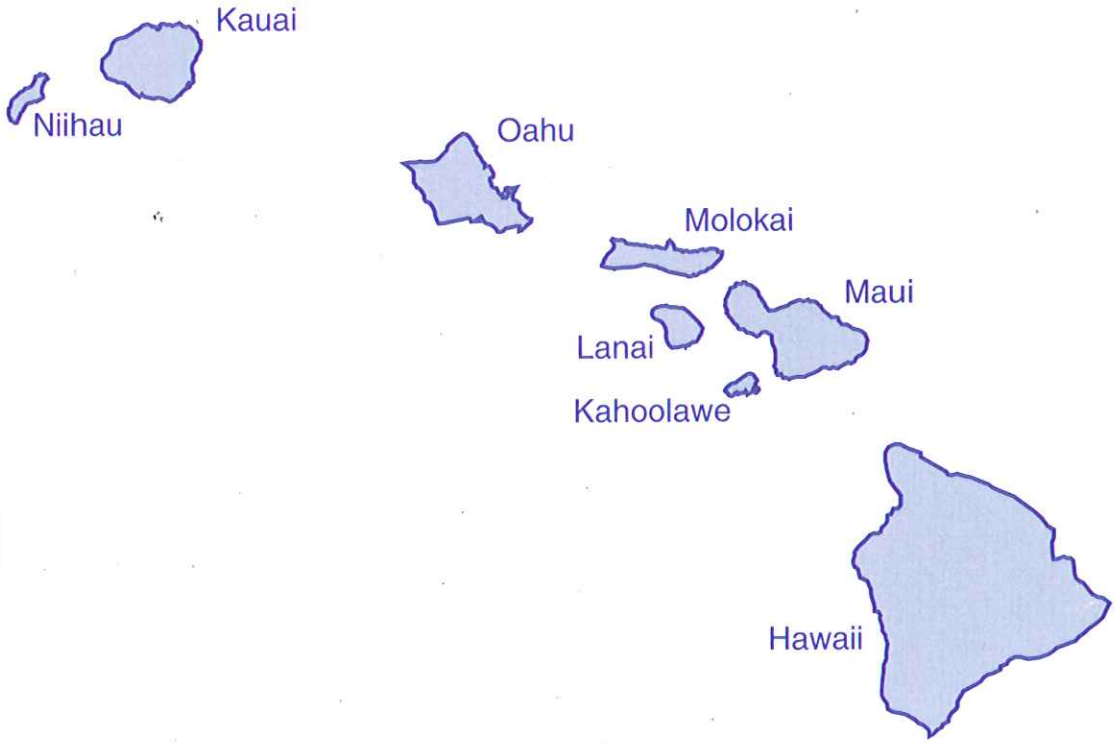
Water Resources Data
Hawaii
Water Year 1996



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-96-1
Prepared in cooperation with the State of Hawaii
Department of Land and Natural Resources,
Commission on Water Resource Management
and with other agencies

CALENDAR FOR WATER YEAR 1996

1995

OCTOBER

S	M	T	W	T	F	S
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31						

1996

JANUARY

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JUNE

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JULY

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AUGUST

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18	19	20	21	22	23	24
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SEPTEMBER

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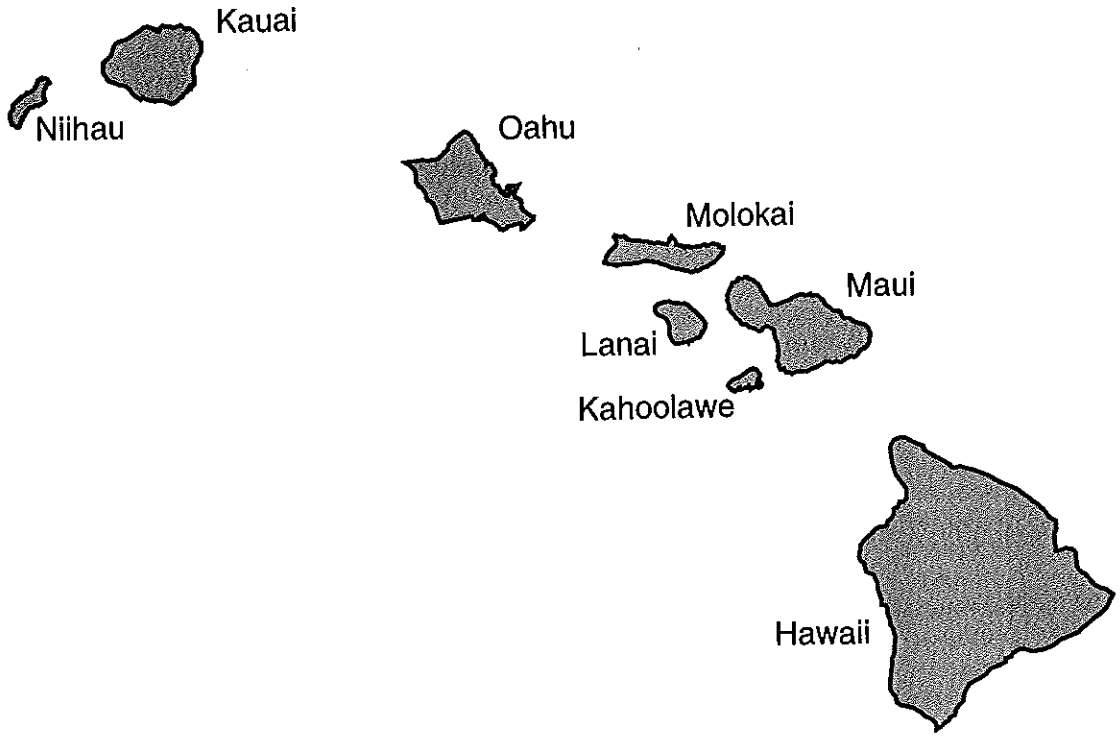
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Water Resources Data
Hawaii
Water Year 1996

by Richard A. Fontaine, Stephen S. Anthony, Roy I. Taogoshi,
Vaughn E. Kunishige, and Wayne S. Shibata



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-96-1
Prepared in cooperation with the State of Hawaii
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and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U. S. GEOLOGICAL SURVEY

Gordon Eaton, Director

Prepared in cooperation with the
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and with other agencies as listed
under cooperation

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District Chief, Water Resources Division
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1997

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, 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 following individuals contributed significantly to the collection, processing, and tabulation of the data:

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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 William Meyer, District Chief, Hawaii.

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13. ABSTRACT *(Maximum 200 words)*

Water resources data for the 1996 water year for Hawaii consist of records of stage, discharge, and water quality of streams and springs; and water levels and quality of water wells.

- Water discharge for 87 gaging stations on streams, springs, and ditches.
- Discharge data for 107 crest-stage partial-record stations and 4 miscellaneous sites.
- Water-quality data for 11 streams, 19 partial-record stations, and 155 wells.
- Water levels for 69 observation wells.
- Rainfall data for 43 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.

14. SUBJECT TERMS
*Hawaii, *Hydrologic data, *Surface water, *Water quality, *Ground water, Gaging stations, Flow rate, Chemical analyses, Sediment, Water temperature, Sampling sites, Water analyses, Water levels, Rainfall accumulation.

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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.

HAWAII	Station number	Page
ISLAND OF KAUAI		
Kawaikoi Stream (head of Waimea River) near Waimea (d)	16010000	32
Waimea River:		
Waialae Stream at altitude 3,820 ft, near Waimea (dct)	16019000	34
Waimea River near Waimea (d)	16031000	38
Makaweli River near Waimea (d)	16036000	40
Hanapepe River below Manuahi Stream, near Eleele (d)	16049000	42
Wailua River:		
South Fork Wailua River near Lihue (d)	16060000	44
North Fork Wailua River:		
North Wailua ditch below Waikoko Stream, near Lihue (d)	16061200	46
Stable storm ditch near Lihue (d)	16062000	48
East Branch of North Fork Wailua River near Lihue (d)	16068000	50
Wailua ditch near Kapaa (d)	16069000	52
North Fork Wailua River near Kapaa (d)	16071000	54
Opaekaa Stream:		
Left Branch Opaekaa Stream near Kapaa (d)	16071500	56
Kapaa Stream:		
Makaleha Stream:		
Makaleha ditch near Kealia (d)	16077000	58
Kapahi ditch near Kealia (d)	16079000	60
Anahola Stream:		
Anahola ditch above Kaneha Reservoir, near Kealia (d)	16088000	62
Kilauea Stream:		
Halaulani Stream at altitude 400 ft, near Kilauea (d)	16097500	64
Hanalei River near Hanalei (d)	16103000	66
Wainiha River near Hanalei (d)	16108000	68
Limahuli Stream near Wainiha (d)	16114000	70
ISLAND OF OAHU		
Kaukonahua Stream (head of Kiikii Stream):		
North Fork Kaukonahua Stream above Right Branch, near Wahiawa (d)	16200000	74
South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa (d)	16208000	76
Makaha Stream near Makaha (d)	16211600	78
Waikele Stream:		
Kipapa Stream near Wahiawa (d)	16212800	80
Waikele Stream at Waipahu (d)	16213000	82
Waiawa Stream near Pearl City (d)	16216000	84
Halawa Stream:		
North Halawa Stream near Kaneohe (ds)	16225800	86
North Halawa Stream near Aiea (d)	16226000	90
North Halawa Stream near Honolulu (dcmts)	16226200	92
Kalihi Stream near Honolulu (dct)	16229000	96
Kalihi Stream at Kalihi (d)	16229300	100
Nuuanu Stream below reservoir 2 wasteway, near Honolulu (dct)	16232000	102
Waiakeakua Stream (head of Manoa Stream) at Honolulu (d)	16240500	106
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Maunawili ditch at Ainoni Spring (d)	16249500	108
Maunawili ditch above Anianinui tunnel near Kailua (d)	16249900	110

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Maunawili Stream:		
Makawao Stream near Kailua (d)	16254000	114
Maunawili Stream at Highway 61, near Kailua (d)	16260500	116
Kaneohe Stream:		
Kamooalii Stream:		
Right Branch Kamooalii Stream near Kaneohe (dcmts)	16265600	118
Luluku Stream at altitude 220 ft, near Kaneohe (dcmts)	16270900	122
Kamooalii Stream below Luluku Stream, near Kaneohe (dcmts)	16272200	126
Kapunahala Stream:		
South Fork Kapunahala Stream at Kaneohe (dcmts)	16273950	134
Haiku Stream near Heeia (dcmts)	16275000	138
Kahaluu Stream near Ahuimanu (d)	16283200	142
Waihee Stream:		
South Fork Waihee Stream near Heeia (d)	16283600	144
North Fork Waihee Stream near Heeia (d)	16283700	146
Waihee Stream near Kahaluu (d)	16284200	148
Waikane Stream at altitude 75 ft, at Waikane (d)	16294900	150
Kahana Stream at altitude 30 ft, near Kahana (d)	16296500	152
Punaluu Stream:		
Punaluu ditch near Punaluu (d)	16302000	154
Punaluu Stream near Punaluu (d)	16303000	156
Kaluanui Stream near Punaluu (d)	16304200	158
Waimea River:		
Kamananui Stream at Pupukea Military Road, near Maunawai (d)	16325000	160
Kamananui Stream at Maunawai (d)	16330000	162
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Opaeula Stream near Wahiawa (d)	16345000	164
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Molokai tunnel at east portal (d)	16405100	174
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Waikolu Stream below pipeline crossing, near Kalaupapa (d)	16408000	180
Kaunakakai Gulch at Kaunakakai (d)	16414000	182
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Oheo Gulch at dam near Kipahulu (d)	16501200	188
Hanawi Stream:		
near Nahiku (d)	16508000	190
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Honopou Stream near Huelo (d)	16587000	194
Kakipi Gulch:		
Opana Gulch:		
Opana tunnel at Kailiili (d)	16599500	196
Iao Stream at Kepaniwai Park, near Wailuku (d)	16604500	198
Waihee River at dam, near Waihee (d)	16614000	200
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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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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

			Page
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	293
(2-0023-01)	220051159231801	(ct)	341
(2-0044-13)	220018159444702	(ct)	341
(2-0044-14)	220019159444801	(w)	294
(2-0044-15)	220016159442701	(ct)	341
(2-0120-01)	220136159205501	(ct)	341
(2-0120-02)	220134159205401	(w)	295
(2-0126-01)	220126159261501	(ct)	341
(2-0145-10)	220148159453501	(ct)	341
(2-0320-01)	220354159205601	(ctw)	295, 341
(2-0320-03)	220354159205602	(ctw)	296, 341
(2-0345-04)	220341159453901	(ct)	341
(2-0545-01)	220530159450401	(ct)	341
(2-0623-04)	220621159232101	(ctw)	296, 341
(2-0818-01)	220827159185401	(ct)	341
(2-0818-02)	220826159185401	(ct)	342
(2-0818-03)	220825159185301	(w)	297
(2-1020-03)	221038159203801	(w)	297
(2-1125-01)	221141159252501	(ct)	342
(2-1125-02)	221141159252502	(ct)	342
(2-1126-01)	221150159264501	(ctw)	298, 342
(2-1126-02)	221151159265001	(ct)	342
(2-1229-03)	221201159293401	(ct)	342
(2-1232-01)	221247159324801	(ctw)	298, 342
(2-1333-01)	221318159335901	(ctw)	299, 342
(2-5426-03)	215434159263301	(ctw)	299, 342
(2-5427-01)	215454159274201	(ctw)	300, 342
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(2-5842-03)	215843159422901	(ct)	343
(2-5843-01)	215857159430101	(w)	353
(2-5921-01)	215958159214301	(w)	304
(2-5923-01)	215901159235301	(ct)	343
(2-5923-07)	215901159235201	(ctw)	305, 343
(2-5923-08)	215950159231601	(ct)	343
(2-5939-01)	215906159395601	(ctw)	306, 343
(2-5943-01)	215937159434201	(ct)	343
ISLAND OF OAHU			
(3-1646-01)	211646157465201	(ct)	344
(3-1646-02)	211646157465202	(w)	308
(3-1851-19A)	211832157515501	(ctw)	308, 344
(3-1851-19B)	211832157515502	(ctw)	309, 344
(3-1851-22)	211828157515801	(w)	309
(3-1959-05)	211907157594701	(w)	310
(3-2006-12)	212038158061501	(w)	311
(3-2101-03)	212154158015201	(w)	312

ISLAND OF OAHU--Continued

(3-2103-01)	212132158035701 (w)	312
(3-2103-03)	212133158035501 (ct)	344
(3-2153-02)	212106157533701 (ct)	344
(3-2153-05)	212123157535501 (w)	313
(3-2153-05)	212123157535503 (w)	314
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The following continuous record streamflow stations in Hawaii have been discontinued or converted to partial-record stations. Daily records were collected and are stored in WATSTORE for the period of record shown for each station.

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ISLAND OF KAUAI			
16011000	Waikoali Str nr Waimea	1.58	1909-13, 1919-25
16012000	Kauaikinana Str nr Waimea	0.84	1919-25
16013000	Mohihi Str at alt 3,420 ft nr Waimea	1.68	1920-26, 1936-71
16014000	Kokee Ditch nr Waimea	--	1926-82
16015000	Mohihi Str nr Waimea	2.20	1909-17
16016000	Waimea River at alt 840 ft nr Waimea	20.0	1916-18, 1925-68
16017000	Koaie Str at alt 3,770 ft nr Waimea	1.68	1919-32, 1954-68
16018000	Koaie Str nr Waimea	9.97	1916-18
16020000	Waialae Str nr Waimea	2.81	1910-16
16021000	Waialae Str at alt 800 ft nr Waimea	7.87	1917-21
16022000	Kekaha Ditch at Camp 1 nr Waimea	--	1908-68
16024000	Kekaha Ditch at siphon nr Waimea	--	1910-12
16025000	Kekaha Ditch at flume 2 nr Waimea	--	1910-12
16027000	Kekaha Ditch below tunnel 12 nr Waimea	--	1908-34
16028000	Waimea River below Kekaha Ditch intake near Waimea	44.2	1921-55
16029000	Waimea Ditch nr Waimea	--	1912-14 1916-21
16029100	Waimea Ditch below wasteway nr Waimea	--	1960-72
16031000	Waimea River nr Waimea	57.8	1910-18, 1919, 1943-68, 1969-72
16033000	Olokele Ditch at weir nr Makaweli	--	1912-17
16034000	Olokele River nr Waimea	4.85	1915-16
16035000	Halekua Str nr Waimea	0.56	1912-14
16037000	Poowaiomahaihai Ditch nr Waimea	--	1911-13
16037100	Makaweli R bl Poowaiomahaihai Ditch nr Waimea	25.0	1911-17
16039000	Hiloa Ditch nr Eleele	--	1911-15
16042000	Hanapepe Ditch at Hanapepe Falls nr Eleele	--	1911-15
16043000	Hanapepe Ditch below intake	--	1930-38
16044000	Hanapepe Ditch at Koula nr Eleele	--	1910-21, 1927-49
16045000	Hanapepe Ditch below makai siphon nr Eleele	--	1929-32
16046000	Hanapepe Ditch at weir nr Hanapepe	--	1912-13, 1915-17
16047000	Koula River at Koula nr Eleele	12.6	1910-16
16048000	Manuahi Str at Koula nr Eleele	5.44	1917-20
16050000	G Ditch at makai siphon nr Eleele	--	1929-32
16051000	Hanapepe River at makai siphon nr Eleele	20.5	1929-32
16053000	Kamoolao Str nr Koloa	1.30	1939-41
16053400	Upper Haiku Ditch nr Puhi	--	1963-71
16053600	Lower Haiku Ditch nr Puhi	--	1963-71
16053800	Kamooloa Str nr Puhi	5.79	1963-70
16054000	Kuia Str nr Puhi	0.40	1939-41
16054200	Koloa Ditch nr Koloa	--	1964-71
16054400	Koloa tunnel nr Koloa	--	1966-71
16054500	Kuia Str nr Puhi	5.09	1963-66
16056000	Hanamaulu Str at Kapaia nr Lihue	6.41	1911-13
16056800	Waiahi-Kuia aqueduct nr Puhi	--	1964-71
16057000	Lihue Ditch nr Lihue	--	1910-19
16058000	Hanamaulu Ditch nr Lihue	--	1910-20
16058500	S F Wailua River nr rock quarry nr Lihue	20.2	1974-83
16061000	North Wailua Ditch nr Lihue	--	1932-85
16063000	N F Wailua River at alt. 650 ft nr Lihue	5.29	1914-85
16064000	Kanaha Ditch nr Lihue	--	1910-55
16068700	North Fork Wailua River nr Lihue	14.6	1910-14
16070000	Aahoaka Ditch nr Kapaa	--	1966-72
16072000	Konohiki Str at Makakualele mka weir nr Kapaa	0.65	1911-13

WATER RESOURCES DATA FOR HAWAII, 1996
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Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF KAUAI--Continued			
16073000	Konohiki Str at Makakualele mki weir nr Kapaa	0.89	1912
16074000	N F Kaehulua Str at Kainahola weir nr Kapaa	1.39	1911-13
16075000	S F Kaehulua Str at Wainamuamu weir nr Kapaa	0.04	1911-13
16076000	Kaehulua Str at Kuhinoa weir nr Kapaa	1.90	1911-13
16078000	Kapaa Str nr Kealia	3.05	1910-20
16079200	Tunnel Ditch at Kapahi nr Kapaa	--	1909-11
16079400	Pipe Ditch at Kapahi nr Kapaa	--	1909-11
16079600	Kapaa Ditch at Kapahi nr Kapaa	--	1909-11
16082000	Kaneha Ditch nr Kealia	--	1909-13
16086000	Anahola Ditch above wasteway nr Kealia	--	1915-21
16087000	Anahola Ditch wasteway nr Kealia	--	1936-85
16089000	Anahola Str nr Kealia	4.27	1910, 1913-85
16090000	Lower Anahola Ditch at Kiokala nr Kealia	--	1909-14
16091000	Lower Anahola Ditch nr Kealia	--	1937-83, 1985-95
16092000	Lower Anahola Ditch at makai weir nr Kealia	--	1909-10
16093000	Anahola Str at Kiokala Dam nr Kealia	4.27	1910-12
16093200	Anahola Str at Anahola	9.24	1962-65
16094200	Ka Loko Ditch nr Kilauea	--	1932-68
16095000	Puu Ka Ele Ditch nr Kilauea	--	1932-67
16095200	Ross Ditch nr Kilauea	--	1955-67
16095900	Kalihiwai Ditch above wasteway nr Kilauea	--	1960-68
16096000	Kalihiwai Ditch nr Kilauea	--	1934-67
16097000	Pohakuhonu Str nr Kilauea	1.73	1957-72
16097300	Halaulani Str nr Kilauea	0.12	1922-25
16098000	Kalihiwai River nr Hanalei	3.64	1914-23
16099000	Kalihiwai River nr Kilauea	4.12	1912-13
16099500	Hanalei Ditch nr Kilauea	--	1956-62
16100000	Hanalei tunnel outlet nr Lihue	--	1932-85
16101000	Hanalei River at alt. 625 ft. nr Hanalei	7.17	1914-55
16102000	China Ditch nr Hanalei	--	1911-19
16104000	Kuna Ditch nr Hanalei	--	1912-14, 1917-20
16105000	Waioli Str nr Hanalei	1.81	1914-32
16106000	Lumahai River nr Hanalei	6.95	1914-33
16109000	Wainiha River above intake nr Hanalei	11.6	1914-16
16110000	Wainiha Canal at intake nr Wainiha	--	1910-16
16111000	Wainiha Canal at tunnel 18 nr Wainiha	--	1911
16113000	Wainiha River nr Wainiha	20.6	1912-16
16115000	Hanakapiai Str nr Hanalei	2.73	1931-52
16116000	Hanakoa Str nr Hanalei	0.50	1931-52
16117000	Kalalau Str nr Hanalei	1.55	1931-55
ISLAND OF OAHU			
16201000	RB of NF Kaukonahua Str nr Wahiawa	1.17	1913-53
16203000	Mauka Ditch nr Wahiawa	--	1947-68
16204000	North Fork Kaukonahua Str nr Wahiawa	4.86	1946-68
16206000	South Fork Kaukonahua Str nr Wahiawa	1.93	1913-14, 1915-16,1944-50
16206500	Koolau Ditch at reservoir nr Wahiawa	4.00	1914-15
16207000	SF Kaukonahua Str bl U.S. Army res nr Wahiawa	0.86	1914-17
16208500	RB of South Fork Kaukonahua Str nr Wahiawa	5.26	1957-72
16209000	SF Kaukonahua Str ab Wahiawa res nr Wahiawa	--	1946-58
16210900	Poamoho Tunnel nr Wahiawa	1.79	1958-79
16211000	Poamoho Str nr Wahiawa	--	1947-73
16211850	Puea Mauka Ditch nr Waianae	4.39	1960-67
16211900	Kaupuni Str nr Waianae	0.60	1957-60
16212000	Puhawai Str at Lualualei nr Waianae	1.16	1930-44
16212400	Awanui Gulch nr Barbers Point NAS	13.80	1957-58
16212900	Kipapa Str nr Waipahu	--	1966-68
16217000	Pearl Harbor Spr at Puukapu nr Pearl City	--	1931-35

DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16218000	Pearl Harbor Springs at Loko Kukona	--	1931-35, 1936-45
16218500	Pearl Harbor Spr at Kaluaoopu nr Pearl City	--	1931-37
16219000	Hawn Elec. Co. tunnel at Waiau nr Pearl City	--	1939-42
16220000	Hawn Elec. Co. wasteway at Waiau nr Pearl City	--	1953-59
16222000	Pearl Harbor Sprngs at Waiau	--	1913-39, 1942-47
16224000	Pearl Harbor Springs at Kalauoa	--	1931-62, 1964-65,1966-68, 1970-88
16224500	Kalauao Str at Moanalua Road at Aiea	2.59	1957-82
16225000	Kalauao Str at Aiea	2.61	1953-57
16227500	Moanalua Str nr Kaneohe	0.94	1968-78
16227700	Moanalua Str tributary nr Kaneohe	0.62	1968-78
16227900	Moanalua Str tributary nr Aiea	0.03	1972-78
16228900	Kalihi Str nr Kaneohe	0.60	1966-71
16230000	Lulumahu Dit at upper Nuuanu Res nr Honolulu	--	1911-13
16231000	Luakaha weir in upper Nuuanu Valley nr Hon	--	1910-13
16231500	Moole Ditch mauka station nr Honolulu	--	1917-20
16231700	Moole Ditch makai station nr Honolulu	--	1918-23
16235000	Nuuanu Str at Kuakini Street nr Honolulu	4.39	1911-12
16236000	Kahuawai Spring nr Honolulu	--	1912-14
16237000	Pauoa Str at upper Pauoa Valley nr Honolulu	0.79	1911-13
16238500	Waihi Str at Honolulu	1.14	1913-21, 1925-83
16239500	East Manoa Ditch nr Honolulu	--	1915-16, 1918-20,1926-39
16241000	Manoa Str at upper Manoa Valley nr Honolulu	2.62	1910-13
16242000	Manoa Str at College of Hawaii nr Honolulu	4.99	1909-10, 1912-18
16243000	Manoa Str at Waialae Road nr Honolulu	5.38	1910-12
16244000	Pukele Str nr Honolulu	1.18	1926-82
16245000	Waiomao Str at upper Palolo Valley nr Hon	0.35	1911-13
16246000	Waiomao Str nr Honolulu	1.04	1911, 1912,1926-71
16247000	Palolo Str nr Honolulu	3.63	1952-79
16248900	Waimanalo Ditch below main res nr Waimanalo	--	1912-13
16249000	Waimanalo Str at Waimanalo	2.16	1967-70
16249200	Maunawili Str nr Waimanalo	1.28	1912-16
16249400	Main Spring nr Kailua	--	1914-16
16249600	Makawao Spring nr Kailua	--	1914-16
16249800	Makawao Ditch nr Kailua	--	1912-15
16250000	Maunawili Ditch nr Waimanalo	--	1954-68
16256000	Kamakalepo Str nr Kailua	0.82	1912, 1913-16
16257000	Pohakea Str nr Kailua	0.21	1912-14
16258000	Maunawili Str ab Wong Leongs Ditch nr Kailua	4.60	1922-23
16260000	Maunawili Str nr Kailua	4.60	1912, 1913-16
16260500	Maunawili Str at highway 61 nr Kailua	5.34	1967-71
16261000	North Branch Kahanaiki Str nr Kailua	0.34	1913-14
16262000	South Branch Kahanaiki Str nr Kailua	0.21	1913-14
16263000	Kahanaiki Str nr Kailua	0.58	1912, 1914-16
16264400	Kawainui Swamp drain canl at Kailua Rd at Kailua	--	1961-65
16264500	Kawainui Swamp canal at Wanaao Rd at Kailua	--	1961-64
16266000	Kamooalii Str nr Kaneohe	1.48	1914-16
16267000	Hooleinaiwa Str nr Kaneohe	0.61	1914-16
16268000	Piho Str nr Kaneohe	0.43	1914-16
16269000	Kuou Ditch nr Kaneohe	--	1914-16
16270000	Kuou Str nr Kaneohe	0.37	1914-16
16270500	Kamooalii Str below Kuou Str nr Kaneohe	3.21	1967-70, 1971,1972-76
16271000	North Luluku Ditch nr Kaneohe	--	1914-16
16272000	Luluku Str nr Kaneohe	0.46	1914-16
16273000	Young Mau Ditch nr Kaneohe	--	1914-16
16273900	Kamooalii Str at Kaneohe	4.38	1959-63, 1965-80
16274000	Ahlo Ditch nr Kaneohe	--	1914-16

WATER RESOURCES DATA FOR HAWAII, 1996
DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16276000	Reservoir Ditch nr Heeia	--	1914-16
16277000	Waipio Ditch nr Heeia	--	1914-16
16278000	Iolekaa Str mauka nr Heeia	0.29	1940-70
16279000	Iolekaa Str nr Heeia	0.52	1914-16
16280000	Wing Wo Tai Ditch nr Heeia	--	1914-16
16281000	Hop Tuck Ditch nr Heeia	--	1914-16
16282000	Lee Ditch nr Heeia	--	1914-16
16283000	Kahaluu Str nr Heeia	0.28	1935-71
16283800	Waihee Str at alt. 260 ft nr Heeia	0.31	1961-66
16284000	Waihee Str nr Heeia	0.93	1935-82
16284500	Waihee Str at Kahaluu	2.26	1966-71
16285000	Waiahole tunnel at Waianu nr Waiahole	--	1950-69
16286000	Waiahole tunl wasteway at intk 31 nr Waiahole	--	1951-69
16287000	Waiahole tunnel at north portal nr Waiahole	--	1951-69
16287200	Waiahole tunnel at adit 8 nr Waipahu	--	1956-69
16288000	Halona Str nr Waikane	0.08	1911
16289000	Waihi Str nr Waikane	0.11	1911
16290000	Waiahole Str below powerhouse nr Waiahole	0.46	1915
16291000	Waiahole Str at alt. 250 ft. nr Waiahole	0.99	1955-68
16292000	Waiahole Str nr Waiahole	1.22	1911-16
16293000	Waianu Str nr Waikane	1.28	1911
16294000	Waiahole Str at Waiahole nr Waikane	3.60	1911-12
16295000	Waikane Str nr Waikane	2.35	1912
16296000	Kahana Str nr Kahana	3.20	1914-17
16297000	Kawa Str nr Kahana	2.09	1914-17
16299000	Punaluu Str at alt. 539 ft. nr Punaluu	0.98	1915-18
16300000	Waihoi Str nr Punaluu	0.50	1915-17
16301000	Punaluu Str at alt. 250 ft. nr Punaluu	2.78	1914-18
16304000	Kaluanui Str nr Hauula	0.50	1915-17
16305000	Kaipapau Str nr Hauula	0.21	1906-07
16306000	Koloa Gulch nr Laie	0.90	1914-18
16307000	Wailele Gulch nr Laie	0.50	1914-15, 1916-18
16308000	East Branch Kahawainui Str nr Laie	0.53	1914-18
16308990	Malaekahana Str nr Laie	0.64	1963-71
16309000	Malaekahana Str nr Kahuku	1.66	1914-18
16310000	Middle Branch Malaekahana Str nr Kahuku	0.69	1914-18
16329000	Kaiwikoele Str tributary nr Maunawai	0.97	1967-71
16340500	Anahulu River tributary nr Haleiwa	0.83	1967-71
16343000	Helemano Str at Haleiwa	14.20	1967-82
ISLAND OF MOLOKAI			
16401000	Papalaua Str nr Pukoo	2.00	1919-29
16402000	Pulena Str nr Wailau	4.38	1919-28, 1937-57
16403000	Waiakeakua Str nr Wailau	1.41	1919-29, 1937-57
16404000	Pelekunu Str nr Pelekunu	2.59	1919-29, 1937-47,1948-57, 1971-82
16405000	Lanipuni Str nr Pelekunu	1.09	1919-29, 1937-57
16406000	Waikolu Str at alt. 650 ft nr Kalaupapa	2.99	1920-23
16409000	Waihanau Str nr Kalaupapa	1.18	1930-32
16410000	Keolewa Str nr Kalae	0.18	1940-44
16411000	Waialala Spring nr Kalae	--	1940-60
16412000	Mokomoko Gulch nr Kalae	0.23	1940-45
16411300	Kakaako Gulch at Hwy 46 nr Mauna Loa	0.18	1964-85
16415000	EF Kawela Gulch	0.45	1946-71
16416000	Punaula Gulch nr Pukoo	0.24	1947-72

DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI			
16501000	Palikea Str bl diversion dam nr Kipahulu	6.29	1927-29, 1931-35,1935-38, 1939-83
16502000	Hahalawe Gulch nr Kipahulu	0.43	1927-37, 1938-69
16503000	Kaeluku flume nr Kaeleku	--	1940-45
16504000	Hana flume nr Hana	--	1940-45
16506000	Makapipi Ditch nr Nahiku	--	1948-66
16506500	West Makapipi Spring nr Nahiku	--	1932-45
16507000	Makapipi Str nr Nahiku	1.93	1932-45
16509000	Hanawi Str below government road, nr Nahiku	5.03	1932-47, 1992-95
16510000	Kapaula Gulch nr Nahiku	0.69	1921-63
16511000	Kapaula Gulch below government road nr Nahiku	0.93	1932-47
16512000	Koolau Ditch at Nahiku weir nr Nahiku	--	1919-85
16513000	Waiaaka Str nr Nahiku	0.10	1932-47
16514000	Paakea Gulch nr Nahiku	0.34	1932-47
16515000	Waiohue Gulch nr Nahiku	0.32	1921-63
16516000	Kopiliula Str nr Keanae	4.31	1914-17, 1921-58
16517000	East Wailuaiki Str nr Keanae	3.11	1913-17, 1922-58
16519000	West Wailuanui Str nr Keanae	1.93	1913-17, 1922-58
16520000	East Wailuanui Str nr Keanae	0.51	1914-17, 1921-58
16521000	Wailuanui Str nr Keanae	2.51	1932-36, 1938-47
16522000	Taro patch feeder Ditch at Keanae	--	1934-68
16523000	Koolau Ditch nr Keanae	--	1910-12, 1917-85
16524000	Honomanu Str at Haiku-uka boundry nr Kaili	2.54	1919-27, 1932-34,1962-68
16525000	Sevth Br Honomanu Str at Haiku-uka nr Kailiili	0.30	1932-33
16526000	Fourth Br Honomanu Str at Haiku-uka nr Kailiili	0.10	1932-33
16527000	Honomanu Str nr Keanae	3.17	1913-64
16528000	Spreckels Ditch at station 1 nr Huelo	--	1910-13
16529000	Spreckels Ditch at station 2 nr Kuelo	--	1911-13
16530000	Spreckels Ditch at station 3 nr Kuelo	--	1910-13
16531000	Kula diversion from Haipuaena Str nr Olinda	--	1945-85
16531100	Haipuaena Str at Kula pipeline intake nr Olinda	0.27	1946-68
16532000	Haipuaena Str at Haiku-uka bdy nr Kailiili	0.63	1919-26, 1932-34
16533000	Third Br Haipuaena Str at Haiku-uka nr Kailiili	0.06	1932-33
16534000	First Br Haipuaena Str at Haiku-uka nr Kailiili	0.05	1932-33
16535000	Haipuaena div ditch at Kolea Gulch nr Keanae	--	1938-60
16536000	Haipuaena Str above Spreckels Ditch nr Huelo	1.16	1913-67
16537000	Haipuaena Str nr Huelo	1.10	1910-13
16538000	Spreckels Ditch at Haipuaena weir nr Huelo	--	1922-85
16539000	Spreckels Ditch at station 4 nr Huelo	--	1910-13
16541000	Koolau Ditch at Haipuaena nr Huelo	--	1932-87
16541500	Manuel Luis Ditch at Puohokamoa Gulch nr Huelo	--	1917-24
16542000	E Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.14	1919-27, 1932-33
16543000	M Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.48	1919-27, 1932-34,1962-69
16544000	W Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.45	1919-28, 1932-34
16545000	Puohokamoa Str above Spreckels Ditch nr Huelo	2.35	1913-71
16546000	Puohokamoa Str nr Huelo	2.60	1910-13
16547000	Puohokamoa intake of Koolau Ditch nr Huelo	--	1922-30
16551000	Koolau Ditch at Wahinepee nr Huelo	--	1922-29
16552000	Spreckels Ditch at Wahinepee nr Huelo	--	1929-30, 1931-38
16552200	Spreckels Ditch at station 5 nr Huelo	--	1911-13
16552500	Manuel Luis Ditch W of Puohokamoa Str nr Huelo	--	1930-35
16552600	Waikamoi Str at Puuluau nr Olinda	2.10	1949-66
16552800	Waikamoi Str ab res at Kula pl intake nr Olinda	2.50	1953-68
16553000	Waikamoi Str bl res at Kula pl intake nr Olinda	2.52	1945-49
16554000	Waikamoi Str at Haiku-uka boundary nr Kailiili	3.46	1918,19-28, 1932-34
16554500	E Br Waikamoi Str at Haiku-uka bdry nr Kailiili	0.07	1918-28, 1932-33
16555000	Waikamoi Str above Wailoa Ditch nr Huelo	3.93	1922-57
16556000	Waikamoi Str nr Huelo	3.98	1910-22

DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16557000	Alo Str nr Huelo	0.47	1910-57
16558000	Koolau Ditch at Alo diversion weir nr Huelo	--	1908-11
16560000	Spreckels Ditch at station 6 nr Huelo	--	1911-13
16561000	Center Ditch below Kolea reservoir nr Huelo	--	1918, 1919, 1920-24,1925-30
16562000	Center Ditch nr Huelo	--	1910-12
16565000	Kaaiea Gulch nr Huelo	0.58	1921-62
16565500	Spreckels Ditch below Kaaiea Gulch nr Huelo	--	1917-30
16566000	Oopuola Str nr Huelo	0.20	1930-57
16567000	Oopuola Str ab Spreckels Dt crossing nr Huelo	0.58	1910-15
16567500	Spreckels Ditch at station 7 nr Huelo	--	1911-12
16568000	Spreckels Ditch at station 8 nr Huelo	--	1911-13
16569000	Second Branch Nailiilihaele Str at Haiku-uka	0.20	1932-33
16570000	Nailiihaele Str nr Huelo	3.49	1910-11, 1913-18,1919-24, 1925-75
16571000	Nailiilihaele Str bl new Hamakua Dt nr Huelo	3.60	1912
16572000	New Hamakua Ditch at Nailiilihaele weir nr Huelo	--	1910-12
16573000	New Hamakua Ditch at station 1 nr Kailiili	--	1912-13
16574000	Kailua Str at Haiku-uka boundary nr Kailiili	0.80	1918-28, 1932-34
16574500	Kailua Str nr Kailiili	1.10	1963-71
16575000	Tenth Br Kailua Str at Haiku-uka nr Kailiili	0.10	1932-33
16576000	Ninth Br Kailua Str at Haiku-uka nr Kailiili	0.20	1932-33
16577000	Kailua Str nr Huelo	2.41	1910-11, 1912-18,1919-58
16578000	New Hamakua Ditch at station 2 nr Huelo	--	1912-13
16579000	New Hamakua Ditch at station 3 nr Huelo	--	1912-13
16579500	New Hamakua Ditch at station 4 nr Huelo	--	1912-13
16580000	Oanui Str nr Huelo	0.90	1910-11, 1913-16
16582000	New Hamakua Ditch at station 5 nr Huelo	--	1912-13
16583000	Old Hamakua Ditch at Kailua nr Huelo	--	1919-22
16584000	Kailua Str nr Huelo	3.69	1912-13
16585000	Hoolawanui Str nr Huelo	1.34	1910-71
16586000	Hoolawaliilii Str nr Huelo	0.55	1911-57
16588000	Wailoa Ditch at Honopou nr Huelo	--	1922-87
16589000	New Hamakua Ditch at Honopou nr Huelo	--	1918-85
16590000	Old Hamakua Ditch at Honopou nr Huelo	--	1918-22, 1936-65
16591000	Honopou Str at Lowrie Ditch siphon nr Huelo	2.00	1932-47
16592000	Lowrie Ditch at Honopou Gulch nr Huelo	--	1910-27
16593000	Honopou Str above Haiku Ditch nr Huelo	2.20	1930-85
16594000	Haiku Ditch at Honopou Gulch nr Kailua	--	1910-28, 1930-85
16595000	Honopou Str below Haiku Ditch nr Huelo	2.30	1932-47
16596000	New Hamakua Ditch at Halehaku weir nr Huelo	--	1910-14, 1915-23
16596200	Halehaku Gulch nr Kailiili	0.13	1965-71
16597000	Halehaku Gulch weir at New Hamakua Dt nr Huelo	--	1910-12
16598000	Halehaku Gulch nr Huelo	1.40	1910-12
16599000	E Br Opana Gulch at Haiku-uka bdry nr Kailiili	0.60	1932-33
16600000	Opana Ditch nr Huelo	--	1910-12
16601000	Opana Str nr Huelo	3.30	1910-12
16602000	Kauhikoa Ditch at Opana weir nr Huelo	--	1910-13, 1913-15,1916-28
16602400	Awalau Gulch nr Kailiili	0.23	1965-71
16603000	Kaluanui Ditch at Puuomalei nr Hamakuapoko	--	1910-12
16604000	Iao Str nr Wailuku	--	1910-15
16605000	Maniania Ditch nr Wailuku	--	1910-13
16608000	North Waiehu Str nr Wailuku	0.90	1912-15
16609000	North Waiehu Ditch nr Wailuku	--	1910-11, 1916-17
16609500	North Waiehu Str bl N Waiehu Ditch nr Wailuku	0.90	1910-11
16610000	South Waiehu Str nr Wailuku	0.70	1910-17
16611000	South Waiehu Ditch nr Wailuku	--	1913
16612000	Waihee River nr Waihee	3.90	1913-17

DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16613000	Waihee Canal nr Waihee	--	1910-12
16613500	Waihee Canal at Waiale weir nr Wailulu	--	1911-12
16615000	Spreckels Ditch nr Waihee	--	1910-13
16616000	Spreckels Ditch at Waiale weir nr Wailuku	--	1910-11
16617000	Left Branch Makamakaole Str nr Waihee	0.40	1939-52
16617700	Kahakuloa Str at alt. 1,380 ft. nr Honokohau	1.50	1913-14
16619000	Kahakuloa Str at Kahaluloa nr Waihee	4.00	1912-13
16620000	Honokohau Str nr Honokohau	4.11	1911, 1913-20, 1922-88
16621000	Honokohau Ditch intake nr Honokohau	--	1907-13
16622000	Honokohau Ditch above Honolua Str nr Honolohau	--	1910-11
16623000	Honolua Str nr Honokohau	2.90	1913-17
16624000	Honokohau Ditch at Honokowai weir nr Lahaina	--	1910-12
16625000	Honolua Ditch nr Honokohau	--	1911-12
16626000	Honolua Str at Honolua Ranch nr Honokahau	3.96	1911
16627000	Kapaloa Str at weir 1 nr Lahaina	1.00	1901
16628000	Kapaloa Str nr Lahaina	1.00	1911-12
16629000	Honokowai Ditch nr Lahaina	--	1912-17, 1918-67
16630000	Honokowai Str nr Lahaina	1.10	1913-17
16633000	Kahoma development tunnel nr Lahaina	--	1911-17
16634000	Kahoma Str nr Lahaina	1.19	1911-12, 1913-17
16635000	Lahainaluna Str at weir 1 nr Lahaina	0.54	1901
16635500	Lahainaluna Str at weir 2 nr Lahaina	0.19	1901
16636000	Kahana Str above pipeline intake nr Lahaina	1.51	1916-25, 1926-32
16637000	Lahainaluna Ditch nr Lahaina	--	1913-14
16638000	Kahana Str nr Lahaina	1.83	1911-16
16638500	Kahoma Str at Lahaina	5.22	1962-89
16639000	North Fork Kauaula Str nr Lahaina	0.52	1901
16640000	South Fork Kauaula Str nr Lahaina	0.18	1901
16641000	Kauaula Str nr Lahaina	1.84	1912, 1914-17
16643000	Kauaula Ditch nr Lahaina	--	1911-17
16644000	Launiupoko Str nr Lahaina	1.13	1911-18
16645000	Olowalu Ditch nr Olowalu	--	1911-16, 1916-20,1920-58, 1958-67
16646000	Olowalu Str nr Olowalu	4.00	1913-16
16647000	Ukumehame Gulch nr Olowalu	3.75	1911-12, 1913-19
16647100	Ukumehame Gulch at mouth nr Olowalu	4.03	1964-71
16648000	South side Waikapu Ditch nr Waikapu	--	1910-17
16649000	Palolo Ditch nr Waikapu	--	1910-17
16650000	Waikapu Str nr Waikapu	2.76	1910-17
ISLAND OF HAWAII			
16700950	Lyman Springs no. 2 nr Piihonua	--	1981-95
16701000	Olaa Flume at Kaumana nr Hilo	--	1917-20
16701200	Waiakea Str nr Hilo	33.60	1957-67
16701700	Wailuku River nr Pua Akala	10.20	1964-65
16701750	Wailuku River nr Humuula	34.80	1965-82
16701800	Wailuku River nr Kaumana	43.40	1966-82
16703000	Wailuku River at Pukamaui nr Hilo	97.20	1923-28, 1929-40
16705000	Hilo Boarding School Ditch at intake nr Hilo	--	1931-40
16706000	Hilo Boarding School Ditch nr Hilo	--	1918-19
16707000	Kapehu Ditch diversion nr Hilo	--	1954-62
16708000	Kapehu Ditch nr Hilo	--	1938-41, 1942-48, 1948-51, 1951-62
16709000	Kapehu Str at Piihonua nr Hilo	4.84	1928-37
16710000	Wailuku River nr Hilo	150.00	1911-13, 1918-19
16713000	Wailuku River at Hilo	256	1977-79, 1980-95
16716000	Honolii Str nr Hilo	8.00	1924-32
16717500	Kawainui Str nr Pepeekeo	9.20	1912
16717820	Manowaiopae Str nr Laupahoehoe	1.04	1965-71
16718000	Upper Hamakua Ditch at Puualala nr Kukuihaele	--	1913-20

WATER RESOURCES DATA FOR HAWAII, 1996
DISCONTINUED GAGING STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF HAWAII--Continued			
16721000	Kawainui Str at alt. 2,120 ft nr Waipio	3.48	1901-02
16721500	Br 3 Kawainui Str at alt. 1,700 ft nr Waipio	3.90	1901-02
16722000	Kawainui Str at alt. 1,435 ft nr Waipio	4.43	1901-02
16722300	Br 3 Kawainui Str at alt. 1,405 ft nr Waipio	0.47	1901-02
16722600	Br 1 Kawainui Str at alt. 1,380 ft nr Waipio	5.19	1901-02
16723000	Kawainui Str nr Waipio	5.55	1901-02
16724000	Kawainui Str at alt. 775 ft nr Waipio	6.00	1901-02
16728000	Alakahi Str at alt. 1,200 ft nr Waipio	1.49	1901-02
16729000	Alakahi Str at alt. 730 ft. nr Waipio	3.14	1901-02
16730000	Koiawe Str at alt. 1,120 ft. nr Waipio	1.65	1901-02
16731000	Koiawe Str at alt. 610 ft. nr Waipio	2.23	1901-02
16732000	Waipio Str below Koiawe Str nr Waipio	11.70	1901-02
16732100	Waima Str at alt. 790 ft. nr Waipio	0.51	1901-02
16732150	Waima Str at alt. 385 ft nr Waipio	0.77	1901-02
16732200	Wailoa Str nr Waipio	14.30	1901-02, 1911-12, 1964-69
16732300	Upper Hamakua Ditch at Puualala and Res No. 3	--	1913-20
16732600	Lower Hamakua Ditch at Waima flume nr Kukuihaele	--	1910-13
16732900	Lower Hamakua Ditch at main weir nr Kukuihaele	--	1910-20
16733000	Lower Hamakua Ditch wasteway nr Kukuihaele	--	1964-73
16733100	Lower Hamakua Ditch bl main weir nr Kukuihaele	--	1964-73
16733200	Honokaa diversion at Honokaa	--	1964-73
16733300	Lower Hamakua Ditch bl Honokaa div at Honokaa	--	1964-73
16737000	Waiilikahi Str nr Waimanu	0.76	1939-60
16738000	Kaimu Str nr Waimanu	0.90	1939-47, 1950-52
16739000	Punalulu Str nr Waimanu	0.66	1939-52
16740000	Waiaalala Str nr Waimanu	0.12	1939-52
16741000	Paopao Str nr Waimanu	0.32	1939-52
16742000	Kukui Str nr Waimanu	0.22	1939-52, 1959-66
16743000	Awini Ditch at E Honokane iki Gulch nr Niulii	--	1927-38, 1938-49, 1950-72
16744000	E Honokane iki intake to Awini Ditch nr Niulii	--	1927-36, 1937-38, 1939-40, 1940-49, 1951-72
16745000	Awini Ditch above Honokane Gulch nr Kohala	--	1918
16745500	Awini Ditch at Awini Weir nr Kohala	--	1907-17
16747000	E Br Honokane nui Str at alt 1,300 ft nr Honokane	4.53	1901
16747500	East Branch Honokane nui Str nr Niulii	4.96	1963-69
16748000	E Br Honokane nui Str at alt 770 ft nr Honokane	5.41	1901
16749000	W Br Honokane nui Str at alt 1,370 ft nr Honokane	1.81	1901
16749500	W Br Honokane nui Str at alt 775 ft nr Honokane	2.40	1901
16750000	Kohala Ditch at Honokane weir nr Kohala	--	1907-12
16750900	Kohala Ditch at Honokane nr Niulii	--	1963-72
16751000	Kohala Ditch at Pololu nr Niulii	--	1927-38, 1938-72
16752000	Kohala Ditch at Niulii weir nr Kohala	--	1907-17
16755000	Kehena Ditch nr Kohala	--	1917-19, 1928-66
16757000	Waikoloa Str nr Kamuela	0.78	1947-71
16759200	Right Branch Waiaha Str nr Holualoa	1.89	1960-82
16759500	Waiaha Str nr Holualoa	9.35	1957-68
16759800	Kiilae Str nr Honaunau	0.67	1958-82
16761200	Kahilipali nui Gulch at Waiohinu	0.47	1962-65
16765000	Hilea Gulch tributary 2 nr Honuapo	1.86	1966-82
16767000	Ninole Gulch nr Punaluu	15.5	1966-82
16770500	Paauau Gulch at Pahala	1.74	1962-79

DISCONTINUED WATER-QUALITY STATIONS

The following continuous water-quality stations in Hawaii have been discontinued. Daily records were collected and are stored in WATSTORE for the period of record shown for each station.

[Type of record: C (specific conductance), S (sediment), T (temperature).]

Station number	Station name	Drainage area (mi^2)	Type of record	Period of record
ISLAND OF OAHU				
16212800	Kipapa Str nr Wahiawa	4.29	S	1973-82
16213000	Waikele Str nr Waipahu	45.70	C,T	1973-81
			S	1972-93
16227500	Moanalua Str nr Kaneohe,	0.94	S	1971-78
16270500	Kamooalii Str blw Kuou Str nr Kaneohe	3.21	S	1972-76
ISLAND OF HAWAII				
16704000	Wailuku River at Piihonua, Hawaii, HI	125.00	C	1975-78
			T	1975-79
16713000	Wailuku River at Hilo, Hawaii, HI	256.00	S	1977-79, 1980-83
			C,T	1982-84, 1984-85

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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 and other Pacific areas 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 and the Pacific areas. 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 and other Pacific Areas."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 87 stream-gaging stations, 4 miscellaneous streamflow stations, and 107 crest-stage partial-record streamflow stations; (2) water-quality records for 11 streamflow-gaging stations, and 19 partial-record streamflow stations; (3) water-level records for 66 observation wells; (4) water-quality records for 155 observation wells; and (5) accumulated rainfall records for 43 rainfall stations.

This series of annual reports for Hawaii and other Pacific areas 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 other Pacific areas) and for several water years concurrent with it, water-resources data for Hawaii and other Pacific areas 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-96-1." 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 Chief at the address given on the back of the title page or by telephone (808) 522-8290.

COOPERATION

The U.S. Geological Survey and organizations of the State 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 agreement with the USGS are:

Hawaii Department of Land and Natural Resources, Commission of Water Resource Management, Rae Loui, Deputy Director.

Hawaii Department of Transportation, Kazu Hayashida, Director.

Hawaii Department of Agriculture, Paul Matsuo, Administrator.

City and County of Honolulu, Board of Water Supply, Raymond Sato, Manager and Chief Engineer.

City and County of Honolulu, Department of Public Works, Johathan K. Shimada, Ph.D., Director and Chief Engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, Public Works, U.S. Navy, National Weather Service, and National Park Service.

The following organizations aided in collecting records:

Maui County Board of Water Supply; East Kauai Water Co., Ltd.; McBryde Sugar Co., Ltd.; East Maui Irrigation Co., Ltd.; and Bernice Pauahi Bishop Estate.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

Runoff during the 1996 water year was normal at the index stations on the islands of Oahu and Maui, excessive (upper 25 percent of record) at the index station on the island of Kauai, and deficient (lower 25 percent of record) at the index station on the island of Hawaii. The monthly mean flow for all index stations was normal for the month of January and deficient for the month of May.

The annual mean discharge at East Branch of North Fork Wailua River near Lihue, Kauai was 121 percent of the 1961-90 median, 81 percent at Kalihi Stream near Honolulu, Oahu, and 116 percent at Honopou Stream near Huelo, Maui. The annual mean discharge at Honolii Stream near Papaikou, Hawaii was 71 percent of the 1967-90 median.

Monthly and yearly mean discharges of the four index stations are compared with their medians in figure 1. Comparisons of 1996 peak discharge to peaks for period of record at the index stations are shown in Table 1.

Table 1.--Comparison of peak discharge for 1996 water year with the peak discharge for the period of record at four representative stations

Station Number	Station name	Water year 1996		Period of record	
		Date	Peak discharge (ft^3/s)	Date	Peak discharge (ft^3/s)
16068000	East Branch of North Fork Wailua River near Lihue, Kauai	Nov. 3	7,650	Nov. 12, 1955	18,400
16229000	Kalihi Stream near Honolulu, Oahu	Jan. 25	1,060	Nov. 18, 1930	12,400
16587000	Honopou Stream near Huelo, Maui	Jan. 18	1,350	Nov. 18, 1930	5,710
16717000	Honolii Stream near Papaikou, Hawaii	Mar. 3	11,500	May 23, 1978	22,600

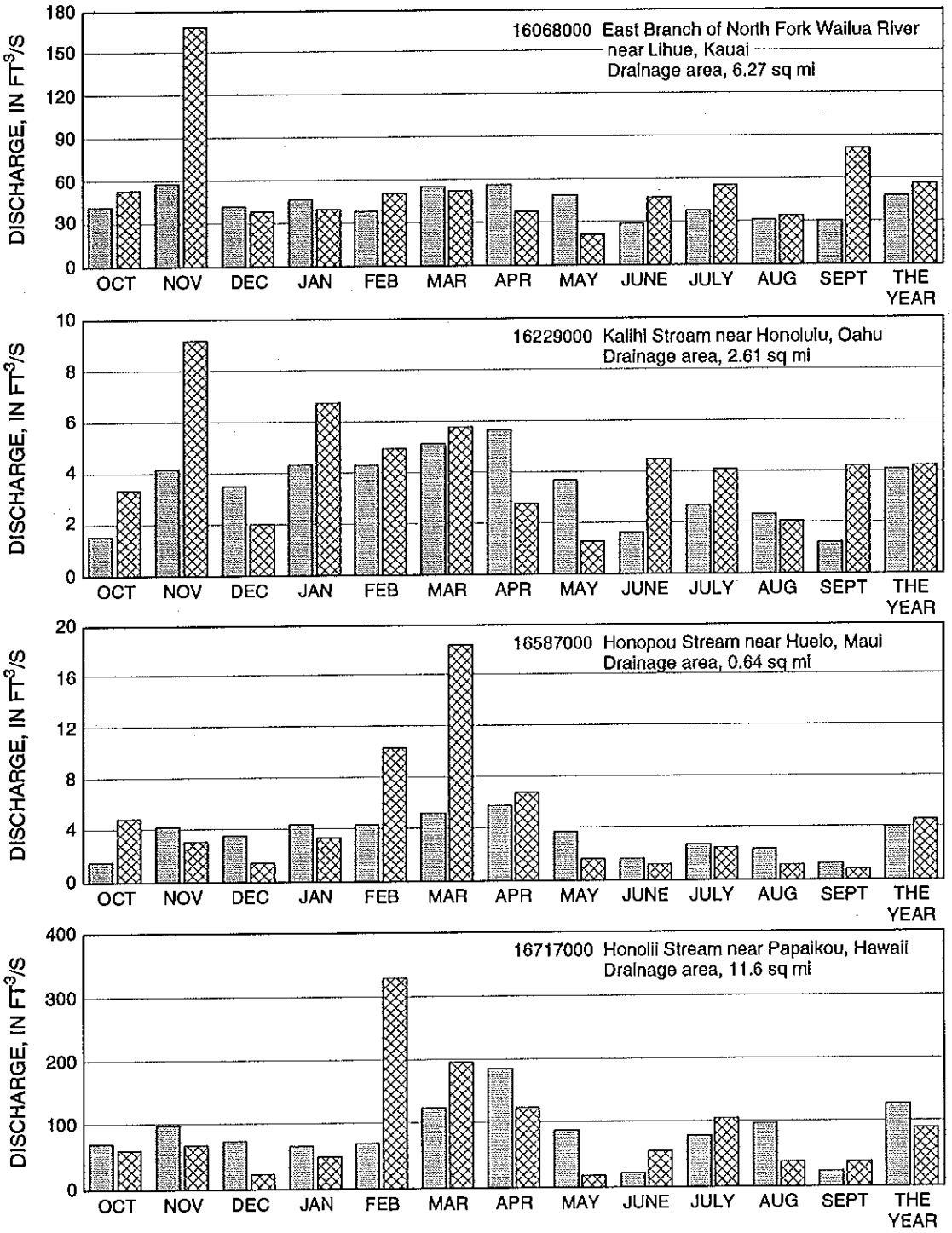

Figure 1. Discharge during 1996 water year compared with median discharge for four representative gaging stations.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. 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 Program (NAWQA); (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.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites; (2) provide the mechanism to evaluate the effectiveness of the significant reduction in SO_2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred; and (3) provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO_2 and NO_x scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

http://nadp.nrel.colostate.edu/NADP

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey 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; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 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 will be 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 decision making by water-resources managers 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 is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1996 water year that began October 1, 1995, and ended September 30, 1996. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, water-quality data for surface water, ground-water, and reservoirs, ground-water level data, and rainfall accumulation data. The locations of the stations and wells where the data were collected are shown in figures 4–14 and 16–25. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether a streamgage, well, or rain gage, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water wells differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Hawaii and other Pacific areas, for surface-water stations where only miscellaneous measurements are made, and for rainfall stations.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, 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 made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000, which appears just to the left of the station name, includes the two-digit number "16" plus the six-digit downstream order number "200000."

Latitude-Longitude System

The identification numbers for wells, miscellaneous surface-water sites, and rainfall stations are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description (See figure 2).

Local Identifier Well-Numbering System

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, aud 60 was added to the minutes of longitudes more than 156°00″ longitude. See figures 3 and 4.

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

Local 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

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 5–14.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relations between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relations between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with electronic data loggers with digital recorders that punch stage values on paper tapes at selected time intervals, or with analog recorders that trace continuous graphs of stage. Measurements of discharge are made with current meters, using methods adapted by the U.S. Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, Water-Supply Paper 2175, and the U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A1 to A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

In computing discharge records, results of individual measurements are plotted against corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This 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 set at some distance from the base gage. At some stations the 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.

In computing records of lake or reservoir contents, it is necessary to have information available from surveys, curves, or tables that define the relation of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Discharges over lake or reservoir spillways are computed from stage-discharge relations much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the validity of the recorded gage height is so questionable that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous and following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous and following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1992 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences. In addition, beginning with the 1992 water year, a graphical hydrograph is included for surface-water discharge stations.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of five parts, the station manuscript; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; a summary statistics table that includes statistical data of annual and daily flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and a hydrograph of the daily mean values of discharge for the current water year. Summary statistics were not included for certain sites where these data would be misleading. Contact the U.S. Geological Survey Hawaii District office for information concerning summary statistics for these sites.

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.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage 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.

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 indicates the period for which there are published records 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 records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means the instantaneous maximum discharge was revised; "(m)" the instantaneous minimum was revised; and "(P)" the peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to mean sea level, and a condensed history of the types, locations, and datums of previous gages are given under this heading. In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the National Mapping Division of the U.S. Geological Survey unless otherwise qualified.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station manuscript for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remark statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, special methods of computation, conditions that affect natural flow at the station, and possibly other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic average of the water-year mean discharges. Average discharge is computed only for stations having at least 5 water years of complete record; water years with incomplete record are not included in the computation. The mean-discharge value that uses all published data may differ from that given in the summary statistics data, which is based only on computer-stored data. The summary data do not include values of monthly or yearly data that were determined by various methods for the series of Water-Supply Papers entitled "Compilation of Records of Surface Water of the United States." The average-discharge value is not computed for stations where diversions, storage or other water-use practices cause the value to be meaningless. If water projects that significantly alter flow at a station are put into use after the station has been in operation for a period of years, the new average is computed as soon as 5 water years of record have accumulated after the project began.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning 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 U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for any canals, ditches, drains, or streams for which the peaks are subject to substantial artificial control. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published 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 ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because 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 skeleton stage-capacity table when daily contents are given.

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 average flow in cubic feet per second during the month, and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for the month. Discharge for the month also is usually expressed in acre-feet (line headed "AC-FT").

Statistics of monthly mean data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "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 figures. The designated period will be expressed as "FOR WATER YEAR __-__, 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. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be 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 record within the specified water years, inclusive, including months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be 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 headings. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to 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 of 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.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District Office. (see address on back title page of this report.)

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, 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 second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates 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.

HYDROGRAPH.--The hydrograph gives a graphical presentation of the mean discharge for each day of the water year. Where possible, the same scale is used in order to facilitate visual comparison between gaging stations.

Data collected at miscellaneous sites are presented in a table following the information for continuous sites. This table summarizes discharge measuremeuts made at sites other than continuous-record sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station manuscript.

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretations of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the published daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair" within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft^3/s; 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 for more than 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge figure. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the U.S. Geological Survey Hawaii District office. Also, most of the daily mean discharges are in computer readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the unpublished records may be obtained from the U.S. Geological Survey Hawaii District office.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurements frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-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 continuing or partial-record station, where random 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 "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape or obtained via data collection platform. 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 5–14.

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, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, treating the samples to prevent changes in quality pending analysis, and shipping the samples to the laboratory. Procedures for on site measurements and for collecting, treating, and shipping samples are detailed in the TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. These references are listed in the PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS section of this report. These methods are consistent with ASTM standards and generally follow ISO standards. Also, detailed information on collecting, treating, and shipping samples may be obtained from the U.S. Geological Survey Hawaii District office.

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 through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream-Quality Accounting Network (see "DEFINITION OF TERMS") are obtained from at least five verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

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 measurements 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, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey office whose address is given on the back of the 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 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, maximum, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the U.S. Geological Survey Hawaii District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment," 1985 revision. Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

For stations with daily suspended-sediment records, mean daily suspended-sediment concentrations and loads are computed and published for each day of the water year. During periods of unchanging flow and sediment concentration, daily suspended-sediment loads are computed as the product of mean daily streamflow, mean daily suspended-sediment concentrations, and 0.0027, a conversion factor. During periods of rapidly changing flow or rapidly changing suspended-sediment concentration, samples may have been 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. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with ASTM standards and generally follow ISO standards.

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

In addition to the records of suspended-sediment discharge, periodic measurements of the particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance and chloride are analyzed locally. All other samples are analyzed in the U.S. Geological Survey National Water-Quality Laboratory in Arvada, Colorado. Methods used to analyze sediment samples and to compute sediment records are described in the TWRI Book 5, Chapter C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapter A1, A3, A4, and A5. These methods are consistent with ASTM standards and generally follow ISO standards.

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

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, as appropriate, 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 under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. 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, 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 Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums and minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file.

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 to 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 report:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
&	Biological organism estimated as dominant.

Dissolved Trace-Element Concentrations

*NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Data above the µg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Change in National Trends Network procedures

*NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80532 (Telephone: 303-491-5643).

Records of Ground-Water Levels

Only water-level data from a basic network of observation wells are given in this report. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers. Locations of the observation wells in Hawaii listed in this report are shown in figures 16–20.

Although, in this report, records of water levels are presented for fewer than 100 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout Hawaii and are placed in computer storage, published in reports, or kept in files. Information about the availability of ground-water data may be obtained from the District Chief, Hawaii District, U.S. Geological Survey, 677 Ala Moana Blvd., Suite 415, Honolulu, Hawaii, 96813.

Data Collection and Computation

Measurements of water levels are made in many types of wells, under varying conditions, but the method of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey TWRI publications referred to in the "On-site Measurements and Sample Collection" and the "Laboratory Measurements" sections in this data report. In addition, the TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected constituents. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure 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.

Tables of water-level data are presented by islands. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, a 7-digit number based on the local identifier well-numbering system (page 6).

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph, digital record, or punched tape of a water-stage recorder. The water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean 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 every day. When complete water-level data for a day is not available, the day is noted with three dashes (---). To show the intraday variation in the ground-water levels caused by local pumping and tidal fluctuations, instantaneous maximum and minimum water levels for the year are given at the bottom of each daily tables.

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 to 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

Each well record consists of three parts, the station description, the data table of mean daily water levels observed during the current water year, and a hydrograph of water levels observed during the past 5 years. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other 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 weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes the land-surface elevation at the well. The elevation of the land-surface datum is described is described in feet above (or below) mean sea level; 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. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-U.S. Geological Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet above mean sea level and all taped measurements of water levels are listed. For wells equipped with a recorder, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. As part of the U.S. Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National WATer Data STOrage and REtrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

- Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.
- Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperatures, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.
- Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.
- Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.
- Ground-Water Site Inventory Data Base - Contains inventory data for more than 900,000 wells, springs, and other sources of ground water. The data includes site location, geohydrologic characteristics, well-construction history, and one-time field measurements such as water temperature.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requester will be expected to pay all computer costs he/she incurs. Direct access may be obtained by contacting:

U.S. Geological Survey
National Water Data Exchange
421 USGS National Center
Reston, Virginia 20192

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or $5^1/_4$ inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page).

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See the table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms which produce colonies within 24 hours when incubated at 35°C ± 0.5°C on M-Endo agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C ± 0.2°C on M-FC agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 0.5°C on KF Streptococcus agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Benthic organisms (invertebrates) are the group of animals living in or on the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any time, expressed as the weight per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in g/m^3 (grams per cubic meter), and periphyton and benthic organisms in g/m^2 (grams per square meter).

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash, and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually mL or liters (L).

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common pigments in plants.

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate or delayed incubation membrane filter method.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

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

Continuing record station is a specified site which meets one or all conditions listed:

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.
2. When water temperature records include observations taken one or more times daily.
3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic foot per second-day [$(ft^3/s)/d$] is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons or 2,447 cubic meters.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic average of individual daily mean discharges during a specified period.

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the table is "STREAMFLOW INSTANTANEOUS (CFS)."

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or 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.)

Dissolved is that material in a representative water sample which passes through a 0.45 micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

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

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded water.

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

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Hydrologic Bench-Mark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the human activities.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Microgram per gram ($\mu g/g$) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element per unit mass (gram) of sediment.

Microgram per liter (µG/L, µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligram per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L, and is based on the mass of sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or " mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

Parameter code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

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

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	0.00024-0.004	Sedimentation
Silt	.004-.062	Sedimentation
Sand	.062-2.0	Sedimentation or sieve
Gravel	2.0-64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of micro-organisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, the periphyton also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

Pesticides are chemical compounds used to control the growth of undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton are suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton compose the plant part of the plankton. They are usually microscopic, and their movement is subject to water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials into the surrounding water, the phytoplankton have a profound effect on the quality of the water. They are the primary food producers in the aquatic environment and are commonly known as algae.

Blue-green algae are phytoplankton organisms having a blue pigment in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

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

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

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge times suspended-sediment concentration in milligrams per liter times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total-sediment discharge (tons/day) is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time. It is commonly computed as the sum of suspended-sediment and bedload discharge, however, this is an approximation of the actual total-sediment discharge.

Solute is any substance that is dissolved in water.

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

Stage-discharge relation is the relation between gage height (stage) and discharge, or volume of water per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation. Streamflow includes water and all constituents transported by water in the stream.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

Suspended recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituents.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata is the following:

Kingdom. . . . . Animal
Phylum . . . . . Arthropoda
Class . . . . . Insecta
Order . . . . . Ephemeroptera
Family . . . . . Ephemeridae
Genus . . . . . Hexagenia
Species . . . . . Hexagenia limbata

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

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

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

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is contained in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Turbidity of a sample is the reduction of transparency due to the presence of particulate matter. In this report it is expressed in Nephelometric turbidity units (NTU).

Water year in U.S. Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends. Thus the year ending September 30, 1994, is called the "1994 water year".

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

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS--TWRI Book I, Chapter D2. 1976. 24 pages.

2-D1. *Application of surface geophysics to ground-water investigations*, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

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3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

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3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3. Chapter A5. 1967. 29 pages.

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3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G.D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

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7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L.F. Konikow and J.D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. *A model for simulation of flow in singular and interconnected channels*, by R.W. Schaffranek, R.A. Baltzer, and D.E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

8-A1. *Methods of measuring water levels in deep wells*, by M.S. Garber and F.C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. *Installation and service manual for U.S. Geological Survey manometers*, by J.D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

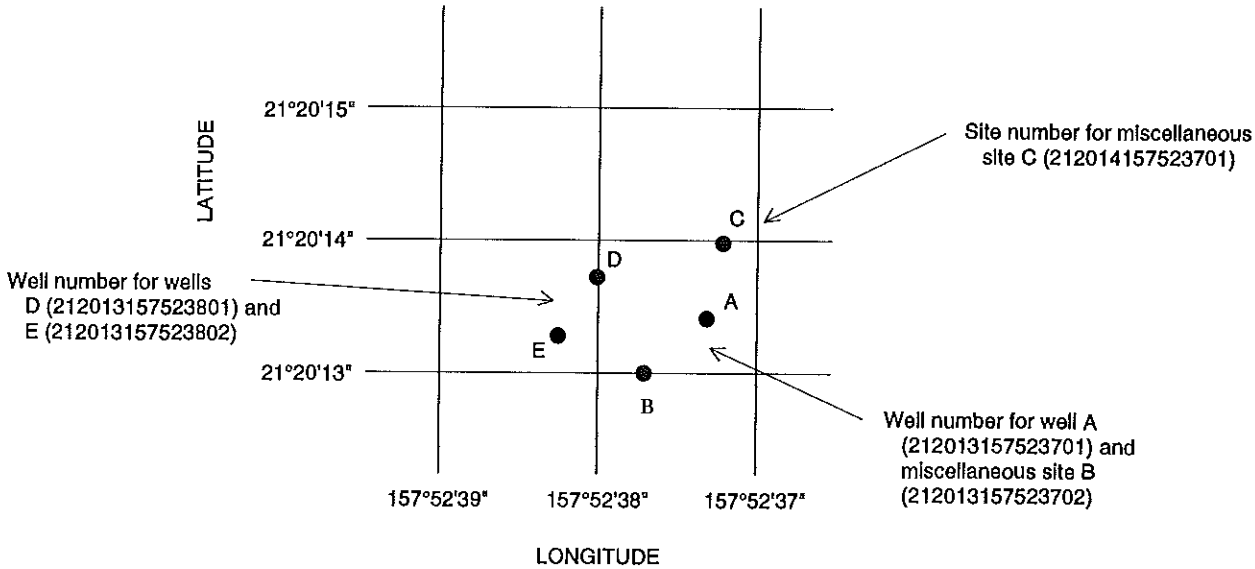


Figure 2. Sketch showing system for numbering wells and miscellaneous sites.

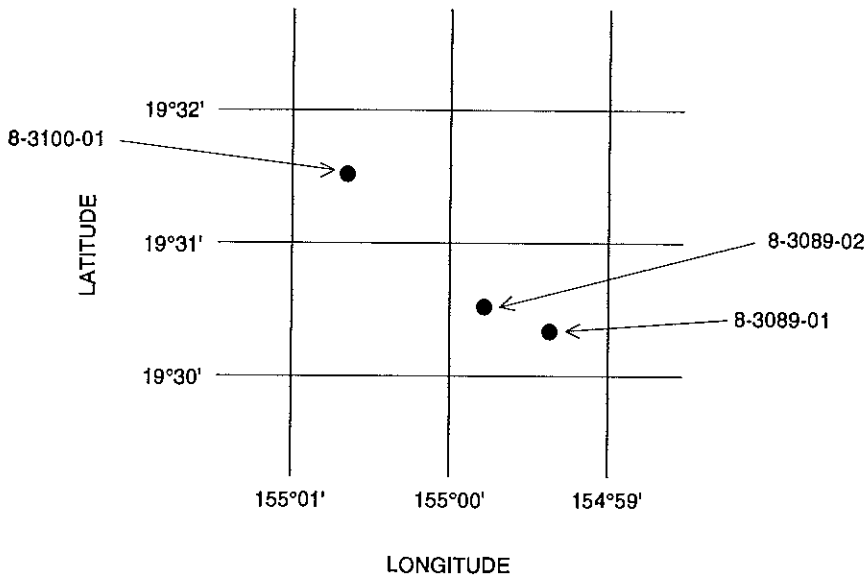


Figure 3. Sketch showing local well-numbering system.

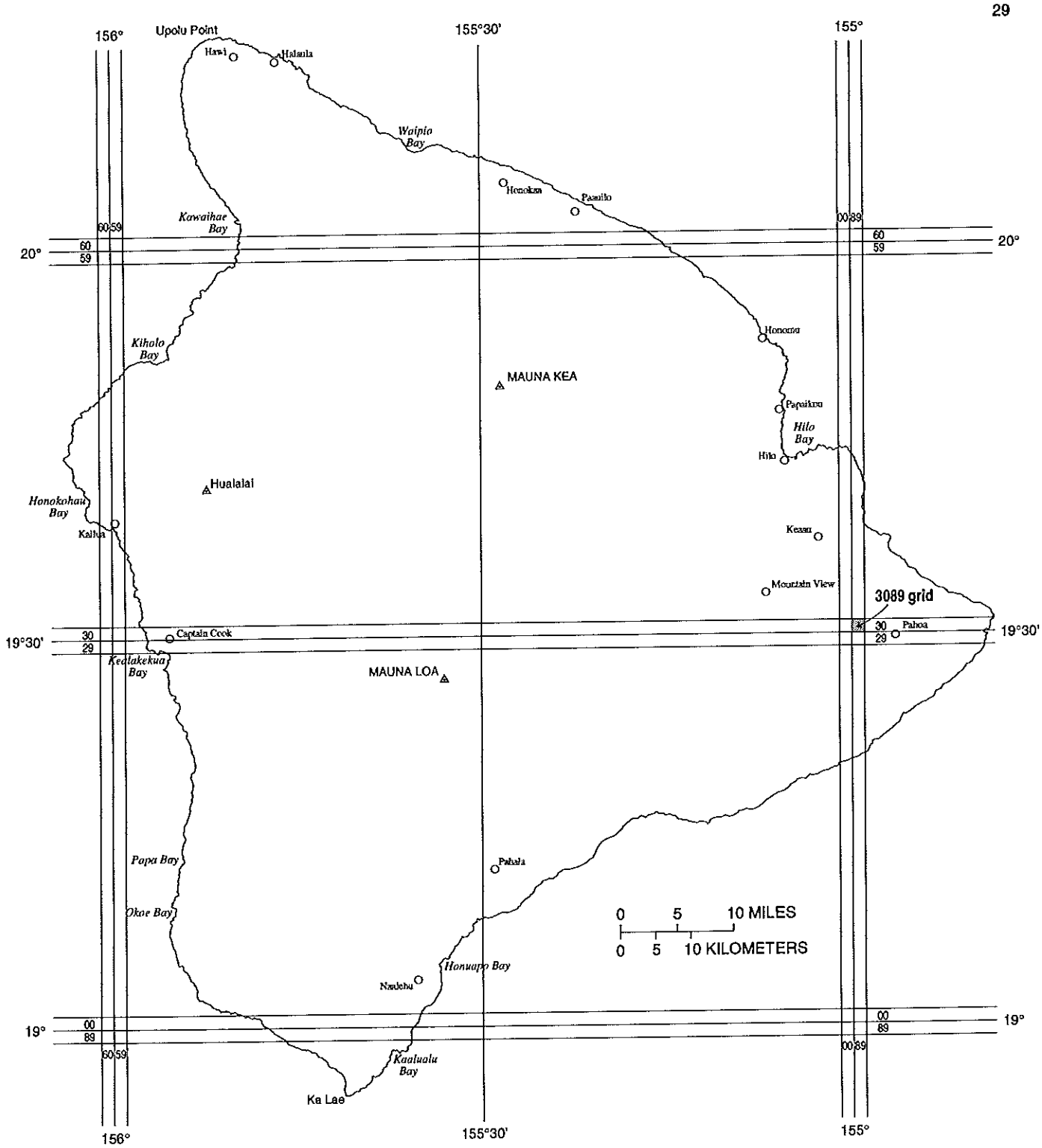


Figure 4. Map of island of Hawaii showing system for numbering local well numbers.

Surface-Water Station Records for Kauai

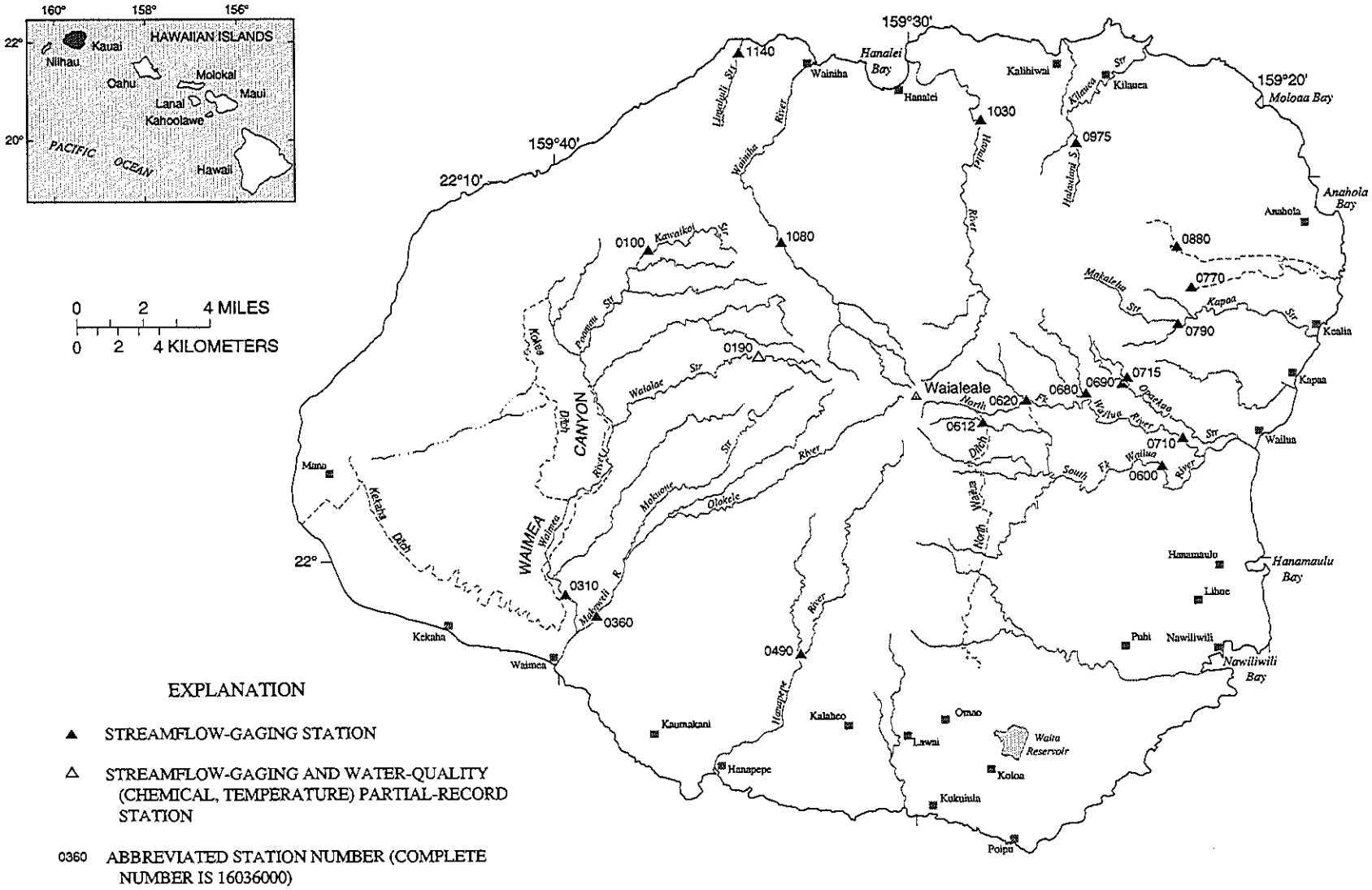


Figure 5. Locations of gaging, water-quality, and partial-record stations on Kauai.

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

LOCATION.--Lat 22°08′09″, long 159°37′22″, 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 good. No diversion upstream.

AVERAGE DISCHARGE.--79 years (water years 1912, 1914, 1920-96), 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 discharge 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)
Nov. 03	1230	*4,030	*10.04	Mar. 03	0500	2,260	7.97
Jan. 18	0400	3,580	9.55	Jun. 30	0800	2,940	8.81

Minimum discharge, 2.5 ft^3/s, June 5, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	21	14	34	19	16	10	8.9	3.3	26	7.6	27
2	9.1	14	14	20	23	72	9.6	6.2	3.0	25	5.5	16
3	6.5	757	12	15	17	439	8.7	5.3	2.8	19	4.9	6.8
4	7.6	76	15	14	14	316	8.1	5.8	2.8	29	4.7	5.5
5	9.8	26	15	16	13	69	7.5	5.7	2.6	27	4.9	4.6
6	26	18	11	13	12	43	6.9	5.0	2.6	13	11	15
7	84	15	10	11	15	28	6.5	5.2	117	10	7.7	121
8	181	12	9.7	9.6	13	22	6.3	42	69	10	5.9	26
9	53	289	9.3	281	11	18	6.1	20	55	9.3	4.7	12
10	16	61	8.7	43	54	16	5.8	7.7	22	7.8	4.9	6.7
11	12	22	8.1	18	14	14	5.9	5.8	10	7.0	31	21
12	10	16	8.8	14	11	13	6.6	4.9	6.7	8.4	42	55
13	9.1	60	23	12	9.5	42	6.1	4.5	14	14	10	49
14	7.5	20	31	11	63	18	7.1	4.2	16	7.8	6.1	10
15	6.6	14	9.8	10	96	12	6.1	4.0	7.1	11	4.9	6.5
16	5.9	12	7.7	9.4	42	11	5.2	7.3	5.4	29	4.4	5.1
17	5.4	11	7.2	150	17	10	5.0	5.2	5.6	22	4.1	4.5
18	5.2	10	6.7	623	13	10	11	3.9	77	79	3.9	4.2
19	5.3	14	6.3	32	12	9.8	138	3.7	26	40	3.8	4.3
20	6.1	39	6.0	36	13	13	25	3.5	13	39	3.6	4.0
21	7.4	13	5.8	21	20	44	9.6	3.5	11	24	3.5	3.7
22	6.9	9.8	5.7	16	34	35	7.0	3.4	7.7	12	3.5	3.5
23	9.6	9.0	5.6	14	21	52	6.0	3.3	21	9.2	3.5	3.3
24	7.3	8.3	5.4	48	12	30	5.5	3.3	158	8.1	3.5	3.2
25	9.8	43	282	146	24	25	5.4	3.3	43	7.2	3.3	3.1
26	31	181	37	33	26	18	5.2	3.2	13	6.8	3.2	3.0
27	13	128	12	130	251	13	5.1	3.0	9.4	6.5	3.1	2.9
28	89	37	9.2	94	73	11	4.9	3.9	42	7.0	2.9	2.8
29	61	19	8.3	19	21	43	17	6.7	51	6.4	2.9	2.8
30	115	15	246	119	---	36	34	4.5	306	5.5	3.2	3.3
31	95	---	150	24	---	13	---	3.8	---	5.8	3.8	---
TOTAL	935.1	1970.1	1000.3	2036.0	963.5	1511.8	391.2	200.7	1123.0	531.8	212.0	435.8
MEAN	30.2	65.7	32.3	65.7	33.2	48.8	13.0	6.47	37.4	17.2	6.84	14.5
MAX	181	757	282	623	251	439	138	42	306	79	42	121
MIN	5.2	8.3	5.4	9.4	9.5	9.8	4.9	3.0	2.6	5.5	2.9	2.8
AC-FT	1850	3910	1980	4040	1910	3000	776	398	2230	1050	421	864

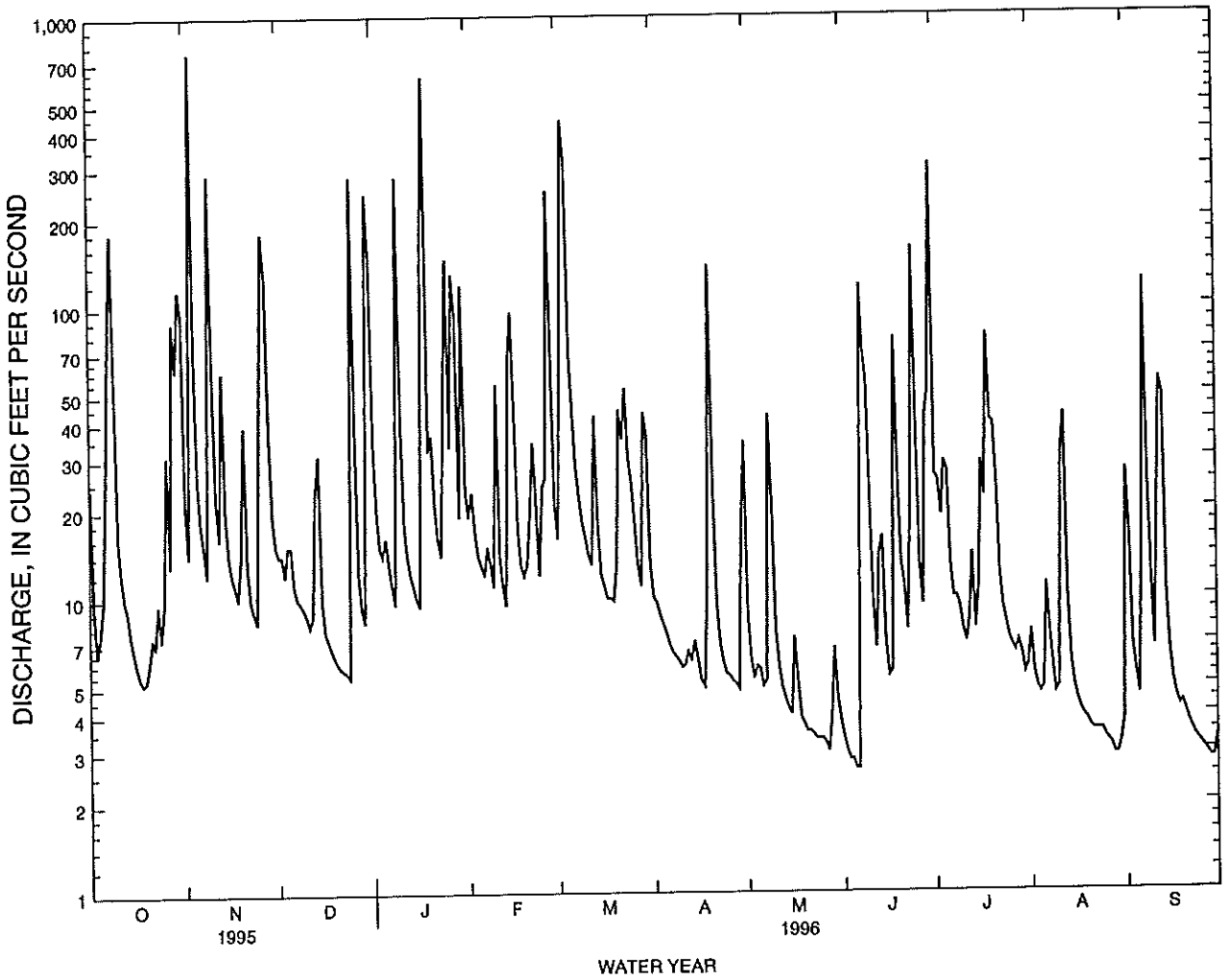
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1996, BY WATER YEAR (WY)

MEAN	21.9	43.7	53.4	53.4	42.0	49.1	44.9	26.8	16.9	23.5	21.8	14.6
MAX	60.3	170	176	343	165	152	115	86.2	68.7	94.7	195	58.1
(WY)	1917	1929	1968	1921	1956	1951	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	1923	1945	1945	1926	1992	1966	1951	1922	1984	1953

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1911 - 1996	
ANNUAL TOTAL	9737.0		11311.3			
ANNUAL MEAN	26.7		30.9		34.2	
HIGHEST ANNUAL MEAN					60.7	1982
LOWEST ANNUAL MEAN					15.3	1945
HIGHEST DAILY MEAN	757	Nov 3	757	Nov 3	2620	Jan 15 1921
LOWEST DAILY MEAN	3.4	Jul 9	2.6	Jun 5	1.1	Sep 21 1953
ANNUAL SEVEN-DAY MINIMUM	3.9	Jun 21	3.0	May 31	1.2	Sep 17 1953
ANNUAL RUNOFF (AC-FT)	19310		22440		24790	
10 PERCENT EXCEEDS	60		62		74	
50 PERCENT EXCEEDS	10		11		13	
90 PERCENT EXCEEDS	4.5		3.8		4.4	



HAWAII, ISLAND OF KAUAI

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

LOCATION.--Lat 22°05′20″, long 159°34′18″, 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 good. No diversion upstream.

AVERAGE DISCHARGE.--55 years (water years 1921-31, 1953-96), 21.5 ft^3/s (15,600 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 discharge 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. 03	1200	*3,550	*7.50	Jun. 30	0830	2,930	6.78
Nov. 09	1130	1,540	4.92				

Minimum discharge, 2.1 ft^3/s, June 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	11	8.7	11	7.6	8.5	14	3.1	2.8	19	4.3	21
2	15	34	8.7	6.9	6.1	73	6.6	2.7	2.5	14	3.9	21
3	9.0	572	6.6	5.3	5.1	159	4.0	2.7	2.4	16	3.6	13
4	7.2	41	33	7.3	4.4	93	3.3	2.7	2.3	55	3.5	13
5	13	13	12	8.4	4.1	23	2.9	2.6	2.3	24	4.2	4.9
6	32	8.6	8.7	5.5	3.9	14	2.8	2.5	2.2	9.8	5.5	4.5
7	26	6.6	7.1	4.3	6.9	9.8	2.7	2.6	8.8	6.9	5.2	207
8	151	5.5	8.2	3.8	7.7	7.5	2.7	2.6	16	5.8	4.3	47
9	25	477	8.4	44	6.2	6.2	2.7	2.6	9.8	5.2	3.4	11
10	12	51	5.4	35	7.2	5.4	2.6	2.5	6.2	4.5	3.2	7.3
11	9.8	13	4.4	8.1	5.7	4.8	4.1	2.5	4.9	4.0	11	23
12	13	8.8	4.0	5.5	4.1	4.5	7.7	2.4	46	5.3	21	24
13	9.9	8.6	4.7	4.5	3.5	11	3.9	2.4	32	6.7	6.0	23
14	7.6	7.4	19	4.0	6.2	11	3.0	2.4	14	4.7	3.7	7.4
15	5.4	5.6	5.3	3.8	23	5.4	2.8	2.4	5.3	5.6	3.1	4.9
16	4.4	4.7	4.0	3.4	17	4.3	2.7	2.4	4.4	36	2.8	3.9
17	3.9	4.1	3.6	3.5	6.4	3.9	2.7	2.3	17	49	2.7	3.5
18	4.1	3.8	3.3	12	4.6	3.8	3.0	2.3	83	33	2.6	8.0
19	5.1	3.5	3.1	7.5	4.0	3.6	84	2.3	25	33	2.5	7.0
20	12	3.5	3.0	81	4.1	3.5	13	2.3	19	25	2.5	5.7
21	25	3.1	2.9	15	5.4	3.8	5.3	2.3	18	8.8	2.4	5.8
22	10	3.0	2.8	8.5	27	5.3	3.4	2.3	7.7	26	2.4	3.9
23	9.2	3.0	2.8	6.3	20	16	2.9	2.3	8.5	46	2.4	3.1
24	6.6	2.7	2.8	20	36	11	2.7	2.3	54	30	2.4	2.7
25	10	169	10	101	219	11	2.7	2.4	33	17	2.4	2.6
26	28	270	12	81	209	6.5	2.7	3.0	9.4	12	2.4	2.5
27	9.0	99	4.4	21	179	4.3	2.7	2.6	6.0	15	2.3	2.5
28	7.9	22	3.3	22	37	3.7	3.0	4.9	5.1	20	2.3	2.4
29	20	11	8.0	9.5	13	3.4	3.1	4.8	11	7.6	2.3	2.4
30	21	8.3	245	16	---	3.5	3.0	7.1	337	5.4	2.7	2.4
31	33	---	61	18	---	3.6	---	4.1	---	4.8	5.6	---
TOTAL	603.1	1873.8	516.2	583.1	883.2	527.3	202.7	88.4	795.6	555.1	128.6	490.4
MEAN	19.5	62.5	16.7	18.8	30.5	17.0	6.76	2.85	26.5	17.9	4.15	16.3
MAX	151	572	245	101	219	159	84	7.1	337	55	21	207
MIN	3.9	2.7	2.8	3.4	3.5	3.4	2.6	2.3	2.2	4.0	2.3	2.4
AC-FT	1200	3720	1020	1160	1750	1050	402	175	1580	1100	255	973

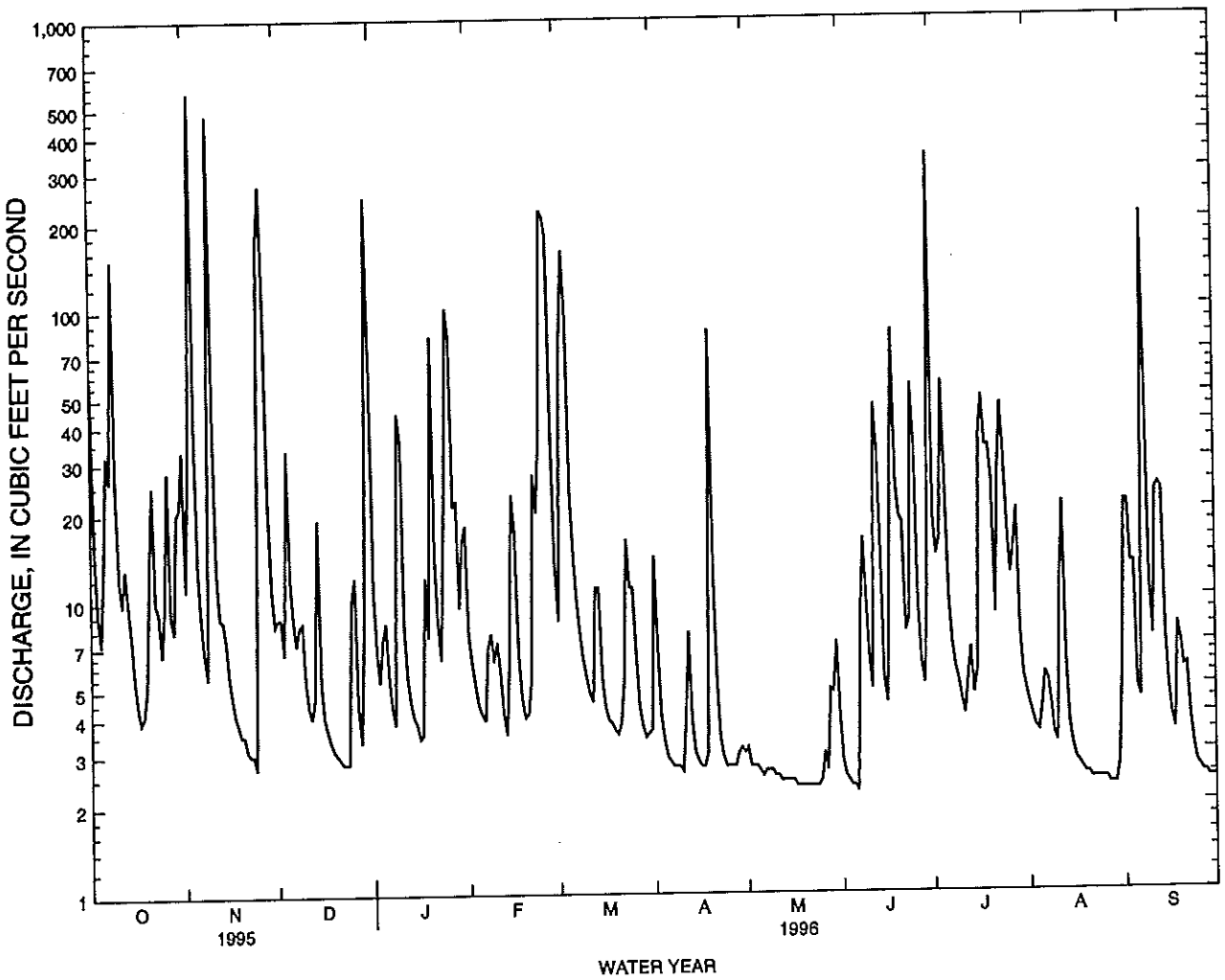
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1996, BY WATER YEAR (WY)

MEAN	15.8	32.9	33.9	33.6	27.5	28.1	24.1	13.2	9.83	15.4	12.6	11.2
MAX	52.1	99.2	106	166	155	106	92.4	44.1	39.4	58.0	44.9	56.0
(WY)	1995	1968	1968	1921	1956	1982	1974	1927	1978	1989	1959	1922
MIN	2.49	5.58	4.16	4.48	2.44	2.15	1.87	1.81	1.89	2.56	2.86	1.67
(WY)	1927	1927	1923	1966	1983	1926	1966	1966	1975	1984	1952	1975

HAWAII, ISLAND OF KAUAI

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1920 - 1996	
ANNUAL TOTAL	7101.3		7247.5			
ANNUAL MEAN	19.5		19.8		21.5	
HIGHEST ANNUAL MEAN					40.9	1982
LOWEST ANNUAL MEAN					8.94	1926
HIGHEST DAILY MEAN	572	Nov 3	572	Nov 3	1440	Dec 1 1957
LOWEST DAILY MEAN	2.3	Jul 2	2.2	Jun 6	.99	May 17 1966
ANNUAL SEVEN-DAY MINIMUM	2.5	Jun 26	2.3	May 17	1.1	May 26 1966
ANNUAL RUNOFF (AC-FT)	14090		14380		15570	
10 PERCENT EXCEEDS	34		33		45	
50 PERCENT EXCEEDS	6.6		5.6		6.6	
90 PERCENT EXCEEDS	2.8		2.5		2.5	



HAWAII, ISLAND OF KAUAI

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

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

REMARKS.--Quality-of-water samples obtained at the gage.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT
NOV											
30...	1020	8.6	26	5.9	18.5	16.0	4	0.56	0.58	3.2	63
MAR											
26...	1020	7.1	32	6.1	13.5	11.5	6	0.86	0.95	3.5	55
JUL											
09...	1015	5.3	27	6.5	20.0	18.0	4	0.59	0.63	3.1	61

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV											
30...	0.7	0.20	2.5	0.50	5.0	<0.10	5.6	17	0.02	220	2.0
MAR											
26...	0.6	0.20	3.4	0.50	7.0	<0.10	3.9	19	0.03	290	2.0
JUL											
09...	0.7	0.20	3.1	0.40	6.0	<0.10	5.2	18	0.02	250	2.0

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HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA

(National stream-quality accounting network station)

LOCATION.--Lat 21°59'02", long 159°34'47", Hydrologic Unit 20070000, on right bank 1.3 mi upstream from Makaweli River and 1.9 mi north of Waimea Post Office.

DRAINAGE AREA.--57.8 mi^2.

PERIOD OF RECORD.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968, October 1969 to September 1972 (discontinued as a continuous-record station, converted to a crest-stage partial-record station October 1972 to April 1975), May 1975 to current year (discontinued).

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

GAGE.--Water-stage recorder. Datum of gage is 20.0 ft above mean sea level (Department of Water, County of Kauai benchmark). Prior to October 5, 1911, nonrecording gage at site 1.0 mi downstream at different datum. October 5, 1911 to October 31, 1919, nonrecording gage at present site at different datum.

REMARKS.--Records good except for estimated discharges which are fair. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--55 years (water years 1911-17, 1945-68, 1970-72, 1976-96), 124 ft^3/s (90,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft^3/s, February 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft^3/s on basis of slope-area measurements at gage heights 10.28 ft and 18.7 ft; practically no flow occasionally owing to upstream diversions.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 19, 1974, which destroyed the station reached a stage of 19.05 ft, from floodmarks, discharge, 29,100 ft^3/s, from rating curve extended above 2,200 ft^3/s on basis of slope-area measurement at gage heights 19.05 ft.

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)
Nov. 03	1300	*26,600	*18.48	Nov. 09	1345	16,000	15.36

Minimum discharge, 4.7 ft^3/s, August 21, 26-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	453	84	141	204	143	110	21	12	8.7	149	8.3	15
2	48	35	127	131	120	214	38	10	7.8	86	8.0	119
3	31	3940	106	98	104	1630	20	8.0	7.7	102	7.6	31
4	24	616	223	89	93	1820	15	7.5	8.0	76	7.5	26
5	22	148	158	100	93	640	14	7.2	7.9	129	7.6	17
6	35	155	123	80	86	320	12	7.0	7.5	51	9.1	11
7	88	82	101	62	100	223	11	7.8	20	31	11	579
8	672	56	98	51	103	168	10	8.1	93	16	9.4	176
9	221	2730	95	341	91	145	9.9	17	80	13	8.3	78
10	59	775	79	703	144	129	9.3	9.4	96	16	7.2	28
11	37	203	72	150	101	100	9.6	7.4	24	14	9.2	20
12	30	140	60	103	82	75	15	6.7	42	10	72	82
13	30	137	57	73	76	89	15	6.5	125	12	38	107
14	23	99	110	63	103	128	10	6.2	118	14	11	38
15	18	77	73	57	178	73	9.5	6.2	38	9.4	8.3	15
16	16	68	46	52	217	59	9.5	6.6	21	52	6.9	10
17	15	60	41	49	82	52	9.3	6.4	12	93	6.3	9.8
18	15	50	39	804	55	44	9.2	6.0	171	88	6.2	8.7
19	15	48	37	155	49	41	213	5.9	139	120	6.0	17
20	15	54	36	235	45	40	92	6.3	50	85	5.8	13
21	33	55	34	146	40	52	36	7.7	45	35	5.7	12
22	39	55	32	85	70	60	13	8.2	32	17	6.3	11
23	21	55	32	54	89	111	9.8	7.8	15	66	6.0	8.2
24	23	52	31	113	94	98	9.2	6.8	153	61	5.9	7.3
25	17	533	257	539	389	83	9.2	6.8	193	50	5.8	7.5
26	52	2040	204	474	581	64	9.0	7.6	52	32	5.7	7.6
27	53	1580	57	279	1020	36	9.2	8.2	23	16	5.5	7.3
28	26	407	37	391	456	27	9.0	7.5	16	54	5.4	7.3
29	150	218	33	168	152	22	10	12	40	24	5.5	8.2
30	98	157	1320	310	---	44	16	9.6	1320	11	5.5	9.9
31	264	---	758	346	---	28	---	11	---	9.0	9.9	---
TOTAL	2643	14709	4617	6505	4956	6725	682.7	251.4	2965.6	1541.4	320.8	1486.8
MEAN	85.3	490	149	210	171	217	22.8	8.11	98.9	49.7	10.3	49.6
MAX	672	3940	1320	804	1020	1820	213	17	1320	149	72	579
MIN	15	35	31	49	40	22	9.0	5.9	7.5	9.0	5.4	7.3
AC-FT	5240	29180	9160	12900	9830	13340	1350	499	5880	3060	636	2950

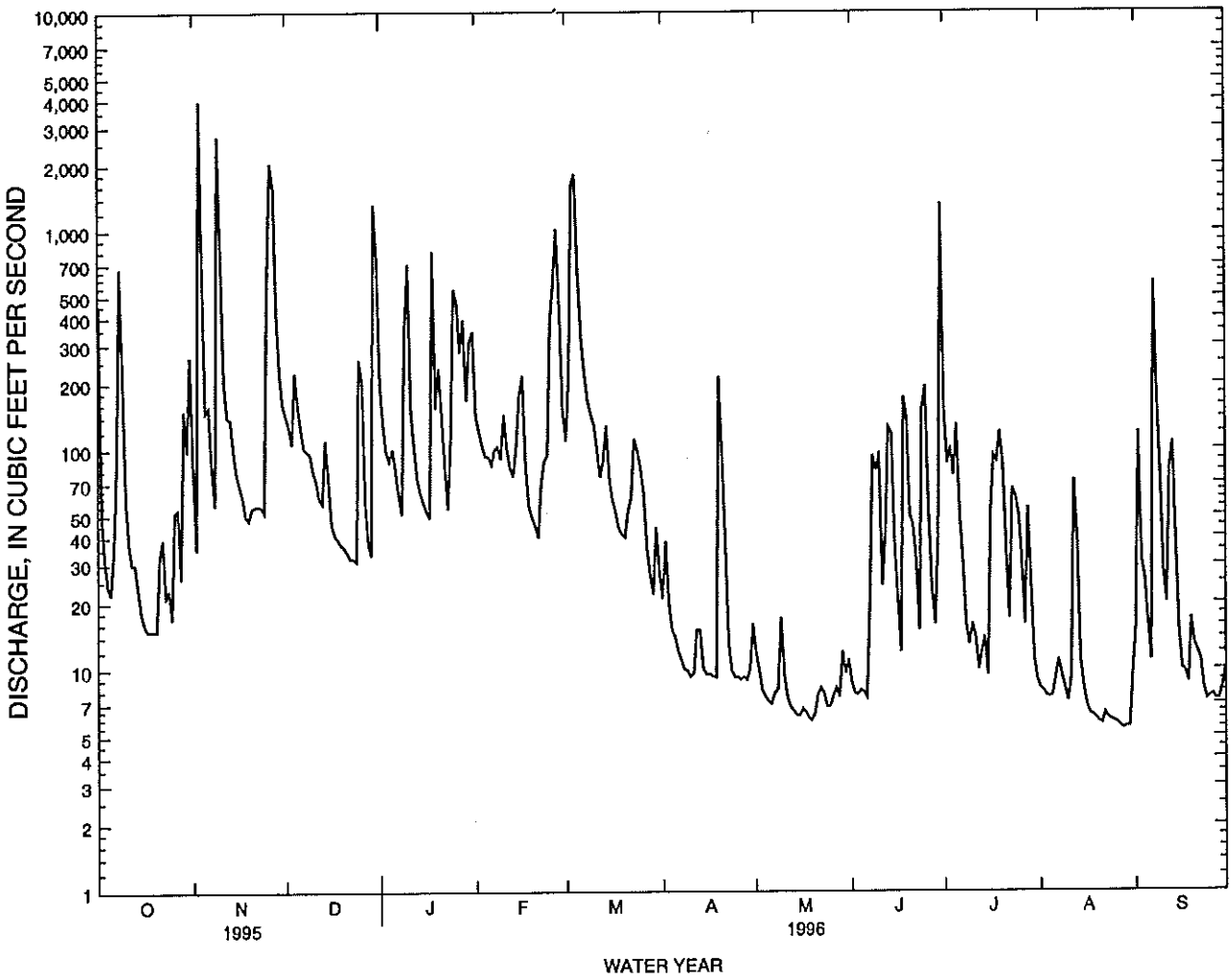
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1996, BY WATER YEAR (WY)

MEAN	67.7	185	220	255	193	209	138	61.4	27.8	42.9	57.9	34.7
MAX	381	1632	1285	1639	996	1113	589	244	125	423	1453	294
(WY)	1995	1914	1968	1916	1956	1951	1918	1965	1978	1989	1950	1914
MIN	2.79	8.94	8.39	2.28	2.97	1.80	1.60	.95	1.02	2.54	.000	1.13
(WY)	1950	1945	1977	1945	1978	1915	1966	1966	1912	1953	1911	1949

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1910 - 1996	
ANNUAL TOTAL	39977.4		47403.7			
ANNUAL MEAN	110		130		124	
HIGHEST ANNUAL MEAN					297	1982
LOWEST ANNUAL MEAN					24.1	1984
HIGHEST DAILY MEAN	3940	Nov 3	3940	Nov 3	17300	Aug 16 1950
LOWEST DAILY MEAN	8.3	Jan 22	5.4	Aug 28	.00	Jun 12 1911
ANNUAL SEVEN-DAY MINIMUM	8.7	Jan 19	5.6	Aug 24	.00	Jun 16 1911
ANNUAL RUNOFF (AC-FT)	79300		94030		90010	
10 PERCENT EXCEEDS	201		222		249	
50 PERCENT EXCEEDS	29		41		16	
90 PERCENT EXCEEDS	12		7.5		2.2	



HAWAII, ISLAND OF KAUAI

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58′31″, long 159°38′55″, 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.

