	8.08
1995	Aug. 23, 1995	1390	7.68
1996	Jan. 19, 1996	2090	8.95
	Jan. 25, 1996	1560	8.02
1997	Oct. 19, 1996	1630	8.15
1998	Oct. 08, 1997	817	6.32
1999	Jan. 22, 1999	714	6.02
2000	Jan. 19, 2000	1710	8.29
	Dec. 02, 1999	1590	8.07
2001	Oct. 29, 2000	1500	7.90
	Feb. 09, 2001	1480	7.86
2002	May 06, 2002	3020	10.36
	Jan. 27, 2002	2380	9.43

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	1.5	43	33	23	8.1	17	6.8	8.9	43	3.6	3.4
2	2.3	4.0	19	80	7.8	35	28	6.2	11	25	32	3.8
3	2.3	3.6	26	30	6.7	7.3	56	6.0	10	14	66	5.2
4	2.2	13	75	6.9	20	20	41	14	8.2	14	183	3.6
5	2.1	18	119	e6.0	41	9.1	15	9.5	6.7	21	17	2.9
6	2.0	36	109	e5.7	23	6.0	12	67	7.5	28	9.5	10
7	2.5	11	195	e5.0	146	9.6	12	48	9.6	14	32	2.9
8	22	13	50	4.7	36	21	10	11	19	33	11	2.7
9	13	3.2	41	4.3	13	6.7	18	8.0	37	16	8.4	14
10	3.4	2.9	80	3.9	9.7	5.7	72	6.8	56	11	20	7.8
11	46	4.3	51	3.7	8.0	5.1	15	37	33	31	32	3.2
12	25	2.7	24	3.7	6.9	6.7	63	31	24	30	17	6.0
13	9.3	6.4	27	3.3	6.1	23	42	11	15	16	11	3.0
14	30	16	20	18	5.6	18	15	10	15	10	20	6.5
15	22	17	14	4.3	5.1	5.8	32	32	9.7	9.4	8.5	3.1
16	7.3	16	12	3.1	4.6	4.8	47	12	15	8.7	6.6	2.6
17	5.0	46	11	2.8	4.2	4.6	14	7.7	32	8.1	6.0	2.6
18	4.9	22	9.3	2.7	3.9	4.0	11	6.6	10	7.2	5.2	3.5
19	3.4	18	8.5	2.6	3.7	3.7	20	6.0	18	6.9	4.7	13
20	3.0	6.3	7.7	4.2	3.5	12	29	5.6	22	6.1	4.1	3.8
21	2.8	4.9	7.0	2.8	3.3	135	22	5.1	12	5.7	23	8.3
22	2.6	4.7	6.4	22	3.0	151	31	4.7	43	5.3	5.4	13
23	2.6	4.6	6.0	14	25	77	25	5.9	18	5.0	5.0	20
24	2.4	4.4	6.4	4.0	5.5	34	18	5.0	11	4.8	9.2	14
25	2.2	3.5	5.7	50	10	54	10	21	9.2	6.9	6.4	13
26	2.0	3.1	5.0	28	22	33	42	6.1	12	7.2	13	6.1
27	1.9	2.8	4.6	9.8	106	16	11	5.3	14	6.2	8.5	4.2
28	1.8	2.7	4.9	5.2	17	21	8.9	33	50	14	5.8	3.6
29	1.8	288	4.2	6.5	7.8	92	8.0	21	19	4.5	6.6	27
30	1.7	96	8.9	34	---	126	7.4	28	37	3.9	4.1	22
31	1.6	---	20	24	---	26	---	29	---	4.3	3.7	---
TOTAL	233.6	675.6	1,020.6	428.2	577.4	981.2	752.3	506.3	592.8	420.2	588.3	234.8
MEAN	7.54	22.5	32.9	13.8	19.9	31.7	25.1	16.3	19.8	13.6	19.0	7.83
MAX	46	288	195	80	146	151	72	67	56	43	183	27
MIN	1.6	1.5	4.2	2.6	3.0	3.7	7.4	4.7	6.7	3.9	3.6	2.6
AC-FT	463	1,340	2,020	849	1,150	1,950	1,490	1,000	1,180	833	1,170	466

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2004, BY WATER YEAR (WY)

MEAN	13.1	17.4	15.1	14.4	12.5	18.6	19.7	16.2	13.4	18.2	17.9	14.9
MAX	32.7	76.5	48.9	126	117	74.4	58.6	53.3	31.3	48.0	50.1	79.1
(WY)	(1942)	(1966)	(1988)	(1921)	(1932)	(1982)	(1963)	(1927)	(1963)	(1930)	(1931)	(1914)
MIN	2.21	1.31	1.57	0.36	0.40	0.28	1.39	0.67	2.63	4.22	1.81	1.95
(WY)	(1985)	(1934)	(1990)	(1986)	(1986)	(1983)	(1966)	(1992)	(1951)	(1951)	(1971)	(1975)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1913 - 2004	
ANNUAL TOTAL	4,497.73		7,011.3			
ANNUAL MEAN	12.3		19.2		16.1	
HIGHEST ANNUAL MEAN					29.5	1932
LOWEST ANNUAL MEAN					8.60	2003
HIGHEST DAILY MEAN	288	Nov 29	288	Nov 29	975	Feb 27, 1935
LOWEST DAILY MEAN	0.41	Jan 29	1.5	Nov 1	0.12	Mar 13, 1941
ANNUAL SEVEN-DAY MINIMUM	0.48	Feb 7	1.8	Oct 26	0.13	Mar 5, 1986
ANNUAL RUNOFF (AC-FT)	8,920		13,910		11,690	
10 PERCENT EXCEEDS	29		41		36	
50 PERCENT EXCEEDS	4.6		9.6		7.1	
90 PERCENT EXCEEDS	1.3		3.1		1.7	

e Estimated

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA

LOCATION.--Lat 21°29'32", long 157°59'54", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank on upstream side of dam at East Pump Reservoir, 2.3 mi east of Wahiawa Post Office, and 7.1 mi north of Waipahu.

DRAINAGE AREA.--4.04 mi^2.

PERIOD OF RECORD.--July 1957 to June 1963, water years 1963-64 (annual maximum), July 1964 to September 2004 (discontinued).

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level (from U.S. Coast and Geodetic Survey trig station).

REMARKS.--Records computed by H.A. Jeppesen. Records good except for estimated days which are poor. Prior to 1960, water was diverted from reservoirs upstream of station for use at Schofield Barracks.

AVERAGE DISCHARGE.--42 years (water years 1961-62, 1965-2004), 21.0 ft^3/s (15,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft^3/s, April 15, 1963, gage height, 11.33 ft, from rating curve extended above 1,100 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	1,730	6.15
Dec 7	2215	*2,550	*7.43
Dec 7	unknown	e1,260	e5.33
Aug 4	0730	1,750	6.19

Minimum discharge, 1.6 ft^3/s, Nov. 11, gage height, 1.28 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	2.0	52	e100	e26	e9.1	28	8.2	13	43	6.3	8.0
2	4.7	2.0	27	245	e10	e65	37	7.6	10	39	38	9.9
3	6.7	4.6	20	112	e7.6	e11	89	7.1	11	25	44	7.6
4	6.3	12	67	25	e20	e24	62	23	8.1	21	459	7.5
5	5.5	17	196	17	e50	e12	27	23	11	24	36	6.3
6	5.5	15	122	13	e25	e7.2	21	92	8.0	27	19	17
7	9.1	6.1	590	11	e210	e11	20	45	7.6	18	31	6.8
8	23	18	157	10	e60	e30	17	16	31	23	18	5.5
9	48	4.5	79	8.9	e16	e9.2	22	11	53	18	15	11
10	6.3	2.3	122	7.8	e11	e7.4	110	9.2	66	16	16	17
11	4.2	1.9	87	7.0	e9.2	e6.9	28	67	55	32	36	7.4
12	20	2.4	39	7.0	e7.9	e9.4	48	68	33	36	26	20
13	11	3.9	44	6.4	e6.9	e23	35	14	24	44	16	8.9
14	51	22	33	16	e6.2	e28	18	18	21	20	17	15
15	e22	29	25	11	e5.7	e8.1	58	39	14	17	12	7.3
16	e12	15	21	e3.9	e5.2	e6.0	70	24	14	15	11	5.5
17	e6.3	21	18	e3.3	e4.8	e5.5	23	12	35	14	9.9	6.1
18	e5.6	33	16	e3.0	e4.3	6.5	17	10	15	12	9.2	7.9
19	e4.1	29	14	e3.0	e4.0	5.7	16	8.9	27	11	7.9	18
20	e3.4	9.9	12	e4.3	e3.8	7.6	19	8.4	54	10	7.2	11
21	e2.9	6.4	11	e3.8	e3.6	235	28	7.6	25	9.3	14	10
22	e2.7	5.6	10	e30	e3.3	347	23	6.8	39	8.7	11	17
23	e2.6	5.5	9.5	e17	e15	157	17	6.7	65	8.3	10	43
24	e2.6	5.7	8.9	e5.5	e4.8	57	27	6.2	32	7.8	26	32
25	e2.4	4.7	8.2	e60	e7.6	77	13	13	21	8.8	15	28
26	e2.2	3.8	7.5	e41	e19	47	45	9.8	19	11	25	19
27	e2.1	3.2	7.1	e13	e184	31	16	13	18	14	25	13
28	e1.9	2.8	7.5	e6.5	e24	25	11	32	43	13	16	12
29	2.4	413	6.8	e9.5	e9.7	162	9.7	14	32	8.5	22	17
30	2.2	209	e9.0	e44	---	190	8.8	18	37	6.7	12	50
31	2.1	---	e20	e24	---	38	---	38	---	7.3	9.5	---
TOTAL	285.5	910.3	1,846.5	868.9	764.6	1,658.6	963.5	676.5	841.7	568.4	1,020.0	444.7
MEAN	9.21	30.3	59.6	28.0	26.4	53.5	32.1	21.8	28.1	18.3	32.9	14.8
MAX	51	413	590	245	210	347	110	92	66	44	459	50
MIN	1.9	1.9	6.8	3.0	3.3	5.5	8.8	6.2	7.6	6.7	6.3	5.5
AC-FT	566	1,810	3,660	1,720	1,520	3,290	1,910	1,340	1,670	1,130	2,020	882

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2004, BY WATER YEAR (WY)

MEAN	16.8	27.1	22.4	20.2	16.4	25.6	29.1	20.5	17.1	25.0	18.3	14.5
MAX	38.0	107	61.7	55.2	99.7	104	90.1	64.9	46.1	60.9	53.7	35.7
(WY)	(1967)	(1966)	(1988)	(1989)	(1969)	(1980)	(1963)	(1963)	(1987)	(1989)	(1967)	(1990)
MIN	0.32	3.54	2.07	0.38	0.11	0.66	2.45	0.51	3.40	4.25	3.04	1.43
(WY)	(1985)	(1963)	(1990)	(1986)	(1986)	(1983)	(1992)	(1992)	(1968)	(1968)	(1971)	(1975)

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1961 - 2004	
ANNUAL TOTAL	5,782.56		10,849.2			
ANNUAL MEAN	15.8		29.6		21.0	
HIGHEST ANNUAL MEAN					37.2	1982
LOWEST ANNUAL MEAN					9.12	2003
HIGHEST DAILY MEAN	590	Dec 7	590	Dec 7	1,050	Feb 1, 1969
LOWEST DAILY MEAN	0.00	Feb 13	1.9	Oct 28	0.00	Dec 24, 1960
ANNUAL SEVEN-DAY MINIMUM	0.15	Feb 7	2.1	Oct 27	0.00	Jan 19, 1977
ANNUAL RUNOFF (AC-FT)	11,470		21,520		15,190	
10 PERCENT EXCEEDS	26		56		47	
50 PERCENT EXCEEDS	5.4		14		8.9	
90 PERCENT EXCEEDS	0.69		4.7		1.8	

e Estimated

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.8 mi northeast of Kaneaki Heiau, and 2.9 mi northeast of Makaha.

DRAINAGE AREA.--2.31 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records computed by V.E. Kunishige. Records fair, except for estimated days which are poor. Honolulu Board of Water Supply wells upstream of station may influence flows at gage. Recording rain gage located at station.

AVERAGE DISCHARGE.--45 years (water years 1960-2004), 1.71 ft^3/s (1,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,680 ft^3/s, November 14, 1996, gage height, 9.54 ft, from high-water profile of slope-area measurement; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 2	1515	241	3.28	Mar 2	0515	*692	*4.98
Feb 27	1015	420	4.04				

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 0.14 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	12	e0.50	15	e1.4	1.5	0.58	0.24	0.00	0.00
2	0.00	0.00	2.5	e69	e0.42	219	e1.3	1.4	0.56	0.20	0.00	0.02
3	0.00	0.00	0.92	e38	e0.39	50	e2.1	1.2	0.53	0.43	0.00	0.06
4	0.00	0.00	0.71	e0.44	e0.38	e1.2	e1.8	1.1	0.50	0.77	0.67	0.06
5	0.00	0.00	3.4	e0.01	e0.32	e1.2	e1.3	1.1	0.45	0.75	0.37	0.04
6	0.00	0.00	1.9	e0.00	e0.26	e0.78	e0.80	1.1	0.38	0.67	0.52	0.05
7	0.00	0.00	1.2	e0.00	e0.30	e0.62	e0.77	0.99	0.38	0.49	0.52	0.03
8	0.00	0.00	0.06	e0.00	e0.37	e1.5	e0.66	0.94	0.38	0.41	0.53	0.02
9	0.00	0.00	0.00	e0.00	e0.31	e1.3	e0.54	0.89	0.38	0.30	0.47	0.02
10	0.00	0.00	0.00	e0.00	e0.20	e0.69	e4.8	0.88	0.37	0.22	0.38	0.03
11	0.00	0.00	0.00	e0.00	e0.19	e0.56	e1.9	0.74	0.38	0.19	0.29	0.03
12	0.00	0.00	0.00	e0.00	e0.31	e0.82	e1.9	0.79	0.44	0.18	0.21	0.03
13	0.00	0.00	0.00	e0.00	e0.35	e0.74	2.2	1.3	0.63	0.16	0.13	0.03
14	0.00	0.00	0.00	e0.01	e0.27	e2.3	2.0	2.0	0.64	0.12	0.08	0.02
15	0.00	0.00	0.00	e0.02	e0.40	e0.90	1.8	7.8	0.61	0.10	0.05	0.02
16	0.00	0.00	0.00	e0.02	e0.31	e0.52	1.6	4.5	0.54	0.08	0.04	0.00
17	0.00	0.00	0.00	e0.01	e0.73	e0.42	1.5	2.8	0.42	0.06	0.06	0.00
18	0.00	0.00	0.00	e0.00	e0.90	e0.37	1.4	2.1	0.36	0.06	0.10	0.00
19	0.00	0.00	0.00	e0.00	e0.84	e0.34	1.4	1.7	0.51	0.06	0.10	0.00
20	0.00	0.00	0.00	e0.08	e0.69	e0.31	1.3	1.5	0.98	0.05	0.07	0.00
21	0.00	0.00	0.00	e0.15	0.54	e6.6	1.3	1.4	0.94	0.04	0.06	0.00
22	0.00	0.00	0.00	e0.44	0.47	e7.5	1.4	1.2	0.75	0.03	0.03	0.00
23	0.00	0.00	0.00	e12	0.41	e7.9	1.3	1.1	0.61	0.03	0.02	0.00
24	0.00	0.00	0.00	e2.3	0.36	e3.8	1.2	0.87	0.49	0.02	0.02	0.00
25	0.00	0.00	0.00	e1.2	0.33	e2.1	1.1	0.80	0.47	0.02	0.01	0.00
26	0.00	0.00	0.00	e0.97	0.35	e2.5	7.8	0.76	0.46	0.01	0.01	0.00
27	0.00	0.00	0.00	e0.93	125	e2.2	3.9	0.72	0.41	0.01	0.00	0.00
28	0.00	0.00	0.00	e0.78	33	e1.5	2.5	0.71	0.36	0.01	0.00	0.00
29	0.00	0.00	0.00	e0.75	13	e5.1	2.0	0.71	0.32	0.00	0.00	0.00
30	0.00	0.00	0.00	e0.68	---	e8.6	1.6	0.66	0.30	0.00	0.00	0.00
31	0.00	---	0.33	e0.59	---	e2.1	---	0.60	---	0.00	0.00	---
TOTAL	0.00	0.00	11.02	140.38	181.90	348.47	56.57	45.86	15.13	5.71	4.74	0.46
MEAN	0.00	0.00	0.36	4.53	6.27	11.2	1.89	1.48	0.50	0.18	0.15	0.02
MAX	0.00	0.00	3.4	69	125	219	7.8	7.8	0.98	0.77	0.67	0.06
MIN	0.00	0.00	0.00	0.00	0.19	0.31	0.54	0.60	0.30	0.00	0.00	0.00
AC-FT	0.00	0.00	22	278	361	691	112	91	30	11	9.4	0.9

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2004, BY WATER YEAR (WY)

MEAN	0.64	1.77	2.62	3.94	3.13	3.14	2.41	1.33	0.55	0.44	0.30	0.33
MAX	3.66	20.6	15.0	22.7	16.3	11.5	15.7	5.33	1.72	1.31	1.44	2.19
(WY)	(1983)	(1997)	(1965)	(1982)	(1976)	(1962)	(1963)	(1965)	(1978)	(1986)	(1983)	(1974)
MIN	0.00	0.00	0.04	0.00	0.00	0.11	0.13	0.07	0.00	0.00	0.00	0.00
(WY)	(1976)	(1995)	(1995)	(2001)	(2001)	(2001)	(1993)	(2003)	(2000)	(2000)	(1995)	(1961)

16211600 MAKAHA STREAM NEAR MAKAHA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1960 - 2004	
ANNUAL TOTAL	205.43		810.24			
ANNUAL MEAN	0.56		2.21		1.71	
HIGHEST ANNUAL MEAN					4.58	1997
LOWEST ANNUAL MEAN					0.07	2001
HIGHEST DAILY MEAN	14	Feb 14	219	Mar 2	283	Feb 7, 1976
LOWEST DAILY MEAN	0.00	Jan 1	0.00	Oct 1	0.00	Sep 25, 1960
ANNUAL SEVEN-DAY MINIMUM	0.00	Jan 1	0.00	Oct 1	0.00	Aug 28, 1961
ANNUAL RUNOFF (AC-FT)	407		1,610		1,240	
10 PERCENT EXCEEDS	1.5		2.0		3.2	
50 PERCENT EXCEEDS	0.00		0.28		0.49	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

e Estimated

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28'13", long 157°57'40", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu.

DRAINAGE AREA.--4.29 mi^2.

PERIOD OF RECORD.--January 1957 to September 2004 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records computed by V.E. Kunishige. Records good except for period when large datum correction was applied (November 29 to January 7), which is fair. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--47 years (water years 1958-2004), 10.6 ft^3/s (7,640 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft^3/s, March 21, 1991, gage height, 12.67 ft, from rating curve extended above 5,680 ft^3/s on basis of the shape of the rating; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1530	3,400	10.50	May 11	2100	1,420	7.90
Dec 7	1430	1,260	7.60	Aug 4	0615	*3,530	*10.62
Feb 7	2145	2,790	9.87				

Minimum discharge, 0.22 ft^3/s, Oct. 1, gage height, 1.99 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.27	0.42	59	44	14	12	14	3.1	3.3	8.9	0.87	2.0
2	0.32	0.56	22	156	7.2	52	18	2.7	1.7	5.2	23	1.9
3	0.47	1.4	17	77	4.6	10	19	2.5	1.7	4.8	40	2.5
4	0.50	1.7	63	16	6.5	9.5	18	4.1	1.4	3.2	340	1.5
5	0.40	1.2	147	9.2	24	7.3	9.6	11	1.4	3.1	20	1.2
6	0.35	0.95	49	6.6	11	4.3	7.3	23	1.5	3.2	8.4	15
7	4.6	0.71	235	4.9	202	4.8	8.6	44	1.2	3.3	17	2.3
8	5.6	6.2	72	4.0	75	27	5.6	8.4	3.9	11	8.7	1.2
9	20	1.9	33	3.4	15	7.1	9.2	4.6	5.4	8.2	5.5	1.3
10	3.0	0.90	57	2.9	9.0	4.4	76	3.5	16	3.5	4.8	4.6
11	11	0.89	36	2.6	6.6	3.6	19	65	14	14	16	2.2
12	17	0.68	18	2.6	5.2	14	40	31	6.8	7.4	7.3	4.7
13	4.8	0.67	17	2.2	4.4	14	29	7.4	6.4	4.8	6.0	2.4
14	18	6.1	12	13	3.9	24	12	13	3.5	2.8	6.1	7.1
15	25	3.6	9.0	5.7	3.4	6.0	25	45	2.2	2.8	3.5	3.9
16	14	2.2	7.4	2.5	2.9	3.8	34	16	3.3	2.3	2.5	1.4
17	6.0	9.4	6.4	2.0	2.6	3.0	11	7.2	14	1.8	3.9	1.3
18	5.4	18	5.6	1.7	2.3	2.6	7.6	5.3	3.8	1.4	2.5	1.4
19	2.8	19	4.6	2.0	2.1	2.2	9.9	4.3	5.7	1.3	1.8	7.4
20	2.0	5.8	4.1	3.1	1.9	5.5	19	3.8	5.4	1.1	1.5	2.5
21	1.5	3.3	3.6	2.6	1.7	120	24	3.3	6.0	0.89	5.6	3.5
22	1.3	2.6	3.2	50	1.5	75	12	2.7	13	0.79	4.2	5.0
23	1.2	2.7	3.1	14	2.1	79	10	2.8	8.8	0.72	2.4	15
24	1.0	5.3	2.9	5.7	1.9	34	7.1	2.6	4.6	0.72	8.2	7.9
25	1.0	2.6	2.7	48	1.6	32	5.3	2.4	2.6	1.2	8.2	7.1
26	0.79	1.7	2.4	37	36	33	35	2.2	2.2	2.7	12	3.4
27	0.66	1.2	2.2	15	202	19	8.3	2.1	2.0	8.9	6.6	2.8
28	0.63	0.88	2.6	6.5	36	14	5.0	3.1	4.2	5.4	8.7	2.8
29	0.56	360	2.2	4.8	12	70	4.0	3.8	8.4	2.8	8.8	4.7
30	0.51	201	4.7	18	---	102	3.5	2.0	7.9	1.3	3.9	4.2
31	0.45	---	36	9.3	---	23	---	4.2	---	0.99	2.7	---
TOTAL	151.11	663.56	939.7	572.3	698.4	818.1	506.0	336.1	162.3	120.51	590.67	124.2
MEAN	4.87	22.1	30.3	18.5	24.1	26.4	16.9	10.8	5.41	3.89	19.1	4.14
MAX	25	360	235	156	202	120	76	65	16	14	340	15
MIN	0.27	0.42	2.2	1.7	1.5	2.2	3.5	2.0	1.2	0.72	0.87	1.2
AC-FT	300	1,320	1,860	1,140	1,390	1,620	1,000	667	322	239	1,170	246

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2004, BY WATER YEAR (WY)

MEAN	9.43	14.6	12.5	11.4	9.92	15.4	14.6	9.30	5.54	9.46	8.09	5.83
MAX	49.6	61.8	42.2	32.1	54.4	98.4	60.9	39.4	21.9	28.1	37.5	23.6
(WY)	(1982)	(1966)	(1988)	(1989)	(1969)	(1991)	(1963)	(2002)	(1978)	(1989)	(1958)	(1994)
MIN	0.84	0.23	0.83	0.17	0.19	0.02	0.33	0.39	0.16	0.47	0.30	0.49
(WY)	(1958)	(1963)	(1990)	(1977)	(1978)	(1983)	(1966)	(1992)	(1959)	(1968)	(1971)	(1998)

16212800 KIPAPA STREAM NEAR WAHIAWA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1957 - 2004	
ANNUAL TOTAL	2,855.77		5,682.95			
ANNUAL MEAN	7.82		15.5		10.6	
HIGHEST ANNUAL MEAN					25.2	1982
LOWEST ANNUAL MEAN					3.81	2003
HIGHEST DAILY MEAN	360	Nov 29	360	Nov 29	852	Apr 15, 1963
LOWEST DAILY MEAN	0.08	Jan 10	0.27	Oct 1	0.00	Jun 18, 1959
ANNUAL SEVEN-DAY MINIMUM	0.14	Jan 6	0.54	Oct 27	0.00	Jun 18, 1959
ANNUAL RUNOFF (AC-FT)	5,660		11,270		7,640	
10 PERCENT EXCEEDS	14		34		24	
50 PERCENT EXCEEDS	1.3		4.8		2.8	
90 PERCENT EXCEEDS	0.27		1.2		0.37	

16213000 WAIKELE STREAM AT WAIPAHU

LOCATION.--Lat 21°23'11", long 158°00'49", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of former sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi^2.

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

REVISED RECORDS.--WSP 1639: 1955(M). WSP 1937: Drainage area. WSP 2137: 1965.

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

REMARKS.--Records computed by V.E. Kunishige. Records fair, except estimated days, which are poor.

AVERAGE DISCHARGE.--51 years (water years 1953-59, 1961-2004), 39.7 ft^3/s (28,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s, November 28, 1954, gage height, 14.82 ft, site and datum then in use, from rating curve extended above 730 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of February 25, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1715	3,500	6.92
Dec 7	2130	*13,500	*12.94
Jan 2	1930	3,500	6.92
Jan 25	2245	1,550	5.02
Feb 7	2330	2,310	5.81
Feb 27	1415	4,860	7.97
Aug 4	0800	4,820	7.94

Minimum discharge, 5.3 ft^3/s, Oct. 4-5. gage height 1.6 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	11	270	218	29	81	e44	18	18	27	16	17
2	11	11	72	1,210	31	173	41	18	17	23	24	16
3	11	10	41	461	22	62	62	17	16	21	45	15
4	9.6	9.6	89	81	19	39	52	31	15	20	1,050	16
5	8.9	9.1	369	46	30	38	40	31	16	18	80	16
6	9.8	9.4	180	35	41	28	29	43	16	17	37	27
7	10	9.5	e703	29	208	25	28	75	16	17	35	21
8	9.8	10	e245	25	356	47	26	37	15	21	35	16
9	27	11	e88	23	52	41	23	24	22	22	25	15
10	15	11	e131	22	36	26	126	21	41	20	22	15
11	11	9.2	e95	20	28	23	55	64	30	21	28	18
12	26	9.5	e54	22	25	30	57	140	30	26	30	22
13	15	9.8	e51	18	22	28	67	33	26	25	22	23
14	21	13	e40	85	21	65	36	35	22	20	21	20
15	22	16	e35	37	19	32	74	108	19	18	19	22
16	48	13	25	22	18	22	83	68	21	17	16	17
17	19	12	22	18	17	20	48	31	27	16	28	16
18	15	19	20	16	16	18	31	25	28	16	21	17
19	13	40	19	16	15	18	27	22	21	15	16	18
20	11	25	17	20	13	17	35	20	22	14	15	22
21	11	14	16	26	13	170	60	19	29	14	15	17
22	10	12	16	81	13	194	30	18	24	14	19	19
23	10	12	14	173	13	203	31	18	36	14	17	35
24	18	12	14	40	13	104	27	17	28	15	22	39
25	13	14	14	115	14	60	24	16	22	15	28	32
26	11	12	13	213	163	70	48	16	19	15	23	26
27	11	10	13	51	1,570	62	41	18	17	17	29	20
28	10	10	18	33	236	e45	24	17	17	22	22	19
29	9.6	682	14	25	90	e134	20	18	21	16	32	19
30	9.6	618	15	34	---	e219	19	18	21	14	23	21
31	9.7	---	224	35	---	e62	---	17	---	15	19	---
TOTAL	447.0	1,664.1	2,937	3,250	3,143	2,156	1,308	1,053	672	565	1,834	616
MEAN	14.4	55.5	94.7	105	108	69.5	43.6	34.0	22.4	18.2	59.2	20.5
MAX	48	682	703	1,210	1,570	219	126	140	41	27	1,050	39
MIN	8.9	9.1	13	16	13	17	19	16	15	14	15	15
AC-FT	887	3,300	5,830	6,450	6,230	4,280	2,590	2,090	1,330	1,120	3,640	1,220

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2004, BY WATER YEAR (WY)

MEAN	31.8	48.9	49.0	59.5	53.0	52.4	48.0	33.3	23.7	28.5	26.0	22.1
MAX	97.8	198	146	222	179	195	235	115	51.5	76.8	90.0	68.1
(WY)	(1992)	(1966)	(1966)	(1969)	(1955)	(1991)	(1963)	(2002)	(1980)	(1989)	(1958)	(1994)
MIN	7.22	12.2	12.7	13.1	7.72	6.13	15.5	12.3	10.6	9.08	7.50	6.28
(WY)	(1978)	(1954)	(2003)	(2003)	(1978)	(1978)	(2002)	(2003)	(1981)	(1985)	(1984)	(1975)

16213000 WAIKELE STREAM AT WAIPAHU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1953 - 2004	
ANNUAL TOTAL	10,277.2		19,645.1			
ANNUAL MEAN	28.2		53.7		39.7	
HIGHEST ANNUAL MEAN					77.3	1969
LOWEST ANNUAL MEAN					18.5	1954
HIGHEST DAILY MEAN	703	Dec 7	1,570	Feb 27	2,590	Mar 21, 1991
LOWEST DAILY MEAN	8.2	Jul 15	8.9	Oct 5	0.61	Feb 25, 1978
ANNUAL SEVEN-DAY MINIMUM	9.8	Nov 2	9.8	Nov 2	2.5	Feb 24, 1978
ANNUAL RUNOFF (AC-FT)	20,380		38,970		28,750	
10 PERCENT EXCEEDS	38		84		62	
50 PERCENT EXCEEDS	12		22		23	
90 PERCENT EXCEEDS	10		12		12	

e Estimated

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 100 ft upstream from lower bridge on Highway 90, 0.6 mi northwest of Pearl City, and 2.0 mi northeast of Waipahu.

DRAINAGE AREA.--26.4 mi^2.

PERIOD OF RECORD.--June 1952 to September 2004 (discontinued).

REVISED RECORDS.--WSP 1569: Drainage area, WDR HI-90-1: 1982-89 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level (State of Hawaii benchmark).

REMARKS.--Records computed by V.E. Kunishige. Records poor. Occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--52 years (water years 1953-2004), 32.7 ft^3/s (23,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft^3/s, October 28, 1981, gage height, 22.46 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, e0.70 ft^3/s, October 5, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1600	7,220	15.47
Dec 7	2215	9,530	17.09
Jan 2	1745	4,220	12.78
Feb 27	1600	7,920	15.99
May 11	2130	5,280	13.84
Aug 4	0715	*10,000	*17.39

Minimum daily discharge, 0.70 ft^3/s, Oct 5.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.80	e0.91	454	108	12	79	59	21	e3.5	8.7	2.8	4.2
2	e0.90	e0.98	82	1,190	12	85	53	21	e2.6	5.2	15	3.6
3	e1.0	e1.3	28	485	7.5	56	70	21	e2.4	4.4	16	4.2
4	e0.83	e1.2	177	57	6.0	47	50	22	2.9	3.8	1,500	3.5
5	e0.70	e1.0	494	25	22	47	42	33	2.9	3.3	48	3.1
6	e0.78	e0.99	154	15	22	39	37	53	3.0	4.1	e13	12
7	e1.9	e0.92	1,360	10	262	34	35	84	3.0	4.6	e15	5.3
8	e1.8	e2.0	493	e6.1	147	54	33	38	3.0	8.4	e12	3.6
9	8.9	e1.5	95	e5.1	16	47	31	29	2.9	11	e6.8	3.3
10	3.4	e1.1	122	e4.4	9.6	37	87	24	17	6.4	e5.2	3.2
11	2.9	e0.95	103	e3.9	7.2	33	51	341	12	4.0	e11	3.5
12	27	e0.92	50	4.7	5.6	34	82	89	9.8	6.1	e9.1	7.7
13	5.6	e0.94	45	3.5	4.7	32	65	e10	7.3	5.9	e5.5	6.7
14	26	e2.7	29	15	4.4	47	42	e14	6.8	3.8	e5.4	5.8
15	25	e3.0	e12	11	e3.8	36	67	252	5.4	3.1	e4.1	5.4
16	34	e2.1	e7.4	4.1	e3.5	30	75	57	3.8	2.9	e2.9	3.7
17	7.8	e2.9	e5.8	3.2	e3.2	27	48	e9.6	12	2.9	e7.1	3.2
18	5.9	e6.4	e4.9	2.9	e2.8	25	36	e6.7	8.2	3.0	e4.1	3.5
19	3.1	8.0	5.6	2.9	e2.5	25	31	e5.0	4.8	3.0	4.2	3.9
20	e1.6	5.1	4.8	4.8	2.0	24	52	e4.5	4.4	2.9	4.0	5.1
21	e1.4	2.4	4.3	4.4	2.0	329	55	e3.9	7.0	2.9	4.2	3.4
22	e1.3	2.4	3.9	67	2.0	298	37	e3.4	11	2.9	6.2	4.4
23	e1.2	4.5	3.7	24	2.0	147	34	e3.3	14	2.9	5.6	34
24	e2.4	7.8	3.5	9.0	1.9	96	30	e3.2	10	2.9	13	9.3
25	e1.6	6.3	3.2	76	1.9	79	26	e2.8	6.2	2.9	14	4.8
26	e1.2	6.2	3.2	89	64	101	51	e2.6	4.3	2.9	15	3.5
27	e1.1	7.1	3.1	24	1,690	89	37	e3.0	3.5	2.9	13	2.9
28	e0.97	8.0	3.8	13	208	58	26	e3.2	3.1	3.4	8.3	2.7
29	e0.87	1,240	3.1	9.4	85	85	23	e3.6	3.0	2.8	13	2.4
30	e0.85	729	3.7	14	---	249	22	e3.0	3.7	2.8	7.8	2.2
31	e0.82	---	101	12	---	84	---	e3.5	---	2.8	5.3	---
TOTAL	173.62	2,058.61	3,863.0	2,303.4	2,612.6	2,453	1,387	1,170.3	183.5	129.6	1,796.6	164.1
MEAN	5.60	68.6	125	74.3	90.1	79.1	46.2	37.8	6.12	4.18	58.0	5.47
MAX	34	1,240	1,360	1,190	1,690	329	87	341	17	11	1,500	34
MIN	0.70	0.91	3.1	2.9	1.9	24	22	2.6	2.4	2.8	2.8	2.2
AC-FT	344	4,080	7,660	4,570	5,180	4,870	2,750	2,320	364	257	3,560	325

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2004, BY WATER YEAR (WY)

MEAN	27.2	51.7	43.9	45.0	36.6	49.9	39.5	24.0	14.4	25.0	20.9	13.9
MAX	131	295	351	199	208	336	241	131	72.9	149	128	104
(WY)	(1967)	(1997)	(1988)	(1969)	(1955)	(1980)	(1974)	(1965)	(1987)	(1970)	(1982)	(1992)
MIN	1.55	2.54	1.50	1.39	1.66	1.43	1.75	1.44	1.43	1.40	1.25	1.28
(WY)	(1985)	(1990)	(2003)	(2001)	(1986)	(2000)	(1992)	(2000)	(1984)	(1984)	(2003)	(1984)

16216000 WAIAWA STREAM NEAR PEARL CITY—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1952 - 2004	
ANNUAL TOTAL	9,117.31		18,295.33			
ANNUAL MEAN	25.0		50.0		32.7	
HIGHEST ANNUAL MEAN					80.8	1982
LOWEST ANNUAL MEAN					7.56	1984
HIGHEST DAILY MEAN	1,360	Dec 7	1,690	Feb 27	5,150	Mar 24, 1994
LOWEST DAILY MEAN	0.70	Oct 5	0.70	Oct 5	0.70	Oct 5, 2003
ANNUAL SEVEN-DAY MINIMUM	0.85	Sep 30	0.93	Oct 27	0.85	Sep 30, 2003
ANNUAL RUNOFF (AC-FT)	18,080		36,290		23,690	
10 PERCENT EXCEEDS	26		84		46	
50 PERCENT EXCEEDS	1.6		6.2		6.1	
90 PERCENT EXCEEDS	0.99		2.0		1.8	

e Estimated

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 2.7 mi upstream from confluence with South Halawa Stream, and 2.7 mi northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi^2.

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

REVISED RECORDS.--WSP 1319: Drainage area. WSP 1719: 1954-55(P), 1956, 1957(P), 1958-59.

GAGE.--Water-stage recorder. Elevation of gage is 320 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records fair. Recording rain gage located at station.

AVERAGE DISCHARGE.--54 years (water years 1930-32, 1954-2004), 5.15 ft^3/s (3,730 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s, February 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft^3/s; maximum gage height, 13.46 ft, May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 430 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2130	1,150	10.40
Dec 1	1145	599	8.93
Dec 5	1715	536	8.72
Dec 7	1600	513	8.64
Jan 2	1545	494	8.57
Feb 27	1445	949	9.92
Aug 4	0630	*1,260	*10.64

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 3.99 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	83	34	4.9	13	8.4	0.39	0.11	1.7	0.02	0.57
2	0.00	0.09	13	158	2.1	21	6.8	0.29	0.50	1.3	10	1.2
3	0.33	0.10	6.4	70	1.2	7.3	19	0.35	0.54	0.76	25	0.72
4	0.04	0.07	39	12	1.7	4.6	10	2.4	0.31	0.40	204	0.20
5	0.00	0.07	127	5.0	3.0	2.4	5.3	2.9	0.12	0.52	16	0.37
6	0.36	0.00	40	2.4	12	1.1	2.9	4.1	0.18	0.52	5.1	1.5
7	0.63	0.42	137	1.3	71	1.9	1.9	7.9	0.24	0.43	14	0.44
8	1.1	0.07	68	0.86	20	5.7	1.3	1.8	0.19	0.66	4.2	0.11
9	0.34	0.00	16	0.58	5.0	3.1	1.4	0.65	0.83	2.2	2.3	0.30
10	0.14	0.26	25	0.39	2.3	1.6	14	0.34	6.5	0.52	1.4	0.11
11	1.9	0.06	36	0.27	1.1	0.84	7.1	28	3.1	5.4	1.9	0.10
12	2.8	0.00	9.4	0.32	0.61	2.8	20	18	1.6	4.8	1.7	0.70
13	0.52	0.33	5.9	0.17	0.37	11	10	4.4	1.5	3.0	1.2	0.05
14	0.94	0.40	3.2	2.4	0.25	14	4.5	2.4	0.64	1.2	0.67	0.47
15	0.79	0.25	2.2	0.78	0.17	4.4	28	34	0.34	0.54	0.27	0.38
16	0.23	0.30	1.5	0.19	0.10	1.5	20	15	0.34	0.29	0.12	0.10
17	0.36	0.28	1.3	0.10	0.06	0.70	8.4	5.2	1.5	0.21	0.23	0.15
18	0.11	0.49	0.86	0.06	0.04	0.33	4.0	2.5	0.69	0.12	0.05	0.19
19	0.04	0.25	0.56	0.21	0.03	0.19	3.1	1.5	0.36	0.06	0.03	4.5
20	0.00	0.03	0.40	0.66	0.03	3.5	12	1.2	2.6	0.00	0.01	0.66
21	0.00	0.07	0.31	0.59	0.02	146	12	0.69	1.8	0.00	2.1	0.49
22	0.00	0.10	0.20	6.8	0.01	113	4.2	0.50	4.5	0.00	0.78	2.3
23	0.00	0.30	0.17	12	0.03	69	2.4	0.62	6.5	0.00	0.57	4.8
24	0.00	0.07	0.15	1.9	0.01	27	1.5	0.39	7.0	0.00	2.9	4.5
25	0.00	0.16	0.09	10	0.01	23	0.97	0.63	2.2	0.48	2.2	2.5
26	0.00	0.01	0.07	9.1	28	22	24	0.26	0.94	0.40	18	1.3
27	0.00	0.00	0.05	10	197	19	6.2	0.49	0.62	0.03	7.1	0.71
28	0.05	0.03	0.26	2.9	43	9.9	2.0	0.37	0.83	2.5	3.0	0.33
29	0.01	207	0.05	1.7	13	19	0.93	0.19	1.3	0.16	2.3	0.78
30	0.00	73	0.98	2.2	---	71	0.58	0.47	1.1	0.04	1.5	0.45
31	0.00	---	23	4.3	---	17	---	0.35	---	0.15	1.1	---
TOTAL	10.69	284.21	641.05	351.18	407.04	636.86	242.88	138.28	48.98	28.39	329.75	30.98
MEAN	0.34	9.47	20.7	11.3	14.0	20.5	8.10	4.46	1.63	0.92	10.6	1.03
MAX	2.8	207	137	158	197	146	28	34	7.0	5.4	204	4.8
MIN	0.00	0.00	0.05	0.06	0.01	0.19	0.58	0.19	0.11	0.00	0.01	0.05
AC-FT	21	564	1,270	697	807	1,260	482	274	97	56	654	61

16226000 NORTH HALAWA STREAM NEAR AIEA—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3.28	7.54	7.49	6.61	7.43	7.82	6.78	4.59	1.77	3.39	3.56	2.12
MAX	16.3	50.6	35.0	26.0	76.3	37.8	33.3	30.1	7.86	23.0	21.6	17.1
(WY)	(1959)	(1966)	(1930)	(1988)	(1932)	(1968)	(1932)	(1965)	(1932)	(1954)	(1982)	(1931)
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(WY)	(1933)	(1954)	(1990)	(1977)	(1931)	(1931)	(1931)	(1931)	(1931)	(1953)	(1962)	(1953)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1929 - 2004	
ANNUAL TOTAL	1,477.56		3,150.29			
ANNUAL MEAN	4.05		8.61		5.15	
HIGHEST ANNUAL MEAN					15.7	1932
LOWEST ANNUAL MEAN					1.41	1984
HIGHEST DAILY MEAN	207	Nov 29	207	Nov 29	956	Nov 18, 1930
LOWEST DAILY MEAN	0.00	Jan 1	0.00	Oct 1	0.00	Sep 14, 1929
ANNUAL SEVEN-DAY MINIMUM	0.00	Mar 9	0.00	Oct 20	0.00	Sep 14, 1929
ANNUAL RUNOFF (AC-FT)	2,930		6,250		3,730	
10 PERCENT EXCEEDS	3.1		19		11	
50 PERCENT EXCEEDS	0.06		0.83		0.35	
90 PERCENT EXCEEDS	0.00		0.03		0.00	

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA

LOCATION.--Lat 21°23'53", long 157°53'30", Old Hawaiian Datum, Hydrologic Unit 2006000, on manhole 6.1 mi west of Kaneohe Elementary School, 1.65 mi northeast of Halawa Prison, and 1.05 mi east of Keaiwa Heiau.

PERIOD OF RECORD.--September 1998 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 336.22 ft from Hawaii State Department of Transportation levels.

REMARKS.--Records computed by S.T.M. Young. Records poor.

AVERAGE DISCHARGE.--6 years (water years 1999-2004), 0.18 ft^3/s (134 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42 ft^3/s, October 15, 2002, gage height, 4.99 ft, no flow at times during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1550	34	4.37	Feb 27	1102	*41	4.89
Dec 5	1636	34	4.36	Apr 20	2025	32	4.26
Jan 25	1700	33	4.28	Aug 3	1848	33	4.34
Feb 26	1544	32	4.27	Aug 4	0543	41	*4.92

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 1.20 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.8	1.3	0.22	0.24	0.02	0.00	0.01	0.15	0.03	0.06
2	0.00	0.18	0.22	3.5	0.00	0.35	0.27	0.00	0.25	0.17	0.84	0.14
3	0.31	0.15	0.37	1.1	0.03	0.03	0.57	0.10	0.03	0.04	1.0	0.08
4	0.03	0.07	1.4	0.02	0.32	0.11	0.13	0.67	0.10	0.07	3.9	0.01
5	0.00	0.09	3.0	0.00	0.34	0.06	0.00	0.09	0.04	0.18	0.01	0.16
6	0.36	0.07	0.95	0.00	0.62	0.00	0.01	0.46	0.13	0.18	0.07	0.09
7	0.29	0.36	3.2	0.00	1.4	0.34	0.03	0.16	0.16	0.04	0.52	0.00
8	0.59	0.00	0.99	0.00	0.00	0.28	0.00	0.00	0.14	0.16	0.04	0.01
9	0.16	0.00	0.34	0.00	0.00	0.00	0.28	0.00	0.44	0.13	0.06	0.13
10	0.04	0.28	1.2	0.00	0.00	0.11	0.73	0.02	0.40	0.12	0.03	0.07
11	0.64	0.04	0.21	0.00	0.00	0.02	0.25	1.1	0.14	0.64	0.30	0.05
12	0.13	0.05	0.23	0.10	0.00	0.00	0.72	0.01	0.16	0.25	0.20	0.36
13	0.03	0.37	0.07	0.00	0.00	0.97	0.10	0.02	0.25	0.16	0.05	0.02
14	0.34	0.25	0.07	0.41	0.00	0.22	0.05	0.06	0.01	0.08	0.01	0.27
15	0.24	0.16	0.04	0.00	0.00	0.00	1.0	0.99	0.04	0.01	0.00	0.06
16	0.02	0.26	0.00	0.00	0.00	0.00	0.33	0.00	0.18	0.02	0.00	0.04
17	0.13	0.16	0.10	0.00	0.00	0.06	0.00	0.00	0.16	0.05	0.07	0.11
18	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.02	0.00	0.07
19	0.00	0.16	0.00	0.31	0.00	0.00	0.19	0.00	0.09	0.00	0.00	0.51
20	0.00	0.01	0.00	0.33	0.00	0.77	0.71	0.06	0.47	0.00	0.01	0.00
21	0.00	0.11	0.00	0.09	0.00	3.1	0.01	0.00	0.06	0.00	0.52	0.23
22	0.01	0.12	0.00	0.62	0.00	2.0	0.03	0.00	0.49	0.00	0.02	0.19
23	0.00	0.29	0.03	0.11	0.07	1.1	0.11	0.08	0.43	0.00	0.23	0.56
24	0.04	0.00	0.04	0.06	0.01	0.36	0.01	0.05	0.12	0.03	0.46	0.19
25	0.00	0.13	0.00	0.78	0.11	0.63	0.00	0.15	0.05	0.26	0.13	0.15
26	0.00	0.00	0.00	0.50	1.7	0.45	0.74	0.00	0.06	0.24	0.78	0.13
27	0.01	0.00	0.00	0.06	4.5	0.11	0.00	0.13	0.13	0.02	0.20	0.05
28	0.10	0.11	0.26	0.03	0.48	0.11	0.00	0.11	0.21	0.47	0.18	0.02
29	0.00	6.7	0.01	0.33	0.38	1.1	0.00	0.04	0.15	0.00	0.09	0.29
30	0.00	0.80	0.49	0.13	---	0.91	0.00	0.25	0.22	0.00	0.16	0.18
31	0.01	---	0.89	0.43	---	0.03	---	0.04	---	0.12	0.01	---
TOTAL	3.48	11.29	15.91	10.21	10.18	13.46	6.29	4.59	5.28	3.61	9.92	4.23
MEAN	0.11	0.38	0.51	0.33	0.35	0.43	0.21	0.15	0.18	0.12	0.32	0.14
MAX	0.64	6.7	3.2	3.5	4.5	3.1	1.0	1.1	0.49	0.64	3.9	0.56
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
AC-FT	6.9	22	32	20	20	27	12	9.1	10	7.2	20	8.4

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2004, BY WATER YEAR (WY)

MEAN	0.15	0.24	0.23	0.26	0.18	0.22	0.22	0.13	0.13	0.15	0.17	0.13
MAX	0.24	0.38	0.51	0.42	0.35	0.43	0.33	0.30	0.18	0.22	0.32	0.18
(WY)	(2002)	(2004)	(2004)	(2000)	(2004)	(2004)	(2001)	(2002)	(2004)	(2000)	(2004)	(2003)
MIN	0.09	0.13	0.04	0.04	0.03	0.11	0.12	0.04	0.09	0.10	0.08	0.09
(WY)	(1999)	(2000)	(2002)	(2001)	(2000)	(2003)	(2002)	(2003)	(2003)	(2001)	(2003)	(2002)

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1998 - 2004	
ANNUAL TOTAL	63.29		98.45			
ANNUAL MEAN	0.17		0.27		0.18	
HIGHEST ANNUAL MEAN					0.27	2004
LOWEST ANNUAL MEAN					0.12	2003
HIGHEST DAILY MEAN	6.7	Nov 29	6.7	Nov 29	6.7	Nov 29, 2003
LOWEST DAILY MEAN	0.00	Jan 1	0.00	Oct 1	0.00	Sep 23, 1998
ANNUAL SEVEN-DAY MINIMUM	0.00	Mar 8	0.00	Jan 5	0.00	Feb 24, 1999
ANNUAL RUNOFF (AC-FT)	126		195		134	
10 PERCENT EXCEEDS	0.36		0.65		0.48	
50 PERCENT EXCEEDS	0.03		0.08		0.05	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

212353157533001 -- N. Halawa Valley, Storm Drain C nr Aiea, Oahu, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Sample type	Dis-charge, cfs (00060)	Instan-taneous dis-charge, cfs (00061)	Sam-pling method, code (82398)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conduc-tance, wat unf lab, uS/cm 25 degC (90095)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Residue on evap. at 180degC wat flt mg/L (70300)	Residue total at 105 deg. C, sus-pended, mg/L (00530)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV													
29...	1225	H	15	--	50	6.8	7.3	38	37	--	18	<10	.17
29...	1605	9	--	24	70	6.9	7.3	28	25	23.0	15	<10	.13
JAN													
22...	2332	H	9.2	--	50	--	7.0	E58	--	--	26	61	--
25...	1703	H	18	--	50	--	7.0	42	--	--	24	53	--
FEB													
26...	1401	H	14	--	50	--	7.5	51	49	--	27	17	.77
26...	1549	H	17	--	50	--	7.4	E42	38	--	22	14	.19
27...	0956	9	--	1.8	70	7.8	7.6	129	108	--	66	40	1.5
AUG													
03...	1850	H	20	--	50	--	7.3	36	41	--	23	28	.18

Date	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd mg/L (00665)	COD, high level, water, unfltrd mg/L (00340)	Cadmium water, unfltrd ug/L (01027)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Zinc, water, unfltrd recover -able, ug/L (01092)	Oil and grease, water, unfltrd freon extract mg/L (00556)	Petrol-eum hydro-carbons wat unf frn ext mg/L (45501)
NOV												
29...	E.03	E.03	<.008	<.04	.05	10	.11	11.4	2.93	46	<7	3
29...	E.02	<.06	<.008	<.04	E.04	10	.08	9.5	3.15	30	E4	<2
JAN												
22...	--	--	--	--	--	--	.42	43.1	13.5	172	--	--
25...	--	--	--	--	--	--	.26	35.0	10.2	122	--	--
FEB												
26...	<.04	.07	E.004	<.04	.10	40	.22	19.8	8.13	74	--	--
26...	<.04	E.05	<.008	<.04	.06	20	.09	10.9	3.07	44	--	--
27...	E.03	.08	.014	E.02	.24	60	.61	68.0	20.2	274	E5	3
AUG												
03...	<.04	<.06	<.008	<.04	.05	40	.14	21.3	4.30	63	--	--

Remark codes used in this table:
< -- Less than
E -- Estimated value

16226200 NORTH HALAWA STREAM NEAR HONOLULU

LOCATION.--Lat 21°23'04", long 157°54'22", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.5 mi north of Halawa quarry, 1.7 mi east of Aiea High School, and 1.9 mi east of Aiea.

DRAINAGE AREA.--4.01 mi^2.

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 160 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records fair, except for estimated days which are poor.

AVERAGE DISCHARGE.--21 years (water years 1984-2004), 4.95 ft^3/s (3,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft^3/s, December 18, 1990, gage height, 12.02 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2130	*1,570	*11.76	Dec 7	2100	1,090	11.08
Dec 1	1150	659	10.15	Jan 2	1550	864	10.63
Dec 5	1720	540	9.83	Feb 27	1540	860	10.62

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 5.43 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	100	53	7.2	15	e9.1	0.94	0.27	1.9	0.11	0.37
2	0.00	0.00	19	208	3.5	e22	7.0	0.68	0.39	1.5	8.4	0.74
3	0.01	0.00	12	100	2.0	e7.9	19	0.67	0.61	0.94	16	0.47
4	0.03	0.00	55	20	2.8	e5.2	10	3.1	0.47	0.53	e217	0.26
5	0.00	0.00	145	10	4.1	e3.1	5.7	3.7	0.27	0.51	e17	0.20
6	0.00	0.00	52	6.1	13	e1.8	3.7	4.2	0.28	0.51	e5.7	1.3
7	0.30	0.00	187	3.8	73	e2.7	2.8	7.6	0.24	0.44	e41	0.31
8	1.1	0.00	69	2.4	26	e6.4	2.2	2.9	0.34	0.59	e4.8	0.16
9	0.82	0.00	18	1.2	6.0	e3.8	2.2	1.5	0.96	2.0	e2.6	0.16
10	0.12	0.00	29	0.75	3.2	e2.3	13	0.88	5.6	0.57	e1.2	0.13
11	1.3	0.00	35	0.52	2.1	1.9	7.0	26	3.4	4.6	e1.9	0.14
12	4.7	0.00	12	0.61	1.3	3.2	19	21	2.0	4.5	e2.7	0.77
13	0.86	0.00	9.6	0.35	0.78	e12	10	5.2	1.9	3.0	0.84	0.13
14	1.5	0.00	5.7	3.0	0.53	e15	4.9	3.4	0.96	1.5	0.41	0.25
15	1.5	0.22	3.8	1.4	0.40	4.9	30	36	0.51	0.63	0.22	0.17
16	0.46	0.51	2.5	0.41	0.28	2.5	19	11	0.41	0.34	0.16	0.12
17	0.24	1.3	2.2	0.26	0.23	1.6	8.8	3.0	1.5	0.30	0.14	0.12
18	0.22	1.5	1.5	0.20	0.18	0.90	4.8	1.7	0.94	0.23	0.12	0.13
19	0.17	1.4	0.76	0.32	0.15	0.56	4.0	1.0	0.53	0.17	0.11	4.2
20	0.12	0.54	0.52	1.0	0.12	3.1	14	0.74	2.3	0.13	0.09	0.55
21	0.09	0.58	0.40	0.87	0.10	149	13	0.53	2.3	0.11	1.4	0.23
22	0.16	0.41	0.31	7.6	0.09	e119	5.0	0.39	3.9	0.11	0.66	2.2
23	0.08	0.52	0.26	14	0.11	e73	3.7	0.58	5.7	0.09	0.56	5.0
24	0.06	0.30	0.23	2.9	0.07	e29	2.7	0.46	6.7	0.08	2.5	4.8
25	0.05	0.61	0.19	13	0.07	e25	2.2	0.61	2.5	0.08	2.3	2.6
26	0.04	0.31	0.16	10	31	e24	26	0.38	1.4	0.17	20	0.98
27	0.03	0.36	0.13	11	200	e20	6.4	0.53	0.80	0.12	7.6	0.62
28	0.00	0.34	0.33	3.9	54	e11	2.9	0.45	0.80	2.0	3.3	0.22
29	0.00	201	0.18	2.7	15	e21	1.9	0.32	1.7	0.36	2.5	0.46
30	0.00	91	1.3	3.2	---	e76	1.3	0.41	1.3	0.17	1.4	0.37
31	0.00	---	35	6.2	---	e19	---	0.41	---	0.17	0.82	---
TOTAL	13.96	300.90	798.07	488.69	447.31	681.86	261.3	140.28	50.98	28.35	363.54	28.16
MEAN	0.45	10.0	25.7	15.8	15.4	22.0	8.71	4.53	1.70	0.91	11.7	0.94
MAX	4.7	201	187	208	200	149	30	36	6.7	4.6	217	5.0
MIN	0.00	0.00	0.13	0.20	0.07	0.56	1.3	0.32	0.24	0.08	0.09	0.12
AC-FT	28	597	1,580	969	887	1,350	518	278	101	56	721	56

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2004, BY WATER YEAR (WY)

MEAN	3.23	7.19	8.08	7.31	4.51	7.72	6.06	3.10	1.82	3.48	2.92	2.68
MAX	9.71	29.1	40.6	29.6	17.4	31.0	35.3	15.5	7.84	15.0	11.7	12.6
(WY)	(1992)	(1997)	(1988)	(1988)	(1989)	(1991)	(1989)	(1988)	(1987)	(1989)	(2004)	(1992)
MIN	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(WY)	(1985)	(1990)	(1990)	(1986)	(1983)	(1983)	(1983)	(1992)	(1984)	(1984)	(1984)	(1984)

16226200 NORTH HALAWA STREAM NEAR HONOLULU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1983 - 2004	
ANNUAL TOTAL	1,614.66		3,603.40			
ANNUAL MEAN	4.42		9.85		4.95	
HIGHEST ANNUAL MEAN					10.1	1988
LOWEST ANNUAL MEAN					1.43	1984
HIGHEST DAILY MEAN	201	Nov 29	217	Aug 4	476	Mar 24, 1994
LOWEST DAILY MEAN	0.00	Jan 5	0.00	Oct 1	0.00	Feb 1, 1983
ANNUAL SEVEN-DAY MINIMUM	0.00	Jan 5	0.00	Oct 28	0.00	Feb 1, 1983
ANNUAL RUNOFF (AC-FT)	3,200		7,150		3,590	
10 PERCENT EXCEEDS	3.9		20		10	
50 PERCENT EXCEEDS	0.02		1.3		0.40	
90 PERCENT EXCEEDS	0.00		0.09		0.00	

e Estimated

16226200 -- N. Halawa Str nr Honolulu, Oahu, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Sample type	Dis-charge, cfs (00060)	Instan-taneous dis-charge, cfs (00061)	Sam-pling method, code (82398)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conduc-tance, wat unf lab, uS/cm 25 degC (90095)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Residue on evap. at 180degC wat flt mg/L (70300)	Residue total at 105 deg. C, sus-pended, mg/L (00530)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV													
29...	1210	9	--	38	50	--	--	--	--	--	--	--	--
29...	1335	H	303	--	50	--	7.4	83	--	--	47	550	8.5
29...	1440	H	641	--	50	--	7.2	85	--	--	51	2420	14
29...	1655	9	--	640	70	6.8	7.2	61	57	22.5	36	1690	6.6
JAN													
22...	0616	H	52	--	50	--	7.1	145	--	--	79	156	1.3
22...	1005	9	--	9.5	30	6.8	7.2	96	98	20.0	74	21	.33
23...	0146	H	80	--	50	--	7.1	103	--	--	65	344	--
25...	1855	H	79	--	50	--	6.6	98	--	--	58	304	--
FEB													
26...	1722	H	170	--	50	--	7.4	85	--	--	66	286	2.1
27...	1247	9	--	322	70	6.8	7.5	86	80	19.9	57	449	2.4

Date	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd mg/L (00665)	COD, high level, water, unfltrd mg/L (00340)	Cadmium water, unfltrd ug/L (01027)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Zinc, water, unfltrd recover -able, ug/L (01092)	Oil and grease, water, unfltrd freon extract mg/L (00556)	Petrol-eum hydro-carbons wat unf frn ext mg/L (45501)
NOV												
29...	--	--	--	--	--	--	--	--	--	--	<7	--
29...	<.04	.10	<.008	<.08	1.40	230	.42	80.7	14.3	191	--	--
29...	<.04	.17	<.008	<.20	3.51	410	.51	137	13.0	182	--	--
29...	<.04	.12	<.008	<.08	2.31	200	.41	114	8.64	146	<7	<2
JAN												
22...	<.04	.09	<.008	<.04	.26	30	.10	20.5	4.95	63	--	--
22...	<.04	E.06	<.008	<.04	.05	<10	<.04	3.5	.23	3	<7	<2
23...	--	--	--	--	--	--	.12	26.5	4.68	57	--	--
25...	--	--	--	--	--	--	.12	27.9	4.34	60	--	--
FEB												
26...	<.04	.29	E.004	E.02	.57	90	.11	32.4	2.74	45	--	--
27...	<.04	.35	E.004	E.03	1.02	60	.16	52.1	3.62	66	<7	<2

Remark codes used in this table:
< -- Less than
E -- Estimated value

16226400 NORTH HALAWA STREAM NEAR QUARANTINE STATION AT HALAWA

LOCATION.--Lat 21°22'28", long 157°54'59", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank, 0.9 mi west of Oahu Prison, 1.4 mi north of Salt Lake Elementary School, and 1.2 mi northeast of Radford High School.

DRAINAGE AREA.--4.68 mi^2.

PERIOD OF RECORD.--October 2001 to December 2003 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 60 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records poor. Gage destroyed on Dec. 7, 2003.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,250 ft^3/s, January 26, 2002, gage height, 9.10 ft; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*) during period October to December 2003:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1643	*892	*7.21	Dec 5	1714	613	6.82
Dec 1	1154	804	7.08	Dec 7	1618	668	6.90

Minimum discharge for period October to December 2003, 0.00 ft^3/s, on many days, gage height, 3.32 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	98	---	---	---	---	---	---	---	---	---
2	0.00	0.00	19	---	---	---	---	---	---	---	---	---
3	0.00	0.00	10	---	---	---	---	---	---	---	---	---
4	0.00	0.00	54	---	---	---	---	---	---	---	---	---
5	0.00	0.00	150	---	---	---	---	---	---	---	---	---
6	0.00	0.00	51	---	---	---	---	---	---	---	---	---
7	0.00	0.00	---	---	---	---	---	---	---	---	---	---
8	0.00	0.00	---	---	---	---	---	---	---	---	---	---
9	0.00	0.00	---	---	---	---	---	---	---	---	---	---
10	0.00	0.00	---	---	---	---	---	---	---	---	---	---
11	0.00	0.00	---	---	---	---	---	---	---	---	---	---
12	0.71	0.00	---	---	---	---	---	---	---	---	---	---
13	0.04	0.00	---	---	---	---	---	---	---	---	---	---
14	0.08	0.00	---	---	---	---	---	---	---	---	---	---
15	0.00	0.00	---	---	---	---	---	---	---	---	---	---
16	0.00	0.00	---	---	---	---	---	---	---	---	---	---
17	0.00	0.00	---	---	---	---	---	---	---	---	---	---
18	0.00	0.00	---	---	---	---	---	---	---	---	---	---
19	0.00	0.00	---	---	---	---	---	---	---	---	---	---
20	0.00	0.00	---	---	---	---	---	---	---	---	---	---
21	0.00	0.00	---	---	---	---	---	---	---	---	---	---
22	0.00	0.00	---	---	---	---	---	---	---	---	---	---
23	0.00	0.00	---	---	---	---	---	---	---	---	---	---
24	0.00	0.00	---	---	---	---	---	---	---	---	---	---
25	0.00	0.00	---	---	---	---	---	---	---	---	---	---
26	0.00	0.00	---	---	---	---	---	---	---	---	---	---
27	0.00	0.00	---	---	---	---	---	---	---	---	---	---
28	0.00	0.00	---	---	---	---	---	---	---	---	---	---
29	0.00	119	---	---	---	---	---	---	---	---	---	---
30	0.00	100	---	---	---	---	---	---	---	---	---	---
31	0.00	---	---	---	---	---	---	---	---	---	---	---
TOTAL	0.83	219.00	---	---	---	---	---	---	---	---	---	---
MEAN	0.03	7.30	---	---	---	---	---	---	---	---	---	---
MAX	0.71	119	---	---	---	---	---	---	---	---	---	
MIN	0.00	0.00	---	---	---	---	---	---	---	---	---	
AC-FT	1.6	434	---	---	---	---	---	---	---	---	---	---

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2002 - 2004, BY WATER YEAR (WY)

MEAN	1.86	4.93	1.32	14.3	5.11	6.49	0.91	9.40	0.00	0.16	0.04	2.67
MAX	4.73	7.30	2.63	27.1	8.18	11.4	0.91	18.8	0.00	0.21	0.09	5.18
(WY)	(2002)	(2004)	(2002)	(2002)	(2002)	(2002)	(2003)	(2002)	(2002)	(2003)	(2002)	(2003)
MIN	0.03	1.27	0.00	1.46	2.03	1.56	0.90	0.00	0.00	0.12	0.00	0.16
(WY)	(2004)	(2003)	(2003)	(2003)	(2003)	(2003)	(2002)	(2003)	(2002)	(2002)	(2003)	(2002)

16226400 NORTH HALAWA STREAM NEAR QUARANTINE STATION AT HALAWA—Continued

SUMMARY STATISTICS	WATER YEARS 2002 - 2004	
ANNUAL MEAN	3.92	
HIGHEST ANNUAL MEAN	6.74	2002
LOWEST ANNUAL MEAN	1.10	2003
HIGHEST DAILY MEAN	324	May 6, 2002
LOWEST DAILY MEAN	0.00	Oct 3, 2001
ANNUAL SEVEN-DAY MINIMUM	0.00	Oct 16, 2001
ANNUAL RUNOFF (AC-FT)	2,840	
10 PERCENT EXCEEDS	5.4	
50 PERCENT EXCEEDS	0.00	
90 PERCENT EXCEEDS	0.00	

16226400 -- N. Halawa Str nr Quar. Stn. at Halawa, Oahu, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

PERIOD OF RECORD.--October 27, 2001 to current year
INSTRUMENTATION.--Automatic water-qulity (point) sampler since October 2001.

Date	Time	Sample type	Dis-charge, cfs (00060)	Instan-taneous dis-charge, cfs (00061)	Sam-pling method, code (82398)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conduc-tance, wat unf lab, uS/cm 25 degC (90095)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Residue on evap. at 180degC wat flt mg/L (70300)	Residue total at 105 deg. C, sus-pended, mg/L (00530)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV													
29...	1305	9	--	56	50	6.9	--	--	71	--	--	--	--
29...	1426	H	366	--	50	6.9	7.1	98	90	--	62	1150	9.7
29...	1740	9	--	103	30	6.9	7.2	E70	71	22.0	42	769	4.1
FEB													
27...	1037	9	--	11	10	8.3	7.8	161	104	20.6	98	110	1.6

Date	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd mg/L (00665)	COD, high level, water, unfltrd mg/L (00340)	Cadmium water, unfltrd ug/L (01027)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Zinc, water, unfltrd recover -able, ug/L (01092)	Oil and grease, water, unfltrd freon extract mg/L (00556)	Petrol-eum hydro-carbons wat unf frn ext mg/L (45501)
NOV												
29...	--	--	--	--	--	--	--	--	--	--	E3	--
29...	<.04	.17	<.008	<.20	2.60	270	.47	124	15.4	185	--	--
29...	<.04	.15	<.008	<.08	2.06	120	.38	105	9.14	135	<7	<2
FEB												
27...	.08	.20	E.005	.12	.49	130	.20	34.9	5.92	92	E6	<2

Date	Time	Sample type	Dis-charge, cfs (00060)	Instan-taneous dis-charge, cfs (00061)	Sam-pling method, code (82398)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conduc-tance, wat unf lab, uS/cm 25 degC (90095)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Residue on evap. at 180degC wat flt mg/L (70300)	Residue total at 105 deg. C, sus-pended, mg/L (00530)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
NOV													
29...	1305	9	--	56	50	6.9	--	--	71	--	--	--	--
29...	1426	H	366	--	50	6.9	7.1	98	90	--	62	1150	9.7
29...	1740	9	--	103	30	6.9	7.2	E70	71	22.0	42	769	4.1
FEB													
27...	1037	9	--	11	10	8.3	7.8	161	104	20.6	98	110	1.6

Date	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd mg/L (00665)	COD, high level, water, unfltrd mg/L (00340)	Cadmium water, unfltrd ug/L (01027)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Zinc, water, unfltrd recover -able, ug/L (01092)	Oil and grease, water, unfltrd freon extract mg/L (00556)	Petrol-eum hydro-carbons wat unf frn ext mg/L (45501)
NOV												
29...	--	--	--	--	--	--	--	--	--	--	E3	--
29...	<.04	.17	<.008	<.20	2.60	270	.47	124	15.4	185	--	--
29...	<.04	.15	<.008	<.08	2.06	120	.38	105	9.14	135	<7	<2
FEB												
27...	.08	.20	E.005	.12	.49	130	.20	34.9	5.92	92	E6	<2

Remark codes used in this table:
< -- Less than
E -- Estimated value

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°21'59", long 157°50'49", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank 1.9 mi upstream from Kamanaiki Stream, and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi^2.

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319. CHEMICAL ANALYSES: Water years 1972, 1974-93, 1996, quarterly.

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

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

REMARKS.--Records computed by M.T.J. Ball. Records fair.

AVERAGE DISCHARGE.--90 years (water years 1915-2004), 6.34 ft^3/s (4,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s, November 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft^3/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft^3/s, October 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1400	*1,100	*8.24	May 11	2015	881	7.77
Feb 27	--	958	7.94	Aug 4	0615	873	7.75

Minimum discharge, 0.36 ft^3/s, Nov. 11, gage height, 2.04 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	0.79	42	24	e5.3	e12	17	4.5	3.5	4.4	1.9	1.4
2	1.4	0.78	17	139	e4.9	e9.4	15	3.8	3.6	3.7	4.7	1.6
3	1.4	0.82	13	73	e4.7	7.6	22	3.6	2.9	3.3	10	1.6
4	1.2	0.73	56	25	e4.5	7.5	15	5.7	2.8	2.9	84	1.4
5	0.97	0.68	137	15	e5.5	6.1	12	6.1	2.3	3.4	5.6	1.5
6	1.0	0.83	55	12	e7.2	6.0	10	6.4	2.8	3.1	2.5	1.9
7	1.7	0.90	146	9.6	e36	5.7	8.6	14	2.5	2.7	6.0	1.3
8	2.2	0.98	55	8.5	e22	5.7	7.7	4.9	2.5	2.4	2.6	1.3
9	2.4	0.67	27	7.0	e8.5	5.1	7.0	4.1	3.9	2.7	2.3	1.2
10	1.2	0.66	30	6.1	e7.3	5.7	12	4.3	5.0	2.4	2.2	0.99
11	3.9	0.75	22	5.8	e6.6	5.3	7.4	58	4.6	2.7	3.3	1.5
12	3.8	0.77	14	5.9	e5.6	4.9	12	15	3.7	2.6	3.6	2.0
13	2.1	0.90	11	e4.0	e4.6	14	7.5	6.6	3.1	2.4	2.4	1.2
14	3.3	1.1	8.9	e6.4	e4.4	9.5	7.9	6.2	3.3	2.1	2.0	3.1
15	2.5	1.2	e7.9	e4.5	e4.1	6.6	11	25	2.6	2.4	1.7	1.6
16	1.8	1.4	6.7	e4.4	e4.0	6.0	9.1	8.2	6.5	4.4	1.6	1.2
17	1.6	2.0	6.2	e4.2	e4.0	5.7	6.5	5.6	6.1	2.0	2.3	0.91
18	1.4	4.1	5.6	e4.2	e3.6	4.6	6.1	5.0	3.6	1.7	1.5	0.72
19	1.2	2.0	5.1	e4.2	e3.3	4.0	5.9	4.8	4.0	1.8	1.1	2.3
20	1.2	1.4	5.0	e6.3	e3.3	8.3	17	4.3	5.7	1.6	1.0	1.0
21	1.1	1.3	4.5	e4.5	e3.2	100	8.9	3.9	4.5	1.5	3.0	1.2
22	1.0	0.90	4.2	e8.3	e3.3	79	6.5	3.5	6.1	1.5	1.6	1.4
23	0.99	1.2	4.2	e20	e3.4	59	5.6	3.6	6.1	1.4	1.9	7.9
24	0.95	1.2	3.8	e6.0	e3.3	26	5.4	3.5	5.3	1.1	2.1	2.8
25	0.91	1.4	3.6	e17	e3.5	24	5.4	4.1	3.8	1.1	2.5	2.0
26	0.88	0.79	3.3	e9.4	e36	25	12	4.1	3.1	1.2	10	1.7
27	0.84	0.64	3.4	e5.8	e124	20	5.8	4.2	3.0	1.4	4.8	1.7
28	0.84	0.74	5.2	e4.9	e30	15	5.1	3.9	3.9	2.5	2.7	1.5
29	0.82	115	3.7	e4.3	e14	35	5.2	3.6	4.1	1.6	2.6	1.9
30	0.75	45	11	e4.9	---	78	4.6	3.5	4.1	1.7	2.2	3.8
31	0.73	---	27	e5.9	---	24	---	4.0	---	1.9	1.7	---
TOTAL	47.18	191.63	744.3	460.1	370.1	624.7	281.2	238.0	119.0	71.6	177.4	55.62
MEAN	1.52	6.39	24.0	14.8	12.8	20.2	9.37	7.68	3.97	2.31	5.72	1.85
MAX	3.9	115	146	139	124	100	22	58	6.5	4.4	84	7.9
MIN	0.73	0.64	3.3	4.0	3.2	4.0	4.6	3.5	2.3	1.1	1.0	0.72
AC-FT	94	380	1,480	913	734	1,240	558	472	236	142	352	110

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2004, BY WATER YEAR (WY)

MEAN	4.44	7.16	8.33	8.99	7.09	8.44	8.15	6.38	3.63	4.38	4.90	4.43
MAX	18.9	35.0	35.0	65.7	48.6	40.6	36.0	37.5	12.9	16.6	26.7	31.3
(WY)	(1937)	(1928)	(1930)	(1923)	(1932)	(1951)	(1989)	(1927)	(1934)	(1954)	(1958)	(1914)
MIN	0.29	0.46	0.74	0.50	0.34	0.74	0.63	0.27	0.32	0.60	0.43	0.30
(WY)	(1985)	(1954)	(1977)	(1977)	(1978)	(1926)	(1926)	(1926)	(1966)	(1984)	(1984)	(1984)

16229000 KALIHI STREAM NEAR HONOLULU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1914 - 2004	
ANNUAL TOTAL	1,546.63		3,380.83			
ANNUAL MEAN	4.24		9.24		6.34	
HIGHEST ANNUAL MEAN					13.5	1923
LOWEST ANNUAL MEAN					1.81	2003
HIGHEST DAILY MEAN	146	Dec 7	146	Dec 7	951	Jan 19, 1923
LOWEST DAILY MEAN	0.20	Sep 6	0.64	Nov 27	0.11	Jul 29, 1966
ANNUAL SEVEN-DAY MINIMUM	0.29	Aug 31	0.75	Oct 30	0.15	May 15, 1926
ANNUAL RUNOFF (AC-FT)	3,070		6,710		4,590	
10 PERCENT EXCEEDS	5.0		18		11	
50 PERCENT EXCEEDS	0.95		4.0		2.8	
90 PERCENT EXCEEDS	0.37		1.1		0.93	

e Estimated

16229300 KALIHI STREAM AT KALIHI

LOCATION.--Lat 21°20'29", long 157°52'36", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi^2.

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.
CHEMICAL ANALYSES: Water years 1970-74, 1975-93, quarterly.
SUSPENDED-SEDIMENT DISCHARGE: Water years 1969-74, 1975-93, quarterly.

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

REMARKS.--Records computed by M.T.J. Ball. Records good.

AVERAGE DISCHARGE.--42 years (water years 1963-2004), 9.79 ft^3/s (7,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s, April 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft^3/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0.00 ft^3/s, October 13-14, 1999.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft from floodmarks, present site and datum, discharge, 6,350 ft^3/s, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1415	993	4.02	Feb 27	1500	1,390	4.68
Dec 7	2130	*3,580	*7.22	Aug 4	0630	1,030	4.09
Jan 2	1630	987	4.01				

Minimum discharge, 0.68 ft^3/s, Oct. 2, gage height, 0.57 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	3.8	62	76	8.9	21	23	5.7	4.8	6.6	2.0	3.8
2	1.2	4.5	20	342	8.2	17	21	5.7	5.1	5.2	6.6	3.9
3	1.5	5.1	13	132	7.8	13	29	6.5	4.7	4.4	12	3.8
4	1.9	3.8	52	33	7.4	12	20	13	4.4	4.1	170	3.2
5	1.4	2.7	154	19	9.3	10	16	11	4.0	5.6	14	3.2
6	1.4	3.3	63	14	13	8.9	14	8.2	4.2	4.6	7.0	4.2
7	4.1	3.6	365	12	74	8.7	12	17	4.5	4.0	10	3.4
8	6.4	4.1	97	10	42	9.2	17	7.7	4.7	3.9	6.6	2.7
9	6.0	3.2	32	8.9	15	7.3	11	6.5	8.9	3.6	6.0	2.9
10	2.9	3.4	46	8.1	13	7.8	18	6.1	8.7	3.1	5.1	2.9
11	6.0	3.6	31	7.4	11	7.0	11	59	9.1	5.0	8.2	4.0
12	7.0	2.7	18	7.1	9.6	6.6	15	23	7.2	4.1	7.9	5.3
13	4.3	3.2	15	6.6	7.6	22	11	9.4	6.2	4.9	5.5	3.8
14	7.3	5.3	12	11	7.3	16	10	8.8	5.3	3.2	5.1	6.4
15	4.8	4.5	9.8	7.5	6.8	9.6	16	39	4.5	2.9	4.1	3.7
16	3.5	5.3	8.5	7.2	6.5	7.6	17	14	9.6	4.0	3.8	2.8
17	3.2	4.4	8.0	6.9	6.5	7.1	10	10	8.7	2.8	4.2	2.7
18	3.1	7.9	7.2	6.8	5.9	6.4	9.0	8.5	5.7	2.6	3.5	2.9
19	2.7	7.1	6.4	6.8	5.4	6.0	8.9	7.6	6.0	2.6	3.1	6.0
20	2.2	3.7	5.9	11	5.3	10	20	7.2	9.4	2.4	3.1	2.7
21	2.4	3.5	5.2	7.5	5.2	154	13	6.8	6.7	2.3	6.1	2.6
22	2.5	2.9	4.9	15	5.4	176	9.1	6.4	10	2.1	3.4	3.9
23	2.4	3.7	5.1	39	5.5	108	8.6	6.9	10	2.1	7.3	15
24	2.5	3.4	4.2	10	5.4	42	7.7	6.3	9.0	2.1	5.7	7.1
25	2.3	5.0	4.0	31	5.7	37	7.2	6.2	6.0	2.0	5.8	3.5
26	2.4	3.2	3.7	17	75	59	15	5.4	5.3	2.3	16	3.1
27	2.3	3.1	3.7	9.8	291	35	8.2	5.8	4.8	2.9	9.4	2.8
28	2.9	2.8	7.5	8.2	61	22	7.0	6.1	5.7	4.1	7.2	2.5
29	2.7	116	4.3	7.1	26	42	6.4	7.3	5.5	2.1	6.6	2.8
30	3.4	51	19	8.2	---	121	6.0	5.1	6.9	2.0	4.8	5.9
31	3.5	---	57	10	---	35	---	5.6	---	2.6	4.3	---
TOTAL	101.6	279.8	1,144.4	896.1	750.7	1,044.2	397.1	341.8	195.6	106.2	364.4	123.5
MEAN	3.28	9.33	36.9	28.9	25.9	33.7	13.2	11.0	6.52	3.43	11.8	4.12
MAX	7.3	116	365	342	291	176	29	59	10	6.6	170	15
MIN	1.2	2.7	3.7	6.6	5.2	6.0	6.0	5.1	4.0	2.0	2.0	2.5
AC-FT	202	555	2,270	1,780	1,490	2,070	788	678	388	211	723	245

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2004, BY WATER YEAR (WY)

MEAN	6.37	13.0	14.4	13.6	10.8	15.0	12.6	9.13	5.12	7.16	5.78	4.63
MAX	22.2	49.2	56.6	45.8	60.3	73.2	57.6	40.9	19.5	29.3	35.7	20.4
(WY)	(1964)	(1966)	(1988)	(1982)	(1969)	(1968)	(1989)	(1965)	(1980)	(1970)	(1982)	(1992)
MIN	0.95	2.07	1.15	0.82	0.78	1.15	1.65	1.17	0.72	0.96	0.68	0.64
(WY)	(1985)	(2003)	(1977)	(1977)	(1978)	(1983)	(1992)	(2003)	(2003)	(2003)	(2003)	(1984)

16229300 KALIHI STREAM AT KALIHI—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1962 - 2004	
ANNUAL TOTAL	2,315.58		5,745.4			
ANNUAL MEAN	6.34		15.7		9.79	
HIGHEST ANNUAL MEAN					21.3	1982
LOWEST ANNUAL MEAN					2.67	2003
HIGHEST DAILY MEAN	365	Dec 7	365	Dec 7	781	Feb 1, 1969
LOWEST DAILY MEAN	0.40	Jul 12	1.2	Oct 2	0.05	Oct 14, 1999
ANNUAL SEVEN-DAY MINIMUM	0.45	Aug 29	1.8	Oct 1	0.36	Oct 14, 1984
ANNUAL RUNOFF (AC-FT)	4,590		11,400		7,090	
10 PERCENT EXCEEDS	7.1		30		17	
50 PERCENT EXCEEDS	2.1		6.5		3.6	
90 PERCENT EXCEEDS	0.51		2.8		1.2	

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'52", long 157°48'08", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank 5 ft downstream from bridge on Waaloa Way, 500 ft upstream from confluence with Waihi Stream, and 4.2 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi^2.

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

REVISED RECORDS.--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M). WDR HI-04-1: 1961-72(P), 1974-2000(P).

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 benchmark). Prior to May 20, 1914, nonrecording gage at site 200 ft upstream at different datum. May 20, 1914 to January 16, 1921, water-stage recorder at site 30 ft upstream at different datum. August 18, 1925 to March 15, 1928, water-stage recorder at present site at datum 2.99 ft lower. March 16, 1928 to October 18, 1933, water-stage recorder at present site at datum 0.41 ft higher.

REMARKS.--Records computed by H.A. Jeppesen. Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream of station. Occasional small diversions for irrigation upstream of station.

AVERAGE DISCHARGE.--86 years (water years 1914-20, 1926-2004), 4.83 ft^3/s (3,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s, January 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft^3/s; minimum, 0.6 ft^3/s, June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1400	601	3.60	May 11	2115	499	3.43
Feb 27	1500	392	3.22	Aug 4	0545	*607	*3.61
May 7	0245	511	3.45				

Minimum discharge, 0.75 ft^3/s, Oct. 6, gage height, 0.14 ft.

REVISIONS.--The maximum annual discharges for water years 1961 to 1972 and 1974 to 2000 have been revised as shown in the following table. These figures supercede those published in Annual Data Reports 1961-1972 and 1974-2000 .

WATER YEAR	DATE	PEAK DISCHARGE (CFS)	GAGE HEIGHT (FT)
1961	Dec. 30, 1960	2400	5.28
1962	Oct. 31, 1961	717	3.78
	Nov. 02, 1961	383	3.20
1963	May 14, 1963	1910	4.96
1964	Jul. 24, 1964	696	3.75
1965	Feb. 04, 1965	3890	6.06
	Dec. 10, 1964	1090	4.25
	Dec. 15, 1964	601	3.60
	Dec. 19, 1964	483	3.40
	Jul. 12, 1965	451	3.34
1966	Nov. 14, 1965	2110	5.10
	Oct. 13, 1965	683	3.73
	Nov. 10, 1965	488	3.41
	Nov. 12, 1965	619	3.63
	Dec. 10, 1965	619	3.63
	Dec. 14, 1965	1060	4.21
	Jan. 20, 1966	451	3.34
1967	Oct. 11, 1966	1260	4.42
	Oct. 10, 1966	406	3.25
	Mar. 22, 1967	564	3.54
	Aug. 09, 1967	773	3.86
1968	Dec. 18, 1967	1670	4.78
	Dec. 09, 1967	879	4.00
	Jan. 04, 1968	802	3.90
	Jan. 16, 1968	564	3.54
	Mar. 14, 1968	582	3.57
	Mar. 16, 1968	1200	4.36
	Apr. 15, 1968	456	3.35
1969	Nov. 29, 1968	1280	4.44
	Mar. 16, 1969	788	3.88
1970	Nov. 14, 1969	388	3.21
1971	Mar. 25, 1971	1470	4.61
	Apr. 23, 1971	1190	4.35
1972	Apr. 14, 1972	632	3.65
1974	Mar. 12, 1974	416	3.27
1975	Nov. 21, 1974	1080	4.24

REVISIONS.--continued

	Oct. 15, 1974	516	3.46
	Jan. 11, 1975	411	3.26
1976	Nov. 26, 1975	505	3.44
1977	Apr. 19, 1977	832	3.94
	May 12, 1977	825	3.93
	Jun. 08, 1977	564	3.54
1978	May 23, 1978	1020	4.17
1979	Feb. 03, 1979	832	3.94
1980	Dec. 25, 1979	730	3.80
	Jan. 08, 1980	664	3.70
	May 25, 1980	676	3.72
1981	May 07, 1981	632	3.65
	Aug. 04, 1981	431	3.30
1982	Aug. 25, 1982	879	4.00
	Oct. 28, 1981	494	3.42
	Nov. 01, 1981	817	3.92
	Dec. 25, 1981	500	3.43
	Mar. 23, 1982	710	3.77
	Apr. 02, 1982	540	3.50
	Aug. 16, 1982	730	3.80
	Sep. 01, 1982	446	3.33
1983	Oct. 27, 1982	352	3.13
1984	Apr. 19, 1984	239	2.83
1985	Feb. 14, 1985	626	3.64
1986	Oct. 19, 1985	558	3.53
1987	Jun. 12, 1987	411	3.26
1988	Dec. 31, 1987	987	4.13
	Dec. 12, 1987	802	3.90
	Mar. 24, 1988	619	3.63
1989	Dec. 06, 1988	690	3.74
	Feb. 11, 1989	426	3.29
	Mar. 02, 1989	406	3.25
	Apr. 24, 1989	552	3.52
	Jun. 01, 1989	467	3.37
	Jul. 20, 1989	505	3.44
1990	Oct. 03, 1989	516	3.46
1991	Mar. 19, 1991	456	3.35
	Nov. 16, 1990	411	3.26
	Feb. 18, 1991	451	3.34
	Aug. 08, 1991	416	3.27
1992	Sep. 16, 1992	528	3.48
1993	Dec. 30, 1992	944	4.08
	Dec. 25, 1992	402	3.24
1994	Mar. 24, 1994	1010	4.16
1995	Feb. 28, 1995	505	3.44
	Oct. 16, 1994	365	3.16
1996	Jan. 25, 1996	717	3.78
	Dec. 01, 1995	456	3.35
	Aug. 31, 1996	456	3.35
1997	Nov. 14, 1996	421	3.28
1998	Oct. 09, 1997	284	2.96
1999	Apr. 02, 1999	200	2.70
2000	Jan. 19, 2000	411	3.26
	Dec. 02, 1999	397	3.23

16240500 WAIAKEAKUA STREAM AT HONOLULU—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.84	1.3	12	15	3.8	4.8	8.1	4.3	4.7	5.9	3.6	3.8
2	0.84	1.4	4.6	54	3.3	5.7	13	4.3	5.4	5.2	8.6	3.8
3	0.89	1.1	5.0	8.3	3.4	4.0	14	4.4	4.7	4.8	7.1	3.6
4	0.88	1.2	22	5.7	3.4	5.1	8.3	8.0	4.4	4.5	50	3.6
5	0.86	1.6	47	4.8	4.6	4.0	6.8	5.9	4.2	5.7	5.7	3.6
6	0.86	1.3	23	4.1	5.2	3.8	6.2	11	4.2	5.3	4.6	3.7
7	0.91	1.5	38	3.9	9.9	4.7	6.2	22	4.3	4.4	8.5	3.5
8	2.5	1.6	13	3.5	4.9	4.9	5.9	5.5	4.3	4.7	4.7	3.5
9	1.6	1.1	8.4	3.2	3.7	3.6	5.8	4.8	6.6	5.3	4.7	3.6
10	1.2	1.2	13	3.1	3.4	3.8	9.6	4.8	7.2	4.3	4.1	3.6
11	5.2	1.3	8.3	3.0	3.3	3.4	6.8	25	6.0	16	5.6	3.6
12	2.6	1.1	5.7	3.1	3.1	3.3	12	9.3	4.9	6.7	5.8	4.4
13	1.8	1.3	7.4	3.0	3.1	8.0	6.4	5.2	4.5	5.5	4.7	3.9
14	4.0	1.3	4.9	3.5	3.0	6.1	6.0	6.4	4.2	4.5	4.3	5.8
15	2.6	1.8	4.1	3.0	2.9	3.7	6.6	7.3	4.1	4.3	4.1	3.7
16	2.0	1.9	3.7	3.0	2.9	3.4	7.3	5.7	8.9	4.5	4.1	3.5
17	2.1	1.8	4.2	2.8	2.8	3.3	5.5	4.9	6.7	4.4	3.9	3.4
18	1.7	4.1	3.4	2.9	2.8	3.2	5.2	4.5	5.9	4.4	3.7	3.5
19	1.6	2.4	3.2	3.0	2.7	3.1	5.4	4.5	4.8	4.1	3.6	5.3
20	1.4	1.6	3.0	7.2	2.7	4.3	6.5	4.6	8.5	3.9	3.6	3.5
21	1.3	1.3	2.9	3.6	2.7	56	5.3	4.4	5.1	3.8	6.3	3.6
22	1.3	1.3	2.8	13	2.7	29	5.1	4.3	6.5	3.8	4.0	3.7
23	1.3	1.6	2.9	8.2	2.9	27	4.9	4.4	7.5	3.7	5.1	5.4
24	1.3	1.8	2.8	3.5	2.9	9.8	4.8	4.2	5.3	3.8	5.4	3.9
25	1.3	1.7	2.8	6.1	3.0	14	4.7	4.2	4.5	3.7	4.6	3.6
26	1.3	1.3	2.7	4.9	17	16	9.1	4.1	4.3	4.0	12	3.5
27	1.3	1.2	2.7	3.5	38	8.6	5.0	4.4	4.1	4.2	6.5	3.4
28	1.2	1.2	6.2	3.6	9.9	6.9	4.6	4.4	7.1	4.9	4.9	3.7
29	1.2	30	3.0	3.2	5.4	30	4.5	4.6	5.7	3.7	4.5	3.3
30	1.2	10	11	6.1	---	39	4.4	4.5	7.5	3.7	4.1	8.3
31	1.2	---	8.3	4.0	---	10	---	6.4	---	3.7	3.9	---
TOTAL	50.28	83.3	282.0	199.8	159.4	332.5	204.0	202.3	166.1	151.4	206.3	119.3
MEAN	1.62	2.78	9.10	6.45	5.50	10.7	6.80	6.53	5.54	4.88	6.65	3.98
MAX	5.2	30	47	54	38	56	14	25	8.9	16	50	8.3
MIN	0.84	1.1	2.7	2.8	2.7	3.1	4.4	4.1	4.1	3.7	3.6	3.3
AC-FT	100	165	559	396	316	660	405	401	329	300	409	237

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2004, BY WATER YEAR (WY)

MEAN	4.11	5.16	5.28	4.92	4.43	5.38	5.57	5.08	4.12	4.85	4.77	4.14
MAX	10.7	18.1	15.5	14.8	15.6	19.5	17.5	13.3	10.3	12.3	13.6	13.3
(WY)	(1915)	(1928)	(1988)	(1988)	(1955)	(1942)	(1989)	(1988)	(1938)	(1958)	(1958)	(1914)
MIN	1.18	1.17	1.42	1.28	1.03	1.14	1.16	0.87	1.19	0.87	1.07	1.27
(WY)	(1946)	(1934)	(1920)	(1977)	(1920)	(1926)	(1926)	(1926)	(2003)	(1926)	(2003)	(1984)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1913 - 2004	
ANNUAL TOTAL	958.20		2,156.68			
ANNUAL MEAN	2.63		5.89		4.83	
HIGHEST ANNUAL MEAN					8.23	1988
LOWEST ANNUAL MEAN					1.94	1920
HIGHEST DAILY MEAN	72	Sep 11	56	Mar 21	183	Mar 24, 1994
LOWEST DAILY MEAN	0.74	Sep 6	0.84	Oct 1	0.62	Feb 26, 1920
ANNUAL SEVEN-DAY MINIMUM	0.84	Aug 31	0.87	Oct 1	0.75	May 23, 1926
ANNUAL RUNOFF (AC-FT)	1,900		4,280		3,500	
10 PERCENT EXCEEDS	3.8		9.4		8.0	
50 PERCENT EXCEEDS	1.3		4.3		3.5	
90 PERCENT EXCEEDS	0.95		1.5		1.7	

16242500 MANOA STREAM AT KANEWAI FIELD

LOCATION.--Lat 21°17'47", long 157°48'56", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream from confluence with Palolo Stream.

DRAINAGE AREA.--5.99 mi^2.

PERIOD OF RECORD.--January 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 22 ft above mean sea level, from topographic map.

REMARKS.--Records computed by C. Yoshida. Records fair.

AVERAGE DISCHARGE.--5 years (water years 2000-2004), 9.88 ft^3/s (7,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,320 ft^3/s, Jan. 26, 2002, gage height, 15.59 ft. Minimum discharge, 0.66 ft^3/s, Jun. 7, 2003, gage height, 8.52 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1430	881	12.65
Dec 5	1715	693	12.18
Jan 2	1815	1,190	13.37
Jan 23	0015	885	12.66
Feb 27	1500	1,250	13.51
Mar 13	1100	826	12.52
Mar 26	1715	671	12.12
May 11	2145	716	12.24
Aug 4	0615	*1,390	*13.81

Minimum discharge, 0.85 ft^3/s, Nov. 7, gage height, 8.59 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.8	78	50	8.3	16	23	6.5	8.5	15	5.5	e4.1
2	1.5	2.1	15	292	8.3	13	42	6.2	9.0	12	21	e4.2
3	1.4	1.4	10	90	8.2	9.5	36	7.6	8.1	9.5	15	e3.8
4	0.98	2.4	44	23	7.8	11	20	25	7.3	8.5	e139	e3.8
5	0.99	2.5	129	16	12	8.2	16	13	6.8	12	e6.6	e4.2
6	1.2	1.5	85	10	17	7.5	13	21	6.8	11	e5.2	e4.2
7	1.7	1.3	157	8.5	25	9.2	12	45	6.8	8.3	e8.4	e3.5
8	6.1	3.0	63	7.8	14	9.7	15	10	8.1	12	e5.1	e3.1
9	4.5	1.8	32	7.6	8.9	6.9	11	8.4	19	10	e5.2	e3.8
10	2.3	2.2	57	7.5	8.4	7.1	23	7.7	20	7.4	e4.8	e3.8
11	13	2.6	30	7.4	7.1	6.3	12	41	16	42	e6.5	e4.0
12	6.2	2.6	18	7.2	6.7	6.0	28	20	12	16	e6.5	e9.8
13	3.5	4.9	24	6.5	6.2	50	13	8.2	11	16	e4.5	e5.1
14	14	4.1	12	9.1	5.8	17	11	15	10	8.6	e4.3	e7.2
15	9.7	5.5	10	6.6	5.6	8.1	17	19	9.6	8.5	e4.2	e4.2
16	6.0	6.1	8.4	6.6	5.4	7.1	18	10	26	9.4	e3.9	e3.9
17	4.3	5.2	9.6	6.1	4.9	6.5	11	8.2	16	7.9	e3.9	e4.0
18	2.6	11	7.4	7.0	4.7	6.0	9.2	7.5	13	7.7	e3.7	e4.8
19	2.2	11	7.0	7.6	4.4	5.7	10	7.8	10	6.9	e3.5	e9.2
20	2.1	4.4	6.4	34	4.2	8.6	14	8.1	19	6.9	e3.4	e4.4
21	2.1	4.0	5.9	9.2	4.0	193	9.7	9.0	10	6.4	e6.7	e4.8
22	2.1	3.4	5.4	23	3.8	163	8.5	6.6	15	6.6	e4.1	e5.3
23	2.1	5.3	5.3	61	5.2	114	8.1	6.9	18	6.6	e5.8	e10
24	2.3	4.3	4.9	8.1	6.5	39	7.7	6.6	12	6.2	e6.1	e5.9
25	1.9	6.1	4.6	17	6.3	50	7.2	7.0	8.7	5.9	e5.3	e4.8
26	1.7	3.9	4.3	13	65	73	19	6.4	9.1	7.0	e17	e5.4
27	1.6	3.5	4.2	8.3	192	31	8.0	7.2	7.5	7.7	e7.4	e4.6
28	1.5	3.0	15	8.0	57	22	7.2	7.7	16	9.9	e5.7	e3.9
29	1.5	89	5.9	6.7	22	75	6.9	10	12	6.2	e5.3	e4.3
30	1.1	28	38	19	---	141	6.6	8.2	16	6.2	e4.9	e18
31	1.8	---	50	9.6	---	35	---	14	---	6.5	e4.4	---
TOTAL	105.47	227.9	946.3	793.4	534.7	1,155.4	443.1	384.8	367.3	310.8	332.9	162.1
MEAN	3.40	7.60	30.5	25.6	18.4	37.3	14.8	12.4	12.2	10.0	10.7	5.40
MAX	14	89	157	292	192	193	42	45	26	42	139	18
MIN	0.98	1.3	4.2	6.1	3.8	5.7	6.6	6.2	6.8	5.9	3.4	3.1
AC-FT	209	452	1,880	1,570	1,060	2,290	879	763	729	616	660	322

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2004, BY WATER YEAR (WY)

MEAN	6.51	10.6	13.5	16.9	10.6	13.1	10.4	8.53	6.47	6.65	7.82	7.33
MAX	9.02	18.0	30.5	26.8	18.4	37.3	15.7	15.1	12.2	10.0	10.7	13.1
(WY)	(2001)	(2001)	(2004)	(2000)	(2004)	(2004)	(2000)	(2002)	(2004)	(2004)	(2004)	(2000)
MIN	3.40	6.52	3.46	3.02	5.54	4.45	4.38	2.25	1.87	2.97	2.52	4.87
(WY)	(2004)	(2003)	(2003)	(2001)	(2000)	(2000)	(2003)	(2003)	(2003)	(2003)	(2003)	(2002)

16242500 MANOA STREAM AT KANEWAI FIELD—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 2000 - 2004	
ANNUAL TOTAL	2,482.17		5,764.17			
ANNUAL MEAN	6.80		15.7		9.88	
HIGHEST ANNUAL MEAN					15.7	2004
LOWEST ANNUAL MEAN					4.58	2003
HIGHEST DAILY MEAN	157	Dec 7	292	Jan 2	292	Jan 2, 2004
LOWEST DAILY MEAN	0.98	Oct 4	0.98	Oct 4	0.98	Oct 4, 2003
ANNUAL SEVEN-DAY MINIMUM	1.1	Jun 6	1.3	Oct 1	1.1	Jun 6, 2003
ANNUAL RUNOFF (AC-FT)	4,920		11,430		7,160	
10 PERCENT EXCEEDS	11		30		17	
50 PERCENT EXCEEDS	2.6		7.6		5.2	
90 PERCENT EXCEEDS	1.2		3.3		2.4	

e Estimated

16244000 PUKELE STREAM NEAR HONOLULU

LOCATION.--Lat 21°18'35", long 157°47'30", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank 200 ft upstream from bridge on Palolo Avenue, 0.6 mi upstream from confluence with Waiomao Stream, and 4.8 mi east of Honolulu Post Office.

DRAINAGE AREA.--1.18 mi^2.

PERIOD OF RECORD.--June 1926 to September 1982, October 2002 to current year.

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

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

REMARKS.--Records computed by H.A. Jeppesen. Records fair below 50 ft^3/s and poor above that. No diversion above station.

AVERAGE DISCHARGE.--58 years (water years 1926-82, 2003-2004), 1.93 ft^3/s (1,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,600 ft^3/s, April 11, 1930, gage height, 7.75 ft, from floodmarks, from rating curve extended above 71 ft^3/s by test of model of station site; minimum, 0.08 ft^3/s, Oct. 31, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1415	*312	*3.96	Feb 27	1315	251	3.68
Jan 2	1815	312	3.96	May 11	2130	173	3.25
Jan 23	0015	183	3.31	Aug 4	0600	278	3.81

Minimum discharge, 0.19 ft^3/s, on several days, gage height, 0.84 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.14	0.20	14	8.5	1.4	1.8	5.3	0.94	0.85	1.3	0.54	0.69
2	e0.14	0.20	3.4	58	1.4	2.8	11	0.91	0.81	0.92	0.60	0.66
3	e0.15	0.20	1.7	20	1.4	1.4	11	0.87	0.76	0.87	0.56	0.60
4	e0.15	0.20	12	5.5	1.4	1.5	5.5	1.6	0.75	0.88	24	0.61
5	e0.14	0.20	23	2.6	1.4	1.2	3.7	1.2	0.70	0.93	1.8	0.57
6	e0.14	0.20	20	1.9	1.4	1.2	3.0	1.7	0.69	0.90	0.69	0.58
7	e0.15	0.20	19	1.8	2.1	1.2	3.2	8.9	0.68	0.86	2.0	0.52
8	e0.41	0.19	12	1.7	1.7	1.2	2.6	1.5	0.68	0.96	0.76	0.49
9	e0.26	0.19	3.4	1.6	1.5	1.2	3.0	1.0	0.70	0.83	0.71	0.47
10	e0.19	0.19	5.2	1.6	1.5	1.2	7.1	1.0	0.68	0.80	0.68	0.40
11	0.41	0.19	4.9	1.6	1.4	1.1	3.1	14	0.68	4.8	0.75	0.42
12	0.31	0.19	2.2	1.6	1.4	1.1	3.9	7.2	0.66	1.3	0.77	0.56
13	0.26	0.19	3.3	1.7	1.4	6.0	2.6	2.0	0.66	0.98	0.69	0.41
14	0.25	0.20	1.8	1.7	1.4	5.5	2.2	1.8	0.67	0.88	0.68	0.70
15	0.25	0.20	1.5	1.7	1.4	1.8	2.0	3.2	0.70	0.88	0.68	0.41
16	0.25	0.20	1.3	1.7	1.4	1.2	2.0	2.4	3.7	0.85	0.65	0.39
17	0.24	0.22	1.3	1.6	1.4	1.2	1.8	1.8	1.1	0.82	0.63	0.39
18	0.24	0.23	1.1	1.6	1.4	1.2	1.7	1.7	0.89	0.80	0.61	0.40
19	0.24	0.25	1.0	1.6	1.5	1.1	1.7	1.5	1.2	0.80	0.58	0.41
20	0.24	0.23	0.91	1.8	1.4	1.2	1.6	1.4	2.4	0.80	0.56	0.39
21	0.24	0.23	0.83	1.5	1.4	42	1.5	1.4	1.2	0.77	0.68	0.38
22	0.24	0.22	0.76	1.9	1.4	28	1.4	1.3	1.5	0.74	0.52	0.39
23	0.23	0.24	0.69	11	1.5	26	1.4	1.2	1.7	0.71	0.56	0.41
24	0.22	0.24	0.62	1.6	1.4	9.6	1.2	1.2	1.4	0.66	0.55	0.47
25	0.22	0.27	0.58	6.8	1.4	9.4	1.2	1.1	1.0	0.63	0.51	0.41
26	0.22	0.25	0.54	3.0	5.5	14	3.3	1.0	1.0	0.65	3.5	0.46
27	0.22	0.24	0.51	1.6	30	9.0	1.3	1.0	0.99	0.61	1.4	0.50
28	0.21	0.24	3.6	1.6	13	4.4	1.3	0.95	1.0	0.60	0.64	0.45
29	0.20	23	0.52	1.6	3.1	14	1.0	0.94	0.94	0.56	0.63	0.46
30	0.20	4.2	2.1	2.4	---	31	0.99	0.87	1.1	0.54	0.69	0.46
31	0.20	---	7.8	1.5	---	9.4	---	0.93	---	0.55	0.69	---
TOTAL	6.96	33.20	151.56	154.3	88.0	232.9	92.59	68.51	31.79	29.18	49.31	14.46
MEAN	0.22	1.11	4.89	4.98	3.03	7.51	3.09	2.21	1.06	0.94	1.59	0.48
MAX	0.41	23	23	58	30	42	11	14	3.7	4.8	24	0.70
MIN	0.14	0.19	0.51	1.5	1.4	1.1	0.99	0.87	0.66	0.54	0.51	0.38
AC-FT	14	66	301	306	175	462	184	136	63	58	98	29

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 2004, BY WATER YEAR (WY)

MEAN	1.33	2.29	2.45	2.50	2.24	2.90	2.48	2.18	1.05	1.26	1.44	0.98
MAX	6.01	25.8	10.5	11.6	12.1	14.0	7.66	9.46	3.61	4.58	7.85	5.45
(WY)	(1937)	(1966)	(1930)	(1943)	(1932)	(1951)	(1927)	(1927)	(1938)	(1954)	(1958)	(1931)
MIN	0.16	0.12	0.24	0.23	0.23	0.24	0.32	0.20	0.15	0.13	0.14	0.22
(WY)	(1946)	(1946)	(2003)	(1973)	(1978)	(1978)	(2003)	(2003)	(2003)	(1945)	(2003)	(1975)

16244000 PUKELE STREAM NEAR HONOLULU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1926 - 2004	
ANNUAL TOTAL	346.05		952.76			
ANNUAL MEAN	0.95		2.60		1.93	
HIGHEST ANNUAL MEAN					3.78	1966
LOWEST ANNUAL MEAN					0.51	2003
HIGHEST DAILY MEAN	33	Sep 11	58	Jan 2	155	Mar 5, 1958
LOWEST DAILY MEAN	0.13	Sep 3	0.14	Oct 1	0.08	Oct 31, 1929
ANNUAL SEVEN-DAY MINIMUM	0.13	Sep 3	0.14	Oct 1	0.09	Oct 26, 1929
ANNUAL RUNOFF (AC-FT)	686		1,890		1,400	
10 PERCENT EXCEEDS	1.0		5.5		3.3	
50 PERCENT EXCEEDS	0.21		1.0		0.77	
90 PERCENT EXCEEDS	0.14		0.23		0.31	

e Estimated

16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILILI

LOCATION.--Lat 21°17'24", long 157°49'17", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank at Kaimuki High School, and 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.

DRAINAGE AREA.--10.6 mi^2.

PERIOD OF RECORD.--Annual maximum, water years 1968-99. October 1, 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5 ft above mean sea level (from topographic map). October 1, 1967 to November 29, 1972 crest-stage gage at site 1,800 feet upstream at same datum. November 29, 1972 to current year crest-stage gage at site 160 feet upstream at same datum.

REMARKS.--Records computed by R.I. Taogoshi. Records poor due to tidal backwater.

AVERAGE DISCHARGE.--5 years (water years 2000-2004), 14.6 ft^3/s (10,550 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft^3/s, December 18, 1967, gage height, 12.60 feet, site then in use, from slope-area measurement of peak flow; minimum daily discharge, e1.6 ft^3/s, August 16-17, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 2	-	2,380	6.16	Mar 26	1715	954	4.28
Feb 27	1500	2,090	5.86	Aug 4	0615	*2,180	*5.96
Mar 13	1100	1,130	4.57				

Minimum discharge, 2.6 ft^3/s, Oct. 10, 11, gage height, 1.03 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.0	e3.1	e128	e81	e12	32	e36	e9.2	e11	e20	e5.7	e8.1
2	e2.7	e3.1	e24	e477	e12	e23	e68	e8.7	e11	e14	33	9.6
3	e2.3	e2.8	e16	e146	e12	e18	e58	e11	e9.9	e12	24	e7.1
4	e2.1	e3.7	e70	e36	e11	e20	e30	e39	e8.4	e11	313	e7.2
5	e2.0	e3.7	e210	e25	e18	e13	e24	e21	e7.8	e15	24	e8.3
6	e2.3	e3.1	e137	e15	e26	e11	e20	e34	e7.9	e14	17	11
7	e3.5	e2.9	e256	e12	e39	14	e18	e72	e7.9	11	e30	e6.2
8	e8.4	e4.4	e101	e11	e22	15	e23	e16	e8.9	15	e14	e5.7
9	e5.9	e2.9	e52	e11	e13	11	e16	e12	e18	12	16	e7.1
10	e3.0	e3.5	e92	e11	e12	11	e37	e11	19	9.0	12	e7.8
11	e19	e3.7	e48	e11	e10	9.4	e19	e65	16	63	e17	e7.8
12	e9.1	e4.3	e27	e10	e9.4	9.9	e45	e31	e12	e23	e17	e20
13	e4.5	e6.7	e38	e9.2	e8.6	104	e19	e12	e9.6	e23	e12	e10
14	e22	e5.9	e19	e13	e8.0	e42	e17	e23	e9.3	e11	e11	e18
15	e14	e7.5	e16	e9.3	e7.6	e14	e26	e29	e8.8	e10	e9.2	e7.6
16	e8.3	e8.6	e12	e9.3	e7.3	e9.6	e27	e15	e38	e12	e9.9	e6.3
17	e6.3	e7.2	e14	e8.6	e6.5	e9.5	e16	e12	e19	e9.9	12	e7.3
18	e4.7	e17	e11	e10	e6.2	e8.9	e14	e11	e15	e9.2	8.5	e8.5
19	e4.4	e17	e9.9	e11	e5.8	e8.1	e16	e11	e15	e8.3	7.7	e7.5
20	e4.0	e6.7	e9.0	e54	e5.3	e12	e21	e12	e25	e7.8	6.7	e6.9
21	e3.8	e5.9	e8.1	e14	e5.2	359	e14	e13	e14	e6.9	17	e7.4
22	e3.6	e5.4	e7.4	e35	e5.1	305	e12	e9.3	22	7.5	8.9	e9.0
23	e3.6	e7.3	e7.2	e98	7.8	233	e12	e9.8	26	7.2	17	e20
24	e3.6	e5.8	e6.5	e12	8.4	e87	e11	e9.2	17	6.4	22	e11
25	e3.2	e8.5	e6.0	e26	7.5	e90	e10	e9.1	12	e6.5	e12	e7.3
26	e3.2	e5.7	e5.6	e20	105	e130	e30	e8.2	12	e6.5	e52	e8.4
27	e3.1	e5.2	e5.3	e12	386	e55	e12	e9.6	11	e9.0	e23	e7.0
28	e2.8	e4.6	e24	e12	144	e32	e10	10	24	e11	e15	e6.1
29	e2.7	e146	e8.2	e9.5	54	115	e9.8	14	e14	e6.5	e12	e6.2
30	e2.4	e46	e60	e29	---	e229	e9.4	14	e20	e6.2	e9.9	e28
31	e2.8	---	e80	e14	---	e55	---	17	---	e6.7	e8.9	---
TOTAL	166.3	358.2	1,508.2	1,251.9	974.7	2,085.4	680.2	578.1	449.5	390.6	797.4	288.4
MEAN	5.36	11.9	48.7	40.4	33.6	67.3	22.7	18.6	15.0	12.6	25.7	9.61
MAX	22	146	256	477	386	359	68	72	38	63	313	28
MIN	2.0	2.8	5.3	8.6	5.1	8.1	9.4	8.2	7.8	6.2	5.7	5.7
AC-FT	330	710	2,990	2,480	1,930	4,140	1,350	1,150	892	775	1,580	572

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2004, BY WATER YEAR (WY)

MEAN	8.61	13.5	19.3	25.7	18.2	21.8	14.0	12.0	8.76	9.74	12.6	10.5
MAX	11.4	19.9	48.7	40.5	33.6	67.3	22.7	23.9	15.0	15.5	25.7	16.9
(WY)	(2001)	(2002)	(2004)	(2002)	(2004)	(2004)	(2004)	(2002)	(2004)	(2000)	(2004)	(2000)
MIN	5.36	7.54	3.77	6.05	6.08	5.16	6.28	3.11	3.82	5.24	3.05	6.04
(WY)	(2004)	(2003)	(2003)	(2003)	(2000)	(2000)	(2003)	(2003)	(2003)	(2001)	(2003)	(2001)

16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILILI—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 2000 - 2004	
ANNUAL TOTAL	4,011.8		9,528.9			
ANNUAL MEAN	11.0		26.0		14.6	
HIGHEST ANNUAL MEAN					26.0	2004
LOWEST ANNUAL MEAN					7.04	2003
HIGHEST DAILY MEAN	264	Sep 11	477	Jan 2	477	Jan 2, 2004
LOWEST DAILY MEAN	1.6	Aug 16	2.0	Oct 5	1.6	Aug 16, 2003
ANNUAL SEVEN-DAY MINIMUM	1.7	May 29	2.6	Oct 1	1.7	May 29, 2003
ANNUAL RUNOFF (AC-FT)	7,960		18,900		10,550	
10 PERCENT EXCEEDS	18		53		25	
50 PERCENT EXCEEDS	3.8		11		6.9	
90 PERCENT EXCEEDS	2.1		5.0		3.2	

e Estimated

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 650 ft upstream of confluence with Maunawili Stream, 2.7 mi southwest of Kailua, and 4.3 mi southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records computed by R. Taogoshi. Records fair. Maunawili ditch diverts ground and surface water 1.5 mi upstream of station at elevation 920 ft for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--48 years (water years 1914-15, 1959-2004), 4.87 ft^3/s (3,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s, February 4, 1965, gage height, 12.41 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.43 ft^3/s, September 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 2	1830	573	5.61	Feb 27	1315	*806	*6.29
Jan 23	0030	529	5.46				

Minimum discharge, 1.1 ft^3/s, on Oct 29-31, Nov 3, Nov 6, Nov 26-28, gage height, 1.33 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.2	16	25	7.5	21	10	5.0	4.7	3.4	2.8	3.0
2	1.4	1.3	8.5	129	6.9	23	14	5.3	4.7	3.4	3.6	2.8
3	1.3	1.3	13	61	16	18	14	5.2	5.1	3.5	3.5	2.4
4	1.4	1.2	23	24	11	17	11	5.8	5.1	3.5	32	2.8
5	1.6	1.3	24	15	9.3	15	9.7	5.2	5.0	3.9	5.5	3.4
6	1.6	1.4	12	11	8.3	14	9.0	5.4	5.5	3.8	3.6	3.6
7	1.5	1.3	24	8.7	11	13	16	15	5.2	3.2	4.4	3.0
8	1.8	1.3	12	7.5	10	12	9.9	6.2	4.9	3.1	3.7	3.2
9	1.7	1.3	7.1	6.4	8.9	10	11	5.7	4.6	3.1	3.4	2.9
10	1.5	1.5	6.1	5.8	8.2	9.8	9.8	17	5.1	3.1	2.8	2.8
11	1.8	1.5	5.2	5.6	7.7	9.0	8.9	14	4.8	6.1	2.9	3.4
12	1.9	1.5	4.4	5.4	7.7	8.8	8.4	8.3	5.2	3.5	3.5	3.8
13	1.8	1.5	4.8	4.8	7.2	19	7.8	6.8	5.2	3.2	3.2	3.5
14	1.7	1.4	4.4	6.1	7.1	11	7.5	7.5	4.6	3.1	3.2	4.3
15	1.7	1.5	3.9	4.8	7.3	9.1	7.4	17	4.0	3.1	3.2	3.1
16	1.7	1.8	3.4	4.6	7.9	8.1	7.1	13	6.0	3.2	3.1	3.4
17	1.6	1.8	4.0	4.4	7.4	7.8	7.2	8.9	4.8	3.2	3.5	3.3
18	1.4	1.5	3.4	4.4	6.5	7.4	7.2	7.3	4.0	3.7	3.3	3.4
19	1.5	1.5	3.1	4.4	6.0	6.9	6.8	7.1	4.4	3.4	3.0	3.8
20	1.4	1.5	3.1	7.4	5.9	7.0	7.1	7.1	4.6	2.7	3.3	3.2
21	1.4	1.3	3.1	5.5	5.7	14	6.4	6.2	3.8	2.7	3.9	3.0
22	1.5	1.2	2.9	7.3	5.7	11	6.1	6.3	4.0	2.6	3.9	3.1
23	1.4	1.5	2.8	38	5.6	25	5.7	6.2	4.4	2.5	3.9	3.6
24	1.5	1.5	2.7	9.7	5.8	12	5.7	6.1	4.3	2.6	3.9	3.2
25	1.5	1.6	2.7	32	5.9	10	5.8	5.8	3.5	2.7	3.4	3.3
26	1.5	1.3	2.7	20	34	15	7.7	5.2	3.5	2.8	6.9	3.9
27	1.5	1.2	2.6	12	119	11	5.8	5.0	3.7	2.6	4.2	3.8
28	1.3	1.2	11	9.5	39	10	5.3	4.9	3.6	2.9	3.6	3.3
29	1.3	12	4.5	8.5	24	13	5.5	4.7	3.8	2.6	3.5	3.0
30	1.2	12	16	8.9	---	18	5.3	4.7	4.1	2.5	3.2	3.6
31	1.2	---	21	7.9	---	11	---	4.8	---	2.5	3.1	---
TOTAL	47.0	63.4	257.4	504.6	412.5	396.9	249.1	232.7	136.2	98.2	141.0	98.9
MEAN	1.52	2.11	8.30	16.3	14.2	12.8	8.30	7.51	4.54	3.17	4.55	3.30
MAX	1.9	12	24	129	119	25	16	17	6.0	6.1	32	4.3
MIN	1.2	1.2	2.6	4.4	5.6	6.9	5.3	4.7	3.5	2.5	2.8	2.4
AC-FT	93	126	511	1,000	818	787	494	462	270	195	280	196

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2004, BY WATER YEAR (WY)

MEAN	2.84	5.26	6.57	8.15	6.86	7.30	6.31	5.13	3.22	2.64	2.52	2.43
MAX	8.43	38.2	34.8	39.2	27.2	24.3	31.4	17.2	11.3	6.66	8.52	15.1
(WY)	(1966)	(1966)	(1988)	(1916)	(1979)	(1958)	(1963)	(1981)	(1982)	(1982)	(1982)	(1914)
MIN	1.06	0.99	1.22	1.24	1.11	1.25	1.17	1.40	1.15	1.16	1.10	1.00
(WY)	(1976)	(1963)	(1978)	(1973)	(1978)	(1978)	(2001)	(1973)	(1973)	(2001)	(2001)	(1975)

16254000 MAKAWAO STREAM NEAR KAILUA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1913 - 2004	
ANNUAL TOTAL	1,130.0		2,637.9			
ANNUAL MEAN	3.10		7.21		4.87	
HIGHEST ANNUAL MEAN					11.1	1982
LOWEST ANNUAL MEAN					1.31	1973
HIGHEST DAILY MEAN	68	Feb 14	129	Jan 2	518	Dec 31, 1987
LOWEST DAILY MEAN	1.2	Aug 26	1.2	Oct 30	0.50	Sep 8, 1964
ANNUAL SEVEN-DAY MINIMUM	1.2	Oct 29	1.2	Oct 29	0.67	Sep 8, 1964
ANNUAL RUNOFF (AC-FT)	2,240		5,230		3,530	
10 PERCENT EXCEEDS	4.4		14		8.4	
50 PERCENT EXCEEDS	2.0		4.6		2.7	
90 PERCENT EXCEEDS	1.4		1.5		1.4	

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 300 ft downstream from Luluku Stream, 1.0 mi southwest of Castle High School, and 1.9 mi northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi^2.

PERIOD OF RECORD.--November 1976 to current year.

REVISED RECORDS.--WDR HI-92-1: 1991(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 116.39 ft above mean sea level (levels by Corps of Engineers).

REMARKS.--Records computed by R. Taogoshi. Records good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--27 years (water years 1977-2004), 10.2 ft^3/s (7,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft^3/s, January 25, 1996, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.22 ft^3/s , September 25-26, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 360 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1600	*652	*4.24	Feb 27	1530	626	4.18
Dec 7	1600	440	3.71	Aug 4	0630	379	3.53
Jan 2	1900	488	3.84				

Minimum daily discharge, 2.1 ft^3/s, Nov. 6, result of maintenance work on dock upstream.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	2.3	60	41	16	29	21	16	15	12	9.0	9.5
2	3.6	4.0	27	158	14	55	21	15	15	12	11	9.8
3	5.9	5.3	30	68	18	27	27	15	15	11	13	9.4
4	5.7	2.4	46	31	17	26	21	17	14	11	93	9.0
5	4.1	3.9	56	24	16	24	20	16	14	11	15	9.0
6	4.0	2.1	31	21	16	23	21	15	14	11	12	9.9
7	5.4	3.3	104	19	61	23	28	40	14	11	15	8.9
8	5.0	3.4	37	18	53	20	23	15	14	10	12	8.6
9	4.9	3.4	25	17	20	19	21	15	14	10	11	8.8
10	4.1	3.6	23	16	19	20	23	26	15	10	10	8.8
11	5.2	4.0	20	16	17	23	20	54	15	11	11	9.9
12	5.1	4.1	17	16	16	28	20	33	14	11	12	9.8
13	4.5	3.1	16	15	16	23	19	18	14	10	10	8.6
14	4.5	3.7	15	30	15	21	18	18	13	10	10	9.9
15	4.5	4.1	15	17	15	18	21	73	13	10	10	8.9
16	4.1	3.7	15	14	15	17	20	29	14	11	9.8	8.4
17	4.5	4.1	15	14	15	17	18	21	14	10	11	8.4
18	4.1	5.1	13	14	14	16	17	19	13	9.8	9.9	8.1
19	3.9	3.9	13	14	14	16	18	19	13	9.9	9.6	9.6
20	3.8	3.3	12	16	14	19	48	17	13	9.8	9.6	8.3
21	3.9	3.2	12	14	14	42	33	17	13	9.6	12	8.9
22	3.9	3.3	11	34	14	27	20	17	13	9.5	9.9	8.5
23	3.8	3.7	11	71	14	37	18	17	13	9.2	10	12
24	3.8	3.7	11	19	14	25	17	16	13	9.2	10	9.7
25	3.8	4.2	10	46	13	24	17	16	12	9.0	10	8.8
26	3.8	3.5	10	28	71	26	25	16	12	9.5	12	8.4
27	4.1	3.3	10	17	170	30	17	15	12	9.4	11	8.6
28	5.3	3.5	13	16	46	23	16	15	12	11	10	8.1
29	3.7	141	10	16	31	26	16	15	12	9.2	10	9.0
30	2.6	97	33	16	---	40	16	15	12	9.2	10	10
31	4.5	---	40	16	---	24	---	15	---	9.3	9.6	---
TOTAL	133.7	339.2	761	872	788	788	640	665	404	315.6	418.4	273.6
MEAN	4.31	11.3	24.5	28.1	27.2	25.4	21.3	21.5	13.5	10.2	13.5	9.12
MAX	5.9	141	104	158	170	55	48	73	15	12	93	12
MIN	2.6	2.1	10	14	13	16	16	15	12	9.0	9.0	8.1
AC-FT	265	673	1,510	1,730	1,560	1,560	1,270	1,320	801	626	830	543

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 2004, BY WATER YEAR (WY)

MEAN	7.32	10.4	11.7	14.6	12.2	13.0	11.9	10.5	8.38	7.42	7.06	6.91
MAX	16.8	29.6	37.2	53.4	35.9	34.3	49.1	23.0	25.7	19.9	24.0	16.9
(WY)	(1983)	(1987)	(1988)	(1988)	(1979)	(1982)	(1989)	(1981)	(1982)	(1982)	(1982)	(1982)
MIN	2.91	3.29	4.02	4.05	3.83	4.03	3.82	3.44	2.65	2.75	2.89	2.27
(WY)	(1985)	(2000)	(2002)	(1977)	(1978)	(1978)	(2001)	(2000)	(2000)	(2001)	(2001)	(2001)

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1977 - 2004	
ANNUAL TOTAL	2,804.4		6,398.5			
ANNUAL MEAN	7.68		17.5		10.2	
HIGHEST ANNUAL MEAN					22.0	1982
LOWEST ANNUAL MEAN					4.32	2001
HIGHEST DAILY MEAN	141	Nov 29	170	Feb 27	723	Jan 1, 1988
LOWEST DAILY MEAN	2.1	Nov 6	2.1	Nov 6	0.29	Oct 10, 1984
ANNUAL SEVEN-DAY MINIMUM	3.2	Nov 4	3.2	Nov 4	0.30	Oct 10, 1984
ANNUAL RUNOFF (AC-FT)	5,560		12,690		7,410	
10 PERCENT EXCEEDS	12		30		16	
50 PERCENT EXCEEDS	4.5		14		7.0	
90 PERCENT EXCEEDS	3.3		4.1		3.8	

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24'45", long 157°49'35", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank, 1.7 mi west of Kaneohe Post Office, and 1.8 mi southwest of Heeia.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to September 1977, October 1982 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

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

REMARKS.--Records computed by B. Shimizu. Records poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--56 years (water years 1944-77, 1983-2004), 2.21 ft^3/s, (1,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft^3/s, May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft^3/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft^3/s, July 20, 1957, September 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2100	309	3.14	Feb 27	1445	398	3.34
Dec 7	1600	365	3.27	Aug 4	0600	*417	*3.38
Feb 7	2145	298	3.11				

Minimum discharge, 1.2 ft^3/s, on Nov 2-8, Nov 26-28.,

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.3	24	9.2	2.4	3.2	3.1	3.4	2.7	2.4	2.2	2.3
2	1.3	1.2	9.0	34	2.4	5.8	3.0	3.3	3.1	2.5	2.3	2.4
3	1.3	1.2	6.6	14	2.4	3.6	3.1	3.2	2.9	2.4	3.7	2.4
4	1.4	1.2	9.6	5.9	2.5	3.1	3.1	3.3	2.8	2.4	39	2.3
5	e1.4	1.2	11	3.9	2.5	2.9	2.9	3.2	2.8	2.3	4.4	2.3
6	e1.4	1.2	6.2	3.3	2.6	2.8	2.9	3.1	2.9	2.2	3.0	2.2
7	e1.7	1.2	38	2.9	30	2.8	2.8	3.4	2.9	2.2	3.3	2.1
8	e1.5	1.2	9.8	2.6	7.4	2.7	3.3	3.3	2.6	2.2	3.0	2.1
9	e1.7	1.3	6.0	2.6	3.5	2.6	2.9	3.0	2.6	2.2	2.8	2.0
10	e1.5	1.4	4.8	2.7	2.9	2.6	3.0	3.0	2.9	2.2	2.7	2.0
11	e1.7	1.4	4.2	2.7	2.7	3.1	2.7	3.7	2.8	2.3	2.7	1.9
12	e1.7	1.4	4.0	3.1	2.6	3.2	2.9	3.6	2.8	2.2	2.8	2.0
13	e1.5	1.4	3.9	2.9	2.5	3.2	2.8	3.1	2.7	2.2	2.8	1.9
14	e1.5	1.4	3.7	3.8	2.5	3.1	2.6	3.0	2.6	2.2	2.7	2.0
15	e1.5	1.4	3.6	4.0	2.4	2.8	4.3	8.1	2.6	2.2	2.6	1.8
16	e1.5	1.3	3.5	3.3	2.3	2.7	3.7	5.0	2.8	2.2	2.6	1.7
17	e1.5	1.3	3.5	3.1	2.3	2.7	3.2	3.7	2.8	2.2	2.7	1.7
18	e1.5	1.4	3.4	2.9	2.3	2.6	2.8	3.3	2.7	2.2	2.8	1.7
19	e1.4	1.3	3.4	2.8	2.2	2.6	2.7	3.2	2.6	2.2	2.8	1.9
20	e1.4	1.3	3.3	2.7	2.2	2.7	4.9	3.0	2.6	2.2	2.8	1.8
21	e1.4	1.4	3.2	2.6	2.2	6.2	4.3	2.9	2.4	2.1	2.8	1.8
22	e1.4	1.4	3.2	3.7	2.2	4.5	3.8	2.8	2.5	2.1	2.8	1.8
23	e1.4	1.3	3.2	4.9	2.2	4.5	3.5	2.8	2.5	2.1	2.8	1.9
24	e1.4	1.3	3.4	2.8	2.2	3.5	3.4	2.6	2.4	2.2	2.8	1.9
25	e1.4	1.3	3.8	3.1	2.2	3.3	3.2	2.6	2.4	2.1	2.6	1.9
26	e1.4	1.2	3.9	3.1	6.3	3.2	5.3	2.7	2.3	2.2	2.9	1.9
27	1.3	1.2	4.0	2.7	50	3.1	4.3	2.7	2.3	2.2	2.6	1.9
28	1.3	1.2	4.4	2.6	6.1	3.0	3.7	2.7	2.4	2.3	2.4	1.8
29	1.3	54	4.6	2.4	3.7	3.1	3.4	2.7	2.5	2.2	2.2	2.0
30	1.3	32	4.9	2.4	---	4.3	3.4	2.7	2.6	2.2	2.3	1.9
31	1.3	---	6.5	2.4	---	3.3	---	2.7	---	2.2	2.3	---
TOTAL	44.6	122.3	206.6	145.1	159.7	102.8	101.0	101.8	79.5	69.0	122.2	59.3
MEAN	1.44	4.08	6.66	4.68	5.51	3.32	3.37	3.28	2.65	2.23	3.94	1.98
MAX	1.7	54	38	34	50	6.2	5.3	8.1	3.1	2.5	39	2.4
MIN	1.3	1.2	3.2	2.4	2.2	2.6	2.6	2.6	2.3	2.1	2.2	1.7
AC-FT	88	243	410	288	317	204	200	202	158	137	242	118

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1.88	2.72	2.67	2.66	2.53	3.15	2.49	2.33	1.43	1.56	1.61	1.50
MAX	11.6	15.7	9.72	9.68	10.7	16.5	13.0	27.3	2.65	3.25	4.24	3.68
(WY)	(1959)	(1966)	(1988)	(1949)	(1955)	(1958)	(1989)	(1965)	(2004)	(1989)	(1967)	(2003)
MIN	0.32	0.33	0.64	0.94	0.86	0.60	0.50	0.51	0.38	0.41	0.56	0.36
(WY)	(1946)	(1946)	(1960)	(1977)	(1963)	(1946)	(1946)	(1961)	(1946)	(1945)	(1961)	(1945)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1944 - 2004	
ANNUAL TOTAL	903.0		1,313.9			
ANNUAL MEAN	2.47		3.59		2.21	
HIGHEST ANNUAL MEAN					4.82	1965
LOWEST ANNUAL MEAN					0.67	1946
HIGHEST DAILY MEAN	65	Sep 11	54	Nov 29	620	May 2, 1965
LOWEST DAILY MEAN	1.2	Jul 4	1.2	Nov 2	0.29	Jul 13, 1945
ANNUAL SEVEN-DAY MINIMUM	1.2	Jul 7	1.2	Nov 2	0.29	Oct 19, 1945
ANNUAL RUNOFF (AC-FT)	1,790		2,610		1,600	
10 PERCENT EXCEEDS	3.5		4.3		2.7	
50 PERCENT EXCEEDS	1.5		2.7		1.5	
90 PERCENT EXCEEDS	1.2		1.4		0.94	

e Estimated

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank, 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.84 mi^2.

PERIOD OF RECORD.--October 1983 to current year.

REVISED RECORDS.--WDR HI-01-1: Drainage Area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by B. Shimizu. Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pump and/or divert small amounts of water from the stream.

AVERAGE DISCHARGE.--21 years (water years 1984-2004), 3.09 ft^3/s (2,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 922 ft^3/s, November 29, 2003, gage height 5.34; maximum gage height, 6.05 ft on Sept. 18, 1994; minimum, 0.47 ft^3/s on October 20-27, 2001.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 399 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	*922	*5.34	Feb 27	1445	438	3.59
Dec 7	1530	745	4.70	Aug 4	0545	595	4.15
Feb 7	2045	412	3.50				

Minimum discharge, 0.74 ft^3/s, Oct. 1, gage height, 1.11 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.80	1.0	20	12	3.2	4.8	4.4	4.0	3.9	3.7	3.5	3.8
2	0.81	1.1	6.7	50	3.1	15	4.3	4.0	4.0	3.8	4.7	3.8
3	0.90	1.0	8.8	17	3.1	5.8	7.0	4.0	3.9	3.7	8.4	3.5
4	0.88	1.0	22	5.3	3.2	5.1	5.0	4.1	3.9	3.7	88	3.5
5	0.81	1.0	28	3.9	3.8	4.7	4.6	4.0	3.8	3.7	6.2	3.6
6	0.95	1.0	7.3	3.3	3.5	4.2	4.4	4.2	3.8	3.9	4.7	4.2
7	1.5	1.0	92	3.0	39	4.0	4.3	6.9	3.8	3.9	4.8	3.6
8	1.1	1.0	13	2.9	13	4.1	4.2	4.4	3.8	3.9	4.2	3.6
9	1.2	1.00	e5.9	2.8	4.7	3.8	4.1	4.2	3.9	3.9	4.1	3.6
10	1.1	0.98	e4.5	2.7	3.9	3.9	4.2	4.3	4.4	3.7	4.0	3.7
11	1.4	0.95	e3.3	2.6	3.6	4.3	4.1	7.6	4.1	3.8	4.0	3.7
12	1.4	0.95	e2.8	2.7	3.4	4.4	5.7	6.4	3.9	3.7	4.0	3.7
13	1.1	0.95	e2.5	2.6	3.3	4.1	4.4	4.7	3.9	3.8	4.0	3.6
14	1.2	0.99	e2.3	3.1	3.2	4.0	4.2	4.4	3.9	3.7	3.9	4.0
15	1.2	0.95	e2.3	2.7	3.1	3.8	13	18	3.8	3.6	3.9	3.8
16	1.1	0.95	e2.1	2.6	3.1	3.7	5.3	7.0	4.0	3.7	3.9	3.7
17	1.3	0.95	e2.2	2.6	3.0	3.8	4.6	5.2	4.7	3.6	4.1	3.9
18	1.2	1.0	e2.1	2.5	3.0	3.6	4.3	4.7	4.1	3.5	4.0	3.7
19	1.1	1.0	2.1	2.5	3.0	3.7	4.2	4.0	3.9	3.4	3.9	3.8
20	1.1	1.0	2.0	2.8	2.9	3.4	5.1	3.7	3.9	3.5	3.8	3.7
21	1.1	1.0	2.0	2.7	2.9	9.9	4.6	4.2	3.8	3.5	3.9	3.8
22	1.1	0.99	1.9	11	2.9	6.1	4.5	4.1	3.9	3.5	3.9	3.7
23	1.0	1.0	1.9	7.2	2.9	5.5	4.4	4.1	3.9	3.5	3.8	3.8
24	1.0	1.1	2.0	3.8	2.9	5.2	4.3	4.0	3.8	3.5	4.0	3.7
25	1.0	0.94	2.0	3.9	2.9	4.8	4.1	4.1	3.8	3.5	3.9	3.6
26	1.0	0.87	2.0	3.7	10	4.7	5.2	4.0	3.7	3.5	4.2	3.6
27	1.0	0.87	2.0	3.3	80	4.6	4.3	4.0	3.7	3.5	4.0	3.7
28	1.0	0.87	2.1	3.1	11	4.3	4.3	4.1	3.8	3.7	3.9	3.6
29	1.0	88	2.1	3.0	5.3	4.5	4.1	3.9	3.4	3.4	3.9	3.7
30	1.0	44	2.5	3.2	---	6.2	4.1	3.9	3.3	3.6	3.9	2.8
31	1.0	---	5.8	2.8	---	4.7	---	3.9	---	3.5	3.9	---
TOTAL	33.35	159.41	258.2	177.3	232.9	154.7	145.3	154.1	116.5	112.9	215.4	110.5
MEAN	1.08	5.31	8.33	5.72	8.03	4.99	4.84	4.97	3.88	3.64	6.95	3.68
MAX	1.5	88	92	50	80	15	13	18	4.7	3.9	88	4.2
MIN	0.80	0.87	1.9	2.5	2.9	3.4	4.1	3.7	3.3	3.4	3.5	2.8
AC-FT	66	316	512	352	462	307	288	306	231	224	427	219

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2004, BY WATER YEAR (WY)

MEAN	2.64	3.45	3.47	3.52	3.56	3.78	3.21	3.11	2.46	2.64	2.57	2.75
MAX	6.69	10.6	9.56	8.65	8.03	11.8	10.6	7.27	4.78	5.89	6.95	5.81
(WY)	(1992)	(1991)	(1988)	(1988)	(2004)	(1991)	(1989)	(2002)	(1991)	(1989)	(2004)	(1992)
MIN	0.61	1.15	0.86	0.80	1.03	0.77	0.84	0.85	0.73	0.67	0.67	0.55
(WY)	(2002)	(2001)	(2001)	(2001)	(1986)	(2001)	(2001)	(1984)	(1984)	(2001)	(1984)	(2001)

16283200 KAHALUU STREAM NEAR AHUIMANU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1984 - 2004	
ANNUAL TOTAL	969.69		1,870.56			
ANNUAL MEAN	2.66		5.11		3.09	
HIGHEST ANNUAL MEAN					5.97	1991
LOWEST ANNUAL MEAN					0.90	2001
HIGHEST DAILY MEAN	92	Dec 7	92	Dec 7	142	May 6, 2002
LOWEST DAILY MEAN	0.80	Oct 1	0.80	Oct 1	0.47	Oct 21, 2001
ANNUAL SEVEN-DAY MINIMUM	0.81	Sep 26	0.95	Nov 22	0.47	Oct 20, 2001
ANNUAL RUNOFF (AC-FT)	1,920		3,710		2,240	
10 PERCENT EXCEEDS	2.4		5.8		4.7	
50 PERCENT EXCEEDS	1.1		3.8		2.4	
90 PERCENT EXCEEDS	0.87		1.0		0.85	

e Estimated

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.2 mi downstream from forest-reserve boundary, 1.0 mi south of Kahaluu School, and 1.6 mi west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft above mean sea level (from topographic map).

REMARKS.--Records computed by B.H. Shimizu. Records fair. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--30 years (water years 1975-2004), 6.15 ft^3/s (4,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft^3/s, March 21, 1991, gage height, 7.93 ft, from rating curve extended above 100 ft^3/s on basis of slope area measurement at gage height 7.93 ft; minimum, 1.1 ft^3/s, April 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	*895	*6.77
Dec 7	1415	544	5.90
Feb 7	2115	323	5.17
Feb 27	1445	385	5.40
Aug 4	0545	666	6.23

Minimum discharge, 4.9 ft^3/s, on many days in Oct and Nov, gage height, 2.71 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	5.0	30	14	7.2	9.6	8.6	8.5	8.2	7.3	6.7	6.3
2	5.3	5.0	13	54	6.9	17	8.5	8.4	7.6	7.3	8.1	6.4
3	5.4	5.0	9.4	28	6.9	10	10	8.3	7.4	7.3	13	6.3
4	5.5	5.0	35	10	7.0	9.5	8.9	8.4	7.3	7.3	102	6.3
5	5.3	5.0	43	8.2	7.7	8.8	8.5	8.3	7.3	7.3	12	6.4
6	5.3	5.0	13	7.5	7.5	8.5	8.4	9.0	7.4	7.6	8.5	6.5
7	5.6	5.1	89	7.0	53	8.3	8.3	13	7.4	7.3	8.2	6.3
8	5.5	5.1	22	6.8	27	8.3	8.2	8.9	7.4	7.4	8.3	6.3
9	5.7	5.1	11	6.7	10	8.0	8.2	8.7	7.4	7.4	7.6	6.3
10	5.4	5.1	8.6	6.6	8.9	8.0	8.5	8.7	8.0	7.6	7.2	6.2
11	5.7	5.1	7.5	6.5	8.2	8.2	8.3	17	7.6	7.9	7.1	6.3
12	5.5	5.1	7.0	6.6	7.9	8.2	9.5	10	7.5	7.1	6.9	6.3
13	5.3	5.1	6.6	6.5	7.6	8.1	8.9	9.1	7.5	7.1	6.8	6.3
14	5.5	5.3	6.4	7.0	7.6	8.0	8.5	8.9	7.4	7.2	6.7	6.4
15	5.4	5.3	6.2	6.6	7.5	8.0	9.6	21	7.4	7.2	6.5	6.3
16	5.3	5.3	6.1	6.5	7.3	8.0	9.5	12	7.5	7.1	6.6	6.3
17	5.4	5.1	6.1	6.4	7.3	7.9	8.8	10	9.4	7.1	6.6	6.3
18	5.3	5.1	6.0	6.4	7.3	7.9	8.6	9.4	7.7	7.1	6.5	6.2
19	5.3	4.9	6.0	6.4	7.2	7.8	8.6	9.1	7.6	7.1	6.5	6.3
20	5.2	4.9	6.0	6.5	7.2	8.3	9.9	9.0	7.5	7.0	6.4	6.2
21	5.2	4.9	5.9	6.5	7.1	15	9.6	8.8	7.4	6.9	6.5	6.3
22	5.1	5.0	5.8	15	7.2	11	9.5	8.8	7.5	6.9	6.4	6.2
23	5.1	5.0	5.8	9.1	7.2	9.6	9.1	8.8	7.5	6.9	6.5	6.4
24	5.1	5.0	5.8	7.5	7.1	9.0	8.9	8.7	7.3	6.9	6.5	6.2
25	5.1	5.0	5.8	7.9	7.2	8.9	8.8	8.7	7.3	7.0	6.4	6.2
26	5.1	4.9	5.8	7.6	14	9.1	9.5	8.5	7.3	6.9	6.5	6.2
27	5.1	4.9	5.8	7.1	79	8.9	8.9	8.6	7.3	7.0	6.5	6.1
28	5.1	4.9	5.8	7.0	20	8.5	8.7	8.5	7.4	7.0	6.4	6.1
29	5.0	94	5.8	6.9	11	9.1	8.6	8.5	7.3	6.9	6.3	6.2
30	5.1	79	6.1	7.0	---	11	8.5	8.5	7.4	6.9	6.3	6.1
31	5.1	---	9.0	6.9	---	9.0	---	8.5	---	6.7	6.3	---
TOTAL	164.3	314.2	405.3	302.7	377.0	285.5	266.4	300.6	226.2	221.7	318.8	188.2
MEAN	5.30	10.5	13.1	9.76	13.0	9.21	8.88	9.70	7.54	7.15	10.3	6.27
MAX	5.7	94	89	54	79	17	10	21	9.4	7.9	102	6.5
MIN	5.0	4.9	5.8	6.4	6.9	7.8	8.2	8.3	7.3	6.7	6.3	6.1
AC-FT	326	623	804	600	748	566	528	596	449	440	632	373

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2004, BY WATER YEAR (WY)

MEAN	5.58	6.50	6.49	6.78	6.60	7.15	6.20	6.11	5.58	5.65	5.63	5.56
MAX	9.81	14.3	15.5	12.1	13.2	17.7	15.1	14.7	8.88	9.95	10.6	9.43
(WY)	(1983)	(1991)	(1988)	(1988)	(1979)	(1991)	(1989)	(2002)	(1982)	(1989)	(1982)	(1982)
MIN	2.70	3.97	3.60	3.71	3.05	2.85	2.72	3.18	3.36	2.40	2.61	2.74
(WY)	(1976)	(2000)	(1976)	(1977)	(1977)	(1977)	(1977)	(1977)	(1976)	(1977)	(1976)	(1976)

16284200 WAIHEE STREAM NEAR KAHALUU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1975 - 2004	
ANNUAL TOTAL	2,432.6		3,370.9			
ANNUAL MEAN	6.66		9.21		6.15	
HIGHEST ANNUAL MEAN					9.36	1982
LOWEST ANNUAL MEAN					3.32	1977
HIGHEST DAILY MEAN	94	Nov 29	102	Aug 4	195	May 6, 2002
LOWEST DAILY MEAN	4.2	Jun 7	4.9	Nov 19	1.3	Apr 15, 1977
ANNUAL SEVEN-DAY MINIMUM	4.3	Jun 2	5.0	Nov 19	1.4	Apr 12, 1977
ANNUAL RUNOFF (AC-FT)	4,830		6,690		4,460	
10 PERCENT EXCEEDS	6.4		10		7.5	
50 PERCENT EXCEEDS	5.1		7.3		5.4	
90 PERCENT EXCEEDS	4.8		5.2		3.9	

16294100 WAIAHOLE STREAM ABOVE KAMEHAMEHA HIGHWAY

LOCATION.--Lat 21°29'05", long 157°50'57", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank 300 ft upstream from Kamehameha Highway, 0.4 miles southwest of Waiahole Elementary School, 1.8 miles northwest of Kahaluu Elementary School.
DRAINAGE AREA.--3.76 mi².

PERIOD OF RECORD.--Miscellaneous streamflow measurements 1988-1990, 1995. August 2001 to current year. Unpublished record from Aug-Sept 2001 available at USGS Hawaii District Office.

GAGE.--Water-stage recorder. Elevation of gage is 14 ft above mean sea level (from NGS benchmark F16).

REMARKS.--Records computed by H.A. Jeppesen. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,980 ft^3/s May 6, 2002, gage height, 13.52 ft; minimum daily discharge, 17 ft^3/s, July 8-11, 16-17, Nov. 11-13, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 499 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 30	0700	2,710	11.52
Dec 7	1400	3,050	12.09
Jan 2	1900	1,250	8.95
Jan 25	1945	1,220	8.90
Feb 7	2130	1,380	9.18
Feb 27	1445	2,100	10.46
Mar 2	0415	909	8.35
May 11	2000	1,680	9.72
Aug 4	0615	*3,520	*12.82

Minimum daily discharge, 17 ft^3/s, Nov. 11-13.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	23	157	88	45	58	54	50	46	45	41	45
2	23	24	97	285	43	170	54	49	46	44	49	46
3	24	23	100	140	42	70	63	49	46	44	100	44
4	24	22	189	73	46	64	54	50	46	44	531	44
5	25	22	166	61	54	58	51	49	46	44	74	45
6	24	21	107	56	46	54	49	56	45	45	60	58
7	24	21	444	52	155	53	47	86	45	42	63	45
8	24	22	134	49	88	57	47	55	46	43	57	44
9	25	22	87	47	53	50	46	53	46	43	55	45
10	24	18	77	45	50	49	52	57	49	43	53	45
11	25	17	65	44	48	49	47	150	50	45	54	45
12	26	17	58	44	47	75	57	65	47	45	52	45
13	23	17	54	42	46	56	51	50	46	44	53	44
14	25	18	50	55	46	54	47	48	45	42	52	48
15	28	18	47	46	45	52	49	104	45	41	50	44
16	28	19	45	43	44	51	50	58	47	42	51	44
17	30	19	45	43	44	50	46	50	50	43	48	44
18	26	24	43	43	43	49	44	48	46	43	48	43
19	27	26	41	43	43	49	45	50	47	43	48	44
20	24	20	40	43	42	59	71	52	46	43	46	42
21	24	22	40	44	42	91	58	51	45	39	48	43
22	24	22	37	74	42	64	53	52	47	36	46	43
23	23	23	36	51	43	60	54	50	46	36	46	48
24	25	22	33	42	43	57	51	50	45	36	49	46
25	25	22	34	108	42	60	50	50	45	41	48	45
26	26	24	34	59	59	63	79	49	44	41	51	43
27	24	24	38	49	365	56	55	48	44	40	49	43
28	22	22	39	45	91	53	52	46	45	34	49	43
29	22	568	38	44	65	71	50	48	43	39	47	44
30	23	540	40	42	---	73	48	47	45	38	46	42
31	22	---	61	44	---	57	---	49	---	38	40	---
TOTAL	761	1,702	2,476	1,944	1,862	1,932	1,574	1,769	1,379	1,286	2,104	1,344
MEAN	24.5	56.7	79.9	62.7	64.2	62.3	52.5	57.1	46.0	41.5	67.9	44.8
MAX	30	568	444	285	365	170	79	150	50	45	531	58
MIN	22	17	33	42	42	49	44	46	43	34	40	42
AC-FT	1,510	3,380	4,910	3,860	3,690	3,830	3,120	3,510	2,740	2,550	4,170	2,670

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2004, BY WATER YEAR (WY)

MEAN	29.8	41.5	50.3	50.5	48.9	48.2	42.9	61.0	37.4	35.4	42.5	37.7
MAX	35.6	56.7	79.9	62.7	64.2	62.3	52.5	104	46.0	42.6	67.9	44.8
(WY)	(2003)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2002)	(2004)	(2002)	(2004)	(2004)
MIN	24.5	31.0	32.4	34.0	36.2	26.1	33.5	22.2	21.4	22.1	20.5	32.4
(WY)	(2004)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

16294100 WAIAHOLE STREAM ABOVE KAMEHAMEHA HIGHWAY—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 2001 - 2004	
ANNUAL TOTAL	12,443		20,133			
ANNUAL MEAN	34.1		55.0		43.8	
HIGHEST ANNUAL MEAN					55.0	2004
LOWEST ANNUAL MEAN					28.9	2003
HIGHEST DAILY MEAN	568	Nov 29	568	Nov 29	1,150	May 6, 2002
LOWEST DAILY MEAN	17	Jul 8	17	Nov 11	17	Jul 8, 2003
ANNUAL SEVEN-DAY MINIMUM	18	Nov 10	18	Nov 10	18	Nov 10, 2003
ANNUAL RUNOFF (AC-FT)	24,680		39,930		31,760	
10 PERCENT EXCEEDS	39		66		54	
50 PERCENT EXCEEDS	24		46		39	
90 PERCENT EXCEEDS	19		24		22	

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area, WDR HI-94-1: 1993 (M).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records computed by B. Shimizu. Records fair for discharges up to 200 ft^3/s, and poor above that. Waiahole tunnel diverts ground water from tunnels upstream of station. Beginning early October, 2002, Waiahole Ditch began releasing water into Waikane Stream. Elevation of the Waiahole tunnel is 800 ft (from topographic map).

AVERAGE DISCHARGE Prior to release from Waiahole Ditch in October 2002.--42 years (water years 1961-2002), 8.50 ft^3/s (6,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, February 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, October 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	1,210	6.72	Mar 2	0330	737	5.27
Dec 7	1330	1,610	7.79	May 11	1930	1,270	6.92
Feb 27	1430	794	5.45	Aug 4	0515	*2,000	*8.61

Minimum discharge, 5.6 ft^3/s, Oct. 29, gage height, 1.57 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	6.3	52	31	16	16	19	14	11	10	7.7	8.9
2	6.8	6.3	37	110	14	137	21	13	11	9.8	14	8.9
3	7.0	6.3	57	68	13	31	25	13	11	9.4	47	8.6
4	7.1	6.3	125	27	18	25	19	13	11	9.2	268	8.4
5	6.9	6.5	114	21	19	20	16	13	10	9.2	31	9.0
6	6.9	6.6	50	18	15	17	15	14	10	11	21	18
7	7.2	6.5	182	17	39	17	14	48	10	9.1	20	9.1
8	7.6	7.0	65	16	29	21	13	15	11	9.4	16	8.6
9	8.1	6.2	37	15	17	15	14	13	11	9.0	15	8.9
10	7.1	6.2	29	14	15	14	28	22	14	8.8	15	9.3
11	8.1	6.2	24	13	14	14	22	129	14	11	15	8.6
12	8.2	6.2	20	13	13	30	31	46	13	9.4	13	9.6
13	7.2	6.5	20	13	13	18	21	26	11	8.9	12	8.4
14	8.7	7.2	17	17	12	17	17	25	11	8.7	12	10
15	11	6.6	16	13	12	14	23	60	10	8.6	11	8.6
16	8.7	6.9	15	12	12	12	25	31	12	8.3	11	8.5
17	9.4	7.4	15	12	11	12	16	25	21	8.2	11	8.3
18	8.3	9.4	14	11	11	12	14	23	12	8.2	10	8.1
19	7.2	7.9	13	11	11	11	14	19	12	8.3	10	8.7
20	6.8	6.6	13	11	11	14	35	16	11	8.1	9.8	8.0
21	6.6	6.3	12	12	10	74	23	15	11	8.1	9.9	8.2
22	6.6	6.4	12	21	10	34	20	14	12	8.0	9.4	8.3
23	6.5	6.6	12	16	11	41	16	14	11	8.0	9.3	9.8
24	6.5	7.0	11	12	11	25	15	13	10	8.0	10	10
25	6.3	6.4	11	50	10	28	14	13	9.9	8.3	9.5	11
26	6.3	6.3	11	34	24	34	59	12	9.8	8.2	11	8.8
27	6.3	6.1	11	18	181	23	20	12	9.7	8.9	10	8.4
28	6.3	6.5	11	15	38	19	16	12	10	8.2	9.9	8.4
29	6.3	189	10	14	20	54	15	11	9.8	8.0	9.7	11
30	6.3	252	18	17	---	45	14	11	11	8.0	9.0	8.9
31	6.3	---	20	15	---	23	---	12	---	7.8	8.7	---
TOTAL	225.4	627.7	1,054	687	630	867	614	717	341.2	272.1	675.9	277.3
MEAN	7.27	20.9	34.0	22.2	21.7	28.0	20.5	23.1	11.4	8.78	21.8	9.24
MAX	11	252	182	110	181	137	59	129	21	11	268	18
MIN	6.3	6.1	10	11	10	11	13	11	9.7	7.8	7.7	8.0
AC-FT	447	1,250	2,090	1,360	1,250	1,720	1,220	1,420	677	540	1,340	550

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2004, BY WATER YEAR (WY)

MEAN	6.49	11.2	9.64	11.5	11.9	12.6	10.2	9.29	5.46	6.24	5.59	5.33
MAX	31.0	55.7	44.1	45.6	65.5	53.1	49.3	43.9	16.2	30.2	25.0	22.1
(WY)	(1992)	(1966)	(1988)	(1988)	(1994)	(1982)	(1963)	(2002)	(1977)	(1987)	(1967)	(1986)
MIN	1.55	2.13	2.23	1.67	1.78	2.03	2.65	1.98	1.83	1.76	1.58	1.38
(WY)	(1985)	(1963)	(1978)	(1977)	(1978)	(1978)	(1998)	(2000)	(1984)	(1984)	(1984)	(1984)

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1960 - 2004	
ANNUAL TOTAL	4,711.5		6,988.6			
ANNUAL MEAN	12.9		19.1		8.77	
HIGHEST ANNUAL MEAN					19.1	2004
LOWEST ANNUAL MEAN					3.33	1984
HIGHEST DAILY MEAN	252	Nov 30	268	Aug 4	868	Feb 4, 1965
LOWEST DAILY MEAN	3.8	Jan 1	6.1	Nov 27	1.1	Oct 17, 1975
ANNUAL SEVEN-DAY MINIMUM	4.2	Jan 1	6.3	Oct 25	1.3	Sep 19, 1984
ANNUAL RUNOFF (AC-FT)	9,350		13,860		6,350	
10 PERCENT EXCEEDS	16		31		14	
50 PERCENT EXCEEDS	7.5		12		4.2	
90 PERCENT EXCEEDS	6.0		6.9		2.1	

16295300 HAKIPUU STREAM NEAR WAIKANE

LOCATION.--Lat 21°30'42", long 157°51'27", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 100 ft downstream of Kamehameha Highway bridge, 1.7 mi north of Waiahole Elementary School, and 1.0 mi southwest of Kualoa Regional Park.

DRAINAGE AREA.--0.85 mi^2.

PERIOD OF RECORD.--October 2002 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 30 ft above mean sea level (from topographic map).

REMARKS.--Records computed by B.H. Shimizu. Records fair. Small diversion upstream of gage for diversified agriculture.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 540 ft^3/s, August 4, 2004, gage height, 3.30 ft, minimum, 0.24 ft^3/s, November 5, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 80 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 30	0600	296	2.64
Jan 2	1845	89	1.89
Feb 27	1415	153	2.17
Mar 2	0615	310	2.68
Mar 26	1630	91	1.90
May 7	0630	166	2.22
May 11	1845	116	2.02
May 15	1245	111	2.00
Aug 4	0515	*540	*3.30

Minimum discharge, 0.24 ft^3/s, Nov. 5, gage height, 0.62 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.38	0.34	8.9	2.8	2.5	4.8	4.2	2.7	2.2	1.4	0.93	1.2
2	0.37	0.35	6.8	17	2.3	49	4.4	2.6	2.2	1.4	1.3	1.2
3	0.39	0.41	7.9	13	2.4	13	4.4	2.5	2.1	1.3	3.7	1.2
4	0.41	0.34	13	6.5	4.5	8.9	3.9	2.5	2.0	1.2	64	1.1
5	0.37	0.29	17	5.1	2.9	6.8	3.6	2.5	1.9	1.2	6.5	1.3
6	0.36	0.36	9.5	4.1	2.6	5.5	3.4	2.4	1.9	1.3	4.4	2.5
7	0.40	0.41	9.4	3.4	2.6	4.9	3.3	9.0	1.8	1.2	3.8	1.2
8	0.41	0.40	8.2	3.1	3.2	4.4	3.1	3.0	1.7	1.2	2.9	1.2
9	0.43	0.38	5.7	2.8	2.5	3.8	3.0	3.0	1.9	1.1	2.6	1.2
10	0.49	0.38	4.6	2.6	2.4	3.6	3.1	6.8	1.9	1.1	2.4	1.2
11	0.57	0.38	3.7	2.4	2.3	3.9	2.8	21	2.0	1.4	2.2	1.2
12	0.59	0.38	3.2	2.3	2.2	4.8	2.7	7.0	1.8	1.2	2.1	1.2
13	0.56	0.38	2.9	2.0	2.2	3.6	2.4	5.3	1.6	1.2	1.9	1.1
14	0.46	0.37	2.5	2.6	2.1	3.2	2.3	4.8	1.6	1.2	1.9	1.3
15	0.52	0.30	2.3	1.9	2.0	3.0	2.9	14	1.6	1.2	1.8	1.1
16	0.43	0.31	2.1	1.8	1.9	2.8	3.4	6.8	1.6	1.2	1.7	1.1
17	0.65	0.30	2.5	1.7	1.8	2.8	2.6	5.1	1.9	1.2	1.7	1.1
18	0.47	0.33	1.9	1.7	1.8	2.6	2.4	4.6	1.6	1.2	1.5	1.0
19	0.40	0.31	1.8	1.6	1.7	2.4	2.4	4.3	1.8	1.1	1.5	1.0
20	0.37	0.30	1.8	1.6	1.7	2.6	5.6	4.1	1.6	1.0	1.4	0.98
21	0.36	0.30	1.6	2.2	1.6	3.5	4.0	3.8	1.5	1.0	1.4	0.97
22	0.37	0.32	1.5	1.9	1.6	3.3	2.9	3.6	1.6	0.98	1.4	0.98
23	0.35	0.35	1.5	2.1	1.5	3.3	2.7	3.5	1.5	0.96	1.3	1.0
24	0.37	0.44	1.4	1.8	1.5	3.0	2.6	3.1	1.4	0.92	1.4	1.1
25	0.37	0.42	1.4	7.1	1.4	3.6	2.5	2.8	1.3	1.1	1.3	1.2
26	0.35	0.37	1.3	6.1	2.3	7.9	6.7	2.7	1.4	1.1	1.4	0.98
27	0.35	0.37	1.3	3.2	29	4.7	3.3	2.6	1.4	1.1	1.4	0.95
28	0.33	0.53	1.3	2.6	9.7	3.8	2.8	2.5	1.5	1.0	1.3	0.95
29	0.32	10	1.3	2.4	6.0	5.0	2.7	2.3	1.5	1.0	1.3	0.97
30	0.33	36	1.4	2.6	---	4.9	2.7	2.4	1.6	1.0	1.2	0.93
31	0.32	---	1.8	2.4	---	4.4	---	2.2	---	1.0	1.2	---
TOTAL	12.85	56.12	131.5	114.4	102.2	183.8	98.8	145.5	51.4	35.46	124.83	34.41
MEAN	0.41	1.87	4.24	3.69	3.52	5.93	3.29	4.69	1.71	1.14	4.03	1.15
MAX	0.65	36	17	17	29	49	6.7	21	2.2	1.4	64	2.5
MIN	0.32	0.29	1.3	1.6	1.4	2.4	2.3	2.2	1.3	0.92	0.93	0.93
AC-FT	25	111	261	227	203	365	196	289	102	70	248	68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2002 - 2004, BY WATER YEAR (WY)

MEAN	0.56	1.26	2.43	2.16	2.96	3.46	2.61	2.74	1.10	0.86	2.25	0.98
MAX	0.70	1.87	4.24	3.69	3.52	5.93	3.29	4.69	1.71	1.14	4.03	1.15
(WY)	(2003)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)
MIN	0.41	0.65	0.61	0.64	2.37	1.00	1.92	0.78	0.49	0.58	0.47	0.81
(WY)	(2004)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

16295300 HAKIPUU STREAM NEAR WAIKANE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 2002 - 2004	
ANNUAL TOTAL	471.09		1,091.27			
ANNUAL MEAN	1.29		2.98		1.95	
HIGHEST ANNUAL MEAN					2.98	2004
LOWEST ANNUAL MEAN					0.91	2003
HIGHEST DAILY MEAN	36	Nov 30	64	Aug 4	64	Aug 4, 2004
LOWEST DAILY MEAN	0.29	Nov 5	0.29	Nov 5	0.29	Nov 5, 2003
ANNUAL SEVEN-DAY MINIMUM	0.31	Nov 15	0.31	Nov 15	0.31	Nov 15, 2003
ANNUAL RUNOFF (AC-FT)	934		2,160		1,410	
10 PERCENT EXCEEDS	1.9		5.2		3.6	
50 PERCENT EXCEEDS	0.59		1.8		0.98	
90 PERCENT EXCEEDS	0.38		0.38		0.43	

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank 600 ft upstream from Kawa Stream, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi^2.

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

REVISED RECORDS.--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Clayton Yoshida. Records fair. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waiahole tunnel is 800 ft (from topographic map). Recording rain gage located 50 ft from the streamgage at an elevation of 80 ft.

AVERAGE DISCHARGE.--45 years (water years 1960-2004), 36.5 ft^3/s (26,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,580 ft^3/s, May 6, 2002, gage height, 9.39 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over weir at gage height 8.10 ft and slope area computation at gage height 9.39 ft; minimum, 9.9 ft^3/s, June 5, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	2030	*5,080	*7.83
Dec 7	1345	4,350	7.31
Feb 7	2115	2,370	5.62
Feb 27	1215	1,620	4.80
Aug 4	0545	3,570	6.70

Minimum discharge, 16 ft^3/s, on several days, gage height, 1.09 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	16	169	79	42	39	54	32	26	32	19	19
2	18	18	88	240	32	253	56	30	27	27	35	19
3	18	17	163	142	32	61	89	29	25	25	150	19
4	18	16	382	53	46	63	67	30	26	24	570	18
5	17	25	637	41	57	46	44	29	25	26	60	18
6	17	31	259	36	39	39	41	73	24	30	41	30
7	17	24	707	33	373	38	38	199	24	23	60	19
8	21	27	194	31	165	39	34	43	25	27	38	18
9	22	20	97	29	58	33	33	39	29	31	32	20
10	18	19	88	28	45	31	75	44	56	24	35	19
11	40	18	67	27	39	31	42	216	47	37	38	18
12	30	17	51	26	35	102	141	202	36	31	34	19
13	21	17	50	25	33	45	101	60	28	25	31	18
14	34	21	44	48	30	43	48	49	27	24	30	21
15	37	19	39	27	29	34	63	101	26	23	28	18
16	27	20	36	25	28	31	99	54	27	23	26	18
17	25	29	37	25	27	31	44	43	58	22	25	18
18	23	28	33	24	26	29	38	38	29	22	24	17
19	21	23	31	24	25	28	49	36	35	21	23	20
20	20	20	30	24	24	33	143	34	33	21	23	17
21	19	19	28	23	24	252	86	33	27	20	25	18
22	19	19	27	56	23	104	70	31	40	20	22	20
23	19	19	27	33	31	131	54	30	30	20	22	22
24	18	19	26	26	33	68	48	29	26	20	23	22
25	18	18	26	132	23	113	40	28	25	21	21	24
26	17	17	25	80	76	107	102	27	25	21	22	20
27	17	17	25	39	387	64	45	27	25	20	22	19
28	16	18	25	32	85	51	38	29	35	21	21	18
29	16	807	24	30	46	224	35	27	27	20	20	44
30	16	692	58	44	---	265	33	27	33	19	20	23
31	16	---	54	35	---	75	---	35	---	20	19	---
TOTAL	654	2,070	3,547	1,517	1,913	2,503	1,850	1,704	926	740	1,559	613
MEAN	21.1	69.0	114	48.9	66.0	80.7	61.7	55.0	30.9	23.9	50.3	20.4
MAX	40	807	707	240	387	265	143	216	58	37	570	44
MIN	16	16	24	23	23	28	33	27	24	19	19	17
AC-FT	1,300	4,110	7,040	3,010	3,790	4,960	3,670	3,380	1,840	1,470	3,090	1,220

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2004, BY WATER YEAR (WY)

MEAN	31.6	44.0	38.6	37.6	36.8	43.8	44.5	40.5	26.9	31.8	30.4	29.4
MAX	55.1	170	114	94.9	141	176	137	162	56.5	90.5	73.7	84.7
(WY)	(1992)	(1991)	(2004)	(1988)	(1969)	(1982)	(1963)	(2002)	(1978)	(1987)	(1978)	(1994)
MIN	12.6	14.5	14.5	12.9	13.2	14.5	19.3	13.3	13.8	15.0	13.6	13.3
(WY)	(1985)	(1963)	(1978)	(1977)	(1978)	(2000)	(1992)	(2000)	(2000)	(1984)	(1984)	(1975)

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1959 - 2004	
ANNUAL TOTAL	14,320		19,596			
ANNUAL MEAN	39.2		53.5		36.5	
HIGHEST ANNUAL MEAN					67.2	1982
LOWEST ANNUAL MEAN					20.1	1984
HIGHEST DAILY MEAN	807	Nov 29	807	Nov 29	2,160	May 6, 2002
LOWEST DAILY MEAN	13	Sep 2	16	Oct 28	10	Jun 5, 2000
ANNUAL SEVEN-DAY MINIMUM	13	Aug 31	16	Oct 26	11	May 31, 2000
ANNUAL RUNOFF (AC-FT)	28,400		38,870		26,450	
10 PERCENT EXCEEDS	50		91		57	
50 PERCENT EXCEEDS	19		29		23	
90 PERCENT EXCEEDS	15		18		15	

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank 800 ft downstream from intake, 1.5 mi west of Kahana, and 1.7 mi southwest of Punaluu.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1719: 1954-55, WDR HI-91-1: 1990 (Maximum and minimum daily discharges).

GAGE.--Water-stage recorder. Elevation of gage is 200 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Heather Jeppesen. Records good, except for period from November 7 to January 8, which is poor. Ditch diverts water from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--51 years (water years 1954-2004), 8.43 ft^3/s (6,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, October 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 16 ft^3/s on January 4-5, and February 9; 0.86 ft^3/s, November 30.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	9.8	2.7	10	13	14	12	13	13	10	11	11
2	12	11	7.8	6.4	13	4.2	9.4	15	12	10	9.1	8.3
3	12	11	7.3	5.8	10	1.7	9.8	14	8.6	9.9	5.6	7.3
4	12	9.4	6.5	16	8.3	9.6	15	11	9.7	13	2.3	9.0
5	11	7.7	5.3	16	6.7	14	14	11	11	11	9.4	12
6	8.5	5.1	7.4	15	8.0	13	12	14	12	9.2	13	11
7	7.0	6.7	10	13	7.8	15	13	3.3	9.7	11	8.4	11
8	5.7	12	4.7	13	9.7	13	15	9.2	7.6	11	10	9.3
9	4.9	12	5.1	12	16	13	12	15	6.5	9.5	11	7.9
10	4.6	11	10	12	13	14	13	13	6.9	9.8	11	8.2
11	7.1	10	8.8	12	11	12	14	7.9	6.3	9.1	8.6	9.4
12	8.9	9.0	7.9	5.9	9.9	9.3	11	7.7	5.4	12	9.0	10
13	11	6.9	9.0	5.1	8.4	13	12	15	9.1	11	8.1	11
14	11	6.6	9.7	1.7	10	12	13	12	11	9.9	6.2	7.6
15	8.9	5.9	12	8.2	13	14	11	7.5	12	9.5	5.3	5.8
16	8.0	6.2	12	12	13	12	6.0	7.8	11	9.4	8.8	4.9
17	9.2	8.1	11	11	11	10	7.4	15	11	9.4	9.8	8.8
18	11	7.8	9.6	11	10	9.0	14	14	12	12	8.7	11
19	11	7.5	8.9	12	10	7.5	12	11	8.6	12	10	9.0
20	11	6.5	8.5	10	13	9.4	6.7	8.6	8.6	12	9.6	11
21	10	6.6	9.1	8.3	13	7.5	8.3	7.3	11	8.9	11	8.6
22	11	9.0	14	3.8	14	10	15	6.4	11	11	12	7.2
23	11	8.6	12	2.3	13	8.2	13	9.9	9.1	12	9.7	5.8
24	9.8	9.7	11	8.6	11	11	12	12	7.3	11	6.4	6.8
25	10	9.2	12	6.7	10	14	11	9.2	9.6	11	6.7	10
26	11	8.4	12	8.6	7.4	10	5.0	9.7	12	12	10	11
27	11	8.9	11	13	2.0	8.9	10	9.9	12	11	7.2	10
28	8.5	11	9.9	11	5.1	13	14	11	12	7.4	9.0	9.9
29	7.7	6.2	11	8.6	15	9.4	13	13	10	9.7	12	4.7
30	11	0.86	11	6.4	---	13	13	13	7.0	12	11	6.5
31	9.9	---	7.1	8.5	---	14	---	13	---	11	10	---
TOTAL	295.7	248.66	284.3	293.9	305.3	338.7	346.6	339.4	293.0	327.7	279.9	264.0
MEAN	9.54	8.29	9.17	9.48	10.5	10.9	11.6	10.9	9.77	10.6	9.03	8.80
MAX	12	12	14	16	16	15	15	15	13	13	13	12
MIN	4.6	0.86	2.7	1.7	2.0	1.7	5.0	3.3	5.4	7.4	2.3	4.7
AC-FT	587	493	564	583	606	672	687	673	581	650	555	524

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2004, BY WATER YEAR (WY)

MEAN	9.24	7.81	6.51	6.38	6.48	7.31	8.71	8.96	9.68	10.1	10.2	10.1
MAX	26.4	15.3	16.0	17.6	21.7	16.1	19.0	21.2	22.6	22.0	23.9	21.3
(WY)	(1965)	(1988)	(1988)	(1960)	(1964)	(1964)	(1961)	(1964)	(1963)	(1963)	(1958)	(1958)
MIN	0.00	0.00	0.00	0.00	0.01	0.05	0.01	0.03	0.02	0.00	0.00	0.00
(WY)	(1981)	(1981)	(1981)	(1981)	(1981)	(1979)	(1979)	(1981)	(1979)	(1980)	(1974)	(1980)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1953 - 2004	
ANNUAL TOTAL	3,770.46		3,617.16			
ANNUAL MEAN	10.3		9.88		8.43	
HIGHEST ANNUAL MEAN					15.2	1964
LOWEST ANNUAL MEAN					0.23	1981
HIGHEST DAILY MEAN	16	Feb 16	16	Jan 4	54	Oct 31, 1964
LOWEST DAILY MEAN	0.86	Nov 30	0.86	Nov 30	0.00	Dec 7, 1963
ANNUAL SEVEN-DAY MINIMUM	5.2	Nov 29	5.2	Nov 29	0.00	Jan 5, 1969
ANNUAL RUNOFF (AC-FT)	7,480		7,170		6,110	
10 PERCENT EXCEEDS	14		13		17	
50 PERCENT EXCEEDS	11		10		8.0	
90 PERCENT EXCEEDS	6.9		6.4		0.37	

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

GAGE.--Gage destroyed by flood of March 20-21, 1991 was restored and water-stage recorder installed on March 29, 1993. Masonry control and elevation of gage is 212 ft above mean sea level (from topographic map). Prior to March 29, 1993, datum 2.00 ft higher.

REMARKS.--Records computed by Heather Jeppesen. Records good, except for discharges above 50 ft^3/s, which are poor. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--51 years (water years 1954-2004), 16.3 ft^3/s (11,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft^3/s, March 20, 1991, gage height, 10.02 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 7.77 ft and 9.60 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1430	*1,120	*5.92	Aug 4	0530	1,070	5.83
Feb 7	2030	1,040	5.78				

Minimum discharge, 1.1 ft^3/s, Nov. 27, gage height, 2.12 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	2.8	72	33	15	22	27	16	13	13	9.9	9.3
2	1.8	3.5	51	89	13	116	27	13	15	14	18	12
3	2.5	2.3	65	64	15	43	37	14	17	13	43	13
4	1.8	3.5	124	23	24	30	23	16	16	10	195	11
5	2.8	5.8	149	17	23	20	19	16	14	11	35	8.5
6	5.3	19	67	15	19	17	20	16	12	14	19	11
7	6.7	10	135	14	164	15	17	64	15	11	30	9.1
8	8.4	5.2	75	13	64	17	14	22	17	13	20	11
9	8.8	2.6	41	13	25	14	16	17	20	39	17	13
10	8.6	2.6	33	11	20	13	19	23	23	14	16	12
11	8.2	3.5	31	11	18	18	15	81	24	16	18	10
12	6.5	4.5	25	16	17	52	33	53	21	12	17	10
13	2.0	4.8	22	17	17	27	26	27	16	12	17	8.7
14	3.6	4.8	18	33	14	23	19	24	13	13	18	13
15	6.2	5.7	14	14	11	16	21	47	12	13	19	14
16	6.2	4.6	15	11	11	16	44	33	13	13	15	15
17	6.1	3.4	19	11	11	17	26	21	20	13	14	11
18	3.5	5.5	18	10	12	17	16	20	13	9.9	14	8.0
19	2.6	6.1	17	8.6	11	18	25	20	18	10	12	11
20	2.3	6.7	17	11	8.6	17	59	22	16	10	13	8.3
21	2.9	5.4	13	13	8.4	87	39	23	13	13	12	11
22	2.8	2.5	8.0	26	7.6	42	22	22	17	11	11	12
23	2.5	3.7	9.2	24	8.0	47	22	19	17	9.3	12	14
24	3.5	2.7	8.9	15	9.1	34	22	16	18	10	16	13
25	2.8	3.6	7.8	41	11	31	21	18	15	11	15	10
26	1.7	4.8	7.9	28	23	44	73	17	12	9.3	12	8.7
27	1.8	3.6	8.1	17	128	38	28	17	12	11	14	9.0
28	4.2	2.3	10	16	42	25	19	16	13	14	13	9.3
29	4.9	240	6.9	19	25	54	18	14	14	11	9.7	21
30	1.9	228	22	25	---	64	17	13	17	9.1	10	13
31	2.7	---	28	18	---	31	---	15	---	9.7	10	---
TOTAL	129.8	603.5	1,137.8	676.6	774.7	1,025	784	755	476	392.3	694.6	339.9
MEAN	4.19	20.1	36.7	21.8	26.7	33.1	26.1	24.4	15.9	12.7	22.4	11.3
MAX	8.8	240	149	89	164	116	73	81	24	39	195	21
MIN	1.7	2.3	6.9	8.6	7.6	13	14	13	12	9.1	9.7	8.0
AC-FT	257	1,200	2,260	1,340	1,540	2,030	1,560	1,500	944	778	1,380	674

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2004, BY WATER YEAR (WY)

MEAN	13.0	19.3	19.8	20.2	20.5	21.0	20.6	17.1	10.9	11.6	11.1	10.0
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	29.9
(WY)	(1959)	(1991)	(1965)	(1988)	(1969)	(1982)	(1963)	(1965)	(1982)	(1974)	(1982)	(1994)
MIN	0.28	4.58	0.23	2.11	0.58	3.19	2.37	1.00	0.00	0.00	0.31	0.49
(WY)	(1958)	(1960)	(1960)	(2001)	(1964)	(1993)	(1954)	(1961)	(1953)	(1953)	(1961)	(1961)

16303000 PUNALUU STREAM NEAR PUNALUU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1953 - 2004	
ANNUAL TOTAL	3,974.31		7,789.2			
ANNUAL MEAN	10.9		21.3		16.3	
HIGHEST ANNUAL MEAN					35.4	1982
LOWEST ANNUAL MEAN					7.17	2000
HIGHEST DAILY MEAN	240	Nov 29	240	Nov 29	1,010	Apr 15, 1963
LOWEST DAILY MEAN	0.75	Jul 19	1.7	Oct 26	0.00	Jun 1, 1953
ANNUAL SEVEN-DAY MINIMUM	1.9	Aug 24	2.6	Oct 21	0.00	Jun 1, 1953
ANNUAL RUNOFF (AC-FT)	7,880		15,450		11,820	
10 PERCENT EXCEEDS	18		40		29	
50 PERCENT EXCEEDS	4.9		14		11	
90 PERCENT EXCEEDS	1.8		4.7		2.4	

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.8 mi downstream from Sacred Falls, 1.6 mi west of Punaluu Beach Park, and 1.7 mi south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 110 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Heather Jeppesen. Records good except for discharges greater than 80 ft^3/s, which are poor. No diversion upstream of station.