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 good, except for periods of estimated discharges which are poor. 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.--53 years (water years 1944-96), 87.1 ft^3/s (63,110 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.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 03	1300	*21,500	*13.80	Feb. 27	1130	5,480	9.08
Nov. 09	1200	13,700	11.98	Jun. 30	0830	17,300	12.88

Minimum discharge, 9.3 ft^3/s, August 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	441	24	94	92	62	118	167	13	12	198	17	40
2	198	28	71	69	53	319	30	13	11	85	17	57
3	115	e2000	61	61	50	646	21	13	11	71	17	32
4	66	e250	304	59	46	438	20	13	11	99	26	31
5	44	e80	146	58	36	138	19	13	11	91	20	17
6	97	e60	144	49	29	96	18	13	11	36	16	16
7	94	e45	98	40	50	74	18	13	24	25	17	647
8	413	e80	95	34	46	61	18	13	38	24	15	227
9	178	e2500	80	89	48	54	17	13	23	21	15	86
10	120	e300	61	224	55	50	17	13	18	20	17	27
11	102	e120	58	64	41	46	57	13	16	19	36	60
12	69	e80	59	43	31	43	35	13	68	28	89	60
13	46	e64	77	38	29	78	19	13	87	26	19	71
14	34	e52	83	35	29	63	17	12	50	18	15	24
15	29	e44	41	33	40	46	17	12	21	27	14	19
16	27	e39	37	30	39	36	16	12	29	59	13	17
17	30	e35	35	19	27	33	16	12	42	79	12	21
18	27	e50	35	25	25	32	40	12	158	59	12	46
19	22	e32	32	40	24	31	218	13	76	70	12	23
20	52	e28	30	334	24	29	50	12	57	53	12	23
21	52	e26	29	137	24	27	18	12	58	25	12	24
22	28	27	29	116	66	27	15	12	25	53	14	15
23	34	27	30	39	67	28	14	12	19	82	13	14
24	19	26	28	92	162	27	13	13	71	69	12	14
25	28	549	32	384	939	27	13	42	104	41	11	13
26	103	1250	43	422	904	26	14	16	34	40	10	13
27	25	760	28	304	1110	24	19	15	19	83	10	13
28	20	221	29	178	286	23	14	35	23	88	10	13
29	30	122	37	95	149	22	16	22	38	45	10	14
30	26	100	483	79	---	26	14	21	2000	21	10	15
31	47	---	226	93	---	21	---	14	---	18	25	---
TOTAL	2616	9019	2635	3375	4491	2709	980	468	3165	1673	548	1692
MEAN	84.4	301	85.0	109	155	87.4	32.7	15.1	105	54.0	17.7	56.4
MAX	441	2500	483	422	1110	646	218	42	2000	198	89	647
MIN	19	24	28	19	24	21	13	12	11	18	10	13
AC-FT	5190	17890	5230	6690	8910	5370	1940	928	6280	3320	1090	3360

e Estimated

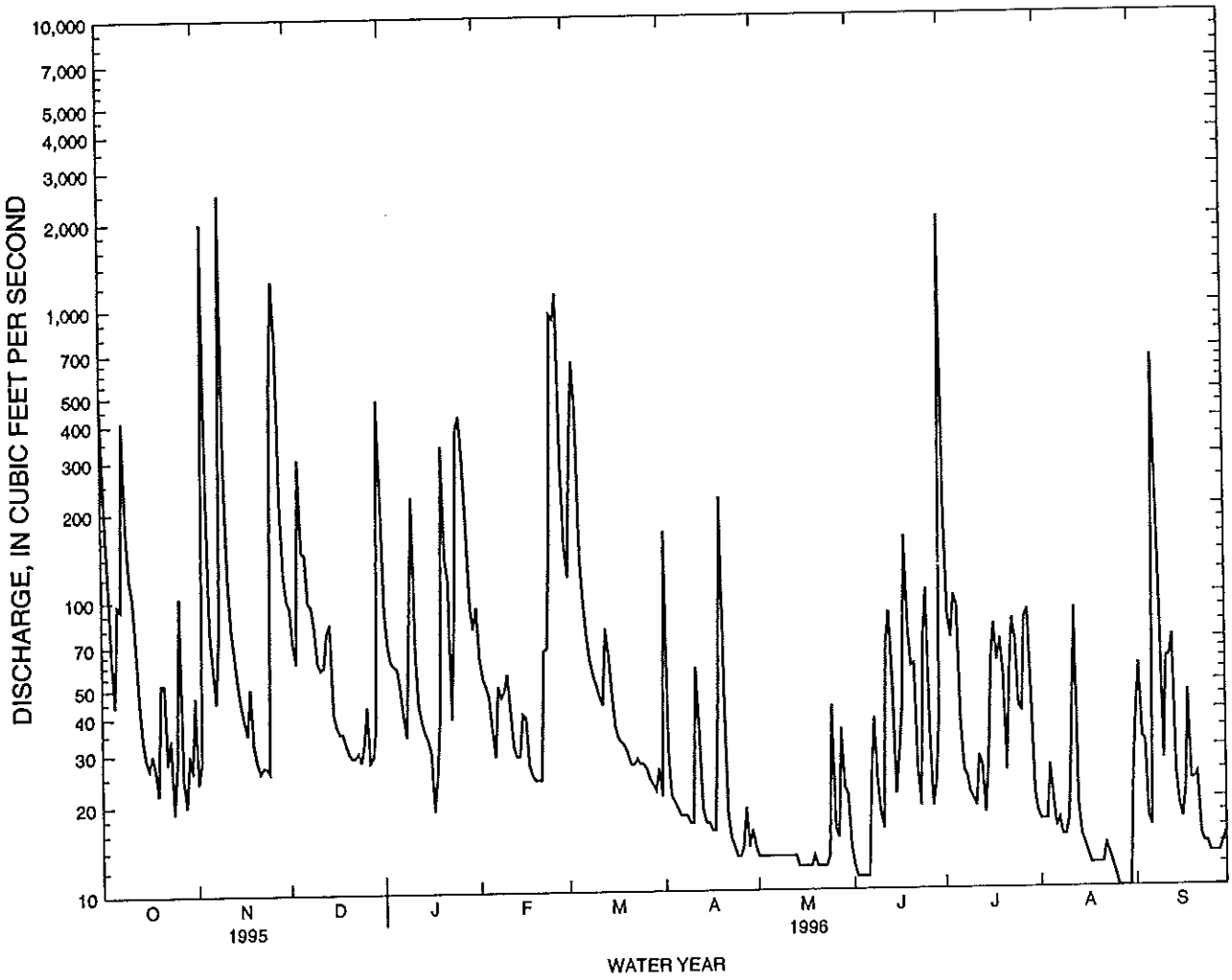
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1996, BY WATER YEAR (WY)

MEAN	60.6	127	143	132	118	131	95.9	57.2	38.3	53.2	52.5	37.6
MAX	311	491	577	441	774	609	419	283	105	222	328	204
(WY)	1995	1991	1993	1989	1956	1982	1963	1965	1996	1989	1950	1994
MIN	11.7	15.2	18.0	9.49	12.0	10.6	11.6	15.1	9.56	10.0	14.2	9.54
(WY)	1960	1951	1977	1945	1978	1959	1992	1996	1951	1984	1944	1962

HAWAII, ISLAND OF KAUAI

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1943 - 1996	
ANNUAL TOTAL	29653		33371			
ANNUAL MEAN	81.2		91.2		87.1	
HIGHEST ANNUAL MEAN					204	1982
LOWEST ANNUAL MEAN					31.1	1984
HIGHEST DAILY MEAN	2500	Nov 9	2500	Nov 9	5170	Dec 1 1957
LOWEST DAILY MEAN	13	Sep 9	10	Aug 26	4.3	Jul 19 1951
ANNUAL SEVEN-DAY MINIMUM	13	Sep 9	10	Aug 24	5.7	Oct 21 1944
ANNUAL RUNOFF (AC-FT)	58820		66190		63110	
10 PERCENT EXCEEDS	130		152		171	
50 PERCENT EXCEEDS	29		32		27	
90 PERCENT EXCEEDS	15		13		12	



HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57′29″, long 159°33′13″, 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 good except for estimated discharges, which are fair. Koula ditch diverts water 3.0 mi upstream of station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--72 years (water years 1918-20, 1928-96), 84.7 ft^3/s (61,350 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 03	1230	4,720	6.90	Feb. 27	1130	7,080	8.11
Nov. 09	1130	7,410	8.26	Jun. 30	0800	*8,310	*8.61

Minimum discharge, 15 ft^3/s, April 4-10, 14-18, May 1-7, 9-21, 26, 27, May 31 to June 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	350	33	134	83	76	100	90	17	16	224	21	38
2	205	28	100	71	72	273	21	16	16	128	20	120
3	212	1050	99	67	68	598	17	17	16	153	21	56
4	97	216	394	68	65	338	17	17	16	263	63	54
5	82	78	152	66	47	109	16	16	16	137	55	21
6	149	59	158	62	22	46	16	17	16	54	27	53
7	194	35	91	61	57	45	16	16	19	34	27	729
8	406	57	67	44	31	38	16	17	20	28	22	414
9	164	1950	57	69	36	39	16	16	21	26	21	105
10	84	349	50	113	80	34	16	16	25	27	27	59
11	50	128	53	68	63	31	60	16	19	24	112	149
12	82	82	58	63	50	25	26	16	23	25	237	141
13	57	64	111	60	48	23	17	16	293	26	35	141
14	34	60	67	60	51	40	17	16	102	23	23	46
15	21	92	28	59	43	24	16	16	21	27	22	28
16	18	86	26	58	22	21	16	16	90	154	19	23
17	31	82	26	43	21	21	16	15	110	172	18	27
18	54	107	25	22	21	20	37	15	295	185	18	69
19	26	81	25	21	21	19	296	16	162	103	18	31
20	63	66	25	272	20	19	52	16	115	61	18	42
21	78	31	24	68	22	18	19	17	115	53	20	42
22	45	31	40	63	28	18	17	19	35	153	19	22
23	46	31	69	30	33	18	17	18	26	92	18	20
24	32	29	64	106	110	18	17	22	128	113	17	18
25	59	370	67	497	695	18	17	48	113	48	17	18
26	215	763	71	346	641	17	17	18	41	27	17	17
27	60	507	63	199	1060	17	25	17	26	87	17	17
28	31	188	62	132	178	17	18	33	26	62	17	17
29	24	128	65	97	97	17	17	18	47	24	17	19
30	35	115	260	103	---	18	17	18	1640	21	21	19
31	95	---	150	91	---	17	---	16	---	21	61	---
TOTAL	3099	6896	2681	3162	3778	2056	975	567	3608	2575	1065	2555
MEAN	100	230	86.5	102	130	66.3	32.5	18.3	120	83.1	34.4	85.2
MAX	406	1950	394	497	1060	598	296	48	1640	263	237	729
MIN	18	28	24	21	20	17	16	15	16	21	17	17
AC-FT	6150	13680	5320	6270	7490	4080	1930	1120	7160	5110	2110	5070

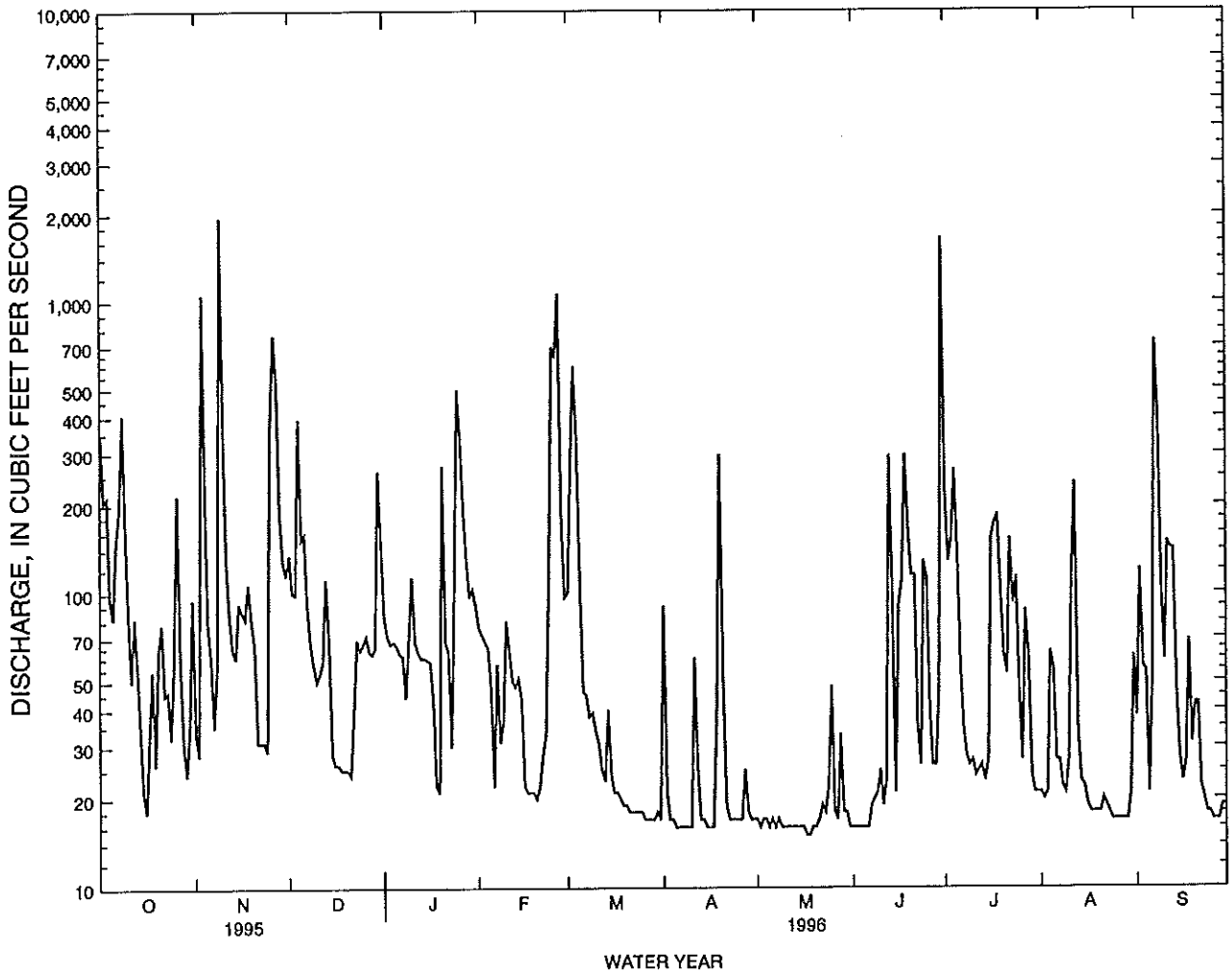
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1996, BY WATER YEAR (WY)

MEAN	61.8	107	115	110	100	116	91.1	66.5	52.4	72.7	73.1	54.2
MAX	240	430	720	578	657	803	470	201	175	202	222	190
(WY)	1995	1991	1920	1920	1932	1918	1963	1965	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

HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1917 - 1996	
ANNUAL TOTAL	27670		33017			
ANNUAL MEAN	75.8		90.2		84.7	
HIGHEST ANNUAL MEAN					182	1918
LOWEST ANNUAL MEAN					30.6	1953
HIGHEST DAILY MEAN	1950	Nov 9	1950	Nov 9	10900	Dec 3 1919
LOWEST DAILY MEAN	16	Apr 2	15	May 17	5.3	May 21 1954
ANNUAL SEVEN-DAY MINIMUM	17	Jun 24	16	May 12	6.4	May 10 1954
ANNUAL RUNOFF (AC-FT)	54880		65490		61350	
10 PERCENT EXCEEDS	151		180		173	
50 PERCENT EXCEEDS	28		36		30	
90 PERCENT EXCEEDS	18		17		15	



HAWAII, ISLAND OF KAUAI

160600000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02′24″, long 159°22′58″, 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 good. Lihue and Hanamaulu ditches divert water upstream of station for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--79 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-96), 117 ft^3/s (84,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s, April 15, 1963, gage height, 22.90 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)
Nov. 03	1400	*29,400	*19.02	Feb. 27	1130	8,190	15.39
Nov. 09	2200	11,850	16.37	Jul. 22	0130	7,410	15.14

Minimum discharge, 3.3 ft^3/s, June 3, 4, 6, 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	507	156	243	116	83	126	280	12	8.8	213	73	112
2	245	179	186	94	75	421	44	9.1	5.1	199	63	334
3	295	4450	151	84	67	918	33	7.6	3.7	250	56	62
4	156	551	239	62	61	453	36	6.6	4.2	293	139	81
5	152	294	121	29	43	216	57	5.8	5.0	243	150	72
6	156	567	99	25	30	34	60	4.9	3.4	169	84	82
7	234	281	84	21	15	40	50	5.6	7.2	138	134	1850
8	435	252	74	19	68	85	28	5.3	12	92	84	999
9	207	3330	68	80	48	74	17	4.8	73	47	67	409
10	150	930	61	95	18	66	16	4.4	188	37	80	280
11	112	358	51	19	10	48	83	4.4	132	26	219	231
12	143	264	40	13	7.1	12	77	4.3	57	9.2	441	205
13	104	216	162	9.9	6.9	42	27	4.2	101	38	130	209
14	72	187	171	8.8	7.1	33	19	4.1	84	13	91	145
15	50	130	70	8.5	7.1	12	16	4.1	10	53	89	121
16	61	59	56	11	7.6	10	6.4	4.0	62	179	46	91
17	122	51	47	27	6.7	9.7	5.0	3.9	88	245	14	110
18	83	273	45	27	6.2	9.4	6.0	3.7	205	168	11	113
19	53	88	51	39	6.0	8.9	279	3.9	180	145	10	80
20	100	67	36	184	5.8	8.3	90	4.0	165	128	8.4	123
21	81	76	33	80	5.8	7.8	12	4.4	181	200	7.9	148
22	66	95	32	125	5.8	16	6.7	4.6	98	1530	11	105
23	63	98	43	54	6.2	38	30	4.5	77	351	45	87
24	52	79	36	108	6.0	38	27	25	203	630	43	60
25	72	423	62	591	325	23	25	42	259	336	41	42
26	491	856	109	444	349	7.6	28	15	156	197	38	23
27	241	603	58	358	1130	7.4	86	5.8	91	245	27	19
28	172	248	57	314	245	7.1	48	43	65	271	6.3	16
29	135	196	59	156	147	7.3	31	40	82	134	5.6	15
30	126	186	382	123	---	7.4	20	28	919	101	11	16
31	264	---	221	115	---	6.7	---	19	---	85	48	---
TOTAL	5200	15543	3147	3440.2	2798.3	2792.6	1543.1	338.0	3525.4	6765.2	2273.2	6240
MEAN	168	518	102	111	96.5	90.1	51.4	10.9	118	218	73.3	208
MAX	507	4450	382	591	1130	918	280	43	919	1530	441	1850
MIN	50	51	32	8.5	5.8	6.7	5.0	3.7	3.4	9.2	5.6	15
AC-FT	10310	30830	6240	6820	5550	5540	3060	670	6990	13420	4510	12380

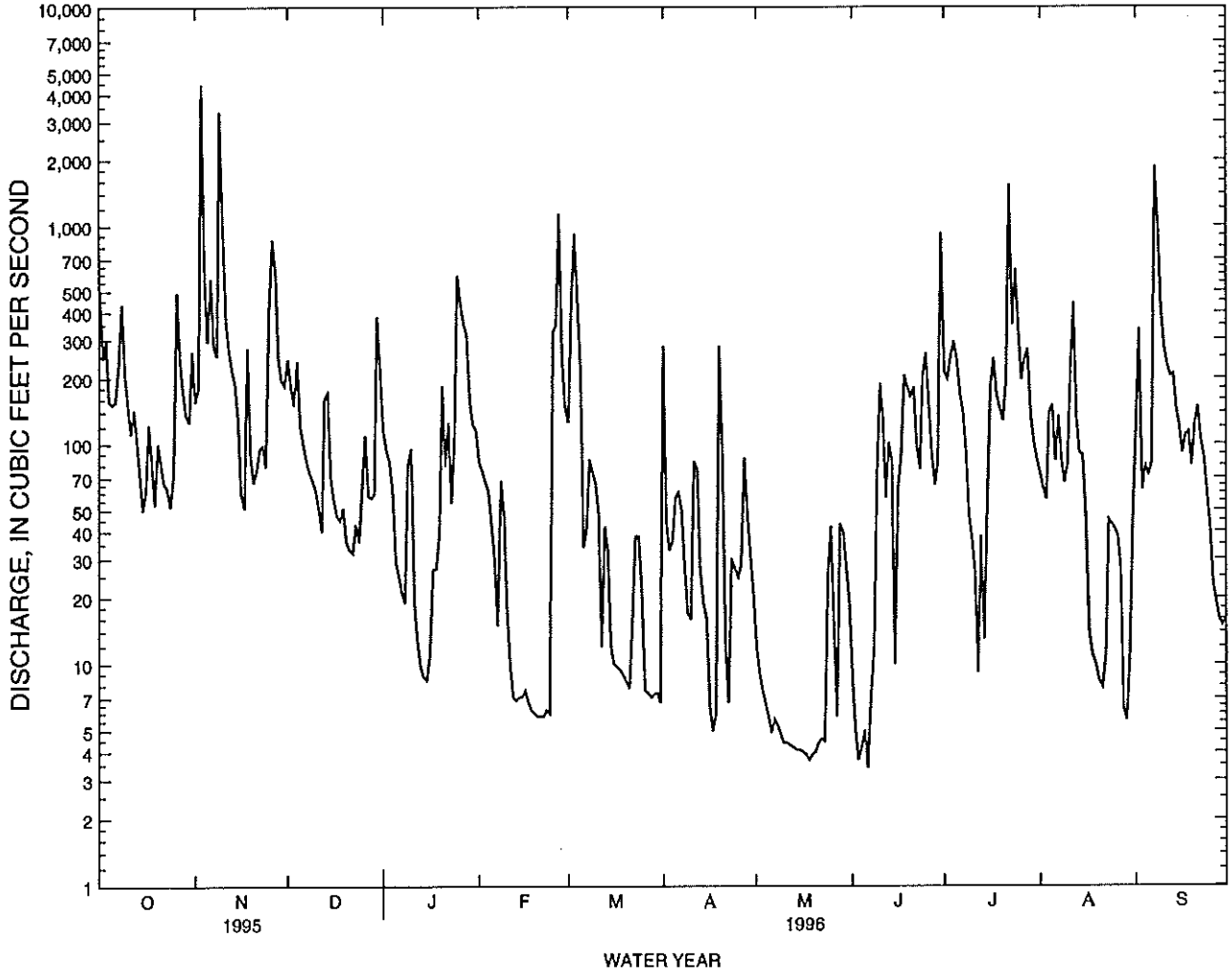
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1996, BY WATER YEAR (WY)

MEAN	92.1	174	172	175	128	149	133	98.4	55.3	75.3	84.3	76.5
MAX	339	866	696	1485	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

HAWAII, ISLAND OF KAUAI

160600000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1912 - 1996	
ANNUAL TOTAL	41127.6		53606.0			
ANNUAL MEAN	113		146		117	
HIGHEST ANNUAL MEAN					284	1982
LOWEST ANNUAL MEAN					17.3	1984
HIGHEST DAILY MEAN	4450	Nov 3	4450	Nov 3	13800	Jan 16 1921
LOWEST DAILY MEAN	3.7	Sep 13	3.4	Jun 6	1.8	Sep 17 1953
ANNUAL SEVEN-DAY MINIMUM	4.0	Sep 9	4.0	May 14	1.8	Sep 16 1953
ANNUAL RUNOFF (AC-FT)	81580		106300		84420	
10 PERCENT EXCEEDS	242		285		266	
50 PERCENT EXCEEDS	44		66		38	
90 PERCENT EXCEEDS	5.2		6.4		4.7	



HAWAII, ISLAND OF KAUAI

160620000 STABLE STORM DITCH NEAR LIHUE

LOCATION.--Lat 22°04′09″, long 159°26′46″, Hydrologic Unit 20070000, on left bank 100 ft downstream from intake, 7.8 mi northwest of Lihue, and 7.9 mi west of Kapaa.

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

GAGE.--Water-stage recorder and sharp-crested weir. Elevation of gage is 710 ft above mean sea level, by barometer.

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

AVERAGE DISCHARGE.--59 years (water years 1938-96), 9.75 ft^3/s (7,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s, April 3, 1948; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s, May 25, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.08	.01	3.5	.62	.74	.00	.00	5.2
2	.00	.00	.00	.00	.06	.04	2.6	.62	.74	.01	.00	5.3
3	.00	7.1	.00	.00	.03	.08	2.1	.62	.65	.01	.00	4.2
4	.00	.12	.00	.00	.02	.10	1.8	.62	7.5	.01	.00	3.6
5	.00	.08	.00	.00	.00	.07	1.8	.62	4.0	.00	.00	3.4
6	.00	.07	.00	.00	.00	.04	1.7	.62	1.2	.00	.00	4.1
7	.00	.01	.00	.00	.00	.02	1.6	.62	2.7	.00	.03	5.8
8	.02	.00	.00	.00	.00	.00	1.6	.62	1.4	.00	.03	1.6
9	.03	7.8	.00	.00	.00	.00	1.6	4.1	9.5	.00	.03	.22
10	.01	.17	.00	.00	.00	.00	1.4	11	12	.00	.03	.08
11	.00	.10	.00	.00	.01	.00	1.5	10	10	.00	.05	.05
12	.00	.06	.00	.00	.03	.00	1.3	9.9	8.2	.00	.08	.01
13	.00	.01	.00	.00	.03	.02	1.2	9.6	8.0	.00	.08	.00
14	.00	.00	.00	.00	.04	.07	1.2	9.1	8.6	.00	.08	.00
15	.00	.00	.00	.00	.03	.08	1.2	8.6	4.7	.00	.08	.00
16	.00	.00	.00	.36	.02	.05	1.1	8.8	.65	.00	.03	.00
17	.00	.00	.00	.30	.00	.03	1.1	13	9.0	.00	.03	.00
18	.00	.00	.00	.30	.00	.00	1.3	14	7.2	.00	.03	.00
19	.00	.00	.00	.29	.00	.00	1.2	14	6.6	.00	.01	.00
20	.00	.00	.00	.22	.00	.00	1.1	13	3.8	.00	.00	.00
21	.00	.00	.00	.22	.00	.00	1.1	8.7	.38	.00	.00	.00
22	.00	.00	.00	.18	.00	.00	.95	12	.25	.09	.00	.00
23	.00	.00	.00	.15	.00	.00	.90	8.4	.22	.11	.00	.00
24	.00	.00	.00	.10	.00	.00	.90	15	.23	.14	.00	.00
25	.00	.00	.00	.15	.01	.00	.90	18	.22	.08	.00	.00
26	.00	.00	.00	.16	.01	1.1	.90	16	.22	.08	.00	.00
27	.00	.03	.00	.15	3.2	2.9	.90	14	.17	.09	.00	.00
28	.00	.03	.00	.15	.06	2.9	.82	2.5	.15	.07	.00	.00
29	.00	.02	.00	.13	.03	3.0	.74	.90	.15	.00	1.6	.00
30	.00	.00	.00	.08	---	3.1	.68	.74	.37	.00	3.0	.00
31	.00	---	.00	.08	---	3.0	---	.74	---	.00	4.2	---
TOTAL	0.06	15.60	0.00	3.02	3.66	16.61	40.69	227.04	109.54	0.69	9.39	33.56
MEAN	.002	.52	.000	.097	.13	.54	1.36	7.32	3.65	.022	.30	1.12
MAX	.03	7.8	.00	.36	3.2	3.1	3.5	18	12	.14	4.2	5.8
MIN	.00	.00	.00	.00	.00	.00	.68	.62	.15	.00	.00	.00
AC-FT	.1	31	.00	6.0	7.3	33	81	450	217	1.4	19	67

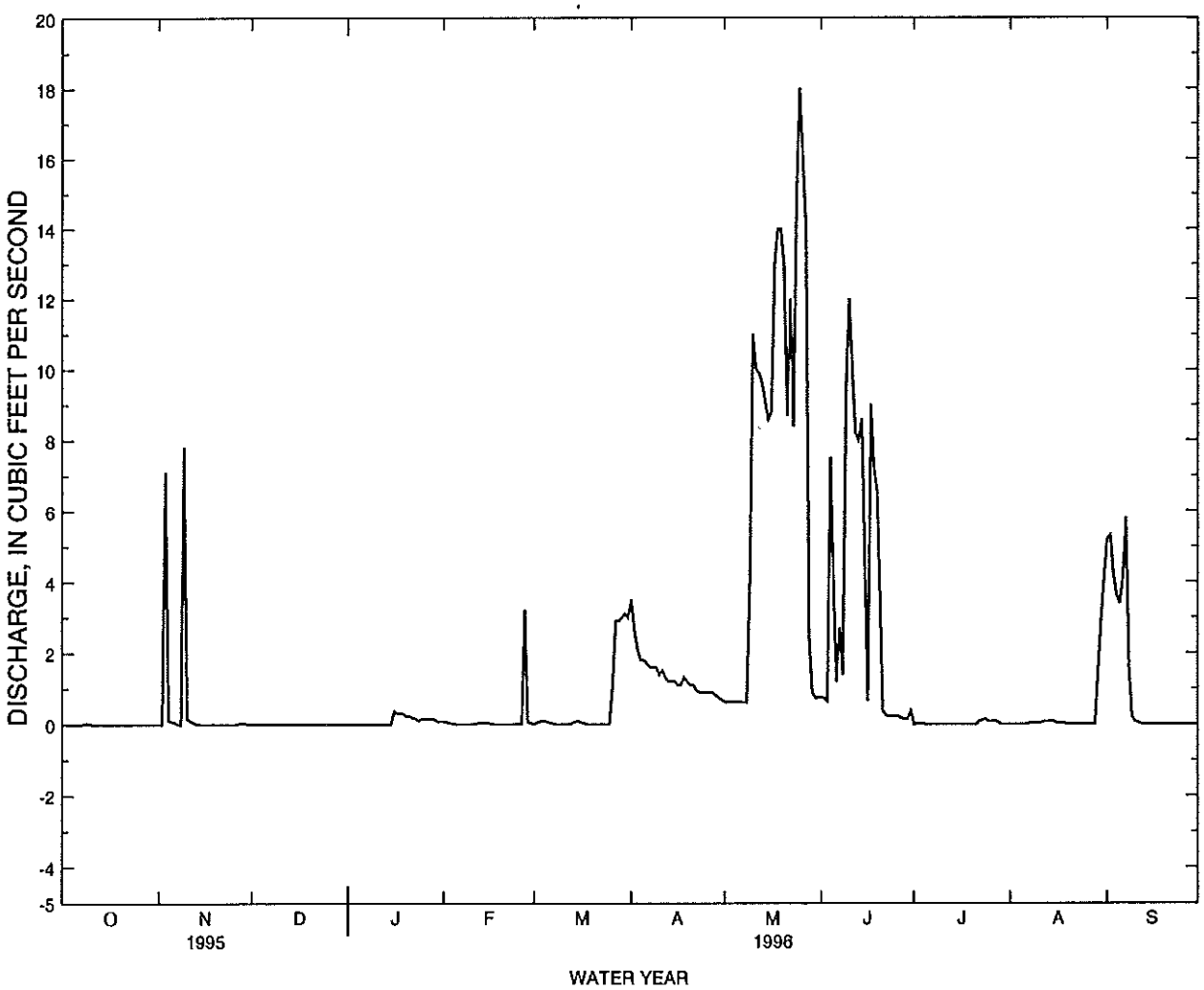
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1996, BY WATER YEAR (WY)

MEAN	12.6	6.07	4.46	6.33	8.71	7.60	8.66	9.67	15.4	11.5	11.5	14.6
MAX	37.3	35.7	24.8	31.4	32.3	36.0	34.7	34.4	38.7	36.8	37.0	36.1
(WY)	1951	1951	1984	1946	1991	1947	1954	1954	1953	1953	1970	1950
MIN	.002	.000	.000	.000	.000	.000	.000	.000	.000	.014	.000	.000
(WY)	1996	1938	1991	1939	1938	1939	1939	1963	1938	1980	1964	1989

HAWAII, ISLAND OF KAUAI

160620000 STABLE STORM DITCH NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1938 - 1996	
ANNUAL TOTAL	1016.18		459.86			
ANNUAL MEAN	2.78		1.26		9.75	
HIGHEST ANNUAL MEAN					22.1	1984
LOWEST ANNUAL MEAN					.15	1994
HIGHEST DAILY MEAN	25	Jun 7	18	May 25	71	Apr 3 1948
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Oct 1 1937
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Oct 1 1937
ANNUAL RUNOFF (AC-FT)	2020		912		7070	
10 PERCENT EXCEEDS	12		4.1		33	
50 PERCENT EXCEEDS	.10		.01		.29	
90 PERCENT EXCEEDS	.00		.00		.00	



HAWAII, ISLAND OF KAUAI

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°04'19", long 159°25'05", 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 fair. No diversion upstream.

AVERAGE DISCHARGE.--81 years (water years 1913-14, 1916-17, 1920-96), 48.5 ft^3/s (35,100 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 discharge 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. 03	1300	*7,650	*9.53	Feb. 27	1000	1,950	5.36
Nov. 09	2030	5,380	8.20	Sep. 07	1030	4,300	7.46

Minimum discharge, 15 ft^3/s June 4-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	63	79	31	35	45	198	25	17	78	30	41
2	43	128	49	28	34	160	41	23	16	80	30	76
3	61	1220	43	27	32	321	66	22	16	76	32	30
4	43	204	41	26	31	110	35	21	16	72	43	26
5	60	e103	38	26	29	73	29	21	15	60	48	23
6	66	e81	36	26	29	57	27	23	15	51	36	53
7	79	e69	34	25	28	49	26	27	17	46	44	945
8	138	e63	33	24	57	43	25	35	29	44	32	271
9	61	e1310	32	31	36	39	24	25	177	41	31	125
10	52	322	30	32	32	35	23	21	107	39	31	81
11	48	e123	29	25	28	33	30	21	46	36	68	65
12	54	e92	31	24	27	31	25	20	36	43	120	58
13	43	84	54	24	26	129	22	20	32	39	46	60
14	39	66	40	23	30	47	21	19	31	39	38	47
15	36	e59	31	22	35	36	21	18	28	40	37	43
16	34	e50	28	22	29	33	20	18	33	48	31	42
17	34	e49	28	23	26	31	20	18	33	60	30	44
18	35	e55	27	29	25	30	27	18	51	50	29	42
19	32	e42	27	25	24	28	101	17	48	51	28	37
20	39	e41	26	34	24	27	43	17	60	47	26	39
21	35	e36	25	28	24	30	26	18	52	49	25	37
22	31	e36	25	65	24	27	23	18	38	122	23	34
23	34	e36	26	28	24	28	22	17	38	59	23	32
24	30	e35	25	59	27	26	21	18	78	142	22	31
25	34	201	138	142	45	26	21	27	73	66	21	30
26	145	212	49	74	70	24	26	23	63	48	20	29
27	58	127	31	100	482	23	37	19	e46	52	20	28
28	58	e63	28	88	e112	22	63	27	e48	e53	19	27
29	51	52	27	49	e53	22	34	24	58	e39	18	26
30	48	48	38	44	---	27	34	19	109	e34	23	29
31	81	---	54	39	---	22	---	20	---	e32	47	---
TOTAL	1664	5070	1202	1243	1478	1634	1131	659	1426	1736	1071	2451
MEAN	53.7	169	38.8	40.1	51.0	52.7	37.7	21.3	47.5	56.0	34.5	81.7
MAX	145	1310	138	142	482	321	198	35	177	142	120	945
MIN	30	35	25	22	24	22	20	17	15	32	18	23
AC-FT	3300	10060	2380	2470	2930	3240	2240	1310	2830	3440	2120	4860

e Estimated

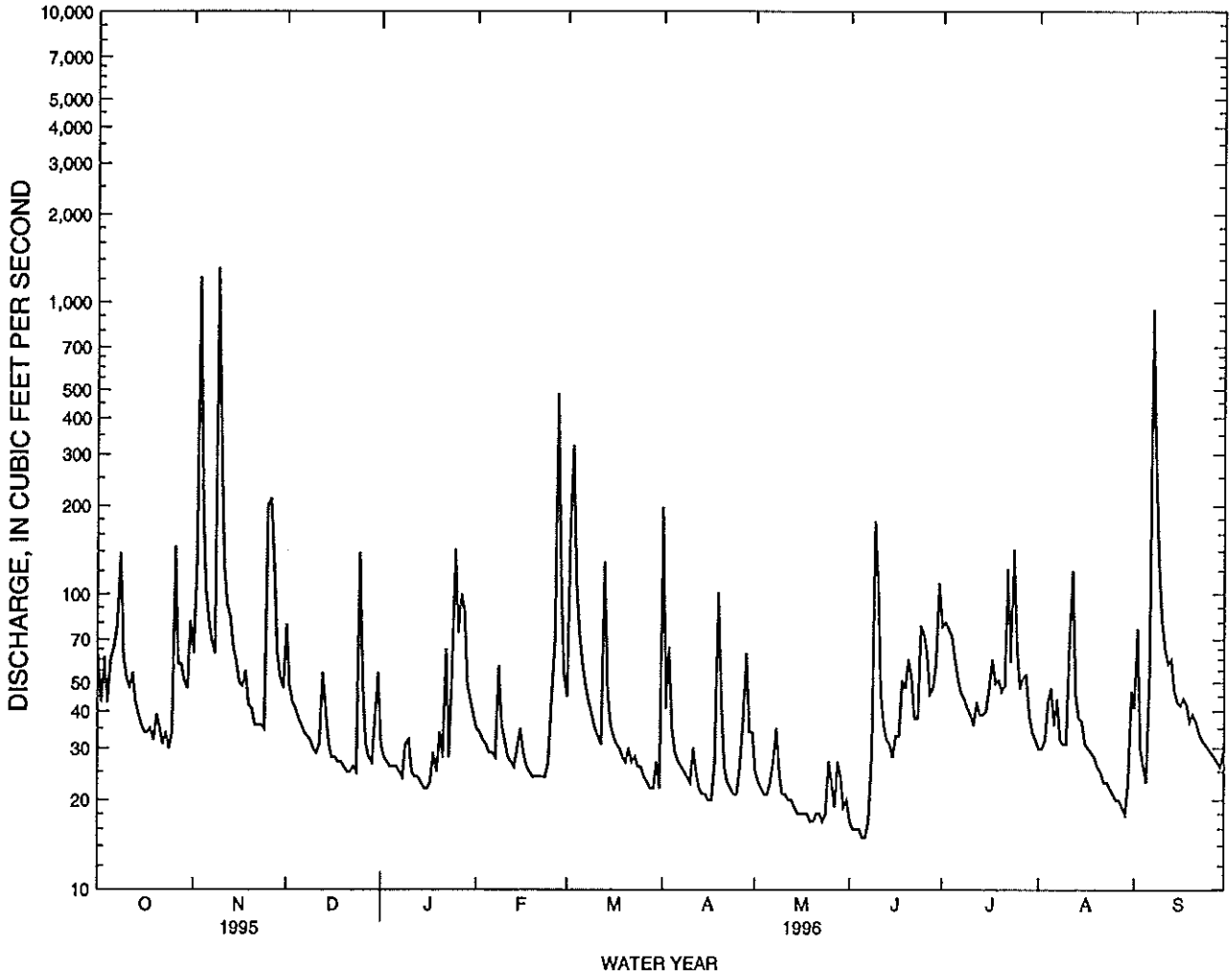
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1996, BY WATER YEAR (WY)

MEAN	41.6	61.0	60.5	59.2	48.8	56.5	57.0	46.8	33.1	38.6	40.1	37.2
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	8.87	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

HAWAII, ISLAND OF KAUAI

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1912 - 1996	
ANNUAL TOTAL	16327		20765			
ANNUAL MEAN	44.7		56.7		48.5	
HIGHEST ANNUAL MEAN					95.5	1982
LOWEST ANNUAL MEAN					21.3	1984
HIGHEST DAILY MEAN	1310	Nov 9	1310	Nov 9	2570	Feb 13 1994
LOWEST DAILY MEAN	13	Jun 19	15	Jun 5	7.0	Jul 8 1926
ANNUAL SEVEN-DAY MINIMUM	14	Mar 15	16	Jun 1	8.2	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	32380		41190		35100	
10 PERCENT EXCEEDS	76		81		84	
50 PERCENT EXCEEDS	25		34		31	
90 PERCENT EXCEEDS	16		21		16	



HAWAII, ISLAND OF KAUAI

16069000 WAILUA DITCH NEAR KAPAA

LOCATION.--Lat 22°04′34″, long 159°24′04″, Hydrologic Unit 20070000, on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 mi west of Kapaa, and 7.0 mi north of Lihue.

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

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

REMARKS.--Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft upstream and thence to fields for irrigation of sugarcane in vicinity of Kapaa.

AVERAGE DISCHARGE.--59 years (water years 1938-96), 16.2 ft^3/s (11,710 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft^3/s, June 4, 1937; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft^3/s, October 3, 4: minimum daily, 0.17 ft^3/s, April 6-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	26	.77	2.7	9.5	2.7	23	22	24	17	15	18
2	28	25	.24	2.7	9.4	4.3	23	22	24	17	15	18
3	29	28	.24	2.7	9.2	4.3	23	22	24	17	15	18
4	29	28	.24	2.7	9.0	6.3	12	22	20	17	15	18
5	28	27	.24	2.7	16	9.8	.19	22	18	17	15	18
6	26	25	.24	2.7	21	9.8	.17	22	18	17	15	18
7	24	8.6	.22	2.7	21	9.7	.17	22	18	17	15	19
8	23	.20	.20	13	21	9.5	15	22	18	16	15	19
9	21	.32	.20	21	21	9.3	23	23	18	16	15	19
10	21	.37	.20	22	21	9.2	23	23	19	16	15	19
11	21	.26	16	22	21	16	23	23	19	16	15	18
12	21	.24	25	22	21	21	22	23	19	16	15	17
13	21	.22	25	22	21	21	22	26	19	16	15	17
14	21	.20	24	22	21	21	22	27	18	16	15	16
15	21	15	22	21	20	21	21	26	18	16	15	15
16	21	24	20	21	20	21	21	26	18	16	15	15
17	21	23	18	21	20	21	21	25	18	16	15	15
18	22	22	6.1	16	20	21	21	25	18	16	14	15
19	23	21	2.5	8.9	20	21	22	24	18	16	14	15
20	23	19	2.5	9.1	20	21	22	23	18	15	15	15
21	24	19	2.5	9.4	20	21	22	23	18	15	15	15
22	25	12	2.6	9.7	19	22	22	23	18	15	15	15
23	25	.64	2.6	9.9	19	22	22	22	18	15	16	15
24	26	.60	2.6	10	20	22	22	9.3	18	15	16	15
25	26	.59	2.6	10	21	22	22	4.4	18	16	16	15
26	27	.54	2.6	10	22	23	22	4.4	18	15	16	15
27	25	.54	2.7	10	13	23	22	13	18	15	16	15
28	26	.51	2.7	10	4.9	23	22	22	18	15	17	15
29	26	.46	2.7	10	3.0	23	22	23	17	15	17	15
30	26	.39	2.7	10	---	23	22	23	17	15	17	15
31	26	---	2.7	9.8	---	23	---	24	---	15	17	---
TOTAL	754	328.68	192.89	368.7	504.0	526.9	579.53	661.1	562	492	476	492
MEAN	24.3	11.0	6.22	11.9	17.4	17.0	19.3	21.3	18.7	15.9	15.4	16.4
MAX	29	28	25	22	22	23	23	27	24	17	17	19
MIN	21	.20	.20	2.7	3.0	2.7	.17	4.4	17	15	14	15
AC-FT	1500	652	383	731	1000	1050	1150	1310	1110	976	944	976

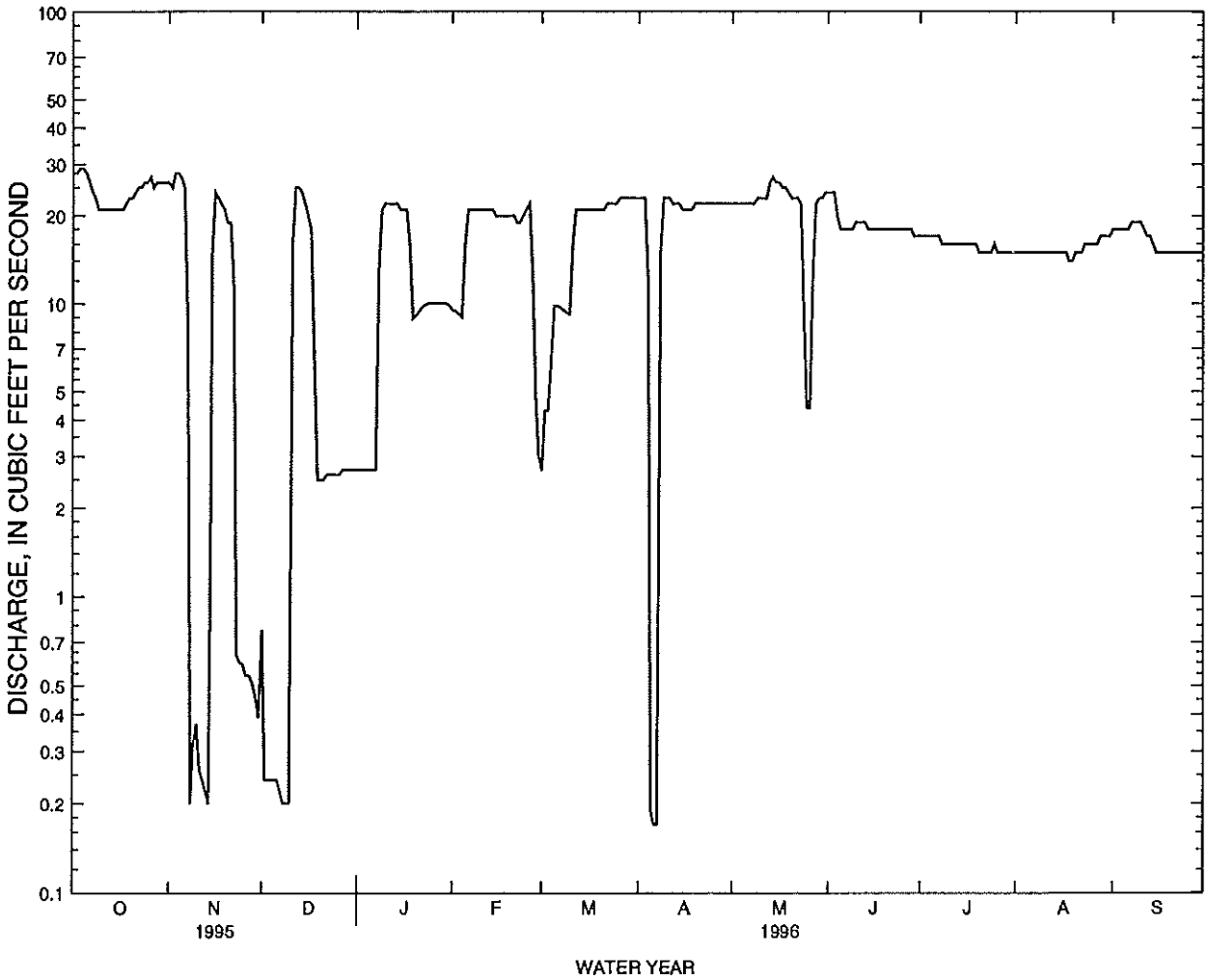
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1996, BY WATER YEAR (WY)

MEAN	19.0	12.3	9.24	10.7	12.0	12.7	13.7	16.8	21.5	22.2	22.1	22.6
MAX	35.2	28.5	33.3	35.3	37.8	27.3	28.8	40.5	40.0	46.5	48.6	53.5
(WY)	1958	1984	1938	1938	1940	1980	1938	1938	1937	1938	1939	1938
MIN	2.80	.19	.009	.20	.071	.41	.90	1.08	7.87	9.72	5.72	3.89
(WY)	1969	1965	1955	1968	1969	1956	1963	1965	1962	1954	1954	1946

HAWAII, ISLAND OF KAUAI

16069000 WAILUA DITCH NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR			FOR 1996 WATER YEAR			WATER YEARS 1937 - 1996		
ANNUAL TOTAL	7921.97			5937.80					
ANNUAL MEAN	21.7			16.2			16.2		
HIGHEST ANNUAL MEAN							32.9		1938
LOWEST ANNUAL MEAN							6.52		1962
HIGHEST DAILY MEAN	29	Jul	6	29	Oct	3	63	Jun 4	1937
LOWEST DAILY MEAN	.20	Nov	8	.17	Apr	6	.00	May 15	1940
ANNUAL SEVEN-DAY MINIMUM	.22	Dec	4	.22	Dec	4	.00	May 15	1940
ANNUAL RUNOFF (AC-FT)	15710			11780			11710		
10 PERCENT EXCEEDS	27			24			31		
50 PERCENT EXCEEDS	25			18			16		
90 PERCENT EXCEEDS	2.7			2.7			.87		



HAWAII, ISLAND OF KAUAI

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

LOCATION.--Lat 22°03′08″, long 159°22′22″, Hydrologic Unit 20070000, on right bank 1.1 mi upstream from confluence with South Fork, 3.7 mi southwest of Kapaa, and 5.0 mi north of Lihue.

DRAINAGE AREA.--17.9 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-75-1: 1974.

GAGE.--Water-stage recorder. Elevation of gage is 18 ft above mean sea level, from topographic map.

REMARKS.--Records good. Wailua ditch (station 16069000) diverts water upstream for irrigation of sugarcane in vicinities of Kapaa and Wailua.

AVERAGE DISCHARGE.--44 years (water years 1953-96), 122 ft^3/s (88,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft^3/s, November 12, 1955, gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks, from rating curve extended above 3,700 ft^3/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft^3/s, October 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 03	1330	*20,000	*13.60	Feb. 27	1000	6,090	8.54
Nov. 09	2100	11,300	10.83	Sep. 07	1100	9,960	10.32

Minimum discharge, 6.3 ft^3/s, June 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	230	128	251	79	e65	119	506	22	7.1	233	59	105
2	116	245	205	67	e56	402	113	19	6.7	205	55	173
3	149	2880	e144	61	e52	773	109	18	6.5	200	69	64
4	114	619	e126	57	e49	363	59	18	7.3	181	102	57
5	187	311	111	55	e48	206	45	17	7.0	151	104	41
6	182	230	104	51	e46	157	44	16	6.6	116	68	74
7	200	201	97	48	e45	133	41	30	7.0	101	97	1770
8	380	190	93	36	e44	118	40	35	17	103	65	752
9	179	2850	89	72	73	106	35	26	246	89	52	327
10	135	1280	85	58	50	97	31	11	206	81	58	214
11	124	524	83	31	38	80	59	8.5	98	75	148	171
12	170	324	86	27	34	62	44	7.8	66	86	310	153
13	118	248	151	26	32	248	28	7.6	114	67	98	159
14	94	202	117	25	44	119	26	7.6	61	55	73	116
15	79	174	75	23	53	86	23	7.6	44	63	71	100
16	88	157	66	21	43	84	19	7.5	62	80	58	90
17	97	141	61	23	31	74	16	7.4	51	115	53	98
18	76	276	58	30	29	72	31	8.3	91	82	48	100
19	51	162	41	37	27	61	214	8.1	103	84	39	72
20	62	128	30	e98	27	48	84	8.4	121	76	29	82
21	49	99	29	e70	27	57	32	7.7	124	59	27	84
22	32	92	28	e200	30	39	24	7.5	71	437	25	59
23	37	94	29	e70	30	41	21	6.9	61	166	23	55
24	24	82	27	e170	54	40	19	7.1	153	286	22	49
25	31	468	201	e400	212	37	17	19	206	160	22	45
26	347	678	120	e230	222	34	17	11	147	116	20	42
27	126	456	57	e300	948	31	42	7.5	101	178	18	47
28	105	228	46	e270	276	30	85	18	116	158	18	46
29	100	176	47	e150	148	29	34	18	133	88	17	44
30	80	160	215	e100	---	48	43	9.2	477	73	17	48
31	175	---	166	e76	---	35	---	7.5	---	66	84	---
TOTAL	3937	13803	3038	2961	2833	3829	1901	410.2	2917.2	4030	1949	5237
MEAN	127	460	98.0	95.5	97.7	124	63.4	13.2	97.2	130	62.9	175
MAX	380	2880	251	400	948	773	506	35	477	437	310	1770
MIN	24	82	27	21	27	29	16	6.9	6.5	55	17	41
AC-FT	7810	27380	6030	5870	5620	7590	3770	814	5790	7990	3870	10390

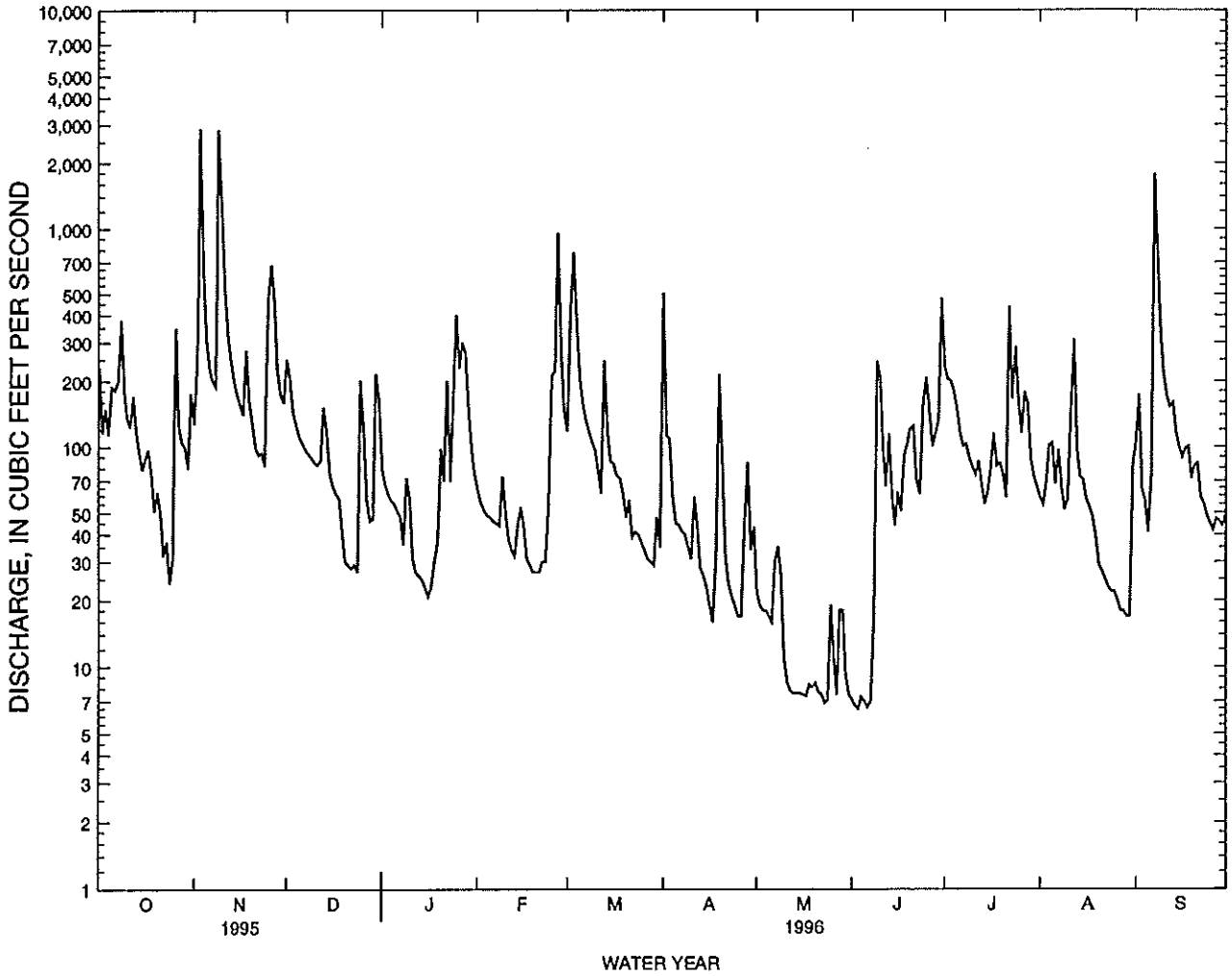
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1996, BY WATER YEAR (WY)

MEAN	99.8	189	169	147	134	145	152	117	62.1	90.3	88.0	64.4
MAX	255	591	459	529	522	730	474	418	247	230	223	273
(WY)	1983	1991	1993	1956	1979	1982	1971	1967	1980	1980	1958	1994
MIN	2.54	19.1	7.74	6.90	4.43	4.76	15.0	11.8	5.78	5.22	5.80	3.17
(WY)	1954	1977	1984	1986	1978	1978	1966	1992	1957	1953	1984	1953

HAWAII, ISLAND OF KAUAI

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1952 - 1996	
ANNUAL TOTAL	38243.0		46845.4			
ANNUAL MEAN	105		128		122	
HIGHEST ANNUAL MEAN					262	1982
LOWEST ANNUAL MEAN					25.7	1984
HIGHEST DAILY MEAN	2880	Nov 3	2880	Nov 3	7350	Jan 25 1956
LOWEST DAILY MEAN	5.6	Feb 10	6.5	Jun 3	2.2	Oct 21 1953
ANNUAL SEVEN-DAY MINIMUM	9.0	Jun 27	6.9	Jun 1	2.4	Oct 20 1953
ANNUAL RUNOFF (AC-FT)	75850		92920		88120	
10 PERCENT EXCEEDS	216		230		255	
50 PERCENT EXCEEDS	45		70		67	
90 PERCENT EXCEEDS	11		18		8.2	



HAWAII, ISLAND OF KAUAI

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'44", long 159°23'55", 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 good. Recording rain gage located at station.

AVERAGE DISCHARGE.--36 years (water years 1961-95), 2.65 ft^3/s (1,920 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)
Nov. 03	1345	*623	5.25	Jun. 09	1330	112	2.70
Nov. 09	1345	334	4.07	Sep. 07	1200	80	2.40
Feb. 27	1015	103	2.62				

Minimum discharge, 0.60 ft^3/s June 6-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.85	7.1	7.5	2.5	2.7	3.0	2.1	1.1	.79	3.2	2.0	2.0
2	.75	5.7	5.1	2.4	2.6	6.3	1.8	1.1	.78	2.9	2.0	2.7
3	1.0	112	4.7	2.4	2.5	18	1.7	1.1	.78	3.4	1.9	1.8
4	.80	17	4.6	2.3	2.3	7.8	1.6	1.1	.78	3.1	2.2	1.7
5	.89	8.8	4.2	2.2	2.2	5.7	1.5	.99	.78	2.8	2.3	1.6
6	.80	6.5	4.0	2.1	2.2	5.0	1.5	.99	.75	2.5	2.0	1.7
7	.90	5.3	3.7	2.1	2.1	4.4	1.5	1.5	.75	2.2	2.1	24
8	3.7	4.9	3.4	2.1	2.8	4.0	1.4	1.4	.83	2.2	1.9	8.5
9	1.6	63	3.2	2.3	2.5	3.7	1.4	1.2	9.2	2.1	1.8	5.9
10	1.3	23	3.0	2.4	2.1	3.4	1.4	1.1	7.4	1.9	1.8	4.7
11	1.1	11	2.9	2.0	2.0	3.2	1.6	1.0	3.0	1.9	2.5	4.0
12	1.3	8.5	2.9	1.9	1.8	3.0	1.4	.99	2.0	1.9	4.5	3.7
13	1.1	7.1	3.4	1.9	1.8	3.4	1.4	.99	1.7	1.9	2.6	3.4
14	1.0	6.1	3.2	1.8	1.8	3.0	1.3	.96	1.6	1.8	2.3	3.0
15	.97	5.5	2.7	1.8	1.8	2.7	1.3	.92	1.5	1.8	2.3	2.9
16	.96	5.0	2.6	1.8	1.7	2.6	1.3	.92	1.5	1.8	2.2	3.5
17	1.0	4.6	2.5	1.8	1.7	2.6	1.3	.92	1.4	2.0	2.1	3.2
18	.95	4.3	2.5	1.7	1.6	2.4	1.3	.92	1.4	1.7	2.1	2.7
19	.91	4.1	2.4	1.7	1.6	2.4	2.3	.90	1.7	1.7	2.1	2.6
20	.92	3.8	2.2	1.8	1.5	2.3	1.6	.90	1.5	1.6	2.0	2.5
21	.88	3.6	2.2	2.2	1.5	2.3	1.3	.92	1.4	1.5	2.0	2.4
22	.85	3.3	2.1	2.0	1.5	2.2	1.3	.91	1.2	2.5	2.0	2.3
23	.89	3.3	2.1	1.7	1.5	2.2	1.2	.85	1.3	3.2	1.9	2.3
24	.88	3.0	2.0	6.7	1.5	2.1	1.2	.99	2.0	6.3	1.9	2.2
25	.92	9.6	7.4	6.7	1.6	2.1	1.1	.92	1.6	3.4	1.9	2.1
26	3.3	11	5.0	4.8	1.8	2.0	1.1	.87	2.0	2.5	1.8	2.1
27	2.2	9.8	3.0	3.9	18	1.9	1.2	.86	1.7	2.4	1.8	2.1
28	1.7	6.2	2.7	4.1	4.6	1.9	1.4	.96	1.8	2.4	1.8	2.0
29	1.6	5.3	2.6	3.3	3.1	1.9	1.3	.96	1.9	2.1	1.7	2.0
30	1.5	5.0	2.9	3.2	---	1.9	1.3	.85	4.1	2.0	1.9	2.3
31	2.2	---	3.2	2.9	---	1.8	---	.85	---	2.0	2.0	---
TOTAL	39.72	373.4	105.9	82.5	76.4	111.2	43.1	30.94	59.14	74.7	65.4	107.9
MEAN	1.28	12.4	3.42	2.66	2.63	3.59	1.44	1.00	1.97	2.41	2.11	3.60
MAX	3.7	112	7.5	6.7	18	18	2.3	1.5	9.2	6.3	4.5	24
MIN	.75	3.0	2.0	1.7	1.5	1.8	1.1	.85	.75	1.5	1.7	1.6
AC-FT	79	741	210	164	152	221	85	61	117	148	130	214

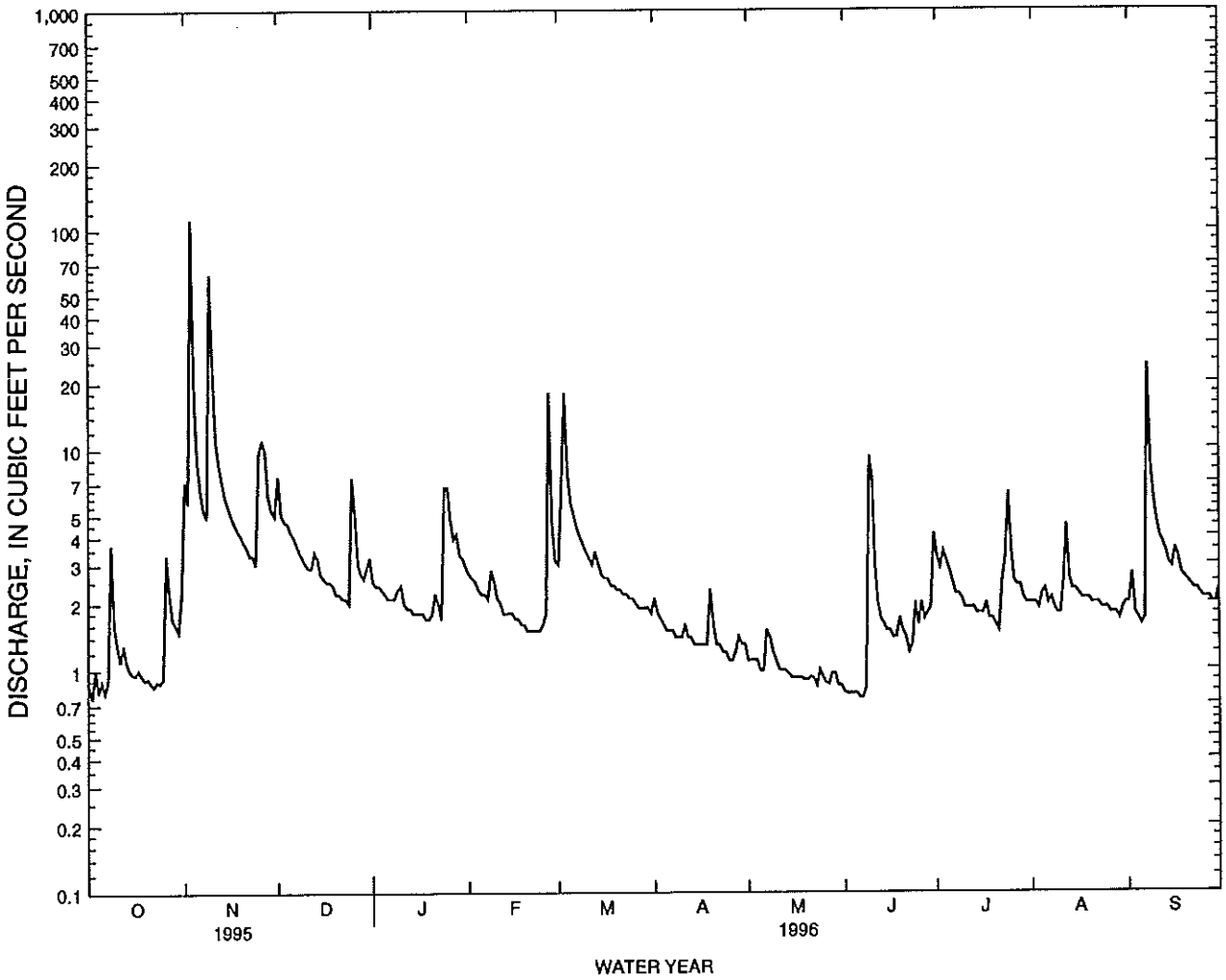
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1996, BY WATER YEAR (WY)

MEAN	2.28	4.00	3.94	3.19	2.64	2.88	3.24	2.79	1.85	1.70	1.67	1.60
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	.42	.59	.56	.58	.50	.50	.81	.62	.29	.59	.36	.38
(WY)	1985	1964	1963	1977	1986	1978	1993	1966	1968	1968	1984	1975

HAWAII, ISLAND OF KAUAI

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1960 - 1996	
ANNUAL TOTAL	826.90		1170.30			
ANNUAL MEAN	2.27		3.20		2.65	
HIGHEST ANNUAL MEAN					5.72	1982
LOWEST ANNUAL MEAN					.92	1984
HIGHEST DAILY MEAN	112	Nov 3	112	Nov 3	218	Dec 14 1991
LOWEST DAILY MEAN	.55	Sep 6	.75	Oct 2	.09	Sep 28 1968
ANNUAL SEVEN-DAY MINIMUM	.55	Sep 6	.77	Jun 1	.10	Jun 6 1968
ANNUAL RUNOFF (AC-FT)	1640		2320		1920	
10 PERCENT EXCEEDS	3.8		5.0		4.5	
50 PERCENT EXCEEDS	.99		2.0		1.7	
90 PERCENT EXCEEDS	.66		.96		.67	



HAWAII, ISLAND OF KAUAI

16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06′09″, long 159°22′28″, Hydrologic Unit 20070000, on right bank 500 ft downstream from intake, and 4.0 mi west of Kealia.

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

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

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

AVERAGE DISCHARGE.--78 years (water years 1918-20, 1922-96), 6.21 ft^3/s (4,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s, February 6, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s, December 13; minimum daily, 0.01 ft^3/s, November 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	3.3	.58	.73	.67	.18	7.1	7.4	6.5	.93	1.5	.15
2	2.9	2.9	.04	.73	.67	.38	4.5	6.4	6.3	.93	1.5	.17
3	5.1	9.3	.03	.70	.69	.66	4.8	6.5	4.6	.87	1.4	.17
4	5.1	.14	.03	3.0	.67	.28	4.1	7.2	2.5	.77	1.4	.17
5	5.4	.10	.03	4.8	.69	.27	3.6	6.1	2.4	.68	7.5	.39
6	5.4	.09	.03	4.6	.70	.24	3.0	3.4	2.1	.65	12	1.3
7	5.5	.08	1.6	4.4	.73	.26	2.5	.27	1.4	.65	12	10
8	5.6	.08	4.1	4.5	.78	.35	2.4	.16	1.2	.62	9.5	.36
9	2.3	6.6	3.7	2.3	4.1	.32	2.4	.13	1.3	.60	7.8	.67
10	.90	.18	3.6	1.1	5.2	.32	2.3	.13	.17	.56	9.4	2.3
11	.82	.11	3.4	.97	4.2	2.2	2.5	.67	1.0	.52	11	2.0
12	.73	.09	9.7	.94	4.1	4.2	3.7	.29	3.3	2.0	8.2	1.8
13	.72	.08	18	.89	3.9	4.3	4.6	.25	2.7	4.9	4.4	1.3
14	.49	.06	3.7	.89	3.8	3.9	4.5	.23	2.2	4.6	2.5	1.1
15	.37	.06	3.4	.88	3.7	3.8	4.3	.18	2.0	4.5	1.4	1.1
16	.28	.06	3.2	.81	3.3	3.8	4.1	.17	1.7	4.5	.99	1.0
17	.23	.05	3.1	.82	3.1	3.7	4.1	2.4	1.8	4.7	.73	.70
18	.19	.04	3.3	.85	3.0	3.7	4.8	3.8	1.3	4.4	.46	.67
19	.20	.03	3.9	.83	2.9	3.6	5.6	3.8	1.2	4.2	.46	.67
20	3.3	.03	2.6	.88	2.9	3.6	4.9	3.9	1.5	3.9	.37	.67
21	11	.02	1.7	.90	2.9	4.0	4.5	4.1	1.2	3.6	.35	.63
22	12	.01	1.5	.91	2.9	3.8	4.4	5.8	.77	4.1	.35	.60
23	13	.01	1.6	.83	2.9	3.9	4.3	6.4	.57	2.7	.36	.62
24	10	.02	1.6	1.0	2.9	3.9	4.7	5.9	.41	2.6	.46	.67
25	11	1.9	2.4	1.1	2.9	3.4	5.0	7.1	.39	1.2	.47	.67
26	16	.13	.92	.99	2.9	2.5	7.8	7.0	.36	1.2	.47	.67
27	9.1	.07	.82	.89	1.9	2.4	11	6.8	.31	1.1	.45	.67
28	1.4	.06	.81	.81	.15	2.4	16	7.2	.29	1.0	.47	.66
29	1.0	.04	.81	.73	.14	2.6	13	6.9	.94	1.1	.47	.60
30	.90	.04	.81	.73	---	2.6	13	6.8	1.1	1.2	.73	.65
31	.52	---	.82	.69	---	2.5	---	6.8	---	1.5	.32	---
TOTAL	131.65	25.68	81.83	45.20	69.39	74.06	163.5	124.18	53.51	66.78	99.41	33.13
MEAN	4.25	.86	2.64	1.46	2.39	2.39	5.45	4.01	1.78	2.15	3.21	1.10
MAX	16	9.3	18	4.8	5.2	4.3	16	7.4	6.5	4.9	12	10
MIN	.19	.01	.03	.69	.14	.18	2.3	.13	.17	.52	.32	.15
AC-FT	261	51	162	90	138	147	324	246	106	132	197	66

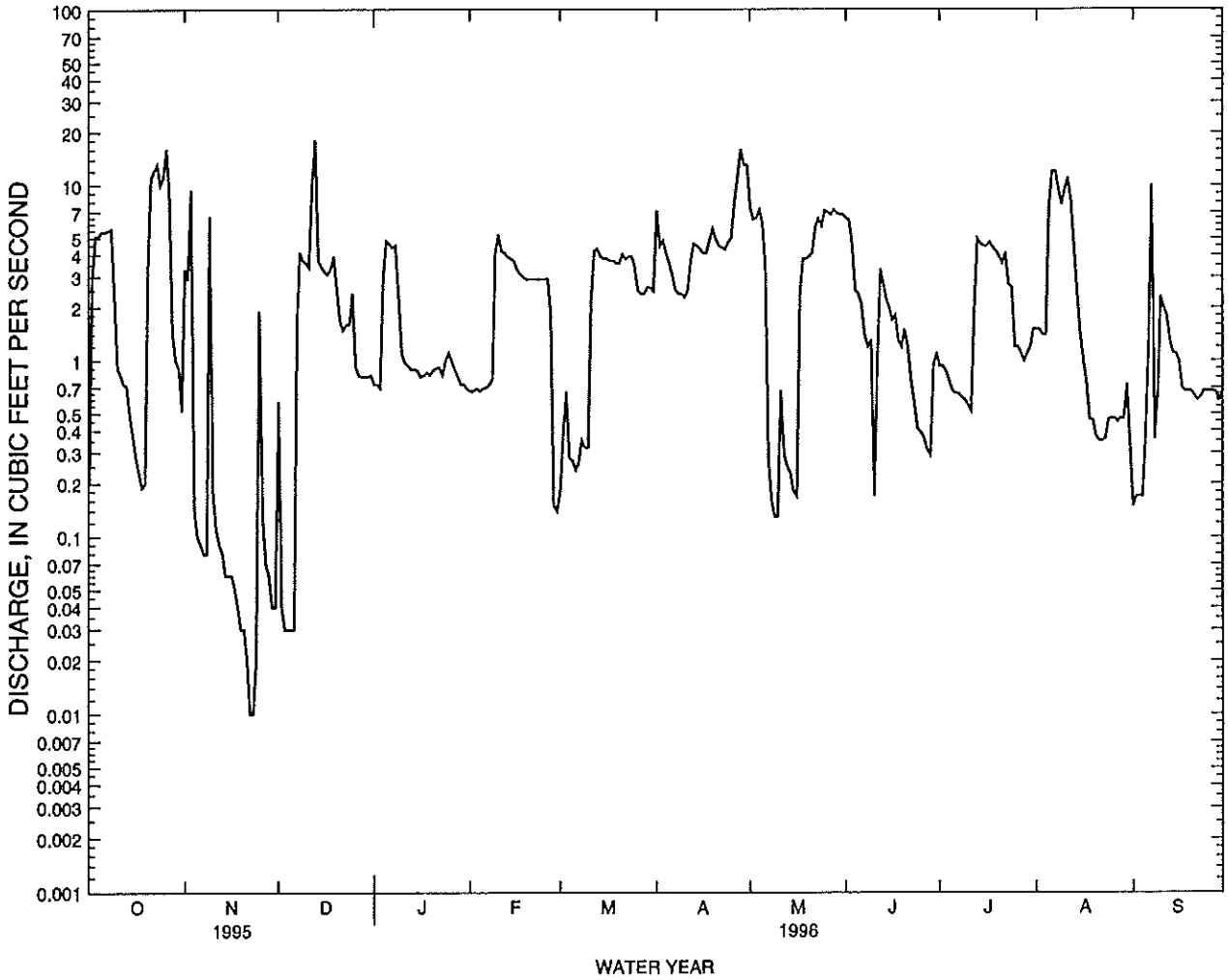
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 1996, BY WATER YEAR (WY)

MEAN	6.05	5.13	4.61	4.45	4.86	5.65	6.49	7.70	7.56	8.19	8.48	7.02
MAX	26.0	21.8	27.5	22.9	19.4	22.6	21.2	28.0	26.1	33.6	30.0	25.8
(WY)	1919	1919	1922	1918	1919	1919	1922	1918	1918	1918	1918	1920
MIN	.27	.044	.073	.012	.042	.22	.27	.32	1.57	1.66	1.88	.72
(WY)	1961	1952	1949	1943	1956	1968	1945	1965	1962	1987	1995	1946

HAWAII, ISLAND OF KAUAI

16079000 KAPAHI DITCH NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1918 - 1996	
ANNUAL TOTAL	2056.85		968.32			
ANNUAL MEAN	5.64		2.65		6.21	
HIGHEST ANNUAL MEAN					21.0	1918
LOWEST ANNUAL MEAN					2.23	1965
HIGHEST DAILY MEAN	23	Feb 17	18	Dec 13	94	Oct 25 1926
LOWEST DAILY MEAN	.01	Nov 22	.01	Nov 22	.00	Jun 4 1922
ANNUAL SEVEN-DAY MINIMUM	.02	Nov 18	.02	Nov 18	.00	Nov 13 1925
ANNUAL RUNOFF (AC-FT)	4080		1920		4500	
10 PERCENT EXCEEDS	12		6.5		15	
50 PERCENT EXCEEDS	5.1		1.4		4.5	
90 PERCENT EXCEEDS	.10		.17		.25	



HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

LOCATION.--Lat 22°08'10", long 159°22'28", Hydrologic Unit 20070000, on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 4.8 mi northwest of Kealia.

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

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

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flood sometimes diverted upstream by Anahola Ditch wasteway (see station 16087000).

AVERAGE DISCHARGE.--72 years (water years, 1923-25, 1928-96), 4.21 ft^3/s (3,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft^3/s, November 12, 1947; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 35 ft^3/s, November 03; minimum daily, no flow November 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	1.9	.87	.11	.05	.06	.12	.11	.24	1.0	.87	.78
2	6.8	1.8	.18	.10	.05	3.9	.05	.10	.22	1.0	.87	.74
3	8.4	35	.15	.10	.05	1.9	.05	.11	.22	.96	.89	.56
4	2.7	11	.14	.10	.05	.58	.05	.16	.22	.96	1.0	.65
5	2.8	9.6	.10	.10	.05	.37	.05	.12	.22	.92	1.1	.56
6	2.4	7.8	.10	.10	.05	.28	.09	.21	.22	.87	1.0	.77
7	2.6	6.4	.10	.10	.11	.22	.10	1.1	.54	.90	.90	7.7
8	2.2	6.3	.10	.10	.45	.18	.10	.96	.75	.92	.89	1.4
9	1.7	33	.10	.08	.14	.15	.10	.27	1.7	.94	.86	.91
10	1.4	3.6	.10	.07	.32	.15	.10	.17	2.5	.91	.99	.80
11	1.3	.17	.10	.05	.07	.15	.18	.15	.49	.91	1.3	.82
12	1.5	.10	.17	.05	.05	.15	.07	.13	.31	1.1	2.1	.81
13	1.4	.09	.32	.05	.05	.15	.05	.10	.27	.97	1.1	.83
14	1.2	.03	.18	.05	.07	.10	.09	.10	.27	.96	.98	.74
15	1.1	.02	.10	.05	.05	.10	.10	.10	.27	.95	.97	.72
16	1.0	.02	.10	.05	.04	.10	.10	.14	.33	1.1	.94	.82
17	.99	.02	.10	.07	.03	.10	.10	.10	.33	1.1	.88	.72
18	.96	.02	.10	.11	.05	.10	.20	.10	.44	1.1	.87	.72
19	.88	.03	.10	.10	.05	.10	.29	.10	.61	1.2	.86	.72
20	.85	.02	.10	.12	.05	.10	.11	.13	.78	1.1	.95	.72
21	.84	.00	.10	.11	.05	.12	.10	.15	.67	1.0	.84	.72
22	.81	.00	.11	.07	.05	.07	.10	.17	.64	1.5	.77	.72
23	.98	.03	.17	.05	.05	.10	.12	.13	.82	1.3	.71	.67
24	.82	.03	.29	.11	.10	.10	.15	.31	.96	1.1	.64	.64
25	.97	2.7	1.1	.35	.12	.11	.15	.38	.83	1.0	.63	.64
26	1.9	.68	.44	.08	.12	.10	.15	.30	.91	1.0	.56	.64
27	1.4	.42	.23	.09	1.6	.10	.19	.30	.85	1.0	.56	.64
28	1.5	.24	.19	.06	.31	.11	.18	.44	1.0	.99	.49	.64
29	1.3	.17	.13	.05	.09	.11	.65	.31	1.0	.93	.48	.66
30	1.3	.15	.17	.06	---	.07	.27	.22	1.2	.87	.80	.74
31	1.8	---	.30	.05	---	.07	---	.27	---	.87	.72	---
TOTAL	65.80	121.34	6.54	2.74	4.32	10.00	4.16	7.44	19.81	31.43	27.52	29.20
MEAN	2.12	4.04	.21	.088	.15	.32	.14	.24	.66	1.01	.89	.97
MAX	10	35	1.1	.35	1.6	3.9	.65	1.1	2.5	1.5	2.1	7.7
MIN	.81	.00	.10	.05	.03	.06	.05	.10	.22	.87	.48	.56
AC-FT	131	241	13	5.4	8.6	20	8.3	15	39	62	55	58

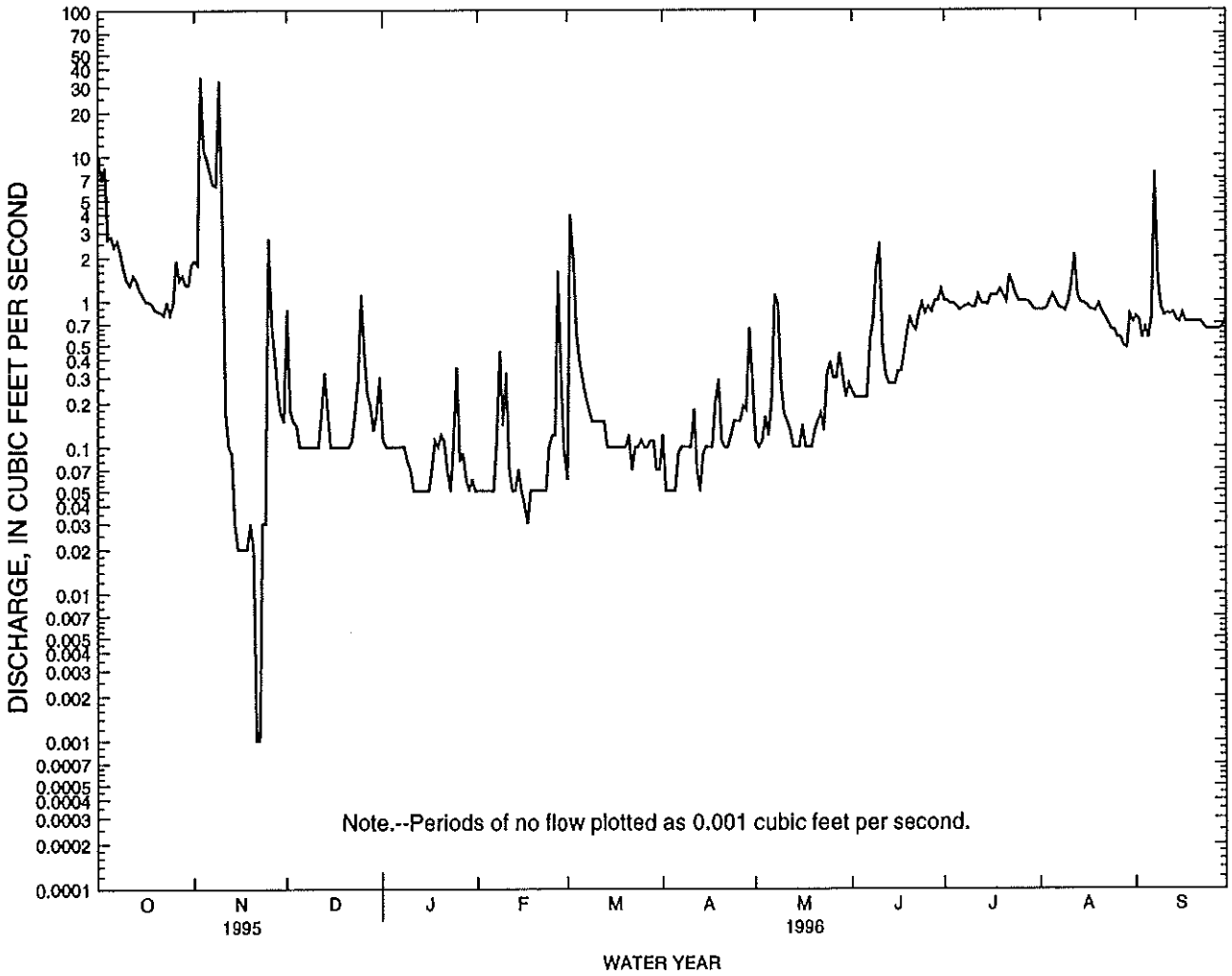
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 1996, BY WATER YEAR (WY)

MEAN	4.56	3.42	2.14	2.28	3.20	3.58	4.63	4.84	4.80	6.25	5.50	4.87
MAX	12.1	9.93	7.96	10.8	16.1	11.1	12.5	11.1	11.5	11.4	11.8	10.0
(WY)	1987	1950	1987	1975	1989	1986	1986	1986	1952	1969	1951	1941
MIN	.007	.004	.002	.003	.004	.000	.001	.009	.000	.003	.005	.002
(WY)	1995	1992	1961	1933	1969	1993	1993	1993	1993	1993	1993	1991

HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1922 - 1996	
ANNUAL TOTAL	591.37		330.30			
ANNUAL MEAN	1.62		.90		4.21	
HIGHEST ANNUAL MEAN					8.00	1987
LOWEST ANNUAL MEAN					.13	1992
HIGHEST DAILY MEAN	35	Nov 3	35	Nov 3	62	Nov 12 1947
LOWEST DAILY MEAN	.00	May 8	.00	Nov 21	.00	Dec 11 1923
ANNUAL SEVEN-DAY MINIMUM	.02	Nov 16	.02	Nov 16	.00	Dec 15 1923
ANNUAL RUNOFF (AC-FT)	1170		655		3050	
10 PERCENT EXCEEDS	4.5		1.3		10	
50 PERCENT EXCEEDS	.56		.27		2.9	
90 PERCENT EXCEEDS	.04		.05		.03	



HAWAII, ISLAND OF KAUAI

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", 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, revised. (Drainage area of 1.9 mi^2 published in the data report for water years 1977-94 was in error; the correct figure is 1.19 mi^2).

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good.

AVERAGE DISCHARGE.--38 years (water years 1959-96), 12.0 ft^3/s (8,720 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 discharge 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)
Nov. 03	1230	*4,000	*9.64	Sep. 07	1030	1,200	5.94
Nov. 09	2100	3,760	9.40				

Minimum discharge, 4.6 ft^3/s, June 3-6, August 27-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	19	33	9.2	7.5	9.7	50	8.2	5.1	22	6.0	29
2	11	36	11	8.0	7.8	54	9.7	6.9	4.9	21	5.9	14
3	14	384	9.1	7.5	6.9	55	7.5	6.7	4.8	17	6.2	6.8
4	13	31	9.5	7.2	6.6	20	6.7	6.4	4.7	20	8.3	7.3
5	12	17	8.4	8.7	6.3	13	6.2	5.9	4.6	14	12	6.2
6	12	12	7.6	7.2	6.0	9.9	6.0	7.8	4.6	10	8.8	25
7	14	10	7.2	6.7	9.7	8.6	5.6	77	4.9	9.2	7.9	155
8	25	9.9	6.9	6.5	17	7.9	5.5	92	16	8.7	6.5	38
9	17	625	6.6	9.2	9.3	7.4	5.4	18	22	7.9	6.0	16
10	12	48	6.4	9.2	23	7.0	5.4	11	21	7.3	7.3	11
11	11	19	6.3	6.8	8.4	6.6	8.4	8.9	8.9	7.2	22	9.7
12	11	13	13	6.4	7.3	6.4	6.3	8.0	6.9	7.9	35	9.7
13	9.4	20	34	6.2	6.8	8.4	5.5	7.3	6.1	7.9	10	10
14	8.5	11	15	6.1	8.4	6.8	5.3	6.8	5.6	9.1	8.1	8.0
15	7.3	11	9.0	5.8	6.8	6.2	5.1	6.5	5.4	11	7.3	7.2
16	6.7	9.5	7.9	5.7	6.3	5.9	5.0	6.4	6.8	14	6.7	6.7
17	6.5	8.9	7.4	6.0	6.0	5.8	5.0	5.9	5.9	13	6.4	6.9
18	6.7	9.3	7.0	6.8	5.8	6.0	6.8	5.6	5.8	11	6.0	7.5
19	6.3	9.5	6.8	7.1	5.7	5.6	45	5.5	6.6	9.8	5.7	6.5
20	6.4	9.3	6.5	9.5	5.6	5.6	13	5.4	11	8.2	6.2	6.3
21	6.6	8.4	6.3	7.0	5.5	6.2	7.8	5.3	12	12	5.4	5.9
22	6.1	8.0	6.2	21	5.5	5.5	6.8	5.3	8.3	16	5.2	5.6
23	6.4	9.1	6.2	7.8	5.7	5.5	6.2	5.2	8.9	13	5.1	5.4
24	5.7	7.8	24	18	6.4	5.4	5.8	5.8	11	9.5	5.0	5.2
25	6.7	60	66	50	8.6	5.5	5.7	6.5	14	7.9	4.9	5.1
26	43	37	20	29	9.5	5.3	6.0	5.5	9.7	8.5	4.8	5.0
27	10	17	10	14	78	5.2	5.7	5.3	8.1	12	4.7	4.9
28	20	12	8.5	11	26	6.6	5.9	10	8.7	9.4	4.6	4.8
29	14	10	7.8	8.7	10	11	24	7.0	18	7.2	4.6	4.8
30	12	10	12	11	---	17	20	5.9	34	6.5	5.4	6.1
31	17	---	22	8.5	---	7.5	---	5.4	---	6.2	6.8	---
TOTAL	373.3	1491.7	407.6	331.8	322.4	336.5	307.3	373.4	294.3	344.4	244.8	439.6
MEAN	12.0	49.7	13.1	10.7	11.1	10.9	10.2	12.0	9.81	11.1	7.90	14.7
MAX	43	625	66	50	78	55	50	92	34	22	35	155
MIN	5.7	7.8	6.2	5.7	5.5	5.2	5.0	5.2	4.6	6.2	4.6	4.8
AC-FT	740	2960	808	658	639	667	610	741	584	683	486	872

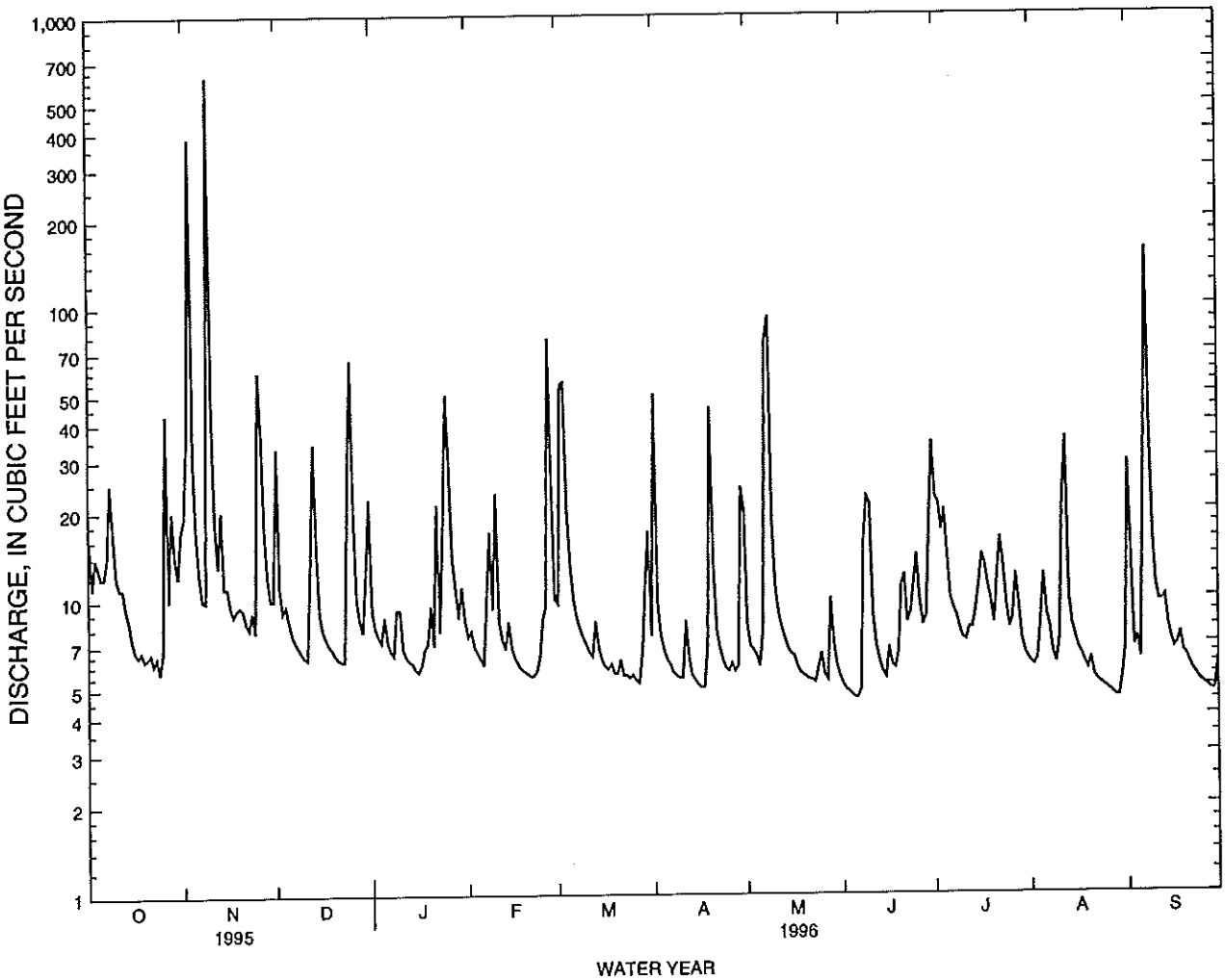
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1996, BY WATER YEAR (WY)

MEAN	10.5	17.0	14.2	11.4	11.7	13.8	15.0	12.0	8.57	11.5	10.4	8.47
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	5.62	4.27	5.05	3.95	3.93
(WY)	1985	1977	1986	1986	1986	1995	1992	1995	1959	1975	1973	1975

HAWAII, ISLAND OF KAUAI

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1958 - 1996	
ANNUAL TOTAL	4332.9		5267.1			
ANNUAL MEAN	11.9		14.4		12.0	
HIGHEST ANNUAL MEAN					19.6	1982
LOWEST ANNUAL MEAN					7.01	1984
HIGHEST DAILY MEAN	625	Nov 9	625	Nov 9	879	Feb 13 1994
LOWEST DAILY MEAN	3.8	Mar 25	4.6	Jun 5	1.9	Sep 5 1968
ANNUAL SEVEN-DAY MINIMUM	3.9	Mar 14	4.8	Jun 1	2.4	Sep 2 1968
ANNUAL RUNOFF (AC-FT)	8590		10450		8720	
10 PERCENT EXCEEDS	16		21		21	
50 PERCENT EXCEEDS	6.6		7.8		7.5	
90 PERCENT EXCEEDS	4.3		5.4		4.6	



HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11′31″, long 159°27′57″, Hydrologic Unit 20070000, on right bank 2.6 mi southeast of Hanalei School, and 4.9 mi upstream from mouth.

DRAINAGE AREA.--19.1 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.

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

REMARKS.--Records fair except for estimated daily discharges, which are poor. Since 1925, Hanalei tunnel (station 16100000) has diverted water from Hanalei River and its tributary Kaapoko Stream upstream of the station to North Branch of North Fork Wailua River for irrigation. China Ditch diverts water upstream of station for irrigation of taro in vicinity of Hanalei.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--33 years (water years 1964-96), 214 ft^3/s (155,300) 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 discharge greater than base discharge of 9,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 03	1400	*44,600	*15.81	Sep. 07	1030	18,400	12.86
Nov. 09	1700	20,100	13.28				

Minimum discharge, 81 ft^3/s June 4-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	745	250	e280	147	153	186	812	117	90	332	127	348
2	342	375	e175	125	145	611	204	105	85	285	120	345
3	e338	e4000	e150	116	131	845	201	102	84	254	129	173
4	e198	e505	e160	113	122	402	146	103	82	294	187	152
5	290	e260	e145	115	118	273	130	95	81	241	190	129
6	298	e180	e130	108	113	201	122	106	82	181	163	320
7	434	e156	e123	103	135	167	115	348	127	161	164	2240
8	e800	e167	e117	97	175	149	110	496	373	155	125	e685
9	406	e7100	e113	219	139	137	106	203	383	138	113	e325
10	287	e515	e110	177	224	128	104	150	238	130	133	e228
11	250	e440	e110	109	123	120	179	125	187	126	264	e226
12	301	e260	e175	101	113	116	127	115	149	154	390	e229
13	213	e390	308	96	106	277	102	107	178	142	159	e242
14	182	e230	215	95	176	149	100	103	151	161	132	e164
15	165	e220	124	93	189	120	94	100	113	175	129	e142
16	157	e180	e120	91	138	114	92	103	161	237	116	e133
17	150	e160	e117	103	114	110	92	94	169	256	114	e142
18	163	e160	e108	442	107	111	150	92	276	223	107	e167
19	134	e180	e107	235	105	106	504	91	241	254	103	e130
20	202	e170	e105	429	104	103	199	92	308	220	110	e154
21	179	e160	e103	204	103	160	128	92	254	218	97	e132
22	146	e155	e100	636	114	110	114	98	171	566	95	e113
23	160	e170	e98	193	130	132	106	86	214	251	93	e109
24	127	e150	e150	246	240	119	103	94	427	222	93	e106
25	157	e479	983	658	808	112	101	153	428	171	90	e102
26	707	e326	293	512	841	103	101	110	261	163	87	e100
27	247	e161	153	510	1130	99	119	105	190	608	86	e97
28	376	e170	119	451	469	104	125	147	227	301	84	e95
29	310	e150	89	220	230	178	212	118	341	178	84	e95
30	351	e150	272	231	---	200	203	108	853	150	134	e115
31	445	---	371	186	---	117	---	106	---	139	233	---
TOTAL	9260	17969	5723	7161	6795	5859	5001	4064	6924	7086	4251	7738
MEAN	299	599	185	231	234	189	167	131	231	229	137	258
MAX	800	7100	983	658	1130	845	812	496	853	608	390	2240
MIN	127	150	89	91	103	99	92	86	81	126	84	95
AC-FT	18370	35640	11350	14200	13480	11620	9920	8060	13730	14060	8430	15350

e Estimated

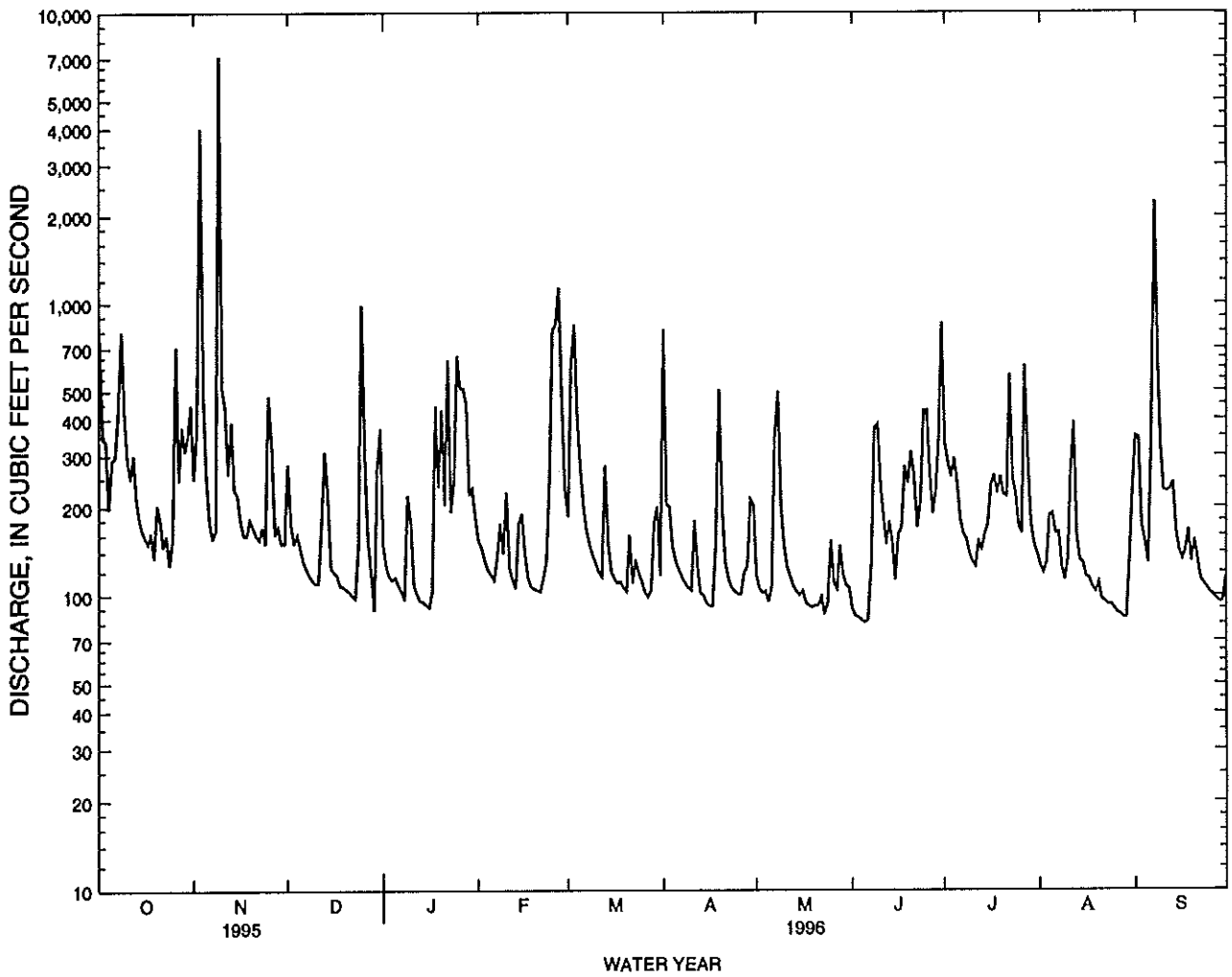
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1996, BY WATER YEAR (WY)

MEAN	182	313	245	216	226	274	290	212	144	187	158	142
MAX	466	793	596	614	616	1096	781	626	567	418	413	523
(WY)	1983	1991	1968	1989	1989	1982	1974	1967	1978	1989	1982	1994
MIN	44.0	72.8	59.6	49.5	42.8	56.4	76.3	73.5	57.5	62.6	42.1	35.7
(WY)	1985	1964	1984	1986	1978	1970	1966	1984	1975	1984	1973	1975

HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1962 - 1996	
ANNUAL TOTAL	75994		87831			
ANNUAL MEAN	208		240		214	
HIGHEST ANNUAL MEAN					408	1982
LOWEST ANNUAL MEAN					92.7	1984
HIGHEST DAILY MEAN	7100	Nov 9	7100	Nov 9	8340	May 22 1967
LOWEST DAILY MEAN	58	Jun 30	81	Jun 5	31	Nov 3 1975
ANNUAL SEVEN-DAY MINIMUM	62	Jun 26	87	May 31	33	Sep 19 1975
ANNUAL RUNOFF (AC-FT)	150700		174200		155300	
10 PERCENT EXCEEDS	340		403		419	
50 PERCENT EXCEEDS	119		151		119	
90 PERCENT EXCEEDS	71		98		58	



HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI

LOCATION.--Lat 22°08′20″, long 159°33′38″, 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.

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

REMARKS.--Records fair, except for estimated discharges which are poor. No diversion upstream.