AVERAGE DISCHARGE.--37 years (water years 1968-2004), 4.33 ft^3/s (3,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, January 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurement at gage height 10.84 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1430	*920	*8.54	Jul 9	0200	739	8.18
May 11	1900	526	7.74	Aug 4	0500	598	7.90

Minimum discharge, 0.10 ft^3/s, Nov. 1, 2, gage height, 4.61 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.24	0.12	21	22	6.4	1.9	3.3	1.4	1.3	2.3	0.60	0.97
2	0.21	1.0	29	52	2.1	100	9.2	1.4	4.2	2.4	18	1.5
3	0.21	0.47	50	18	2.3	6.1	25	1.2	2.2	1.6	22	0.86
4	0.22	0.32	99	2.7	8.6	13	12	2.5	3.6	1.6	128	0.69
5	0.19	0.27	70	1.7	12	3.1	3.4	1.9	1.8	1.9	4.3	0.59
6	0.17	2.0	13	1.3	3.7	2.0	2.5	15	1.4	2.6	2.1	2.1
7	0.16	14	54	1.1	68	9.8	2.0	62	3.6	1.3	14	0.75
8	2.3	5.1	15	1.0	19	6.9	1.7	3.1	3.8	1.9	3.0	0.50
9	3.5	0.83	10	0.80	3.5	1.9	1.5	8.6	11	38	2.0	0.74
10	0.57	0.47	9.5	0.67	2.3	3.7	11	19	12	1.7	4.4	0.83
11	5.3	0.38	6.4	0.56	1.8	11	5.4	75	8.1	3.0	6.3	1.5
12	3.0	0.32	3.3	0.66	1.6	43	23	8.8	4.0	1.6	3.5	1.7
13	1.6	0.31	3.6	0.53	1.3	14	6.5	3.2	3.7	1.9	2.0	0.61
14	5.7	2.0	4.0	8.5	1.1	7.4	2.5	2.8	2.3	1.4	3.1	1.5
15	4.0	1.3	2.0	1.2	1.1	2.1	3.9	32	1.9	1.3	1.7	0.88
16	1.7	0.56	1.7	0.62	1.6	1.6	10	9.6	5.0	1.1	1.4	0.70
17	1.0	1.4	7.8	0.48	0.84	1.6	2.7	3.1	17	0.96	1.3	1.6
18	0.92	4.0	1.6	0.38	0.68	1.3	1.8	2.1	2.3	0.90	1.3	0.61
19	0.56	1.9	1.3	0.34	0.58	1.1	7.7	1.7	4.0	0.86	0.95	4.5
20	0.40	0.77	1.2	0.88	0.49	16	20	1.5	2.7	0.71	0.80	1.0
21	0.33	0.56	1.0	0.72	0.42	78	9.8	1.4	1.9	0.58	4.7	1.2
22	0.31	0.80	0.90	16	0.38	10	5.3	1.2	14	0.49	1.4	1.1
23	0.77	2.2	0.91	5.3	0.37	28	4.8	1.6	3.6	0.43	1.1	2.1
24	0.38	2.6	0.98	2.3	0.31	7.2	2.3	1.3	2.2	0.39	1.8	1.0
25	0.45	1.0	0.75	19	0.29	18	1.9	2.1	1.7	0.37	1.8	1.9
26	0.27	0.78	0.61	11	6.8	25	60	1.2	1.5	0.42	2.1	0.98
27	0.21	0.54	0.51	2.6	99	8.2	4.1	1.2	1.6	0.62	3.0	0.70
28	0.17	1.1	3.6	3.8	6.4	3.3	2.3	4.5	5.4	2.9	2.8	0.72
29	0.15	134	0.75	2.0	1.9	49	1.8	1.6	2.4	0.69	2.4	0.90
30	0.17	109	16	15	---	30	1.5	4.7	2.4	0.37	1.9	0.80
31	0.16	---	12	5.8	---	5.3	---	3.7	---	0.45	1.3	---
TOTAL	35.32	290.10	441.41	198.94	254.86	509.5	248.9	280.4	132.6	76.74	245.05	35.53
MEAN	1.14	9.67	14.2	6.42	8.79	16.4	8.30	9.05	4.42	2.48	7.90	1.18
MAX	5.7	134	99	52	99	100	60	75	17	38	128	4.5
MIN	0.15	0.12	0.51	0.34	0.29	1.1	1.5	1.2	1.3	0.37	0.60	0.50
AC-FT	70	575	876	395	506	1,010	494	556	263	152	486	70

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2004, BY WATER YEAR (WY)

MEAN	3.30	5.83	5.05	5.26	4.62	5.56	5.61	3.97	2.77	3.94	3.28	2.91
MAX	7.68	19.0	17.7	17.9	19.7	32.2	19.3	14.6	7.72	11.7	8.37	9.34
(WY)	(1992)	(1991)	(1988)	(1988)	(1979)	(1982)	(1989)	(2002)	(1987)	(1982)	(1991)	(1994)
MIN	0.27	1.66	0.48	0.26	0.37	0.14	0.87	0.52	0.49	0.21	0.53	0.22
(WY)	(1985)	(1981)	(1977)	(1986)	(2000)	(1983)	(1979)	(2000)	(2003)	(1971)	(1984)	(1975)

16304200 KALUANUI STREAM NEAR PUNALUU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1967 - 2004	
ANNUAL TOTAL	1,589.84		2,749.35			
ANNUAL MEAN	4.36		7.51		4.33	
HIGHEST ANNUAL MEAN					9.94	1982
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	134	Nov 29	134	Nov 29	230	Feb 1, 1969
LOWEST DAILY MEAN	0.00	Jun 11	0.12	Nov 1	0.00	Jul 24, 1971
ANNUAL SEVEN-DAY MINIMUM	0.02	Jun 9	0.18	Oct 26	0.00	Sep 14, 1975
ANNUAL RUNOFF (AC-FT)	3,150		5,450		3,130	
10 PERCENT EXCEEDS	6.4		16		9.4	
50 PERCENT EXCEEDS	0.83		1.9		1.4	
90 PERCENT EXCEEDS	0.19		0.45		0.26	

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 0.5 mi upstream from Kamehameha Highway, 5.9 mi northeast of Waialua School, and 7.4 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2.

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

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

GAGE.--Gage destroyed by flood of November 20, 1990 was restored and water-stage recorder installed on February 25, 1993. Control rebuilt about 75 ft downstream of gage. Elevation of gage is 20 ft above mean sea level (from topographic map). Prior to May 18, 1966, datum 2.00 ft higher.

REMARKS.--Records computed by H.A. Jeppesen. Records good. Small diversion upstream of station.

AVERAGE DISCHARGE (Since diversion of Elehaha Stream into Kamananui Stream).--30 years (water years 1975-2004), 18.3 ft^3/s (13,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, November 20, 1990, gage height, 15.84 ft, from rating curve extended above 150 ft^3/s on basis of slope-area measurements at gage heights 5.68 ft, 11.46 ft, and 15.84 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1715	*2,780	*8.07	Feb 7	2300	1,360	6.57
Dec 7	2045	1,780	7.07	Feb 27	1245	1,610	6.88

Minimum discharge, 0.01 ft^3/s, on Oct 6-7, gage height, 1.37 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.02	0.03	102	40	14	15	30	9.5	7.3	6.6	1.9	3.1
2	0.03	0.03	71	216	12	301	30	8.7	7.5	6.9	1.7	2.7
3	0.03	0.03	43	222	6.1	58	85	7.6	11	5.6	4.3	2.6
4	0.02	0.03	114	42	5.0	72	74	8.5	7.4	4.5	281	2.3
5	0.02	0.03	274	21	29	37	38	9.2	8.6	4.1	28	2.1
6	0.01	0.03	97	14	40	22	27	14	5.3	4.5	10	2.4
7	0.01	0.03	290	11	133	20	22	42	4.7	5.2	19	2.2
8	0.02	6.9	194	8.9	238	39	19	15	7.5	4.0	15	1.9
9	0.03	4.2	86	7.5	35	26	17	8.5	17	12	6.7	2.0
10	0.02	1.7	78	6.4	20	19	64	12	24	6.7	4.8	2.9
11	0.02	0.81	74	5.7	14	17	29	202	28	4.2	17	2.7
12	5.6	0.49	35	5.2	11	27	43	96	19	3.6	16	2.4
13	5.5	0.36	27	4.6	9.0	15	32	27	14	3.5	9.2	2.1
14	7.2	0.34	20	4.4	7.5	46	18	20	11	3.5	5.7	2.0
15	7.4	3.4	15	4.6	6.6	18	32	37	7.3	3.4	4.6	3.3
16	3.4	5.3	12	3.7	6.4	12	60	50	5.8	3.0	3.8	2.8
17	2.8	2.1	14	3.3	5.5	10	29	20	20	2.7	3.3	2.6
18	1.4	1.5	11	3.0	4.8	8.7	19	14	11	2.6	3.3	2.8
19	0.62	4.5	7.4	2.9	4.3	7.9	19	12	8.0	2.6	3.0	2.7
20	0.32	4.3	6.3	2.9	4.0	7.9	22	11	8.0	2.4	2.7	2.8
21	0.23	2.8	5.7	2.9	3.7	274	60	9.4	8.3	2.1	2.8	2.7
22	0.21	1.7	5.1	16	3.5	158	19	7.6	21	1.9	5.2	4.4
23	0.16	1.4	5.0	33	3.4	134	16	7.2	18	1.8	4.3	8.5
24	0.12	2.9	5.3	8.9	3.3	76	14	7.0	9.7	1.7	8.7	8.1
25	0.09	6.0	5.0	6.9	3.1	50	12	8.3	6.7	1.7	7.1	3.8
26	0.06	4.7	4.3	37	3.2	52	71	10	5.6	1.6	4.7	3.2
27	0.05	3.6	4.1	24	386	29	32	6.6	4.9	2.3	5.0	3.2
28	0.04	1.9	6.9	9.0	95	22	16	11	4.9	4.3	4.0	2.7
29	0.03	428	6.3	6.5	25	88	12	13	9.5	5.9	11	1.9
30	0.03	301	4.7	23	---	154	11	6.3	6.4	2.6	6.7	1.4
31	0.03	---	52	16	---	45	---	8.5	---	2.0	3.9	---
TOTAL	35.52	790.11	1,675.1	812.3	1,131.4	1,860.5	972	718.9	327.4	119.5	504.4	90.3
MEAN	1.15	26.3	54.0	26.2	39.0	60.0	32.4	23.2	10.9	3.85	16.3	3.01
MAX	7.4	428	290	222	386	301	85	202	28	12	281	8.5
MIN	0.01	0.03	4.1	2.9	3.1	7.9	11	6.3	4.7	1.6	1.7	1.4
AC-FT	70	1,570	3,320	1,610	2,240	3,690	1,930	1,430	649	237	1,000	179

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2004, BY WATER YEAR (WY)

MEAN	11.2	30.2	21.6	29.8	21.1	31.0	24.4	15.0	8.65	11.9	9.33	6.03
MAX	54.1	168	107	143	96.9	155	168	58.3	52.9	52.7	46.2	19.9
(WY)	(1992)	(1991)	(1988)	(1988)	(1979)	(1982)	(1989)	(1988)	(1978)	(1989)	(1995)	(1994)
MIN	0.01	2.60	0.67	0.09	0.02	0.85	0.64	0.63	0.40	0.98	0.05	0.01
(WY)	(1985)	(1990)	(1977)	(1986)	(1978)	(1998)	(1992)	(2003)	(2003)	(1984)	(2003)	(1984)

16330000 KAMANANUI STREAM AT MAUNAWAI—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1975 - 2004	
ANNUAL TOTAL	4,061.65		9,037.43			
ANNUAL MEAN	11.1		24.7		18.3	
HIGHEST ANNUAL MEAN					50.3	1982
LOWEST ANNUAL MEAN					4.81	1984
HIGHEST DAILY MEAN	428	Nov 29	428	Nov 29	1,940	Jan 1, 1988
LOWEST DAILY MEAN	0.00	Aug 19	0.01	Oct 6	0.00	Sep 15, 1975
ANNUAL SEVEN-DAY MINIMUM	0.00	Aug 31	0.02	Oct 4	0.00	Sep 15, 1975
ANNUAL RUNOFF (AC-FT)	8,060		17,930		13,290	
10 PERCENT EXCEEDS	11		54		30	
50 PERCENT EXCEEDS	1.1		6.9		3.9	
90 PERCENT EXCEEDS	0.02		1.4		0.23	

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank, 4.3 mi northeast of Leilehua High School in Wahiawa, and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft above mean sea level (from topographic map).

REMARKS.--Records computed by H.A. Jeppesen. Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--45 years (water years 1960-2004), 13.5 ft^3/s (9,760 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/s on basis of slope-area measurements at gage heights 6.74 ft, 6.98 ft, and 10.12 ft; maximum gage height, 13.20 ft, November 20, 1990; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1630	*1,860	*7.93
Dec 7	1945	1,590	7.38
Feb 7	0600	1,330	6.86
Aug 4	0645	1,670	7.54

Minimum discharge, 0.23 ft^3/s, Nov. 2, gage height, 1.20 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.56	0.31	62	48	15	5.8	12	4.8	5.8	7.5	1.2	2.7
2	0.53	0.27	46	155	9.2	168	22	4.5	4.3	5.9	19	2.1
3	0.88	0.58	36	75	5.1	15	54	4.2	6.4	5.6	22	2.4
4	0.76	2.0	132	11	9.8	15	39	4.7	4.0	4.1	370	1.8
5	0.61	1.2	188	6.9	30	10	13	9.0	7.1	4.0	22	1.9
6	0.47	6.4	43	5.4	13	5.8	9.3	17	3.9	5.0	6.8	3.3
7	0.43	9.5	241	4.6	175	7.2	7.9	112	3.3	5.1	28	4.2
8	0.59	25	75	4.2	112	42	6.9	9.6	12	4.3	8.2	2.1
9	18	4.3	44	3.8	11	10	8.1	5.8	22	49	5.5	1.5
10	4.1	2.0	43	3.3	7.7	6.9	76	8.6	25	6.0	5.1	1.6
11	1.9	1.3	38	2.9	6.2	7.2	18	37	25	7.2	14	3.8
12	17	1.2	14	2.9	5.3	11	50	35	13	6.1	14	4.8
13	6.0	1.2	15	2.9	4.8	10	22	7.0	9.9	4.9	6.9	4.5
14	13	6.8	14	13	4.3	50	10	5.7	7.0	4.2	6.0	2.3
15	8.9	6.4	8.8	9.5	4.0	9.0	10	34	5.2	4.9	5.3	5.2
16	14	4.9	7.2	3.5	3.8	5.4	45	19	4.6	3.6	3.9	2.4
17	4.0	6.3	11	2.4	3.5	4.6	11	7.4	38	2.8	3.7	1.8
18	2.8	9.9	7.3	2.0	2.9	4.3	8.0	5.3	8.1	2.4	3.6	2.4
19	2.4	16	5.4	1.9	2.5	3.7	28	4.7	7.9	2.4	2.9	7.1
20	1.6	6.3	4.8	2.3	2.3	25	15	4.3	7.3	2.2	2.3	6.0
21	1.2	3.2	4.4	3.8	2.1	265	28	3.8	6.8	1.9	4.9	3.0
22	1.00	3.2	4.1	26	1.9	122	9.1	3.9	26	1.6	7.4	3.3
23	0.92	4.4	3.7	14	1.8	116	9.5	3.3	12	1.5	3.9	3.8
24	1.1	13	3.7	6.3	1.8	34	7.1	4.2	7.8	1.4	3.5	5.7
25	1.1	5.2	3.6	31	1.6	39	5.9	3.5	5.1	1.3	4.1	7.4
26	1.0	3.4	3.1	61	4.7	35	110	3.7	4.4	1.4	3.9	5.8
27	0.86	2.4	2.7	12	260	19	16	3.6	4.3	1.8	4.8	3.0
28	0.61	1.8	4.9	5.8	33	14	7.5	7.0	4.4	2.8	4.3	2.1
29	0.47	400	4.8	12	7.7	97	6.0	6.9	12	4.7	7.9	2.0
30	0.40	242	8.5	39	---	116	5.3	4.7	5.7	2.0	4.9	3.2
31	0.35	---	52	9.6	---	20	---	6.4	---	1.4	3.6	---
TOTAL	107.54	790.46	1,131.0	581.0	742.0	1,292.9	669.6	390.6	308.3	159.0	603.6	103.2
MEAN	3.47	26.3	36.5	18.7	25.6	41.7	22.3	12.6	10.3	5.13	19.5	3.44
MAX	18	400	241	155	260	265	110	112	38	49	370	7.4
MIN	0.35	0.27	2.7	1.9	1.6	3.7	5.3	3.3	3.3	1.3	1.2	1.5
AC-FT	213	1,570	2,240	1,150	1,470	2,560	1,330	775	612	315	1,200	205

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2004, BY WATER YEAR (WY)

MEAN	10.7	18.3	15.7	16.1	13.7	19.9	20.0	12.3	7.45	11.5	8.66	7.41
MAX	30.7	71.9	52.6	54.1	66.9	90.0	75.7	45.7	24.9	29.3	31.0	24.9
(WY)	(1982)	(1991)	(1988)	(1988)	(1969)	(1982)	(1989)	(2002)	(1978)	(1989)	(1982)	(1994)
MIN	0.06	2.90	1.29	0.37	0.32	0.35	1.57	1.37	1.59	0.95	1.51	0.52
(WY)	(1985)	(1963)	(1977)	(1977)	(1978)	(1983)	(1966)	(2000)	(2000)	(1971)	(1984)	(1975)

16345000 OPAEULA STREAM NEAR WAHIAWA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1959 - 2004	
ANNUAL TOTAL	4,025.62		6,879.20			
ANNUAL MEAN	11.0		18.8		13.5	
HIGHEST ANNUAL MEAN					29.7	1982
LOWEST ANNUAL MEAN					7.12	1998
HIGHEST DAILY MEAN	400	Nov 29	400	Nov 29	845	May 6, 2002
LOWEST DAILY MEAN	0.15	Jun 3	0.27	Nov 2	0.00	Jan 24, 1977
ANNUAL SEVEN-DAY MINIMUM	0.21	May 29	0.43	Oct 28	0.00	Oct 24, 1984
ANNUAL RUNOFF (AC-FT)	7,980		13,640		9,760	
10 PERCENT EXCEEDS	17		39		28	
50 PERCENT EXCEEDS	2.2		5.7		4.5	
90 PERCENT EXCEEDS	0.42		1.6		0.93	

Surface-Water Station Records for Molokai

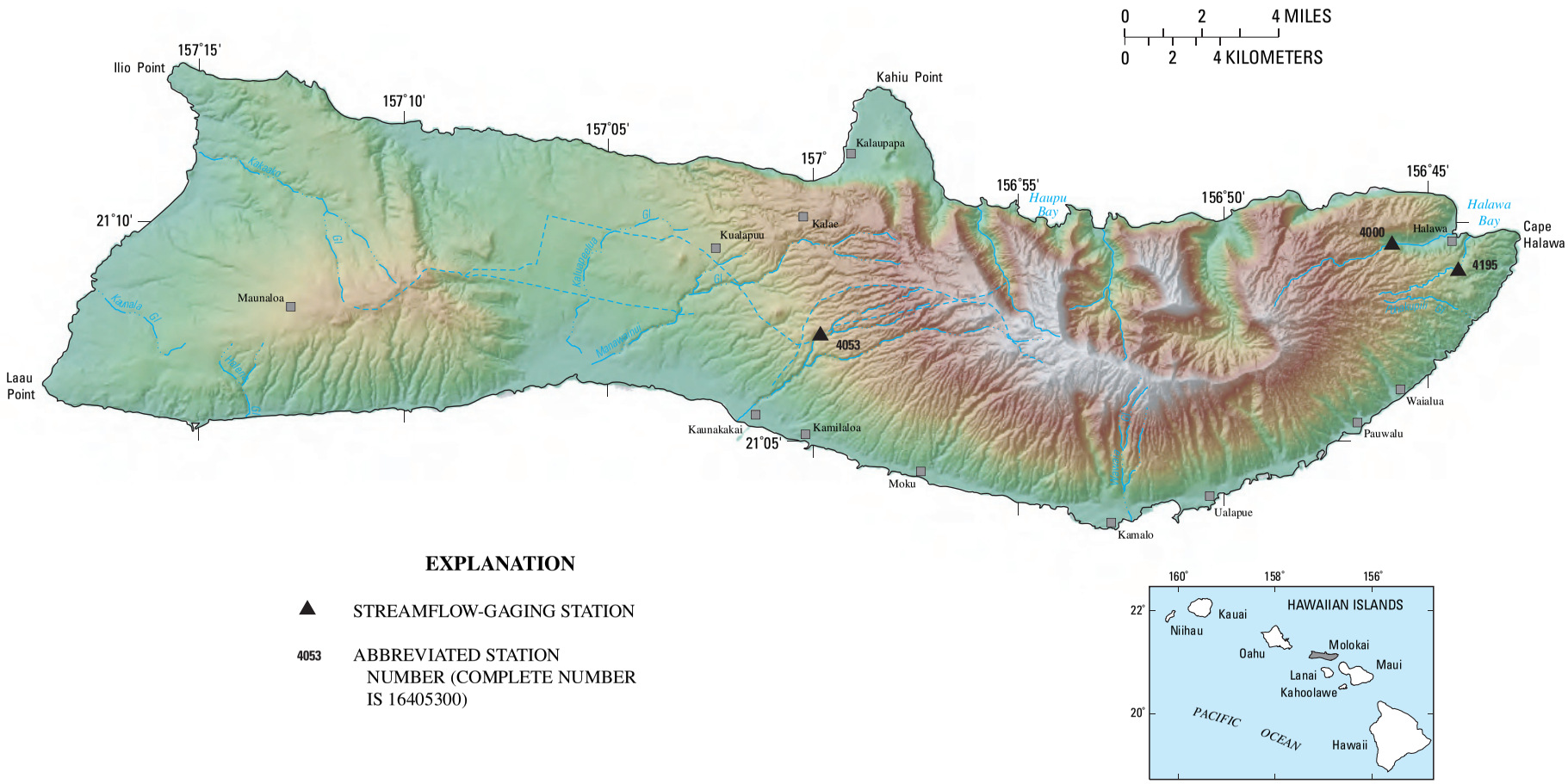


Figure 7. Locations of streamflow-gaging stations on Molokai.

16400000 HALAWA STREAM NEAR HALAWA

LOCATION.--Lat 21°09'31", long 156°45'53", Old Hawaiian Datum, Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream, and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft above mean sea level (from topographic map). Prior to June 25, 1923, at site 350 ft upstream of gage at different datum. June 25, 1923 to July 18, 1932, and November 17, 1937 to February 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records computed by Phillip Teeters. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--80 years (water years 1918-31, 1939-2004), 29.6 ft^3/s (21,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s, February 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s, about November 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1400	2,250	8.94	Jan 25	1540	2,110	8.74
Jan 1	1450	*2,640	*9.46	Feb 27	1615	1,980	8.55

Minimum discharge, 2.6 ft^3/s, Nov. 1, gage height, 1.52 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	2.7	113	318	27	195	32	12	13	18	5.1	5.0
2	3.6	8.0	70	464	13	235	30	11	85	21	86	4.6
3	5.6	6.8	73	228	11	114	37	9.9	17	12	43	4.3
4	3.3	14	166	36	54	51	24	13	10	11	33	4.0
5	2.9	21	174	21	20	27	17	81	9.3	12	9.2	14
6	3.0	11	87	16	38	19	14	69	13	11	7.0	5.2
7	4.3	35	63	13	98	32	13	159	9.2	8.0	33	4.2
8	21	11	42	11	60	31	19	25	23	8.0	22	3.8
9	21	5.1	38	10	16	16	111	14	52	6.9	14	4.0
10	5.7	3.9	60	8.7	12	12	137	73	46	6.3	8.3	4.2
11	88	5.2	27	8.0	10	85	24	28	30	20	7.6	6.3
12	22	4.0	17	7.4	9.7	58	54	68	21	17	8.3	15
13	25	27	15	7.1	9.5	19	27	15	13	19	8.0	5.3
14	20	25	12	73	7.8	230	44	25	13	9.5	9.4	27
15	40	27	13	14	101	61	22	e50	11	17	6.6	8.5
16	11	62	11	8.1	82	29	36	e250	39	12	6.0	6.5
17	27	24	151	7.6	13	18	14	e30	12	9.7	5.9	11
18	10	109	17	6.5	9.9	14	12	e20	9.9	7.5	5.1	9.3
19	6.7	84	12	5.9	8.7	12	50	15	14	6.6	4.6	62
20	5.7	16	10	6.2	7.7	32	33	12	32	5.8	4.3	12
21	4.9	18	9.0	19	7.0	172	44	11	16	5.4	26	6.4
22	4.5	18	8.0	14	12	459	27	10	21	5.2	14	7.6
23	4.8	26	15	22	15	185	35	12	11	5.0	52	14
24	4.1	21	18	219	14	146	18	10	11	4.7	11	14
25	3.8	26	9.1	193	14	49	14	22	9.9	5.8	7.7	12
26	3.5	13	20	64	27	96	293	9.8	8.3	7.2	40	7.9
27	3.3	7.9	11	27	329	45	61	13	16	6.1	15	19
28	3.2	6.8	73	15	266	21	24	67	37	24	10	7.6
29	3.0	575	11	15	43	118	17	38	17	6.4	9.2	74
30	2.8	250	13	44	---	184	13	30	24	4.8	6.8	74
31	2.7	---	11	21	---	34	---	22	---	5.7	5.6	---
TOTAL	369.8	1,463.4	1,369.1	1,922.5	1,335.3	2,799	1,296	1,224.7	643.6	318.6	523.7	452.7
MEAN	11.9	48.8	44.2	62.0	46.0	90.3	43.2	39.5	21.5	10.3	16.9	15.1
MAX	88	575	174	464	329	459	293	250	85	24	86	74
MIN	2.7	2.7	8.0	5.9	7.0	12	12	9.8	8.3	4.7	4.3	3.8
AC-FT	733	2,900	2,720	3,810	2,650	5,550	2,570	2,430	1,280	632	1,040	898

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2004, BY WATER YEAR (WY)

MEAN	26.2	36.4	35.8	34.5	29.4	37.6	39.3	26.9	18.7	25.3	24.6	20.3
MAX	100	97.8	84.7	118	114	134	157	85.2	59.2	58.2	69.8	58.2
(WY)	(1942)	(1951)	(1947)	(1921)	(1932)	(1942)	(1989)	(1963)	(1961)	(1954)	(1938)	(1992)
MIN	2.04	5.80	8.56	5.31	2.98	5.48	11.7	4.26	4.93	6.00	1.19	2.85
(WY)	(1918)	(1920)	(1977)	(1977)	(1978)	(1970)	(1990)	(1920)	(1966)	(1917)	(1971)	(1975)

16400000 HALAWA STREAM NEAR HALAWA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1917 - 2004	
ANNUAL TOTAL	9,025.5		13,718.4			
ANNUAL MEAN	24.7		37.5		29.6	
HIGHEST ANNUAL MEAN					47.4	1965
LOWEST ANNUAL MEAN					17.4	1975
HIGHEST DAILY MEAN	575	Nov 29	575	Nov 29	1,240	Feb 4, 1965
LOWEST DAILY MEAN	1.7	Jun 11	2.7	Oct 31	0.86	Sep 1, 1971
ANNUAL SEVEN-DAY MINIMUM	1.9	Jun 7	3.0	Oct 26	0.90	Aug 26, 1971
ANNUAL RUNOFF (AC-FT)	17,900		27,210		21,410	
10 PERCENT EXCEEDS	51		85		65	
50 PERCENT EXCEEDS	9.0		14		13	
90 PERCENT EXCEEDS	3.4		5.2		4.8	

e Estimated

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Old Hawaiian Datum, Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

PERIOD OF RECORD.--July 1965 to Sept. 2004 (discontinued).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft above mean sea level, from tunnel plans.

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--39 years (water years 1966-2004), 7.34 ft^3/s (5,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, April 8, 9, 1986, January 2, 26, 1988, and March 3, 1989; minimum daily, 1.8 ft^3/s, October 15, 1967, August 27, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 27 ft^3/s, January 2; minimum daily discharge, 3.1 ft^3/s, December 25.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	4.7	15	13	6.3	20	5.4	5.3	5.7	7.8	4.5	4.4
2	5.2	4.6	9.5	27	5.3	15	15	5.1	5.8	7.2	11	4.4
3	5.2	4.7	6.4	23	3.9	15	6.8	4.9	5.9	6.4	13	4.4
4	5.2	6.7	5.6	7.3	3.7	7.4	5.7	11	5.4	6.4	12	4.4
5	5.2	7.3	7.2	5.2	4.0	6.1	5.3	19	5.3	5.6	6.0	4.5
6	5.2	5.4	4.7	4.7	6.1	4.9	5.1	11	6.0	5.1	5.1	4.5
7	5.2	5.1	4.1	4.4	5.7	4.3	4.9	7.8	5.7	4.9	6.5	4.4
8	5.2	6.3	5.5	4.4	4.7	14	4.9	6.4	9.6	4.9	5.6	4.4
9	7.3	5.4	7.7	4.2	3.8	6.1	20	5.7	15	4.9	4.9	5.0
10	5.3	5.3	17	4.1	3.8	4.7	23	5.4	13	4.7	4.6	5.6
11	5.9	5.8	9.3	4.0	3.9	4.3	10	5.3	6.3	4.7	4.8	5.6
12	7.2	5.3	4.5	4.3	3.6	4.1	12	5.3	5.7	5.2	5.2	5.6
13	7.9	12	4.5	4.4	3.8	11	8.5	5.1	5.3	8.7	4.9	5.6
14	8.5	11	4.0	13	3.6	22	6.4	5.2	5.1	6.0	4.8	5.7
15	8.8	8.1	3.6	7.4	3.6	9.3	6.7	10	5.1	5.5	4.7	5.9
16	6.6	12	3.6	4.4	9.6	6.0	8.2	20	5.1	5.7	4.6	5.8
17	5.2	8.2	14	4.1	4.5	4.8	8.8	8.0	5.0	5.3	4.6	5.7
18	4.9	6.4	5.6	3.9	3.7	4.4	8.2	6.1	4.9	5.0	4.6	5.6
19	4.9	16	4.0	3.9	3.5	4.1	5.7	5.7	4.9	4.9	4.4	9.0
20	4.9	6.7	3.6	4.5	3.2	6.3	5.9	5.6	5.0	4.7	4.4	6.9
21	4.7	14	3.4	9.7	3.2	23	9.5	5.9	5.3	4.6	4.4	6.0
22	5.5	9.4	3.3	7.6	3.2	25	5.7	5.4	6.2	4.6	4.8	5.8
23	4.7	12	3.2	13	3.2	24	5.3	5.3	5.5	4.6	11	5.7
24	4.7	6.6	3.2	6.6	3.2	9.5	5.3	5.3	5.3	4.6	5.9	5.8
25	4.7	11	3.1	5.2	3.2	12	5.2	5.4	5.1	4.6	5.1	5.6
26	4.7	8.6	4.1	5.6	3.4	7.7	16	5.5	5.1	4.6	4.9	5.6
27	4.7	5.3	5.6	6.2	9.9	5.6	11	5.3	4.9	4.6	5.8	5.4
28	4.7	4.1	6.3	5.0	23	6.9	6.4	8.0	4.9	4.6	5.0	5.6
29	4.7	14	4.5	5.6	7.2	13	5.6	6.6	5.3	4.6	5.6	5.6
30	4.7	13	4.0	8.7	---	13	5.3	6.6	10	4.6	4.8	5.6
31	4.7	---	3.8	6.9	---	6.8	---	6.1	---	4.6	4.6	---
TOTAL	171.5	245.0	183.9	231.3	149.8	320.3	251.8	223.3	187.4	164.2	182.1	164.1
MEAN	5.53	8.17	5.93	7.46	5.17	10.3	8.39	7.20	6.25	5.30	5.87	5.47
MAX	8.8	16	17	27	23	25	23	20	15	8.7	13	9.0
MIN	4.7	4.1	3.1	3.9	3.2	4.1	4.9	4.9	4.9	4.6	4.4	4.4
AC-FT	340	486	365	459	297	635	499	443	372	326	361	325

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2004, BY WATER YEAR (WY)

MEAN	6.51	8.17	7.92	7.62	7.48	8.27	8.33	7.24	6.85	7.15	6.43	5.90
MAX	10.6	14.0	13.8	14.4	15.9	15.5	15.6	15.8	12.8	13.2	10.2	9.21
(WY)	(1996)	(1999)	(1991)	(1988)	(1990)	(1986)	(1986)	(1987)	(1998)	(1986)	(1985)	(1987)
MIN	2.60	2.60	2.83	2.61	2.25	2.55	2.61	2.69	2.32	2.30	2.21	2.33
(WY)	(1966)	(1966)	(1966)	(1966)	(1974)	(1967)	(1974)	(1974)	(1974)	(1974)	(1974)	(1974)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1965 - 2004	
ANNUAL TOTAL	2,590.1		2,474.7			
ANNUAL MEAN	7.10		6.76		7.34	
HIGHEST ANNUAL MEAN					11.4	1987
LOWEST ANNUAL MEAN					3.46	1974
HIGHEST DAILY MEAN	37	Jan 30	27	Jan 2	39	Apr 8, 1986
LOWEST DAILY MEAN	2.9	Sep 13	3.1	Dec 25	1.8	Oct 15, 1967
ANNUAL SEVEN-DAY MINIMUM	3.4	Dec 19	3.2	Feb 20	1.9	May 3, 1976
ANNUAL RUNOFF (AC-FT)	5,140		4,910		5,320	
10 PERCENT EXCEEDS	10		12		12	
50 PERCENT EXCEEDS	5.9		5.4		6.2	
90 PERCENT EXCEEDS	4.4		4.1		3.3	

16414200 KAUNAKAKAI GULCH AT 75 FEET

LOCATION.--Lat 21°05'50", Long 157°00'51", North American Datum 1983, Hydrologic Unit 2000500000, on left bank 0.7 mile upstream of Highway 46, and 0.4 mile northeast of Kaunakakai Post Office.

DRAINAGE AREA.--7.05 mi^2.

PERIOD OF RECORD.--Water Year 2002 (annual maximum), February 2003 to current year.

GAGE.--Crest stage gage in water year 2002. Water stage recorder Sept. 2003 to current year. Elevation of gage is 75 feet above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records poor. No diversions upstream. Flow may have been augmented by occasional spillage from Molokai Tunnel since February 2003.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 978 ft^3/s, January 2, 2004, gage height, 8.11 ft; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 2	2345	*978	*8.11
Jan 23	0115	288	6.33
Mar 22	1845	582	7.25

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 3.78 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	e42	91	0.00	22	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	15	128	0.00	19	e15	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	e3.5	116	0.00	15	e0.08	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	e12	0.00	e3.1	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	e0.12	0.00	0.00	0.00	e2.5	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.26	27	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	e8.9	0.00	0.00	0.00	44	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	e6.4	0.00	0.00	0.00	e7.8	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	e0.01	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	5.6	0.00	26	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	e4.2	0.00	e3.6	0.00	0.44	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e26	0.00	0.00	0.00	0.00
17	0.00	0.00	e5.0	0.05	0.00	0.00	0.00	e0.33	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	e4.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	e4.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	e0.16	0.00	0.00	0.00	81	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	e1.4	0.00	e24	0.00	69	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	e0.25	0.00	14	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	e0.82	0.00	0.00	0.00	e3.1	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	e0.05	0.00	0.00	0.00	0.00	4.3	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.69	0.00	e4.2	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	17	0.00	0.00	e7.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	e18	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	0.00	0.00	---	0.00	---	0.00	---	0.00	0.00	---
TOTAL	0.00	46.23	80.80	381.22	50.29	257.52	102.39	29.27	0.00	0.00	0.00	0.00
MEAN	0.00	1.54	2.61	12.3	1.73	8.31	3.41	0.94	0.00	0.00	0.00	0.00
MAX	0.00	18	42	128	42	81	44	26	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	92	160	756	100	511	203	58	0.00	0.00	0.00	0.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2004, BY WATER YEAR (WY)

MEAN	0.00	1.54	2.61	12.3	1.73	4.35	3.41	0.94	0.00	0.00	0.00	0.00
MAX	0.00	1.54	2.61	12.3	1.73	8.31	3.41	0.94	0.00	0.00	0.00	0.00
(WY)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2004)	(2003)	(2003)
MIN	0.00	1.54	2.61	12.3	1.73	0.39	3.41	0.94	0.00	0.00	0.00	0.00
(WY)	(2004)	(2004)	(2004)	(2004)	(2004)	(2003)	(2004)	(2004)	(2004)	(2004)	(2003)	(2003)

16414200 KAUNAKAKAI GULCH AT 75 FEET—Continued

SUMMARY STATISTICS	FOR 2004 WATER YEAR		WATER YEARS 2003 - 2004	
ANNUAL TOTAL	947.72			
ANNUAL MEAN	2.59		2.59	
HIGHEST ANNUAL MEAN			2.59	2004
LOWEST ANNUAL MEAN			2.59	2004
HIGHEST DAILY MEAN	128	Jan 2	128	Jan 2, 2004
LOWEST DAILY MEAN	0.00	Oct 1	0.00	Feb 6, 2003
ANNUAL SEVEN-DAY MINIMUM	0.00	Oct 1	0.00	Feb 6, 2003
ANNUAL RUNOFF (AC-FT)	1,880		1,880	
10 PERCENT EXCEEDS	2.7		2.7	
50 PERCENT EXCEEDS	0.00		0.00	
90 PERCENT EXCEEDS	0.00		0.00	

e Estimated

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Old Hawaiian Datum, Hydrologic Unit 20050000, on left bank 200 ft downstream from concrete bridge on Highway 45, and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 640 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records fair, except for the estimated which are poor. Diversion upstream of station for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--41 years (water years 1964-2004), 0.78 ft^3/s (562 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, April 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 1	1500	*197	*3.95
Jan 24	2000	143	3.54
Feb 27	2215	87	3.00

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 0.30 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	2.5	16	e0.40	3.6	1.3	0.81	0.76	0.55	0.18	0.11
2	0.00	0.00	0.91	23	e0.25	6.4	1.2	0.79	1.7	0.50	0.80	0.12
3	0.00	0.00	1.0	25	e0.14	3.0	1.2	0.79	0.96	0.45	0.98	0.11
4	0.00	0.00	0.99	2.9	e0.10	1.8	1.1	0.79	0.76	0.43	0.68	0.12
5	0.00	0.00	1.9	1.4	e0.06	1.3	0.98	1.4	0.72	0.42	0.42	0.12
6	0.00	0.00	0.61	0.97	e0.04	1.1	0.92	0.94	0.70	0.42	0.25	0.12
7	0.00	0.00	0.20	e0.53	1.0	0.98	0.88	1.4	0.68	0.37	0.59	0.10
8	0.00	0.00	0.07	e0.35	e0.70	1.00	0.85	1.3	0.66	0.37	0.42	0.11
9	0.00	0.00	0.02	e0.21	e0.53	0.83	1.3	0.84	0.81	0.36	0.41	0.12
10	0.00	0.00	0.05	e0.12	e0.40	0.77	1.8	0.93	0.92	0.34	0.29	0.13
11	0.00	0.00	0.07	e0.08	e0.23	0.80	0.95	1.1	0.90	0.35	0.25	0.21
12	0.00	0.00	0.01	e0.06	e0.16	1.6	0.91	0.81	0.74	0.36	0.24	0.46
13	0.00	0.00	0.00	e0.03	e0.10	0.78	0.82	0.78	0.63	0.41	0.24	0.24
14	0.00	0.00	0.00	e1.5	e0.07	1.8	0.95	0.77	0.74	0.32	0.29	0.36
15	0.00	0.00	0.00	0.85	e0.05	0.97	0.86	3.9	0.69	0.32	0.25	0.44
16	0.00	0.00	0.00	0.41	2.8	0.76	0.96	11	0.80	0.32	0.20	0.29
17	0.00	0.00	2.6	e0.12	e0.40	0.66	0.77	1.7	0.71	0.29	0.21	0.37
18	0.00	0.00	0.34	e0.04	0.27	0.62	0.72	1.2	0.64	0.28	0.20	0.35
19	0.00	0.00	0.06	e0.01	0.20	0.57	0.90	1.0	0.61	0.27	0.14	0.78
20	0.00	0.00	0.01	e0.01	0.19	0.59	0.86	0.94	0.64	0.26	0.15	0.39
21	0.00	0.00	0.00	1.9	0.18	1.6	0.85	0.87	0.63	0.26	0.22	0.19
22	0.00	0.00	0.00	0.92	0.18	9.1	0.84	0.82	0.61	0.26	0.30	0.14
23	0.00	0.00	0.00	0.85	0.21	8.4	0.89	0.84	0.57	0.25	0.37	0.14
24	0.00	0.16	0.00	9.1	0.17	5.0	0.76	0.80	0.55	0.25	0.22	0.19
25	0.00	0.13	0.00	3.9	0.17	1.9	0.71	0.79	0.53	0.26	0.15	0.22
26	0.00	0.00	0.72	1.6	0.19	2.3	8.3	0.77	0.50	0.27	0.16	0.22
27	0.00	0.00	1.2	1.2	15	4.4	3.3	0.77	0.54	0.25	0.33	0.33
28	0.00	0.00	2.4	e0.70	13	1.5	1.1	1.3	0.59	0.38	0.17	0.24
29	0.00	3.9	0.41	e0.60	2.1	1.8	0.94	1.1	0.66	0.27	0.14	0.90
30	0.00	1.8	0.18	e0.89	---	4.3	0.84	0.91	0.57	0.20	0.13	0.90
31	0.00	---	0.13	e0.60	---	1.6	---	0.77	---	0.21	0.12	---
TOTAL	0.00	5.99	16.38	95.85	39.29	71.83	38.76	42.93	21.52	10.25	9.50	8.52
MEAN	0.00	0.20	0.53	3.09	1.35	2.32	1.29	1.38	0.72	0.33	0.31	0.28
MAX	0.00	3.9	2.6	25	15	9.1	8.3	11	1.7	0.55	0.98	0.90
MIN	0.00	0.00	0.00	0.01	0.04	0.57	0.71	0.77	0.50	0.20	0.12	0.10
AC-FT	0.00	12	32	190	78	142	77	85	43	20	19	17

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2004, BY WATER YEAR (WY)

MEAN	0.45	1.07	0.96	1.31	1.09	1.30	1.26	0.64	0.30	0.40	0.28	0.27
MAX	2.63	7.56	6.12	4.84	5.88	6.42	10.3	3.99	1.43	1.56	1.21	2.24
(WY)	(1986)	(1971)	(1965)	(1988)	(1965)	(1968)	(1989)	(1987)	(1982)	(1993)	(1980)	(1992)
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(WY)	(1972)	(1972)	(1972)	(1977)	(1973)	(2001)	(2001)	(1975)	(1964)	(1972)	(1964)	(1964)

16419500 PAPIO GULCH AT HALAWA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1963 - 2004	
ANNUAL TOTAL	100.57		360.82			
ANNUAL MEAN	0.28		0.99		0.78	
HIGHEST ANNUAL MEAN					2.32	1989
LOWEST ANNUAL MEAN					0.06	2001
HIGHEST DAILY MEAN	16	Jan 30	25	Jan 3	164	Apr 13, 1965
LOWEST DAILY MEAN	0.00	Jan 1	0.00	Oct 1	0.00	Jul 5, 1963
ANNUAL SEVEN-DAY MINIMUM	0.00	Jan 1	0.00	Oct 1	0.00	Aug 3, 1963
ANNUAL RUNOFF (AC-FT)	199		716		562	
10 PERCENT EXCEEDS	0.43		1.7		1.4	
50 PERCENT EXCEEDS	0.00		0.40		0.18	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

e Estimated

Surface-Water Station Records for Maui

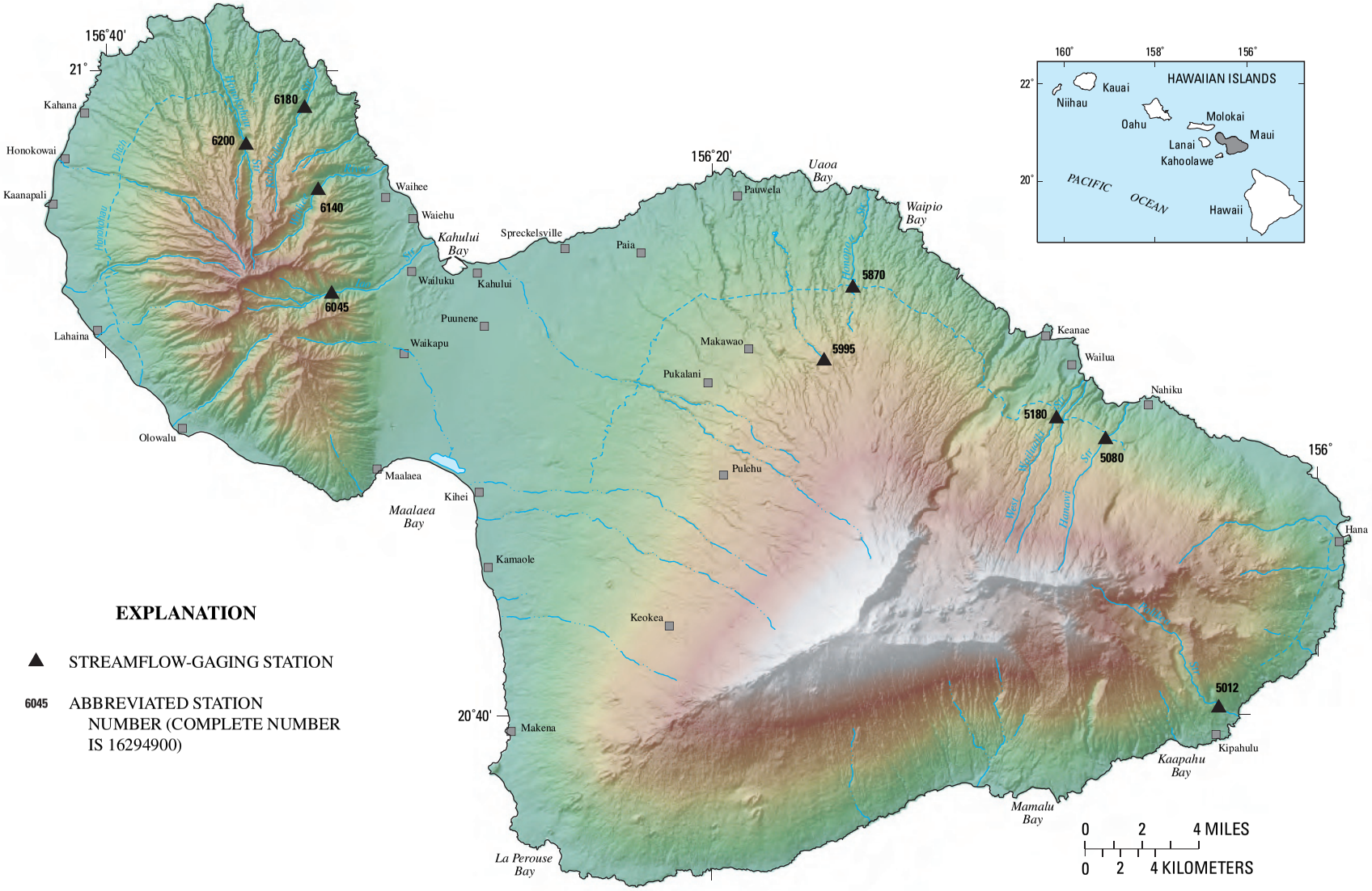


Figure 8. Locations of streamflow-gaging stations on Maui.

16501200 OHEO GULCH AT DAM NEAR KIPAHULU

LOCATION.--Lat 20°40'17", long 156°03'17", Old Hawaiian Datum, Hydrologic Unit 20020000, on right bank 31 ft. upstream from dam, 1,000 ft. downstream from the confluence of Palikea and Pipiwai Streams, 0.8 mi. upstream from mouth, and 1.0 mi. north from Kipahulu Church.

DRAINAGE AREA.--8.06 mi^2.

PERIOD OF RECORD.--July 1988 to September 1997. Oct. 2001 to Sept 2002 (peak discharge and discharge measurements only), Oct. 2002 to current year.

REVISED RECORDS.--WDR HI-94-1: 1989-93 (P).

GAGE.--Water-stage recorder. Elevation of the gage is 420 ft. above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversions upstream of gage.

AVERAGE DISCHARGE.--11 years (water years 1989-97, 2003-2004), 53.3 ft^3/s (38,650 acre ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,700 ft^3/s, September 18, 1994 from rating curve extended on the basis of flow over dam computation; no flow, on many days.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,680 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 28	2130	6,660	8.68	Mar 22	0815	5,380	7.95
Dec 6	0830	2,990	6.30	Mar 26	1615	3,130	6.41
Feb 27	2315	3,690	6.84	Aug 3	1215	*6,940	*8.83

Minimum discharge, 0.42 ft^3/s, Sept. 13, gage height, 0.71 ft.

REVISIONS.--Peak discharge and annual maximum (*) for water years 2002 and 2003 have been revised, as shown in the following table. These figures supercede those published reports for 2002 and 2003.

Water Year	Date	Discharge (ft^3/s)	Gage Height (ft.)
2002	Oct 24, 2001	*5,510	*8.03
	Nov 27, 2001	3,580	6.76
	May 13, 2002	4,560	7.44
2003	Oct 15, 2002	*4,780	7.58
	April 10, 2003	4,580	7.45

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	7.6	100	135	77	4.7	40	2.0	11	13	1.1	1.3
2	1.3	44	25	98	11	3.2	9.5	1.9	8.8	85	71	1.1
3	1.0	46	18	964	52	4.2	6.9	1.7	3.9	13	793	0.95
4	0.94	167	123	122	163	28	4.4	108	3.7	6.7	153	0.77
5	0.81	126	442	17	32	56	3.6	131	3.3	3.9	7.3	0.63
6	0.95	92	484	7.5	124	7.8	3.0	69	3.6	2.4	8.7	0.70
7	3.0	49	62	4.5	214	4.5	2.7	10	8.0	1.8	68	0.67
8	33	11	126	3.4	41	40	2.7	4.2	32	1.9	38	0.68
9	22	5.0	120	e3.0	8.2	7.3	25	2.5	7.3	2.3	10	0.77
10	3.1	93	518	2.5	4.6	3.2	209	1.8	37	1.5	6.8	0.59
11	124	90	110	2.3	3.5	2.3	31	5.4	55	2.4	28	0.80
12	78	70	11	2.7	2.5	166	177	83	69	24	20	1.6
13	82	140	30	2.1	2.2	15	36	4.9	38	64	9.0	0.55
14	128	261	8.4	159	1.9	119	54	4.2	15	8.0	28	2.5
15	172	147	5.6	23	2.0	6.3	22	3.1	4.7	27	8.0	0.86
16	38	392	4.0	5.9	1.7	2.8	139	77	6.4	9.4	15	1.3
17	39	132	3.4	3.5	1.9	1.6	138	9.8	2.1	4.7	9.9	5.4
18	7.7	47	3.3	2.6	14	1.3	31	3.9	1.7	2.5	4.1	8.2
19	4.3	52	3.0	2.1	3.9	1.3	197	2.5	2.4	1.7	3.1	27
20	3.0	10	2.9	1.9	1.6	1.2	168	1.8	7.8	1.3	1.9	5.1
21	2.3	5.9	2.5	1.7	1.4	33	35	1.5	3.0	1.1	6.0	1.9
22	2.0	4.0	2.1	1.6	1.4	1,600	61	1.5	5.2	1.0	50	6.6
23	20	3.1	2.0	4.0	1.5	118	137	3.1	4.6	0.93	103	69
24	7.0	3.0	1.9	1.4	2.9	102	37	8.3	3.1	0.90	7.0	17
25	3.2	2.5	2.4	117	9.9	575	8.7	22	2.1	0.74	3.9	9.6
26	5.4	2.5	4.8	65	6.7	512	6.5	5.5	3.3	0.77	11	9.0
27	25	2.3	2.2	26	273	490	4.3	24	4.9	0.75	11	11
28	9.4	356	1.7	6.6	311	26	3.3	130	11	2.2	5.7	4.6
29	3.5	1,200	1.6	41	11	32	2.6	27	25	1.8	2.7	6.0
30	2.3	437	1.5	99	---	325	2.2	310	49	1.8	1.8	30
31	3.1	---	7.8	193	---	96	---	99	---	1.6	1.5	---
TOTAL	826.50	3,997.9	2,230.1	2,118.3	1,380.8	4,384.7	1,597.4	1,159.6	431.9	290.09	1,487.5	226.17
MEAN	26.7	133	71.9	68.3	47.6	141	53.2	37.4	14.4	9.36	48.0	7.54
MAX	172	1,200	518	964	311	1,600	209	310	69	85	793	69
MIN	0.81	2.3	1.5	1.4	1.4	1.2	2.2	1.5	1.7	0.74	1.1	0.55
AC-FT	1,640	7,930	4,420	4,200	2,740	8,700	3,170	2,300	857	575	2,950	449

16501200 OHEO GULCH AT DAM NEAR KIPAHULU—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	48.5	92.1	81.8	51.7	48.7	88.3	45.7	25.0	31.3	43.9	33.0	38.3
MAX	145	334	203	218	163	320	116	99.1	88.8	114	82.4	131
(WY)	(1990)	(1991)	(1993)	(1989)	(1994)	(1991)	(1989)	(1989)	(1997)	(1993)	(1991)	(1994)
MIN	6.03	0.77	5.28	1.94	2.90	8.90	6.56	3.03	6.05	9.36	5.33	5.62
(WY)	(1993)	(2003)	(1990)	(1998)	(1992)	(2003)	(1992)	(1992)	(2003)	(2004)	(1997)	(1997)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1988 - 2004	
ANNUAL TOTAL	13,334.66		20,130.96			
ANNUAL MEAN	36.5		55.0		53.3	
HIGHEST ANNUAL MEAN					102	1991
LOWEST ANNUAL MEAN					20.6	2003
HIGHEST DAILY MEAN	1,200	Nov 29	1,600	Mar 22	2,220	Nov 19, 1990
LOWEST DAILY MEAN	0.00	Jan 11	0.55	Sep 13	0.00	Feb 25, 1992
ANNUAL SEVEN-DAY MINIMUM	0.10	Jan 6	0.69	Sep 4	0.00	Feb 25, 1992
ANNUAL RUNOFF (AC-FT)	26,450		39,930		38,650	
10 PERCENT EXCEEDS	118		133		138	
50 PERCENT EXCEEDS	4.8		6.8		6.4	
90 PERCENT EXCEEDS	0.86		1.5		1.0	

e Estimated

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau Ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to November 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

REMARKS.--Records computed by Phillip Teeters. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--82 years (water years 1923-2004), 23.8 ft^3/s (17,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, January 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, October 28 to November 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 28	2115	1,820	6.68
Feb 27	2315	2,000	7.03
Mar 22	0915	*2,800	*8.41

Minimum discharge, 2.2 ft^3/s, Sept. 9, 13, gage height, 0.21 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	2.6	11	33	26	5.0	16	10	13	7.3	3.0	2.8
2	3.3	2.6	11	17	13	5.8	23	9.0	11	16	94	2.7
3	3.2	2.6	26	175	9.3	24	21	8.6	7.9	8.0	56	2.6
4	3.1	3.7	218	15	7.4	6.4	13	122	7.5	6.2	7.4	2.6
5	3.0	4.5	94	8.5	15	5.5	12	129	7.2	5.5	4.5	2.5
6	3.0	4.2	63	7.0	17	4.8	11	219	7.3	5.0	4.0	2.5
7	3.3	3.4	19	6.3	22	15	10	79	9.5	4.7	5.9	2.4
8	4.3	2.8	94	5.8	9.3	123	9.5	15	13	4.6	3.8	2.4
9	4.3	2.6	70	5.4	6.8	9.6	115	10	17	5.7	3.4	2.4
10	3.2	7.3	156	5.0	5.7	17	431	14	16	4.6	3.3	2.4
11	7.2	14	45	4.8	5.0	8.9	221	13	15	4.3	3.2	2.4
12	4.9	9.2	16	4.6	4.8	6.3	308	18	15	4.6	3.4	2.5
13	8.1	30	24	4.4	4.9	135	34	9.0	11	10	3.2	2.3
14	23	77	14	4.3	4.3	316	25	8.2	8.2	7.9	3.1	4.3
15	46	32	13	4.1	4.1	25	43	8.0	7.3	14	2.9	2.7
16	26	90	12	4.0	8.9	18	79	46	6.3	6.4	5.1	2.5
17	17	20	17	3.9	5.3	23	115	14	5.8	5.5	3.9	2.8
18	6.5	30	17	3.8	4.3	11	29	9.4	5.5	4.6	3.1	3.4
19	4.9	84	14	3.7	4.0	7.6	48	8.5	5.6	4.2	2.9	5.7
20	4.4	14	12	3.6	3.8	6.4	15	8.1	6.8	3.8	2.8	3.7
21	4.0	8.8	12	3.6	3.6	215	12	7.6	6.0	3.6	2.8	2.7
22	3.7	6.2	11	3.6	3.6	1,040	12	7.1	5.9	3.5	9.2	2.5
23	3.5	4.9	10	4.3	3.5	191	22	6.7	5.7	3.4	28	6.1
24	3.3	4.8	9.5	5.5	3.6	74	16	6.5	6.0	3.3	4.7	7.4
25	3.1	4.5	8.7	94	6.8	282	17	9.2	6.2	3.3	3.7	6.9
26	3.0	4.0	8.2	57	4.0	23	89	8.7	5.6	3.2	4.7	8.8
27	2.9	3.6	7.6	12	186	60	26	24	5.2	3.3	4.5	6.3
28	2.8	218	7.4	5.9	152	34	15	40	7.1	5.8	3.5	5.0
29	2.7	87	6.9	71	6.9	89	13	18	11	3.8	3.1	4.3
30	2.7	19	6.6	35	---	119	12	99	9.8	3.2	3.0	9.2
31	2.6	---	6.5	49	---	53	---	32	---	3.2	2.8	---
TOTAL	216.4	797.3	1,040.4	660.1	550.9	2,953.3	1,812.5	1,016.6	264.4	172.5	288.9	116.8
MEAN	6.98	26.6	33.6	21.3	19.0	95.3	60.4	32.8	8.81	5.56	9.32	3.89
MAX	46	218	218	175	186	1,040	431	219	17	16	94	9.2
MIN	2.6	2.6	6.5	3.6	3.5	4.8	9.5	6.5	5.2	3.2	2.8	2.3
AC-FT	429	1,580	2,060	1,310	1,090	5,860	3,600	2,020	524	342	573	232

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2004, BY WATER YEAR (WY)

MEAN	15.0	29.6	32.2	30.2	30.7	40.9	36.0	19.9	11.0	15.8	16.8	11.4
MAX	101	110	129	123	182	235	161	68.2	61.2	62.0	66.2	52.3
(WY)	(1942)	(1991)	(1947)	(1979)	(1969)	(1980)	(1989)	(1987)	(1997)	(1997)	(1957)	(1914)
MIN	1.15	2.99	2.71	1.87	2.25	2.10	2.75	2.82	2.16	2.42	2.40	1.88
(WY)	(1985)	(1990)	(1981)	(1977)	(1983)	(1983)	(1992)	(1945)	(1981)	(1926)	(1973)	(1974)

16508000 HANAWI STREAM NEAR NAHIKU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1914 - 2004	
ANNUAL TOTAL	5,912.1		9,890.1			
ANNUAL MEAN	16.2		27.0		23.8	
HIGHEST ANNUAL MEAN					52.6	1969
LOWEST ANNUAL MEAN					7.59	1926
HIGHEST DAILY MEAN	517	Feb 14	1,040	Mar 22	1,610	Jan 25, 1948
LOWEST DAILY MEAN	1.6	Feb 13	2.3	Sep 13	0.90	Oct 31, 1984
ANNUAL SEVEN-DAY MINIMUM	1.9	Feb 7	2.4	Sep 7	0.96	Oct 25, 1984
ANNUAL RUNOFF (AC-FT)	11,730		19,620		17,220	
10 PERCENT EXCEEDS	30		72		50	
50 PERCENT EXCEEDS	4.4		7.2		7.0	
90 PERCENT EXCEEDS	2.2		3.0		2.8	

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau Ditch crossing and trail bridge, and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to October 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records computed by Phillip Teeters. Records fair. No diversion upstream of station. Water is diverted by Koolau Ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--84 years (water years 1915, 1917, 1923-2004), 34.5 ft^3/s (24,980 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, January 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 28	2130	2,980	8.88	Mar 22	1245	*7,510	*12.46
Jan 24	1615	3,840	9.69	Mar 25	0700	2,470	8.35
Feb 27	2315	2,510	8.39	Apr 10	0215	2,700	8.60
Mar 13	1600	2,640	8.53	May 6	1045	2,010	7.79

Minimum discharge, 2.2 ft^3/s, Sept. 10, gage height, 0.58 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	3.2	18	20	27	9.3	28	15	18	9.0	3.1	3.4
2	3.1	3.2	19	21	16	8.5	31	13	15	17	107	3.2
3	3.0	3.6	36	154	12	41	26	16	12	9.8	75	3.1
4	2.8	6.0	291	24	9.7	13	16	171	10	7.9	13	2.9
5	2.7	5.7	95	11	15	9.2	14	161	11	7.0	7.1	2.8
6	2.8	4.9	46	8.3	16	7.6	12	278	11	6.2	5.6	2.7
7	4.5	4.2	21	7.1	22	14	11	e66	12	5.7	8.2	2.6
8	6.7	3.3	112	6.5	11	125	10	27	18	5.3	4.8	2.5
9	6.4	3.1	67	6.0	9.1	18	163	19	23	8.9	4.1	2.5
10	4.0	6.4	131	5.5	7.7	28	664	21	20	5.1	4.1	2.5
11	9.4	14	47	5.1	7.1	14	267	17	20	4.4	3.9	3.1
12	5.9	11	20	4.8	7.3	10	400	17	17	5.6	4.2	4.3
13	9.4	49	33	4.6	8.1	294	47	12	14	17	3.6	4.5
14	33	92	17	4.3	6.2	499	30	11	11	12	3.4	13
15	72	45	15	4.2	5.8	42	43	11	11	25	3.1	4.2
16	36	86	12	4.1	14	30	80	68	10	11	6.6	3.9
17	27	23	20	4.0	8.2	29	126	23	8.6	9.0	4.8	6.1
18	11	38	23	3.8	6.5	20	45	14	8.1	6.5	3.3	9.2
19	8.2	124	14	3.5	5.7	16	47	12	8.2	5.4	3.0	16
20	6.7	25	11	3.3	5.2	13	24	11	9.5	4.7	2.9	7.3
21	5.8	17	9.9	4.0	4.8	207	18	11	8.1	4.4	2.9	4.4
22	5.3	13	9.0	4.0	4.6	1,500	16	9.3	7.5	4.1	24	3.7
23	4.8	10	8.3	9.1	4.3	175	22	8.5	7.8	3.9	60	23
24	4.5	10	7.8	155	4.4	74	20	8.5	7.9	3.7	11	13
25	4.9	9.4	7.0	76	9.1	313	18	13	8.0	3.5	6.7	12
26	4.1	8.0	6.5	61	4.8	36	113	12	7.0	3.4	9.4	14
27	3.9	7.3	6.1	18	216	26	42	31	6.5	3.9	7.3	10
28	3.7	273	6.4	9.8	175	66	23	48	9.3	7.9	5.6	8.9
29	3.5	79	5.8	99	14	89	19	22	12	3.8	4.4	6.9
30	3.3	26	5.5	37	---	134	18	89	11	3.3	3.9	14
31	3.2	---	5.8	47	---	62	---	33	---	3.6	3.6	---
TOTAL	304.8	1,003.3	1,126.1	825.0	656.6	3,922.6	2,393	1,268.3	352.5	228.0	409.6	209.7
MEAN	9.83	33.4	36.3	26.6	22.6	127	79.8	40.9	11.8	7.35	13.2	6.99
MAX	72	273	291	155	216	1,500	664	278	23	25	107	23
MIN	2.7	3.1	5.5	3.3	4.3	7.6	10	8.5	6.5	3.3	2.9	2.5
AC-FT	605	1,990	2,230	1,640	1,300	7,780	4,750	2,520	699	452	812	416

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2004, BY WATER YEAR (WY)

MEAN	23.7	45.3	47.7	41.4	45.5	55.9	53.5	28.8	16.4	24.6	25.6	17.8
MAX	133	198	200	192	222	303	221	88.4	67.7	99.4	111	101
(WY)	(1942)	(1922)	(1937)	(1979)	(1932)	(1942)	(1989)	(1914)	(1997)	(1914)	(1914)	(1914)
MIN	0.88	4.06	2.82	2.01	2.65	2.04	4.17	3.86	2.37	1.72	2.85	1.68
(WY)	(1985)	(1992)	(1981)	(1977)	(1995)	(1926)	(1992)	(1945)	(1981)	(1922)	(1973)	(1974)

16518000 WEST WAILUAIKI STREAM NEAR KEANAE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1914 - 2004	
ANNUAL TOTAL	7,363.6		12,699.5			
ANNUAL MEAN	20.2		34.7		34.5	
HIGHEST ANNUAL MEAN					67.3	1980
LOWEST ANNUAL MEAN					14.5	1981
HIGHEST DAILY MEAN	665	Feb 14	1,500	Mar 22	2,260	Jan 26, 1948
LOWEST DAILY MEAN	1.2	Jun 11	2.5	Sep 8	0.62	Jul 23, 1922
ANNUAL SEVEN-DAY MINIMUM	1.6	Jun 5	2.6	Sep 4	0.71	Oct 25, 1984
ANNUAL RUNOFF (AC-FT)	14,610		25,190		24,980	
10 PERCENT EXCEEDS	38		75		73	
50 PERCENT EXCEEDS	6.7		10		10	
90 PERCENT EXCEEDS	2.8		3.6		3.3	

e Estimated

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank 75 ft upstream from Wailoa Ditch intake, 2.2 mi southwest of Huelo, and 2.5 mi west of Kailua.

DRAINAGE AREA.--0.64 mi^2.

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorders and steel weir plate. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records computed by Phillip Teeters. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--93 years (water years 1912-2004), 4.78 ft^3/s (3,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, November 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of physical model of station site; minimum, 0.02 ft^3/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 22	0515	*2,980	*5.76
Apr 9	2345	328	3.18

Minimum discharge, 0.35 ft^3/s, Sept. 21, 22, 28, 29, 30, gage height, 0.44 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.88	0.63	6.0	2.2	3.2	1.4	11	4.2	5.4	1.3	0.50	0.54
2	0.82	0.61	7.5	2.4	2.0	15	15	3.8	5.4	2.4	4.0	0.52
3	0.80	0.64	5.8	13	1.8	17	11	3.6	4.4	1.3	4.7	0.51
4	0.76	0.82	25	3.8	1.6	4.7	8.4	8.6	4.1	1.1	1.2	0.51
5	0.70	0.77	27	2.8	1.9	3.8	7.5	8.5	3.8	1.0	0.78	0.51
6	0.70	0.69	17	2.6	2.3	3.4	6.5	13	3.5	0.96	0.78	0.51
7	0.81	0.68	12	2.5	3.7	4.0	5.8	6.4	3.5	0.90	1.1	0.51
8	0.92	0.55	14	2.3	2.0	5.1	5.2	5.3	3.4	0.86	0.70	0.46
9	0.83	0.51	14	2.2	1.7	3.1	18	4.8	3.7	1.5	0.63	0.50
10	0.70	1.0	28	2.1	1.7	2.8	53	9.6	3.8	0.85	0.60	0.45
11	1.4	1.2	18	2.0	1.6	4.9	23	7.3	4.0	0.80	0.63	0.56
12	0.83	1.2	12	1.9	1.6	3.1	73	5.2	3.1	0.82	0.66	0.57
13	1.1	3.1	11	1.8	1.5	2.8	19	4.8	3.0	1.0	0.60	0.53
14	2.3	3.8	8.6	1.6	1.4	41	15	4.5	2.5	0.88	0.57	0.71
15	5.4	2.2	7.6	1.6	1.6	8.6	14	4.4	2.4	1.9	0.53	0.43
16	2.2	8.9	6.4	1.5	3.5	6.9	16	18	2.1	1.1	0.65	0.46
17	2.6	4.4	6.8	1.4	1.5	6.1	12	5.8	2.0	0.99	0.55	0.43
18	1.1	2.8	5.3	1.4	1.3	5.2	9.6	5.0	1.9	0.76	0.51	0.45
19	0.93	17	4.6	1.3	1.3	4.6	17	4.7	1.8	0.70	0.51	0.62
20	0.90	4.0	4.1	1.3	1.2	4.3	9.2	4.4	1.9	0.66	0.52	0.64
21	0.82	3.6	3.8	1.3	1.1	10	8.0	4.2	1.8	0.60	0.51	0.39
22	0.80	3.2	3.4	1.2	1.2	299	7.1	3.9	1.7	0.60	2.2	0.36
23	0.77	2.8	3.2	2.3	1.2	32	6.9	3.6	1.6	0.60	2.8	0.96
24	0.70	2.5	3.1	1.3	1.2	17	6.0	3.6	1.6	0.60	0.85	0.54
25	0.70	2.3	2.8	4.1	1.7	30	5.5	5.5	1.6	0.58	0.72	0.62
26	0.70	2.3	2.6	2.9	1.2	14	15	3.4	1.4	0.57	0.89	0.63
27	0.70	2.0	2.3	1.8	1.6	11	7.4	5.2	1.2	0.57	0.68	0.45
28	0.70	8.5	6.1	1.3	6.1	11	5.4	6.6	1.5	0.97	0.64	0.38
29	0.66	11	2.5	1.5	1.5	17	4.9	4.1	1.9	0.55	0.60	0.35
30	0.60	5.3	2.3	2.1	---	35	4.6	31	2.0	0.51	0.60	0.48
31	0.61	---	2.3	3.2	---	16	---	6.5	---	0.59	0.57	---
TOTAL	34.44	99.00	275.1	74.7	55.2	639.8	420.0	209.5	82.0	28.52	31.78	15.58
MEAN	1.11	3.30	8.87	2.41	1.90	20.6	14.0	6.76	2.73	0.92	1.03	0.52
MAX	5.4	17	28	13	6.1	299	73	31	5.4	2.4	4.7	0.96
MIN	0.60	0.51	2.3	1.2	1.1	1.4	4.6	3.4	1.2	0.51	0.50	0.35
AC-FT	68	196	546	148	109	1,270	833	416	163	57	63	31

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2004, BY WATER YEAR (WY)

MEAN	2.73	5.42	6.13	5.42	5.17	7.26	7.49	4.97	2.72	3.52	3.93	2.56
MAX	15.9	21.4	20.0	20.9	24.5	33.0	43.4	24.3	9.97	14.6	18.1	14.6
(WY)	(1942)	(1991)	(1947)	(1921)	(1969)	(1942)	(1989)	(1916)	(1914)	(1997)	(1982)	(1992)
MIN	0.15	0.25	1.04	0.57	0.62	0.79	0.58	0.84	0.37	0.41	0.40	0.25
(WY)	(1985)	(1963)	(1981)	(2001)	(1983)	(1992)	(1992)	(1933)	(2000)	(1981)	(1973)	(1984)

16587000 HONOPOU STREAM NEAR HUELO—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1912 - 2004	
ANNUAL TOTAL	1,150.61		1,965.62			
ANNUAL MEAN	3.15		5.37		4.78	
HIGHEST ANNUAL MEAN					9.88	1914
LOWEST ANNUAL MEAN					1.73	1981
HIGHEST DAILY MEAN	97	Feb 14	299	Mar 22	305	Apr 7, 1989
LOWEST DAILY MEAN	0.40	Jun 11	0.35	Sep 29	0.11	Oct 27, 1984
ANNUAL SEVEN-DAY MINIMUM	0.45	Jun 5	0.48	Sep 16	0.11	Oct 26, 1984
ANNUAL RUNOFF (AC-FT)	2,280		3,900		3,460	
10 PERCENT EXCEEDS	6.6		12		9.9	
50 PERCENT EXCEEDS	1.5		2.1		2.4	
90 PERCENT EXCEEDS	0.66		0.57		0.72	

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--39 years (water years 1966-2004), 3.14 ft^3/s (2,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 24 ft^3/s, April 10, 2004; minimum daily, 0.11 ft^3/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s, Apr. 10; minimum daily, 0.20 ft^3/s, Sept. 8-10.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.69	0.34	5.1	2.4	4.9	2.5	11	2.8	4.4	1.3	0.43	0.36
2	0.64	0.33	7.2	2.4	3.8	4.2	9.3	2.5	4.0	1.6	2.4	0.33
3	0.62	0.33	5.6	8.1	2.6	9.5	8.7	3.9	3.6	1.4	6.5	0.30
4	0.58	0.50	7.7	6.8	2.2	6.0	6.6	9.3	3.4	1.2	2.7	0.27
5	0.58	0.48	8.7	3.9	2.1	3.4	5.2	10	3.1	1.1	1.4	0.24
6	0.56	0.37	6.2	3.0	2.1	2.6	4.2	11	3.0	0.99	1.0	0.24
7	0.62	0.34	4.8	2.5	2.3	2.4	3.6	7.6	3.1	0.93	1.5	0.23
8	0.73	0.30	7.8	2.4	3.6	8.0	3.2	6.5	3.7	0.90	1.1	0.21
9	0.86	0.28	8.5	2.2	4.2	6.5	5.3	6.0	4.0	1.0	0.85	0.21
10	0.63	0.31	9.7	2.1	2.4	4.9	24	5.8	4.7	0.87	0.70	0.21
11	0.76	0.43	8.1	2.0	2.0	5.9	20	5.7	4.3	0.81	0.61	0.22
12	0.72	0.45	6.8	1.9	1.9	5.0	23	5.7	3.4	0.82	0.60	0.28
13	0.69	2.8	7.6	1.8	1.8	6.8	16	5.5	2.9	1.1	0.57	0.30
14	2.4	8.3	6.5	1.7	1.6	13	13	5.2	2.6	1.2	0.52	0.77
15	8.2	7.0	5.8	1.6	1.6	8.8	13	5.0	2.4	2.1	0.48	0.42
16	3.9	8.9	5.0	1.6	3.4	7.3	17	8.9	2.3	1.6	0.45	0.29
17	5.1	4.8	6.1	1.6	2.2	6.3	18	6.4	2.1	1.2	0.42	0.30
18	1.9	3.1	6.8	1.5	1.8	5.4	13	5.7	2.0	0.93	0.38	0.38
19	1.2	7.7	5.2	1.4	1.5	4.7	12	5.3	1.9	0.80	0.36	0.81
20	0.88	5.6	4.3	1.4	1.4	4.3	9.9	5.1	1.9	0.72	0.34	0.62
21	0.71	4.4	3.9	1.4	1.3	6.9	7.9	4.8	1.9	0.65	0.32	0.34
22	0.61	3.2	3.6	1.3	1.2	20	6.1	4.5	1.8	0.63	1.2	0.27
23	0.60	2.2	3.3	2.9	1.1	16	5.5	4.2	1.7	0.59	6.3	1.3
24	0.54	1.8	3.1	1.7	1.1	12	4.8	4.1	1.7	0.56	2.2	0.71
25	0.51	1.6	3.0	1.9	1.4	20	3.8	4.4	1.6	0.53	1.2	0.42
26	0.48	1.7	2.7	4.7	1.1	13	6.4	4.0	1.5	0.52	0.97	0.33
27	0.44	1.5	2.5	4.0	1.4	11	6.9	4.8	1.4	0.54	1.1	0.29
28	0.43	3.1	3.7	2.0	8.7	14	4.5	6.4	1.4	0.83	0.75	0.24
29	0.43	8.0	2.7	7.8	3.2	15	3.6	5.0	1.6	0.58	0.56	0.24
30	0.38	6.0	2.4	5.7	---	18	3.1	6.2	1.5	0.50	0.46	0.24
31	0.35	---	2.4	7.5	---	13	---	5.4	---	0.47	0.40	---
TOTAL	37.74	86.16	166.8	93.2	69.9	276.4	288.6	177.7	78.9	28.97	38.77	11.37
MEAN	1.22	2.87	5.38	3.01	2.41	8.92	9.62	5.73	2.63	0.93	1.25	0.38
MAX	8.2	8.9	9.7	8.1	8.7	20	24	11	4.7	2.1	6.5	1.3
MIN	0.35	0.28	2.4	1.3	1.1	2.4	3.1	2.5	1.4	0.47	0.32	0.21
AC-FT	75	171	331	185	139	548	572	352	156	57	77	23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2004, BY WATER YEAR (WY)

MEAN	1.85	3.26	3.98	3.60	3.64	4.66	5.07	3.42	2.11	2.51	2.13	1.51
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.62	7.42	6.38	8.17	4.98	5.69
(WY)	(1984)	(1968)	(1971)	(1989)	(1969)	(1982)	(2004)	(1987)	(1997)	(1997)	(1969)	(1992)
MIN	0.14	0.25	0.65	0.22	0.36	0.51	0.27	0.54	0.50	0.40	0.19	0.15
(WY)	(1985)	(1992)	(1977)	(1977)	(1978)	(1983)	(1992)	(2003)	(1999)	(1981)	(1974)	(1984)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1965 - 2004	
ANNUAL TOTAL	755.94		1,354.51			
ANNUAL MEAN	2.07		3.70		3.14	
HIGHEST ANNUAL MEAN					5.34	1969
LOWEST ANNUAL MEAN					1.45	1981
HIGHEST DAILY MEAN	11	Feb 15	24	Apr 10	24	Apr 10, 2004
LOWEST DAILY MEAN	0.20	Jun 11	0.21	Sep 8	0.11	Nov 5, 1973
ANNUAL SEVEN-DAY MINIMUM	0.26	May 28	0.22	Sep 5	0.11	Nov 4, 1973
ANNUAL RUNOFF (AC-FT)	1,500		2,690		2,280	
10 PERCENT EXCEEDS	5.6		8.4		7.7	
50 PERCENT EXCEEDS	1.1		2.3		2.1	
90 PERCENT EXCEEDS	0.36		0.38		0.38	

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank of Maniania and Waikapu Ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi^2.

PERIOD OF RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 780 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records fair. No appreciable diversion upstream of station.

AVERAGE DISCHARGE.--21 years (water years 1984-2004), 64.0 ft^3/s (46,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft^3/s, January 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 9.6 ft^3/s on September 28, 29, 2004.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/s, December 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 3	0115	4,080	7.32
Jan 14	1715	1,130	4.03
Feb 27	2230	*4,770	*7.87
Mar 1	1000	1,040	3.89
Mar 14	0130	1,430	4.49
Mar 22	0415	3,480	6.79
Mar 30	0200	1,010	3.83
Apr 10	0145	1,670	4.81
May 16	0000	1,420	4.47

Minimum discharge, 10 ft^3/s, on several days, gage height, 0.73 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	16	213	367	64	419	169	38	75	39	17	12
2	16	15	228	479	38	186	193	36	70	83	294	12
3	16	13	105	1,140	33	112	195	31	48	34	142	12
4	15	14	283	304	48	68	93	188	45	30	41	12
5	15	13	397	128	62	51	69	218	41	25	27	12
6	15	14	268	78	84	44	58	442	39	23	31	14
7	15	14	152	54	50	124	49	256	56	28	47	14
8	18	14	139	45	35	242	43	127	46	23	23	12
9	18	13	110	39	30	92	543	72	93	55	21	12
10	15	13	150	36	31	63	912	56	43	24	20	12
11	30	14	75	36	27	91	417	53	60	23	23	16
12	25	12	55	32	25	51	571	44	49	27	21	16
13	26	37	94	29	24	160	273	40	36	26	20	13
14	76	37	50	189	24	675	154	44	33	25	17	18
15	114	20	50	77	22	287	98	183	29	36	15	13
16	42	47	37	45	27	155	81	256	28	28	18	14
17	51	30	58	38	23	108	77	73	26	24	15	14
18	24	101	46	34	22	76	57	48	26	20	14	13
19	21	257	33	31	20	60	83	41	28	18	13	16
20	20	61	29	29	19	94	60	72	46	18	15	14
21	19	104	27	29	18	588	49	46	28	17	17	13
22	18	50	25	27	19	1,700	50	40	28	16	145	12
23	17	34	35	104	21	566	109	39	31	18	116	35
24	16	28	37	33	18	239	77	33	26	19	30	17
25	16	27	28	93	52	208	63	50	41	18	24	15
26	17	25	26	70	26	103	204	33	34	18	45	13
27	15	21	26	42	527	78	85	92	26	18	21	12
28	15	55	25	34	346	108	56	125	59	23	18	12
29	15	225	23	94	159	271	46	145	48	18	15	11
30	15	82	25	49	---	636	40	300	58	18	13	16
31	15	---	25	59	---	279	---	205	---	21	13	---
TOTAL	766	1,406	2,874	3,844	1,894	7,934	4,974	3,426	1,296	813	1,291	427
MEAN	24.7	46.9	92.7	124	65.3	256	166	111	43.2	26.2	41.6	14.2
MAX	114	257	397	1,140	527	1,700	912	442	93	83	294	35
MIN	15	12	23	27	18	44	40	31	26	16	13	11
AC-FT	1,520	2,790	5,700	7,620	3,760	15,740	9,870	6,800	2,570	1,610	2,560	847

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	50.0	67.0	63.6	70.2	58.0	82.6	82.8	63.4	55.1	66.1	59.6	46.2
MAX	103	132	103	149	108	256	230	136	110	137	97.0	133
(WY)	(1984)	(1998)	(1997)	(1988)	(1994)	(2004)	(1989)	(1987)	(1998)	(1994)	(1993)	(1992)
MIN	11.9	20.5	18.3	23.5	24.0	23.6	20.8	23.4	24.4	25.2	26.0	14.2
(WY)	(1985)	(1985)	(1985)	(2001)	(2000)	(1998)	(1992)	(1999)	(1985)	(1984)	(1984)	(2004)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1983 - 2004	
ANNUAL TOTAL	16,128		30,945			
ANNUAL MEAN	44.2		84.5		64.0	
HIGHEST ANNUAL MEAN					93.4	1994
LOWEST ANNUAL MEAN					39.3	2003
HIGHEST DAILY MEAN	397	Dec 5	1,700	Mar 22	1,700	Mar 22, 2004
LOWEST DAILY MEAN	12	Nov 12	11	Sep 29	11	Oct 7, 1984
ANNUAL SEVEN-DAY MINIMUM	13	Nov 6	12	Aug 30	11	Oct 16, 1984
ANNUAL RUNOFF (AC-FT)	31,990		61,380		46,370	
10 PERCENT EXCEEDS	85		206		132	
50 PERCENT EXCEEDS	27		36		40	
90 PERCENT EXCEEDS	17		15		20	

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--Lat 20°56'21", long 156°32'59", Old Hawaiian Datum, Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi^2.

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to December 31, 1913, due to Waihee canal diversion of water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--20 years (water years 1985-2004), 76.4 ft^3/s (55,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,660 ft^3/s, January 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 14 ft^3/s, July 13, 1995.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 1	1345	2,680	5.41	Feb 27	2200	2,190	5.01
Jan 1	1515	*4,430	*6.58	Mar 22	0415	3,350	5.90
Feb 27	1730	3,380	5.92	Mar 22	1500	2,310	5.11

Minimum discharge, 31 ft^3/s, on several days, gage height, 1.23 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e34	34	103	330	62	131	86	65	70	62	45	43
2	e33	33	92	201	46	71	111	64	81	76	125	42
3	e33	32	79	346	44	79	90	63	63	55	74	41
4	e32	34	320	68	59	55	63	128	62	59	49	40
5	e32	33	300	54	59	50	60	110	60	54	46	41
6	e32	37	153	51	59	55	66	269	61	52	56	40
7	e32	37	76	49	124	112	59	93	67	64	70	40
8	e36	33	78	49	50	96	58	71	66	54	48	40
9	e36	32	75	48	44	53	327	67	81	71	46	39
10	e31	33	95	47	42	51	364	78	63	52	45	40
11	60	33	55	46	41	120	168	82	66	50	46	44
12	52	32	50	46	44	53	248	68	63	52	51	44
13	47	50	69	45	44	84	109	63	57	52	48	43
14	77	48	50	91	40	327	80	62	57	54	45	51
15	91	37	61	49	42	126	75	86	57	57	44	41
16	67	49	45	45	67	77	78	103	56	56	60	42
17	65	54	73	45	44	80	79	67	54	53	46	42
18	40	114	51	44	40	58	71	62	54	49	44	41
19	37	172	45	44	40	53	99	61	54	49	43	46
20	36	48	44	43	40	81	106	66	68	48	42	42
21	35	64	43	44	39	383	76	61	57	48	43	40
22	35	43	42	43	56	907	76	59	56	47	93	39
23	35	41	54	77	62	164	95	64	56	47	64	53
24	34	40	54	63	43	74	81	61	55	47	46	44
25	34	37	44	95	76	94	77	76	57	46	44	41
26	33	36	43	68	44	65	141	59	58	46	62	39
27	33	33	41	49	378	60	88	92	55	47	45	39
28	33	109	49	45	108	84	72	100	77	53	48	39
29	32	301	41	62	65	158	68	76	69	46	43	39
30	32	85	42	53	---	233	66	159	71	46	42	47
31	33	---	42	49	---	131	---	99	---	50	42	---
TOTAL	1,272	1,764	2,409	2,389	1,902	4,165	3,237	2,634	1,871	1,642	1,645	1,262
MEAN	41.0	58.8	77.7	77.1	65.6	134	108	85.0	62.4	53.0	53.1	42.1
MAX	91	301	320	346	378	907	364	269	81	76	125	53
MIN	31	32	41	43	39	50	58	59	54	46	42	39
AC-FT	2,520	3,500	4,780	4,740	3,770	8,260	6,420	5,220	3,710	3,260	3,260	2,500

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2004, BY WATER YEAR (WY)

MEAN	66.7	79.9	71.3	75.2	67.5	87.7	88.5	76.0	69.2	82.5	74.1	67.7
MAX	91.7	150	109	186	106	179	276	143	118	136	99.6	160
(WY)	(1986)	(1991)	(1988)	(1988)	(1988)	(1994)	(1989)	(1987)	(1987)	(1994)	(1991)	(1992)
MIN	27.4	36.8	31.3	29.4	42.2	43.7	36.6	39.4	35.8	52.3	46.1	32.9
(WY)	(1985)	(1985)	(1985)	(1985)	(1993)	(1992)	(1992)	(2003)	(2003)	(2001)	(1984)	(1984)

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1984 - 2004	
ANNUAL TOTAL	18,990		26,192			
ANNUAL MEAN	52.0		71.6		76.4	
HIGHEST ANNUAL MEAN					106	1994
LOWEST ANNUAL MEAN					50.6	2003
HIGHEST DAILY MEAN	417	Feb 14	907	Mar 22	1,160	Jan 28, 1988
LOWEST DAILY MEAN	28	Jun 8	31	Oct 10	22	Jan 18, 1985
ANNUAL SEVEN-DAY MINIMUM	28	Jun 5	33	Oct 1	23	Jan 18, 1985
ANNUAL RUNOFF (AC-FT)	37,670		51,950		55,320	
10 PERCENT EXCEEDS	76		107		128	
50 PERCENT EXCEEDS	40		54		54	
90 PERCENT EXCEEDS	32		37		38	

e Estimated

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

(National Streamflow Information Program)

LOCATION.--Lat 20°58'54", long 156°33'26", Old Hawaiian Datum, Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi^2.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records poor. No diversion upstream of station.

AVERAGE DISCHARGE.--55 years (water years 1940-42, 1948-70, 1976-2004), 17.9 ft^3/s (13,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, January 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft^3/s, January 22, 28, 29, February 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1530	1,020	6.15	Mar 22	1730	1,810	7.80
Dec 5	0045	716	4.98	Apr 9	1945	926	5.82
Jan 1	1530	*1,810	*7.80	Apr 12	0730	793	5.30
Jan 3	0045	917	5.79	Apr 26	1300	797	5.31
Feb 7	1645	716	4.97	May 6	0930	865	5.58
Feb 27	1830	1,070	6.33	May 10	1715	712	4.95
Mar 14	0500	762	5.18	May 30	0730	712	4.95

Minimum discharge, 3.0 ft^3/s, on several days, gage height, 1.80 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	3.0	71	254	9.9	29	45	12	21	9.7	7.0	6.7
2	3.3	3.0	83	145	7.7	162	34	11	55	18	103	6.7
3	3.3	3.0	60	405	6.0	150	69	11	18	10	54	6.7
4	3.2	3.1	339	25	6.3	27	14	65	15	8.6	10	6.7
5	3.2	3.1	184	12	8.4	17	13	80	14	8.7	7.9	6.7
6	3.2	3.0	84	9.2	9.6	14	12	241	13	8.6	7.6	6.7
7	3.4	3.7	15	7.9	138	104	12	92	12	8.4	50	6.7
8	3.7	3.5	19	7.3	17	52	13	24	14	8.4	9.7	6.7
9	4.1	3.0	17	6.8	7.0	18	432	15	19	15	7.9	6.6
10	3.4	3.0	27	6.4	6.0	14	368	142	20	8.6	7.6	6.5
11	14	3.1	12	6.2	5.7	103	83	124	14	7.8	7.4	6.5
12	5.2	3.0	8.6	6.1	5.9	21	413	31	19	7.8	7.4	6.5
13	6.6	4.7	13	5.9	11	50	56	16	12	7.9	7.2	6.5
14	15	5.6	8.9	9.2	7.3	478	30	13	11	7.8	7.2	e13
15	30	5.0	21	8.0	7.5	167	20	29	11	8.6	7.1	e7.0
16	13	5.4	8.2	5.7	44	46	24	150	9.4	11	20	6.5
17	18	6.9	49	5.5	10	38	26	23	8.9	9.1	12	6.6
18	5.7	99	13	5.3	8.2	23	19	15	8.9	8.4	7.5	6.5
19	4.2	103	8.1	5.3	7.7	18	70	13	8.6	8.1	7.1	7.4
20	3.8	8.5	7.2	5.2	7.5	33	71	24	15	7.9	6.8	6.5
21	3.6	13	6.9	5.2	7.4	374	26	17	9.4	7.9	6.7	6.5
22	3.5	11	6.4	5.2	10	823	18	12	10	7.9	29	6.4
23	3.5	8.7	8.1	70	26	468	21	12	8.6	7.7	23	8.3
24	3.3	13	13	45	11	40	23	11	8.6	7.6	8.6	8.4
25	3.2	5.4	7.0	53	19	46	29	25	8.9	7.4	7.5	7.7
26	3.2	5.0	7.8	24	8.9	19	273	13	9.4	7.4	15	7.0
27	3.2	4.1	7.1	11	237	14	81	35	8.6	7.4	8.1	6.5
28	3.1	43	25	6.6	133	18	23	72	20	7.4	8.0	6.4
29	3.1	220	7.6	12	16	79	16	16	16	7.2	7.6	6.3
30	3.1	61	6.3	10	---	250	13	174	18	7.0	7.0	6.7
31	3.1	---	6.6	7.8	---	97	---	100	---	7.1	7.0	---
TOTAL	185.6	659.8	1,149.8	1,190.8	799.0	3,792	2,347	1,618	436.3	270.4	481.9	209.9
MEAN	5.99	22.0	37.1	38.4	27.6	122	78.2	52.2	14.5	8.72	15.5	7.00
MAX	30	220	339	405	237	823	432	241	55	18	103	13
MIN	3.1	3.0	6.3	5.2	5.7	14	12	11	8.6	7.0	6.7	6.3
AC-FT	368	1,310	2,280	2,360	1,580	7,520	4,660	3,210	865	536	956	416

16618000 KAHAKULOA STREAM NEAR HONOKOHAU—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.0	20.4	18.8	18.6	17.8	26.0	24.2	17.5	12.0	16.0	16.4	11.8
MAX	49.6	51.2	37.5	71.2	50.2	133	121	54.5	28.1	34.4	37.2	40.4
(WY)	(1942)	(1979)	(1955)	(1988)	(1969)	(1942)	(1989)	(1987)	(1987)	(1989)	(1957)	(1992)
MIN	3.20	4.41	4.88	4.82	5.09	5.78	7.02	5.21	4.99	6.32	6.09	4.18
(WY)	(1985)	(1963)	(1985)	(1977)	(1978)	(1961)	(1992)	(1975)	(1962)	(1975)	(1976)	(1984)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1939 - 2004	
ANNUAL TOTAL	5,693.2		13,140.5			
ANNUAL MEAN	15.6		35.9		17.9	
HIGHEST ANNUAL MEAN					35.9	2004
LOWEST ANNUAL MEAN					11.0	1981
HIGHEST DAILY MEAN	398	Feb 14	823	Mar 22	823	Mar 22, 2004
LOWEST DAILY MEAN	3.0	Nov 1	3.0	Nov 1	2.7	Jan 28, 1985
ANNUAL SEVEN-DAY MINIMUM	3.0	Oct 31	3.0	Oct 31	2.8	Feb 6, 1985
ANNUAL RUNOFF (AC-FT)	11,290		26,060		13,000	
10 PERCENT EXCEEDS	27		83		36	
50 PERCENT EXCEEDS	5.7		9.6		8.8	
90 PERCENT EXCEEDS	3.6		4.5		5.1	

e Estimated

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'45", long 156°35'22", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank 1,250 ft upstream from intake of Honokohau Ditch, and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to November 1988, October 1990 to current year. Record since October 1990 equivalent to earlier records.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P). WDR HI-00-1: 1991-99 (P). GAGE.--Water-stage recorders. Elevation of gage is 870 ft above mean sea level (from topographic map). Prior to March 7, 1913, nonrecording gage at site just below Honokohau Ditch intake at different datum. Prior to Oct. 1, 1990, at site 250 ft downstream of gage at datum 26.67 ft lower.

REMARKS.--Records computed by Matt Wong. Records fair. No diversion upstream of station. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau Ditch.

AVERAGE DISCHARGE.--86 years (water years 1914-19, 1923-88, 1991-2004), 39.0 ft^3/s (28,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s, January 28, 1988 (gage-height, 8.38 ft for datum and site then in use) from rating curve extended above 3,200 ft^3/s, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft^3/s, May 1, 1945, January 5, 1946.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov 29	1500	1,170	3.91
Jan 1	1530	2,160	4.45
Jan 3	0030	1,350	4.03
Feb 27	2245	1,480	4.11
Mar 22	0430	*2,460	*4.57

Minimum discharge, 11 ft^3/s, on several days, gage height, 1.36 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	12	77	234	40	64	39	29	33	32	22	20
2	12	12	61	95	19	50	67	29	45	55	111	20
3	12	11	27	305	17	54	60	29	30	27	49	19
4	12	14	152	26	29	24	28	127	29	27	24	19
5	12	12	204	19	31	21	26	109	29	28	22	19
6	12	13	93	18	39	24	26	271	32	24	27	19
7	14	16	43	17	64	68	26	71	39	35	50	19
8	26	13	58	17	20	76	25	36	40	26	23	19
9	20	12	49	17	17	23	351	31	66	58	23	19
10	13	13	96	16	16	24	377	31	37	24	22	19
11	38	15	29	16	16	108	147	32	46	24	24	20
12	31	12	18	16	16	25	207	30	38	25	27	22
13	23	31	44	16	17	70	65	29	27	29	26	19
14	71	36	20	43	16	284	41	28	27	26	23	27
15	94	16	26	19	16	60	33	56	27	29	21	19
16	31	43	16	17	24	31	43	85	26	29	22	19
17	37	24	37	16	17	28	38	32	26	26	22	20
18	14	50	21	16	16	23	33	29	26	23	21	19
19	13	144	15	16	16	21	88	28	27	23	20	23
20	12	20	14	16	16	36	40	42	41	22	20	20
21	12	31	14	16	15	323	36	30	27	22	22	18
22	12	20	13	16	17	800	43	28	29	22	83	18
23	12	16	14	63	25	160	81	31	28	22	49	33
24	12	15	19	17	17	38	42	29	28	22	22	22
25	12	13	15	28	41	78	36	47	30	22	21	20
26	12	14	13	33	17	29	120	29	36	22	34	19
27	12	12	13	19	269	26	44	62	26	22	22	18
28	11	51	22	17	76	55	33	85	55	29	23	18
29	11	232	13	34	26	158	31	91	40	23	21	18
30	11	43	14	30	---	334	30	152	45	22	20	24
31	11	---	16	26	---	60	---	86	---	24	20	---
TOTAL	637	966	1,266	1,254	965	3,175	2,256	1,824	1,035	844	936	608
MEAN	20.5	32.2	40.8	40.5	33.3	102	75.2	58.8	34.5	27.2	30.2	20.3
MAX	94	232	204	305	269	800	377	271	66	58	111	33
MIN	11	11	13	16	15	21	25	28	26	22	20	18
AC-FT	1,260	1,920	2,510	2,490	1,910	6,300	4,470	3,620	2,050	1,670	1,860	1,210

16620000 HONOKOHAU STREAM NEAR HONOKOHAU—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2004, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	31.6	40.9	40.7	36.0	36.9	44.4	48.4	40.8	34.3	39.9	40.8	30.3
MAX	94.8	110	97.5	98.6	132	144	120	130	81.1	116	103	122
(WY)	(1915)	(1915)	(1955)	(1916)	(1932)	(1942)	(1980)	(1916)	(1916)	(1914)	(1914)	(1914)
MIN	10.8	11.8	13.0	12.3	13.5	13.4	12.9	12.2	14.2	16.2	14.5	12.1
(WY)	(1985)	(1963)	(1936)	(1944)	(1963)	(1926)	(1992)	(1945)	(1962)	(1926)	(1971)	(1984)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1913 - 2004	
ANNUAL TOTAL	10,221		15,766			
ANNUAL MEAN	28.0		43.1		39.0	
HIGHEST ANNUAL MEAN					68.3	1914
LOWEST ANNUAL MEAN					24.1	1926
HIGHEST DAILY MEAN	313	Feb 14	800	Mar 22	800	Mar 22, 2004
LOWEST DAILY MEAN	11	Oct 28	11	Oct 28	8.0	Aug 10, 1920
ANNUAL SEVEN-DAY MINIMUM	11	Oct 28	11	Oct 28	8.5	Feb 6, 1985
ANNUAL RUNOFF (AC-FT)	20,270		31,270		28,270	
10 PERCENT EXCEEDS	49		77		79	
50 PERCENT EXCEEDS	16		26		24	
90 PERCENT EXCEEDS	13		14		13	

Surface-Water Station Records
for Hawaii

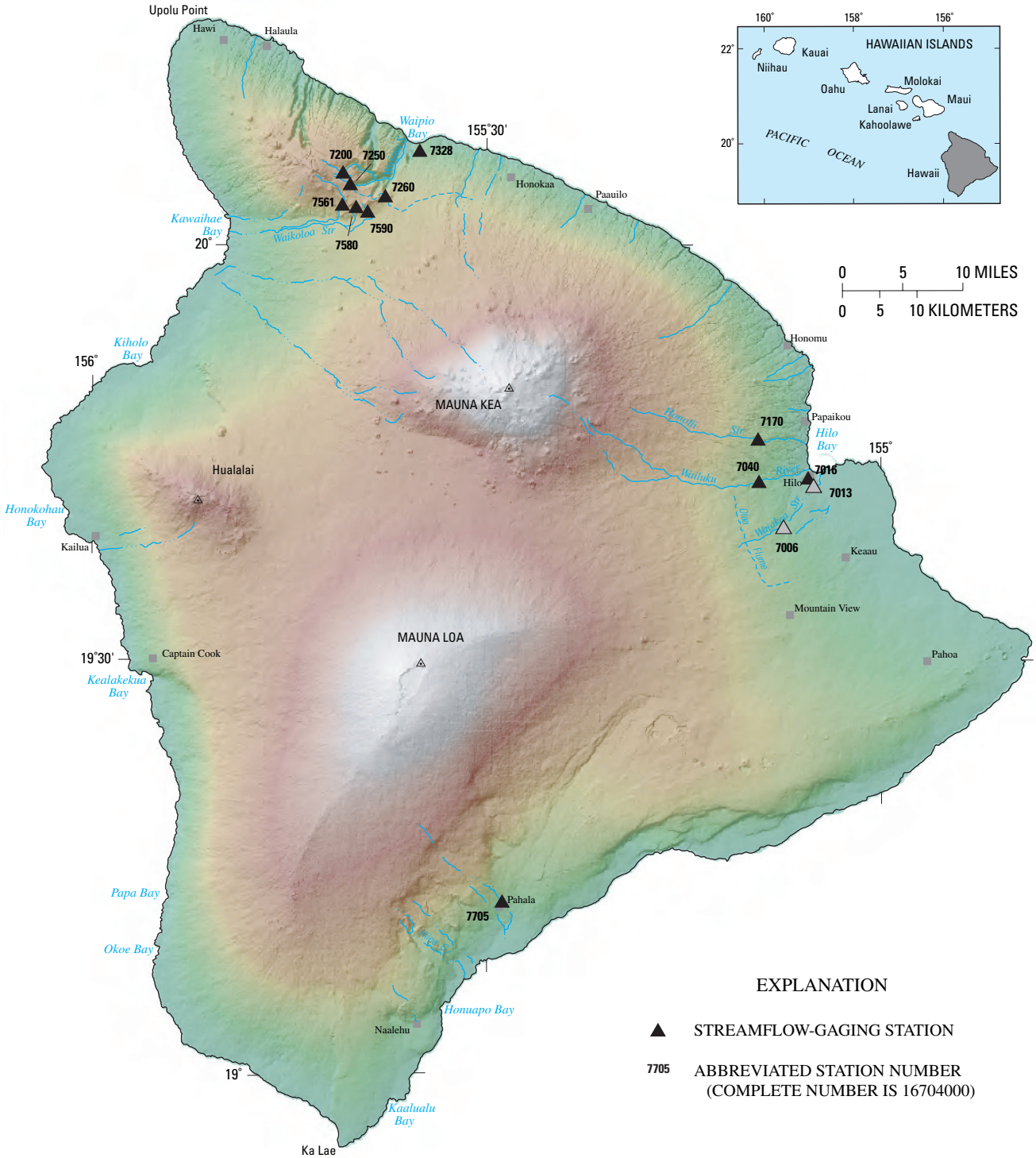


Figure 9. Locations of streamflow-gaging stations on Hawaii.

16700600 WAIAKEA STREAM AT HOAKA ROAD.

LOCATION.--Lat 19°39'40", long 155°07'20", North American Datum 1983, Hydrologic Unit 20010000, on right bank 5.0 mi southwest of Hilo Post Office, 4.0 mi south of Hilo Hospital and 0.6 mi west of Ainaola-Hoaka road intersection.

DRAINAGE AREA.--31.92 mi^2.

PERIOD OF RECORD.--Oct 1, 2003 to current year.

GAGE.--Water-stage recorder and water-quality sampler. Elevation of gage is 860 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Gary Sanchez. Records fair. No diversion upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 25	2130	*1,330	*7.36
Mar 14	2000	865	6.41
Apr 12	1130	1,000	6.72

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 0.99 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	19	1.5	63	1.1	95	11	3.5	e0.00	0.00	0.00
2	0.00	0.00	14	0.30	58	0.39	85	8.3	1.6	e0.00	0.00	0.00
3	0.00	0.00	16	0.02	51	0.33	70	6.4	0.67	0.00	0.01	0.00
4	0.00	0.00	26	0.01	41	0.31	55	19	0.36	0.00	0.00	0.00
5	0.00	0.00	15	0.32	39	1.2	48	15	0.97	0.00	0.00	0.00
6	0.00	0.00	46	0.02	49	0.75	36	7.7	0.99	0.00	0.00	0.00
7	0.00	0.00	18	0.00	45	0.13	26	5.2	0.41	0.00	0.03	0.00
8	0.00	0.00	16	0.00	37	3.5	20	4.0	0.11	0.00	0.00	0.00
9	0.00	0.00	19	0.00	24	1.2	18	3.1	0.01	0.00	0.00	0.00
10	0.00	0.00	38	0.00	19	0.21	45	2.2	1.8	0.00	0.00	0.00
11	0.00	0.00	36	0.00	17	0.00	261	1.5	19	0.38	0.00	0.00
12	0.00	2.6	17	0.00	15	0.00	440	43	15	0.00	0.00	0.00
13	0.00	0.63	14	0.00	12	0.62	220	9.0	11	0.00	0.00	0.00
14	0.00	0.03	12	0.00	10	207	162	5.6	3.6	4.7	0.00	0.00
15	0.00	0.51	11	0.00	7.5	281	125	4.3	2.8	1.1	0.00	0.00
16	0.00	53	9.2	0.00	5.8	48	96	3.8	2.0	0.15	0.00	0.00
17	0.00	23	7.4	0.00	5.1	39	104	3.2	0.71	0.00	0.00	0.00
18	0.00	14	5.8	0.00	3.6	33	86	2.5	0.32	0.00	0.00	0.00
19	0.00	14	4.3	0.00	2.2	27	73	3.2	0.08	0.00	0.00	0.00
20	0.00	10	3.1	0.00	1.2	21	67	2.9	0.29	0.00	0.00	0.00
21	0.00	8.6	2.2	0.00	0.52	16	55	0.82	0.66	0.00	0.00	0.00
22	0.00	7.4	1.1	0.00	0.24	20	47	0.30	0.70	0.00	0.00	0.00
23	0.00	6.1	0.45	3.5	0.02	88	47	0.04	0.31	0.00	0.00	0.00
24	0.00	5.0	0.16	1.7	0.00	218	41	0.00	0.15	0.00	0.00	0.00
25	0.00	3.8	0.00	218	0.00	112	34	0.00	e0.00	0.00	0.00	0.00
26	0.00	2.8	0.00	48	0.00	109	26	0.78	e0.00	0.00	0.00	0.00
27	0.00	2.1	0.00	13	0.00	119	22	7.7	e0.00	0.00	0.00	0.00
28	0.00	1.2	0.00	12	15	92	19	7.9	e0.00	0.00	0.00	0.00
29	0.00	30	8.6	109	4.9	72	17	3.4	e0.00	0.00	0.00	0.00
30	0.00	81	8.3	59	---	100	14	3.0	e0.00	0.00	0.00	0.00
31	0.00	---	3.8	98	---	197	---	7.6	---	0.00	0.00	---
TOTAL	0.00	265.77	371.41	564.37	526.08	1,808.74	2,454	192.44	67.04	6.33	0.04	0.00
MEAN	0.00	8.86	12.0	18.2	18.1	58.3	81.8	6.21	2.23	0.20	0.00	0.00
MAX	0.00	81	46	218	63	281	440	43	19	4.7	0.03	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	14	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	527	737	1,120	1,040	3,590	4,870	382	133	13	0.08	0.00

SUMMARY STATISTICS	FOR 2004 WATER YEAR	
ANNUAL TOTAL	6,256.22	
ANNUAL MEAN	17.1	
HIGHEST DAILY MEAN	440	Apr 12
LOWEST DAILY MEAN	0.00	Oct 1
ANNUAL SEVEN-DAY MINIMUM	0.00	Oct 1
ANNUAL RUNOFF (AC-FT)	12,410	
10 PERCENT EXCEEDS	48	
50 PERCENT EXCEEDS	0.31	
90 PERCENT EXCEEDS	0.00	

e Estimated

16701300 WAIAKEA STREAM AT HILO

LOCATION.--Lat 19°42'38", long 155°05'02", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 0.3 mi upstream from Kinoole Street Bridge and 1.3 mi southeast of Hilo Post Office.

DRAINAGE AREA.--35.8 mi^2.

PERIOD OF RECORD.--Annual maximum, water years 1969-75, 1979, 1994-2003, October 2003 to current year.

REVISED RECORDS.-WDR HI-95-1: 1976-80 (m), 1980-90 (m).

GAGE.--Water-stage recorder and water-quality sampler. Elevation of gage is 80 ft above mean sea level (from topographic map).
Prior to Oct. 1, 2003, crest-stage gage at same site and datum.

REMARKS.--Records computed by Gary Sanchez. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,760 ft^3/s, November 2, 2000, gage height, 15.05 ft; minimum, no flow on many days.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 25	2245	*725	*4.98
Mar 15	0945	607	4.63
Mar 24	2330	345	3.77
Apr 12	1245	701	4.91

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 0.93 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.00	0.00	0.00	0.00	21	0.00	48	0.00	0.00	0.00	0.00	0.00
2	e0.00	0.00	0.00	0.00	15	0.00	34	0.00	0.00	0.00	0.00	0.00
3	e0.00	0.00	0.00	0.00	4.8	0.00	20	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	6.1	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	2.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	1.5	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	168	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	359	3.6	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	179	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	108	116	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	233	81	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	14	54	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.92	56	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	46	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	27	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	21	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	10	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.07	2.3	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	23	0.42	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	150	0.79	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	101	0.00	78	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	44	0.00	58	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	63	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	41	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	57	0.00	22	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	5.1	0.00	15	---	35	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	0.00	54	---	128	---	0.00	---	0.00	0.00	---
TOTAL	0.00	5.10	0.00	271.00	49.60	953.99	1,230.85	3.60	0.00	0.00	0.00	0.00
MEAN	0.00	0.17	0.00	8.74	1.71	30.8	41.0	0.12	0.00	0.00	0.00	0.00
MAX	0.00	5.1	0.00	101	21	233	359	3.6	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	10	0.00	538	98	1,890	2,440	7.1	0.00	0.00	0.00	0.00

16701300 WAIAKEA STREAM AT HILO—Continued

SUMMARY STATISTICS	FOR 2004 WATER YEAR	
ANNUAL TOTAL	2,514.14	
ANNUAL MEAN	6.87	
HIGHEST DAILY MEAN	359	Apr 12
LOWEST DAILY MEAN	0.00	Oct 1
ANNUAL SEVEN-DAY MINIMUM	0.00	Oct 1
ANNUAL RUNOFF (AC-FT)	4,990	
10 PERCENT EXCEEDS	4.6	
50 PERCENT EXCEEDS	0.00	
90 PERCENT EXCEEDS	0.00	

e Estimated

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Old Hawaiian Datum, Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office.

DRAINAGE AREA.--230 mi^2, of which a portion probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS.--WSP 865: 1929-36(M). WSP 965: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft above mean sea level (from topographic map). Prior to November 16, 1977, at site directly across river, on left bank at same datum.

REMARKS.--Records computed by Dale Nishimoto. Records good except for estimated periods which are fair. Kapehu ditch diverted water from Kapehu Stream into Wailuku River upstream 1938-63. Department of Water Supply diverted about 6 ft^3/s of water upstream of gage untill 1967. Hydroelectric plant diverts variable amounts of water up to 160 ft^3/s about 1 mi upstream of gage and discharges it about 500 ft below gage (from 1993).

AVERAGE DISCHARGE.--73 years (water years 1929-39, 1942-47, 1949-2004), 275 ft^3/s (199,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, August 11, 1940, gage height, 28.6 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s based on slope-area measurement at gage height 26.16 ft; minimum, 0.15 ft^3/s, January 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 25	2115	13,200	16.09	Apr 12	1215	10,100	14.75
Mar 24	1730	*16,800	*17.36				

Minimum discharge, 5.3 ft^3/s, Sept. 29, gage height, 1.27 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	15	e166	e80	475	62	689	81	72	30	e23	e15
2	24	14	e131	e66	322	51	354	71	60	34	e55	e14
3	25	14	e133	e60	282	48	255	65	52	32	e400	e13
4	24	29	e270	e76	200	45	216	127	49	30	e249	e12
5	22	37	e129	e75	217	61	192	145	54	28	e60	e12
6	21	32	e380	e56	606	48	151	119	59	26	e43	e12
7	20	29	e116	e43	230	41	126	102	45	24	e75	e11
8	19	33	e132	e37	513	55	108	112	40	27	e40	e11
9	22	27	e249	e33	308	38	93	95	39	34	e33	e11
10	22	31	e939	e30	212	34	227	66	81	27	e33	e11
11	23	131	e640	e27	175	32	3,710	466	48	50	e28	e10
12	28	85	e142	e25	125	69	6,320	387	179	35	e25	e10
13	25	74	e112	e24	97	49	1,930	151	326	48	e23	e10
14	34	151	e84	e23	82	1,360	804	118	100	91	e23	e10
15	30	184	e71	e21	75	2,120	398	98	89	62	e21	e9.7
16	32	1,600	e61	e22	64	368	346	83	71	51	e40	e9.4
17	27	811	e51	e21	58	227	2,030	71	58	48	e50	e9.1
18	24	337	e47	e19	54	157	1,440	62	51	34	e28	e8.8
19	24	217	e53	e18	59	121	622	58	45	31	e25	e8.5
20	21	158	e45	e18	57	96	521	56	46	27	e22	e8.2
21	20	122	e39	e17	45	79	314	47	51	35	e25	e7.9
22	19	97	e34	e17	43	362	236	43	49	39	e36	e7.6
23	18	81	e31	e60	37	720	207	40	49	27	e45	e7.3
24	18	e51	e29	e61	31	5,350	200	38	43	24	e32	e7.0
25	19	e42	e28	1,290	29	2,330	183	39	39	26	e24	e6.8
26	19	e37	e27	802	29	915	155	53	37	22	e20	e6.5
27	18	e54	e26	455	27	468	132	62	38	e23	e20	e6.3
28	16	e60	e31	199	604	287	114	87	34	e46	e19	e6.0
29	15	e295	e204	2,130	118	239	102	72	39	e35	e18	e5.8
30	14	e980	e188	1,240	---	899	92	67	48	e26	e16	e6.0
31	15	---	e118	1,940	---	3,300	---	89	---	e23	e16	---
TOTAL	682	5,828	4,706	8,985	5,174	20,031	22,267	3,170	1,991	1,095	1,567	282.9
MEAN	22.0	194	152	290	178	646	742	102	66.4	35.3	50.5	9.43
MAX	34	1,600	939	2,130	606	5,350	6,320	466	326	91	400	15
MIN	14	14	26	17	27	32	92	38	34	22	16	5.8
AC-FT	1,350	11,560	9,330	17,820	10,260	39,730	44,170	6,290	3,950	2,170	3,110	561

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2004, BY WATER YEAR (WY)

MEAN	169	376	359	285	299	399	383	218	126	211	280	165
MAX	765	2,238	1,368	2,061	2,050	2,026	2,262	1,246	715	1,140	1,989	992
(WY)	(1942)	(1991)	(1971)	(1975)	(1969)	(1991)	(1986)	(1964)	(1941)	(1989)	(1930)	(1930)
MIN	2.96	17.6	7.15	1.10	0.51	0.26	7.83	6.23	5.48	2.79	12.8	9.43
(WY)	(1985)	(2003)	(1934)	(1981)	(1983)	(1983)	(1992)	(1992)	(1981)	(1981)	(1971)	(2004)

16704000 WAILUKU RIVER AT PIIHONUA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1928 - 2004	
ANNUAL TOTAL	44,010.3		75,778.9			
ANNUAL MEAN	121		207		275	
HIGHEST ANNUAL MEAN					588	1991
LOWEST ANNUAL MEAN					103	1981
HIGHEST DAILY MEAN	4,650	Sep 1	6,320	Apr 12	22,200	Jan 8, 1975
LOWEST DAILY MEAN	3.4	Mar 31	5.8	Sep 29	0.22	Mar 20, 1983
ANNUAL SEVEN-DAY MINIMUM	3.7	Mar 26	6.3	Sep 24	0.23	Mar 17, 1983
ANNUAL RUNOFF (AC-FT)	87,290		150,300		199,400	
10 PERCENT EXCEEDS	260		390		593	
50 PERCENT EXCEEDS	37		48		79	
90 PERCENT EXCEEDS	5.7		16		13	

e Estimated

16717000 HONOLII STREAM NEAR PAPAIKOU

LOCATION.--Lat 19°46'00", long 155°09'16", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi^2.

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

REVISED RECORDS.--WDR HI-95-1: 1967-90 (maximum, 1988-90 (m), 1988-90).

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft above mean sea level (from topographic map). Prior to August 27, 1911, nonrecording gage and August 27, 1911 to March 24, 1913, water-stage recorder, at site 0.5 mi upstream at different datum.

REMARKS.--Records computed by Gary Sanchez. Records good. No diversion upstream. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft^3/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--38 years (water years 1968-2004), 129 ft^3/s (93,360 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s, May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s, January 31, 1912. Minimum since February 1967 (period of no diversions), 1.0 ft^3/s, February 22-28, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 25	2030	8,300	14.66	Mar 24	1715	7,290	14.02
Jan 29	0400	4,830	11.92	Apr 12	0545	5,350	12.41
Mar 14	1415	*8,790	*14.95				

Minimum discharge, 5.5 ft^3/s, Sept. 27, 28, 29, gage height, 2.16 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	13	106	51	121	37	140	32	55	26	14	9.2
2	15	11	84	42	85	54	76	27	39	32	35	8.7
3	14	19	85	39	79	65	55	24	33	34	194	8.0
4	13	140	172	49	53	47	44	117	32	28	170	7.7
5	12	111	83	48	109	77	60	126	45	24	39	7.5
6	12	67	242	36	207	45	40	57	38	19	28	7.3
7	12	45	74	28	69	32	34	41	34	17	50	7.1
8	12	51	85	24	89	45	30	33	28	17	26	7.0
9	14	39	159	21	53	29	27	28	34	20	21	7.0
10	19	43	596	19	41	23	364	25	111	27	21	7.0
11	21	233	407	18	34	20	2,270	492	40	104	18	7.1
12	28	135	91	16	29	20	2,660	348	134	38	16	7.1
13	96	104	72	15	26	19	513	61	150	68	14	6.9
14	130	156	54	15	25	1,540	158	66	56	145	15	7.1
15	120	144	46	14	22	1,360	97	46	42	62	13	6.8
16	79	1,020	39	14	20	106	227	42	36	38	26	6.9
17	54	362	33	14	23	65	1,160	40	29	28	33	6.5
18	34	141	30	13	24	47	476	36	26	23	18	6.5
19	26	129	34	12	23	38	243	32	24	20	16	6.2
20	22	90	29	12	19	32	204	35	35	18	14	6.4
21	18	55	25	11	17	28	95	38	49	31	16	6.2
22	16	42	22	11	15	368	68	27	47	44	23	6.0
23	19	35	20	38	14	657	59	24	47	21	30	5.9
24	17	33	19	39	14	2,520	70	32	39	17	21	5.9
25	14	27	18	753	16	592	58	43	38	16	15	5.8
26	13	24	18	254	20	211	46	87	34	15	13	5.8
27	11	35	17	151	16	122	43	74	28	14	13	5.7
28	11	38	20	54	457	70	37	108	28	30	12	5.6
29	10	189	131	1,260	77	101	34	70	42	22	11	5.8
30	9.6	622	120	624	---	663	35	70	32	16	10	5.9
31	11	---	76	758	---	1,420	---	106	---	14	9.7	---
TOTAL	899.6	4,153	3,007	4,453	1,797	10,453	9,423	2,387	1,405	1,028	954.7	202.6
MEAN	29.0	138	97.0	144	62.0	337	314	77.0	46.8	33.2	30.8	6.75
MAX	130	1,020	596	1,260	457	2,520	2,660	492	150	145	194	9.2
MIN	9.6	11	17	11	14	19	27	24	24	14	9.7	5.6
AC-FT	1,780	8,240	5,960	8,830	3,560	20,730	18,690	4,730	2,790	2,040	1,890	402

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2004, BY WATER YEAR (WY)

MEAN	80.2	188	164	128	117	202	192	93.8	71.3	116	115	79.9
MAX	222	783	625	648	752	1,349	772	319	349	384	420	276
(WY)	(1991)	(1995)	(1971)	(1975)	(1969)	(1980)	(1986)	(1989)	(1997)	(1989)	(1982)	(1994)
MIN	9.70	11.2	10.5	5.64	4.80	6.71	12.5	11.4	8.61	9.66	13.9	6.75
(WY)	(1985)	(2003)	(1984)	(1981)	(1980)	(1983)	(1992)	(1992)	(1981)	(1981)	(1973)	(2004)

16717000 HONOLII STREAM NEAR PAPAIKOU—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1968 - 2004	
ANNUAL TOTAL	30,788.1		40,162.9			
ANNUAL MEAN	84.4		110		129	
HIGHEST ANNUAL MEAN					220	1991
LOWEST ANNUAL MEAN					53.1	1981
HIGHEST DAILY MEAN	2,490	Sep 1	2,660	Apr 12	6,410	Dec 10, 1999
LOWEST DAILY MEAN	5.3	Feb 13	5.6	Sep 28	1.0	Feb 23, 1980
ANNUAL SEVEN-DAY MINIMUM	5.6	Feb 8	5.8	Sep 23	1.0	Feb 22, 1980
ANNUAL RUNOFF (AC-FT)	61,070		79,660		93,360	
10 PERCENT EXCEEDS	181		177		264	
50 PERCENT EXCEEDS	34		34		41	
90 PERCENT EXCEEDS	6.9		11		11	

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 125 ft upstream from Upper Hamakua ditch intake, and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi^2.

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

REVISED RECORDS.--WDR HI-95-1: 1965-90 (m), 1970, 1971, 1979, 1984, 1990.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft above mean sea level (from topographic map).

REMARKS.--Record computed by Clayton Yoshida. Records good. No diversion upstream.

AVERAGE DISCHARGE.--40 years (water years 1965-2004), 14.9 ft^3/s (10,830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s, November 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/s, January 23-28, February 20-21, 1977, December 16-19, February 23, 24, 1980 (revised).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 7	1915	659	5.74
Mar 14	1030	*1,530	*7.71
Mar 23	1300	491	5.19
Apr 10	2245	567	5.45

Minimum discharge, 0.10 ft^3/s, Oct. 31, Nov. 1, 2, 3, gage height, 1.05 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.17	0.10	8.3	1.2	19	27	15	2.6	5.3	2.4	3.3	0.86
2	0.15	0.10	18	0.94	29	35	6.8	1.7	14	23	16	0.66
3	0.15	0.13	12	4.7	12	35	8.5	3.3	5.9	6.6	29	0.53
4	0.13	0.98	28	43	6.6	10	3.6	55	13	3.1	5.4	0.45
5	0.14	1.3	9.1	5.3	20	4.9	5.0	37	21	3.1	2.3	0.52
6	0.13	0.70	5.6	2.2	21	3.3	3.3	13	5.7	1.9	3.7	0.42
7	0.14	0.82	3.0	1.3	55	3.4	2.3	19	9.6	1.3	12	0.36
8	0.16	3.6	65	0.95	16	79	1.7	13	13	0.99	2.9	0.32
9	0.17	4.8	29	0.69	4.6	16	1.7	3.7	15	0.92	1.7	0.30
10	0.18	3.5	25	0.55	2.7	4.3	149	2.2	9.5	0.97	1.2	0.31
11	0.40	11	25	0.47	1.9	2.4	211	1.8	4.8	3.1	0.88	0.63
12	1.2	5.8	5.6	0.41	1.4	1.6	153	2.0	4.6	1.5	0.70	1.1
13	3.0	8.0	22	0.39	1.2	44	46	1.4	2.7	2.8	0.89	0.79
14	5.3	20	9.5	1.7	1.0	314	11	1.3	2.7	18	1.6	1.8
15	15	17	10	1.0	0.91	53	9.9	1.1	5.6	6.4	1.1	1.1
16	30	55	5.6	0.69	1.5	15	11	23	4.0	3.1	14	1.7
17	13	14	7.8	0.54	3.0	9.9	84	6.9	1.9	2.3	8.1	6.8
18	3.0	20	25	0.45	1.9	4.4	45	2.5	1.5	1.8	2.3	9.0
19	1.4	71	9.2	0.37	1.4	2.6	20	1.6	2.9	1.2	1.3	2.4
20	0.85	16	4.1	0.31	1.2	1.8	13	1.2	15	0.95	0.96	1.2
21	0.57	18	2.4	0.27	1.2	1.5	5.5	0.96	14	0.77	8.2	0.80
22	0.42	6.0	1.7	0.22	1.0	58	3.6	0.86	19	0.68	20	0.59
23	0.33	2.7	1.3	10	0.87	102	3.7	0.88	6.3	0.50	27	0.53
24	0.26	1.5	1.1	5.1	1.2	83	5.5	1.0	4.8	0.43	3.7	0.48
25	0.21	1.8	1.1	18	2.8	52	11	13	4.4	0.37	1.7	0.41
26	0.17	34	0.83	56	1.8	32	38	25	2.4	0.34	1.2	0.37
27	0.14	4.4	0.64	18	1.4	7.1	22	19	1.7	0.44	1.0	0.32
28	0.12	1.9	0.97	8.2	132	19	5.8	12	8.0	14	0.88	0.30
29	0.12	2.4	2.3	117	7.4	24	3.1	29	8.8	6.6	2.8	0.28
30	0.12	6.0	2.4	30	---	84	2.2	13	3.5	2.2	3.6	0.27
31	0.11	---	1.4	33	---	54	---	14	---	1.3	1.4	---
TOTAL	77.24	332.53	342.94	362.95	350.98	1,183.2	901.2	322.00	230.6	113.06	180.81	35.60
MEAN	2.49	11.1	11.1	11.7	12.1	38.2	30.0	10.4	7.69	3.65	5.83	1.19
MAX	30	71	65	117	132	314	211	55	21	23	29	9.0
MIN	0.11	0.10	0.64	0.22	0.87	1.5	1.7	0.86	1.5	0.34	0.70	0.27
AC-FT	153	660	680	720	696	2,350	1,790	639	457	224	359	71

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2004, BY WATER YEAR (WY)

MEAN	9.55	16.4	15.4	14.5	13.0	20.5	22.4	12.1	13.7	18.5	15.2	8.55
MAX	27.7	55.8	41.4	62.5	40.6	98.0	67.5	36.0	37.7	37.0	31.8	27.5
(WY)	(2002)	(1980)	(1971)	(1979)	(1969)	(1980)	(1986)	(1998)	(1998)	(1982)	(1982)	(1992)
MIN	0.17	0.70	0.51	0.34	0.51	3.07	1.71	1.07	3.18	3.65	2.70	0.27
(WY)	(1985)	(2003)	(1981)	(1981)	(1995)	(2003)	(1992)	(1999)	(1985)	(2004)	(1971)	(1965)

16720000 KAWAINUI STREAM NEAR KAMUELA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1964 - 2004	
ANNUAL TOTAL	4,133.11		4,433.11			
ANNUAL MEAN	11.3		12.1		14.9	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	227	Sep 1	314	Mar 14	612	Nov 18, 1979
LOWEST DAILY MEAN	0.10	Nov 1	0.10	Nov 1	0.01	Jan 23, 1977
ANNUAL SEVEN-DAY MINIMUM	0.11	Oct 28	0.11	Oct 28	0.01	Jan 22, 1977
ANNUAL RUNOFF (AC-FT)	8,200		8,790		10,830	
10 PERCENT EXCEEDS	29		29		41	
50 PERCENT EXCEEDS	3.1		3.0		4.5	
90 PERCENT EXCEEDS	0.26		0.37		0.50	

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Old Hawaiian Datum, Hydrologic Unit 20010000, on right bank 25 ft upstream from Upper Hamakua ditch intake, and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

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

REVISED RECORDS.--WDR HI-94-1: 1964-90.

GAGE.--Water-stage recorders. Elevation of gage is 3,900 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good except estimated period which is poor. Parker Ranch pipeline no longer diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--40 years (water years 1965-2004), 7.87 ft^3/s (5,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,430 ft^3/s, January 11, 1967, gage height 8.65 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 8.65 ft; maximum gage height, 12.80 ft, November 18, 1979; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 7	1900	243	5.50
Mar 14	1230	*884	*7.46
Mar 23	1315	285	5.13
Apr 10	2230	362	5.52

Minimum discharge, 0.29 ft^3/s, on Sept.29, gage height, 1.31 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e0.50	e0.39	e4.9	e1.1	11	11	8.7	1.8	3.7	1.5	1.4	0.78
2	e0.48	e0.38	e6.0	e0.94	13	18	3.7	1.4	9.2	9.9	7.8	0.67
3	e0.47	e0.65	e5.5	e2.5	6.2	21	4.4	2.5	4.4	4.1	11	0.57
4	e0.44	e0.90	e14	e24	3.0	7.6	2.1	34	8.4	1.9	3.9	0.48
5	e0.45	e1.2	e5.6	e3.9	9.2	3.2	2.8	24	11	1.9	1.6	0.51
6	e0.44	e0.90	e3.5	e2.0	9.8	1.8	2.1	11	3.4	1.3	2.9	0.44
7	e0.46	e1.0	e2.2	e1.4	27	2.1	1.4	19	4.1	0.96	6.9	0.41
8	e0.48	e1.6	e25	e1.2	8.9	40	1.1	9.5	7.2	0.81	1.9	0.39
9	e0.48	e1.9	e16	e0.95	2.6	9.4	1.2	2.6	11	0.75	1.2	0.37
10	e0.50	e1.6	e11	e0.90	1.8	3.1	80	1.6	6.9	0.90	0.86	0.39
11	e0.70	e2.8	e12	e0.85	1.4	1.7	134	1.2	4.2	1.6	0.72	0.44
12	e0.97	e2.1	e3.6	e0.80	1.2	1.3	83	1.0	4.2	1.0	0.62	0.46
13	e1.6	e2.5	e8.6	e0.75	1.1	16	28	0.88	2.2	1.1	0.70	0.45
14	e2.2	e4.5	e4.7	e1.3	1.0	165	7.9	0.86	2.3	9.1	0.82	0.50
15	e4.0	e4.8	e4.7	e1.0	0.95	32	6.6	0.78	5.4	3.7	0.82	0.48
16	e12	e22	e3.2	e0.95	1.2	7.5	6.0	12	3.5	1.9	9.3	0.61
17	e8.1	e7.8	e4.0	e0.90	1.5	4.7	47	3.2	1.8	1.3	5.7	1.7
18	e2.6	e8.8	e12	e0.85	1.3	2.7	30	1.5	1.4	1.0	1.6	2.6
19	e1.5	e33	e5.2	e0.80	1.2	1.6	16	1.0	2.6	0.80	0.96	1.2
20	e1.0	e10	e2.9	e0.74	1.2	1.1	9.0	0.86	10	0.69	0.77	0.80
21	e0.90	e8.2	e1.9	0.68	1.2	0.93	4.0	0.78	10	0.67	3.1	0.66
22	e0.83	e4.1	e1.6	0.65	1.0	41	2.3	0.72	12	0.64	8.6	0.51
23	e0.72	e2.3	e1.3	1.4	0.91	60	2.8	0.72	4.5	0.57	18	0.45
24	e0.64	e1.6	e1.1	1.8	1.0	48	4.9	0.71	3.7	0.52	2.6	0.41
25	e0.56	e1.6	e1.1	5.1	1.3	32	6.8	3.0	2.4	0.49	1.3	0.38
26	e0.51	e19	e0.91	24	1.2	20	22	13	1.5	0.49	0.94	0.36
27	e0.48	e3.8	e0.78	9.3	1.2	4.1	13	10	1.2	0.52	0.81	0.36
28	e0.45	e2.0	e1.1	5.6	64	6.1	3.7	7.0	5.4	2.9	0.73	0.34
29	e0.41	e2.1	e2.0	61	4.9	13	2.0	24	5.4	3.2	2.0	0.32
30	e0.41	e3.4	e2.0	11	---	41	1.6	8.8	2.2	1.3	3.0	0.32
31	e0.40	---	e1.3	13	---	30	---	8.4	---	0.87	1.1	---
TOTAL	45.68	156.92	169.69	181.36	181.26	646.93	538.1	207.81	155.2	58.38	103.65	18.36
MEAN	1.47	5.23	5.47	5.85	6.25	20.9	17.9	6.70	5.17	1.88	3.34	0.61
MAX	12	33	25	61	64	165	134	34	12	9.9	18	2.6
MIN	0.40	0.38	0.78	0.65	0.91	0.93	1.1	0.71	1.2	0.49	0.62	0.32
AC-FT	91	311	337	360	360	1,280	1,070	412	308	116	206	36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2004, BY WATER YEAR (WY)

MEAN	5.20	8.18	7.33	7.36	6.39	10.1	11.4	6.78	7.83	10.3	8.53	5.05
MAX	14.7	26.5	16.7	26.4	18.6	37.9	31.6	20.5	22.6	22.5	19.2	17.8
(WY)	(1999)	(1980)	(1971)	(1979)	(1969)	(1980)	(1986)	(1998)	(1998)	(2002)	(2001)	(1992)
MIN	0.31	0.95	0.54	0.46	0.40	1.11	0.82	0.78	2.04	1.88	1.72	0.09
(WY)	(1985)	(2003)	(1981)	(1981)	(1993)	(2003)	(1992)	(1999)	(1985)	(2004)	(1971)	(1965)

16725000 ALAKAHI STREAM NEAR KAMUELA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1964 - 2004	
ANNUAL TOTAL	1,962.37		2,463.34			
ANNUAL MEAN	5.38		6.73		7.87	
HIGHEST ANNUAL MEAN					13.4	1994
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	104	Sep 1	165	Mar 14	338	Nov 18, 1979
LOWEST DAILY MEAN	0.38	Nov 2	0.32	Sep 29	0.03	May 22, 1965
ANNUAL SEVEN-DAY MINIMUM	0.42	Oct 27	0.36	Sep 24	0.04	Sep 22, 1965
ANNUAL RUNOFF (AC-FT)	3,890		4,890		5,700	
10 PERCENT EXCEEDS	13		15		20	
50 PERCENT EXCEEDS	2.0		1.9		3.1	
90 PERCENT EXCEEDS	0.47		0.50		0.59	

e Estimated

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 500 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to September 1983, September 1992 to September 1994 (discharge measurements only). October 1994 to September 2004 (discontinued).

REVISED RECORDS.--WDR HI-94-1: 1981, 1984-90.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Gary Sanchez. Records good. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--19 years (water years 1975-83, 1995-2004), 9.41 ft^3/s (6,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s, April 6, 1977; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 40 ft^3/s, Apr 11; minimum daily discharge, 0.18 ft^3/s, Mar 21.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	0.69	8.0	3.4	4.0	6.8	1.7	5.7	7.0	4.1	2.8	2.3
2	1.1	0.65	12	2.7	3.7	8.2	1.9	4.4	12	7.9	8.2	1.8
3	1.1	0.64	13	3.7	2.9	8.8	1.2	5.3	7.8	7.6	12	1.5
4	1.1	0.69	17	15	2.1	5.3	0.45	16	10	4.7	7.6	1.3
5	1.1	1.2	10	8.3	3.2	4.6	0.64	14	12	4.7	4.5	1.3
6	1.0	0.90	8.8	6.3	3.7	4.1	2.7	14	7.3	3.8	5.0	1.1
7	0.96	0.60	7.4	4.2	5.9	4.5	3.7	15	7.1	3.1	9.0	0.98
8	1.1	1.5	10	3.0	2.7	20	3.5	11	9.6	2.7	4.8	0.91
9	1.0	3.9	11	2.4	1.5	7.7	5.0	6.4	10	2.4	3.7	0.85
10	0.95	3.9	8.5	2.0	1.1	5.4	29	4.7	10	2.4	2.9	0.84
11	0.98	5.3	8.3	1.6	0.91	4.6	40	4.1	7.3	4.5	2.2	0.91
12	1.7	5.2	7.1	1.4	0.83	4.0	25	3.9	7.4	3.3	1.8	0.93
13	2.9	4.9	7.1	1.3	0.80	10	14	3.5	5.1	3.3	2.1	0.98
14	6.3	5.0	6.8	2.1	0.75	37	8.6	3.3	4.2	7.7	2.8	1.2
15	7.3	4.6	6.7	1.8	0.73	6.4	7.4	3.1	8.0	6.5	2.4	1.3
16	16	8.5	6.5	1.4	2.8	2.8	7.2	8.2	6.9	4.4	7.6	1.5
17	14	7.5	9.3	1.2	1.8	1.9	16	6.1	4.4	3.6	7.9	3.5
18	8.1	7.9	12	0.99	1.0	0.71	15	4.3	3.8	3.2	4.1	4.6
19	4.9	21	8.0	0.87	0.88	0.34	9.6	3.5	4.7	2.6	3.0	3.3
20	3.2	10	6.7	0.80	2.4	0.21	9.0	3.1	11	2.1	2.3	2.1
21	2.5	8.7	6.2	0.75	3.2	0.18	7.6	2.9	9.5	1.8	3.9	1.4
22	2.0	5.8	5.2	0.74	2.6	9.0	6.3	2.7	12	1.8	7.0	1.0
23	1.6	4.1	4.0	1.3	2.1	13	5.9	2.6	8.0	1.6	11	0.83
24	1.4	2.9	3.5	4.2	2.0	4.3	7.6	2.7	7.1	1.4	5.4	0.76
25	1.2	3.5	3.3	3.4	4.1	4.6	8.3	4.9	6.0	1.2	3.7	0.69
26	1.00	11	2.7	18	3.4	3.1	14	9.5	4.4	1.2	2.9	0.64
27	0.89	7.5	2.3	4.5	2.7	0.75	13	10	3.7	1.1	2.5	0.63
28	0.82	5.9	2.9	3.5	29	4.0	7.9	9.5	5.9	3.8	2.2	0.60
29	0.78	6.6	4.9	13	7.1	2.3	5.7	11	8.4	5.6	3.4	0.58
30	0.75	9.5	6.4	3.5	---	5.5	4.9	11	5.2	3.3	5.4	0.54
31	0.70	---	4.4	4.1	---	4.4	---	9.8	---	2.5	3.3	---
TOTAL	89.63	160.07	230.0	121.45	99.90	194.49	282.79	216.2	225.8	109.9	147.4	40.87
MEAN	2.89	5.34	7.42	3.92	3.44	6.27	9.43	6.97	7.53	3.55	4.75	1.36
MAX	16	21	17	18	29	37	40	16	12	7.9	12	4.6
MIN	0.70	0.60	2.3	0.74	0.73	0.18	0.45	2.6	3.7	1.1	1.8	0.54
AC-FT	178	317	456	241	198	386	561	429	448	218	292	81

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2004, BY WATER YEAR (WY)

MEAN	7.69	9.85	8.05	5.64	5.96	10.3	12.6	10.2	9.99	13.1	11.2	8.04
MAX	17.3	17.4	12.6	13.4	15.1	19.7	26.0	23.9	26.3	26.0	19.6	16.9
(WY)	(1999)	(1977)	(1979)	(2000)	(1999)	(1982)	(1998)	(1998)	(1998)	(1978)	(1978)	(1982)
MIN	1.18	2.82	0.79	0.31	0.63	3.34	2.76	2.05	3.03	2.84	2.23	1.36
(WY)	(1975)	(1996)	(1981)	(1981)	(1995)	(2003)	(1981)	(1999)	(1981)	(1981)	(1979)	(2004)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1975 - 2004	
ANNUAL TOTAL	2,323.30		1,918.50			
ANNUAL MEAN	6.37		5.24		9.41	
HIGHEST ANNUAL MEAN					15.0	1998
LOWEST ANNUAL MEAN					3.80	1981
HIGHEST DAILY MEAN	33	Sep 1	40	Apr 11	48	Apr 6, 1977
LOWEST DAILY MEAN	0.40	Feb 25	0.18	Mar 21	0.00	Oct 1, 1974
ANNUAL SEVEN-DAY MINIMUM	0.70	Oct 29	0.63	Sep 24	0.00	Oct 1, 1974
ANNUAL RUNOFF (AC-FT)	4,610		3,810		6,820	
10 PERCENT EXCEEDS	14		11		22	
50 PERCENT EXCEEDS	4.9		3.9		6.6	
90 PERCENT EXCEEDS	0.96		0.90		0.80	

16732800 LOWER HAMAKUA DITCH ABOVE MAIN WEIR

LOCATION.--Lat 20°06'52", long 155°35'06", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 500 ft upstream from Lower Hamakua ditch Main Weir and 1 mile west of Kukuihaele County Park.

PERIOD OF RECORD.--October 2002 to current year (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1000 ft above mean sea level (from topographic map).

COOPERATION.--State of Hawaii, Department of Agriculture.

REMARKS.--Records computed by Dale Nishimoto. Records good, except for periods of estimation and period of no record, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s, November 19: minimum daily, 0.10 ft^3/s, (estimated) April 5.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	19	---	---	---	<2.9	<1.7	<1.8	11	9.6	9.8
2	14	14	26	---	---	---	<2.9	<1.7	e4.2	13	11	9.8
3	14	14	24	---	---	---	<2.9	<1.8	e2.0	13	17	9.7
4	14	14	28	---	---	---	<2.9	9.7	e6.4	11	12	9.6
5	13	14	e24	---	---	---	e0.10	10	13	11	10	9.7
6	13	14	---	---	---	---	<2.9	4.3	11	11	9.9	9.6
7	13	14	---	---	---	---	<2.9	6.4	10	11	13	12
8	13	15	---	---	---	---	<2.9	e6.0	11	10	10	16
9	13	16	---	---	---	---	<2.9	<1.8	11	10	9.5	16
10	13	15	---	---	---	---	e9.6	<1.8	12	10	9.3	16
11	13	17	---	---	---	e16	19	<1.9	10	11	9.8	16
12	13	16	---	---	---	---	19	<1.8	10	10	10	14
13	13	16	---	---	e5.2	---	14	<1.9	9.5	10	10	6.7
14	15	19	---	---	---	---	7.3	<1.9	9.4	13	10	6.7
15	18	21	---	---	---	---	3.9	<1.9	11	12	10	8.0
16	25	27	---	---	---	---	e2.1	e5.3	11	11	12	15
17	27	23	---	---	---	---	e10	e2.3	11	10	14	16
18	17	21	---	---	---	e13	10	<1.9	10	10	11	18
19	16	31	---	---	---	e10	e4.5	<1.9	11	10	10	16
20	15	25	---	---	---	<9.6	e4.0	<1.9	14	10	10	15
21	15	24	---	---	---	<9.6	<2.9	<1.9	12	9.9	11	15
22	15	21	---	---	---	e19	<2.9	<1.9	18	10	12	15
23	15	17	---	---	---	21	<2.9	<1.9	13	9.6	18	15
24	15	16	---	---	---	13	<2.9	<1.9	12	9.1	12	15
25	15	15	---	---	---	e3.6	<2.9	e2.4	11	9.1	11	15
26	14	23	---	---	---	e3.8	<4.5	e4.7	11	9.1	10	15
27	14	18	---	---	---	<2.9	e6.4	e3.5	11	9.1	10	15
28	14	16	---	---	---	<2.9	<1.7	e2.2	11	11	9.9	15
29	14	17	---	---	---	e2.4	<1.7	e3.8	13	12	10	15
30	14	26	---	---	---	e3.7	<1.7	6.4	11	9.7	11	15
31	14	---	---	---	---	e3.4	---	3.7	---	9.3	10	---
TOTAL	465	553	---	---	---	---	157.20	102.2	312.3	325.9	343.0	399.6
MEAN	15.0	18.4	---	---	---	---	5.24	3.30	10.4	10.5	11.1	13.3
MAX	27	31	---	--	--	19	10	18	13	18	18	
MIN	13	14	---	--	--	0.10	1.7	1.8	9.1	9.3	6.7	
AC-FT	922	1,100	---	---	---	---	312	203	619	646	680	793

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2004, BY WATER YEAR (WY)

MEAN	7.78	9.49	0.55	0.55	0.55	18.6	11.6	10.5	14.5	14.5	13.3	11.9
MAX	15.0	18.4	0.55	0.55	0.55	18.6	17.9	17.6	18.5	18.5	15.5	13.3
(WY)	(2004)	(2004)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2004)
MIN	0.55	0.55	0.55	0.55	0.55	18.6	5.24	3.30	10.4	10.5	11.1	10.4
(WY)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2004)	(2004)	(2004)	(2004)	(2004)	(2003)

SUMMARY STATISTICS	WATER YEARS 2003 - 2004	
ANNUAL MEAN	10.0	
HIGHEST ANNUAL MEAN	10.0	2003
LOWEST ANNUAL MEAN	10.0	2003
HIGHEST DAILY MEAN	31	Nov 19, 2003
LOWEST DAILY MEAN	0.10	Apr 5, 2004
ANNUAL SEVEN-DAY MINIMUM	0.55	Oct 1, 2002
ANNUAL RUNOFF (AC-FT)	7,270	
10 PERCENT EXCEEDS	21	
50 PERCENT EXCEEDS	10	
90 PERCENT EXCEEDS	0.55	

e Estimated
< Actual value is known to be less than the value shown

16756100 KOHAKOHAU STREAM ABOVE DWS INTAKE, NEAR KAMUELA

LOCATION.--Lat 20°02'58", long 155°41'05", Old Hawaiian Datum, Hydrologic Unit 20010000, on right bank 200 ft upstream of Dept. of Water Supply dam and intake, 0.85 mi west of Puu Ohu, and 1.85 mi northwest of junction of Highways 19 and 190.

DRAINAGE AREA.--2.40 mi^2.

PERIOD OF RECORD.--June 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,470 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records fair. Parker Ranch diverts water from Kohakohau Stream at an altitude of 4,250 ft through a 4-inch pipeline. Hawaii Dept. of Water Supply diverts water at dam 200 ft downstream for domestic use in the Kamuela and Kawaihae areas since August 20, 1973.

AVERAGE DISCHARGE.--7 years (water years 1998-2004), 11.7 ft^3/s (8440 acrs-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,860 ft^3/s, March 14, 2004, gage height, 8.86 ft from rating curve developed using flow-over-dam computations and high water marks at gage; minimum, 0.14 ft^3/s, February 10, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb 28	0215	787	6.06
Mar 14	1230	*1,860	*8.86
Mar 23	1330	618	5.62
Apr 10	2245	690	5.88

Minimum discharge, 0.20 ft^3/s, Nov. 10, gage height, 1.38 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.43	0.25	3.1	0.86	9.2	21	17	2.1	3.5	1.8	0.58	0.83
2	0.39	0.24	9.5	0.70	14	33	5.3	1.8	6.6	15	2.6	0.66
3	0.37	0.24	5.7	1.1	8.4	33	4.8	3.0	3.9	5.4	20	0.55
4	0.36	0.27	16	39	3.2	12	3.0	70	6.4	2.3	3.3	0.49
5	0.38	0.24	5.4	4.3	6.3	3.5	3.5	57	15	1.9	1.5	0.52
6	0.36	0.22	2.8	2.0	12	2.2	2.7	14	4.1	1.7	1.7	0.44
7	0.35	0.22	1.8	1.4	24	2.0	2.1	54	3.7	1.5	3.9	0.40
8	0.37	0.22	19	1.1	13	40	2.5	20	14	1.3	1.6	0.38
9	0.37	0.22	19	0.92	3.5	13	2.8	3.9	14	1.2	1.2	0.36
10	0.34	0.21	9.0	0.78	2.1	3.2	192	2.5	9.8	1.2	0.91	0.36
11	0.34	0.24	9.2	0.70	1.6	1.9	376	2.0	3.6	1.5	0.74	0.41
12	0.33	0.23	3.1	0.63	1.3	1.5	271	1.8	3.3	1.2	0.62	0.37
13	0.32	0.25	4.1	0.59	1.2	21	86	1.6	2.3	1.1	0.60	0.34
14	0.34	0.40	2.8	0.73	1.0	486	13	1.7	1.9	3.4	0.62	0.36
15	0.48	0.79	2.3	0.59	0.89	89	8.4	1.5	2.0	2.4	0.53	0.33
16	7.1	19	2.0	0.51	0.95	13	6.2	34	2.0	1.6	2.8	0.34
17	7.8	5.9	2.1	0.45	1.3	7.3	136	4.0	1.7	1.3	2.7	0.36
18	1.9	4.9	9.2	0.40	0.96	3.8	88	2.1	1.6	1.2	1.2	0.43
19	1.1	47	4.1	0.35	0.79	2.6	17	1.8	1.7	1.0	0.81	0.42
20	0.85	13	2.3	0.33	0.72	2.0	12	1.6	6.7	0.87	0.68	0.36
21	0.66	4.6	1.6	0.30	0.69	1.8	4.7	1.4	7.6	0.76	1.3	0.33
22	0.55	2.8	1.3	0.29	0.61	83	3.1	1.3	18	0.76	8.4	0.31
23	0.47	1.7	1.1	3.8	0.57	166	2.7	1.3	3.8	0.66	40	0.30
24	0.42	1.2	0.96	2.4	0.56	146	3.0	1.2	3.0	0.61	2.7	0.29
25	0.37	1.1	0.87	1.9	0.57	90	5.9	2.1	2.4	0.56	1.5	0.28
26	0.33	28	0.74	25	0.50	49	45	14	1.9	0.55	1.2	0.28
27	0.31	3.6	0.66	12	0.49	7.3	24	11	1.7	0.56	1.1	0.26
28	0.29	1.8	1.1	3.9	196	6.8	4.4	9.6	2.7	0.90	0.95	0.25
29	0.28	1.3	1.8	120	7.3	18	2.6	43	3.4	1.3	1.5	0.25
30	0.26	1.4	1.7	14	---	127	2.2	15	2.3	0.80	2.1	0.25
31	0.25	---	1.1	21	---	90	---	7.4	---	0.62	1.1	---
TOTAL	28.47	141.54	145.43	262.03	313.70	1,575.9	1,346.9	387.7	154.6	56.95	110.44	11.51
MEAN	0.92	4.72	4.69	8.45	10.8	50.8	44.9	12.5	5.15	1.84	3.56	0.38
MAX	7.8	47	19	120	196	486	376	70	18	15	40	0.83
MIN	0.25	0.21	0.66	0.29	0.49	1.5	2.1	1.2	1.6	0.55	0.53	0.25
AC-FT	56	281	288	520	622	3,130	2,670	769	307	113	219	23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2004, BY WATER YEAR (WY)

MEAN	10.2	12.4	11.7	10.4	18.6	21.1	13.8	4.98	5.19	13.4	13.9	9.02
MAX	24.6	21.5	31.3	25.4	39.8	54.8	44.9	12.5	11.7	30.5	23.8	21.7
(WY)	(1999)	(2000)	(2002)	(2000)	(2002)	(1999)	(2004)	(2004)	(2002)	(2002)	(2001)	(1998)
MIN	0.92	0.30	1.32	0.38	0.52	1.27	1.46	0.50	2.01	1.84	3.56	0.38
(WY)	(2004)	(2003)	(2001)	(2001)	(2000)	(2003)	(2002)	(1999)	(1999)	(2004)	(2004)	(2004)

16756100 KOHAKOHAU STREAM ABOVE DWS INTAKE, NEAR KAMUELA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1998 - 2004	
ANNUAL TOTAL	2,553.85		4,535.17			
ANNUAL MEAN	7.00		12.4		11.7	
HIGHEST ANNUAL MEAN					16.4	2002
LOWEST ANNUAL MEAN					6.71	2003
HIGHEST DAILY MEAN	285	Sep 1	486	Mar 14	524	Feb 26, 2002
LOWEST DAILY MEAN	0.15	Feb 8	0.21	Nov 10	0.15	Feb 8, 2003
ANNUAL SEVEN-DAY MINIMUM	0.16	Feb 7	0.22	Nov 6	0.16	Feb 7, 2003
ANNUAL RUNOFF (AC-FT)	5,070		9,000		8,440	
10 PERCENT EXCEEDS	18		20		28	
50 PERCENT EXCEEDS	1.6		1.8		2.4	
90 PERCENT EXCEEDS	0.26		0.34		0.37	

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Old Hawaiian Datum, Hydrologic Unit 20010000, on right bank 160 ft upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. Parker Ranch diverts less than 1 ft^3/s through a 6-in. pipe upstream of gage.

AVERAGE DISCHARGE.--57 years (water years 1948-2004), 9.31 ft^3/s (6,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s, November 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on the basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.34 ft^3/s, June 5-6, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 26	1730	354	3.90
Feb 28	0245	291	3.72
Mar 14	1230	*2,960	*6.85
Mar 23	1300	454	4.15
Apr 10	2300	495	4.24

Minimum discharge, 0.72 ft^3/s, Sept. 29, 30, gage height, 1.37 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.1	5.0	2.2	9.6	10	14	5.0	5.2	2.5	1.5	1.5
2	1.3	1.1	11	1.9	12	16	8.6	4.1	10	5.4	6.6	1.4
3	1.4	1.2	9.7	2.5	7.6	23	9.0	5.9	5.7	4.5	19	1.3
4	1.3	1.2	20	24	4.2	9.4	5.8	29	8.4	3.0	7.1	1.2
5	1.4	1.0	7.2	5.3	7.3	4.3	6.8	22	10	2.7	3.2	1.4
6	1.4	1.00	5.0	3.0	9.9	3.3	5.3	18	5.0	2.3	3.6	1.2
7	1.3	0.85	3.5	2.3	21	4.0	4.3	31	4.2	2.1	6.9	1.1
8	1.4	0.90	10	2.0	12	48	4.4	14	5.3	2.0	3.2	1.1
9	1.4	0.93	11	1.8	4.4	13	6.9	6.0	8.9	2.0	2.2	1.1
10	1.4	0.88	5.7	1.7	3.1	4.7	119	4.5	7.6	2.0	1.8	1.1
11	1.4	1.0	5.7	1.6	2.6	3.3	207	4.0	4.9	3.3	1.5	1.2
12	1.4	0.99	3.8	1.4	2.2	2.8	121	3.6	4.6	2.1	1.4	1.2
13	1.4	0.93	3.9	1.4	1.9	22	45	3.2	3.5	1.9	1.6	1.1
14	1.5	1.5	3.4	1.5	1.9	396	13	3.2	3.0	3.1	1.5	1.1
15	1.9	2.2	3.3	1.4	1.9	49	8.5	2.8	3.4	3.0	1.4	1.1
16	13	7.2	3.1	1.3	2.5	15	6.9	10	3.7	2.3	6.3	1.1
17	8.8	4.6	5.5	1.2	4.1	12	48	5.8	2.9	1.9	6.3	1.5
18	3.3	6.6	14	1.2	2.6	6.3	38	3.8	2.7	1.8	2.8	1.5
19	2.4	42	5.4	1.2	2.2	4.5	12	3.2	3.1	1.6	1.9	1.2
20	2.0	12	3.6	1.1	2.1	3.6	11	2.9	6.8	1.5	1.5	1.0
21	1.7	6.6	2.9	1.0	2.1	3.3	7.1	2.6	8.0	1.4	2.7	0.97
22	1.4	4.5	2.4	1.1	2.0	56	5.8	2.5	11	1.5	4.7	0.91
23	1.3	3.0	2.2	1.5	1.8	97	5.4	2.5	4.8	1.4	11	0.85
24	1.3	2.4	2.1	1.5	1.9	47	6.1	2.4	4.0	1.3	3.4	0.89
25	1.2	2.1	2.0	1.8	2.1	38	7.7	3.9	3.3	1.3	2.2	0.87
26	1.1	16	1.8	41	2.0	27	21	8.8	2.6	1.2	1.9	0.86
27	1.2	4.6	1.7	12	1.9	8.9	18	8.2	2.4	1.3	1.6	0.84
28	1.1	2.8	2.2	5.6	80	12	7.1	6.2	3.4	2.7	1.4	0.84
29	1.1	2.6	3.2	70	6.7	17	5.2	13	4.1	3.2	2.5	0.81
30	1.1	4.1	3.1	10	---	58	4.5	9.3	3.0	1.8	4.0	0.77
31	1.1	---	2.4	13	---	37	---	7.4	---	1.5	2.0	---
TOTAL	64.5	137.88	165.8	218.5	215.6	1,051.4	782.4	248.8	155.5	69.6	118.7	33.01
MEAN	2.08	4.60	5.35	7.05	7.43	33.9	26.1	8.03	5.18	2.25	3.83	1.10
MAX	13	42	20	70	80	396	207	31	11	5.4	19	1.5
MIN	1.1	0.85	1.7	1.0	1.8	2.8	4.3	2.4	2.4	1.2	1.4	0.77
AC-FT	128	273	329	433	428	2,090	1,550	493	308	138	235	65

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2004, BY WATER YEAR (WY)

MEAN	6.06	8.76	9.56	8.42	7.87	10.9	12.9	8.97	8.86	12.0	11.2	6.00
MAX	18.2	43.7	31.4	38.7	23.0	52.1	43.4	22.1	28.4	26.9	33.6	24.9
(WY)	(1984)	(1980)	(1958)	(1979)	(1960)	(1980)	(1986)	(1998)	(1998)	(2002)	(1958)	(1992)
MIN	0.98	1.42	1.47	1.46	1.31	2.11	1.53	1.95	2.68	2.25	2.27	0.91
(WY)	(1997)	(1963)	(1996)	(1953)	(1954)	(1983)	(1992)	(1999)	(1962)	(2004)	(1973)	(1965)

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1947 - 2004	
ANNUAL TOTAL	2,384.76		3,261.69			
ANNUAL MEAN	6.53		8.91		9.31	
HIGHEST ANNUAL MEAN					17.8	1980
LOWEST ANNUAL MEAN					4.49	1981
HIGHEST DAILY MEAN	118	Sep 1	396	Mar 14	641	Nov 18, 1979
LOWEST DAILY MEAN	0.85	Nov 7	0.77	Sep 30	0.37	Jun 3, 1992
ANNUAL SEVEN-DAY MINIMUM	0.93	Nov 7	0.84	Sep 24	0.42	May 21, 1992
ANNUAL RUNOFF (AC-FT)	4,730		6,470		6,750	
10 PERCENT EXCEEDS	15		14		21	
50 PERCENT EXCEEDS	3.2		3.0		4.3	
90 PERCENT EXCEEDS	1.3		1.1		1.8	

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary, and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2.

PERIOD OF RECORD.--March 1956 to Setember 2004 (discontinued). Prior to July 1960, published as Hauani Stream near Kamuela.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder. Concrete control since February 27, 1963. Elevation of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply benchmark).

REMARKS.--Records computed by Gary Sanchez. Records good. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--48 years (water years 1957-2004), 1.74 ft^3/s (1,260 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 980 ft^3/s, March 14, 2004, gage height, 4.78 ft, from rating curve extended above 11 ft^3/s on basis of slope-conveyance study; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 26	1700	229	3.29
Feb 28	0245	82	2.57
Mar 14	1230	*980	*4.78
Mar 23	1300	232	3.30
Apr 11	0030	191	3.15

Minimum discharge, 0.06 ft^3/s, on several days, gage height, 0.82 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.21	0.12	0.62	0.19	1.8	1.1	3.1	0.76	0.67	0.45	0.18	0.14
2	0.21	0.12	1.7	0.17	2.1	2.7	2.3	0.67	1.5	0.77	1.5	0.12
3	0.20	0.12	1.6	0.24	1.2	3.2	1.9	0.90	0.79	0.57	1.9	0.11
4	0.20	0.13	3.5	3.4	0.69	0.95	1.0	5.5	1.6	0.41	0.74	0.10
5	0.20	0.11	0.97	0.56	1.0	0.58	1.1	4.2	1.7	0.38	0.35	0.14
6	0.20	0.10	0.57	0.34	1.3	0.44	0.82	5.3	0.77	0.33	0.48	0.10
7	0.20	0.10	0.40	0.29	6.0	0.63	0.69	7.9	0.64	0.30	0.77	0.09
8	0.24	0.10	0.67	0.24	2.2	13	0.65	3.0	0.72	0.29	0.34	0.09
9	0.21	0.11	0.97	0.22	0.74	2.6	0.85	1.1	1.1	0.27	0.24	0.09
10	0.20	0.09	0.59	0.21	0.54	0.77	36	0.87	0.91	0.31	0.20	0.11
11	0.22	0.09	0.56	0.20	0.43	0.54	60	0.75	0.66	0.36	0.18	0.12
12	0.20	0.09	0.38	0.20	0.37	0.43	30	0.70	0.57	0.28	0.16	0.09
13	0.20	0.09	0.40	0.19	0.32	5.8	11	0.64	0.50	0.27	0.23	0.09
14	0.19	0.13	0.32	0.20	0.28	128	3.2	0.65	0.47	0.45	0.21	0.09
15	0.25	0.12	0.31	0.19	0.25	16	1.8	0.59	0.53	0.36	0.17	0.08
16	1.2	0.31	0.30	0.17	0.47	4.3	1.3	1.7	0.67	0.30	1.1	0.10
17	0.78	0.32	0.65	0.15	0.67	2.6	14	0.78	0.53	0.25	0.75	0.09
18	0.32	0.37	1.1	0.14	0.36	1.3	11	0.58	0.50	0.23	0.31	0.08
19	0.23	4.3	0.48	0.13	0.29	0.80	2.8	0.54	0.52	0.22	0.22	0.08
20	0.21	1.2	0.33	0.12	0.32	0.65	2.0	0.49	1.0	0.20	0.17	0.07
21	0.17	0.78	0.28	0.12	0.32	0.59	1.2	0.46	1.4	0.20	0.25	0.07
22	0.17	0.45	0.25	0.12	0.26	15	1.0	0.44	1.9	0.21	0.68	0.06
23	0.15	0.29	0.22	0.23	0.23	34	0.99	0.44	1.2	0.19	1.6	0.06
24	0.14	0.22	0.21	0.16	0.23	13	0.96	0.41	0.94	0.17	0.38	0.06
25	0.13	0.21	0.20	0.15	0.23	10	0.94	0.54	0.61	0.16	0.25	0.06
26	0.12	1.2	0.17	14	0.21	5.9	3.8	0.91	0.53	0.16	0.20	0.06
27	0.12	0.40	0.17	2.2	0.23	1.9	4.3	1.0	0.50	0.18	0.18	0.06
28	0.12	0.26	0.21	0.75	20	6.0	1.2	0.73	0.67	0.29	0.14	0.06
29	0.12	0.56	0.24	19	1.3	3.8	0.88	1.6	0.67	0.26	0.23	0.06
30	0.12	0.95	0.24	1.8	---	15	0.77	1.6	0.53	0.18	0.28	0.06
31	0.12	---	0.22	2.3	---	7.6	---	1.0	---	0.15	0.16	---
TOTAL	7.35	13.44	18.83	48.38	44.34	299.18	201.55	46.75	25.30	9.15	14.55	2.59
MEAN	0.24	0.45	0.61	1.56	1.53	9.65	6.72	1.51	0.84	0.30	0.47	0.09
MAX	1.2	4.3	3.5	19	20	128	60	7.9	1.9	0.77	1.9	0.14
MIN	0.12	0.09	0.17	0.12	0.21	0.43	0.65	0.41	0.47	0.15	0.14	0.06
AC-FT	15	27	37	96	88	593	400	93	50	18	29	5.1

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2004, BY WATER YEAR (WY)

MEAN	0.99	1.58	1.77	1.72	1.49	2.29	2.71	1.44	1.51	2.28	2.11	0.97
MAX	3.86	8.31	7.01	11.9	6.69	15.7	10.5	4.89	7.07	6.78	8.13	5.93
(WY)	(1984)	(1980)	(1960)	(1979)	(1960)	(1980)	(1986)	(1998)	(1998)	(2002)	(1958)	(1992)
MIN	0.01	0.00	0.07	0.05	0.09	0.10	0.20	0.20	0.16	0.15	0.12	0.00
(WY)	(1985)	(1963)	(1996)	(1962)	(1983)	(1983)	(1981)	(1966)	(1981)	(1961)	(1965)	(1965)

16759000 HAUANI GULCH NEAR KAMUELA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1956 - 2004	
ANNUAL TOTAL	396.53		731.41			
ANNUAL MEAN	1.09		2.00		1.74	
HIGHEST ANNUAL MEAN					3.66	1998
LOWEST ANNUAL MEAN					0.48	1981
HIGHEST DAILY MEAN	39	Sep 1	128	Mar 14	128	Mar 14, 2004
LOWEST DAILY MEAN	0.09	Nov 10	0.06	Sep 22	0.00	Jul 29, 1961
ANNUAL SEVEN-DAY MINIMUM	0.10	Nov 7	0.06	Sep 22	0.00	Sep 8, 1961
ANNUAL RUNOFF (AC-FT)	787		1,450		1,260	
10 PERCENT EXCEEDS	2.0		3.0		3.9	
50 PERCENT EXCEEDS	0.40		0.40		0.53	
90 PERCENT EXCEEDS	0.13		0.12		0.09	

16770500 PAAUAU GULCH AT PAHALA

LOCATION.--Lat 19°12'39", long 155°28'48", Old Hawaiian Datum, Hydrologic Unit 20010000, on right bank 50 ft downstream from Wood Valley Road bridge and 0.7 mi north of Pahala.

DRAINAGE AREA.--1.74 mi^2.

PERIOD OF RECORD.--May 1962 to January 1979, annual maximum, water years 1994-98, October 1999 to June 2000 (gage heights only) annual maximum, water year 2001, October 2001 to current year.

REVISED RECORDS.--WDR HI-01-1: 1963 (P), 1965-77 (P), 1979-90 (P), 1997-98 (P).

GAGE.--Water-stage recorder. Elevation of gage is 972 ft above mean sea level (from stadia survey). Nonrecording gage water years 1994 to 1998 and 2001.

REMARKS.--Records computed by Dale Nishimoto. Records fair, except for periods of estimation, which are poor. No diversion upstream.

AVERAGE DISCHARGE.--19 years (water years 1963-78, 2004), 0.70 ft^3/s (505 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,480 ft^3/s, November 2, 2000, gage height, 12.02 ft, from floodmarks and culvert computation with road-over-flow section; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 23	1400	*359	*4.27
May 11	0445	248	3.81

Minimum discharge, 0.00 ft^3/s, on many days, gage height, 0.82 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	e0.00	e0.00	0.00
2	0.00	0.00	0.04	0.00	0.00	0.09	0.00	0.00	0.00	e0.00	e0.00	0.00
3	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.01	e0.00	e0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13	e0.00	e0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	e0.00	e0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	e0.00	e0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	e0.00	e0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
23	0.00	0.00	0.00	39	e0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	e0.00	0.00	0.07	0.00	e0.00	e0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	5.9	0.00	e0.00	e0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	9.9	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	e0.00	e0.00	0.00	0.00
31	0.00	---	0.00	0.00	---	0.00	---	0.00	---	e0.00	0.00	---
TOTAL	0.00	0.00	0.04	39.03	10.35	0.66	6.27	13.68	0.00	0.00	0.00	0.00
MEAN	0.00	0.00	0.00	1.26	0.36	0.02	0.21	0.44	0.00	0.00	0.00	0.00
MAX	0.00	0.00	0.04	39	9.9	0.52	5.9	13	0.00	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	0.00	0.08	77	21	1.3	12	27	0.00	0.00	0.00	0.00

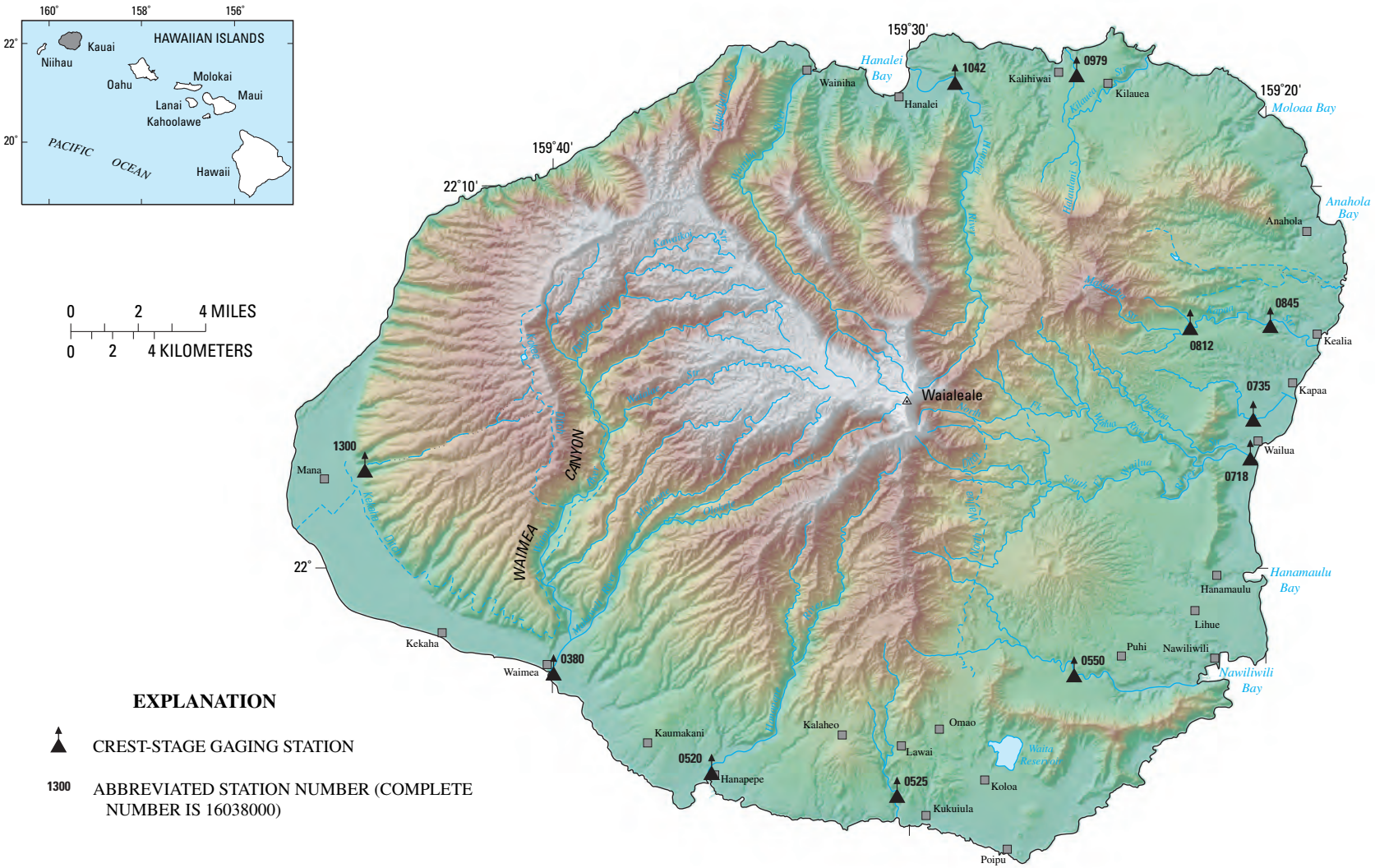
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2004, BY WATER YEAR (WY)

MEAN	0.40	1.40	0.50	3.56	0.76	0.19	0.56	0.49	0.04	0.04	0.18	0.11
MAX	5.65	9.19	7.01	29.5	8.12	1.54	6.89	2.58	0.27	0.25	1.81	1.06
(WY)	(1969)	(1967)	(1974)	(1975)	(1976)	(1963)	(1963)	(2002)	(1978)	(1978)	(1977)	(1973)
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(WY)	(1964)	(1963)	(1963)	(1963)	(1970)	(1970)	(1970)	(1974)	(1962)	(1962)	(1962)	(1964)

16770500 PAAUAU GULCH AT PAHALA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1962 - 2004	
ANNUAL TOTAL	0.04		70.03			
ANNUAL MEAN	0.00		0.19		0.70	
HIGHEST ANNUAL MEAN					2.76	1975
LOWEST ANNUAL MEAN					0.00	2003
HIGHEST DAILY MEAN	0.04	Dec 2	39	Jan 23	720	Jan 8, 1975
LOWEST DAILY MEAN	0.00	Jan 1	0.00	Oct 1	0.00	May 1, 1962
ANNUAL SEVEN-DAY MINIMUM	0.00	Jan 1	0.00	Oct 1	0.00	May 20, 1962
ANNUAL RUNOFF (AC-FT)	0.08		139		505	
10 PERCENT EXCEEDS	0.00		0.00		0.20	
50 PERCENT EXCEEDS	0.00		0.00		0.00	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

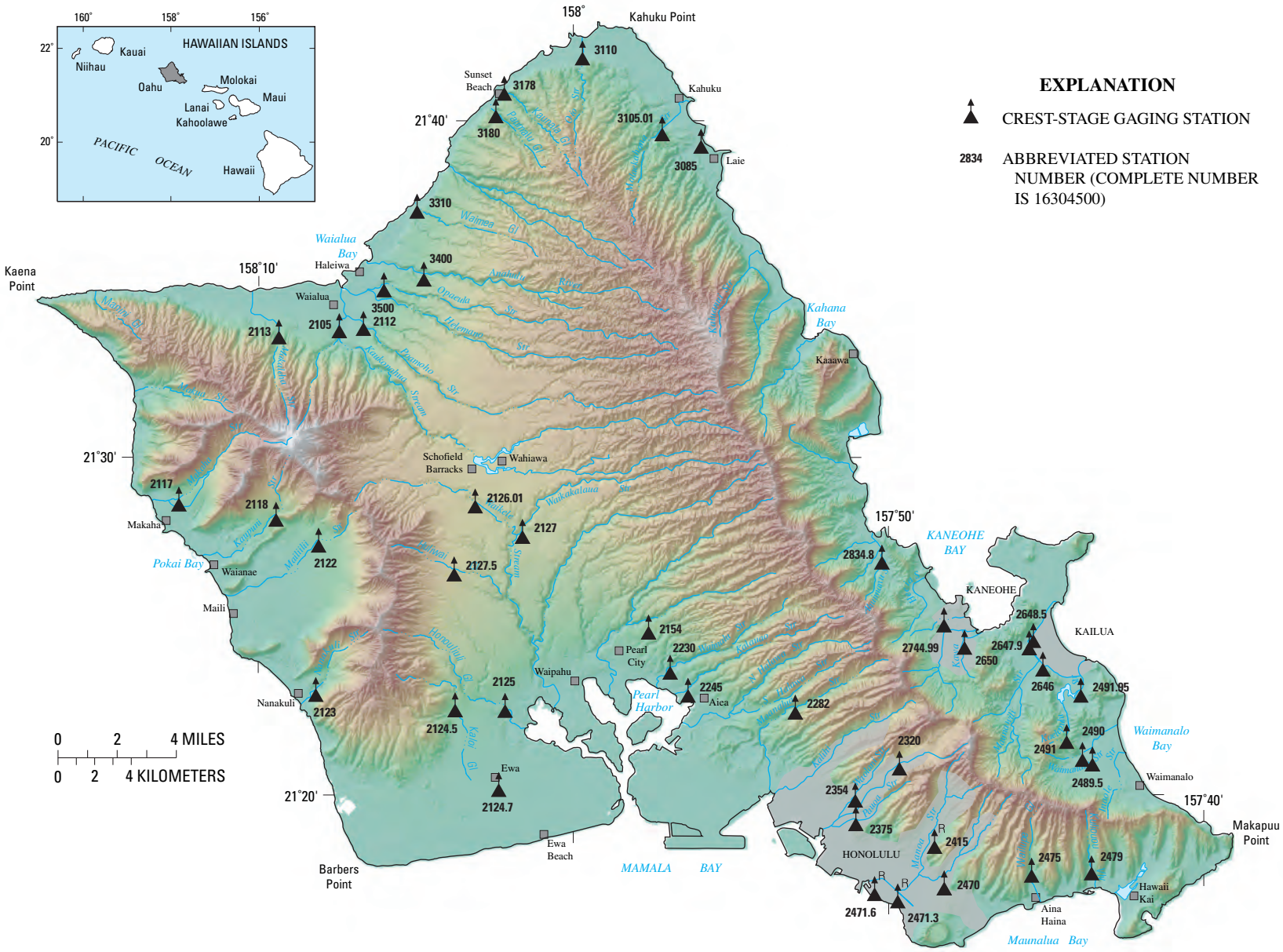
e Estimated



EXPLANATION

▲ CREST-STAGE GAGING STATION

1300 ABBREVIATED STATION NUMBER (COMPLETE NUMBER IS 16038000)


EXPLANATION
CREST-STAGE GAGING STATION
2834 ABBREVIATED STATION NUMBER (COMPLETE NUMBER IS 16304500)
HAWAIIAN ISLANDS
Kauai
Niihau
Oahu
Molokai
Maui
Lanai
Kahoolawe
Hawaii
PACIFIC OCEAN
160°
158°
156°
22°
20°
158°
Kahuku Point
Sunset Beach
Kahuku
Laie
21°40'
158°10'
Kaena Point
Waialua Bay
Haleiwa
Waialua
Kahana Bay
Kaaawa
21°30'
Schofield Barracks
Wahiawa
Makaha
Pokai Bay
Waianae
Maili
157°50'
KANEOHE BAY
KANEOHE
KAILUA
Pearl City
Waipahu
Pearl Harbor
Aiea
Nanakuli
Waimanalo Bay
Waimanalo
157°40'
Makapuu Point
21°20'
Ewa
Ewa Beach
Barbers Point
MAMALA BAY
HONOLULU
Aina Haina
Hawaii Kai
Maunalua Bay
0 2 4 MILES
0 2 4 KILOMETERS
3110
3178
3180
3105.01
3085
3310
3400
3500
2112
2105
2113
2117
2118
2122
2126.01
2127
2127.5
2834.8
2154
2230
2245
2282
2744.99
2650
2648.5
2647.9
2646
2491.95
2490
2491
2489.5
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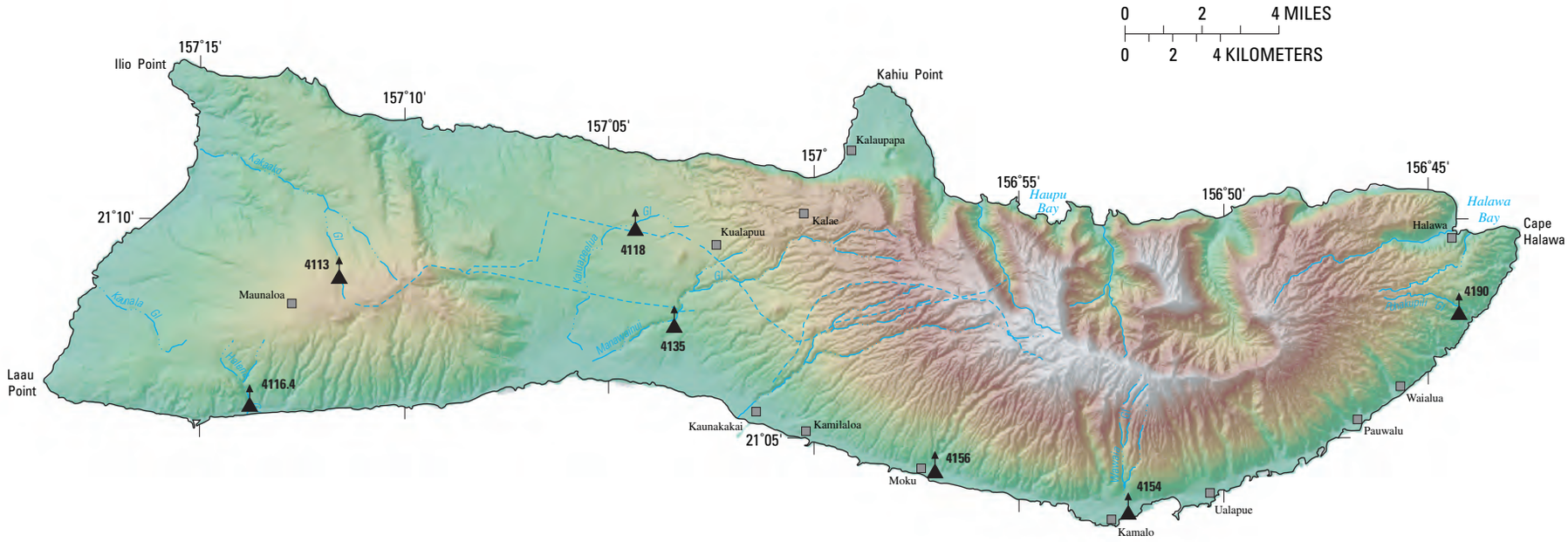
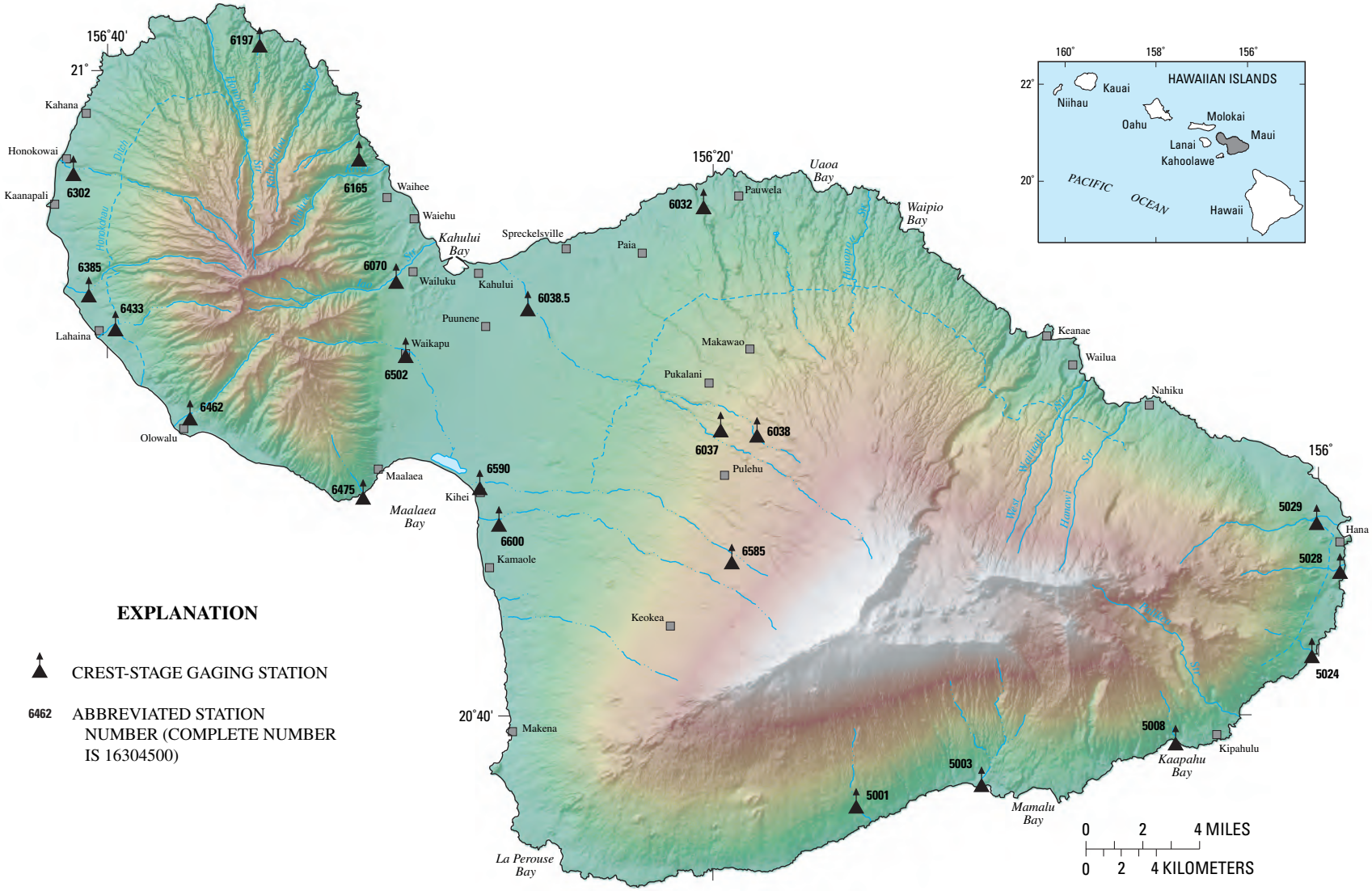
2124.7

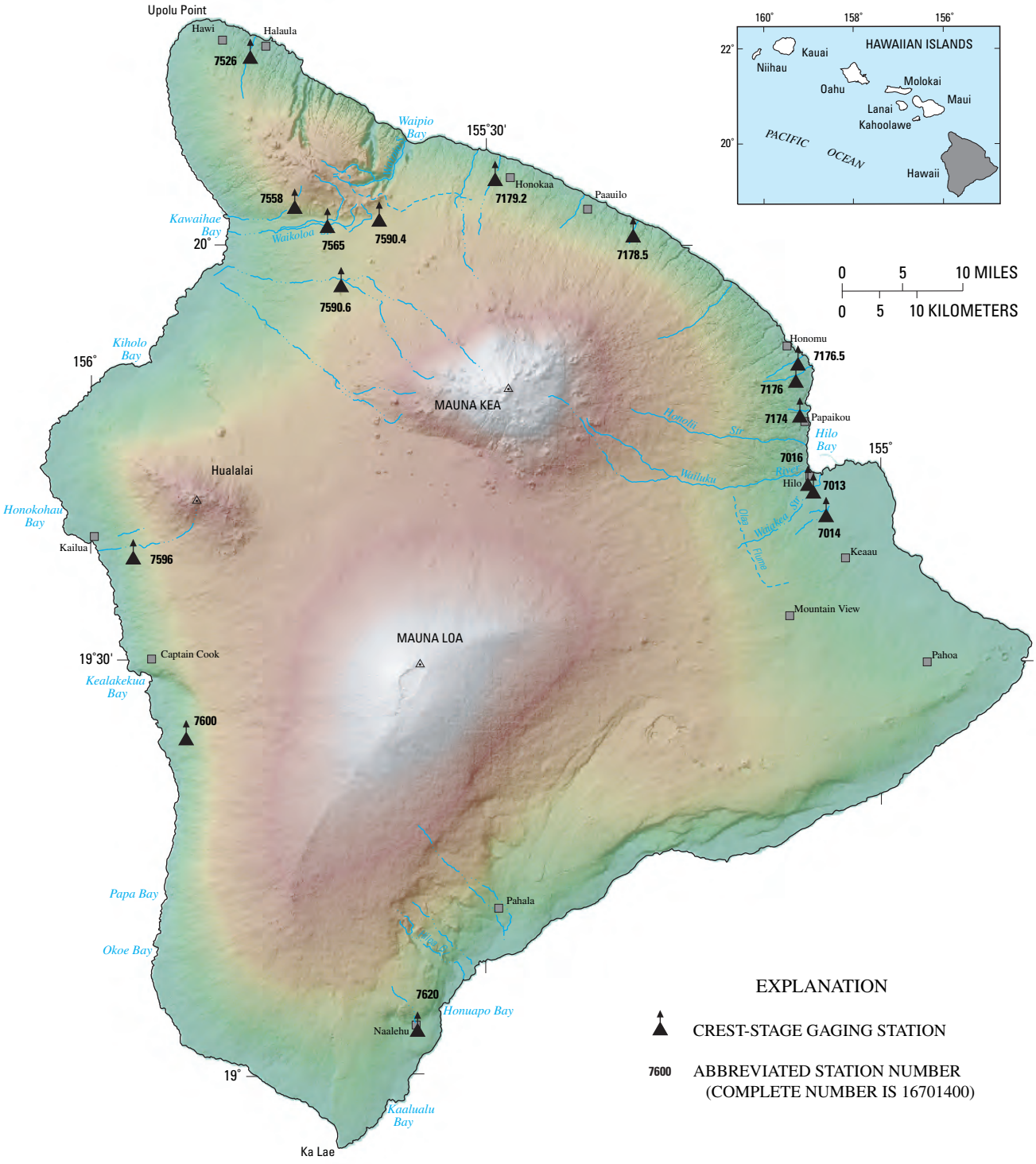

0 2 4 MILES
0 2 4 KILOMETERS
157°15'
Ilio Point
157°10'
157°05'
157°
Kahiu Point
Kalaupapa
156°55'
Haupu Bay
156°50'
156°45'
Halawa Bay
Cape Halawa
Halawa
21°10'
Kalaeo
Kualapuu
Kalaupapa
Kaunala Gl
Kaunala Gl
Hoolulu
Manawainui
Gl
4113
4118
4135
4116.4
4190
Maunaloa
Laau Point
Kaunakakai
Kamilaloa
21°05'
Moku
4156
4154
Kamalo
Ualapue
Pauwalu
Waialua
Manawainui
Gl
Halawa
Gl
EXPLANATION
CREST-STAGE GAGING STATION
4116 ABBREVIATED STATION NUMBER (COMPLETE NUMBER IS 16413500)
160°
158°
156°
22°
20°
HAWAIIAN ISLANDS
Niihau
Kauai
Oahu
Molokai
Maui
Lanai
Kahoolawe
Hawaii
PACIFIC OCEAN



EXPLANATION

▲ CREST-STAGE GAGING STATION

6462 ABBREVIATED STATION NUMBER (COMPLETE NUMBER IS 16304500)


Upolu Point
Hawi
Halaula
7526
Waipio Bay
155°30'
Honokaa
7179.2
Paauilo
7178.5
7558
7565
7590.4
Kawaihae Bay
Waikoloa
20°
7590.6
Kiholo Bay
156°
Honomu
7176.5
7176
MAUNA KEA
7174
Papaikou
Hilo Bay
155°
7016
Hilo
7013
7014
Hualalai
Honokohau Bay
Kailua
7596
Keaau
Mountain View
MAUNA LOA
19°30'
Captain Cook
Pahoa
Kealakekua Bay
7600
Papa Bay
Pahala
Okoe Bay
7620
Honuapo Bay
Naalehu
19°
Kaalualu Bay
Ka Lae
160°
158°
156°
22°
20°
HAWAIIAN ISLANDS
Kauai
Niihau
Oahu
Molokai
Maui
Lanai
Kahoolawe
PACIFIC
OCEAN
Hawaii
0 5 10 MILES
0 5 10 KILOMETERS
EXPLANATION
CREST-STAGE GAGING STATION
7600 ABBREVIATED STATION NUMBER
(COMPLETE NUMBER IS 16701400)

As the number of streams on which streamflow information is likely to be desired far exceeds the number of continuous-record stream- gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous-record 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 these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in three tables. The first is a table of annual maximum stage and discharge at crest-stage stations, the second is a table of discharge measurements at low-flow partial-record stations, and the third is a table of discharge measurements at miscellaneous sites.