AVERAGE DISCHARGE.--41 years (water years 1953-55, 1959-96), 138 ft^3/s (100,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 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, 32 ft^3/s, October 21-23, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharge 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. 03	1200	*22,500	*8.61	Nov. 09	1030	3,900	5.34

Minimum discharge, 35 ft^3/s June 4-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	457	116	101	e120	e80	e94	338	55	41	190	49	161
2	178	184	78	e70	e73	e365	80	54	37	165	50	137
3	145	1640	77	e62	e70	446	59	53	36	136	84	105
4	99	e196	104	e60	e68	283	56	53	36	207	106	73
5	149	e150	65	e64	e65	e110	55	53	35	156	90	54
6	185	e100	59	e60	e61	e98	54	52	38	100	71	127
7	213	e82	54	e54	e77	e88	54	52	128	79	88	969
8	574	e100	56	e50	e74	e78	54	72	144	76	55	e290
9	190	1770	56	e180	e72	e74	53	66	106	67	49	e140
10	127	e216	54	e134	e130	e69	53	53	80	68	65	e130
11	122	e170	53	e70	e90	e65	144	52	63	59	176	e152
12	162	e140	66	e54	e72	e62	83	52	96	119	180	163
13	114	e230	199	e51	e60	e170	54	51	209	73	59	e72
14	80	e120	107	e49	e88	e92	53	50	e96	85	e56	e66
15	70	e110	62	e48	211	e72	52	48	e72	85	e57	e55
16	63	e100	56	e47	e88	e68	52	49	e100	161	e54	e62
17	73	e82	56	e120	e70	e64	51	46	132	209	e52	73
18	104	e80	63	e292	e58	e64	146	43	301	166	e51	114
19	69	e86	58	e212	e57	e60	369	42	163	197	e51	59
20	151	e94	53	459	e56	e54	120	41	160	150	e57	110
21	137	e82	53	e130	e56	e96	e70	41	146	129	e49	e56
22	79	e80	53	e220	e64	e68	e62	40	82	163	e48	e50
23	109	e86	54	e160	e74	e80	e56	38	113	103	e46	e45
24	70	e78	53	e170	e248	e68	e54	45	273	72	e46	e44
25	127	e617	242	463	1240	e65	56	121	276	60	e45	e44
26	237	446	e130	318	1050	e63	57	53	e160	95	e44	e43
27	81	e120	e74	e310	e580	59	86	75	e110	231	e43	e42
28	150	e92	e62	e320	e240	56	55	116	e130	92	e41	e40
29	151	e82	e54	e110	e115	80	57	81	144	55	e40	e40
30	204	e104	525	e120	---	113	72	100	924	50	e55	e48
31	240	---	e231	e100	---	73	---	58	---	51	93	---
TOTAL	4910	7553	3008	4677	5287	3297	2605	1805	4431	3649	2050	3564
MEAN	158	252	97.0	151	182	106	86.8	58.2	148	118	66.1	119
MAX	574	1770	525	463	1240	446	369	121	924	231	180	969
MIN	63	78	53	47	56	54	51	38	35	50	40	40
AC-FT	9740	14980	5970	9280	10490	6540	5170	3580	8790	7240	4070	7070

e Estimated

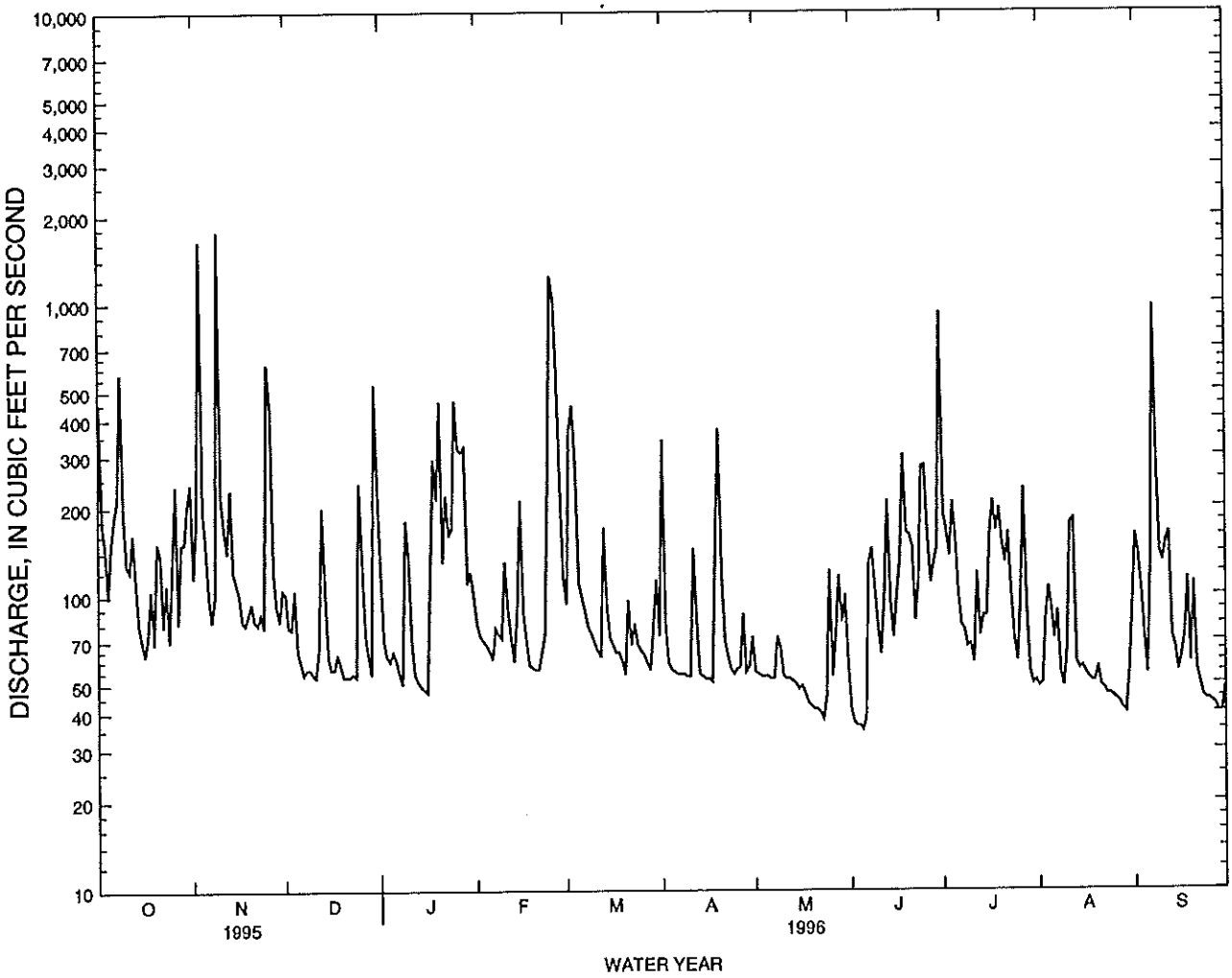
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1996, BY WATER YEAR (WY)

MEAN	114	189	167	143	144	170	173	122	100	132	115	95.4
MAX	228	414	384	371	492	611	504	238	187	315	272	249
(WY)	1983	1991	1968	1989	1969	1982	1971	1967	1978	1989	1982	1994
MIN	42.8	72.7	54.1	44.6	36.5	52.2	52.8	51.9	53.1	50.4	54.6	42.3
(WY)	1985	1964	1984	1986	1978	1970	1992	1966	1993	1984	1965	1965

HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1952 - 1996	
ANNUAL TOTAL	46897		46836			
ANNUAL MEAN	128		128		138	
HIGHEST ANNUAL MEAN					243	1982
LOWEST ANNUAL MEAN					84.7	1984
HIGHEST DAILY MEAN	1770	Nov 9	1770	Nov 9	3650	Nov 21 1974
LOWEST DAILY MEAN	52	Mar 18	35	Jun 5	31	Sep 29 1965
ANNUAL SEVEN-DAY MINIMUM	53	Mar 14	40	May 31	33	Sep 24 1965
ANNUAL RUNOFF (AC-FT)	93020		92900		100200	
10 PERCENT EXCEEDS	215		217		263	
50 PERCENT EXCEEDS	80		77		78	
90 PERCENT EXCEEDS	56		49		48	



HAWAII, ISLAND OF KAUAI

16114000 LIMAHUL STREAM NEAR WAINIHA

LOCATION.--Lat 22°13'15", long 159°34'48", 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 September 1996.

GAGE.--Water-stage recorders and natural control. Elevation of gage is 160 ft above mean sea level, by altimeter.

REMARKS.--Records fair. No diversion upstream of station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 458 ft^3/s, June 30, 1996, gage height, 3.76 ft; minimum, 3.5 ft^3/s, June 30, July 1, 2, 1995.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 03	1200	430	4.32	Jun. 08	1530	300	3.16
Dec. 30	2300	373	4.10	Jun. 30	0430	*458	*3.76

Minimum discharge, 4.1 ft^3/s, February 5, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	12	8.0	8.6	4.9	8.0	6.1	8.4	4.7	15	5.8	5.7
2	11	9.9	6.8	6.6	9.2	15	5.6	6.3	4.5	12	5.6	5.8
3	8.9	94	6.2	5.7	6.0	23	5.4	5.8	4.5	10	5.5	5.9
4	9.3	26	8.2	5.3	4.7	16	5.2	8.0	4.4	11	5.9	6.1
5	8.9	13	7.4	7.4	4.3	10	5.1	5.7	4.4	11	5.6	6.0
6	9.1	9.3	6.4	5.5	4.5	8.1	5.0	5.3	4.5	8.9	5.6	10
7	12	7.9	5.9	5.1	12	6.9	4.9	35	5.1	12	5.5	70
8	17	7.4	5.7	5.0	10	6.4	4.8	98	51	9.9	5.3	22
9	15	28	5.2	32	8.3	6.1	4.8	16	19	8.7	5.2	11
10	11	14	5.1	14	51	5.9	4.9	8.3	8.5	8.1	6.2	8.0
11	9.1	8.5	4.9	7.6	9.9	5.8	6.4	6.5	6.3	7.8	9.9	7.6
12	7.7	7.3	15	5.8	7.5	5.7	5.5	5.9	5.9	7.6	11	7.9
13	7.1	19	20	5.2	6.6	5.9	5.3	5.5	35	7.3	7.0	8.1
14	6.5	8.8	16	4.9	9.5	5.7	5.3	5.3	12	7.3	6.2	6.8
15	6.3	7.4	9.4	4.6	8.4	5.4	5.2	5.2	6.9	7.4	5.9	6.4
16	5.7	6.7	7.8	4.5	6.7	5.3	5.4	5.6	6.1	8.3	5.8	7.1
17	5.2	6.4	7.4	5.2	6.1	5.3	5.6	5.1	5.7	7.5	5.6	6.6
18	5.6	6.3	6.6	13	5.8	5.5	9.5	4.9	7.0	10	5.5	6.4
19	5.6	7.4	6.1	8.1	5.7	5.2	47	4.9	6.8	11	5.5	6.1
20	5.2	7.7	5.8	7.8	5.6	5.3	11	4.9	8.4	8.3	5.5	6.1
21	5.8	6.4	5.6	6.0	5.8	6.2	6.8	4.9	10	7.3	5.5	6.0
22	5.1	6.1	5.5	5.3	6.7	5.6	5.8	4.7	6.9	e7.4	5.5	5.9
23	5.1	6.7	5.2	5.6	6.2	5.9	5.4	4.7	7.0	e7.1	5.5	5.9
24	4.8	6.0	11	8.8	6.0	5.8	5.2	5.0	12	e6.8	5.5	e5.9
25	5.6	6.9	47	39	9.2	5.8	5.1	4.8	9.5	6.2	5.5	e5.8
26	12	8.4	14	11	11	6.0	4.9	4.8	6.7	6.6	5.5	e5.8
27	7.7	7.2	7.5	7.2	73	5.9	6.2	4.7	6.2	8.3	5.5	e5.8
28	16	6.3	5.7	7.8	34	9.0	4.9	7.5	6.5	7.2	5.6	e5.7
29	17	6.1	5.0	5.4	10	15	61	5.5	26	6.1	5.6	e5.7
30	18	8.1	63	6.8	---	16	24	5.0	65	5.8	5.5	e7.4
31	18	---	48	5.7	---	7.3	---	4.8	---	5.9	5.6	---
TOTAL	298.3	375.2	381.4	270.5	348.6	249.0	287.3	307.0	366.5	263.8	184.9	279.5
MEAN	9.62	12.5	12.3	8.73	12.0	8.03	9.58	9.90	12.2	8.51	5.96	9.32
MAX	18	94	63	39	73	23	61	98	65	15	11	70
MIN	4.8	6.0	4.9	4.5	4.3	5.2	4.8	4.7	4.4	5.8	5.2	5.7
AC-FT	592	744	757	537	691	494	570	609	727	523	367	554

e Estimated

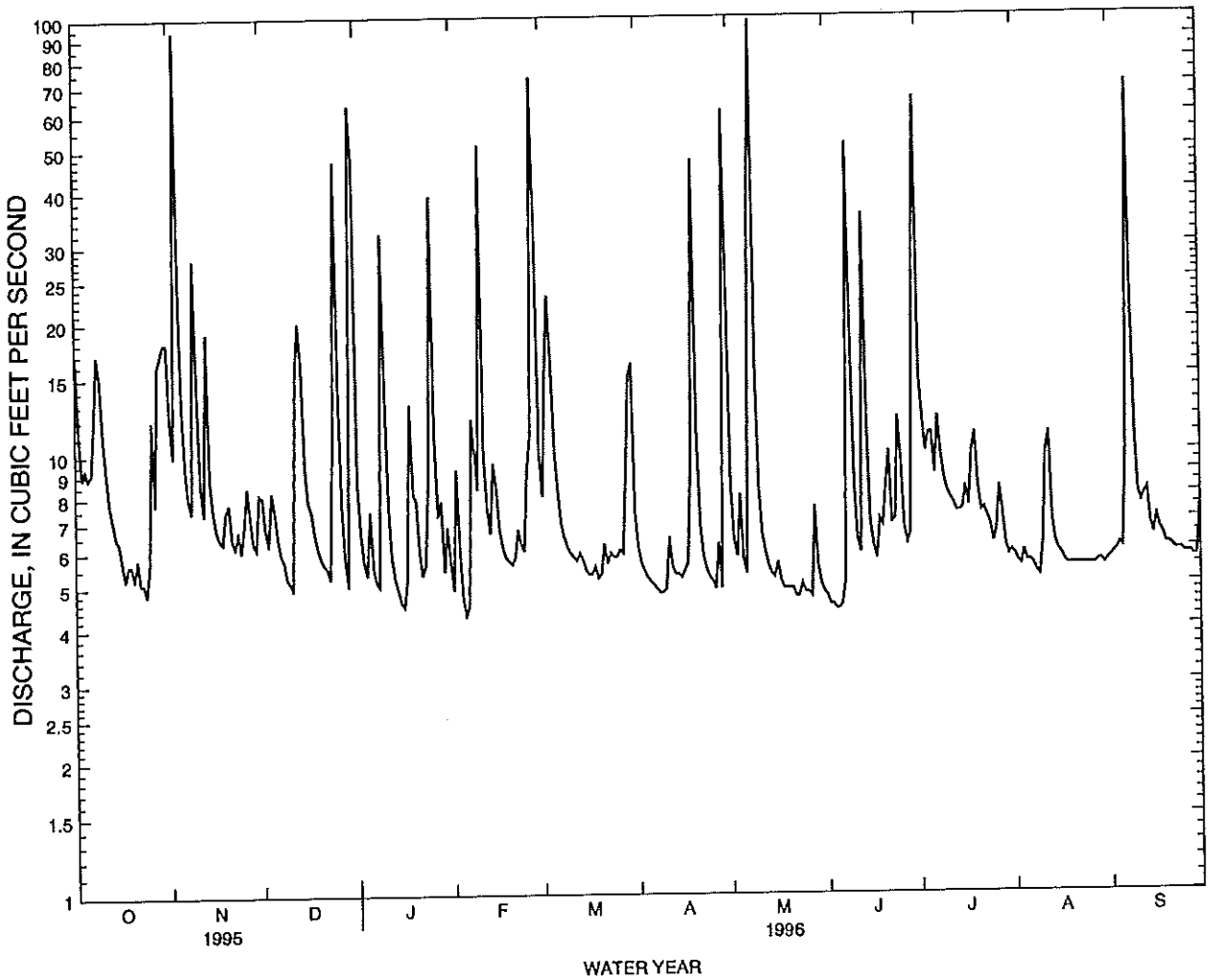
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1996, BY WATER YEAR (WY)

MEAN	9.04	10.1	9.87	7.38	9.19	6.83	10.7	8.82	8.71	8.62	7.90	8.53
MAX	9.62	12.5	12.3	8.73	12.0	8.03	11.9	9.90	12.2	8.74	9.84	9.32
(WY)	1996	1996	1996	1996	1996	1996	1995	1996	1996	1995	1995	1996
MIN	8.45	7.66	7.43	6.04	6.27	5.63	9.58	7.74	5.20	8.51	5.96	7.75
(WY)	1995	1995	1995	1995	1995	1995	1996	1995	1995	1996	1996	1995

HAWAII, ISLAND OF KAUAI

16114000 LIMAHULI STREAM NEAR WAINIHA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1995 - 1996	
ANNUAL TOTAL	3152.2		3612.0			
ANNUAL MEAN	8.64		9.87		8.80	
HIGHEST ANNUAL MEAN					9.87	1996
LOWEST ANNUAL MEAN					7.72	1995
HIGHEST DAILY MEAN	94	Nov 3	98	May 8	98	May 8 1996
LOWEST DAILY MEAN	3.7	Jul 1	4.3	Feb 5	3.7	Jul 1 1995
ANNUAL SEVEN-DAY MINIMUM	3.9	Jun 26	4.5	May 31	3.9	Jun 26 1995
ANNUAL RUNOFF (AC-FT)	6250		7160		6370	
10 PERCENT EXCEEDS	13		15		12	
50 PERCENT EXCEEDS	6.6		6.4		6.3	
90 PERCENT EXCEEDS	4.7		5.1		4.9	



Surface-Water Station Records for Oahu

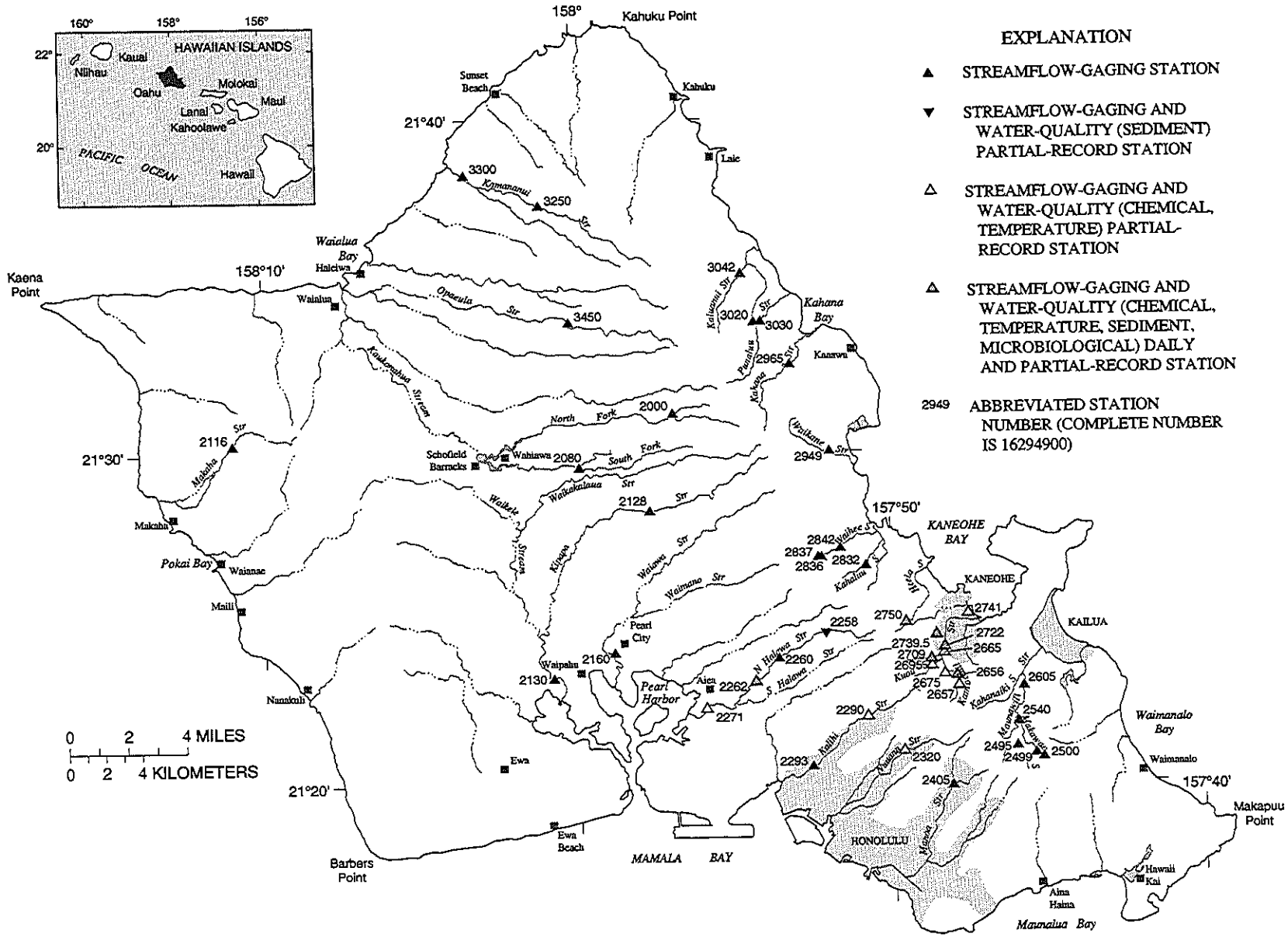


Figure 6. Locations of gaging, water-quality, and partial-record stations on Oahu.

HAWAII, ISLAND OF OAHU

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

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

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

REMARKS.--Records fair.

AVERAGE DISCHARGE.--73 years (water years 1914-24, 1927-52, 1961-96), 16.4 ft^3/s (11,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s, October 28, 1981, gage height, 13.2 ft, from rating curve extended above 68 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)
Jan. 19	0730	*2,880	*8.95	Jan. 25	0345	2,320	8.02

Minimum discharge, 0.75 ft^3/s, March 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	72	25	2.4	2.9	4.4	27	2.6	2.7	15	4.7	3.0
2	19	12	7.0	1.7	2.6	8.1	17	2.4	2.2	54	6.5	2.4
3	12	16	5.5	1.5	2.4	63	4.8	2.2	1.9	14	8.2	3.2
4	27	11	4.9	1.4	2.2	36	3.3	2.1	1.8	34	23	3.0
5	15	7.4	4.5	1.7	2.0	6.7	3.3	2.0	1.9	28	11	12
6	11	6.5	4.1	1.5	1.9	5.2	2.5	1.8	2.8	8.4	9.2	33
7	17	6.2	5.9	5.5	1.8	4.4	2.2	1.7	30	28	13	113
8	46	50	3.8	8.8	5.2	3.7	2.0	2.1	5.8	7.3	8.2	13
9	22	19	3.4	2.6	4.0	3.3	1.8	1.6	16	8.1	5.0	8.0
10	21	15	3.1	6.7	2.1	3.0	22	1.4	7.0	7.3	17	8.8
11	18	8.0	2.8	3.0	1.8	2.8	24	1.3	3.7	6.8	31	8.9
12	30	7.2	2.6	1.6	1.4	2.9	4.2	1.3	12	14	11	7.6
13	10	30	22	1.4	1.3	3.3	2.7	1.2	8.2	7.4	32	6.9
14	7.9	14	10	1.3	3.2	2.4	9.9	1.1	19	6.0	8.3	4.7
15	10	17	3.4	1.1	4.5	2.3	5.0	1.1	3.6	8.4	6.1	4.0
16	6.5	7.5	2.8	1.0	2.6	2.2	2.5	1.1	5.8	25	6.1	7.6
17	5.9	32	3.0	.98	1.5	3.6	14	1.3	26	24	5.5	4.9
18	8.9	8.6	3.1	3.7	1.2	3.6	28	1.0	13	19	9.6	5.5
19	6.7	6.4	2.6	100	1.0	2.2	26	.94	12	19	5.1	3.7
20	39	6.1	2.4	57	.88	2.2	6.5	13	7.8	13	4.6	21
21	22	6.7	2.2	17	.86	3.1	28	8.7	27	32	4.0	5.5
22	7.6	5.4	2.1	12	1.2	2.2	6.1	1.8	8.9	9.7	3.6	5.7
23	6.1	5.0	2.1	41	1.5	1.8	4.4	1.3	8.8	8.4	3.4	3.8
24	5.3	4.5	1.9	9.5	26	3.1	3.7	11	72	12	3.2	13
25	16	4.3	1.8	184	61	1.7	3.3	22	32	6.4	3.1	8.4
26	66	4.1	1.8	7.9	66	1.4	4.1	15	29	16	2.9	4.1
27	10	5.4	1.6	6.9	23	1.2	11	7.7	17	17	2.8	3.3
28	25	40	1.4	13	19	1.1	3.4	21	25	8.4	2.7	3.0
29	16	10	1.3	4.4	5.7	1.1	17	18	33	5.9	2.5	2.8
30	17	26	12	4.3	---	1.0	3.1	6.8	21	5.3	2.7	2.6
31	172	---	15	5.3	---	99	---	4.1	---	5.1	12	---
TOTAL	708.9	463.3	165.1	510.18	250.74	282.0	292.8	160.64	456.9	472.9	268.0	326.4
MEAN	22.9	15.4	5.33	16.5	8.65	9.10	9.76	5.18	15.2	15.3	8.65	10.9
MAX	172	72	25	184	66	99	28	22	72	54	32	113
MIN	5.3	4.1	1.3	.98	.86	1.0	1.8	.94	1.8	5.1	2.5	2.4
AC-FT	1410	919	327	1010	497	559	581	319	906	938	532	647

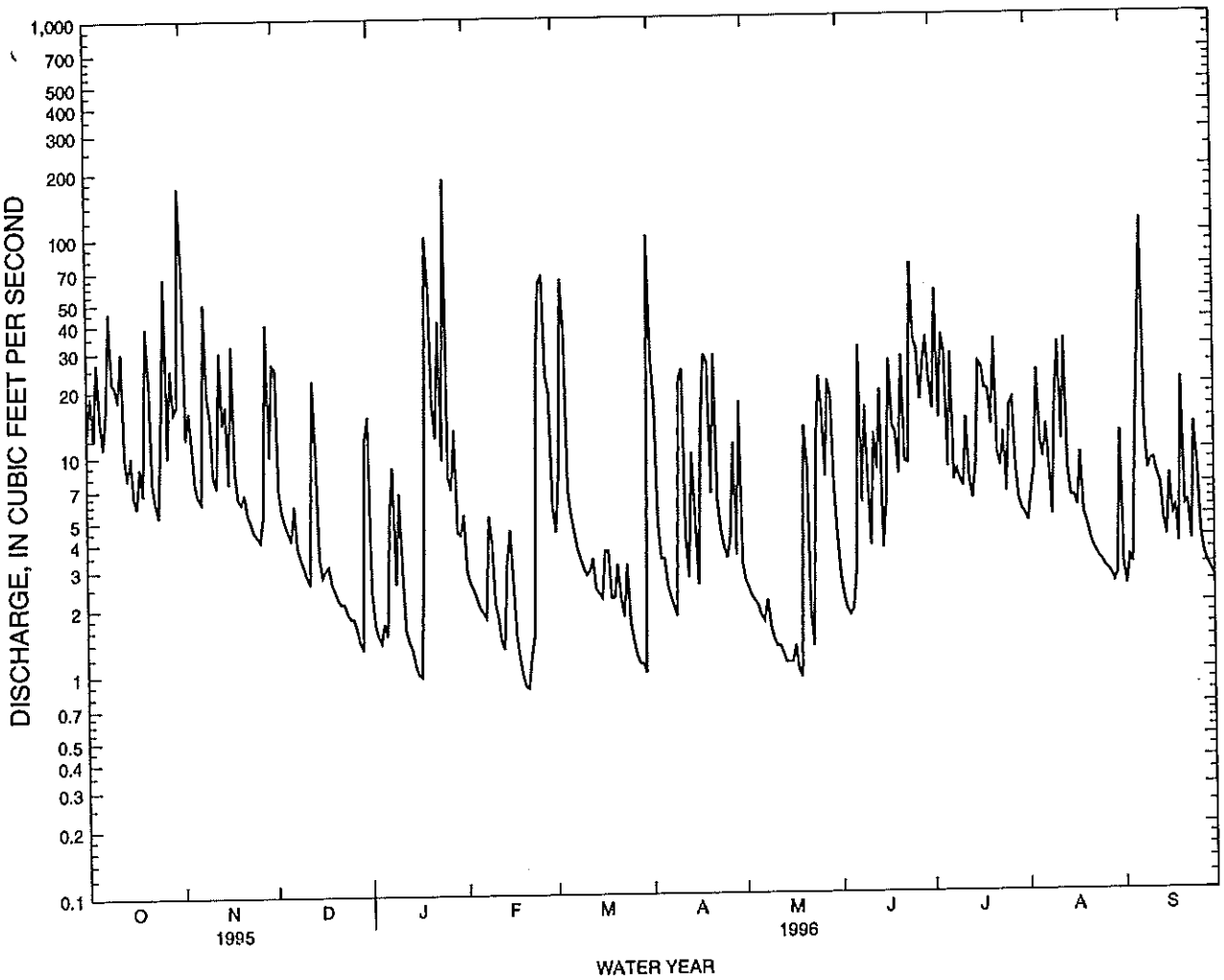
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1996, BY WATER YEAR (WY)

MEAN	13.2	17.5	15.1	14.6	12.8	19.1	19.9	16.4	13.2	18.6	18.4	15.3
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	.36	.40	.28	1.38	.67	2.63	4.22	1.81	1.95
(WY)	1985	1934	1990	1986	1986	1983	1966	1992	1951	1951	1971	1975

HAWAII, ISLAND OF OAHU

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1913 - 1996	
ANNUAL TOTAL	4482.94		4357.86			
ANNUAL MEAN	12.3		11.9		16.4	
HIGHEST ANNUAL MEAN					29.5	1932
LOWEST ANNUAL MEAN					9.11	1984
HIGHEST DAILY MEAN	197	Jan 14	184	Jan 25	975	Feb 27 1935
LOWEST DAILY MEAN	.38	Mar 18	.86	Feb 21	.12	Mar 13 1941
ANNUAL SEVEN-DAY MINIMUM	.43	Mar 14	1.1	May 13	.13	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	8890		8640		11870	
10 PERCENT EXCEEDS	27		27		36	
50 PERCENT EXCEEDS	5.3		5.9		7.1	
90 PERCENT EXCEEDS	1.7		1.6		1.6	



HAWAII, ISLAND OF OAHU

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

LOCATION.--Lat 21°29′32″, long 157°59′54″, Hydrologic Unit 20060000, on right 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 current year.

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level (from USC&GS trig station).

REMARKS.--Records good. Prior to 1960, water was diverted from reservoirs upstream of station for use at Schofield Barracks.

AVERAGE DISCHARGE.--34 years (water years 1961-62, 1965-96), 21.5 ft^3/s (15,550 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	unknown	*1,660	*6.05	No peak greater than base discharge.			

Minimum discharge, 0.49 ft^3/s, June 4-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	89	32	5.4	4.5	3.8	27	2.9	1.6	24	9.8	7.2
2	16	17	9.3	2.6	3.9	4.4	15	2.5	.99	113	21	3.9
3	16	19	4.6	1.7	3.4	107	5.4	2.2	.75	40	9.1	4.2
4	24	26	3.6	1.2	2.9	79	3.2	2.1	.58	85	12	4.0
5	14	11	3.2	1.7	2.7	11	2.8	2.0	.50	91	23	9.8
6	29	8.8	2.9	1.5	2.6	6.7	2.6	1.9	3.0	37	21	15
7	32	7.9	5.4	1.2	2.5	5.1	2.0	1.7	76	76	18	68
8	132	25	4.6	13	4.1	4.1	1.7	1.7	16	26	9.7	26
9	43	36	2.8	5.4	5.0	3.5	1.6	1.6	20	20	7.7	9.2
10	52	17	2.5	9.3	3.0	3.1	6.8	1.5	27	16	19	14
11	27	8.7	2.2	4.7	2.0	2.8	30	1.3	4.8	14	24	24
12	32	8.1	2.0	2.3	1.6	2.6	6.1	1.3	13	30	31	14
13	18	27	6.9	1.4	1.3	2.6	2.7	1.3	55	22	20	13
14	14	18	31	1.1	1.3	2.2	2.0	1.2	5.9	14	12	7.6
15	13	18	4.1	.84	7.0	2.1	8.7	1.1	3.6	29	8.2	6.1
16	11	8.7	2.7	.76	4.7	2.0	2.5	1.1	21	44	9.2	5.6
17	9.7	6.3	2.4	.71	2.7	3.6	8.7	1.4	17	31	9.0	6.1
18	10	8.8	2.6	1.3	1.6	4.9	42	1.4	60	88	7.1	7.1
19	9.7	5.4	2.9	102	1.1	3.7	29	1.2	31	97	6.8	5.4
20	44	5.2	2.6	66	.87	2.1	7.9	.96	29	76	6.3	8.0
21	24	5.1	2.7	12	.81	2.2	59	1.1	25	46	6.2	8.8
22	15	5.1	2.6	23	1.1	2.6	12	1.7	21	28	5.8	4.8
23	9.5	4.3	2.5	111	1.2	2.0	6.1	1.3	23	23	5.4	4.5
24	8.2	3.9	2.6	29	1.2	2.9	4.4	.86	51	38	5.1	5.2
25	10	3.7	2.8	237	67	2.4	4.0	6.8	23	17	4.8	5.8
26	37	3.6	2.9	17	40	1.5	3.7	3.8	13	16	4.6	4.7
27	20	3.7	2.7	9.3	30	1.2	14	3.6	10	20	4.4	3.8
28	10	13	2.0	18	30	1.0	4.6	24	17	19	4.2	3.2
29	48	9.7	.88	7.2	7.3	.89	17	19	58	11	4.0	3.0
30	22	14	10	5.3	---	.79	4.3	4.6	35	10	4.9	2.8
31	93	---	29	10	---	170	---	2.4	---	11	22	---
TOTAL	866.1	437.0	190.98	702.91	237.38	443.78	336.8	101.52	662.72	1212	355.3	304.8
MEAN	27.9	14.6	6.16	22.7	8.19	14.3	11.2	3.27	22.1	39.1	11.5	10.2
MAX	132	89	32	237	67	170	59	24	76	113	31	68
MIN	8.2	3.6	.88	.71	.81	.79	1.6	.86	.50	10	4.0	2.8
AC-FT	1720	867	379	1390	471	880	668	201	1310	2400	705	605

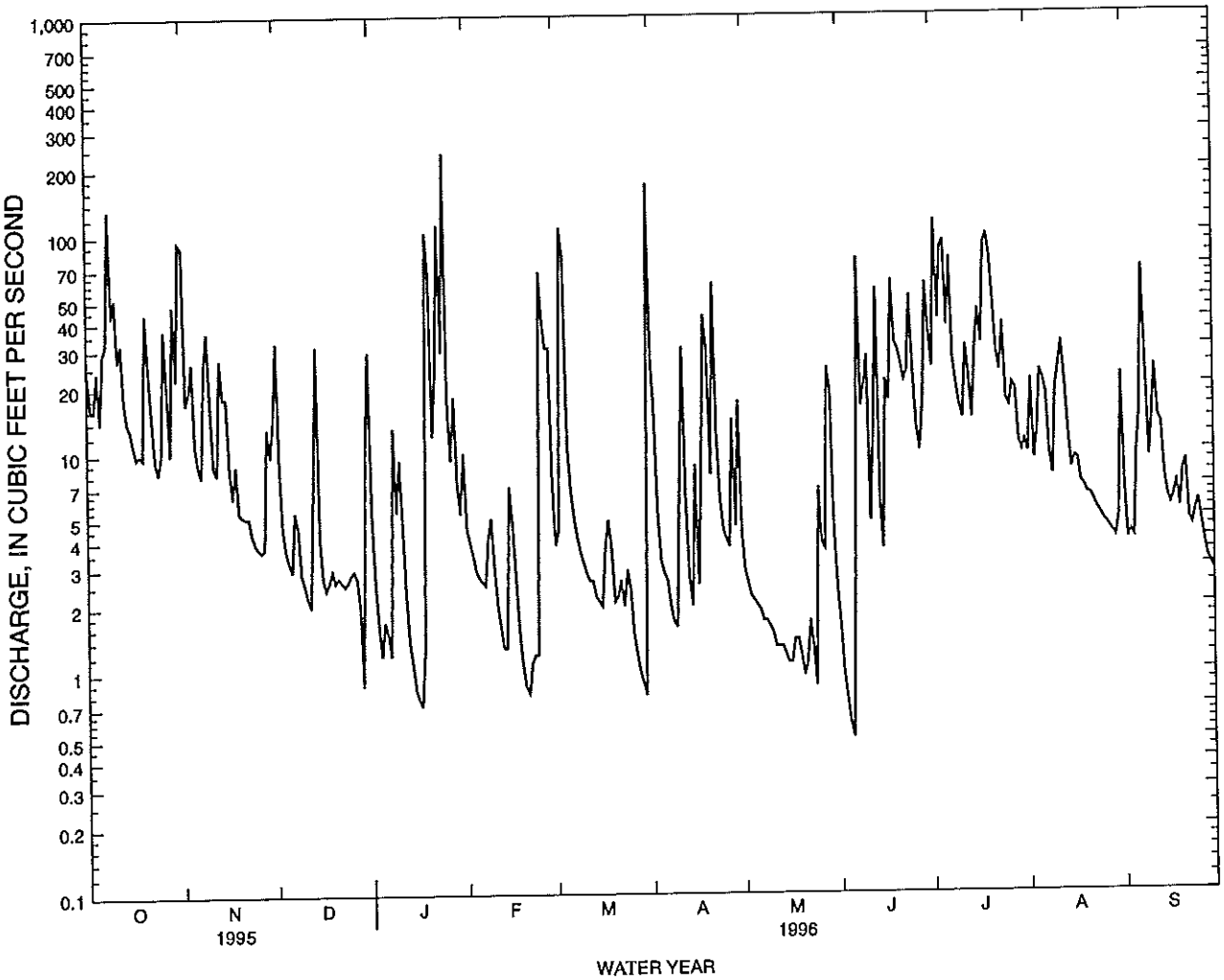
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1996, BY WATER YEAR (WY)

MEAN	17.5	28.1	22.3	19.9	17.1	27.0	30.3	21.1	16.5	26.0	18.7	14.8
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	.32	3.54	2.07	.38	.11	.66	2.45	.51	3.40	4.25	3.04	1.43
(WY)	1985	1963	1990	1986	1986	1983	1992	1992	1968	1968	1971	1975

HAWAII, ISLAND OF OAHU

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1961 - 1996	
ANNUAL TOTAL	5633.19		5851.29			
ANNUAL MEAN	15.4		16.0		21.5	
HIGHEST ANNUAL MEAN					37.2	1982
LOWEST ANNUAL MEAN					11.1	1984
HIGHEST DAILY MEAN	154	Sep 30	237	Jan 25	1050	Feb 1 1969
LOWEST DAILY MEAN	.51	Mar 20	.50	Jun 5	.00	Dec 24 1960
ANNUAL SEVEN-DAY MINIMUM	.64	Mar 15	1.1	Feb 18	.00	Jan 19 1977
ANNUAL RUNOFF (AC-FT)	11170		11610		15550	
10 PERCENT EXCEEDS	36		37		50	
50 PERCENT EXCEEDS	6.1		6.7		8.9	
90 PERCENT EXCEEDS	2.0		1.4		1.8	



HAWAII, ISLAND OF OAHU

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 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 good, except for periods of no gage height record which is poor. Honolulu Board of Water Supply wells upstream of station may influence flows at gage. Recording rain gage located at station.

AVERAGE DISCHARGE.--37 years (water years 1960-96), 1.82 ft^3/s (1,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft^3/s, January 6, 1982, gage height, 7.40 ft, from floodmarks, from rating curve extended above 51 ft^3/s on basis of slope-area measurements at gage heights 6.50 ft and 7.40 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1953, about 7.8 ft, November 24, 1954, from information by local resident. Discharge, about 1,700 ft^3/s.

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. 24	1800	*306	*3.88	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.16	1.2	1.1	4.1	1.1	.46	.04	.29	.00	.51
2	.00	.00	.18	.70	1.1	2.8	.74	.35	.03	.34	.00	.31
3	.00	.00	.23	.54	.99	26	.60	.25	.02	.22	.00	.27
4	.00	.00	.16	2.1	.73	18	.54	.18	.01	.14	.00	.18
5	.00	.00	.08	4.3	.63	9.0	1.6	.15	.00	.10	.00	.14
6	.00	.00	.03	1.4	.76	5.4	.78	.15	.00	.17	.00	.12
7	.00	.01	.01	4.5	2.3	3.9	.57	.16	.00	.26	.00	2.6
8	.00	.02	.08	1.6	1.7	3.0	.50	.14	.01	.28	.00	1.2
9	.00	.00	.40	1.6	.85	2.4	.47	.63	.44	.19	.00	.57
10	.00	.00	.29	2.2	1.7	2.0	.45	.31	.45	.11	.00	.44
11	.00	.00	.20	.95	.99	1.6	.56	.22	4.1	.06	.00	.37
12	.00	.00	.13	.66	.68	1.4	.51	.16	2.2	.04	.00	.28
13	.00	5.0	.07	.53	.55	1.2	.42	.11	2.6	.02	.00	.24
14	.00	1.1	.03	.41	.97	1.1	.39	.08	1.4	.01	.00	.14
15	.00	.54	.03	.31	1.2	.95	.35	.07	.81	.01	.00	.06
16	.00	.36	.06	.24	1.2	.83	.31	.06	.64	.00	.00	.04
17	.00	.22	.06	.17	.74	.76	.29	.05	.60	.00	.00	.02
18	.00	.14	.02	.13	.58	.73	.56	.04	.49	.00	.00	.00
19	.00	.06	.00	.09	.48	.68	.48	.04	.40	.00	.00	.00
20	.00	.03	.00	.06	.43	1.0	.38	.04	.30	.00	.00	.00
21	.00	.00	.00	.04	.39	7.7	.28	.04	.22	.00	.00	.00
22	.00	.00	.00	.03	.34	2.6	.24	.03	.16	.00	.00	.00
23	.00	.00	.00	.03	.30	2.8	.22	.03	.12	.00	.00	.00
24	.00	.00	.00	20	.26	2.1	.26	.02	.09	.00	.00	.00
25	.00	.00	.00	6.8	.24	1.8	.33	.02	.06	.00	.00	.00
26	.00	.00	.00	2.8	.33	1.3	.31	.02	.04	.00	.00	.00
27	.00	.42	.00	1.9	7.2	.97	.34	.02	.04	.00	.00	.00
28	.00	.38	.00	1.4	30	.82	.35	.00	.04	.00	.00	.00
29	.00	.31	.00	1.1	8.0	.70	.26	.02	.06	.00	.00	.00
30	.00	.23	3.8	1.9	---	.61	.77	.04	.16	.00	.00	.00
31	.00	---	6.2	2.4	---	2.8	---	.04	---	.00	.89	---
TOTAL	0.00	8.82	12.22	62.09	66.74	111.05	14.96	3.93	15.53	2.24	0.89	7.49
MEAN	.000	.29	.39	2.00	2.30	3.58	.50	.13	.52	.072	.029	.25
MAX	.00	5.0	6.2	20	30	26	1.6	.63	4.1	.34	.89	2.6
MIN	.00	.00	.00	.03	.24	.61	.22	.00	.00	.00	.00	.00
AC-FT	.00	17	24	123	132	220	30	7.8	31	4.4	1.8	15

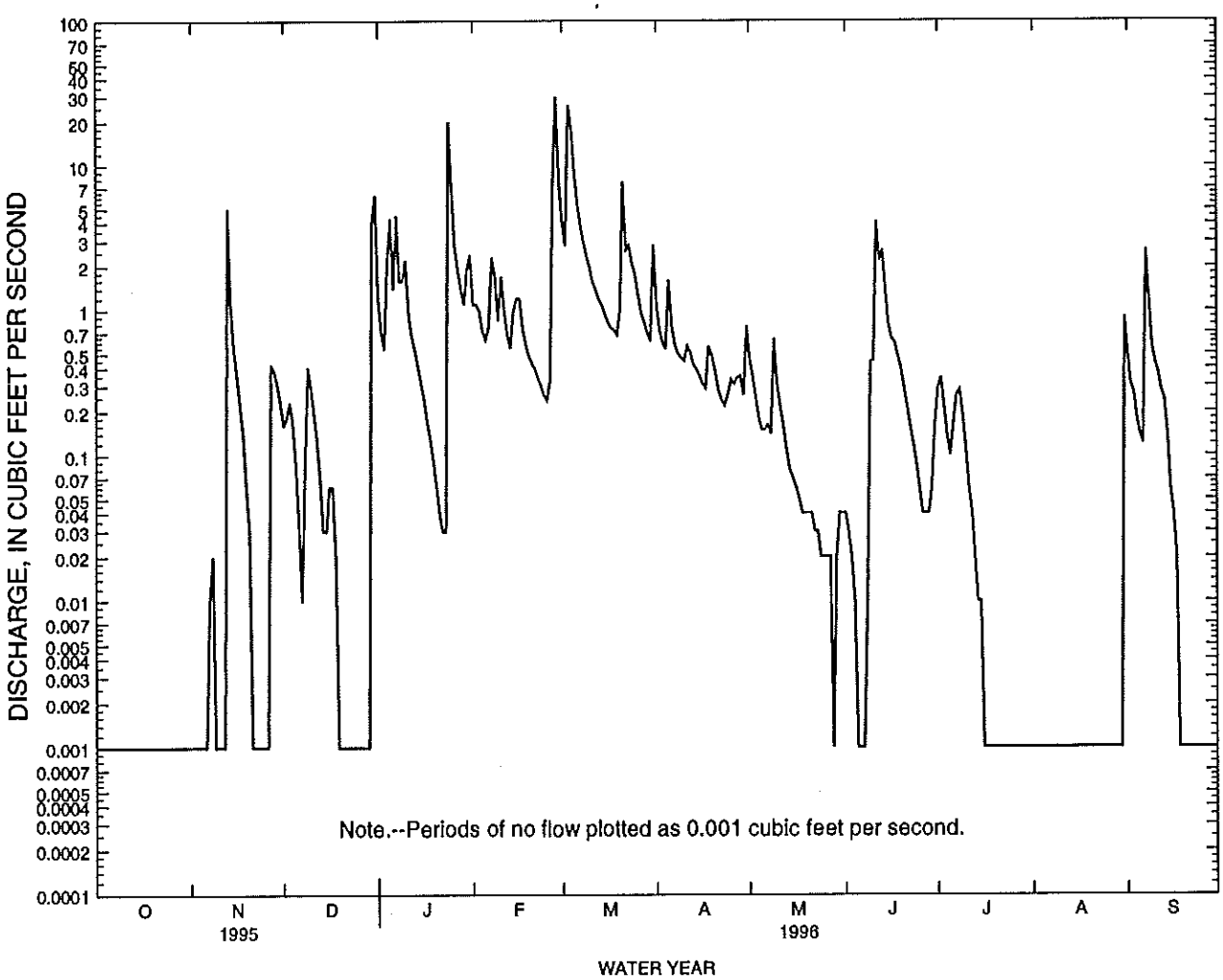
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1996, BY WATER YEAR (WY)

MEAN	.75	1.54	2.95	4.20	3.47	3.15	2.59	1.44	.63	.48	.37	.39
MAX	3.66	8.67	15.0	22.7	16.3	11.5	15.7	5.33	1.72	1.31	1.44	2.19
(WY)	1983	1966	1965	1982	1976	1962	1963	1965	1978	1986	1983	1974
MIN	.000	.000	.038	.22	.25	.18	.13	.13	.013	.005	.000	.000
(WY)	1976	1995	1995	1995	1995	1995	1993	1996	1995	1995	1995	1961

HAWAII, ISLAND OF OAHU

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1959 - 1996	
ANNUAL TOTAL	96.02		305.96			
ANNUAL MEAN	.26		.84		1.82	
HIGHEST ANNUAL MEAN					3.80	1963
LOWEST ANNUAL MEAN					.25	1995
HIGHEST DAILY MEAN	8.3	Apr 4	30	Feb 28	283	Feb 7 1976
LOWEST DAILY MEAN	.00	Jan 2	.00	Oct 1	.00	Sep 25 1960
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 2	.00	Oct 1	.00	Aug 28 1961
ANNUAL RUNOFF (AC-FT)	190		607		1320	
10 PERCENT EXCEEDS	.64		1.8		3.5	
50 PERCENT EXCEEDS	.00		.13		.57	
90 PERCENT EXCEEDS	.00		.00		.05	



HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28′13″, long 157°57′40″, 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 current year.

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

REMARKS.--Records 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.--39 years (water years 1958-96), 11.0 ft^3/s (7,940 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)
Jan. 25	0400	*1,880	*8.74	No other peak greater than base discharge.			

Minimum discharge, 0.05 ft^3/s, June 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	82	9.3	1.7	2.8	4.7	33	1.1	.39	10	2.2	3.8
2	4.4	10	5.7	1.2	2.3	11	11	.77	.21	30	2.1	1.2
3	2.6	15	2.5	.71	2.1	104	4.3	.60	.15	12	1.7	1.1
4	3.4	16	1.8	.81	1.7	45	2.3	.53	.09	12	2.2	.90
5	3.4	5.2	1.4	2.7	1.4	11	2.6	.52	.10	27	2.6	4.5
6	2.4	3.8	1.3	1.6	1.3	6.9	2.1	.39	.24	11	2.3	5.8
7	5.0	3.0	4.2	.89	1.1	4.7	1.3	.35	12	33	3.1	32
8	79	34	3.0	21	12	3.4	.96	.35	5.3	7.4	2.3	19
9	13	26	1.5	4.3	4.3	2.8	.80	.25	5.6	5.6	1.4	5.4
10	11	14	1.1	21	2.1	2.5	2.3	.16	14	4.1	4.1	2.8
11	8.0	5.0	.97	3.0	1.4	2.2	23	.16	15	3.3	8.8	5.2
12	25	3.8	.80	1.7	.94	1.9	4.7	.16	21	3.3	5.9	3.6
13	8.8	20	8.8	1.2	.72	1.7	2.3	.16	66	17	4.8	2.2
14	5.3	10	17	.94	.87	1.6	1.5	.16	6.0	5.0	3.1	1.6
15	3.8	20	2.6	.74	4.2	1.4	1.1	.17	3.2	5.2	1.6	1.1
16	3.1	5.6	1.5	.58	3.4	1.3	.85	.29	5.7	11	1.6	.88
17	2.3	7.6	1.1	.53	1.8	1.3	2.6	.39	6.4	20	1.7	.83
18	2.5	6.1	1.0	7.0	.99	1.2	14	.38	40	17	1.1	.96
19	2.0	2.8	.99	56	.66	1.1	17	.26	8.6	28	.78	.68
20	11	2.4	.84	5.6	.48	1.1	4.6	.42	7.1	17	.64	.83
21	11	2.2	.68	4.5	.47	1.2	11	.59	12	8.0	.55	3.3
22	5.9	2.7	.63	4.7	.87	.96	4.3	.63	7.4	8.2	.43	1.1
23	2.5	1.9	.58	55	.82	.91	2.2	.42	7.8	6.0	.38	.57
24	1.8	1.7	.61	11	1.0	2.3	1.5	.30	15	53	.34	.38
25	1.7	1.6	.62	192	65	1.6	1.4	3.2	9.8	6.0	.31	.33
26	17	1.4	.57	15	21	.99	1.3	2.7	4.5	5.8	.32	.47
27	9.8	2.0	.55	7.3	34	.74	3.5	2.5	2.8	15	.35	.34
28	15	13	.64	20	27	.58	2.2	5.7	4.5	7.7	.27	.23
29	30	5.1	.59	5.2	7.7	.49	11	4.9	53	3.0	.21	.19
30	10	5.5	7.8	3.9	---	.42	2.0	1.6	35	2.4	.75	.18
31	17	---	19	9.4	---	23	---	.83	---	2.3	18	---
TOTAL	328.7	329.4	99.67	461.20	204.42	243.99	172.71	30.94	368.88	396.3	75.93	101.47
MEAN	10.6	11.0	3.22	14.9	7.05	7.87	5.76	1.00	12.3	12.8	2.45	3.38
MAX	79	82	19	192	65	104	33	5.7	66	53	18	32
MIN	1.7	1.4	.55	.53	.47	.42	.80	.16	.09	2.3	.21	.18
AC-FT	652	653	198	915	405	484	343	61	732	786	151	201

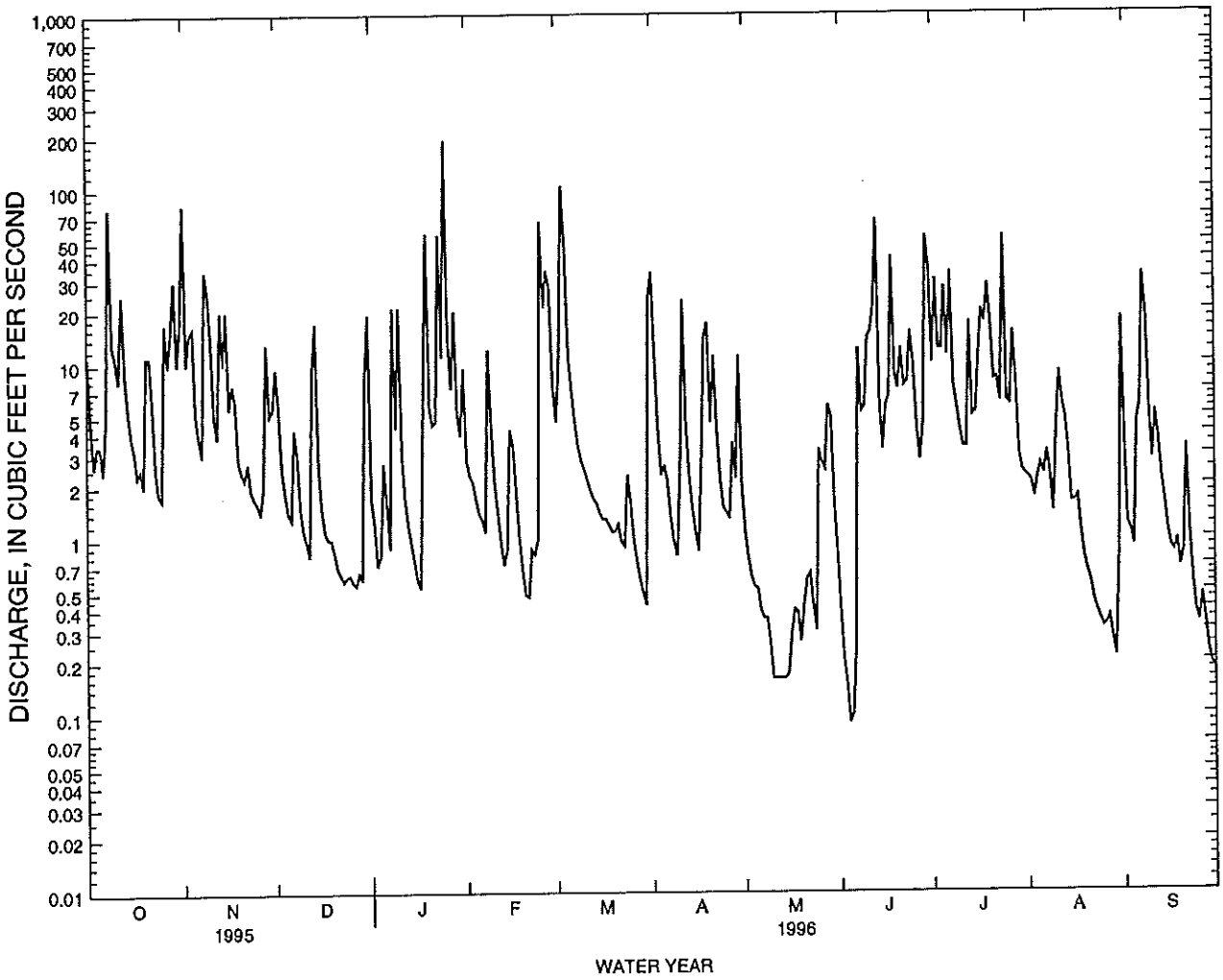
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1996, BY WATER YEAR (WY)

MEAN	10.3	14.9	12.6	11.2	10.3	16.6	15.3	9.30	5.59	9.97	8.49	6.26
MAX	49.6	61.8	42.2	32.1	54.4	98.4	60.9	34.0	21.9	28.1	37.5	23.6
(WY)	1982	1966	1988	1989	1969	1991	1963	1965	1978	1989	1958	1994
MIN	.84	.23	.83	.17	.19	.021	.33	.39	.16	.47	.30	.54
(WY)	1958	1963	1990	1977	1978	1983	1966	1992	1959	1968	1971	1984

HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1957 - 1996	
ANNUAL TOTAL	2595.30		2813.61			
ANNUAL MEAN	7.11		7.69		11.0	
HIGHEST ANNUAL MEAN					25.2	1982
LOWEST ANNUAL MEAN					4.50	1984
HIGHEST DAILY MEAN	132	Aug 23	192	Jan 25	852	Apr 15 1963
LOWEST DAILY MEAN	.06	Mar 20	.09	Jun 4	.00	Jun 18 1959
ANNUAL SEVEN-DAY MINIMUM	.11	Mar 15	.17	May 9	.00	Jun 18 1959
ANNUAL RUNOFF (AC-FT)	5150		5580		7940	
10 PERCENT EXCEEDS	19		19		25	
50 PERCENT EXCEEDS	2.0		2.6		2.9	
90 PERCENT EXCEEDS	.46		.42		.34	



HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU

LOCATION.--Lat 21°23'11", long 158°00'49", Hydrologic Unit 20060000, on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of 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 good.

AVERAGE DISCHARGE.--43 years (water years 1953-59, 1961-96), 40.7 ft^3/s (29,460 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0630	*1,940	*5.44	No other peak greater than base discharge.			
Sept. 07	1915	1,640	5.16				

Minimum discharge, 14 ft^3/s June 4-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	135	25	30	27	28	62	20	16	40	22	41
2	24	39	29	21	23	26	43	18	16	47	22	22
3	20	131	26	20	22	398	31	17	16	43	22	19
4	18	61	23	23	21	260	23	17	15	33	22	17
5	18	30	22	35	20	58	29	17	15	51	21	16
6	18	25	21	25	21	39	20	17	15	47	21	21
7	23	23	27	23	21	32	20	16	15	68	22	206
8	177	37	24	37	21	29	19	17	23	35	22	82
9	44	78	23	30	25	26	18	16	51	28	21	31
10	37	41	21	64	24	26	17	16	39	23	20	24
11	30	28	21	31	19	24	30	16	26	21	23	23
12	41	24	20	24	18	25	27	15	119	20	33	25
13	36	26	20	22	17	26	20	15	188	25	26	21
14	27	41	37	22	17	23	18	15	38	29	24	19
15	24	37	27	21	17	22	17	15	25	22	21	18
16	21	33	22	21	20	22	16	15	23	32	20	17
17	19	24	20	21	20	22	16	15	27	37	19	17
18	18	27	19	23	19	22	25	15	58	44	18	17
19	18	23	19	94	18	22	36	15	44	89	18	17
20	19	21	20	48	19	21	30	15	27	93	18	17
21	25	21	20	33	18	22	27	15	31	43	19	17
22	26	21	19	30	17	21	31	15	26	34	18	18
23	20	21	19	90	17	21	21	16	27	33	17	18
24	18	21	19	84	17	22	18	16	63	87	17	17
25	17	21	19	373	68	21	17	16	32	40	18	17
26	21	21	19	60	90	21	17	17	27	29	17	17
27	28	22	19	41	71	21	17	15	22	49	17	17
28	22	23	18	41	91	21	21	16	21	49	17	17
29	64	29	18	33	43	20	24	18	56	28	17	16
30	26	26	28	42	---	20	24	18	92	24	17	16
31	34	---	76	40	---	40	---	17	---	23	77	---
TOTAL	977	1110	740	1502	841	1401	734	501	1193	1266	686	840
MEAN	31.5	37.0	23.9	48.5	29.0	45.2	24.5	16.2	39.8	40.8	22.1	28.0
MAX	177	135	76	373	91	398	62	20	188	93	77	206
MIN	17	21	18	20	17	20	16	15	15	20	17	16
AC-FT	1940	2200	1470	2980	1670	2780	1460	994	2370	2510	1360	1670

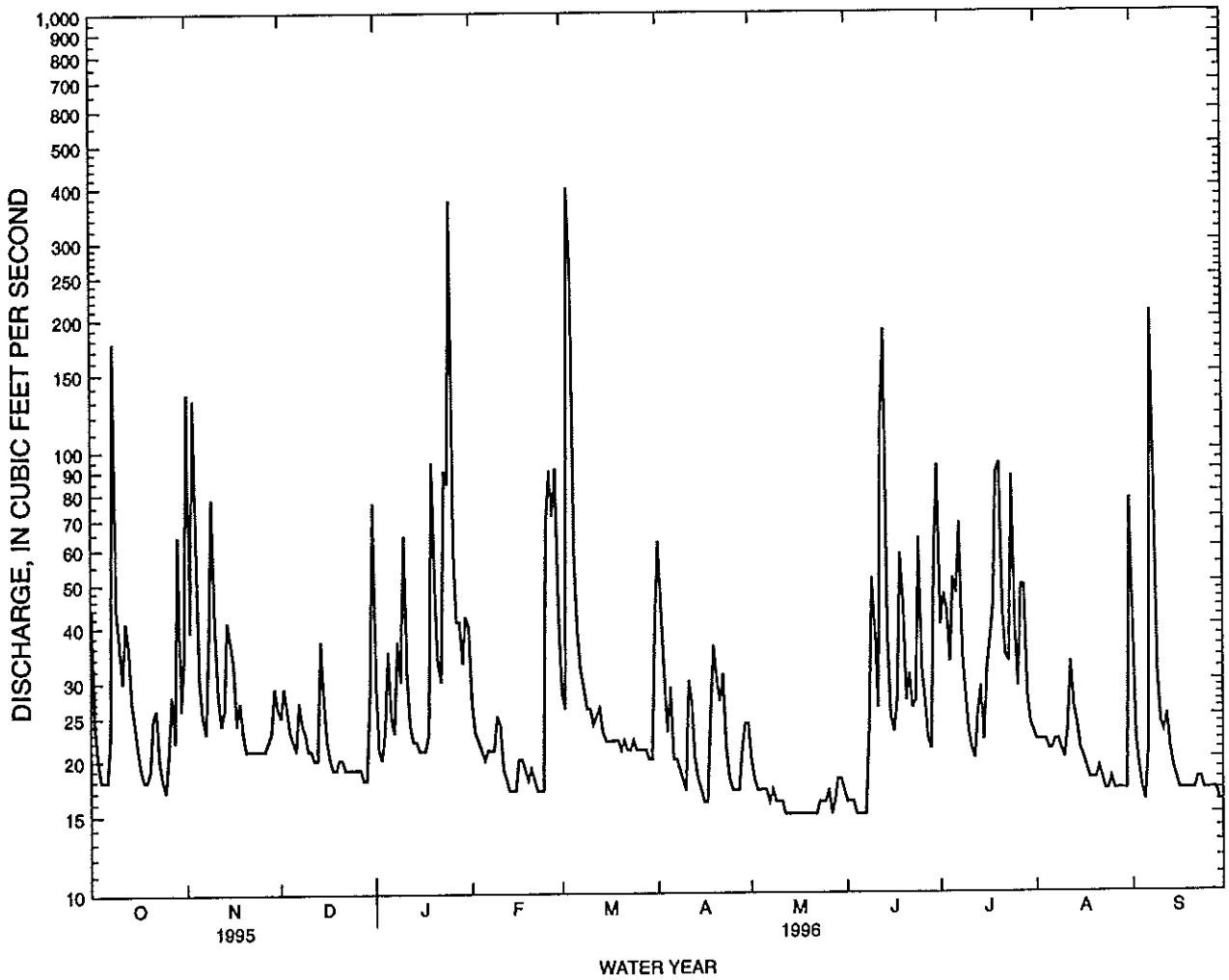
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1996, BY WATER YEAR (WY)

MEAN	33.2	47.6	50.3	60.7	55.9	55.2	50.0	33.0	23.8	29.4	26.3	22.7
MAX	97.8	198	146	222	179	195	235	99.3	51.5	76.8	90.0	68.1
(WY)	1992	1966	1966	1969	1955	1991	1963	1965	1980	1989	1958	1994
MIN	7.22	12.2	13.3	14.7	7.72	6.13	18.4	14.9	10.6	9.08	7.50	6.28
(WY)	1978	1954	1954	1986	1978	1978	1961	1954	1981	1985	1984	1975

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1953 - 1996	
ANNUAL TOTAL	10310		11791			
ANNUAL MEAN	28.2		32.2		40.7	
HIGHEST ANNUAL MEAN					77.3	1969
LOWEST ANNUAL MEAN					18.5	1954
HIGHEST DAILY MEAN	208	Aug 23	398	Mar 3	2590	Mar 21 1991
LOWEST DAILY MEAN	15	Sep 16	15	May 12	.61	Feb 25 1978
ANNUAL SEVEN-DAY MINIMUM	16	Sep 13	15	May 12	2.5	Feb 24 1978
ANNUAL RUNOFF (AC-FT)	20450		23390		29460	
10 PERCENT EXCEEDS	41		50		64	
50 PERCENT EXCEEDS	22		22		24	
90 PERCENT EXCEEDS	18		17		12	



HAWAII, ISLAND OF OAHU

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23′57″, long 157°58′51″, 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 current year.

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 poor. Occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--44 years (water years 1953-96), 34.2 ft^3/s (24,740 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, 1.1 ft^3/s on several days in 1984 and 1985.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 01	0530	5,520	12.18	June 29	1845	2,560	9.14
Jan. 25	0530	*14,000	*17.17	Sept. 07	1945	5,560	12.22

Minimum discharge, 1.3 ft^3/s, June 4, 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e17	921	10	e8.6	e8.0	5.4	56	2.2	1.4	e25	2.0	16
2	e4.6	34	6.4	e3.0	e5.0	6.7	18	1.8	1.4	e27	2.0	e3.6
3	e3.6	199	3.1	e2.0	e4.0	416	7.4	1.7	1.4	e20	2.0	e6.5
4	e2.2	112	2.3	e3.0	e3.2	221	3.6	1.6	1.4	e16	1.9	e7.8
5	e2.0	17	2.1	7.3	e2.6	30	9.6	1.6	1.4	e72	1.8	e5.6
6	e1.9	8.5	2.3	3.1	e2.1	14	7.4	1.6	1.4	e37	1.8	11
7	e1.8	5.1	2.9	5.4	2.0	7.7	2.7	1.6	1.4	e93	1.8	690
8	e230	77	3.9	74	1.9	4.7	1.9	1.6	4.0	e21	1.8	134
9	e15	107	2.4	14	4.4	3.2	1.8	1.6	4.3	e11	1.8	27
10	e7.0	22	2.2	97	2.5	2.5	1.8	1.6	47	e6.5	1.8	16
11	e4.5	8.8	e2.1	11	1.9	2.2	13	1.6	5.2	e4.0	e14	12
12	e16	5.2	e2.0	4.5	1.8	2.2	8.5	1.5	67	e3.0	e12	12
13	e10	76	e2.0	2.7	1.8	2.1	3.2	1.5	91	e3.1	e6.2	7.3
14	e5.0	28	e36	2.0	1.8	2.0	2.0	1.5	8.0	e7.3	e2.7	6.0
15	e4.0	42	e5.3	1.8	1.7	2.0	1.8	1.5	2.8	e3.4	2.7	4.5
16	e2.7	12	e2.5	1.8	1.7	2.0	1.8	1.5	2.3	e9.4	2.0	3.8
17	e1.7	6.9	e2.4	1.8	1.7	1.9	1.7	1.5	2.0	e24	e1.8	e3.6
18	1.6	13	e2.3	1.7	1.7	1.9	13	1.5	e36	e19	e1.8	e3.4
19	1.6	4.0	e2.2	88	1.7	1.9	23	1.4	e27	e65	1.8	e3.0
20	1.5	2.7	e2.1	10	1.6	1.9	10	1.4	e10	e38	e1.8	e3.0
21	1.5	2.4	e2.0	5.8	1.7	1.8	21	1.4	e7.6	e17	1.8	e3.6
22	1.5	2.2	e2.0	5.2	1.7	1.8	11	1.4	e8.3	e12	1.8	e3.4
23	1.5	2.1	e2.0	15	1.6	1.7	4.6	1.4	e22	e6.5	1.8	e3.0
24	1.5	2.0	e1.9	14	1.7	1.7	2.7	1.4	e64	e32	1.8	e2.7
25	1.5	2.0	e1.9	1380	5.0	1.7	2.0	1.4	e17	e9.1	1.6	e2.7
26	1.5	2.0	e1.8	48	29	1.7	1.9	1.4	e8.3	e4.2	1.6	e2.7
27	14	2.1	e1.8	70	39	1.7	2.9	1.4	e4.3	e26	1.6	e2.6
28	3.4	1.9	e1.7	92	47	1.6	24	1.4	e3.4	e14	1.6	e2.4
29	106	1.9	e1.7	18	14	1.6	22	2.1	e171	e4.8	1.6	e2.4
30	7.1	2.8	e6.0	18	---	1.7	4.2	1.6	e102	e2.5	1.6	e2.4
31	78	---	e73	26	---	16	---	1.5	---	2.2	e85	---
TOTAL	551.2	1722.6	192.3	2034.7	193.8	764.3	284.5	48.2	724.3	635.0	167.3	1004.0
MEAN	17.8	57.4	6.20	65.6	6.68	24.7	9.48	1.55	24.1	20.5	5.40	33.5
MAX	230	921	73	1380	47	416	56	2.2	171	93	85	690
MIN	1.5	1.9	1.7	1.7	1.6	1.6	1.7	1.4	1.4	2.2	1.6	2.4
AC-FT	1090	3420	381	4040	384	1520	564	96	1440	1260	332	1990

e Estimated

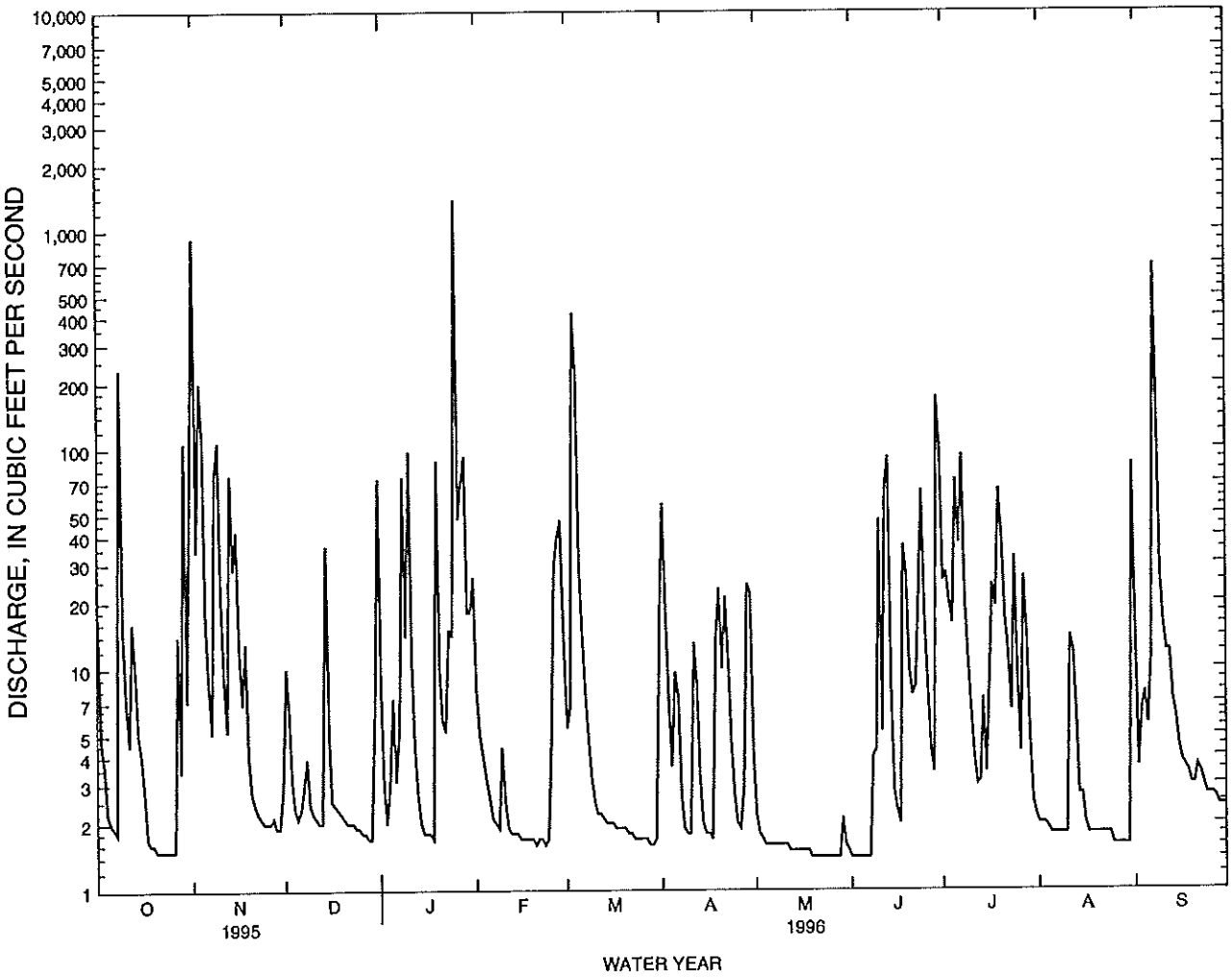
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1996, BY WATER YEAR (WY)

MEAN	29.9	50.3	45.5	45.1	39.5	54.4	41.6	24.3	14.5	27.2	21.9	14.9
MAX	131	209	351	199	208	336	241	131	72.9	149	128	104
(WY)	1967	1991	1988	1969	1955	1980	1974	1965	1987	1970	1982	1992
MIN	1.55	2.54	1.92	1.65	1.66	1.56	1.75	1.55	1.43	1.40	1.28	1.28
(WY)	1985	1990	1984	1986	1986	1993	1992	1996	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16216000 WAIAWA STREAM NEAR PEARL CITY--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1952 - 1996	
ANNUAL TOTAL	7199.7		8322.2			
ANNUAL MEAN	19.7		22.7		34.2	
HIGHEST ANNUAL MEAN					80.8	1982
LOWEST ANNUAL MEAN					7.56	1984
HIGHEST DAILY MEAN	921	Nov 1	1380	Jan 25	5150	Mar 24 1994
LOWEST DAILY MEAN	1.4	Jan 3	1.4	May 19	1.1	May 18 1993
ANNUAL SEVEN-DAY MINIMUM	1.4	Jan 3	1.4	May 19	1.1	May 25 1993
ANNUAL RUNOFF (AC-FT)	14280		16510		24740	
10 PERCENT EXCEEDS	40		37		47	
50 PERCENT EXCEEDS	2.6		2.8		6.6	
90 PERCENT EXCEEDS	1.7		1.6		2.3	



HAWAII, ISLAND OF OAHU

16225800 NORTH HALAWA STREAM NEAR KANEOHE

LOCATION.--Lat 21°24′33″, long 157°52′06″, Hydrologic Unit 2006000 (Kaneohe quadrangle, 1968, 1:24,000), on right bank, 4.1 mi west of Kaneohe Post Office, and 4.4 mi east of Aiea High School.

DRAINAGE AREA.--1.64 mi^2.

PERIOD OF RECORD.--April 1991 to current year.

GAGE.--Water-stage recorder. Gage datum is 646.52 ft above mean sea level (by stadia survey).

REMARKS.--Records fair. Suspended sediment data are collected at this site.

AVERAGE DISCHARGE- 5 years (water years 1992-96), 2.69 ft^3/s (1,950 acre ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 470 ft^3/s, revised, October 16, 1991, gage height, 6.94 ft, revised; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 01	0330	307	5.51	Jan. 25	0345	*403	*6.31
Nov. 13	1000	334	5.72				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	52	5.2	.84	.73	1.0	9.6	.20	.03	2.1	.08	2.2
2	.42	4.1	1.3	.38	.53	5.2	2.2	.15	.00	2.6	.06	.33
3	.21	5.6	.76	.22	.41	31	1.1	.12	.00	1.1	.41	.16
4	.16	3.0	.54	.25	.31	8.3	.93	.11	.00	3.6	.42	.08
5	.11	1.3	.42	1.9	.24	1.8	4.1	.09	.00	15	.25	.06
6	.31	.88	4.0	.70	.19	1.0	.79	.06	.02	3.2	.12	2.9
7	1.4	.71	4.2	6.3	5.5	.68	.32	.03	1.4	7.5	.14	13
8	15	22	.95	12	5.6	.58	.18	.01	.30	1.4	.10	6.0
9	1.2	5.8	.67	1.5	.74	.50	.12	.00	.97	.80	.06	1.2
10	.56	2.0	.48	6.4	.38	.44	1.1	.00	.76	.42	2.0	.53
11	.41	1.2	.37	1.2	.23	.41	2.8	.00	.06	.26	3.6	1.6
12	2.0	1.3	.31	.57	.14	.39	.75	.00	1.0	.22	.96	3.9
13	.58	47	2.2	.34	.11	.35	.29	.00	6.2	.17	1.7	2.3
14	.26	16	2.5	.21	.52	.35	.17	.00	.23	.14	.37	.58
15	.16	7.8	.56	.15	.50	.32	.11	.00	.07	.38	.12	.24
16	.11	2.4	.36	.12	.18	.32	.08	.00	.05	.85	.08	.22
17	.09	3.5	.45	.16	.11	.39	.11	.00	.03	.47	.06	.14
18	.09	1.5	.32	.36	.09	.32	1.5	.00	3.5	.97	.04	.10
19	.08	1.0	.26	5.0	.07	.26	.95	.00	.89	1.4	.03	.08
20	1.0	.89	.19	.82	.07	.28	1.4	.01	.71	1.1	.01	.07
21	.51	.82	.17	.79	.06	.26	6.0	.00	.36	.60	.00	.06
22	.19	.68	.14	.40	.05	.26	.82	.00	.75	.35	.00	.05
23	.10	.57	.14	2.6	.04	.22	.28	.00	9.2	.19	.00	.04
24	.07	.50	.12	1.2	.05	.20	.17	.01	5.3	2.5	.00	.03
25	.18	.45	.12	60	1.3	.19	.10	.19	1.4	.36	.00	.02
26	5.9	.43	.48	4.7	3.8	.17	.13	1.1	.67	2.1	.00	.01
27	1.4	.71	.16	5.0	4.4	.15	.13	.37	.44	4.2	.00	.00
28	18	1.8	.11	11	21	.12	8.6	2.3	.38	.62	.00	.00
29	9.8	.79	.09	1.7	2.1	.09	1.3	.94	19	.19	.00	.00
30	1.8	6.1	9.8	3.1	---	.08	.33	.13	11	.10	.00	.00
31	25	---	7.5	1.7	---	7.9	---	.05	---	.08	12	---
TOTAL	88.30	192.83	44.87	131.61	49.45	63.53	46.46	5.87	64.72	54.97	22.61	35.90
MEAN	2.85	6.43	1.45	4.25	1.71	2.05	1.55	.19	2.16	1.77	.73	1.20
MAX	25	52	9.8	60	21	31	9.6	2.3	19	15	12	13
MIN	.07	.43	.09	.12	.04	.08	.08	.00	.00	.08	.00	.00
AC-FT	175	382	89	261	98	126	92	12	128	109	45	71

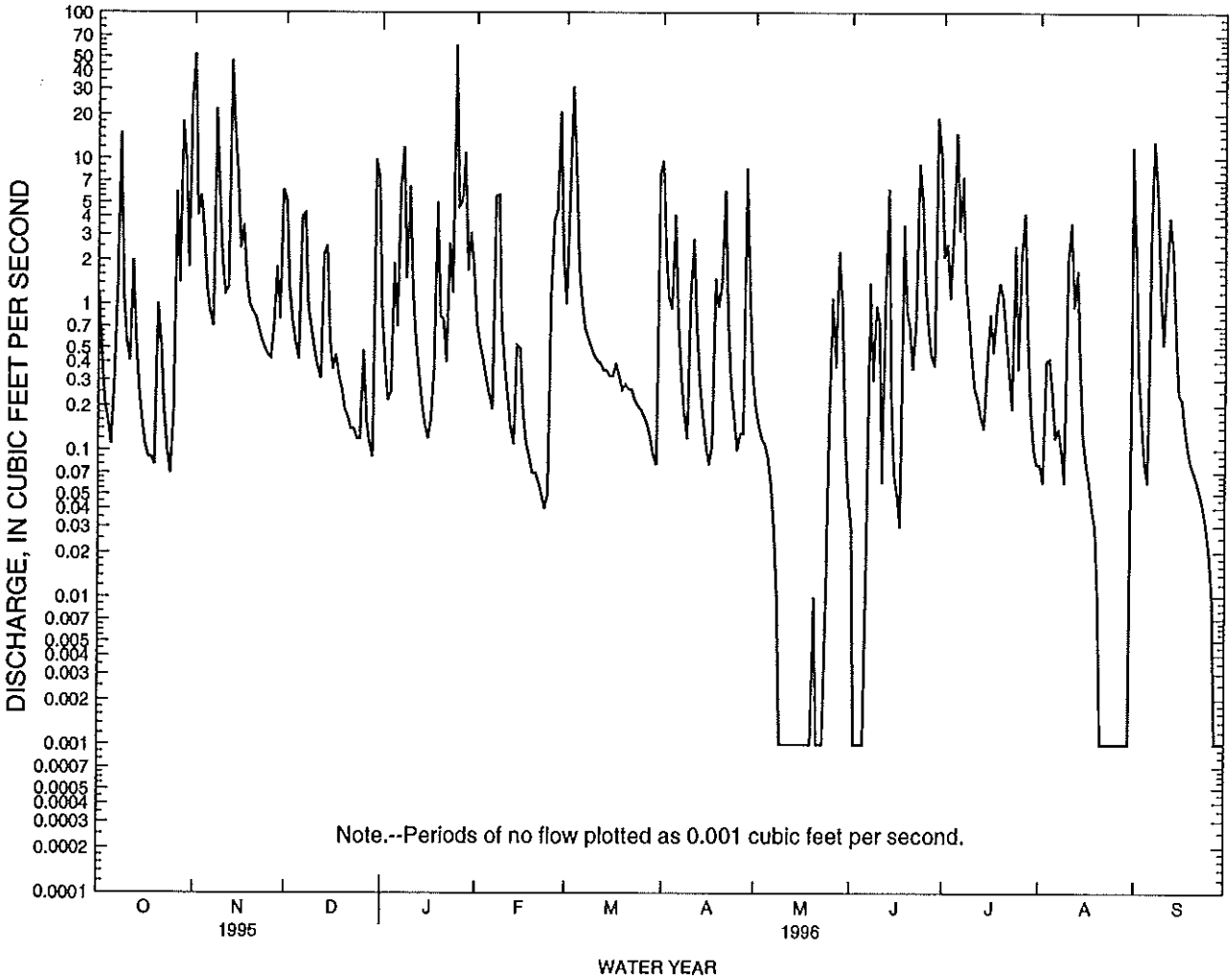
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1996, BY WATER YEAR (WY)

MEAN	3.21	3.66	2.81	3.22	2.24	3.32	2.39	.61	1.35	3.21	2.59	3.79
MAX	4.48	7.27	6.89	8.09	7.87	12.0	5.44	1.59	2.85	7.07	5.97	12.3
(WY)	1992	1993	1993	1994	1994	1994	1995	1994	1994	1993	1991	1992
MIN	1.85	.56	1.28	.81	.25	.20	.018	.033	.11	1.77	.73	.68
(WY)	1995	1992	1994	1992	1993	1993	1992	1992	1992	1996	1996	1995

HAWAII, ISLAND OF OAHU

16225800 NORTH HALAWA STREAM NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1991 - 1996	
ANNUAL TOTAL	859.87		801.12			
ANNUAL MEAN	2.36		2.19		2.69	
HIGHEST ANNUAL MEAN					4.28	1994
LOWEST ANNUAL MEAN					1.94	1995
HIGHEST DAILY MEAN	52	Nov 1	60	Jan 25	213	Mar 24 1994
LOWEST DAILY MEAN	.00	Mar 14	.00	May 9	.00	Nov 28 1991
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 14	.00	May 9	.00	Jan 24 1992
ANNUAL RUNOFF (AC-FT)	1710		1590		1950	
10 PERCENT EXCEEDS	6.1		5.6		6.1	
50 PERCENT EXCEEDS	.31		.39		.44	
90 PERCENT EXCEEDS	.04		.01		.01	



PERIOD OF RECORD.--April 1991 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: April 1991 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since September 1991.

REMARKS.--Record of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

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HAWAII, ISLAND OF OAHU

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23′46″, long 157°53′37″, 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 good. Recording rain gage located at station.

AVERAGE DISCHARGE.--46 years (water years 1930-32, 1954-96), 5.42 ft^3/s (3,930 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 570 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	0345	*422	*8.24	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	85	6.2	1.8	1.8	1.7	12	.04	.00	5.8	.05	15
2	.77	10	2.0	.68	1.0	3.7	2.6	.02	.00	5.2	.03	3.0
3	.18	25	.87	.22	.65	50	1.7	.02	.00	2.3	.01	1.5
4	.15	19	.48	.17	.31	19	1.5	.00	.00	5.4	.21	.86
5	.04	5.3	.19	3.7	.13	5.8	5.9	.02	.00	26	.31	.65
6	1.3	2.7	7.7	2.2	.07	2.6	1.4	.00	.00	9.3	.08	3.1
7	1.5	1.6	5.2	6.3	2.7	1.4	.45	.00	.38	12	.09	29
8	26	39	1.8	12	6.6	.75	.09	.00	.21	3.3	.02	17
9	3.8	14	1.0	2.3	.87	.42	.04	.00	.01	1.6	.01	4.4
10	1.8	5.0	.64	6.8	.26	.21	1.1	.00	.83	.77	1.6	2.3
11	1.0	2.7	.31	2.1	.07	.12	4.1	.00	.01	.34	3.3	4.3
12	3.2	1.7	.13	.84	.05	.06	1.4	.00	.16	.18	1.3	6.1
13	1.4	49	1.4	.36	.04	.04	.43	.00	5.5	.05	1.6	5.6
14	.56	18	3.2	.12	.26	.03	.07	.00	.14	.08	.41	1.8
15	.20	12	.69	.06	.70	.03	.06	.00	.01	.51	.03	.79
16	.07	4.0	.28	.04	.17	.03	.02	.00	.01	1.7	.02	.68
17	.05	4.5	.45	.05	.05	.03	.02	.00	.03	1.2	.01	.39
18	.04	2.3	.17	.20	.04	.02	1.6	.00	4.8	1.9	.01	.29
19	.03	1.3	.07	5.6	.03	.02	1.4	.00	2.1	4.5	.01	.07
20	1.3	.98	.06	1.3	.03	.02	.78	.00	1.9	3.3	.01	.20
21	.74	.84	.05	1.1	.03	.01	7.8	.00	1.0	1.6	.01	.04
22	.24	.64	.04	.50	.02	.01	1.6	.00	2.7	.83	.02	.03
23	.04	.39	.04	2.7	.02	.01	.51	.00	15	.37	.01	.03
24	.03	.32	.04	1.9	.02	.01	.14	.00	14	2.1	.01	.03
25	.12	.21	.04	69	4.7	.01	.05	.00	4.4	.53	.01	.03
26	6.4	.13	.03	12	9.9	.01	.04	.00	2.0	1.5	.00	.02
27	3.0	.55	.03	11	7.8	.00	.02	.00	.79	3.9	.00	.02
28	18	1.8	.03	24	24	.00	7.4	.75	.42	.66	.00	.02
29	19	1.0	.03	5.5	4.2	.00	1.7	.57	30	.09	.00	.01
30	3.7	6.8	5.3	5.6	---	.00	.16	.02	22	.03	.00	.01
31	43	---	14	4.7	---	7.7	---	.01	---	.03	41	---
TOTAL	140.26	315.76	52.47	184.84	66.52	93.74	56.08	1.45	108.40	97.07	50.17	97.27
MEAN	4.52	10.5	1.69	5.96	2.29	3.02	1.87	.047	3.61	3.13	1.62	3.24
MAX	43	85	14	69	24	50	12	.75	30	26	41	29
MIN	.03	.13	.03	.04	.02	.00	.02	.00	.00	.03	.00	.01
AC-FT	278	626	104	367	132	186	111	2.9	215	193	100	193

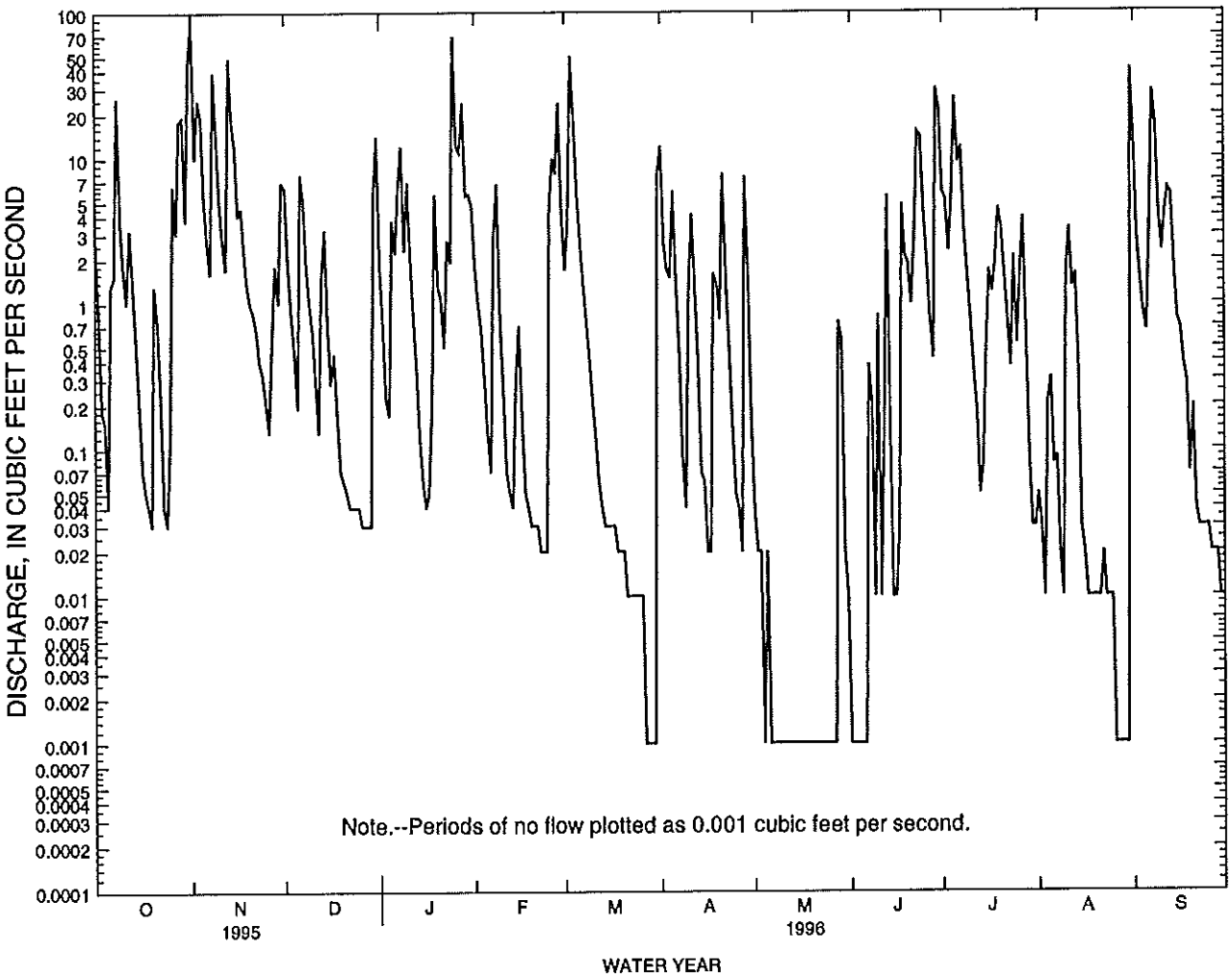
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1996, BY WATER YEAR (WY)

MEAN	3.55	7.85	7.82	6.58	8.10	8.23	7.09	4.82	1.81	3.74	3.77	2.24
MAX	16.3	50.6	35.0	26.0	76.3	37.8	33.2	30.1	7.86	23.0	21.6	17.1
(WY)	1959	1966	1930	1988	1932	1968	1932	1965	1932	1954	1982	1931
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1933	1954	1990	1977	1931	1931	1931	1931	1931	1953	1962	1953

HAWAII, ISLAND OF OAHU

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1929 - 1996	
ANNUAL TOTAL	1236.42		1264.03			
ANNUAL MEAN	3.39		3.45		5.42	
HIGHEST ANNUAL MEAN					15.7	1932
LOWEST ANNUAL MEAN					1.41	1984
HIGHEST DAILY MEAN	85	Nov 1	85	Nov 1	956	Nov 18 1930
LOWEST DAILY MEAN	.00	Jan 13	.00	Mar 27	.00	Sep 14 1929
ANNUAL SEVEN-DAY MINIMUM	.00	Jun 15	.00	May 6	.00	Sep 14 1929
ANNUAL RUNOFF (AC-FT)	2450		2510		3930	
10 PERCENT EXCEEDS	9.8		7.8		11	
50 PERCENT EXCEEDS	.30		.43		.39	
90 PERCENT EXCEEDS	.01		.00		.00	



HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU

LOCATION.--Lat 21°23′04″, long 157°54′22″, 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 good, except for periods of estimated record which are poor.

AVERAGE DISCHARGE.--13 years (water years 1984-96), 5.31 ft^3/s (3,850 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 750 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	0400	*778	*10.43	No other peak greater than base discharge.			

Minimum discharge, 0.01 ft^3/s on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	124	5.9	e1.8	3.1	2.0	12	.04	.01	9.5	e.07	22
2	.71	11	2.1	e.92	2.1	3.3	2.6	.02	.01	8.0	e.07	5.5
3	.19	33	.87	e.37	1.2	74	2.0	.02	.01	4.3	e.05	3.8
4	.05	21	.39	e.31	.63	28	1.3	.02	.01	7.2	e.21	2.0
5	.05	5.5	.12	e3.6	.22	7.4	6.5	.02	.01	39	e.30	1.7
6	1.1	3.0	7.0	e1.9	.13	3.9	1.8	.02	.03	15	e.09	4.7
7	1.2	1.8	4.8	e6.9	2.2	2.1	.62	.02	.08	19	e.07	48
8	37	47	1.8	e12	8.0	1.2	.24	.01	.10	6.3	e.05	27
9	5.0	e16	.89	2.8	1.3	.58	.08	.01	.04	3.5	.02	8.5
10	2.5	e7.2	.50	7.2	.22	.30	.56	.01	.60	1.8	1.4	4.4
11	1.2	e5.2	.41	2.7	.12	.16	4.2	.01	.04	1.0	3.4	6.8
12	3.5	e3.1	.07	1.1	.15	.09	1.6	.01	.95	.53	1.6	7.7
13	1.8	e45	.94	.49	.02	.06	.57	.01	6.1	.32	1.6	8.0
14	.63	e19	2.9	.15	.02	.05	.19	.01	.37	.18	.57	2.4
15	.21	e12	.59	.11	.55	.02	.07	.01	.11	.88	.07	.97
16	.12	e6.4	.20	.11	.17	.02	.05	.01	.12	3.5	.03	.74
17	.05	e5.4	.14	.06	.03	.02	.02	.01	.12	2.3	.02	.41
18	.04	e3.8	.16	.04	.02	.02	1.2	.01	5.2	3.0	.02	.33
19	.02	e2.6	.05	5.7	.05	.02	1.4	.01	3.0	7.0	.02	.10
20	1.1	e1.2	.02	1.3	.02	.02	.50	.01	2.8	4.7	.01	.09
21	.52	e.89	.02	.92	.02	.02	7.9	.01	1.6	2.6	.01	.06
22	.27	e.47	.01	.41	.02	.01	1.8	.01	3.0	1.6	.01	.03
23	.07	.10	.02	2.1	.02	.01	.51	.01	20	.88	.01	.02
24	.03	.05	.01	1.8	.02	.01	.12	.01	18	3.7	.01	.02
25	.04	e.17	.01	92	4.9	.01	.06	.02	5.3	1.2	.01	.01
26	6.7	e.40	.01	12	9.9	.01	.03	.02	2.5	1.6	.01	.01
27	4.0	e.50	.02	13	8.0	.01	.02	.02	1.2	4.6	.01	.01
28	18	e2.1	e.01	32	28	.01	7.0	.08	.63	1.2	.01	.01
29	31	.83	e.04	7.7	4.8	.01	2.1	.36	45	.27	.01	.01
30	4.6	6.5	e6.2	6.9	---	.01	.26	.02	32	.11	.01	.01
31	65	---	e12	6.2	---	7.5	---	.01	---	.09	58	---
TOTAL	189.70	385.21	48.20	224.59	75.93	130.87	57.30	0.86	148.94	154.86	67.77	155.33
MEAN	6.12	12.8	1.55	7.24	2.62	4.22	1.91	.028	4.96	5.00	2.19	5.18
MAX	65	124	12	92	28	74	12	.36	45	39	58	48
MIN	.02	.05	.01	.04	.02	.01	.02	.01	.01	.09	.01	.01
AC-FT	376	764	96	445	151	260	114	1.7	295	307	134	308

e Estimated

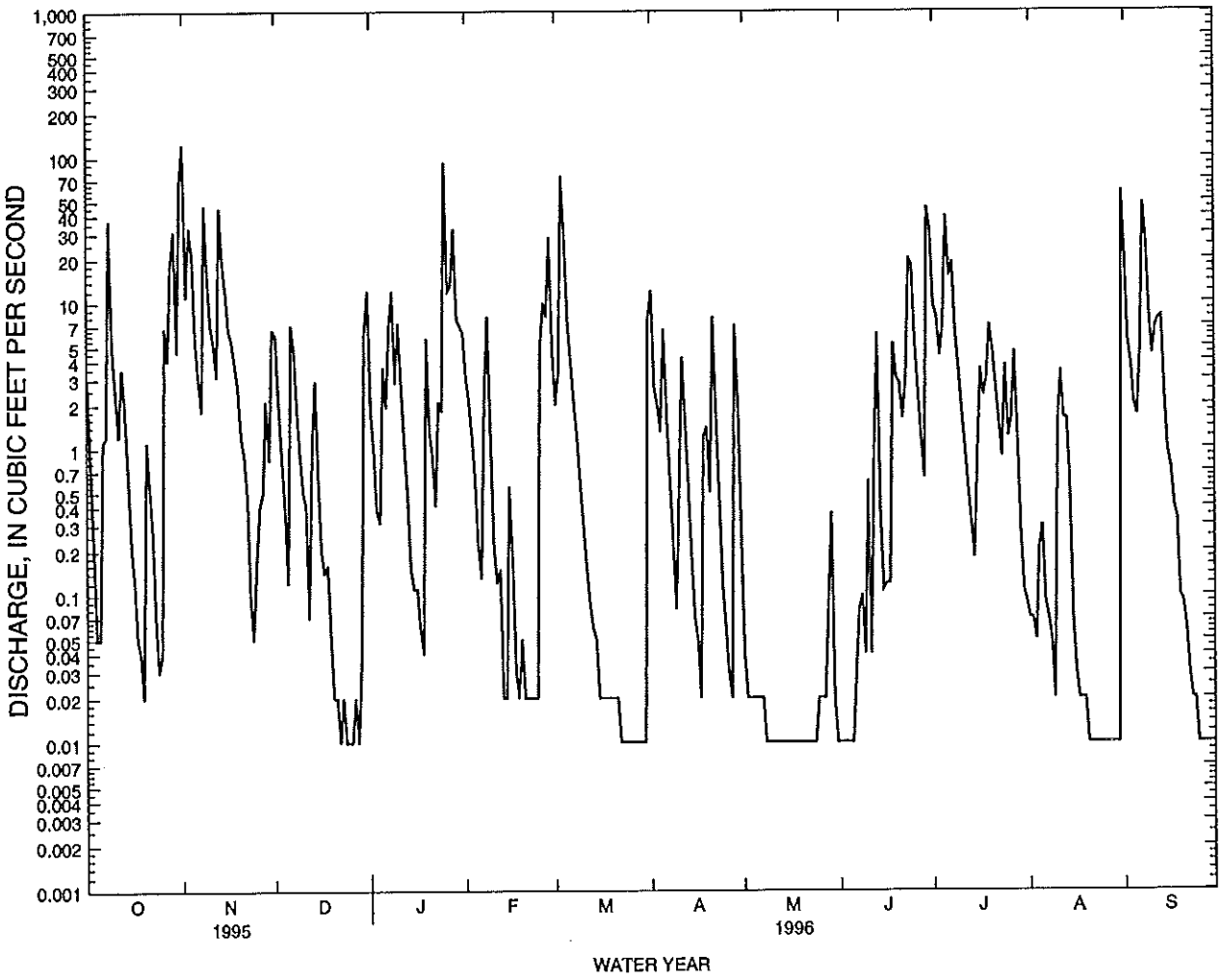
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1996, BY WATER YEAR (WY)

MEAN	4.01	6.92	8.72	6.83	4.71	8.41	6.18	2.79	1.86	4.54	3.13	3.41
MAX	9.71	25.9	40.6	29.6	17.4	31.0	35.3	15.5	7.84	15.0	10.0	12.6
(WY)	1992	1991	1988	1988	1989	1991	1989	1988	1987	1989	1991	1992
MIN	.000	.059	.008	.001	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1985	1990	1990	1986	1983	1983	1983	1992	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1983 - 1996	
ANNUAL TOTAL	1569.23		1639.56			
ANNUAL MEAN	4.30		4.48		5.31	
HIGHEST ANNUAL MEAN					10.1	1988
LOWEST ANNUAL MEAN					1.43	1984
HIGHEST DAILY MEAN	124	Nov 1	124	Nov 1	476	Mar 24 1994
LOWEST DAILY MEAN	.00	Jun 20	.01	Dec 22	.00	Feb 1 1983
ANNUAL SEVEN-DAY MINIMUM	.00	Sep 22	.01	Mar 22	.00	Feb 1 1983
ANNUAL RUNOFF (AC-FT)	3110		3250		3850	
10 PERCENT EXCEEDS	11		8.8		11	
50 PERCENT EXCEEDS	.25		.50		.54	
90 PERCENT EXCEEDS	.02		.01		.00	



HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
11...	1313	1.2	240	8.0	27.5	24.0	4.7	761	8.0	95	--
NOV											
20...	1435	0.96	250	8.2	25.0	23.5	340	759	8.1	96	--
JAN											
16...	1212	0.14	400	7.8	25.0	21.5	1.1	762	7.7	87	--
FEB											
12...	1030	0.39	420	7.9	18.0	17.5	3.9	760	8.9	93	2500
MAR											
05...	1205	7.6	240	8.0	21.5	20.0	280	756	8.7	97	--
APR											
24...	1100	0.14	326	8.1	25.5	22.5	0.80	763	8.6	99	--
MAY											
14...	1030	0.01	428	7.7	28.0	23.0	1.0	763	6.8	79	8000

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
12...	1030	140	28	16	23	27	0.9	1.5	124	8.5	43

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
FEB										
12...	1030	<0.10	22	219	217	0.30	3	<0.050	<0.20	<0.010
MAY										
14...	1030	--	--	--	--	--	1	<0.050	<0.20	0.030

< Actual value is known to be greater than the value shown

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 12...	1030	230	30	<1	<100	4.0	<10	<1	<1	1	<3.0

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 12...	1	350	49	<1	<10	<4	170	150	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 12...	1	<1.0	<1	<1	<1	<1.0	150	<6	<10	1.2	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TECHNICAL TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISULFOTON UNFILT RECOVER (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 12...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 12...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 12...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be greater than the value shown

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22′00″, long 157°50′49″, 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, quarterly (discontinued).

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 fair. Miscellaneous chemical analyses published for the 1969, and 1973 water years.

AVERAGE DISCHARGE.--82 years (water years 1915-96), 6.51 ft^3/s (4,720 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 discharge 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. 01	0330	894	7.81	June 29	1400	782	7.53
Jan. 25	0200	*1,060	*8.17				

Minimum discharge, 0.52 ft^3/s, August 30-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	75	7.8	1.9	3.6	4.6	12	1.5	1.0	4.9	1.6	6.3
2	2.1	6.4	3.6	1.6	3.7	8.4	4.0	1.5	.99	5.2	1.7	2.4
3	1.7	4.4	2.8	1.5	3.3	52	3.4	1.4	.90	3.9	1.6	1.9
4	1.5	3.7	2.5	1.7	3.0	11	3.1	1.4	.90	4.2	1.6	1.8
5	1.3	3.0	2.2	7.3	2.9	6.9	3.1	1.3	1.0	18	1.6	15
6	1.4	2.7	1.9	2.3	2.8	5.9	2.3	1.1	1.6	8.8	1.6	4.7
7	3.7	3.5	2.0	4.9	8.4	5.1	2.1	1.1	2.2	8.4	1.8	23
8	12	24	1.9	5.3	6.5	4.6	1.9	1.2	1.6	4.5	1.6	8.6
9	3.3	11	1.8	3.1	3.5	4.2	1.7	1.2	17	3.7	1.3	4.7
10	2.7	6.4	1.6	7.9	2.8	3.9	2.8	1.1	4.1	3.0	2.5	3.4
11	2.1	4.4	1.4	2.7	2.4	3.9	3.6	1.1	2.0	2.6	4.7	7.3
12	2.2	4.5	1.4	2.2	2.3	3.7	2.8	.98	5.3	3.3	2.0	4.5
13	1.7	41	2.4	1.8	2.2	3.4	2.1	1.1	4.1	2.6	2.8	4.0
14	1.4	17	2.1	1.6	2.3	3.2	2.0	1.1	2.2	2.4	1.9	3.4
15	1.3	9.9	1.6	1.6	2.1	3.0	1.9	1.0	1.8	2.3	1.6	2.9
16	1.2	5.8	1.4	1.6	2.0	2.8	1.7	1.0	2.0	2.3	1.3	2.5
17	1.1	5.3	1.3	1.6	1.9	3.0	1.9	1.1	1.9	2.9	1.3	2.5
18	1.2	4.8	1.4	2.3	1.9	3.3	3.5	.90	3.0	4.7	1.3	2.9
19	1.2	4.0	1.3	7.5	1.9	e3.4	3.8	.82	2.3	5.2	1.4	2.5
20	1.6	3.8	1.1	2.7	1.8	e3.6	2.5	1.2	2.2	4.0	1.2	3.0
21	1.6	3.9	1.0	4.2	1.8	e3.1	3.0	1.5	1.8	3.3	1.1	2.4
22	1.2	3.4	1.0	2.2	1.7	e3.3	2.3	1.3	2.0	2.6	1.1	2.1
23	1.2	3.1	1.0	5.6	1.6	e3.5	2.0	.84	8.0	2.4	1.0	1.9
24	1.0	2.8	1.0	5.6	2.0	e3.0	1.6	1.1	4.8	2.3	.93	1.9
25	1.4	2.5	.98	77	11	e2.7	1.6	1.6	3.1	2.2	.87	1.9
26	2.3	2.3	1.1	7.7	18	e2.7	1.9	1.8	2.0	3.0	1.0	1.8
27	1.8	2.6	.84	17	13	e2.6	1.8	1.4	1.7	5.0	.78	1.6
28	14	3.0	.80	12	26	e2.6	2.9	1.8	1.7	3.1	.74	1.6
29	11	2.2	1.0	5.2	6.2	e2.6	1.9	2.4	39	2.2	.91	1.5
30	2.8	8.4	5.0	4.9	---	e3.0	1.7	1.3	12	1.8	.56	1.4
31	17	---	4.9	4.1	---	9.5	---	1.2	---	1.8	18	---
TOTAL	103.5	274.8	62.12	208.6	142.6	178.5	82.9	39.34	134.19	126.6	63.39	125.4
MEAN	3.34	9.16	2.00	6.73	4.92	5.76	2.76	1.27	4.47	4.08	2.04	4.18
MAX	17	75	7.8	77	26	52	12	2.4	39	18	18	23
MIN	1.0	2.2	.80	1.5	1.6	2.6	1.6	.82	.90	1.8	.56	1.4
AC-FT	205	545	123	414	283	354	164	78	266	251	126	249

e Estimated

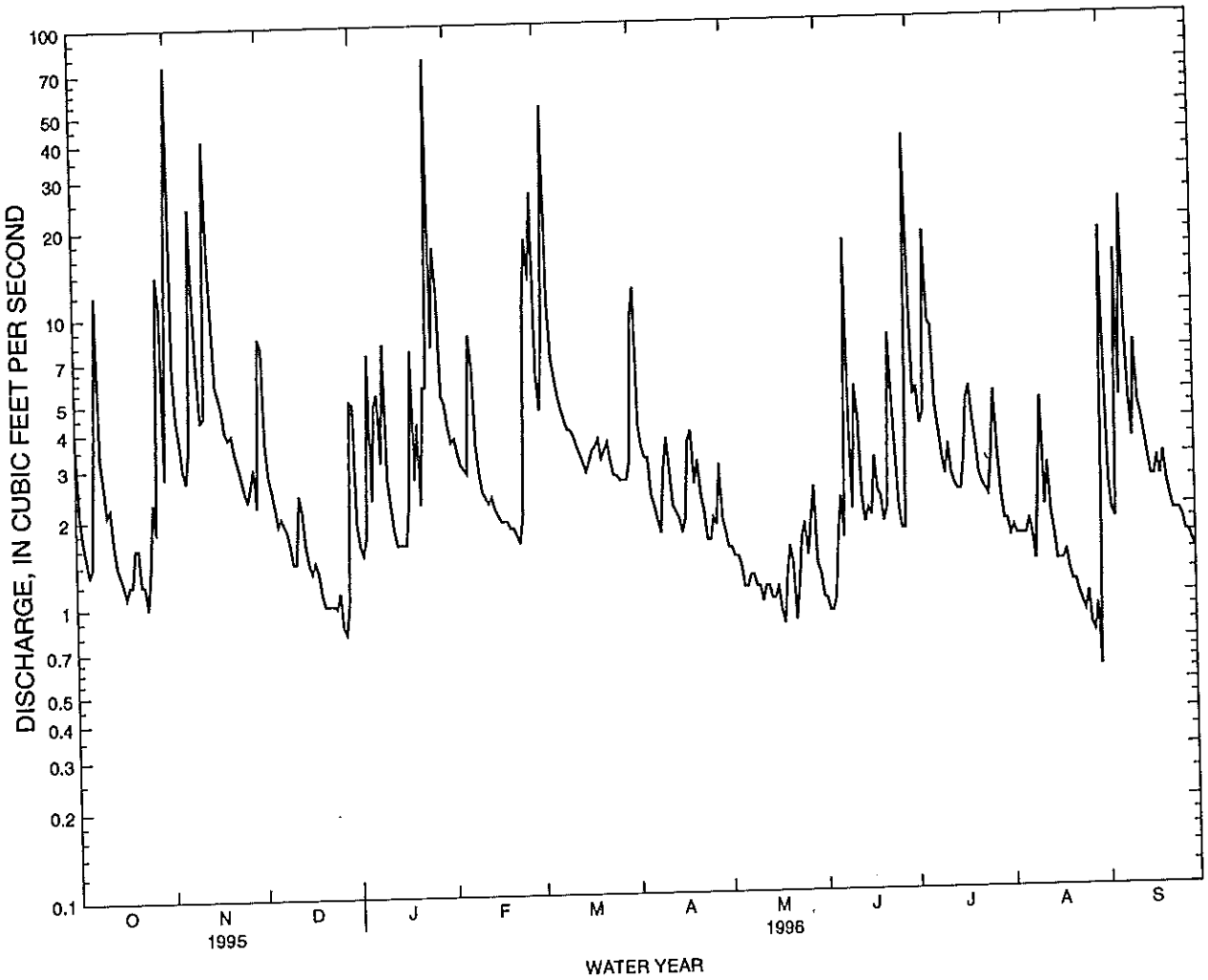
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1996, BY WATER YEAR (WY)

MEAN	4.66	7.29	8.51	9.08	7.28	8.64	8.41	6.52	3.72	4.56	5.14	4.59
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	.29	.46	.74	.50	.34	.74	.63	.27	.32	.60	.43	.30
(WY)	1985	1954	1977	1977	1978	1926	1926	1926	1966	1984	1984	1984

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1914 - 1996	
ANNUAL TOTAL	1470.08		1541.94			
ANNUAL MEAN	4.03		4.21		6.51	
HIGHEST ANNUAL MEAN					13.5	1923
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	75	Nov 1	77	Jan 25	951	Jan 19 1923
LOWEST DAILY MEAN	.80	Dec 28	.56	Aug 30	.11	Jul 29 1966
ANNUAL SEVEN-DAY MINIMUM	.92	Sep 21	.83	Aug 24	.15	May 15 1926
ANNUAL RUNOFF (AC-FT)	2920		3060		4720	
10 PERCENT EXCEEDS	7.7		7.8		12	
50 PERCENT EXCEEDS	2.1		2.3		2.9	
90 PERCENT EXCEEDS	1.2		1.1		1.0	



HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974 to current year.

REMARKS.--Miscellaneous chemical analyses published for the 1969 and 1973 water years. Quality of water samples obtained at the gage.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT
MAR											
01...	1420	4.4	120	7.5	22.0	19.5	34	5.4	5.1	14	46
JUN											
03...	1455	0.95	144	7.6	25.5	24.5	41	6.4	6.0	15	44

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
MAR											
01...	1	0.80	29	3.7	25	<0.10	13	85	0.11	150	14
JUN											
03...	1	0.90	35	4.0	22	<0.10	15	91	0.12	370	25

< Actual value is known to be less than the value shown

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HAWAII, ISLAND OF OAHU

16229300 KALIHI STREAM AT KALIHI

LOCATION.--Lat 21°20′29″, long 157°52′36″, 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 (discontinued).
SUSPENDED-SEDIMENT DISCHARGE: Water years 1969-74, 1975-93, quarterly (discontinued).

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. 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 fair.

AVERAGE DISCHARGE.--34 years (water years 1963-96), 10.3 ft^3/s (7,470 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, 0.16 ft^3/s, June 24, 1966.

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 (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 01	0330	982	4.00	June 29	1400	*1,660	*5.07
Jan. 25	0230	1,070	4.15				

Minimum discharge, 0.95 ft^3/s, August 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	133	23	3.2	4.4	5.9	11	e1.5	e1.4	7.7	2.4	15
2	3.5	11	6.9	2.7	4.6	9.7	4.2	e1.5	e1.3	8.9	2.6	4.3
3	2.8	15	4.7	2.6	3.4	108	4.0	e1.4	e1.2	6.2	2.5	5.6
4	2.4	6.7	3.7	4.2	2.8	17	5.1	e1.4	e1.2	8.7	3.9	4.1
5	2.5	4.8	3.4	16	2.7	9.3	3.8	e1.3	e1.3	33	4.0	26
6	2.9	4.1	3.3	4.4	2.5	7.0	2.8	e1.3	e2.5	11	3.2	12
7	13	3.9	3.5	5.9	4.9	5.9	2.7	e1.3	e3.5	15	2.0	71
8	24	33	3.3	6.0	7.0	5.6	2.5	e1.5	e3.0	5.5	2.0	26
9	5.7	13	2.7	6.7	2.8	5.0	2.5	e1.4	20	3.6	1.9	11
10	5.5	8.8	2.8	16	e3.0	4.7	5.0	e1.4	6.5	3.0	3.7	9.0
11	3.5	5.6	2.5	4.2	e2.4	e5.0	6.5	e1.3	2.7	2.7	5.1	19
12	3.9	4.7	2.5	2.8	e2.3	e4.7	4.3	e1.3	11	4.8	2.2	9.4
13	2.9	46	3.8	2.6	e2.2	e4.4	3.3	e1.4	7.5	2.6	3.4	6.7
14	2.6	21	3.9	2.7	e2.3	e4.2	3.2	e1.4	3.3	2.4	2.2	5.0
15	2.4	14	2.5	2.5	e2.2	e4.0	3.4	e1.3	3.4	3.7	2.0	4.2
16	2.1	8.7	e1.9	2.6	e2.1	e4.0	2.7	e1.3	4.4	2.9	1.7	3.7
17	1.9	7.5	e1.8	3.3	e2.1	e4.5	3.7	e1.4	3.1	4.2	1.5	3.9
18	2.3	6.4	e2.0	6.1	e2.1	e4.6	7.8	e1.3	7.7	12	2.2	4.3
19	2.0	5.3	e1.8	11	e2.1	e4.7	6.6	e1.2	4.3	14	1.4	3.4
20	3.2	5.0	e1.5	3.9	e2.0	e5.0	3.8	e1.8	5.2	11	1.3	3.9
21	3.1	5.3	e1.4	5.3	e2.0	e4.2	4.9	e2.0	4.1	6.4	1.2	3.2
22	2.1	4.6	e1.4	3.2	e1.9	e4.6	3.6	e1.8	3.9	3.5	1.2	3.1
23	1.8	3.9	e1.4	8.7	e1.8	e4.2	e2.9	e1.2	17	2.7	1.2	3.0
24	1.8	3.1	e1.4	8.9	e2.2	e4.1	e2.5	e1.5	8.7	2.8	1.3	2.9
25	2.9	2.8	e1.4	102	24	e4.0	e2.5	e2.2	4.7	2.3	1.3	3.1
26	5.7	2.9	e1.6	16	26	e3.9	e2.8	e2.4	3.2	3.2	2.0	2.8
27	3.4	3.5	e1.2	26	23	e3.9	e2.7	e1.8	2.7	4.5	1.2	2.6
28	14	4.3	e1.1	20	30	e3.8	e3.4	e2.5	3.1	2.6	1.0	2.5
29	23	3.5	e1.4	7.7	8.9	e3.8	e2.3	e3.5	99	1.8	.97	2.6
30	5.1	14	13	9.0	---	e4.5	e1.9	e2.0	22	1.7	4.6	2.4
31	38	---	11	6.3	---	7.9	---	e1.6	---	1.9	74	---
TOTAL	195.7	405.4	117.8	322.5	179.7	272.1	118.4	50.2	262.9	196.3	141.17	275.7
MEAN	6.31	13.5	3.80	10.4	6.20	8.78	3.95	1.62	8.76	6.33	4.55	9.19
MAX	38	133	23	102	30	108	11	3.5	99	33	74	71
MIN	1.8	2.8	1.1	2.5	1.8	3.8	1.9	1.2	1.2	1.7	.97	2.4
AC-FT	388	804	234	640	356	540	235	100	521	389	280	547

e Estimated

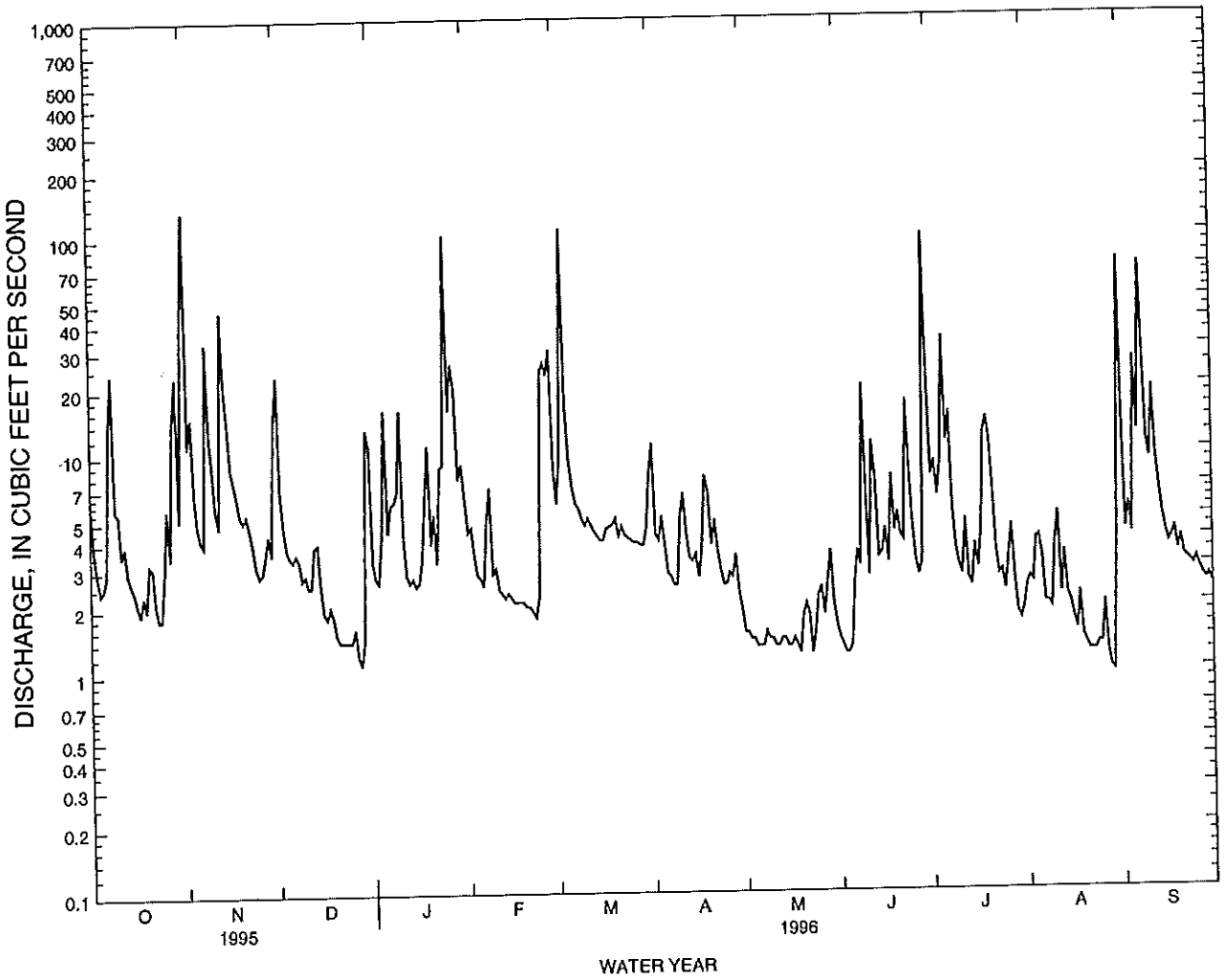
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1996, BY WATER YEAR (WY)

MEAN	6.98	13.6	15.1	13.4	11.4	16.1	13.5	9.70	5.33	7.95	6.19	4.83
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	.95	2.15	1.15	.82	.78	1.15	1.65	1.49	.87	1.17	.83	.64
(WY)	1985	1981	1977	1977	1978	1983	1992	1966	1966	1984	1984	1984

HAWAII, ISLAND OF OAHU

16229300 KALIHI STREAM AT KALIHI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1962 - 1996	
ANNUAL TOTAL	2412.99		2537.87			
ANNUAL MEAN	6.61		6.93		10.3	
HIGHEST ANNUAL MEAN					21.3	1982
LOWEST ANNUAL MEAN					3.13	1984
HIGHEST DAILY MEAN	223	Feb 27	133	Nov 1	781	Feb 1 1969
LOWEST DAILY MEAN	.58	Mar 11	.97	Aug 29	.23	Jun 28 1966
ANNUAL SEVEN-DAY MINIMUM	1.0	Mar 13	1.3	Aug 19	.36	Oct 14 1984
ANNUAL RUNOFF (AC-FT)	4790		5030		7470	
10 PERCENT EXCEEDS	13		14		18	
50 PERCENT EXCEEDS	3.3		3.5		3.8	
90 PERCENT EXCEEDS	1.5		1.4		1.3	



HAWAII, ISLAND OF OAHU

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

LOCATION.--Lat 21°20′57″, long 157°49′40″, Hydrologic Unit 20060000, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mi downstream from reservoir 2 wasteway, and 3.5 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi^2.

PERIOD OF RECORD.--October 1913 to January 1921. September 1921 to January 1996 (discontinued).

REVISED RECORDS.--WSP 985: 1921-35(M). WSP 1319: 1931. WSP 1569: Drainage area. WSP 1639: 1931, 1935.

GAGE.--Water-stage recorder and sharp-crested weirs. Datum of gage is 630.71 ft above mean sea level (by stadia survey). Prior to September 7, 1915, nonrecording gage at same site at datum 631.68 ft and September 7, 1915 to March 31, 1918, at 631.71 ft above mean sea level. Datum of gage lowered 1.00 ft on February 4, 1992.

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

AVERAGE DISCHARGE.--80 years (water years 1915-16, 1918-20, 1922-96), 7.00 ft^3/s (5,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft^3/s, January 16, 1921, gage height, 8.74 ft, from floodmarks, from rating curve extended above 420 ft^3/s by test of physical model of station site; minimum, 0.09 ft^3/s, September 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 01	0100	*302	*4.86				

Minimum discharge, 2.7 ft^3/s, October 19, 24, 28, 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	57	12	4.2	---	---	---	---	---	---	---	---
2	3.4	6.3	9.0	4.1	---	---	---	---	---	---	---	---
3	3.2	5.2	6.8	---	---	---	---	---	---	---	---	---
4	3.0	4.9	6.2	---	---	---	---	---	---	---	---	---
5	2.9	4.6	5.8	---	---	---	---	---	---	---	---	---
6	3.0	4.4	5.9	---	---	---	---	---	---	---	---	---
7	3.5	4.3	6.2	---	---	---	---	---	---	---	---	---
8	5.7	13	5.8	---	---	---	---	---	---	---	---	---
9	3.8	6.4	5.7	---	---	---	---	---	---	---	---	---
10	3.8	5.2	5.5	---	---	---	---	---	---	---	---	---
11	3.4	4.8	5.4	---	---	---	---	---	---	---	---	---
12	4.5	4.8	5.4	---	---	---	---	---	---	---	---	---
13	3.5	21	5.5	---	---	---	---	---	---	---	---	---
14	3.2	12	5.5	---	---	---	---	---	---	---	---	---
15	3.1	9.3	5.2	---	---	---	---	---	---	---	---	---
16	2.9	6.6	5.1	---	---	---	---	---	---	---	---	---
17	2.9	7.3	5.1	---	---	---	---	---	---	---	---	---
18	3.0	6.5	4.9	---	---	---	---	---	---	---	---	---
19	2.8	6.1	4.8	---	---	---	---	---	---	---	---	---
20	4.6	5.9	4.8	---	---	---	---	---	---	---	---	---
21	3.8	5.9	4.7	---	---	---	---	---	---	---	---	---
22	3.1	5.7	4.7	---	---	---	---	---	---	---	---	---
23	2.9	5.6	4.6	---	---	---	---	---	---	---	---	---
24	2.8	5.6	4.5	---	---	---	---	---	---	---	---	---
25	3.1	5.5	4.4	---	---	---	---	---	---	---	---	---
26	3.7	5.4	4.4	---	---	---	---	---	---	---	---	---
27	3.2	5.6	4.3	---	---	---	---	---	---	---	---	---
28	7.2	6.9	4.2	---	---	---	---	---	---	---	---	---
29	12	5.9	4.1	---	---	---	---	---	---	---	---	---
30	3.8	12	4.9	---	---	---	---	---	---	---	---	---
31	26	---	5.6	---	---	---	---	---	---	---	---	---
TOTAL	142.2	259.7	171.0	---	---	---	---	---	---	---	---	---
MEAN	4.59	8.66	5.52	---	---	---	---	---	---	---	---	---
MAX	26	57	12	---	---	---	---	---	---	---	---	---
MIN	2.8	4.3	4.1	---	---	---	---	---	---	---	---	---
AC-FT	282	515	339	---	---	---	---	---	---	---	---	---

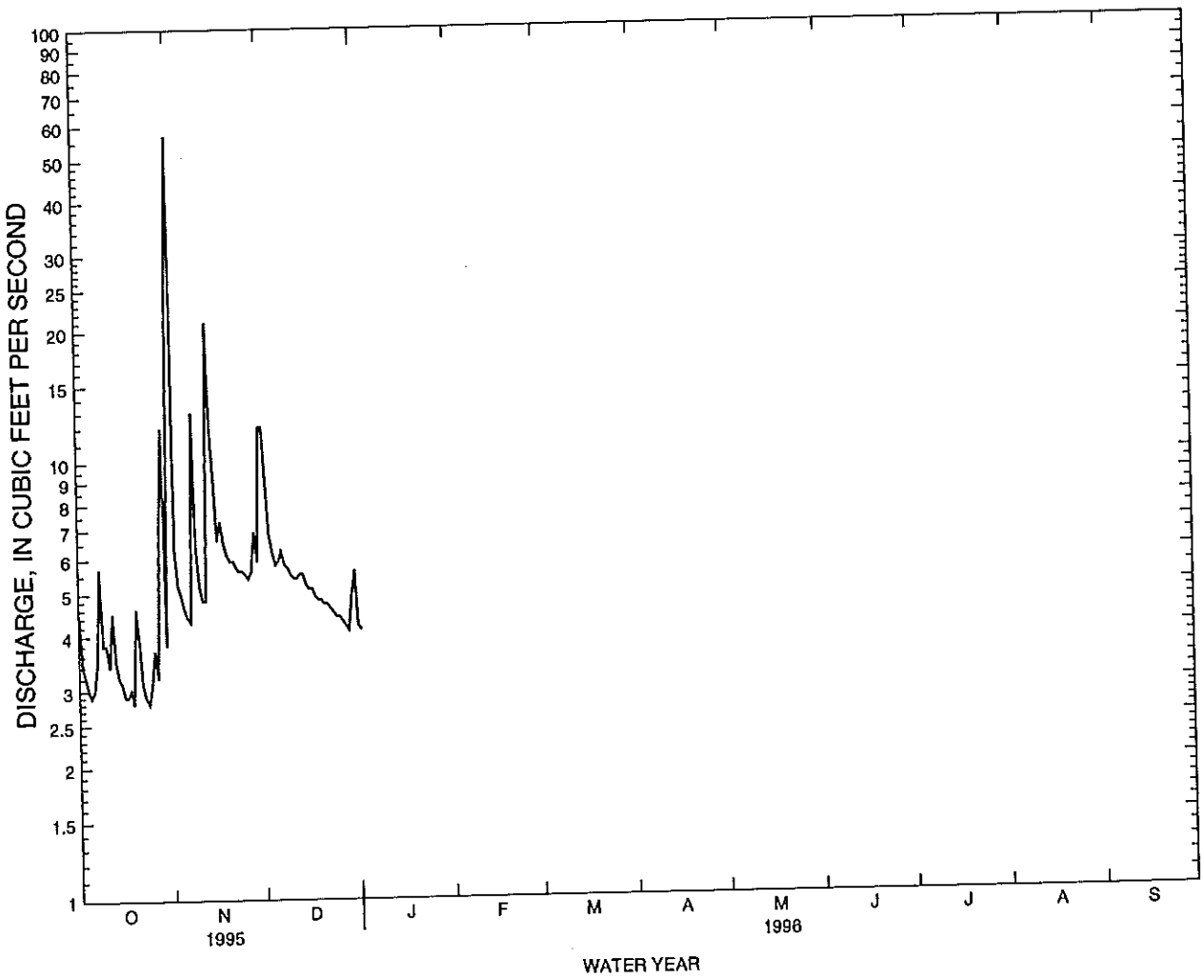
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1996, BY WATER YEAR (WY)

MEAN	4.35	6.90	8.82	9.46	9.07	9.62	9.44	8.05	5.00	4.30	5.04	4.50
MAX	21.5	43.7	46.8	56.0	81.3	52.5	41.7	46.2	19.0	10.7	32.4	27.7
(WY)	1931	1966	1928	1988	1932	1968	1989	1927	1938	1954	1982	1931
MIN	.23	.38	.38	.51	.39	.39	.32	.28	.35	.22	.43	.38
(WY)	1918	1946	1920	1920	1920	1926	1926	1926	1920	1922	1920	1917

HAWAII, ISLAND OF OAHU

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		WATER YEARS 1914 - 1996	
ANNUAL TOTAL	1923.8		7.00	
ANNUAL MEAN	5.27		20.0	1932
HIGHEST ANNUAL MEAN			.88	1920
LOWEST ANNUAL MEAN			514	May 16 1927
HIGHEST DAILY MEAN	57	Nov 1	.14	Jul 7 1922
LOWEST DAILY MEAN	2.3	Feb 22	.14	Jul 18 1922
ANNUAL SEVEN-DAY MINIMUM	2.6	Feb 17		
ANNUAL RUNOFF (AC-FT)	3820		5070	
10 PERCENT EXCEEDS	7.6		13	
50 PERCENT EXCEEDS	4.0		3.7	
90 PERCENT EXCEEDS	3.0		.93	



HAWAII, ISLAND OF OAHU

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT
DEC											
01...	1025	9.3	130	8.0	23.5	21.5	35	4.7	5.6	10	38

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
DEC											
01...	0.7	0.70	31	3.6	16	<0.10	13	72	0.10	180	21

< Actual value is known to be less than the value shown

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HAWAII, ISLAND OF OAHU

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19′53″, long 157°48′12″, 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).

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 good. 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.--78 years (water years 1914-20, 1926-96), 4.92 ft^3/s (3,560 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. Current peak discharges are derived from rating curve extended above 1,760 ft^3/s on the basis of slope-area measurement at gage height 5.28 ft; 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)
Dec. 01	1200	389	3.35	Aug. 31	2015	389	3.35
Jan. 25	0130	*580	*3.78				

Minimum discharge, 1.4 ft^3/s, August 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	21	19	2.1	2.5	3.0	9.5	2.1	2.0	4.0	2.3	9.7
2	2.9	4.1	7.4	2.0	2.6	4.5	5.2	2.1	1.9	8.1	2.4	3.7
3	2.7	3.3	4.1	2.0	2.4	20	3.4	2.1	1.9	5.3	2.1	3.2
4	2.7	3.1	3.3	2.5	2.3	5.4	3.7	2.1	1.9	6.6	2.7	3.1
5	2.5	2.7	3.0	5.2	2.3	3.7	3.9	2.0	1.9	15	2.2	4.4
6	2.7	2.6	2.9	2.4	2.2	3.2	2.6	2.0	2.8	6.6	3.0	4.4
7	3.6	2.9	2.9	2.9	6.7	3.1	2.4	2.0	5.5	5.6	2.4	13
8	4.9	8.0	2.7	5.9	4.6	2.9	2.2	2.0	4.8	4.1	2.2	6.1
9	3.4	3.4	2.6	2.5	2.7	2.8	2.1	1.9	5.7	3.5	2.1	4.1
10	3.1	2.8	2.5	3.0	2.7	2.7	4.7	1.9	2.8	3.1	3.7	4.0
11	2.8	2.6	2.5	2.2	2.3	2.7	4.6	1.9	2.4	2.9	6.3	4.6
12	2.8	2.7	2.4	2.0	2.2	2.6	2.9	1.9	4.3	4.4	3.4	3.6
13	2.5	19	2.8	2.0	2.2	2.6	2.5	1.9	5.6	3.2	4.0	3.3
14	2.4	11	2.8	2.0	2.4	2.5	2.8	1.9	2.3	2.8	2.7	2.9
15	2.4	6.7	2.4	1.9	2.3	2.5	2.5	2.0	2.1	2.7	2.3	2.8
16	2.3	3.7	2.3	1.9	2.2	2.4	2.2	2.2	2.2	2.5	2.2	4.9
17	2.2	4.2	2.4	2.2	2.1	2.5	2.9	2.2	2.1	2.4	2.0	2.9
18	2.2	3.1	2.3	5.0	2.1	2.4	3.8	1.9	4.3	5.6	2.1	3.2
19	2.2	2.9	2.3	6.6	2.0	2.4	3.0	1.9	2.8	4.3	1.8	2.7
20	2.8	2.9	2.2	3.5	2.0	2.7	2.9	2.4	4.0	4.2	1.8	3.0
21	3.0	3.2	2.2	3.5	2.0	2.4	3.8	2.4	3.2	3.9	1.7	2.6
22	2.3	2.7	2.2	3.2	2.0	2.4	3.2	2.0	3.0	3.3	1.6	2.6
23	2.3	2.6	2.2	6.1	2.0	2.3	2.6	1.9	5.7	2.8	1.6	2.5
24	2.2	2.6	2.1	7.8	2.1	2.3	2.5	2.8	4.6	2.7	1.5	2.4
25	3.1	2.5	2.2	30	6.2	2.3	2.4	3.2	3.1	2.5	1.5	2.7
26	6.4	2.5	2.9	4.8	8.3	2.2	2.5	2.8	2.6	3.9	1.8	2.4
27	3.1	2.7	2.1	3.8	7.0	2.2	2.3	2.3	2.6	6.6	1.5	2.3
28	7.8	4.5	2.1	4.4	13	2.2	3.3	3.7	4.9	3.4	1.5	2.3
29	6.1	2.9	2.1	2.9	3.7	2.2	2.4	2.6	11	2.7	1.5	2.3
30	3.3	13	2.4	3.4	---	2.2	2.2	2.3	6.7	2.4	4.9	2.3
31	12	---	3.4	2.8	---	4.7	---	2.2	---	2.3	32	---
TOTAL	108.6	151.9	100.7	132.5	99.1	104.0	97.0	68.6	110.7	133.4	104.8	114.0
MEAN	3.50	5.06	3.25	4.27	3.42	3.35	3.23	2.21	3.69	4.30	3.38	3.80
MAX	12	21	19	30	13	20	9.5	3.7	11	15	32	13
MIN	2.2	2.5	2.1	1.9	2.0	2.2	2.1	1.9	1.9	2.3	1.5	2.3
AC-FT	215	301	200	263	197	206	192	136	220	265	208	226

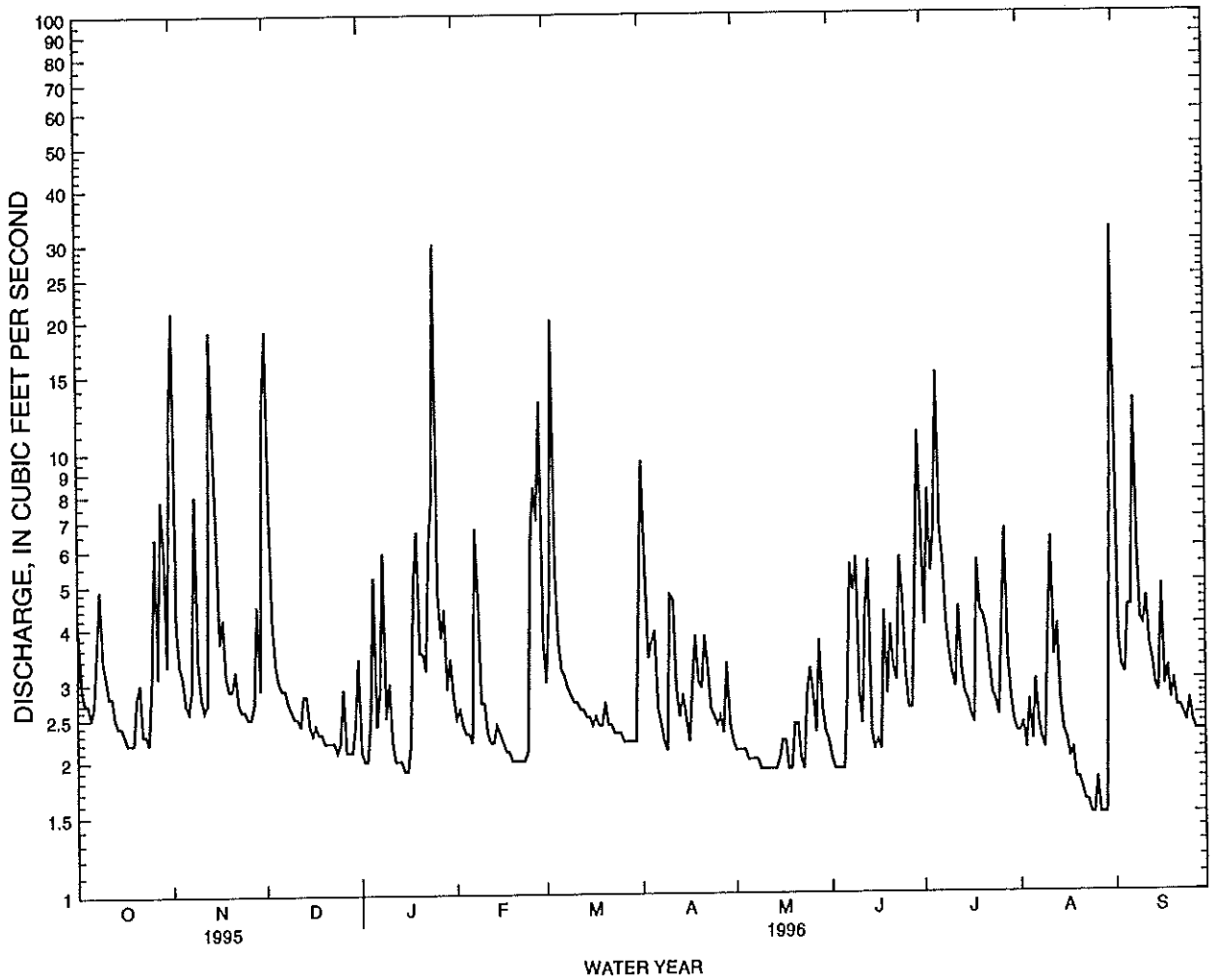
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1996, BY WATER YEAR (WY)

MEAN	4.21	5.24	5.37	4.90	4.53	5.47	5.70	5.20	4.17	4.95	4.89	4.21
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	.87	1.27	.87	1.31	1.27
(WY)	1946	1934	1920	1977	1920	1926	1926	1926	1920	1926	1984	1984

HAWAII, ISLAND OF OAHU

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1913 - 1996	
ANNUAL TOTAL	1463.5		1325.3			
ANNUAL MEAN	4.01		3.62		4.92	
HIGHEST ANNUAL MEAN					8.23	1988
LOWEST ANNUAL MEAN					1.94	1920
HIGHEST DAILY MEAN	39	Feb 28	32	Aug 31	183	Mar 24 1994
LOWEST DAILY MEAN	2.1	Dec 24	1.5	Aug 24	.62	Feb 26 1920
ANNUAL SEVEN-DAY MINIMUM	2.2	Dec 19	1.6	Aug 23	.75	May 23 1926
ANNUAL RUNOFF (AC-FT)	2900		2630		3560	
10 PERCENT EXCEEDS	6.6		5.8		8.1	
50 PERCENT EXCEEDS	2.9		2.7		3.5	
90 PERCENT EXCEEDS	2.3		2.0		1.7	



HAWAII, ISLAND OF OAHU

16249500 MAUNAWILI DITCH AT AINONI SPRING

LOCATION.--Lat 21°21′08″, long 157°46′03″, on left bank approximately 1,000 ft below Siphon 8, 3.2 mi east of Waimanalo Elementary School, and 3.8 mi northeast of Manoa Elementary School.

PERIOD OF RECORD.--June 1991 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 440 ft above mean sea level, from topographic map.

REMARKS.--Records good. At times flow is diverted above gage by Waimanalo Irrigation System, State Department of Agriculture.

AVERAGE DISCHARGE.--5 years (water years 1992-96) 1.29 ft^3/s (934 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2.8 ft^3/s, June 25, 1994; minimum daily, no flow on January 1, 2, 1993, January 25-30, and February 3-7, 1996.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.7 ft^3/s, November 3 and August 31; no flow, January 25-30 and February 3-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.3	1.4	.33	.08	.36	.24	.71	.63	.62	.91	1.0
2	1.4	1.5	.68	.29	.08	.35	.21	1.2	.56	1.1	1.2	.88
3	1.6	1.7	.68	.27	.04	.39	.60	1.4	.52	1.1	1.3	.86
4	1.5	1.4	1.2	.33	.00	.31	.93	1.4	.84	.91	1.1	.95
5	1.4	1.2	1.4	.62	.00	.31	.62	1.3	.95	.74	1.1	1.1
6	1.4	1.1	.90	.44	.00	.31	.58	1.4	1.0	.66	1.3	.98
7	1.3	.91	.68	.49	.05	.31	.58	1.3	1.0	.66	1.1	.88
8	1.1	1.4	.70	.51	.04	.31	.53	1.3	.63	1.2	1.0	.80
9	1.2	1.4	.74	.41	.28	.30	1.2	1.3	.69	1.3	1.2	.80
10	1.4	1.1	.75	.59	.25	.25	.83	1.2	.85	.94	1.2	.89
11	1.3	.98	.79	.40	.10	.24	.50	1.3	1.1	.75	1.1	.91
12	1.3	.95	.86	.35	.52	.24	.65	1.2	.89	.58	.98	.75
13	1.3	1.1	.94	.33	.79	.24	.74	1.1	1.0	.49	.88	.99
14	1.3	.92	.83	.31	.78	.24	.69	1.1	1.2	.52	1.1	1.1
15	1.3	.87	.71	.31	.63	.24	.64	1.1	1.2	.84	1.3	1.0
16	1.4	.83	.66	.31	.50	.23	.61	1.1	1.0	.99	1.1	.92
17	1.4	.74	.63	.33	.48	.30	.58	1.1	.88	.90	.96	.91
18	1.4	.76	.63	.38	.48	.56	.58	.92	1.1	.70	.92	.78
19	1.3	.73	.68	.40	.46	.71	.58	.87	1.1	.41	1.0	.74
20	1.3	.61	.69	.34	.74	.56	.58	.79	1.0	.39	1.1	.73
21	1.3	.56	1.0	.32	.73	.47	.58	1.1	1.1	.41	1.0	.66
22	1.0	.71	1.2	.33	.58	.43	.58	1.2	1.2	.90	1.1	.66
23	1.2	.75	1.0	.39	.78	.43	.63	.94	1.1	1.0	1.1	.67
24	1.4	1.3	1.0	.55	.81	.43	.62	.75	1.1	.97	1.1	.60
25	1.1	1.4	.99	.28	.62	.38	.58	.68	1.1	.89	1.1	.60
26	1.2	1.2	1.3	.00	.50	.33	.58	.64	.95	.82	1.1	.68
27	1.4	1.3	1.5	.00	.39	.26	.58	.67	.80	.79	1.1	.65
28	1.4	1.4	1.3	.00	.54	.30	.73	.74	.72	.74	1.0	.64
29	1.1	1.1	.59	.00	.52	.31	.86	.68	.67	1.2	1.0	.66
30	1.2	1.0	.39	.14	---	.31	.82	.63	.68	1.2	1.1	.61
31	1.5	---	.52	.09	---	.27	---	.63	---	1.0	1.7	---
TOTAL	40.6	32.22	27.34	9.84	11.77	10.68	19.03	31.75	27.56	25.72	34.25	24.40
MEAN	1.31	1.07	.88	.32	.41	.34	.63	1.02	.92	.83	1.10	.81
MAX	1.6	1.7	1.5	.62	.81	.71	1.2	1.4	1.2	1.3	1.7	1.1
MIN	1.0	.56	.39	.00	.00	.23	.21	.63	.52	.39	.88	.60
AC-FT	81	64	54	20	23	21	38	63	55	51	68	48

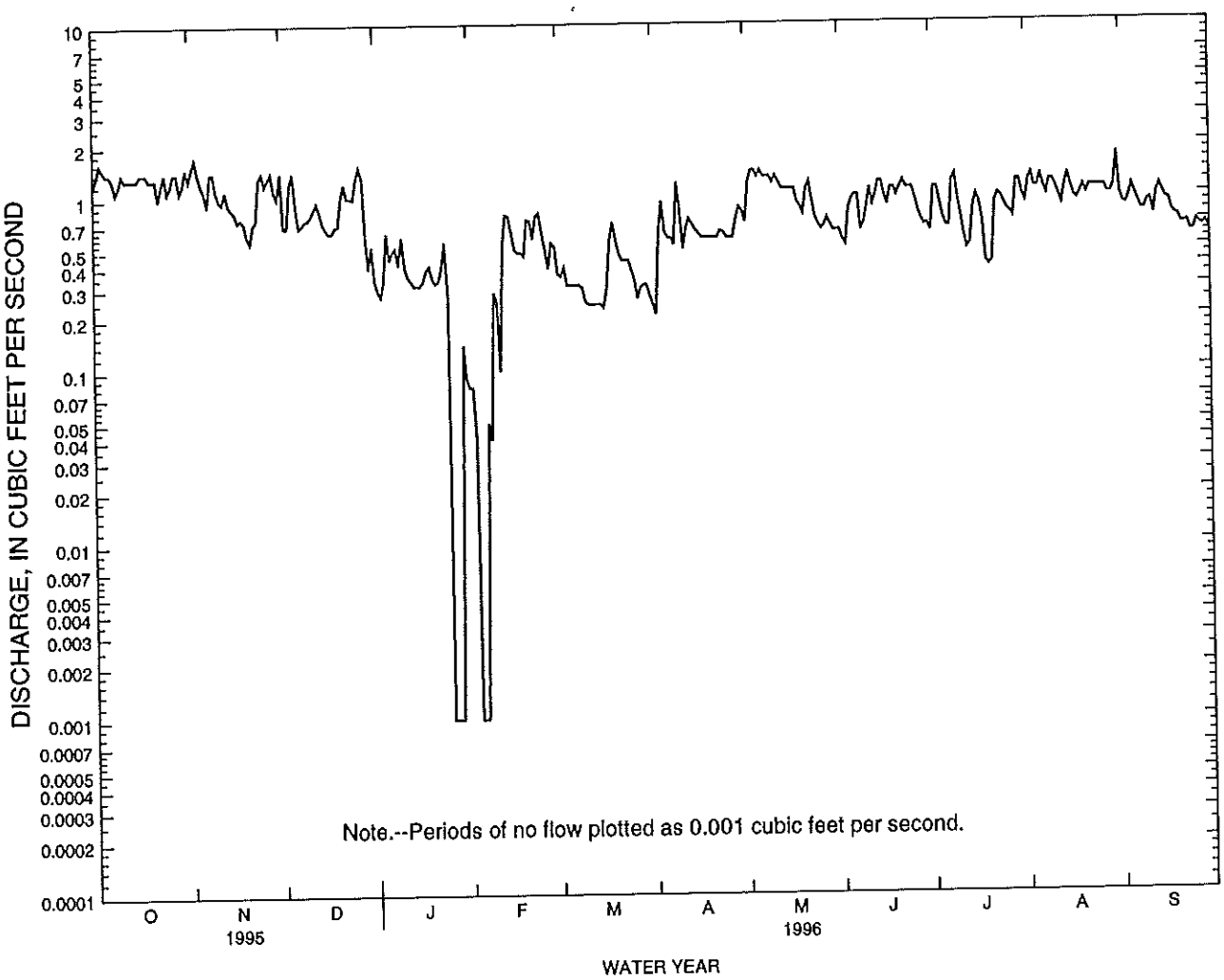
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1996, BY WATER YEAR (WY)

MEAN	1.40	1.43	1.14	1.01	1.06	1.22	1.20	1.43	1.43	1.38	1.50	1.46
MAX	2.01	1.84	1.86	1.89	1.60	1.76	1.63	1.64	1.80	1.76	1.76	1.90
(WY)	1992	1992	1992	1992	1995	1992	1992	1994	1994	1991	1991	1992
MIN	1.03	1.07	.74	.32	.41	.34	.63	1.02	.92	.83	1.10	.81
(WY)	1995	1996	1993	1996	1996	1996	1996	1996	1996	1996	1996	1996

HAWAII, ISLAND OF OAHU

16249500 MAUNAWILI DITCH AT AINONI SPRING--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1991 - 1996	
ANNUAL TOTAL	463.71		295.16			
ANNUAL MEAN	1.27		.81		1.29	
HIGHEST ANNUAL MEAN					1.75	1992
LOWEST ANNUAL MEAN					.81	1996
HIGHEST DAILY MEAN	2.3	Feb 21	1.7	Nov 3	2.8	Jun 25 1994
LOWEST DAILY MEAN	.20	Mar 1	.00	Jan 26	.00	Jan 1 1993
ANNUAL SEVEN-DAY MINIMUM	.55	Feb 28	.03	Feb 2	.03	Feb 2 1996
ANNUAL RUNOFF (AC-FT)	920		585		934	
10 PERCENT EXCEEDS	1.7		1.3		2.0	
50 PERCENT EXCEEDS	1.3		.79		1.4	
90 PERCENT EXCEEDS	.75		.31		.57	



HAWAII, ISLAND OF OAHU

16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA

LOCATION.--Lat 21°20'50", long 157°46'26", on left bank approximately 1,000 ft above Aniani Nui Tunnel, 2.5 mi east of Waimanalo Elementary School, and 3.6 mi north of Wailupe Valley Elementary School.

PERIOD OF RECORD.--December 3, 1990 to current year.

GAGE.--Water-stage recorder and 3 ft semi-circular corrugated metal pipe control with concrete on upstream end. Elevation of gage is 400 ft above mean sea level, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--6 years (water years 1991-96), 1.83 ft^3/s (1,330 acre-ft/yr)

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 5.5 ft^3/s, March 24, 1994; no flow on March 22, 24, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.7 ft^3/s, June 13; minimum daily, 0.02 ft^3/s, January 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.9	2.0	.87	.15	.57	.60	1.6	1.0	.82	1.7	.75
2	1.7	1.9	1.2	.77	.24	.55	.57	1.7	1.1	1.2	1.6	.72
3	2.0	2.1	1.1	.64	.24	.69	.72	2.1	1.5	1.3	1.5	.89
4	2.0	1.8	1.7	.71	.23	.53	1.3	2.1	1.4	1.1	1.3	.91
5	1.8	1.5	2.0	.79	.28	.51	1.0	1.7	1.5	1.4	1.3	1.1
6	1.7	1.4	1.4	.48	.31	.50	.93	1.8	1.7	1.1	1.3	1.3
7	1.6	1.2	1.1	.54	.55	.54	.90	1.8	1.6	1.1	.82	1.2
8	1.4	1.6	1.0	.52	.49	.53	.89	2.0	1.5	1.3	.72	1.1
9	1.4	1.8	1.1	.46	.28	.53	1.3	2.0	1.8	1.5	1.1	1.0
10	1.8	1.4	1.1	.70	.33	.55	1.2	1.8	1.9	1.2	.83	1.1
11	1.7	1.2	1.1	.54	.24	.57	.98	1.6	2.1	.99	.76	1.3
12	1.7	1.1	1.2	.50	.92	.55	1.1	1.4	1.9	.76	1.0	1.0
13	1.7	1.8	1.3	.53	1.2	.56	1.3	1.3	2.7	.58	1.1	1.2
14	1.7	1.6	1.1	.56	1.1	.55	1.2	1.6	2.7	.57	1.1	.98
15	1.6	1.7	.95	.58	.94	.56	1.0	1.6	2.4	.90	1.4	1.2
16	1.7	1.3	.88	.67	.82	.56	1.1	1.5	1.8	1.1	1.2	1.1
17	1.8	1.1	.84	.68	.82	.62	1.2	1.4	1.5	1.1	1.3	1.1
18	1.8	1.1	.80	.74	.78	.79	1.2	1.3	1.5	1.0	1.2	.96
19	1.7	1.0	.82	.68	.74	1.0	1.1	1.2	1.1	.85	1.8	.88
20	1.7	.91	.77	.63	.89	.91	1.1	1.1	1.1	.76	1.5	.85
21	1.7	.94	1.3	.63	.92	.80	1.1	1.5	1.2	.69	1.3	.75
22	1.4	.98	1.6	.63	.76	.75	1.1	1.8	1.4	.72	.97	.78
23	1.4	.96	1.4	.74	1.0	.71	1.1	1.5	1.2	1.0	.63	.75
24	1.7	1.5	1.4	1.2	1.1	.71	1.3	1.3	1.1	1.2	.59	.63
25	1.6	1.7	1.4	1.5	.90	.69	1.3	1.2	1.1	1.3	.98	.60
26	1.6	1.5	1.6	.20	.82	.66	1.2	1.1	.98	1.3	.79	.55
27	2.0	1.6	1.7	.02	.75	.60	1.2	1.1	.84	1.4	.95	.53
28	2.1	1.7	1.5	.12	.72	.61	1.3	1.1	.77	1.1	1.1	.49
29	1.9	1.4	.95	.06	.64	.62	1.6	1.1	.83	1.4	1.1	.67
30	1.7	1.3	.85	.21	---	.62	1.7	1.0	.77	1.0	.99	.83
31	2.0	---	1.3	.16	---	.62	---	1.0	---	1.6	.95	---
TOTAL	53.1	42.99	38.46	18.06	19.16	19.56	33.59	46.3	43.99	33.34	34.88	27.22
MEAN	1.71	1.43	1.24	.58	.66	.63	1.12	1.49	1.47	1.08	1.13	.91
MAX	2.1	2.1	2.0	1.5	1.2	1.0	1.7	2.1	2.7	1.6	1.8	1.3
MIN	1.4	.91	.77	.02	.15	.50	.57	1.0	.77	.57	.59	.49
AC-FT	105	85	76	36	38	39	67	92	87	66	69	54

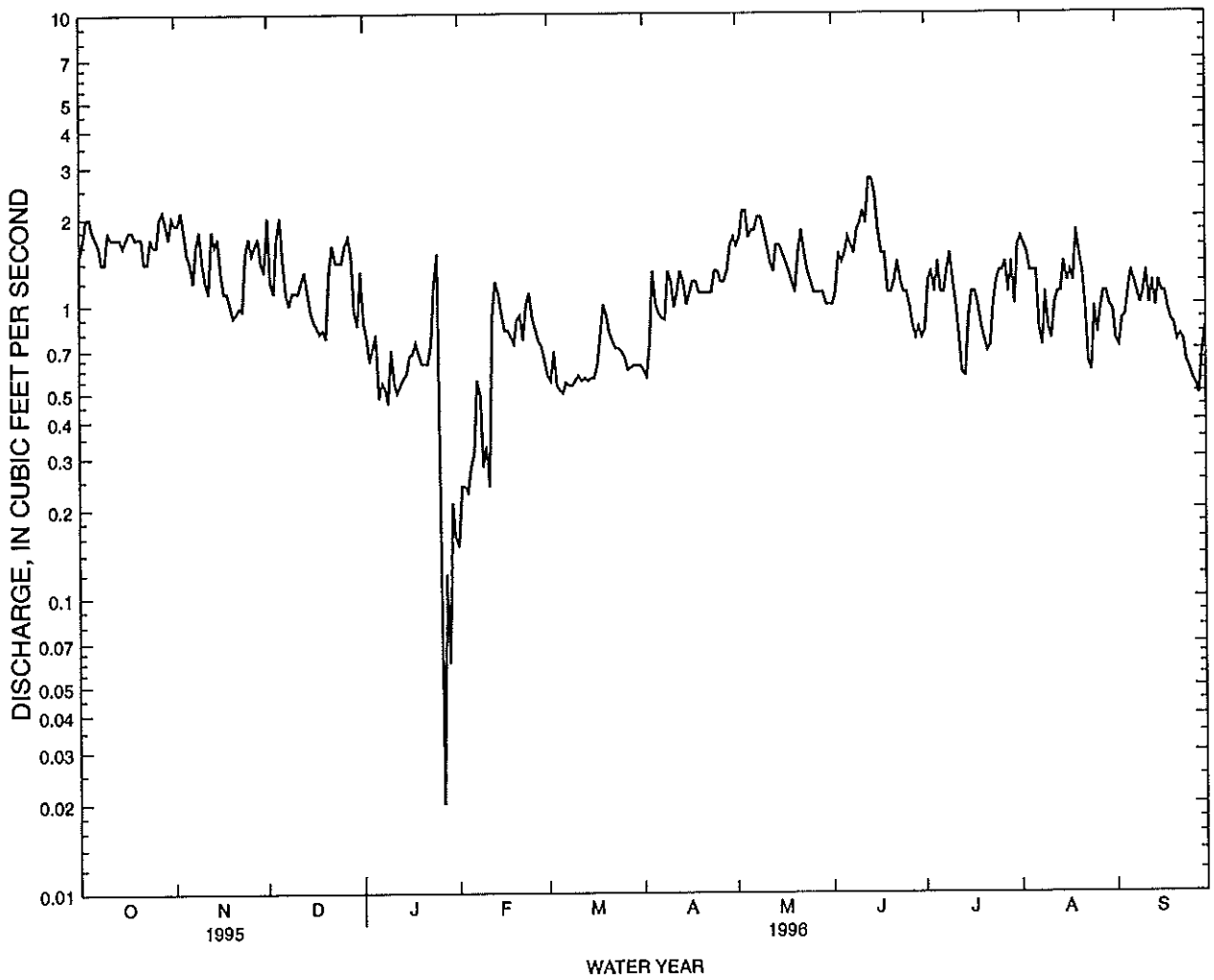
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1996, BY WATER YEAR (WY)

MEAN	2.08	2.07	1.60	1.52	1.72	1.72	1.79	2.05	2.00	1.90	2.02	2.11
MAX	2.69	2.99	2.57	2.22	2.46	2.23	2.26	2.38	2.39	2.80	2.75	3.22
(WY)	1992	1992	1992	1992	1991	1992	1991	1994	1991	1992	1992	1992
MIN	1.62	1.43	1.20	.58	.66	.63	1.12	1.49	1.47	1.08	1.13	.91
(WY)	1995	1996	1995	1996	1996	1996	1996	1996	1996	1996	1996	1996

HAWAII, ISLAND OF OAHU

16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1991 - 1996	
ANNUAL TOTAL	611.81		410.65			
ANNUAL MEAN	1.68		1.12		1.83	
HIGHEST ANNUAL MEAN					2.48	1992
LOWEST ANNUAL MEAN					1.12	1996
HIGHEST DAILY MEAN	3.0	Aug 27	2.7	Jun 13	5.5	Mar 24 1994
LOWEST DAILY MEAN	.68	Mar 1	.02	Jan 27	.00	Mar 22 1991
ANNUAL SEVEN-DAY MINIMUM	.88	Dec 14	.13	Jan 26	.13	Jan 26 1996
ANNUAL RUNOFF (AC-FT)	1210		815		1330	
10 PERCENT EXCEEDS	2.3		1.7		2.8	
50 PERCENT EXCEEDS	1.7		1.1		1.9	
90 PERCENT EXCEEDS	1.1		.55		.98	



HAWAII, ISLAND OF OAHU

16250000 MAUNAWILI DITCH NEAR WAIMANALO

LOCATION.--Lat 21°20′45″, long 157°45′10″, Hydrologic Unit 20060000, on left bank 80 ft downstream from Aniani Nui Ridge tunnel, and 3.5 mi west of Waimanalo Post Office.

PERIOD OF RECORD.--March 1954 to September 1968, October 1993 to current year.

GAGE.--Water-stage recorder with concrete Columbus type control. Altitude of gage is 390 ft above mean sea level, from topographic map. Prior to July 12, 1993, water stage recorder at same site with different datum.

REMARKS.--Records good. Ditch diverts from headwaters of Maunawili and Makawao streams for irrigation in vicinity of Waimanalo. Station was reestablished on October 1, 1993.

AVERAGE DISCHARGE.-- 17 years (water years 1955-68, 1994-96), 2.36 ft^3/s (1,710 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 10.8 ft^3/s, March 5, 1958; minimum, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 3.6 ft^3/s, January 25; minimum daily 0.01 ft^3/s January 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.7	1.7	.54	.18	.60	.31	1.6	1.0	.82	1.1	.76
2	1.6	1.7	1.0	.48	.29	.57	.29	1.8	.97	1.2	1.4	.64
3	1.9	1.9	.92	.48	.27	1.3	.42	2.1	.92	1.4	1.6	.86
4	1.9	1.6	1.5	.59	.24	.40	.83	2.2	1.1	1.2	1.4	.88
5	1.8	1.4	1.8	.84	.36	.36	.70	1.8	1.4	1.5	1.4	1.3
6	1.7	1.2	1.2	.68	.42	.32	.60	1.9	1.5	1.2	1.6	1.5
7	1.6	1.1	.96	.76	.91	.37	.59	1.8	1.6	1.1	1.1	1.3
8	1.5	1.5	.98	.73	.90	.36	.56	2.1	1.2	1.4	.70	1.1
9	1.4	1.6	1.1	.66	.25	.32	.67	2.0	1.7	1.6	1.1	1.1
10	1.7	1.3	1.1	.79	.31	.32	.67	1.8	1.3	1.2	1.4	1.1
11	1.7	1.1	1.1	.66	.24	.33	.53	1.7	1.4	.98	1.4	1.1
12	1.6	1.0	1.2	.63	.66	.32	.67	1.6	1.2	.73	1.1	.92
13	1.6	1.5	1.2	.61	.97	.32	.86	1.4	1.7	.52	.83	1.2
14	1.6	1.5	1.1	.65	.92	.32	.83	1.7	1.8	.50	1.1	1.4
15	1.6	1.5	.95	.65	.79	.32	.72	1.7	1.7	.86	2.1	1.3
16	1.6	1.2	.90	.65	.68	.32	.78	1.6	1.4	1.2	2.1	1.1
17	1.7	1.1	.85	.64	.69	.36	.87	1.5	1.1	1.1	1.7	1.1
18	1.6	.97	.85	.73	.78	.49	.86	1.3	1.2	.97	1.2	.98
19	1.6	.94	.85	.72	.77	.72	.94	1.2	1.2	.73	1.3	.85
20	1.5	.83	.80	.66	.92	.62	1.0	1.1	1.2	.61	1.4	.84
21	1.5	.84	1.2	.66	.96	.57	1.0	1.6	1.3	.57	1.1	.73
22	1.3	.85	1.4	.68	.79	.53	1.0	1.9	1.5	.65	1.2	.78
23	1.3	.84	1.3	.71	1.1	.53	.98	1.6	1.2	.96	1.4	.73
24	1.5	1.3	1.2	1.5	1.2	.44	1.1	1.3	1.1	1.3	1.3	.60
25	1.4	1.6	1.2	3.6	.96	.42	1.2	1.2	1.2	1.2	1.2	.53
26	1.4	1.3	1.5	.08	.83	.41	1.2	1.1	1.0	1.1	1.3	.49
27	1.7	1.4	1.5	.02	.86	.33	1.1	1.1	.86	1.3	1.2	.46
28	1.6	1.5	1.4	.05	.91	.32	1.3	1.1	.80	1.0	1.2	.40
29	1.4	1.3	.93	.01	.69	.32	1.6	1.1	.84	1.2	1.1	.57
30	1.5	1.2	.77	.23	---	.32	1.8	1.0	.78	1.3	.93	.74
31	1.9	---	.82	.14	---	.32	---	1.0	---	1.1	1.2	---
TOTAL	49.2	38.77	35.28	20.83	19.85	13.55	25.98	47.9	37.17	32.50	40.16	27.36
MEAN	1.59	1.29	1.14	.67	.68	.44	.87	1.55	1.24	1.05	1.30	.91
MAX	1.9	1.9	1.8	3.6	1.2	1.3	1.8	2.2	1.8	1.6	2.1	1.5
MIN	1.3	.83	.77	.01	.18	.32	.29	1.0	.78	.50	.70	.40
AC-FT	98	77	70	41	39	27	52	95	74	64	80	54

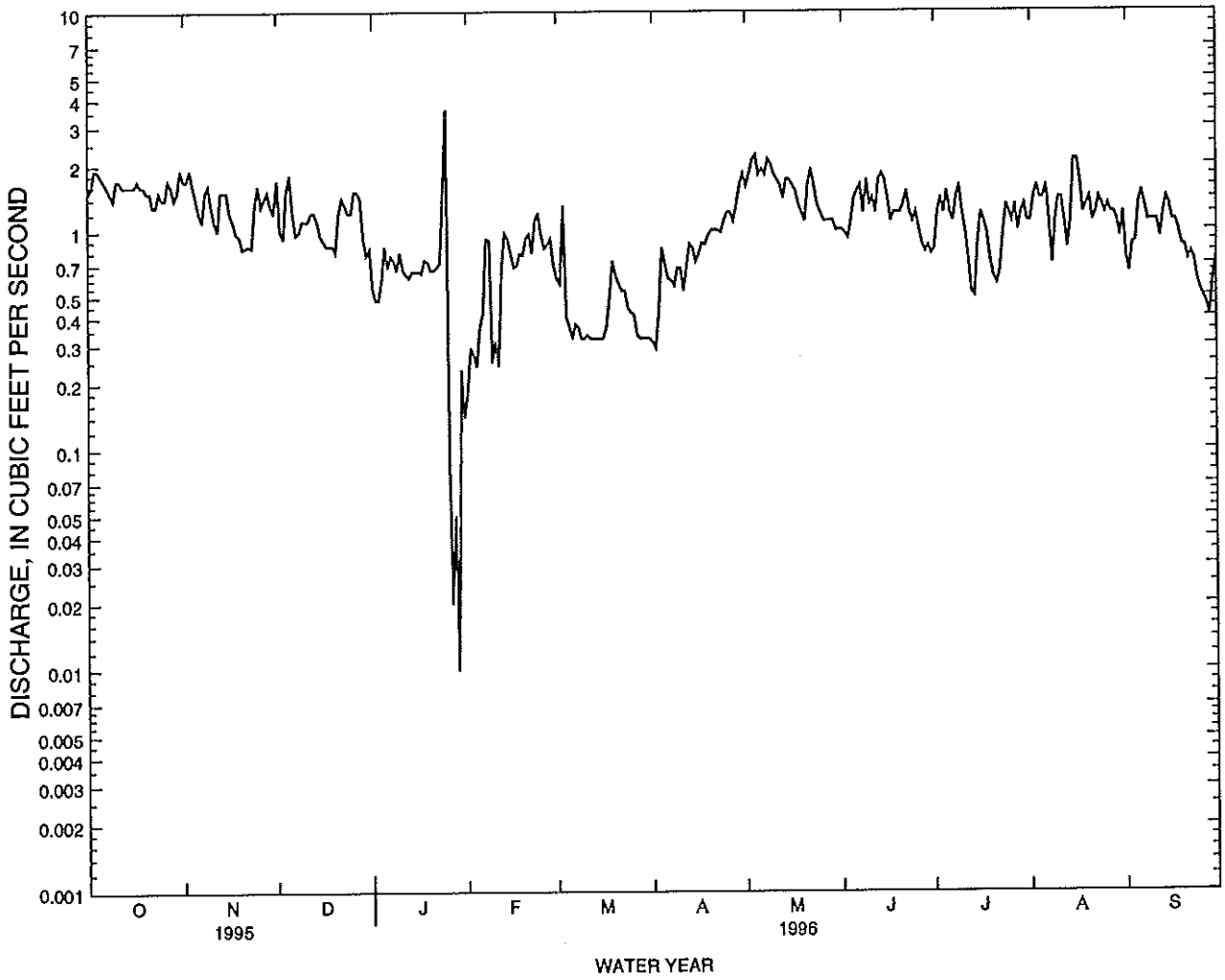
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1996, BY WATER YEAR (WY)

MEAN	2.82	2.44	1.62	1.63	1.46	1.76	2.45	3.00	3.08	2.87	5.15	5.17
MAX	4.36	3.87	3.24	3.22	2.67	3.89	4.07	4.90	4.52	4.02	46.8	47.9
(WY)	1955	1955	1961	1955	1957	1956	1966	1955	1955	1955	1993	1993
MIN	1.44	.93	.026	.000	.000	.097	.39	1.19	1.24	1.05	1.30	.61
(WY)	1995	1965	1968	1968	1968	1968	1963	1965	1996	1996	1996	1968

HAWAII, ISLAND OF OAHU

16250000 MAUNAWILI DITCH NEAR WAIMANALO--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1954 - 1996	
ANNUAL TOTAL	562.59		388.55			
ANNUAL MEAN	1.54		1.06		2.36	
HIGHEST ANNUAL MEAN					3.43	1955
LOWEST ANNUAL MEAN					1.06	1996
HIGHEST DAILY MEAN	2.9	Feb 27	3.6	Jan 25	128	Jul 28 1993
LOWEST DAILY MEAN	.58	Mar 1	.01	Jan 29	.00	Dec 27 1955
ANNUAL SEVEN-DAY MINIMUM	.81	Jul 14	.10	Jan 26	.00	Dec 27 1955
ANNUAL RUNOFF (AC-FT)	1120		771		1710	
10 PERCENT EXCEEDS	2.1		1.6		4.0	
50 PERCENT EXCEEDS	1.5		1.1		2.6	
90 PERCENT EXCEEDS	.96		.41		.57	



HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft upstream from mouth, 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 good. Maunawili ditch diverts 1.5 mi upstream of station for irrigation in vicinity of Waimanalo. Records do not include flow of Maunawili ditch (stations 16249500, 16249900, and 16250000).

AVERAGE DISCHARGE.--40 years (water years 1914-15, 1959-96), 5.11 ft^3/s (3,700 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)
Dec. 01	1200	654	5.84	Jan. 25	0200	2,870	9.77

Minimum discharge, 1.4 ft^3/s September 4, 5, 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	4.2	43	4.3	5.6	5.6	4.3	3.3	3.0	3.6	3.4	12
2	2.2	2.6	9.0	3.7	6.6	6.2	5.3	3.0	3.1	3.9	3.0	4.6
3	1.8	2.4	5.3	3.5	5.3	41	4.7	2.7	3.1	3.4	2.6	3.8
4	1.8	2.5	4.3	3.9	4.5	13	4.8	2.8	2.8	3.9	3.0	3.7
5	1.8	2.3	3.5	7.9	4.1	9.5	6.5	2.9	2.6	8.9	3.0	3.7
6	2.0	2.4	3.3	4.9	3.9	8.3	5.4	4.0	2.7	5.2	3.1	2.8
7	2.1	2.3	3.2	6.5	23	7.6	5.0	3.1	2.7	5.8	3.0	3.1
8	2.6	2.4	2.9	5.6	25	7.0	4.8	4.2	2.7	4.1	3.2	3.0
9	2.3	2.2	2.7	4.4	11	6.6	4.3	3.4	20	3.5	3.0	2.9
10	1.9	2.2	2.6	7.3	11	6.2	4.8	3.0	4.7	3.7	2.8	2.8
11	1.8	2.1	2.6	4.4	7.7	6.0	4.7	3.0	4.9	3.7	3.2	2.7
12	1.9	2.6	2.5	4.0	6.4	5.8	4.4	3.0	4.1	5.3	2.9	2.5
13	1.7	9.2	2.4	2.9	5.5	5.5	4.0	3.0	4.8	4.1	3.3	2.6
14	1.6	5.3	2.6	2.8	5.5	5.2	4.2	2.9	3.3	3.8	3.0	2.4
15	1.7	5.3	2.5	2.8	5.6	4.8	4.2	2.8	3.1	3.6	2.4	2.5
16	1.6	3.6	2.5	2.9	5.5	4.5	4.0	2.9	3.3	3.3	2.3	2.6
17	1.7	3.4	2.5	3.2	5.4	4.6	4.1	2.9	3.4	3.1	2.3	2.6
18	1.8	3.2	2.4	4.7	5.2	4.9	4.2	2.9	3.3	3.5	2.4	2.9
19	1.8	3.1	2.3	4.1	5.0	4.7	3.9	3.0	3.3	3.6	2.2	2.7
20	1.9	2.8	2.3	3.8	4.6	5.2	3.9	3.2	3.6	3.6	2.0	2.9
21	2.0	3.0	2.3	3.7	4.5	4.9	3.9	2.9	3.3	3.5	2.2	2.8
22	2.2	2.8	2.5	3.6	4.4	4.8	e3.7	2.4	3.1	3.5	2.2	2.8
23	2.1	3.1	2.7	4.3	4.1	4.8	3.5	2.6	4.1	3.3	1.9	2.8
24	1.8	2.7	2.6	21	3.8	4.6	3.6	2.9	3.6	2.9	1.9	2.9
25	2.1	2.3	3.4	215	3.9	4.5	3.4	3.1	3.2	3.1	2.1	2.9
26	2.1	2.5	3.7	13	3.9	4.4	3.4	3.1	3.3	3.4	2.2	2.9
27	1.7	2.6	3.3	9.2	6.3	4.2	3.4	3.0	3.4	7.1	2.0	2.9
28	1.9	2.5	2.8	8.8	14	4.3	11	3.1	3.6	4.1	2.0	3.0
29	2.5	2.7	2.6	6.9	6.2	4.3	4.4	3.0	5.4	3.4	2.1	2.9
30	2.0	4.0	5.7	8.0	---	4.2	3.3	3.1	3.9	3.2	2.3	2.6
31	2.9	---	7.6	6.4	---	4.7	---	3.1	---	3.4	27	---
TOTAL	61.7	94.3	143.6	387.5	207.5	211.9	135.1	94.3	121.4	124.5	104.0	97.3
MEAN	1.99	3.14	4.63	12.5	7.16	6.84	4.50	3.04	4.05	4.02	3.35	3.24
MAX	2.9	9.2	43	215	25	41	11	4.2	20	8.9	27	12
MIN	1.6	2.1	2.3	2.8	3.8	4.2	3.3	2.4	2.6	2.9	1.9	2.4
AC-FT	122	187	285	769	412	420	268	187	241	247	206	193

e Estimated

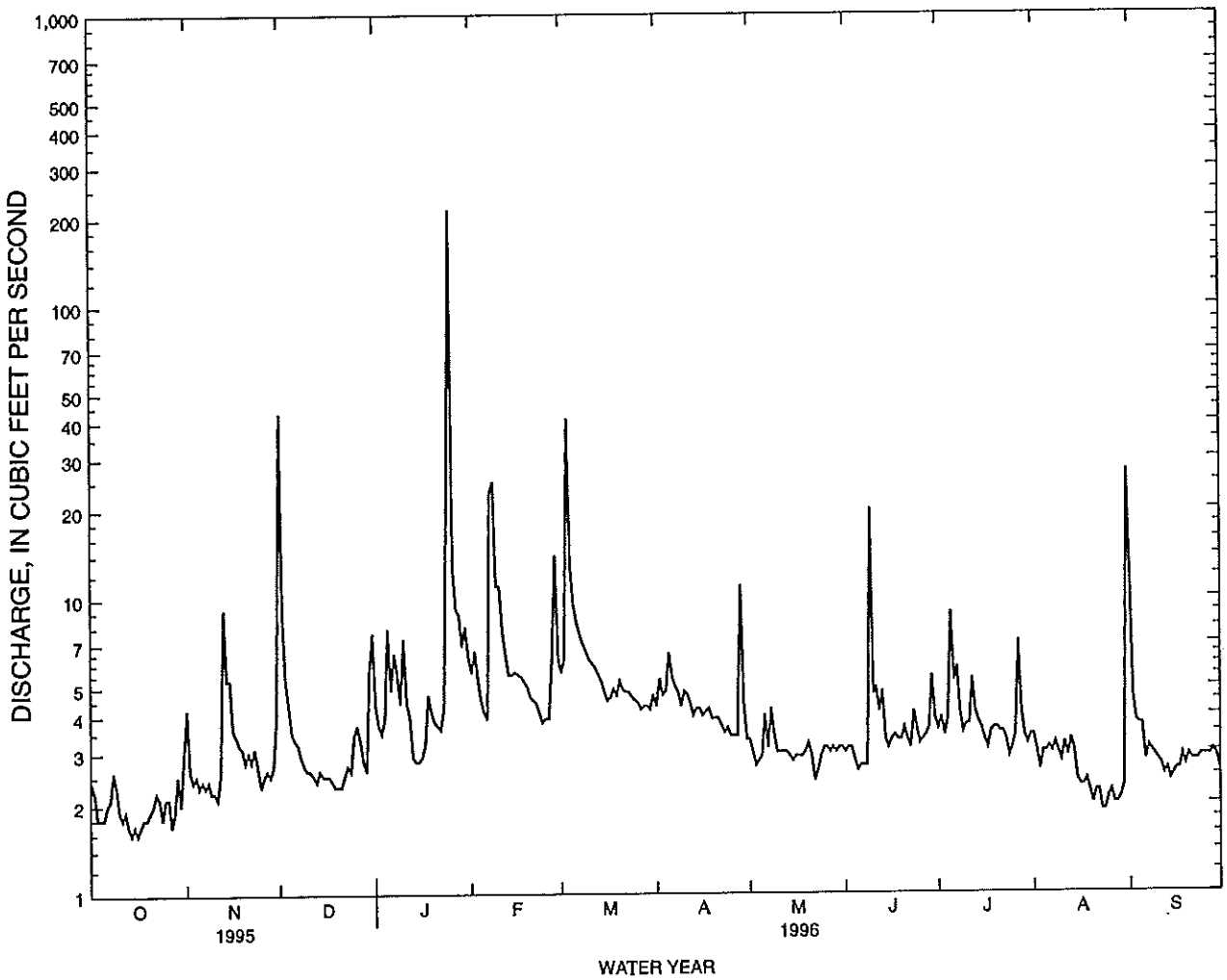
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1996, BY WATER YEAR (WY)

MEAN	3.02	5.50	7.09	8.40	7.17	7.77	6.66	5.33	3.34	2.71	2.58	2.51
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	.99	1.22	1.24	1.11	1.25	1.55	1.40	1.15	1.25	1.18	1.00
(WY)	1976	1963	1978	1973	1978	1978	1973	1973	1973	1959	1984	1975

HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1913 - 1996	
ANNUAL TOTAL	1218.4		1783.1			
ANNUAL MEAN	3.34		4.87		5.11	
HIGHEST ANNUAL MEAN					11.1	1982
LOWEST ANNUAL MEAN					1.31	1973
HIGHEST DAILY MEAN	78	Feb 28	215	Jan 25	518	Dec 31 1987
LOWEST DAILY MEAN	1.5	Jan 21	1.6	Oct 14	.50	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	1.7	Oct 13	1.7	Oct 13	.67	Sep 8 1964
ANNUAL RUNOFF (AC-FT)	2420		3540		3700	
10 PERCENT EXCEEDS	4.2		6.4		8.8	
50 PERCENT EXCEEDS	2.7		3.3		2.8	
90 PERCENT EXCEEDS	1.9		2.2		1.4	



HAWAII, ISLAND OF OAHU

16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA

LOCATION.--Lat 21°22′51″, long 157°45′48″, Hydrologic Unit 20060000, on right bank at downstream side of bridge on Highway 61, 0.6 mi west of Maunawili School, and 1.6 mi southwest of Kailua Post Office.

DRAINAGE AREA.--5.34 mi^2.

PERIOD OF RECORD.--Water years 1922, 1956-62, 1965-67 (low-flow measurements); water years 1958-67, 1971-91 (annual maximum); daily record January 1967 to October 1971, April 1991 to January 1996 (discontinued).

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

REMARKS.--Records good. Maunawili ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo. Records of chemical analyses and suspended sediment loads were published during the water years 1969-71, and 1967-71 respectively.

AVERAGE DISCHARGE.--9 years (water years 1968-71, 1992-96), 15.0 ft^3/s (10,830 acre-ft/yr)

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,690 ft^3/s, February 4, 1965, gage height, 15.62 ft (site and datum then in use), from rating curve extended above 700 ft^3/s on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft^3/s, October 12, 13, 1991.

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)
Dec. 01	1300	*1,070	7.77	No peaks greater than base discharge.			

Minimum discharge, 3.0 ft^3/s, November 10, 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	31	121	11	---	---	---	---	---	---	---	---
2	4.7	6.1	40	8.8	---	---	---	---	---	---	---	---
3	3.8	8.2	24	---	---	---	---	---	---	---	---	---
4	3.7	7.2	18	---	---	---	---	---	---	---	---	---
5	3.7	5.1	14	---	---	---	---	---	---	---	---	---
6	4.6	4.8	13	---	---	---	---	---	---	---	---	---
7	4.7	4.8	13	---	---	---	---	---	---	---	---	---
8	7.3	5.5	11	---	---	---	---	---	---	---	---	---
9	5.6	4.1	11	---	---	---	---	---	---	---	---	---
10	4.7	3.1	10	---	---	---	---	---	---	---	---	---
11	4.4	3.2	9.3	---	---	---	---	---	---	---	---	---
12	4.5	3.8	8.6	---	---	---	---	---	---	---	---	---
13	4.1	34	8.4	---	---	---	---	---	---	---	---	---
14	3.9	20	8.3	---	---	---	---	---	---	---	---	---
15	4.1	21	7.7	---	---	---	---	---	---	---	---	---
16	4.2	14	7.1	---	---	---	---	---	---	---	---	---
17	3.6	14	7.1	---	---	---	---	---	---	---	---	---
18	3.7	11	6.9	---	---	---	---	---	---	---	---	---
19	3.6	9.3	6.6	---	---	---	---	---	---	---	---	---
20	4.1	8.8	6.6	---	---	---	---	---	---	---	---	---
21	4.7	11	6.1	---	---	---	---	---	---	---	---	---
22	4.6	8.0	5.0	---	---	---	---	---	---	---	---	---
23	4.3	7.3	5.1	---	---	---	---	---	---	---	---	---
24	3.6	6.6	4.9	---	---	---	---	---	---	---	---	---
25	4.6	5.7	7.3	---	---	---	---	---	---	---	---	---
26	5.2	6.1	8.5	---	---	---	---	---	---	---	---	---
27	4.1	7.0	7.7	---	---	---	---	---	---	---	---	---
28	4.3	5.7	5.1	---	---	---	---	---	---	---	---	---
29	8.7	5.4	5.3	---	---	---	---	---	---	---	---	---
30	5.8	11	13	---	---	---	---	---	---	---	---	---
31	14	---	20	---	---	---	---	---	---	---	---	---
TOTAL	152.3	292.8	439.6	---	---	---	---	---	---	---	---	---
MEAN	4.91	9.76	14.2	---	---	---	---	---	---	---	---	---
MAX	14	34	121	---	---	---	---	---	---	---	---	---
MIN	3.6	3.1	4.9	---	---	---	---	---	---	---	---	---
AC-FT	302	581	872	---	---	---	---	---	---	---	---	---

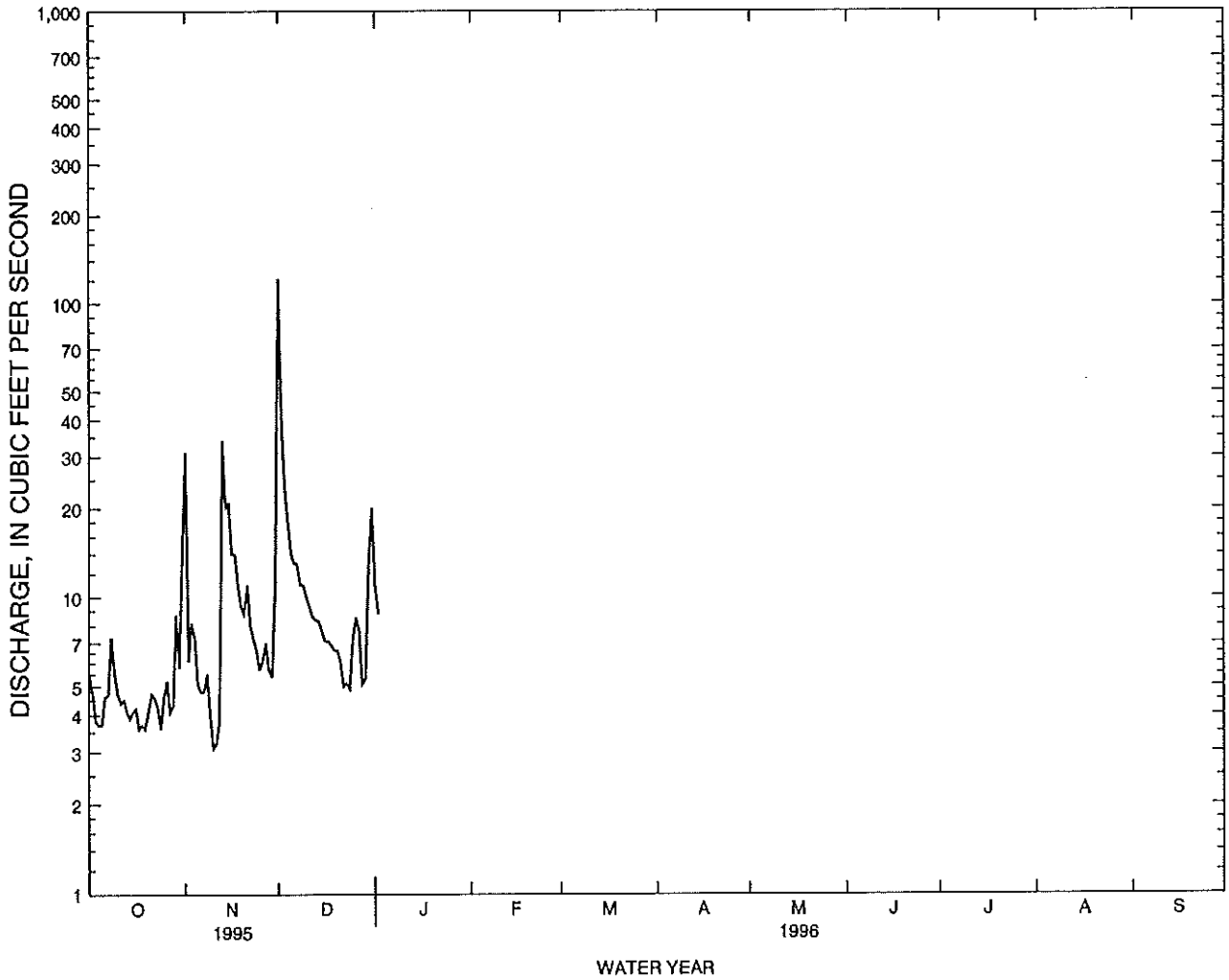
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1996, BY WATER YEAR (WY)

MEAN	10.7	17.7	24.9	22.3	22.4	25.8	16.4	9.38	7.34	6.77	7.18	7.79
MAX	19.8	47.6	78.2	41.1	60.6	72.9	40.3	15.1	12.5	9.90	21.0	16.9
(WY)	1993	1971	1968	1969	1969	1968	1968	1968	1971	1967	1967	1967
MIN	4.91	5.59	5.45	5.61	9.79	5.84	4.45	3.85	3.04	5.55	4.63	4.38
(WY)	1996	1995	1995	1995	1993	1993	1993	1993	1993	1970	1994	1995

HAWAII, ISLAND OF OAHU

16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		WATER YEARS 1967 - 1996	
ANNUAL TOTAL	3257.2			
ANNUAL MEAN	8.92		15.0	
HIGHEST ANNUAL MEAN			26.0	1968
LOWEST ANNUAL MEAN			8.32	1995
HIGHEST DAILY MEAN	213	Feb 28	875	Dec 18 1967
LOWEST DAILY MEAN	3.1	Nov 10	2.3	Jun 24 1993
ANNUAL SEVEN-DAY MINIMUM	3.6	Sep 21	2.5	Jun 22 1993
ANNUAL RUNOFF (AC-FT)	6460		10830	
10 PERCENT EXCEEDS	14		26	
50 PERCENT EXCEEDS	6.3		7.9	
90 PERCENT EXCEEDS	4.1		4.3	



HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE

LOCATION.--Lat 21°23′22″, long 157°47′44″, Hydrologic Unit 20060000, on left bank, 0.3 mi south of Hawaiian Memorial Park cemetery, 1.0 mi northwest of Pali Golf Course, and 1.3 mi south of Castle High School.

DRAINAGE AREA.--1.11 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 210 ft above mean sea level, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--13 years (water years 1984-96), 1.47 ft^3/s (1,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,800 ft^3/s, January 25, 1996, gage height, 11.64 ft from rating curve extended above 100 ft^3/s on basis of slope-area computation; minimum, 0.03 ft^3/s for several days in November, December 1984 and January 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 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	0145	2,800	11.64	Jun. 09	1500	605	8.55

Minimum discharge, 0.10 ft^3/s, October 13, 17-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	7.6	12	.42	e.32	.44	.38	.55	.68	.52	.49	1.0
2	.26	.17	.46	.34	e.40	9.0	.46	.56	.65	.59	.48	.40
3	.26	.29	.24	.25	e.29	29	.34	.71	.67	.64	.48	.41
4	.24	.17	.22	.51	e.27	1.2	.36	.56	.72	.62	.48	.47
5	.34	.16	.25	4.7	e.23	.58	.46	.58	.67	4.4	.54	2.1
6	.41	.12	.27	.40	e.23	.48	.39	.63	.83	2.2	.61	.47
7	.79	.11	.33	2.0	e5.7	.50	.37	.79	.74	.92	.55	.42
8	.85	.29	.26	.58	6.4	.43	.40	.74	.65	.53	.55	.44
9	.27	.33	.29	.32	.56	.44	.41	.66	21	.54	.48	.42
10	.36	.33	.26	1.8	.53	.44	.48	.54	.94	.50	.55	.43
11	.29	.42	.23	.33	.42	.47	.50	.55	.73	.58	.53	.53
12	.14	.44	.21	.26	.41	.44	.52	.55	.52	.72	.33	.43
13	.10	3.0	.19	.19	.40	.44	.51	.54	.56	.53	.36	.46
14	.12	.83	.18	.24	.38	.38	.48	.54	.53	.51	.32	.46
15	.11	.44	.16	.22	.35	.38	.52	.48	.56	.54	.34	.44
16	.11	.25	.18	.18	.35	.46	.47	.54	.60	.51	.34	.41
17	.10	.22	.19	.19	.36	.40	.46	.46	.71	.42	.35	.43
18	.10	.39	.20	.65	.35	.40	.55	.48	.69	.43	.35	.46
19	.12	.25	.22	.47	.32	.38	.45	.48	.51	.51	.38	.42
20	.12	.43	.17	.26	.31	.44	.44	.71	.52	.58	.35	.45
21	.14	.33	.17	.26	.36	.42	.46	.51	.56	.49	.36	.48
22	.11	.22	.14	.26	.43	.44	.40	.51	.61	.96	.37	.53
23	.11	.18	.16	1.3	.44	.46	.38	.58	1.3	.49	.39	.49
24	.12	.19	.17	14	.45	.45	.35	.60	.49	.48	.40	.93
25	.16	.27	1.5	162	.44	.45	.37	.65	.57	.52	.45	.43
26	.16	.27	.53	.94	.56	.44	.38	.62	.57	.58	.42	.44
27	.11	.63	.42	6.9	5.3	.45	.42	.61	.61	6.8	.45	.42
28	.57	.27	.43	2.8	6.7	.42	7.7	.72	.65	.45	.43	.48
29	.16	.19	.52	.30	.38	.52	.65	.75	2.5	.42	.46	.49
30	.14	1.0	6.0	2.6	---	.45	.58	.63	.64	.48	.49	.51
31	2.0	---	5.4	.59	---	1.9	---	.62	---	.47	11	---
TOTAL	9.04	19.79	31.95	206.26	33.64	53.10	20.64	18.45	41.98	28.93	24.08	16.25
MEAN	.29	.66	1.03	6.65	1.16	1.71	.69	.60	1.40	.93	.78	.54
MAX	2.0	7.6	12	162	6.7	29	7.7	.79	21	6.8	11	2.1
MIN	.10	.11	.14	.18	.23	.38	.34	.46	.49	.42	.32	.40
AC-FT	18	39	63	409	67	105	41	37	83	57	48	32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1996, BY WATER YEAR (WY)

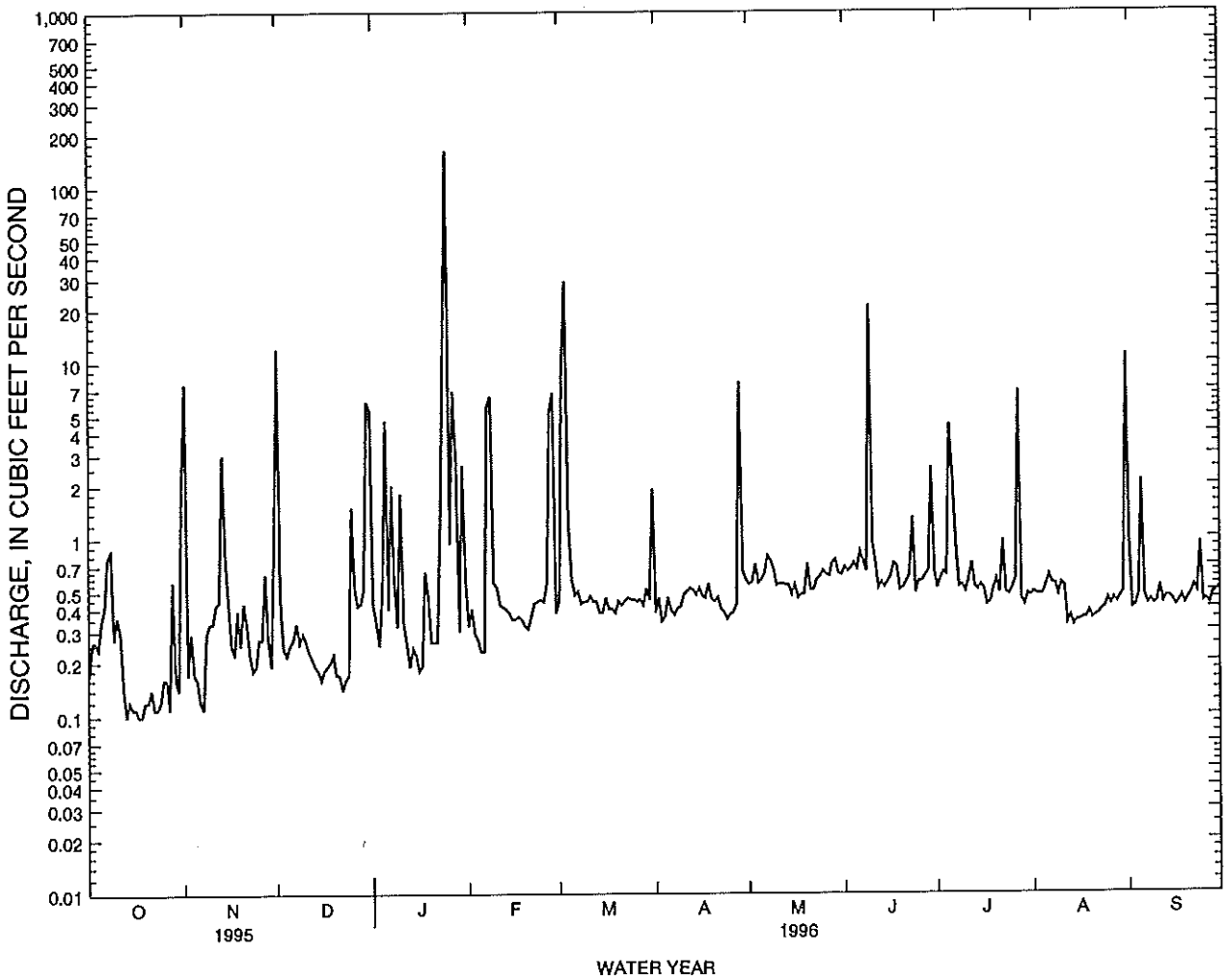
MEAN	1.06	2.26	2.43	1.73	2.25	2.15	1.72	.90	.82	.75	.57	.98
MAX	2.21	9.43	15.0	6.65	5.56	8.83	11.9	1.95	2.17	1.92	1.10	4.36
(WY)	1990	1987	1988	1996	1994	1991	1989	1988	1989	1989	1989	1986
MIN	.29	.12	.26	.18	.44	.26	.34	.33	.20	.18	.14	.11
(WY)	1996	1985	1994	1985	1984	1995	1992	1984	1995	1984	1984	1984

HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1983 - 1996	
ANNUAL TOTAL	224.28		504.11			
ANNUAL MEAN	.61		1.38		1.47	
HIGHEST ANNUAL MEAN					2.84	1989
LOWEST ANNUAL MEAN					.33	1984
HIGHEST DAILY MEAN	34	Feb 27	162	Jan 25	177	Dec 31 1987
LOWEST DAILY MEAN	.10	Sep 26	.10	Oct 13	.03	Nov 16 1984
ANNUAL SEVEN-DAY MINIMUM	.11	Oct 13	.11	Oct 13	.04	Nov 15 1984
ANNUAL RUNOFF (AC-FT)	445		1000		1070	
10 PERCENT EXCEEDS	.48		.95		1.7	
50 PERCENT EXCEEDS	.22		.45		.54	
90 PERCENT EXCEEDS	.14		.19		.23	

e Estimated



HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

REMARKS.--Water-quality samples also were collected at this site. Record of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
11...	1610	0.15	194	6.6	25.0	23.5	1.2	759	4.1	49	--
NOV											
21...	1510	0.21	196	6.7	25.0	24.0	1.7	756	3.5	42	--
DEC											
12...	1220	0.27	250	6.7	24.0	23.0	1.8	763	4.2	49	2800
JAN											
18...	0940	0.45	150	6.8	21.5	21.5	22	761	5.4	61	--
FEB											
20...	1030	0.33	250	6.7	20.5	21.0	1.7	761	5.3	60	1300
MAR											
06...	1305	0.48	240	6.6	23.0	22.5	0.50	755	5.2	61	--
APR											
24...	1322	0.38	234	6.8	26.5	24.5	0.70	763	5.7	68	--
MAY											
15...	1240	0.43	202	6.7	25.5	23.5	1.4	762	5.5	65	4000

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC											
12...	1220	76	15	9.3	18	34	0.9	1.4	74	12	21

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
12...	1220	<0.10	23	142	146	0.19	<1	0.400	0.400	<0.20	<0.010
FEB											
20...	1030	--	--	--	--	--	4	0.510	0.510	<0.20	0.010
MAY											
15...	1240	--	--	--	--	--	1	0.500	0.500	<0.20	0.030

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
DEC											
12...	1220	20	<10	<1	<100	14	<10	<1	<1	<1	<3.0

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
DEC 12...	<1	510	110	<1	<10	<4	240	220	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
DEC 12...	2	<1.0	<1	<1	<1	<1.0	110	<6	<10	1.6	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
DEC 12...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	ENDO-SULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
DEC 12...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 12...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE

LOCATION.--Lat 21°23'42", long 157°48'44", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from mouth, 1.4 mi southwest of Castle High School, and 1.9 mi south of Kaneohe Post Office.

DRAINAGE AREA.--0.44 mi^2.

PERIOD OF RECORD.--1960-63 (low-flow measurements), 1965-71, 1971-84 (annual maximum), April 1984 to current year.

GAGE.--Water-stage recorder and wooden control. Elevation of gage is 220 ft above mean sea level from topographic map (revised). Prior to April 1984, the station was located 400 ft upstream.

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

AVERAGE DISCHARGE.--16 years (water years 1968-71, 1985-96), 1.40 ft^3/s (1,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 957 ft^3/s, January 25, 1996 on the basis of slope-area measurement at gage height 4.10 ft; minimum, 0.03 ft^3/s on many days 1984-85.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0215	*957	*4.10	Jun. 09	1545	378	2.86
Jan. 27	2100	599	3.42				

Minimum discharge, 0.14 ft^3/s, September 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	9.5	2.9	2.0	1.1	1.6	1.2	.65	1.1	.83	.81	2.1
2	1.2	1.2	1.6	1.9	1.2	2.9	1.2	.77	1.0	.90	.82	1.4
3	1.1	1.1	1.6	1.8	1.2	8.9	1.1	.75	.96	.88	.82	1.3
4	1.0	1.1	1.5	1.8	1.2	1.8	1.2	.75	.97	.91	.80	1.0
5	1.1	1.0	1.5	2.3	1.1	1.8	1.3	.65	1.0	1.6	.72	1.4
6	1.1	1.0	1.4	1.3	1.2	2.0	1.2	.73	.98	1.7	.75	1.2
7	1.6	1.1	1.2	1.7	4.2	1.8	1.2	.81	1.2	1.1	.77	1.2
8	1.4	2.4	1.2	1.4	1.2	1.5	1.0	.92	1.1	.98	.71	1.2
9	1.5	2.6	1.3	1.7	1.1	1.6	1.1	1.0	16	.99	.75	.91
10	1.2	1.6	1.2	2.5	1.0	1.7	1.1	.93	1.4	.89	.71	.97
11	1.1	1.5	1.2	1.5	.86	1.5	1.1	.92	1.4	.85	.95	.99
12	.95	1.5	1.2	1.3	1.0	1.5	1.3	.81	1.1	.82	.74	.93
13	.94	4.3	1.3	1.3	1.3	1.6	.94	.72	1.0	.78	.77	.90
14	1.3	2.3	1.1	1.2	1.3	1.6	.93	.91	1.0	.74	.74	.91
15	1.3	2.0	1.1	1.4	1.3	1.5	.94	.82	.94	.81	.72	.86
16	1.3	1.6	1.2	1.3	1.3	1.5	.84	.91	.86	.80	.81	.92
17	1.2	2.0	1.1	1.4	1.5	1.5	.89	1.0	.92	.78	.76	.86
18	1.3	1.8	1.1	1.4	1.4	1.5	.97	.92	1.1	.94	.78	.87
19	1.2	1.7	1.1	1.5	1.2	1.5	.97	.78	.88	1.1	.73	.84
20	1.4	1.7	1.1	1.3	1.2	1.3	.86	.99	.99	.88	.78	.82
21	1.4	1.7	1.1	1.3	1.6	1.2	.98	1.1	.93	.87	.81	.76
22	1.3	1.7	1.2	1.3	1.3	1.2	.94	.91	.97	.93	.77	.78
23	1.1	1.7	1.2	1.5	1.4	1.2	.87	.82	1.8	.81	.74	.73
24	1.0	1.6	1.2	1.9	.90	1.2	.87	1.1	1.0	.78	.71	.83
25	1.3	1.7	1.2	e32	1.0	1.0	.85	1.2	.97	.72	.77	.71
26	1.1	1.7	1.2	1.7	1.1	1.1	.80	1.4	.87	.78	.75	.71
27	1.2	1.7	1.3	12	2.1	1.1	.78	1.2	.88	1.5	.70	.70
28	1.5	1.7	1.3	1.9	2.8	1.1	1.6	1.3	.91	1.1	.74	.65
29	1.2	1.6	1.1	1.3	1.6	1.0	.92	1.1	1.5	.99	.72	.70
30	1.2	2.1	2.9	1.3	---	1.1	.75	1.0	.93	.96	.69	.72
31	1.8	---	2.6	1.1	---	1.4	---	1.1	---	.83	6.8	---
TOTAL	38.69	60.2	43.2	89.3	40.66	53.2	30.70	28.97	46.66	29.55	29.64	28.87
MEAN	1.25	2.01	1.39	2.88	1.40	1.72	1.02	.93	1.56	.95	.96	.96
MAX	1.8	9.5	2.9	32	4.2	8.9	1.6	1.4	16	1.7	6.8	2.1
MIN	.94	1.0	1.1	1.1	.86	1.0	.75	.65	.86	.72	.69	.65
AC-FT	77	119	86	177	81	106	61	57	93	59	59	57

e Estimated

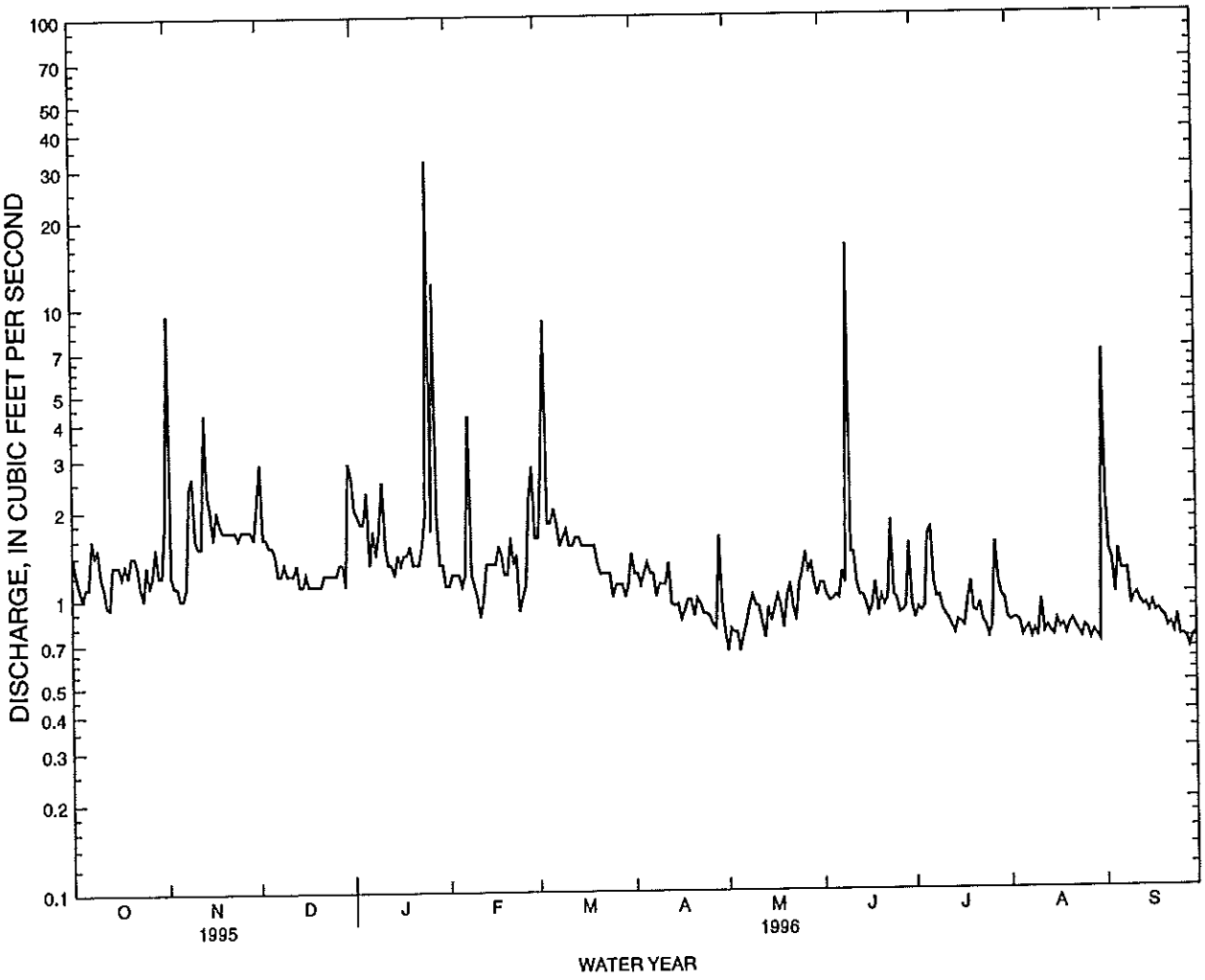
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1996, BY WATER YEAR (WY)

MEAN	1.08	1.58	1.78	1.64	1.62	1.72	1.52	1.18	1.05	1.14	1.08	1.07
MAX	2.30	3.57	4.10	3.02	4.92	3.78	3.67	2.07	1.89	2.12	2.39	2.21
(WY)	1992	1971	1988	1969	1969	1968	1989	1969	1971	1994	1991	1994
MIN	.089	.12	.26	.16	.17	.63	.39	.34	.23	.16	.14	.14
(WY)	1985	1985	1986	1986	1986	1985	1984	1984	1984	1984	1985	1984

HAWAII, ISLAND OF OAHU

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1967 - 1996	
ANNUAL TOTAL	564.03		519.64			
ANNUAL MEAN	1.55		1.42		1.40	
HIGHEST ANNUAL MEAN					2.13	1969
LOWEST ANNUAL MEAN					.41	1986
HIGHEST DAILY MEAN	9.5	Nov 1	32	Jan 25	67	Feb 1 1969
LOWEST DAILY MEAN	.54	Jul 13	.65	May 1	.03	Oct 14 1988
ANNUAL SEVEN-DAY MINIMUM	.80	Jul 11	.72	Sep 24	.07	Nov 18 1984
ANNUAL RUNOFF (AC-FT)	1120		1030		1010	
10 PERCENT EXCEEDS	2.1		1.7		2.1	
50 PERCENT EXCEEDS	1.5		1.1		1.1	
90 PERCENT EXCEEDS	1.0		.77		.32	



HAWAII, ISLAND OF OAHU

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1984 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: April 1984 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since April 1984.

REMARKS.--Water-quality samples also were collected at this site. Record of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
11...	1445	1.1	148	6.9	26.0	20.5	1.9	759	8.1	91	--
NOV											
21...	1150	1.6	145	7.5	29.0	20.5	0.90	757	9.3	104	--
DEC											
11...	1015	1.2	157	7.7	24.0	20.0	2.3	762	8.8	97	940
JAN											
17...	1215	1.3	157	7.7	25.5	20.0	2.2	759	8.8	97	--
FEB											
20...	1235	1.0	180	7.7	20.0	18.5	0.30	760	9.2	98	550
MAR											
05...	0930	1.9	187	7.0	22.5	19.5	0.40	759	8.5	93	--
APR											
24...	1040	0.89	155	7.4	27.0	21.0	0.10	762	8.6	97	--
MAY											
14...	1340	1.1	158	7.6	25.5	22.0	0.30	761	8.8	101	1000

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC											
11...	1015	45	8.9	5.5	12	36	0.8	1.0	49	3.6	15

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
11...	1015	<0.10	29	103	105	0.14	<1	0.170	0.170	<0.20	0.040
FEB											
20...	1235	--	--	--	--	--	1	0.110	0.110	<0.20	0.030
MAY											
14...	1340	--	--	--	--	--	2	0.080	0.080	<0.20	0.020

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
DEC 11...	1015	170	10	<1	<100	<2.0	<10	<1	2	<1	<3.0

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
DEC 11...	<1	250	23	<1	<10	<4	30	6.0	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
DEC 11...	<1	<1.0	<1	<1	<1	<1.0	53	6	<10	0.80	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UO/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
DEC 11...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	ENDO-SULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
DEC 11...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 11...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", 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 good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--19 years (water years 1978-96), 11.0 ft^3/s (7,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft^3/s, December 31, 1987, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.25 ft^3/s on several days in October 1984.