Crest-Stage Partial-Record Stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled “An Investigation of Floods in Hawaii.” The following table contains annual maximum discharge 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 water year is given. Information on some lower floods may have been obtained for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Click on a station number for site description.

Annual maximum gage height and discharge at crest-stage partial-record stations during water year 2004

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Kauai									
16038000 Waimea River at Waimea	Lat 21° 57’23”, long 159° 39’59”, 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-2004b	10-28-03	6.33	-	02-07-49	11.40	-
16052000 Hanapepe River at Hanapepe	Lat 21° 54’47”, long 159° 35’33”, 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	26.6	1950-2004b,r	02-27-04	4.74	-	04-15-63	11.30	-
16052500 Lawai Str nr Koloa	Lat 21° 54’11”, long 159° 30’21”, on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72#, 1973-2004	02-27-04	4.59	931	01-31-75	11.37	5,810
16055000 Huleia Str nr Lihue	Lat 21° 57’20”, long 159° 25’23”, at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.6	1912-15#, 1962-67, 1968-70#, 1971-2004	02-27-04	14.25	7,670	11-28-70	22.40	26,800
16071800 Wailua Riv nr Kapaa	Lat 22° 03’00”, long 159° 20’26”, at State park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-2004b	08-04-04	5.60	-	11-26-70	8.57	-

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
Island of Kauai--Continued									
16073500 Konohiki Str nr Kapaa	Lat 22° 04'01", long 159° 20'21", at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-2004r	02-27-04	5.38	74	12-14-91	16.92	2,530
16081200 Akulikuli Str nr Kapaa	Lat 22° 06'25", long 159° 22'07", at Kahuna Road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	0.40	1964-2004r	11-30-03	4.48	207	12-14-91	11.40	1,550
16084500 Kapaa Str at old highway crossing nr Kealia	Lat 22° 06'28", long 159° 19'52", at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-2004	02-27-04	10.30	3,710	12-14-91	23.11	30,300
16097900 Puukumu Str nr Kilauea	Lat 22° 13'02", long 159° 25'18", at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	0.91	1964-68, 1971-2004	04-20-04	4.36	126	04-07-71	17.27	1,430
16104200 Hanalei Riv at Highway 56 bridge nr Hanalei	Lat 22° 12'50", long 159° 28'43", at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-2004b,r	02-27-04	8.43	-	11-03-95	13.82	-
16130000 Nahomalu Valley nr Mana	Lat 22° 02'41", long 159° 45'17", on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71#, 1972-2004	02-27-04	4.70	266	04-15-72	7.15	2,120

Operated as a continuous-record gaging station
b Gage height only
r Revised

16052000 peak gage height and discharge published for water years 1963-92 were revised in water-resources data report for Hawaii, water year 1993.
16073500 peak gage height and discharge published for water year 1993 were revised in water-resources data report for Hawaii, water year 1999.
16081200 peak gage heights and discharges published for water years 1993-98 were revised in water-resources data report for Hawaii, water year 1999.
16104200 peak gage height published for water years 1983-92 were revised in water-resources data report for Hawaii, water year 1993.

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Oahu									
16210500 Kaukonahua Str at Waialua	Lat 21° 33’56”, long 158° 07’26”, 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-2004	12-07-03	24.74	unknown	04-15-63	26.4	15,600
16211200 Poamoho Str at Waialua	Lat 21° 34’00”, long 158° 06’40”, at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	12.7	1967-2004	11-29-03	20.89	unknown	– 04-19-74	24.0	7,340
16212450 Kaloi Gulch Tributary nr Honouliuli	Lat 21° 22’41”, long 158° 03’45”, at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of ‘Ewa Post Office.	1.70	1968-2004	02-27-04	3.61	unknown	1 01-25-75 0 01-08-80	7.89 7.45	- 724
16212470 Kaloi Gulch at Railroad Bridge at Ewa	Lat 21° 20’19”, long 158° 02’22”, at Railroad Bridge, 100 ft upstream of Coral Creek Golf Course pond, 0.6 mi south of Ewa Elementary School, and 2.3 mi south of Saint Francis Medical Center.	9.37	2001-2004	02-27-04	6.49	unknown		--unknown	
16212500 Honouliuli Str nr Waipahu	Lat 21° 22’40”, long 158° 02’10”, at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-2004	02-27-04	3.82	unknown	01-06-82	10.28	3,500
16212750 Huliwai Gulch nr Kunia Camp	Lat 21° 26’43”, long 158° 03’47”, 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	4.29	1974-2004	02-07-04	11.39	unknown	02-10-79 10-16-91	8.36 13.49	e600 -
16215400 Waimano Str nr Pearl City	Lat 21° 25’11”, long 157° 57’47”, at Komo Mai Drive bridge, 0.5 mi northwest of Pearl City High School and 1.7 mi northeast of Pearl City Post Office.	5.15	2002-2004	02-27-04	6.60	1,810	02-27-04	6.60	1,180
16223000 Waimalu Str nr Aiea	Lat 21° 23’48”, long 157° 56’56”, 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi north west of Aiea High School.	5.97	1952-70#, 1973-2004	08-04-04	3.83	1,960	01-05-68 05-14-60	a6.82 a9.49	8,020 -

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height(ft)	Discharge (ft)
Island of Oahu--Continued									
16228200 Moanalua Stream nr Aiea	Lat 21°22’37”, long 157°53’03”, on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1969-2004	11-29-03	5.68	1,740	3-18-80	9.97	4,860
16232000 Nuuanu Stream blw Reservoir 2 wasteway nr Honolulu	Lat 21° 20’57”, long 157° 49’40”, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mi down stream from reservoir 2 wasteway, and 3.5 mi northeast of Honolulu Post Office.	3.35	1913-96, 2002-2004r	11-29-03	5.92	588	01-16-21	a8.74	6,990
16235400 Waolani Str at Honolulu	Lat 21° 20’00”, long 157° 51’04” at Wyllie Street Bridge and 1.8 mi NE of Honolulu Post Office.	1.29	1958-2004r	12-07-03	4.84	unknown	05-14-63	6.14	2,510
16237500 Pauoa Str at Honolulu	Lat 21° 19’18”, long 157° 51’03”, at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-2004	02-27-04	0.65	unknown	05-14-63	4.65	2,200
16247130 Ala Wai Canal at Ala Wai Elem. School, Oahu	Lat 21°17’16”, long 157° 49’51”, at Ala Wai Canal, 300 ft south of Ala Wai Elem. School, 30 ft south of the Ala Wai Community Garden	11.7	2004b	06-03-04	280	-	06-14-03	2.82	-
16247160 Ala Wai Canal at Ala Moana Blvd. Bridge, Oahu	Lat 21° 17’29”, long 157° 50’35”, on right bank, at downstream end of Ala Moana Blvd. Bridge, 0.9 mi NW of Ala Wai Elem. School.	16.0	2004b	06-03-04	3.14	-	06-03-04	3.14	-
16248950 Kahawai Str at Waimanalo	Lat 21° 21’04”, long 157° 43’33”, on left bank 30 ft downstream from Kalanianaole Highway bridge, 1.9 mi northwest of Waimanalo Post Office, and 0.75 mi southwest of Bellows Air Force Station radio towers.	1.18	1998-2004	01-02-04	9.11	unknown	01-02-04	9.11	unknown
16249100 Kaelepulu Str tributary at Kailua	Lat 21° 21’44”, long 157° 44’22”, 30 ft upstream from Kalanianaole High way, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-2004	02-27-04	3.17	113	12-31-87	7.53	467
16249195 Kaelepulu Stream at Keolu Drive bridge	Lat 21° 22’55”, long 157° 43’45”, at bridge on Keolu Drive, 0.2 mi south of St. John Vianney School and 1.2 mi east of Kailua High School.	2.73	2002-2004b	02-27-04	10.09	-	02-27-04	10.09	-

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Oahu--Continued									
16264600 Kawainui Marsh nr Levee Station 15+00	Lat 21° 23’53”, long 157° 45’07”, at Kawainui Marsh, 0.6 mi west of Kailua Elementary School and 1.1 mi southeast of Kalaheo High School. Datum of gage is at mean sea level.	11.0	2002-2004b,r	02-27-04	6.11	-	02-27-04	6.11	-
16265000 Kawa Str at Kaneohe	Lat 21° 24’32”, long 157° 47’36”, 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-2004	11-29-03	7.45	975	02-01-69	17.90	5,290
16274499 Keaahala Str at Kamehameha Highway, at Kaneohe	Lat 21° 25’12”, long 157° 48’15”, 35 ft upstream from bridge on Kamehameha Highway at Kaneohe.	0.62	1959-2004r	11-27-04	3.81	533	05-02-65	a11.50	2,750
16283480 Ahuimanu Str nr Kahaluu	Lat 21° 27’04”, long 157° 50’13”, at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-2004	11-29-03	6.05	940	02-01-69 11-25-70	a11.80 a14.30	7,300 7,300
16308500 Kahawainui Stream at Laie	Lat 21° 39’25”, long 157° 55’57” , 800 ft northeast of Zion Cemetery on upstream side of bridge at Kamehameha Highway.	4.79	1997-2004b	11-29-03	5.15	-	01-29-02	5.55	-
16310501 Malaekahana Str at altitude 30 ft, nr Kahuku	Lat 21° 39’47”, long 157° 57’11”, at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-2004	05-11-04	12.78	743	04-15-63 05-06-02	a12.10 c13.04	4,640 -
16311000 Oio Stream nr Kahuku	Lat 21° 42’02”, long 157° 59’43”, on left bank of stream 30 ft upstream of Highway 83 and 3.0 mi northwest of Kahuku Hospital.	2.27	1958-2004	05-11-04	8.13	461	05-02-65 11-14-96	a8.13 a8.63	1,390 -

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Oahu--Continued									
16317800 Kaunala Gulch nr Sunset Beach	Lat 21° 40’59”, long 158° 02’12”, on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-2004	11-29-03	4.56	unknown	11-27-01 02-14-03	5.91 6.36	663 -
16318000 Paumalu Gulch at Sunset Beach	Lat 21° 40’19”, long 158° 02’28”, 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi northeast of Waimea.	2.59	1968-2004	05-11-04	4.19	303	04-19-74 04-04-89	4.97 6.44	982 -
16331000 Waimea Gulch nr Kawailoa Camp	Lat 21° 37’29”, long 158° 04’58”, at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-2004	11-29-03	1.04	<21	03-18-80	11.2	2,030
16340000 Anahulu River nr Hale‘iwa	Lat 21° 35’28”, long 158° 04’45”, 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Hale‘iwa.	13.5	1958-2004	11-29-03	7.56	2,890	04-19-74	15.80	15,900
16350000 Opaeula Str nr Haleiwa	Lat 21° 35’09”, long 158° 06’01”, 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-2004	11-29-03	13.32	1,580	04-19-74	20.7	7,600

< Actual value is known to be less than the value shown
Operated as a continuous-record gaging station
a At old gage datum
b Gage height
c At new gage datum
e Estimated
r Revised
16232000 peak discharge for water year 2002 was revised in water resources data report for Hawaii, water year 2003.
16235400 peak discharge for period of record published for water year 1992-2002 revised in water resources data report for Hawaii, water year 2003.
16249000 peak discharge for water year 1994 was revised in water resources data report for Hawaii, water year 2003.
16264600 peak gage height for water year 2002 was revised in water resources data report for Hawaii, water year 2003.
16274499 peak gage height for water year 2002 was revised in water resources data report for Hawaii, water year 2003

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Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Molokai									
16411300 Kakaako Gulch at Highway 46 nr Mauna Loa	Lat 21° 08’49”, long 157° 11’36”, at Highway 46, 1.6 mi northeast of Mauna Loa, and 1.8 mi upstream from Kamakahi Gulch.	0.55	1964-85, 2003-04	01-02-04	<3.23	unknown	04-13-65	3.06	a 80
16411640 Halena Gulch nr Mauna Loa	Lat 21° 05’53”, long 157° 13’47”, 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-2004	01-02-04	4.06	802	01-11-74	8.20	2,920
16411800 Kaluapeelua Gulch at Ho‘olehua	Lat 21° 09’55”, long 157° 04’22”, 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-2004	01-02-04	<0.66	<8.40	12-08-73	3.30	86
16413500 Manawainui Gulch nr Kualapuu	Lat 21° 07’42”, long 157° 03’25”, at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-87, 2000-2004r	01-02-04	9.18	unknown	04-04-89	-	a 3,620
16415400 Wawaia Gulch at Kamalo	Lat 21° 03’25”, long 156° 52’20”, at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-2004	01-01-04	1.68	615	04-13-65	2.61	1,250
16415600 Kawela Gulch nr Moku	Lat 21° 04’22”, long 156° 57’03”, on left bank 1,000 ft upstream of High way 45, and 5 mi southeast of Kaunakakai.	5.30	2002-2004	01-24-04	5.16	2,090	11-27-01	6.76	3,190
16419000 Pohakupili Gulch nr Halawa	Lat 21° 07’59”, long 156° 44’15”, at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	0.48	1964-2004	01-01-04	unknown	unknown	11-04-66	8.93	989

< Actual value is known to be less than the value shown
a At old gage datum.
r Revised
16413500 peak discharge published for water year 1988 and 1990-97 were revised in water-resources data report for Hawaii, water year 2001.

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Maui									
16500100 Kepuni Gulch nr Kahikinui House	Lat 20°31’21”, long 156°15’16”, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.1 mi west of Kaupo	1.91	1963-72#, 1973-2004	2-27-04	6.27	325	9-18-94	13.68	2,320
16500300 Hawelewele Gulch nr Kaupo	Lat 20°38’01”, long 156°11’08”, 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo	11.3	1967-2004	3-22-04	9.27	3,350	1-08-80	15.10	13,600
16500800 Kukuiula Gulch nr Kaupo	Lat 20°39’18”, long 156°04’44”, at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo	0.76	1963-68#, 1969-2004	11-28-03	5.29	unknown	03-31-82	13.76	5,950
16502400 Pukuilua Gulch nr Hana	Lat 20°42’00”, long 156°00’14”, at Highway 31, 0.4 mi southwest of Puuiki and 4.0 mi south of Hana	0.48	1963-2004	03-22-04	4.86	278	01-23-65	9.30	788
16502800 Moomoonui Gulch nr Hana	Lat 20°44’37”, long 155°59’18”, at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi south of Hana.	0.90	1963-2004	03-22-04	4.05	unknown	10-29-00	15.64	2,950
16502900 Kawaipapa Gulch at Hana	Lat 20°46’08”, long 156°00’04”, 1,000 ft. upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-2004	03-22-04	11.65	unknown	10-29-00	14.53	e22,200
16603700 Kalialinui Gulch tributary nr Pukalani	Lat 20°49’02”, long 156°19’44”, at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-2004	01-23-04	3.42	unknown	01-09-80	7.35	414
16603800 Kaluapulani Gulch tributary nr Pukalani	Lat 20°48’52”, long 156°18’32”, at Haleakala Highway, 1.5 mi west of Olinda Prison Camp and 2.3 mi southeast of Pukalani.	0.45	1963-2004	01-23-04	2.23	53	07-23-64	9.90	306
16603850 Kalialinui Gulch nr Kahului	Lat 20°52’49”, long 156°26’05”, 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital and 2.5 mi southeast of Kahului Post Office.	17.9	1967-2004	12-05-03	5.56	unknown	01-28-71	8.33	1,330
16607000 Iao Str at Wailuku	Lat 20°53’38”, long 156°30’27”, 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951#, 1952-2004	02-27-04	5.74	4,660	12-03-50	6.21	7,540

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Maui--Continued									
16616500 Unnamed gulch at Maluhia Camp	Lat 20°57’26”, long 156°31’41”, at Kahekili Highway, 0.6 mi east of Maluhia Camp and 1.8 mi northwest of Waihee.	0.12	1964-2004	03-22-04	4.17	40	01-12-75	7.29	e97
16619700 Poelua Gulch nr Kahakuloa	Lat 21°00’58”, long 156°34’58”, at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse and 2.2 mi northwest of Kahakuloa	1.18	1965-2004	03-22-04	12.67	467	03-16-68	15.22	1,760
16630200 Honokawai Stream at Honokawai	Lat 20°56’58”, long 156°41’02”, 0.5 mi southeast of Honokowai and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-2004	01-01-04	6.16	1,190	08-01-82	a11.0	4,520
16638500 Kahoma Str at Lahaina	Lat 20°53’12”, long 156°40’36”, 0.2 mi west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Str and 0.9 mi upstream from mouth.	5.22	1963-89#, 1990-2004	01-01-04	8.61	2,100	07-11-65	11.03	2,490
16643300 Kauaula Str nr mouth, nr Lahaina	Lat 20°52’09”, long 156°39’43”, 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960, 1962, 1964-2004	01-01-04	5.06	777	5-13-60	a7.9	2,660
16646200 Olowalu Stream at Olowalu	Lat 20°39’23”, long 156°37’15”, on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72#, 1973-2004	02-27-04	5.48	unknown	03-24-67	5.40	1,300
16647500 Malalowaiaole Gulch nr Maalaea	Lat 20°46’56”, long 156°31’32”, at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi southwest of Maalaea.	0.64	1964-2004	02-27-04	11.08	279	01-10-80	12.95	350
16650200 Waikapu Stream at Waikapu	Lat 20°51’20”, long 156°30’08”,500 ft. downstream from Highway 30 bridge in Waikapu.	3.45	2002-04	02-27-04	8.20	1,400	02-27-04	8.20	1,400

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Maui--Continued									
16658500 Waiakoa Gulch tributary nr Waiakoa	Lat 20°44’56”, long 156°19’22”, at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads	0.98	1964-2004	02-27-04	5.23	199	01-28-71	8.23	409
16659000 Waiakoa Gulch at Kihei	Lat 20°47’15”, long 156°27’42”, 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-2004	02-27-04	7.87	unknown	01-28-71	9.66	1,560
16660000 Kulanihakoi Gulch nr Kihei	Lat 20°46’06”, long 156°27’03”, on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70#, 1971-2004	01-23-04	3.40	1,380	01-28-71	9.40	4,460

< Actual value is known to be less than the value shown
Operated as a continuous-record gaging station
e Estimated
r Revised
a At old gage datum

16619700 peak gage height and discharge published for water year 1999 were revised in water-resources data report for Hawaii, water year 2000.
16630200 peak gage height and discharge published for water years 1997 were revised in water-resources data report for Hawaii, water year 2000.

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
			Island of Hawaii						
16701400 Palai Str at Hilo	Lat 19° 40’56”, long 155° 04’04”, 160 ft. upstream of Olu Street and 3.6 mi. southeast of Hilo Post Office.	5.06	1965-71, 1979-80, 1994, 2002-04r	01-25-04	4.51	unknown	11-02-00	unknown	1,580
16701600 Alenaio Str at Hilo	Lat 19° 43’10”, long 155° 05’27”, 0.65 mi south of Hilo Post Office, 0.65 mi west of Kapiolani School, and 0.1 mi upstream from Kapiolani Street bridge.	8.62	1997-2004	03-14-04	unknown	unknown	11-02-00	13.12	6,300
16717400 Kalaoa Mauka Stream near Hilo	Lat 19° 48’07”, long 155° 06’03”, on upstream side of Hwy 19, 1.0 mi north of Papaikou, 5.1 mi north of Hilo Post Office.	0.24	1963-67, 1973-76, 1978-79, 1985, 2002-04r	03-14-04	5.51	109	02-20-79	20.60	400
16717600 Alia Str nr Hilo	Lat 19° 50’38”, long 155° 06’21”, on upstream right bank wingwall of culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72, 1979, 1986, 1994-2004r	03-14-04	9.53	359	02-20-79	17.1	2,850
16717650 Kapehu Str nr Pepeekeo	Lat 19° 51’52”, long 155° 06’11”, at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-68, 1975, 1979, 1985-86, 1994-2004r	03-14-04	9.84	1030	02-20-79	29.93	3,320
16717850 Keehia Gulch nr Ookala	Lat 20° 01’08”, long 155° 18’45”, at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	0.62	1963-91, 1993-2004			Records being reviewed.			
16717920 Ahualoa Gulch at Honokaa	Lat 20° 05’12”, long 155° 29’17”, at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	0.62	1963-90, 1995-2004			Records being reviewed.			
16752600 Hapahapai Gulch at Kapaau	Lat 20° 14’00”, long 155° 48’00”, at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1963-90, 1995-2004	03-23-04	10.42	673	Previous records being reviewed.		

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2004 maximum			Period of record maximum		
				Date	Gage height (ft)	Discharge (ft)	Date	Gage height (ft)	Discharge (ft)
Island of Hawaii--Continued									
16755800 Luahine Gulch nr Waimea	Lat 20° 03’11”, long 155° 44’35”, on culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	0.32	1963-90, 1995-2004	Records being reviewed.					
16756500 Keanuiomano Str nr Kamuela	Lat 20° 01’48”, long 155° 42’05”, on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72#, 1973-2004r	03-14-04	8.60	2,070	04-20-68	10.02	3,540
16759040 Paiakuli Reservoir tributary nr Waimea	Lat 20° 02’16”, long 155° 38’08”, at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	0.27	1963-70, 1994-2004r	03-14-04	8.65	856	03-14-04	8.65	856
16759060 Kamakoa Gulch nr Waimea	Lat 19° 57’32”, long 155° 41’02”, at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.6	1963-68, 1972-74, 1979, 1982-83, 1994-2004r	03-14-04	3.69	237	01-16-63	4.35	1,290
16759600 Waiaha Stream at Holualoa	Lat 19° 38’03”, long 155° 57’00”, on right bank, 3 mi southeast of intersection of Hwy 19 and 190 and 1.7 mi north of intersection of Hwy 180 and Halualoa Road.	9.61	2002-2004	04-21-04	5.31	1,820	04-21-04	5.31	1,820

Operated as a continuous-record gaging station
-- f 16759040 probable backwater from debris in culvert entrance
-- r Revised

16701300 peak gage height and discharge published for water years 1976-78, 1980-90 were revised in water resources data report for Hawai‘i, water year 1999; peak gage height and discharge published for water years 1991 and 1993 were revised in water-resources data report for Hawai‘i, water year 2001.

16701300 peak gage height and discharge published for water years 1976-78, 1980-90 were revised in water-resources data report for Hawai‘i, water year 1999; peak gage height and discharge published for water years 1991 and 1993 were revised in water-resources data report for Hawai‘i, water year 2001.

16717400 peak gage height and discharge published for water years 1968-72, 1977, 1979-84, 1986-90 were revised in water-resources data report for Hawai‘i, water year 1999.

16717600 peak gage height and dishcarge published for water years 1973-78, 1980-90, 1995-97 were revised in water-resources data report for Hawai‘i, water year 1998.

16717650 peak gage height and dishcharge published for water years 1966, 1969-74, 1976-78, 1980-84, 1987-90, 1996, 1999-2000 were revised in water-resources data report for Hawai‘i, water year 2001.

16756500 peak gage height and discharge published for water years 1964, 1975, 1978, 1991-96 were revised in water-resources data report for Hawai‘i, water year 1998.

16759040 peak gage height and discharge published for water years 1966, 1971-90, 1994-98 were revised in water-resources data report for Hawaii, water year 1999.

16759060 peak gage height and discharge published for water years 1967, 1969-71, 1973, 1975-79, 1981, 1984-90, 1994-2002 were revised in water-resources data report for Hawai‘i, water year 2003

Low-Flow Partial-Record Stations

Measurements of streamflow made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where long-term continuous records are available, will give a picture of the low-flow potential of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or nearly the same, site.

Discharge measurements made at low-flow partial-record stations during water year 2004

Station name and number	Location	Drainage area (mi^2)	Period of record	Date	Measurement: Gage height (ft)	Measurement: Discharge (ft^3/s)
	Island of Maui					
16588000 Wailoa ditch at Honopou, near Huelo	Lat 20° 53’20”, long 156° 15’19”, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mi west of Lupi, and 2.2 mi southwest of Huelo.	unknown	1924-87# , 1988-2004	10-07-03	2.22	68.1
				10-07-03	2.24	70.1
				10-23-03	2.54	84.2
				10-23-03	2.54	83.7
				02-23-04	2.61	89.8
				05-24-04	3.67	138.0
				07-01-04	3.83	150.0
16589000 New Hamakua ditch at Honopou, near Huelo	Lat 20° 53’28”, long 156° 15’22”, on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing and 2.1 mi southwest of Huelo.	unknown	1919-85# , 1986-2004	10-07-03	0.82	0.63
				02-23-04	0.94	1.54
				05-24-04	1.03	2.35
				07-01-04	0.99	2.06
16592000 Lowrie ditch at Honopou Gulch, near Huelo	Lat 20° 54’57”, long 156° 15’08”, on left bank 0.2 mi downstream from siphon across Honopou Stream, 1.6 mi west of Huelo, and 2.7 mi northwest of Kailua.	unknown	1911-26#, 1931-85#, 1986-2004	10-07-03	2.36	5.81
				02-23-04	2.80	21.1
				05-24-04	2.75	18.6
				07-01-04	2.71	17.6
16594000 Ha‘iku ditch at Honopou Gulch, near Kailua	Lat 20° 55’07”, long 156° 14’58”, on right bank on west side of Honopou Gulch, 160 ft below Hana Highway, 2.5 mi northwest of Kailua, and 5.0 mi east of Ha‘iku.	unknown	1911#, 1914#, 1916-28#, 1931-85#, 1986-2004	10-07-03	0.24	0.61
				02-23-04	0.44	2.25
				05-24-04	0.57	3.83
				07-01-04	0.44	2.23

Operated as a continuous-record gaging station.

Miscellaneous discharge water-quality measurements at low-flow stations during water year 2004, Molokai Springs.

Station name and number	Location	Time	Date	Discharge (ft^3/s)	Water temperature C°	Specific conductance (µS/cm)
	Island of Molokai					
210545157022201	Lat 21° 05’45”, long 157° 02’22”, at Kapuaiwa	1637	12-15-03	2.65	23.9	3,660
Coconut Grove	Coconut Grove, 1.3 mi west of Kaunakakai	1053	02-19-04	2.57	24.0	4,280
Springs near	on Hwy 460	0920	05-19-04	3.25	23.9	3,700
Kaunakakai		0820	07-16-04	3.53	24.0	3,950
210432156484801	Lat 21° 04’32”, long 156° 48’48”, at Pukoo, 15	1245	12-15-03	0.46	24.9	579
Pukoo Spring at	mi east of Kaunakakai on Hwy 450, 300 ft	1036	02-17-04	0.67	26.4	596
Pukoo	towards ocean from Hwy	0947	05-18-04	0.60	24.3	614
		0955	07-16-04	0.63	24.8	569

Discharge at Partial Record Stations on Stream Tributaries to Kealia Pond, Maui during water year 2004.

Miscellaneous discharge measurements during water year 2004.

Station name and number	Location	Date	Gage height (ft)	Discharge (ft^3/s)
	Island of Maui			
204839156295901 Pohakea Stream at Upper Maalaea Rd. near Maalaea	Lat 20° 48’39”, long 156° 29’59”	02-27-04	13.11	700
204858156293101 Paleaahu Stream at alt. 100 ft near Maalaea	Lat 20° 48’58”, long 156° 29’31”	02-27-04	11.08	772

Discharge measurements in the following table were made at miscellaneous sites on the south-southwestern side of the Island of Maui during water years 2002, 2003 and 2004.

Site number and name	Location	Date	Gage Height (ft)	Discharge (ft^3/sec)
204853156302501	Lat 20° 48’53”, long 156° 30’25”	09-03-03	2.36	1.73
Pohakea Stream at Hwy. 30		11-21-03	2.72	3.76
nr. Maalaea		02-27-04		3.80
204818156294001	Lat 20° 48’18”, long 156° 29’40”	09-03-03		1.32
Pohakea Stream at Lower Maalaea Rd. nr. Maalaea.				
204808156293101	Lat 20° 48’08”, long 156° 29’31”	09-03-03		0.96
Pohakea Stream at alt. 10 ft nr. Maalaea.				
204858156293101	Lat 20° 48’58”, long 156° 29’31”	01-23-04		3.25
Paleaahu Stream at alt. 100 ft nr. Maalaea.				
204831156291301	Lat 20° 48’31”, long 156° 29’31”	01-23-04		3.12
Paleaahu Stream at Lower Maalaea Rd. nr. Maalaea.				
204805156290601	Lat 20° 48’05”, long 156° 29’06”	01-23-04		2.81
Paleaahu Stream at alt. 10 ft nr. Maalaea.				
16650200	Lat 20° 51’ 20”, long 156° 30’08”	11-28-01	4.45	48.6
Waikapu Stream at Waikapu.		11-28-01	4.42	42.4
		03-18-04	4.00	16.3
204850156284901	Lat 20° 48’ 50”, long 156° 28’49”	03-18-04		7.10
Waikapu Stream at Lower Maalaea Rd nr. Maalaea				
. 204827156283601	Lat 20° 48’27”, long 156° 28’36”	03-18-04		5.74
Waikapu Stream at alt. 30 ft nr. Kihei.				

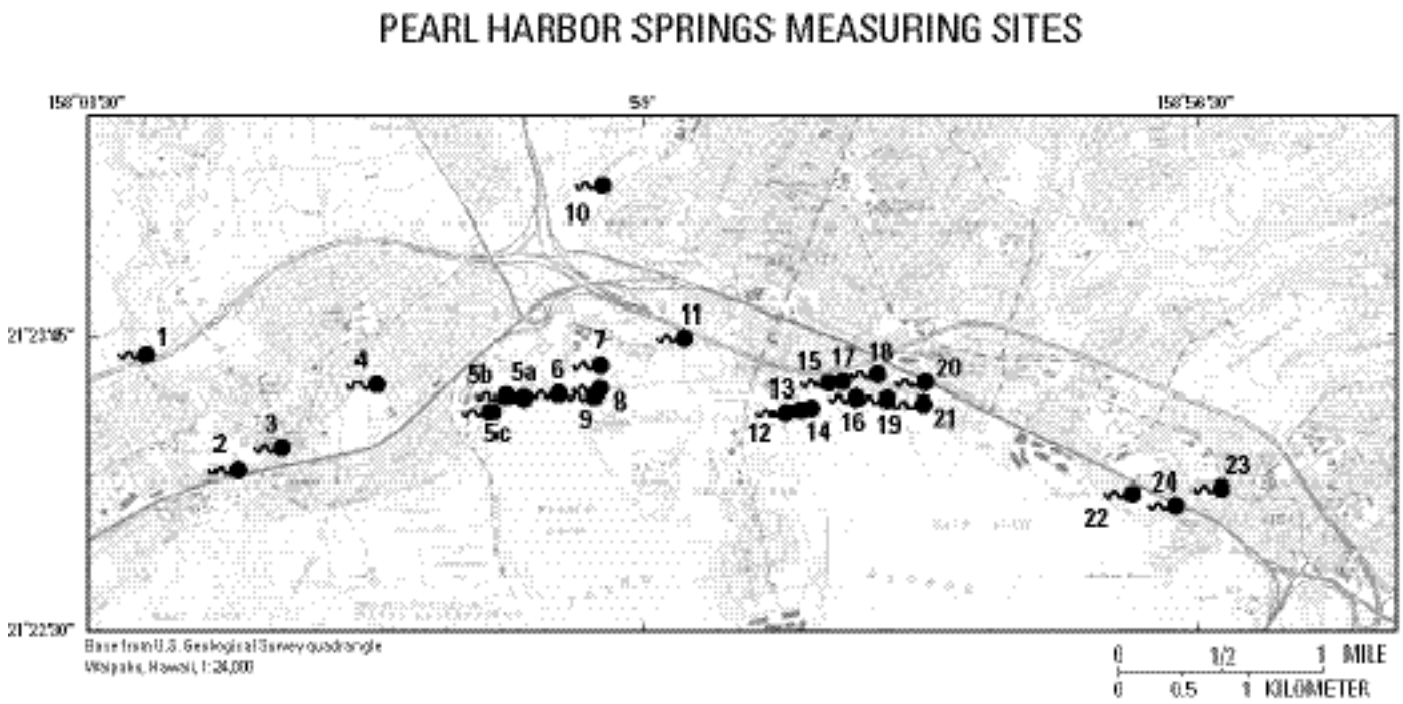


Figure 15. Map showing locations of Pearl Harbor Springs measuring sites, O‘ahu.

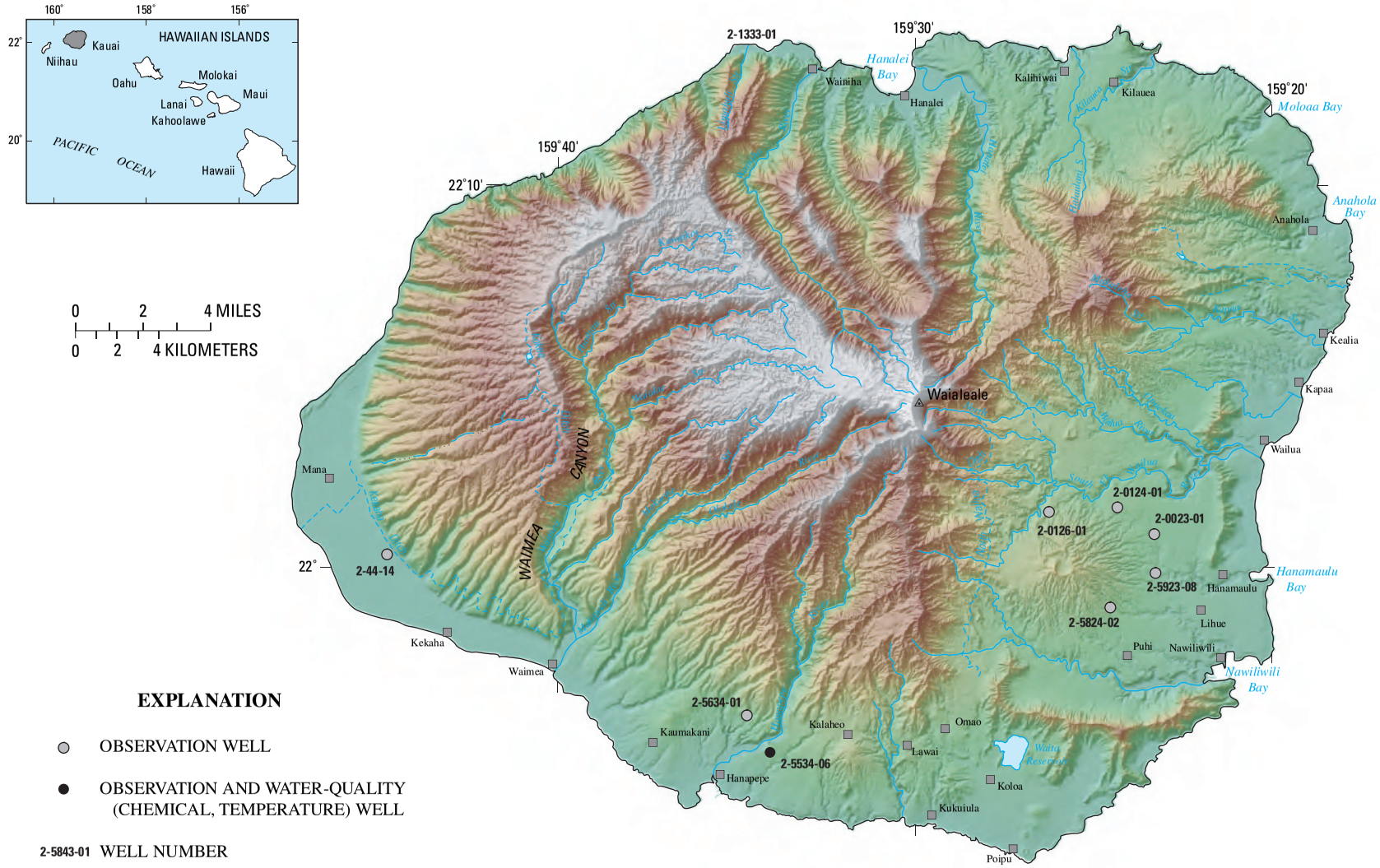
Discharge and water-quality measurements at low-flow stations during water year 2004, Pearl Harbor Springs, O‘ahu

Map number (see figure 15)	Station number and name	Location	Measurement					
			Time	Date	Discharge (ft^3/s)	Spec. Cond. (µs/cm)	Temp. (ºC)	Chloride (mg/L)
1	16212950 Waikele Stream below H-1 Freeway at Waipahu	Lat 21° 23’39”, long 158° 01’14” below H-1 Freeway, 100 ft upstream from cane haul road, 0.7 mi northwest of Waipahu Sugar Mill, and 0.7 mi upstream from gaging station 16213000.	1400 1210	05/19/04 07/02/04	7.01 8.3	110 104	24.5 26.5	12 13
2	16213000 Waikele Stream at Waipahu	Lat 21° 23’11”, long 158° 00’49”, on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of former sugar refinery at Waipahu.	0843 0835	05/18/04 07/02/04	30 26	387 405	22.0 23.5	70 77
3	212317158003701 Kapakahi Stream above Farrington Highway	Lat 21° 23’17”, long 158° 00’37”, upstream from two 4-ft concrete pipe culverts in parking lot of shopping center at Hanawai Circle at Waipahu, 500 ft upstream from Farrington Highway.	1115 1103	05/18/04 07/02/04	1.7 1.6	563 545	23.5 23.5	100 100
4	212332158001201 Waipahu Drainage Canal above Paiwa Street	Lat 21° 23’ 32”, long 158° 00’12”, 1,500 ft upstream from Farrington Highway and 0.5 mi east of Waipahu Sugar Mill, upstream from Paiwa Street bridge.	1010 0952	05/18/04 07/02/04	2.8 2.7	580 561	25.0 24.5	110 110
5	212328157593601 Spring Outlet 2 West of Waiawa Spring	Lat 21° 23’28”, long 157° 59’36”, a 5-8 ft concrete box culvert 0.4 mi west of Waiawa Spring outlet and 1,200 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	0845 0926	05/19/04 07/02/04	0.33 0.17	3990 4830	24.0 24.5	1200 1400
6	212330157592201 Spring Outlet 1 West of Waiawa Spring	Lat 21° 23’30”, long 157° 59’-22”, a 12-in. concrete pipe culvert 1,000 ft west of Waiawa Spring outlet and 2,500 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	0956 1009	05/19/04 07/02/04	0.75 0.86	5060 5250	24.0 23.5	1600 1600

Map number (see figure 15)	Station number and name	Location	Measurement					
			Time	Date	Discharge (ft^3/s)	Spec. Cond. (µs/cm)	Temp. (ºC)	Chloride (mg/L)
7	16214000 Pearl Harbor Springs at Waiawa near Pearl City	Lat 21° 23’36”, long 157° 59’11”, near Leeward Community College, 0.7 mi west of Pearl City, and 9.8 mi northwest of Honolulu, about 350 ft upstream from the mouth.	0838 0805	05/19/04 07/01/04	14 18	4000 4380	22.0 22.5	1200 1300
10	16215800 Waiawa Stream above Kamehameha Highway near Pearl City	Lat 21° 24’23”, long 157° 59’10”, 50 ft downstream from old cane haul road in Pearl City Industrial Park, 2,000 ft upstream from Kamehameha Highway, and 0.6 mi upstream from gaging station 16216000.	1103 1115	05/19/04 07/02/04	6.8 3.0	168 156	23.0 25.0	22 18
11	16216100 Waiawa Stream below H-1 near Pearl City	Lat 21° 23’44”, long 157° 58’48”, below H-1 Freeway, 1,200 ft downstream from gaging station 16216000, and 2,000 ft east of Leeward Community College.	1329 1135	05/19/04 07/02/04	12 7.7	425 518	25.5 25.0	81 110
12	212325157581801 Puukapu Site 3	Lat 21° 23’25”, long 157° 58’18”, at a 3-ft concrete pipe 1,000 ft west of Waimano flood channel at mouth. Drains from watercress fields to Pearl Harbor.	1020 0910	05/19/04 07/01/04	1.2 1.3	1450 1440	21.0 21.0	360 370
13	212325157581301 Puukapu Site 2	Lat 21° 23’25”, long 157° 58’13”, at two 4-ft concrete culverts on concrete roadway 100 ft north of old concrete gage house and 300 ft west of Waimano flood channel at mouth.	0925 0855	05/19/04 07/02/04	1.7 --	1700 1790	21.0 21.0	440 480
14	212326157580901 Puukapu Site 1	Lat 21° 23’26”, long 157° 58’09”, at two 3-ft concrete pipe culverts on right bank of Waimano flood channel at mouth. Drains from watercress fields to mouth of channel.	1033 0825	05/19/04 07/02/04	0.63 0.68	3170 3460	20.0 20.5	920 1000
15	16216550 Waimano Flood Channel below H-1 at Pearl City	Lat 21° 23’32”, long 157° 58’08”, 100 ft below Pearl Harbor bikeway, 600 ft from mouth, and 1,600 ft west of Hawaiian Electric Co. power plant at Waiau.	0832 1010	05/19/04 07/02/04	0.76 0.86	663 440	21.5 23.0	140 75

Map number (see figure 15)	Station number and name	Location	Measurement					
			Time	Date	Discharge (ft^3/s)	Spec. Cond. (µs/cm)	Temp. (ºC)	Chloride (mg/L)
17	212333157580101 Kaluaoopu Spring	Lat 21° 23’33”, long 157° 58’01”, at concrete bridge on bikeway, 700 ft west of No. 1 generator in the Hawaiian Electric Co. power plant. Measures the combined flow from the watercress fields and freeway storm drain.	0840 0833	05/18/04 07/01/04	7.5 7.7	945 1030	22.0 22.0	260 260
18	16219000 Hawaiian Electric Co. Tunnel at Waiau near Pearl City	Lat 21° 23’33”, long 157° 57’55”, concrete ditch at Hawaiian Electric Co. Waiau power plant, 20 ft downstream from tunnel portal, and 0.6 mi east of Pearl City.	1106 1018	05/19/04 07/01/04	2.5 2.8	1020 1020	20.5 20.5	240 250
19	212329157575001 Makai Spring at Hawaiian Electric Co. Power Plant	Lat 21° 23’29”, long 157° 57’50”, south of power plant at outlet of a 30-in. concrete pipe draining overflow from power plant and seepage from Old Rice Mill Spring into Pearl Harbor.	0940 0949	05/18/04 07/01/04	0.52 0.68	1120 1330	21.0 21.0	330 360
20	212331157574101 Waiau Spring below Kamehameha Highway	Lat 21° 23’31”, long 157° 57’41”, below Kamehameha Highway and 500 ft from outlet to Pearl Harbor. Drains from Waiau Springs.	1030 1058	05/18/04 07/01/04	1.9 2.0	323 356	21.5 22.0	59 61
22	16224000 Pearl Harbor Spring at Kalauao near Aiea	Lat 21° 23’06”, long 157° 56’46”, at Kamehameha Highway bridge, drains from Sumida watercress farm, 1.1 mi west of Aiea, and 7.6 mi northwest of Honolulu.	0934 0820	05/18/04 07/01/04	13 13	1740 1880	22.5 22.0	480 510
23	16224500 Kalauao Stream at Moanalua Road at Aiea	Lat 21° 23’07”, long 157° 56’22”, at Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	1045 1020	05/18/04 07/01/04	1.5 2.6	344 228	24.0 24.0	77 35
24	16224550 Kalauao Stream above Kamehameha Highway at Aiea	Lat 21° 23’02”, long 157° 56’35”, above Kamehameha Highway and 1,300 ft from mouth, 1,000 ft downstream from gaging station 16224500, and 0.8 mi northwest of Aloha Stadium.	1045 0915	05/18/04 07/01/04	1.6 2.7	423 305	22.5 24.0	59 55

Ground-Water Station Records



EXPLANATION

OBSERVATION WELL

OBSERVATION AND WATER-QUALITY (CHEMICAL, TEMPERATURE) WELL

2-5843-01 WELL NUMBER

Figure 16. Locations of observation wells and ground-water quality sampling sites on Kauai.

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01. Kalepa Ridge, Kauai.

LOCATION.--Lat 22°01', long 159°21', Old Hawaiian Datum, Hydrologic Unit 20070000, 1.0 mi southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 277 ft, casing diameter 8-in., cased to 196 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point is the top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1980 to June 1993. Water-level recorder, June 1993 to November 1999. Occasional measurements, November 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.86 ft above mean sea level, March 3, 1995; lowest water level measured, , 8.65 ft above mean sea level, March 4, 2002.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	9.70	DEC 18	10.66	FEB 03	9.80	APR 12	9.86	JUN 08	9.73	AUG 09	9.78

HAWAII, ISLAND OF KAUAI

220013159224001. Local number 2-0022-01, Hanamaulu W-1, Kauai.

LOCATION.--Lat 22°00', long 159°23', Old Hawaiian Datum, Hydrologic Unit 20070000, 3.2 mi north of Lihue, and 1.4 mi west of the nearest shoreline.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 700 ft; 20-in. solid casing: 0-58 ft; grouted: 0-58 ft; open hole: 58 ft to bottom.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point is the top of 4-in. stem welded to 20-in. casing, 277.67 ft above mean sea level.

PERIOD OF RECORD.--Water-level: occasional measurements, February 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 251.64 ft above mean sea level, August 2, 1999; lowest water level measured, 234.61 ft above mean sea level, January 22, 2002.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	241.41	DEC 18	240.58	FEB 11	242.79	JUN 08	244.79	AUG 09	243.02
NOV 18	240.57	JAN 13	240.70	APR 15	246.26	JUL 12	243.60		

HAWAII, ISLAND OF KAUAI

220051159231801. Local number 2-0023-01. Pukaki Reservoir monitor well, Kauai.

LOCATION.--Lat 22°01', long 159°23', Old Hawaiian Datum, Hydrologic Unit 20070000, 2.5 mi northwest of Lihue, and 2.8 mi west of the nearest shoreline.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,590 ft; 10-in. solid steel outer casing: 0-156 ft, annular space grouted: 0-156 ft, open hole: 156 ft to bottom. Well deepened in 2002 from 1,147 to 1,590 ft.

DATUM.--Elevation of land-surface datum is 319 ft. Measuring point is the top of 10-in. well casing, 320.12 ft above mean sea level.

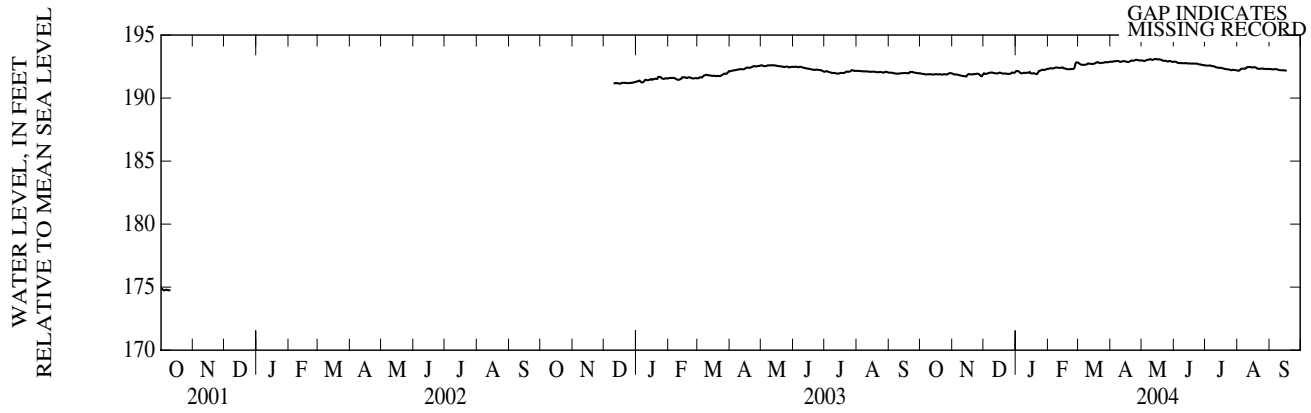
PERIOD OF RECORD.--Water-level: occasional measurements, November 1996 to December 1999. Continuous water-level recorder, December 1999 to October 2001. Occasional measurements October 2001 to December 2002. Continuous water-level recorder, January 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 193.13 ft above mean sea level, May 14, 2004; lowest water level measured, 163.85 ft above mean sea level, November 14, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191.95	191.93	191.96	192.15	192.32	192.79	192.89	192.99	192.89	192.58	192.18	192.29
2	191.93	191.89	191.93	192.15	192.34	192.72	192.88	192.96	192.89	192.58	192.17	192.30
3	191.92	191.87	191.92	192.13	192.36	192.66	192.89	192.94	192.86	192.57	192.22	192.29
4	191.91	191.87	191.95	192.08	192.36	192.65	192.91	192.96	192.80	192.57	192.31	192.26
5	191.90	191.87	191.97	191.99	192.34	192.64	192.93	193.00	192.78	192.59	192.33	192.28
6	191.87	191.85	191.98	191.97	192.36	192.63	192.93	193.04	192.78	192.58	192.33	192.30
7	191.88	191.82	192.02	191.97	192.40	192.64	192.95	193.04	192.77	192.55	192.34	192.29
8	191.89	191.80	192.02	192.00	192.42	192.65	192.94	193.05	192.77	192.53	192.33	192.27
9	191.89	191.78	192.02	192.01	192.42	192.69	192.91	193.10	192.77	192.52	192.37	192.24
10	191.89	191.76	192.00	191.98	192.41	192.75	192.87	193.06	192.76	192.49	192.46	192.22
11	191.89	191.75	191.97	192.01	192.40	192.73	192.88	193.02	192.76	192.45	192.46	192.21
12	191.88	191.74	191.97	192.02	192.39	192.72	192.91	193.05	192.78	192.42	192.46	192.21
13	191.87	191.73	191.95	192.01	192.39	192.72	192.93	193.09	192.76	192.42	192.46	192.20
14	191.87	191.71	191.96	192.07	192.43	192.69	192.93	193.11	192.75	192.40	192.44	192.20
15	191.89	191.82	191.98	191.98	192.41	192.71	192.90	193.09	192.74	192.40	192.42	192.20
16	191.90	191.90	192.02	191.95	192.35	192.73	192.89	193.06	192.75	192.40	192.44	192.19
17	191.88	191.90	192.00	191.96	192.35	192.76	192.86	193.08	192.74	192.37	192.45	192.18
18	191.88	191.88	191.97	191.97	192.31	192.82	192.85	193.07	192.73	192.35	192.43	---
19	191.89	191.87	191.94	191.94	192.29	192.84	192.90	193.05	192.74	192.33	192.39	---
20	191.88	191.88	191.95	191.92	192.29	192.83	192.95	193.01	192.73	192.30	192.33	---
21	191.87	191.90	191.95	191.91	192.29	192.78	192.98	192.96	192.73	192.29	192.33	---
22	191.86	191.90	191.93	192.02	192.29	192.78	192.97	192.96	192.74	192.28	192.33	---
23	191.88	191.91	191.93	192.15	192.30	192.79	192.96	192.96	192.73	192.27	192.33	---
24	191.89	191.92	191.92	192.17	192.31	192.80	193.00	192.95	192.70	192.26	192.34	---
25	191.88	191.94	191.92	192.21	192.31	192.80	193.03	192.91	192.67	192.23	192.34	---
26	191.87	191.91	191.92	192.24	192.40	192.84	193.04	192.90	192.67	192.21	192.32	---
27	191.89	191.84	191.96	192.24	192.74	192.85	193.01	192.94	192.64	192.24	192.31	---
28	191.95	191.75	192.03	192.23	192.84	192.84	192.99	192.94	192.62	192.24	192.31	---
29	191.97	191.74	192.01	192.25	192.83	192.84	192.99	192.91	192.62	192.22	192.30	---
30	191.98	191.87	192.00	192.28	---	192.86	192.98	192.88	192.60	192.21	192.32	---
31	191.96	---	192.05	192.32	---	192.88	---	192.87	---	192.20	192.31	---
MEAN	191.90	191.84	191.97	192.07	192.40	192.76	192.94	193.00	192.74	192.39	192.35	---
MAX	191.98	191.94	192.05	192.32	192.84	192.88	193.04	193.11	192.89	192.59	192.46	---
MIN	191.86	191.71	191.92	191.91	192.29	192.63	192.85	192.87	192.60	192.20	192.17	---



HAWAII, ISLAND OF KAUAI

220019159444801. Local number 2-0044-14. Kaunalewa, Kauai.

LOCATION.--Lat 22°00', long 159°45', Old Hawaiian Datum, Hydrologic Unit 20070000,1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 13-in., cased to 164 ft.

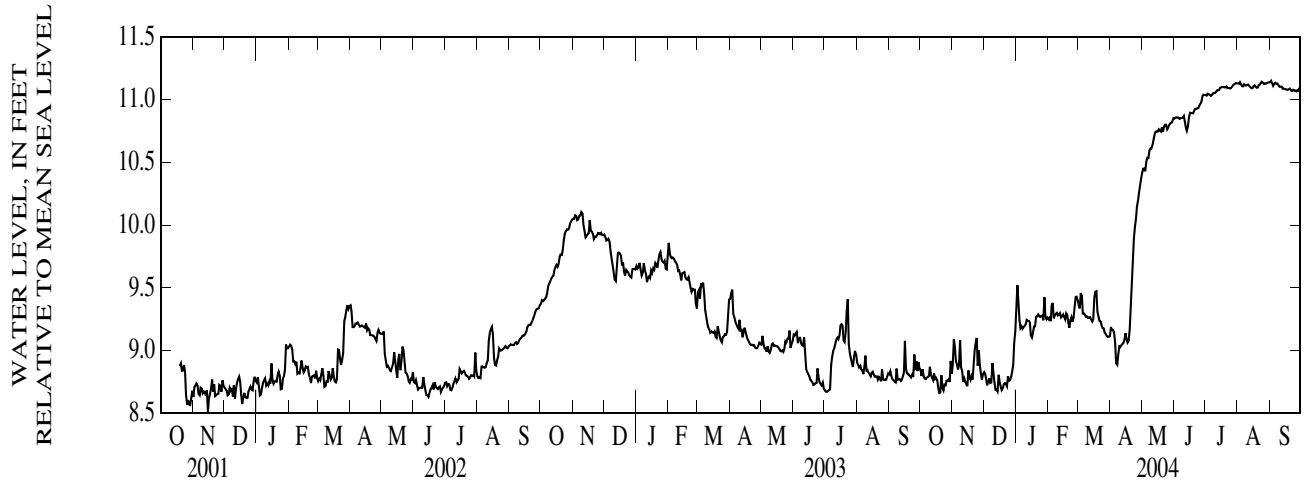
DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is the top of standpipe, 11.49 ft until February 9, 1997; changed measuring point to top of recorder shelf on February 10, 1997, 11.57 ft above mean sea level. Prior to June 1979, nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements 1937 to 1962 (measured by Kekaha Sugar Company). Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.32 ft above mean sea level, August 26, 27, 28, 2004; lowest water level measured, 7.52 ft above mean sea level, August 15, 1947.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.85	8.89	8.83	9.33	9.25	9.37	9.19	10.42	10.85	11.04	11.13	11.14
2	8.80	9.09	8.82	9.52	9.26	9.34	9.17	10.45	10.86	11.03	11.13	11.15
3	8.85	9.03	8.78	9.39	9.23	9.46	9.16	10.45	10.86	11.05	11.14	11.13
4	8.80	8.92	8.72	9.24	9.36	9.44	9.15	10.43	10.85	11.04	11.12	11.11
5	8.78	8.89	8.75	9.18	9.38	9.30	9.06	10.51	10.86	11.04	11.11	11.13
6	8.77	8.85	8.78	9.19	9.26	9.30	8.90	10.54	10.85	11.03	11.11	11.13
7	8.78	8.89	8.74	9.17	9.28	9.28	8.89	10.53	10.85	11.03	11.12	11.12
8	8.79	9.08	8.75	9.19	9.29	9.27	8.96	10.59	10.85	11.05	11.11	11.13
9	8.80	8.87	8.90	9.20	9.30	9.27	9.03	10.61	10.85	11.05	11.11	11.11
10	8.87	8.83	8.82	9.21	9.28	9.26	9.03	10.61	10.87	11.05	11.12	11.10
11	8.81	8.75	8.74	9.25	9.29	9.26	9.04	10.64	10.83	11.06	11.12	11.10
12	8.79	8.78	8.69	9.24	9.30	9.27	9.05	10.68	10.78	11.07	11.11	11.10
13	8.77	8.75	8.69	9.24	9.26	9.25	9.06	10.72	10.75	11.08	11.10	11.09
14	8.82	8.73	8.68	9.23	9.27	9.23	9.08	10.74	10.79	11.08	11.09	11.09
15	8.77	8.72	8.81	9.12	9.29	9.25	9.14	10.75	10.86	11.09	11.09	11.08
16	8.78	8.84	8.75	9.10	9.27	9.42	9.09	10.74	10.89	11.10	11.11	11.08
17	8.77	8.79	8.71	9.14	9.25	9.47	9.06	10.76	10.89	11.10	11.11	11.08
18	8.71	8.77	8.69	9.19	9.30	9.47	9.08	10.75	10.89	11.10	11.10	11.08
19	8.66	8.80	8.70	9.19	9.28	9.31	9.17	10.74	10.89	11.10	11.09	11.08
20	8.66	8.77	8.73	9.27	9.22	9.27	9.32	10.78	10.91	11.10	11.10	11.09
21	8.80	8.87	8.74	9.27	9.18	9.24	9.52	10.74	10.92	11.10	11.11	11.07
22	8.70	9.00	8.74	9.29	9.24	9.23	9.69	10.78	10.93	11.09	11.12	11.07
23	8.68	9.06	8.72	9.28	9.27	9.20	9.89	10.80	10.93	11.09	11.13	11.08
24	8.73	9.10	8.80	9.27	9.23	9.18	9.98	10.80	10.93	11.09	11.14	11.07
25	8.72	8.88	8.76	9.28	9.26	9.18	10.05	10.76	10.95	11.09	11.14	11.07
26	8.76	9.00	8.76	9.28	9.34	9.14	10.15	10.78	10.97	11.10	11.12	11.07
27	8.76	8.89	8.79	9.24	9.43	9.14	10.20	10.80	10.98	11.11	11.13	11.07
28	8.77	8.82	8.83	9.43	9.43	9.11	10.26	10.81	11.03	11.12	11.13	11.07
29	8.75	8.77	8.89	9.27	9.40	9.11	10.32	10.82	11.04	11.12	11.13	11.09
30	8.92	8.81	9.06	9.25	---	9.11	10.37	10.82	11.04	11.13	11.14	11.10
31	8.81	---	9.16	9.26	---	9.12	---	10.85	---	11.13	11.14	---
MEAN	8.78	8.87	8.78	9.25	9.29	9.27	9.40	10.68	10.89	11.08	11.12	11.10
MAX	8.92	9.10	9.16	9.52	9.43	9.47	10.37	10.85	11.04	11.13	11.14	11.15
MIN	8.66	8.72	8.68	9.10	9.18	9.11	8.89	10.42	10.75	11.03	11.09	11.07



HAWAII, ISLAND OF KAUAI

220133159242001. Local number, 2-0124-01. Northeast Kilohana monitor well.

LOCATION.--Lat 22°01', long 159°24', Old Hawaiian Datum, Hydrologic unit 20070000, 3.7 mi northwest of Lihue, and 3.8 mi west of the nearest shoreline.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,033 ft, 10-in. solid steel outer casing: 0-161 ft; 4-in. solid steel casing: 0-80 ft; 4-in. alternating perforated/solid steel casing: 80-1,032 ft; annular space grouted: 0-160 ft; annular space open: 160-726 ft.

DATUM.--Elevation of land-surface datum is 466 ft. Measuring point is the top of 4-in. well casing, 467.12 ft above mean sea level.

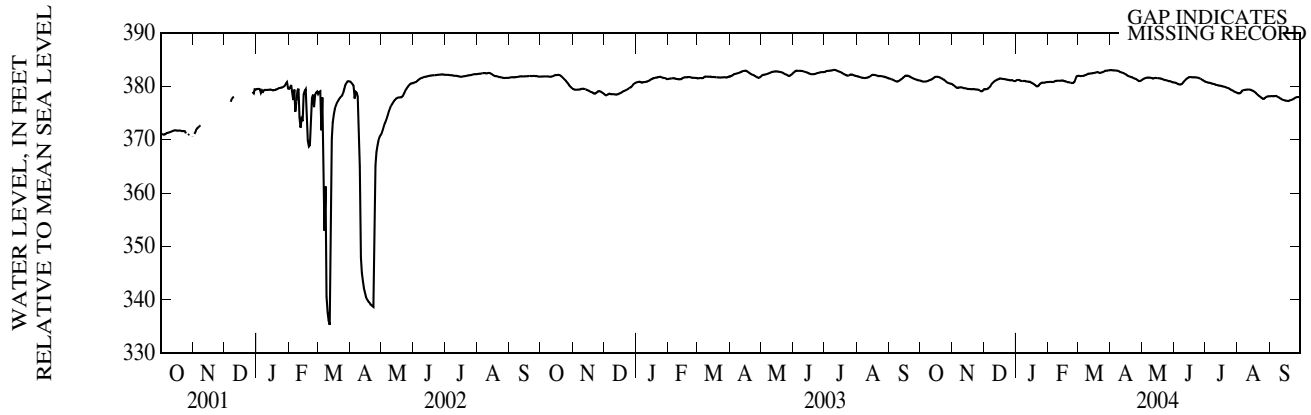
PERIOD OF RECORD.--Water level: occasional measurements, started in November 1996. Continuous water level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 388.31 ft above mean sea level, May 19, 1998; lowest static water level measured, 368.10 ft above mean sea level, October 27, 1998. Lowest water level measured, 332.98 ft above sea level when nearby pump was running on Mar. 4, 2002.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water. Water level affected by drilling of nearby well after August 2001.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	381.07	380.36	379.49	381.15	380.85	382.00	383.08	381.23	380.76	380.88	378.75	378.18
2	380.98	380.21	379.50	381.23	380.86	381.97	383.05	381.37	380.71	380.80	378.71	378.21
3	380.93	380.05	379.47	381.24	380.88	381.96	383.03	381.48	380.61	380.75	378.74	378.22
4	380.93	379.89	379.51	381.19	380.86	381.97	383.02	381.56	380.50	380.72	378.89	378.18
5	380.92	379.75	379.62	381.08	380.85	381.99	383.01	381.63	380.43	380.68	379.18	378.21
6	380.92	379.74	379.83	381.05	380.87	382.02	382.99	381.67	380.38	380.62	379.29	378.23
7	380.97	379.81	380.04	381.03	380.95	382.08	382.98	381.66	380.36	380.55	379.34	378.20
8	381.03	379.85	380.35	381.06	381.05	382.17	382.92	381.67	380.45	380.51	379.36	378.12
9	381.10	379.84	380.63	381.04	381.08	382.29	382.80	381.64	380.64	380.47	379.40	377.99
10	381.19	379.78	380.80	380.96	381.07	382.38	382.70	381.58	380.88	380.39	379.43	377.87
11	381.26	379.74	380.97	380.95	381.08	382.41	382.65	381.51	381.11	380.31	379.44	377.76
12	381.36	379.70	381.12	380.92	381.07	382.44	382.59	381.50	381.32	380.26	379.44	377.64
13	381.49	379.66	381.21	380.87	381.09	382.45	382.52	381.58	381.46	380.22	379.41	377.52
14	381.64	379.60	381.30	380.89	381.15	382.46	382.43	381.63	381.63	380.17	379.32	377.45
15	381.78	379.55	381.38	380.76	381.11	382.50	382.30	381.60	381.73	380.14	379.21	377.39
16	381.84	379.54	381.49	380.66	381.01	382.54	382.18	381.56	381.78	380.12	379.13	377.35
17	381.83	379.53	381.50	380.58	380.98	382.58	382.04	381.57	381.76	380.04	379.02	377.32
18	381.79	379.51	381.46	380.45	380.90	382.65	381.93	381.54	381.72	379.99	378.85	377.28
19	381.74	379.48	381.41	380.26	380.84	382.69	381.85	381.50	381.72	379.94	378.64	377.30
20	381.65	379.50	381.40	380.11	380.81	382.62	381.81	381.41	381.73	379.87	378.44	377.39
21	381.54	379.53	381.39	380.00	380.77	382.54	381.77	381.31	381.72	379.80	378.28	377.45
22	381.45	379.49	381.33	380.05	380.71	382.57	381.66	381.25	381.71	379.74	378.14	377.52
23	381.33	379.47	381.29	380.32	380.65	382.62	381.54	381.23	381.68	379.68	377.99	377.63
24	381.19	379.44	381.25	380.55	380.65	382.67	381.46	381.18	381.61	379.58	377.84	377.77
25	381.02	379.43	381.20	380.67	380.70	382.75	381.40	381.10	381.54	379.44	377.69	377.88
26	380.84	379.37	381.16	380.72	380.83	382.89	381.29	381.04	381.46	379.32	377.70	377.97
27	380.71	379.26	381.17	380.72	381.40	382.97	381.15	381.02	381.35	379.24	377.87	378.01
28	380.64	379.13	381.19	380.72	381.88	382.97	381.01	380.98	381.21	379.13	377.99	378.03
29	380.56	379.11	381.09	380.75	381.99	382.97	381.02	380.91	381.10	378.99	378.08	378.06
30	380.54	379.23	381.02	380.80	---	383.02	381.11	380.82	380.99	378.91	378.16	378.08
31	380.47	---	381.03	380.85	---	383.07	---	380.77	---	378.83	378.17	---
MEAN	381.18	379.62	380.83	380.76	381.00	382.49	382.18	381.37	381.20	380.00	378.71	377.81
MAX	381.84	380.36	381.50	381.24	381.99	383.07	383.08	381.67	381.78	380.88	379.44	378.23
MIN	380.47	379.11	379.47	380.00	380.65	381.96	381.01	380.77	380.36	378.83	377.69	377.28



HAWAII, ISLAND OF KAUAI

220126159261501. Local number, 2-0126-01. Northwest Kilohana monitor well, Kauai.

LOCATION.--Lat 22°01', long 159°26', Old Hawaiian Datum, Hydrologic unit 20070000, 5.3 northwest of Lihue, and 6.2 mi west of the nearest shoreline.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,004 ft, 10-in. solid steel outer casing: 0-198 ft; 4-in. solid pvc casing: 0-126 ft; 4.5-in. perforated pvc casing: 126 ft to bottom; annular space grouted: 0-198 ft; annular space open: 198 ft to bottom.

DATUM.--Elevation of land-surface datum is 678 ft. Measuring point is the top of 4-in. well casing, 679.06 ft above mean sea level.

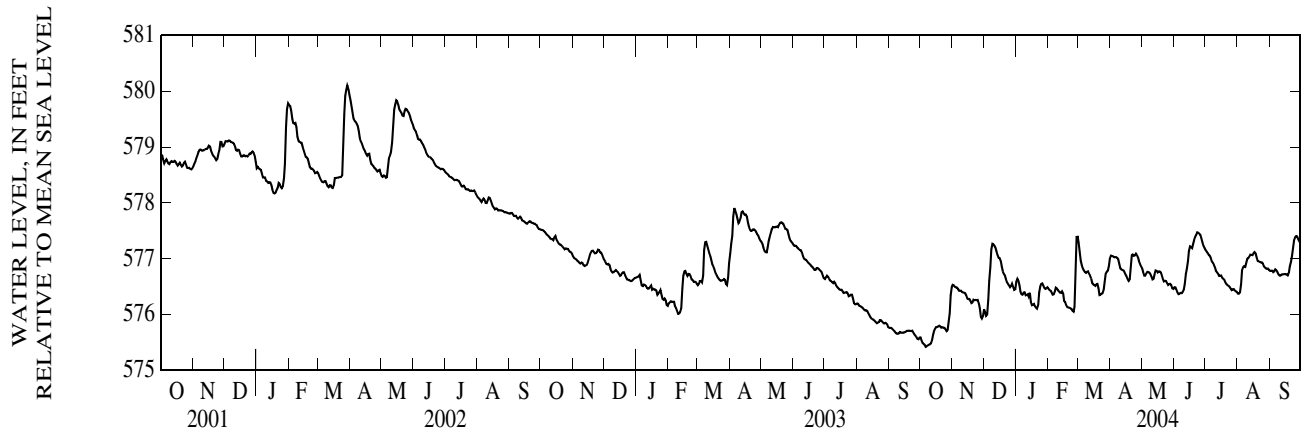
PERIOD OF RECORD.-- Water level: occasional measurements started in November 1996. Continuous water-level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 589.96 ft above mean sea level, December 23, 1996; lowest water level measured, 575.40 ft above mean sea level, October 6, 7, 2003.

REMARKS.--Well part of network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	575.59	576.53	576.09	576.58	576.46	577.28	577.05	576.82	576.49	577.16	576.37	576.78
2	575.54	576.52	576.05	576.64	576.44	577.10	577.05	576.76	576.49	577.13	576.37	576.78
3	575.49	576.50	575.97	576.61	576.43	576.96	577.04	576.70	576.44	577.10	576.39	576.78
4	575.47	576.49	576.00	576.52	576.40	576.88	577.03	576.70	576.39	577.07	576.54	576.76
5	575.46	576.48	576.26	576.41	576.35	576.83	577.03	576.73	576.36	577.05	576.79	576.77
6	575.42	576.46	576.61	576.36	576.36	576.79	577.03	576.76	576.37	577.01	576.84	576.81
7	575.43	576.42	576.85	576.35	576.41	576.76	577.02	576.76	576.39	576.95	576.86	576.79
8	575.44	576.42	577.17	576.39	576.48	576.74	576.99	576.75	576.38	576.92	576.85	576.76
9	575.46	576.42	577.26	576.40	576.47	576.77	576.90	576.72	576.40	576.89	576.92	576.72
10	575.47	576.40	577.26	576.34	576.44	576.77	576.83	576.68	576.44	576.84	577.00	576.70
11	575.48	576.40	577.23	576.35	576.41	576.73	576.81	576.63	576.54	576.78	577.01	576.70
12	575.53	576.39	577.20	576.36	576.39	576.69	576.80	576.64	576.73	576.75	577.04	576.72
13	575.63	576.38	577.12	576.32	576.38	576.65	576.79	576.73	576.82	576.73	577.07	576.72
14	575.70	576.34	577.07	576.39	576.41	576.56	576.76	576.79	576.95	576.69	577.07	576.72
15	575.75	576.29	577.02	576.23	576.38	576.54	576.72	576.78	577.14	576.69	577.06	576.72
16	575.78	576.27	577.01	576.16	576.24	576.53	576.69	576.75	577.22	576.70	577.10	576.72
17	575.78	576.28	576.96	576.17	576.22	576.51	576.63	576.77	577.21	576.66	577.12	576.72
18	575.78	576.25	576.86	576.19	576.17	576.54	576.60	576.77	577.19	576.64	577.09	576.70
19	575.80	576.21	576.77	576.15	576.13	576.55	576.63	576.75	577.26	576.62	577.03	576.75
20	575.78	576.22	576.73	576.12	576.12	576.47	576.85	576.70	577.34	576.57	576.96	576.87
21	575.76	576.26	576.70	576.10	576.12	576.34	577.06	576.63	577.39	576.54	576.95	576.95
22	575.77	576.25	576.64	576.16	576.11	576.35	577.07	576.59	577.43	576.52	576.94	577.04
23	575.76	576.26	576.58	576.39	576.10	576.37	577.05	576.60	577.47	576.52	576.93	577.19
24	575.76	576.25	576.55	576.50	576.07	576.38	577.06	576.60	577.46	576.49	576.93	577.32
25	575.73	576.26	576.52	576.55	576.05	576.44	577.09	576.56	577.45	576.46	576.92	577.38
26	575.70	576.20	576.49	576.56	576.14	576.59	577.07	576.53	577.43	576.44	576.86	577.40
27	575.72	576.11	576.51	576.52	576.83	576.73	577.02	576.54	577.37	576.45	576.84	577.40
28	575.85	575.96	576.55	576.47	577.39	576.77	576.96	576.55	577.28	576.45	576.82	577.35
29	576.02	575.92	576.49	576.46	577.39	576.78	576.90	576.52	577.23	576.43	576.82	577.31
30	576.34	575.97	576.44	576.47	---	576.87	576.86	576.47	577.19	576.42	576.82	577.28
31	576.49	---	576.45	576.49	---	577.00	---	576.46	---	576.40	576.80	---
MEAN	575.70	576.30	576.69	576.38	576.39	576.69	576.91	576.67	576.94	576.71	576.87	576.92
MAX	576.49	576.53	577.26	576.64	577.39	577.28	577.09	576.82	577.47	577.16	577.12	577.40
MIN	575.42	575.92	575.97	576.10	576.05	576.34	576.60	576.46	576.36	576.40	576.37	576.70



HAWAII, ISLAND OF KAUAI

220354159205602. Local number, 2-0320-03. Nonou W-B, Kauai.

LOCATION.--Lat 22°04', long 159°21', Old Hawaiian Datum, Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 302 ft; 14-in. casing diameter, cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top of 1-in. hole on pump base on southeast side after removing elbow and nipple, 156.65 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, August 1976 to current year. Water quality: occasional measurements, 1972, 1976 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, November 19, 1982; lowest water level measured, 13.69 ft below mean sea level, August 11, 2004.

REMARKS.--Water is used for public supply. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	-9.42	JAN 09	-10.25	FEB 11	-8.93	APR 21	-12.41	JUN 09	-12.28	AUG 11	-13.69

HAWAII, ISLAND OF KAUAI

220825159185301. Local number 2-0818-03. Anahola C, Kauai.

LOCATION.--Lat 22°08', long 159°19', Old Hawaiian Datum, Hydrologic Unit 20070000, 1.3 mi southwest of Kahala Point, and 0.2 mi south of Anahola School.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 466 ft, 12-in. casing diameter, cased to 290 ft.

DATUM.--Elevation of land-surface datum is 267 ft. Measuring point is the top of west side of 4 $^1/_2$ -in. pipe at 268.98 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.64 ft above mean sea level, October 8, 1997; lowest water level measured, 7.34 ft above mean sea level, April 8, 1998, lowest water level measured with nearby pump on, 6.79 ft above mean sea level, February 15, 2000.

REMARKS.--Water for future public supply. Water level affected by pumping of nearby wells.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	11.55	JAN 09	11.48	FEB 11	11.56	APR 21	11.14	JUN 09	11.34	AUG 11	11.43

HAWAII, ISLAND OF KAUAI

221038159203801. Local number, 2-1020-03. Moloaa, Kauai.

LOCATION.--Lat 22°11', long 159°21', Old Hawaiian Datum, Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point, and 2.6 mi northwest of Kuaehu Point.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 700 ft.

DATUM.--Elevation of land-surface datum is 358 ft. Measuring point is the top of the 12 inch casing, elevation 357.92 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 1991, 1997.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level, March 30, 1990; lowest water level measured, 66.17 ft above mean sea level, November 6, 1973, lowest water level measured with pump on, 42.69 ft above mean sea level, October 4, 1973.

REMARKS.--Pump is in the process of being replaced. Well unused at this time.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	105.42	DEC 04	106.76	FEB 04	107.47	APR 14	108.12	JUN 15	108.97	AUG 11	108.73

HAWAII, ISLAND OF KAUAI

221150159264501. Local number, 2-1126-01. Princeville W-1, Kauai.

LOCATION.--Lat 22°12', long 159°27', Old Hawaiian Datum, Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal, and 4.0 mi east southeast of Puupoa Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 763 ft; 14-in. casing diameter, cased to 435 ft.

DATUM.--Elevation of land-surface datum is 349 ft. Measuring point is the top of 3/4-in. pipe, in 1-in. hole on southside of pump base, after removing airline connection, 349.88 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1977 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level, June 3, 1974; lowest water level measured, 4.12 ft below mean sea level, November 17, 1992, lowest water level measured with pump on, 10.30 ft below mean sea level, June 2, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	7.31	DEC 04	8.85	FEB 05	12.18	APR 14	10.95	JUN 15	8.70	AUG 19	8.32

HAWAII, ISLAND OF KAUAI

221247159324801. Local number, 2-1232-01. Wainiha, Kauai.

LOCATION.--Lat 22°13', long 159°33', Old Hawaiian Datum, Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point, and 1.5 mi southeast of Haena Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 188 ft, 6-in. casing diameter, cased to 140 ft.

DATUM.--Elevation of land-surface datum is 67 ft. Measuring point was the top of 1-in. pipe 0.06 ft above flange, 66.56 ft above mean sea level. New measuring point is the top of 1-in. pipe 0.16 ft above flange, 66.68 ft above mean sea level from levels of June 16, 1999.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1975 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974; lowest water level measured, 4.69 ft above mean sea level, August 6, 1993, lowest water level measured with pump on, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	6.12	JAN 09	7.41	FEB 11	7.98	APR 21	9.16	JUN 09	8.98	AUG 11	7.48

HAWAII, ISLAND OF KAUAI

221318159335901. Local number, 2-1333-01. Haena, Kauai.

LOCATION.--Lat 22°13', long 159°34', Old Hawaiian Datum, Hydrologic Unit 20070000, 0.6 mi south southwest of Haena Point, and 1.2 mi east southeast of Kailiu Point.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 159 ft; 8-in. casing diameter, cased to 104 ft.