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)
Jan. 25	0315	*1,760	*5.87				

Minimum discharge, 1.0 ft^3/s, December 18, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	62	31	7.7	8.7	8.9	8.4	6.8	6.0	5.9	5.6	28
2	5.2	8.4	12	6.8	10	31	8.0	6.7	6.0	5.9	5.6	8.9
3	5.0	7.1	8.3	6.3	8.9	101	7.8	6.7	5.8	5.9	6.0	7.5
4	4.8	7.5	7.7	7.3	8.0	20	7.7	6.9	5.9	5.9	6.1	7.1
5	4.7	5.8	7.1	19	7.8	14	8.3	6.4	5.9	16	5.7	18
6	5.1	5.3	7.0	9.2	7.8	12	7.8	6.1	6.3	11	5.8	10
7	7.7	4.9	7.7	15	26	11	7.6	6.5	6.8	14	5.8	10
8	10	9.6	7.0	13	24	11	7.1	7.1	6.2	6.6	5.2	9.6
9	6.1	11	7.2	9.1	11	11	7.0	7.0	73	6.4	5.3	7.8
10	5.5	8.3	6.5	17	8.7	10	7.3	6.3	16	5.6	6.0	7.4
11	5.3	6.2	6.3	8.9	7.5	10	7.7	6.3	8.2	5.6	7.2	8.7
12	5.2	6.0	6.6	7.9	7.5	9.8	7.8	6.3	7.0	6.3	5.6	7.6
13	4.7	24	8.0	7.6	7.7	9.7	6.9	6.3	8.3	5.8	5.7	7.3
14	4.9	16	7.3	7.3	7.8	9.4	6.7	6.3	6.0	5.7	5.3	6.9
15	4.9	12	6.8	7.3	7.6	9.3	6.7	6.2	5.6	5.6	4.9	6.3
16	4.8	8.5	6.6	7.2	7.3	9.2	6.4	6.0	5.6	6.1	5.1	6.5
17	4.5	8.1	8.6	7.2	7.6	9.2	6.5	6.0	5.7	5.8	5.0	6.4
18	4.4	8.9	18	8.3	7.4	9.0	7.5	6.0	7.0	6.2	4.8	6.8
19	4.0	7.4	1.5	8.8	6.9	8.7	7.2	6.0	5.6	7.0	4.8	6.5
20	4.5	8.3	1.5	7.1	6.7	9.5	6.5	6.6	5.9	5.9	4.7	6.8
21	4.5	8.9	1.5	6.9	7.1	9.2	7.2	6.7	5.5	5.6	4.7	6.5
22	3.8	7.7	4.8	6.7	7.0	8.7	6.6	6.1	5.6	6.1	4.7	6.3
23	3.7	7.2	6.0	11	6.9	8.5	6.3	5.8	11	5.4	4.7	6.3
24	3.3	6.8	5.9	28	6.5	8.2	6.3	6.3	6.7	5.3	4.5	8.6
25	3.8	6.6	7.1	399	6.6	8.1	6.3	7.2	5.6	5.2	4.6	6.7
26	4.5	6.4	8.6	18	8.0	8.0	6.3	7.3	5.4	5.6	4.7	6.4
27	4.1	7.9	6.1	31	17	7.7	7.8	6.5	5.3	19	4.7	6.3
28	4.7	7.1	5.8	30	26	7.4	29	6.7	5.3	8.2	4.5	5.9
29	6.7	6.3	5.6	11	9.6	7.5	12	7.0	11	6.1	4.5	6.0
30	4.8	9.9	14	11	---	7.8	7.5	6.3	8.4	6.0	4.5	6.1
31	12	---	20	11	---	11	---	6.3	---	5.9	54	---
TOTAL	163.2	310.1	258.1	751.6	289.6	415.8	242.2	200.7	272.6	221.6	210.3	249.2
MEAN	5.26	10.3	8.33	24.2	9.99	13.4	8.07	6.47	9.09	7.15	6.78	8.31
MAX	12	62	31	399	26	101	29	7.3	73	19	54	28
MIN	3.3	4.9	1.5	6.3	6.5	7.4	6.3	5.8	5.3	5.2	4.5	5.9
AC-FT	324	615	512	1490	574	825	480	398	541	440	417	494

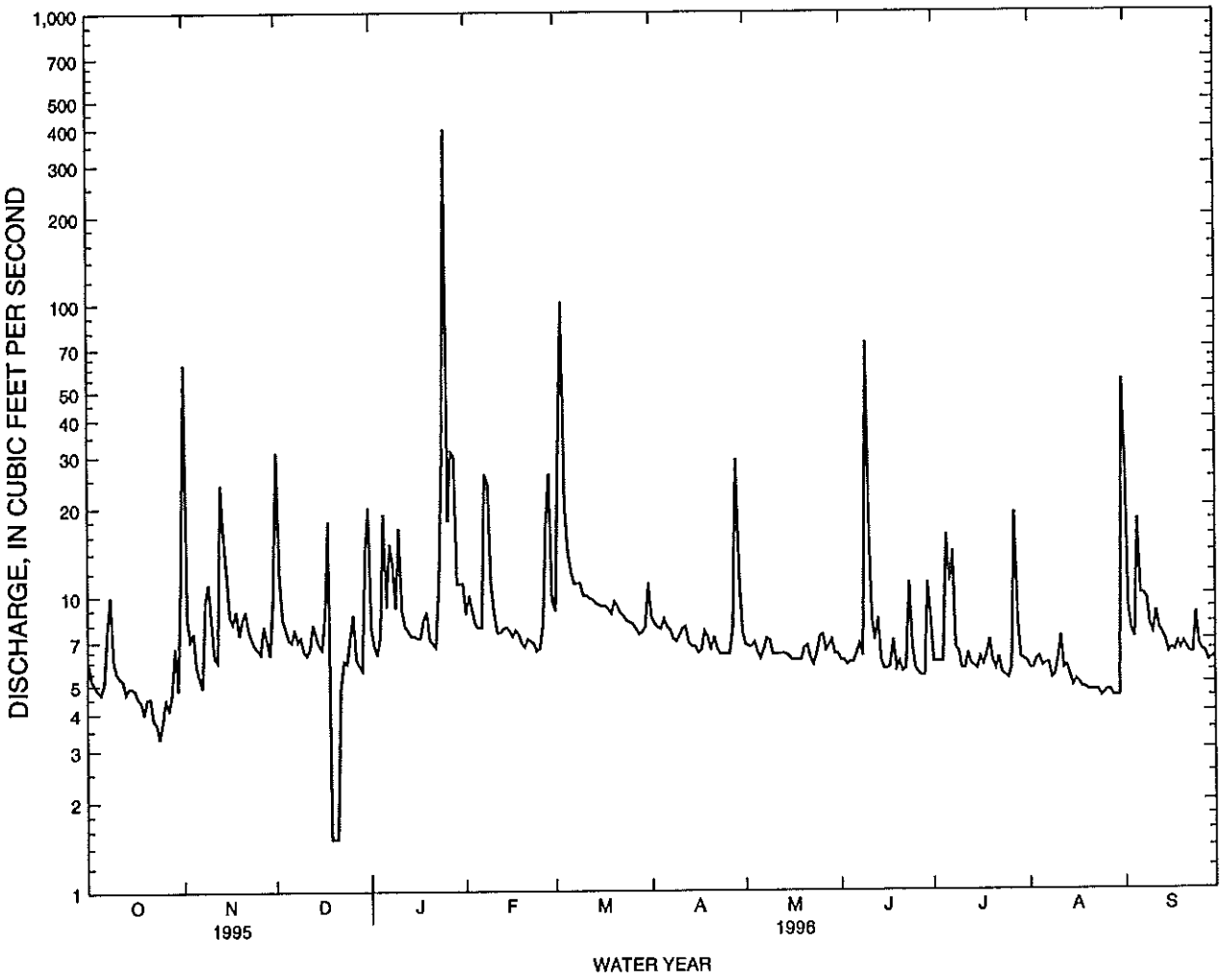
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1996, BY WATER YEAR (WY)

MEAN	8.37	11.0	12.7	15.4	12.9	13.9	12.6	10.7	9.07	8.10	7.65	7.57
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	3.90	4.56	4.05	3.83	4.03	5.32	4.53	3.59	3.19	2.91	2.94
(WY)	1985	1985	1978	1977	1978	1978	1985	1984	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1977 - 1996	
ANNUAL TOTAL	2654.1		3585.0			
ANNUAL MEAN	7.27		9.80		11.0	
HIGHEST ANNUAL MEAN					22.0	1982
LOWEST ANNUAL MEAN					4.36	1984
HIGHEST DAILY MEAN	64	Feb 28	399	Jan 25	723	Jan 1 1988
LOWEST DAILY MEAN	1.5	Dec 19	1.5	Dec 19	.29	Oct 10 1984
ANNUAL SEVEN-DAY MINIMUM	3.8	Aug 29	3.9	Oct 19	.30	Oct 10 1984
ANNUAL RUNOFF (AC-FT)	5260		7110		7990	
10 PERCENT EXCEEDS	9.2		12		17	
50 PERCENT EXCEEDS	6.1		6.9		7.4	
90 PERCENT EXCEEDS	4.7		4.9		4.5	



HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: November 1976 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since November 1976.

REMARKS.--Water-quality samples also were collected at this site. Table of "Sediment discharge, suspended (tons/day)" for water years 1995 and 1996 was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
WATER YEAR 1994:
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L, March 18, 1980; minimum daily mean, 1 mg/L on several days in 1988, 1990, 1991, 1994.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons, March 18, 1980; minimum daily, 0.01 ton, October 9-11, 1981, Aug. 13, 1993.

EXTREMES FOR CURRENT YEAR.--
WATER YEAR 1994:
SEDIMENT CONCENTRATIONS: Maximum daily mean, 158 mg/L, March 24; minimum daily mean, 1 mg/L, April 25, May 2, 3, 7, 8.
SEDIMENT DISCHARGE: Maximum daily, 231 tons, March 24; minimum daily, 0.03 ton, May 3, 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
11...	1020	5.4	180	8.0	27.5	24.5	1.6	761	9.0	108	--
NOV											
21...	1040	9.0	175	8.0	25.5	24.0	3.4	759	9.0	107	--
DEC											
12...	1000	6.7	182	8.0	24.0	23.5	2.5	764	8.8	103	250
JAN											
17...	1015	6.9	180	8.0	24.5	23.0	0.90	758	8.8	103	--
FEB											
20...	1040	7.2	180	7.9	21.0	19.5	2.1	765	8.3	90	50
MAR											
05...	1330	14	174	6.5	25.5	22.5	6.0	755	8.6	100	--
APR											
24...	1520	6.4	215	7.2	27.5	27.0	0.70	763	7.9	99	--
MAY											
14...	1100	6.0	198	8.1	27.0	26.0	0.60	765	9.1	112	100

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC											
12...	1000	54	8.9	7.7	13	34	0.8	1.4	54	6.5	18

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
12...	1000	<0.10	22	106	111	0.14	4	0.280	0.280	<0.20	0.010
FEB											
20...	1040	--	--	--	--	--	8	0.320	0.320	<0.20	0.020
MAY											
14...	1100	--	--	--	--	--	1	0.320	0.320	0.20	0.030

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)	COBALT, DISSOLVED (UG/L AS CO) (01035)
DEC 12...	1000	160	10	<1	<100	5.0	<10	<1	1	<1	<3.0

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
DEC 12...	2	320	79	<1	<10	<4	70	11	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
DEC 12...	2	<1.0	<1	<1	<1	<1.0	74	<6	<10	1.9	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TECHNICAL TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DBF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
DEC 12...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	ENDOSULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
DEC 12...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 12...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	5.2	e7	.10	7.9	9	.21	6.7	e8	.14
2	4.8	e7	.09	7.4	5	.10	6.3	e8	.13
3	4.6	e7	.08	28	19	2.8	6.0	e8	.12
4	4.8	e7	.08	18	18	.98	6.3	e7	.13
5	4.8	e6	.08	9.2	8	.20	6.0	e7	.12
6	4.8	e6	.08	7.7	6	.12	5.5	e7	.11
7	4.5	e6	.08	7.2	6	.12	5.6	8	.13
8	4.2	e6	.07	9.2	7	.17	5.3	14	.20
9	4.2	e6	.07	7.8	7	.15	5.6	8	.12
10	5.0	e8	.11	7.7	8	.17	5.2	e7	.09
11	4.3	e6	.07	7.8	10	.21	5.1	e6	.08
12	4.2	e6	.07	7.5	7	.15	5.7	e6	.10
13	4.2	e6	.07	7.3	11	.21	6.2	e6	.09
14	6.0	e7	.13	7.2	12	.24	6.0	e6	.10
15	9.8	e17	.50	7.4	11	.21	5.6	8	.11
16	5.4	9	.13	7.4	10	.19	5.7	e9	.14
17	5.0	e7	.10	7.1	14	.26	6.2	9	.15
18	5.5	e7	.12	6.9	11	.21	6.2	5	.09
19	9.7	e10	.33	6.6	10	.17	5.9	6	.09
20	7.8	e6	.14	6.4	9	.16	5.6	e7	.11
21	5.3	e6	.09	6.1	9	.15	6.1	e4	.11
22	5.0	e7	.10	6.3	11	.19	4.3	e4	.05
23	21	e23	2.0	6.9	14	.26	5.0	e6	.08
24	15	e17	.82	5.8	e14	.22	4.8	e5	.07
25	32	21	1.9	6.0	e13	.21	5.0	e5	.07
26	13	9	.32	5.7	e12	.18	4.9	e5	.06
27	8.0	10	.21	6.4	e11	.19	5.2	e4	.06
28	7.2	8	.15	6.1	e10	.16	6.5	e6	.13
29	7.6	8	.16	5.7	e9	.14	7.4	8	.16
30	10	e10	.30	6.9	e8	.16	4.9	e6	.08
31	7.6	e4	.09	---	---	---	4.7	e5	.07
TOTAL	240.5	---	8.64	243.6	---	8.89	175.5	---	3.29

e Estimated

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	5.1	e5	.07	7.6	4	.09	12	6	.19
2	4.8	e5	.06	7.8	5	.09	12	7	.20
3	5.0	e4	.06	9.2	7	.18	11	13	.38
4	6.6	e5	.09	9.1	7	.18	10	7	.19
5	5.3	e4	.06	7.6	5	.10	13	e10	.37
6	4.7	e4	.05	7.4	16	.32	11	5	.16
7	8.0	8	.18	7.3	88	1.7	11	8	.23
8	6.8	6	.11	7.5	53	1.1	11	13	.38
9	5.1	4	.06	9.4	e11	.32	9.9	12	.33
10	5.1	e5	.06	10	19	.53	9.7	6	.15
11	5.7	5	.08	8.6	8	.19	11	e6	.17
12	5.6	5	.08	32	76	8.7	9.6	6	.17
13	6.9	30	.59	30	39	3.5	9.5	4	.10
14	6.4	18	.32	154	102	70	9.8	3	.08
15	5.4	8	.11	74	148	109	9.6	3	.08
16	5.5	7	.11	104	81	35	9.0	3	.08
17	13	14	.88	34	e34	3.4	9.0	5	.11
18	31	e24	2.3	18	18	.87	9.0	5	.13
19	13	e14	.50	16	16	.69	8.7	4	.08
20	11	18	.55	15	10	.41	11	e6	.19
21	8.2	13	.28	14	8	.31	8.9	3	.06
22	6.7	9	.16	13	9	.30	9.5	e7	.18
23	6.8	9	.16	12	9	.31	49	37	8.2
24	40	31	5.7	12	19	.65	333	158	231
25	61	37	8.5	21	e20	1.2	69	103	19
26	15	10	.40	19	e12	.77	27	76	5.6
27	11	8	.23	13	7	.23	22	48	2.9
28	9.3	6	.16	12	6	.20	21	36	2.0
29	8.7	8	.20	---	---	---	27	e31	2.3
30	8.6	9	.21	---	---	---	19	22	1.1
31	8.4	7	.17	---	---	---	18	25	1.2
TOTAL	343.7	---	22.49	684.5	---	240.34	810.2	---	277.31

e Estimated

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	17	22	.97	12	2	.07	8.6	2	.05
2	16	25	1.1	12	1	.05	8.6	2	.05
3	15	12	.52	12	1	.03	8.5	2	.05
4	15	6	.24	14	e6	.23	8.3	2	.05
5	15	4	.17	12	2	.06	8.0	2	.04
6	14	4	.16	12	2	.06	7.8	5	.10
7	14	7	.27	11	1	.04	7.3	11	.21
8	15	8	.33	11	1	.03	7.2	12	.23
9	30	e21	3.3	11	3	.10	7.2	8	.15
10	20	e20	1.2	11	5	.14	7.2	9	.17
11	14	10	.40	10	3	.08	7.1	13	.25
12	14	6	.20	10	2	.06	6.9	10	.20
13	13	5	.17	11	e5	.16	6.9	8	.16
14	13	4	.14	9.7	2	.05	7.0	9	.16
15	13	3	.12	9.8	2	.05	7.7	9	.18
16	12	3	.10	9.5	2	.05	7.1	7	.14
17	15	e8	.41	9.2	3	.07	7.2	e8	.16
18	19	e9	.52	9.4	3	.08	8.8	e10	.24
19	13	4	.14	11	e6	.18	9.3	e9	.24
20	14	3	.12	9.7	3	.08	7.2	7	.13
21	14	6	.21	9.2	3	.08	7.1	e6	.11
22	13	3	.11	9.1	3	.07	9.6	e9	.22
23	13	2	.07	10	e5	.14	8.5	7	.15
24	13	2	.07	10	e5	.15	8.1	12	.27
25	13	1	.04	9.2	4	.09	17	e22	1.2
26	12	2	.05	10	e6	.17	10	e11	.31
27	12	4	.13	10	e4	.12	8.8	8	.20
28	34	e24	3.2	9.6	2	.05	8.9	8	.19
29	15	4	.16	9.2	2	.05	9.3	e9	.24
30	13	2	.08	8.7	2	.05	8.2	12	.27
31	---	---	---	8.7	2	.05	---	---	---
TOTAL	463	---	14.70	321.0	---	2.69	249.4	---	6.12

e Estimated

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	8.2	15	.32	7.2	6	.12	8.7	11	.26
2	8.2	11	.25	6.6	10	.18	8.1	18	.38
3	8.0	12	.25	6.5	25	.44	7.7	14	.29
4	7.9	10	.21	6.9	21	.39	6.9	10	.19
5	8.1	8	.16	6.7	10	.19	6.6	12	.22
6	8.5	7	.16	6.8	10	.19	7.1	8	.16
7	8.3	8	.18	7.0	13	.24	6.9	8	.14
8	7.7	8	.16	6.6	12	.21	7.7	13	.27
9	7.8	10	.22	6.6	11	.19	7.1	16	.31
10	7.8	13	.27	6.5	10	.18	6.7	8	.14
11	7.6	8	.16	6.9	12	.24	6.6	8	.13
12	7.7	7	.15	11	e11	.33	7.4	7	.14
13	7.7	7	.14	7.7	6	.13	7.9	12	.26
14	7.4	5	.11	6.9	6	.10	7.2	12	.24
15	9.3	12	.29	6.7	5	.09	6.7	9	.16
16	7.9	11	.23	6.8	4	.07	6.5	9	.15
17	7.7	9	.19	6.8	5	.10	6.4	7	.11
18	7.8	8	.17	7.2	6	.12	16	e21	1.3
19	7.4	6	.12	7.4	e6	.12	15	e17	.83
20	7.3	4	.08	7.8	e5	.10	8.7	8	.18
21	7.1	25	.47	6.9	5	.09	7.3	9	.17
22	7.5	22	.43	6.6	e7	.12	7.2	8	.16
23	7.7	5	.09	7.1	e9	.17	7.3	8	.16
24	14	e19	.87	6.8	7	.13	7.0	10	.18
25	12	13	.45	6.7	7	.13	6.8	10	.19
26	8.2	26	.57	6.7	9	.16	6.7	10	.19
27	7.9	19	.41	6.2	10	.16	6.7	8	.14
28	7.5	4	.09	6.1	13	.22	6.8	9	.16
29	7.3	7	.15	6.1	12	.19	6.6	8	.14
30	7.2	7	.14	6.0	7	.12	6.4	6	.11
31	7.2	5	.10	17	e20	1.1	---	---	---
TOTAL	251.9	---	7.59	224.8	---	6.32	230.7	---	7.46
YEAR	4238.8		605.84						

e Estimated

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE

LOCATION.--Lat 21°24′21″, long 157°48′31″, Hydrologic Unit 20060000, on right bank, 1.8 mi west of Castle High School, 1.2 mi northwest of Hawaiian Memorial Park Cemetary, and 2.4 mi northwest of Pali Golf Course.

DRAINAGE AREA.--0.40 mi^2.

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 115 ft above mean sea level, from topographic map.

REMARKS.--Records fair except estimated days which are poor.

AVERAGE DISCHARGE.--9 years (water years 1988-96), 2.38 ft^3/s (1,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft^3/s, December 31, 1987, gage height, 5.18 ft, from rating curve extended above 21 ft^3/s; minimum, 1.4 ft^3/s, January 22, 1996.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 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	0300	*181	*4.85	No other peaks greater than base discharge.			

Minimum discharge, 1.6 ft^3/s for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	5.3	4.8	2.0	1.8	2.2	2.1	1.8	1.8	1.7	1.7	e3.1
2	1.7	1.8	2.2	2.0	1.8	e3.3	2.2	1.8	1.8	1.7	1.7	e2.6
3	1.7	2.2	1.9	2.0	1.8	e6.2	2.1	1.8	1.8	1.7	1.7	e2.1
4	1.7	2.1	1.7	2.3	1.8	e2.1	e2.2	1.8	1.8	1.7	1.7	e1.8
5	1.7	2.0	1.7	2.5	e1.8	e2.2	2.2	1.8	1.8	2.1	1.7	e2.0
6	1.7	2.0	1.7	2.1	e2.0	2.0	2.2	1.8	1.8	2.1	1.7	e1.8
7	2.2	2.0	1.8	2.7	e2.7	1.9	2.2	1.8	1.8	1.8	1.7	e1.9
8	2.3	2.7	1.8	2.5	e2.1	1.9	2.2	1.9	1.8	1.7	1.7	e1.7
9	1.8	2.8	1.8	2.0	1.9	2.0	2.2	1.9	e6.0	1.7	1.7	e1.6
10	1.8	2.1	1.7	2.3	1.8	2.0	2.2	1.8	2.1	1.7	1.7	e1.7
11	1.7	2.0	1.8	1.8	1.8	2.0	2.3	1.8	2.1	1.7	1.8	e1.7
12	1.6	2.0	1.8	1.7	1.8	2.1	2.3	1.8	1.8	1.7	1.7	e1.7
13	1.6	2.8	1.8	1.7	1.8	2.1	2.1	1.8	1.8	1.7	1.7	e1.7
14	1.6	2.5	1.7	1.7	1.8	2.1	2.1	1.8	1.8	1.6	1.7	e1.7
15	1.6	2.2	1.7	1.6	1.8	2.1	2.0	1.8	1.8	1.7	1.7	e1.7
16	1.6	2.1	1.6	1.7	1.8	2.1	2.0	1.8	1.8	1.6	1.7	e1.7
17	1.6	2.0	1.7	1.7	1.8	2.1	2.0	1.8	1.8	1.6	1.7	e1.7
18	1.6	1.9	1.7	1.8	1.8	2.2	2.0	1.8	2.0	1.7	1.7	e1.7
19	1.6	1.9	1.7	1.8	1.8	2.1	1.9	1.8	1.8	1.7	1.7	e1.7
20	1.7	1.9	1.7	1.7	1.8	2.1	1.9	1.9	1.8	1.7	e1.6	e1.6
21	1.7	1.8	1.6	1.7	1.8	2.1	1.9	1.9	1.7	1.7	e1.6	e1.6
22	1.6	1.8	1.7	1.7	1.8	2.0	1.8	1.8	1.8	1.7	e1.6	e1.6
23	1.6	1.7	1.6	1.9	1.8	2.0	1.8	1.8	2.6	1.6	e1.6	e1.6
24	1.6	1.8	1.7	e2.7	1.9	2.0	1.8	1.9	1.8	1.6	e1.6	e1.6
25	1.7	1.7	2.1	e15	1.8	1.9	1.8	1.9	1.7	1.6	e1.6	e1.6
26	1.6	1.8	1.8	2.8	1.8	2.0	1.8	2.0	1.7	1.7	e1.6	e1.6
27	1.6	1.9	1.8	e2.9	e2.9	2.0	1.8	1.9	1.7	e2.0	e1.6	e1.6
28	1.8	1.8	1.8	2.6	e2.7	2.0	3.4	1.9	1.7	1.7	e1.6	e1.6
29	1.7	1.8	1.8	2.2	2.2	2.0	1.9	1.9	2.0	1.7	e1.6	e1.6
30	1.7	2.1	3.3	2.0	---	2.1	1.9	1.8	1.8	1.7	e2.9	e1.6
31	2.2	---	2.9	1.8	---	2.7	---	1.8	---	1.6	e5.0	---
TOTAL	53.3	64.5	60.4	76.9	56.2	69.6	62.3	56.9	59.5	53.2	56.3	53.2
MEAN	1.72	2.15	1.95	2.48	1.94	2.25	2.08	1.84	1.98	1.72	1.82	1.77
MAX	2.3	5.3	4.8	15	2.9	6.2	3.4	2.0	6.0	2.1	5.0	3.1
MIN	1.6	1.7	1.6	1.6	1.8	1.9	1.8	1.8	1.7	1.6	1.6	1.6
AC-FT	106	128	120	153	111	138	124	113	118	106	112	106

e Estimated

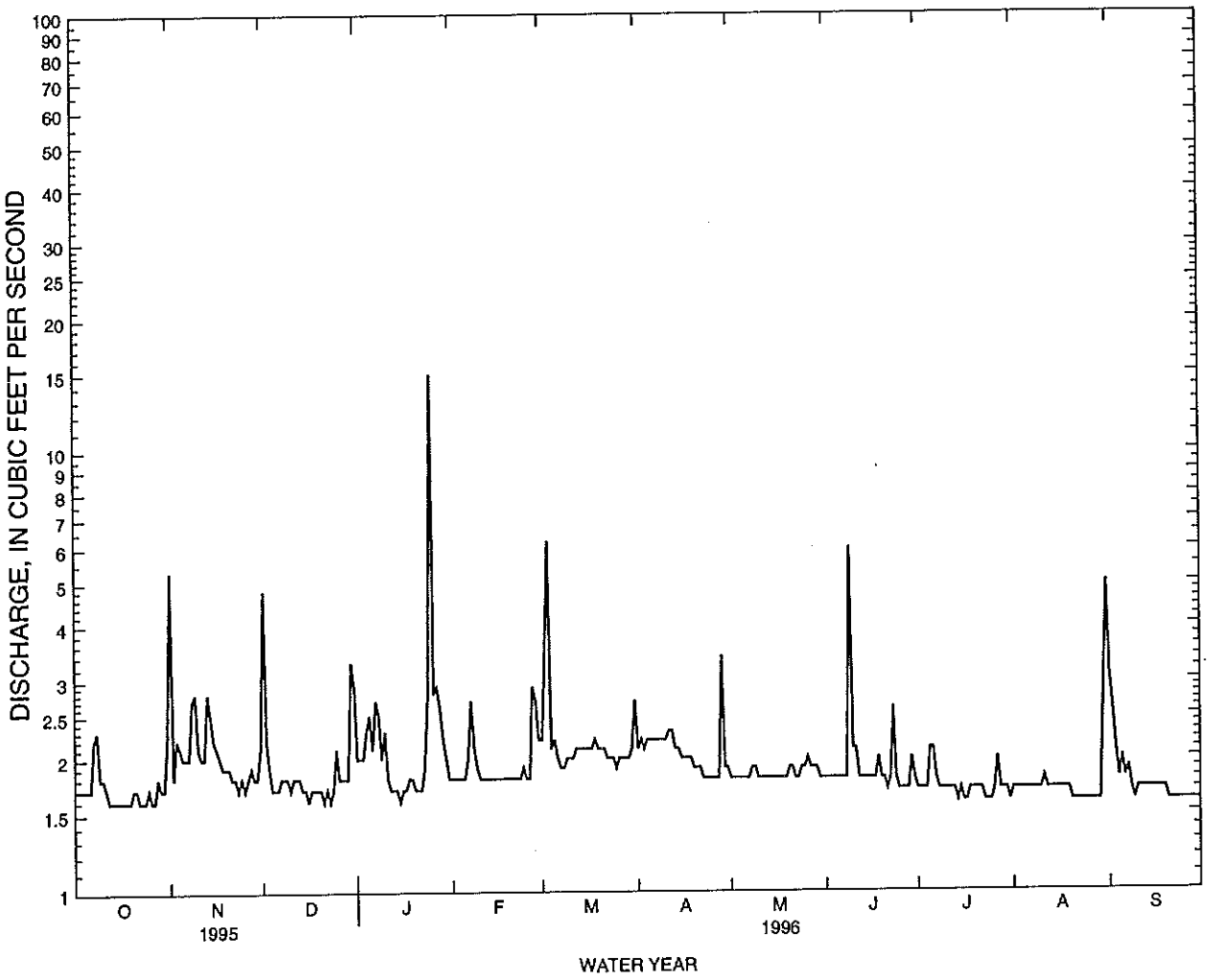
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1996, BY WATER YEAR (WY)

MEAN	2.30	2.43	2.71	2.61	2.69	2.63	2.59	2.12	2.07	2.14	2.10	2.13
MAX	3.07	3.45	4.99	4.31	3.57	3.78	5.44	2.46	2.31	2.64	2.50	2.85
(WY)	1992	1991	1988	1988	1994	1991	1989	1988	1988	1990	1989	1988
MIN	1.72	1.82	1.93	1.96	1.94	2.02	1.92	1.84	1.92	1.72	1.76	1.64
(WY)	1996	1995	1995	1995	1996	1995	1992	1996	1990	1996	1995	1995

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1988 - 1996	
ANNUAL TOTAL	704.6		722.3			
ANNUAL MEAN	1.93		1.97		2.38	
HIGHEST ANNUAL MEAN					2.87	1989
LOWEST ANNUAL MEAN					1.93	1995
HIGHEST DAILY MEAN	5.3	Nov 1	15	Jan 25	30	Apr 8 1989
LOWEST DAILY MEAN	1.6	Aug 22	1.6	Oct 12	1.5	Jul 18 1989
ANNUAL SEVEN-DAY MINIMUM	1.6	Sep 11	1.6	Oct 12	1.6	Sep 11 1995
ANNUAL RUNOFF (AC-FT)	1400		1430		1720	
10 PERCENT EXCEEDS	2.2		2.2		2.8	
50 PERCENT EXCEEDS	1.8		1.8		2.1	
90 PERCENT EXCEEDS	1.6		1.6		1.8	



HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--July 1988 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: October 1990 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since August 1984.

REMARKS.--Water-quality samples also were collected at this site. Record of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
12...	0950	1.7	200	7.8	21.5	25.5	2.3	762	8.4	103	--
NOV											
20...	1420	2.1	191	7.7	25.0	22.5	7.1	758	8.2	95	--
DEC											
13...	1225	1.7	205	7.8	24.5	22.5	4.8	764	8.6	99	2400
JAN											
16...	1429	1.6	200	7.8	26.0	23.5	2.4	764	8.2	96	--
FEB											
20...	1345	1.8	170	7.9	21.5	20.0	1.8	764	8.8	97	780
MAR											
05...	0920	2.2	239	7.7	19.5	20.0	2.4	757	8.6	95	--
APR											
24...	1530	1.7	195	8.0	25.5	23.0	1.5	764	8.2	95	--
MAY											
15...	1000	1.7	193	8.0	24.5	22.5	2.5	765	8.6	99	8000

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC											
13...	1225	58	12	6.7	16	37	0.9	1.5	65	5.6	19

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
13...	1225	<0.10	33	133	134	0.18	8	0.100	0.100	<0.20	0.050
FEB											
20...	1345	--	--	--	--	--	5	0.090	0.090	<0.20	0.020
MAY											
15...	1000	--	--	--	--	--	4	0.060	0.060	<0.20	0.040

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
DEC 13...	1225	190	20	<1	<100	3.0	<10	<1	2	<1	<3.0

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
DEC 13...	2	800	200	<1	<10	<4	60	25	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
DEC 13...	<1	<1.0	<1	<1	<1	<1.0	70	8	<10	1.8	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TECHNICAL TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
DEC 13...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	ENDOSULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
DEC 13...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 13...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24′46″, long 157°49′33″, 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 fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--48 years (water years 1944-77, 1983-96), 2.22 ft^3/s, (1,610 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 340 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	0400	*640	*3.43	No other peaks greater than base discharge.			

Minimum discharge, 1.2 ft^3/s, many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	9.3	4.0	2.1	2.7	2.5	1.7	1.5	1.3	1.5	1.5	1.4
2	1.4	1.9	2.2	1.8	2.8	3.5	1.9	1.5	1.3	1.5	1.6	1.3
3	1.4	1.6	1.8	1.7	2.7	24	1.8	1.6	1.3	1.5	1.6	1.3
4	1.3	1.5	1.6	1.6	2.6	7.8	1.8	1.7	1.3	1.6	1.5	1.3
5	1.2	1.4	1.6	1.7	2.6	3.5	1.9	1.7	1.3	2.4	1.6	1.3
6	1.3	1.4	1.6	1.7	2.6	2.6	1.8	1.7	1.4	2.1	1.6	1.4
7	1.5	1.3	1.6	2.1	3.7	2.3	1.7	1.6	1.4	2.1	1.5	1.7
8	3.4	2.0	1.6	3.0	2.5	2.2	1.7	1.6	1.4	1.7	1.4	1.4
9	1.7	2.8	1.6	3.1	2.1	2.1	1.8	1.5	3.2	1.6	1.5	1.3
10	1.4	1.9	1.5	5.2	2.3	2.1	1.7	1.4	1.8	1.5	1.3	1.3
11	1.4	1.6	1.5	2.4	2.4	2.0	1.7	1.4	1.6	1.5	1.5	1.3
12	1.4	1.5	1.5	2.0	2.2	2.0	1.6	1.4	1.5	1.5	1.4	1.4
13	1.3	10	1.5	1.8	2.0	1.9	1.7	1.3	2.4	1.5	1.4	1.3
14	1.3	3.8	1.5	1.7	1.9	1.9	1.8	1.2	1.7	1.4	1.4	1.3
15	1.3	3.1	1.5	1.7	1.8	1.9	1.7	1.2	1.5	1.5	1.4	1.3
16	1.3	2.3	1.5	1.7	1.8	1.9	1.6	1.2	1.5	1.5	1.3	1.3
17	1.3	2.0	1.5	1.6	1.9	1.9	1.6	1.2	1.5	1.5	1.3	1.3
18	1.2	1.8	1.5	1.6	1.9	1.8	1.6	1.2	1.5	1.5	1.3	1.3
19	1.2	1.7	1.5	1.7	2.0	1.8	1.5	1.2	1.4	1.5	1.3	1.3
20	1.3	1.7	1.4	1.7	2.0	1.8	1.4	1.3	1.4	1.5	1.4	1.3
21	1.3	1.6	1.4	1.7	2.0	1.9	1.5	1.3	1.4	1.5	1.3	1.3
22	1.3	1.6	1.4	1.8	2.0	1.8	1.5	1.3	1.4	1.5	1.3	1.3
23	1.3	1.6	1.4	2.3	2.0	1.8	1.5	1.3	4.8	1.5	1.3	1.3
24	1.3	1.6	1.5	1.9	2.0	1.7	1.5	1.3	1.7	1.5	1.3	1.4
25	1.3	1.5	1.8	48	2.0	1.7	1.4	1.3	1.5	1.5	1.3	1.3
26	1.3	1.5	1.9	3.4	2.1	1.7	1.4	1.3	1.5	1.5	1.2	1.3
27	1.3	1.5	1.7	7.7	2.3	1.7	1.4	1.3	1.6	2.1	1.2	1.3
28	2.8	1.5	1.7	4.3	5.4	1.7	2.4	1.4	1.6	1.8	1.2	1.3
29	2.1	1.5	1.9	3.3	3.1	1.6	1.4	1.4	2.3	1.6	1.2	1.4
30	1.6	1.8	4.6	3.2	---	1.7	1.6	1.4	2.1	1.5	1.2	1.4
31	2.9	---	3.6	2.9	---	1.9	---	1.3	---	1.5	2.1	---
TOTAL	47.6	70.3	56.9	122.4	69.4	90.7	49.6	43.0	51.6	49.9	43.4	40.1
MEAN	1.54	2.34	1.84	3.95	2.39	2.93	1.65	1.39	1.72	1.61	1.40	1.34
MAX	3.4	10	4.6	48	5.4	24	2.4	1.7	4.8	2.4	2.1	1.7
MIN	1.2	1.3	1.4	1.6	1.8	1.6	1.4	1.2	1.3	1.4	1.2	1.3
AC-FT	94	139	113	243	138	180	98	85	102	99	86	80

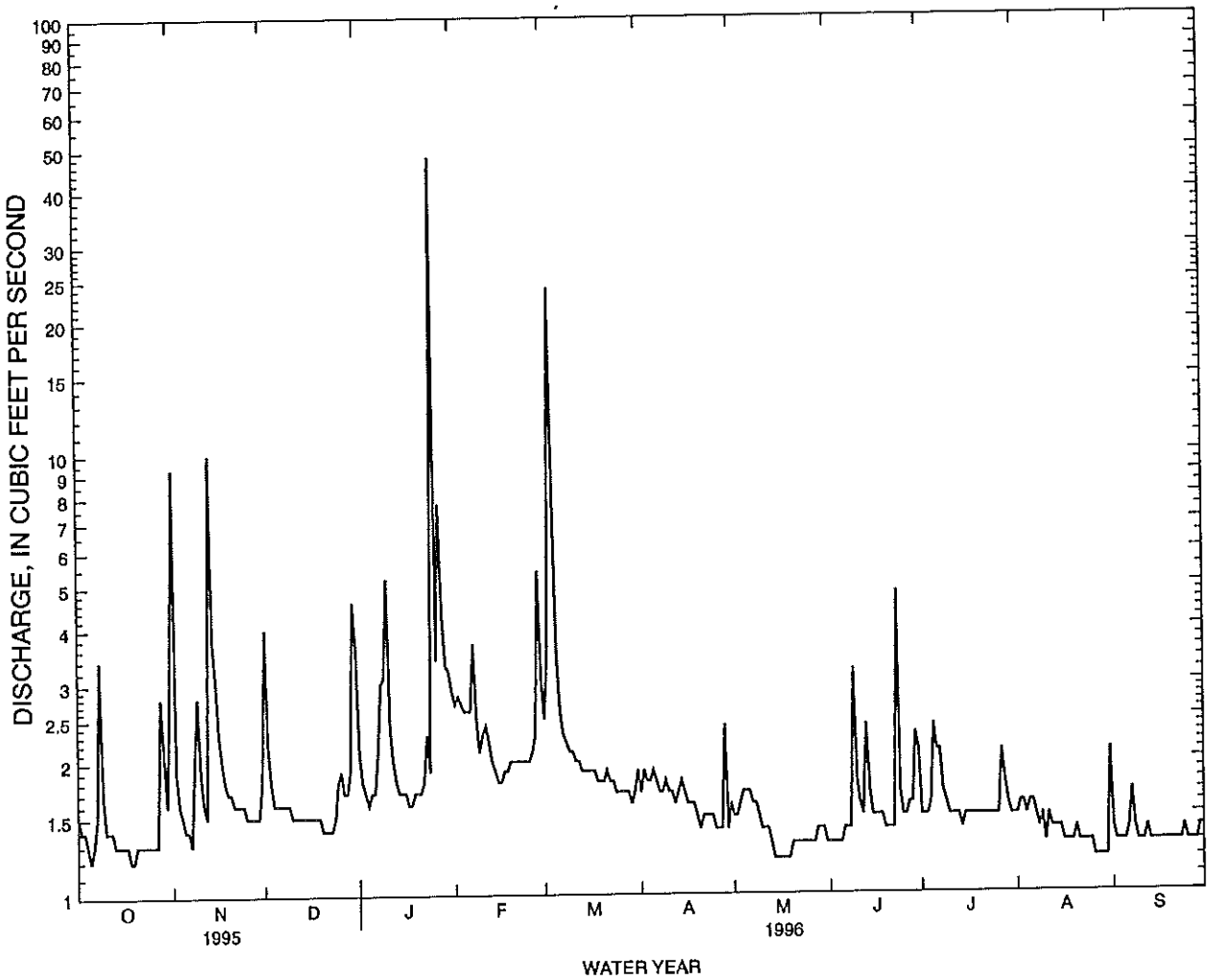
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1996, BY WATER YEAR (WY)

MEAN	1.94	2.74	2.70	2.63	2.54	3.30	2.54	2.34	1.38	1.56	1.59	1.45
MAX	11.6	15.7	9.72	9.68	10.7	16.5	13.0	27.3	2.34	3.25	4.24	3.62
(WY)	1959	1966	1988	1949	1955	1958	1989	1965	1989	1989	1967	1992
MIN	.32	.33	.64	.94	.86	.60	.50	.51	.38	.41	.56	.36
(WY)	1946	1946	1960	1977	1963	1946	1946	1961	1946	1945	1961	1945

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1944 - 1996	
ANNUAL TOTAL	628.9		734.9			
ANNUAL MEAN	1.72		2.01		2.22	
HIGHEST ANNUAL MEAN					4.82	1965
LOWEST ANNUAL MEAN					.67	1946
HIGHEST DAILY MEAN	10	Nov 13	48	Jan 25	620	May 2 1965
LOWEST DAILY MEAN	1.2	Apr 22	1.2	Oct 5	.29	Jul 13 1945
ANNUAL SEVEN-DAY MINIMUM	1.3	Oct 13	1.2	May 13	.29	Oct 19 1945
ANNUAL RUNOFF (AC-FT)	1250		1460		1610	
10 PERCENT EXCEEDS	2.0		2.6		2.6	
50 PERCENT EXCEEDS	1.5		1.6		1.5	
90 PERCENT EXCEEDS	1.3		1.3		.87	



HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1982 to September 1985, October 1986 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: December 1983 to September 1984, July 1987 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since December 1983.

REMARKS.--Water-quality samples also were collected at this site. Record of "Sediment discharge, suspended (tons/day)" for water years 1994, 1995, and 1996 was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
12...	1256	1.3	150	7.9	23.5	20.0	0.20	762	8.9	98	--
NOV											
21...	1421	1.8	155	7.8	23.5	20.5	0.30	759	8.8	98	--
JAN											
17...	1237	1.6	155	7.8	22.5	20.0	0.30	763	8.8	97	--
FEB											
13...	1120	2.0	165	7.6	20.5	19.0	0.30	757	9.1	99	K36
MAR											
05...	1500	3.0	161	7.7	23.0	20.0	0.40	750	8.7	97	--
APR											
25...	0929	1.4	154	7.9	23.5	20.0	0.20	758	8.8	97	--
MAY											
15...	1005	1.2	146	7.8	24.5	20.0	0.30	761	9.2	101	150

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
13...	1120	45	9.2	5.4	12	36	0.8	0.90	49	3.5	15

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
FEB											
13...	1120	<0.10	26	96	102	0.13	1	0.090	0.090	<0.20	<0.010
MAY											
15...	1005	--	--	--	--	--	3	0.090	0.090	<0.20	0.030

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 13...	1120	40	20	<1	<100	<2.0	<10	<1	<1	<1	<3.0

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 13...	<1	50	32	<1	<10	<4	20	4.0	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 13...	<1	<1.0	<1	<1	<1	<1.0	53	<6	<10	0.80	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TECHNICAL TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISULFOTON UNFILT RECOVER (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 13...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 13...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 13...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF OAHU

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26′32″, long 157°50′47″, 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.--0.99 mi^2.

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

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

REMARKS.--Records poor. 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 amount of water from the stream.

AVERAGE DISCHARGE.--13 years (water years 1984-96), 3.45 ft^3/s (2,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 728 ft^3/s, September 18, 1994, gage height, 6.05 ft; minimum, 0.58 ft^3/s on several days in September, October, November 1984.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0330	*428	*4.99	No other peak greater than base discharge.			

Minimum discharge, 1.1 ft^3/s, several days in October.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	13	2.8	2.5	2.8	2.8	2.9	2.8	2.4	2.7	2.6	2.8
2	2.2	2.9	2.3	2.2	2.8	4.5	3.0	2.7	2.3	2.7	2.4	2.3
3	2.1	6.2	2.3	2.2	2.6	20	2.9	2.6	2.3	2.5	2.4	2.5
4	3.0	4.0	2.3	2.4	2.7	9.5	3.0	2.8	2.4	2.4	2.6	2.4
5	4.0	2.9	2.2	2.6	2.7	4.3	3.1	2.7	2.4	2.8	2.4	3.1
6	1.9	2.5	2.2	2.3	2.8	3.5	2.8	2.8	2.4	2.7	2.6	3.5
7	2.0	2.4	2.5	2.5	5.5	3.2	2.7	2.8	2.5	4.1	2.5	5.4
8	2.2	4.8	2.1	2.7	5.6	3.0	2.8	2.8	2.7	2.7	2.4	5.4
9	2.2	3.4	2.1	2.4	3.9	2.8	2.8	2.6	3.2	2.5	2.4	3.4
10	2.1	2.8	2.1	2.9	3.3	2.9	2.9	2.5	2.9	2.5	2.4	2.8
11	1.9	2.7	2.0	2.6	2.9	2.9	2.9	2.5	2.6	2.4	3.2	2.6
12	1.8	2.7	2.0	2.5	2.9	2.8	2.8	2.3	2.6	2.4	2.8	2.5
13	e1.8	14	2.6	2.5	2.9	2.8	2.7	2.3	2.7	2.3	2.6	2.5
14	e1.8	4.8	2.3	2.5	2.9	2.8	2.7	2.4	2.4	2.4	2.5	2.5
15	e1.7	3.9	2.1	2.2	2.8	2.8	2.7	2.3	2.4	2.3	2.4	2.3
16	e1.8	3.0	2.0	2.2	2.8	2.6	2.7	2.4	2.4	2.4	2.4	3.2
17	1.6	2.7	2.2	2.3	2.6	2.8	2.8	2.3	2.4	2.5	2.3	2.7
18	1.7	2.5	2.0	2.4	2.7	2.8	2.9	2.3	2.9	2.4	2.5	2.4
19	1.7	2.4	2.1	3.8	2.9	2.7	2.7	2.2	2.5	2.3	2.3	2.4
20	1.6	2.4	2.0	2.4	2.8	2.9	2.7	2.4	2.5	2.3	2.2	2.6
21	1.7	2.4	2.1	2.3	2.5	2.8	2.9	2.4	2.5	3.0	2.2	2.4
22	1.8	2.2	2.0	2.4	2.6	2.8	2.7	2.3	2.5	3.4	2.1	2.4
23	2.0	2.2	2.1	2.4	2.5	2.8	2.6	2.4	5.7	2.8	2.1	2.4
24	1.9	2.2	2.1	2.8	2.6	2.8	2.6	2.3	3.3	6.4	2.1	2.6
25	1.8	2.2	2.0	33	2.4	2.8	2.6	2.4	2.6	2.9	2.0	2.4
26	2.4	2.3	2.2	5.2	2.5	2.8	2.7	2.7	2.5	3.6	2.1	2.4
27	1.9	2.3	2.0	4.7	3.0	2.8	2.6	2.2	2.3	5.9	2.1	2.2
28	3.1	2.3	2.1	5.8	3.0	2.7	6.0	2.7	2.3	3.8	2.1	2.2
29	2.7	2.2	1.9	3.5	2.6	2.7	3.2	2.3	4.2	3.0	2.0	2.2
30	2.1	2.5	5.2	4.5	---	2.7	2.9	2.4	3.8	2.8	2.1	2.2
31	5.8	---	5.6	3.4	---	3.7	---	2.5	---	2.6	7.3	---
TOTAL	68.4	108.8	73.5	120.1	86.6	115.8	87.3	77.1	82.6	91.5	78.1	82.7
MEAN	2.21	3.63	2.37	3.87	2.99	3.74	2.91	2.49	2.75	2.95	2.52	2.76
MAX	5.8	14	5.6	33	5.6	20	6.0	2.8	5.7	6.4	7.3	5.4
MIN	1.6	2.2	1.9	2.2	2.4	2.6	2.6	2.2	2.3	2.3	2.0	2.2
AC-FT	136	216	146	238	172	230	173	153	164	181	155	164

e Estimated

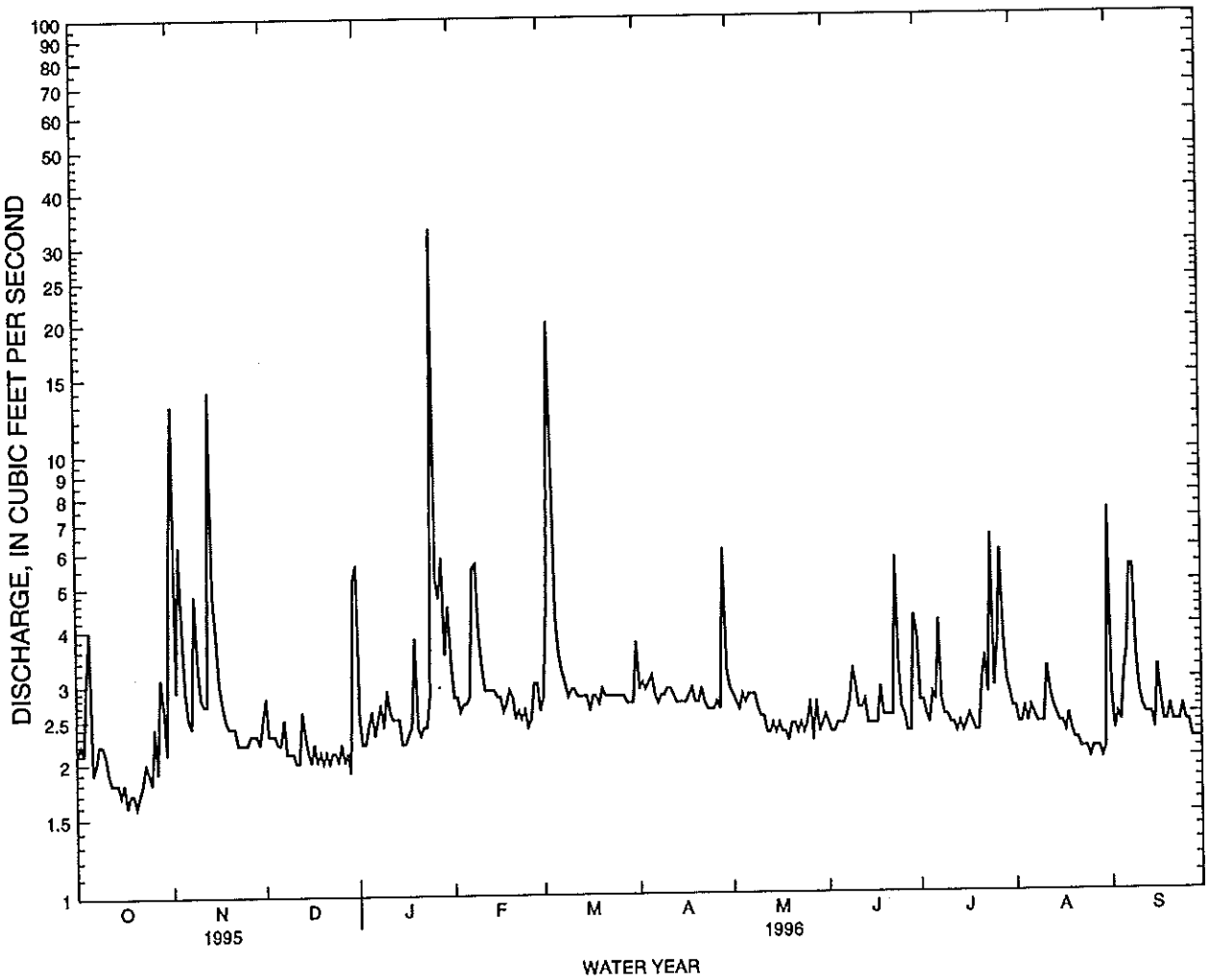
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1996, BY WATER YEAR (WY)

MEAN	3.26	3.82	3.88	3.70	3.88	4.40	3.59	3.11	2.76	3.09	2.80	3.15
MAX	6.69	10.5	9.56	8.65	7.55	11.8	10.6	5.52	4.78	5.89	5.78	5.81
(WY)	1992	1991	1988	1988	1989	1991	1989	1988	1991	1989	1991	1992
MIN	.66	1.24	1.09	.95	1.03	1.03	.92	.85	.73	.74	.67	.67
(WY)	1985	1986	1986	1986	1986	1984	1985	1984	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16283200 KAHALUU STREAM NEAR AHUIMANU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1984 - 1996	
ANNUAL TOTAL	911.4		1072.5			
ANNUAL MEAN	2.50		2.93		3.45	
HIGHEST ANNUAL MEAN					5.97	1991
LOWEST ANNUAL MEAN					1.07	1984
HIGHEST DAILY MEAN	14	Aug 20	33	Jan 25	97	Mar 19 1991
LOWEST DAILY MEAN	1.2	May 31	1.6	Oct 17	.58	Sep 22 1984
ANNUAL SEVEN-DAY MINIMUM	1.5	Mar 26	1.7	Oct 15	.59	Nov 5 1984
ANNUAL RUNOFF (AC-FT)	1810		2130		2500	
10 PERCENT EXCEEDS	3.1		3.6		5.0	
50 PERCENT EXCEEDS	2.2		2.5		2.8	
90 PERCENT EXCEEDS	1.8		2.1		.91	



HAWAII, ISLAND OF OAHU

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26′47″, long 157°52′12″, Hydrologic Unit 20060000, on left bank 0.2 mi upstream from confluence with North Fork, 3.0 mi southwest of Waiahole School, and 4.0 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

PERIOD OF RECORD.--September 1962 to September 1996 (discontinued).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records fair. Honolulu Board of Water Supply pumps water from wells in drainage area.

AVERAGE DISCHARGE.--34 years (water years 1963-96), 1.25 ft^3/s (903 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s, October 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft^3/s; no flow, July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 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	0400	*66	2.40	No other peak greater than base discharge.			

Minimum discharge, 0.22 ft^3/s, June 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.47	.78	.45	.47	.47	.42	.51	.33	.26	.32	.28	.30
2	.47	.47	.37	.47	.47	.58	.47	.33	.26	.33	.28	.30
3	.47	1.0	.33	.47	.47	1.3	.47	.33	.28	.33	.29	.33
4	.47	.56	.33	.43	.43	.65	.47	.33	.28	.33	.29	.30
5	.47	.49	.37	.47	.42	.51	.47	.33	.28	.38	.29	.33
6	.47	.47	.45	.47	.42	.51	.47	.33	.29	.32	.30	.42
7	.50	.47	.48	.61	.45	.51	.47	.33	.33	.40	.29	.67
8	.66	.57	.47	.51	.49	.49	.47	.33	.33	.30	.28	.40
9	.47	.52	.47	.47	.45	.47	.47	.33	.36	.30	.28	.31
10	.47	.50	.47	.57	.42	.47	.47	.31	.33	.30	.30	.30
11	.47	.47	.47	.47	.42	.47	.49	.30	.30	.30	.44	.30
12	.52	.47	.47	.47	.42	.47	.47	.29	.30	.28	.31	.30
13	.47	1.3	.57	.47	.42	.47	.47	.28	.34	.28	.30	.30
14	.47	.61	.51	.45	.42	.47	.44	.28	.30	.28	.29	e.30
15	.47	.57	.47	.42	.42	.47	.47	.28	.28	.28	.28	e.30
16	.47	.47	.47	.42	.42	.47	.47	.28	.28	.28	.28	e.31
17	.47	.47	.47	.47	.42	.47	.44	.28	.28	.30	.28	e.32
18	.51	.47	.47	.47	.42	.47	.48	.28	.32	.30	.28	e.32
19	.51	.47	.47	.69	.42	.47	.47	.28	.29	.30	.28	e.32
20	.51	.47	.47	.46	.42	.47	.38	.28	.28	.30	.28	e.32
21	.51	.47	.43	.42	.42	.47	.42	.28	.28	.35	.28	e.32
22	.49	.47	.42	.42	.42	.47	.37	.28	.28	.31	.28	e.31
23	.47	.47	.42	.42	.42	.47	.37	.28	.32	.30	.28	e.31
24	.47	.47	.42	.46	.42	.47	.37	.28	.27	.39	.28	e.30
25	.47	.47	.44	3.9	.42	.47	.37	.30	.24	.28	.28	e.30
26	.51	.47	.43	.58	.42	.47	.37	.32	e.30	.30	.28	e.30
27	.48	.45	.42	.94	.45	.47	.37	.30	e.30	.59	.28	e.30
28	.56	.42	.42	.69	.46	.47	.76	.36	.33	.29	.28	e.30
29	.52	.42	.42	.48	.42	.47	.37	.31	.57	.28	.28	e.29
30	.47	.42	.68	.58	---	.47	.33	.29	.44	.28	.28	e.29
31	.77	---	.63	.48	---	.50	---	.28	---	.28	.83	---
TOTAL	15.51	16.13	14.16	19.10	12.54	15.81	13.42	9.39	9.30	9.86	9.53	9.77
MEAN	.50	.54	.46	.62	.43	.51	.45	.30	.31	.32	.31	.33
MAX	.77	1.3	.68	3.9	.49	1.3	.76	.36	.57	.59	.83	.67
MIN	.47	.42	.33	.42	.42	.42	.33	.28	.24	.28	.28	.29
AC-FT	31	32	28	38	25	31	27	19	18	20	19	19

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1995, BY WATER YEAR (WY)

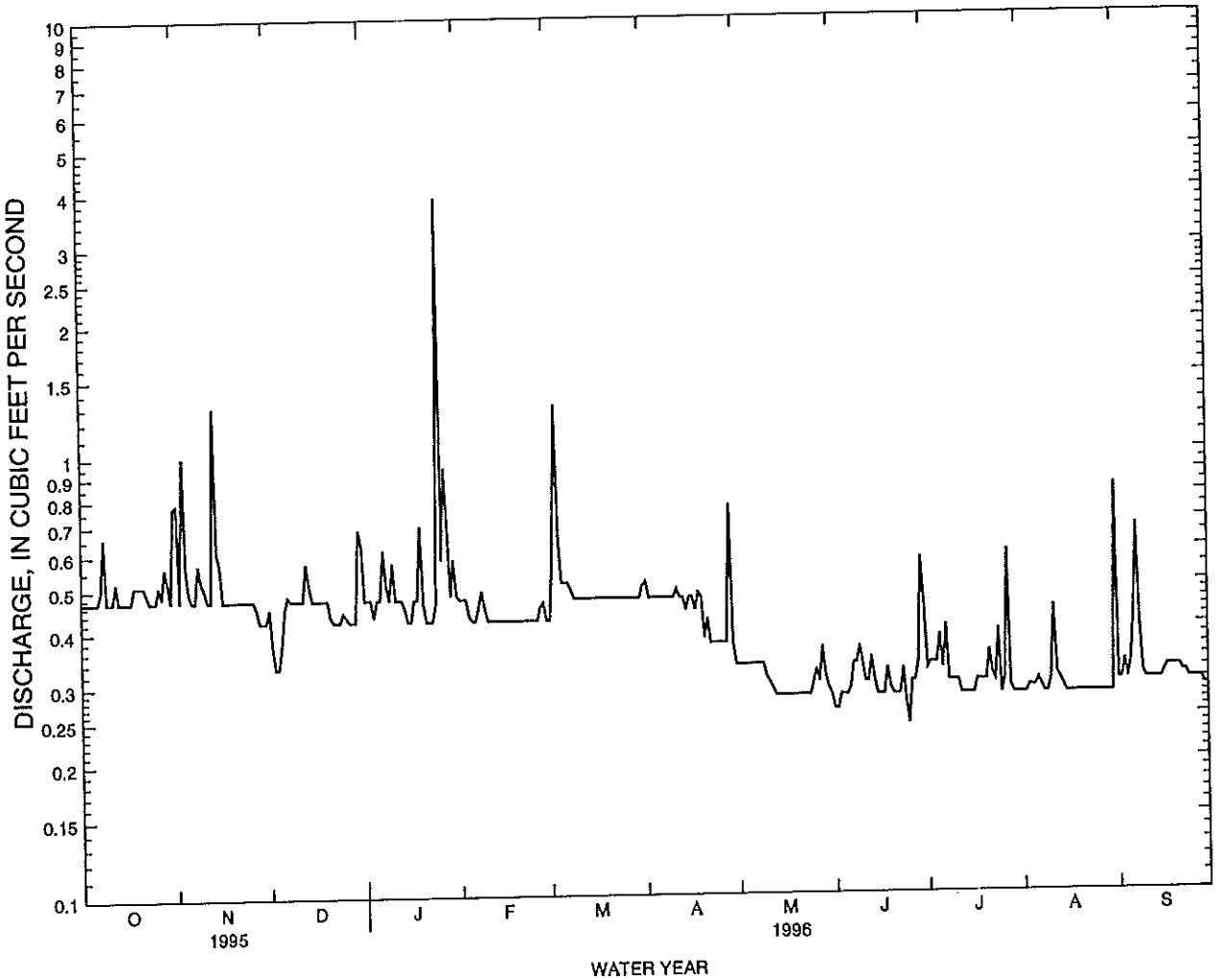
MEAN	1.28	1.31	1.27	1.27	1.27	1.32	1.27	1.28	1.19	1.26	1.28	1.26
MAX	2.47	2.85	2.49	2.39	2.97	2.96	2.79	3.57	2.60	2.62	3.17	2.47
(WY)	1969	1966	1969	1968	1969	1968	1968	1965	1968	1971	1971	1968
MIN	.36	.29	.28	.31	.28	.25	.24	.29	.27	.41	.32	.28
(WY)	1990	1990	1990	1983	1983	1983	1983	1989	1989	1981	1989	1989

HAWAII, ISLAND OF OAHU

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1962 - 1995	
ANNUAL TOTAL	224.50		154.52			
ANNUAL MEAN	.62		.42		1.27	
HIGHEST ANNUAL MEAN					2.52	1968
LOWEST ANNUAL MEAN					.37	1990
HIGHEST DAILY MEAN	1.8	Aug 23	3.9	Jan 25	33	May 2 1965
LOWEST DAILY MEAN	.32	Apr 14	.24	Jun 25	.00	Jul 8 1977
ANNUAL SEVEN-DAY MINIMUM	.37	Apr 13	.28	May 30	.20	Sep 2 1994
ANNUAL RUNOFF (AC-FT)	445		306		921	
10 PERCENT EXCEEDS	.80		.51		2.2	
50 PERCENT EXCEEDS	.56		.42		1.1	
90 PERCENT EXCEEDS	.47		.28		.42	

e Estimated



HAWAII, ISLAND OF OAHU

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'46", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi upstream from confluence with South Fork, 2.8 mi southwest of Waiahole School, and 4.3 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

PERIOD OF RECORD.--September 1962 to September 1996 (discontinued).

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Honolulu Board of Water Supply pumps water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--34 years (water years 1963-96), 1.47 ft^3/s (1,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s, February 4, 1965, gage height, 3.38 ft, from rating curve extended above 19 ft^3/s; no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 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	0300	*79	*2.07	No other peaks greater than base discharge.			

Minimum discharge, 0.92 ft^3/s for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	1.3	1.0	1.0	1.0	1.0	1.1	.98	.92	.99	.92	1.0
2	.98	.98	1.0	1.0	1.0	1.4	1.1	.98	.92	.98	.92	.98
3	.98	1.4	.98	1.0	1.0	2.2	1.1	.98	.92	.98	.96	1.0
4	.98	1.1	.98	.99	1.0	1.4	1.0	.98	.92	.98	.98	.99
5	.98	.98	.98	1.0	1.0	1.1	1.0	.98	.92	1.1	.93	1.0
6	.98	.98	.98	1.0	1.0	1.0	1.0	.97	.92	.99	.96	1.2
7	1.0	.98	1.0	1.2	1.1	1.0	1.0	.98	.96	1.1	.92	1.7
8	1.2	1.1	.98	1.1	1.1	1.0	1.0	.98	.94	.95	.92	1.1
9	.98	1.0	.98	1.0	1.0	1.0	1.0	.98	.99	.93	.92	1.0
10	.98	1.0	.98	1.1	1.0	1.0	1.0	.98	.99	.92	.92	.99
11	.98	.98	.98	1.0	1.0	1.0	1.0	.98	.98	.92	1.2	.98
12	.98	.98	.98	1.0	1.0	1.0	1.0	.98	.97	.92	.98	.98
13	.98	1.8	1.1	1.0	1.0	1.0	1.0	.98	.97	.92	.97	.98
14	.98	1.2	1.0	1.0	.99	1.0	1.0	.98	.92	.92	.93	.98
15	.98	1.2	1.0	1.0	.98	1.0	1.0	.98	.92	.92	.92	.95
16	.98	1.0	.98	1.0	.98	1.0	1.0	.98	.92	.92	.92	1.0
17	.98	1.0	.98	1.0	.99	1.0	1.0	.98	.92	.94	.92	1.0
18	.98	1.0	.98	1.0	1.0	1.0	.96	.98	1.0	.93	.92	1.0
19	.98	.98	.98	1.3	1.0	1.0	.98	.98	.95	.92	.92	1.0
20	.98	.98	.98	1.0	1.0	1.0	.93	.98	.92	.92	.92	1.0
21	.98	.98	.98	1.0	1.0	1.0	.97	.98	.93	.97	.92	1.0
22	.98	.98	.98	1.0	.98	1.0	.95	.98	.92	.92	.92	.98
23	.98	.98	.98	1.0	.98	1.0	.92	.98	1.1	.92	.92	.98
24	.98	.98	.98	1.2	.99	1.0	.92	.98	.97	1.1	.92	.98
25	.98	.98	.98	4.4	1.0	1.0	.92	1.0	.92	.92	.92	.98
26	.98	.98	1.0	1.1	.98	1.0	.98	1.0	.92	.94	.92	.98
27	.98	.98	.98	1.4	1.0	1.0	.95	.98	.92	1.9	.92	.96
28	1.1	.98	.98	1.3	1.0	1.0	1.4	1.0	.92	1.0	.92	.92
29	1.0	.98	.98	1.0	1.0	1.0	1.0	.98	1.4	.98	.92	.92
30	.98	1.0	1.2	1.2	---	1.0	.98	.98	1.1	.95	.92	.92
31	1.3	---	1.2	1.1	---	1.1	---	.96	---	.95	1.6	---
TOTAL	31.08	31.76	31.06	36.39	29.07	33.2	30.16	30.41	28.97	30.70	29.75	30.45
MEAN	1.00	1.06	1.00	1.17	1.00	1.07	1.01	.98	.97	.99	.96	1.01
MAX	1.3	1.8	1.2	4.4	1.1	2.2	1.4	1.0	1.4	1.9	1.6	1.7
MIN	.98	.98	.98	.99	.98	1.0	.92	.96	.92	.92	.92	.92
AC-FT	62	63	62	72	58	66	60	60	57	61	59	60

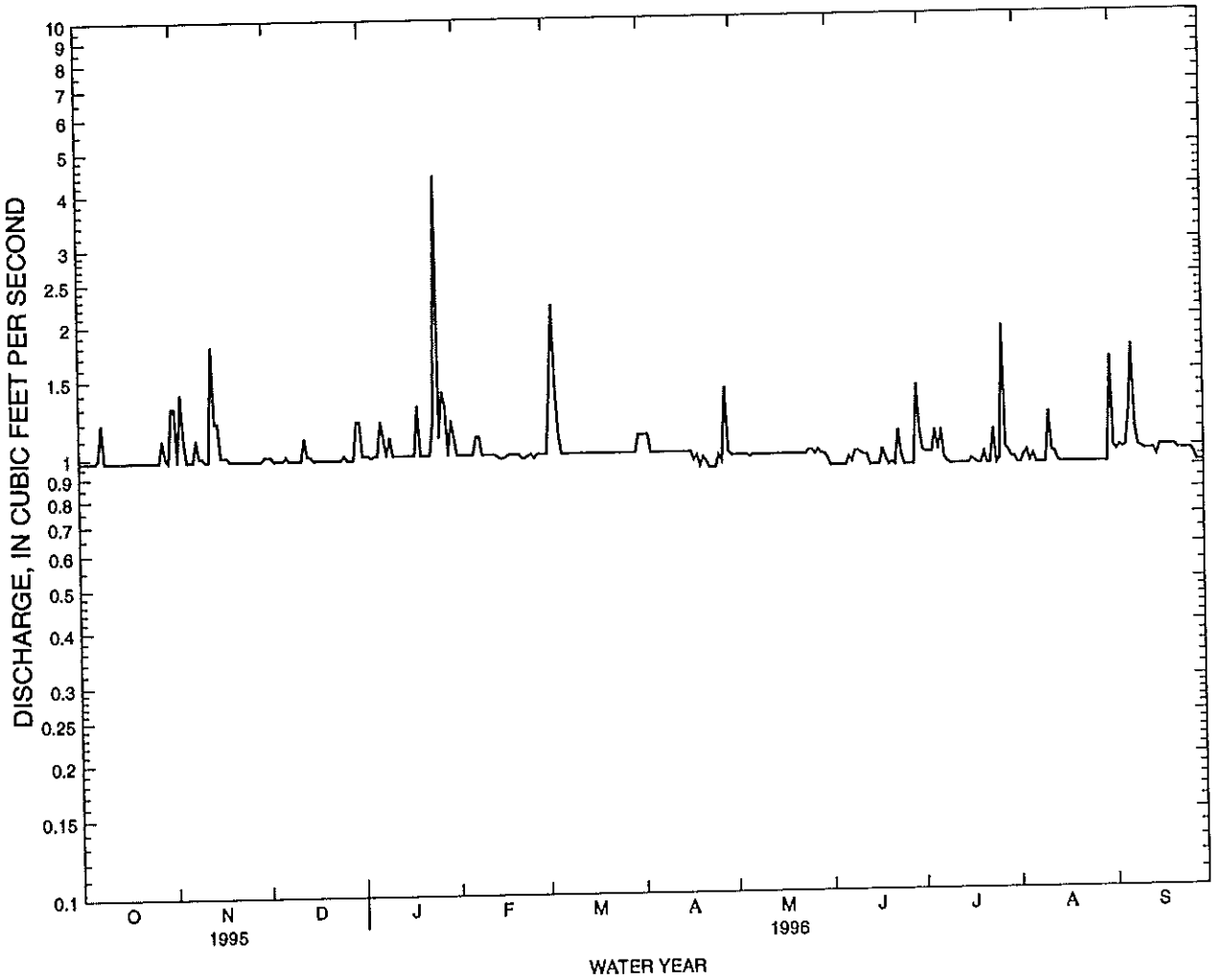
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1996, BY WATER YEAR (WY)

MEAN	1.48	1.49	1.46	1.46	1.48	1.48	1.46	1.48	1.44	1.47	1.48	1.49
MAX	2.35	2.82	2.43	2.39	3.42	2.74	2.64	3.40	2.40	2.47	2.55	2.48
(WY)	1970	1966	1966	1970	1965	1968	1968	1965	1969	1965	1965	1969
MIN	.82	.82	.76	.72	.61	.56	.43	.58	.64	.80	.70	.78
(WY)	1990	1990	1990	1983	1983	1983	1983	1990	1990	1990	1990	1989

HAWAII, ISLAND OF OAHU

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1962 - 1996	
ANNUAL TOTAL	418.63		373.00			
ANNUAL MEAN	1.15		1.02		1.47	
HIGHEST ANNUAL MEAN					2.42	1965
LOWEST ANNUAL MEAN					.76	1990
HIGHEST DAILY MEAN	2.1	Apr 3	4.4	Jan 25	32	May 2 1965
LOWEST DAILY MEAN	.98	Aug 27	.92	Apr 23	.00	Jul 7 1977
ANNUAL SEVEN-DAY MINIMUM	.98	Aug 27	.92	Jul 10	.35	Apr 25 1983
ANNUAL RUNOFF (AC-FT)	830		740		1070	
10 PERCENT EXCEEDS	1.3		1.1		2.2	
50 PERCENT EXCEEDS	1.1		.98		1.4	
90 PERCENT EXCEEDS	.98		.92		.83	



HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", 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 good except for estimated daily discharges, which are fair. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--22 years (water years 1975-96), 6.26 ft^3/s (4,540 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0400	*612	6.08(hwm)	July 27	1345	347	5.24

Minimum discharge, 4.1 ft^3/s, October 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	8.8	5.2	5.4	5.8	5.3	5.5	5.4	4.9	5.7	5.2	5.2
2	4.6	5.3	5.1	5.1	5.5	6.6	5.4	5.2	4.9	5.6	5.0	4.9
3	4.6	9.5	5.0	5.0	5.4	25	5.4	5.2	4.9	5.4	5.1	5.2
4	4.6	6.4	4.9	5.1	5.2	14	5.3	5.2	4.9	5.3	5.1	5.0
5	4.6	5.4	4.9	5.1	5.2	7.2	5.4	5.2	4.9	5.6	5.0	5.3
6	4.6	5.0	4.9	5.1	5.2	6.3	5.3	5.2	4.9	5.4	5.2	6.1
7	4.7	4.9	5.0	5.9	5.6	5.9	5.3	5.2	4.9	6.2	5.1	10
8	6.1	5.4	4.9	5.4	5.8	5.7	5.2	5.2	4.9	5.4	4.9	7.5
9	4.8	5.4	4.9	5.2	5.7	5.6	5.2	5.2	6.3	5.3	4.9	6.2
10	4.7	5.2	4.9	5.7	5.4	5.5	5.3	5.2	5.3	5.1	4.9	5.7
11	4.6	5.0	4.9	5.1	5.3	5.5	5.3	5.2	5.1	5.0	5.8	5.4
12	4.7	4.9	4.9	4.9	5.2	5.5	5.3	5.0	5.0	5.1	5.2	5.2
13	4.6	14	5.2	4.9	5.2	5.5	5.2	5.0	5.1	5.2	5.1	5.2
14	4.6	7.5	5.2	4.9	5.2	5.5	5.2	5.0	4.9	5.2	5.0	5.2
15	4.5	7.4	5.0	4.9	5.2	5.5	5.2	5.0	4.9	5.2	4.7	5.1
16	4.3	6.1	4.9	4.7	5.2	5.5	5.2	5.0	4.9	5.1	8.3	5.3
17	4.3	5.7	4.9	4.8	5.2	5.5	5.2	5.0	4.9	5.1	4.7	5.2
18	4.5	5.5	4.9	4.9	5.1	5.5	5.4	5.0	5.3	5.1	4.7	5.1
19	4.5	5.3	4.9	6.1	5.0	5.5	5.4	5.0	5.1	5.2	4.7	5.0
20	4.5	5.2	4.9	5.1	5.0	5.5	5.3	5.0	5.0	5.1	4.7	5.2
21	4.4	5.2	4.9	4.9	5.0	5.5	5.3	5.0	4.9	5.2	4.7	5.0
22	4.5	5.1	4.9	4.9	5.0	5.4	5.3	5.0	5.0	5.2	4.7	5.0
23	4.5	5.0	4.9	4.9	5.0	5.3	5.2	5.0	6.0	5.2	4.7	4.9
24	4.5	5.0	4.9	5.1	5.2	5.3	5.2	4.9	5.8	7.8	4.7	4.9
25	4.5	5.0	4.9	51	5.2	5.3	5.2	5.1	5.2	5.5	4.6	4.9
26	4.6	5.0	4.9	7.4	5.2	5.3	5.2	5.1	5.2	5.4	4.6	4.9
27	4.6	5.0	4.9	10	5.4	5.3	5.2	4.9	5.2	17	4.6	4.9
28	4.8	5.0	4.9	8.2	5.4	5.3	11	5.2	5.2	7.2	4.6	4.9
29	4.9	4.9	4.9	6.2	5.2	5.3	6.1	5.0	7.4	6.0	4.5	4.8
30	4.7	4.9	6.1	7.0	---	5.3	5.5	4.9	6.5	5.7	4.5	4.7
31	6.4	---	6.5	6.2	---	5.7	---	4.9	---	5.4	11	---
TOTAL	145.5	178.0	156.1	219.1	153.0	201.1	165.2	157.4	157.4	181.9	160.5	161.9
MEAN	4.69	5.93	5.04	7.07	5.28	6.49	5.51	5.08	5.25	5.87	5.18	5.40
MAX	6.4	14	6.5	51	5.8	25	11	5.4	7.4	17	11	10
MIN	4.3	4.9	4.9	4.7	5.0	5.3	5.2	4.9	4.9	5.0	4.5	4.7
AC-FT	289	353	310	435	303	399	328	312	312	361	318	321

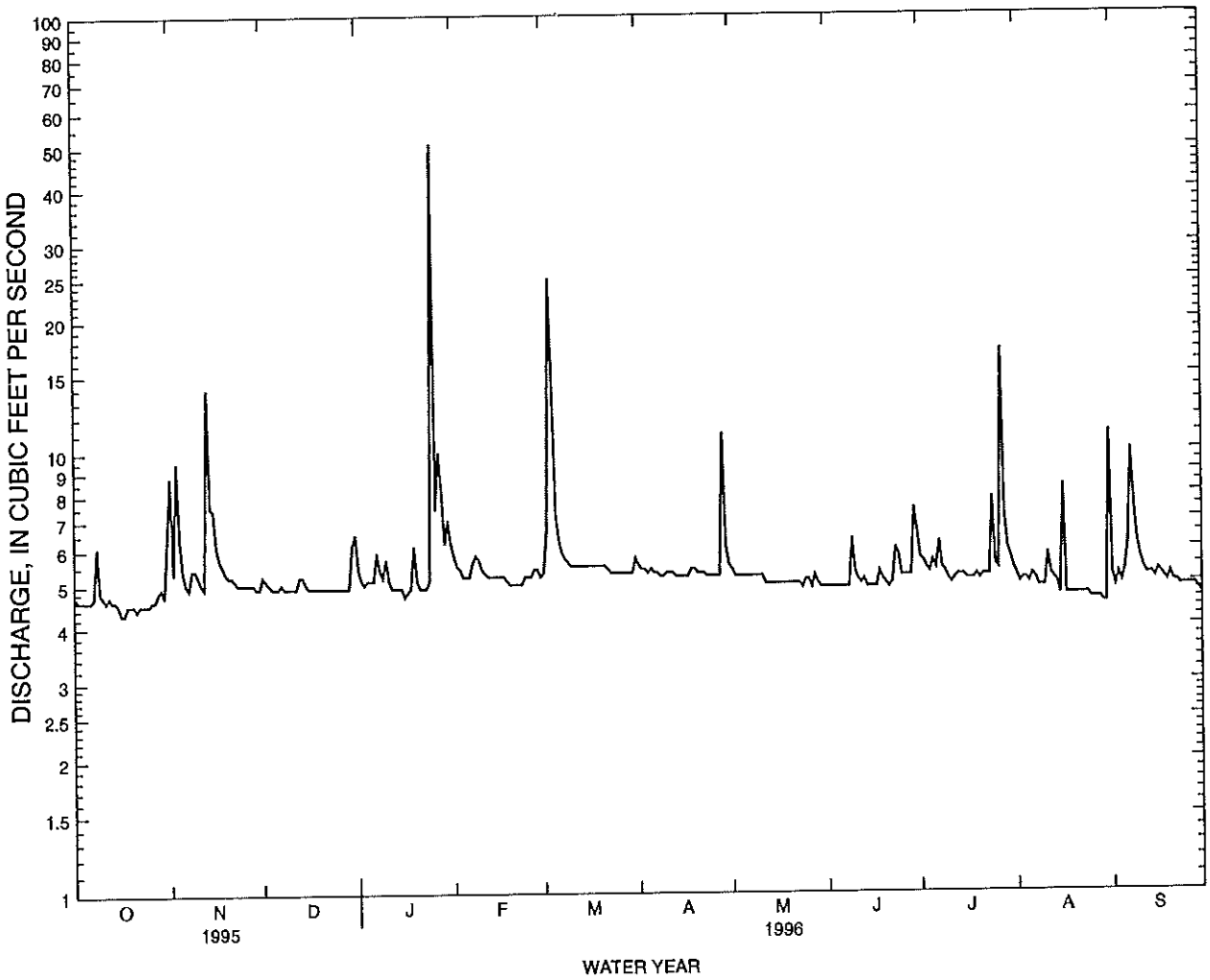
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1996, BY WATER YEAR (WY)

MEAN	5.90	6.51	6.58	6.81	6.67	7.53	6.36	5.92	5.69	5.81	5.72	5.69
MAX	9.81	14.3	15.5	12.1	13.2	17.7	15.1	8.46	8.88	9.95	10.6	9.43
(WY)	1983	1991	1988	1988	1979	1991	1989	1981	1982	1989	1982	1982
MIN	2.70	4.08	3.60	3.71	3.05	2.85	2.72	3.18	3.36	2.40	2.61	2.74
(WY)	1976	1978	1976	1977	1977	1977	1977	1977	1976	1977	1976	1976

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1975 - 1996	
ANNUAL TOTAL	1995.1		2037.1			
ANNUAL MEAN	5.47		5.57		6.26	
HIGHEST ANNUAL MEAN					9.36	1982
LOWEST ANNUAL MEAN					3.32	1977
HIGHEST DAILY MEAN	23	Aug 23	51	Jan 25	149	Mar 19 1991
LOWEST DAILY MEAN	4.3	Sep 21	4.3	Oct 16	1.3	Apr 15 1977
ANNUAL SEVEN-DAY MINIMUM	4.4	Sep 20	4.4	Oct 15	1.4	Apr 12 1977
ANNUAL RUNOFF (AC-FT)	3960		4040		4540	
10 PERCENT EXCEEDS	6.2		6.1		7.5	
50 PERCENT EXCEEDS	5.1		5.2		5.6	
90 PERCENT EXCEEDS	4.6		4.7		3.8	



HAWAII, ISLAND OF OAHU

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30′00″, long 157°51′34″, 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 fair.

AVERAGE DISCHARGE.--36 years (water years 1961-96), 8.88 ft^3/s (6,430 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 (*): (4.79 ft)

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0430	2,120	7.13	No other peak greater than base discharge.			

Minimum discharge, 2.06 ft^3/s, October 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	7.2	7.7	5.6	8.9	7.9	5.3	4.8	2.8	6.3	6.8	4.1
2	2.9	4.8	8.2	4.4	8.4	62	5.5	4.3	2.8	5.7	6.4	3.3
3	2.6	10	5.2	4.1	7.6	118	4.6	4.1	2.7	5.4	6.1	3.2
4	2.8	7.7	4.5	3.9	6.9	55	4.1	4.3	2.7	5.2	5.9	3.0
5	2.5	4.9	4.3	4.6	6.5	21	4.1	3.9	2.8	8.7	5.9	4.1
6	2.5	4.3	4.1	4.0	6.2	16	3.8	3.9	2.9	5.8	5.4	3.9
7	2.6	3.8	5.0	14	13	13	3.6	3.8	4.6	12	5.1	5.6
8	9.7	21	4.1	12	33	11	3.4	4.0	3.2	5.6	4.8	6.1
9	3.6	21	3.8	7.7	17	9.6	3.3	4.0	8.2	5.3	4.6	4.1
10	3.6	11	3.7	22	10	8.7	4.4	3.6	6.6	4.7	4.9	3.4
11	3.2	6.3	3.6	8.3	8.4	8.2	4.9	3.6	26	4.4	6.5	3.2
12	3.4	6.0	3.6	6.6	7.6	7.6	3.8	3.5	11	4.8	5.0	3.1
13	2.8	46	7.5	6.0	7.1	7.2	3.5	3.5	57	8.7	4.9	3.0
14	2.6	18	7.7	5.6	7.2	6.8	3.5	3.5	7.1	4.7	4.3	2.8
15	2.6	29	4.4	5.3	6.7	6.5	3.5	3.4	5.3	5.0	4.1	2.8
16	2.4	14	3.9	5.1	6.2	6.1	3.3	3.5	5.4	4.9	4.2	2.8
17	2.3	11	3.7	4.9	6.0	5.9	4.9	3.4	4.8	4.7	3.9	2.7
18	2.2	9.0	3.6	6.0	5.8	5.6	5.8	3.4	7.3	4.4	3.8	2.7
19	2.2	7.8	3.5	23	5.6	5.5	6.0	3.4	4.8	6.8	3.6	2.7
20	2.2	7.0	3.4	5.9	5.5	6.1	4.4	3.5	4.8	4.8	3.5	3.5
21	2.6	7.5	3.3	5.3	5.3	6.1	5.6	3.4	4.3	4.8	3.4	2.9
22	2.3	6.3	3.2	8.2	5.2	5.3	4.0	3.4	4.1	8.2	3.3	2.8
23	2.1	5.8	3.2	41	5.1	5.5	3.6	3.3	4.1	6.9	3.2	2.7
24	2.1	5.5	3.1	21	5.1	5.2	3.4	3.4	4.6	140	3.2	3.5
25	2.2	5.3	3.1	220	5.4	4.8	3.4	3.4	4.2	12	3.1	2.8
26	4.4	5.1	4.0	20	5.0	4.7	3.6	3.5	3.8	9.4	3.0	2.8
27	3.1	4.9	3.2	22	11	4.5	3.4	3.3	3.8	55	3.0	2.7
28	25	4.7	3.0	20	36	4.3	28	5.3	4.5	13	3.0	2.7
29	13	4.4	3.0	12	8.7	4.2	18	3.6	18	8.9	3.0	2.7
30	9.1	4.6	14	14	---	4.3	5.8	3.2	15	7.8	3.0	2.7
31	10	---	20	11	---	10	---	3.0	---	7.2	9.2	---
TOTAL	138.4	303.9	158.6	553.5	270.4	446.6	164.5	114.2	239.2	391.1	140.1	98.4
MEAN	4.46	10.1	5.12	17.9	9.32	14.4	5.48	3.68	7.97	12.6	4.52	3.28
MAX	25	46	20	220	36	118	28	5.3	57	140	9.2	6.1
MIN	2.1	3.8	3.0	3.9	5.0	4.2	3.3	3.0	2.7	4.4	3.0	2.7
AC-FT	275	603	315	1100	536	886	326	227	474	776	278	195

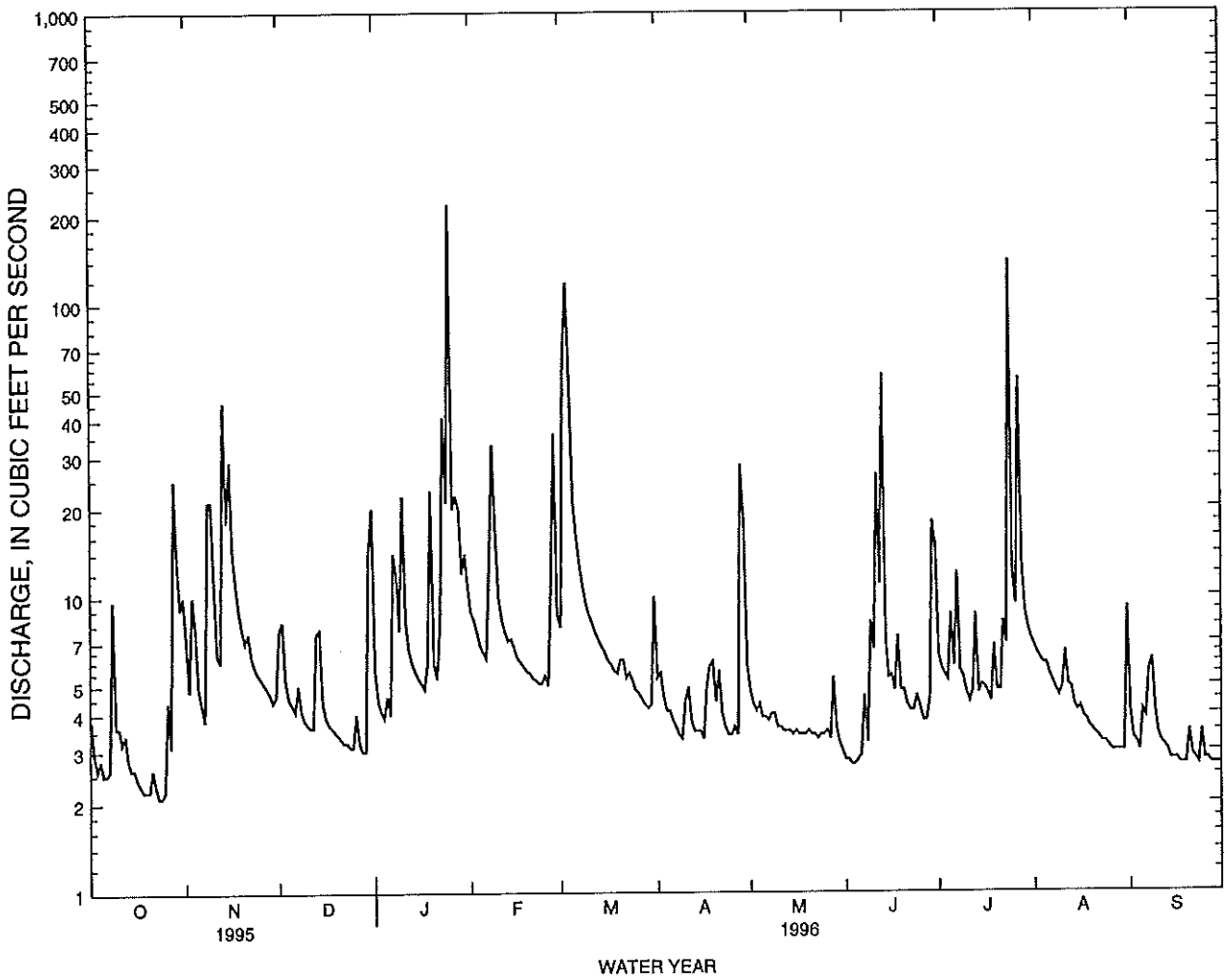
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1996, BY WATER YEAR (WY)

MEAN	6.92	11.5	9.71	11.2	12.4	13.2	10.4	8.58	5.49	6.48	5.44	5.42
MAX	31.0	55.7	44.1	45.6	65.5	53.1	49.3	29.3	16.2	30.2	25.0	22.1
(WY)	1992	1966	1988	1988	1994	1982	1963	1965	1977	1987	1967	1986
MIN	1.55	2.13	2.23	1.67	1.77	2.03	2.88	2.19	1.83	1.76	1.57	1.38
(WY)	1985	1963	1978	1977	1978	1978	1985	1991	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1960 - 1996	
ANNUAL TOTAL	1959.2		3018.9			
ANNUAL MEAN	5.37		8.25		8.88	
HIGHEST ANNUAL MEAN					16.7	1982
LOWEST ANNUAL MEAN					3.33	1984
HIGHEST DAILY MEAN	75	Aug 23	220	Jan 25	868	Feb 4 1965
LOWEST DAILY MEAN	2.0	Jun 19	2.1	Oct 23	1.1	Oct 17 1975
ANNUAL SEVEN-DAY MINIMUM	2.1	Jun 15	2.2	Oct 18	1.3	Sep 19 1984
ANNUAL RUNOFF (AC-FT)	3890		5990		6430	
10 PERCENT EXCEEDS	9.0		13		14	
50 PERCENT EXCEEDS	3.4		4.8		4.2	
90 PERCENT EXCEEDS	2.3		2.8		2.2	



HAWAII, ISLAND OF OAHU

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", 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 fair. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waihole tunnel is 800 ft, from topographic map. Recording rain gage located 50 ft from the streamgage at an elevation of 80 ft.

AVERAGE DISCHARGE.--37 years (water years 1960-96), 37.1 ft^3/s (26,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,250 ft^3/s, March 20, 1991, gage height, 8.60 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 10 ft^3/s, September 17, 18, 20, 1961.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0430	3,290	6.50	No other peak greater than base discharge.			

Minimum discharge, 11 ft^3/s, September 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	91	88	19	26	26	78	22	15	28	21	13
2	28	35	33	17	25	90	55	21	15	36	22	12
3	25	44	26	17	23	266	30	20	14	28	20	12
4	25	37	24	16	22	151	26	20	14	27	24	12
5	24	29	23	17	21	51	25	19	14	48	22	17
6	23	27	22	17	20	39	23	19	14	27	19	20
7	29	25	23	30	22	34	22	19	28	50	19	80
8	62	154	21	48	49	30	21	19	17	25	18	33
9	30	101	20	25	31	28	20	18	29	23	17	22
10	30	54	20	52	24	26	24	17	25	21	23	19
11	27	36	19	28	21	25	27	16	41	20	32	19
12	38	32	19	23	20	29	21	16	35	20	21	18
13	26	88	31	21	20	25	20	15	129	19	32	17
14	24	50	32	20	19	23	19	15	23	19	20	16
15	24	79	20	19	19	23	20	15	20	18	18	16
16	23	43	19	19	19	22	19	15	24	19	18	56
17	21	106	19	18	18	21	28	15	20	20	17	22
18	21	43	18	19	18	21	32	15	27	18	17	19
19	20	35	18	136	18	20	34	15	21	19	16	18
20	25	32	18	42	17	21	24	17	20	18	16	24
21	29	33	17	29	17	22	35	20	20	36	15	19
22	22	27	17	42	17	20	23	15	19	30	15	18
23	19	25	17	104	16	20	21	14	20	89	15	18
24	19	26	17	126	17	20	20	15	24	114	15	43
25	20	24	16	446	39	19	20	18	20	27	15	29
26	95	22	16	56	58	19	22	20	19	32	14	21
27	30	23	16	46	57	19	21	19	18	66	14	19
28	82	41	15	45	95	18	44	30	21	34	14	19
29	56	24	15	33	32	18	129	19	90	26	13	18
30	44	27	28	32	---	18	26	17	60	24	12	17
31	74	---	43	29	---	85	---	16	---	23	18	---
TOTAL	1048	1413	730	1591	800	1249	929	551	856	1004	572	686
MEAN	33.8	47.1	23.5	51.3	27.6	40.3	31.0	17.8	28.5	32.4	18.5	22.9
MAX	95	154	88	446	95	266	129	30	129	114	32	80
MIN	19	22	15	16	16	18	19	14	14	18	12	12
AC-FT	2080	2800	1450	3160	1590	2480	1840	1090	1700	1990	1130	1360

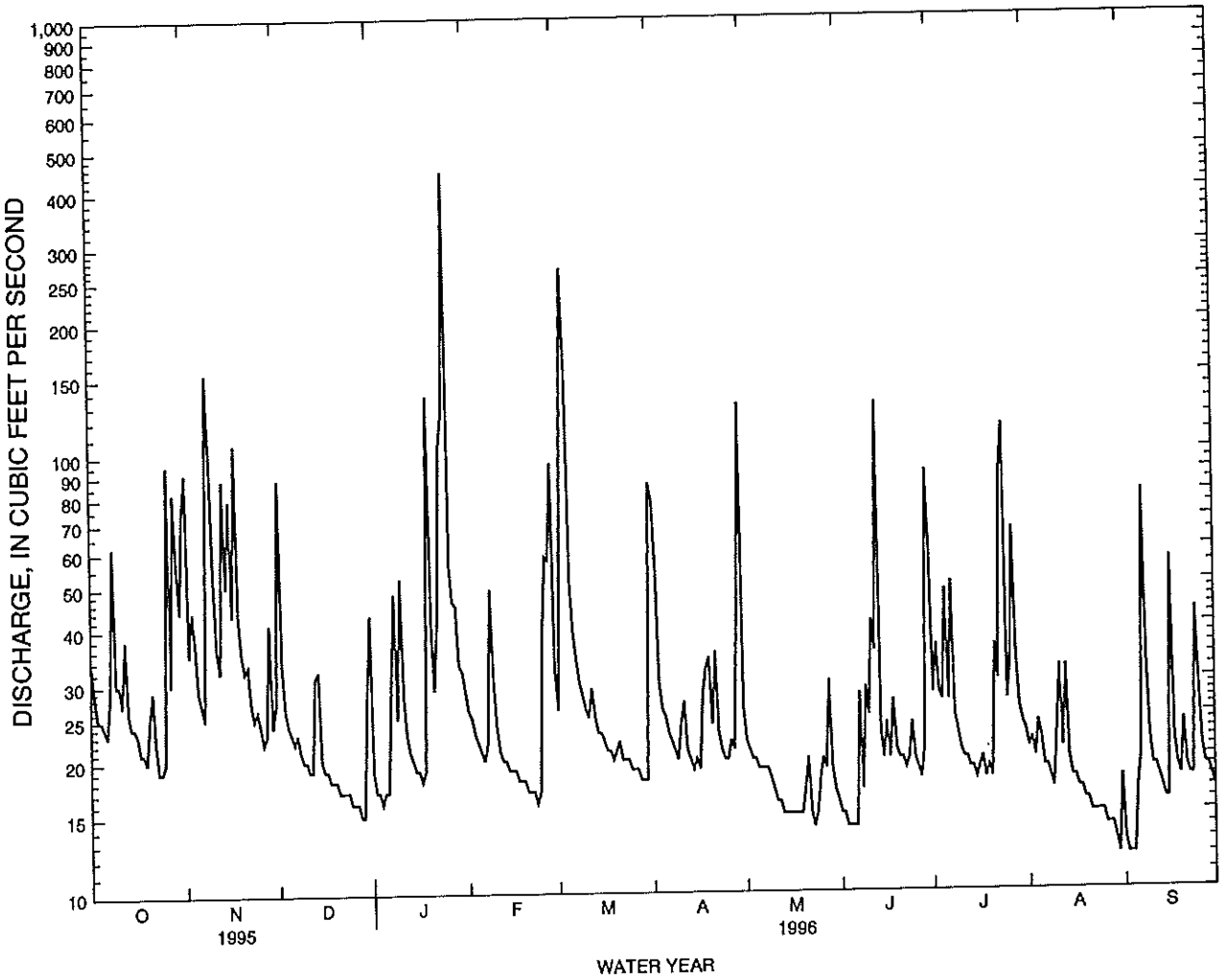
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1996, BY WATER YEAR (WY)

MEAN	32.8	45.0	38.2	37.1	37.3	45.8	46.1	39.5	27.4	32.8	30.6	30.2
MAX	55.1	170	101	94.9	141	176	137	102	56.5	90.5	73.7	84.7
(WY)	1992	1991	1988	1988	1969	1982	1963	1965	1978	1987	1978	1994
MIN	12.6	14.5	14.5	12.9	13.2	15.4	19.3	17.8	14.3	15.0	13.6	13.3
(WY)	1985	1963	1978	1977	1978	1984	1992	1996	1984	1984	1984	1975

HAWAII, ISLAND OF OAHU

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

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1959 - 1996	
ANNUAL TOTAL	10484		11429			
ANNUAL MEAN	28.7		31.2		37.1	
HIGHEST ANNUAL MEAN					67.2	1982
LOWEST ANNUAL MEAN					20.1	1984
HIGHEST DAILY MEAN	306	Jun 22	446	Jan 25	1750	Apr 15 1963
LOWEST DAILY MEAN	11	Mar 18	12	Aug 30	11	Sep 16 1961
ANNUAL SEVEN-DAY MINIMUM	11	Mar 15	13	Aug 29	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	20800		22670		26900	
10 PERCENT EXCEEDS	48		53		58	
50 PERCENT EXCEEDS	20		21		23	
90 PERCENT EXCEEDS	13		16		15	



HAWAII, ISLAND OF OAHU

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", 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 good. Ditch diverts water from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--43 years (water years 1954-96), 8.04 ft^3/s (5,820 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, 18 ft^3/s, March 5; minimum daily, 1.4 ft^3/s, February 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	9.0	13	12	3.7	5.5	12	8.2	12	5.7	7.3
2	14	13	17	11	10	10	17	11	14	9.5	11	6.0
3	11	11	16	9.6	8.6	9.6	15	10	12	11	13	9.4
4	12	16	15	7.9	7.4	13	13	9.2	12	14	11	13
5	14	15	13	6.7	8.9	18	10	13	14	7.7	8.6	12
6	9.9	14	14	12	12	16	13	16	11	3.9	12	12
7	12	12	13	10	15	13	16	15	7.2	3.7	12	7.0
8	12	7.7	9.6	12	5.9	11	12	13	5.7	8.6	11	9.9
9	12	11	12	14	13	13	6.8	12	9.6	14	9.9	13
10	9.2	7.7	15	11	14	16	5.2	11	11	11	8.8	11
11	12	6.5	15	7.9	13	14	12	11	11	9.1	9.5	14
12	14	12	15	7.0	14	12	15	14	9.2	7.9	9.8	12
13	11	11	12	12	13	12	13	15	7.4	10	7.4	9.7
14	9.3	14	14	15	11	16	14	13	11	14	6.5	14
15	12	16	13	12	8.2	14	15	11	12	12	5.6	11
16	14	13	10	9.9	6.6	14	13	9.7	7.9	9.1	5.0	7.7
17	14	8.4	11	7.7	6.3	10	10	8.0	5.8	7.9	4.7	8.9
18	12	13	10	11	12	8.8	13	10	9.3	6.4	4.3	12
19	10	17	7.8	12	14	8.0	12	14	10	10	11	9.4
20	8.9	16	7.4	13	11	7.3	13	11	12	14	14	10
21	8.0	12	10	14	7.6	6.3	11	9.0	11	11	12	14
22	12	10	14	14	6.3	5.7	8.5	7.3	8.3	11	10	13
23	13	8.6	11	12	5.9	13	7.6	6.3	6.5	13	9.4	15
24	13	8.0	9.7	8.5	5.2	16	6.3	11	4.6	14	8.4	12
25	14	6.9	8.4	9.0	2.6	15	5.3	11	11	12	7.6	13
26	11	9.6	7.3	15	1.4	14	9.3	12	12	9.5	7.4	15
27	11	10	6.6	12	9.2	13	16	14	11	6.7	6.8	14
28	12	13	6.1	12	5.6	11	15	11	9.2	11	6.5	13
29	14	13	5.4	13	4.1	10	9.9	8.4	6.7	12	11	11
30	15	11	7.0	8.8	---	8.7	14	6.7	11	8.5	14	12
31	13	---	12	9.4	---	6.9	---	5.2	---	6.7	10	---
TOTAL	373.3	351.4	346.3	342.4	263.8	359.0	346.4	340.8	291.6	311.2	283.9	341.3
MEAN	12.0	11.7	11.2	11.0	9.10	11.6	11.5	11.0	9.72	10.0	9.16	11.4
MAX	15	17	17	15	15	18	17	16	14	14	14	15
MIN	8.0	6.5	5.4	6.7	1.4	3.7	5.2	5.2	4.6	3.7	4.3	6.0
AC-FT	740	697	687	679	523	712	687	676	578	617	563	677

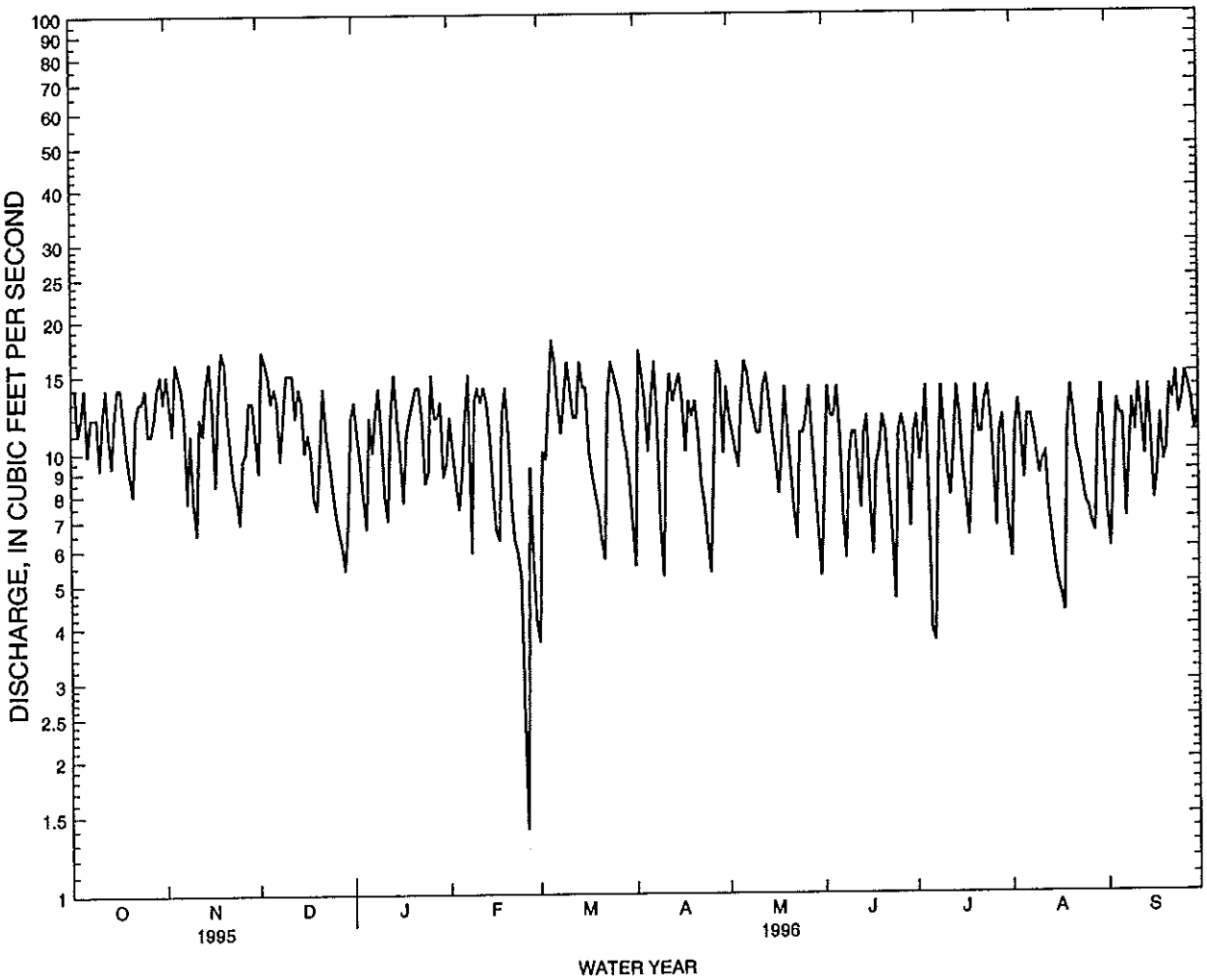
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1996, BY WATER YEAR (WY)

MEAN	9.03	7.36	5.84	5.67	5.63	6.63	8.22	8.63	9.56	9.96	10.2	10.0
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	.002	.000	.001	.003	.011	.046	.015	.027	.020	.003	.002	.001
(WY)	1981	1981	1981	1981	1981	1979	1979	1981	1979	1980	1974	1980

HAWAII, ISLAND OF OAHU

16302000 PUNALUU DITCH NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1953 - 1996	
ANNUAL TOTAL	4392.1		3951.4			
ANNUAL MEAN	12.0		10.8		8.04	
HIGHEST ANNUAL MEAN					15.2	1964
LOWEST ANNUAL MEAN					.23	1981
HIGHEST DAILY MEAN	19	Apr 26	18	Mar 5	54	Oct 31 1964
LOWEST DAILY MEAN	5.4	Dec 29	1.4	Feb 26	.00	Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	7.2	Dec 24	4.5	Feb 24	.00	Jan 5 1969
ANNUAL RUNOFF (AC-FT)	8710		7840		5820	
10 PERCENT EXCEEDS	15		14		17	
50 PERCENT EXCEEDS	12		11		6.4	
90 PERCENT EXCEEDS	9.2		6.6		.19	



HAWAII, ISLAND OF OAHU

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33′33″, long 157°54′06″, 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 good up to 20 ft^3/s and fair above that. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--43 years (water years 1954-96), 17.2 ft^3/s (12,480 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. (Datum was lowered 2.0 ft after the flood of March 20, 1991).

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. 08	1600	1,340	6.03	Jan. 25	0400	*2,070	*7.02
Jan. 19	1030	1,040	5.55	Mar. 03	2400	1,060	5.56
Jan. 24	2000	1,080	5.61				

Minimum discharge, 0.10 ft^3/s, August 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	35	49	5.1	11	24	58	6.6	8.5	7.5	13	e3.5
2	3.3	9.3	7.4	6.3	12	47	10	7.2	2.5	9.9	6.6	e2.8
3	5.3	20	5.4	7.4	13	138	7.9	8.4	4.4	7.9	4.8	e2.8
4	5.0	7.2	5.1	9.2	13	85	8.5	9.5	4.1	4.8	7.6	e2.8
5	2.7	4.9	6.7	12	12	20	11	5.5	2.4	20	9.3	e4.0
6	6.7	4.7	6.0	5.6	7.8	17	6.9	2.6	4.8	16	5.2	e4.6
7	5.1	6.7	7.3	23	13	16	4.3	3.6	11	17	4.8	e25
8	12	130	9.5	19	23	14	8.2	5.7	11	9.5	6.1	e13
9	4.8	55	6.8	9.4	11	11	13	6.9	14	4.7	7.1	e5.4
10	7.5	36	3.0	20	8.0	7.4	16	6.6	8.2	7.1	8.7	e4.5
11	5.0	24	3.3	15	7.8	9.2	9.5	6.9	5.5	9.3	9.3	e4.5
12	4.6	14	3.2	14	6.0	13	4.4	4.0	7.2	11	7.6	e4.2
13	5.7	53	10	8.2	7.4	9.7	6.7	2.8	8.9	7.5	11	e4.0
14	6.9	22	7.5	4.6	9.8	5.8	5.7	4.2	5.5	3.8	11	e3.8
15	4.5	24	5.1	7.0	12	7.1	4.0	6.0	4.3	6.1	11	e3.8
16	1.7	18	7.8	8.6	13	7.3	6.0	7.4	8.8	9.3	12	e16
17	2.1	35	6.8	11	13	10	11	8.8	11	11	12	e5.8
18	4.2	15	7.2	7.1	7.0	12	8.7	6.6	15	11	12	e4.8
19	5.4	7.1	9.9	75	4.2	13	10	3.6	7.3	8.4	4.8	e4.6
20	7.3	8.1	10	15	7.7	14	6.9	6.1	5.7	3.5	2.5	e6.6
21	8.5	13	6.7	15	11	16	9.0	8.5	6.1	29	4.5	e4.9
22	4.3	12	2.9	13	12	15	11	9.6	8.8	12	5.2	e4.6
23	2.8	13	5.2	14	13	7.5	11	11	12	19	6.6	e4.6
24	2.7	14	6.8	68	13	3.5	13	5.7	14	5.7	7.1	e12
25	2.0	14	8.5	193	41	4.4	13	6.1	7.9	7.1	8.2	e8.0
26	11	10	9.5	24	45	5.4	11	6.5	4.7	11	8.2	e5.0
27	5.6	12	9.9	21	33	6.4	3.1	3.3	6.0	20	8.7	e4.6
28	22	7.9	10	20	66	7.6	6.4	6.4	7.9	9.7	9.3	e4.6
29	12	6.1	11	12	27	9.0	17	8.6	27	7.6	4.4	e4.3
30	4.7	10	17	17	---	10	5.2	10	17	11	e2.7	e4.1
31	28	---	14	15	---	21	---	11	---	12	e5.6	---
TOTAL	208.5	641.0	278.5	694.5	472.7	586.3	316.4	205.7	261.5	329.4	236.9	183.2
MEAN	6.73	21.4	8.98	22.4	16.3	18.9	10.5	6.64	8.72	10.6	7.64	6.11
MAX	28	130	49	193	66	138	58	11	27	29	13	25
MIN	1.7	4.7	2.9	4.6	4.2	3.5	3.1	2.6	2.4	3.5	2.5	2.8
AC-FT	414	1270	552	1380	938	1160	628	408	519	653	470	363

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1995, BY WATER YEAR (WY)

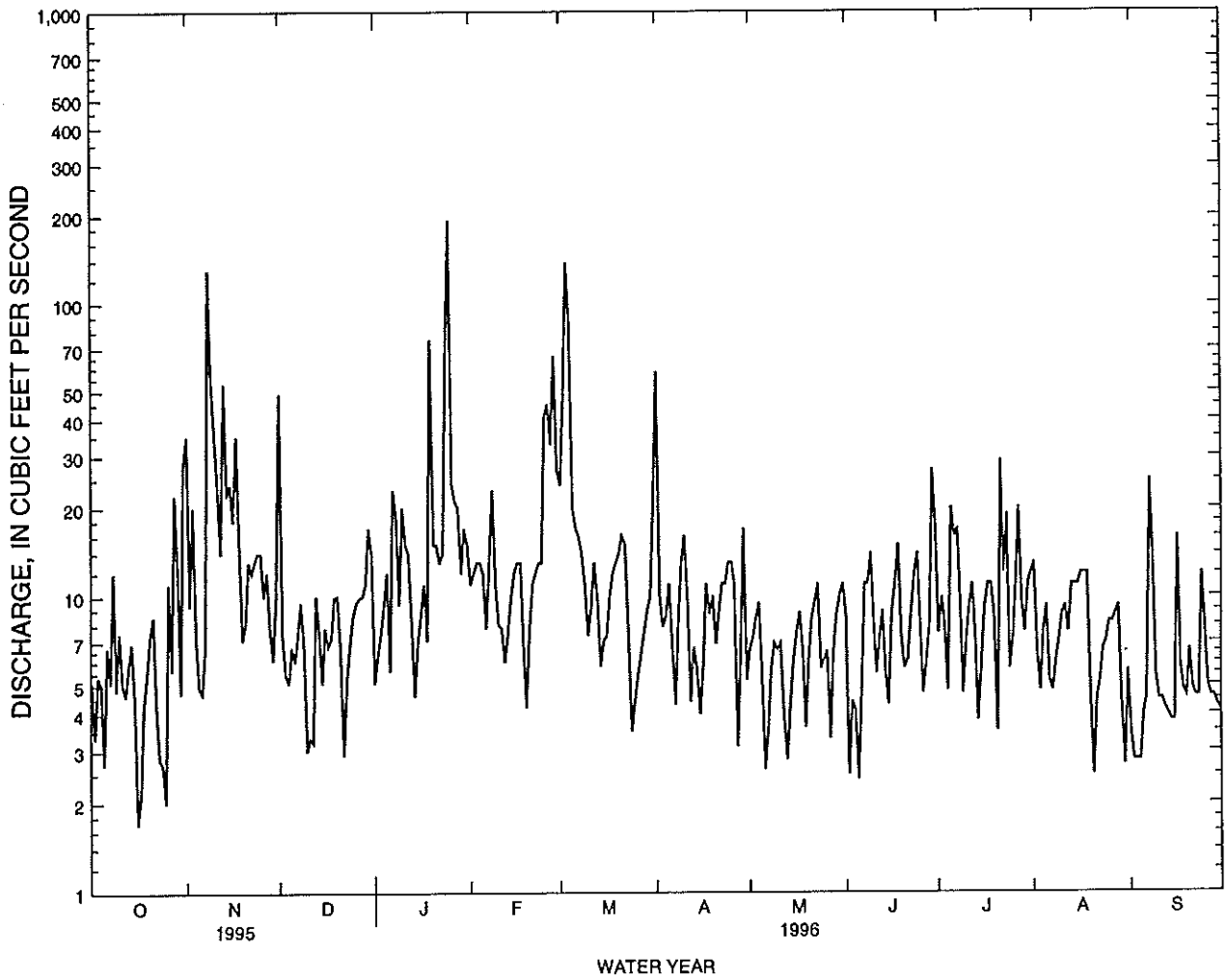
MEAN	14.1	20.4	21.2	21.1	22.0	22.6	22.3	17.6	11.5	12.3	11.6	10.6
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	29.9
(WY)	1959	1991	1965	1988	1969	1982	1963	1965	1982	1974	1982	1994
MIN	.28	4.58	.23	3.32	.58	3.19	2.37	1.00	.000	.000	.31	.49
(WY)	1958	1960	1960	1960	1964	1993	1954	1961	1953	1953	1961	1961

e Estimated

HAWAII, ISLAND OF OAHU

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1953 - 1995	
ANNUAL TOTAL	3247.0		4414.6			
ANNUAL MEAN	8.90		12.1		17.3	
HIGHEST ANNUAL MEAN					35.4	1982
LOWEST ANNUAL MEAN					7.27	1961
HIGHEST DAILY MEAN	130	Nov 8	193	Jan 25	1010	Apr 15 1963
LOWEST DAILY MEAN	1.4	Mar 6	1.7	Oct 16	.00	Jun 1 1953
ANNUAL SEVEN-DAY MINIMUM	2.3	Mar 14	3.5	Aug 30	.00	Jun 1 1953
ANNUAL RUNOFF (AC-FT)	6440		8760		12570	
10 PERCENT EXCEEDS	15		20		30	
50 PERCENT EXCEEDS	5.8		8.2		12	
90 PERCENT EXCEEDS	2.9		4.2		2.3	



HAWAII, ISLAND OF OAHU

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35′22″, long 157°54′38″, 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 good. No diversion upstream of station.

AVERAGE DISCHARGE.--29 years (water years 1968-96), 4.41 ft^3/s (3,190 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 measurements at gage heights 8.85 ft and 10.0 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)
--*	--	*1,530	*10.65	No other peak greater than base discharge.			

Minimum discharge, 0.16 ft^3/s on May 19, August 30.

--* sometime during January 19-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	e16	21	e1.0	1.0	e1.0	e30	.98	.61	2.7	1.2	1.1
2	1.1	e2.0	2.8	e.50	1.1	e1.5	e9.0	.68	.45	6.9	.99	.41
3	2.1	e2.3	1.2	e.35	1.1	e35	e.90	.55	.38	2.7	.88	.56
4	1.5	e21	.89	e.30	.68	e10	e.55	1.2	.34	8.0	2.7	.44
5	1.2	e1.7	.75	e.70	.65	e2.5	e.47	.77	.34	16	2.2	7.4
6	3.2	e1.2	.63	e1.5	e.62	e1.1	e.41	.45	.45	3.6	2.1	5.6
7	2.4	e.96	.63	e5.4	e.60	e.90	e.36	.41	12	6.5	1.7	26
8	12	e29	.53	e1.7	e9.0	e.70	e.35	1.4	2.0	2.1	1.2	3.1
9	1.6	e34	.46	e15	e1.5	e.60	e.35	2.8	12	2.4	.77	1.4
10	2.1	e20	.40	e3.0	e.80	e.55	e1.0	.43	5.9	1.5	2.8	.96
11	2.6	e2.7	.34	e.70	e.60	e.50	e10	.31	1.3	1.2	7.2	1.3
12	2.5	e2.0	1.1	e.40	e.55	e.48	e2.0	.25	.89	3.6	3.0	1.2
13	1.1	e34	17	e.35	e.52	e.45	e.50	.22	.99	1.2	5.2	1.3
14	.85	e14	2.6	e.30	e.60	e.43	e.45	.22	.61	.95	1.5	.78
15	1.0	e21	1.0	e.27	e2.2	e.41	e2.0	.18	1.2	2.0	1.0	.54
16	.74	e4.8	.72	e.26	e1.0	e.40	.58	.47	1.9	5.9	.94	.50
17	.62	e9.3	.61	e.25	e.60	e.39	7.5	.74	3.3	3.4	1.4	.46
18	1.0	e4.1	.55	e.30	e.45	e.38	9.1	.28	17	2.6	.88	.38
19	.61	e2.1	.50	e70	e.35	e.37	11	.73	1.8	2.3	.71	.38
20	2.1	e2.7	.44	e4.5	e.30	e1.0	2.0	5.6	2.6	1.3	.60	4.6
21	3.2	e6.4	.37	e6.0	e.25	e2.5	4.7	3.6	4.1	2.7	.51	1.1
22	.86	e1.9	.31	e2.2	e.23	e1.5	1.6	.72	4.1	6.0	.45	.53
23	.56	e1.4	.35	e5.0	e.22	e.50	1.1	.40	2.6	1.3	.39	.44
24	.47	e1.9	.28	e20	e.25	e2.5	.91	.33	5.4	7.1	.35	3.3
25	e.40	e1.6	.85	e100	e30	e.90	.80	5.3	8.7	1.2	.31	.60
26	e5.3	e1.0	1.7	e5.0	e10	e.40	5.4	6.1	1.6	7.7	.30	.37
27	e2.0	e.87	.42	2.9	e6.0	e.35	1.3	3.6	1.4	22	.29	.29
28	e.75	e.84	.28	4.6	e15	e.33	9.3	4.3	2.0	3.0	.23	.22
29	e18	.96	.22	1.6	e5.0	e.31	2.1	1.8	17	1.6	.19	.19
30	e5.2	2.0	e10	2.1	---	e.30	1.7	1.1	15	1.4	.18	.17
31	e10	---	e5.0	2.6	---	e3.0	---	.82	---	1.3	4.7	---
TOTAL	89.26	243.73	73.93	258.78	91.17	71.25	117.43	46.74	127.96	132.15	46.87	65.62
MEAN	2.88	8.12	2.38	8.35	3.14	2.30	3.91	1.51	4.27	4.26	1.51	2.19
MAX	18	34	21	100	30	35	30	6.1	17	22	7.2	26
MIN	.40	.84	.22	.25	.22	.30	.35	.18	.34	.95	.18	.17
AC-FT	177	483	147	513	181	141	233	93	254	262	93	130

e Estimated

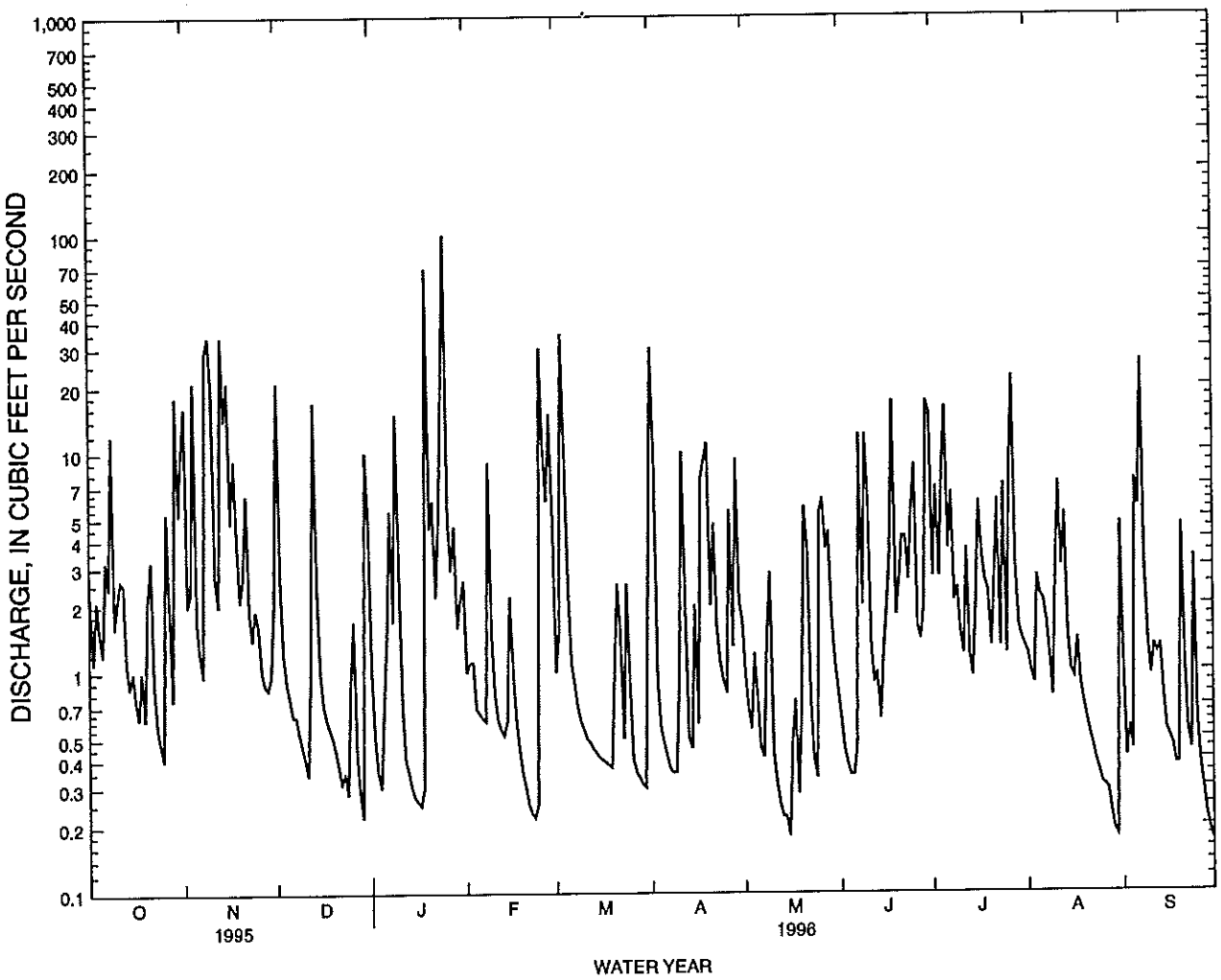
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1996, BY WATER YEAR (WY)

MEAN	3.41	5.95	5.07	5.25	4.78	5.80	5.79	3.73	2.80	4.09	3.35	3.13
MAX	7.68	19.0	17.7	17.9	19.7	32.2	19.3	7.93	7.72	11.7	8.37	9.34
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1987	1982	1991	1994
MIN	.27	1.66	.48	.26	.41	.14	.87	.85	.61	.21	.53	.22
(WY)	1985	1981	1977	1986	1983	1983	1979	1991	1981	1971	1984	1975

HAWAII, ISLAND OF OAHU

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1967 - 1996	
ANNUAL TOTAL	1364.51		1364.89			
ANNUAL MEAN	3.74		3.73		4.41	
HIGHEST ANNUAL MEAN					9.94	1982
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	51	Apr 25	100	Jan 25	230	Feb 1 1969
LOWEST DAILY MEAN	.00	Mar 20	.17	Sep 30	.00	Jul 24 1971
ANNUAL SEVEN-DAY MINIMUM	.05	Mar 15	.26	Aug 24	.00	Sep 14 1975
ANNUAL RUNOFF (AC-FT)	2710		2710		3190	
10 PERCENT EXCEEDS	10		9.2		9.6	
50 PERCENT EXCEEDS	1.1		1.2		1.4	
90 PERCENT EXCEEDS	.22		.34		.25	



HAWAII, ISLAND OF OAHU

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37′25″, long 158°01′04″, Hydrologic Unit 20060000, on left bank 75 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

DRAINAGE AREA.--3.13 mi^2.

PERIOD OF RECORD.--June 1963 to current year. Occasional low-flow measurements, water years 1961 and 1963.

REVISED RECORDS.--WDR HI-94-1: 1992-93 (M).

GAGE.--Water-stage recorder and combination pipe culvers and paved road control. Elevation of gage is 590 ft above mean sea level, from topographic map.

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

AVERAGE DISCHARGE.--33 years (water years 1964-96), 10.3 ft^3/s (7,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,810 ft^3/s, revised, November 20, 1990, gage height, 11.34 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurements at gage heights 10.06 ft, and 11.34 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 19	0900	1,460	8.14	Jan. 25	0500	1,520	8.23
Jan. 24	2100	*2,270	*9.16	Jun. 29	1415	1,000	7.38

Minimum discharge, 0.84 ft^3/s on June 4-6, August 29-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	27	10	7.5	11	9.5	80	6.2	1.7	16	2.9	3.9
2	3.0	5.8	12	3.5	11	7.5	14	3.3	1.2	22	2.6	2.1
3	4.3	50	8.9	2.5	9.7	100	7.6	2.6	.99	12	2.3	1.5
4	5.1	29	5.2	2.2	8.4	44	4.3	2.4	.88	12	2.3	2.0
5	4.0	13	4.5	2.7	7.6	16	3.3	2.4	.84	42	2.3	2.4
6	4.2	9.6	4.1	3.8	6.9	11	2.7	2.1	.97	14	2.6	8.6
7	4.5	7.7	3.9	38	6.6	8.6	2.5	2.1	11	46	2.8	107
8	38	39	3.6	23	24	7.0	2.2	2.0	9.3	10	2.6	16
9	6.6	28	3.3	9.7	11	6.1	2.1	2.3	6.9	7.1	2.0	5.3
10	5.1	13	3.1	16	8.3	5.4	7.4	2.1	18	5.9	4.6	3.8
11	4.0	10	2.9	6.6	7.8	4.9	31	1.8	5.1	5.0	8.2	5.0
12	13	8.8	2.8	4.0	5.7	4.5	10	1.7	2.5	6.1	7.2	5.7
13	4.3	53	23	3.1	5.1	4.2	5.4	1.6	5.2	5.0	4.6	4.4
14	2.9	30	23	2.7	5.6	3.9	3.7	1.5	3.1	4.0	3.9	2.9
15	2.6	31	6.2	2.4	6.7	3.6	3.2	1.5	1.8	4.4	2.1	2.3
16	2.3	15	4.0	2.2	5.2	3.4	2.8	1.6	4.3	6.4	1.9	2.1
17	2.1	13	3.3	2.1	4.4	3.4	8.1	1.8	4.7	8.0	1.8	1.9
18	2.0	14	3.0	2.1	4.1	3.1	19	1.6	8.7	7.3	1.7	1.9
19	1.9	10	2.7	142	3.7	2.8	32	1.4	11	11	1.9	1.8
20	4.4	9.1	2.5	12	3.5	3.2	8.9	4.5	7.7	5.6	1.6	2.0
21	3.9	9.2	2.3	10	3.3	6.7	11	9.6	5.2	4.2	1.4	3.1
22	3.3	8.2	2.3	7.5	3.7	5.2	7.1	3.0	5.5	5.4	1.3	2.1
23	2.1	7.0	2.3	8.0	3.3	3.3	4.4	1.6	5.1	3.7	1.2	1.7
24	1.7	6.4	2.1	205	3.8	3.9	3.6	1.4	7.7	4.7	1.1	2.1
25	1.9	6.0	2.1	219	41	2.9	3.2	6.5	15	3.6	1.1	2.8
26	9.5	5.6	2.2	37	19	2.2	5.2	9.0	4.1	5.6	1.1	1.6
27	3.5	12	1.9	25	53	1.9	7.3	5.7	2.5	24	.98	1.4
28	3.8	11	1.8	20	88	1.8	3.5	2.5	2.8	8.3	.90	1.3
29	24	8.2	1.7	16	16	1.7	3.0	3.7	114	4.0	.88	1.3
30	7.4	6.8	2.5	14	---	1.7	14	3.2	63	3.1	.86	1.2
31	14	---	36	18	---	14	---	2.5	---	2.9	10	---
TOTAL	196.7	496.4	189.2	867.6	387.4	297.4	312.5	95.2	330.78	319.3	82.72	201.2
MEAN	6.35	16.5	6.10	28.0	13.4	9.59	10.4	3.07	11.0	10.3	2.67	6.71
MAX	38	53	36	219	88	100	80	9.6	114	46	10	107
MIN	1.7	5.6	1.7	2.1	3.3	1.7	2.1	1.4	.84	2.9	.86	1.2
AC-FT	390	985	375	1720	768	590	620	189	656	633	164	399

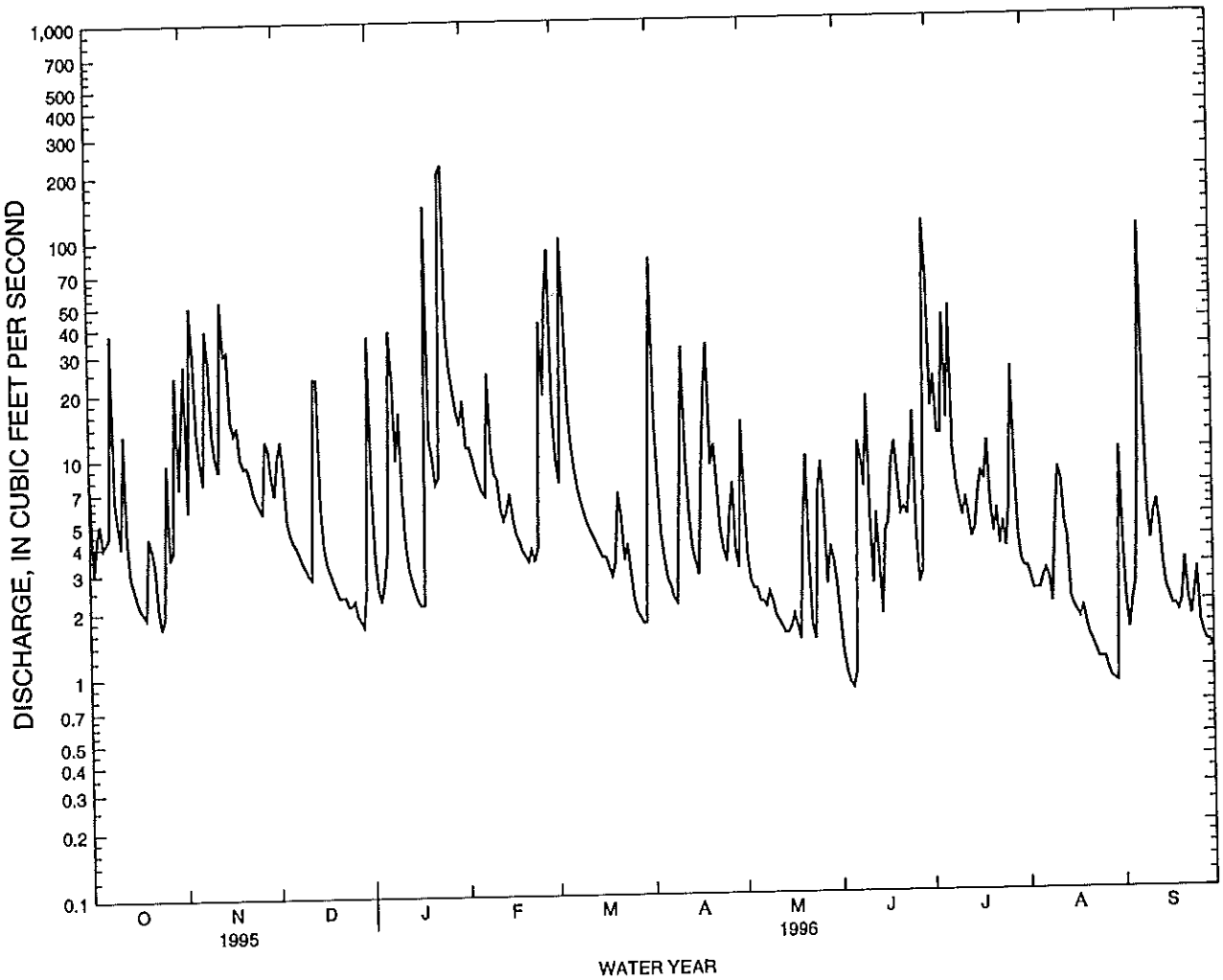
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1996, BY WATER YEAR (WY)

MEAN	6.83	15.9	12.8	15.0	12.8	15.9	14.1	8.11	4.92	8.02	5.56	4.14
MAX	16.3	68.6	44.8	75.8	64.2	77.3	53.6	30.5	20.1	20.2	19.7	10.8
(WY)	1966	1966	1965	1988	1969	1968	1989	1965	1978	1982	1982	1994
MIN	.000	2.27	.91	.45	.073	1.07	.79	.95	1.00	.76	.57	.000
(WY)	1985	1990	1977	1986	1978	1983	1992	1966	1992	1971	1984	1984

HAWAII, ISLAND OF OAHU

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1963 - 1996	
ANNUAL TOTAL	2765.52		3776.40			
ANNUAL MEAN	7.58		10.3		10.3	
HIGHEST ANNUAL MEAN					22.1	1982
LOWEST ANNUAL MEAN					4.09	1984
HIGHEST DAILY MEAN	160	Aug 23	219	Jan 25	620	Nov 20 1990
LOWEST DAILY MEAN	.13	Mar 18	.84	Jun 5	.00	Aug 27 1971
ANNUAL SEVEN-DAY MINIMUM	.18	Mar 15	.99	Aug 24	.00	Oct 15 1971
ANNUAL RUNOFF (AC-FT)	5490		7490		7490	
10 PERCENT EXCEEDS	18		21		19	
50 PERCENT EXCEEDS	3.2		4.3		3.4	
90 PERCENT EXCEEDS	1.2		1.7		.66	



HAWAII, ISLAND OF OAHU

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38′20″, long 158°03′27″, Hydrologic Unit 20060000, on right bank, 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

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 fair. Small diversion upstream of station.

AVERAGE DISCHARGE.--38 years (water years 1959-96), 18.5 ft^3/s (13,430 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. 03	2030	1,760	6.18	Jan. 25	0545	3,890	8.35
Jan. 19	0945	2,490	6.95	June 29	1500	2,790	7.25
Jan. 24	2100	*4,540	*8.86	Sept. 07	1845	1,730	6.14

Minimum discharge, 0.20 ft^3/s, June 5-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	59	7.5	11	12	13	116	11	1.7	30	3.2	9.9
2	5.4	15	11	3.5	10	9.7	17	4.1	.84	30	3.0	4.4
3	4.0	167	15	1.9	9.7	208	9.4	2.7	.56	20	2.8	2.2
4	7.4	113	5.3	1.3	8.2	96	4.8	2.2	.38	14	2.5	1.3
5	5.7	31	3.5	1.1	6.8	29	3.2	2.0	.25	80	2.5	2.0
6	4.8	21	2.7	1.4	6.2	16	2.6	1.8	.20	30	2.8	6.5
7	5.0	16	2.1	57	5.6	12	2.1	1.5	4.1	107	3.0	289
8	80	73	1.8	28	24	9.7	1.8	1.5	13	23	3.0	57
9	16	115	1.6	12	14	7.7	1.4	1.5	4.2	13	2.7	12
10	7.8	29	1.4	14	7.8	5.8	1.2	1.9	24	10	3.2	6.2
11	6.0	21	1.3	8.1	9.3	5.1	33	1.8	7.9	8.0	10	4.7
12	17	17	1.1	3.7	6.4	4.5	15	1.2	3.7	7.6	13	8.8
13	10	137	23	2.3	5.2	4.0	6.7	.85	5.2	8.0	5.9	6.9
14	5.1	61	35	1.7	4.9	3.7	3.7	.72	7.4	5.8	7.7	3.9
15	3.8	50	6.0	1.2	5.9	3.2	3.0	.71	2.6	5.0	3.4	2.5
16	3.1	20	2.9	1.1	5.3	3.2	2.4	.66	5.8	6.8	2.4	1.9
17	2.4	13	2.0	.95	4.2	3.0	2.5	.69	7.5	12	2.1	1.5
18	2.1	12	1.5	.88	4.0	2.9	21	.72	6.9	13	1.5	1.2
19	2.0	8.4	1.4	286	3.7	2.5	54	.69	18	18	1.3	1.1
20	3.0	6.9	1.2	19	3.4	2.3	14	.81	8.4	14	1.4	1.1
21	5.7	6.4	1.0	12	3.1	3.2	10	7.5	8.7	6.8	1.1	1.3
22	4.8	6.5	.95	9.9	3.0	6.9	10	4.5	4.4	8.5	.86	1.7
23	3.3	5.7	.88	7.2	2.7	3.6	5.0	1.9	6.3	6.1	.76	1.0
24	2.1	5.0	.86	503	2.5	2.8	3.5	.95	8.6	5.9	.65	.75
25	1.6	4.5	.79	703	41	2.8	2.9	2.0	17	7.7	.59	1.7
26	10	4.1	.79	63	25	2.4	2.7	9.1	6.8	6.1	.54	1.2
27	7.0	6.6	.75	31	110	2.0	6.8	8.6	3.2	45	.53	.79
28	3.4	14	.64	22	184	1.6	3.4	3.0	2.4	23	.47	.60
29	39	6.7	.58	17	27	1.3	2.6	2.3	375	7.7	.40	.47
30	8.6	6.1	1.1	14	---	1.2	9.2	2.7	178	5.2	.40	.39
31	17	---	71	18	---	9.9	---	2.4	---	4.1	10	---
TOTAL	307.1	1050.9	206.64	1856.23	554.9	479.0	370.9	84.00	733.03	581.3	93.70	434.00
MEAN	9.91	35.0	6.67	59.9	19.1	15.5	12.4	2.71	24.4	18.8	3.02	14.5
MAX	80	167	71	703	184	208	116	11	375	107	13	289
MIN	1.6	4.1	.58	.88	2.5	1.2	1.2	.66	.20	4.1	.40	.39
AC-FT	609	2080	410	3680	1100	950	736	167	1450	1150	186	861

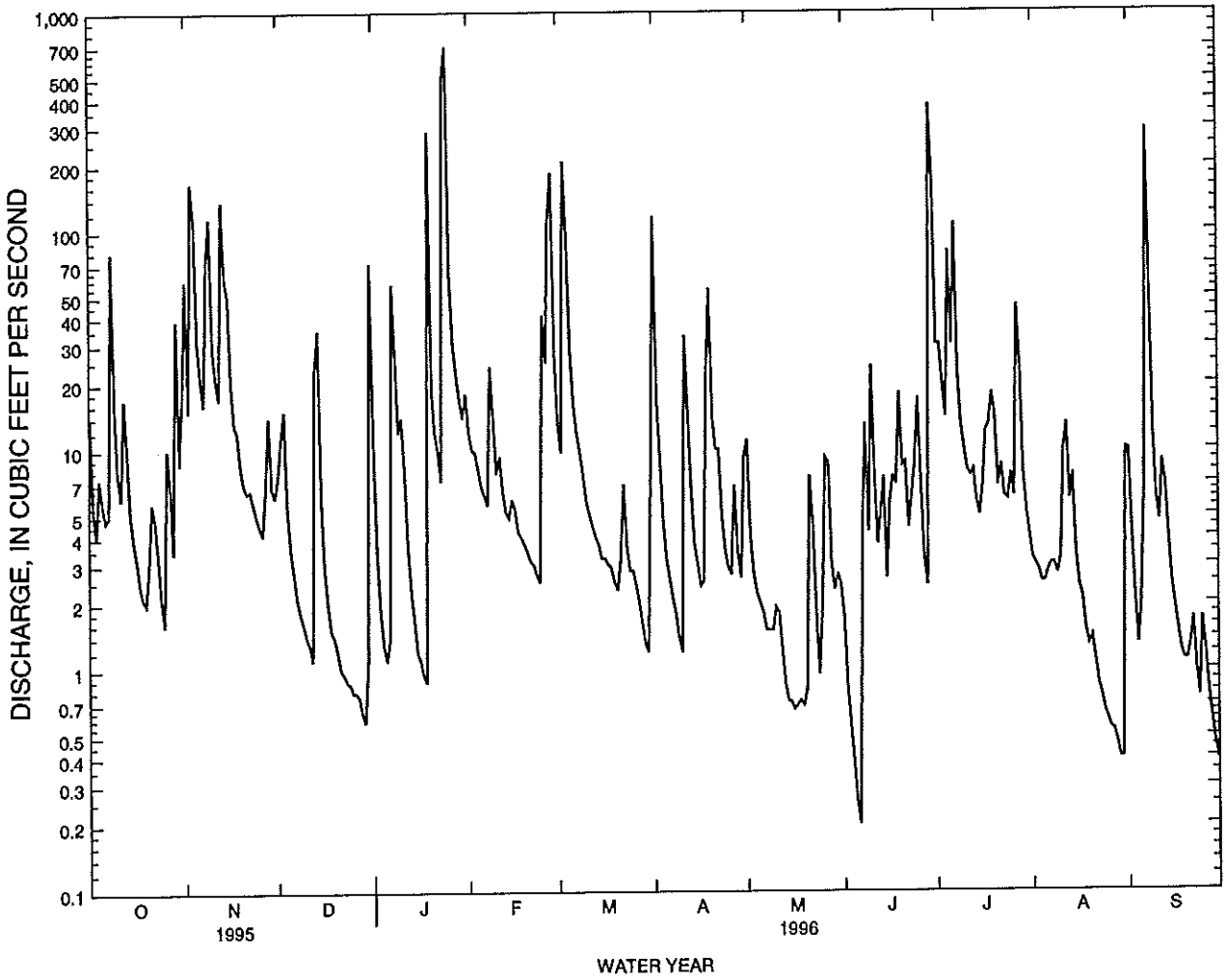
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1996, BY WATER YEAR (WY)

MEAN	12.3	28.2	21.6	27.2	23.0	32.4	28.5	14.9	7.35	12.9	9.95	6.03
MAX	56.7	168	107	143	106	155	168	62.8	52.9	52.7	68.0	19.9
(WY)	1959	1991	1988	1988	1969	1982	1989	1965	1978	1989	1958	1994
MIN	.006	.51	.67	.094	.022	1.23	.64	.95	.33	.52	.20	.006
(WY)	1985	1963	1977	1986	1978	1983	1992	1984	1959	1971	1971	1984

HAWAII, ISLAND OF OAHU

16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1958 - 1996	
ANNUAL TOTAL	5476.62		6751.70			
ANNUAL MEAN	15.0		18.4		18.5	
HIGHEST ANNUAL MEAN					50.3	1982
LOWEST ANNUAL MEAN					4.81	1984
HIGHEST DAILY MEAN	545	Aug 23	703	Jan 25	1940	Jan 1 1988
LOWEST DAILY MEAN	.02	Mar 16	.20	Jun 6	.00	Jun 21 1959
ANNUAL SEVEN-DAY MINIMUM	.02	Mar 15	.51	Aug 24	.00	Jul 23 1959
ANNUAL RUNOFF (AC-FT)	10860		13390		13430	
10 PERCENT EXCEEDS	32		30		31	
50 PERCENT EXCEEDS	3.8		5.0		3.9	
90 PERCENT EXCEEDS	.63		.95		.33	



HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33′55″, long 158°00′10″, 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 good. No diversion upstream of station.

AVERAGE DISCHARGE.--37 years (water years 1960-96), 13.9 ft^3/s (10,040 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 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 18	1830	*2,260	*9.13	Jan. 25	0530	2,160	8.91

Minimum discharge, 0.51 ft^3/s, May 16, August 30-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	75	18	3.4	4.5	5.9	122	3.2	1.7	9.3	2.5	5.6
2	5.4	9.1	4.7	2.0	3.3	6.8	14	2.2	1.2	14	2.6	2.1
3	3.7	35	2.8	1.3	3.1	143	9.4	1.6	.88	8.2	2.2	1.3
4	3.9	26	2.2	1.2	2.7	80	4.2	1.4	.69	10	1.7	1.1
5	5.7	6.4	1.9	5.8	2.3	12	3.3	1.3	.59	46	3.1	1.9
6	4.4	4.3	1.8	12	2.0	7.5	2.9	1.3	.60	14	4.8	16
7	8.0	25	1.7	33	1.9	5.5	2.3	1.2	20	17	5.3	109
8	40	108	1.7	14	14	4.3	1.9	1.1	11	7.4	6.3	21
9	7.3	27	1.5	72	5.0	3.7	1.6	1.0	5.1	5.1	3.1	5.7
10	6.4	9.3	1.3	9.6	3.6	3.2	2.0	1.2	25	4.4	2.1	3.6
11	6.6	5.6	1.2	4.2	3.8	2.8	29	1.2	4.3	3.5	11	4.2
12	9.5	27	4.9	2.8	2.1	2.6	8.5	.85	4.0	3.8	10	5.0
13	6.0	65	30	2.1	1.5	2.4	3.4	.69	3.0	4.6	7.9	4.4
14	3.7	32	6.7	1.8	3.0	2.2	2.4	.61	1.4	3.1	6.7	3.6
15	2.9	16	2.9	1.5	11	1.8	9.1	.56	1.1	3.4	3.1	2.2
16	2.9	7.6	1.9	1.4	6.5	1.8	3.4	.52	1.2	14	2.5	1.7
17	2.3	22	1.6	1.3	3.3	2.1	8.1	.57	6.4	13	2.7	1.3
18	2.1	6.4	1.5	e300	1.9	2.7	29	.74	46	7.6	3.7	1.3
19	3.9	4.9	1.4	e350	1.4	2.6	24	.96	8.9	11	2.1	1.2
20	6.0	4.8	1.3	15	1.1	5.9	7.4	3.4	4.8	7.4	1.9	4.5
21	6.0	7.5	1.1	19	.98	10	12	11	8.4	14	1.4	8.9
22	9.6	4.0	1.0	11	.94	6.4	7.0	4.0	9.2	11	1.2	2.8
23	3.1	3.3	.91	35	.91	4.1	3.8	1.7	7.3	4.4	1.1	1.6
24	2.2	3.0	.88	26	1.0	10	2.8	1.0	10	3.0	.94	1.3
25	2.0	2.8	.83	278	117	3.9	2.4	3.8	43	3.2	.83	2.1
26	8.2	2.8	1.9	13	50	2.2	2.2	10	6.2	2.7	.74	4.7
27	7.9	4.6	1.8	7.4	35	1.6	7.2	15	3.8	23	.74	6.5
28	10	3.3	1.1	10	87	1.3	3.2	4.4	3.4	11	.70	5.7
29	57	3.9	.84	6.7	11	1.1	10	8.1	42	3.9	.59	5.2
30	21	9.9	46	4.8	---	.94	4.3	e3.1	43	2.7	.51	4.8
31	49	---	12	7.7	---	37	---	2.3	---	2.5	12	---
TOTAL	318.7	561.5	159.36	1253.0	381.83	377.34	342.8	90.00	324.16	288.2	106.05	240.3
MEAN	10.3	18.7	5.14	40.4	13.2	12.2	11.4	2.90	10.8	9.30	3.42	8.01
MAX	57	108	46	350	117	143	122	15	46	46	12	109
MIN	2.0	2.8	.83	1.2	.91	.94	1.6	.52	.59	2.5	.51	1.1
AC-FT	632	1110	316	2490	757	748	680	179	643	572	210	477

e Estimated

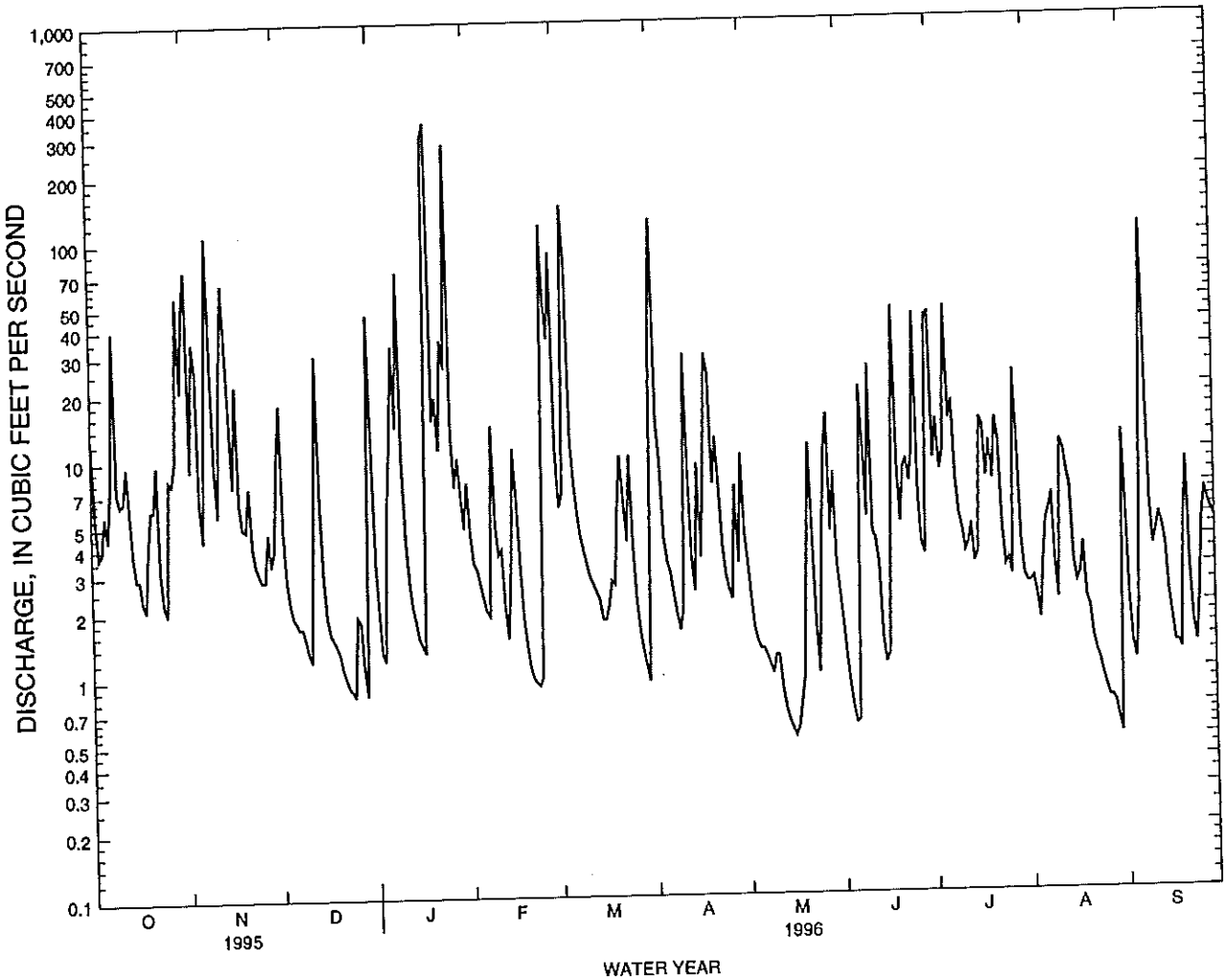
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1996, BY WATER YEAR (WY)

MEAN	11.1	18.5	15.9	16.3	14.2	21.2	21.1	12.4	7.36	11.8	8.74	7.78
MAX	30.7	71.9	52.6	54.1	66.9	90.0	75.7	43.7	24.9	29.3	31.0	24.9
(WY)	1982	1991	1988	1988	1969	1982	1989	1965	1978	1989	1982	1994
MIN	.057	2.90	1.29	.37	.32	.35	1.57	1.75	2.02	.95	1.51	.52
(WY)	1985	1963	1977	1977	1978	1983	1966	1966	1975	1971	1984	1975

HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1959 - 1996	
ANNUAL TOTAL	3579.35		4443.24			
ANNUAL MEAN	9.81		12.1		13.9	
HIGHEST ANNUAL MEAN					29.7	1982
LOWEST ANNUAL MEAN					7.24	1984
HIGHEST DAILY MEAN	323	Aug 23	350	Jan 19	825	Feb 1 1969
LOWEST DAILY MEAN	.09	Mar 21	.51	Aug 30	.00	Jan 24 1977
ANNUAL SEVEN-DAY MINIMUM	.17	Mar 15	.65	May 12	.00	Oct 24 1984
ANNUAL RUNOFF (AC-FT)	7100		8810		10040	
10 PERCENT EXCEEDS	23		25		28	
50 PERCENT EXCEEDS	3.3		3.9		4.5	
90 PERCENT EXCEEDS	.90		1.1		.92	



Surface-Water Station Records for Molokai

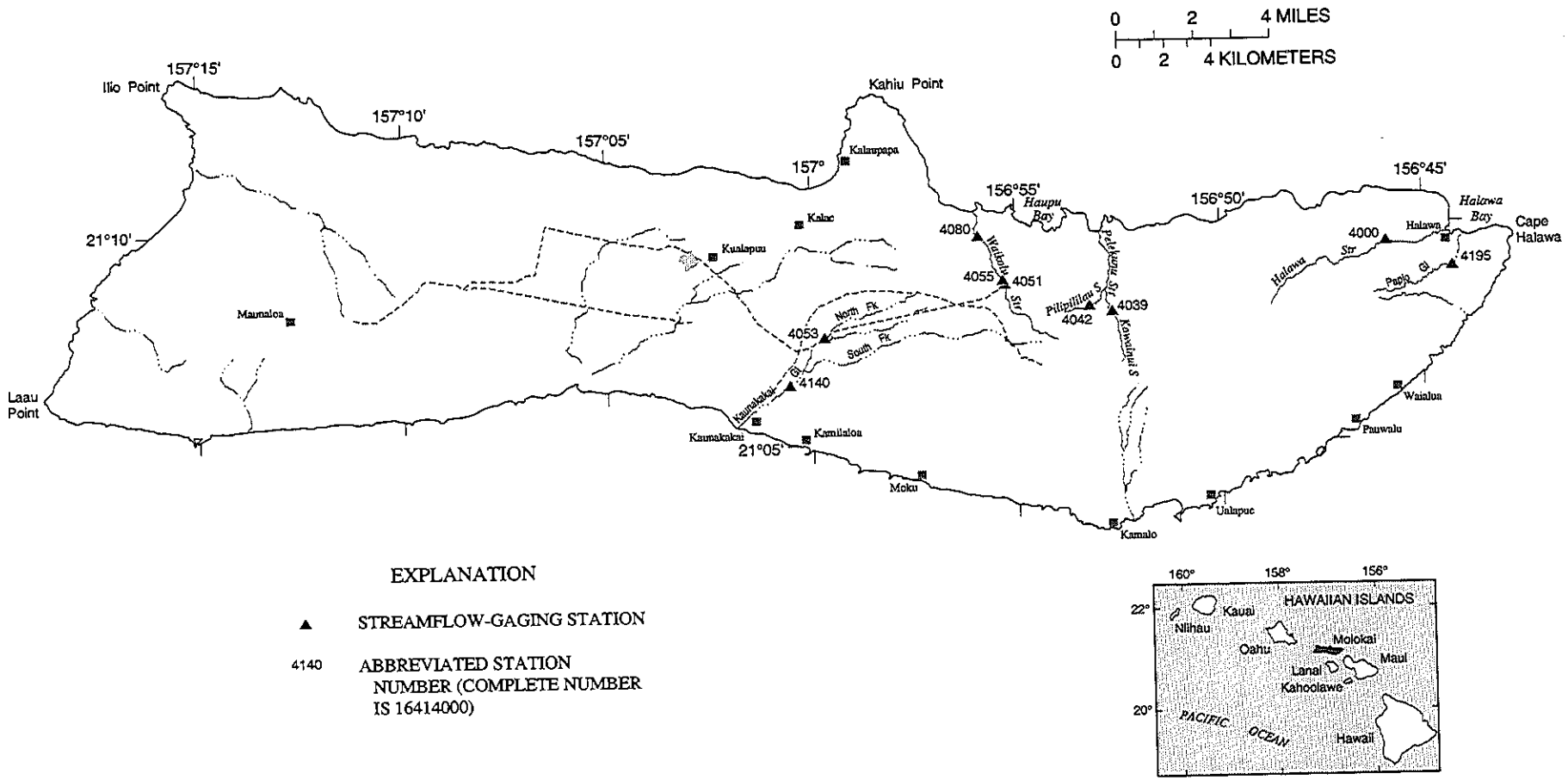


Figure 7. Locations of gaging, water-quality, and partial-record stations on Molokai.

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STREAM NEAR HALAWA

LOCATION.--Lat 21°09′31″, long 156°45′53″, 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 fair. No diversion upstream.

AVERAGE DISCHARGE.--72 years (water years 1918-31, 1939-96), 29.8 ft^3/s (21,580 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)
Feb. 28	0600	*1,370	*7.48	No peak greater than base discharge.			

Minimum discharge, 2.3 ft^3/s, September 02.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	32	30	11	7.4	26	40	9.5	6.9	16	5.2	2.5
2	10	16	26	17	17	86	73	4.8	5.6	95	8.9	2.4
3	13	26	9.6	6.1	9.3	379	24	4.0	5.2	57	5.3	11
4	7.0	26	7.6	4.7	5.9	109	9.1	3.9	4.6	71	8.8	4.7
5	9.5	9.6	6.8	4.4	5.3	40	9.1	4.6	4.3	164	12	25
6	6.4	7.8	6.3	4.3	4.8	19	11	5.9	4.6	23	35	14
7	45	7.0	5.8	75	57	14	6.5	4.0	57	17	18	117
8	97	26	5.2	130	61	11	5.5	69	9.6	10	11	30
9	44	26	4.8	19	8.5	9.4	5.0	36	56	9.8	5.2	10
10	66	16	4.4	7.6	70	8.9	16	6.1	10	7.2	13	14
11	45	8.8	4.3	7.4	9.1	8.0	19	4.6	6.3	6.3	42	21
12	48	46	4.1	5.8	6.1	8.6	6.3	4.0	5.5	11	11	10
13	12	98	4.1	5.2	5.2	6.8	7.0	4.7	5.9	6.6	101	11
14	23	190	16	5.2	75	6.1	16	3.5	4.4	5.3	11	5.7
15	40	46	5.0	4.3	54	5.6	11	7.1	8.3	5.0	7.5	4.6
16	9.1	18	8.1	4.0	36	5.3	7.0	46	29	21	8.7	5.2
17	6.8	85	4.8	14	10	5.5	45	15	21	17	9.4	10
18	5.8	16	5.8	32	17	8.0	85	5.2	86	21	6.4	8.1
19	5.2	12	4.7	39	7.3	5.5	31	4.5	32	63	5.1	5.1
20	31	9.6	4.1	7.8	5.5	7.3	15	17	9.4	23	4.5	12
21	41	8.4	3.2	7.2	4.8	76	45	5.7	7.2	15	4.0	6.2
22	9.9	7.4	3.0	5.9	6.0	9.6	26	3.8	12	11	3.5	4.3
23	7.8	7.0	2.9	29	5.2	22	8.2	3.3	13	6.3	3.3	5.8
24	6.1	18	2.6	43	8.3	40	6.6	65	21	5.7	3.4	16
25	58	12	9.7	38	34	14	5.6	22	13	4.7	3.1	10
26	21	9.6	15	28	28	7.0	5.6	56	7.2	29	3.0	5.4
27	8.2	6.5	7.2	104	153	5.7	5.5	12	14	57	2.8	3.9
28	5.6	26	3.2	82	375	4.8	10	105	7.2	9.7	2.6	3.3
29	219	20	2.7	12	61	4.7	15	27	30	5.8	2.5	3.0
30	77	137	55	8.7	---	82	24	18	37	4.9	2.4	2.9
31	42	---	148	16	---	151	---	14	---	4.5	2.7	---
TOTAL	1031.4	973.7	420.0	777.6	1146.7	1185.8	593.0	591.2	533.2	802.8	362.3	384.1
MEAN	33.3	32.5	13.5	25.1	39.5	38.3	19.8	19.1	17.8	25.9	11.7	12.8
MAX	219	190	148	130	375	379	85	105	86	164	101	117
MIN	5.2	6.5	2.6	4.0	4.8	4.7	5.0	3.3	4.3	4.5	2.4	2.4
AC-FT	2050	1930	833	1540	2270	2350	1180	1170	1060	1590	719	762

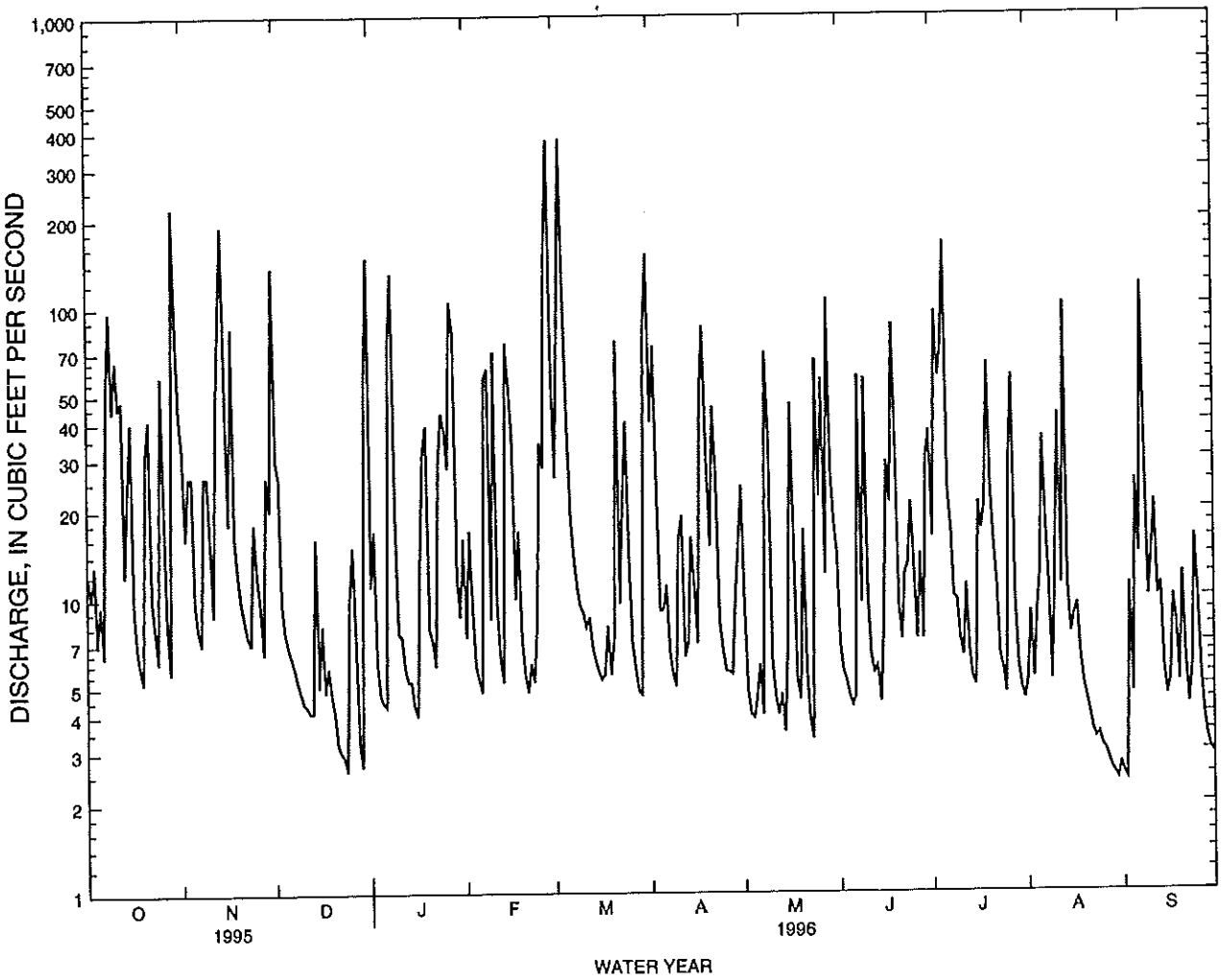
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1996, BY WATER YEAR (WY)

MEAN	26.8	36.2	36.2	33.7	30.0	37.8	40.4	27.1	18.5	25.7	25.0	20.5
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

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STREAM NEAR HALAWA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1917 - 1996	
ANNUAL TOTAL	8174.9		8801.8			
ANNUAL MEAN	22.4		24.0		29.8	
HIGHEST ANNUAL MEAN					47.4	1965
LOWEST ANNUAL MEAN					17.4	1975
HIGHEST DAILY MEAN	223	Jan 14	379	Mar 3	1240	Feb 4 1965
LOWEST DAILY MEAN	1.6	Sep 15	2.4	Aug 30	.86	Sep 1 1971
ANNUAL SEVEN-DAY MINIMUM	2.4	Feb 18	2.6	Aug 27	.90	Aug 26 1971
ANNUAL RUNOFF (AC-FT)	16210		17460		21580	
10 PERCENT EXCEEDS	55		61		65	
50 PERCENT EXCEEDS	8.8		9.6		13	
90 PERCENT EXCEEDS	3.2		4.3		4.8	



HAWAII, ISLAND OF MOLOKAI

16403900 KAWAINUI STREAM NEAR PELEKUNU

LOCATION.--Lat 21°07′59″, long 156°52′38″, Hydrologic Unit 20050000, on right bank 900 ft upstream from confluence with Kapuhi stream, 2.1 mi south of former village of Pelekunu, and 5.7 mi north of Kamalo.

DRAINAGE AREA.--1.17 mi^2.

PERIOD OF RECORD.--August 1968 to December 1979. Destroyed by flood of January 1980. Low-flow partial record site from 1980 to 1994. October 1994 to September 1996 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 770 ft above mean sea level, from topographic map.

REMARKS.--Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--13 years (water years 1968-80, 1995-96), 8.05 ft^3/s (5,830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,800 ft^3/s, December 6, 1979, gage height, 9.01 ft, from floodmarks; minimum, 0.70 ft^3/s, September 22, 1968.

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. 30	2300	*661	*6.03	No peak greater than base discharge.			

Minimum discharge, 1.2 ft^3/s, September 28, 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	e13	e13	e7.4	e6.0	14	e29	e5.4	4.4	6.2	3.2	1.5
2	3.2	e9.0	e7.4	e6.2	e6.8	10	e37	e3.2	3.8	13	2.8	1.5
3	3.1	e11	e5.2	e3.5	e5.6	85	e13	3.0	3.4	10	2.5	1.8
4	3.0	e9.8	e4.3	e2.8	e4.2	56	e6.4	2.8	2.9	13	2.7	1.6
5	3.0	e5.4	e3.5	e2.5	e3.5	20	e6.2	3.0	2.8	35	3.3	1.7
6	3.1	e4.5	e3.0	e3.5	e3.0	14	e5.6	2.6	4.9	17	5.3	1.7
7	8.6	e3.9	2.7	e21	e17	11	e4.4	2.3	8.7	12	3.2	3.7
8	15	e9.9	2.8	e29	e20	8.7	e3.5	2.7	3.6	8.2	2.6	2.1
9	10	e9.6	2.7	e7.4	8.1	7.4	e3.4	4.0	14	6.7	2.5	1.6
10	13	e7.3	2.4	e5.0	9.7	6.4	e8.0	2.4	6.7	5.6	2.7	2.9
11	12	e5.5	2.3	e4.0	6.5	5.6	e8.5	2.1	4.7	4.9	3.4	7.5
12	11	e20	2.3	e3.2	5.5	4.9	e4.0	2.0	3.9	5.0	2.8	5.9
13	7.8	e33	2.2	e2.9	4.9	4.5	e4.3	2.0	3.4	4.1	7.5	3.2
14	6.7	e4.8	5.4	e2.8	13	4.0	e8.0	2.2	3.0	3.6	3.4	2.2
15	6.0	e14	2.4	e2.7	24	3.5	e6.0	2.2	3.5	4.8	2.8	2.0
16	4.6	e18	2.4	e2.5	21	3.3	e4.8	3.3	5.5	5.7	2.9	1.8
17	4.0	e34	2.3	e6.3	13	3.3	e18	2.7	6.3	4.0	2.5	2.2
18	3.6	e11	2.5	e13	9.6	4.7	e26	2.1	16	8.0	2.8	2.2
19	3.7	e7.0	2.4	e15	7.5	2.9	e12	2.5	13	15	2.3	1.8
20	7.6	e6.0	2.2	e7.0	6.4	3.4	e10	3.5	8.5	13	2.2	2.1
21	8.6	e4.8	2.0	e4.5	5.8	7.6	e21	2.1	6.2	8.5	2.1	1.7
22	5.4	e4.1	2.0	e3.6	5.5	3.7	e14	1.9	5.3	7.0	2.0	1.5
23	5.5	e3.8	1.9	e9.0	4.6	7.3	e5.8	1.8	8.2	5.7	2.0	1.6
24	e4.5	e7.5	1.9	e15	5.8	13	e4.5	6.1	8.5	4.9	1.9	1.9
25	e19	e5.3	2.4	e13	9.5	6.6	e3.7	4.4	8.0	4.4	1.8	1.5
26	e10	e4.2	2.5	e12	11	5.0	e3.7	4.7	6.2	4.5	1.7	1.4
27	e4.3	e3.7	1.8	e29	19	4.3	e3.6	4.1	5.7	4.2	1.7	1.4
28	e3.6	e11	1.8	e23	71	3.7	e5.3	14	5.0	3.7	1.6	1.3
29	e45	e8.6	1.8	e9.3	22	3.3	e7.0	7.7	5.8	3.3	1.6	1.3
30	e27	e39	e15	e6.6	---	e25	e10	8.1	7.0	3.1	1.6	1.3
31	e15	---	e30	e7.4	---	e50	---	5.9	---	3.4	1.6	---
TOTAL	280.9	328.7	136.5	280.1	349.5	402.1	296.7	116.8	188.9	247.5	83.0	65.9
MEAN	9.06	11.0	4.40	9.04	12.1	13.0	9.89	3.77	6.30	7.98	2.68	2.20
MAX	45	39	30	29	71	85	37	14	16	35	7.5	7.5
MIN	3.0	3.7	1.8	2.5	3.0	2.9	3.4	1.8	2.8	3.1	1.6	1.3
AC-FT	557	652	271	556	693	798	589	232	375	491	165	131

e Estimated

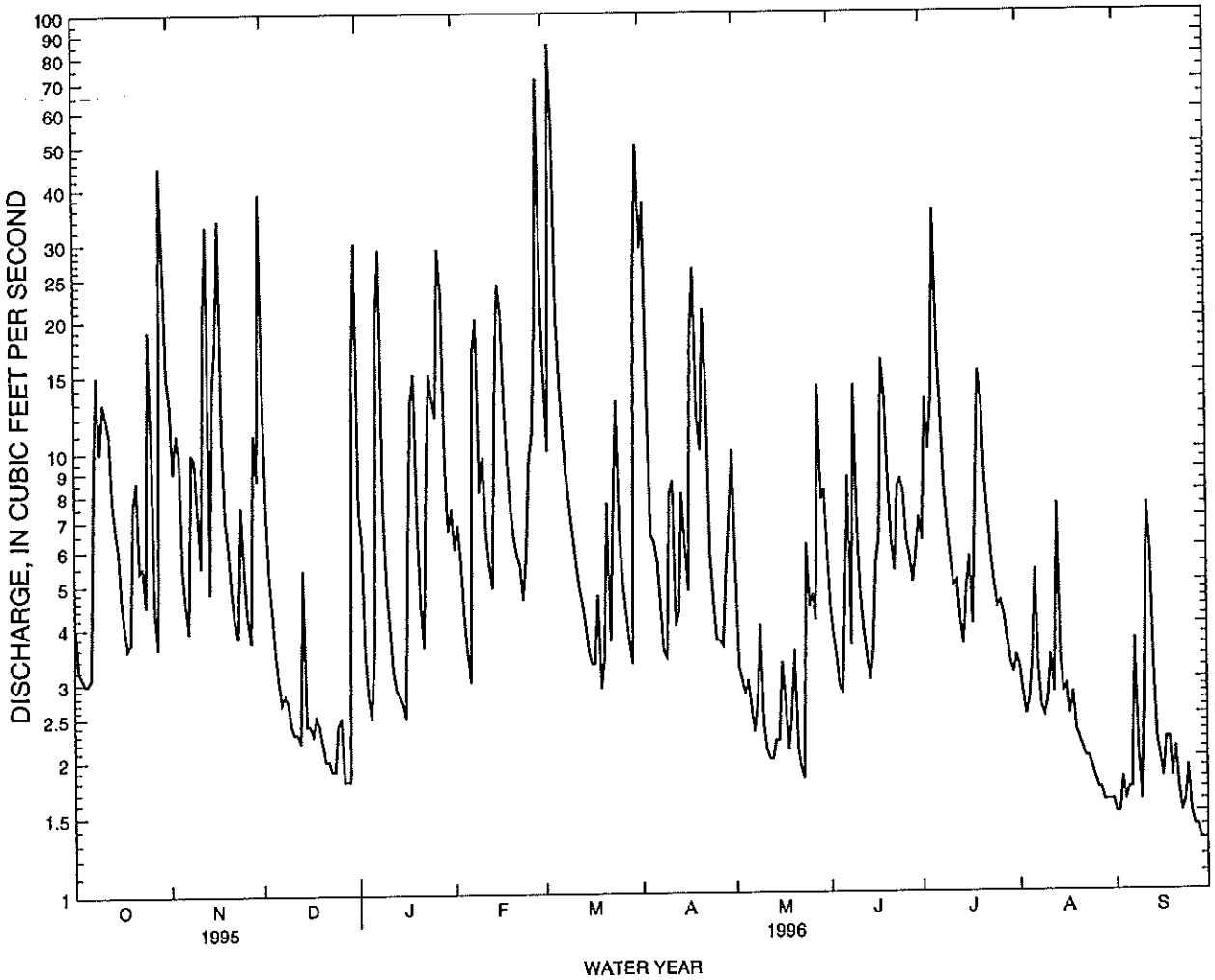
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1996, BY WATER YEAR (WY)

MEAN	3.92	10.5	9.78	13.1	12.7	11.6	11.6	6.56	4.55	5.37	4.05	2.87
MAX	9.06	26.2	22.9	29.4	39.3	16.5	16.5	11.7	7.96	8.29	7.11	6.77
(WY)	1996	1971	1969	1971	1979	1972	1977	1978	1978	1978	1978	1978
MIN	1.72	3.59	3.26	1.93	1.61	2.13	6.63	2.77	2.12	2.09	1.36	1.45
(WY)	1972	1978	1977	1977	1978	1970	1978	1972	1972	1971	1971	1974

HAWAII, ISLAND OF MOLOKAI

16403900 KAWAINUI STREAM NEAR PELEKUNU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1968 - 1996	
ANNUAL TOTAL	2320.3		2776.6			
ANNUAL MEAN	6.36		7.59		8.05	
HIGHEST ANNUAL MEAN					11.8	1969
LOWEST ANNUAL MEAN					6.24	1978
HIGHEST DAILY MEAN	52	Jan 29	85	Mar 3	296	Nov 29 1968
LOWEST DAILY MEAN	1.1	Jun 29	1.3	Sep 28	.75	Sep 22 1968
ANNUAL SEVEN-DAY MINIMUM	1.3	Sep 20	1.4	Sep 24	.95	Nov 17 1968
ANNUAL RUNOFF (AC-FT)	4600		5510		5830	
10 PERCENT EXCEEDS	12		15		15	
50 PERCENT EXCEEDS	4.5		4.7		4.8	
90 PERCENT EXCEEDS	1.9		2.0		1.6	



HAWAII, ISLAND OF MOLOKAI

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08′08″, long 156°53′09″, Hydrologic Unit 20050000, on right bank 500 ft downstream from left-bank tributary, 1.9 mi south of former village of Pelekunu, and 5.8 mi north of Kamalo.

DRAINAGE AREA.--0.49 mi^2.

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft above mean sea level, from topographic map.

REMARKS.--Records good, except for estimated daily discharges which are fair. No diversions upstream of station.

AVERAGE DISCHARGE.--28 years (water years 1969-96), 1.58 ft^3/s (1,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s, January 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft^3/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft^3/s, September 2-8, 21-29, 1975, November 26 to December 3, 1977.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 30	2330	*125	*3.05	No peak greater than base discharge.			

Minimum discharge, 0.52 ft^3/s, August 25-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	.64	.68	1.0	.72	1.9	2.5	1.1	.76	.68	.61	.55
2	.55	.61	.61	.84	.86	1.7	2.0	.96	.72	.72	.61	.55
3	.55	.61	.58	.76	.72	9.8	1.9	.94	.72	.76	.58	.58
4	.55	.58	.58	.72	.68	6.5	1.7	.94	.72	.94	.58	.58
5	.55	.58	.58	1.2	.68	3.2	1.6	.99	.72	2.5	.61	.58
6	.55	.55	.58	.76	.68	2.6	1.6	.94	.80	.99	.68	.61
7	.80	.58	.61	1.3	5.4	2.1	1.4	.89	.80	.84	.64	.76
8	1.0	.64	.61	.99	3.2	2.0	1.4	.99	.72	.76	.64	.61
9	.68	.58	.55	.80	1.3	1.8	1.3	.99	1.9	.72	.61	.58
10	.70	.55	.55	.95	1.5	1.6	1.4	.89	.89	.72	.64	.61
11	.68	.55	.55	.94	1.1	1.6	1.3	.84	.76	.72	.64	.72
12	.68	.76	.55	.76	.99	1.5	1.2	.84	.72	.72	.61	.68
13	.61	1.4	.58	.72	.89	1.4	1.3	.84	.72	.72	.72	.61
14	.61	2.4	.64	.72	1.4	1.3	1.4	.89	.68	.72	.61	.58
15	.61	.89	.55	.68	4.2	1.2	1.2	.84	.72	.80	.58	.58
16	.58	1.3	.55	.64	2.5	1.2	1.2	.89	.76	.80	.61	.55
17	.55	1.0	.55	.89	1.4	1.2	1.3	.84	.80	.72	.58	.58
18	.55	.72	.55	.76	1.2	1.2	1.7	.84	1.2	.84	.61	.58
19	.58	.68	.55	.72	1.1	1.1	1.3	.84	.89	1.2	.58	.58
20	.64	.64	.55	.72	.99	1.4	1.2	.80	.76	1.0	.58	.58
21	.64	.64	.55	.68	.94	2.4	1.2	.80	.72	.76	.55	.58
22	.61	.61	.55	.68	.94	1.3	1.2	.76	.72	.72	.55	.58
23	.58	.61	.55	.64	.89	2.0	1.1	.76	.84	.68	.55	.58
24	.55	.61	.55	.76	.99	3.0	1.0	.89	.76	.68	.55	.58
25	.68	.58	.89	.72	1.2	1.6	.99	.80	.76	.64	.55	.58
26	.58	.58	.76	.68	1.3	1.3	1.0	.84	.72	.64	.55	.58
27	.55	.58	.61	.76	3.1	1.2	.99	.80	.68	.64	.55	.58
28	.69	.61	.58	1.3	12	1.2	1.3	1.2	.68	.61	.55	.58
29	2.6	.64	.58	.84	2.8	1.2	1.0	.84	.72	.61	.55	.58
30	.84	.80	2.9	.91	---	9.6	1.5	.84	.72	.58	.55	.58
31	.68	---	4.6	.84	---	6.3	---	.80	---	.61	.55	---
TOTAL	21.57	22.52	24.67	25.68	55.67	77.4	41.18	27.42	24.08	25.04	18.37	17.85
MEAN	.70	.75	.80	.83	1.92	2.50	1.37	.88	.80	.81	.59	.59
MAX	2.6	2.4	4.6	1.3	12	9.8	2.5	1.2	1.9	2.5	.72	.76
MIN	.55	.55	.55	.64	.68	1.1	.99	.76	.68	.58	.55	.55
AC-FT	43	45	49	51	110	154	82	54	48	50	36	35

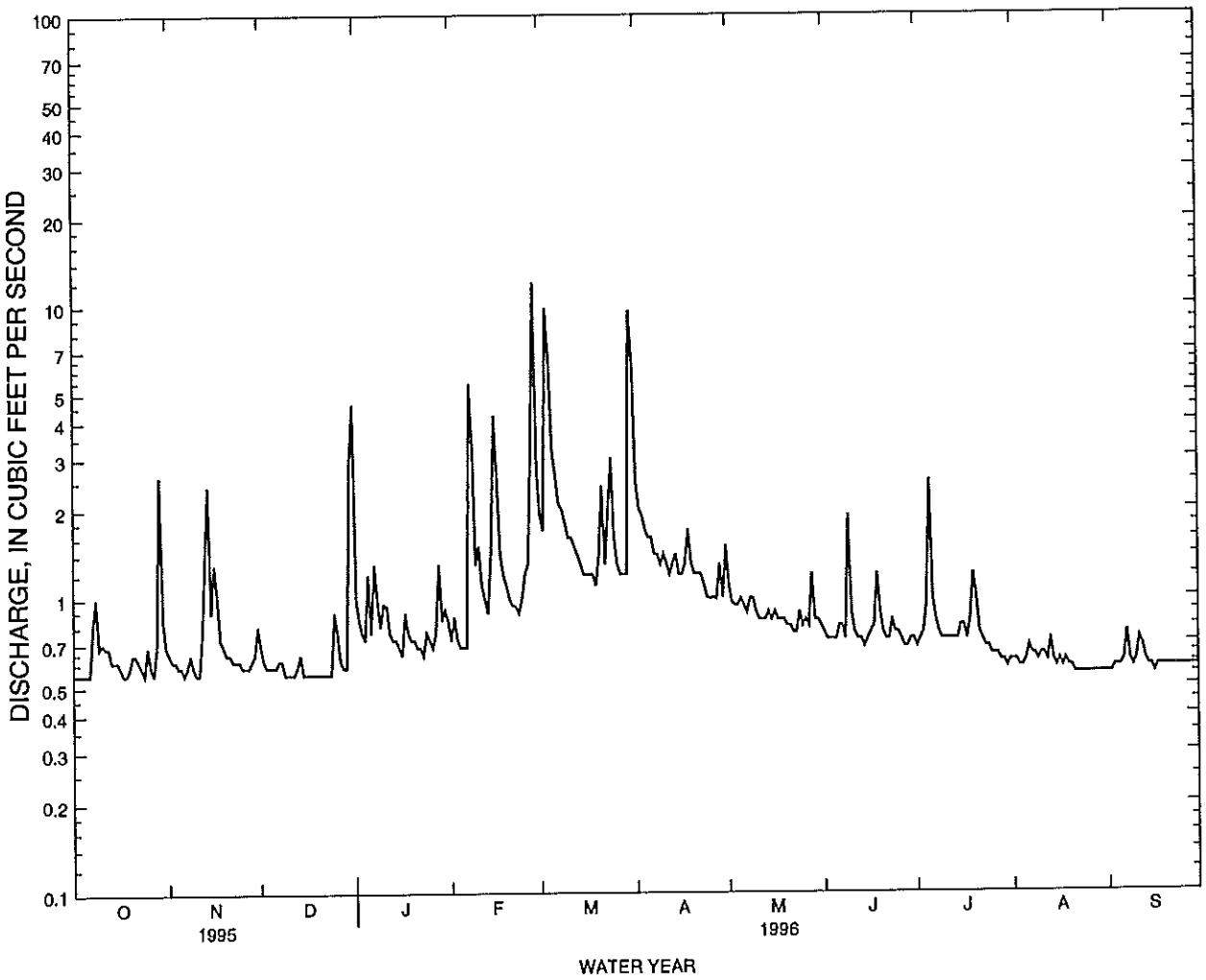
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1996, BY WATER YEAR (WY)

MEAN	.90	1.54	1.76	2.51	2.07	2.29	2.36	1.67	1.12	1.02	.89	.80
MAX	1.68	4.85	3.92	6.55	5.56	4.41	12.1	5.92	2.22	1.90	1.56	1.38
(WY)	1994	1979	1969	1982	1979	1980	1989	1987	1987	1980	1980	1992
MIN	.58	.60	.58	.64	.58	1.02	.75	.77	.69	.60	.58	.53
(WY)	1978	1978	1976	1977	1978	1975	1978	1975	1975	1975	1975	1975

HAWAII, ISLAND OF MOLOKAI

16404200 PILIPILILAU STREAM NEAR PELEKUNU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1968 - 1996	
ANNUAL TOTAL	345.06		381.45			
ANNUAL MEAN	.95		1.04		1.58	
HIGHEST ANNUAL MEAN					2.69	1982
LOWEST ANNUAL MEAN					.77	1978
HIGHEST DAILY MEAN	6.3	Mar 1	12	Feb 28	152	Apr 8 1989
LOWEST DAILY MEAN	.52	Sep 7	.55	Oct 1	.50	Sep 3 1975
ANNUAL SEVEN-DAY MINIMUM	.52	Sep 11	.55	Dec 15	.50	Sep 21 1975
ANNUAL RUNOFF (AC-FT)	684		757		1140	
10 PERCENT EXCEEDS	1.4		1.6		2.7	
50 PERCENT EXCEEDS	.68		.72		1.0	
90 PERCENT EXCEEDS	.55		.55		.64	



HAWAII, ISLAND OF MOLOKAI

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08′38″, long 156°55′16″, Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft above mean sea level, from tunnel plans.

REMARKS.--Records good except for period of estimated discharge, which are fair. 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. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--30 years (water years 1967-96), 4.59 ft^3/s (3,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, March 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 23 ft^3/s, February 28; minimum daily, 1.4 ft^3/s, March 12, 13, 14, and May 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	6.6	9.0	7.5	5.2	7.2	11	5.4	e4.8	e9.0	e2.8	e3.5
2	6.3	6.2	6.7	6.4	4.5	5.8	8.5	4.0	e4.1	e8.0	e2.8	e5.8
3	6.1	5.5	6.0	5.7	4.2	21	6.9	3.7	e4.0	e6.6	e2.9	e7.0
4	6.0	5.8	5.7	5.5	2.8	19	4.8	3.1	e3.8	e5.0	e3.1	e5.1
5	5.9	5.5	5.1	14	3.4	11	4.2	3.2	e3.8	e16	e4.5	e3.3
6	5.7	5.3	5.5	5.1	2.5	6.6	4.3	3.3	e4.1	e10	e6.0	e4.0
7	7.5	5.6	5.1	7.7	8.3	6.2	4.2	3.1	e8.1	e8.0	e4.2	e2.8
8	16	5.8	5.7	6.8	12	4.3	3.6	3.6	e4.8	e5.6	e3.3	e2.8
9	9.2	6.5	6.0	4.6	5.6	3.5	3.5	3.1	e4.1	e4.5	e4.8	e3.0
10	12	5.8	5.6	3.2	6.7	3.3	4.1	1.6	e10	e3.9	e6.0	e3.5
11	11	5.5	5.6	5.4	5.0	2.4	5.5	1.5	e6.0	e4.6	e8.0	e5.0
12	11	6.6	5.5	3.8	4.3	1.4	4.0	1.4	e4.5	e5.4	e10	e4.0
13	7.4	14	5.3	2.6	4.4	1.4	5.2	1.4	e4.0	e5.4	e7.0	e3.8
14	6.6	19	8.0	2.4	9.6	1.4	6.5	e5.0	e5.4	e5.4	e4.6	e4.5
15	7.1	9.2	6.3	2.3	21	2.0	6.3	e4.2	e3.5	e4.0	e3.9	e4.3
16	6.4	9.2	5.7	2.3	12	2.0	6.5	e4.0	e2.6	e4.6	e3.5	e4.1
17	6.0	8.8	5.5	6.5	5.5	2.0	7.3	e7.2	e5.4	e6.8	e3.3	e4.2
18	5.9	6.8	5.4	5.4	4.7	2.2	13	e5.0	e15	e3.9	e3.3	e4.3
19	5.7	6.1	5.4	4.4	4.4	2.0	7.2	e4.3	e11	e3.6	e3.5	4.2
20	7.6	5.4	5.1	3.4	4.4	2.1	5.1	e6.0	e5.7	e3.3	e4.0	4.3
21	8.9	5.2	5.2	3.2	3.1	7.6	6.5	e4.5	e2.5	e3.6	e4.5	5.0
22	6.9	5.8	5.2	3.4	3.3	4.3	6.0	e4.2	e2.1	e3.6	e5.2	4.9
23	6.2	5.6	5.2	3.0	3.4	7.1	4.5	e4.1	e3.0	e4.0	e5.3	3.0
24	4.9	5.6	5.3	3.0	3.0	13	3.8	e4.1	e5.0	e5.5	e4.6	3.9
25	6.5	5.5	5.5	4.5	8.8	4.9	3.7	e8.0	e3.5	e4.8	e4.1	4.8
26	7.6	5.5	7.0	4.3	9.3	3.4	3.3	e3.0	e7.0	e4.0	e3.4	4.6
27	6.0	5.5	5.6	2.9	11	2.5	3.3	e4.0	e3.0	e4.4	e3.4	4.6
28	6.2	5.6	5.2	5.0	23	2.2	5.9	e5.4	e3.0	e5.0	e3.8	4.7
29	20	5.6	5.4	5.3	12	2.1	5.5	e8.0	e3.6	e4.0	e4.0	4.7
30	11	10	13	3.3	---	6.6	6.5	e5.0	e6.9	e3.0	e3.8	4.6
31	8.5	---	19	6.9	---	12	---	e3.5	---	e2.9	e3.2	---
TOTAL	249.7	209.1	199.8	149.8	207.4	172.5	170.7	127.9	154.3	168.4	136.8	128.3
MEAN	8.05	6.97	6.45	4.83	7.15	5.56	5.69	4.13	5.14	5.43	4.41	4.28
MAX	20	19	19	14	23	21	13	8.0	15	16	10	7.0
MIN	4.9	5.2	5.1	2.3	2.5	1.4	3.3	1.4	2.1	2.9	2.8	2.8
AC-FT	495	415	396	297	411	342	339	254	306	334	271	254

e Estimated

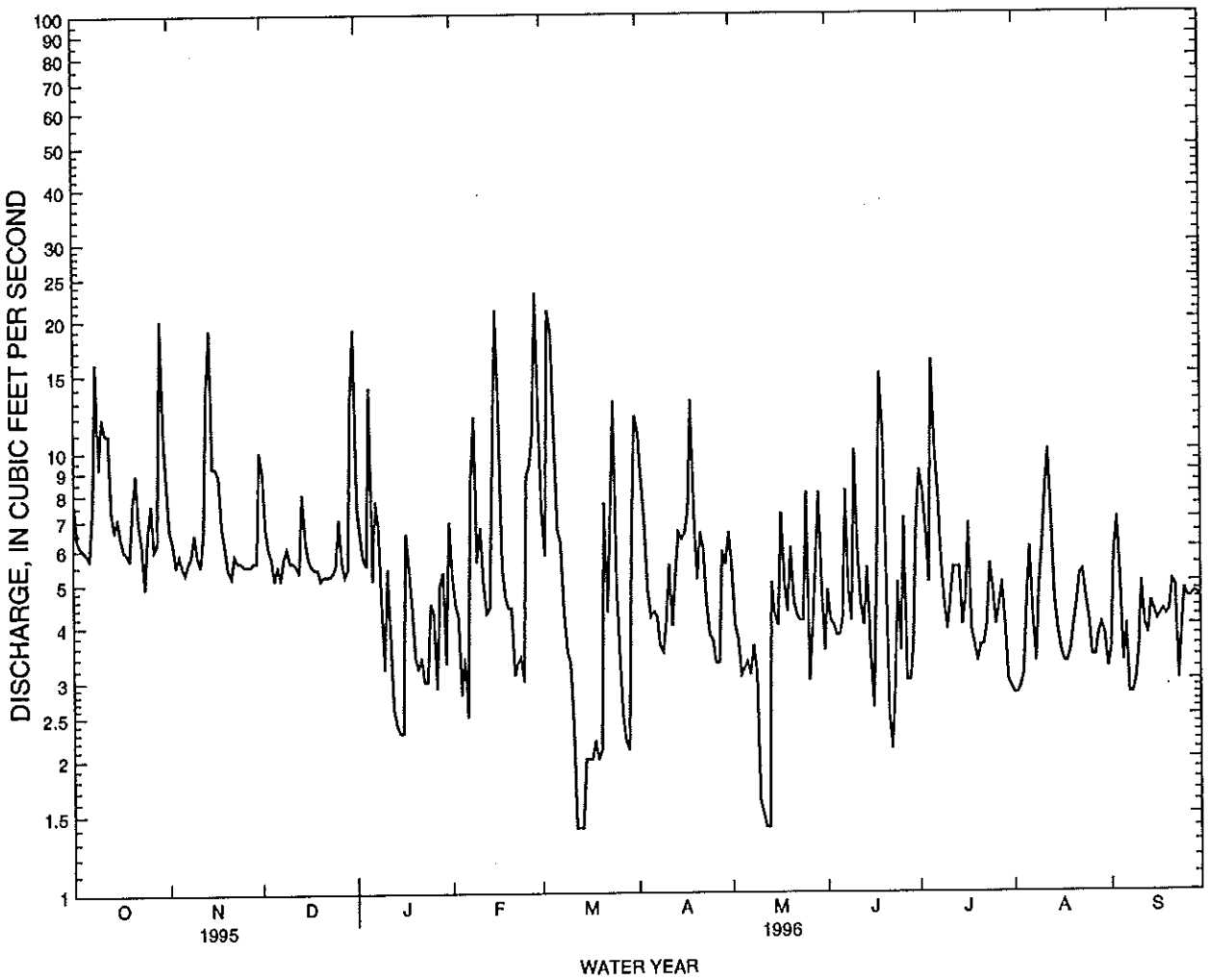
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1996, BY WATER YEAR (WY)

MEAN	3.95	5.38	5.22	4.95	4.81	5.45	5.46	4.43	3.96	4.32	3.73	3.25
MAX	8.05	10.2	10.6	12.5	12.5	13.8	12.8	12.3	8.37	9.89	7.22	5.81
(WY)	1996	1988	1991	1987	1990	1986	1986	1987	1986	1986	1985	1994
MIN	1.80	1.86	.41	.086	.010	.009	.001	.037	.016	.055	.004	.24
(WY)	1972	1992	1968	1968	1968	1968	1967	1967	1974	1974	1974	1974

HAWAII, ISLAND OF MOLOKAI

16405100 MOLOKAI TUNNEL AT EAST PORTAL--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1966 - 1996	
ANNUAL TOTAL	2051.0		2074.7			
ANNUAL MEAN	5.62		5.67		4.59	
HIGHEST ANNUAL MEAN					8.19	1987
LOWEST ANNUAL MEAN					1.31	1974
HIGHEST DAILY MEAN	21	Apr 4	23	Feb 28	41	Mar 19 1986
LOWEST DAILY MEAN	1.3	Aug 21	1.4	Mar 12	.00	Mar 30 1967
ANNUAL SEVEN-DAY MINIMUM	2.3	Aug 19	1.8	Mar 12	.00	Mar 30 1967
ANNUAL RUNOFF (AC-FT)	4070		4120		3320	
10 PERCENT EXCEEDS	9.7		9.1		9.5	
50 PERCENT EXCEEDS	5.1		5.1		3.3	
90 PERCENT EXCEEDS	2.7		3.0		.99	



HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", 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 current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft above mean sea level, from tunnel plans.

REMARKS.--Records fair. 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.--31 years (water years 1966-96), 7.12 ft^3/s (5,160 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, 24 ft^3/s, October 29, December 31, and February 28; minimum daily, 2.0 ft^3/s (estimated), March 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e10	10	9.2	11	7.1	e11	e11	7.4	e5.6	e11	e3.1	e4.5
2	e8.0	9.6	6.9	9.6	6.2	e6.6	e9.9	5.7	e4.5	e8.2	e3.1	e6.8
3	e7.0	8.6	6.1	7.7	6.4	e22	8.7	5.2	e4.4	e5.4	e3.2	e8.8
4	e6.9	8.9	5.8	6.1	5.1	e21	6.5	4.9	e4.2	e5.0	e4.2	e5.8
5	e6.9	8.6	5.1	14	5.7	e15	5.7	4.9	e4.2	e17	e5.6	e5.0
6	e6.8	8.3	5.8	5.8	4.4	e11	6.0	5.0	e4.3	e12	e8.4	e5.8
7	e12	8.3	5.8	8.0	8.3	e10	5.8	4.8	e9.0	e8.0	e6.0	e4.1
8	e20	8.3	5.6	7.9	e15	e8.0	5.5	5.1	e6.0	e7.0	e4.0	e3.9
9	e13	8.9	6.6	5.8	e9.0	e6.0	5.2	5.2	e5.0	e6.4	e5.6	e5.9
10	e16	8.3	6.1	4.3	e7.8	e4.0	5.6	3.5	e10	e6.4	e6.0	e7.2
11	e13	8.0	6.1	6.4	e6.2	e3.8	7.0	3.5	e7.0	5.2	e9.0	e9.0
12	e12	8.3	6.1	5.2	e6.2	e2.8	5.8	3.4	e5.0	6.1	e12	e6.8
13	e11	16	5.6	3.9	e9.0	e2.0	6.5	3.3	e4.6	5.7	e8.0	e6.0
14	e9.0	20	8.5	3.9	e18	e2.0	7.8	4.7	e6.6	5.7	e5.8	e8.2
15	e10	11	7.1	3.6	e23	e2.3	8.3	7.0	e4.5	4.4	e4.5	e7.0
16	e8.4	11	6.6	3.8	e11	e2.4	7.9	e5.0	e3.5	5.5	e4.1	e6.4
17	e8.0	12	6.3	7.1	e7.0	e2.5	8.8	e7.6	e8.0	12	e4.0	e6.4
18	e7.8	9.9	6.3	6.4	e5.9	e2.6	15	e6.6	e17	5.4	e4.0	e6.6
19	e8.4	8.9	6.3	5.8	e5.4	e2.4	9.4	e5.2	e12	3.9	e4.0	e6.8
20	e10	7.7	6.6	5.0	e5.4	e6.0	6.8	e6.2	e8.0	3.7	e4.5	e6.4
21	e13	7.4	8.6	4.6	e4.5	e9.0	7.9	e5.6	e4.5	4.2	e5.2	e7.4
22	e8.0	8.3	8.6	4.9	e5.0	e6.4	7.8	e4.7	e4.0	4.2	e6.8	e7.0
23	e7.0	8.3	8.6	4.6	e5.2	e10	6.3	e4.2	e4.5	4.4	e7.4	e5.2
24	e6.2	7.7	8.6	4.6	e4.5	e15	5.5	e4.4	e5.8	7.0	e5.4	e6.0
25	e8.9	5.6	8.6	5.9	e9.0	e6.4	5.4	e9.0	e4.5	6.9	e4.5	e7.8
26	e12	5.6	11	6.1	e10	e4.3	5.0	e6.2	e7.8	e5.4	e3.8	e7.0
27	9.6	5.3	8.9	4.9	e14	e4.0	5.1	e6.0	e5.4	e5.0	e3.8	e7.0
28	8.9	5.3	8.6	6.8	e24	e3.6	7.1	e6.8	e4.0	e6.2	e4.7	e7.4
29	24	5.3	8.3	7.2	e12	e4.2	7.4	e9.0	e4.5	e5.4	e5.0	e7.6
30	14	9.3	15	5.1	---	e8.0	7.4	e7.0	e7.8	e3.8	e4.2	e7.0
31	12	---	24	8.7	---	e13	---	e4.0	---	e3.1	e3.6	---
TOTAL	327.8	268.7	247.3	194.7	260.3	227.3	218.1	171.1	186.2	199.6	163.5	196.8
MEAN	10.6	8.96	7.98	6.28	8.98	7.33	7.27	5.52	6.21	6.44	5.27	6.56
MAX	24	20	24	14	24	22	15	9.0	17	17	12	9.0
MIN	6.2	5.3	5.1	3.6	4.4	2.0	5.0	3.3	3.5	3.1	3.1	3.9
AC-FT	650	533	491	386	516	451	433	339	369	396	324	390

e Estimated

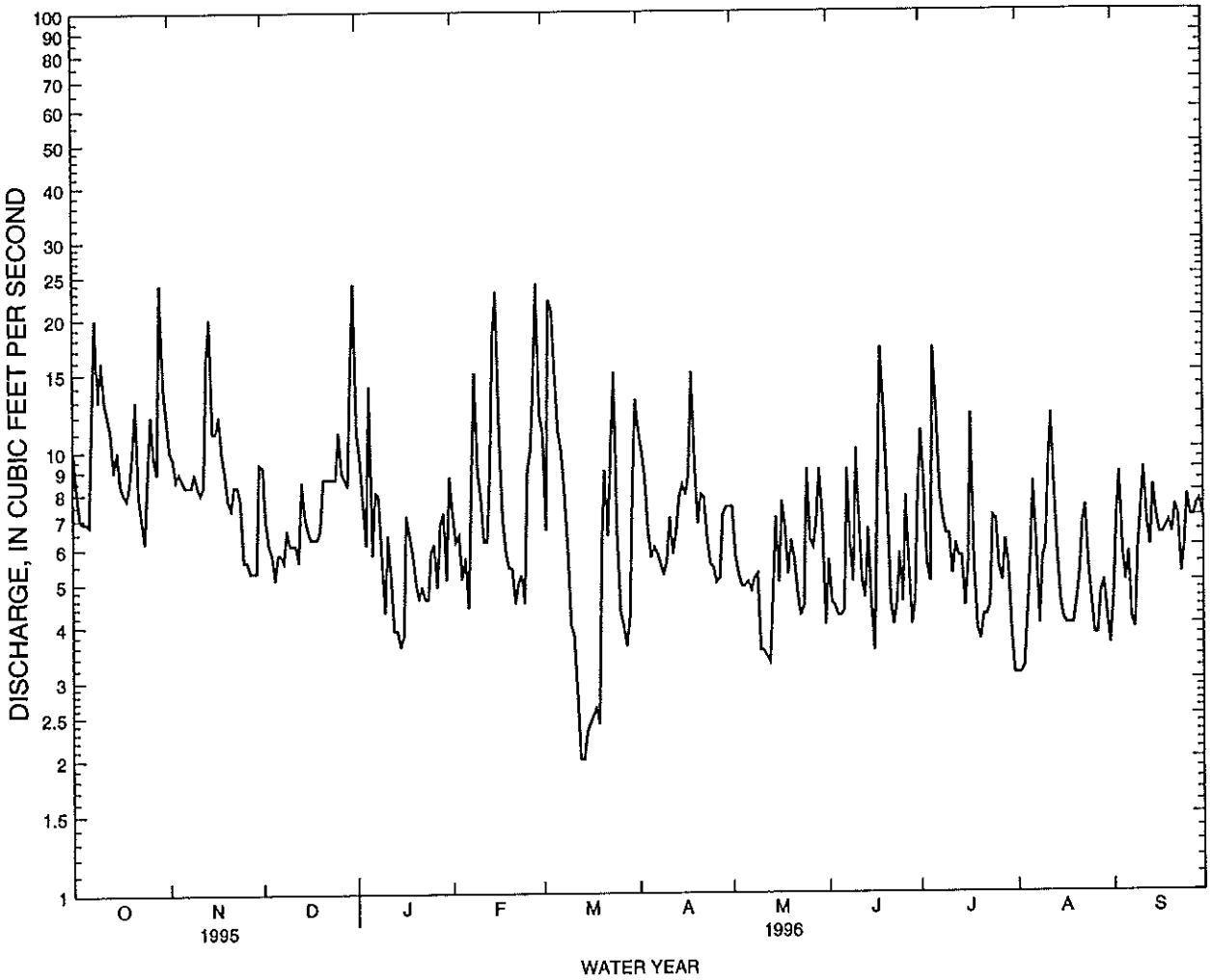
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1996, BY WATER YEAR (WY)

MEAN	6.36	7.78	7.55	7.24	7.33	8.02	8.08	7.09	6.64	6.95	6.28	5.80
MAX	10.6	13.3	13.8	14.4	15.9	15.5	15.6	15.8	11.7	13.2	10.2	9.21
(WY)	1996	1988	1991	1988	1990	1986	1986	1987	1986	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

HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1965 - 1996	
ANNUAL TOTAL	3042.5		2661.4			
ANNUAL MEAN	8.34		7.27		7.12	
HIGHEST ANNUAL MEAN					11.4	1987
LOWEST ANNUAL MEAN					3.46	1974
HIGHEST DAILY MEAN	33	Feb 14	24	Oct 29	39	Apr 8 1986
LOWEST DAILY MEAN	2.2	Aug 21	2.0	Mar 13	1.8	Oct 15 1967
ANNUAL SEVEN-DAY MINIMUM	3.8	Aug 19	2.3	Mar 13	1.9	May 3 1976
ANNUAL RUNOFF (AC-FT)	6030		5280		5160	
10 PERCENT EXCEEDS	13		11		12	
50 PERCENT EXCEEDS	7.0		6.4		5.8	
90 PERCENT EXCEEDS	4.8		4.0		3.1	



HAWAII, ISLAND OF MOLOKAI

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08′43″, long 156°55′18″, Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above mean sea level, from topographic map. Prior to July 1, 1962, at site 200 ft upstream of gage at datum 6.14 ft higher.

REMARKS.--Records good. Since November 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--35 years (water years 1961, 1963-96), 6.24 ft^3/s (4,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, January 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of October 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 03	0745	877	4.21	Mar. 30	2330	*1,450	*4.94

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	e.00	.11	.00	.18	3.4	.05	.00	.00	.00	.00
2	.00	e.00	e.00	.00	.00	.00	.28	.00	.00	.24	.00	.00
3	.00	e.00	e.00	.00	.00	77	.00	.00	.00	.00	.00	.00
4	.00	e.00	e.00	.00	.00	31	.00	.00	.00	.99	.00	.00
5	.00	e.00	e.00	3.5	.00	3.4	.00	.00	.00	15	.00	.00
6	.00	e.00	e.00	.04	.00	.04	.00	.00	.00	.26	.00	.00
7	1.2	e.00	e.00	9.1	53	.00	.00	.00	.00	.00	.00	.00
8	6.8	e.00	e.00	3.4	14	.00	.00	.00	.00	.00	.00	.00
9	.00	e.00	e.00	.00	.00	.00	.00	.00	11	.00	.00	.00
10	.27	e.00	e.00	.00	2.0	.00	.00	.00	1.8	.00	.00	.00
11	.08	e18	e.00	.03	.00	.00	.00	.00	.00	.00	.00	.00
12	.24	e17	e.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	e.00	.00	.00	.00	.00	.26	.00	.00	.00	.30	.00
14	.00	e27	.00	.00	13	.00	2.9	.00	.00	.00	.01	.00
15	.00	e.01	.00	.00	49	.00	.85	.00	.00	.00	.00	.00
16	.00	e.00	.00	.00	11	.00	2.0	.00	.00	.00	.00	.00
17	.00	e.00	.00	4.9	.19	.00	.70	.00	.00	.00	.00	.00
18	.00	e.00	.00	.00	.00	.00	7.9	.00	5.3	.00	.00	.00
19	.00	e.00	.00	.00	.00	.00	.71	.00	.16	1.9	.00	.00
20	.00	e.00	.00	.00	.00	.00	.00	.00	.00	.31	.00	.00
21	.00	e.00	.00	.00	.00	9.8	.07	.00	.00	.00	.00	.00
22	.00	e.00	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00
23	.00	e.00	.00	.00	.00	7.4	.00	.00	.15	.00	.00	.00
24	.00	e.00	.00	.00	.00	20	.00	.00	.01	.00	.00	.00
25	.00	e.00	.00	.00	3.3	1.6	.00	.00	.00	.00	.00	.00
26	.00	e.00	.07	.00	3.6	.01	.00	.00	.00	.00	.00	.00
27	.00	e.00	.00	.00	22	.00	.00	.00	.00	.00	.00	.00
28	.00	e.00	.00	3.1	141	.00	1.2	5.4	.00	.00	.00	.00
29	32	e3.0	.00	.00	7.3	.00	.10	.44	.00	.00	.00	.00
30	.66	e.01	25	.00	---	91	.93	.00	.00	.00	.00	.00
31	.00	---	42	.14	---	32	---	.00	---	.00	.00	---
TOTAL	41.25	65.02	67.07	24.32	319.39	273.79	21.30	5.89	18.42	18.70	0.31	0.00
MEAN	1.33	2.17	2.16	.78	11.0	8.83	.71	.19	.61	.60	.010	.000
MAX	32	27	42	9.1	141	91	7.9	5.4	11	15	.30	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	82	129	133	48	634	543	42	12	37	37	.6	.00

e Estimated

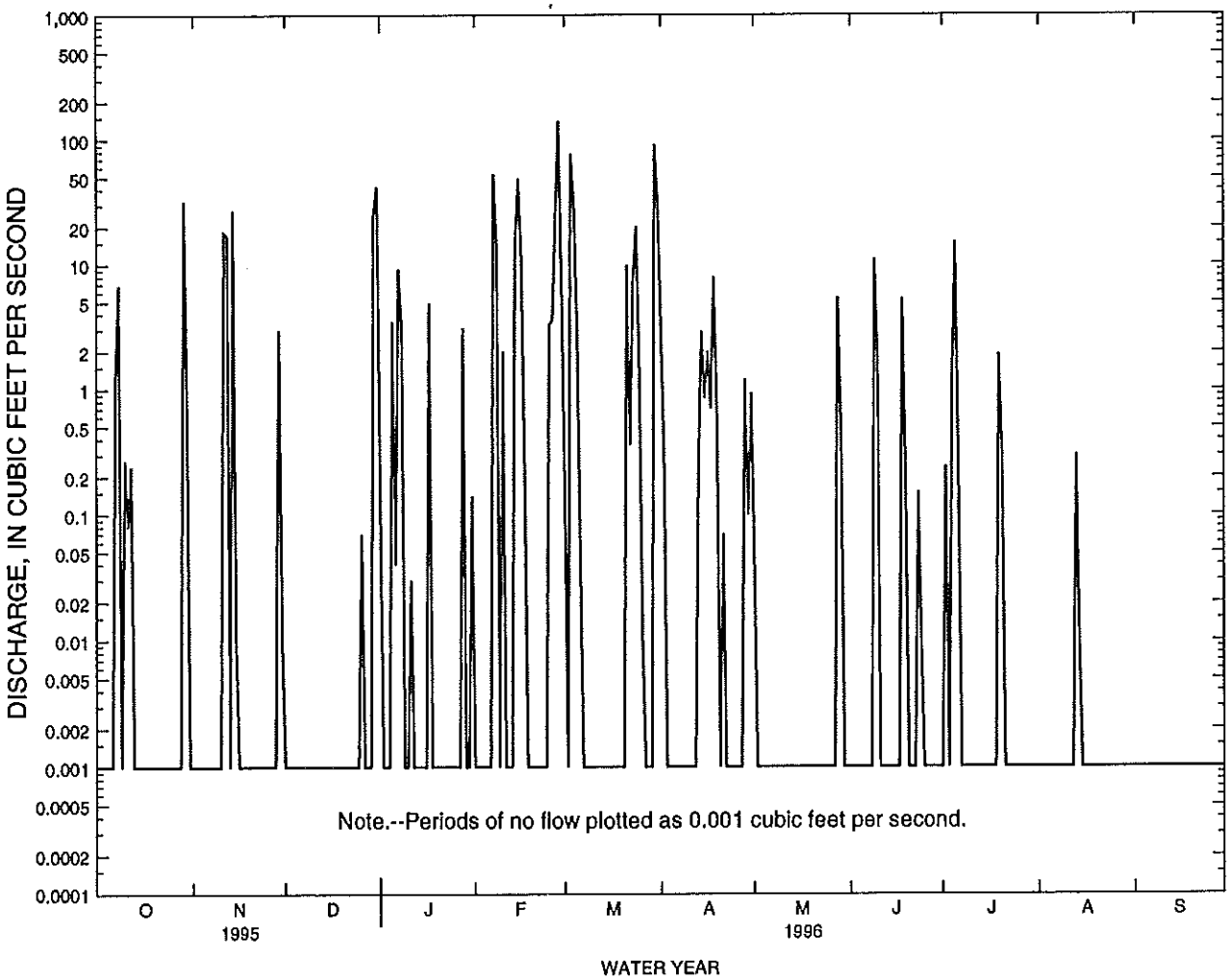
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1996, BY WATER YEAR (WY)

MEAN	3.38	8.78	9.32	11.4	9.36	9.27	9.78	4.85	2.46	2.95	2.11	1.48
MAX	16.7	30.5	31.0	40.5	30.6	22.6	64.8	23.6	10.5	11.0	7.52	6.81
(WY)	1966	1971	1966	1982	1979	1968	1989	1987	1961	1964	1961	1963
MIN	.000	.77	.37	.78	.81	1.31	.71	.19	.000	.23	.010	.000
(WY)	1985	1985	1976	1996	1978	1983	1996	1996	1985	1984	1996	1996

HAWAII, ISLAND OF MOLOKAI

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1961 - 1996	
ANNUAL TOTAL	635.49		855.46			
ANNUAL MEAN	1.74		2.34		6.24	
HIGHEST ANNUAL MEAN					11.8	1965
LOWEST ANNUAL MEAN					1.26	1985
HIGHEST DAILY MEAN	90	Apr 4	141	Feb 28	847	Apr 8 1989
LOWEST DAILY MEAN	.00	Jun 17	.00	Oct 1	.00	Sep 12 1984
ANNUAL SEVEN-DAY MINIMUM	.00	Jun 17	.00	Oct 13	.00	Sep 12 1984
ANNUAL RUNOFF (AC-FT)	1260		1700		4520	
10 PERCENT EXCEEDS	3.0		3.0		11	
50 PERCENT EXCEEDS	.16		.00		1.4	
90 PERCENT EXCEEDS	.00		.00		.21	



HAWAII, ISLAND OF MOLOKAI

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi upstream from mouth, and 4.4 mi southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi^2.