DATUM.--Elevation of land-surface datum is 82 ft. Measuring point is the top of airline hole after removing plug, elevation 82.05 ft above mean sea level from levels of December 12, 1995.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 2002.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level, December 8, 1989; lowest water level measured, 5.49 ft below mean sea level, June 7, 2001.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	6.18	JAN 09	-.36	FEB 11	-.60	APR 21	6.43	JUN 09	6.97	AUG 11	7.53

HAWAII, ISLAND OF KAUAI

215434159263301. Local number, 2-5426-03. Koloa, Kauai.

LOCATION.--Lat 21°55', long 159°27', Old Hawaiian Datum, Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 318 ft, 12-in. casing diameter, cased to 176 ft.

DATUM.--Elevation of land-surface datum is 222 ft. Measuring point is the top of 1-in. hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1997.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, January 10, 1974; lowest water level measured, 15.48 ft above mean sea level, June 16, 1982, lowest water level measured with pump on, 5.05 ft above mean sea level, March 10, 1975.

REMARKS.--Water used for irrigation. Water level affected by pumping.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	25.20	DEC 18	25.19	FEB 10	25.13	APR 19	25.06	JUN 02	25.20	AUG 10	25.11

HAWAII, ISLAND OF KAUAI

215454159274201. Local number, 2-5427-01. Koloa W-A, Kauai.

LOCATION.--Lat 21°55', long 159°28', Old Hawaiian Datum, Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir, and 2.7 mi northeast of Kaulala Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 455 ft; 12-in. casing diameter, cased to 263 ft.

DATUM.--Elevation of land-surface datum is 247 ft. Measuring point is the bottom edge of the east side opening on pump base 246.68 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-94 (the minimum water level for the period of record).
WDR HI-01-1: 1988-2001 (the maximum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.74 ft above mean sea level, January 9, 1975; lowest water level measured, 27.97 ft above mean sea level, October 6, 1988, lowest water level measured with pump on, 22.77 ft above mean sea level, March 3, 1983.

REMARKS.--Water used for public supply. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	33.74	JAN 07	33.74	FEB 10	33.80	APR 20	33.52	JUN 08	33.50	AUG 12	33.53

HAWAII, ISLAND OF KAUAI

215522159342601. Local number, 2-5534-03. Hanapepe Town, Kauai.

LOCATION.--Lat 21°55', long 159°34', Old Hawaiian Datum, Hydrologic Unit 20070000, 1.9 mi north from Weli Point, and 2.9 mi northeast from Puolo Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 109 ft; 9-in. casing diameter.

DATUM.--Elevation of land-surface datum is 79 ft. Measuring point is the top of 3/4-in. galvanized pipe on northwest side of pump base 78.78 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level, February 1, 1990; lowest water level measured, 12.62 ft above mean sea level, May 20, 1986, lowest water level measured with pump on, 9.19 ft above mean sea level, October 13, 1978.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 08	14.61	JAN 07	15.73	FEB 10	16.87	APR 20	16.93	JUN 02	17.84	AUG 19	16.19

HAWAII, ISLAND OF KAUAI

215509159340401. Local number, 2-5534-06. Upper Eleele Reservoir, Kauai.

LOCATION.--Lat 21°55', long 159°34', Old Hawaiian Datum, Hydrologic Unit 20070000, 1.6 mi north of Weli Point and 2.4 mi northeast of Puolo Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 740 ft; 12 in solid steel outer casing: 0-100 ft.

DATUM.--Elevation of land surface is 385.48 ft. Measuring point is top of 4 inch pvc casing from September 9, 2002, 386.78 ft above mean sea level.

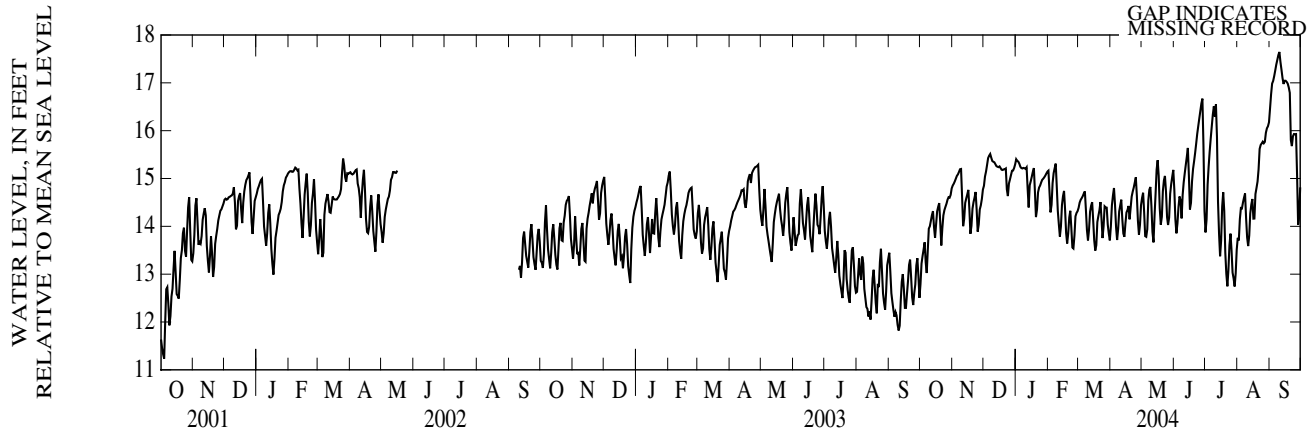
PERIOD OF RECORD.--Water-level recorder January 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.71 ft above mean sea level, September 10, 2004; lowest water level measured, 11.02 ft above mean sea level, June 29, 2000.

REMARKS.--Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.79	14.85	14.85	15.40	15.16	14.39	14.00	14.59	14.76	13.87	13.76	16.46
2	13.22	14.89	15.04	15.37	14.73	14.50	14.44	14.70	14.15	14.14	13.70	16.76
3	13.38	14.94	15.15	15.35	14.29	14.55	14.64	14.30	13.85	14.87	14.15	16.98
4	13.52	15.00	15.28	15.31	14.45	14.59	14.80	13.80	14.06	15.25	14.38	17.04
5	13.67	15.06	15.43	15.25	14.90	14.63	14.45	13.78	14.40	15.57	14.38	17.14
6	13.25	15.09	15.48	15.22	15.11	14.69	13.98	13.94	14.62	15.84	14.50	17.26
7	13.02	15.14	15.51	15.21	15.22	14.73	13.71	14.54	14.54	16.09	14.60	17.38
8	13.50	15.19	15.44	15.22	15.31	14.35	13.94	14.77	14.17	16.33	14.69	17.48
9	13.95	15.20	15.37	15.21	14.84	13.92	14.31	14.82	14.65	16.51	14.17	17.58
10	14.00	14.62	15.35	15.20	14.32	13.71	14.44	14.42	14.92	16.30	13.77	17.64
11	14.12	14.00	15.34	15.23	14.05	13.93	14.56	13.88	15.11	16.55	13.59	17.44
12	14.23	14.15	15.30	14.79	13.79	14.30	14.15	13.66	15.28	15.87	13.81	17.27
13	14.32	14.49	15.26	14.39	14.00	14.43	13.85	14.22	15.45	14.52	14.27	17.10
14	13.99	14.58	15.25	14.86	14.44	14.50	13.78	14.68	15.64	13.85	14.45	16.98
15	13.76	14.67	15.24	14.94	14.63	14.13	14.06	15.19	15.06	13.37	14.57	17.04
16	14.04	14.76	15.25	15.04	14.74	13.71	14.29	15.38	14.35	13.70	14.16	17.04
17	14.31	14.36	15.22	15.14	14.35	13.49	14.34	15.05	14.49	14.41	14.16	17.02
18	14.41	13.84	15.18	15.22	13.86	13.61	14.43	14.38	14.94	14.71	14.67	16.98
19	14.49	14.01	15.18	14.73	13.64	14.09	14.15	14.04	15.20	14.32	14.81	16.90
20	14.08	14.37	15.19	14.19	13.85	14.22	14.38	14.20	15.36	13.45	14.94	16.79
21	13.60	14.51	15.19	14.35	14.19	14.34	14.62	14.74	15.53	13.01	15.19	15.80
22	13.96	14.60	15.21	14.71	14.33	14.51	14.73	14.96	15.73	12.75	15.62	15.68
23	14.23	14.72	14.77	14.81	13.96	14.16	14.81	15.05	15.93	13.08	15.70	15.88
24	14.34	14.35	14.63	14.85	13.56	13.76	14.92	14.72	16.10	13.61	15.73	15.93
25	14.41	13.89	14.89	14.92	13.54	14.00	15.02	14.19	16.26	13.85	15.77	15.93
26	14.47	14.04	14.98	14.97	13.81	14.42	14.63	14.03	16.41	13.50	15.74	15.93
27	14.56	14.35	15.07	15.00	14.21	14.40	14.12	14.18	16.57	13.03	15.77	15.07
28	14.61	14.44	15.16	15.03	14.28	14.39	13.83	14.68	16.67	12.91	15.96	14.04
29	14.60	14.57	15.17	15.06	14.32	14.04	14.04	14.89	15.69	12.74	16.05	14.19
30	14.66	14.77	15.22	15.10	---	13.85	14.44	15.04	14.32	13.02	16.09	14.81
31	14.79	---	15.30	15.14	---	13.71	---	15.18	---	13.51	16.18	---
MEAN	14.01	14.58	15.19	15.01	14.34	14.20	14.33	14.52	15.14	14.34	14.82	16.52
MAX	14.79	15.20	15.51	15.40	15.31	14.73	15.02	15.38	16.67	16.55	16.18	17.64
MIN	12.79	13.84	14.63	14.19	13.54	13.49	13.71	13.66	13.85	12.74	13.59	14.04



HAWAII, ISLAND OF KAUAI

215630159265101. Local number, 2-5626-01. Puakukui Springs, Kauai.

LOCATION.--Lat 21°57', long 159°27', Old Hawaiian Datum, Hydrologic Unit 20070000, 5.7 mi south of Lihue, and 3.8 mi northwest of the nearest shoreline.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 802 ft; 12.25-in. solid steel outer casing: 0-156 ft; 4-in. solid pvc casing: 0-20 ft; annular space grouted: 0-256 ft; open hole: 256 ft to bottom.

DATUM.--Elevation of land-surface is 485 ft. Measuring point is the top of 4-in. well casing, 485.40 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 180.15 ft above mean sea level, December 14, 1998; lowest water level measured, 173.49 ft above mean sea level, November 8, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	175.64	DEC 18	175.41	FEB 03	175.22	JUN 08	174.81	AUG 09	174.90
NOV 18	175.48	JAN 13	175.35	APR 12	174.90	JUL 12	174.92		

HAWAII, ISLAND OF KAUAI

215607159344301. Local number 2-5634-01. Hanapepe Ridge, Kauai.

LOCATION.--Lat 21°56', long 159°35', Old Hawaiian Datum, Hydrologic Unit 20070000, 2.7 mi north of Weli Point, and 3.3 mi northeast of Puolo Point.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 508 ft, 8-in. casing diameter, cased to 507 ft.

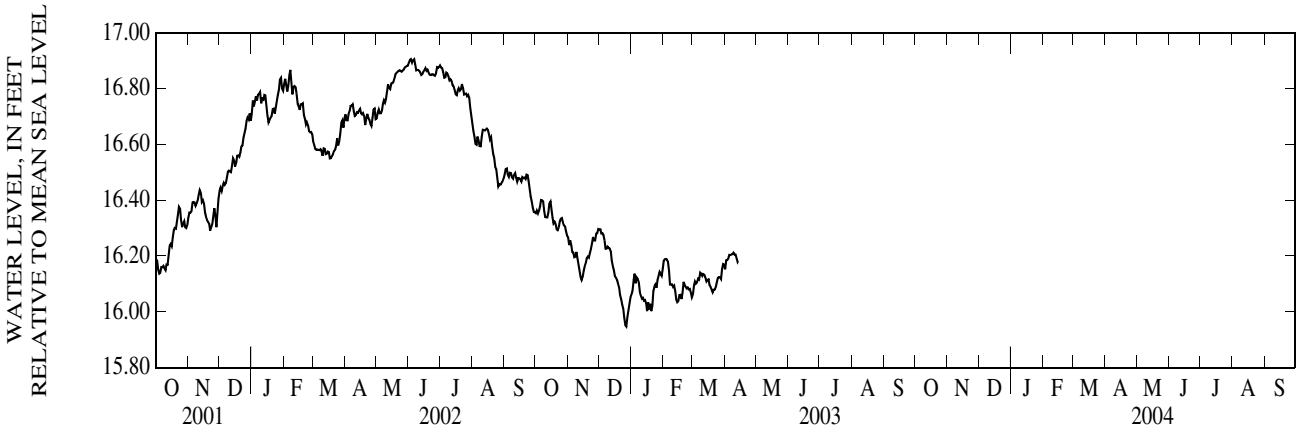
DATUM.--Elevation of land-surface datum is 439 ft. Measuring point is the top of recorder shelf 440.68 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.83 ft above mean sea level, January 15, 16, 1992; lowest water level measured, 15.76 ft above mean sea level, September 17, 18, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.93	16.16	16.33	16.53	16.42	16.43	16.24	16.46	16.56	16.58	16.51	16.51
2	15.92	16.16	16.30	16.52	16.42	16.43	16.25	16.47	16.55	16.58	16.51	16.53
3	15.93	16.16	16.31	16.52	16.40	16.41	16.24	16.47	16.53	16.59	16.53	16.52
4	15.94	16.18	16.34	16.50	16.39	16.42	16.24	16.49	16.52	16.60	16.52	16.51
5	15.94	16.18	16.33	16.48	16.40	16.40	16.23	16.51	16.53	16.61	16.52	16.54
6	15.94	16.17	16.35	16.49	16.41	16.41	16.24	16.49	16.54	16.60	16.53	16.54
7	15.95	16.18	16.35	16.50	16.43	16.40	16.26	16.50	16.53	16.61	16.52	16.53
8	15.95	16.18	16.33	16.51	16.44	16.39	16.27	16.52	16.51	16.63	16.51	16.53
9	15.96	16.18	16.34	16.48	16.44	16.40	16.26	16.53	16.51	16.64	16.50	16.52
10	15.98	16.18	16.34	16.48	16.44	16.39	16.27	16.52	16.52	16.63	16.49	16.52
11	15.98	16.17	16.35	16.53	16.45	16.37	16.29	16.51	16.54	16.63	16.48	16.53
12	15.98	16.16	16.35	16.52	16.45	16.38	16.29	16.52	16.55	16.64	16.46	16.54
13	15.98	16.17	16.33	16.52	16.46	16.37	16.30	16.54	16.54	16.62	16.45	16.53
14	16.00	16.16	16.33	16.52	16.47	16.35	16.29	16.55	16.55	16.60	16.44	16.54
15	16.01	16.17	16.35	16.49	16.45	16.35	16.28	16.55	16.55	16.61	16.44	16.53
16	16.01	16.20	16.38	16.50	16.43	16.33	16.29	16.56	16.56	16.60	16.46	16.53
17	16.02	16.21	16.37	16.53	16.43	16.35	16.28	16.57	16.55	16.59	16.45	16.54
18	16.04	16.19	16.36	16.52	16.38	16.36	16.30	16.57	16.55	16.59	16.45	16.54
19	16.05	16.19	16.38	16.51	16.38	16.36	16.33	16.56	16.55	16.59	16.44	16.56
20	16.05	16.22	16.40	16.50	16.38	16.32	16.35	16.54	16.56	16.58	16.44	16.57
21	16.05	16.23	16.41	16.50	16.37	16.27	16.36	16.54	16.58	16.57	16.45	16.55
22	16.07	16.23	16.40	16.50	16.38	16.29	16.36	16.56	16.59	16.56	16.46	16.54
23	16.09	16.27	16.42	16.47	16.38	16.29	16.38	16.56	16.58	16.56	16.47	16.55
24	16.11	16.28	16.41	16.47	16.36	16.29	16.41	16.55	16.58	16.55	16.48	16.55
25	16.09	16.29	16.40	16.47	16.38	16.27	16.44	16.53	16.59	16.55	16.47	16.55
26	16.11	16.28	16.42	16.47	16.44	16.27	16.44	16.52	16.61	16.55	16.46	16.55
27	16.14	16.26	16.46	16.43	16.51	16.26	16.42	16.53	16.60	16.54	16.47	16.54
28	16.15	16.25	16.49	16.43	16.46	16.25	16.42	16.53	16.60	16.53	16.48	16.52
29	16.12	16.28	16.45	16.43	16.44	16.24	16.43	16.52	16.61	16.52	16.49	16.52
30	16.14	16.31	16.47	16.44	---	16.25	16.45	16.52	16.60	16.51	16.50	16.53
31	16.15	---	16.52	16.44	---	16.24	---	16.54	---	16.51	16.49	---
MEAN	16.03	16.21	16.38	16.49	16.42	16.34	16.32	16.53	16.56	16.58	16.48	16.54
MAX	16.15	16.31	16.52	16.53	16.51	16.43	16.45	16.57	16.61	16.64	16.53	16.57
MIN	15.92	16.16	16.30	16.43	16.36	16.24	16.23	16.46	16.51	16.51	16.44	16.51



HAWAII, ISLAND OF KAUAI

215901159235301. Local number 2-5923-01.Kilohana W-A, Kauai

LOCATION.--Lat 21°59', long 159°24', Old Hawaiian Datum, Hydrologic Unit 20070000, 3.4 mi west from Lihue Airport terminal, and 4.2 mi northwest of Ninini Point. Owner: Kauai County Dept. of Water.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 920 ft, casing diameter 14 in., cased to 341 ft.

DATUM.--Elevation of land-surface datum is 371 ft. Measuring point is the top of 1-in. hole northside of pump base after removing elbow. Elevation of measuring point is at 372.42 ft above mean sea level.

PERIOD OF RECORD.--Water-level: Occasional measurements, 1974 to 1988, 2004. Water Quality: Occasional measurements, 1974 to 1999.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 50.42 ft above mean sea level, Sep. 12, 1983; lowest water level measured, 10.45 ft above mean sea level, August 1, 2004.

REMARKS.--Well used for public supply.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL
AUG 01	10.45

HAWAII, ISLAND OF KAUAI

215906159395601. Local number, 2-5939-01. Waimea Shaft, Kauai.

LOCATION.--Lat 21°59', long 159°40', Old Hawaiian Datum, Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park, and 3.2 mi northeast from Oomano Point.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 43 ft, 6.5-ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point is the top west side of concrete base 41.61 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, 1972 to current year. Water quality: occasional measurements, 1972 to 2002.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).
WDR HI-01-1: 1988-01 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.57 ft above mean sea level, December 11, 1986; lowest water level measured, 8.71 ft above mean sea level, March 9, 1981, lowest water level measured with pump on, 5.86 ft above mean sea level, May 7, 1975.

REMARKS.--Well is presently unused.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	9.24	DEC 23	9.28	FEB 10	9.45	APR 19	9.15	JUN 02	9.44	AUG 10	9.41

HAWAII, ISLAND OF OAHU

212106157533701. Local number and name, 3-2153-02 Moanalua, Oahu.

LOCATION.--Lat 21°21', long 157°54', Old Hawaiian Datum, Hydrologic Unit 20060000, in Pineapple Place near Moanalua School.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 289 ft, 10-in. diameter casing, cased to 79 ft.

DATUM.--Elevation of land-surface datum is 20 ft. Measuring point is top of 3/4-in. pipe on casing about 15 ft streamward from small pump house and elevation is 20.78 ft above mean sea level.

REMARKS.--Prior to March 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, April 1910 to March 1974, December 1977 to March 1993, and June 1999 to current year. Water quality: occasional measurements, April 1910 to September 2002 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.88 ft above mean sea level, April 1917; lowest measured, 16.39 ft above mean sea level, September 19, 1978.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	16.60	DEC 19	16.92	MAR 01	17.65	APR 22	18.15	JUN 08	18.55	AUG 02	18.58

HAWAII, ISLAND OF OAHU

212318157583401. Local number and name, 3-2358-19 Pearl City Peninsula, Oahu.

LOCATION.--Lat 21°23', long 157°59', Old Hawaiian Datum, Hydrologic Unit 20060000, 0.3 mi southwest of Lehua Elementary School, and 0.7 mi south of Pearl City Elementary School.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 172 ft, 17-in. casing diameter, cased to 112 ft.

DATUM.--Elevation of land-surface datum is 13.30 ft. Measuring point is 1-in. square chiseled on concrete base wall, northeast corner, elevation is 13.30 ft above mean sea level.

REMARKS.--Prior to October 1995, unpublished records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, September 1972, November 1973 to December 1988, and March 1993 to current year. Water quality: occasional measurements, 1944, 1946, 1954, 1956-58, 1972-80.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.68 ft above mean sea level, December 7, 1982; lowest measured, 12.30 ft above mean sea level, September 18, 1978.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	13.12	DEC 19	13.46	MAR 02	14.46	APR 20	14.86	JUN 08	15.44	AUG 19	15.74

HAWAII, ISLAND OF OAHU

212927158014801. Local number and name, 3-2901-07 Schofield Shaft, Oahu.

LOCATION.--Lat 21°29', long 158°02', Old Hawaiian Datum, Hydrologic Unit 20060000, across the main gate of Wheeler Air Force Base, and 1,200 ft south of Wahiawa bridge on Kaukonahua Stream.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 ft. x 8 ft., length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point is top of 2-inch pipe for float tape cable (cap removed) 287.16 ft. above mean sea level.

REMARKS.--Maximum daily water levels are published due to the fluctuations in the water level caused by pumping.

PERIOD OF RECORD.-- Water level: water-level recorder, November 1938 to current year. Water quality: occasional measurements, 1966-72, 1975 to current year.

REVISED RECORDS.--WDR HI-99-1: Elevation of land-surface datum and measuring point. WDR HI-99-1: (m) based on non-pumping values.

EXTREMES FOR PERIOD OF RECORD (Non-pumping values).--Highest water level measured, 284.40 ft above mean sea level, May 12, 1969; lowest measured, 270.82 ft above mean sea level, May 1, 1985.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MAXIMUM VALUES

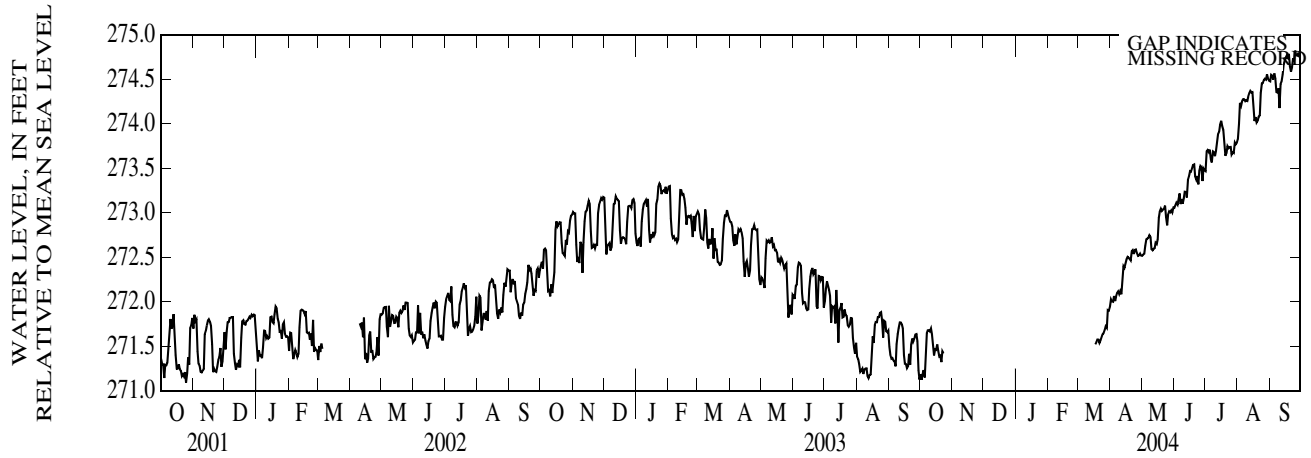
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	271.89	---	---	---	---	---	272.17	272.76	273.31	273.87	274.28	274.70
2	271.34	---	---	---	---	---	272.17	272.77	273.31	273.91	274.37	274.78
3	271.34	---	---	---	---	---	272.20	272.82	273.37	273.93	274.44	274.76
4	271.38	---	---	---	---	---	272.21	272.87	273.22	273.99	274.43	274.72
5	271.35	---	---	---	---	---	272.22	272.90	273.35	274.01	274.44	274.78
6	271.71	---	---	---	---	---	272.26	272.91	273.42	273.99	274.52	274.82
7	271.80	---	---	---	---	---	272.29	272.95	273.44	273.97	274.50	274.78
8	271.88	---	---	---	---	---	272.29	272.96	273.46	274.04	274.49	274.78
9	271.83	---	---	---	---	---	272.26	272.95	273.40	274.05	274.47	274.82
10	271.85	---	---	---	---	---	272.29	272.95	273.48	274.04	274.47	274.79
11	271.86	---	---	---	---	---	272.33	272.67	273.51	274.04	274.50	274.82
12	271.83	---	---	---	---	---	272.65	272.68	273.56	274.04	274.50	274.83
13	271.83	---	---	---	---	---	272.60	272.73	273.56	274.04	274.55	274.75
14	271.71	---	---	---	---	---	272.62	272.74	273.54	274.14	274.53	274.85
15	271.85	---	---	---	---	---	272.62	272.76	273.60	274.17	274.45	274.87
16	271.86	---	---	---	---	---	272.62	272.78	273.62	274.19	274.58	274.88
17	271.86	---	---	---	---	271.63	272.62	273.10	273.62	274.10	274.50	274.93
18	271.86	---	---	---	---	271.66	272.64	273.10	273.63	274.08	274.52	274.83
19	271.89	---	---	---	---	271.69	272.69	273.13	273.68	274.08	274.13	274.93
20	271.83	---	---	---	---	271.65	272.73	273.09	273.68	274.11	274.13	274.89
21	271.83	---	---	---	---	271.63	272.77	273.11	273.69	274.13	274.19	274.91
22	271.86	---	---	---	---	271.67	272.74	273.14	273.63	274.15	274.19	274.97
23	271.80	---	---	---	---	271.69	272.76	273.17	273.65	274.17	274.58	274.99
24	---	---	---	---	---	271.70	272.77	273.21	273.77	274.17	274.55	274.99
25	---	---	---	---	---	271.72	272.76	273.14	273.69	274.15	274.55	275.03
26	---	---	---	---	---	271.74	272.80	273.16	273.75	274.25	274.61	275.06
27	---	---	---	---	---	271.77	272.82	273.19	273.81	274.15	274.64	275.02
28	---	---	---	---	---	271.77	272.74	273.20	273.75	274.14	274.65	275.02
29	---	---	---	---	---	272.12	272.75	273.20	273.84	274.17	274.70	274.99
30	---	---	---	---	---	272.15	272.75	273.19	273.87	274.19	274.69	275.02
31	---	---	---	---	---	272.15	---	273.26	---	274.32	274.73	---
MEAN	---	---	---	---	---	---	272.54	272.99	273.57	274.09	274.48	274.88
MAX	---	---	---	---	---	---	272.82	273.26	273.87	274.32	274.73	275.06
MIN	---	---	---	---	---	---	272.17	272.67	273.22	273.87	274.13	274.70

HAWAII, ISLAND OF OAHU—Continued

NON-PUMPING VALUES

DATE	WATER LEVEL (ft)
OCT 1	271.89
NOV 3	271.80
NOV 12	271.86
DEC 1	271.88
JAN 7	271.80
FEB 1	271.88
MAR 1	271.98
APR 5	272.22
MAY 3	272.82
JUN 1	273.31
JUL 1	273.87
AUG 2	274.32
SEP 1	274.70
OCT 1	275.03
OCT 13	275.20

Note: Non-pumping water levels are measured after all pumps in the pump chamber are turned off for 2 hours.



HAWAII, ISLAND OF OAHU

212934157592301. Local number and name, 3-2959-01 Schofield, Army MW2-5, Oahu.

LOCATION.--Lat 21°30', long 157°59', Old Hawaiian Datum, Hydrologic Unit 20060000, inside "East Range" remote area, 0.1 mile east of USGS gaging station 16208000, and 2.4 miles east of Wahiawa Post Office.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Depth 775 ft., 6 ½ -inch casing diameter, cased to 625 ft. (solid) and 775 ft. (perforated)..

DATUM.--Elevation of land-surface datum is 910 ft. Measuring point is top of sounding tube with an elevation of 912.20 ft. above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, December 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 272.48 ft. above mean sea level, March 4, 2003; lowest measured, 270.82 ft. above mean sea level, December 30, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	271.00	DEC 30	270.82	MAR 04	270.85	APR 14	271.35	JUN 02	272.34	AUG 10	273.50

HAWAII, ISLAND OF OAHU

213224158135901. Local number and name, 3-3213-06 Makua, U.S. Air Force, Oahu.

LOCATION.--Lat 21°32', long 158°14', Old Hawaiian Datum, Hydrologic Unit 20060000, along Farrington Highway, 1.2 miles north of Makua Cave, and 1.0 mile southeast of Yokohama Bay.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 50 ft, cased to 21 ft with 6-in. black steel pipe.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point is top of 6-in. casing, elevation is 26.47 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, October 1972 to September 2004 (discontinued). Water quality: occasional measurements, 1965, 1967, February 1972 to March 2002.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.92 ft above mean sea level, January 2, 1975; lowest measured, 6.39 ft above mean sea level, March 12, 2002.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	6.66	DEC 18	6.48	MAR 02	6.95	APR 12	7.00	JUN 07	7.04	SEP 21	6.94

HAWAII, ISLAND OF OAHU

213430158071601. Local number and name, 3-3407-37 Kiikii Exploratory Well, Oahu.

LOCATION.--Lat 21°34', long 158°07', Old Hawaiian Datum, Hydrologic Unit 20060000, 2.75 miles down Haleiwa Beach Road from Weed Circle heading southwest and 0.5 miles northeast of Waialua Elementary School.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age

WELL CHARACTERISTICS.--Drilled flowing well, depth 135ft., surface casing steel, diameter 8 5/8-inch, inner casing 4 $^{1}/_{2}$-inch PVC, cased to 115 ft.

DATUM.--Elevation of land-surface datum is 5 ft. Measuring point is top of casing, 14.68 ft. above mean sea level.

REMARKS.-.Prior to October 2000, unpublished records in files of the U.S. Geological survey

PERIOD OF RECORD.-- Water level: occasional measurements, August 1994 to current year. Water quality: occasional measurements, October 2000 to September 2002 (discontinued)..

EXTREMES FOR PERIOD OF RECORD.-- Highest water level measured, 11.60 ft. above mean sea level, February 13, 1995; lowest 10.96 ft. above mean sea level, May 13, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	11.36	JAN 16	11.28	MAR 16	11.09	APR 27	11.10	JUN 22	11.21	JUL 28	11.21

HAWAII, ISLAND OF OAHU

213438158091101. Local number and name, 3-3409-16 Mokuleia, Oahu.

LOCATION.--Lat 21°35', long 158°09', Old Hawaiian Datum, Hydrologic Unit 20060000, 1.6 mi west of Waialua High School, 2.6 mi east of Mokuleia Beach Park along Farrington Highway.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 518 ft, cased to 440 ft, diameter 10-in. to 396 ft, 8-in. to 440 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is chiseled 1- $^1/_2$ -in. square on concrete, 3.7 ft in front of door of well shelter, elevation is 8.48 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: occasional measurements, December 1924 to current year. Water quality: occasional measurements, 1924-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, January 16, 1969; lowest measured, 15.76 ft above mean sea level, March 16, 2004.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	16.14	MAR 16	15.76	APR 27	15.80	JUN 03	15.95	JUL 21	16.00

HAWAII, ISLAND OF OAHU

213446158104901. Local number and name, 3-3410-08 Kawaihapai, Mokuleia, Oahu.

LOCATION.--Lat 21°35', long 158°11', Old Hawaiian Datum, Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 447 ft, 1-in. casing diameter, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point is top of recorder shelf over 12-in. stilling well, 20.53 ft above mean sea level. On June 14, 2000, measuring point was changed to top of 1 ½ inch drain pipe at bottom of 12-inch stilling well, 14.50 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: water-level recorder, January 1963 to February 1972. Occasional measurements, January 1929 to December 1962, March 1972 to current year. Water quality: occasional measurements, 1929 to 1985, 1989 to 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.98 ft above mean sea level, January 5, 1969; lowest measured, 16.08 ft above mean sea level, August 6, 1929.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	17.04	JAN 16	16.83	APR 12	16.88	JUN 03	17.02	JUL 27	17.11

HAWAII, ISLAND OF OAHU

213626158044601. Local number and name, 3-3604-01 Kawailoa Deep Monitoring Well, Oahu.

LOCATION.--Lat 21°36', long 158°05', Old Hawaiian Datum, Hydrologic Unit 20060000, 12.6 miles northwest of Weed Circle and 1.0 miles north of Anahulu Gulch.

AQUIFER.--Koolau, Basalt, Pliocene to Pleistocene age

WELL CHARACTERISTICS.--Drilled well, depth 701 ft., surface casing diameter 8 5/8-in., cased to 69 ft., inner casing 4 ½-in., cased to 701 ft., bottom 400 ft. screened.

DATUM.--Elevation of land-surface datum is 308 ft. Measuring point is located on the top of the casing, 309.01 ft. above mean sea level.

REMARKS.--Prior to September 2000, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--Water level: occasional measurements, January 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.52 ft. above mean sea level, October 24, 2003; lowest 3.81 ft. above mean sea level, April 10, 1995.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	4.52	JAN 16	4.43	FEB 17	4.35	APR 23	4.16	JUN 22	4.21	JUL 28	4.09

HAWAII, ISLAND OF OAHU

214053157570401. Local number and name, 3-4057-05 Kahuku, Oahu.

LOCATION.--Lat 21°41', long 157°57', Old Hawaiian Datum, Hydrologic Unit 20060000, 0.4 mi northeast of Kahuku Hospital, and 500 ft north of Kahuku High School.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 397 ft, 12-in. metal casing, cased to 172 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point is top of 10-in. standpipe, elevation is 16.01 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.-- Water level: water-level recorder, August 1958 to December 1990. Occasional measurements, March 1911 to May 1918, March 1921, January 1926 to August 1958, December 1990 to current year. Water quality: occasional measurements, 1908, 1911-16, 1924-78.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.12 ft above mean sea level, January 1916; lowest measured, 8.00 ft above mean sea level, October 5, 1962.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	11.71	DEC 05	11.90	FEB 12	12.08	APR 21	12.49	JUN 21	12.79	AUG 03	12.87

HAWAII, ISLAND OF OAHU

214125158013401. Local number and name, 3-4101-03 Waialee, Oahu.

LOCATION.--Lat 21°41', long 158°02', Old Hawaiian Datum, Hydrologic Unit 20060000, 1,500 ft northeast of University of Hawaii agriculture experiment station in Waialee, and 1.9 mi northeast of Sunset Beach.

AQUIFER.--Koolau Basalt, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, 8-in. casing diameter, cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point is top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, November 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 09	12.84	DEC 05	12.61	FEB 12	12.68	APR 21	12.54	JUN 22	12.87	AUG 03	13.02

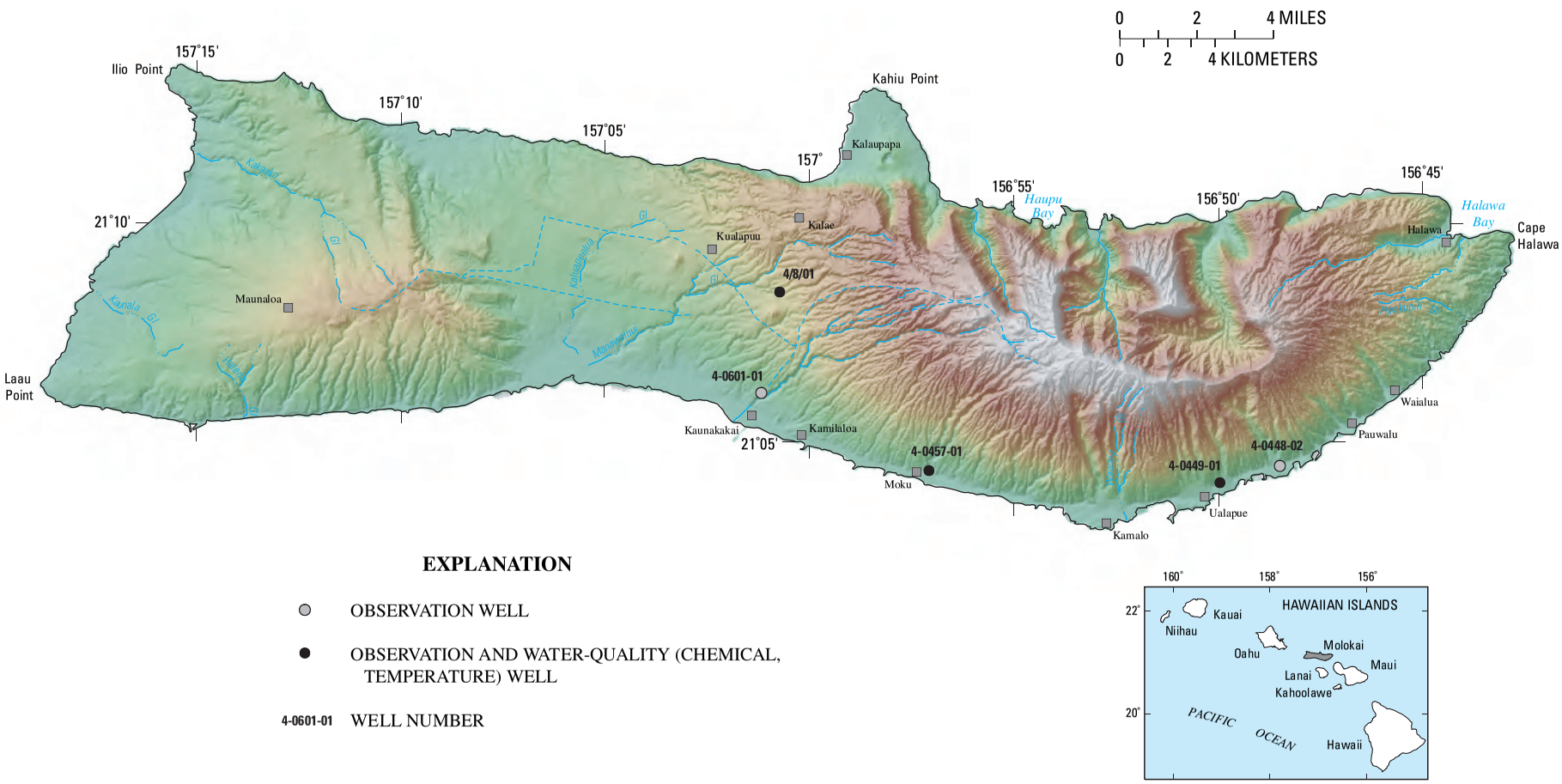


Figure 18. Locations of observation wells and ground-water quality sampling sites on Molokai.

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02. Mapulehu Shaft 2, Molokai.

LOCATION.--Lat 21°04', long 156°49', Old Hawaiian Datum, Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug water-table well, size 4 ft x 6 ft, depth 21 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point is top of 2 in. x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

PERIOD OF RECORD.-- Water level: water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year. Water quality: occasional measurements, 1970-73, 1993-2000, 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, November 26, 1970; lowest measured, 3.67 ft above mean sea level, February 8, 1977.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	no data	DEC 15	4.63	FEB 17	4.43	MAY 17	4.66	JUL 14	4.23	AUG 30	4.24

HAWAII, ISLAND OF MOLOKAI

210402156495801. Local number, 4-0449-01. Ualapue Shaft, Molokai.

LOCATION.--Lat 21°04', long 156°50', Old Hawaiian Datum, Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug water-table well, size 4 ft x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point is top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply; water level affected by pumping.

PERIOD OF RECORD.-- Water level: occasional measurements, 1938-39, 1941-63, November 1972 to current year. Water quality: occasional measurements, 1948, 1952-56, 1970-91, 1993 to 2002.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, January 19, 1950; lowest measured, 2.09 ft above mean sea level, September 16, 1975.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	3.20	FEB 18	3.24	MAY 17	3.49	JUL 14	3.27	AUG 30	3.36

HAWAII, ISLAND OF MOLOKAI

210419156570501. Local number, 4-0457-01. Kawela Shaft, Molokai.

LOCATION.--Lat 21°04', long 156°57', Old Hawaiian Datum, Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug water-table well, size 4 ft x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point is top of steel plate, 37.56 ft, above mean sea level until August. 14, 2001. New measuring point August 14, 2001 37.56 ft. above mean sea level.

REMARKS.--Water from this well is used for public supply. Water level measured after pump has been turned off for 30 minutes. Water level affected by pumping.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year. Water quality: occasional measurements, 1948, 1954-56, 1960, 1962, 1971, 1973- 91, 1993 to 2002.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.78 ft above mean sea level, February 5, 1991; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	2.01	DEC 17	1.80	FEB 19	1.82	MAY 17	1.96	JUL 14	1.75	AUG 30	1.94

HAWAII, ISLAND OF MOLOKAI

210605157012001. Local number, 4-0601-01. Kaunakakai, Molokai.

LOCATION.--Lat 21°06', long 157°01', Old Hawaiian Datum, Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 59 ft, 12-in. casing diameter, cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point is top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, May 1954 to current year. Water quality: occasional measurements, 1954-2000, 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, January 20, 1969; lowest measured, 1.60 ft above mean sea level, December 5, 1964.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	2.83	DEC 17	2.67	FEB 19	2.79	MAY 19	2.85	JUL 16	2.67	AUG 31	2.81

QUALITY OF GROUND WATER -- WELLS

HAWAII, ISLAND OF MOLOKAI

210425156483001 -- 4-0448-02 Mapulehu Shaft 2, Molokai, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Chlor- ide, water, unfltrd mg/L (99220)
OCT				
14...	1305	351	24.8	16
DEC				
15...	1341	557	24.7	60
FEB				
17...	1455	844	25.0	138
MAY				
17...	1406	805	24.1	141
JUL				
14...	1500	642	25.0	96
AUG				
30...	1350	550	25.4	70

210605157012001 -- 4-0601-01 Kaunakakai, Molokai, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Chlor- ide, water, unfltrd mg/L (99220)
OCT				
14...	1655	497	25.4	75
DEC				
17...	1356	484	24.6	80
FEB				
19...	1205	717	25.5	142
MAY				
19...	1145	553	26.0	99
JUL				
16...	1210	622	26.3	107
AUG				
31...	1635	561	25.6	91

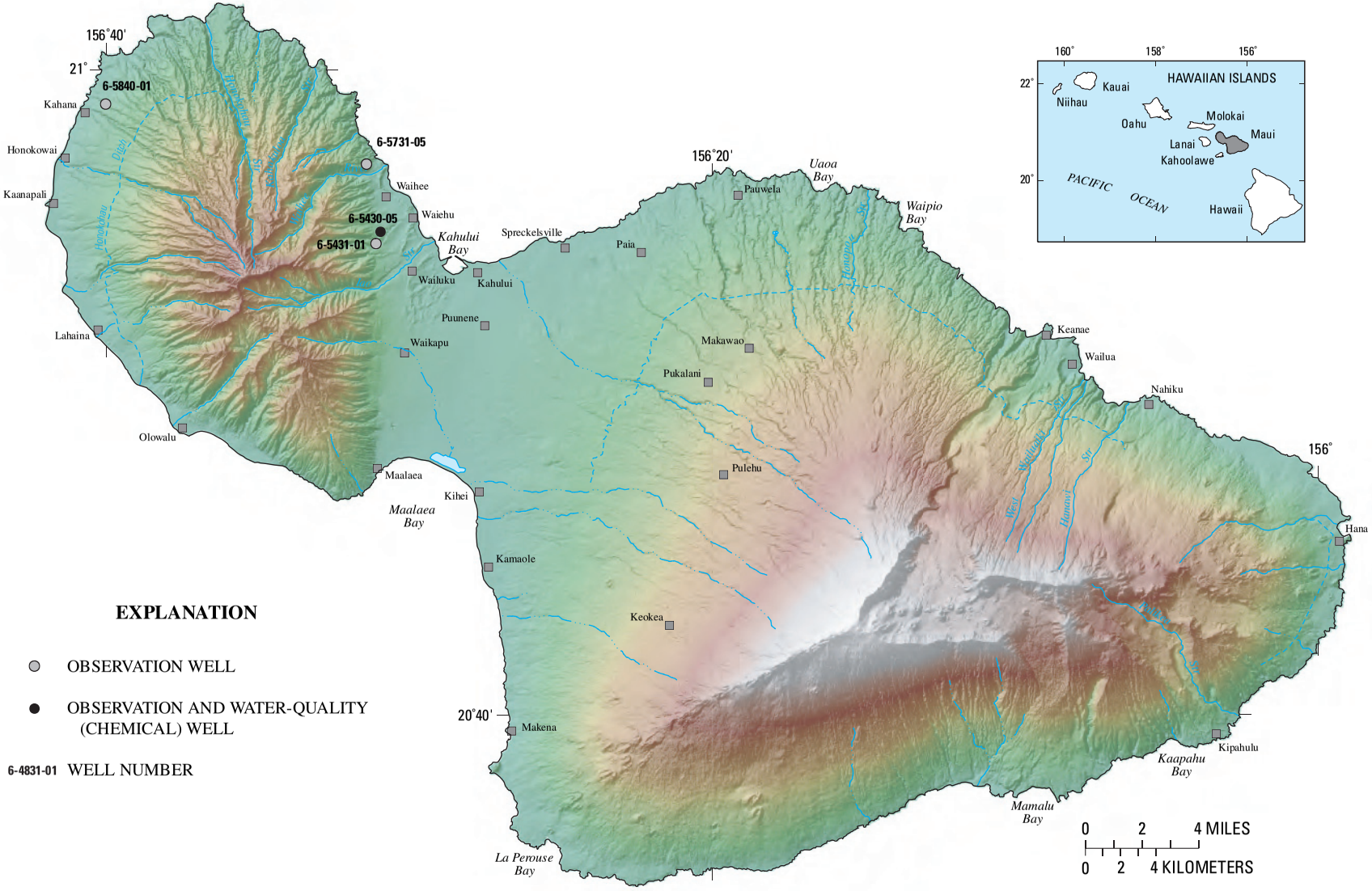


Figure 19. Locations of observation wells and ground-water quality sampling sites on Maui.

HAWAII, ISLAND OF MAUI

203912156255901. Local number, 6-3925-01. Makena, Maui.

LOCATION.--Lat 20°39', long 156°26', Old Hawaiian Datum, Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena Roads.

AQUIFER.--Hana Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 382 ft, 8-in. casing diameter, cased to 343 ft, perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 351 ft. Measuring point is top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, August 24, 1964; lowest measured, 0.60 ft below mean sea level, May 24, 2001.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	.13	DEC 01	-.07	FEB 20	.07	MAY 12	.01	JUL 12	-.34	AUG 09	-.23

HAWAII, ISLAND OF MAUI

204827156242201. Local number, 6-4824-01. Kihei exploratory well, Maui

LOCATION.--Lat 20°48', long 156°24', Old Hawaiian Datum, Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa Gulch, and 4 mi east of Kihei.

AQUIFER.--Kula Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 646 ft, 12-in. casing diameter, cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point is top of 3-in. pipe attached to the steel casing cover, 594.74 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971, May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 5.20 ft above mean sea level, January 17, 1974; lovest measured 3.8 ft above mean sea level, June 14, 2000.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	4.05	JAN 07	4.44	FEB 10	4.29	APR 02	4.49	MAY 13	4.66	AUG 18	4.05

HAWAII, ISLAND OF MAUI

205140156304501. Local number, 6-5130-01. Waikapu 1, Maui.

LOCATION.--Lat 20°51', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water table well, depth 757 ft, 8-in. casing diameter, cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point is top of 6-in. pipe coupling, 551.33 ft. above mean sea level, until September 30, 2003. New measuring point elevation October 1, 2003 551.04 ft. above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, October 13, 1982; lowest measured, 10.40 ft above mean sea level, January 5, 2004.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	11.70	JAN 05	10.40	FEB 10	11.44	MAY 13	13.21
NOV 13	11.68	JAN 05	10.48	APR 02	11.99		

HAWAII, ISLAND OF MAUI

205154156303801. Local number, 6-5130-02. Waikapu 2, Maui.

LOCATION.--Lat 20°52', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,020 ft, 20-in. casing diameter, cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point is top of casing, 519.33 ft above mean sea level, until September 30, 2003. New measuring point elevation, October 1, 2003, 518.96 ft. above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, July 15, 1987; lowest measured, 10.23 ft above mean sea level, October 1, 2002.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	10.93	NOV 13	10.70	JAN 05	10.96	FEB 10	11.02	APR 02	11.18

HAWAII, ISLAND OF MAUI

205305156304401. Local number, 6-5330-05. Shaft 33, well 1, Maui.

LOCATION.--Lat 20°53', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 1,500 ft southwest of Wailuku Elementary School, 1,500 ft southeast of Maui DWS water tank near intersection of Wailuku Heights Road and Iao Valley Road.

AQUIFER.--Wailuku Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Three drilled wells in vault, at bottom of excavated inclined shaft. Vault floor about 32 ft above mean sea level, well nearest inclined shaft is measured. Depth 310 ft below vault floor, casing length unknown.

DATUM.--Elevation of land-surface datum is 401.51 ft. Datum of vault floor is 32.14 ft. Measuring point is the edge of steel plate, inside access hole cut through pump base casing, at cement floor level, 32.17 ft above mean sea level, until September 30, 2003. New measurement point elevation October 1. 2003, 32.33 ft. above mean sea level.

REMARKS.--Water levels affected by pumping of adjacent well in shaft, and by other nearby wells.

PERIOD OF RECORD.--Occasional measurements, February 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.33 ft above mean sea level, April 22, 1997; lowest measured, 7.41 ft above mean sea level, January 7, 2004.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	8.15	FEB 10	8.89	MAY 13	9.51	AUG 18	9.13
JAN 07	7.41	APR 02	9.24	JUL 12	9.54		

HAWAII, ISLAND OF MAUI

205329156305502. Local number, 6-5330-09. Mokuhau Pump 2, Maui.

LOCATION.--Lat 20 53'. long 156 31', Old Hawaiian Datum, Hydrologic Unit 20020000, .5 mi northwest of Wailuku and 0.6 mi west on Mokuhau Road from Market Street.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water table well. Depth 600 ft, 18-in. casing diameter, length of casing 411 ft.

DATUM.--Elevation of land-surface datum is 354 ft. Measuring point is top of 1 $^1/_2$ -in. pipe. 353.79 ft above mean sea level, until September 30, 2003. New measuring point elevation, October 1, 2003, 353.37 ft. above mean sea level.

REMARKS.--Water level affected by pumping of nearby well.

PERIOD FOR RECORD.--Chloride samples collected since 1972. Pump removed sometime in 1998 (Sept., Oct., Nov.). Occasional measurements December 1998 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.04 ft above mean sea level, March 5, 1999; lowest measured, 3.88 ft above mean sea level, August 24, 1999.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	6.13	JAN 05	7.62	APR 02	9.33	JUL 12	6.28
NOV 13	8.19	FEB 10	8.69	MAY 13	7.08	AUG 18	6.93

HAWAII, ISLAND OF MAUI

205312156321402. Local number, 6-5332-04. Kepaniwai observation well, Maui.

LOCATION.--Lat 20°53', long 15632", Old Hawaiian Datum, Hydrologic Unit 20020000, 1.9 mi southwest of Puuohala Village, 1.9 mi west of Wailuku Elementary School, and 10 ft from well 6-5332-04.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 254 ft.

DATUM.--Elevation of land-surface datum is 713 ft. Measuring point is top of 2-in. PVC pipe.

REMARKS.--Water level affected by pumping of nearby well.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year. Prior to October 1995, unpublished records are in the files of the U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.41 ft below land-surface datum, July 1, 1996; lowest measured, 83.20 ft below land-surface datum, July 6, 2000.

WATER LEVEL,IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	80.36	JAN 05	77.19	APR 02	73.58	JUL 12	76.38
NOV 13	80.82	FEB 10	77.59	MAY 13	75.29	AUG 18	76.79

HAWAII, ISLAND OF MAUI

205433156184101. Local number, 6-5418-01. EMWDP Monitor well, Pauwela, Maui.

LOCATION.--Lat 20°55', long 156°19', Old Hawaiian Datum, Hydrologic Unit 20020000.

AQUIFER.--Honomanu Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 733 ft, 24-in. casing diameter, cased to 149 ft, 14-in casing diameter, cased to 733 ft, screened to 668 to 733 ft.

DATUM.--Elevation of land-surface datum is 667.10 ft. Measuring point is top of 14-in casing, 669.17 ft above mean sea level.

PERIOD OF RECORD.--Occasional water level measurements, October 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.02 ft. above mean sea level, May 13, 2004; lowest measured, 4.41 ft above mean sea level, Apr. 29, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	4.55	JAN 07	4.72	FEB 10	4.64	APR 02	4.66	MAY 13	5.02	AUG 18	4.60

HAWAII, ISLAND OF MAUI

205419156304401. Local number, 6-5430-03. TH-E Waiehu, Maui.

LOCATION.--Lat 20°54', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point is top of 1-in. galvanized pipe, 416.75 ft above mean sea level, until September 30, 2003. New measuring point elevation, October 1, 2003, 415.65 ft. above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, December 31, 1982; lowest measured, 8.86 ft. above mean sea level, October 2, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	8.86	JAN 07	9.58	APR 02	11.15	JUL 12	10.55
NOV 13	8.89	FEB 10	10.72	MAY 13	11.22	AUG 18	9.88

HAWAII, ISLAND OF MAUI

205405156305401. Local number, 6-5430-05. Waiehu deep monitor well, Maui

LOCATION.--Lat 20°55', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,400 ft, 10-in. casing diameter, cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point is top of 10-in. casing, 380.84 ft above mean sea level, until Sept. 30, 2003. New measuring point elevation, October 1, 2003, 381.16 ft. above mean sea level.

REMARKS.--Geophysical log and water-quality records are available in files at USGS Hawaii District Office.

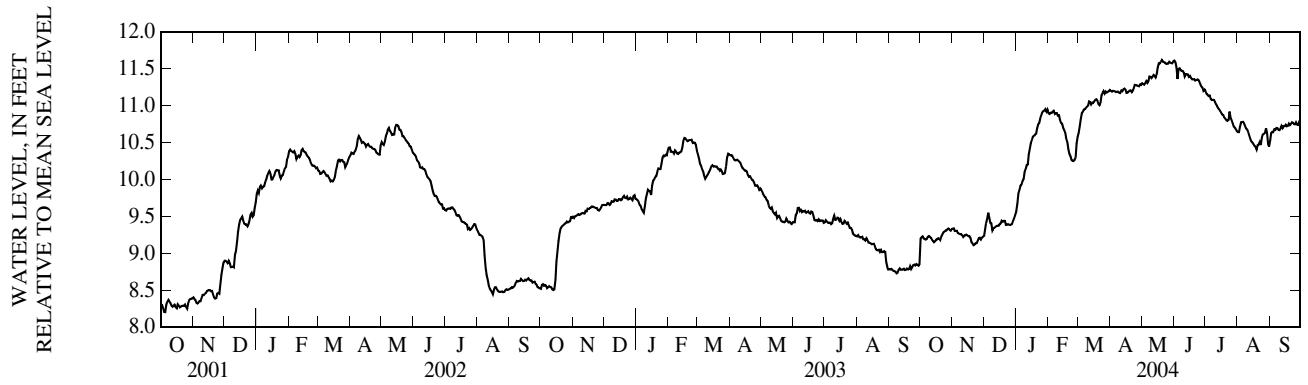
PERIOD OF RECORD.--Water level: occasional measurements, August 1983 to May 1986. Water level recorder, June 1986 to current year. Water quality: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, December 14, 1989; lowest measured, 7.66 ft above mean sea level, October 18, 1999.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e9.20	9.33	9.24	9.57	10.90	10.63	e11.20	11.30	11.61	11.20	10.64	10.53
2	9.22	9.34	9.32	9.68	10.89	10.72	11.19	11.29	11.59	11.16	10.64	10.63
3	9.23	9.31	9.41	9.81	10.90	10.82	11.20	11.28	11.52	11.15	10.71	10.64
4	9.20	9.30	9.47	9.86	10.90	10.90	11.20	11.30	11.36	11.13	10.77	10.64
5	9.19	9.31	9.55	9.92	10.92	10.91	11.19	11.33	11.50	11.14	10.78	10.68
6	9.19	9.27	9.48	e9.93	10.93	10.95	11.18	11.31	11.51	11.09	10.78	10.67
7	9.20	9.27	9.41	9.98	10.89	10.95	11.19	11.33	11.48	11.08	10.76	10.70
8	9.22	9.26	9.41	10.01	10.90	10.97	11.19	11.39	11.47	e11.08	10.72	10.70
9	9.23	9.26	9.31	10.10	10.90	10.99	11.17	11.39	11.47	11.08	10.69	10.67
10	9.23	9.25	9.34	10.14	10.87	11.00	11.17	11.37	11.45	11.05	10.68	10.67
11	9.21	9.22	9.35	10.19	10.87	11.06	11.21	11.39	11.39	11.02	10.64	10.69
12	9.19	9.24	9.36	10.21	10.81	11.05	11.19	11.42	11.43	11.00	10.59	10.73
13	9.17	9.24	9.37	10.34	10.77	11.02	11.22	11.40	11.43	10.97	10.55	10.70
14	9.15	9.25	9.38	10.42	10.76	11.04	11.23	11.38	11.42	10.95	10.52	10.72
15	9.16	9.24	9.37	10.49	10.70	11.04	11.22	11.43	11.39	10.93	10.50	10.72
16	9.19	9.23	9.40	10.53	10.67	11.06	11.17	11.52	11.40	10.90	10.48	10.74
17	9.19	9.23	9.41	10.58	10.64	11.08	11.17	11.57	11.38	10.88	10.46	10.72
18	9.20	9.21	9.44	10.59	10.56	11.09	11.19	11.57	11.36	10.88	10.44	10.72
19	9.20	9.15	9.43	10.61	10.51	11.07	11.20	11.60	11.36	10.84	10.41	10.76
20	9.18	9.13	9.44	10.62	10.42	11.02	11.21	11.62	11.36	10.83	10.47	10.74
21	9.23	9.11	9.44	10.69	10.35	11.01	11.18	11.60	11.34	10.80	10.47	10.76
22	9.25	9.12	9.39	10.75	10.32	11.04	11.20	11.59	11.35	10.79	10.51	10.77
23	9.28	9.14	9.39	10.76	10.27	11.14	11.24	11.58	11.36	10.81	10.47	10.77
24	9.30	9.14	9.39	10.83	10.25	11.17	11.28	11.57	11.35	10.92	10.57	10.75
25	9.31	9.17	9.39	10.87	10.25	11.20	11.28	11.57	11.33	10.83	10.61	10.75
26	9.31	9.20	9.38	10.91	10.26	11.16	11.27	11.57	11.29	10.81	10.62	10.77
27	9.33	9.21	9.39	10.93	10.30	11.19	11.27	11.60	11.26	10.76	10.63	10.74
28	9.34	9.19	9.40	10.93	10.49	11.18	11.26	11.58	11.24	10.72	10.69	10.74
29	9.32	9.21	9.44	10.96	10.58	11.19	11.29	11.58	11.20	10.70	10.64	10.79
30	9.31	9.23	9.48	10.92	---	11.20	11.28	11.57	11.22	10.68	10.48	10.78
31	9.33	---	9.52	10.95	---	11.21	---	11.60	---	10.65	10.44	---
MEAN	9.23	9.23	9.40	10.42	10.65	11.03	11.21	11.47	11.39	10.93	10.59	10.71
MAX	9.34	9.34	9.55	10.96	10.93	11.21	11.29	11.62	11.61	11.20	10.78	10.79
MIN	9.15	9.11	9.24	9.57	10.25	10.63	11.17	11.28	11.20	10.65	10.41	10.53

e Estimated



HAWAII, ISLAND OF MAUI

205437156310501. Local number, 6-5431-01. TH-B Waiehu, Maui

LOCATION.--Lat 20°55', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 555 ft, 1.5-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point is top of 1.5-in. PVC casing, 492.51 ft above mean sea level, until Sept. 30, 2003. Measuring point elevation 492.09 October 1, 2003 to March 31, 2004. New measuring point elevation 492.15 feet above mean sea level March 31, 2004.

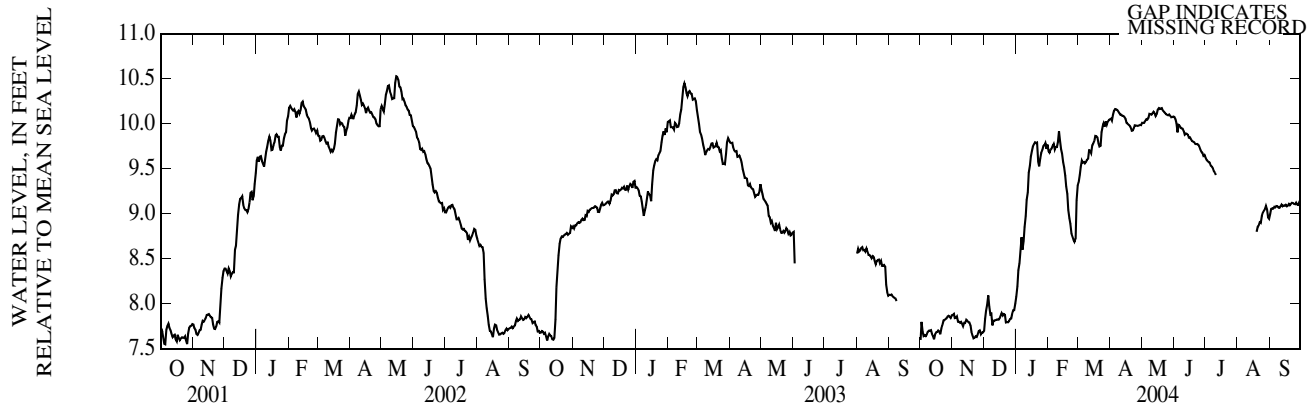
PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, January 2, 1983; lowest measured, 6.86 ft above mean sea level, November 26, 1999.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e7.60	7.88	7.70	8.08	9.70	9.35	10.06	10.01	10.08	9.63	---	9.00
2	e7.80	7.89	7.83	8.20	9.68	9.43	10.04	10.01	10.05	9.60	---	9.06
3	7.69	7.84	7.92	8.37	9.72	9.52	10.11	10.01	10.01	9.59	---	9.06
4	7.64	7.85	7.99	8.45	9.72	9.59	10.15	10.03	9.91	9.57	---	9.06
5	7.65	7.86	8.09	8.57	9.76	9.57	10.16	10.05	9.99	9.57	---	9.08
6	7.64	7.80	7.97	8.74	9.78	9.58	10.16	10.05	9.98	9.54	---	9.07
7	7.66	7.80	7.88	8.60	9.71	9.56	10.16	10.07	9.96	9.53	---	9.09
8	7.69	7.79	7.89	8.70	9.74	9.58	10.14	10.11	9.95	9.51	---	9.08
9	7.70	7.80	7.76	8.85	9.74	9.60	10.12	10.11	9.95	9.48	---	9.07
10	7.70	7.78	7.81	8.98	9.79	9.61	10.10	10.10	9.92	9.46	---	9.07
11	7.71	7.75	7.81	9.15	9.92	9.71	10.10	10.12	9.88	9.43	---	9.09
12	7.67	7.79	7.82	9.24	9.82	9.70	10.09	10.13	9.89	---	---	9.10
13	7.64	7.79	7.83	9.46	9.72	9.68	10.09	10.12	9.89	---	---	9.08
14	7.61	7.82	7.83	9.53	9.67	9.76	10.08	10.09	9.88	---	---	9.09
15	7.66	7.81	7.82	9.63	9.57	9.78	10.06	10.11	9.85	---	---	9.09
16	7.68	7.80	7.84	9.70	9.52	9.81	10.01	10.16	9.85	---	---	9.10
17	7.69	7.80	7.87	9.75	9.42	9.87	10.00	10.18	9.83	---	---	9.08
18	7.70	7.76	7.90	9.78	9.30	9.86	9.99	10.16	9.81	---	---	9.09
19	7.69	7.69	7.87	9.80	9.22	9.85	9.98	10.17	9.80	---	8.80	9.11
20	7.66	7.65	7.89	9.79	9.04	9.78	9.96	10.18	9.80	---	8.86	9.10
21	7.73	7.62	7.88	9.79	8.95	9.75	9.92	10.15	9.78	---	8.87	9.11
22	7.76	7.63	7.79	9.58	8.89	9.76	9.93	10.13	9.78	---	8.91	9.12
23	7.82	7.64	7.80	9.53	8.78	9.91	9.95	10.12	9.78	---	8.90	9.12
24	7.82	7.63	7.80	9.62	8.75	9.97	9.98	10.11	9.77	---	8.98	9.11
25	7.83	7.66	7.81	9.68	8.71	10.01	9.98	10.10	9.75	---	9.01	9.11
26	7.84	7.70	7.83	9.71	8.69	9.97	9.98	10.10	9.72	---	9.04	9.12
27	7.86	7.71	7.84	9.75	8.72	10.03	9.98	10.10	9.69	---	9.05	9.10
28	7.87	7.66	7.89	9.76	9.15	9.99	9.98	10.09	9.68	---	9.09	9.10
29	7.86	7.68	7.93	9.79	9.31	10.02	9.99	10.07	9.64	---	9.05	9.13
30	7.84	7.68	7.93	9.72	---	10.04	9.98	10.07	9.65	---	8.96	9.12
31	7.87	---	8.01	9.77	---	e10.05	---	10.08	---	---	8.94	---
MEAN	7.73	7.75	7.87	9.29	9.40	9.76	10.04	10.10	9.85	---	---	9.09
MAX	7.87	7.89	8.09	9.80	9.92	10.05	10.16	10.18	10.08	---	---	9.13
MIN	7.60	7.62	7.70	8.08	8.69	9.35	9.92	10.01	9.64	---	---	9.00

e Estimated



HAWAII, ISLAND OF MAUI

205617156311101. Local number, 6-5631-01. TH-A1 Waihee, Maui.

LOCATION.--Lat 20°56', long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point is top of 1.5-in. PVC pipe, 248.05 ft above mean sea level, until September 30, 2003. New measuring point elevation, October 1, 2003, 246.17 ft. above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, December 6, 1982; lowest measured, 9.42 ft above mean sea level, November 13, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	9.69	NOV 13	9.42	JAN 05	10.07

HAWAII, ISLAND OF MAUI

205705156312401. Local number, 6-5731-05. Kanoa Test Hole, Maui

LOCATION.-Lat 20°57', Long 156°31', Old Hawaiian Datum, Hydrologic Unit 20020000, 300 ft. west of highway 330 and 1.0 mile north of Waihee school.

AQUIFER.-Wailuku basalt, Pliocene age.

WELL CHARACTERISTICS.-Drilled water-table well, 2-in. PVC casing, depth is approximately 358.00 ft.

DATUM.-Elevation of land-surface datum is 303 ft. Measuring point is top of 2-in. well casing, 303.56 ft. above mean sea level. Measuring point surveyed December 2003.

REMARKS.-Water level affected by pumping of nearby wells.

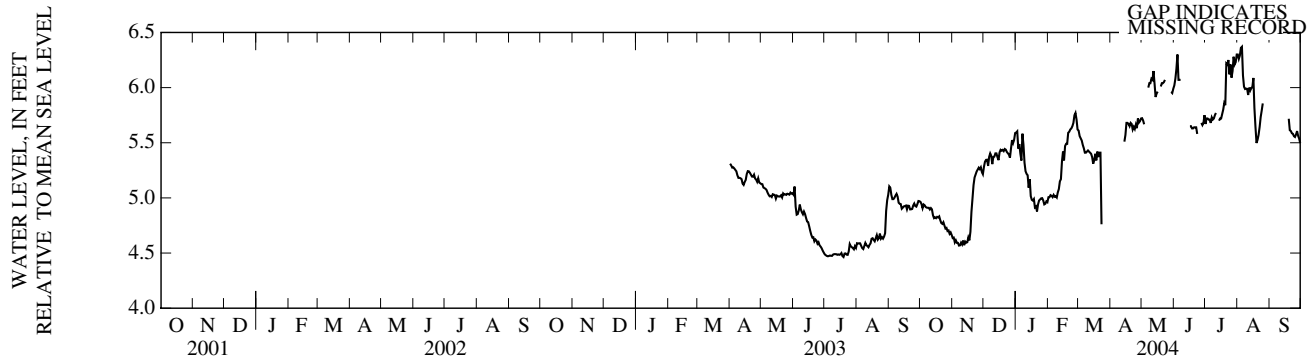
PERIOD OF RECORD.-Water level: occasional measurements, Aug. 2001 to Mar 2003. Water level recorder, Apr. 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.-Highest water level measured, 6.37 ft. above mean sea level, Aug. 5, 2004, but may have been higher during period of estimated record in August 2004; Lowest measured, 4.46 ft. above mean sea level, Aug. 21, 2001.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.96	4.64	5.28	5.59	5.01	e5.61	---	5.72	e6.02	e5.67	e6.30	---
2	4.94	4.64	5.33	5.60	5.01	e5.56	---	5.70	e6.08	e5.72	e6.26	---
3	4.91	4.60	5.34	5.45	5.02	e5.54	---	5.67	e6.17	e5.72	e6.29	---
4	4.94	4.62	5.35	5.49	5.02	e5.52	---	---	e6.30	e5.71	e6.36	---
5	4.93	4.59	5.29	5.40	5.01	e5.48	---	---	e6.07	e5.71	e6.37	---
6	4.92	4.59	5.37	5.34	5.03	e5.45	---	---	e6.07	e5.68	e6.11	---
7	4.91	4.57	5.40	5.58	5.01	e5.41	---	e6.00	e6.07	e5.73	6.01	---
8	4.91	4.57	5.38	5.48	5.02	e5.41	---	e6.04	---	e5.71	5.99	---
9	4.91	4.59	5.31	5.32	5.00	e5.42	---	e6.04	---	e5.72	5.99	---
10	4.89	4.58	5.37	5.24	e5.05	e5.43	---	e6.08	---	e5.75	5.99	---
11	4.91	4.61	5.37	5.22	e5.08	e5.42	---	e6.07	---	e5.77	5.93	---
12	4.90	4.57	5.40	5.21	e5.15	e5.41	---	e6.15	---	---	6.00	---
13	4.84	4.60	5.40	5.09	e5.17	e5.40	---	6.04	---	---	5.97	---
14	4.82	4.59	5.37	5.17	e5.33	e5.37	e5.51	5.91	---	e5.70	6.00	---
15	4.82	4.60	5.34	5.02	e5.42	e5.31	e5.57	5.95	---	e5.72	6.00	---
16	4.82	4.64	5.41	4.98	e5.34	e5.34	e5.68	5.96	e5.65	e5.72	6.09	---
17	4.83	4.61	5.44	4.98	e5.47	e5.40	e5.68	---	e5.65	e5.76	5.82	---
18	4.82	4.69	5.43	4.99	e5.49	e5.34	e5.67	---	e5.63	e5.80	5.65	---
19	4.83	4.87	5.44	4.91	e5.49	e5.42	e5.65	e6.01	e5.63	e5.86	5.50	5.72
20	4.80	4.99	5.42	4.92	e5.59	e5.37	e5.68	e6.04	e5.64	e5.84	5.53	5.61
21	4.77	5.12	5.44	4.88	e5.60	e5.41	e5.67	e6.04	e5.64	e6.22	5.57	5.61
22	4.76	5.18	5.44	4.94	e5.62	e5.41	e5.62	e6.05	e5.64	e6.21	5.64	5.59
23	4.78	5.21	5.42	4.98	e5.63	4.76	5.64	e6.07	e5.58	e6.25	5.73	5.58
24	4.75	5.24	5.40	4.99	e5.65	---	5.62	---	---	e6.12	5.79	5.56
25	4.72	5.26	5.39	5.00	e5.68	---	5.66	---	---	e6.21	5.86	5.55
26	4.73	5.27	5.36	5.00	e5.75	---	5.63	---	---	e6.09	---	5.58
27	4.70	5.26	5.45	4.98	e5.77	---	5.72	---	e5.68	e6.15	---	5.61
28	4.70	5.28	5.52	4.94	e5.71	---	5.68	---	e5.66	e6.28	---	5.56
29	4.67	5.23	5.50	4.95	e5.62	---	5.70	e5.96	e5.68	e6.21	---	5.54
30	4.69	5.21	5.53	4.97	---	---	5.72	e5.95	e5.75	e6.23	---	5.50
31	4.66	---	5.59	4.96	---	---	---	e5.99	---	e6.30	---	---
MEAN	4.82	4.83	5.40	5.15	5.34	---	---	---	---	---	---	---
MAX	4.96	5.28	5.59	5.60	5.77	---	---	---	---	---	---	---
MIN	4.66	4.57	5.28	4.88	5.00	---	---	---	---	---	---	---

e Estimated



HAWAII, ISLAND OF MAUI

205856156400101. Local number, 6-5840-01 Alaeloa, Maui.

LOCATION.--Lat 20°59', long 156°40', Old Hawaiian Datum, Hydrologic Unit 20020000, on pineapple plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua.

AQUIFER.--Honolua Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 274 ft, 8-in. casing diameter, cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft, but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point is top of 9-in. casing, 257.33 ft. above mean sea level.

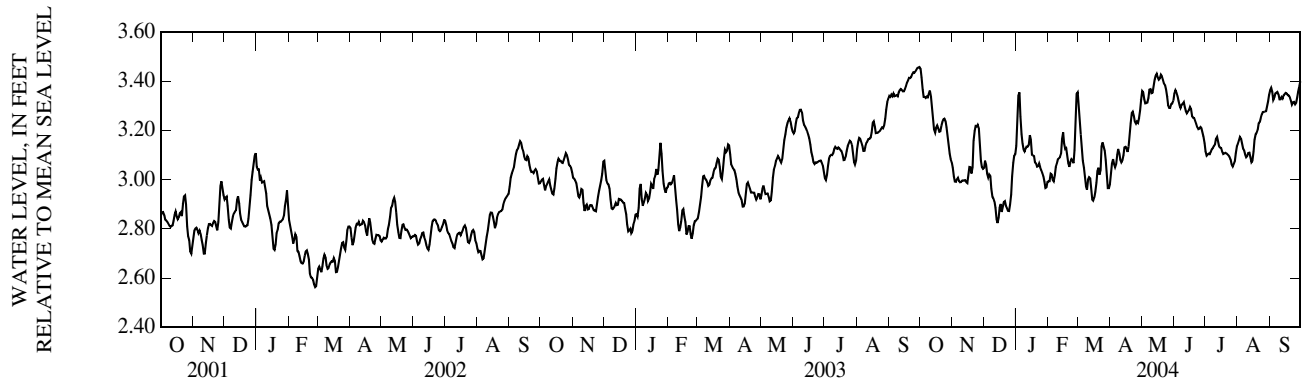
REMARKS.--Water-quality records for 1964 and 1980 are available in files of USGS Hawaii District Office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water- level recorder, August 1975 to June 1993. Occasional measurements, July 1993 to July 2001. Water level recorder July 12, 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, September 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985, Feb. 26, 27 2002.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.45	3.05	3.05	3.14	2.99	3.31	3.02	3.36	3.35	3.11	3.14	3.36
2	3.42	3.01	3.08	3.24	2.99	3.25	3.06	3.35	3.36	3.10	3.16	3.37
3	3.37	2.99	3.06	3.34	3.02	3.18	3.08	3.33	3.35	3.10	3.17	3.36
4	3.34	2.99	3.02	3.35	3.02	3.13	3.06	3.31	3.34	3.10	3.17	3.32
5	3.34	3.00	3.01	3.26	3.00	3.08	3.05	3.31	3.32	3.10	3.15	3.33
6	3.33	3.01	3.02	3.18	2.99	3.05	3.06	3.31	3.30	3.11	3.13	3.35
7	3.34	2.99	3.01	3.15	3.02	3.01	3.10	3.33	3.29	3.12	3.12	3.35
8	3.33	2.99	2.96	3.12	3.05	2.97	3.12	3.36	3.30	3.13	3.10	3.36
9	3.35	2.99	2.93	3.11	3.07	2.96	3.11	3.37	3.31	3.14	3.09	3.35
10	3.36	3.00	2.92	3.13	3.08	3.00	3.08	3.35	3.31	3.14	3.10	3.33
11	3.34	3.00	2.91	3.13	3.09	3.01	3.07	3.35	3.30	3.17	3.11	3.33
12	3.30	3.00	2.89	3.13	3.09	3.01	3.08	3.38	3.28	3.17	3.11	3.33
13	3.24	3.00	2.84	3.14	3.10	2.97	3.10	3.41	3.27	3.16	3.09	3.33
14	3.20	2.99	2.82	3.18	3.16	2.92	3.13	3.42	3.28	3.13	3.07	3.34
15	3.19	2.99	2.85	3.16	3.19	2.91	3.13	3.43	3.28	3.13	3.08	3.35
16	3.21	3.02	2.89	3.10	3.15	2.93	3.13	3.42	3.29	3.13	3.11	3.35
17	3.22	3.05	2.90	3.10	3.12	2.95	3.11	3.41	3.29	3.11	3.16	3.35
18	3.21	3.05	2.87	3.10	3.13	2.99	3.13	3.41	3.26	3.10	3.18	3.34
19	3.19	3.02	2.89	3.07	3.09	3.03	3.19	3.43	3.25	3.11	3.19	3.34
20	3.20	3.05	2.91	3.07	3.07	3.05	3.23	3.42	3.25	3.11	3.20	3.33
21	3.22	3.16	2.91	3.05	3.05	3.02	3.27	3.40	3.24	3.11	3.23	3.32
22	3.23	3.20	2.89	3.05	3.07	3.04	3.28	3.39	3.23	3.10	3.23	3.30
23	3.24	3.22	2.88	3.06	3.08	3.13	3.26	3.38	3.21	3.10	3.25	3.31
24	3.25	3.22	2.87	3.05	3.08	3.15	3.23	3.37	3.20	3.09	3.26	3.31
25	3.24	3.22	2.87	3.04	3.07	3.13	3.23	3.34	3.21	3.08	3.27	3.31
26	3.21	3.21	2.90	3.03	3.12	3.12	3.24	3.30	3.21	3.06	3.27	3.31
27	3.17	3.15	2.94	3.01	3.22	3.08	3.23	3.29	3.21	3.05	3.28	3.33
28	3.14	3.08	3.01	2.99	3.35	3.02	3.25	3.29	3.19	3.06	3.28	3.36
29	3.10	3.05	3.07	2.97	3.35	2.97	3.28	3.31	3.17	3.07	3.30	3.38
30	3.08	3.04	3.10	2.97	---	2.96	3.32	3.31	3.15	3.11	3.32	3.40
31	3.07	---	3.10	2.99	---	2.98	---	3.32	---	3.13	3.34	---
MEAN	3.25	3.06	2.95	3.11	3.10	3.04	3.15	3.36	3.27	3.11	3.18	3.34
MAX	3.45	3.22	3.10	3.35	3.35	3.31	3.32	3.43	3.36	3.17	3.34	3.40
MIN	3.07	2.99	2.82	2.97	2.99	2.91	3.02	3.29	3.15	3.05	3.07	3.30



QUALITY OF GROUND WATER -- WELLS

HAWAII, ISLAND OF MAUI

205405156305401 -- 6-5430-05 Waiehu Deep Monitor Well, Maui, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Sampling depth, feet below MSL (78890)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)	Chloride, water, unfltrd mg/L (99220)
OCT					
01...	1038	200	234	22.7	14
01...	1055	400	226	23.3	10
01...	1115	600	805	22.6	211
01...	1138	650	5140	22.7	1620
01...	1208	675	16600	22.4	5840
01...	1232	700	35600	22.5	13500
01...	1255	725	44400	22.9	16500
01...	1320	750	47200	22.9	17400
01...	1345	800	49100	22.9	18000
01...	1414	1000	50300	22.9	18500
JAN					
06...	1015	200	231	21.9	11
06...	1030	400	577	22.0	140
06...	1050	600	793	21.6	207
06...	1115	650	5190	21.8	1650
06...	1140	675	18600	21.8	6720
06...	1205	700	36700	21.9	14200
06...	1230	725	44700	22.2	17000
06...	1255	750	47400	22.2	17700
06...	1320	800	49100	22.2	18400
06...	1350	1000	50000	22.4	18800
APR					
01...	1025	200	230	22.7	11
01...	1040	400	220	22.1	11
01...	1100	600	855	22.1	230
01...	1123	650	5300	22.2	1710
01...	1145	675	19800	22.0	7160
01...	1209	700	37200	22.2	14400
01...	1237	725	45300	22.2	17100
01...	1300	750	47600	22.4	17800
01...	1326	800	49000	22.3	18400
01...	1352	1000	50300	22.6	18800

205405156305401 -- 6-5430-05 Waiehu Deep Monitor Well, Maui, HI

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Sampling depth, feet below MSL (78890)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)	Chloride, water, unfltrd mg/L (99220)
JUL					
08...	0945	200	231	22.5	11
08...	1000	400	227	22.4	10
08...	1020	600	917	22.2	244
08...	1043	650	5970	22.7	1900
08...	1107	675	20700	22.4	7520
08...	1130	700	38200	22.4	14800
08...	1155	725	45500	23.0	17200
08...	1220	750	47800	22.5	17900
08...	1253	800	49200	22.4	18400
08...	1325	1000	50400	22.4	19000

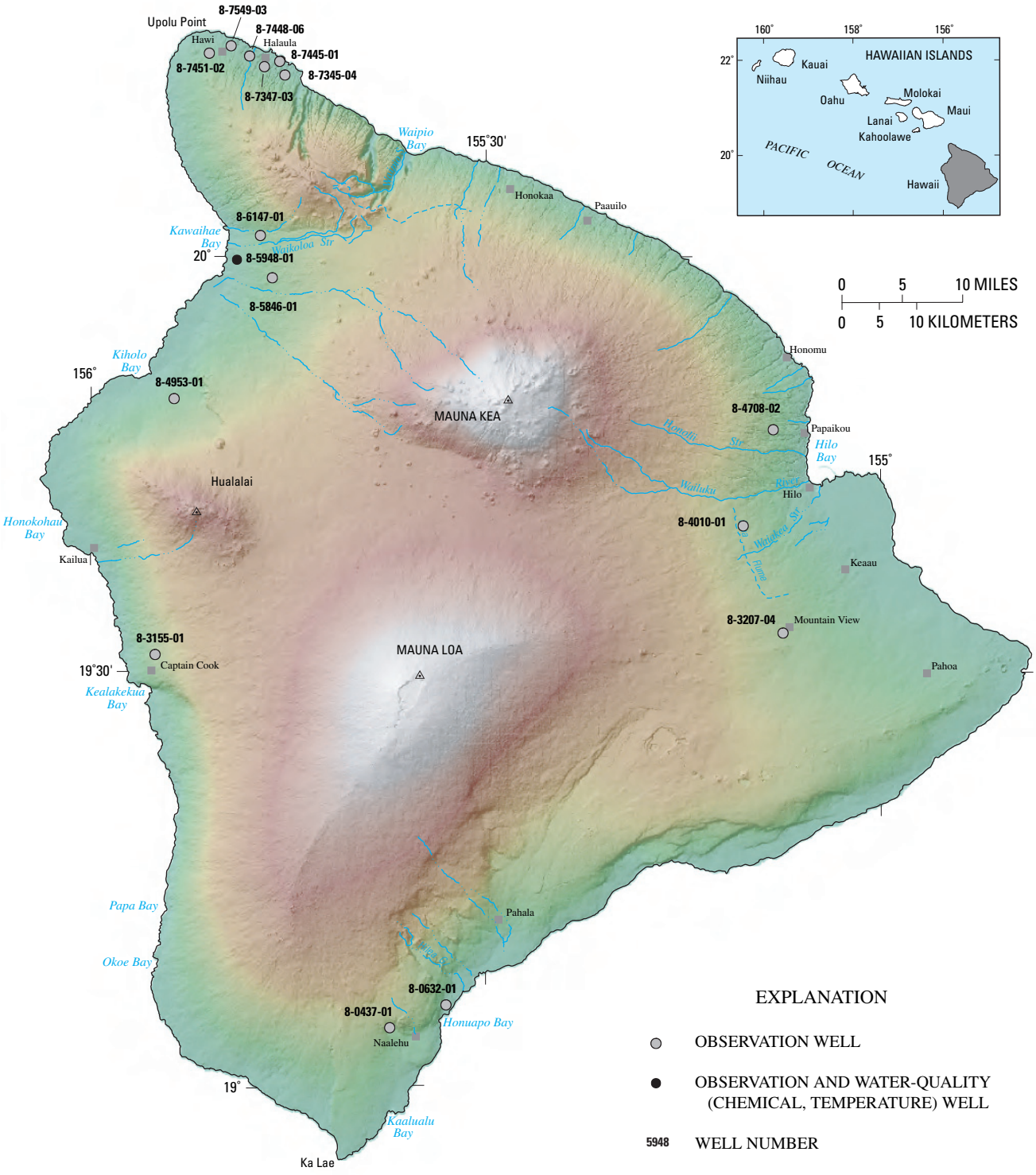


Figure 19. Locations of observation wells and ground-water quality sampling sites on Hawaii.

HAWAII, ISLAND OF HAWAII

194945155534401. Local number and name 8-4953-01 Kiholo, Hawaii.

LOCATION.--Lat 19°50', long 155°54', Old Hawaiian Datum, Hydrologic Unit 20010000, 2.7 mi inland from Kiholo Bay.

AQUIFER.--Hualalai Volcanics, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 971 ft, 12-in. casing diameter, cased to 926 ft, screened from 926 to 966 ft.

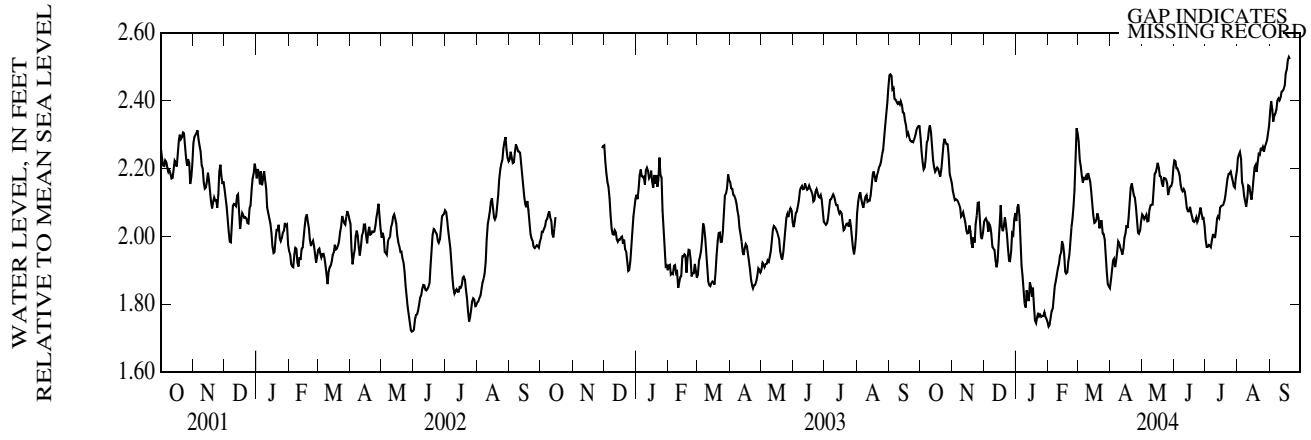
DATUM.--Elevation of land-surface datum is 931.65 ft. Measuring point is top of 7 ¼ in. (O.D.) casing, 932.48 ft above mean sea level.

PERIOD OF RECORD.-- Water level: occasional measurements, June 1972 to September 1999; continuous water-level measurements September 30, 1999 to current year. Water quality: 1972.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.85 ft above mean sea level, June 6, 1972 (data from Hawaii State Department of Land and Natural Resources, Circular C63, 1973); lowest measured, 1.47 ft above mean sea level, November 21, 2000.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.29	2.14	2.04	2.05	1.73	2.28	1.87	2.06	2.22	1.99	2.23	2.37
2	2.25	2.12	2.05	2.09	1.74	2.22	1.90	2.06	2.22	1.97	2.24	2.40
3	2.22	2.11	2.05	2.09	1.76	2.21	1.93	2.05	2.20	1.97	2.25	2.38
4	2.20	2.11	2.04	2.06	1.78	2.18	1.93	2.06	2.20	1.98	2.23	2.34
5	2.20	2.11	2.01	1.99	1.79	2.16	1.91	2.06	2.19	1.97	2.16	2.36
6	2.23	2.10	2.04	1.91	1.82	2.17	1.93	2.04	2.18	1.97	2.15	2.36
7	2.28	2.10	2.03	1.88	1.86	2.17	1.96	2.05	2.15	1.99	2.12	2.38
8	2.28	2.09	2.01	1.84	1.87	2.18	1.99	2.08	2.14	2.00	2.10	2.40
9	2.31	2.06	1.97	1.80	1.89	2.17	1.98	2.09	2.13	2.01	2.09	2.41
10	2.33	2.06	1.96	1.79	1.91	2.19	1.97	2.09	2.14	2.00	2.11	2.40
11	2.31	2.07	1.96	1.84	1.92	2.18	1.96	2.09	2.13	2.02	2.15	2.41
12	2.27	2.06	1.93	1.82	1.94	2.16	1.95	2.13	2.11	2.05	2.15	2.43
13	2.23	2.04	1.91	1.81	1.95	2.13	1.96	2.18	2.08	2.06	2.13	2.43
14	2.21	2.02	1.93	1.86	1.99	2.09	2.00	2.19	2.08	2.05	2.11	2.43
15	2.19	2.01	1.99	1.85	1.97	2.06	2.01	2.20	2.07	2.09	2.13	2.44
16	2.20	2.01	2.04	1.82	1.95	2.04	2.03	2.22	2.09	2.09	2.17	2.48
17	2.20	2.03	2.09	1.85	1.90	2.04	2.03	2.20	2.07	2.09	2.20	2.49
18	2.20	2.01	2.03	1.79	1.89	2.05	2.06	2.18	2.06	2.09	2.21	2.52
19	2.19	1.98	2.02	1.75	1.89	2.07	2.10	2.18	2.05	2.10	2.19	2.53
20	2.18	1.97	2.03	1.74	1.92	2.06	2.14	2.16	2.04	2.12	2.22	2.52
21	2.20	2.00	2.06	1.76	1.95	2.02	2.16	2.15	2.05	2.15	2.24	---
22	2.24	1.98	2.04	1.78	1.99	2.04	2.14	2.17	2.06	2.17	2.24	---
23	2.27	2.04	2.00	1.76	2.03	2.05	2.12	2.17	2.04	2.18	2.26	---
24	2.29	2.06	1.97	1.77	2.05	2.01	2.12	2.17	2.05	2.19	2.26	---
25	2.28	2.10	1.93	1.76	2.09	2.01	2.09	2.16	2.07	2.19	2.26	---
26	2.27	2.10	1.93	1.77	2.14	1.99	2.06	2.12	2.09	2.18	2.25	---
27	2.27	2.05	1.96	1.77	2.26	1.95	2.01	2.14	2.07	2.16	2.26	---
28	2.24	2.00	2.01	1.78	2.32	1.89	2.01	2.15	2.05	2.15	2.27	---
29	2.18	1.99	2.00	1.76	2.30	1.86	2.02	2.15	2.05	2.14	2.28	---
30	2.17	2.01	2.05	1.76	---	1.85	2.04	2.16	2.03	2.17	2.31	---
31	2.16	---	2.07	1.75	---	1.85	---	2.20	---	2.19	2.33	---
MEAN	2.24	2.05	2.00	1.84	1.95	2.08	2.01	2.13	2.10	2.08	2.20	---
MAX	2.33	2.14	2.09	2.09	2.32	2.28	2.16	2.22	2.22	2.19	2.33	---
MIN	2.16	1.97	1.91	1.74	1.73	1.85	1.87	2.04	2.03	1.97	2.09	---



HAWAII, ISLAND OF HAWAII

195840155462601. Local number and name 8-5846-01 Waikoloa Mauna Lani Resort 1, Hawaii.

LOCATION.--Lat 19°59', long 155°46', Old Hawaiian Datum, Hydrologic Unit 20010000, 4.0 mi east of Puako Bay.

AQUIFER.--Hamakua Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1240 ft, 20-in. casing diameter, cased to 1240 ft, perforated section 1140 to 1240 ft.

DATUM.--Elevation of land-surface datum is 1146 ft. Measuring point is top of 1 ¼ -in pvc pipe, 1149.23 ft above mean sea level.

REMARKS.--Water level affected by pumping.

PERIOD OF RECORD.--Water level: occasional measurements, October 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.31 ft above mean sea level, May 13, 2002; lowest measured, 2.61 ft above mean sea level, December 16, 2003.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	5.21	DEC 16	4.92	APR 20	5.23	APR 20	4.90	JUN 22	4.85	AUG 05	4.91
DEC 16	2.61	16	4.94	20	5.17	20	4.91	22	4.86		
16	5.22	16	4.95	20	5.01	JUN 22	4.96	22	4.87		
16	5.04	FEB 24	5.03	20	4.89	22	4.83	22	4.87		
16	4.91	APR 20	2.64	20	4.90	22	4.84	22	4.87		

HAWAII, ISLAND OF HAWAII

201347155470501. Local number and name 8-7347-03 Halaula Makai E, Hawaii.

LOCATION.--Lat 20°14', long 155°47', Old Hawaiian Datum, Hydrologic Unit 20010000, near intersection of Highway 270 and Kauhola Point Lighthouse Road and 40 ft north of Kohala Sugar Company Halaula well.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 405 ft, 8-in. casing diameter, cased to 80 ft, open hole 80 to 405 ft.

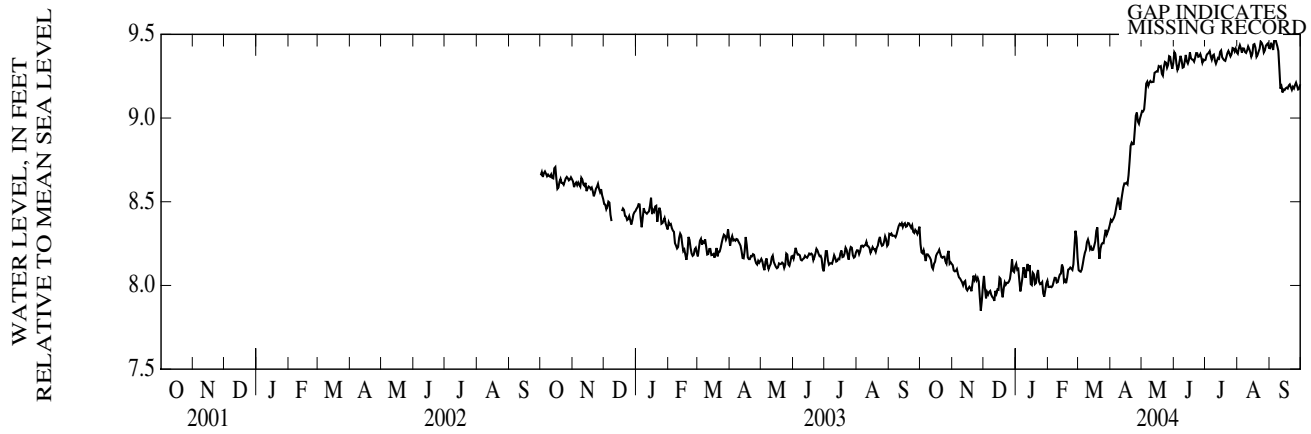
DATUM.--Elevation of land-surface datum is 340.5 ft. Measuring point is top of 2" x 4" wood on angle iron, 341.97.

PERIOD OF RECORD.--Water level: occasional measurements, July 1989, July 1990 to December 1990, September 1999 to September 2002. Continuous record October 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.03 ft above mean sea level, September 10, 1990; lowest measured, 7.80 ft above mean sea level, November 28, 2004.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.25	8.12	8.06	8.13	7.99	8.09	8.39	9.04	9.39	9.35	9.38	9.42
2	8.20	8.09	7.98	8.09	7.99	8.09	8.38	9.04	9.38	9.37	9.42	9.45
3	8.19	8.08	7.92	8.10	7.99	8.08	8.39	9.05	9.33	9.38	9.44	9.43
4	8.21	8.09	7.96	8.03	7.99	8.10	8.41	9.12	9.29	9.39	9.42	9.41
5	8.18	8.10	7.95	7.96	8.00	8.13	8.43	9.21	9.30	9.40	9.39	9.47
6	8.15	8.07	7.96	8.00	8.02	8.16	8.46	9.22	9.34	9.37	9.42	9.48
7	8.19	8.05	7.97	8.05	8.05	8.19	8.49	9.19	9.37	9.35	9.42	9.45
8	8.19	8.04	7.94	8.11	8.04	8.21	8.52	9.21	9.35	9.37	9.39	9.43
9	8.18	8.03	7.93	8.09	8.02	8.26	8.49	9.22	9.30	9.38	9.39	9.40
10	8.17	8.02	7.92	8.05	8.02	8.28	8.45	9.21	9.30	9.34	9.40	9.29
11	8.15	8.00	7.91	8.10	8.05	8.25	8.51	9.22	9.34	9.32	9.43	9.18
12	8.11	8.02	7.97	8.13	8.07	8.22	8.55	9.22	9.38	9.34	9.41	9.19
13	8.10	8.03	7.95	8.09	8.07	8.23	8.59	9.27	9.34	9.36	9.39	9.15
14	8.13	7.98	7.98	8.12	8.12	8.21	8.61	9.27	9.33	9.35	9.37	9.17
15	8.14	7.97	7.97	8.01	8.11	8.21	8.61	9.28	9.35	9.40	9.38	9.17
16	8.18	7.98	8.05	8.00	8.02	8.24	8.61	9.28	9.39	9.40	9.44	9.18
17	8.19	7.99	8.04	8.08	8.03	8.26	8.60	9.31	9.36	9.36	9.44	9.18
18	8.20	7.98	7.97	8.07	8.01	8.33	8.66	9.30	9.35	9.35	9.42	9.18
19	8.21	7.97	7.93	8.01	8.05	8.35	8.74	9.31	9.35	9.35	9.37	9.19
20	8.19	8.01	7.98	8.01	8.09	8.24	8.83	9.27	9.34	9.34	9.38	9.20
21	8.17	8.06	8.02	8.07	8.10	8.16	8.85	9.25	9.36	9.36	9.40	9.18
22	8.17	8.03	8.00	8.09	8.11	8.22	8.84	9.31	9.39	9.39	9.41	9.17
23	8.17	8.05	8.02	8.02	8.10	8.24	8.84	9.34	9.39	9.40	9.46	9.19
24	8.17	8.03	8.02	8.01	8.09	8.25	8.93	9.33	9.37	9.39	9.45	9.18
25	8.14	8.04	8.02	8.01	8.13	8.25	9.01	9.30	9.37	9.37	9.43	9.20
26	8.13	8.02	8.04	8.02	8.23	8.30	9.03	9.32	9.38	9.38	9.39	9.21
27	8.18	7.93	8.09	7.95	8.33	8.33	8.98	9.37	9.36	9.42	9.40	9.19
28	8.21	7.85	8.16	7.93	8.28	8.30	8.97	9.37	9.33	9.42	9.43	9.17
29	8.13	7.91	8.09	7.97	8.17	8.32	9.00	9.33	9.35	9.40	9.44	9.17
30	8.14	7.99	8.08	8.01	---	8.34	9.02	9.29	9.34	9.41	9.45	9.20
31	8.13	---	8.11	8.03	---	8.36	---	9.33	---	9.39	9.42	---
MEAN	8.17	8.02	8.00	8.04	8.08	8.23	8.67	9.25	9.35	9.37	9.41	9.26
MAX	8.25	8.12	8.16	8.13	8.33	8.36	9.03	9.37	9.39	9.42	9.46	9.48
MIN	8.10	7.85	7.91	7.93	7.99	8.08	8.38	9.04	9.29	9.32	9.37	9.15



HAWAII, ISLAND OF HAWAII

201406155454401. Local number and name 8-7445-01 Hapuu Bay D, Hawaii.

LOCATION.--Lat 20°14', long 155°46', Old Hawaiian Datum, Hydrologic Unit 20010000, 7.5 mi east of Hawi.

AQUIFER.--Pololu Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 460 ft, open hole.

DATUM.--Elevation of land-surface datum is 108.50 ft. Measuring point is top of casing, 0.11 ft above bolt head. Measuring point elevation is 108.76 ft above mean sea level.

PERIOD OF RECORD.-- Water level: April 1989, April, July, August 1990, 1991, July 1992, May 1993, June 1994, 1995, 1999 to current year. Water quality: April 1989, 1990, June 1994, 1995, September 2000, January 2001.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.55 ft above mean sea level, January 27, 1995; lowest measured, 6.41 ft above mean sea level, April 26, 2001.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	6.75	DEC 16	6.75	FEB 25	6.73	APR 21	7.33	JUN 09	7.96	AUG 05	7.80

HAWAII, ISLAND OF HAWAII

201429155480201. Local number and name 8-7448-06 Kohala F, Hawaii.

LOCATION.--Lat 20°14', long 155°48', Old Hawaiian Datum, Hydrologic Unit 20010000, 3.4 mi east of Hawi.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 440 ft, 8-in. casing diameter, cased to 123 ft, open hole 123 to 440 ft.

DATUM.--Elevation of land-surface datum is 411 ft. Measuring point is top of casing, 411.77 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, May 1990 to January 1991, October 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.67 ft above mean sea level, August 5, 2004; lowest measured, 6.55 ft above mean sea level, April 26, 2001.

WATER LEVEL, IN FEET RELATIVE TO MEAN SEA LEVEL, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	7.60	DEC 19	6.60	APR 21	8.58	AUG 05	9.67
DEC 16	no data	FEB 25	6.78	JUN 09	8.84		

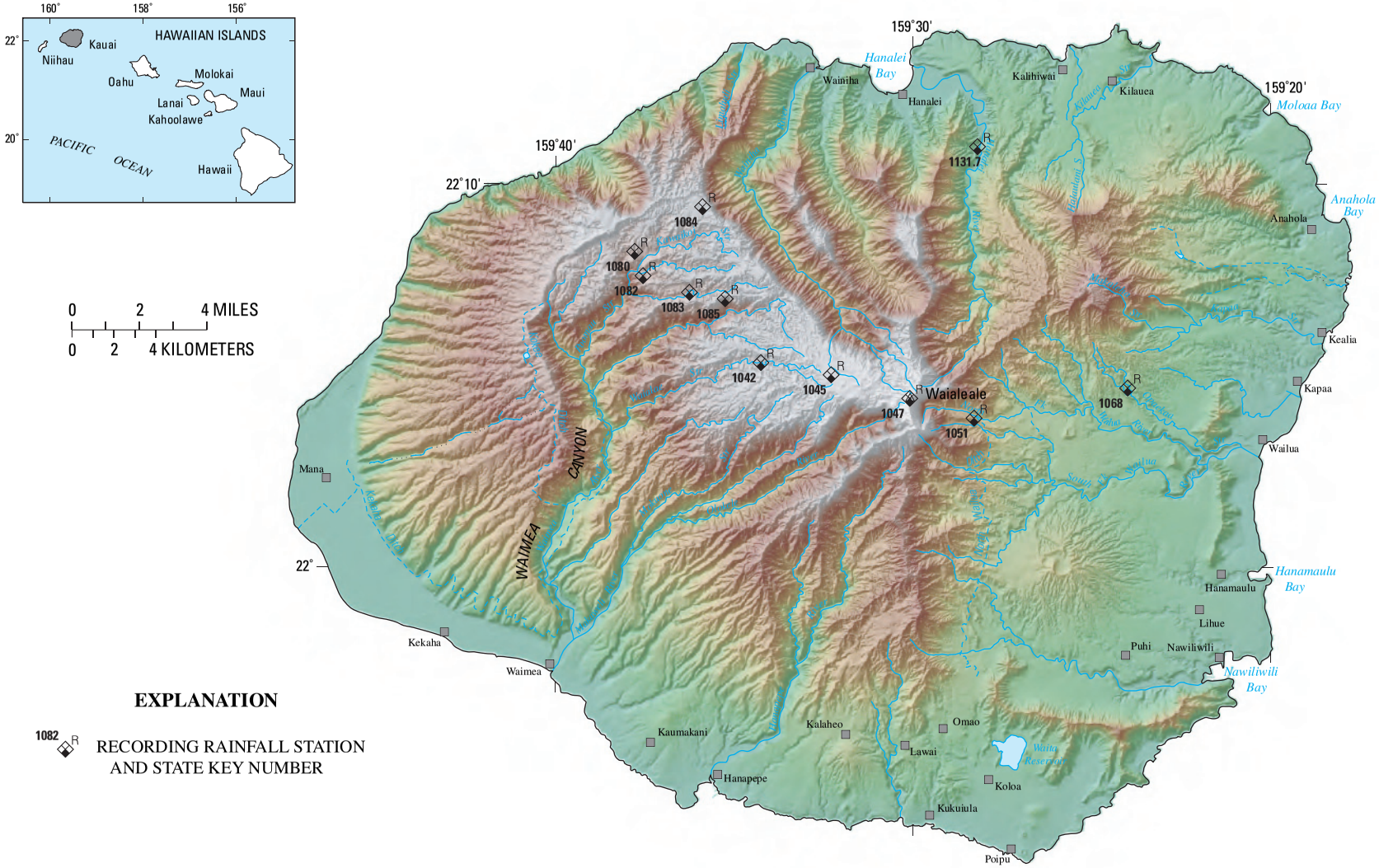


Figure 21. Locations of rainfall stations on Kauai.

HAWAII, ISLAND OF KAUAI

220523159341201. State Key Number 1042.0 Waialae rain gage near Waimea, Kauai.

LOCATION.--Lat 22°05'23", long 159°34'12", Old Hawaiian Datum, Hydrologic Unit 20070000, on ridge 6.4 mi southeast of Kokee Lodge, and 11.0 mi northeast of Waimea.

PERIOD OF RECORD.--1911 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 inch per tip). Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.05	0.01	0.78	2.08	0.01	0.53	0.13	0.00	0.00	0.16	0.04	0.06
2	0.20	0.05	0.13	0.20	0.00	0.06	0.09	0.00	0.09	0.06	0.11	0.16
3	0.34	0.02	0.10	0.02	0.01	0.00	0.14	0.00	0.02	0.02	0.45	0.01
4	0.25	0.08	0.03	0.00	0.02	0.03	0.14	0.07	0.05	0.00	1.04	0.02
5	0.00	0.11	0.15	0.00	0.06	0.00	0.28	0.01	0.00	0.01	0.00	1.60
6	0.02	0.11	0.09	0.01	0.12	0.00	0.01	0.42	0.08	0.00	0.00	0.07
7	0.40	0.12	0.21	0.03	1.34	0.76	0.00	0.22	0.02	0.00	0.02	0.00
8	0.11	0.05	0.40	0.01	0.00	0.64	0.04	0.01	0.43	0.00	0.00	0.03
9	0.22	0.00	0.05	0.01	0.08	0.01	0.21	0.31	0.28	0.00	0.08	0.06
10	0.03	0.07	0.26	0.00	0.09	0.41	0.01	0.10	0.48	0.00	0.11	0.03
11	0.11	0.02	0.05	0.04	0.01	0.03	0.00	0.00	0.44	0.01	0.22	0.03
12	0.62	0.06	0.01	0.49	0.01	0.00	0.00	1.75	0.49	0.01	0.09	0.35
13	0.10	0.18	0.01	0.48	0.00	1.12	0.08	0.00	0.41	0.03	0.02	0.42
14	0.07	0.19	0.00	2.92	0.01	0.01	0.32	1.52	0.15	0.01	0.00	0.17
15	0.31	0.17	0.00	0.00	0.06	0.00	0.11	0.85	0.00	0.03	0.00	0.01
16	0.02	0.06	0.12	0.01	0.00	0.04	0.40	0.01	0.10	0.10	0.00	0.19
17	0.00	0.16	0.15	0.00	0.04	0.01	0.01	0.00	0.08	0.00	0.01	0.11
18	0.00	0.01	0.01	0.01	0.01	0.21	0.00	0.00	0.21	0.07	0.00	0.18
19	0.00	0.05	0.00	0.08	0.00	0.06	0.10	0.00	0.20	0.00	0.00	0.47
20	0.21	0.04	0.00	0.27	0.00	0.30	0.98	0.32	0.06	0.00	0.00	0.08
21	0.06	0.16	0.00	0.01	0.00	0.10	1.26	0.06	0.02	0.00	0.08	0.30
22	0.08	0.42	0.00	1.96	0.00	0.14	0.00	0.00	0.13	0.00	0.00	0.18
23	0.00	0.34	0.02	0.78	0.00	0.56	0.00	0.09	0.05	0.00	0.09	0.11
24	0.04	0.01	0.02	0.00	0.00	0.79	0.01	0.03	0.00	0.00	0.13	0.08
25	0.27	0.06	0.00	0.00	0.00	0.15	0.25	0.07	0.04	0.00	0.19	0.10
26	0.31	0.03	0.00	0.01	2.27	1.47	0.20	0.02	0.05	0.13	0.07	0.00
27	0.50	0.00	0.91	0.00	5.35	0.03	0.07	0.22	0.01	0.12	0.04	0.00
28	2.55	0.00	0.07	0.01	0.03	0.78	0.06	0.05	0.14	0.58	0.14	0.06
29	1.09	0.05	0.06	0.00	0.00	0.01	0.00	0.02	0.01	0.00	0.15	0.01
30	0.04	1.02	1.29	0.01	---	0.00	0.15	0.04	0.03	0.01	0.06	0.01
31	0.25	---	0.65	0.01	---	0.00	---	0.02	---	0.03	0.00	---
TOTAL	8.25	3.65	5.57	9.45	9.52	8.25	5.05	6.21	4.07	1.38	3.14	4.90

CAL YR 2003 TOTAL 56.56
WTR YR 2004 TOTAL 69.44

HAWAII, ISLAND OF KAUAI

220504159321401. State Key Number 1045.0 Waialeale Trail rain gage near Lihue, Kauai.

LOCATION.--Lat 22°05'04", long 159°32'14", Old Hawaiian Datum, Hydrologic Unit 20070000, 14.0 mi west of Kapaa Beach Park and 8.4 mi south of Hanalei Bay.

PERIOD OF RECORD.--1962 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,560 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.02	0.03	1.09	3.13	0.07	1.26	0.12	0.00	0.04	0.48	0.18	0.38
2	0.22	0.22	0.63	0.38	0.01	0.43	0.86	0.01	0.09	0.23	1.50	0.52
3	0.79	0.22	0.60	0.05	0.03	0.01	1.03	0.01	0.11	0.24	0.88	0.06
4	0.18	0.49	0.06	0.00	0.10	0.27	0.78	0.69	0.17	0.07	2.41	0.01
5	0.08	0.31	0.70	0.01	0.57	0.09	0.05	0.09	0.05	0.09	0.00	1.83
6	0.16	0.56	0.29	0.01	1.25	0.02	0.01	0.59	0.55	0.07	0.01	0.27
7	1.36	0.42	1.24	0.06	0.98	2.36	0.00	0.51	0.45	0.03	0.16	0.00
8	0.94	0.27	2.59	0.02	0.01	1.79	0.11	0.01	2.27	0.00	0.02	0.38
9	1.10	0.04	1.12	0.00	0.09	0.06	0.80	0.33	0.77	0.00	0.43	0.84
10	0.58	0.67	1.49	0.00	0.06	1.40	0.06	0.16	1.95	0.10	0.95	0.17
11	1.08	0.32	0.36	0.10	0.02	0.10	0.01	0.00	1.52	0.16	1.07	0.17
12	2.08	0.43	0.09	0.74	0.01	0.00	0.12	1.33	2.18	0.27	1.04	0.92
13	0.70	0.92	0.06	0.51	0.00	3.41	0.97	0.08	1.73	0.29	0.52	0.91
14	0.55	0.47	0.02	3.46	0.03	0.01	0.75	2.69	0.81	0.09	0.09	0.70
15	0.87	0.46	0.04	0.00	0.07	0.01	0.89	0.72	0.00	0.08	0.12	0.27
16	0.12	0.71	0.25	0.00	0.00	0.28	2.23	0.03	0.34	0.50	0.00	0.54
17	0.00	0.49	0.29	0.00	0.18	0.05	0.22	0.00	0.26	0.03	0.00	0.32
18	0.01	0.11	0.06	0.01	0.06	0.34	0.02	0.01	1.78	0.46	0.01	0.64
19	0.02	0.70	0.01	0.15	0.01	0.20	0.59	0.00	1.26	0.04	0.00	1.89
20	0.32	0.38	0.00	0.33	0.00	1.52	0.91	0.55	0.31	0.00	0.00	0.41
21	0.20	1.01	0.00	0.02	0.00	0.67	0.78	0.23	0.50	0.00	0.62	1.70
22	0.24	1.37	0.00	2.57	0.02	2.13	0.03	0.16	1.08	0.00	0.03	1.24
23	0.00	0.88	0.05	1.18	0.04	2.06	0.08	0.21	0.51	0.00	0.31	0.92
24	0.06	0.04	0.07	0.00	0.04	1.81	0.01	0.30	0.03	0.14	0.41	0.47
25	0.53	0.05	0.01	0.05	0.04	1.62	0.97	1.17	0.25	0.05	0.63	0.29
26	0.34	0.04	0.01	0.08	3.06	3.17	0.85	0.08	0.86	0.33	0.46	0.03
27	0.67	0.00	0.26	0.03	5.64	0.10	0.17	0.67	0.04	0.50	0.21	0.04
28	2.59	0.01	0.10	0.07	0.01	2.17	0.15	0.38	0.37	1.88	0.33	0.52
29	2.13	0.22	0.30	0.13	0.06	0.34	0.00	0.27	0.34	0.00	0.58	0.15
30	0.17	1.26	2.30	0.08	---	0.29	0.06	0.33	0.33	0.16	0.17	0.19
31	0.31	---	1.12	0.16	---	0.12	---	0.18	---	0.28	0.03	---
TOTAL	18.42	13.10	15.21	13.33	12.46	28.09	13.63	11.79	20.95	6.57	13.17	16.78

CAL YR 2003 TOTAL 133.46
WTR YR 2004 TOTAL 183.50

HAWAII, ISLAND OF KAUAI

220427159300201. State Key Number 1047.0 Mount Waialeale rain gage near Lihue, Kauai.

LOCATION.--Lat 22°04'27", long 159°30'02", Old Hawaiian Datum, Hydrologic Unit 20070000, 0.75 mi north of Kawaikini summit (5,240 ft).

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Two non standard auxilliary accumulation cans, accumulation capacity 300" ratio 1:10, accumulation capacity 229" ratio 1:6.56. Elevation of gage is 5,150 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.14	0.84	6.47	0.52	0.32	0.40	0.00	0.22	1.60	0.28	1.25
2	0.39	1.58	0.51	0.35	0.17	0.01	3.00	0.05	0.64	1.10	3.27	2.12
3	0.44	0.50	2.86	0.01	0.22	0.00	3.50	0.28	0.58	1.10	1.86	0.31
4	0.71	1.24	4.49	0.00	0.46	0.66	3.70	2.07	0.43	0.30	5.76	0.13
5	0.51	1.15	6.45	0.00	0.74	0.46	0.50	0.27	0.26	0.60	0.01	2.52
6	0.42	2.30	4.61	0.00	2.46	0.26	0.00	5.51	1.95	1.50	0.58	1.09
7	2.18	1.78	2.96	0.00	3.20	3.75	0.00	1.07	1.60	0.30	1.92	0.25
8	1.69	1.93	2.96	0.00	0.00	1.62	0.18	0.01	3.16	0.40	0.30	1.66
9	1.22	0.27	1.69	0.00	0.12	0.02	1.26	0.34	1.15	0.50	1.47	3.16
10	1.09	1.04	1.71	0.00	0.04	0.91	0.96	0.39	3.22	1.00	1.14	0.62
11	3.35	0.71	0.84	0.16	0.01	0.15	0.41	0.62	3.35	0.90	2.11	0.44
12	4.38	0.83	0.43	0.55	0.00	0.00	1.47	1.12	2.50	0.80	1.80	1.64
13	0.82	1.21	0.19	0.36	0.02	6.65	2.44	0.64	2.25	0.80	1.50	1.13
14	0.96	0.69	0.31	4.26	0.04	0.01	1.68	2.23	1.97	0.50	0.63	1.22
15	1.54	0.60	0.12	0.00	0.03	0.01	2.01	0.35	0.19	0.20	0.67	1.06
16	0.30	1.88	0.08	0.00	0.01	0.63	2.36	0.06	0.66	0.80	0.40	0.79
17	0.01	2.42	0.17	0.02	0.18	0.14	0.50	0.00	1.08	0.20	0.00	0.97
18	0.00	0.73	0.22	0.03	0.08	0.10	0.14	0.00	3.98	1.70	0.03	1.14
19	0.01	1.76	0.04	0.07	0.00	0.02	3.72	0.00	2.56	0.20	0.00	2.64
20	0.28	0.26	0.00	0.13	0.00	4.36	2.91	0.65	0.93	0.00	0.02	0.67
21	0.88	0.40	0.00	0.16	0.04	2.79	1.94	2.18	0.97	0.00	2.54	2.64
22	0.79	0.44	0.00	4.66	0.27	5.85	0.77	0.39	3.54	0.00	0.17	1.40
23	0.00	0.92	0.47	0.77	0.06	4.06	0.97	1.30	1.38	0.06	0.74	2.78
24	0.17	0.02	0.43	0.00	0.29	2.28	0.44	0.92	0.21	0.45	0.78	0.95
25	0.44	0.03	0.00	0.17	2.05	3.94	1.45	2.49	0.47	0.53	0.85	1.13
26	0.62	0.00	0.00	0.24	4.62	7.42	0.81	0.36	2.53	0.73	1.08	0.17
27	0.80	0.01	0.34	0.94	6.37	0.48	0.08	1.39	0.45	0.82	0.46	0.71
28	2.87	0.90	0.12	0.28	0.00	5.17	0.04	1.73	1.31	2.29	0.71	0.10
29	3.14	3.74	0.50	0.21	0.25	5.76	0.00	1.28	0.60	0.03	1.06	0.88
30	0.15	0.52	1.50	0.79	---	4.34	0.39	1.08	1.40	1.03	0.50	0.73
31	0.28	---	3.04	1.34	---	0.44	---	1.45	---	0.36	0.16	---
TOTAL	30.44	30.00	37.88	21.97	22.25	62.61	38.03	30.23	45.54	20.80	32.80	36.30

CAL YR 2003 TOTAL 303.55
WTR YR 2004 TOTAL 408.85

RAINFALL RECORDS

220356159281401. State Key Number 1051.0 North Wailua Ditch rain gage near Lihue, Kauai.

LOCATION.--Lat 22°03'56", long 159°28'14", Old Hawaiian Datum, Hydrologic Unit 20070000, 4.0 mi west of Wailua Reservoir and 2.0 mi east southeast of Waialeale rain gage.

PERIOD OF RECORD.--1928 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 inch per tip). Elevation of gage is 1,110 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.10	0.88	3.22	0.09	0.79	0.10	0.08	0.08	0.35	0.01	0.34
2	0.83	0.44	0.64	0.27	0.02	0.19	0.91	0.02	0.20	0.37	0.64	0.56
3	0.26	0.07	1.18	0.00	0.10	0.00	0.86	0.06	0.30	0.18	0.60	0.19
4	0.27	0.34	2.82	0.00	0.30	0.12	0.56	0.40	0.15	0.12	3.22	0.03
5	0.14	0.27	5.52	0.00	0.19	0.18	0.52	0.02	0.08	0.29	0.01	1.15
6	0.24	0.26	1.57	0.00	0.78	0.03	0.05	0.07	0.44	0.21	0.07	0.46
7	0.62	2.23	1.70	0.08	1.35	1.26	0.01	2.07	0.22	0.07	1.39	0.04
8	0.84	1.02	1.18	0.00	0.00	0.54	0.09	0.03	0.73	0.13	0.06	1.40
9	0.50	0.09	0.66	0.00	0.06	0.01	0.38	0.21	0.31	0.05	0.53	0.70
10	0.46	0.56	0.49	0.00	0.02	0.42	0.38	0.19	0.99	0.27	0.45	0.12
11	1.29	0.23	0.16	0.02	0.00	0.01	0.02	0.01	1.14	0.52	0.78	0.07
12	2.07	0.17	0.04	0.47	0.00	0.01	0.81	1.86	0.88	0.40	0.81	0.70
13	0.25	0.44	0.01	0.45	0.00	2.18	0.30	0.15	1.18	0.33	0.73	0.71
14	0.34	0.34	0.04	4.09	0.00	0.00	0.07	0.99	1.03	0.10	0.15	0.58
15	0.48	0.34	0.02	0.00	0.09	0.00	0.59	1.56	0.70	0.03	0.26	0.19
16	0.13	0.48	0.24	0.00	0.00	0.18	0.74	0.12	0.15	0.17	0.10	0.28
17	0.00	0.69	0.11	0.00	0.09	0.04	0.15	0.00	0.53	0.02	0.09	0.42
18	0.00	0.27	0.03	0.00	0.02	0.09	0.01	0.00	1.59	0.96	0.00	0.77
19	0.18	0.37	0.00	0.01	0.00	0.02	1.33	0.00	0.31	0.08	0.00	1.34
20	0.25	0.03	0.00	0.02	0.00	1.38	2.35	0.25	0.15	0.00	0.00	0.27
21	0.50	0.24	0.00	0.05	0.01	0.61	1.33	0.03	0.25	0.00	0.78	1.31
22	0.35	0.32	0.00	3.79	0.08	0.53	0.25	0.14	0.86	0.00	0.12	0.77
23	0.00	0.47	0.32	1.05	0.24	0.53	0.11	0.41	0.39	0.05	0.06	1.22
24	0.05	0.67	0.09	0.00	0.02	0.78	0.20	0.26	0.05	0.13	0.27	0.14
25	0.62	0.01	0.01	0.02	0.48	1.10	0.68	0.63	0.23	0.37	0.32	0.53
26	0.38	0.00	0.02	0.17	2.23	1.82	1.17	0.06	0.74	0.44	0.28	0.20
27	0.73	0.00	0.30	0.14	5.62	0.73	0.04	0.42	0.14	0.50	0.16	0.12
28	2.01	0.28	0.16	0.06	0.01	2.36	0.05	0.73	0.65	0.89	0.26	0.03
29	2.67	0.32	0.23	0.08	0.12	0.64	0.00	0.61	0.13	0.00	0.33	0.23
30	0.29	0.40	0.40	0.18	---	1.39	0.06	0.50	0.34	0.45	0.29	0.34
31	0.02	---	0.49	0.30	---	0.91	---	0.44	---	0.31	0.21	---
TOTAL	16.77	11.45	19.31	14.47	11.92	18.85	14.12	12.32	14.94	7.79	12.98	15.21

CAL YR 2003 TOTAL 144.60
WTR YR 2004 TOTAL 170.13

HAWAII, ISLAND OF KAUAI

220443159235601. State Key Number 1068.0 Left Branch Opaekea rain gage near Kapaa, Kauai.

LOCATION.--Lat 22°04'43", long 159°23'56", Old Hawaiian Datum, Hydrologic Unit 20070000, in USGS stream-gaging station 16071500 on left bank, 5.0 mi west of Kapaa Beach Park and 0.7 mi northeast of Wailua Reservoir.

PERIOD OF RECORD.--1960 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 470 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.19	0.00	0.43	1.23	0.01	0.36	0.14	0.06	0.10	0.27	0.00	0.39
2	1.54	0.07	0.17	0.23	0.00	0.09	0.38	0.00	0.03	0.05	0.36	0.53
3	0.02	0.00	0.70	0.00	0.09	0.00	0.32	0.03	0.12	0.23	0.63	0.29
4	0.06	0.00	1.15	0.00	0.21	0.06	0.48	0.15	0.07	0.02	1.32	0.03
5	0.10	0.09	0.89	0.00	0.02	0.09	0.03	0.02	0.02	0.04	0.00	0.38
6	0.17	0.05	0.30	0.00	0.43	0.12	0.01	0.09	0.33	0.23	0.04	0.31
7	0.50	0.41	0.43	0.00	0.90	1.20	0.01	0.15	0.15	0.18	0.31	0.08
8	0.22	0.18	0.35	0.01	0.01	0.22	0.02	0.14	0.49	0.11	0.22	1.38
9	0.35	0.03	0.37	0.00	0.00	0.00	0.16	0.22	0.15	0.29	0.08	0.38
10	0.13	0.23	0.07	0.00	0.02	0.11	0.07	0.07	0.37	0.07	0.16	0.05
11	0.47	0.04	0.06	0.00	0.00	0.03	0.02	0.03	0.86	0.29	0.28	0.07
12	0.87	0.10	0.02	0.04	0.00	0.13	0.62	1.16	0.19	0.33	0.22	0.29
13	0.35	0.29	0.00	0.11	0.00	1.04	0.13	0.46	0.39	0.02	0.25	0.18
14	0.14	0.20	0.00	1.83	0.00	0.00	0.03	0.04	0.89	0.01	0.14	0.43
15	0.15	0.06	0.06	0.00	0.00	0.00	0.10	0.26	0.09	0.05	0.10	0.07
16	0.08	0.05	0.11	0.00	0.00	0.06	0.25	0.03	0.30	0.09	0.05	0.15
17	0.01	0.12	0.06	0.00	0.19	0.04	0.01	0.00	0.17	0.01	0.02	0.35
18	0.00	0.07	0.00	0.00	0.08	0.11	0.00	0.00	0.80	0.71	0.00	0.23
19	0.01	0.24	0.00	0.00	0.00	0.03	0.05	0.00	0.22	0.07	0.00	0.95
20	0.00	0.02	0.00	0.00	0.00	0.60	0.96	0.00	0.08	0.01	0.04	0.03
21	0.36	0.01	0.00	0.09	0.06	0.47	0.26	0.01	0.21	0.00	0.40	0.49
22	0.15	0.16	0.00	2.32	0.11	0.27	0.15	0.07	0.42	0.00	0.01	0.46
23	0.00	0.27	0.03	0.39	0.07	0.31	0.08	0.12	0.10	0.11	0.21	0.37
24	0.00	0.44	0.00	0.00	0.01	0.46	0.08	0.02	0.00	0.05	0.13	0.03
25	0.36	0.01	0.02	0.01	0.05	0.41	0.25	0.31	0.08	0.02	0.13	0.36
26	0.18	0.00	0.02	0.02	1.41	0.24	0.46	0.01	0.12	0.22	0.09	0.01
27	0.19	0.02	0.12	0.12	2.80	0.04	0.01	0.12	0.07	0.11	0.07	0.15
28	1.00	0.01	0.02	0.05	0.00	0.54	0.02	0.22	0.26	0.16	0.14	0.02
29	0.85	0.69	0.09	0.09	0.21	0.37	0.00	0.11	0.03	0.00	0.39	0.12
30	0.25	3.02	0.31	0.13	---	0.30	0.11	0.19	0.05	0.18	0.15	0.12
31	0.03	---	0.13	0.12	---	0.01	---	0.13	---	0.05	0.12	---
TOTAL	8.73	6.88	5.91	6.79	6.68	7.71	5.21	4.22	7.16	3.98	6.06	8.70

CAL YR 2003 TOTAL 75.28
WTR YR 2004 TOTAL 78.03

HAWAII, ISLAND OF KAUAI

220817159374401. State Key Number 1080.0 Paukahana rain gage near Waimea, Kauai.

LOCATION.--Lat 22°08'17", long 159°37'44", Old Hawaiian Datum, Hydrologic Unit 20070000, 2.0 mi east of Kokee lodge and 7.0 mi south-southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Sstandard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 inch per tip). Elevation of gage is 3,700 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.14	0.01	2.39	2.15	0.02	1.91	0.24	0.01	0.01	0.12	0.00	0.03
2	0.14	0.10	0.57	0.11	0.00	0.39	0.38	0.00	0.05	0.03	0.29	0.18
3	0.53	0.00	0.28	0.01	0.00	0.01	0.72	0.00	0.03	0.06	0.52	0.03
4	0.20	0.00	0.02	0.00	0.24	0.16	0.53	0.46	0.10	0.00	0.40	0.06
5	0.01	0.03	0.70	0.02	0.04	0.01	0.11	0.05	0.02	0.00	0.00	2.00
6	0.04	0.03	0.16	0.01	0.05	0.00	0.01	0.27	0.33	0.02	0.00	0.07
7	0.55	0.08	0.26	0.06	0.39	1.82	0.00	0.02	0.12	0.00	0.02	0.00
8	0.15	0.00	0.27	0.01	0.01	1.21	0.21	0.00	0.78	0.00	0.00	0.01
9	0.20	0.00	0.12	0.00	0.04	0.03	0.47	0.51	0.17	0.00	0.03	0.02
10	0.01	0.01	0.30	0.00	0.20	0.94	0.02	0.04	0.49	0.00	0.17	0.02
11	0.03	0.01	0.01	0.00	0.14	0.00	0.00	0.00	0.21	0.00	0.42	0.50
12	0.19	0.19	0.03	0.72	0.03	0.00	0.00	0.38	0.07	0.01	0.15	0.28
13	0.13	0.29	0.03	0.45	0.00	3.84	0.09	0.72	0.07	0.02	0.02	0.13
14	0.05	0.26	0.00	3.47	0.05	0.01	0.06	2.07	0.22	0.11	0.01	0.28
15	0.47	0.26	0.02	0.00	0.53	0.00	0.27	0.60	0.01	0.16	0.01	0.00
16	0.04	0.02	0.28	0.10	0.00	0.21	0.18	0.02	0.21	0.07	0.01	0.17
17	0.00	0.07	0.11	0.00	0.07	0.05	0.05	0.00	0.14	0.00	0.00	0.18
18	0.00	0.02	0.03	0.01	0.04	0.36	0.00	0.00	0.35	0.24	0.00	0.27
19	0.00	0.24	0.00	0.13	0.00	0.15	0.02	0.00	0.44	0.00	0.00	0.55
20	0.34	0.17	0.00	0.41	0.00	1.34	0.17	0.16	0.09	0.00	0.00	0.01
21	0.04	0.32	0.00	0.02	0.00	0.16	0.07	0.03	0.02	0.00	0.14	0.09
22	0.01	0.96	0.00	2.75	0.00	0.83	0.02	0.00	0.34	0.00	0.00	0.10
23	0.00	0.72	0.01	0.22	0.00	1.69	0.01	0.00	0.13	0.00	0.36	0.09
24	0.03	0.01	0.03	0.00	0.00	2.26	0.03	0.03	0.01	0.00	0.30	0.11
25	0.52	0.32	0.00	0.00	0.00	0.28	1.39	0.01	0.01	0.00	0.20	0.05
26	0.18	0.23	0.00	0.14	2.60	0.04	0.49	0.02	0.17	0.14	0.02	0.00
27	0.39	0.01	1.08	0.00	7.36	0.05	0.09	0.32	0.02	0.04	0.03	0.00
28	4.27	0.00	0.34	0.03	0.50	1.28	0.13	0.03	0.11	0.05	0.12	0.00
29	1.81	0.04	0.03	0.03	0.00	0.08	0.00	0.01	0.03	0.00	0.22	0.03
30	0.13	0.02	0.89	0.00	---	0.15	0.02	0.00	0.10	0.00	0.16	0.01
31	0.15	---	0.51	0.03	---	0.01	---	0.11	---	0.00	0.01	---
TOTAL	10.75	4.42	8.47	10.88	12.31	19.27	5.78	5.87	4.85	1.07	3.61	5.27

CAL YR 2003 TOTAL 72.00
WTR YR 2004 TOTAL 92.55

HAWAII, ISLAND OF KAUAI

220739159373001. State Key Number 1082.0 Waiakoali rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'39", long 159°37'30", Old Hawaiian Datum, Hydrologic Unit 20070000, 2.4 mi east southeast of Kokee Lodge and 7.4 mi south-southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with tipping bucket catchment (0.01 inch per tip). Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.13	0.01	e2.30	e2.34	0.02	1.40	0.41	0.00	0.02	0.11	0.00	0.02
2	0.22	0.08	0.49	0.04	0.00	0.29	0.35	0.00	0.06	0.04	0.30	0.28
3	0.61	0.00	0.24	0.01	0.00	0.00	0.55	0.00	0.02	0.04	e0.64	0.07
4	0.20	0.04	0.02	0.00	0.11	0.18	0.51	0.39	0.06	0.01	e0.46	0.05
5	0.01	0.04	e0.68	0.01	0.03	0.00	0.22	0.04	0.02	0.00	e0.00	1.34
6	0.05	0.03	0.23	0.00	0.04	0.00	0.01	0.31	0.28	0.06	0.00	0.10
7	0.51	0.06	0.32	0.05	0.26	1.51	0.00	0.07	0.12	0.00	0.05	0.00
8	0.13	0.01	0.34	0.01	0.00	0.81	0.19	0.00	0.58	0.00	0.00	0.01
9	0.21	0.00	0.12	0.00	0.00	0.01	0.55	0.36	0.19	0.01	0.04	0.03
10	0.03	0.04	0.32	0.00	0.00	0.75	0.02	0.05	0.34	0.00	0.14	0.03
11	0.04	0.01	0.02	0.00	0.00	0.01	0.01	0.00	0.22	0.00	0.39	0.43
12	0.23	0.18	0.03	e0.73	0.01	0.00	0.00	0.54	0.06	0.02	0.16	0.27
13	0.12	0.31	0.04	e0.49	0.01	2.93	0.08	1.07	0.08	0.04	0.02	0.17
14	0.05	0.24	0.00	e4.19	0.05	0.01	0.08	2.28	0.17	0.07	0.02	0.24
15	0.32	0.23	0.02	0.00	0.37	0.00	0.25	0.74	0.00	0.05	0.03	0.03
16	0.05	0.03	0.25	0.07	0.00	0.22	0.18	0.01	0.21	0.07	0.00	0.23
17	0.00	0.07	0.11	0.00	0.06	0.04	0.06	0.00	0.12	0.00	0.00	0.19
18	0.00	0.02	0.02	0.02	0.04	0.35	0.00	0.00	0.31	0.22	0.00	0.31
19	0.00	0.31	0.01	0.12	0.00	0.16	0.04	0.00	0.40	0.00	0.00	0.50
20	0.25	0.20	0.00	0.41	0.00	1.26	0.22	0.19	0.10	0.00	0.00	0.01
21	0.04	0.37	0.00	0.01	0.00	0.15	0.37	0.06	0.04	0.00	0.18	0.11
22	0.02	e0.91	0.00	2.83	0.00	0.73	0.02	0.00	0.34	0.00	0.00	0.12
23	0.00	0.72	0.02	0.25	0.00	1.61	0.05	0.00	0.14	0.00	0.35	0.09
24	0.06	0.01	0.02	0.00	0.00	2.13	0.02	0.04	0.01	0.00	0.25	0.11
25	0.34	0.26	0.00	0.01	0.00	0.28	1.25	0.04	0.03	0.00	0.20	0.05
26	0.14	0.22	0.00	0.09	2.60	0.10	0.42	0.01	0.19	0.13	0.04	0.01
27	0.43	0.01	1.05	0.00	7.23	0.15	0.11	0.30	0.04	0.05	0.06	0.00
28	e4.55	0.00	0.01	0.04	0.43	1.34	0.13	0.03	0.08	0.07	0.12	0.00
29	e1.81	0.05	0.06	0.03	0.00	0.12	0.00	0.01	0.03	0.00	0.23	0.01
30	0.17	0.02	1.05	0.00	---	0.19	0.03	0.01	0.09	0.00	0.25	0.02
31	0.23	---	0.55	0.02	---	0.01	---	0.10	---	0.00	0.01	---
TOTAL	10.95	4.48	8.32	11.77	11.26	16.74	6.13	6.65	4.35	0.99	3.94	4.83

CAL YR 2003 TOTAL 71.13
WTR YR 2004 TOTAL 90.41

e Estimated

HAWAII, ISLAND OF KAUAI

220713159361201. State Key Number 1083.0 Mohihi crossing rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'13", long 159°36'12", Old Hawaiian Datum, Hydrologic Unit 20070000, 3.8 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" national Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.08	0.01	1.61	2.31	0.03	1.26	0.60	0.00	0.01	0.19	0.01	0.04
2	0.22	0.12	0.44	0.17	0.00	0.36	0.41	0.00	0.07	0.08	0.36	0.10
3	0.38	0.00	0.29	0.01	0.01	0.00	0.53	0.00	0.04	0.06	0.91	0.29
4	0.16	0.07	0.01	0.00	0.10	0.16	0.67	0.39	0.11	0.00	0.57	0.05
5	0.02	0.06	0.02	0.01	0.03	0.01	0.20	0.04	0.02	0.00	0.00	1.35
6	0.10	0.12	0.10	0.00	0.05	0.00	0.01	0.55	0.32	0.11	0.00	0.12
7	0.72	0.09	0.18	0.04	0.60	1.45	0.00	0.43	0.15	0.00	0.02	0.00
8	0.23	0.04	0.49	0.01	0.01	0.90	0.26	0.00	0.65	0.00	0.02	0.02
9	0.31	0.01	0.18	0.00	0.06	0.03	0.58	0.33	0.30	0.00	0.11	0.06
10	0.06	0.12	0.46	0.00	0.14	0.67	0.03	0.07	0.41	0.00	0.20	0.07
11	0.08	0.02	0.02	0.00	0.06	0.01	0.00	0.00	0.32	0.01	0.40	0.36
12	0.44	0.24	0.04	0.63	0.02	0.00	0.00	1.44	0.15	0.04	0.21	0.35
13	0.14	0.44	0.04	0.50	0.00	3.15	0.16	0.94	0.20	0.11	0.04	0.22
14	0.11	0.23	0.00	4.17	0.04	0.01	0.18	2.25	0.27	0.08	0.00	0.18
15	0.45	0.27	0.03	0.00	0.13	0.00	0.29	0.90	0.01	0.08	0.03	0.03
16	0.05	0.05	0.15	0.06	0.00	0.14	0.34	0.02	0.16	0.16	0.00	0.42
17	0.01	0.13	0.14	0.00	0.04	0.05	0.06	0.00	0.08	0.00	0.00	0.18
18	0.00	0.05	0.02	0.01	0.05	0.28	0.00	0.00	0.42	0.26	0.00	0.34
19	0.00	0.37	0.00	0.15	0.00	0.15	0.05	0.00	0.49	0.01	0.00	0.59
20	0.26	0.15	0.00	0.61	0.00	0.92	0.43	0.34	0.09	0.00	0.00	0.03
21	0.11	0.41	0.00	0.02	0.00	0.20	0.47	0.11	0.05	0.00	0.13	0.25
22	0.04	0.86	0.00	2.49	0.01	1.03	0.00	0.00	0.29	0.00	0.00	0.22
23	0.00	0.69	0.03	0.26	0.00	2.05	0.02	0.01	0.18	0.00	0.28	0.21
24	0.08	0.02	0.02	0.00	0.00	2.42	0.00	0.05	0.00	0.00	0.17	0.20
25	0.23	0.19	0.00	0.10	0.00	0.32	0.93	0.10	0.04	0.00	0.21	0.07
26	0.28	0.15	0.00	0.08	2.80	0.44	0.63	0.03	0.01	0.25	0.08	0.02
27	0.50	0.00	0.98	0.00	7.22	0.15	0.13	0.43	0.04	0.06	0.07	0.00
28	4.52	0.00	0.35	0.08	0.20	2.03	0.12	0.03	0.14	0.19	0.18	0.01
29	1.03	0.07	0.09	0.03	0.00	0.13	0.00	0.01	0.05	0.00	0.29	0.02
30	0.13	0.09	1.15	0.00	---	0.32	0.07	0.01	0.11	0.00	0.25	0.02
31	0.24	---	0.53	0.02	---	0.00	---	0.05	---	0.00	0.01	---
TOTAL	10.98	5.07	7.37	11.76	11.60	18.64	7.17	8.53	5.18	1.69	4.55	5.82

CAL YR 2003 TOTAL 71.21
WTR YR 2004 TOTAL 98.36

HAWAII, ISLAND OF KAUAI

220927159355001. State Key Number 1084.0 Kilohana rain gage near Hanalei, Kauai.

LOCATION.--Lat 22°09'27", long 159°35'50", Old Hawaiian Datum, Hydrologic Unit 20070000, 4.1 mi east southeast of Kalalau Beach and 4.9 mi south-southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.21	0.00	5.10	1.78	0.11	6.70	2.76	0.16	0.07	0.43	0.07	0.42
2	1.18	0.02	2.94	0.14	0.00	3.78	4.25	0.01	0.50	0.23	1.87	0.09
3	1.24	0.00	2.82	0.00	0.06	0.08	7.09	0.06	0.17	0.27	1.58	0.00
4	1.13	0.12	0.57	0.00	2.89	2.84	3.20	2.34	0.23	0.03	0.70	0.19
5	0.05	0.10	0.67	0.01	0.53	0.06	0.53	0.38	0.03	0.00	0.01	2.05
6	0.43	0.17	0.03	0.00	0.49	0.07	0.01	0.65	1.12	0.50	0.00	0.89
7	1.53	0.19	2.60	0.37	0.84	4.28	0.02	0.19	0.58	0.01	0.29	0.03
8	0.99	0.10	2.48	0.01	0.02	1.59	1.43	0.20	3.20	0.00	0.10	0.12
9	1.22	0.00	0.79	0.00	0.03	0.04	1.43	1.70	1.03	0.10	0.19	0.53
10	0.24	0.35	1.57	0.00	0.25	1.17	0.55	0.11	2.88	0.03	0.59	0.13
11	0.31	0.31	0.03	0.00	0.23	0.05	0.01	0.42	1.36	0.07	1.12	0.76
12	0.56	0.56	0.17	0.89	0.12	0.00	0.04	0.85	1.73	0.09	0.73	1.50
13	0.28	0.91	0.16	0.42	0.00	11.23	0.65	0.29	1.55	0.21	0.14	0.70
14	0.64	1.45	0.00	5.28	0.04	0.03	0.21	0.99	0.34	0.69	0.07	0.66
15	2.02	0.66	0.11	0.00	1.04	0.09	1.25	0.77	0.01	2.01	0.15	0.17
16	0.12	0.31	0.78	0.16	0.01	1.64	1.24	0.25	1.37	0.27	0.04	0.51
17	0.06	0.15	0.70	0.01	0.01	0.28	0.34	0.00	1.81	0.00	0.01	0.71
18	0.00	0.21	0.12	0.00	0.00	0.76	0.00	0.00	2.77	1.22	0.00	1.20
19	0.00	0.86	0.00	0.04	0.01	0.55	0.32	0.00	4.12	0.00	0.00	1.29
20	1.19	0.44	0.02	0.23	0.00	7.08	0.49	0.03	1.23	0.00	0.00	0.09
21	0.13	0.66	0.00	0.24	0.00	1.91	0.39	1.10	0.45	0.00	1.20	0.72
22	0.06	1.66	0.00	2.72	0.01	6.49	0.40	0.00	2.38	0.00	0.04	0.39
23	0.00	1.76	0.14	0.17	0.00	8.56	0.04	0.10	0.58	0.00	0.61	1.00
24	0.00	0.29	0.10	0.03	0.00	8.35	0.10	0.09	0.13	0.01	0.88	0.61
25	0.17	0.35	0.00	0.16	0.00	1.73	4.75	0.18	0.20	0.01	0.66	0.31
26	0.06	0.26	0.00	1.15	2.18	0.21	3.50	0.14	0.00	1.68	0.65	0.12
27	0.25	0.08	1.47	0.48	8.39	0.65	0.36	1.07	0.08	0.43	0.49	0.03
28	3.11	0.01	1.79	0.16	0.52	6.85	0.56	0.59	0.82	0.34	0.78	0.00
29	0.99	0.01	0.06	0.47	0.05	2.23	0.02	0.08	0.08	0.00	0.84	0.07
30	0.11	0.02	2.01	0.07	---	0.53	0.90	0.14	0.64	0.08	0.41	0.01
31	0.18	---	0.33	0.39	---	0.10	---	0.33	---	0.24	0.01	---
TOTAL	18.46	12.01	27.56	15.38	17.83	79.93	36.84	13.22	31.46	8.95	14.23	15.30

CAL YR 2003 TOTAL 156.31
WTR YR 2004 TOTAL 291.17

HAWAII, ISLAND OF KAUAI

220703159351201. State Key Number 1085.0 Mohihi-Koaie divide rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'03", long 159°35'12", Old Hawaiian Datum, Hydrologic Unit 20070000, 5.0 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with tipping bucket catchment (0.01 inch per tip). Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.05	0.00	1.07	1.47	0.02	0.89	0.54	0.00	0.01	0.21	0.02	0.08
2	0.23	0.08	0.19	0.14	0.00	0.33	0.25	0.00	0.07	0.05	0.34	0.05
3	0.44	0.01	0.15	0.01	0.02	0.01	0.39	0.00	0.02	0.03	0.69	0.00
4	0.16	0.08	0.01	0.00	0.05	0.05	0.53	0.24	0.06	0.01	0.57	0.05
5	0.01	0.04	0.03	0.00	0.02	0.01	0.16	0.02	0.00	0.00	0.00	1.27
6	0.11	0.13	0.09	0.00	0.06	0.00	0.00	0.31	0.21	0.12	0.00	0.14
7	0.57	0.11	0.17	0.03	0.49	0.76	0.00	0.43	0.10	0.01	0.02	0.03
8	0.19	0.06	0.31	0.01	0.00	0.63	0.13	0.00	0.52	0.00	0.01	0.02
9	0.26	0.00	0.08	0.00	0.06	0.00	0.32	0.36	0.24	0.00	0.12	0.09
10	0.06	0.11	0.35	0.00	0.14	0.36	0.03	0.09	0.41	0.00	0.15	0.04
11	0.10	0.03	0.01	0.01	0.04	0.01	0.01	0.00	0.38	0.01	0.28	0.24
12	0.52	0.12	0.02	0.48	0.02	0.00	0.01	0.93	0.20	0.03	0.14	0.30
13	0.12	0.35	0.02	0.47	0.00	1.77	0.15	0.42	0.29	0.06	0.02	0.27
14	0.15	0.19	0.00	3.09	0.02	0.00	0.27	1.58	0.32	0.05	0.01	0.13
15	0.36	0.18	0.01	0.00	0.12	0.00	0.23	0.38	0.01	0.07	0.02	0.02
16	0.04	0.06	0.11	0.05	0.00	0.10	0.25	0.01	0.19	0.13	0.00	0.40
17	0.00	0.18	0.09	0.00	0.01	0.02	0.06	0.00	0.12	0.00	0.00	0.13
18	0.00	0.04	0.03	0.01	0.02	0.27	0.00	0.00	0.34	0.19	0.00	0.21
19	0.00	0.09	0.00	0.13	0.00	0.11	0.07	0.00	0.43	0.01	0.00	0.45
20	0.18	0.06	0.00	0.33	0.00	0.50	0.47	0.56	0.10	0.00	0.00	0.04
21	0.06	0.32	0.00	0.01	0.00	0.16	0.53	0.08	0.04	0.00	0.13	0.30
22	0.05	0.45	0.00	1.88	0.00	0.68	0.01	0.00	0.24	0.00	0.00	0.18
23	0.00	0.28	0.03	0.51	0.00	1.40	0.00	0.03	0.13	0.00	0.17	0.14
24	0.04	0.02	0.03	0.00	0.00	1.83	0.00	0.05	0.01	0.00	0.11	0.20
25	0.16	0.13	0.00	0.10	0.00	0.20	0.48	0.10	0.03	0.00	0.17	0.11
26	0.12	0.07	0.00	0.06	1.76	0.88	0.39	0.02	0.00	0.25	0.09	0.01
27	0.29	0.01	0.53	0.00	5.40	0.03	0.08	0.28	0.03	0.06	0.05	0.01
28	2.62	0.00	0.22	0.06	0.13	1.53	0.09	0.04	0.14	0.23	0.15	0.00
29	0.83	0.02	0.10	0.02	0.00	0.08	0.00	0.01	0.03	0.00	0.21	0.03
30	0.03	0.11	1.22	0.00	---	0.05	0.06	0.02	0.08	0.00	0.21	0.02
31	0.36	---	0.42	0.02	---	0.00	---	0.06	---	0.01	0.00	---
TOTAL	8.11	3.33	5.29	8.89	8.38	12.66	5.51	6.02	4.75	1.53	3.68	4.96

CAL YR 2003 TOTAL 58.72
WTR YR 2004 TOTAL 73.11

HAWAII, ISLAND OF KAUAI

221101159280801. State Key Number 1131.7 Hanalei rain gage at Hanalei, Kauai.

LOCATION.--Lat 22°11'01", long 159°28'08", Old Hawaiian Datum, Hydrologic Unit 20070000, in USGS stream-gaging station 16103000 on left bank 2.3 mi southeast of Hanalei Bridge and 5.5 mi upstream from the river mouth.

PERIOD OF RECORD.--May 2001 to current year.

GAGE.--Standard 8" National Weather Service accumulation can and a electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 60 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.59	0.00	1.61	1.92	0.01	5.12	0.12	0.03	0.11	0.34	0.04	0.29
2	1.50	0.08	0.58	0.02	0.01	0.47	2.06	0.19	0.39	0.08	2.08	0.41
3	0.01	0.07	1.68	0.00	0.04	0.00	1.90	0.00	0.67	0.08	0.55	0.02
4	0.54	0.15	2.64	0.00	0.25	3.06	0.90	0.45	0.06	0.07	0.55	0.06
5	0.31	0.23	2.02	0.01	0.25	0.24	0.54	0.08	0.04	0.00	0.00	0.70
6	0.11	0.08	0.34	0.00	1.27	0.07	0.09	3.41	0.56	0.10	0.01	0.60
7	0.91	0.20	0.89	0.07	0.23	1.11	0.01	0.22	0.25	0.03	0.44	0.39
8	0.57	0.27	1.30	0.02	0.00	0.08	0.03	0.06	1.25	0.00	0.03	0.79
9	0.59	0.01	0.99	0.00	0.00	0.00	0.08	1.29	0.32	0.01	0.17	1.09
10	0.20	0.18	1.13	0.00	0.28	0.34	0.20	0.24	1.20	0.07	0.39	0.13
11	0.59	0.24	0.06	0.00	0.02	0.10	0.05	0.78	0.75	0.04	0.30	0.20
12	1.11	0.26	0.06	0.10	0.02	0.57	0.78	0.39	2.18	0.41	0.75	0.57
13	0.17	0.23	0.01	0.00	0.00	3.56	0.88	0.00	1.31	0.43	0.28	0.76
14	0.22	0.98	0.03	0.97	0.01	0.01	1.30	0.05	1.22	0.10	0.26	0.77
15	0.75	0.24	0.03	0.00	1.03	0.00	0.74	0.81	0.07	0.00	0.16	0.35
16	0.04	0.38	0.11	0.12	0.01	0.32	1.11	0.10	0.34	0.17	0.04	0.31
17	0.09	0.06	0.00	0.00	0.00	0.00	0.05	0.01	0.75	0.02	0.07	0.50
18	0.00	0.08	0.00	0.00	0.00	0.21	0.01	0.00	2.10	0.68	0.00	0.79
19	0.00	0.30	0.00	0.00	0.01	0.07	0.60	0.00	0.67	0.21	0.00	1.37
20	0.02	0.06	0.00	0.01	0.01	1.22	0.17	0.09	0.47	0.00	0.00	0.25
21	0.50	0.03	0.00	0.48	0.01	1.24	0.75	0.53	0.20	0.00	0.42	1.10
22	0.06	0.27	0.00	1.33	0.06	0.71	0.06	0.02	0.97	0.00	0.05	0.70
23	0.00	0.51	0.03	0.05	0.01	1.70	0.13	0.06	0.39	0.00	0.17	0.82
24	0.00	0.23	0.01	0.01	0.01	1.25	0.01	0.02	0.01	0.06	0.22	0.41
25	0.02	0.03	0.00	0.13	0.08	1.48	0.50	0.51	0.44	0.06	0.55	0.58
26	0.02	0.06	0.00	1.27	1.23	1.22	0.39	0.03	0.25	0.99	0.92	0.25
27	0.00	0.00	0.35	0.04	3.16	0.05	0.06	0.29	0.14	0.58	0.24	0.02
28	0.81	0.08	0.40	0.06	0.30	1.41	0.14	0.37	0.22	0.61	0.07	0.17
29	0.55	0.08	0.01	0.10	0.13	2.48	0.00	0.30	0.13	0.00	0.16	0.00
30	0.01	0.23	0.56	0.09	---	0.97	1.29	0.18	0.28	0.24	0.66	0.12
31	0.00	---	0.18	0.20	---	0.01	---	0.14	---	0.25	0.03	---
TOTAL	10.29	5.62	15.02	7.00	8.44	29.07	14.95	10.65	17.74	5.63	9.61	14.52

CAL YR 2003 TOTAL 105.21
WTR YR 2004 TOTAL 148.54

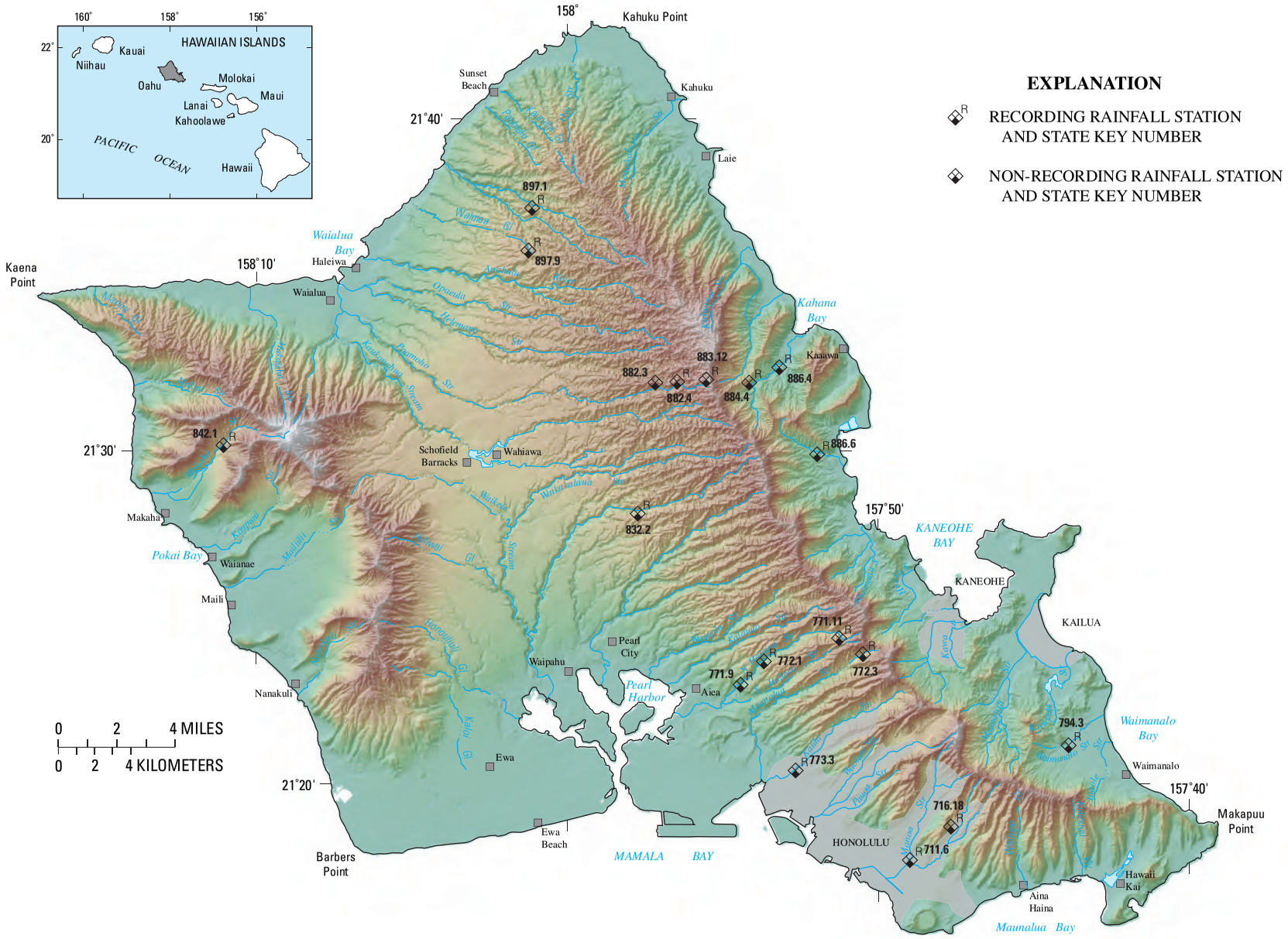


Figure 22. Locations of rainfall stations on Oahu.

HAWAII, ISLAND OF OAHU

211747157485601. State Key Number 711.6 Manoa rain gage at Kanewai Field at Honolulu, Oahu.

LOCATION.--Lat 21°17'47", long 157°48'56", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16242500 on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream of confluence with Palolo Stream.

PERIOD OF RECORD.--Continuous-record station, May 1999 to current year.

GAGE.--A 4-in. diameter tipping bucket rain gage mounted on the roof and connected to an electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 22 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.83	1.71	0.03	0.08	0.14	0.00	0.07	0.01	0.01	0.00
2	0.00	0.05	0.01	4.46	0.00	0.00	0.29	0.00	0.01	0.04	0.32	0.02
3	0.54	0.00	0.00	0.48	0.00	0.09	0.06	0.08	0.00	0.00	0.25	0.00
4	0.00	0.02	0.01	0.01	0.00	0.04	0.00	0.43	0.05	0.06	3.32	0.04
5	0.00	0.01	0.57	0.00	0.02	0.01	0.00	0.03	0.00	0.04	0.00	0.17
6	0.09	0.00	0.07	0.00	0.03	0.01	0.03	0.02	0.03	0.00	0.00	0.14
7	0.03	0.00	0.08	0.00	0.01	0.01	0.01	0.00	0.00	0.06	0.05	0.00
8	0.12	0.00	0.10	0.00	0.00	0.27	0.59	0.00	0.02	0.09	0.01	0.00
9	0.00	0.00	0.10	0.00	0.04	0.00	0.03	0.00	0.04	0.00	0.15	0.01
10	0.00	0.00	0.26	0.00	0.10	0.03	0.03	0.00	0.06	0.01	0.01	0.10
11	0.12	0.00	0.00	0.00	0.02	0.00	0.01	0.22	0.05	0.32	0.06	0.10
12	0.00	0.03	0.15	0.07	0.00	0.00	0.02	0.00	0.04	0.32	0.09	0.35
13	0.00	0.23	0.12	0.00	0.00	2.09	0.00	0.00	0.00	0.19	0.01	0.16
14	0.21	0.08	0.00	0.07	0.00	0.02	0.05	0.72	0.02	0.05	0.00	0.16
15	0.15	0.23	0.02	0.00	0.00	0.00	0.36	0.65	0.03	0.02	0.02	0.00
16	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.00	0.07	0.02	0.00	0.00
17	0.00	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.02	0.00	0.13
18	0.00	0.16	0.00	0.22	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.04
19	0.00	0.54	0.00	0.12	0.00	0.00	0.01	0.09	0.10	0.00	0.00	0.14
20	0.00	0.05	0.00	1.05	0.00	0.08	0.09	0.28	0.08	0.00	0.00	0.01
21	0.00	0.10	0.00	0.09	0.00	0.96	0.00	0.02	0.00	0.00	0.04	0.01
22	0.00	0.03	0.00	1.67	0.00	0.16	0.01	0.00	0.08	0.00	0.00	0.30
23	0.00	0.26	0.01	0.04	0.03	0.45	0.01	0.00	0.16	0.00	0.26	0.49
24	0.11	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.02	0.00	0.12	0.06
25	0.00	0.50	0.00	0.00	0.04	0.14	0.00	0.10	0.04	0.00	0.03	0.02
26	0.00	0.01	0.00	0.04	1.40	1.41	0.15	0.00	0.01	0.07	0.20	0.02
27	0.00	0.00	0.03	0.00	3.81	0.00	0.00	0.08	0.01	0.10	0.00	0.04
28	0.00	0.00	0.47	0.04	0.52	0.04	0.00	0.03	0.02	0.01	0.04	0.00
29	0.00	1.13	0.14	0.01	0.32	0.18	0.00	0.13	0.02	0.00	0.05	0.00
30	0.00	0.68	2.20	0.22	---	0.04	0.00	0.01	0.06	0.04	0.00	0.10
31	0.00	---	1.10	0.13	---	0.00	---	0.10	---	0.08	0.00	---
TOTAL	1.37	4.24	7.27	10.43	6.38	6.21	2.04	2.99	1.20	1.55	5.04	2.61

CAL YR 2003 TOTAL 23.17
WTR YR 2004 TOTAL 51.33

HAWAII, ISLAND OF OAHU

211836157472701. State Key Number 716.18 Palolo rain gage at Pukele Stream.

LOCATION.--Lat 21°18'36", long 157°47'27", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16244000 on right bank, 200 ft. upstream of Palolo Avenue bridge, 0.6 upstream from confluence with Waiomao Stream.

PERIOD OF RECORD.--Continuous-record station, March to September 2004.

GAGE.--An 8-in. diameter tipping bucket rain gage mounted on the roof and connected to an electronic data logger recording rainfall at 15-minute intervals. Elevation of gage is 344.78 ft above mean sea level (from City and County benchmark).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	0.24	0.00	0.17	0.20	0.06	0.08
2	---	---	---	---	---	---	1.00	0.00	0.10	0.20	0.89	0.21
3	---	---	---	---	---	---	0.15	0.14	0.04	0.04	0.31	0.03
4	---	---	---	---	---	---	0.11	1.24	0.16	0.18	3.45	0.07
5	---	---	---	---	---	---	0.00	0.23	0.07	0.36	0.00	0.15
6	---	---	---	---	---	---	0.08	0.60	0.09	0.14	0.04	0.04
7	---	---	---	---	---	---	0.01	0.05	0.12	0.28	0.20	0.00
8	---	---	---	---	---	---	0.23	0.00	0.09	0.32	0.03	0.00
9	---	---	---	---	---	---	0.67	0.00	0.37	0.07	0.20	0.13
10	---	---	---	---	---	---	0.69	0.00	0.22	0.00	0.05	0.17
11	---	---	---	---	---	---	0.10	1.75	0.21	0.99	0.28	0.14
12	---	---	---	---	---	0.00	0.35	0.02	0.16	0.53	0.29	0.59
13	---	---	---	---	---	1.90	0.02	0.02	0.07	0.15	0.12	0.43
14	---	---	---	---	---	0.21	0.10	0.52	0.04	0.08	0.02	0.44
15	---	---	---	---	---	0.00	0.55	0.62	0.19	0.07	0.07	0.02
16	---	---	---	---	---	0.00	0.20	0.00	0.54	0.05	0.02	0.13
17	---	---	---	---	---	0.02	0.06	0.00	0.22	0.05	0.04	0.32
18	---	---	---	---	---	0.00	0.07	0.00	0.34	0.02	0.00	0.15
19	---	---	---	---	---	0.00	0.01	0.09	0.34	0.00	0.00	0.35
20	---	---	---	---	---	0.64	0.08	0.57	0.53	0.00	0.00	0.00
21	---	---	---	---	---	4.44	0.11	0.03	0.09	0.00	0.26	0.10
22	---	---	---	---	---	1.53	0.08	0.00	0.29	0.05	0.00	0.44
23	---	---	---	---	---	1.38	0.12	0.06	0.53	0.00	0.61	0.50
24	---	---	---	---	---	0.14	0.01	0.02	0.09	0.06	0.28	0.35
25	---	---	---	---	---	0.52	0.00	0.13	0.07	0.00	0.05	0.03
26	---	---	---	---	---	0.80	0.64	0.00	0.03	0.26	0.91	0.04
27	---	---	---	---	---	0.00	0.00	0.24	0.12	0.24	0.16	0.22
28	---	---	---	---	---	0.17	0.00	0.19	0.22	0.07	0.11	0.26
29	---	---	---	---	---	1.21	0.00	0.51	0.11	0.00	0.13	0.11
30	---	---	---	---	---	0.85	0.00	0.24	0.22	0.06	0.01	0.27
31	---	---	---	---	---	0.00	---	0.49	---	0.27	0.00	---
TOTAL	---	---	---	---	---	---	5.68	7.76	5.84	4.74	8.59	5.77

HAWAII, ISLAND OF OAHU

212304157542201. State Key Number 771.9 North Halawa rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°23'04", long 157°54'22", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16226200, on right bank, 0.6 mi north of Oahu Prison, 1.0 mi south of Keaiwa Heiau, and 1.7 mi east of Aiea High School.

PERIOD OF RECORD.--Continuous-record station, May 1983 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage receiver and 7 5/16-in. rain can with float-type system attached to an electronic data logger. Elevation of gage is 160 ft above mean sea level (from topographic map). Rain collector is located about 18 ft. above ground.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	1.9	1.8	0.0	0.5	e0.0	0.0	0.0	0.1	0.0	0.0
2	0.0	0.0	0.0	5.4	0.0	e0.2	0.2	0.0	0.0	0.1	0.4	0.0
3	0.2	0.1	0.0	0.5	0.0	e0.0	0.0	0.0	0.0	0.0	0.8	0.0
4	0.0	0.0	0.0	0.0	0.0	e0.0	0.1	0.6	0.0	0.0	3.3	0.0
5	0.0	0.0	0.8	0.0	0.0	e0.0	0.0	0.0	0.0	0.0	0.0	0.2
6	0.2	0.0	0.1	0.0	0.5	e0.0	0.0	0.0	0.1	0.0	0.0	0.1
7	0.4	0.0	9.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
8	0.4	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0
9	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0
10	0.0	0.0	1.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
11	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2
12	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4
13	0.0	0.2	0.1	0.0	0.0	0.8	0.0	0.0	0.1	0.1	0.0	0.0
14	0.2	0.2	0.0	0.7	0.0	e0.0	0.0	0.3	0.0	0.1	0.0	0.1
15	0.2	0.3	0.0	0.0	0.0	0.0	1.1	1.5	0.0	0.0	0.0	0.0
16	0.0	0.2	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.2
18	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
19	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
20	0.0	0.0	0.5	0.3	0.0	0.1	0.5	0.0	0.2	0.0	0.0	0.0
21	0.0	0.1	0.0	0.1	0.0	1.2	0.0	0.0	0.0	0.0	0.2	0.1
22	0.0	0.0	0.0	0.8	0.0	e0.8	0.0	0.0	0.2	0.0	0.0	0.4
23	0.0	0.0	0.0	0.1	0.0	e0.3	0.0	0.0	0.2	0.0	0.4	0.6
24	0.0	0.0	0.0	0.0	0.0	e0.1	0.0	0.0	0.1	0.0	0.3	0.0
25	0.0	0.2	0.0	0.4	0.0	e0.2	0.0	0.0	0.0	0.1	0.1	0.0
26	0.0	0.0	0.0	0.0	2.1	e0.7	0.1	0.0	0.0	0.0	0.3	0.1
27	0.0	0.0	0.0	0.0	6.4	e0.0	0.0	0.2	0.0	0.1	0.1	0.0
28	0.0	0.0	0.3	0.0	0.3	e0.0	0.0	0.0	0.0	0.3	0.1	0.0
29	0.1	1.0	0.0	0.1	0.7	e0.4	0.0	0.1	0.1	0.0	0.2	0.0
30	0.0	0.3	0.6	0.0	---	e0.2	0.0	0.0	0.1	0.0	0.1	0.1
31	0.0	---	1.9	0.1	---	e0.0	---	0.0	---	0.0	0.0	---
TOTAL	2.0	3.1	17.0	10.6	10.0	6.0	2.7	2.7	2.1	1.2	7.0	2.9

CAL YR 2003 TOTAL 36.0
WTR YR 2004 TOTAL 67.3

e Estimated

HAWAII, ISLAND OF OAHU

212428157511201. State Key Number 771.11 North Halawa Valley rain gage at tunnel portal near Kaneohe, Oahu.

LOCATION.--Lat 21°24'28", long 157°51'12", Old Hawaiian Datum, Hydrologic Unit 20060000, on roof of Halawa portal control center, 3.2 mi west of Kaneohe Post Office, and 2.4 mi southwest of Ahuimanu School.

PERIOD OF RECORD.--Continuous-record station, July 1998 to current year.

GAGE.--Standard 8-in. National Weather Service collector attached to a 7 5/16-in. rain can with float-type recorder system. Elevation of the gage is 1,100 ft above mean sea level (from topographic map). Rain gage collector is about 6 ft. above base of gage house.

REMARKS.--Records fair, except for estimated days, which are poor. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	3.0	2.3	0.6	0.5	0.1	0.0	0.1	0.2	0.1	0.1
2	0.0	0.4	0.4	5.5	0.0	1.2	0.7	0.0	0.8	0.4	2.2	0.3
3	0.5	0.2	0.9	0.5	0.2	0.2	1.4	0.3	0.1	0.1	2.4	0.1
4	0.1	0.1	e1.5	0.1	0.8	0.2	0.2	1.5	0.4	0.1	5.7	0.0
5	0.0	0.3	e1.2	0.0	0.8	0.1	0.0	0.5	0.1	0.3	0.0	0.3
6	0.8	0.1	e0.3	0.0	1.1	0.0	0.1	1.2	0.4	0.4	0.1	0.2
7	0.7	0.9	e12.3	0.0	5.2	0.7	0.2	0.5	0.3	0.1	1.4	0.0
8	1.5	0.0	e0.3	0.1	0.0	0.5	0.0	0.0	0.2	0.2	0.1	0.0
9	0.4	0.0	e0.4	0.0	0.0	0.0	0.4	0.0	0.8	0.6	0.0	0.3
10	0.1	0.6	e1.5	0.0	0.0	0.4	1.3	0.2	0.9	0.2	0.1	0.1
11	1.6	0.0	e0.3	0.0	0.0	0.1	0.6	2.0	0.2	1.2	0.7	0.1
12	0.3	0.1	e0.3	0.2	0.0	0.0	1.7	0.1	0.3	0.3	0.4	0.7
13	0.0	0.6	0.1	0.0	0.1	2.5	0.2	0.0	0.3	0.1	0.2	0.0
14	0.6	0.4	0.1	0.8	0.0	0.2	0.1	0.2	0.0	0.2	0.0	0.8
15	0.4	0.3	0.1	0.0	0.0	0.0	1.9	1.8	0.1	0.1	0.0	0.1
16	0.0	0.2	0.0	0.0	0.1	0.0	0.3	0.0	0.8	0.0	0.0	0.1
17	0.4	0.2	0.4	0.0	0.0	0.3	0.0	0.0	0.4	0.2	0.7	0.2
18	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2
19	0.0	0.3	0.0	0.5	0.0	0.0	0.4	0.0	0.1	0.1	0.0	1.1
20	0.0	0.0	0.0	0.6	0.0	2.1	1.6	0.3	0.6	0.0	0.0	0.0
21	0.0	0.2	0.0	0.5	0.0	7.4	0.1	0.0	0.1	0.0	1.3	0.4
22	0.0	0.3	0.0	1.7	0.0	2.6	0.1	0.1	1.1	0.0	0.0	0.6
23	0.0	0.4	0.1	0.1	0.3	1.6	0.2	0.2	0.8	0.0	0.8	0.9
24	0.0	0.0	0.1	0.3	0.1	0.5	0.2	0.0	0.2	0.0	0.9	0.4
25	0.0	0.2	0.0	2.0	0.2	1.2	0.0	0.3	0.2	0.9	0.2	0.4
26	0.0	0.0	0.0	1.1	2.8	0.6	2.6	0.0	0.1	0.4	1.8	0.1
27	0.0	0.0	0.0	0.1	6.4	0.3	0.0	0.4	0.3	0.3	0.4	0.1
28	0.2	0.3	0.4	0.0	0.2	0.2	0.0	0.2	0.3	0.8	0.3	0.1
29	0.0	14.1	0.0	0.9	0.4	2.6	0.0	0.1	0.3	0.0	0.2	0.5
30	0.0	2.1	1.1	0.2	---	1.8	0.0	0.4	0.6	0.0	0.4	0.3
31	0.0	---	1.8	0.8	---	0.0	---	0.1	---	0.2	0.0	---
TOTAL	7.6	23.2	26.6	18.3	19.3	27.8	14.4	10.4	11.4	7.4	20.4	8.5

CAL YR 2003 TOTAL 135.9
WTR YR 2004 TOTAL 195.3

e Estimated

HAWAII, ISLAND OF OAHU

212346157533701. State Key Number 772.1 North Halawa rain gage near Aiea, Oahu.

LOCATION.--Lat 21°23'46", long 157°53'37", Old Hawaiian Datum, Hydrologic Unit 20060000, 2.7 mi above confluence with South Halawa Stream, 2.7 mi northeast of Aiea Post Office, and 6.5 mi northwest of Honolulu.

PERIOD OF RECORD.--Continuous-record station, August 1929 to June 1933, June 1953 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 12-in. collector and 10-in. storage tank with float-type recorder system. Elevation of gage is 320 ft above mean sea level (from topographic map). Rain gage collector is about 8 ft. above gage house floor.

REMARKS.--Records good. Rainfall recorded in 0.083-inch increments.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.83	1.42	0.00	0.17	0.00	0.00	0.16	0.09	0.00	0.00
2	0.00	0.00	0.00	4.25	0.00	0.16	0.24	0.00	0.09	0.08	0.66	0.00
3	0.58	0.08	0.00	0.41	0.08	0.09	0.09	0.08	0.00	0.00	0.92	0.00
4	0.00	0.09	0.17	0.00	0.17	0.09	0.00	0.67	0.00	0.00	3.83	0.00
5	0.00	0.00	2.17	0.00	0.25	0.09	0.00	0.00	0.00	0.16	0.00	0.16
6	0.25	0.09	0.33	0.00	0.58	0.00	0.00	0.00	0.16	0.00	0.00	0.09
7	0.58	0.16	5.42	0.00	0.08	0.09	0.08	0.00	0.09	0.08	0.25	0.00
8	0.67	0.00	0.08	0.00	0.00	0.41	0.00	0.00	0.16	0.00	0.08	0.09
9	0.08	0.00	0.17	0.00	0.00	0.00	0.34	0.00	0.50	0.00	0.08	0.09
10	0.00	0.25	1.25	0.00	0.00	0.08	0.41	0.00	0.17	0.08	0.08	0.00
11	0.42	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.17	0.41	0.25	0.08
12	0.08	0.00	0.16	0.08	0.00	0.00	0.09	0.00	0.08	0.25	0.33	0.41
13	0.00	0.25	0.17	0.00	0.00	1.00	0.00	0.00	0.33	0.09	0.00	0.00
14	0.41	0.42	0.08	0.50	0.00	0.00	0.09	0.08	0.00	0.08	0.00	0.26
15	0.34	0.42	0.08	0.00	0.00	0.00	1.16	1.50	0.00	0.08	0.00	0.00
16	0.00	0.25	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.08
17	0.00	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.08
18	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.08
19	0.00	0.34	0.00	0.17	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.42
20	0.00	0.00	0.00	0.25	0.00	0.42	0.83	0.00	0.58	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.08	0.00	0.33	0.17
22	0.25	0.08	0.00	0.50	0.00	1.25	0.00	0.00	0.42	0.00	0.00	0.25
23	0.00	0.08	0.00	0.00	0.17	0.50	0.00	0.16	0.42	0.00	0.25	0.83
24	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.08	0.08	0.00	0.50	0.08
25	0.00	0.17	0.00	0.42	0.00	0.33	0.00	0.00	0.08	0.08	0.08	0.00
26	0.00	0.00	0.00	0.17	1.83	1.00	0.42	0.00	0.16	0.33	0.75	0.16
27	0.00	0.00	0.00	0.00	5.00	0.08	0.00	0.25	0.08	0.00	0.00	0.00
28	0.00	0.00	0.25	0.00	0.27	0.08	0.00	0.08	0.09	0.42	0.17	0.00
29	0.00	2.00	0.00	0.25	0.50	0.50	0.00	0.08	0.17	0.00	0.08	0.24
30	0.00	0.34	0.58	0.00	---	0.33	0.00	0.00	0.33	0.00	0.00	0.00
31	0.00	---	1.50	0.25	---	0.00	---	0.00	---	0.09	0.00	---
TOTAL	3.66	5.35	14.32	8.67	8.93	9.33	4.33	3.06	4.74	2.32	8.64	3.57

CAL YR 2003 TOTAL 42.87
WTR YR 2004 TOTAL 76.92

HAWAII, ISLAND OF OAHU

212359157502601. State Key Number 772.3 Moanalua rain gage no. 1 at altitude 1,000 ft near Honolulu, Oahu.

LOCATION.--Lat 21°23'59", long 157°50'26", Old Hawaiian Datum, Hydrologic Unit 20060000, 2.7 mi southwest of Kaneohe Post Office, and 4.2 mi northeast of Tripler Hospital.