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to September 1996 (discontinued). Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to November 19, 1930, at site 500 ft upstream of gage at different datums. August 14, 1931, to July 20, 1932, and September 20, 1937, to January 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since November 16, 1960, water has been diverted upstream to Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--36 years (water years 1961-96), 17.8 ft^3/s (12,910 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft^3/s, April 8, 1989, gage height, 8.50 ft, from rating curve extended above 26 ft^3/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft^3/s, November 1, 2, 1926, June 5, 1926.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 16	2115	1,420	4.77	Mar. 31	2245	*3,930	*6.20
Mar. 03	1600	1,870	5.13				

Minimum discharge, 4.4 ft^3/s November 8, 9, 10, 11, and 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	5.1	6.3	7.5	4.4	8.2	e14	e7.6	7.6	6.5	5.7	6.5
2	5.0	5.0	6.1	5.8	4.7	7.3	e8.8	e7.4	7.6	6.5	5.7	6.4
3	5.1	5.1	6.1	5.2	4.5	155	e8.1	e7.4	7.4	6.5	5.7	6.0
4	4.9	5.1	6.2	4.7	4.4	60	e8.1	e7.6	7.1	8.1	5.7	5.6
5	4.9	4.9	6.1	5.8	4.3	9.9	e8.1	e7.6	7.1	37	5.8	5.4
6	4.8	4.8	5.9	4.6	4.3	6.8	e7.4	e7.6	7.4	11	6.1	5.5
7	5.9	4.7	5.9	28	101	6.1	e7.1	e7.4	7.4	8.3	5.7	5.8
8	14	4.9	5.9	13	36	6.2	e7.4	e7.6	7.1	6.9	5.7	5.5
9	5.4	4.7	5.8	7.0	7.1	5.9	e7.6	e8.3	20	6.7	5.8	5.4
10	5.3	4.7	5.8	6.2	12	5.8	e8.8	e7.8	10	6.3	5.9	5.5
11	5.1	4.7	5.6	5.7	7.2	5.7	e7.6	e7.6	7.8	7.4	6.0	5.6
12	4.9	6.7	5.5	5.2	6.3	5.7	e7.8	e7.6	7.6	6.8	6.1	5.4
13	4.8	40	5.5	5.1	6.0	5.7	e8.1	e7.6	7.1	7.0	7.0	5.3
14	4.9	60	6.0	4.9	33	5.6	e9.9	e7.5	6.9	6.9	5.9	5.3
15	5.0	9.2	5.5	4.7	108	5.4	e8.8	7.4	7.4	7.2	6.1	5.3
16	4.9	114	5.5	4.7	35	5.4	e10	7.8	7.6	7.0	6.6	5.3
17	4.9	42	5.4	8.3	9.7	5.4	e8.8	7.8	6.9	6.8	6.6	5.5
18	4.8	12	5.3	5.0	8.1	5.2	e15	9.0	12	6.6	6.5	5.5
19	4.8	9.9	5.4	5.0	7.3	5.2	e9.1	7.8	6.5	9.2	6.0	5.2
20	4.7	8.8	5.4	4.9	7.2	5.2	e8.8	7.6	6.9	7.2	5.6	5.1
21	5.0	8.2	5.4	4.7	7.0	20	e9.9	7.4	6.7	7.0	5.7	5.1
22	4.9	7.7	5.3	4.5	6.4	6.4	e8.8	7.4	6.7	6.9	5.5	5.1
23	4.9	7.7	5.3	4.4	6.1	11	e8.1	7.6	7.6	6.8	5.5	5.1
24	5.0	7.3	5.2	4.9	6.0	34	e7.8	8.1	6.7	6.2	5.5	5.1
25	5.4	7.2	6.3	4.6	7.3	7.5	e7.8	7.6	6.7	6.0	5.5	5.1
26	5.1	7.0	6.1	4.5	7.3	5.7	e7.8	7.8	6.7	6.0	5.5	5.0
27	5.0	6.7	5.5	4.7	42	5.7	e8.1	7.6	6.7	5.9	5.6	5.0
28	5.2	6.5	5.5	7.4	339	5.5	e8.3	14	6.5	5.8	6.4	5.0
29	61	6.8	5.4	4.6	23	5.5	e8.6	8.8	7.1	5.8	6.5	5.0
30	7.4	6.8	43	4.8	---	189	e7.8	8.3	6.7	5.8	6.5	5.0
31	5.6	---	85	4.7	---	e123	---	7.8	---	5.8	6.5	---
TOTAL	224.0	428.2	293.2	195.1	854.6	739.0	262.3	246.4	233.5	243.9	184.9	161.6
MEAN	7.23	14.3	9.46	6.29	29.5	23.8	8.74	7.95	7.78	7.87	5.96	5.39
MAX	61	114	85	28	339	189	15	14	20	37	7.0	6.5
MIN	4.7	4.7	5.2	4.4	4.3	5.2	7.1	7.4	6.5	5.8	5.5	5.0
AC-FT	444	849	582	387	1700	1470	520	489	463	484	367	321

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1996, BY WATER YEAR (WY)

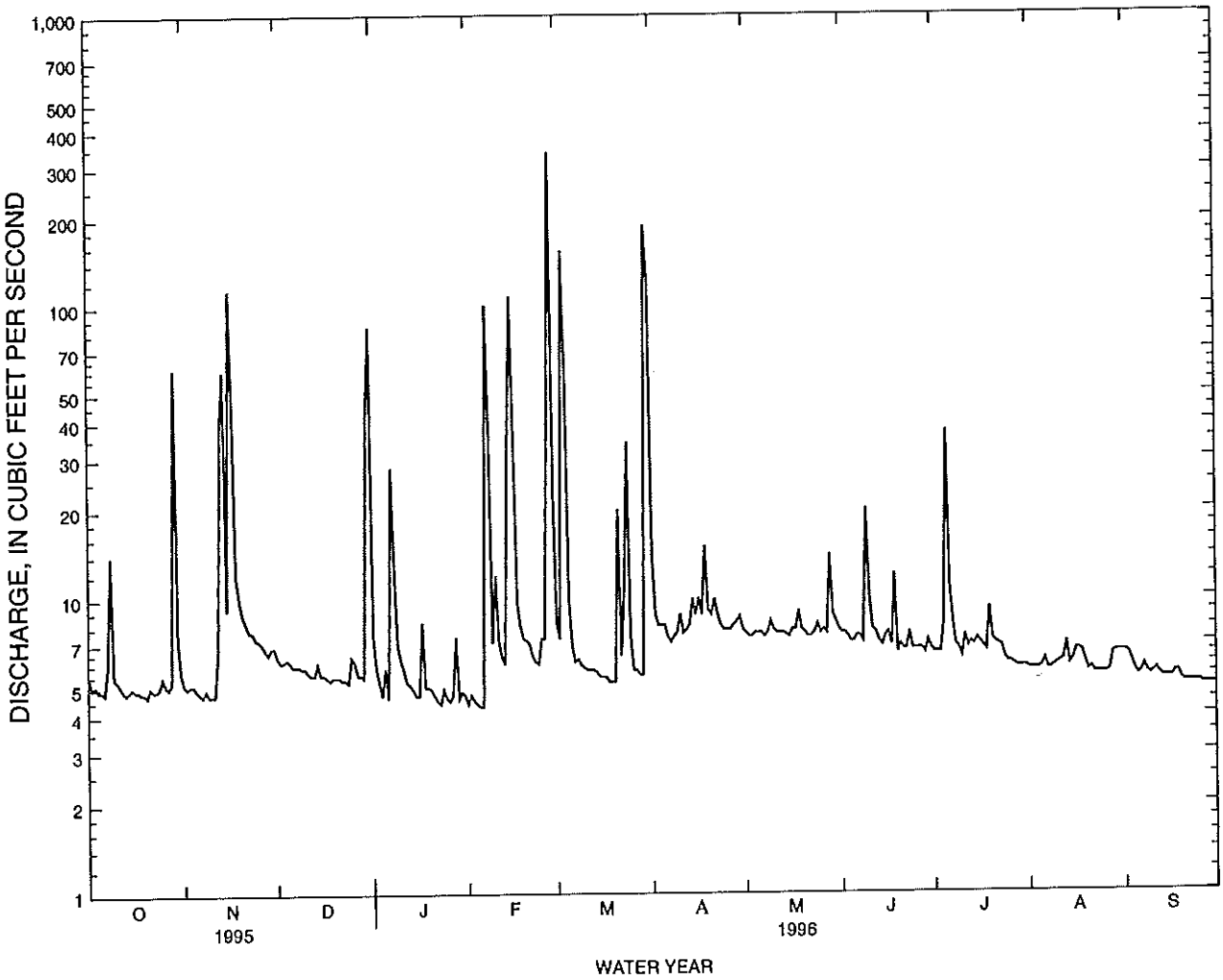
MEAN	12.6	20.1	23.3	23.4	21.3	24.7	25.9	17.4	12.3	12.3	12.0	9.67
MAX	35.9	58.5	65.2	92.4	72.8	116	235	105	26.9	34.9	40.4	28.8
(WY)	1962	1962	1955	1988	1955	1942	1989	1987	1938	1958	1958	1931
MIN	3.20	5.07	2.93	5.91	5.59	7.69	7.13	4.77	3.15	3.43	2.91	3.60
(WY)	1985	1976	1976	1977	1985	1983	1978	1984	1985	1984	1985	1984

e Estimated

HAWAII, ISLAND OF MOLOKAI

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1919 - 1996	
ANNUAL TOTAL	3506.4		4066.7			
ANNUAL MEAN	9.61		11.1		17.8	
HIGHEST ANNUAL MEAN					37.9	1989
LOWEST ANNUAL MEAN					6.12	1985
HIGHEST DAILY MEAN	193	Apr 4	339	Feb 28	3810	Apr 8 1989
LOWEST DAILY MEAN	4.5	Jul 22	4.3	Feb 5	2.0	Oct 6 1985
ANNUAL SEVEN-DAY MINIMUM	4.8	Nov 5	4.5	Jan 31	2.2	Dec 27 1984
ANNUAL RUNOFF (AC-FT)	6950		8070		12910	
10 PERCENT EXCEEDS	12		9.9		28	
50 PERCENT EXCEEDS	6.0		6.4		11	
90 PERCENT EXCEEDS	5.1		4.9		6.0	



HAWAII, ISLAND OF MOLOKAI

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing, 1.3 mi northeast of Kaunakakai Post Office, and 1.7 mi upstream from mouth.

DRAINAGE AREA.--6.57 mi^2.

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft above mean sea level, from topographic map.

REMARKS.--Records good. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--46 years (water years 1951-96), 1.84 ft^3/s (1,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s, October 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft^3/s on basis of slope-area measurements at gage heights 7.22 ft and 9.30 ft; no flow most of the time each year.

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)
Mar. 03	1030	405	5.00	Mar. 31	0100	*600	*5.50

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.46	.00	.68	.30	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	64	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	56	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.64	.00	11	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.14	.00	1.2	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	19	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	8.4	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	82	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	20	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	32	.00	---	71	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	32.00	1.24	129.41	203.91	0.30	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	1.03	.040	4.46	6.58	.010	.000	.000	.000	.000	.000
MAX	.00	.00	32	.64	82	71	.30	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	63	2.5	257	404	.6	.00	.00	.00	.00	.00

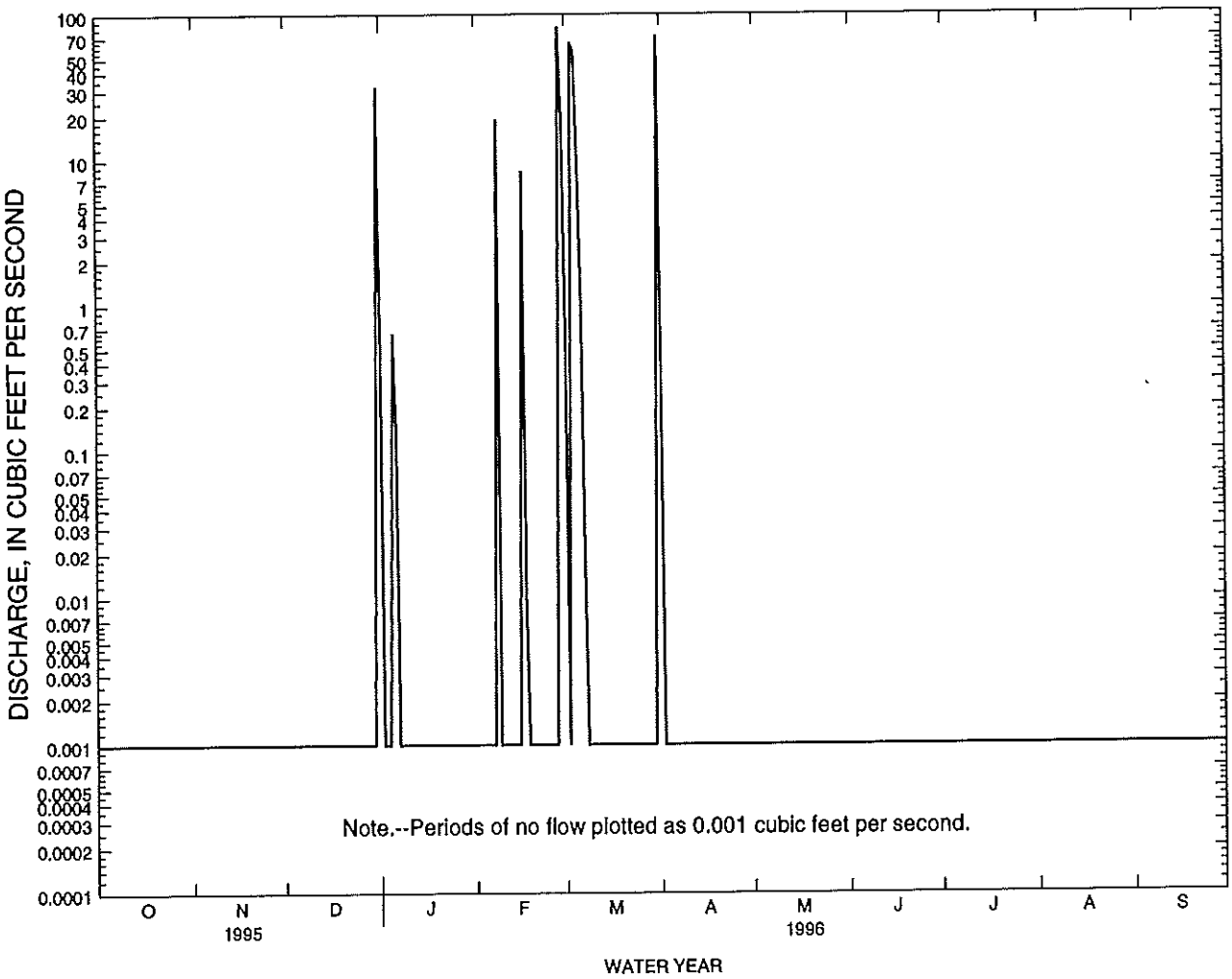
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1996, BY WATER YEAR (WY)

MEAN	.57	3.26	3.81	5.12	2.62	3.19	2.44	.65	.030	.070	.29	.057
MAX	7.09	25.4	16.5	29.7	15.5	26.8	46.2	17.5	.74	1.39	6.56	1.02
(WY)	1962	1951	1956	1982	1979	1951	1989	1987	1966	1966	1950	1966
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1951	1952	1953	1953	1953	1952	1952	1950	1950	1950	1951	1950

HAWAII, ISLAND OF MOLOKAI

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1950 - 1996		
ANNUAL TOTAL	218.11		366.86				
ANNUAL MEAN	.60		1.00		1.84		
HIGHEST ANNUAL MEAN					6.01		1989
LOWEST ANNUAL MEAN					.002		1953
HIGHEST DAILY MEAN	61	Apr 4	82	Feb 28	643	Apr 8	1989
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Jan 1	1950
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Jan 1	1950
ANNUAL RUNOFF (AC-FT)	433		728		1330		
10 PERCENT EXCEEDS	.00		.00		.28		
50 PERCENT EXCEEDS	.00		.00		.00		
90 PERCENT EXCEEDS	.00		.00		.00		



HAWAII, ISLAND OF MOLOKAI

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08′55″, long 156°44′16″, Hydrologic Unit 20050000, on left bank 200 ft downstream from wooden 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 good except for estimated daily discharges which are fair. Diversion upstream of station for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--33 years (water years 1964-96), 0.86 ft^3/s (622 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 210 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 03	0830	*84	*2.98	No peak greater than base discharge.			

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.40	.30	e1.4	.53	.12	.38	.29	.08	.09	.01	.00	.00
2	e.12	.13	e.78	.36	.22	.30	.21	.07	.07	.78	.00	.00
3	e.50	.08	e.11	.15	.36	24	.25	.07	.05	.48	.00	.00
4	e.05	.42	e.02	.06	.10	6.4	.19	.07	.03	.51	.00	.00
5	e.08	.10	e.00	.03	.05	1.6	.18	.08	.03	2.8	.00	.00
6	e.00	.03	.00	.09	.03	.91	.77	.17	.04	.58	.00	.00
7	e.30	.01	e.00	.09	.06	.63	.21	.13	.21	.16	.00	.19
8	e2.5	.04	e.00	.62	1.0	.50	.16	.36	.22	.08	.00	.29
9	e.90	.06	e.00	.21	.17	.41	.13	1.0	.14	.05	.00	.14
10	e2.0	.01	e.00	.07	.90	.37	.12	.14	.18	.03	.00	.01
11	e.96	.01	e.00	.03	.33	.32	.14	.07	.04	.01	.09	.00
12	e1.0	.00	e.00	.02	.11	.43	.15	.05	.04	.02	.17	.00
13	e.05	.50	e.00	.01	.08	.48	.12	.06	.03	.04	.67	.00
14	e.31	1.5	.00	.01	.05	.27	.12	.07	.04	.03	.21	.00
15	e.60	e1.4	.00	.01	.42	.25	.12	.04	.03	.02	.02	.00
16	e.04	e.56	.00	.01	.13	.24	.11	.03	.11	.01	.01	.00
17	e.02	e1.1	.00	.00	.09	.25	.30	.37	.16	.01	.01	.00
18	e.00	e.14	.00	.14	.08	.23	.91	.09	.45	.04	.00	.00
19	e.00	e.08	.00	.34	.10	.22	.34	.03	.23	.28	.00	.00
20	e.45	e.04	.00	.12	.03	.21	.20	.04	.09	.43	.00	.00
21	e.20	e.00	.00	.02	.02	.73	.22	.04	.02	.14	.00	.00
22	e.02	e.00	.00	.01	.01	.34	.18	.02	.01	.08	.00	.00
23	e.00	e.00	.00	.01	.01	.22	.13	.01	.01	.03	.00	.00
24	e.02	e.24	.00	.01	.01	.31	.11	.05	.06	.02	.00	.00
25	e.00	e.12	.01	.51	.02	.22	.09	.34	.09	.02	.00	.00
26	.00	e.00	.00	.55	.02	.16	.09	.65	.04	.01	.00	.00
27	.00	e.00	.00	1.9	.74	.15	.09	.35	.04	.03	.00	.00
28	.00	e.32	.00	2.0	11	.12	.09	1.1	.06	.09	.00	.00
29	5.5	e.28	.00	.40	2.0	.12	.09	.53	.03	.02	.00	.00
30	1.0	e.20	.75	.19	---	.15	.09	.16	.02	.02	.00	.00
31	1.2	---	7.7	.27	---	1.9	---	.11	---	.01	.00	---
TOTAL	18.22	7.67	10.77	8.77	18.26	42.82	6.20	6.38	2.66	6.84	1.18	0.63
MEAN	.59	.26	.35	.28	.63	1.38	.21	.21	.089	.22	.038	.021
MAX	5.5	1.5	7.7	2.0	11	24	.91	1.1	.45	2.8	.67	.29
MIN	.00	.00	.00	.00	.01	.12	.09	.01	.01	.01	.00	.00
AC-FT	36	15	21	17	36	85	12	13	5.3	14	2.3	1.2

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1996, BY WATER YEAR (WY)

MEAN	.53	1.14	1.12	1.28	1.25	1.48	1.48	.70	.31	.45	.30	.30
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	.000	.000	.000	.000	.000	.007	.003	.000	.000	.000	.000	.000
(WY)	1972	1972	1972	1977	1973	1973	1975	1975	1964	1972	1964	1964

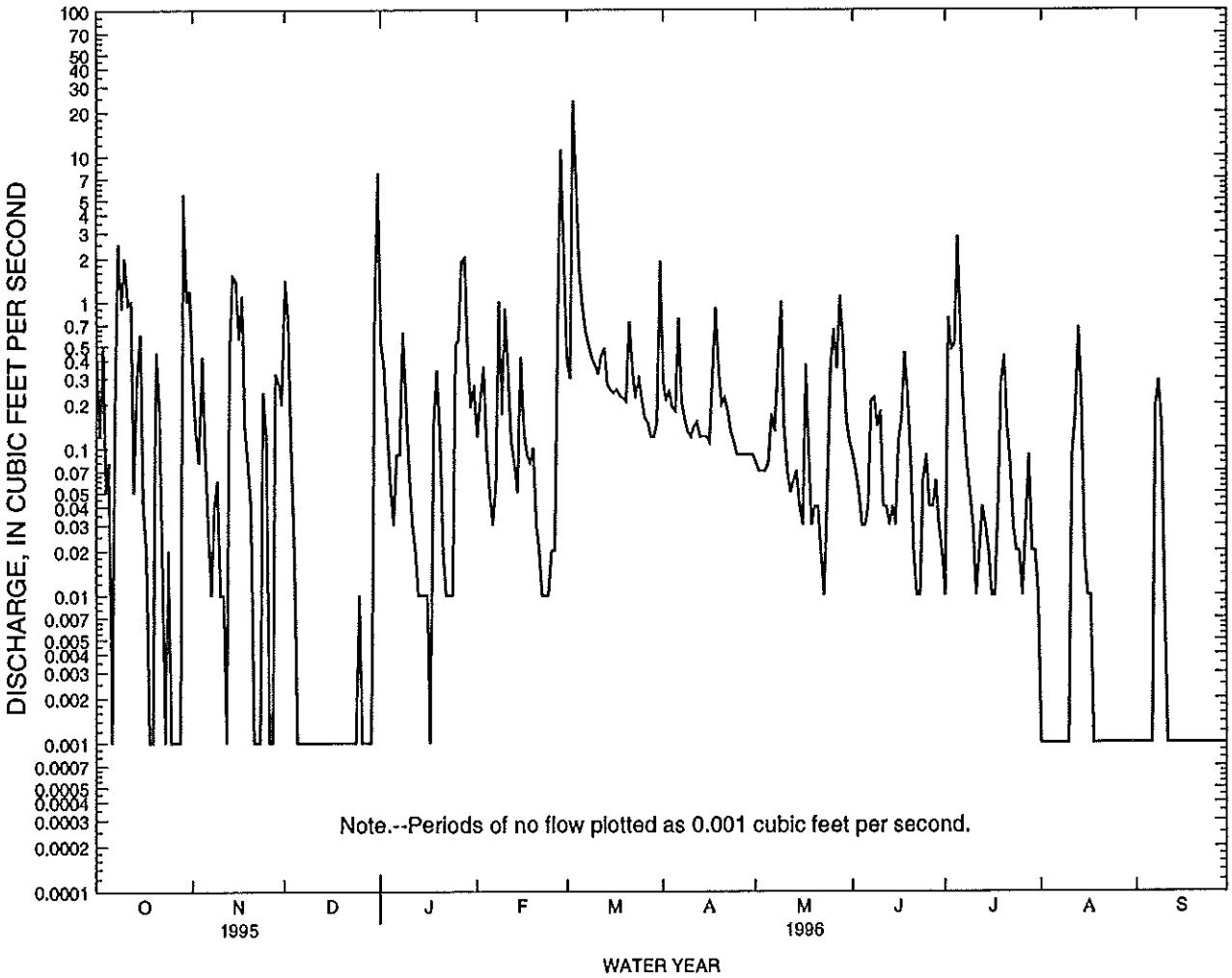
e Estimated

HAWAII, ISLAND OF MOLOKAI

16419500 PAPIO GULCH AT HALAWA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1963 - 1996	
ANNUAL TOTAL	116.76		130.40			
ANNUAL MEAN	.32		.36		.86	
HIGHEST ANNUAL MEAN					2.32	1989
LOWEST ANNUAL MEAN					.063	1973
HIGHEST DAILY MEAN	10	Apr 25	24	Mar 3	164	Apr 13 1965
LOWEST DAILY MEAN	.00	Jan 4	.00	Oct 6	.00	Jul 5 1963
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 4	.00	Dec 5	.00	Aug 3 1963
ANNUAL RUNOFF (AC-FT)	232		259		622	
10 PERCENT EXCEEDS	.74		.64		1.5	
50 PERCENT EXCEEDS	.08		.07		.23	
90 PERCENT EXCEEDS	.00		.00		.00	

e Estimated



Surface-Water Station Records for Maui

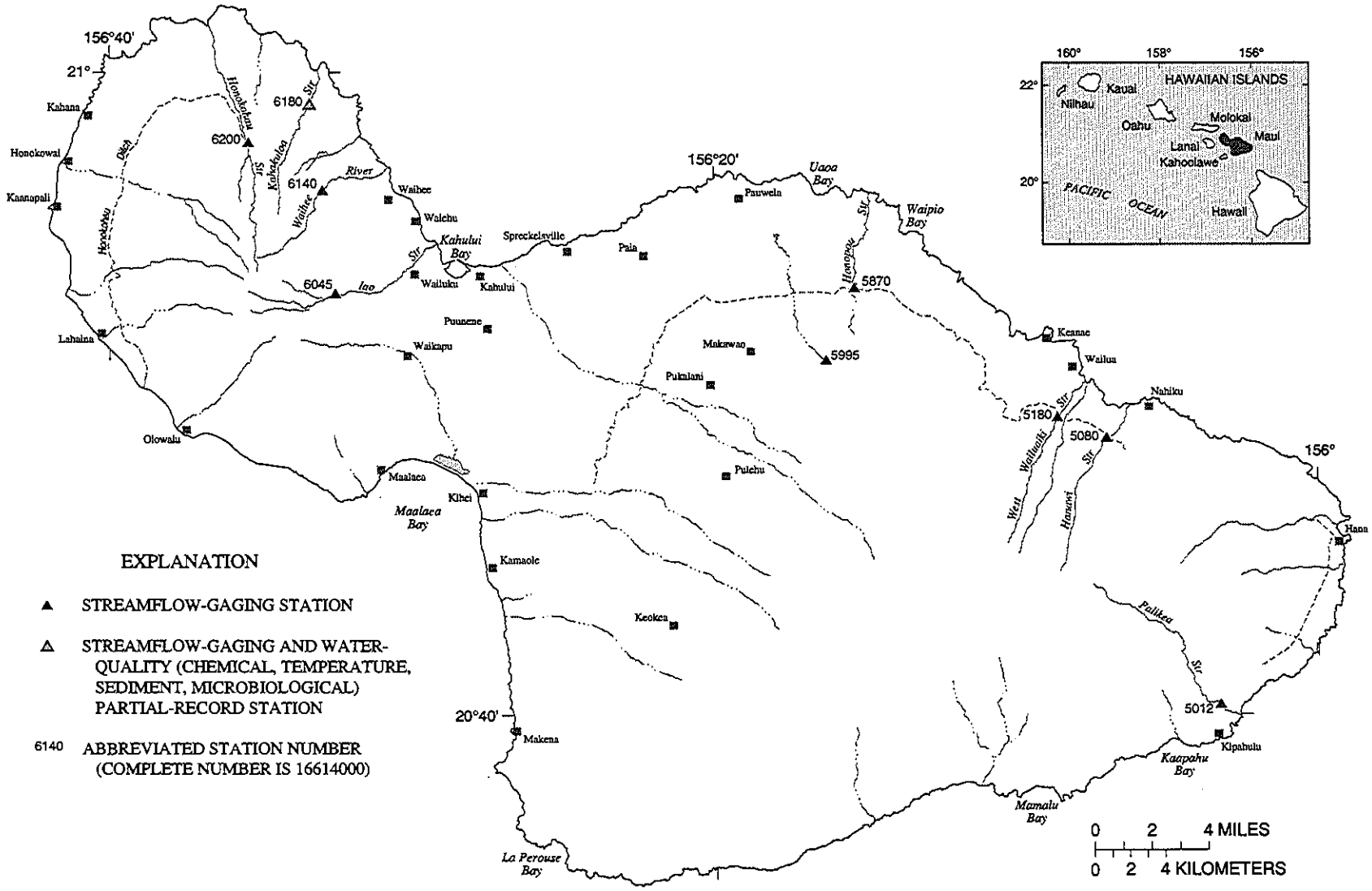


Figure 8. Locations of gaging, water-quality, and partial-record stations on Maui.

HAWAII, ISLAND OF MAUI

16501200 OHEO GULCH AT DAM NEAR KIPAHULU

LOCATION.--Lat 20°40'17", long 156°03'17", 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 1, 1988 to current year. Forty-eight years of records are available for the right branch drainage, 1.3 mi upstream (Palikea Stream, 16501000) for periods prior to September 30, 1983.

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 good except for estimated daily discharges which are fair. No diversion upstream of station.

AVERAGE DISCHARGE.--8 years (water years 1989-96), 58.2 ft^3/s (42,140 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; minimum, no flow, on many days.

EXTREMES FOR CURRENT PERIOD.--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)
Mar. 04	0430	*2,960	*6.49	Sept. 07	2000	2,910	6.45

Minimum discharge, no flow, many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	7.6	125	8.9	4.6	13	95	1.3	3.1	25	3.8	7.4
2	7.2	6.9	35	5.7	2.6	109	85	1.2	1.4	70	8.9	1.3
3	13	15	9.1	2.1	1.9	874	37	1.0	.78	29	5.2	.96
4	10	52	5.1	1.5	1.7	282	5.5	.75	.52	31	4.3	1.7
5	6.4	7.4	3.6	1.4	1.4	13	2.9	.51	.47	131	3.4	1.9
6	4.8	4.3	2.8	7.7	1.2	6.0	2.1	.33	2.7	18	38	8.6
7	11	4.4	16	7.6	1.1	3.8	1.6	.18	5.8	6.5	22	223
8	67	83	7.6	92	2.6	2.6	1.4	.03	.96	3.8	8.5	30
9	160	238	4.2	96	.81	2.1	1.0	.00	84	2.5	3.8	19
10	123	112	3.5	7.7	1.1	1.8	2.3	.00	7.5	2.0	2.4	9.3
11	112	25	4.7	3.9	.70	16	29	.00	1.9	1.9	2.5	62
12	89	11	3.9	2.4	.40	125	6.2	.00	1.9	4.3	1.8	123
13	18	5.3	3.5	1.9	.27	20	2.6	.00	1.3	2.1	89	34
14	9.3	5.5	8.2	1.7	.07	8.8	8.0	.00	.86	2.0	10	6.6
15	15	3.3	4.3	1.4	4.4	4.7	2.4	.00	.78	2.2	5.8	8.8
16	12	2.6	8.9	1.1	3.1	3.3	2.3	.00	14	37	5.0	77
17	5.8	2.9	6.6	1.0	.69	4.7	1.9	.00	43	31	6.5	52
18	4.4	2.3	6.4	1.2	.36	9.7	23	.00	216	26	8.3	136
19	10	1.9	6.7	2.2	.17	4.8	37	1.1	70	43	6.5	13
20	71	1.7	6.4	.86	.01	3.2	28	2.4	34	96	3.5	42
21	52	1.4	6.4	68	.00	10	84	.33	7.7	38	2.3	8.2
22	12	1.3	3.1	25	.01	3.0	21	.00	5.7	51	1.8	4.2
23	33	1.2	2.5	153	1.0	2.4	5.0	.00	9.0	14	1.7	5.5
24	8.8	44	2.2	24	409	2.2	2.6	3.4	34	7.9	1.5	17
25	23	21	1.9	127	654	1.9	1.8	13	68	4.4	1.4	28
26	37	36	2.0	14	380	1.5	2.3	4.5	7.4	4.8	1.9	9.0
27	10	40	8.1	5.2	364	1.3	1.9	1.6	5.1	51	1.0	4.0
28	4.9	122	1.9	3.6	37	.98	3.1	42	3.2	5.8	.74	2.5
29	6.9	11	1.7	2.7	8.6	.95	1.8	21	2.1	3.6	.59	2.0
30	114	199	2.3	12	---	2.3	1.4	21	32	3.2	.42	1.7
31	33	---	71	23	---	193	---	14	---	4.5	.55	---
TOTAL	1097.5	1069.0	374.6	705.76	1882.79	1727.03	499.1	129.63	665.17	752.5	253.10	939.66
MEAN	35.4	35.6	12.1	22.8	64.9	55.7	16.6	4.18	22.2	24.3	8.16	31.3
MAX	160	238	125	153	654	874	95	42	216	131	89	223
MIN	4.4	1.2	1.7	.86	.00	.95	1.0	.00	.47	1.9	.42	.96
AC-FT	2180	2120	743	1400	3730	3430	990	257	1320	1490	502	1860

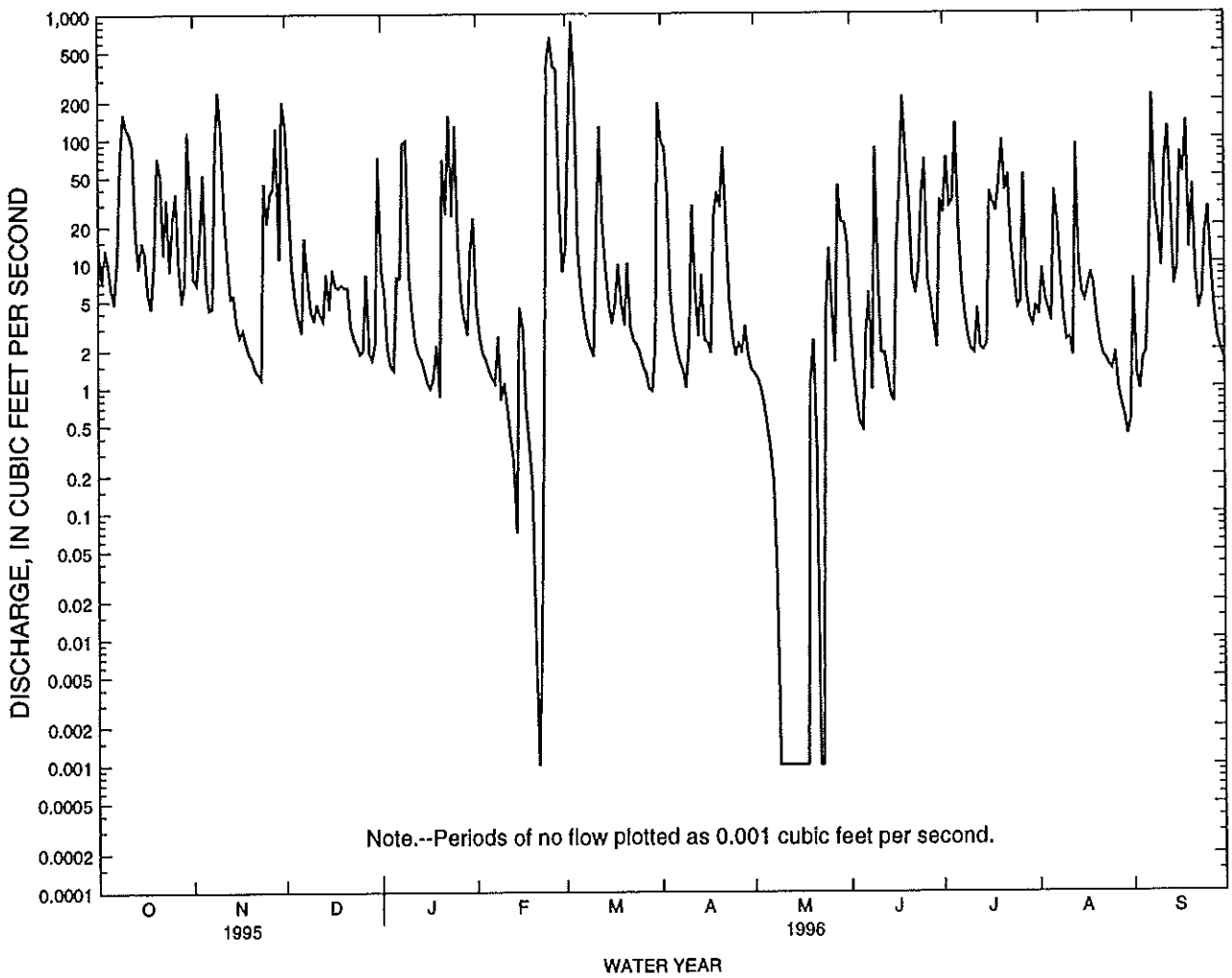
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1996, BY WATER YEAR (WY)

MEAN	54.6	100	93.3	62.2	56.6	90.6	40.5	26.7	29.4	49.0	34.9	47.8
MAX	145	334	203	218	163	320	116	99.1	66.5	114	82.4	131
(WY)	1990	1991	1993	1989	1994	1991	1989	1989	1990	1993	1991	1994
MIN	6.03	11.2	5.28	11.1	2.90	10.2	6.56	3.03	9.11	15.2	8.16	12.5
(WY)	1993	1992	1990	1992	1992	1992	1992	1992	1995	1988	1996	1988

HAWAII, ISLAND OF MAUI

16501200 OHEO GULCH AT DAM NEAR KIPAHULU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1988 - 1996	
ANNUAL TOTAL	8205.35		10095.84			
ANNUAL MEAN	22.5		27.6		58.2	
HIGHEST ANNUAL MEAN					102	1991
LOWEST ANNUAL MEAN					22.3	1992
HIGHEST DAILY MEAN	857	Jan 29	874	Mar 3	2220	Nov 19 1990
LOWEST DAILY MEAN	.12	May 11	.00	Feb 21	.00	Feb 25 1992
ANNUAL SEVEN-DAY MINIMUM	.53	Jan 7	.00	May 9	.00	Feb 25 1992
ANNUAL RUNOFF (AC-FT)	16280		20030		42140	
10 PERCENT EXCEEDS	71		73		149	
50 PERCENT EXCEEDS	3.9		4.8		6.6	
90 PERCENT EXCEEDS	.82		.80		1.0	



HAWAII, ISLAND OF MAUI

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48′37″, long 156°07′00″, 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 of gage at datum 0.12 ft lower.

REMARKS.--Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--74 years (water years 1923-96), 24.0 ft^3/s (17,360 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 29	2400	*1,890	*6.78	Feb. 27	0300	1,710	6.42
Feb. 25	0230	1,710	6.42	Mar. 03	0930	1,720	6.45

Minimum discharge, 2.3 ft^3/s, January 06.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	13	8.3	3.4	4.0	15	71	5.2	3.8	5.4	10	3.0
2	6.3	8.8	5.2	2.8	3.5	26	18	4.4	3.5	21	20	3.0
3	6.3	7.3	4.3	2.6	3.3	537	11	4.0	3.3	8.8	7.7	2.9
4	5.2	8.0	4.0	2.5	2.9	78	8.1	4.2	3.1	16	6.6	2.8
5	4.5	6.2	3.7	2.4	2.8	11	6.7	4.8	3.1	77	6.1	2.9
6	4.2	5.7	3.6	2.3	2.7	8.0	6.0	8.8	3.5	25	9.6	4.9
7	8.5	5.8	3.5	18	2.6	7.4	5.4	6.5	4.9	9.6	7.1	19
8	19	6.0	3.3	32	8.3	7.1	5.0	6.9	3.6	6.4	5.8	8.2
9	88	5.7	3.2	4.6	3.1	7.1	4.6	12	9.2	5.1	5.1	3.8
10	54	6.9	3.1	3.4	2.7	7.0	7.3	7.3	4.8	4.6	4.8	3.5
11	23	6.0	3.0	2.9	2.5	6.9	12	5.4	3.6	6.1	4.8	8.4
12	11	6.5	2.9	2.7	2.4	6.7	5.5	13	3.2	9.4	4.7	53
13	7.0	16	2.8	2.6	2.4	6.7	7.8	8.7	3.0	5.7	13	17
14	6.5	30	3.7	2.5	4.3	6.7	49	6.5	2.9	4.5	6.2	5.7
15	6.6	8.2	3.3	2.4	113	6.5	11	7.3	2.8	5.0	5.6	4.4
16	5.0	24	4.6	2.4	47	6.3	31	5.5	3.4	16	6.8	4.1
17	4.5	12	4.2	2.7	7.9	6.2	10	5.3	11	7.5	6.5	3.9
18	4.2	7.5	5.3	18	5.2	10	22	19	81	21	6.7	16
19	5.4	6.5	3.9	23	4.4	9.5	29	8.4	33	52	5.7	6.4
20	15	5.9	3.2	3.6	6.4	11	23	5.7	12	82	4.9	4.7
21	9.9	5.4	2.8	3.0	20	9.4	37	4.8	6.9	23	4.4	3.9
22	8.0	4.9	2.7	2.8	14	6.9	12	4.4	7.0	8.8	4.2	3.7
23	21	4.6	2.6	3.4	44	5.9	8.2	4.1	46	6.7	4.1	3.5
24	8.2	4.4	2.6	2.9	281	25	6.7	4.2	33	5.7	3.9	3.2
25	10	4.1	2.8	42	417	7.9	6.1	4.0	23	5.3	3.7	3.1
26	7.7	4.0	7.7	5.2	57	6.2	5.5	3.8	7.5	7.4	3.7	3.0
27	6.0	3.9	4.6	44	183	5.5	5.0	3.6	5.8	12	3.6	2.9
28	5.2	3.8	2.9	36	181	5.4	4.8	6.2	4.8	5.7	3.5	2.8
29	230	3.7	2.8	12	49	36	4.6	6.2	5.7	5.1	3.4	2.7
30	355	38	2.7	15	---	179	5.0	4.3	6.1	5.2	3.2	2.6
31	34	---	3.2	5.8	---	364	---	5.1	---	6.7	3.1	---
TOTAL	986.0	272.8	116.5	308.9	1477.4	1431.3	438.3	199.6	344.5	479.7	188.5	209.0
MEAN	31.8	9.09	3.76	9.96	50.9	46.2	14.6	6.44	11.5	15.5	6.08	6.97
MAX	355	38	8.3	44	417	537	71	19	81	82	20	53
MIN	4.2	3.7	2.6	2.3	2.4	5.4	4.6	3.6	2.8	4.5	3.1	2.6
AC-FT	1960	541	231	613	2930	2840	869	396	683	951	374	415

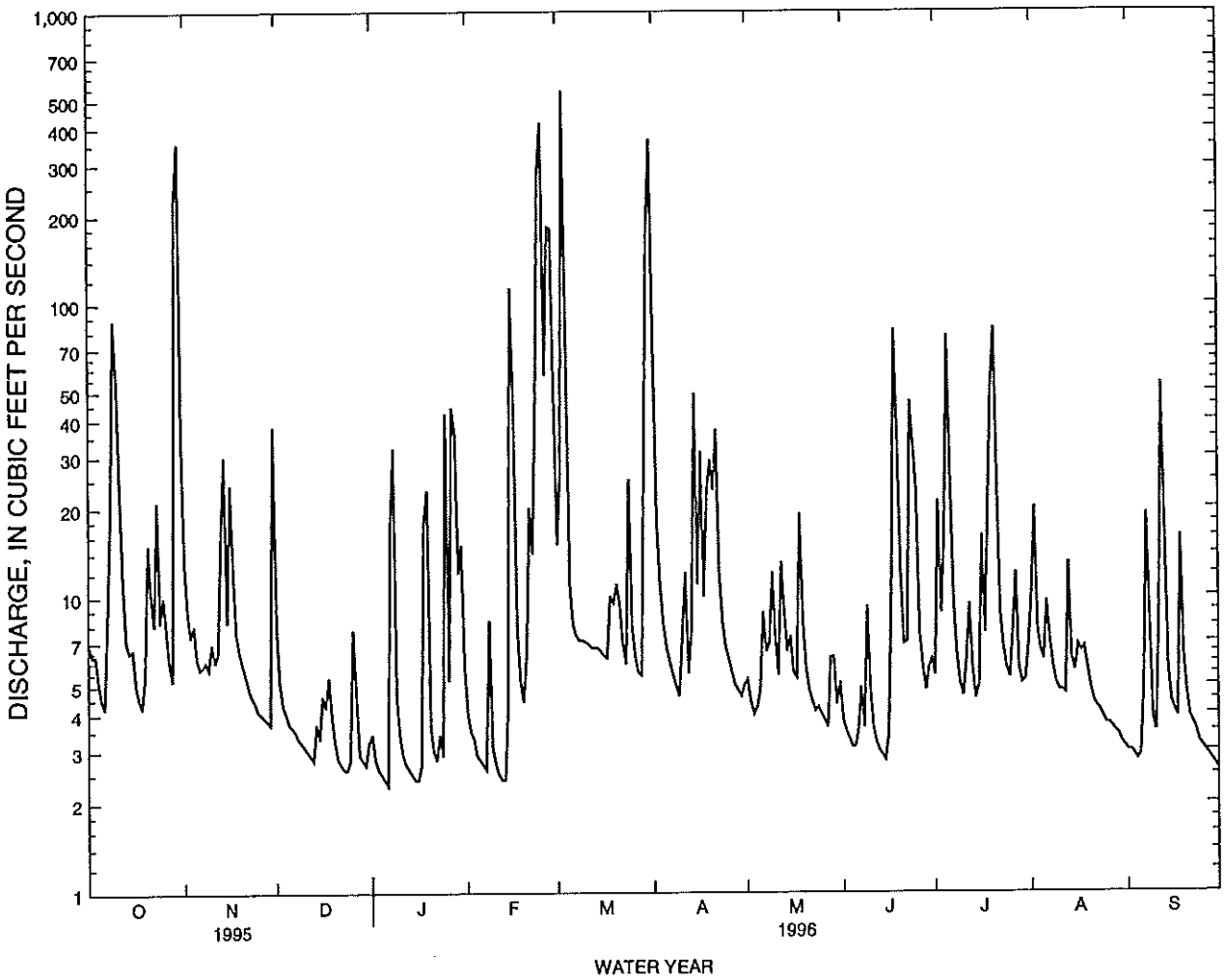
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1996, BY WATER YEAR (WY)

MEAN	15.0	29.6	32.1	30.6	31.1	41.6	36.5	20.3	10.7	15.8	17.1	11.8
MAX	101	110	129	123	182	235	161	68.2	33.5	53.1	66.2	52.3
(WY)	1942	1991	1947	1979	1969	1980	1989	1987	1987	1914	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

HAWAII, ISLAND OF MAUI

16508000 HANAWI STREAM NEAR NAHIKU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1914 - 1996	
ANNUAL TOTAL	4681.1		6452.5			
ANNUAL MEAN	12.8		17.6		24.0	
HIGHEST ANNUAL MEAN					52.6	1969
LOWEST ANNUAL MEAN					7.59	1926
HIGHEST DAILY MEAN	355	Oct 30	537	Mar 3	1610	Jan 25 1948
LOWEST DAILY MEAN	1.8	Mar 17	2.3	Jan 6	.90	Oct 31 1984
ANNUAL SEVEN-DAY MINIMUM	1.9	Mar 12	2.6	Jan 11	.96	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	9280		12800		17360	
10 PERCENT EXCEEDS	29		30		51	
50 PERCENT EXCEEDS	5.2		5.8		7.2	
90 PERCENT EXCEEDS	2.6		2.9		2.8	



HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49′16″, long 156°08′37″, 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 good. 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.--76 years (water years 1915, 1917, 1923-96), 35.2 ft^3/s (25,510 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)
Oct. 30	0100	*3,430	*9.45	Feb. 25	0200	2,580	8.52

Minimum discharge, 1.9 ft^3/s, December 25, January 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	19	8.5	6.4	7.2	29	72	8.0	5.1	7.5	12	2.6
2	9.4	13	5.5	3.8	6.3	41	24	6.1	4.5	32	25	2.7
3	7.8	11	4.5	3.0	5.5	488	15	5.4	4.2	12	9.7	2.7
4	6.3	15	4.0	2.5	4.5	55	11	5.9	3.9	26	8.3	3.4
5	5.4	9.0	3.6	2.2	4.0	22	9.4	7.6	3.9	84	7.5	4.1
6	5.1	7.7	3.4	2.1	3.6	15	8.4	19	5.7	36	13	9.7
7	24	7.5	3.6	30	3.5	12	7.4	11	7.4	16	8.6	21
8	30	7.0	3.3	47	13	9.9	6.8	12	4.5	11	6.7	12
9	95	6.4	2.9	7.6	4.3	8.8	6.3	22	25	8.9	6.0	4.5
10	69	6.3	2.7	5.3	4.0	7.9	13	13	7.8	9.1	5.5	3.9
11	33	6.3	2.5	4.3	3.4	7.3	15	9.4	5.2	11	5.7	18
12	16	6.3	2.4	3.6	3.0	6.8	7.4	23	4.4	14	5.6	72
13	10	23	2.3	3.2	2.8	6.4	19	15	3.9	8.1	20	24
14	10	43	5.3	2.9	10	5.9	69	11	3.6	6.7	7.1	8.0
15	9.2	10	3.4	2.7	152	5.5	23	13	3.6	8.0	8.2	6.1
16	7.1	19	5.7	2.4	77	5.1	43	8.9	5.2	24	9.3	5.3
17	6.5	11	6.2	5.1	18	5.7	17	8.5	27	12	8.1	5.4
18	6.1	7.3	6.2	56	12	14	27	27	110	34	7.6	23
19	8.5	6.5	3.8	37	11	11	35	12	49	67	6.4	8.5
20	21	5.8	2.9	6.4	21	9.7	29	8.5	18	110	5.4	5.9
21	13	5.2	2.6	4.8	41	9.4	43	7.4	10	33	4.8	4.9
22	11	4.8	2.3	4.0	32	7.2	17	6.7	11	14	4.4	4.4
23	43	4.5	2.1	4.8	49	6.4	12	6.1	49	11	4.2	4.1
24	17	4.2	2.0	3.5	204	36	9.6	6.3	44	9.2	4.0	3.9
25	16	4.0	6.4	26	395	12	8.5	5.7	22	8.7	3.7	3.9
26	11	3.8	17	7.8	46	9.0	7.5	5.1	11	13	3.6	3.6
27	8.7	3.6	7.5	28	83	7.5	6.9	5.1	9.2	20	3.3	3.3
28	7.4	3.8	3.1	55	234	7.3	7.2	11	7.8	8.6	3.1	3.1
29	273	3.7	2.7	19	65	45	7.0	9.7	8.8	7.5	3.0	2.9
30	602	35	2.4	23	---	446	10	6.6	8.2	7.4	2.9	2.8
31	43	---	11	11	---	570	---	7.0	---	8.8	2.7	---
TOTAL	1433.5	312.7	141.8	420.4	1515.1	1921.8	586.4	323.0	482.9	678.5	225.4	279.7
MEAN	46.2	10.4	4.57	13.6	52.2	62.0	19.5	10.4	16.1	21.9	7.27	9.32
MAX	602	43	17	56	395	570	72	27	110	110	25	72
MIN	5.1	3.6	2.0	2.1	2.8	5.1	6.3	5.1	3.6	6.7	2.7	2.6
AC-FT	2840	620	281	834	3010	3810	1160	641	958	1350	447	555

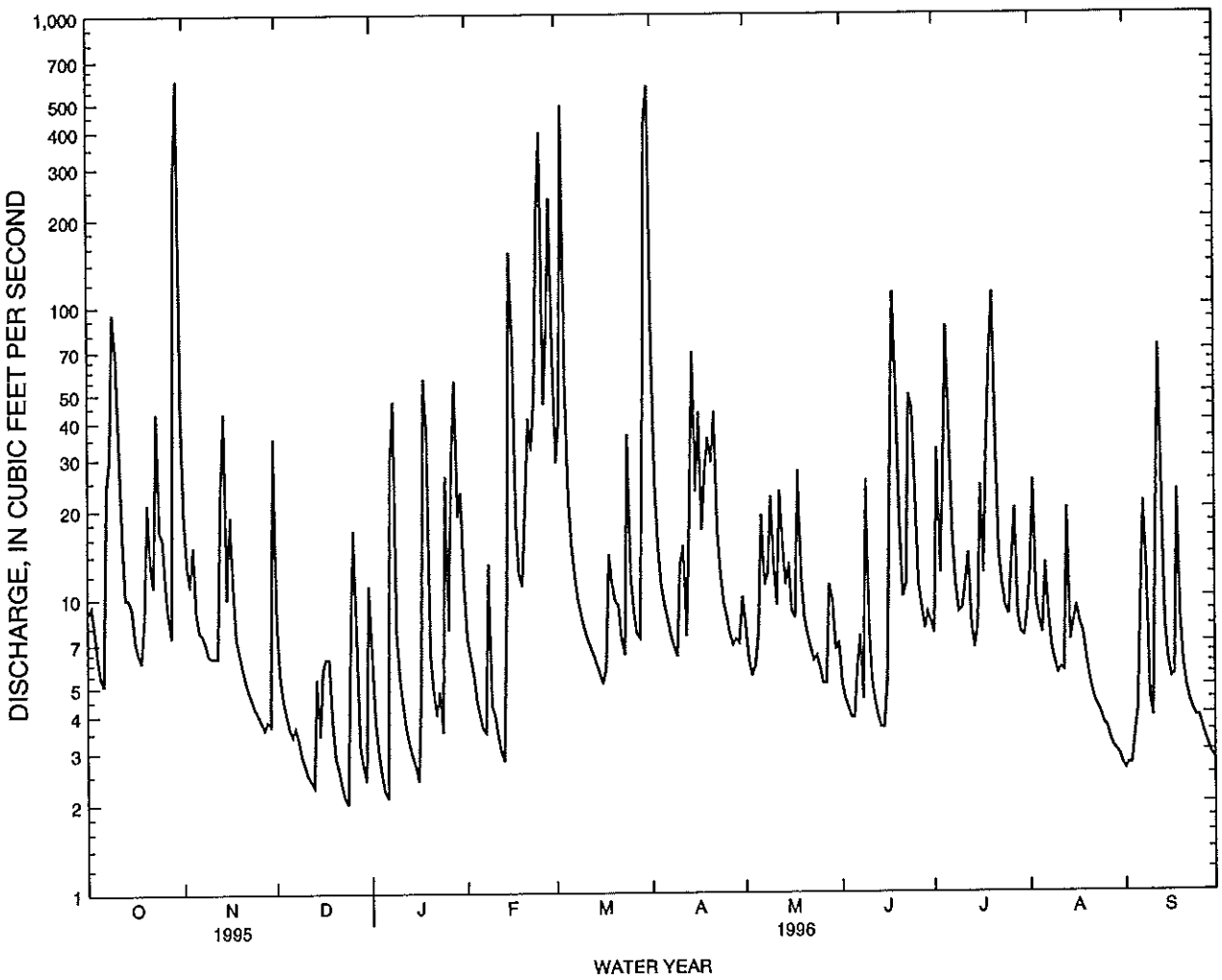
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1996, BY WATER YEAR (WY)

MEAN	24.0	46.0	48.8	42.2	46.6	57.0	55.0	29.9	16.5	25.2	26.2	18.5
MAX	133	198	200	192	222	303	221	88.4	58.1	99.4	111	101
(WY)	1942	1922	1937	1979	1932	1942	1989	1914	1941	1914	1914	1914
MIN	.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

HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1914 - 1996	
ANNUAL TOTAL	6447.06		8321.2			
ANNUAL MEAN	17.7		22.7		35.2	
HIGHEST ANNUAL MEAN					67.3	1980
LOWEST ANNUAL MEAN					14.5	1981
HIGHEST DAILY MEAN	602	Oct 30	602	Oct 30	2260	Jan 26 1948
LOWEST DAILY MEAN	.96	Mar 17	2.0	Dec 24	.62	Jul 23 1922
ANNUAL SEVEN-DAY MINIMUM	1.1	Mar 12	2.8	Aug 28	.71	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	12790		16510		25510	
10 PERCENT EXCEEDS	38		42		77	
50 PERCENT EXCEEDS	7.5		7.9		10	
90 PERCENT EXCEEDS	2.4		3.4		3.3	



HAWAII, ISLAND OF MAUI

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53′20″, long 156°15′20″, 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 concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--85 years (water years 1912-96), 4.83 ft^3/s (3,500 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 30	0230	311	3.15	Mar. 03	2000	420	3.33
Jan. 18	2400	*1,350	*4.38	Mar. 31	0400	1,240	4.27
Feb. 25	1900	1,269	4.30				

Minimum discharge, 0.43 ft^3/s September 26-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	6.8	1.8	1.3	1.3	8.1	45	3.2	.80	1.3	1.5	.57
2	1.3	5.1	1.5	.91	1.4	7.2	16	2.3	.77	2.5	2.1	.59
3	1.1	4.4	1.3	.80	1.3	48	11	2.1	.75	.93	1.2	.55
4	.98	4.3	1.3	.75	1.1	15	8.6	2.0	.70	3.6	1.1	.56
5	.92	3.5	1.2	.70	1.1	8.4	7.2	2.2	.70	6.6	1.1	.53
6	.96	3.2	1.1	.70	1.1	6.9	6.0	1.9	.88	2.3	2.0	.70
7	1.2	3.2	1.1	2.8	3.3	5.8	5.1	1.7	.98	1.4	1.2	2.3
8	4.5	2.8	1.0	4.4	11	5.1	4.5	2.5	.83	1.2	1.0	1.0
9	5.0	2.6	1.0	1.1	1.5	4.5	4.0	3.2	1.3	1.1	.99	.57
10	3.2	2.4	1.0	.88	3.5	4.0	6.2	1.6	.72	1.1	.93	.63
11	2.5	2.3	.90	.80	1.5	3.6	5.7	1.5	.65	1.3	1.0	1.9
12	1.9	2.3	.90	.80	1.3	3.3	3.4	1.4	.60	1.2	.93	3.6
13	1.5	3.0	.90	.80	1.3	3.0	3.0	1.3	.60	.98	5.1	1.6
14	1.5	11	1.2	.72	3.5	2.8	6.0	1.4	.57	.90	1.2	.74
15	1.6	2.7	.91	.70	14	2.5	3.4	1.7	.60	1.0	1.0	.67
16	1.3	4.5	1.1	.70	5.0	2.3	6.7	1.3	.81	2.4	.98	.60
17	1.3	3.3	1.0	.93	2.6	2.3	3.3	1.2	1.2	1.1	.96	.60
18	1.2	2.2	1.0	27	2.3	2.6	5.6	3.8	4.5	3.4	2.1	1.2
19	1.5	2.1	.85	35	2.2	2.1	6.3	1.9	2.8	11	.97	.66
20	3.9	2.0	.80	1.8	2.0	2.1	7.7	1.4	.88	11	.86	.63
21	2.2	1.8	.72	1.5	2.6	5.4	9.8	1.2	.75	4.1	.80	.56
22	1.7	1.8	.70	1.3	2.5	2.2	5.6	1.1	.66	2.1	.77	.51
23	2.9	1.7	.70	2.1	3.0	2.4	4.1	1.0	2.2	1.8	.74	.53
24	1.9	1.6	.70	1.4	84	5.6	3.7	1.1	3.2	1.6	.70	.51
25	2.8	1.5	4.7	2.8	73	2.0	3.5	1.0	3.0	1.6	.70	.51
26	1.7	1.5	5.6	1.5	16	1.7	3.2	.95	.98	3.2	.66	.49
27	1.5	1.4	.89	1.4	10	1.6	3.0	.91	.93	1.8	.65	.44
28	1.4	1.4	.74	3.2	36	1.5	2.8	1.3	.77	1.5	.60	.43
29	28	1.3	.70	1.5	13	4.9	2.6	1.1	1.1	1.4	.60	.43
30	61	6.9	.79	3.9	---	125	3.7	.93	1.0	1.3	.60	.43
31	9.4	---	7.7	1.9	---	279	---	.86	---	1.6	.60	---
TOTAL	153.06	94.6	45.80	106.09	302.4	570.9	206.7	51.05	36.23	78.31	35.64	25.04
MEAN	4.94	3.15	1.48	3.42	10.4	18.4	6.89	1.65	1.21	2.53	1.15	.83
MAX	61	11	7.7	35	84	279	45	3.8	4.5	11	5.1	3.6
MIN	.92	1.3	.70	.70	1.1	1.5	2.6	.86	.57	.90	.60	.43
AC-FT	304	188	91	210	600	1130	410	101	72	155	71	50

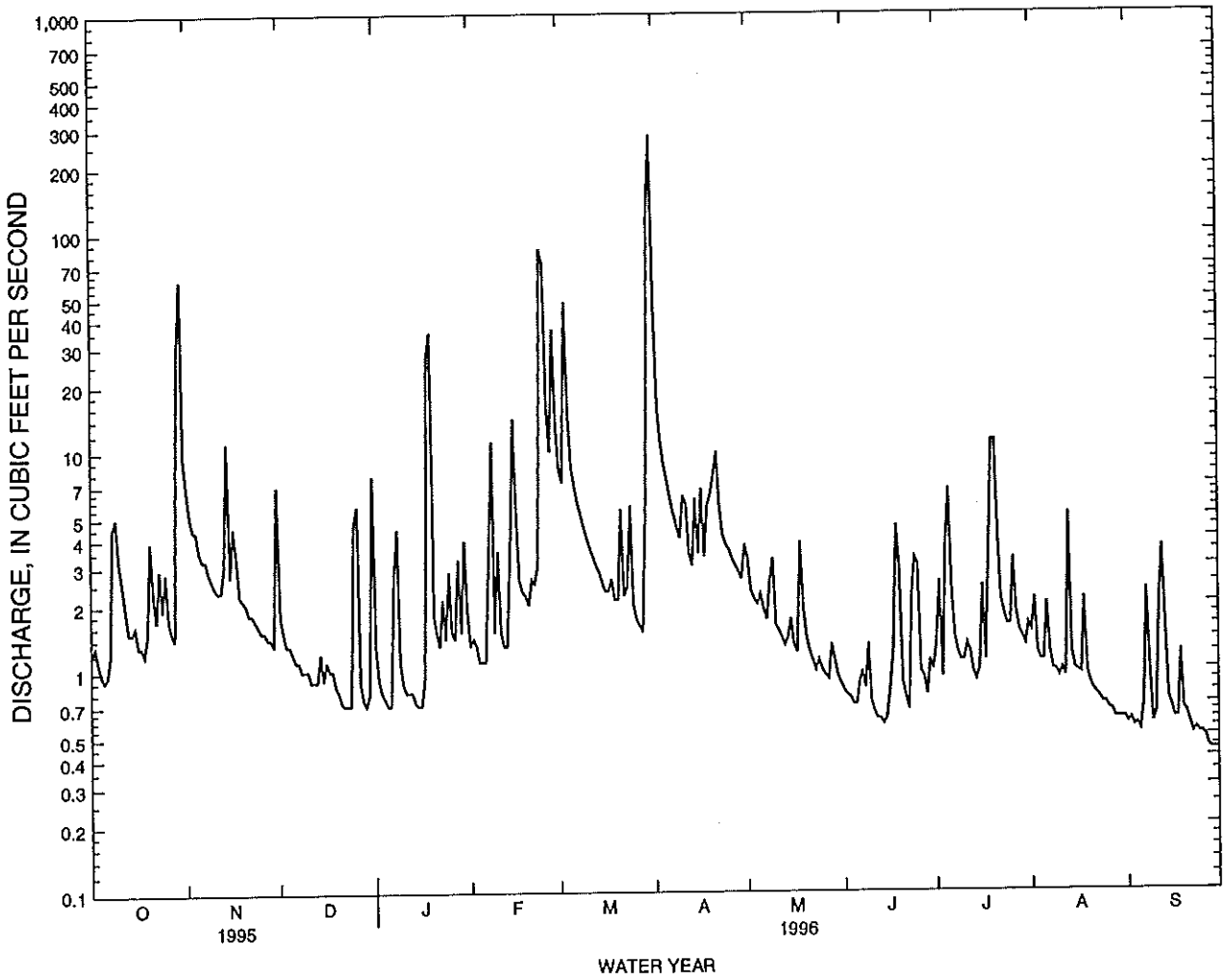
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1996, BY WATER YEAR (WY)

MEAN	2.75	5.48	6.08	5.48	5.26	7.31	7.64	5.08	2.72	3.52	4.00	2.61
MAX	15.9	21.4	20.0	20.9	24.5	33.0	43.4	24.3	9.97	12.6	18.1	14.6
(WY)	1942	1991	1947	1921	1969	1942	1989	1916	1914	1914	1982	1992
MIN	.15	.25	1.04	.61	.62	.79	.58	.84	.52	.41	.40	.25
(WY)	1985	1963	1981	1977	1983	1992	1992	1933	1962	1981	1973	1984

HAWAII, ISLAND OF MAUI

16587000 HONOPOU STREAM NEAR HUELO--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1912 - 1996	
ANNUAL TOTAL	1125.21		1705.82			
ANNUAL MEAN	3.08		4.66		4.83	
HIGHEST ANNUAL MEAN					9.88	1914
LOWEST ANNUAL MEAN					1.73	1981
HIGHEST DAILY MEAN	61	Oct 30	279	Mar 31	305	Apr 7 1989
LOWEST DAILY MEAN	.35	Mar 12	.43	Sep 28	.11	Oct 27 1984
ANNUAL SEVEN-DAY MINIMUM	.47	Mar 6	.46	Sep 24	.11	Oct 26 1984
ANNUAL RUNOFF (AC-FT)	2230		3380		3500	
10 PERCENT EXCEEDS	6.3		6.4		10	
50 PERCENT EXCEEDS	1.8		1.5		2.4	
90 PERCENT EXCEEDS	.75		.70		.74	



HAWAII, ISLAND OF MAUI

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", 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 good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--31 years (water years 1966-96), 3.18 ft^3/s (2,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s, March 31, 1982, April 12, 1986, March 23, 1994; minimum daily, 0.11 ft^3/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft^3/s, February 25; minimum daily, 0.19 ft^3/s, September 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	4.3	1.8	1.3	2.4	7.1	4.7	1.2	1.3	.69	.90	.26
2	1.5	3.3	1.3	.76	1.7	5.6	4.1	1.3	1.1	3.1	.97	.23
3	1.4	2.9	1.1	.56	1.4	10	3.3	1.0	.98	1.5	.83	.23
4	1.0	3.5	1.0	.45	1.0	9.9	2.7	1.0	.90	2.9	.69	.26
5	.97	2.6	.97	.39	.83	8.1	2.4	1.0	.83	6.9	.69	.26
6	.90	2.3	.90	.39	.83	6.7	2.1	.97	.90	5.0	.83	.30
7	.97	2.2	.83	.50	.69	5.3	1.9	1.6	1.0	2.3	.76	.39
8	2.5	2.1	.76	.83	1.2	4.5	1.6	2.5	.90	1.5	.69	1.2
9	6.1	2.0	.69	.62	.69	4.1	1.5	3.6	.83	1.1	.62	.62
10	6.6	1.9	.69	.45	.90	3.7	1.7	2.7	.76	1.0	.62	.39
11	5.3	1.8	.62	.39	1.0	3.3	1.6	2.4	.69	1.0	.62	.76
12	3.0	1.7	.62	.34	.62	3.1	1.3	2.2	.69	.83	.56	4.2
13	2.1	2.0	.62	.34	.50	2.9	1.4	2.1	.62	.69	1.0	2.7
14	1.9	4.2	.76	.34	.86	2.7	3.1	2.1	.50	.62	.90	1.0
15	2.0	2.5	.69	.30	7.8	2.5	2.7	2.3	.50	.76	.69	.69
16	1.6	2.1	.69	.30	8.3	2.4	2.5	2.0	.62	1.8	.69	.56
17	1.2	2.1	.69	.39	3.8	2.3	2.0	2.0	.97	1.3	.69	.45
18	1.1	1.7	.69	.65	2.5	3.1	2.1	2.5	4.8	3.4	.62	1.2
19	1.1	1.5	.56	1.8	1.9	2.4	2.2	2.1	5.4	5.8	.56	.97
20	2.4	1.4	.50	.69	2.0	2.3	1.9	1.9	2.0	7.4	.50	.50
21	2.6	1.3	.50	.45	3.6	5.1	3.2	1.7	1.2	3.8	.45	.39
22	2.5	1.2	.50	.39	3.8	3.8	2.0	1.6	.97	2.3	.39	.34
23	6.5	1.1	.45	.39	6.2	2.7	1.6	1.5	1.2	1.7	.39	.30
24	4.0	1.1	.45	.39	8.6	8.0	1.4	1.5	3.0	1.4	.39	.60
25	2.9	1.0	.45	.69	12	4.5	1.3	1.4	1.4	1.2	.34	.45
26	2.2	1.0	.62	.76	8.1	3.1	1.2	1.4	.97	1.5	.34	.34
27	1.8	1.0	.39	3.8	8.0	2.5	1.1	1.2	.90	1.1	.30	.26
28	1.5	1.0	.39	8.5	10	2.2	1.1	1.5	.76	1.0	.30	.23
29	8.1	.97	.39	4.9	9.5	2.3	1.1	2.2	.69	.97	.30	.19
30	10	3.4	.45	6.0	---	7.2	1.3	1.5	.69	.90	.30	.19
31	6.7	---	2.3	5.6	---	5.7	---	1.6	---	.83	.26	---
TOTAL	94.44	61.17	23.37	43.66	110.72	139.1	62.1	55.57	38.07	66.29	18.19	20.46
MEAN	3.05	2.04	.75	1.41	3.82	4.49	2.07	1.79	1.27	2.14	.59	.68
MAX	10	4.3	2.3	8.5	12	10	4.7	3.6	5.4	7.4	1.0	4.2
MIN	.90	.97	.39	.30	.50	2.2	1.1	.97	.50	.62	.26	.19
AC-FT	187	121	46	87	220	276	123	110	76	131	36	41

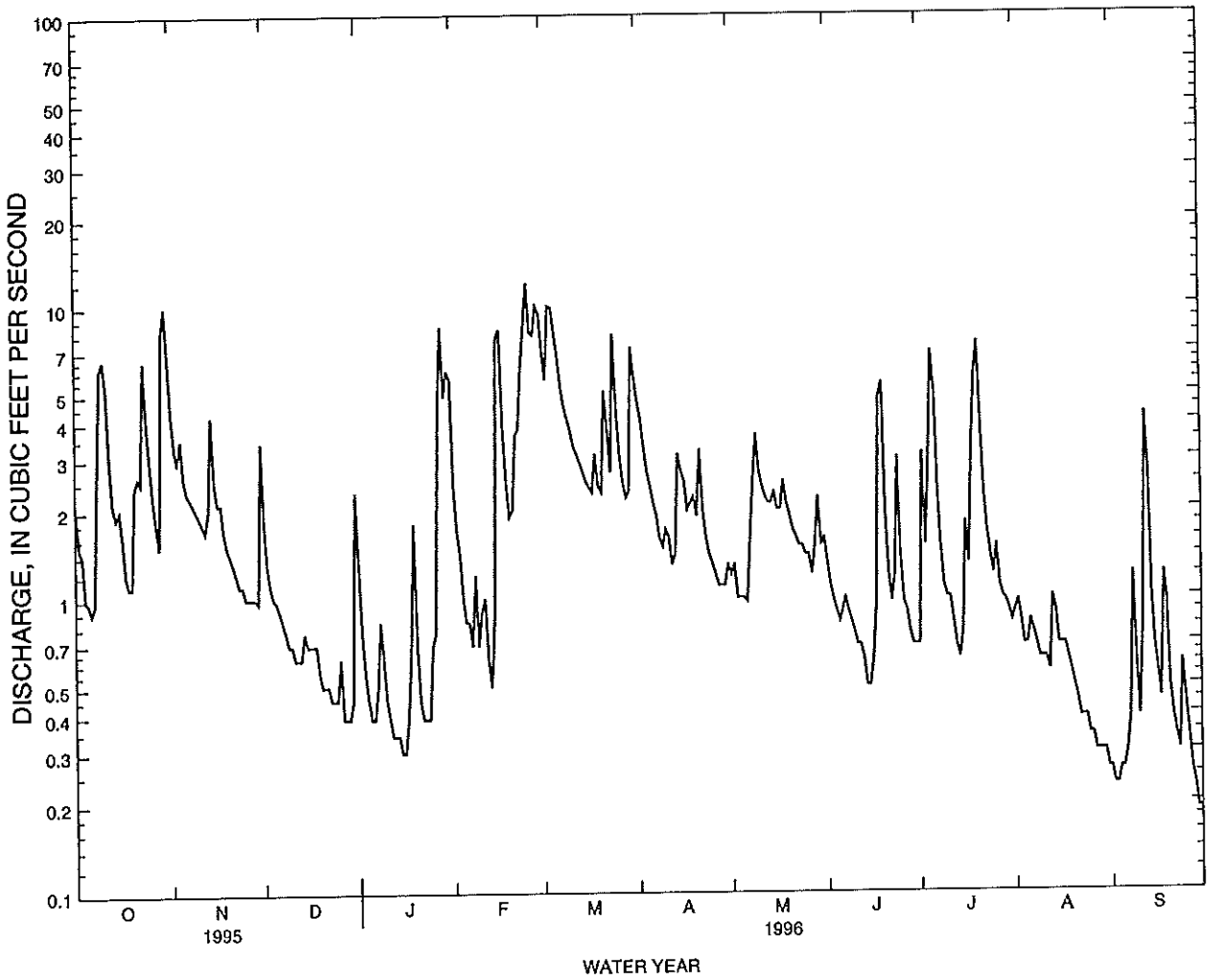
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1996, BY WATER YEAR (WY)

MEAN	1.89	3.29	3.87	3.71	3.70	4.74	5.13	3.52	2.07	2.59	2.14	1.55
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.35	7.42	5.99	6.40	4.98	5.69
(WY)	1984	1968	1971	1989	1969	1982	1968	1987	1986	1982	1969	1992
MIN	.14	.25	.65	.22	.36	.51	.27	1.28	.54	.40	.19	.15
(WY)	1985	1992	1977	1977	1978	1983	1992	1992	1981	1981	1974	1984

HAWAII, ISLAND OF MAUI

16599500 OPANA TUNNEL AT KAILIILI--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1965 - 1996	
ANNUAL TOTAL	769.81		733.14			
ANNUAL MEAN	2.11		2.00		3.18	
HIGHEST ANNUAL MEAN					5.34	1969
LOWEST ANNUAL MEAN					1.45	1981
HIGHEST DAILY MEAN	10	Oct 30	12	Feb 25	18	Mar 31 1982
LOWEST DAILY MEAN	.26	Mar 19	.19	Sep 29	.11	Nov 5 1973
ANNUAL SEVEN-DAY MINIMUM	.34	Mar 14	.26	Aug 30	.11	Nov 4 1973
ANNUAL RUNOFF (AC-FT)	1530		1450		2300	
10 PERCENT EXCEEDS	4.5		4.8		7.7	
50 PERCENT EXCEEDS	1.6		1.2		2.2	
90 PERCENT EXCEEDS	.62		.39		.39	



HAWAII, ISLAND OF MAUI

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", 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 fair. No appreciable diversion upstream of station.

AVERAGE DISCHARGE.--13 years (water years 1984-96), 66.9 ft^3/s (48,440 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, 11 ft^3/s for several days in October and November 1984, May 1996.

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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 31	0300	*2,730	*6.03	No other peak greater than base discharge			

Minimum discharge, 12 ft^3/s, many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	52	28	62	36	38	354	53	40	76	43	20
2	41	39	23	36	34	44	242	51	41	126	56	20
3	36	37	22	28	30	248	107	47	e30	48	49	21
4	29	68	21	24	25	294	74	45	e45	109	46	23
5	25	32	20	41	22	130	62	45	e48	108	42	22
6	23	29	19	32	19	71	55	45	e66	54	62	26
7	27	50	47	84	20	45	45	45	81	40	46	71
8	32	36	34	207	84	36	40	50	43	34	36	27
9	66	29	26	64	26	30	37	44	42	31	32	17
10	66	29	23	43	26	28	109	42	39	30	31	24
11	33	46	23	35	19	26	53	41	39	28	35	46
12	32	43	22	29	17	26	39	42	37	28	40	109
13	28	103	22	26	16	20	39	44	36	26	150	45
14	28	234	55	25	129	17	126	62	55	25	47	24
15	34	95	25	21	285	16	54	61	40	25	43	19
16	25	56	23	20	195	17	81	60	39	33	35	18
17	23	46	22	32	68	22	68	54	48	27	30	18
18	22	38	26	54	41	54	103	85	66	36	31	20
19	56	35	22	96	29	17	129	67	63	60	27	19
20	107	33	20	30	25	15	160	65	39	109	25	17
21	40	30	19	25	24	15	260	48	35	72	24	13
22	30	28	18	22	21	13	124	45	31	42	24	14
23	27	27	18	19	e26	29	82	42	55	34	23	24
24	27	26	17	36	82	58	67	43	120	29	23	15
25	46	25	18	32	68	17	66	42	89	29	22	13
26	30	24	27	26	97	14	64	42	59	62	21	13
27	26	26	27	22	70	13	89	42	70	29	21	12
28	24	25	18	54	166	13	74	120	66	27	22	14
29	260	23	17	26	96	62	63	69	132	27	22	13
30	188	65	112	42	---	187	57	55	46	29	20	12
31	72	---	211	92	---	393	---	46	---	40	20	---
TOTAL	1539	1429	1025	1385	1796	2008	2923	1642	1640	1473	1148	749
MEAN	49.6	47.6	33.1	44.7	61.9	64.8	97.4	53.0	54.7	47.5	37.0	25.0
MAX	260	234	211	207	285	393	354	120	132	126	150	109
MIN	22	23	17	19	16	13	37	41	30	25	20	12
AC-FT	3050	2830	2030	2750	3560	3980	5800	3260	3250	2920	2280	1490

e Estimated

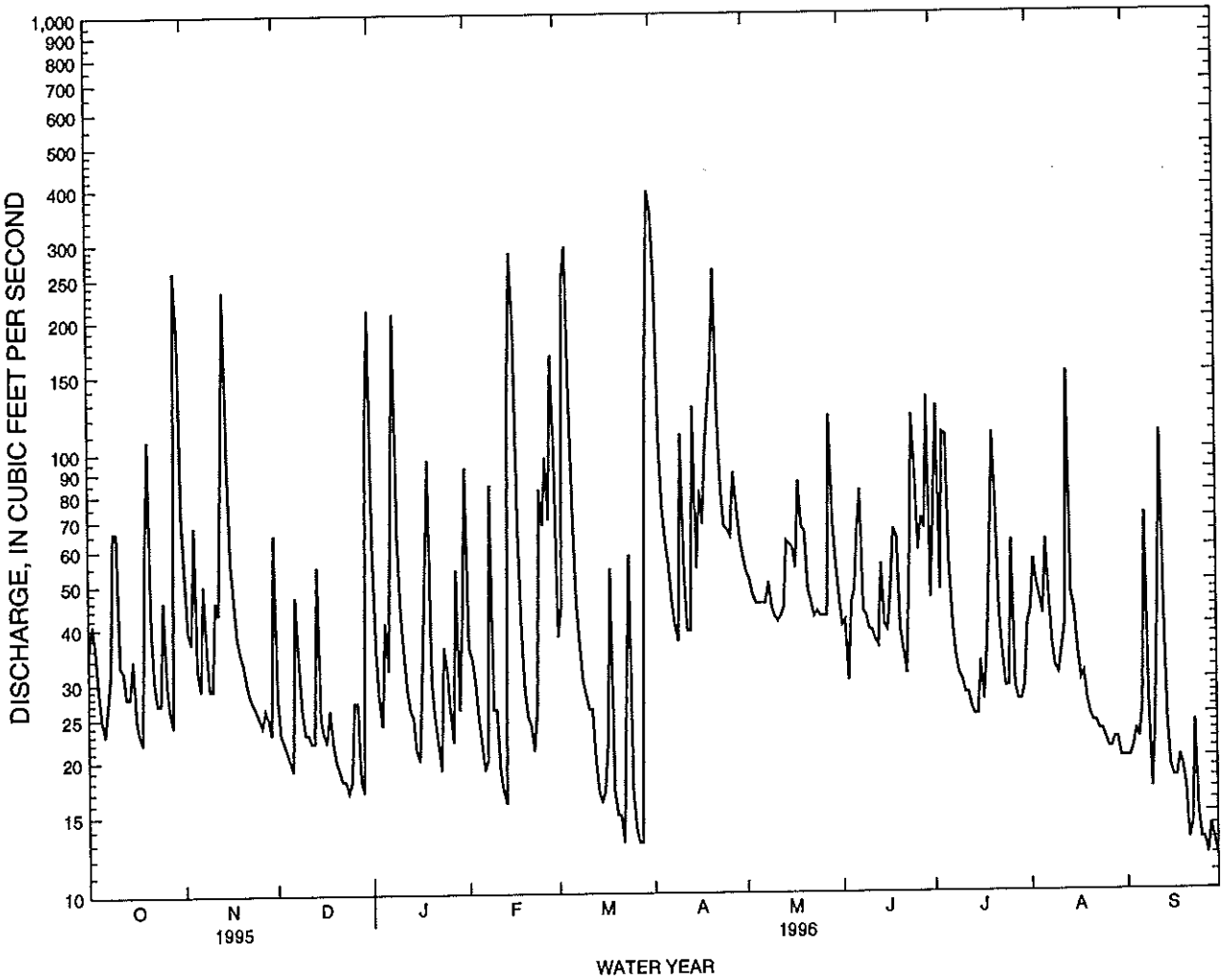
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1996, BY WATER YEAR (WY)

MEAN	56.0	65.2	62.7	69.1	60.3	84.6	90.0	67.4	57.1	73.0	62.2	48.2
MAX	103	132	97.5	149	108	176	230	136	99.7	137	97.0	133
(WY)	1984	1988	1988	1988	1994	1994	1989	1987	1987	1994	1993	1992
MIN	11.9	20.5	18.3	25.4	32.1	30.4	20.8	27.9	24.4	25.2	26.0	15.8
(WY)	1985	1985	1985	1985	1993	1987	1992	1984	1985	1984	1984	1984

HAWAII, ISLAND OF MAUI

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1983 - 1996	
ANNUAL TOTAL	20041		18757			
ANNUAL MEAN	54.9		51.2		66.9	
HIGHEST ANNUAL MEAN					93.4	1994
LOWEST ANNUAL MEAN					41.4	1985
HIGHEST DAILY MEAN	404	Jan 29	393	Mar 31	913	Apr 10 1986
LOWEST DAILY MEAN	17	Jun 28	12	Sep 27	11	Oct 7 1984
ANNUAL SEVEN-DAY MINIMUM	19	Dec 19	13	Sep 24	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	39750		37200		48440	
10 PERCENT EXCEEDS	116		99		134	
50 PERCENT EXCEEDS	31		36		42	
90 PERCENT EXCEEDS	20		19		21	



HAWAII, ISLAND OF MAUI

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--Lat 20°56′21″, long 156°32′59″, 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 diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft above mean sea level, from topographic map.

REMARKS.--Records good, except for the period of no gage height record, which are poor. No diversion upstream of station.

AVERAGE DISCHARGE.--12 years (water years 1985-96), 82.1 ft^3/s (59,460 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)
Mar. 03	0735	2,060	4.37	Mar. 31	----	*e3,950	

Minimum discharge, 29 ft^3/s, May 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	69	51	41	38	113	e410	36	e34	89	49	34
2	48	49	44	38	39	68	e240	35	e35	87	100	34
3	45	47	42	37	37	402	e130	34	e33	47	60	34
4	41	73	42	36	36	125	e80	34	e44	139	66	37
5	40	45	41	36	36	40	e56	34	42	86	48	36
6	39	43	40	35	35	e100	56	33	54	49	76	44
7	49	81	42	128	64	e80	54	33	70	42	55	133
8	55	57	40	226	120	e66	53	34	47	40	41	47
9	111	45	40	46	39	e56	52	33	50	39	40	39
10	64	49	39	40	41	e54	114	32	42	38	44	47
11	44	61	39	38	36	e49	57	31	41	40	54	64
12	57	62	39	37	36	e49	51	31	40	40	45	129
13	44	203	39	40	35	e40	52	31	40	38	193	53
14	47	281	88	37	170	e35	134	52	43	37	43	40
15	55	78	48	36	285	e34	49	43	42	38	42	40
16	43	54	43	37	133	e37	97	52	42	49	41	38
17	46	59	42	57	53	e45	62	40	51	39	39	37
18	42	54	43	126	46	e90	90	68	61	47	41	49
19	92	52	40	117	41	e35	77	56	57	66	38	38
20	96	49	38	45	42	e35	122	42	41	139	37	42
21	52	46	38	40	44	e31	125	32	40	121	37	37
22	44	44	38	38	46	e32	48	31	39	44	36	47
23	42	50	37	38	49	e66	40	30	59	39	36	90
24	41	57	37	52	79	e100	39	35	71	38	36	43
25	60	56	44	48	84	e35	40	35	62	43	35	38
26	42	56	65	41	80	e30	43	42	45	93	35	37
27	39	59	69	52	96	e30	69	e50	49	41	35	36
28	38	61	39	82	227	e30	49	e90	42	38	34	36
29	301	56	38	42	107	e130	39	e62	113	37	34	36
30	213	121	140	56	---	e370	37	e50	43	39	34	35
31	62	---	142	60	---	e510	---	e44	---	45	35	---
TOTAL	2036	2117	1567	1782	2174	2917	2565	1285	1472	1767	1539	1450
MEAN	65.7	70.6	50.5	57.5	75.0	94.1	85.5	41.5	49.1	57.0	49.6	48.3
MAX	301	281	142	226	285	510	410	90	113	139	193	133
MIN	38	43	37	35	35	30	37	30	33	37	34	34
AC-FT	4040	4200	3110	3530	4310	5790	5090	2550	2920	3500	3050	2880

e Estimated

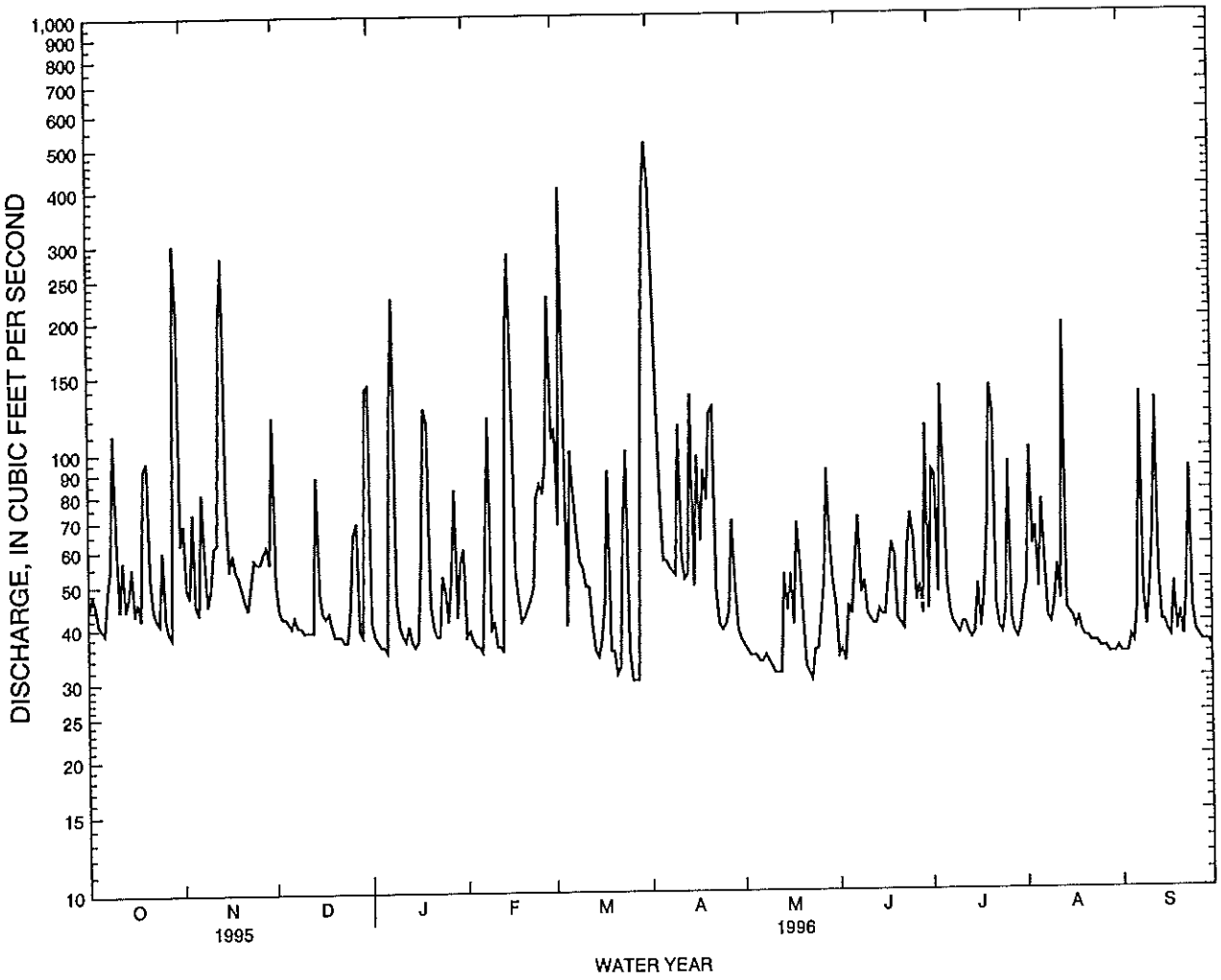
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1996, BY WATER YEAR (WY)

MEAN	72.2	83.8	72.0	77.4	68.5	95.4	97.3	81.6	72.5	91.1	78.3	73.4
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	41.5	43.4	54.8	46.1	32.9
(WY)	1985	1985	1985	1985	1993	1992	1992	1996	1984	1984	1984	1984

HAWAII, ISLAND OF MAUI

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1984 - 1996	
ANNUAL TOTAL	22935		22671			
ANNUAL MEAN	62.8		61.9		82.1	
HIGHEST ANNUAL MEAN					106	1994
LOWEST ANNUAL MEAN					57.5	1985
HIGHEST DAILY MEAN	519	Jan 14	510	Mar 31	1160	Jan 28 1988
LOWEST DAILY MEAN	32	Jun 20	30	Mar 26	22	Jan 18 1985
ANNUAL SEVEN-DAY MINIMUM	39	Sep 19	32	May 7	23	Jan 18 1985
ANNUAL RUNOFF (AC-FT)	45490		44970		59460	
10 PERCENT EXCEEDS	100		112		137	
50 PERCENT EXCEEDS	45		44		56	
90 PERCENT EXCEEDS	39		35		38	



HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

(Hydrologic Benchmark network station)

LOCATION.--Lat 20°58′54″, long 156°33′26″, 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 good. No diversion upstream of station.

AVERAGE DISCHARGE.--47 years (water years 1940-42, 1948-70, 1976-96), 17.9 ft^3/s (12,990 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)
Dec. 31	0730	*1,070	*6.36	Mar. 31	0300	818	5.90

Minimum discharge, 2.8 ft^3/s, September 3, 4, 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	16	7.6	9.1	6.6	42	162	7.6	5.2	7.7	6.6	3.1
2	6.0	8.2	5.7	6.6	6.7	23	31	6.1	4.9	21	19	2.9
3	5.4	6.8	5.0	5.7	7.1	144	14	5.7	4.7	7.0	20	2.8
4	4.7	8.9	4.8	5.2	5.5	48	11	5.5	4.7	27	16	2.8
5	4.6	6.1	4.6	5.0	5.0	14	9.1	7.1	4.6	18	13	3.1
6	4.5	5.5	4.5	4.9	4.8	10	8.3	7.2	5.5	9.2	30	3.0
7	5.7	6.0	4.5	42	10	8.7	7.6	5.8	11	6.7	12	20
8	13	8.5	4.5	92	39	7.7	7.1	7.5	9.5	5.6	6.7	11
9	47	6.0	4.4	12	6.7	7.2	6.8	11	9.6	5.1	5.0	4.2
10	24	4.8	4.4	7.2	7.1	6.7	20	6.2	5.8	4.9	6.5	3.4
11	8.0	5.2	4.3	6.5	5.5	6.3	9.3	5.6	5.0	4.9	13	7.4
12	6.0	16	4.2	5.9	4.7	6.0	7.4	5.5	4.8	4.9	5.6	24
13	6.8	78	4.2	6.0	4.5	5.8	6.8	5.9	4.5	4.8	57	10
14	5.2	130	14	6.2	68	5.6	40	20	4.4	4.6	8.0	4.3
15	9.0	37	5.6	5.3	114	5.4	13	15	4.3	4.5	5.3	3.6
16	6.3	13	5.4	4.9	54	5.3	32	20	4.4	7.2	4.9	4.0
17	5.1	17	5.0	9.3	13	5.3	17	14	5.7	5.9	4.6	3.2
18	6.1	9.5	5.1	e60	8.3	5.9	24	14	11	12	4.9	4.8
19	12	9.3	4.9	e70	7.0	5.3	14	8.4	14	13	4.3	3.8
20	30	7.9	4.3	e7.0	6.2	7.9	13	8.7	5.6	46	3.9	5.3
21	7.2	7.2	4.2	e6.2	5.8	23	36	6.2	4.9	23	3.7	3.7
22	6.2	6.3	4.1	e5.5	6.1	8.2	12	5.1	4.6	10	3.5	3.1
23	5.6	5.9	4.1	e5.5	6.1	7.0	7.7	4.8	12	7.2	3.4	34
24	5.2	5.7	4.0	e5.5	8.9	43	7.0	5.4	17	6.6	3.3	13
25	11	5.5	4.0	15	21	9.6	6.6	5.2	27	6.2	3.2	5.2
26	6.6	5.3	34	8.5	9.4	6.6	6.4	6.6	6.4	24	3.2	4.6
27	4.9	5.2	34	19	51	5.8	9.8	5.8	7.2	14	3.1	4.2
28	4.5	5.1	5.9	34	139	5.3	34	22	5.8	7.3	3.1	4.0
29	132	5.0	4.8	9.5	56	60	9.8	12	6.9	6.5	2.9	3.9
30	103	15	23	7.0	---	179	8.0	6.1	6.9	6.2	2.9	3.8
31	16	---	81	21	---	217	---	5.7	---	6.4	2.9	---
TOTAL	517.8	465.9	310.1	507.5	687.0	934.6	590.7	271.7	227.9	337.4	281.5	206.2
MEAN	16.7	15.5	10.0	16.4	23.7	30.1	19.7	8.76	7.60	10.9	9.08	6.87
MAX	132	130	81	92	139	217	162	22	27	46	57	34
MIN	4.5	4.8	4.0	4.9	4.5	5.3	6.4	4.8	4.3	4.5	2.9	2.8
AC-FT	1030	924	615	1010	1360	1850	1170	539	452	669	558	409

e Estimated

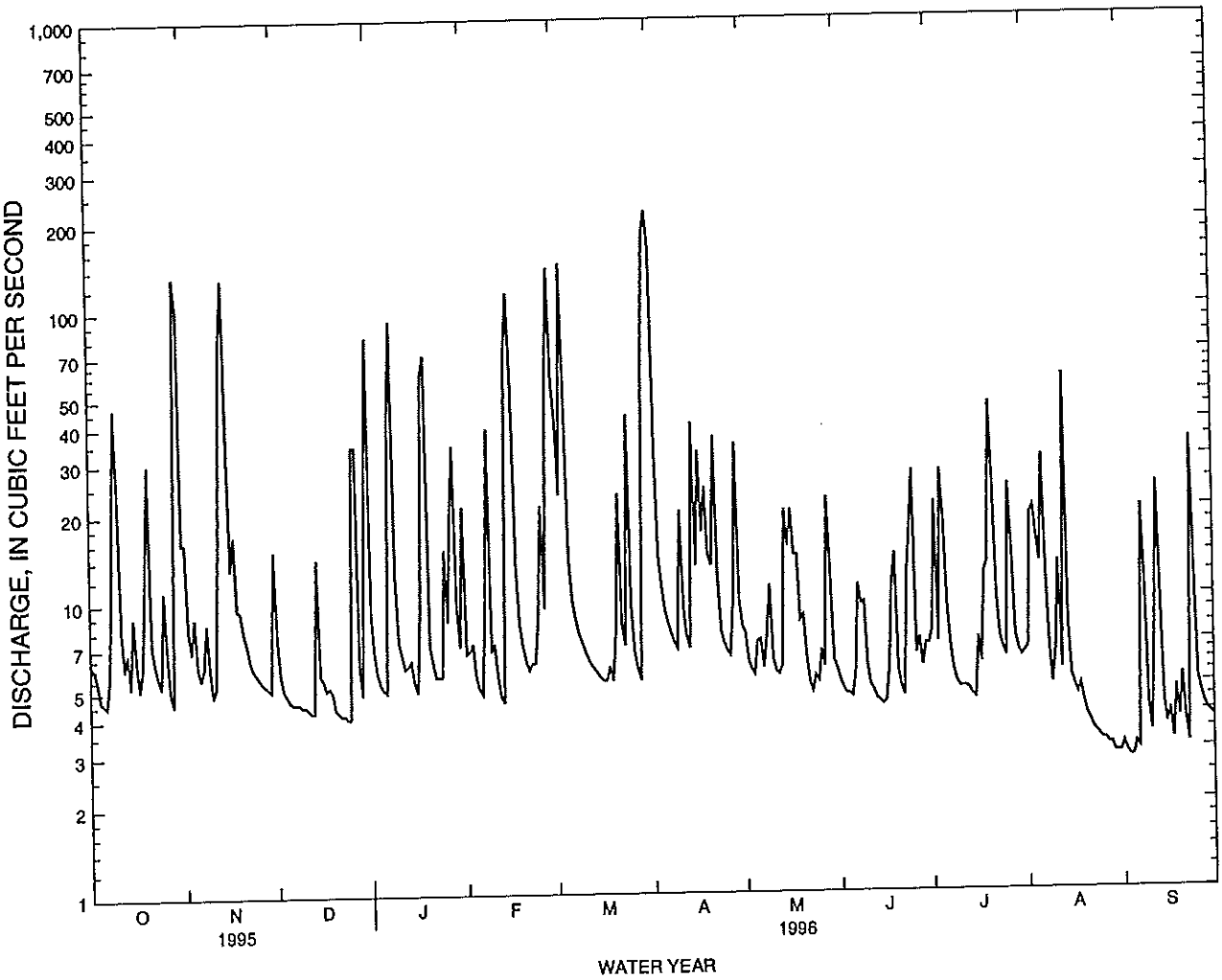
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1996, BY WATER YEAR (WY)

MEAN	15.4	20.4	18.7	18.0	17.7	25.5	24.3	17.4	12.0	16.3	16.7	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

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1939 - 1996	
ANNUAL TOTAL	5324.0		5338.3			
ANNUAL MEAN	14.6		14.6		17.9	
HIGHEST ANNUAL MEAN					30.8	1942
LOWEST ANNUAL MEAN					11.0	1981
HIGHEST DAILY MEAN	242	Jan 14	217	Mar 31	696	Mar 10 1942
LOWEST DAILY MEAN	3.6	Sep 26	2.8	Sep 3	2.7	Jan 28 1985
ANNUAL SEVEN-DAY MINIMUM	3.8	Sep 20	2.9	Aug 29	2.8	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	10560		10590		12990	
10 PERCENT EXCEEDS	33		31		35	
50 PERCENT EXCEEDS	6.6		6.6		9.0	
90 PERCENT EXCEEDS	4.6		4.2		5.2	



HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV												
07...	0940	5.0	81	8.1	24.5	20.5	0.30	755	8.4	94	K9	1400
FEB												
27...	1130	7.3	80	7.7	22.5	19.0	0.20	752	8.7	95	K11	600

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
NOV												
07...	19	3.5	2.4	7.0	44	0.7	0.80	23	0.80	10	<0.10	19
FEB												
27...	18	3.3	2.4	7.9	47	0.8	0.80	18	1.5	12	<0.10	16

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)
NOV											
07...	52	58	0.07	0.090	0.090	<0.015	<0.20	<0.010	0.010	0.010	<10
FEB											
27...	58	55	0.08	0.090	0.090	<0.015	<0.20	0.020	0.010	0.020	30

DATE	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM DIS-SOLVED (UO/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
NOV											
07...	<2.0	<3.0	<3.0	<4	<1.0	<10	<1.0	<1	<1.0	26	<6
FEB											
27...	<2.0	3.0	13	<4	<1.0	20	<1.0	<1	<1.0	24	6

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	RA-226 2 SIGMA WATER, DISS, (PCI/L) (76001)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)
FEB					
27...	1130	<0.02	<0.00	<0.01	0

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV				
07...	0940	2	0.03	--

HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57′45″, long 156°35′22″, 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).

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 October 1, 1990, at site 250 ft downstream of gage at datum 26.67 ft lower.

REMARKS.--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.--78 years (water years 1914-19, 1923-88, 1991-96), 39.3 ft^3/s (28,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Prior to October 1990. 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 31	0330	*1,500	*4.60	No other peak greater than base discharge.			

Minimum discharge, 10.0 ft^3/s on September 27-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	28	21	16	15	27	226	18	15	51	27	11
2	24	18	16	14	15	25	44	17	15	70	44	11
3	22	16	15	13	15	157	24	16	14	21	33	11
4	18	37	15	13	14	72	22	16	14	76	31	12
5	16	16	14	13	13	23	20	16	14	58	25	14
6	16	16	14	13	13	18	19	16	22	24	43	17
7	21	40	16	23	14	17	19	16	43	17	28	71
8	33	26	15	71	53	16	18	16	20	14	17	20
9	86	17	14	16	15	16	18	17	19	13	13	13
10	47	16	14	13	15	16	61	16	15	13	17	14
11	21	23	14	13	14	16	31	15	14	13	25	37
12	24	26	14	12	13	15	22	15	14	15	18	78
13	22	71	14	13	13	15	19	15	14	13	101	24
14	21	103	39	12	62	15	64	20	19	13	17	13
15	29	28	17	12	141	15	25	24	17	13	14	12
16	18	18	17	12	76	16	34	22	18	28	16	11
17	19	18	16	25	22	23	31	22	23	15	13	11
18	18	17	19	53	17	45	59	37	35	23	17	23
19	38	17	15	65	16	18	52	26	31	35	13	13
20	69	16	14	16	15	18	86	24	15	92	13	19
21	28	15	14	14	22	28	91	16	14	44	12	12
22	19	15	14	14	26	17	28	15	14	18	12	12
23	19	15	13	14	27	19	19	15	25	13	12	23
24	17	15	13	24	92	51	18	19	44	13	12	16
25	35	15	15	24	70	19	20	19	49	12	12	11
26	19	15	24	17	61	16	22	24	17	34	12	11
27	16	15	36	18	60	15	31	17	22	13	12	11
28	15	19	15	34	120	14	30	69	15	12	12	11
29	138	15	14	18	52	41	21	30	112	12	12	10
30	105	69	74	19	---	222	18	22	20	13	12	10
31	25	---	82	37	---	580	---	19	---	20	12	---
TOTAL	1018	775	647	671	1101	1605	1192	649	723	821	657	562
MEAN	32.8	25.8	20.9	21.6	38.0	51.8	39.7	20.9	24.1	26.5	21.2	18.7
MAX	138	103	82	71	141	580	226	69	112	92	101	78
MIN	15	15	13	12	13	14	18	15	14	12	12	10
AC-FT	2020	1540	1280	1330	2180	3180	2360	1290	1430	1630	1300	1110

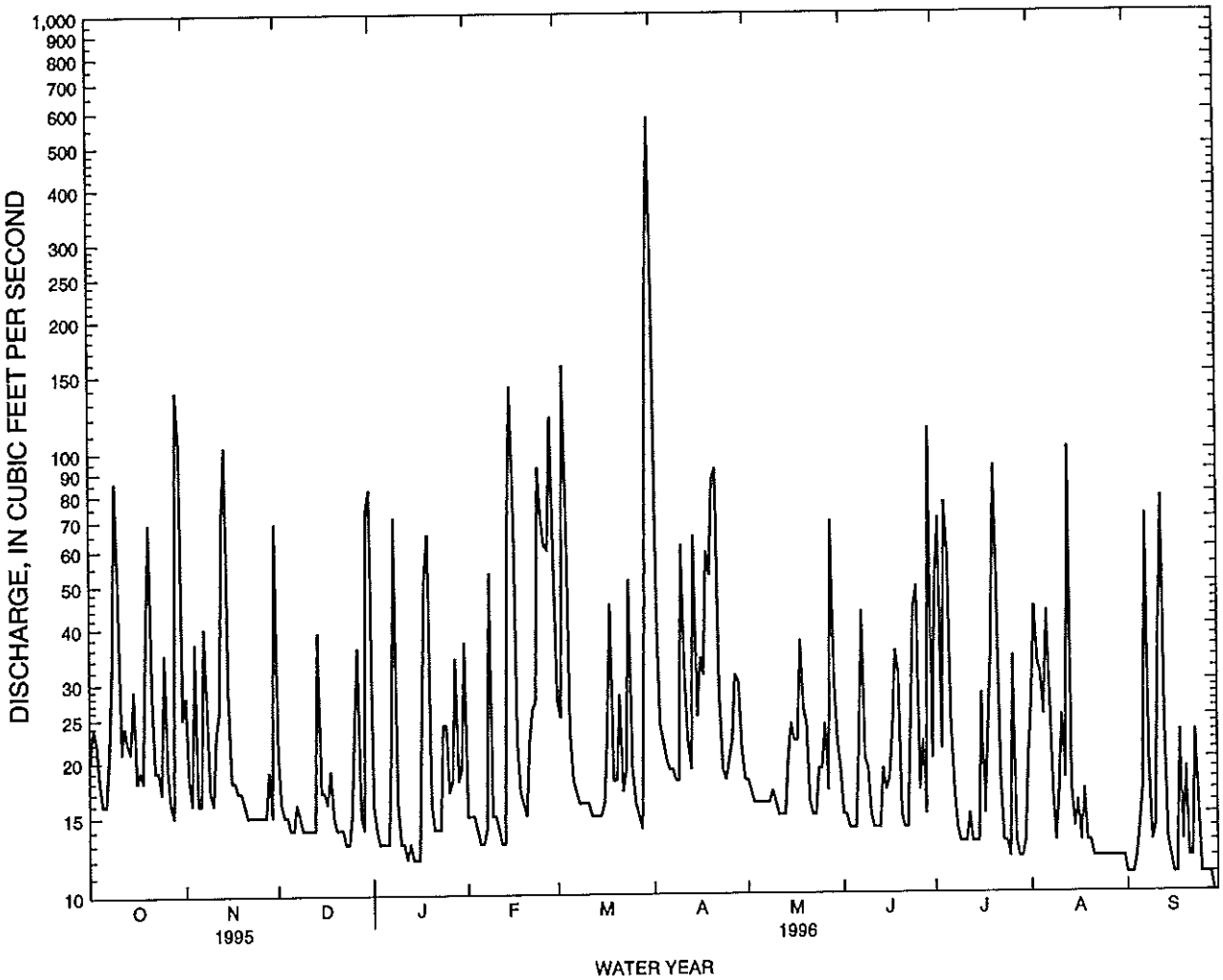
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1996, BY WATER YEAR (WY)

MEAN	31.7	41.1	41.0	35.8	37.1	44.4	49.1	41.5	34.4	40.2	41.3	30.5
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

HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1913 - 1996	
ANNUAL TOTAL	10348		10421			
ANNUAL MEAN	28.4		28.5		39.3	
HIGHEST ANNUAL MEAN					68.3	1914
LOWEST ANNUAL MEAN					24.1	1926
HIGHEST DAILY MEAN	262	Jan 14	580	Mar 31	781	Apr 7 1938
LOWEST DAILY MEAN	11	Mar 12	10	Sep 29	8.0	Aug 10 1920
ANNUAL SEVEN-DAY MINIMUM	12	Mar 12	11	Sep 24	8.5	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	20530		20670		28490	
10 PERCENT EXCEEDS	64		59		79	
50 PERCENT EXCEEDS	17		17		24	
90 PERCENT EXCEEDS	13		13		13	



Surface-Water Station Records for Hawaii

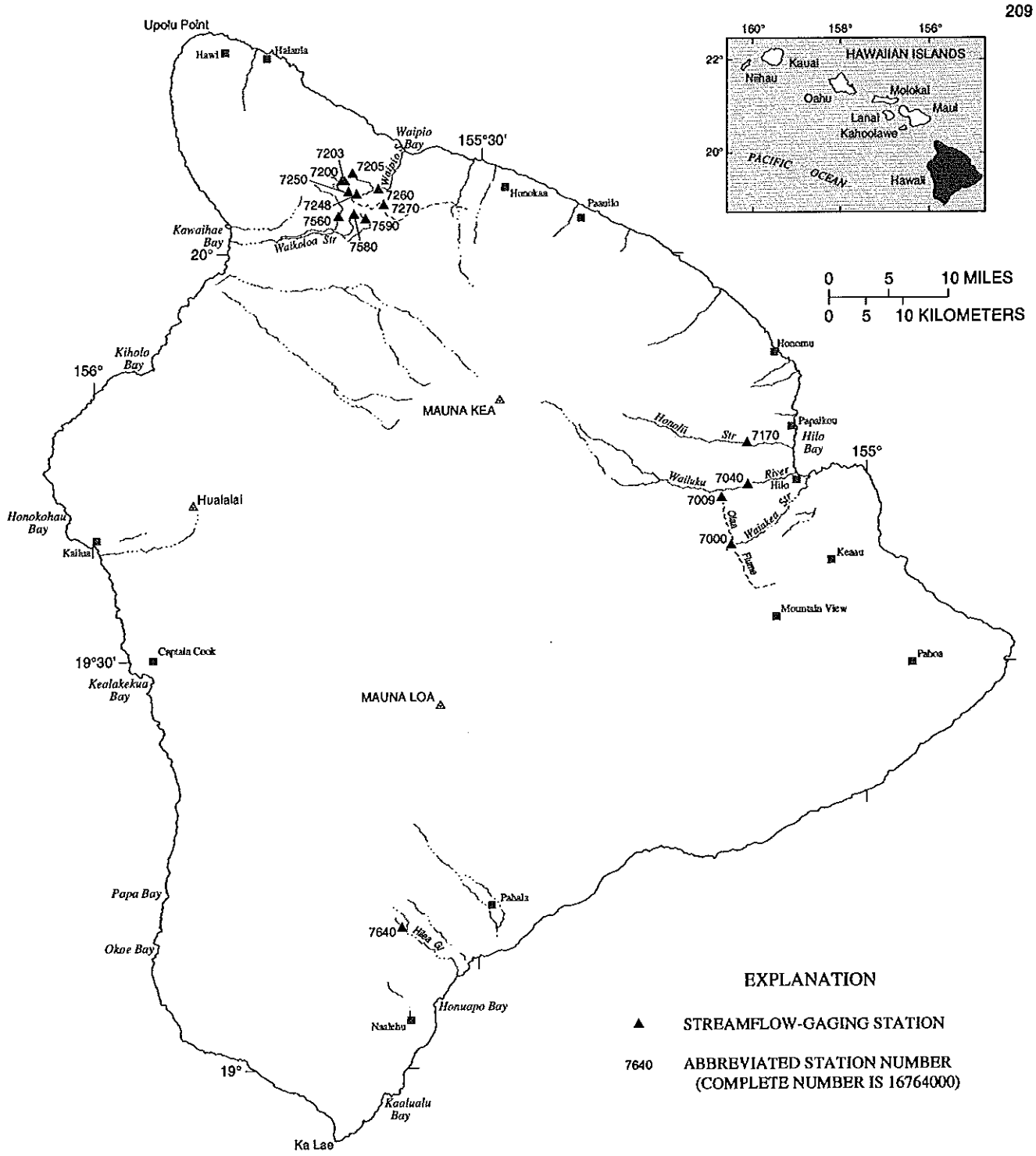


Figure 9. Locations of gaging, water-quality, and partial-record stations on Hawaii.