PERIOD OF RECORD.--Continuous-record station, June 1968 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. rain can with recorder. An electronic data logger was installed on February 5, 1997 replacing the digital recorder. Elevation of gage is 1,000 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	0.9	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.1	0.0
2	0.0	0.5	0.3	0.5	0.0	---	0.2	0.0	0.2	0.2	0.7	0.0
3	0.4	0.1	0.3	0.0	0.0	---	0.1	0.1	0.0	0.1	0.9	0.0
4	0.0	0.0	1.0	0.0	0.1	---	0.0	0.5	0.1	0.0	1.8	0.0
5	0.0	0.0	0.8	0.0	0.4	---	0.0	0.0	0.1	0.1	0.0	0.0
6	0.6	0.0	0.0	0.0	0.5	---	0.1	0.2	0.1	0.1	0.0	0.0
7	0.2	0.5	1.7	0.0	2.1	---	0.0	0.0	0.3	0.0	0.3	0.0
8	1.2	0.0	0.1	0.0	0.0	---	0.0	0.0	0.1	0.0	0.0	0.1
9	0.1	0.0	0.1	0.0	0.0	---	0.0	0.0	0.3	0.2	0.0	0.1
10	0.0	0.5	0.5	0.0	0.0	---	0.5	0.1	0.2	0.1	0.1	0.0
11	0.8	0.1	0.0	0.0	0.0	---	0.0	1.1	0.2	0.4	0.3	0.1
12	0.0	0.1	0.1	0.2	0.0	---	0.2	0.0	0.2	0.1	0.2	0.4
13	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.1	0.1
14	0.1	0.1	0.0	0.7	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.2
15	0.2	0.3	0.0	0.0	0.0	0.0	0.5	0.9	0.0	0.2	0.0	0.1
16	0.1	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.1	0.1
17	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0
18	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
19	0.0	0.1	0.0	0.6	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.5
20	0.0	0.0	0.0	0.5	0.0	0.9	0.2	0.0	0.2	0.0	0.0	0.0
21	0.0	0.2	0.0	0.5	0.0	2.1	0.0	0.0	0.1	0.0	0.2	0.0
22	0.1	0.2	0.0	0.6	0.0	0.6	0.0	0.0	0.2	0.0	0.0	0.4
23	0.0	0.3	0.0	0.0	0.1	0.4	0.1	0.1	0.2	0.0	0.1	0.4
24	0.1	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.1	0.4	0.1
25	0.0	0.2	0.0	0.9	0.2	0.5	0.0	0.1	0.1	0.1	0.0	0.1
26	0.0	0.0	0.0	0.2	2.6	0.0	0.5	0.0	0.1	0.3	0.5	0.2
27	0.0	0.0	0.0	0.0	1.6	0.2	0.0	0.3	0.1	0.0	0.2	0.1
28	0.2	0.4	0.0	0.1	0.0	0.2	0.0	0.1	0.2	0.4	0.1	0.0
29	0.0	6.6	0.0	0.3	0.0	1.4	0.0	0.0	0.2	0.0	0.0	0.1
30	0.0	0.7	1.1	0.2	---	0.7	0.0	0.1	0.2	0.0	0.0	0.3
31	0.0	---	0.2	0.2	---	0.0	---	0.3	---	0.0	0.1	---
TOTAL	4.3	12.5	7.1	5.7	8.0	---	2.8	4.0	4.4	2.6	6.3	3.4

WATERYEAR 2004 TOTAL 71.0
No daily record from March 2-12. Accumulated ranfall for this period is 1.9 inches.

HAWAII, ISLAND OF OAHU

212029157523601. State Key Number 773.3 Kalihi rain gage at Kalihi, Oahu.

LOCATION.--Lat 21°20'29", long 157°52'36", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16229300 on left bank, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

PERIOD OF RECORD.--Continuous-record station, July 1962 to September 2004 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage with float-type system. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 70 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for period of sluggish receiver from March 2 to June 18 which is poor. Rainfall recorded in 0.12 inch increments.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.92	1.80	0.00	0.24	0.00	0.00	0.00	0.12	0.00	0.00
2	0.00	0.12	0.00	4.44	0.00	0.00	0.24	0.00	0.00	0.00	0.24	0.00
3	0.36	0.00	0.00	0.48	0.00	0.00	0.00	0.24	0.00	0.00	0.24	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	3.36	0.12
5	0.00	0.00	0.36	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.12	0.12	0.00	0.12	0.00	0.00	0.12	0.00	0.00	0.00	0.12
7	0.12	0.00	3.24	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00
8	0.12	0.00	0.12	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.12	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.12	0.00
10	0.00	0.00	0.60	0.00	0.12	0.00	0.00	0.00	0.12	0.00	0.00	0.00
11	0.12	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.12	0.12	0.24
12	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.12
13	0.00	0.12	0.12	0.00	0.00	0.60	0.00	0.00	0.12	0.12	0.00	0.24
14	0.12	0.24	0.00	0.36	0.12	0.12	0.00	0.24	0.00	0.00	0.00	0.12
15	0.00	0.12	0.00	0.00	0.00	0.00	0.36	1.08	0.00	0.00	0.00	0.00
16	0.00	0.12	0.00	0.00	0.00	0.00	0.36	0.00	0.24	0.00	0.00	0.00
17	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
18	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.24	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
20	0.00	0.00	0.00	0.60	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00
21	0.00	0.12	0.00	0.12	0.00	0.72	0.00	0.00	0.00	0.00	0.12	0.00
22	0.00	0.00	0.00	0.60	0.00	0.24	0.00	0.00	0.24	0.00	0.00	0.12
23	0.00	0.12	0.00	0.12	0.00	0.48	0.00	0.00	0.12	0.00	0.48	0.36
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
25	0.00	0.36	0.00	0.12	0.00	0.12	0.00	0.00	0.12	0.00	0.12	0.12
26	0.00	0.00	0.00	0.12	2.76	1.32	0.00	0.00	0.00	0.00	0.12	0.00
27	0.00	0.00	0.00	0.00	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.12	0.00
29	0.00	0.48	0.24	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.12	0.00
30	0.00	0.36	0.72	0.12	---	0.12	0.00	0.12	0.12	0.00	0.00	0.00
31	0.00	---	1.32	0.12	---	0.00	---	0.00	---	0.00	0.00	---
TOTAL	0.84	2.88	9.12	9.12	5.88	4.20	1.68	2.28	1.44	0.48	5.40	2.04

WTR YR 2004 TOTAL 45.36

HAWAII, ISLAND OF OAHU

212114157435001. State Key Number 794.3 Waimanalo rain gage at Waimanalo, Oahu.

LOCATION.--Lat 21°21'14", long 157°43'50", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16249000, 260 ft downstream from Kalanianaole Highway, 2.3 mi northwest of Waimanalo Post Office, and 0.9 mi southeast of Bellows AFB radar towers.

PERIOD OF RECORD.--Continuous-record station, January 1967 to September 2004 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage collector and 7 5/16-in. diameter rain can, 3 ft tall, with a float system attached to a data logger. Elevation of gage is 20 ft above mean sea level (from topographic map).

REMARKS.--Records good except for days of no daily rainfall which are poor. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	3.00	3.00	0.10	0.60	---	---	---	---	0.00	0.10
2	0.00	0.00	1.80	---	0.00	2.10	---	---	---	---	0.10	0.00
3	0.00	0.00	0.80	---	0.00	0.50	---	---	---	---	0.70	0.00
4	0.00	0.00	0.10	---	0.40	0.20	---	---	---	---	4.80	0.00
5	0.00	0.00	0.40	---	0.10	0.10	---	---	---	---	0.00	0.00
6	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.00	0.00
7	0.00	0.00	0.00	0.00	0.20	0.10	---	---	---	---	0.80	0.00
8	0.10	0.00	0.10	0.10	0.10	0.20	---	---	---	---	0.00	0.00
9	0.00	0.00	0.00	0.00	0.10	0.00	---	---	---	---	0.00	0.00
10	0.00	0.00	0.40	0.00	0.10	0.30	---	---	---	---	0.00	0.20
11	0.10	0.00	0.00	0.00	0.00	0.10	---	---	---	---	0.00	0.20
12	0.00	0.00	0.40	0.00	0.00	0.00	---	---	---	---	0.10	0.30
13	0.00	0.00	0.00	0.00	0.00	---	---	---	---	---	0.10	0.00
14	0.20	0.00	0.00	0.80	0.10	---	---	---	---	---	0.00	0.40
15	0.00	0.00	0.00	0.00	0.10	---	---	---	---	---	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	---	---	---	---	---	0.00	0.00
17	0.10	0.00	0.90	0.00	0.00	---	---	---	---	---	0.20	0.00
18	0.00	0.00	0.00	0.00	0.00	---	---	---	---	---	0.00	0.00
19	0.00	0.00	0.00	0.10	0.00	---	---	---	---	---	0.00	0.20
20	0.00	0.00	0.00	1.30	0.00	---	---	---	---	---	0.00	0.00
21	0.00	0.00	0.10	0.10	0.00	---	---	---	---	---	0.00	0.00
22	0.00	0.10	0.10	2.30	0.00	---	---	---	---	---	0.00	0.00
23	0.00	0.30	0.10	0.30	0.00	---	---	---	---	---	0.10	0.20
24	0.00	0.00	0.00	0.00	0.00	---	---	---	---	---	0.10	0.10
25	0.00	0.70	0.10	0.80	0.00	---	---	---	---	---	0.10	0.00
26	0.00	0.00	0.10	0.50	6.70	---	---	---	---	---	1.20	0.00
27	0.00	0.00	0.60	0.00	5.50	---	---	---	---	---	0.00	0.00
28	0.00	0.00	2.20	0.00	0.80	---	---	---	---	0.10	0.00	0.00
29	0.00	1.50	0.10	0.00	0.60	---	---	---	---	0.00	0.00	0.00
30	0.00	1.50	2.70	0.50	---	---	---	---	---	0.00	0.00	0.20
31	0.00	---	1.60	0.00	---	---	---	---	---	0.00	0.00	---
TOTAL	0.50	4.10	15.60	---	14.90	---	---	---	---	---	8.30	1.90

CAL YR 2003 TOTAL 46.60

HAWAII, ISLAND OF OAHU

212813157574001. State Key Number 832.2 Kipapa rain gage near Wahiawa, Oahu.

LOCATION.--Lat 21°28'13", long 157°57'40", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank of stream 1,700 ft below Forest Reserve Boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu. The rain gage is housed in the same shelter with USGS stream-gaging station 16212800.

PERIOD OF RECORD.--Continuous-record station, January 1957 to September 2004 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. storage can with a float-type recorder system. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for period of missing daily totals, which is poor. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	1.5	1.8	---	---	0.2	0.0	0.0	0.2	0.0	0.0
2	0.3	0.1	0.0	5.3	---	---	0.5	0.0	0.0	0.1	0.6	0.1
3	0.2	0.3	0.0	0.3	---	---	0.1	0.2	0.1	0.1	1.5	0.0
4	0.0	0.4	0.0	0.0	---	0.2	0.1	0.6	0.1	0.1	3.1	0.0
5	0.0	0.1	1.9	0.0	---	0.2	0.0	0.0	0.0	0.1	0.0	0.2
6	0.2	0.0	0.2	0.0	---	0.0	0.0	0.2	0.1	0.1	0.0	0.3
7	0.4	0.0	7.2	0.0	---	0.2	0.1	0.1	0.3	0.2	0.1	0.0
8	0.9	0.1	0.3	0.0	---	0.3	0.0	0.1	0.2	0.4	0.0	0.0
9	0.2	0.0	0.4	0.0	---	0.1	0.1	0.0	0.7	0.0	0.1	0.1
10	0.0	0.1	1.7	0.0	---	0.1	0.1	0.0	0.3	0.1	0.5	0.0
11	0.3	0.1	0.2	0.0	---	0.0	0.0	0.7	0.1	0.1	0.6	0.2
12	0.4	0.1	0.2	0.2	---	0.1	0.0	0.1	0.2	0.2	0.2	0.3
13	0.1	0.6	0.0	0.0	---	0.7	0.0	0.1	0.2	0.3	0.0	0.3
14	0.9	0.3	0.0	0.4	---	0.0	0.1	0.5	0.1	0.1	0.1	0.1
15	0.6	0.4	0.1	0.0	---	0.0	1.1	1.3	0.0	0.1	0.0	0.0
16	0.0	0.1	0.0	0.0	---	0.0	0.7	0.0	0.1	0.1	0.0	0.0
17	0.0	0.1	0.0	0.0	---	0.0	0.1	0.1	0.2	0.0	1.4	0.3
18	0.0	0.3	0.0	0.0	---	0.0	0.0	0.0	0.1	0.0	0.0	0.1
19	0.0	0.3	0.0	0.0	---	0.0	0.0	0.1	0.1	0.0	0.1	0.3
20	0.0	0.0	0.0	0.0	---	0.1	0.4	0.0	0.4	0.0	0.0	0.0
21	0.0	0.1	0.0	0.0	---	0.7	0.0	0.0	0.0	0.0	0.3	0.2
22	0.0	0.0	0.0	0.2	---	0.8	0.0	0.0	0.4	0.0	0.0	0.5
23	0.1	0.1	0.0	0.1	---	0.8	0.0	0.1	0.3	0.0	0.3	0.7
24	0.3	0.0	0.0	0.0	---	0.1	0.0	0.0	0.0	0.0	0.6	0.3
25	0.1	0.1	0.0	0.5	---	0.2	0.0	0.0	0.0	0.3	0.2	0.1
26	0.2	0.0	0.0	0.3	---	0.3	0.2	0.0	0.0	0.3	0.2	0.0
27	0.1	0.0	0.1	0.1	---	0.0	0.0	0.2	0.0	0.3	0.2	0.1
28	0.1	0.0	0.3	0.0	---	0.2	0.0	0.2	0.0	0.4	0.5	0.0
29	0.1	3.0	0.0	0.3	---	0.2	0.0	0.2	0.2	0.0	0.1	0.0
30	0.0	1.5	0.2	0.1	---	0.1	0.0	0.0	0.5	0.0	0.0	0.0
31	0.0	---	1.9	---	---	0.2	---	0.0	---	0.1	0.0	---
TOTAL	5.5	8.2	16.2	---	---	---	3.8	4.8	4.7	3.7	10.7	4.2

CALYR 2003 TOTAL 62.1
WTR YR 2004 TOTAL 89.7
No daily record from January 31 to March 3. Accumulated rainfall for this period is 12.7 inches.

HAWAII, ISLAND OF OAHU

213016158105901. State Key Number 842.1 Makaha rain gage near Makaha, Oahu.

LOCATION.--Lat 21°30'16", long 158°10'59", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16211600, on right bank, 0.8 mi northeast of Kaneaki Heiau, and 2.9 mi northeast of Makaha.

PERIOD OF RECORD.--Continuous-record station, July 1959 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 938.64 ft above mean sea level (from Waianae Plantation Benchmark).

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.3	1.9	0.0	1.0	0.0	0.0	0.0	0.1	0.0	0.7
2	---	---	0.2	4.9	0.0	4.6	0.6	0.0	0.0	0.0	0.1	0.2
3	---	---	0.0	0.3	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.3
4	---	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	2.0	0.0
5	---	0.0	1.1	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0
6	---	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
7	---	0.0	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
8	---	0.1	0.0	0.0	0.0	0.9	0.1	0.0	0.0	0.1	0.2	0.0
9	---	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.3
10	---	0.0	0.1	0.0	0.1	0.4	0.0	0.1	0.0	0.0	0.0	0.1
11	---	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
12	---	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
13	---	0.1	0.0	0.0	0.0	1.4	0.0	1.1	0.0	0.0	0.0	0.0
14	---	0.0	0.0	0.2	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.1
15	---	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.0
16	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
17	---	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0
18	---	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	---	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	---	0.0	0.0	0.8	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0
21	---	0.2	0.0	0.3	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
22	---	0.4	0.0	1.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
23	---	0.5	0.0	0.3	0.0	0.7	0.0	0.0	0.0	0.0	0.1	0.0
24	---	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
25	---	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
26	---	0.0	0.0	0.1	0.9	0.0	1.3	0.0	0.1	0.0	0.0	0.1
27	---	0.0	0.5	0.0	6.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
28	---	0.0	1.6	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	---	0.1	0.0	0.0	1.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0
30	---	0.7	0.1	0.0	---	0.0	0.0	0.0	0.2	0.0	0.0	0.0
31	---	---	0.9	0.1	---	0.0	---	0.0	---	0.0	0.0	---
TOTAL	---	---	9.2	11.5	9.2	11.0	4.4	3.2	1.3	0.3	2.8	2.1

CALYR 2003 TOTAL 32.1
WTR YR 2004 TOTAL 59.5

No daily record October 1 to November 3. Accumulated rainfall for this period is 1.8 inches.

HAWAII, ISLAND OF OAHU

213205157571001. State Key Number 882.3 Poamoho rain gage no. 3 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'05", long 157°57'10", Old Hawaiian Datum, Hydrologic Unit 20060000, on right side of Poamoho Trail, and 0.2 mi northeast from trail marker.

PERIOD OF RECORD.--Accumulated-rainfall station, July 1967 to November 2004 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 3-in. diameter, 5-ft tall aluminum non-recording gage. Elevation of gage is 1,800 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004 INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Nov. 04	9.8a
Nov. 04 to Jan. 28	54.1
Jan. 28 to Apr. 07	45.0
Apr. 07 to July 27	47.9
July 27 to Sep. 30	25.4b

WTR YR 2004 TOTAL 182.2 (estimated)
CAL YR 2003 TOTAL 120.7 (estimated)

a Estimate based on total accumulated rainfall from Sep. 25 to Nov. 4, 2003 of 9.8 inches.
b Estimate based on total accumulated rainfall from July 27 to Nov. 8, 2004 of 48.9 inches.

HAWAII, ISLAND OF OAHU

213211157562400. State Key Number 882.4 Poamoho rain gage no. 2 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'11", long 157°56'24", Old Hawaiian Datum, Hydrologic Unit 20060000, on Poamoho trail 1.0 mi west of junction with Koolau Summit Trail, and 5.3 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation of gage is 1,960 ft above mean sea level (from topographic map).

REMARKS.--Records fair, except for periods of missing record and estimated day which are poor. Rainfall recorded in 0.188-inch increments.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.19	1.50	1.69	0.37	0.56	0.00	0.00	0.19	0.37	0.00	0.38
2	0.00	1.88	0.37	3.75	0.19	1.88	0.94	0.00	0.57	0.37	2.25	0.19
3	0.00	1.12	0.94	0.38	0.19	0.00	1.68	0.00	0.00	0.19	3.38	0.00
4	0.18	0.76	2.06	0.00	1.50	0.56	0.56	0.75	0.74	0.00	6.00	0.00
5	0.00	0.19	4.50	0.00	0.75	0.19	0.19	e0.00	0.00	0.38	0.00	0.75
6	0.19	2.81	1.13	0.00	1.31	0.19	0.19	1.69	0.19	0.37	0.56	0.19
7	0.57	1.31	6.00	0.00	7.88	1.31	0.19	1.13	0.75	0.38	1.50	0.00
8	1.31	0.00	0.56	0.00	0.18	0.75	0.00	0.00	0.56	0.75	0.19	0.00
9	0.19	0.19	0.56	0.00	0.00	0.00	1.31	0.00	1.13	1.31	0.18	0.56
10	0.00	0.19	2.06	0.00	0.00	0.57	1.50	0.18	1.31	0.19	0.57	0.56
11	1.50	0.00	0.19	0.00	0.00	0.18	---	1.13	0.75	0.94	0.75	0.19
12	0.56	0.19	0.56	0.00	0.00	0.19	---	0.19	0.75	0.19	0.56	0.38
13	0.18	1.31	0.38	0.00	0.00	1.50	---	0.00	0.19	0.37	0.19	0.18
14	0.57	0.56	0.19	1.31	0.00	0.92	---	0.37	0.19	0.19	0.19	0.75
15	1.31	0.37	0.00	0.19	0.00	0.18	---	1.50	0.18	0.38	0.00	0.19
16	0.00	0.94	0.19	0.19	0.00	0.00	1.87	0.00	0.38	0.19	0.18	0.19
17	0.56	0.56	0.00	0.19	0.00	0.18	0.38	0.00	0.75	0.00	0.37	0.38
18	0.00	1.50	0.00	0.19	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.18
19	0.00	0.38	0.00	0.38	0.00	0.18	1.12	0.00	0.57	0.18	0.00	0.94
20	0.00	0.00	0.00	0.37	0.00	1.87	---	0.00	0.75	0.18	0.00	0.38
21	0.00	0.38	0.00	0.19	0.00	5.07	---	0.00	0.18	0.18	0.56	0.18
22	0.38	0.37	0.00	1.31	0.00	3.37	---	0.00	1.32	0.00	0.00	0.94
23	0.00	1.13	0.18	0.19	0.00	1.87	---	0.57	0.37	0.00	0.38	1.13
24	0.18	0.00	0.38	1.69	0.19	0.76	---	0.18	0.00	0.00	0.37	0.75
25	0.00	0.18	0.00	2.25	0.38	1.87	0.00	0.19	0.00	0.00	0.00	0.56
26	0.00	0.00	0.00	1.50	1.31	0.56	1.50	0.00	0.38	0.37	0.38	0.19
27	0.00	0.00	0.00	0.19	4.88	0.19	0.00	0.37	0.19	0.19	0.37	0.37
28	0.00	0.38	0.37	0.38	0.00	0.38	0.00	0.38	0.74	0.38	0.57	0.19
29	0.00	14.44	0.00	0.38	0.18	2.24	0.00	0.38	0.19	0.00	0.18	1.13
30	0.19	3.00	1.31	1.12	---	1.32	0.00	0.74	0.95	0.00	0.00	0.37
31	0.19	---	0.94	0.75	---	0.00	---	0.18	---	0.37	0.19	---
TOTAL	8.06	34.33	24.37	18.59	19.31	28.84	---	9.93	14.64	8.42	19.87	12.20

CALYR TOTAL 159.08
WTR YR TOTAL 216.75

No daily record April 11-15. Accumulated rainfall for this period is 4.12 inches.
No daily record April 20-24. Accumulated rainfall for this period is 2.68 inches.

e Estimated

HAWAII, ISLAND OF OAHU

213215157552800. State Key Number 883.12 Poamoho rain gage no. 1 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'15", long 157°55'28", Old Hawaiian Datum, Hydrologic Unit 20060000, at junction of Poamoho and Koolau summit trails, and 6.2 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation is 2,480 ft above mean sea level (from topographic map).

REMARKS.--Records fair, except for estimated period, which is poor. Rainfall recorded in 0.188-inch increments.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.69	2.06	0.38	0.38	0.19	0.00	0.18	0.19	0.00	0.18
2	---	---	1.50	4.31	0.00	2.81	0.93	0.00	0.57	0.19	1.69	0.19
3	---	---	2.07	0.19	0.19	0.38	1.50	0.00	0.19	0.19	4.13	0.00
4	---	---	3.74	0.00	1.69	0.74	0.38	0.56	0.56	0.18	6.75	0.19
5	---	0.37	5.26	0.00	0.56	0.19	0.00	0.19	0.18	0.38	0.00	0.75
6	---	2.82	1.31	0.00	0.75	0.19	0.75	1.87	0.00	0.37	0.37	0.19
7	---	1.31	5.25	0.00	10.69	0.75	0.19	1.50	0.57	0.00	1.69	0.00
8	---	0.00	0.18	0.00	0.00	0.56	0.00	0.00	0.19	0.57	0.37	0.18
9	---	0.00	0.57	0.00	0.00	0.00	0.56	0.57	0.93	1.50	0.19	0.57
10	---	0.19	1.12	0.00	0.00	0.57	1.12	0.93	0.94	0.18	0.38	0.19
11	---	0.00	0.19	0.00	0.00	0.74	0.57	1.69	0.75	0.75	0.37	0.18
12	---	0.00	0.19	0.19	0.00	0.19	2.06	0.19	0.56	0.19	0.38	0.19
13	---	0.93	0.37	0.00	0.00	1.69	0.37	0.37	0.19	0.19	0.18	0.00
14	---	0.38	0.00	1.69	0.18	0.19	0.19	0.38	0.19	0.00	0.19	0.75
15	---	0.00	0.19	0.00	0.00	0.00	1.13	1.87	0.18	0.19	0.19	0.00
16	---	0.75	0.00	0.00	0.00	0.00	1.87	0.19	0.57	0.00	0.00	0.19
17	---	0.56	0.56	0.00	0.00	0.19	0.19	0.00	1.12	0.00	0.19	0.19
18	---	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.18	0.00	0.00
19	---	0.19	0.00	0.56	0.00	0.00	2.44	0.00	0.38	0.00	0.00	0.74
20	---	0.00	0.00	0.19	0.00	1.68	2.81	0.00	0.74	0.00	0.00	0.19
21	---	0.19	0.00	0.56	0.00	4.50	0.19	0.19	0.19	0.00	0.56	0.38
22	---	0.37	0.00	3.00	0.00	1.88	0.75	0.00	0.94	0.00	0.00	0.37
23	---	0.75	0.38	0.19	0.19	1.12	1.31	0.19	0.19	0.00	0.19	0.75
24	---	0.19	0.00	1.31	0.19	0.75	0.19	0.18	0.00	0.00	0.37	0.57
25	---	0.00	0.00	1.69	0.56	1.50	0.00	0.00	0.18	0.19	0.00	0.56
26	---	0.00	0.00	0.75	2.62	0.57	4.31	0.19	0.19	0.37	0.38	0.00
27	---	0.19	0.19	0.19	5.82	0.56	0.19	0.19	0.38	0.18	0.19	0.37
28	---	0.75	0.18	0.37	0.00	0.56	0.00	0.37	0.56	0.00	0.37	0.38
29	---	17.62	0.00	0.19	0.37	2.25	0.00	0.38	0.19	0.19	0.19	1.12
30	---	5.81	1.88	0.75	---	0.94	0.00	0.56	0.37	0.00	0.00	0.38
31	---	---	1.31	0.56	---	0.00	---	0.19	---	0.37	0.00	---
TOTAL	---	---	28.13	18.75	24.19	25.88	24.19	12.75	12.37	6.55	19.32	9.75

CALYR 2003 TOTAL 135.62
WTR YR 2004 TOTAL 227.85

No daily record October 1 to November 4. Accumulated total for this period is 11.85 inches, estimated.

HAWAII, ISLAND OF OAHU

213335157540601. State Key Number 884.4 Punaluu rain gage at altitude 240 ft., Oahu.

LOCATION.--Lat 21°33'35", long 157°54'06", Old Hawaiian Datum, Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 20 ft bankward from USGS stream-gaging station 16303000, 1.4 mi west of Kahana, and 1.8 mi southwest of Punaluu.

PERIOD OF RECORD.--Continuous-record station, August 2003 to current year.

GAGE.--An electronic data logger with a float system using an 8-in. receiver and 7 5/16-in. diameter rain can, 4-ft tall. Readings are taken at 15-minute intervals. Elevation of gage is 240 ft above mean sea level (from calibrated GPS).

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	e0.10	e4.40	---	e0.50	e0.10	0.00	0.00	0.10	0.00	---	0.00
2	0.00	e0.60	e1.00	---	e0.00	e4.50	0.20	0.00	0.60	0.00	---	0.10
3	0.10	e0.00	e1.20	---	e0.00	e0.10	1.00	0.00	0.00	0.10	---	0.00
4	0.10	e0.10	e3.40	---	e0.30	e0.50	0.20	0.20	0.40	0.10	---	0.10
5	0.00	e0.10	e3.50	---	e0.70	e0.00	0.10	0.10	0.00	0.00	---	0.30
6	0.00	e0.20	---	---	e0.00	e0.00	0.00	0.70	0.10	0.20	---	0.30
7	0.20	e0.30	---	---	e0.30	e0.30	0.00	3.10	0.50	0.00	---	0.00
8	0.80	e0.90	---	---	e3.30	e0.00	0.00	0.00	0.20	0.30	---	0.10
9	0.00	e0.00	---	e0.00	e0.00	e0.00	0.10	1.40	0.50	0.80	---	0.20
10	0.00	e0.00	---	e0.00	e0.00	0.00	0.20	1.80	0.80	0.10	---	0.20
11	0.70	e0.10	---	e0.00	e0.00	3.20	0.40	2.50	0.40	0.40	---	0.10
12	0.30	e0.10	---	e0.10	e0.00	2.30	1.90	0.10	0.10	0.00	---	0.20
13	0.00	e0.00	---	e0.00	e0.00	1.00	0.20	0.00	0.20	0.10	---	0.00
14	0.80	e0.40	---	e1.90	e0.00	0.00	0.00	0.10	0.00	0.00	0.10	0.30
15	0.60	e0.20	---	e0.00	e0.20	0.00	0.60	1.90	0.10	0.10	0.10	0.00
16	0.00	e0.00	---	e0.00	e0.10	0.00	0.50	0.20	0.60	0.00	0.00	0.20
17	0.30	e0.10	---	e0.00	e0.00	0.00	0.30	0.00	0.80	0.00	0.10	0.00
18	0.00	e0.50	---	e0.00	e0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.00
19	0.00	e0.30	---	e0.10	e0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.60
20	0.00	e0.10	---	e0.10	e0.00	0.80	2.40	0.00	0.30	0.00	0.00	0.10
21	0.00	e0.00	---	e0.00	e0.00	1.50	0.00	0.00	0.00	0.00	0.60	0.20
22	e0.40	e0.10	---	e0.70	e0.00	0.10	0.80	0.00	0.80	---	0.00	0.10
23	e0.00	e0.10	---	e0.60	e0.00	0.60	0.10	0.10	0.10	---	0.00	0.00
24	e0.20	e0.60	---	e0.00	e0.00	0.40	0.00	0.00	0.00	---	0.20	0.20
25	e0.00	e0.20	---	e0.80	e0.00	1.10	0.10	0.10	0.00	---	0.00	0.30
26	e0.00	e0.10	---	e2.10	e0.70	1.90	1.30	0.00	0.10	---	0.20	0.00
27	e0.00	e0.00	---	e0.00	e4.20	0.40	0.00	0.10	0.00	---	0.10	0.20
28	e0.00	e0.00	---	e0.00	e2.00	0.30	0.00	0.30	0.30	---	0.10	0.00
29	e0.00	e0.90	---	e0.50	e0.00	2.10	0.00	0.10	0.10	---	0.20	0.00
30	e0.00	e6.40	---	e0.90	---	0.50	0.00	0.40	0.10	---	0.00	0.10
31	e0.00	---	---	e0.10	---	0.00	---	0.10	---	---	0.00	---
TOTAL	4.50	12.50	---	---	12.30	21.70	10.50	13.30	7.40	---	---	3.90

e Estimated

HAWAII, ISLAND OF OAHU

213237157530701. State Key Number 886.4 Kahana rain gage at altitude 95 ft near Kahana, Oahu.

LOCATION.--Lat 21°32'36", long 157°53'06", Old Hawaiian Datum, Hydrologic Unit 20060000, on right bank, 600 ft upstream from Kawa Stream, about 40 ft bankward from USGS stream-gaging station 16296500, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

PERIOD OF RECORD.--Accumulated-rainfall station, December 1958 to May 1961, February 1990 to June 1994. Continuous-record station, May 1961 to February 1990, June 1994 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--An electronic data logger with a float system using an 8-in. receiver and 7 5/16-in. diameter rain can, 4-ft tall. Readings are taken at 15-minute intervals. Elevation of gage is 95 ft above mean sea level (from topographic map).

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.1	1.4	1.2	---	0.0	0.0	0.5	---	---	---	0.0
2	0.0	0.4	0.4	2.9	---	5.3	0.3	0.0	---	---	---	0.0
3	0.1	0.2	1.8	---	---	0.3	0.6	0.1	---	---	---	0.0
4	0.1	0.1	3.4	---	0.1	0.5	0.1	0.1	---	---	---	0.0
5	0.0	0.0	2.4	---	0.3	0.0	0.0	0.1	---	---	---	1.0
6	0.1	0.1	0.1	---	0.1	0.0	0.2	0.6	---	---	---	0.3
7	0.1	0.6	3.8	---	2.2	0.1	0.0	2.0	---	---	---	0.0
8	0.7	0.0	0.1	---	0.1	0.0	0.0	0.0	---	---	---	0.0
9	0.0	0.0	0.2	---	0.0	0.0	0.0	1.4	---	---	---	0.2
10	0.0	0.1	0.6	---	0.0	0.2	0.3	1.7	---	---	---	0.1
11	0.7	0.0	0.0	---	0.0	0.8	0.5	3.6	---	---	---	0.0
12	0.3	0.0	0.3	---	0.1	1.3	2.1	0.6	---	---	---	0.1
13	0.0	0.8	0.3	---	0.0	0.5	0.5	0.0	---	---	---	0.2
14	0.5	0.1	0.0	---	0.0	0.0	0.1	0.0	---	---	---	0.3
15	0.7	0.1	0.0	---	0.2	0.0	0.5	1.5	---	---	---	0.0
16	0.0	0.1	0.0	---	0.0	0.0	1.1	0.2	---	---	---	0.1
17	0.7	0.2	0.5	---	0.0	0.0	0.2	0.0	---	---	---	0.2
18	0.0	0.3	0.0	---	0.0	0.0	0.0	0.0	---	---	---	0.0
19	0.0	0.1	0.0	---	0.0	0.0	0.0	0.0	---	---	---	0.6
20	0.0	0.0	0.1	---	0.0	0.4	2.6	0.4	---	---	---	0.0
21	0.0	0.1	0.0	---	0.0	1.1	0.0	0.0	---	---	---	0.3
22	0.1	0.1	0.0	---	0.0	0.1	0.2	0.2	---	---	---	0.2
23	0.1	0.3	0.1	---	0.0	0.7	0.1	0.0	---	---	---	0.2
24	0.1	0.1	0.0	---	0.0	0.6	0.1	---	---	---	---	0.3
25	0.0	0.0	0.0	---	0.0	1.7	0.0	---	---	---	---	0.5
26	0.0	0.0	0.0	---	1.6	2.2	0.6	---	---	---	---	0.0
27	0.0	0.6	0.1	---	5.6	0.0	0.0	---	---	---	---	0.1
28	0.0	0.7	0.3	---	0.3	0.1	0.0	---	---	---	0.2	0.1
29	0.0	6.4	0.1	---	0.1	1.9	0.0	---	---	---	0.0	0.1
30	0.0	5.4	2.1	---	---	0.4	0.0	---	---	---	0.0	0.1
31	0.0	---	0.9	---	---	0.0	---	---	---	---	0.0	---
TOTAL	4.3	17.0	19.0	---	---	18.2	10.1	---	---	---	---	5.0

CAL YR 2003 TOTAL 96.7

No daily record May 24 to August 27. Accumulated rainfall for this period is 23.0 inches.

HAWAII, ISLAND OF OAHU

213000157515401. State Key Number 886.6 Waikane rain gage at altitude 75 ft at Waikane, Oahu.

LOCATION.--Lat 21°30'00", long 157°51'54", Old Hawaiian Datum, Hydrologic Unit 20060000, in USGS stream-gaging station 16294900, 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

PERIOD OF RECORD.--Continuous-record station, February 1960 to October 1985, May 1994 to current year. Accumulated-rainfall station, October 1985 to May 1994. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records good. Daily record read in nearest tenths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	1.0	1.7	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.2
2	0.0	0.0	0.8	4.3	0.0	7.2	0.2	0.0	0.2	0.0	0.8	0.1
3	0.3	0.0	1.4	0.4	0.1	0.2	0.5	0.0	0.0	0.0	2.5	0.0
4	0.0	0.0	1.4	0.0	1.1	0.1	0.0	0.2	0.0	0.0	5.3	0.0
5	0.0	0.0	0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0
6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.4
7	0.2	0.2	2.5	0.0	0.7	0.1	0.0	2.0	0.0	0.0	0.5	0.0
8	0.2	0.0	0.1	0.1	0.1	0.4	0.0	0.0	0.0	0.1	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.2
10	0.0	0.0	0.2	0.0	0.0	0.3	0.3	1.8	0.1	0.0	0.1	0.1
11	0.2	0.0	0.0	0.1	0.0	1.2	0.0	1.0	0.3	0.2	0.0	0.0
12	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.0	0.0	0.0	0.1	0.1
13	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0
14	0.1	0.0	0.0	0.8	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.2
15	0.5	0.0	0.0	0.0	0.0	0.0	0.6	2.3	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.5	0.0	0.2	0.0
17	0.6	0.1	0.8	0.0	0.0	0.1	0.0	0.0	0.6	0.0	0.1	0.0
18	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
20	0.0	0.0	0.0	0.1	0.0	0.7	1.6	0.1	0.1	0.0	0.0	0.1
21	0.0	0.0	0.0	0.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.1
22	0.0	0.2	0.0	0.8	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0
23	0.0	0.2	0.0	0.1	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.1
24	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.1
25	0.0	0.1	0.0	1.9	0.0	0.4	0.0	0.0	0.1	0.1	0.0	0.0
26	0.0	0.0	0.0	0.5	1.6	1.3	2.0	0.0	0.0	0.3	0.2	0.0
27	0.0	0.2	0.3	0.1	5.7	0.0	0.1	0.0	0.0	0.1	0.2	0.0
28	0.0	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.3
29	0.0	4.7	0.0	0.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.1
30	0.0	4.9	0.3	0.2	---	0.1	0.0	0.0	0.1	0.0	0.0	0.0
31	0.0	---	0.7	0.1	---	0.0	---	0.1	---	0.0	0.0	---
TOTAL	2.2	11.5	10.6	12.4	10.0	15.2	6.6	8.4	2.4	1.2	10.4	3.2

CAL YR 2003 TOTAL 65.0
WTR YR 2004 TOTAL 94.1

HAWAII, ISLAND OF OAHU

213732158010201. State Key Number 897.11 Kamananui rain gage at altitude 720 feet, Oahu.

LOCATION.--Lat 21°37'32", long 158°01'02", Old Hawaiian Datum, Hydrologic Unit 20060000, 5.5 mi west of Bringham Young University Hawaii, and 4.0 mi southeast of Sunset Elementary School.

PERIOD OF RECORD.--Continuous-record station, October 2003 to current year.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. standard rain can attached to a float system with an electronic data logger recording rainfall at 15-minute intervals. 8-in. rain can replaced on December 29, 2003 with a 7 5/16-in. rain can. Elevation of gage is 720 ft above mean sea level (from altimeter).

REMARKS.--Records poor. Rainfall recorded in twelths of an inch until December 29, tenths of an inch thereafter.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.44	1.30	0.10	0.30	0.00	---	---	---	---	---
2	0.84	0.12	0.60	3.00	0.00	2.40	0.40	---	---	---	---	---
3	0.24	0.12	0.24	0.20	0.00	0.20	1.10	---	---	---	---	---
4	0.12	0.24	0.60	0.00	0.20	0.20	0.40	---	---	---	---	---
5	0.00	0.00	1.32	0.00	0.50	0.00	0.00	---	---	---	---	---
6	0.00	0.12	0.12	0.00	0.30	0.20	0.00	---	---	---	---	---
7	0.00	0.36	4.20	0.10	2.00	0.50	0.00	---	---	---	---	---
8	0.72	0.12	0.36	0.00	0.00	0.70	0.00	---	---	---	---	---
9	0.12	0.00	---	0.00	0.00	0.00	0.40	---	---	---	---	0.00
10	0.12	0.12	---	0.00	0.00	0.50	0.70	---	---	---	---	0.00
11	0.36	0.00	---	0.00	0.10	0.10	0.00	---	---	---	---	0.00
12	0.24	0.12	---	0.20	0.00	0.00	0.20	---	---	---	---	0.30
13	0.12	0.48	---	0.00	0.00	1.00	0.00	---	---	---	---	0.30
14	0.84	0.48	---	0.40	0.00	0.00	0.10	---	---	---	---	0.20
15	0.24	0.36	---	0.00	0.00	0.00	1.80	---	---	---	---	0.10
16	0.00	0.12	---	0.00	0.00	0.00	0.30	---	---	---	---	0.00
17	0.00	0.00	---	0.00	0.00	0.00	0.40	---	---	---	---	0.40
18	0.00	0.24	---	0.00	0.00	0.00	0.00	---	---	---	---	0.00
19	0.00	0.12	---	0.00	0.00	0.00	0.30	---	---	---	---	0.20
20	0.00	0.00	---	0.10	0.00	0.60	0.40	---	---	---	---	0.40
21	0.00	0.12	---	0.00	0.00	2.90	0.00	---	---	---	---	0.30
22	0.00	0.24	---	1.90	0.00	0.40	0.00	---	---	---	---	0.60
23	0.00	0.60	---	0.20	0.00	1.40	---	---	---	---	---	0.50
24	0.12	0.00	0.00	0.20	0.00	0.00	---	---	---	---	---	0.20
25	0.00	0.12	0.00	0.20	0.00	0.40	---	---	---	---	---	0.20
26	0.00	0.00	0.00	0.50	0.30	0.00	---	---	---	---	---	0.10
27	0.00	0.12	0.36	0.00	4.80	0.00	---	---	---	---	---	0.20
28	0.00	0.00	0.36	0.40	0.00	0.30	---	---	---	---	---	0.00
29	0.00	5.16	0.00	0.20	0.00	1.80	---	---	---	---	---	0.00
30	0.00	0.72	0.80	0.50	---	0.20	---	---	---	---	---	0.10
31	0.00	---	0.60	0.40	---	0.00	---	---	---	---	---	---
TOTAL	4.08	10.20	---	9.80	8.30	14.10	---	---	---	---	---	---

No daily record December 9 to December 23. Accumulated rainfall for this period is 3.16 inches.

HAWAII, ISLAND OF OAHU

213608158011101. State Key Number 897.9 Pupukea Road rain gage at altitude 1,160 ft near Haleiwa, Oahu (formerly published as Pupukea Road rain gage at altitude 1,600 ft near Haleiwa, Oahu).

LOCATION.--Lat 21°36'08", long 158°01'11", Old Hawaiian Datum, Hydrologic Unit 20060000, 4.3 mi southeast of Maunawai, 5.5 mi east of Haleiwa Beach Park, and 400 ft left of the road on the ridge.

PERIOD OF RECORD.--Continuous-record station, November 1, 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain collector attached to 8-in. storage can with a float-type system attached to an electronic data logger. Elevation of gage is 1,160 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for periods of missing record which are poor. Rainfall recorded in 0.12-inch increments.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	---	---	1.20	0.12	0.60	0.12	0.00	0.00	0.12	0.00	---
2	0.48	---	---	3.24	0.00	1.56	0.24	0.00	0.24	0.24	---	---
3	0.24	---	---	0.36	0.00	0.12	1.20	0.24	0.00	0.12	---	---
4	0.00	---	---	0.00	0.24	0.48	0.48	0.48	0.24	0.00	---	---
5	0.00	---	---	0.00	0.84	0.12	0.00	0.12	0.00	0.12	---	---
6	0.00	---	---	0.00	0.36	0.00	0.00	0.12	0.00	0.00	---	---
7	0.24	---	---	0.00	1.32	0.36	0.00	0.12	0.36	0.12	---	---
8	0.96	---	---	0.00	0.00	0.84	0.00	0.00	0.36	0.12	---	---
9	0.12	---	---	0.00	0.00	0.00	0.96	0.00	0.72	0.12	---	---
10	0.24	---	---	0.00	0.00	0.36	0.72	0.12	0.24	0.00	---	---
11	0.12	---	---	0.00	0.12	0.00	0.00	1.44	0.12	0.00	---	---
12	0.24	---	---	0.00	0.00	0.00	0.12	0.00	0.36	0.12	---	---
13	0.12	---	---	0.00	0.00	0.72	0.00	0.24	0.24	0.36	---	---
14	0.60	---	---	0.24	0.00	0.24	0.00	0.00	0.00	0.36	---	---
15	0.24	---	---	0.00	0.00	0.00	1.32	0.84	0.00	0.00	---	---
16	0.00	---	---	0.00	0.00	0.00	0.60	0.00	0.24	0.00	---	---
17	0.00	---	---	0.00	0.00	0.00	0.12	0.00	0.12	0.00	---	---
18	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.24	0.00	---	---
19	0.00	---	---	0.12	0.00	0.00	0.12	0.00	0.00	0.12	---	---
20	0.00	---	---	0.12	0.00	0.36	0.24	0.00	0.72	0.00	---	---
21	0.00	---	---	0.00	0.00	2.40	0.12	0.00	0.12	0.00	---	---
22	0.00	---	---	1.68	0.00	1.08	0.00	0.00	0.84	0.00	---	---
23	0.00	---	---	0.36	0.00	1.20	0.00	0.00	0.24	0.00	---	---
24	---	---	---	0.12	0.00	0.24	0.00	0.00	0.00	0.00	---	---
25	---	---	---	0.72	0.00	0.36	0.00	0.12	0.00	0.00	---	---
26	---	---	---	0.36	0.36	0.24	0.72	0.00	0.00	0.24	---	---
27	---	---	---	0.00	4.68	0.00	0.00	0.48	0.12	0.48	---	---
28	---	---	---	0.36	0.00	0.24	0.00	0.36	0.24	0.60	---	---
29	---	---	---	0.36	0.12	1.32	0.00	0.12	0.12	0.00	---	---
30	---	---	0.84	0.48	---	0.12	0.00	0.24	0.36	0.00	---	---
31	---	---	1.08	0.36	---	0.00	---	0.12	---	0.24	---	---
TOTAL	---	---	---	10.08	8.16	12.96	7.08	5.16	6.24	3.48	---	---

CALYR TOTAL (2003) 55.06 in.
WTR YR TOTAL (2004) e92.03 in.

Total accumulated rainfall from October 24 to December 29 is 21.22 inches. Estimated total accumulated rainfall from August 2 to September 30 is 12.37 inches.

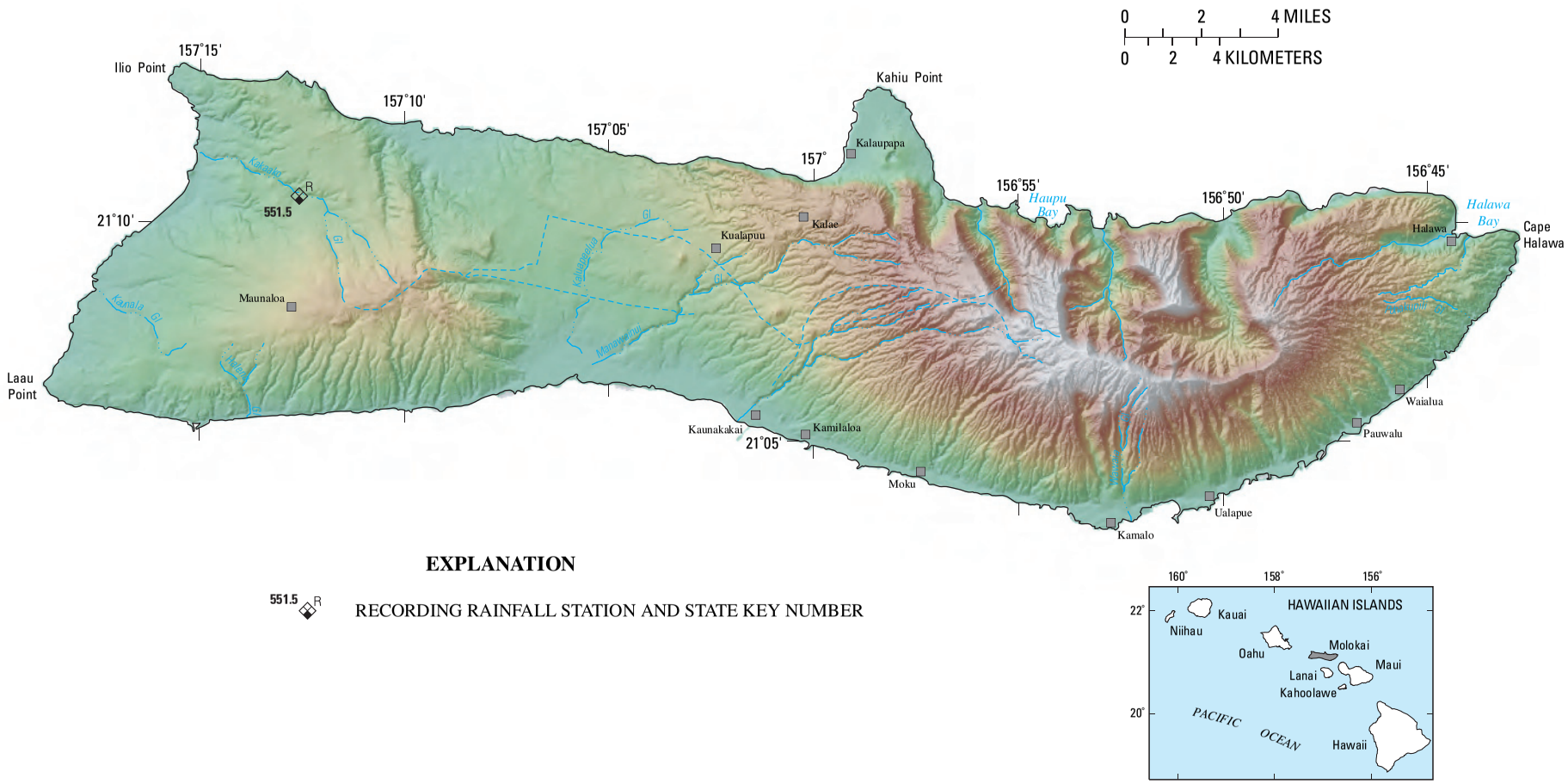


Figure 23. Locations of rainfall stations on Molokai.

HAWAII, ISLAND OF MOLOKAI

211039157123101. State Key Number 551.5 Kakaako rain gage near Mauna Loa, Molokai.

LOCATION.--Lat 21°10'39", long 157°12'31", Old Hawaiian Datum, Hydrologic Unit 20050000, at discontinued USGS stream-gaging station 16411400 on left bank, 1.0 mi downstream of Kamakahi Gulch, and 3.0 mi north of Mauna Loa school.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment and an 8-in. National Weather Service rain gage used as a backup accumulation can. Elevation of gage is 380 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.10	1.80	4.89	0.09	0.16	0.09	0.00	0.00	0.00	0.01	---
2	0.04	0.00	0.02	5.84	0.00	0.75	0.03	0.00	0.00	0.02	0.47	---
3	0.11	0.00	0.01	1.33	0.00	0.16	0.00	0.00	0.00	0.00	0.02	---
4	0.00	0.00	0.02	0.00	0.00	0.00	0.20	0.36	0.03	0.00	2.99	---
5	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.00	---
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	---
7	0.16	0.00	0.01	0.00	0.07	0.02	0.00	0.00	0.02	0.62	0.07	---
8	0.01	0.00	0.09	0.03	0.01	0.00	0.02	0.02	0.00	0.00	0.00	---
9	0.00	0.00	0.05	0.00	0.00	0.00	0.38	0.00	0.21	0.00	0.00	---
10	0.00	0.00	0.08	0.00	0.95	0.00	0.05	0.00	0.00	0.00	0.00	---
11	0.03	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01	0.01	0.06	---
12	0.00	0.00	0.10	0.15	0.03	0.00	0.00	0.00	0.00	0.00	0.01	---
13	0.00	0.22	0.00	0.01	0.00	0.16	0.00	0.00	0.00	0.00	0.00	---
14	0.00	0.00	0.00	0.09	0.02	0.03	0.00	0.00	0.00	0.00	0.00	---
15	0.00	0.04	0.05	0.00	0.07	0.00	0.01	3.53	0.00	0.01	0.00	---
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.38	0.05	0.00	---
17	0.00	0.00	0.27	0.00	0.00	0.00	0.08	0.00	0.00	0.08	0.00	---
18	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.00	---
19	0.00	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---
20	0.00	0.00	0.00	0.22	0.00	0.02	0.06	0.29	0.01	0.00	0.04	---
21	0.00	0.06	0.00	0.00	0.00	0.31	0.47	0.00	0.01	0.00	0.07	---
22	0.00	0.14	0.00	0.50	0.01	1.38	0.00	0.00	0.00	0.00	0.00	---
23	0.00	0.05	0.00	1.02	0.00	1.34	0.00	0.00	0.00	0.00	0.20	---
24	0.00	0.00	0.00	0.50	0.00	0.05	0.00	0.00	0.00	0.00	0.01	---
25	0.00	0.48	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	---
26	0.00	0.00	0.00	0.00	0.24	0.12	0.50	0.00	0.00	0.00	0.02	---
27	0.00	0.00	0.21	0.00	1.73	0.00	0.00	0.00	0.00	0.00	0.00	---
28	0.00	0.00	3.42	0.00	0.77	0.03	0.00	0.00	0.00	0.00	0.02	---
29	0.01	2.28	0.00	0.00	0.21	0.17	0.00	0.00	0.00	0.00	0.05	---
30	0.00	0.97	0.00	0.27	---	0.39	0.00	0.00	0.01	0.00	---	---
31	0.30	---	0.01	0.00	---	0.00	---	0.00	---	0.03	---	---
TOTAL	0.66	4.45	6.33	14.89	4.25	5.09	1.91	4.34	0.71	0.84	---	---

CAL YR 2003 TOTAL 25.44

Data logger reading Aug 30, 2004 (1532) to Oct 6, 2004 (1500): 1.34 inches

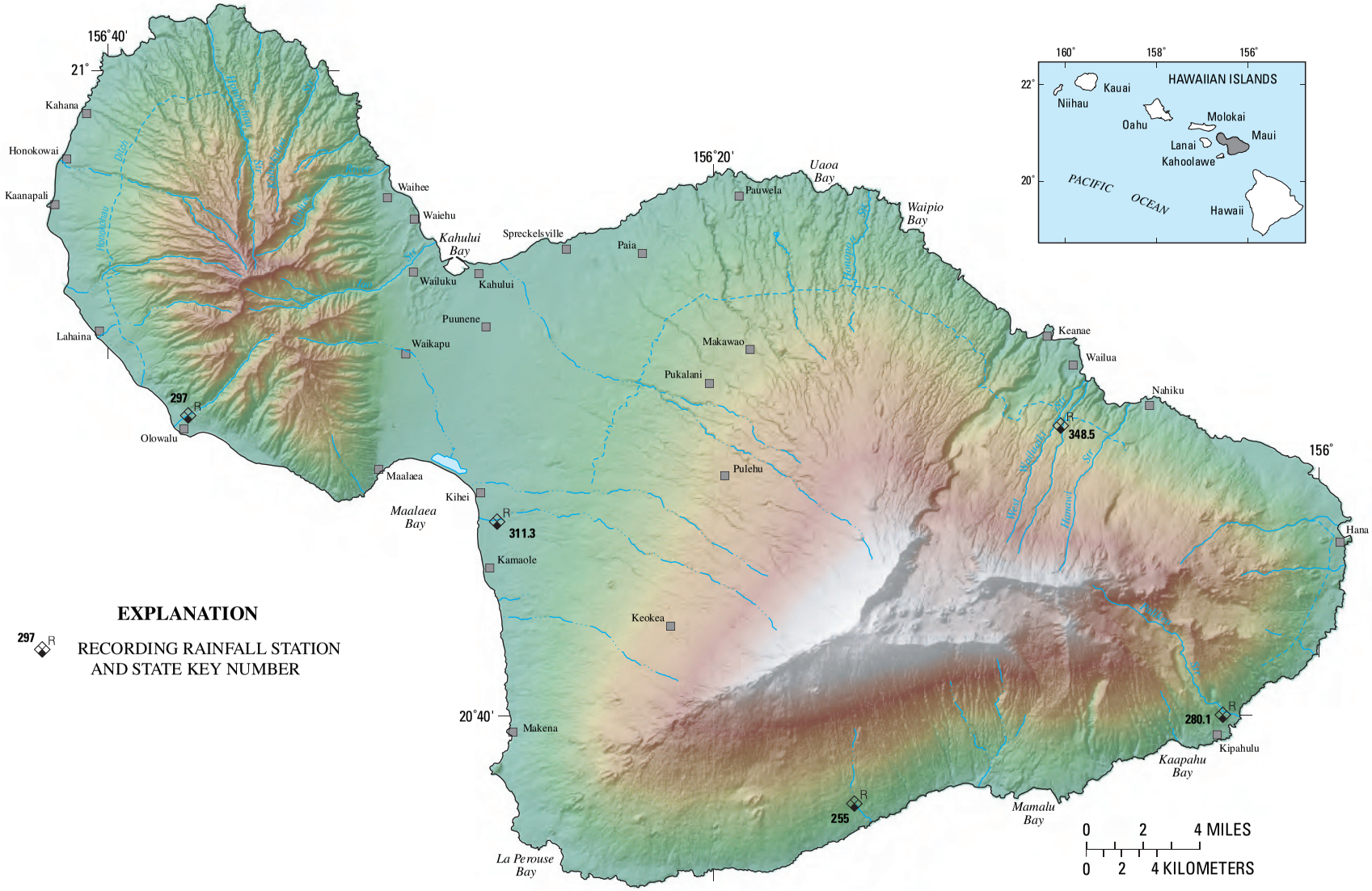


Figure 24. Locations of rainfall stations on Maui.

HAWAII, ISLAND OF MAUI

203721156151601. State Key Number 255.0 Kepuni Gulch rain gage near Kaupo, Maui.

LOCATION.--Lat 20°37'21", long 156°15'16", Old Hawaiian Datum, Hydrologic Unit 20020000, near USGS stream-gaging station 16500100 on right bank, 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui house, and 8.5 mi west of Kaupo.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 750 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.05	1.43	0.65	0.00	0.35	0.00	0.07	0.00	0.00	0.00	0.00
2	0.00	0.13	0.67	1.07	0.00	0.05	0.00	0.00	0.00	0.00	0.42	0.00
3	0.00	0.07	0.00	4.48	0.33	1.00	0.00	0.00	0.00	0.00	4.51	0.00
4	0.00	0.37	0.00	0.06	0.07	0.01	0.00	0.00	0.00	0.00	0.05	0.00
5	0.00	0.25	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.12	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.70	0.00	0.00	0.03	0.00
8	0.01	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.01	0.00
9	0.00	0.00	0.04	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
10	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.04	0.00	0.00	0.00	0.00	0.58	0.00	0.01	0.00	0.00	0.00	0.00
12	0.03	0.01	0.00	0.06	0.13	0.15	0.00	0.16	0.00	0.00	0.00	0.00
13	0.01	0.00	0.00	0.54	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.02	0.00	1.69	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.05	0.00	0.01	0.87	0.00	0.00	0.00	0.00
16	0.47	0.03	0.00	0.00	0.01	0.00	0.08	1.79	0.00	0.00	0.00	0.00
17	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.21	0.00	0.00	0.00	0.17
20	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
21	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
23	0.27	0.00	0.00	0.93	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.22	0.00	0.18	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00
26	0.15	0.00	0.02	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
27	0.29	0.00	0.07	0.00	3.57	0.46	0.05	0.00	0.00	0.00	0.00	0.00
28	0.10	0.04	0.11	0.00	0.90	0.00	0.00	0.02	0.00	0.01	0.00	0.00
29	0.00	1.50	0.10	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.06	0.65	0.00	0.00	---	0.00	0.00	0.30	0.00	0.00	0.00	0.00
31	0.00	---	0.28	0.04	---	0.02	---	0.00	---	0.00	0.00	---
TOTAL	1.43	3.53	2.97	9.70	6.31	3.95	0.45	4.15	0.00	0.01	5.02	0.17

CAL YR 2003 TOTAL 20.36
WTR YR 2004 TOTAL 37.69

HAWAII, ISLAND OF MAUI

204017156031701. State Key Number 280.1 Oheo Gulch rain gage at dam near Kipahulu, Maui.

LOCATION.--Lat 20°40'17", long 156°03'17", Old Hawaiian Datum, Hydrologic Unit 20020000, at USGS stream-gaging station 16501200 on right bank, 31 ft. upstream from dam, 0.8 mi. upstream from mouth, and 1.0 mi north of Kipahulu church.

PERIOD OF RECORD.--January 2002 to current year.

GAGE.--Data logger with a .01-in. tipping bucket attachment. Elevation of gage is 420 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.25	0.50	0.74	0.28	0.11	0.07	0.01	0.06	0.23	0.01	0.01
2	0.00	0.33	0.10	0.68	0.06	0.02	0.04	0.05	0.35	0.78	0.90	0.01
3	0.00	0.05	0.07	5.24	0.22	0.51	0.18	0.01	0.13	0.14	3.22	0.00
4	0.00	0.66	0.74	1.59	0.24	0.26	0.00	0.85	0.04	0.05	0.01	0.00
5	0.00	0.66	2.28	0.01	0.47	0.34	0.03	0.78	0.19	0.05	0.03	0.00
6	0.23	0.22	0.70	0.00	0.16	0.20	0.01	0.28	0.01	0.17	0.51	0.00
7	0.43	0.27	0.06	0.00	1.67	0.18	0.12	0.04	0.27	0.00	0.14	0.00
8	0.18	0.00	0.43	0.00	0.08	0.14	0.97	0.00	0.15	0.01	0.47	0.00
9	0.03	0.02	0.25	0.00	0.00	0.00	1.22	0.00	0.14	0.11	0.43	0.27
10	0.09	0.32	1.19	0.00	0.01	0.02	0.56	0.00	0.28	0.05	0.23	0.26
11	1.32	0.16	0.01	0.00	0.23	0.71	0.28	0.26	0.17	0.23	0.26	0.22
12	0.70	0.34	0.22	0.13	0.00	0.01	1.17	0.00	0.66	0.81	0.24	0.16
13	0.51	0.40	0.13	0.27	0.17	0.48	0.37	0.01	0.07	0.66	0.26	0.30
14	0.90	0.85	0.06	2.40	0.01	0.26	0.03	0.22	0.01	0.26	0.28	1.08
15	0.29	0.34	0.05	0.01	0.12	0.00	0.50	0.67	0.33	0.49	0.09	0.19
16	1.23	0.45	0.04	0.00	0.01	0.00	0.18	2.23	0.42	0.21	0.68	0.24
17	0.25	0.12	0.00	0.00	0.04	0.00	0.15	0.00	0.01	0.00	0.08	0.68
18	0.00	0.44	0.02	0.00	0.24	0.00	0.00	0.00	0.10	0.00	0.01	0.44
19	0.00	0.52	0.02	0.07	0.00	0.34	1.23	0.09	0.22	0.00	0.00	0.32
20	0.05	0.00	0.03	0.10	0.00	0.14	0.22	0.00	0.37	0.00	0.02	0.20
21	0.04	0.00	0.00	0.01	0.00	0.62	0.29	0.02	0.17	0.00	0.27	0.03
22	0.01	0.00	0.00	0.02	0.06	10.51	0.89	0.20	0.19	0.00	1.26	1.19
23	0.03	0.00	0.02	0.76	0.03	0.32	0.84	0.27	0.18	0.02	0.14	0.86
24	0.00	0.11	0.00	0.00	0.34	0.03	0.08	0.35	0.04	0.16	0.06	0.48
25	0.00	0.01	0.18	2.26	0.12	4.15	0.17	0.36	0.27	0.03	0.10	0.16
26	0.00	0.00	0.34	0.42	0.23	0.28	0.19	0.04	0.22	0.24	0.67	0.23
27	0.01	0.00	0.03	0.21	2.38	2.94	0.00	0.80	0.30	0.33	0.06	0.19
28	0.00	3.15	0.15	0.12	1.04	0.01	0.00	1.17	0.72	0.32	0.18	0.03
29	0.00	2.40	0.14	0.34	0.07	0.56	0.00	0.71	0.69	0.00	0.00	0.29
30	0.16	0.70	0.01	0.49	---	0.69	0.00	1.91	0.25	0.18	0.04	0.63
31	0.14	---	0.47	0.42	---	0.49	---	0.55	---	0.13	0.05	---
TOTAL	6.60	12.77	8.24	16.29	8.28	24.32	9.79	11.88	7.01	5.66	10.70	8.47

CAL YR 2003 TOTAL 83.92
WTR YR 2004 TOTAL 130.01

HAWAII, ISLAND OF MAUI

204923156371501. State Key Number 297.0 Olowalu rain gage at Olowalu, Maui.

LOCATION.--Lat 20°49'23", long 156°37'15", Old Hawaiian Datum, Hydrologic Unit 20020000, at USGS stream-gaging station 16646200 on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a tipping basket attachment. A Standard 8-in. National Weather Service accumulation can also was installed as a backup. Elevation of gage is 130 ft (from topographic map).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	3.89	e3.03	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	1.45	e1.81	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.00
3	0.00	0.00	0.00	e0.89	0.00	0.03	0.00	0.07	0.00	0.00	0.28	0.00
4	0.00	0.00	0.00	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	e0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	e0.08	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.01	e0.13	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	e1.20	0.00	0.01	0.00	0.07	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	e0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00
10	0.00	0.00	0.00	e0.00	0.11	0.01	0.02	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	e0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.01	e0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.05	0.00	e0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	e0.00	0.00	0.11	0.00	0.15	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	e0.79	0.02	0.00	0.00	0.28	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00
17	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00
23	0.00	0.00	0.00	2.71	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
24	0.03	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.05	0.00	0.06	0.00	0.00	0.01	0.00	0.00	0.00
26	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.18	0.03	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.14	0.01	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	0.09	0.00	---	0.01	---	0.00	---	0.00	0.00	---
TOTAL	0.03	0.06	5.79	10.96	4.46	0.40	0.07	1.66	0.02	0.00	0.37	0.01

CAL YR 2003 TOTAL 10.79
WTR YR 2004 TOTAL 23.83

e Estimated

HAWAII, ISLAND OF MAUI

204606156270301. State Key Number 311.3 Kulanihakoi rain gage near Kihei, Maui.

LOCATION.--Lat 20°46'06", long 156°27'03", Old Hawaiian Datum, Hydrologic Unit 20020000, at USGS stream-gaging station 16660000 on right bank, 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi northeast of Kihei.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 35 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	2.98	0.99	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.78	1.38	0.00	0.11	0.00	0.00	0.00	0.00	0.09	0.00
3	0.00	0.00	0.00	4.24	0.00	0.60	0.00	0.00	0.00	0.00	0.32	0.00
4	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.16	0.00	0.48	0.00	0.87	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00
17	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
20	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
21	0.00	0.01	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.02	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.05	0.00	1.29	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.18	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.01	0.00	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.12	0.00	0.85	0.01	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.04	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	---	0.19	0.00	---	0.01	---	0.00	---	0.00	0.00	---
TOTAL	0.04	0.49	4.25	8.41	3.98	1.95	0.07	3.65	0.00	0.00	0.41	0.00

CAL YR 2003 TOTAL 9.91
WTR YR 2004 TOTAL 23.25

HAWAII, ISLAND OF MAUI

204916156083701. State Key Number 348.5 West Wailuaiki rain gage near Keanae, Maui.

LOCATION.--Lat 20°49'16", long 156°08'37", Old Hawaiian Datum, Hydrologic Unit 20020000, at USGS stream-gaging station 16518000 on left bank 500 ft. upstream from Koolau ditch crossing and 2.8 mi south of Keanae.

PERIOD OF RECORD.--November 2002 to current year.

GAGE.--Electronic data logger with a 8 inch diameter tipping bucket. A 6 inch diameter tipping bucket was installed on June 8, 2004. Elevation of gage is 1,343 ft (by vertical levels).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.20	0.61	1.14	0.00	---	0.23	---	---	---	---	0.01
2	0.00	0.17	0.73	0.49	0.00	---	1.39	---	---	---	---	0.00
3	0.00	0.56	1.91	2.87	0.03	---	0.28	---	---	---	---	0.00
4	0.00	0.75	7.46	0.06	e0.06	---	0.26	---	---	---	---	0.00
5	0.00	0.63	3.46	0.01	1.78	---	0.05	---	---	---	---	0.00
6	0.23	0.35	0.66	0.00	0.63	---	0.05	---	---	---	---	0.00
7	0.73	0.39	0.37	0.00	1.57	---	0.00	---	---	---	---	0.00
8	0.99	0.05	1.64	0.00	0.17	---	0.02	---	---	---	---	0.00
9	0.10	0.13	1.87	0.00	0.00	---	3.20	---	---	---	---	0.06
10	0.26	1.37	3.27	0.00	0.00	---	1.89	---	---	---	---	0.58
11	1.29	0.34	0.29	0.00	0.00	---	2.86	---	---	---	0.08	0.61
12	0.72	0.76	0.52	0.00	0.63	---	6.57	---	---	---	0.33	0.37
13	1.38	1.23	0.46	0.00	---	---	0.88	---	---	---	0.29	0.61
14	1.37	1.45	0.16	0.00	---	---	0.70	---	---	---	0.14	0.31
15	1.52	1.18	0.31	0.00	---	---	0.75	---	---	---	0.14	0.12
16	1.48	2.32	0.00	0.00	---	---	0.70	---	---	---	1.63	0.51
17	0.22	0.57	0.74	0.00	---	---	0.78	---	---	---	0.01	0.64
18	0.03	1.79	0.22	0.00	---	---	0.03	---	---	---	0.00	0.42
19	0.00	2.38	0.10	0.00	---	---	2.15	---	---	---	0.00	0.62
20	0.00	0.08	0.01	0.00	---	---	0.14	---	---	---	0.14	0.02
21	0.00	0.31	0.02	0.54	---	---	0.21	---	---	---	0.14	0.07
22	0.00	0.01	0.00	0.01	---	3.29	0.60	---	---	---	2.42	0.55
23	0.00	0.08	0.36	0.66	---	3.22	0.83	---	---	---	0.76	1.01
24	0.00	0.03	0.10	3.05	---	1.41	0.73	---	---	---	0.34	0.80
25	0.00	0.00	0.00	2.74	---	3.71	0.31	---	---	---	0.07	0.31
26	0.00	0.00	0.01	2.19	---	0.21	3.17	---	---	---	1.02	0.85
27	0.00	0.07	0.02	0.03	---	0.37	0.38	---	---	---	0.28	0.13
28	0.00	8.66	0.46	0.27	---	0.37	0.21	---	---	---	0.21	0.47
29	0.00	2.78	0.09	0.01	---	2.96	---	---	---	---	0.11	0.06
30	0.00	0.06	0.17	0.00	---	3.41	---	---	---	---	0.02	1.04
31	0.38	---	0.37	0.00	---	2.00	---	---	---	---	0.03	---
TOTAL	10.70	28.70	26.39	14.07	---	---	---	---	---	---	---	10.17

CAL YR 2003 TOTAL 196.94

No data: Feb 13 to Mar 21 and Apr 29 to Jun 8.
Data logger total Jun 8 (1215) to Aug 11 (1315): 24.76 inches.
e Estimated

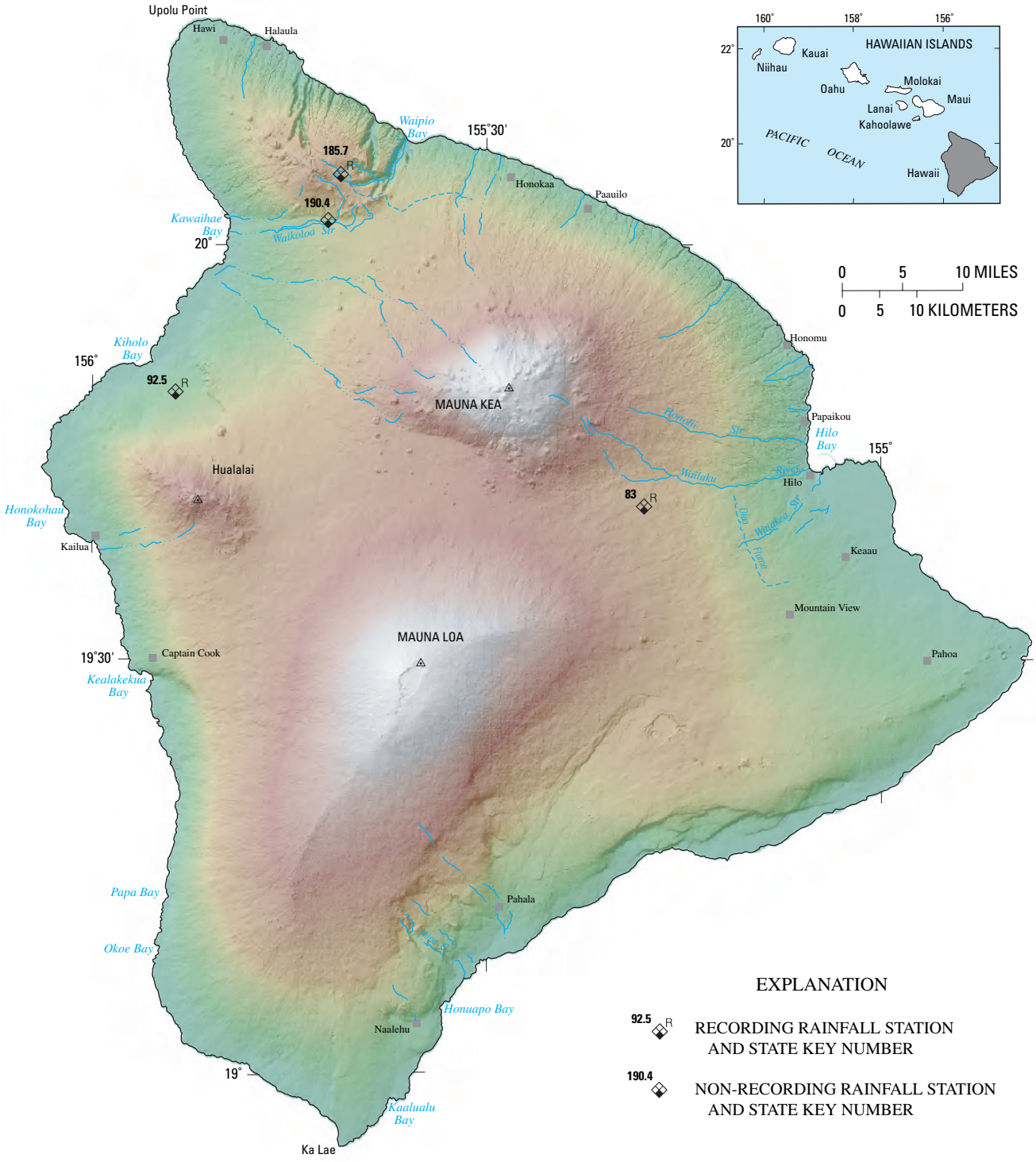


Figure 17. Locations of rainfall stations on Hawaii.

HAWAII, ISLAND OF HAWAII

194117155174801. State Key Number 83.0 Quarry at Saddle Road Rain Gage, Hawaii.

LOCATION.--Lat 19°41'17", long 155°17'48", Old Hawaiian Datum, Hydrologic Unit 20010000, 200 ft north of 16 mi marker on Saddle Road west of Hilo, at old quarry site.

PERIOD OF RECORD.--1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in National Weather Service receiver and rain can connected to tipping bucket attachment and data logger. Elevation of gage is 4,140 ft (from topographic map).

REMARKS.--Records good except for missing period which is poor. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	---	---	0.08	0.06	0.01	0.00	0.03	0.07	0.08	0.33	0.04
2	0.00	---	---	0.03	0.20	0.26	0.04	0.01	0.06	0.26	0.51	0.01
3	0.00	---	---	0.45	0.18	0.21	0.01	0.49	0.04	0.04	0.44	0.00
4	0.00	---	---	0.22	0.23	0.06	0.02	0.96	0.20	0.05	0.03	0.00
5	0.00	---	---	0.11	1.38	0.24	0.14	0.73	0.19	0.02	0.00	0.00
6	0.00	---	---	0.02	0.15	0.00	0.06	0.30	0.09	0.00	0.35	0.17
7	0.06	---	---	0.00	0.72	0.01	0.03	0.00	0.06	0.00	0.17	0.09
8	0.33	---	---	0.00	0.08	0.04	0.02	0.01	0.03	0.59	0.00	0.01
9	0.15	---	---	0.00	0.10	0.00	0.12	0.00	1.02	0.01	0.03	0.03
10	0.28	---	---	0.00	0.00	0.05	2.01	0.01	0.14	0.38	0.05	0.14
11	0.56	---	---	0.00	0.00	0.01	4.42	2.95	0.26	0.38	0.01	0.18
12	0.50	---	---	0.00	0.09	0.39	5.56	0.04	1.79	0.41	0.00	0.21
13	0.23	---	---	0.00	0.12	0.21	0.92	0.22	0.07	0.68	0.01	0.00
14	0.93	---	---	0.00	0.01	1.92	0.05	0.02	0.15	0.49	0.00	0.07
15	0.52	---	---	0.07	0.00	0.52	0.32	0.02	0.08	0.11	0.02	0.06
16	0.24	---	---	0.07	0.23	0.20	0.65	0.34	0.22	0.02	0.82	0.10
17	e0.05	---	---	0.00	0.02	0.15	4.01	0.15	0.00	0.00	0.01	0.08
18	---	---	e0.06	0.00	0.02	0.11	0.79	0.04	0.06	0.00	0.06	0.30
19	---	---	0.03	0.00	0.00	0.03	0.58	0.49	0.08	0.00	0.02	0.04
20	---	---	0.00	0.12	0.00	0.06	0.44	0.03	0.48	0.00	0.00	0.07
21	---	---	0.05	0.09	0.00	0.08	0.05	0.00	0.23	0.54	0.24	0.00
22	---	---	0.00	0.02	0.00	0.48	0.05	0.02	0.23	0.00	0.55	0.02
23	---	---	0.00	1.55	0.00	2.78	0.50	0.29	0.24	0.00	0.28	0.06
24	---	---	0.01	0.01	0.18	8.37	0.13	0.37	0.12	0.16	0.02	0.01
25	---	---	0.05	2.27	0.13	1.56	0.13	0.39	0.26	0.00	0.00	0.00
26	---	---	0.00	0.67	0.05	0.20	0.26	0.56	0.12	0.09	0.27	0.08
27	---	---	0.14	0.11	0.73	0.16	0.37	0.42	0.05	0.53	0.12	0.03
28	---	---	0.38	0.27	2.44	0.00	0.11	0.59	0.28	0.80	0.00	0.11
29	---	---	2.22	3.63	0.01	0.39	0.09	0.35	0.14	0.00	0.17	0.07
30	---	---	0.24	2.60	---	2.89	0.09	0.43	0.04	0.05	0.01	0.28
31	---	---	0.22	1.71	---	2.84	---	0.27	---	0.05	0.00	---
TOTAL	---	---	---	14.10	7.13	24.23	21.97	10.53	6.80	5.74	4.52	2.26

e Estimated

HAWAII, ISLAND OF HAWAII

194945155534402. State Key Number 92.5 Kiholo Rain Gage, Hawaii.

LOCATION.--Lat 19°49'45", long 155°53'44", Old Hawaiian Datum, Hydrologic Unit 20010000, 2.7 mi inland from Kiholo Bay.

PERIOD OF RECORD.--October 2002 to current year.

GAGE.--Standard 8-in. National Weather Service receiver and rain can connected to tipping bucket attachment and data logger. Elevation of gage is 931 ft (from survey).

REMARKS.--Records good except for missing period which is poor. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	1.25	0.02	0.00	0.72	0.00	0.00	0.03	0.00	0.00	0.05
2	0.45	0.00	0.03	0.04	0.00	0.58	0.02	0.00	0.03	0.00	0.07	0.00
3	0.00	0.00	0.00	0.58	0.00	0.13	0.00	0.00	0.00	0.00	1.48	0.00
4	0.00	0.00	0.00	1.60	0.00	0.13	0.00	0.00	0.00	0.08	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.01	0.00	0.00	0.00	0.00	0.28	0.17	0.00	0.02	0.00	0.00
7	0.00	0.00	0.55	0.00	1.23	0.00	0.00	5.28	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.03	0.00	0.00	0.00	0.24
9	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00
10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
11	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.36	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.01	0.00	0.37	0.09	0.12	0.00	0.01	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	1.13	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.46	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	---
22	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	---
23	0.00	0.00	0.00	0.49	0.00	0.07	0.29	0.00	0.00	0.02	0.00	---
24	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.08	0.00	0.01	0.00	---
25	0.00	0.00	0.00	0.21	0.00	0.30	0.00	0.00	0.00	0.16	0.00	---
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.10	0.08	---
27	0.07	0.00	0.17	0.00	1.87	0.00	0.00	0.00	0.00	0.00	0.00	---
28	0.00	0.00	0.54	0.00	2.83	0.00	0.00	0.03	0.00	1.20	0.00	---
29	0.00	0.00	0.25	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03	---
30	0.00	0.00	0.00	0.00	---	0.01	0.00	0.00	0.00	0.00	0.16	---
31	0.14	---	0.10	0.00	---	0.15	---	0.00	---	0.00	0.00	---
TOTAL	0.67	0.01	2.89	2.94	5.98	2.85	2.59	6.65	1.90	1.59	1.83	---

CAL YR 2003 TOTAL 11.19

Accumulated total Sep 21 (0000) to Oct 15 (1200), 0.69 inches

HAWAII, ISLAND OF HAWAII

200518155405801. State Key Number 185.7 Kawainui Rain Gage, Hawaii.

LOCATION.--Lat 20°05'18", long 155°40'58", Old Hawaiian Datum, Hydrologic Unit 20010000, on left bank 125 ft upstream from Upper Hamakua Ditch intake and 4.5 mi north of Kamuela.

PERIOD OF RECORD.--February 2002 to current year.

GAGE.--Standard 8-inch National Weather Service receiver and rain can connected to tipping bucket attachment and data logger. Elevation of gage is 4,060 ft (from topographic map).

REMARKS.--Records good except for estimated periods, which are fair. Rainfall recorded in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.02	0.81	---	1.13	1.08	0.04	0.06	0.58	0.38	0.71	0.00
2	0.00	0.02	e0.19	---	0.94	1.07	0.80	0.04	0.54	0.84	1.17	0.00
3	0.00	0.63	---	---	0.01	1.17	0.00	0.83	0.33	0.07	0.65	0.00
4	0.00	0.37	---	---	0.86	0.00	0.17	2.63	0.99	0.23	0.03	0.01
5	0.18	0.01	---	---	0.90	0.09	0.38	0.83	0.38	0.17	0.18	0.31
6	0.02	0.16	---	---	0.48	0.05	0.07	0.68	0.10	0.00	0.88	0.01
7	0.14	0.38	---	---	2.11	0.96	0.01	1.29	0.46	0.00	0.10	0.00
8	0.28	0.50	---	---	0.00	3.18	0.07	0.02	0.39	0.05	0.11	0.00
9	0.01	0.16	---	---	0.01	0.01	0.64	0.00	0.74	0.07	0.00	0.00
10	0.26	0.37	---	---	0.00	0.02	7.39	0.00	0.13	0.78	0.00	0.55
11	0.27	0.17	---	---	0.00	0.00	8.57	0.26	0.36	0.00	0.00	0.16
12	0.18	0.30	---	---	0.01	0.00	5.91	0.02	0.01	0.21	0.01	0.31
13	0.57	0.30	---	---	0.00	3.98	0.86	0.04	0.02	0.28	0.59	0.16
14	0.44	0.55	---	---	0.01	10.94	0.16	0.11	0.77	0.95	0.01	0.27
15	0.56	0.58	---	---	0.03	1.62	0.21	0.01	0.40	0.25	0.42	0.19
16	1.57	1.08	---	---	0.92	0.50	1.04	1.70	0.00	0.09	1.35	0.36
17	0.00	0.29	---	---	0.11	0.15	3.35	0.01	0.03	0.12	0.04	0.68
18	0.00	1.45	---	---	0.00	0.01	1.10	0.00	0.35	0.00	0.01	0.17
19	0.00	2.19	---	---	0.11	0.00	1.31	0.11	0.61	0.00	0.00	0.00
20	0.01	0.30	---	---	0.24	0.05	0.14	0.00	0.53	0.00	0.20	0.00
21	0.00	0.50	---	---	0.03	0.34	0.19	0.05	1.20	0.33	0.87	0.00
22	0.00	0.01	---	e0.00	0.01	3.21	0.08	0.06	0.25	0.07	1.04	0.08
23	0.00	0.03	---	1.15	0.00	4.83	0.40	0.36	0.39	0.00	0.43	0.07
24	0.00	0.02	---	0.01	0.62	3.38	0.63	0.13	0.26	0.01	0.00	0.00
25	0.00	0.70	---	1.96	0.06	1.89	0.31	0.83	0.06	0.01	0.00	0.01
26	0.00	0.79	---	2.80	0.00	0.60	2.16	1.10	0.20	0.09	0.05	0.00
27	0.00	0.00	---	0.07	1.40	0.01	0.26	0.99	0.08	0.66	0.07	0.01
28	0.00	0.11	---	1.33	3.40	1.72	0.04	0.06	0.97	0.95	0.11	0.06
29	0.00	0.75	---	3.48	0.00	0.75	0.03	1.68	0.07	0.09	0.68	0.01
30	0.00	0.20	---	1.17	---	3.67	0.46	0.57	0.01	0.05	0.00	0.14
31	0.02	---	---	0.70	---	1.73	---	0.45	---	0.00	0.00	---
TOTAL	4.51	12.94	---	---	13.39	47.01	36.78	14.92	11.21	6.75	9.71	3.56

Estimated total rainfall Dec 3 (0000) to 31 (2400), 10.51 inches.
Estimated total rainfall Jan 1 (0000) to 21 (2400), 2.31 inches.
e Estimated.

HAWAII, ISLAND OF HAWAII

200148155420501. State Key Number 190.4 Keanuiomano Rain Gage near Kamuela, Hawaii.

LOCATION.--Lat 20°01'48", long 155°42'05", Old Hawaiian Datum, Hydrologic Unit 20010000, in USGS stream-gaging station 16756500 on left bank, 150 ft upstream from junction of State Highways 19 and 250, and 2.0 mi west of junction of State Highways 19 and 190.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in National Weather Service receiver and rain can housed in old gage 16756500. This is a non-recording site. Elevation of gage is 2,410 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004 INTERMITTENT READINGS

Period	Rainfall
Oct 01 to Oct 08	0.0a
Oct 08 to Dec 04	2.5
Dec 04 to Feb 12	7.6
Feb 12 to Apr 15	21.5
Apr 15 to Jun 14	5.2
Jun 14 to Aug 12	0.5
Aug 12 to Sep 30	0.1b

CAL YR 2003 TOTAL 16.3
WTR YR 2004 TOTAL 37.4

a Estimated value based on accumulated reading of 1.2 inches from Jul 11 to Oct 08, 2003.

b Estimated value based on accumulated reading of <0.1 inches from Aug 12 to Oct 07, 2004.

Conversion Factors

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter (mm)
	2.54×10^{-2}	meter (m)
foot (ft)	3.048×10^{-1}	meter (m)
mile (mi)	1.609×10^{0}	kilometer (km)
	Area	
acre	4.047×10^{3}	square meter (m^2)
	4.047×10^{-1}	square hectometer (hm^2)
	4.047×10^{-3}	square kilometer (km^2)
square mile (mi^2)	2.590×10^{0}	square kilometer (km^2)
	Volume	
gallon (gal)	3.785×10^{0}	liter (L)
	3.785×10^{-3}	cubic meter (m^3)
	3.785×10^{0}	cubic decimeter (dm^3)
million gallons (Mgal)	3.785×10^{3}	cubic meter (m^3)
	3.785×10^{-3}	cubic hectometer (hm^3)
cubic foot (ft^3)	2.832×10^{-2}	cubic meter (m^3)
	2.832×10^{1}	cubic decimeter (dm^3)
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter (m^3)
	2.447×10^{-3}	cubic hectometer (hm^3)
acre-foot (acre-ft)	1.233×10^{3}	cubic meter (m^3)
	1.233×10^{-3}	cubic hectometer (hm^3)
	1.233×10^{-6}	cubic kilometer (km^3)
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second (L/s)
	2.832×10^{-2}	cubic meter per second (m^3/s)
	2.832×10^{1}	cubic decimeter per second (dm^3/s)
gallon per minute (gal/min)	6.309×10^{-2}	liter per second (L/s)
	6.309×10^{-5}	cubic meter per second (m^3/s)
	6.309×10^{-2}	cubic decimeter per second (dm^3/s)
million gallons per day (Mgal/d)	4.381×10^{-2}	cubic meter per second (m^3/s)
	4.381×10^{1}	cubic decimeter per second (dm^3/s)
	Mass	
ton (short)	9.072×10^{-1}	megagram (Mg) or metric ton

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

°F = (1.8 x °C) + 32

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