HAWAII, ISLAND OF HAWAII

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft downstream from tunnel entrance, 3.3 mi northwest of Kaumana School, and 6.5 mi southwest of Hilo Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,970 ft, from topographic map.

REMARKS.--Records good. County of Hawaii, Department of Water Supply, diverts by 16-in. pipeline 50 ft upstream for domestic use in the Kaumana and Piihonua areas since October 2, 1978.

AVERAGE DISCHARGE.--Water year 1991: 17 years (water years 1975-91), 6.20 ft^3/s (4,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s, January 8, 1975; no flow on August 13-18, 1980 (revised).

EXTREMES FOR CURRENT YEAR.--Water year 1991: Maximum daily discharge, 11 ft^3/s, November 15; minimum daily, 0.03 ft^3/s, February 6-13, March 2-6.

REVISIONS.--The annual minimum daily discharge for water years 1975 to 1982 have been revised. Daily discharges, in cubic feet per second, for all daily discharges less than 4 ft^3/s for the period December 5, 1974 to September 30, 1982 have also been revised. These figures supersede those published in the annual reports for water years 1975 to 1982.

Water year 1976: Minimum daily discharge, 3.7 ft^3/s, October 4, 5, 1975.
Water year 1977: Minimum daily discharge, 1.7 ft^3/s, February 23, 1977.
Water year 1978: Minimum daily discharge, 0.12 ft^3/s, February 12, 1978, September 8, 9, 1978.
Water year 1979: Minimum daily discharge, 2.1 ft^3/s, September 24, 1979.
Water year 1980: No flow on August 13-18, 1980.
Water year 1981: Minimum daily discharge, 0.01 ft^3/s, December 24-26, 1980.
Water year 1982: Minimum daily discharge, 0.41 ft^3/s, March 5-8, 1982.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
DAILY MEAN VALUES

June 28	3.7	July 9	3.7	July 11.....	3.2	July 12.....	3.7
June 29	3.5	July 10.....	3.5				

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
June 1975	162.6	5.42	8.4	3.5	323
July 1975	195.0	6.29	9.4	3.2	387
WTR YR 1975	5,232.9	14.3	43	1.2	10,380

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1976
DAILY MEAN VALUES

Oct. 4	3.7	Oct. 5	3.7

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Oct. 1975	425.8	13.7	28	3.7	845
CAL YR 1975	5,572.4	15.3	43	3.2	11,050
WTR YR 1976	6,129.9	16.7	36	3.7	12,160

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1976
DAILY MEAN VALUES

Jan. 20	3.7	Jan. 31	2.1	Feb. 13	2.7	Feb. 23	1.7
Jan. 21	3.4	Feb. 1	2.1	Feb. 14	2.3	Feb. 24	1.8
Jan. 22	3.2	Feb. 2	2.0	Feb. 15	2.5	June 27	3.7
Jan. 23	3.0	Feb. 3	2.1	Feb. 16	2.8	June 28	3.4
Jan. 24	2.8	Feb. 4	2.3	Feb. 17	2.5	June 29	3.2
Jan. 25	2.7	Feb. 5	2.7	Feb. 18	2.3	June 30	3.2
Jan. 26	2.3	Feb. 6	2.8	Feb. 19	2.2	July 1	3.0
Jan. 27	2.2	Feb. 10	3.4	Feb. 20	2.1	July 2	2.8
Jan. 28	2.1	Feb. 11	3.0	Feb. 21	2.0	July 3	2.8
Jan. 29	2.1	Feb. 12	2.8	Feb. 22	1.8	July 4	3.4
Jan. 30	2.1						

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Jan. 1977	168.6	5.44	10	2.1	334
Feb. 1977	115.2	4.11	26	1.7	228
June 1977	204.5	6.82	12	3.2	406
July 1977	484.9	15.6	24	2.8	962
CAL YR 1976	5,918.5	16.2	36	4.6	11,740
WTR YR 1977	5,200.8	14.2	31	1.7	10,320

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	14	6.2	2.3	7.4	2.3	10	12	14	14	13	12
2	8.6	15	6.0	2.3	4.0	2.3	10	13	14	14	13	12
3	8.2	17	5.7	2.5	1.1	2.2	11	16	14	13	12	12
4	8.4	19	5.4	2.7	1.1	2.1	12	16	14	14	12	12
5	8.6	18	5.1	2.8	1.1	2.0	11	16	13	14	12	11
6	8.8	16	4.9	2.5	.96	1.7	12	15	13	18	12	11
7	8.4	14	4.6	2.3	.96	1.7	15	14	12	24	6.8	6.7
8	8.4	12	4.1	2.2	.75	1.8	18	13	12	21	5.9	.12
9	8.6	11	3.7	2.1	.50	3.2	17	12	11	18	10	.12
10	8.6	10	3.4	2.1	.35	4.6	15	12	11	17	8.6	.25
11	9.2	9.8	3.2	1.8	.16	4.6	14	11	11	16	9.5	.30
12	9.2	9.4	3.0	1.7	.12	5.4	12	11	11	17	7.1	5.0
13	10	9.0	2.7	1.7	.35	8.0	12	10	11	18	6.7	8.4
14	10	9.0	2.5	1.6	.85	10	13	10	11	18	8.1	8.4
15	9.4	9.6	2.3	1.6	1.5	12	14	10	11	16	6.6	8.4
16	9.4	14	2.3	1.6	3.5	12	14	11	11	15	5.7	8.4
17	16	16	3.2	1.6	3.0	13	18	14	12	14	12	8.2
18	18	14	4.6	1.5	2.8	12	20	14	13	14	12	8.2
19	15	12	5.5	1.5	2.8	13	18	14	17	14	10	8.2
20	13	11	5.9	1.5	2.7	14	15	13	18	14	6.6	7.4
21	12	10	5.7	4.1	2.7	14	13	14	17	18	7.4	6.9
22	14	9.6	5.4	8.4	2.3	15	12	16	16	20	11	7.1
23	16	9.2	4.9	10	2.5	14	12	16	20	18	11	7.1
24	15	9.0	4.6	9.0	3.4	14	11	18	21	16	8.4	6.9
25	15	8.4	4.0	8.2	3.2	12	11	18	19	15	6.6	6.6
26	15	8.0	3.7	8.2	2.8	12	11	18	17	8.1	6.0	6.4
27	18	7.4	3.4	8.8	2.7	12	11	17	16	2.7	5.4	6.4
28	18	7.1	3.0	9.4	2.3	11	12	16	15	7.3	3.7	6.2
29	17	6.7	2.8	9.0	---	11	12	16	15	10	2.5	6.2
30	16	6.4	2.7	8.6	---	10	12	16	14	12	4.0	6.2
31	15	---	2.3	8.0	---	10	---	15	---	11	7.4	---
TOTAL	375.8	341.6	126.8	131.6	57.90	262.9	398	437	424	461.1	263.0	214.09
MEAN	12.1	11.4	4.09	4.25	2.07	8.48	13.3	14.1	14.1	14.9	8.48	7.14
MAX	18	19	6.2	10	7.4	15	20	18	21	24	13	12
MIN	8.2	6.4	2.3	1.5	.12	1.7	10	10	11	2.7	2.5	.12
AC-FT	745	678	252	261	115	521	789	867	841	915	522	425

CAL YR 1977 TOTAL 5003.4 MEAN 13.7 MAX 31 MIN 1.7 AC-FT 9920
WTR YR 1978 TOTAL 3493.79 MEAN 9.57 MAX 24 MIN .12 AC-FT 6930

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	3.9	4.5	4.5	13	13	4.6	4.0	4.0	8.5	4.2	3.2
2	4.2	4.0	4.5	4.4	12	12	4.7	4.2	4.5	8.0	4.2	3.1
3	3.2	4.2	4.5	4.4	11	11	5.0	4.2	4.5	7.5	3.9	3.1
4	3.2	4.2	4.5	4.3	10	10	6.2	4.2	4.0	8.0	3.6	3.1
5	3.7	4.0	4.4	4.3	11	9.3	9.5	4.0	4.0	8.0	3.5	3.0
6	3.9	5.4	4.4	4.3	14	7.9	8.5	4.0	4.0	8.0	3.5	3.0
7	3.5	10	5.0	4.2	12	6.6	8.3	4.0	4.0	10	3.5	2.8
8	3.5	9.1	4.8	4.2	10	5.6	8.3	4.0	4.0	9.5	3.5	2.8
9	3.7	6.2	5.4	4.2	9.3	5.4	7.7	4.0	3.4	9.0	3.5	2.7
10	3.7	4.5	9.5	4.2	8.5	8.9	5.8	4.0	3.4	7.2	3.5	3.0
11	3.6	4.3	9.3	4.2	7.2	9.9	4.7	4.0	4.5	5.3	3.2	3.1
12	3.5	4.3	8.9	4.2	6.0	8.5	4.6	4.0	7.0	4.7	3.2	3.0
13	3.5	4.3	9.1	4.3	5.3	6.6	4.4	4.0	8.5	4.6	3.2	3.0
14	3.5	4.3	9.9	9.3	5.0	5.6	4.2	4.2	8.0	4.5	3.5	2.7
15	3.5	4.2	11	14	6.4	5.3	4.2	4.2	7.0	4.5	3.7	2.7
16	3.5	4.0	11	17	9.1	5.2	4.2	4.3	7.0	4.4	4.3	2.5
17	3.5	4.0	9.9	17	9.3	5.2	4.0	4.4	7.0	4.4	4.4	2.5
18	3.5	4.0	10	16	11	5.0	4.2	4.4	7.0	4.3	4.2	2.5
19	3.6	4.0	11	13	13	5.0	4.2	4.3	6.5	4.3	4.0	2.5
20	3.7	4.4	11	10	17	5.2	4.5	4.2	6.5	4.3	3.7	2.5
21	3.6	9.5	10	9.7	17	5.6	4.3	4.2	6.0	4.3	3.6	2.5
22	3.5	11	9.5	11	15	5.8	4.2	4.2	6.0	4.3	3.6	2.3
23	3.5	9.7	8.5	16	12	5.6	3.9	4.2	8.0	4.3	3.6	2.2
24	3.5	9.1	6.6	17	12	5.3	3.8	4.2	9.0	4.3	3.5	2.1
25	3.5	8.3	5.4	16	14	5.0	3.8	4.0	9.0	4.3	3.5	2.3
26	3.5	6.6	5.0	13	16	6.0	3.8	4.0	10	4.3	3.5	2.5
27	3.5	5.9	4.7	11	15	5.0	3.8	4.0	10	4.3	3.5	2.7
28	3.5	5.2	4.7	10	14	4.8	3.8	4.0	9.5	4.2	3.2	2.7
29	3.5	4.7	4.6	10	---	4.7	3.9	4.0	9.5	4.2	3.2	2.7
30	3.7	4.5	4.5	11	---	4.7	4.0	3.4	9.0	4.2	3.2	2.7
31	3.9	---	4.5	12	---	4.6	---	4.0	---	4.2	3.2	---
TOTAL	112.4	171.8	220.6	288.7	315.1	207.3	151.1	126.8	194.8	175.9	111.9	81.5
MEAN	3.63	5.73	7.12	9.31	11.3	6.69	5.04	4.09	6.49	5.67	3.61	2.72
MAX	5.2	11	11	17	17	13	9.5	4.4	10	10	4.4	3.2
MIN	3.2	3.9	4.4	4.2	5.0	4.6	3.8	3.4	3.4	4.2	3.2	2.1
AC-FT	223	341	438	573	625	411	300	252	386	349	222	162

CAL YR 1978 TOTAL 3154.39 MEAN 8.64 MAX 24 MIN .12 AC-FT 6260
WTR YR 1979 TOTAL 2157.9 MEAN 5.91 MAX 17 MIN 2.1 AC-FT 4280

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	3.5	5.0	3.9	.14	.22	.22	.07	.16	.16	.02	5.8
2	2.4	3.5	4.7	3.9	.14	.22	.22	.04	.16	.16	.02	5.4
3	2.5	3.5	4.6	3.9	.14	.22	.22	.04	.16	.16	.02	4.7
4	3.0	3.5	4.5	3.7	.14	.25	.22	.11	.21	.16	.02	4.6
5	3.0	3.5	4.5	3.7	.14	.25	.18	.11	.21	.16	.02	7.2
6	3.0	3.4	4.4	3.7	.14	5.0	.18	.14	.16	.16	.03	7.7
7	5.2	3.4	4.4	3.7	.11	11	.18	.14	.16	.16	.03	6.8
8	5.0	3.4	4.6	3.7	.07	11	.18	.14	.16	.16	.03	5.9
9	4.4	3.4	4.8	3.7	.04	10	.18	.14	.16	.16	.03	5.6
10	7.2	3.4	4.6	3.7	.04	9.0	.18	.14	.16	.16	.03	5.2
11	5.8	3.4	4.5	3.7	.07	6.2	.14	.07	.21	.21	.02	4.8
12	4.2	3.4	4.4	3.7	.07	.85	.18	.11	.21	.21	.02	4.7
13	3.6	3.4	4.4	3.6	.07	.07	.18	.14	.21	.21	.00	4.6
14	3.5	2.9	4.4	3.5	.04	.07	.18	.14	.21	.21	.00	4.7
15	3.4	3.2	4.3	3.5	.04	.04	.18	.14	.21	.21	.00	4.6
16	3.4	4.7	4.3	3.2	.04	.07	.25	.11	.21	.21	.00	4.7
17	3.5	12	4.3	2.8	.04	.18	.07	.11	.21	.21	.00	4.7
18	3.9	15	4.3	2.7	.04	.75	.07	.11	.21	.21	.00	4.8
19	3.9	15	4.2	2.5	.03	.18	.07	.11	.21	.21	1.8	4.8
20	4.0	13	4.2	2.4	.02	.18	.07	.07	.21	.21	4.5	4.8
21	4.0	11	4.0	2.3	.02	.18	.07	.04	.21	.16	4.3	9.3
22	4.0	9.3	4.0	2.2	.02	.18	.04	.11	.16	.07	4.4	12
23	3.9	9.1	3.9	2.1	.02	.22	.04	.07	.16	.04	4.4	11
24	4.0	8.5	3.9	2.0	.02	.41	.11	.07	.16	.04	4.2	10
25	3.9	8.7	3.9	2.0	.02	.33	.11	.07	.16	.04	4.0	9.9
26	3.9	9.5	3.9	1.8	.02	.25	.11	.07	.16	.03	3.9	9.3
27	3.6	7.7	3.9	1.7	.02	.33	.11	.07	.16	.03	3.7	8.9
28	3.6	6.4	3.9	1.6	.02	.33	.11	.11	.16	.03	3.5	8.5
29	3.6	5.6	3.9	.65	.11	.25	.11	.11	.16	.03	3.7	7.7
30	3.6	5.2	3.9	.14	---	.25	.07	.11	.16	.03	4.5	7.5
31	3.5	---	3.9	.14	---	.22	---	.11	---	.03	5.8	---
TOTAL	118.9	191.5	132.5	85.83	1.83	58.70	4.23	3.12	5.45	4.23	52.99	200.2
MEAN	3.84	6.38	4.27	2.77	.063	1.89	.14	.10	.18	.14	1.71	6.67
MAX	7.2	15	5.0	3.9	.14	11	.25	.14	.21	.21	5.8	12
MIN	2.4	2.9	3.9	.14	.02	.04	.04	.04	.16	.03	.00	4.6
AC-FT	236	380	263	170	3.6	116	8.4	6.2	11	8.4	105	397

CAL YR 1979 TOTAL 2096.0 MEAN 5.74 MAX 17 MIN 2.1 AC-FT 4160
WTR YR 1980 TOTAL 859.48 MEAN 2.35 MAX 15 MIN .00 AC-FT 1700

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	6.8	6.0	.33	.25	6.2	4.0	3.5	2.7	.41	.14	.18
2	7.2	6.4	5.9	.25	.25	5.8	8.0	3.5	2.7	.41	.14	.18
3	7.0	6.2	5.8	.33	.25	5.4	7.0	3.5	2.5	.41	.85	.14
4	7.0	6.2	5.4	.41	.25	5.6	6.5	3.5	2.5	.41	3.5	.14
5	7.0	6.0	5.3	.48	.14	5.6	6.0	3.5	.85	.41	9.1	.14
6	7.0	5.8	5.0	.41	.07	5.4	6.0	3.5	.22	.33	7.5	.14
7	6.4	5.3	4.8	.41	.07	5.4	5.0	3.5	.22	.33	4.5	.14
8	6.6	4.8	4.6	.33	.07	5.3	5.0	3.5	.18	.25	3.9	.11
9	7.0	4.8	4.4	.33	.22	5.3	4.5	3.5	.18	.33	2.5	.11
10	7.0	5.8	4.2	.33	.22	5.2	4.5	3.5	.18	.33	1.6	.14
11	7.2	7.2	2.3	.33	.14	5.2	4.0	3.5	.18	.33	1.5	.14
12	8.1	8.9	.96	.33	.14	7.2	4.0	3.5	.18	.48	5.6	.14
13	9.3	8.9	.85	.65	.14	7.0	3.4	3.4	.14	.48	8.9	.18
14	8.7	7.5	.85	.41	.11	6.8	3.5	3.4	.14	.48	7.7	.22
15	7.9	7.2	.96	.25	.01	6.2	3.5	3.4	.14	.48	5.2	.22
16	7.5	6.6	.96	.22	.01	5.9	3.5	3.4	.14	.48	3.4	.25
17	8.3	7.2	.96	.18	.01	5.8	3.4	3.4	.11	.54	2.0	.41
18	9.3	8.9	.85	.14	.01	4.7	3.2	3.4	.11	.54	1.4	.41
19	9.1	9.7	.85	.11	.01	4.5	3.4	3.4	.07	.54	1.4	.48
20	8.7	9.3	.75	.07	.01	4.2	3.4	3.4	.07	.54	2.5	.48
21	8.7	8.3	.75	.04	.04	3.5	3.4	3.4	.07	.25	1.4	.54
22	8.1	7.7	.38	.04	.14	3.1	3.4	3.4	.14	.41	.48	.65
23	7.7	7.3	.04	.04	.41	2.7	3.4	3.2	.33	.33	.25	.75
24	7.5	7.2	.01	.04	2.2	2.5	3.4	3.2	.33	.22	.65	.85
25	7.2	7.0	.01	.04	5.2	2.5	3.4	3.2	.41	.18	.25	.85
26	7.0	6.8	.01	.04	5.9	2.5	3.4	3.2	.33	.18	.25	.85
27	6.8	6.8	.14	.04	5.9	2.8	3.4	3.2	.33	.14	.22	5.8
28	6.8	6.6	.14	.04	5.9	3.4	3.5	3.1	.33	.14	.25	14
29	7.0	6.4	.14	.14	---	2.8	3.5	3.0	.41	.22	.25	13
30	7.0	6.2	.22	.22	---	3.4	3.5	3.0	.33	.18	.22	10
31	6.8	---	.33	.25	---	3.4	---	2.8	---	.18	1.7	---
TOTAL	234.1	209.8	63.86	7.23	28.07	145.3	126.1	103.9	16.52	10.94	79.25	51.64
MEAN	7.55	6.99	2.06	.23	1.00	4.69	4.20	3.35	.55	.35	2.56	1.72
MAX	9.3	9.7	6.0	.65	5.9	7.2	8.0	3.5	2.7	.54	9.1	14
MIN	6.4	4.8	.01	.04	.01	2.5	3.2	2.8	.07	.14	.14	.11
AC-FT	464	416	127	14	56	288	250	206	33	22	157	102

CAL YR 1980 TOTAL 924.34 MEAN 2.53 MAX 12 MIN .00 AC-FT 1830
WTR YR 1981 TOTAL 1076.71 MEAN 2.95 MAX 14 MIN .01 AC-FT 2140

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	.85	14	13	7.9	.54	14	14	2.2	.48	9.9	18
2	9.3	.85	16	12	7.0	.54	14	14	1.5	2.7	13	18
3	10	.96	15	11	6.0	.54	13	14	1.1	9.5	13	16
4	9.5	9.1	14	10	5.8	.48	12	12	1.1	10	11	15
5	8.9	8.3	12	9.5	4.6	.41	10	10	.96	10	8.9	14
6	8.1	5.8	11	9.0	4.8	.41	9.9	8.5	.96	11	8.3	13
7	7.5	4.4	10	8.0	4.6	.41	9.1	7.2	1.2	11	7.7	12
8	6.8	5.6	9.7	7.0	4.0	.41	8.5	7.2	1.1	9.7	7.0	11
9	5.9	6.6	9.7	6.5	3.4	.48	7.7	10	.96	8.7	6.4	9.7
10	5.0	5.3	8.9	6.0	2.8	.48	6.8	13	1.2	8.5	9.7	9.7
11	4.2	4.0	8.1	5.0	2.2	.48	6.0	13	2.1	8.9	15	12
12	3.9	2.8	7.2	4.5	1.4	.54	5.3	14	1.6	7.7	14	11
13	4.5	1.8	6.4	4.0	.85	7.7	4.8	13	.85	7.0	12	10
14	4.4	1.1	5.6	3.4	.54	13	4.7	12	.65	6.8	9.7	8.1
15	3.4	.85	5.0	2.8	.48	12	4.5	11	.65	7.2	8.7	10
16	2.4	.85	4.5	2.8	.48	9.9	4.6	9.5	.54	7.5	8.3	12
17	1.7	.75	3.9	2.2	.48	11	7.2	8.3	1.1	8.3	7.9	12
18	1.1	.75	3.2	1.6	.48	14	8.7	11	5.9	7.5	7.7	12
19	.85	.85	2.2	1.1	.48	14	8.9	10	5.9	5.9	7.5	10
20	.85	.75	1.5	1.1	.48	12	8.5	9.5	5.2	4.5	7.7	7.2
21	.85	.75	1.2	.96	.54	11	7.7	8.7	5.8	4.2	7.7	5.4
22	.85	.75	.85	7.7	.54	12	7.5	8.7	5.6	4.3	7.5	3.5
23	.85	.85	.85	8.9	.54	12	6.6	7.9	4.5	4.4	7.7	3.4
24	.85	5.8	1.1	7.3	.54	14	5.8	7.7	3.9	4.0	8.7	3.2
25	.85	12	9.7	7.7	.54	16	5.0	5.4	3.0	3.9	8.7	2.0
26	.85	11	18	13	.54	14	4.5	4.7	2.0	3.9	10	3.6
27	.85	10	17	16	.54	12	4.5	4.5	.96	5.3	13	4.7
28	.85	11	16	16	.48	11	6.4	4.2	.48	7.0	15	5.0
29	2.2	12	15	12	---	11	12	3.6	.65	6.4	16	4.8
30	2.5	12	14	9.7	---	12	14	2.8	.65	6.2	16	4.7
31	1.4	---	14	8.7	---	13	---	2.7	---	6.2	17	---
TOTAL	120.90	138.41	275.60	228.46	63.03	237.32	242.2	282.1	64.31	208.68	320.7	281.0
MEAN	3.90	4.61	8.89	7.37	2.25	7.66	8.07	9.10	2.14	6.73	10.3	9.37
MAX	10	12	18	16	7.9	16	14	14	5.9	11	17	18
MIN	.85	.75	.85	.96	.48	.41	4.5	2.7	.48	.48	6.4	2.0
AC-FT	240	275	547	453	125	471	480	560	128	414	636	557

CAL YR 1981 TOTAL 1103.86 MEAN 3.02 MAX 18 MIN .01 AC-FT 2190
WTR YR 1982 TOTAL 2462.71 MEAN 6.75 MAX 18 MIN .41 AC-FT 4880

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	8.6	4.9	3.0	.04	.04	3.5	5.8	4.6	.84	.15	1.0
2	4.2	8.6	4.6	2.5	.04	.03	3.5	5.6	4.2	.44	1.0	.15
3	4.6	7.9	4.1	2.0	.04	.03	5.8	4.9	3.8	.36	.52	.15
4	4.9	6.5	3.8	1.3	.04	.03	7.0	4.2	3.5	.15	2.4	3.4
5	6.1	5.2	3.4	.68	.04	.03	6.7	3.5	3.4	.10	4.0	5.1
6	7.2	4.6	3.0	.44	.03	.03	8.3	3.0	3.1	.10	3.0	4.4
7	6.3	5.4	2.1	.92	.03	.04	8.3	2.2	3.0	.10	2.5	2.7
8	5.6	7.2	1.7	.52	.03	.05	7.6	1.3	5.1	.10	6.3	1.7
9	4.4	5.6	4.7	.07	.03	3.8	8.1	.60	4.6	.10	7.4	.84
10	3.8	4.2	7.4	.15	.03	7.2	7.2	1.1	3.8	.10	6.3	1.5
11	4.4	3.8	7.2	.07	.03	7.4	6.1	.84	3.0	.10	5.2	2.7
12	8.1	3.4	6.0	.04	.03	7.2	5.8	.44	2.0	.92	4.2	1.6
13	8.1	3.8	6.5	.04	.03	8.8	5.4	.20	1.3	.36	3.1	1.0
14	7.2	6.5	8.6	.15	.05	8.1	4.7	.92	1.5	1.5	2.6	.44
15	6.7	11	8.3	.20	.04	9.7	4.1	3.5	3.8	1.7	1.6	.36
16	7.2	10	6.7	.20	.04	9.1	3.6	3.4	4.2	2.1	.92	.20
17	7.4	8.3	6.1	.20	.04	8.6	3.4	2.8	3.1	1.0	.60	.15
18	8.1	10	5.8	.28	.04	8.3	3.2	1.8	1.7	.52	2.0	.10
19	9.4	10	6.0	.07	.04	8.1	3.2	.84	.60	.44	2.7	.07
20	9.7	7.9	6.1	.05	.07	7.4	3.1	.10	.44	.52	1.5	.15
21	8.3	8.3	6.0	.05	2.5	6.1	3.1	.04	.36	.28	.84	.20
22	7.4	9.1	7.2	.05	3.1	4.7	1.7	.05	.20	.10	.52	1.1
23	6.1	7.6	7.6	.04	2.4	4.4	.36	.07	.10	.07	.28	5.2
24	5.4	6.7	6.1	.04	1.0	4.2	2.0	.05	.10	.05	.20	3.6
25	5.2	6.0	5.4	.04	.60	3.8	3.4	.07	.28	.04	.36	1.6
26	5.2	7.0	4.9	.04	.36	3.4	4.6	.05	4.6	.07	.36	.68
27	4.4	7.4	4.6	.04	.15	3.2	5.2	1.6	5.1	.07	1.0	.20
28	3.6	6.7	4.2	.04	.05	3.6	5.1	3.1	3.8	.07	3.5	.07
29	3.5	6.1	3.8	.04	---	4.0	5.1	4.0	3.0	.07	4.4	.07
30	5.2	5.4	3.5	.04	---	4.0	5.8	5.1	1.8	.10	4.0	.20
31	8.3	---	3.1	.04	---	3.6	---	4.9	---	.05	2.7	---
TOTAL	190.0	208.8	163.4	13.34	10.92	138.98	144.96	66.07	80.08	12.52	76.15	40.63
MEAN	6.13	6.96	5.27	.43	.39	4.48	4.83	2.13	2.67	.40	2.46	1.35
MAX	9.7	11	8.6	3.0	3.1	9.7	8.3	5.8	5.1	2.1	7.4	5.2
MIN	3.5	3.4	1.7	.04	.03	.03	.36	.04	.10	.04	.15	.07
AC-FT	377	414	324	26	22	276	288	131	159	25	151	81

CAL YR 1990 TOTAL 1239.52 MEAN 3.40 MAX 11 MIN .04 AC-FT 2460
WTR YR 1991 TOTAL 1145.85 MEAN 3.14 MAX 11 MIN .03 AC-FT 2270

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", 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. Prior to November 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi^2, of which 81 mi^2 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, from topographic map. Prior to November 16, 1977, at opposite site on left bank at same datum.

REMARKS.--Water year 1991: Records poor. 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 till 1967.

AVERAGE DISCHARGE.--Water year 1991: 60 years (water years 1929-39, 1942-47, 1949-91), 291 ft^3/s (210,500 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; minimum, 0.15 ft^3/s, January 20, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,800 ft^3/s, November 20, gage height, 18.32 ft; minimum discharge, 10 ft^3/s, February 9, 10.

REVISIONS.--The maximum annual discharge for water years 1982 and 1987 have been revised. Maximum annual gage-height for water years 1983 and 1984, and all secondary peaks for water years 1980-90 have been deleted. Revised daily discharges, in cubic feet per second, for water years 1982 and 1990, and for periods in water years 1978-81 and 1985-89, are given below. These figures supersede those published in the annual reports for water years 1978-90. All daily discharges have been downgraded to fair for water years 1968-79 and to poor for water years 1980-90. All annual minimums have also been downgraded to poor.

Maximum for Water Years 1982, 1983, 1984, 1987:

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1982	July 16, 1982	35,000	22.12	1984	Jan. 24, 1984	1,200	Unknown
1983	Aug. 12, 1983	1,900	Unknown	1987	Nov. 13, 1986	12,000	Unknown

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
DAILY MEAN VALUES

Jan. 26.....	45	Feb. 5.....	5.8	Apr. 18.....	e500	Aug. 30.....	e400
Jan. 27.....	49	Feb. 6.....	6.0	May 21.....	e200	Aug. 31.....	e150
Jan. 28.....	29	Feb. 7.....	5.8	May 22.....	e150	Sep. 1.....	e175
Jan. 29.....	24	Feb. 8.....	5.4	May 23.....	e1200	Sep. 2.....	e150
Jan. 30.....	20	Feb. 9.....	5.1	June 23.....	e1910	Sep. 3.....	e125
Jan. 31.....	14	Apr. 7.....	1410	July 6.....	e4100	Sep. 4.....	e120
Feb. 1.....	8.9	Apr. 14.....	e500	Aug. 26.....	e250	Sep. 5.....	e110
Feb. 2.....	8.2	Apr. 15.....	e150	Aug. 27.....	e225	Sep. 6.....	e90
Feb. 3.....	7.2	Apr. 16.....	e300	Aug. 28.....	e200	Sep. 7.....	e80
Feb. 4.....	6.0	Apr. 17.....	e820	Aug. 29.....	e200	Sep. 8.....	e100

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
TOTAL	4843	3225	328.3	555.5	244.5	3679.9	7309	5993	7804	14810	10045	2863
MEAN	156	107	10.6	17.9	8.73	119	244	193	260	478	324	95.4
MAX	619	351	42	140	27	632	1410	1200	1910	4100	1040	264
MIN	25	16	3.9	1.8	3.6	2.2	57	20	37	115	119	20
AC-FT	9610	6400	651	1100	485	7300	14500	11890	15480	29380	19920	5680

CAL YR 1977 TOTAL 106988.4 MEAN 293 MAX 5400 MIN 2.0 AC-FT 212200
WTR YR 1978 TOTAL 61700.2 MEAN 169 MAX 4100 MIN 1.8 AC-FT 122400

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
DAILY MEAN VALUES

May 21	67	June 9	23	June 27	526	July 15	86
May 22	58	June 10	21	June 28	332	July 16	72
May 23	55	June 11	95	June 29	273	July 17	64
May 24	55	June 12	411	June 30	194	July 18	56
May 25	48	June 13	549	July 1	145	July 19	53
May 26	50	June 14	264	July 2	115	July 20	45
May 27	46	June 15	157	July 3	167	July 21	38
May 28	42	June 16	181	July 4	187	July 22	38
May 29	31	June 17	222	July 5	256	July 23	75
May 30	27	June 18	140	July 6	214	July 24	57
May 31	107	June 19	200	July 7	586	July 25	44
June 1	234	June 20	132	July 8	505	July 26	52
June 2	182	June 21	137	July 9	327	July 27	56
June 3	64	June 22	440	July 10	200	July 28	41
June 4	47	June 23	832	July 11	151	July 29	36
June 5	37	June 24	642	July 12	118	July 30	33
June 6	31	June 25	405	July 13	97	July 31	35
June 7	27	June 26	1200	July 14	86	Aug. 1	32
June 8	24						

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
May 1979	2514	81.1	212	27	4990
June 1979	8022	267	1200	21	15910
July 1979	4035	130	586	33	8000
Aug. 1979	1434	46.3	230	13	2840
CAL YR 1978	81512.9	223	4100	1.8	161700
WTR YR 1979	125550.4	344	7210	5.8	249000

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
DAILY MEAN VALUES

Oct. 6	1090	Dec. 2	e45	July 24	80	Aug. 12	36
Oct. 7	290	Dec. 3	e50	July 25	68	Aug. 13	32
Oct. 8	134	Dec. 4	e45	July 26	61	Aug. 14	28
Oct. 9	441	Dec. 5	e40	July 27	69	Aug. 15	26
Oct. 10	242	Dec. 6	e32	July 28	80	Aug. 16	24
Oct. 11	128	Dec. 7	e45	July 29	62	Aug. 17	29
Nov. 18	e8000	July 10	158	July 30	90	Aug. 18	26
Nov. 19	e1300	July 11	172	July 31	69	Aug. 19	27
Nov. 20	e500	July 12	205	Aug. 1	58	Aug. 20	20
Nov. 21	e600	July 13	147	Aug. 2	74	Aug. 21	37
Nov. 22	e550	July 14	137	Aug. 3	58	Sep. 11	e106
Nov. 23	e320	July 15	146	Aug. 4	70	Sep. 12	e97
Nov. 24	e200	July 16	111	Aug. 5	83	Sep. 13	e130
Nov. 25	e100	July 17	118	Aug. 6	168	Sep. 14	e150
Nov. 26	e84	July 18	339	Aug. 7	84	Sep. 15	e160
Nov. 27	e70	July 19	150	Aug. 8	67	Sep. 16	e170
Nov. 28	e58	July 20	111	Aug. 9	59	Sep. 17	e120
Nov. 29	e49	July 21	108	Aug. 10	54	Sep. 18	e110
Nov. 30	e48	July 22	113	Aug. 11	42	Sep. 19	e106
Dec. 1	e47	July 23	109				

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
TOTAL	4207.7	27238	1462	252.8	48.78	61143	15152	6871	8536	4472	2213	8095
MEAN	136	908	47.2	8.15	1.68	1972	505	222	285	144	71.4	270
MAX	1090	10600	264	23	4.5	8500	2500	555	963	713	470	1920
MIN	8.7	11	20	2.2	.35	12	100	111	60	61	15	64
AC-FT	8350	54030	2900	501	97	121300	30050	13630	16930	8870	4390	16060

CAL YR 1979 TOTAL 130249.1 MEAN 357 MAX 10600 MIN 5.8 AC-FT 258300
WTR YR 1980 TOTAL 139691.28 MEAN 382 MAX 10600 MIN .35 AC-FT 277100

e Estimated

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
DAILY MEAN VALUES

June 23.....	e3.0	July 15.....	e.47	Aug. 6.....	e340	Sep. 10.....	e10
June 24.....	e2.7	July 16.....	e.43	Aug. 7.....	e230	Sep. 11.....	e10
June 25.....	e2.4	July 17.....	e.42	Aug. 8.....	e170	Sep. 12.....	e15
June 26.....	e2.4	July 18.....	e1.6	Aug. 9.....	e148	Sep. 13.....	e14
June 27.....	e2.6	July 19.....	e4.7	Aug. 10.....	e125	Sep. 14.....	e12
June 28.....	e3.5	July 20.....	e9.0	Aug. 11.....	e320	Sep. 15.....	e10
June 29.....	e3.2	July 21.....	e8.8	Aug. 12.....	e462	Sep. 16.....	e9.0
June 30.....	e3.0	July 22.....	e4.0	Aug. 13.....	e252	Sep. 17.....	e9.0
July 1.....	e2.4	July 23.....	e1.5	Aug. 14.....	e187	Sep. 18.....	e110
July 2.....	e2.5	July 24.....	e8.3	Aug. 15.....	e146	Sep. 19.....	e50
July 3.....	e2.8	July 25.....	e4.5	Aug. 16.....	e109	Sep. 20.....	e13
July 4.....	e2.6	July 26.....	e3.0	Aug. 17.....	e92	Sep. 21.....	e15
July 5.....	e2.3	July 27.....	e1.6	Aug. 18.....	e95	Sep. 22.....	e12
July 6.....	e2.0	July 28.....	e2.7	Aug. 19.....	e97	Sep. 23.....	e9.0
July 7.....	e1.7	July 29.....	e4.0	Aug. 20.....	e92	Sep. 24.....	e8.0
July 8.....	e1.5	July 30.....	e1.7	Sep. 3.....	e66	Sep. 25.....	e7.0
July 9.....	e1.0	July 31.....	e3.0	Sep. 4.....	e60	Sep. 26.....	e45
July 10.....	e1.1	Aug. 1.....	e1.7	Sep. 5.....	e20	Sep. 27.....	e2500
July 11.....	e1.0	Aug. 2.....	e1.6	Sep. 6.....	e15	Sep. 28.....	e1800
July 12.....	e2.7	Aug. 3.....	e1.6	Sep. 7.....	e12	Sep. 29.....	e500
July 13.....	e2.0	Aug. 4.....	e8000	Sep. 8.....	e12	Sep. 30.....	e250
July 14.....	e1.2	Aug. 5.....	e900	Sep. 9.....	e10		

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
June 1981	164.4	5.48	30	2.4	326
July 1981	86.52	2.79	9.0	.42	172
Aug. 1981	12168.9	393	8000	1.6	24140
Sep. 1981	5632.0	188	2500	7.0	11170
CAL YR 1980	117424.18	321	8500	.35	232900
WTR YR 1981	37420.65	103	8000	.24	74220

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	54	e1600	e100	e200	e30	e2310	e350	68	54	e7050	1560
2	392	41	e2100	e90	e150	e15	e1180	e325	69	908	e1720	1080
3	273	459	e1000	e80	e100	e10	e700	e300	79	731	e950	671
4	221	468	e700	e70	e90	e8.0	e450	e200	95	1060	e600	458
5	217	253	e400	e60	e80	e5.0	311	e150	64	743	e450	339
6	147	104	e300	e45	e70	5.4	234	e125	99	641	e300	269
7	157	142	e200	e40	e65	4.7	189	e100	70	396	e200	221
8	114	196	e450	e35	e50	4.3	156	202	67	290	e150	191
9	102	155	e250	e30	e35	4.9	126	323	79	361	e200	155
10	79	104	e150	e30	e30	25	104	334	111	927	e8470	468
11	71	78	e125	e25	e30	90	87	338	94	613	e1790	221
12	83	65	e100	e25	e25	69	76	455	65	453	e1180	189
13	98	60	e80	24	e20	e2710	68	264	67	426	e700	164
14	66	47	e70	21	e25	e1070	64	229	69	962	e500	417
15	60	40	e60	19	e20	e1130	61	171	55	551	e400	739
16	50	35	e50	18	e25	e1340	e59	140	46	e5140	e300	314
17	41	31	e40	18	e20	e2710	e880	244	737	e5920	327	233
18	35	30	e30	62	e18	e1770	e500	303	540	e1200	412	207
19	31	28	e25	55	e16	506	e250	383	339	823	265	177
20	28	24	e20	26	e15	371	e150	241	213	508	237	148
21	25	21	e20	e950	e15	439	e200	240	148	e700	329	128
22	24	20	e30	e1060	e12	536	e150	230	111	e1070	317	106
23	21	100	e35	e282	e10	e4420	e100	193	86	e600	1330	135
24	20	e2300	e90	e221	e10	e2310	e80	144	71	e500	1610	107
25	20	e1000	e11700	e338	e12	e1080	e75	117	61	e400	1520	e150
26	19	e400	e3900	e6610	e12	525	e90	118	53	e250	1490	e450
27	15	e1050	e1000	e5040	e20	e450	e80	116	46	e200	924	e350
28	124	e1500	e500	e1580	e25	e870	e300	101	63	e175	1390	e325
29	235	e700	e300	e800	---	e960	e600	83	77	e150	1040	e250
30	85	e2000	e200	e400	---	e1320	e450	79	59	e125	1080	e225
31	79	---	e150	e300	---	e4670	---	75	---	e250	1840	---
TOTAL	3137	11505	25675	18454	1200	29458.3	10080	6673	3801	27127	39071	10447
MEAN	101	383	828	595	42.9	950	336	215	127	875	1260	348
MAX	392	2300	11700	6610	200	4670	2310	455	737	5920	8470	1560
MIN	15	20	20	18	10	4.3	59	75	46	54	150	106
AC-FT	6220	22820	50930	36600	2380	58430	19990	13240	7540	53810	77500	20720

CAL YR 1981 TOTAL 67097.05 MEAN 184 MAX 11700 MIN .24 AC-FT 133100
WTR YR 1982 TOTAL 186628.3 MEAN 511 MAX 11700 MIN 4.3 AC-FT 370200

e Estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MEAN VALUES

Nov. 19	e3040	Feb. 28	e6000	Mar. 7	e2500	Mar. 23	e3100
Nov. 20	e3520	Mar. 1	e12500	Mar. 8	e1900	Aug. 8	e4500
Dec. 9	e5340	Mar. 6	e6500	Mar. 22	e1800		

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Nov. 1984	13990.86	466	3520	.86	27750
Dec. 1984	16414	529	5340	62	32560
Feb. 1985	8973.24	320	6000	.97	17800
Mar. 1985	48191	1555	12500	257	95590
Aug. 1985	10144	327	4500	45	20120
CAL YR 1984	57158.14	156	5340	.85	113400
WTR YR 1985	129080.28	354	12500	.86	256000

e Estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
DAILY MEAN VALUES

Apr. 3	e4260	Aug. 25	e60	Sep. 8	e90	Sep. 20	e150
Apr. 4	e2740	Aug. 26	e50	Sep. 9	e60	Sep. 21	e110
Apr. 5	e1710	Aug. 27	e40	Sep. 10	e30	Sep. 22	e75
Apr. 6	e2160	Aug. 28	e35	Sep. 11	e19	Sep. 23	e40
Apr. 7	e1250	Aug. 29	e100	Sep. 12	e17	Sep. 24	e35
Apr. 8	e3710	Aug. 30	e175	Sep. 13	e18	Sep. 25	e70
Apr. 9	e6570	Aug. 31	e90	Sep. 14	e35	Sep. 26	e200
Apr. 10	e20300	Sep. 3	e28	Sep. 15	e25	Sep. 27	e1300
Apr. 11	e11800	Sep. 4	e22	Sep. 16	e20	Sep. 28	e400
Apr. 12	e2460	Sep. 5	e18	Sep. 17	e17	Sep. 29	e600
Aug. 23	e90	Sep. 6	e20	Sep. 18	e14	Sep. 30	e350
Aug. 24	e75	Sep. 7	e23	Sep. 19	e15		

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Apr. 1986	67864	2262	20300	131	134600
Aug. 1986	5312	171	887	35	10540
Sep. 1986	3926	131	1300	14	7790
CAL YR 1985	106974.84	293	12500	.97	212200
WTR YR 1986	117524.06	322	20300	.53	233100

e Estimated

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
DAILY MEAN VALUES

Nov. 9	e600	Nov. 25	e400	Dec. 11	e40	Dec. 26	e35
Nov. 10	e1660	Nov. 26	e350	Dec. 12	e100	Dec. 27	e25
Nov. 11	e1810	Nov. 27	e200	Dec. 13	e70	Dec. 28	e10
Nov. 12	e4450	Nov. 28	e180	Dec. 14	e40	Dec. 29	e20
Nov. 13	e5880	Nov. 29	e350	Dec. 15	e25	Dec. 30	e25
Nov. 14	e2200	Nov. 30	e200	Dec. 16	e15	Dec. 31	e30
Nov. 15	e1090	Dec. 1	e175	Dec. 17	e25	Jan. 1	e70
Nov. 16	e800	Dec. 2	e150	Dec. 18	e20	Jan. 2	e60
Nov. 17	e700	Dec. 3	e160	Dec. 19	e15	Jan. 3	e50
Nov. 18	e450	Dec. 4	e130	Dec. 20	e20	Jan. 4	e30
Nov. 19	e840	Dec. 5	e119	Dec. 21	e25	Jan. 5	e35
Nov. 20	e3980	Dec. 6	e105	Dec. 22	e25	Jan. 6	e30
Nov. 21	e1090	Dec. 7	e96	Dec. 23	e50	Jan. 12	e3150
Nov. 22	e1710	Dec. 8	e80	Dec. 24	e40	July 20	e1450
Nov. 23	e820	Dec. 9	e69	Dec. 25	e20	July 21	e1340
Nov. 24	e600	Dec. 10	e50				

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Nov. 1986	32958	1099	5880	105	65370
Dec. 1986	1809	58.4	175	10	3590
Jan. 1987	6535	211	3150	20	12960
July 1987	7746	250	1450	60	15360
CAL YR 1986	147991.96	405	20300	.53	293500
WTR YR 1987	75518.7	207	5880	2.2	149800

e Estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
DAILY MEAN VALUES

Oct. 1	e2560	Oct. 14	e35	Dec. 19	e700	Jan. 1	e60
Oct. 2	e1810	Nov. 20	e3000	Dec. 20	e300	Jan. 2	e100
Oct. 3	e880	Nov. 21	e9000	Dec. 21	e250	Jan. 3	e100
Oct. 4	e400	Nov. 22	e1960	Dec. 22	e200	Jan. 4	e70
Oct. 5	e200	Nov. 23	e900	Dec. 23	e150	Jan. 5	e60
Oct. 6	e150	Nov. 24	e650	Dec. 24	e140	Jan 6	e55
Oct. 7	e120	Dec. 12	e1500	Dec. 25	e110	Jan. 7	e50
Oct. 8	e110	Dec. 13	e9000	Dec. 26	e100	Jan. 8	e45
Oct. 9	e100	Dec. 14	e700	Dec. 27	e200	Jan. 9	e40
Oct. 10	e80	Dec. 15	e400	Dec. 28	e150	Jan. 10	e45
Oct. 11	e70	Dec. 16	e300	Dec. 29	e100	Jan. 11	e50
Oct. 12	e50	Dec. 17	e250	Dec. 30	e90	Jan. 12	e45
Oct. 13	e30	Dec. 18	e3000	Dec. 31	e80	Mar. 31	e1660

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Oct. 1987	8525	275	2560	21	16910
Nov. 1987	18878	629	9000	25	37440
Dec. 1987	19207	620	9000	76	38100
Jan. 1988	1729	55.8	139	36	3430
Mar. 1988	8196	264	1660	43	16260
CAL YR 1987	83269.7	228	9000	2.2	165200
WTR YR 1988	85660	234	9000	15	169900

e Estimated

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
DAILY MEAN VALUES

Oct. 14	e95	Jan. 8	e2000	Apr. 29	e2280	June 7	e1600
Nov. 4	e1100	Jan. 9	e1800	Apr. 30	e2980	July 6	e3000
Nov. 5	e900	Jan. 10	e8540	May 13	e3400	July 13	e1900
Nov. 11	e1500	Jan. 11	e1950	May 14	e2300	July 14	e2200
Nov. 23	e1550	Jan. 13	e5000	May 15	e1700	July 19	e1640
Dec. 26	e2000	Jan. 14	e4500	May 25	e3500	July 20	e4080
Dec. 30	e3100	Jan. 15	e4600	May 26	e1500	July 21	e1400
Dec. 31	e3400	Jan. 16	e2700	May 29	e1900	July 22	e9640
Jan. 1	e1600	Apr. 23	e1800	June 6	e2300	July 23	e1700
Jan. 7	e1480						

TOTAL	2025	12114	11926	45647	6360	3033	13257	26501	11108	35352	5249	3872
MEAN	65.3	404	385	1472	227	97.8	442	855	370	1140	169	129
MAX	400	1550	3400	8540	1060	518	2980	3500	2300	9640	809	340
MIN	21	46	30	157	42	24	62	143	64	53	56	53
AC-FT	4020	24030	23660	90540	12620	6020	26300	52560	22030	70120	10410	7680

CAL YR 1988 TOTAL 65115 MEAN 178 MAX 3400 MIN 15 AC-FT 129200
WTR YR 1989 TOTAL 176444 MEAN 483 MAX 9640 MIN 21 AC-FT 350000

e Estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	763	e130	12	328	e3410	667	27	19	e110	122	e200	245
2	600	e90	9.6	357	e6120	289	23	26	e95	150	e150	160
3	e700	e75	11	301	e5620	259	33	30	e80	115	e120	99
4	e825	e135	9.3	167	e2000	231	47	24	e75	91	e90	115
5	e725	e530	9.0	129	e1210	188	32	21	e90	77	e67	1140
6	e375	e250	9.2	86	e1450	533	30	24	e120	68	e59	970
7	e280	e175	15	61	e2160	e1870	33	23	e75	61	e59	350
8	e200	e120	41	48	682	e4400	38	105	e70	70	e80	244
9	e150	e110	34	65	458	e1360	27	61	e45	91	e55	278
10	e230	e260	22	61	344	e1250	24	43	50	125	e39	268
11	e140	e90	15	47	274	e1440	21	94	47	90	e35	251
12	e90	e60	10	121	226	654	36	54	41	177	e49	257
13	e70	e50	7.9	120	187	421	25	39	40	101	e336	355
14	e75	e35	6.8	122	154	303	23	51	46	110	111	306
15	e135	e25	5.6	92	132	238	28	98	111	109	164	230
16	e85	e20	5.3	98	110	194	25	50	219	91	140	204
17	e50	e25	5.1	70	98	159	21	42	880	77	173	766
18	e60	e20	4.8	65	86	131	16	66	467	265	117	e1760
19	e45	e20	4.6	e10600	76	111	14	192	302	562	152	e2850
20	e40	e25	4.5	e4500	65	93	17	e450	349	400	176	e3760
21	e85	e25	4.2	843	56	77	17	e1300	385	274	112	880
22	e50	e20	3.8	542	47	67	34	e850	274	212	94	515
23	e850	20	3.6	595	43	58	27	e500	210	e174	117	359
24	e350	18	3.5	442	124	51	84	e750	438	e219	345	341
25	e500	16	3.4	518	304	47	57	e900	448	e195	387	244
26	e350	14	3.2	432	167	41	41	e480	308	e146	191	204
27	e240	13	3.5	352	108	35	34	e450	412	e137	204	224
28	e230	12	43	378	224	32	30	e325	259	e142	194	179
29	e415	11	56	311	---	43	26	e230	191	e450	124	222
30	e245	13	17	421	---	34	22	e210	147	e340	100	335
31	e160	---	13	580	---	30	---	e170	---	e260	83	---
TOTAL	9113	2407	395.9	22852	25935	15306	912	7677	6384	5501	4323	18111
MEAN	294	80.2	12.8	737	926	494	30.4	248	213	177	139	604
MAX	850	530	56	10600	6120	4400	84	1300	880	562	387	3760
MIN	40	11	3.2	47	43	30	14	19	40	61	35	99
AC-FT	18080	4770	785	45330	51440	30360	1810	15230	12660	10910	8570	35920

CAL YR 1989 TOTAL 162294.9 MEAN 445 MAX 9640 MIN 3.2 AC-FT 321900
WTR YR 1990 TOTAL 118916.9 MEAN 326 MAX 10600 MIN 3.2 AC-FT 235900

e Estimated

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	298	602	198	e125	22	e35	e311	448	448	104	226	138
2	347	455	192	111	21	e32	e225	306	338	88	158	110
3	360	313	161	96	21	e29	e306	230	264	76	147	222
4	486	239	143	82	18	e26	236	185	210	67	511	1610
5	356	231	124	74	16	e24	508	156	186	59	267	305
6	308	236	114	67	16	e28	489	127	146	62	168	207
7	244	866	105	74	14	e28	315	113	431	108	489	159
8	191	334	122	71	12	e31	327	96	328	66	2140	152
9	157	237	e1970	63	11	e3960	399	110	230	55	1060	122
10	132	186	e1080	57	11	e1760	298	161	170	65	450	204
11	813	152	489	53	11	e1490	290	106	165	294	286	158
12	437	224	602	51	11	e6650	249	88	154	155	210	127
13	437	395	e2180	136	12	e11500	252	70	117	167	202	101
14	280	e2940	e1730	159	76	e9270	342	259	165	283	146	83
15	350	e2300	941	112	75	e6560	280	230	439	192	121	77
16	525	e1440	753	76	41	e4560	224	150	217	182	111	70
17	513	e2470	650	62	25	e4470	191	150	157	132	163	60
18	910	e17000	1170	55	26	e1880	165	116	134	112	364	54
19	e2310	e9490	900	52	24	e2900	175	115	112	103	170	61
20	650	e18000	e646	43	447	e1890	153	89	87	95	131	103
21	378	e3400	e839	40	356	e1210	130	77	76	78	107	72
22	288	e1720	e5490	36	151	e842	115	78	77	69	127	633
23	255	956	e799	e37	129	e690	111	76	65	61	142	345
24	262	639	e941	e35	82	e488	333	68	68	56	139	165
25	272	478	e486	e32	60	e360	310	73	228	50	163	112
26	197	564	e360	e28	e49	e291	906	120	472	53	169	85
27	172	448	e286	e26	e42	e445	744	229	241	46	315	70
28	140	332	e240	e34	e38	e422	527	209	178	41	613	60
29	149	274	e201	e37	---	e430	703	467	157	43	411	53
30	e1960	230	e164	e28	---	e271	848	624	121	263	266	49
31	457	---	e142	e24	---	e221	---	645	---	110	177	---
TOTAL	14634	67151	24218	1976	1817	62793	10462	5971	6181	3335	10149	5767
MEAN	472	2238	781	63.7	64.9	2026	349	193	206	108	327	192
MAX	2310	18000	5490	159	447	11500	906	645	472	294	2140	1610
MIN	132	152	105	24	11	24	111	68	65	41	107	49
AC-FT	29030	133200	48040	3920	3600	124500	20750	11840	12260	6610	20130	11440

CAL YR 1990 TOTAL 213004 MEAN 584 MAX 18000 MIN 14 AC-FT 422500
WTR YR 1991 TOTAL 214454 MEAN 588 MAX 18000 MIN 11 AC-FT 425400

e Estimated

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU

LOCATION.--Lat 19°46'00", long 155°09'16", 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.--Record 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.--30 years (water years 1912, 1968-96), 130 ft^3/s (94,420 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.

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)
Feb. 25	0930	11,200	16.14	Mar. 31	2130	5,780	12.81
Mar. 03	0100	*11,500	*16.28				

Minimum discharge, 7.0 ft^3/s, January 15-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	20	103	9.1	19	109	1470	26	19	45	31	12
2	41	32	46	8.9	17	1120	241	36	16	56	67	11
3	45	32	29	9.0	15	2450	83	25	16	48	52	13
4	34	43	23	9.0	13	160	55	21	13	74	30	17
5	26	29	25	8.4	12	76	41	19	14	225	26	12
6	21	22	41	8.1	11	52	34	18	13	478	30	12
7	20	20	24	7.9	10	38	28	16	12	88	26	61
8	37	81	19	11	9.7	31	24	15	12	47	24	89
9	216	50	16	14	9.4	26	23	14	24	34	19	31
10	153	719	15	9.5	9.3	22	24	14	17	96	17	24
11	185	301	14	8.6	8.8	20	23	13	14	154	16	37
12	110	91	13	8.3	8.3	21	20	13	12	230	16	100
13	54	51	12	8.1	8.1	22	18	13	10	110	343	89
14	51	37	12	7.6	7.9	24	17	12	9.6	260	96	45
15	67	29	19	7.2	8.7	24	69	12	9.1	66	54	84
16	44	25	85	7.1	22	36	96	11	9.5	68	39	69
17	33	22	41	7.6	21	38	80	11	32	112	46	41
18	33	20	29	15	15	55	42	15	173	65	41	80
19	55	18	20	97	12	74	277	35	482	64	30	76
20	144	16	16	48	15	37	362	23	101	130	23	36
21	59	15	15	275	164	28	230	16	42	97	20	26
22	59	14	13	81	483	23	111	13	31	136	18	21
23	48	14	12	150	1060	20	58	11	27	78	16	19
24	34	14	12	66	1580	18	40	11	76	48	15	26
25	30	32	11	335	3530	17	35	12	254	36	14	23
26	42	31	11	135	1170	19	29	19	52	134	13	21
27	38	20	11	53	618	18	30	26	42	99	12	16
28	29	93	11	37	155	20	33	16	33	46	11	14
29	25	35	9.9	30	279	32	33	22	28	34	10	13
30	22	101	9.3	25	---	42	36	20	38	36	10	12
31	21	---	9.1	24	---	1240	---	33	---	33	10	---
TOTAL	1841	2027	726.3	1520.4	9291.2	5912	3662	561	1631.2	3227	1175	1130
MEAN	59.4	67.6	23.4	49.0	320	191	122	18.1	54.4	104	37.9	37.7
MAX	216	719	103	335	3530	2450	1470	36	482	478	343	100
MIN	20	14	9.1	7.1	7.9	17	17	11	9.1	33	10	11
AC-FT	3650	4020	1440	3020	18430	11730	7260	1110	3240	6400	2330	2240

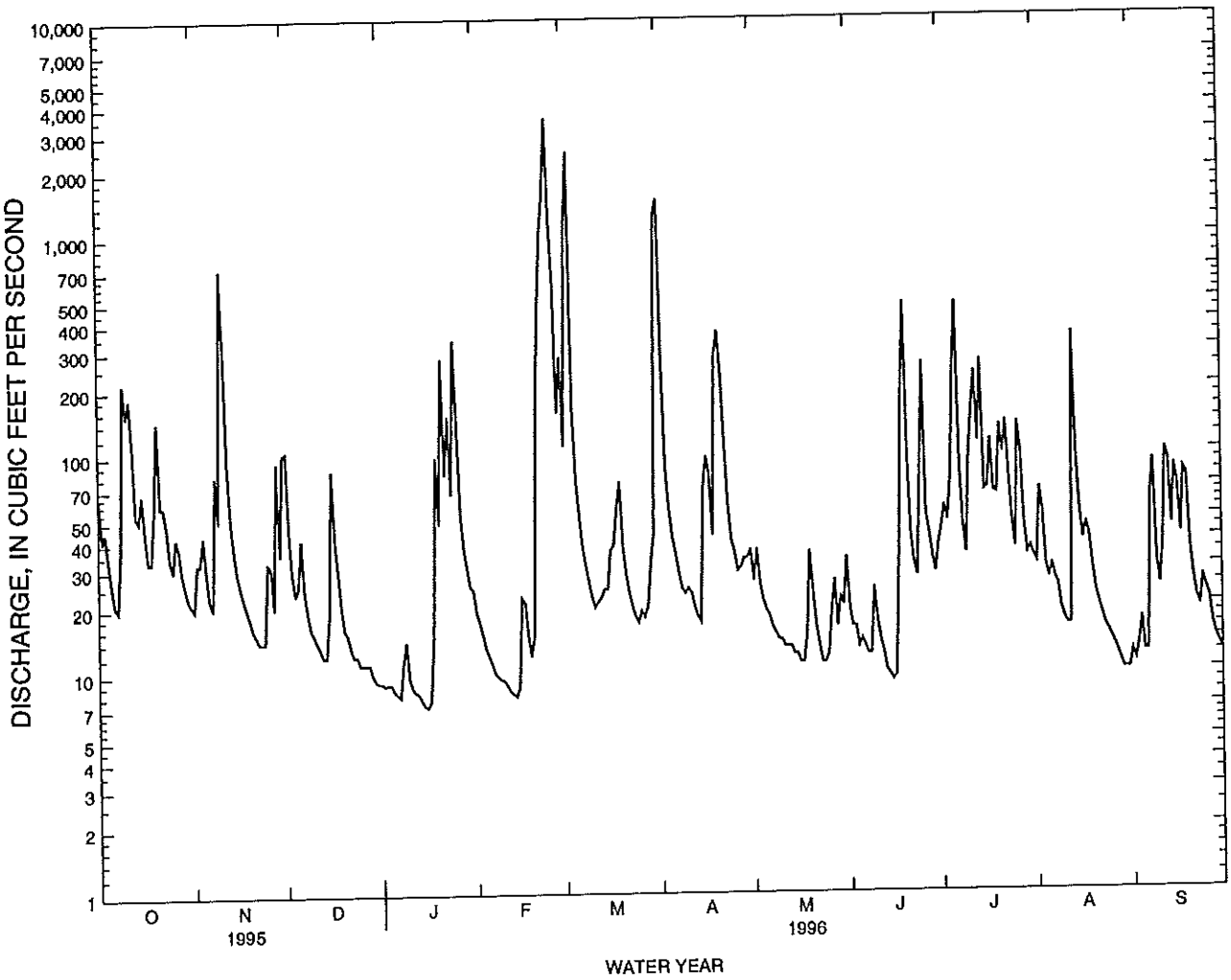
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1996, BY WATER YEAR (WY)

MEAN	80.3	198	156	134	115	214	194	94.6	69.2	118	120	84.0
MAX	222	783	625	648	752	1349	772	319	184	384	420	276
(WY)	1991	1995	1971	1975	1969	1980	1986	1989	1994	1989	1982	1994
MIN	9.70	18.7	10.5	5.64	4.80	6.71	12.5	11.4	8.61	9.66	13.9	8.81
(WY)	1985	1986	1984	1981	1980	1983	1992	1992	1981	1981	1973	1979

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1911 - 1996	
ANNUAL TOTAL	30679.1		32704.1			
ANNUAL MEAN	84.1		89.4		130	
HIGHEST ANNUAL MEAN					220	1991
LOWEST ANNUAL MEAN					53.1	1981
HIGHEST DAILY MEAN	2410	Jan 16	3530	Feb 25	5780	Jan 8 1975
LOWEST DAILY MEAN	7.3	Mar 19	7.1	Jan 16	.80	Jan 31 1912
ANNUAL SEVEN-DAY MINIMUM	7.4	Mar 15	7.8	Jan 11	1.0	Feb 22 1980
ANNUAL RUNOFF (AC-FT)	60850		64870		94420	
10 PERCENT EXCEEDS	181		138		267	
50 PERCENT EXCEEDS	30		26		42	
90 PERCENT EXCEEDS	10		11		11	



HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 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.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft above mean sea level, from topographic map.

REMARKS.--

Water year 1992: Records fair except for periods of estimated record which are poor. No diversions upstream.
Water year 1993: Records fair except for periods of estimated record which are poor. No diversions upstream.
Water year 1994: Records fair. No diversions upstream.
Water year 1995: Records fair. No diversions upstream.
Water year 1996: Records fair. No diversions upstream.

AVERAGE DISCHARGE.--

Water year 1992: 28 years (water years 1965-92), 14.8 ft^3/s (10,710 acre-ft/yr).
Water year 1993: 29 years (water years 1965-93), 14.8 ft^3/s (10,720 acre-ft/yr).
Water year 1994: 30 years (water years 1965-94), 15.0 ft^3/s (10,890 acre-ft/yr).
Water year 1995: 31 years (water years 1965-95), 15.0 ft^3/s (10,880 acre-ft/yr).
Water year 1996: 32 years (water years 1965-96), 14.9 ft^3/s (10,760 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.--Water year 1992: Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Sep. 14	0600	*815	*6.24	No other peak greater than base discharge.			

Minimum discharge, 0.12 ft^3/s, June 4.

Water year 1993: Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 06	2130	*649	*5.75	Sep. 23	2030	479	5.16

Minimum discharge, 0.22 ft^3/s, February 17-18.

Water year 1994: Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 26	0400	*782	*6.15	Mar. 25	0800	606	5.61
Feb. 10	1700	485	5.18				

Minimum discharge, 0.25 ft^3/s, March 10-11.

Water year 1995: Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 15	2030	*707	*5.93	No other peak greater than base discharge.			

Minimum discharge, 0.08 ft^3/s, February 28 to March 03.

Water year 1996: Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 24	2300	*789	*6.17	No other peak greater than base discharge.			

Minimum discharge, 0.11 ft^3/s, February 14, September 1-2.

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.65	.80	.60	e30	e7.0	e4.0	1.6	.85	e.16	e6.0	e4.5	e5.5
2	.56	.60	.58	e35	e2.0	e1.5	9.9	.58	e.15	e5.0	e10	74
3	.50	1.9	2.1	e8.0	e10	e1.0	8.6	.42	e.13	e5.0	e4.5	48
4	.44	1.5	16	e3.0	e20	e.85	3.9	.52	e.12	e35	e9.0	40
5	.42	2.3	4.6	e2.0	e50	e.70	2.0	46	.22	e15	e5.0	105
6	.40	1.5	18	e1.5	e52	e.60	1.3	e60	.36	e10	e5.0	41
7	3.1	1.9	7.0	e1.2	e15	e.50	1.1	e20	e.90	e6.0	e15	9.0
8	4.4	2.5	2.9	e1.0	e6.0	e.40	.80	e6.0	e6.0	e2.5	e5.0	4.8
9	1.6	3.7	1.8	e.90	e2.5	e.40	.62	e3.5	e35	e11	e3.5	3.8
10	.99	1.7	1.3	e.80	e1.5	e.30	1.1	e1.5	e25	e13	e2.5	2.4
11	.70	1.1	1.0	e.70	e1.3	e.25	3.6	e1.2	e8.0	e4.0	e20	1.7
12	.53	.85	.81	e.60	e2.5	e.25	4.3	e.80	e6.5	e4.5	e6.0	1.3
13	.43	.65	.65	e.60	e8.0	e.25	2.1	e.55	e6.0	e7.0	e4.0	31
14	.37	.54	.54	e.60	e3.0	e.40	1.2	e.45	e4.0	e9.0	e2.5	178
15	2.5	.45	.70	e70	e3.5	e4.5	.88	e.40	e11	e8.0	e20	7.3
16	2.0	.41	.64	e10	e2.0	e5.0	.68	e.30	e6.0	e30	e35	4.7
17	1.1	.61	2.8	e3.0	e1.0	e4.0	.55	e.25	e4.0	e35	e10	11
18	.81	.68	1.7	e1.5	e.60	e6.0	.50	e.20	e3.0	e10	e3.5	8.6
19	.63	20	2.5	e15	e.55	e15	.51	e.20	e8.0	e9.0	e10	6.3
20	.53	5.8	6.7	e8.0	e.50	e25	.77	e.18	e7.5	e70	e25	2.8
21	.49	2.6	8.2	e2.5	e.50	e8.0	.60	e.15	e3.5	e30	e50	1.8
22	1.0	25	3.5	e1.5	e.40	e2.5	.50	e.13	e3.5	e35	e10	1.3
23	.80	20	38	e.90	e.40	e1.5	.42	e.13	e9.0	e10	e35	15
24	.69	5.9	6.0	e.60	e.40	e2.5	.35	e.13	e20	e3.5	e33	7.9
25	1.8	5.9	e25	e.60	e.35	34	.30	e.16	e35	e20	e30	50
26	1.5	3.1	e130	e.50	e.30	19	.27	e.15	e50	e100	e30	110
27	1.0	1.8	e20	e.45	e.30	4.7	.27	e.14	e40	e80	e10	41
28	.78	1.2	e23	e.45	e.30	2.6	.38	e.25	e40	e10	e15	5.8
29	.59	.91	e25	e.40	e.50	5.5	.87	e.35	e10	e4.0	e30	2.7
30	.49	.71	e10	e4.0	---	5.7	1.2	e.25	e4.5	e5.0	e10	2.2
31	.53	---	e45	e35	---	2.4	---	e.20	---	e6.0	e7.0	---
TOTAL	32.33	116.61	406.62	240.30	192.40	159.30	51.17	145.94	347.54	598.5	460.0	823.9
MEAN	1.04	3.89	13.1	7.75	6.63	5.14	1.71	4.71	11.6	19.3	14.8	27.5
MAX	4.4	25	130	70	52	34	9.9	60	50	100	50	178
MIN	.37	.41	.54	.40	.30	.25	.27	.13	.12	2.5	2.5	1.3
AC-FT	64	231	807	477	382	316	101	289	689	1190	912	1630

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1992, BY WATER YEAR (WY)

MEAN	9.46	16.1	14.7	15.7	12.1	21.1	23.2	12.6	12.6	18.1	14.4	8.23
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	34.8	25.5	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1964	1986	1982	1982	1992
MIN	.17	1.77	.51	.34	.82	3.33	1.71	3.59	3.18	4.56	2.70	.26
(WY)	1985	1990	1981	1981	1983	1983	1992	1972	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1964 - 1992	
ANNUAL TOTAL	5435.59		3574.61			
ANNUAL MEAN	14.9		9.77		14.8	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	257	Aug 7	178	Sep 14	612	Nov 18 1979
LOWEST DAILY MEAN	.14	Feb 12	.12	Jun 4	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.19	Feb 6	.14	May 21	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	10780		7090		10710	
10 PERCENT EXCEEDS	36		30		40	
50 PERCENT EXCEEDS	4.3		2.5		4.5	
90 PERCENT EXCEEDS	.54		.39		.54	

e Estimated

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.2	6.6	74	1.1	.67	1.7	52	43	5.4	4.0	1.5
2	1.2	.83	17	8.9	.69	75	1.4	33	47	29	21	1.1
3	.97	2.4	6.1	2.5	.52	68	4.3	52	8.0	17	47	.87
4	.79	1.4	11	48	.41	22	4.6	12	27	43	5.6	.74
5	.65	1.5	51	129	.36	12	11	36	35	4.5	3.7	.65
6	.55	5.7	12	136	.36	63	24	10	22	2.5	4.5	.61
7	.49	4.5	11	50	.31	32	73	22	e15	3.3	7.5	.57
8	.56	2.1	5.9	13	.32	12	24	54	e50	1.9	14	.52
9	.45	52	138	3.4	.35	30	7.6	37	e20	1.6	35	1.2
10	.37	14	98	2.2	.30	34	14	58	e30	1.2	59	1.2
11	.34	2.8	51	1.4	.43	27	3.5	7.7	e30	.99	64	3.7
12	1.3	1.7	15	1.1	.42	4.3	2.8	4.5	e25	.81	31	7.3
13	.64	15	3.7	.94	.37	2.9	3.0	4.1	e10	.65	63	5.5
14	.46	63	1.9	1.1	.38	7.0	1.8	1.9	e4.0	.55	59	1.9
15	.38	84	1.3	14	.30	22	8.8	2.6	e2.0	7.9	25	1.2
16	.33	6.9	3.4	32	.26	3.8	3.6	2.9	e6.0	5.6	80	.92
17	.36	2.9	1.7	27	.24	9.4	2.3	3.4	e15	13	6.9	.81
18	.39	1.7	1.2	4.7	.23	4.1	1.3	3.6	e40	21	3.1	1.4
19	.34	1.2	.99	4.8	.26	2.1	10	6.5	e15	79	33	2.1
20	.30	.88	.99	4.6	.38	7.2	133	4.1	e6.0	28	12	6.0
21	.26	.72	2.9	2.2	1.8	6.4	116	2.3	e3.5	105	3.8	3.1
22	.26	4.8	32	1.5	2.2	2.7	105	1.4	e6.0	80	7.4	1.3
23	1.3	24	5.1	1.1	1.6	17	14	1.0	7.1	64	31	28
24	1.9	9.3	2.2	.82	3.3	4.8	9.1	2.8	3.4	101	27	11
25	3.1	5.0	1.3	.66	6.2	2.1	7.8	4.4	44	47	12	2.2
26	18	20	1.0	.55	4.2	1.3	8.4	2.5	42	26	3.5	1.2
27	15	3.2	1.5	.47	1.7	8.2	3.5	5.3	43	125	3.0	.80
28	16	1.9	1.2	.40	.97	7.1	3.3	7.2	36	19	3.2	.63
29	6.7	13	1.2	13	---	2.4	3.8	3.1	17	15	1.7	.55
30	2.7	14	.93	7.4	---	12	64	1.5	9.0	32	1.3	4.8
31	1.5	---	1.1	2.0	---	3.4	---	2.5	---	8.3	1.0	---
TOTAL	79.39	361.63	488.21	588.74	29.96	505.87	670.6	441.3	661.0	889.20	673.2	93.37
MEAN	2.56	12.1	15.7	19.0	1.07	16.3	22.4	14.2	22.0	28.7	21.7	3.11
MAX	18	84	138	136	6.2	75	133	58	50	125	80	28
MIN	.26	.72	.93	.40	.23	.67	1.3	1.0	2.0	.55	1.0	.52
AC-FT	157	717	968	1170	59	1000	1330	875	1310	1760	1340	185

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

MEAN	9.22	16.0	14.7	15.8	11.7	20.9	23.2	12.6	12.9	18.5	14.6	8.06
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	34.8	25.5	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1964	1986	1982	1982	1992
MIN	.17	1.77	.51	.34	.82	3.33	1.71	3.59	3.18	4.56	2.70	.26
(WY)	1985	1990	1981	1981	1983	1983	1992	1972	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1964 - 1993	
ANNUAL TOTAL	3948.28		5482.47			
ANNUAL MEAN	10.8		15.0		14.8	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	178	Sep 14	138	Dec 9	612	Nov 18 1979
LOWEST DAILY MEAN	.12	Jun 4	.23	Feb 18	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.14	May 21	.29	Feb 13	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	7830		10870		10720	
10 PERCENT EXCEEDS	35		47		40	
50 PERCENT EXCEEDS	3.0		4.1		4.4	
90 PERCENT EXCEEDS	.35		.55		.54	

e Estimated

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	4.9	18	.54	.55	1.3	1.7	32	4.4	19	12	38
2	.85	2.0	8.2	.48	.49	.92	1.5	47	4.1	18	13	15
3	.64	1.3	52	3.1	8.4	.72	13	10	4.1	31	40	13
4	.51	.98	62	2.9	56	.60	37	23	29	17	11	17
5	.43	4.3	88	1.4	119	.50	14	23	61	52	7.1	13
6	.37	27	121	21	52	.44	14	7.9	74	31	11	13
7	.32	20	34	17	36	.37	32	3.6	21	29	8.1	11
8	.29	17	58	2.8	17	.33	24	2.5	5.3	21	5.7	3.8
9	.30	61	14	1.4	9.4	.30	8.9	1.5	6.4	6.6	5.0	11
10	.36	6.2	17	.99	37	.28	5.1	1.1	7.6	4.0	5.3	39
11	1.6	2.3	29	.75	38	3.4	31	.90	3.2	13	30	38
12	13	1.5	69	.60	24	122	135	.83	3.1	7.5	63	61
13	13	4.9	44	.51	5.1	102	34	5.6	3.7	3.7	20	13
14	4.2	8.9	13	.43	20	110	7.6	5.1	34	17	5.2	6.1
15	1.7	13	35	.36	10	108	7.6	30	21	62	7.3	5.1
16	1.7	9.2	41	.39	12	42	4.3	15	12	11	13	5.1
17	9.0	43	26	1.4	6.1	50	3.7	9.5	53	59	6.4	55
18	5.7	73	11	6.0	13	40	29	9.1	106	42	33	22
19	2.2	30	114	39	3.5	51	85	16	77	18	16	7.7
20	1.1	4.9	48	95	2.3	61	113	8.4	18	17	10	3.4
21	1.3	5.4	11	87	1.5	92	102	14	19	74	4.5	2.3
22	5.1	8.7	3.8	52	1.0	33	46	13	17	36	15	2.1
23	13	43	11	26	.79	72	37	4.6	17	30	88	4.0
24	5.4	51	10	36	.70	69	29	4.8	35	20	42	2.0
25	2.8	9.1	7.3	35	6.1	173	12	18	59	26	5.3	1.3
26	72	35	2.7	20	19	42	58	8.9	43	33	4.1	1.0
27	4.5	51	1.6	4.3	4.6	8.8	20	8.9	49	8.2	22	.99
28	4.0	38	1.2	1.9	2.0	6.6	17	7.9	35	5.0	5.0	.91
29	5.4	32	.94	1.2	---	9.3	4.9	10	64	9.1	2.7	.74
30	33	41	.75	.88	---	3.5	9.5	25	49	4.1	2.0	.61
31	14	---	.63	.68	---	2.3	---	18	---	4.6	30	---
TOTAL	219.27	649.58	953.12	461.01	505.53	1206.66	936.8	385.13	934.9	728.8	542.7	406.15
MEAN	7.07	21.7	30.7	14.9	18.1	38.9	31.2	12.4	31.2	23.5	17.5	13.5
MAX	72	73	121	95	119	173	135	47	106	74	88	61
MIN	.29	.98	.63	.36	.49	.28	1.5	.83	3.1	3.7	2.0	.61
AC-FT	435	1290	1890	914	1000	2390	1860	764	1850	1450	1080	806

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

MEAN	9.15	16.2	15.3	15.8	11.9	21.5	23.4	12.6	13.5	18.6	14.7	8.24
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	34.8	31.2	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1964	1994	1982	1982	1992
MIN	.17	1.77	.51	.34	.82	3.33	1.71	3.59	3.18	4.56	2.70	.26
(WY)	1985	1990	1981	1981	1983	1983	1992	1972	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1964 - 1994	
ANNUAL TOTAL	6375.21		7929.65			
ANNUAL MEAN	17.5		21.7		15.0	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	136	Jan 6	173	Mar 25	612	Nov 18 1979
LOWEST DAILY MEAN	.23	Feb 18	.28	Mar 10	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.29	Feb 13	.37	Oct 4	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	12650		15730		10890	
10 PERCENT EXCEEDS	51		58		41	
50 PERCENT EXCEEDS	5.6		11		4.6	
90 PERCENT EXCEEDS	.65		.89		.54	

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.52	.97	57	1.9	1.5	.08	8.0	.74	41	8.0	32	28
2	.45	2.1	22	1.3	1.9	.08	3.6	.68	18	8.8	47	26
3	.41	14	25	.98	.79	7.4	4.1	.77	5.7	15	22	4.8
4	.38	50	15	.79	.67	8.3	9.9	1.0	45	23	8.2	7.2
5	.37	34	38	.86	1.2	2.0	9.8	.76	19	10	12	6.1
6	.36	63	23	3.1	2.3	1.6	5.6	1.3	12	14	14	3.0
7	.32	56	34	1.3	1.2	.91	2.9	17	45	11	54	2.1
8	.29	35	69	.94	.68	.54	1.7	6.0	14	8.1	33	1.6
9	.27	20	19	.72	.51	.38	1.0	4.0	15	4.8	58	2.2
10	.27	143	53	.59	.41	.34	.69	12	38	4.5	9.2	1.5
11	.30	102	26	.50	.52	.26	.54	37	80	9.0	5.1	1.1
12	.54	56	10	1.0	.36	.20	.60	77	19	46	49	.89
13	5.4	13	5.0	42	.29	.18	.73	110	7.5	17	26	.74
14	7.5	13	3.1	108	.25	.16	.57	22	4.7	9.4	5.7	.57
15	5.0	32	37	173	.22	.13	53	56	17	7.2	3.4	.49
16	1.9	28	24	104	.19	.11	65	29	8.0	14	2.5	.46
17	1.3	14	9.0	34	.17	.10	11	23	3.9	27	2.3	.36
18	1.2	7.5	4.7	7.6	.15	.11	5.2	5.5	23	5.1	1.7	.36
19	3.5	5.2	3.7	4.0	.13	.26	9.8	2.8	16	56	1.3	.27
20	3.6	4.6	4.8	2.2	.12	.59	9.5	1.9	23	48	1.1	.25
21	5.2	25	2.4	1.3	.11	11	8.3	1.4	15	69	1.1	.25
22	40	31	1.6	.94	.11	57	63	1.2	8.9	9.0	1.0	.25
23	18	18	1.2	.75	.10	21	62	.94	6.9	18	1.1	.29
24	5.8	31	1.0	.60	.10	4.6	24	.86	3.2	4.8	21	.42
25	18	39	.83	.49	.09	2.1	39	4.0	2.1	3.9	44	.68
26	6.1	30	1.5	.41	.09	1.1	10	4.2	1.6	24	25	.61
27	49	10	1.4	.36	.09	.77	4.1	9.2	1.2	57	104	39
28	9.6	6.6	1.1	.30	.08	38	2.2	9.1	1.0	30	66	35
29	3.8	71	13	.27	---	45	1.4	17	.89	6.0	9.8	20
30	2.0	61	22	.57	---	40	.95	18	9.0	5.8	16	10
31	1.3	---	4.1	.54	---	29	---	20	---	3.0	16	---
TOTAL	192.68	1015.97	532.43	495.31	14.33	273.30	418.18	494.35	504.59	576.4	692.5	194.49
MEAN	6.22	33.9	17.2	16.0	.51	8.82	13.9	15.9	16.8	18.6	22.3	6.48
MAX	49	143	69	173	2.3	57	65	110	80	69	104	39
MIN	.27	.97	.83	.27	.08	.08	.54	.68	.89	3.0	1.0	.25
AC-FT	382	2020	1060	982	28	542	829	981	1000	1140	1370	386

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1995, BY WATER YEAR (WY)

MEAN	9.06	16.7	15.3	15.8	11.6	21.1	23.1	12.7	13.6	18.6	15.0	8.18
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	34.8	31.2	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1964	1994	1982	1982	1992
MIN	.17	1.77	.51	.34	.51	3.33	1.71	3.59	3.18	4.56	2.70	.26
(WY)	1985	1990	1981	1981	1995	1983	1992	1972	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1964 - 1995	
ANNUAL TOTAL	7848.76		5404.53			
ANNUAL MEAN	21.5		14.8		15.0	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	173	Mar 25	173	Jan 15	612	Nov 18 1979
LOWEST DAILY MEAN	.27	Oct 9	.08	Feb 28	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.31	Oct 5	.09	Feb 24	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	15570		10720		10880	
10 PERCENT EXCEEDS	56		45		41	
50 PERCENT EXCEEDS	11		4.8		4.6	
90 PERCENT EXCEEDS	.83		.30		.54	

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	3.0	.25	4.1	5.7	15	172	6.0	1.8	25	3.4	.12
2	6.0	1.9	.22	2.4	2.3	14	19	2.2	1.1	16	13	.16
3	8.5	1.4	.20	1.5	1.2	57	4.5	1.1	.85	4.5	9.8	.21
4	3.4	1.1	.18	1.1	.87	42	2.4	.77	.85	20	3.1	.16
5	2.1	.97	.19	.77	.61	13	1.6	.57	3.0	22	2.5	.18
6	1.4	.75	.18	.59	.43	4.9	1.1	.47	2.6	48	1.6	5.7
7	1.2	.88	.18	.49	.36	7.0	.81	.43	13	5.4	3.9	4.4
8	.99	1.6	.17	1.0	.29	2.9	.62	.35	9.4	2.5	3.5	2.6
9	4.8	1.0	.16	1.3	.23	1.8	1.5	.30	9.0	1.8	1.5	1.3
10	16	5.1	.15	.92	.20	1.3	11	.27	2.8	110	.89	.78
11	14	20	.14	.71	.18	1.2	11	.23	1.4	88	1.0	.71
12	6.5	5.9	.14	.61	.15	.96	4.3	.20	1.0	16	27	2.5
13	4.8	2.5	.13	.51	.13	.76	2.1	.19	.76	10	47	9.2
14	22	1.7	.14	.44	.28	.74	13	.17	.52	5.2	8.8	8.8
15	19	1.3	.16	.38	33	1.1	90	.20	.39	2.8	4.0	19
16	4.7	1.0	18	.34	42	12	60	.20	.36	1.9	4.7	6.6
17	2.9	.96	27	.36	8.7	21	21	1.6	5.8	2.0	5.4	2.7
18	3.9	.80	21	3.5	4.0	53	14	27	27	1.8	3.5	7.0
19	20	.67	5.8	9.8	3.0	32	104	25	16	1.8	2.5	6.7
20	42	.59	2.8	3.1	40	5.3	49	7.8	5.9	3.9	2.0	2.2
21	14	.49	1.8	1.6	56	2.4	66	2.7	2.3	1.8	1.2	1.2
22	25	.41	1.2	1.2	42	1.5	25	1.4	1.6	1.2	.76	.76
23	14	.36	.86	.79	98	1.2	6.6	.92	1.3	.84	.55	.60
24	7.6	.32	.63	.61	104	11	3.3	.79	6.5	.61	.43	.58
25	22	.28	.53	.60	179	5.8	2.5	.78	13	.48	.34	.43
26	16	.25	1.4	.65	23	2.5	1.8	1.6	5.0	.92	.29	.36
27	5.2	.22	1.0	.62	29	1.4	2.9	1.9	8.0	1.0	.23	.28
28	2.7	.24	.70	2.3	61	1.1	3.6	2.6	8.9	.84	.20	.22
29	3.0	.23	.57	10	64	29	1.9	2.0	27	.88	.17	.18
30	13	.25	.51	35	---	36	1.2	3.2	17	2.2	.15	.14
31	6.8	---	3.6	58	---	110	---	5.3	---	6.7	.14	---
TOTAL	318.79	56.17	89.99	145.29	799.63	488.86	697.73	98.24	194.13	406.07	153.55	85.77
MEAN	10.3	1.87	2.90	4.69	27.6	15.8	23.3	3.17	6.47	13.1	4.95	2.86
MAX	42	20	27	58	179	110	172	27	27	110	47	19
MIN	.99	.22	.13	.34	.13	.74	.62	.17	.36	.48	.14	.12
AC-FT	632	111	178	288	1590	970	1380	195	385	805	305	170

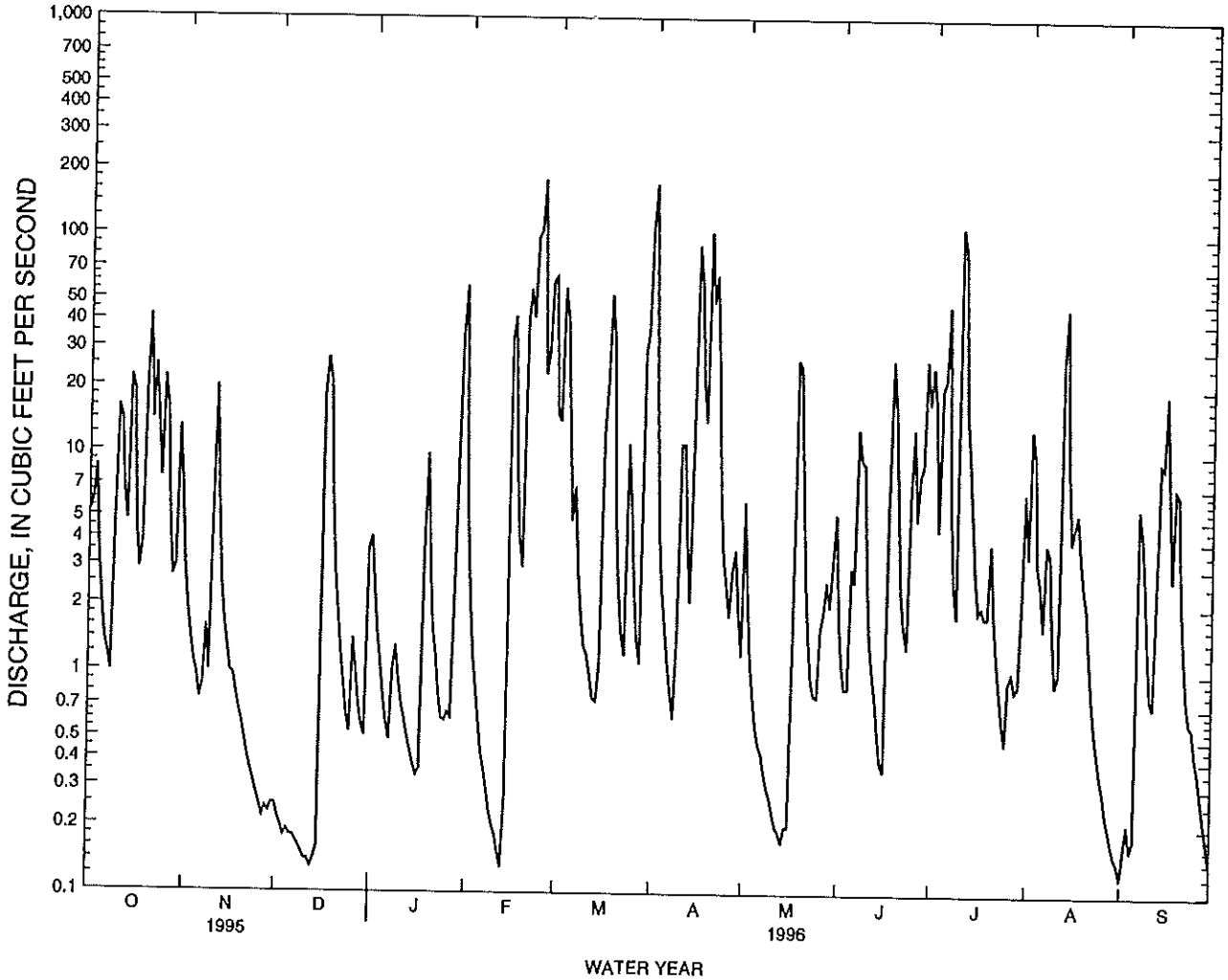
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1996, BY WATER YEAR (WY)

MEAN	9.10	16.3	14.9	15.4	12.1	20.9	23.1	12.4	13.4	18.4	14.7	8.02
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	34.8	31.2	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1964	1994	1982	1982	1992
MIN	.17	1.77	.51	.34	.51	3.33	1.71	3.17	3.18	4.56	2.70	.26
(WY)	1985	1990	1981	1981	1995	1983	1992	1996	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1964 - 1996	
ANNUAL TOTAL	4128.40		3534.22			
ANNUAL MEAN	11.3		9.66		14.9	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	173	Jan 15	179	Feb 25	612	Nov 18 1979
LOWEST DAILY MEAN	.08	Feb 28	.12	Sep 1	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.09	Feb 24	.15	Dec 9	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	8190		7010		10760	
10 PERCENT EXCEEDS	36		26		41	
50 PERCENT EXCEEDS	2.8		1.9		4.5	
90 PERCENT EXCEEDS	.22		.23		.52	

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued



HAWAII, ISLAND OF HAWAII

16720300 KAWAIKI STREAM NEAR KAMUELA

THE RECORDS FOR WATER YEARS 1992-96 WERE NOT COMPUTED
AT THE TIME OF PUBLICATION

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05′15″, long 155°40′42″, Hydrologic Unit 20010000, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 mi north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,020 ft, from topographic map.

REMARKS.--Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Rain gage located at station monitoring total rainfall between service dates.

Water year 1992: Records fair except for estimated daily discharges which are poor.
Water year 1993: Records fair except for estimated daily discharges which are poor.
Water year 1994: Records fair because of variable backwater at this gage.
Water year 1995: Records fair except for estimated daily discharges which are poor.
Water year 1996: Records good except for estimated daily discharges which are poor.

AVERAGE DISCHARGE.--

Water year 1992: 28 years, 7.63 ft^3/s (5,530 acre-ft/yr).
Water year 1993: 29 years, 7.60 ft^3/s (5,510 acre-ft/yr).
Water year 1994: 30 years, 7.61 ft^3/s (5,510 acre-ft/yr).
Water year 1995: 31 years, 7.58 ft^3/s (5,490 acre-ft/yr).
Water year 1996: 32 years, 7.49 ft^3/s (5,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s, November 2, 1967; no flow, July 8-9, 14-16, 1992, August 4-6, 1992.

EXTREMES FOR CURRENT YEAR.--

Water year 1992: Maximum daily discharge, 16 ft^3/s, December 26, May 6, June 26; minimum daily, no flow, July 8-9, 14-16, August 4-6.
Water year 1993: Maximum daily discharge, 18 ft^3/s, April 20; minimum daily, 0.47 ft^3/s, February 18.
Water year 1994: Maximum daily discharge, 16 ft^3/s, July 17, 21, August 3, 12, 23, September 12; minimum daily, 0.49 ft^3/s, March 10.
Water year 1995: Maximum daily discharge, 17 ft^3/s, January 15; minimum daily, 0.17 ft^3/s, March 2.
Water year 1996: Maximum daily discharge, 16 ft^3/s, February 21, 23, 25, April 1, 15-16, 21, July 11, August 13; minimum daily, 0.13 ft^3/s, December 13.

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.97	1.4	.79	13	6.6	e5.0	2.4	1.5	.22	7.8	2.2	e3.3
2	.84	1.0	.78	14	3.2	e2.0	6.2	.97	.18	6.2	4.8	e14
3	.78	2.7	2.5	9.8	12	e1.3	9.9	.66	.16	6.2	1.4	e13
4	.68	2.2	12	5.0	14	e1.1	5.6	.64	.16	15	.00	e12
5	.65	3.3	5.7	3.2	15	e.95	3.0	15	.19	14	.00	e15
6	.63	2.2	12	2.4	15	e.80	2.1	16	.50	7.9	.00	e11
7	3.9	2.6	7.8	1.9	13	e.70	1.6	12	1.7	1.1	5.1	e6.3
8	5.9	3.1	3.8	1.5	7.0	e.55	1.3	6.8	7.9	.00	3.6	e3.3
9	2.3	4.4	2.4	1.3	4.0	e.55	1.0	3.8	15	.00	1.8	e1.8
10	1.4	2.1	1.8	1.1	2.7	e.40	1.6	2.0	15	1.1	1.6	.85
11	1.0	1.4	1.4	.99	2.6	e.40	5.8	1.3	11	1.9	8.8	1.3
12	.81	1.0	1.1	.89	4.7	e.40	6.6	.98	8.1	2.0	4.6	1.6
13	.69	.82	.92	.80	8.1	e.40	3.3	.71	8.0	1.5	2.2	2.1
14	.61	.69	.80	.94	3.9	e.70	1.9	.58	5.1	.00	1.4	15
15	3.3	.59	1.0	14	e5.0	e5.5	1.4	.47	9.8	.00	4.9	5.1
16	2.9	.54	.98	7.0	e2.5	e6.0	1.0	.41	7.6	.00	12	4.2
17	1.7	.76	3.9	3.6	e1.3	e4.5	.83	.36	5.1	6.7	6.9	6.6
18	1.2	.79	2.3	2.4	e.84	e7.0	.73	.31	3.6	7.5	2.2	6.0
19	1.0	11	3.2	12	e.75	e10	.76	.28	6.7	5.1	3.0	5.7
20	.86	7.1	7.6	7.3	e.70	e12	1.1	.25	9.2	13	e7.3	2.9
21	.80	3.3	8.4	3.5	e.70	e8.5	.90	.23	4.2	11	e14	2.2
22	2.0	9.5	4.7	2.4	e.55	e3.0	.76	.18	3.4	9.9	e6.3	1.8
23	1.4	12	14	1.8	e.55	e2.0	.66	.17	11	8.4	e12	5.4
24	1.1	6.9	6.9	1.5	e.55	e3.0	.56	.18	13	1.4	e11	6.4
25	2.5	7.2	7.6	1.2	e.50	15	.46	.22	15	12	e10	6.8
26	2.1	3.9	16	1.0	e.45	12	.43	.19	16	15	e10	14
27	1.4	2.3	13	.91	e.45	6.4	.44	.16	15	15	e6.0	11
28	1.1	1.6	14	.81	e.45	3.8	.59	.29	15	8.9	e8.5	4.0
29	.91	1.2	14	.74	e.75	5.3	1.7	.43	8.6	2.2	e13	2.8
30	.76	.94	9.9	3.7	---	7.7	2.4	.35	5.4	2.4	e7.2	2.6
31	.81	---	15	14	---	3.4	---	.25	---	3.2	e4.5	---
TOTAL	47.00	98.53	196.27	134.68	127.84	130.35	67.02	67.67	221.81	186.40	176.30	188.05
MEAN	1.52	3.28	6.33	4.34	4.41	4.20	2.23	2.18	7.39	6.01	5.69	6.27
MAX	5.9	12	16	14	15	15	9.9	16	16	15	14	15
MIN	.61	.54	.78	.74	.45	.40	.43	.16	.16	.00	.00	.85
AC-FT	93	195	389	267	254	259	133	134	440	370	350	373

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1992, BY WATER YEAR (WY)

MEAN	5.85	7.85	6.89	6.27	5.78	8.31	9.50	7.44	8.45	10.7	8.51	5.77
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	2.43	.77	.53	.93	1.69	2.23	2.18	3.30	2.67	2.66	.19
(WY)	1985	1969	1981	1981	1983	1974	1992	1992	1984	1984	1973	1965

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1919 - 1992	
ANNUAL TOTAL	3011.33		1641.92			
ANNUAL MEAN	8.25		4.49		7.63	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	23	Mar 13	16	Dec 26	49	Nov 2 1967
LOWEST DAILY MEAN	.45	Feb 7	.00	Jul 8	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.46	Feb 6	.19	May 21	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	5970		3260		5530	
10 PERCENT EXCEEDS	19		12		17	
50 PERCENT EXCEEDS	6.0		2.4		5.0	
90 PERCENT EXCEEDS	.90		.45		.72	

e Estimated

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	2.0	5.9	13	1.4	e.70	2.4	16	16	7.3	5.9	2.4
2	1.9	1.3	12	7.4	.90	e16	2.1	14	16	13	11	1.6
3	1.5	3.4	8.9	3.2	.74	e15	6.7	16	9.2	11	14	1.2
4	1.3	2.2	5.9	7.7	.62	e13	4.5	11	11	14	7.8	1.0
5	1.0	2.7	14	13	.58	11	9.8	15	15	6.0	5.6	.92
6	.92	9.1	12	13	.59	16	8.0	11	13	3.3	6.3	.87
7	.81	6.0	11	10	.54	14	17	11	12	4.5	9.5	.81
8	.96	3.3	8.1	5.3	.50	11	14	16	14	2.7	12	.75
9	.81	13	15	2.7	.52	13	8.6	16	13	2.2	13	2.2
10	.70	8.5	14	2.0	.50	14	12	16	15	1.8	16	1.9
11	.64	3.4	14	1.5	.72	13	5.2	9.4	15	1.4	16	4.9
12	1.7	5.1	10	1.3	.73	5.9	4.4	6.5	14	1.2	14	8.4
13	1.1	12	4.6	1.2	.60	4.5	4.7	5.8	9.1	.95	16	7.2
14	.83	15	2.7	1.3	.63	5.0	2.9	3.0	4.3	.81	16	2.7
15	.75	14	2.0	9.5	.58	12	9.7	4.1	2.9	4.9	13	1.6
16	.67	7.7	5.9	11	.52	5.6	5.5	4.4	7.5	7.0	15	1.1
17	.70	4.0	2.7	5.8	.48	9.6	3.6	5.1	9.5	11	8.4	1.1
18	.77	2.5	1.8	3.8	.47	6.0	2.2	5.4	15	13	4.3	2.5
19	.68	1.8	1.4	5.0	.58	3.2	3.9	9.3	14	14	8.5	3.8
20	.62	1.3	1.4	3.0	.86	8.8	18	6.4	9.2	14	10	9.1
21	.55	1.0	2.4	2.0	3.1	8.2	17	3.5	5.2	16	5.4	4.8
22	.52	1.7	12	1.5	3.7	4.1	17	2.2	8.4	15	8.0	2.1
23	1.9	14	7.4	1.2	2.6	9.5	12	1.6	8.4	15	13	3.8
24	3.5	11	3.4	1.0	5.1	6.7	10	4.9	5.0	16	13	9.2
25	1.9	6.4	2.0	.93	8.0	3.0	9.9	6.6	14	15	11	3.7
26	12	12	1.4	1.1	e6.0	1.9	9.7	4.2	16	14	4.9	2.3
27	12	5.1	2.0	.79	e2.7	4.7	5.6	8.5	16	16	4.1	1.5
28	12	3.1	1.5	1.6	e1.4	7.9	5.4	10	15	13	4.7	1.2
29	9.3	3.9	1.5	11	---	3.3	5.3	4.6	13	12	2.6	1.1
30	4.2	12	1.1	5.0	---	9.0	14	2.3	10	15	1.8	6.7
31	2.5	---	2.1	2.3	---	4.5	---	3.7	---	9.5	1.4	---
TOTAL	81.13	188.5	190.1	149.12	45.66	260.10	251.1	253.5	345.7	290.56	292.2	92.45
MEAN	2.62	6.28	6.13	4.81	1.63	8.39	8.37	8.18	11.5	9.37	9.43	3.08
MAX	12	15	15	13	8.0	16	18	16	16	16	16	9.2
MIN	.52	1.0	1.1	.79	.47	.70	2.1	1.6	2.9	.81	1.4	.75
AC-FT	161	374	377	296	91	516	498	503	686	576	580	183

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1993, BY WATER YEAR (WY)

MEAN	5.74	7.79	6.87	6.22	5.64	8.31	9.46	7.47	8.56	10.7	8.54	5.68
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	2.43	.77	.53	.93	1.69	2.23	2.18	3.30	2.67	2.66	.19
(WY)	1985	1969	1981	1981	1983	1974	1992	1992	1984	1984	1973	1965

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1919 - 1993	
ANNUAL TOTAL	1759.85		2440.12			
ANNUAL MEAN	4.81		6.69		7.60	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	16	May 6	18	Apr 20	49	Nov 2 1967
LOWEST DAILY MEAN	.00	Jul 8	.47	Feb 18	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.19	May 21	.55	Feb 4	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	3490		4840		5510	
10 PERCENT EXCEEDS	13		14		17	
50 PERCENT EXCEEDS	2.7		5.2		5.0	
90 PERCENT EXCEEDS	.45		.87		.72	

e Estimated

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	6.4	8.7	.90	.84	1.4	1.9	12	5.3	11	11	15
2	1.5	2.9	7.0	.84	.80	1.0	1.7	14	5.3	11	12	13
3	1.1	1.8	12	3.2	4.0	.78	4.9	9.0	5.5	12	16	12
4	.88	1.3	12	3.2	9.9	.65	13	11	11	11	11	13
5	.75	3.4	13	2.0	12	.56	10	11	14	13	8.2	12
6	.67	11	13	5.6	11	.54	11	7.8	15	12	11	11
7	.62	11	10	6.3	8.7	.54	13	4.3	11	12	10	11
8	.57	8.6	12	2.7	5.6	.52	12	3.2	6.5	12	8.0	5.5
9	.61	12	9.0	1.9	4.5	.51	9.4	2.2	6.6	8.2	7.5	9.4
10	.79	6.8	9.4	1.5	5.8	.49	6.6	1.6	8.3	5.7	6.8	15
11	3.8	3.2	9.1	1.2	8.8	2.9	12	1.3	4.2	8.2	14	14
12	10	2.1	13	.99	5.9	14	15	1.3	4.0	8.7	16	16
13	11	6.0	11	.87	2.2	14	13	8.1	4.9	5.6	13	12
14	6.0	9.0	8.1	.76	5.0	14	8.0	7.0	12	11	7.5	8.4
15	3.0	9.6	11	.69	4.0	14	8.5	12	11	15	8.0	8.1
16	3.0	5.6	11	.75	4.4	14	5.2	10	10	11	11	6.6
17	9.9	12	9.5	2.6	2.4	13	4.3	9.0	13	16	8.2	14
18	7.9	13	7.7	5.9	3.8	13	12	7.7	15	15	15	13
19	3.7	10	12	10	1.7	14	14	11	15	13	13	9.3
20	2.0	5.6	10	12	1.2	14	15	8.9	10	12	10	5.0
21	2.3	6.1	5.4	12	.91	14	14	10	11	16	7.0	3.3
22	7.3	7.3	3.2	11	.79	12	13	9.7	11	15	12	3.2
23	11	11	5.1	8.0	.72	14	13	5.9	11	15	16	6.0
24	6.8	11	5.8	9.4	.70	14	12	6.1	11	13	13	3.0
25	4.0	7.8	4.9	9.2	3.7	15	10	8.9	12	14	7.1	2.1
26	12	11	2.8	7.8	7.2	13	14	8.2	11	15	6.3	1.6
27	5.9	12	2.1	3.5	2.5	9.1	11	8.3	13	9.7	13	1.5
28	4.9	11	1.8	2.2	1.7	7.5	10	8.0	12	7.2	6.1	1.4
29	7.7	10	1.5	1.7	---	9.5	6.1	7.5	14	10	3.2	1.1
30	11	11	1.2	1.3	---	4.3	9.2	11	14	6.1	2.5	.95
31	11	---	1.0	.97	---	2.7	---	10	---	5.8	7.9	---
TOTAL	154.49	239.5	243.3	130.97	120.76	248.99	302.8	246.0	307.6	350.2	311.3	247.45
MEAN	4.98	7.98	7.85	4.22	4.31	8.03	10.1	7.94	10.3	11.3	10.0	8.25
MAX	12	13	13	12	12	15	15	14	15	16	16	16
MIN	.57	1.3	1.0	.69	.70	.49	1.7	1.3	4.0	5.6	2.5	.95
AC-FT	306	475	483	260	240	494	601	488	610	695	617	491

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1994, BY WATER YEAR (WY)

MEAN	5.71	7.80	6.90	6.16	5.59	8.30	9.48	7.48	8.61	10.7	8.59	5.76
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	2.43	.77	.53	.93	1.69	2.23	2.18	3.30	2.67	2.66	.19
(WY)	1985	1969	1981	1981	1983	1974	1992	1992	1984	1984	1973	1965

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1919 - 1994	
ANNUAL TOTAL	2617.68		2903.36			
ANNUAL MEAN	7.17		7.95		7.61	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	18	Apr 20	16	Jul 17	49	Nov 2 1967
LOWEST DAILY MEAN	.47	Feb 18	.49	Mar 10	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.55	Feb 4	.54	Mar 4	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	5190		5760		5510	
10 PERCENT EXCEEDS	14		14		17	
50 PERCENT EXCEEDS	6.4		8.4		5.2	
90 PERCENT EXCEEDS	1.0		1.2		.72	

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.77	1.2	14	2.8	1.8	.22	9.2	e1.0	15	9.8	11	14
2	.67	2.0	12	1.8	2.3	.17	4.9	e.90	12	9.3	16	13
3	.63	11	13	1.4	1.1	3.5	4.6	1.3	7.1	12	14	6.6
4	.63	16	11	1.1	.95	8.9	10	1.9	15	13	9.4	8.2
5	.62	14	15	1.2	1.7	2.9	11	1.3	13	10	11	7.8
6	.61	15	13	4.6	3.0	2.3	8.1	1.9	11	13	9.7	3.7
7	.53	14	13	2.0	1.7	1.4	4.3	13	15	11	16	2.6
8	.48	15	15	1.3	1.0	.84	2.6	7.4	11	9.6	13	2.0
9	.42	13	12	.97	.78	.61	1.6	5.3	12	6.5	15	3.2
10	.43	16	14	.80	.74	.56	1.2	11	14	6.3	9.5	2.1
11	.48	16	12	.68	.87	.47	.90	15	16	8.8	6.7	1.5
12	.94	15	9.9	1.7	.66	.39	1.1	16	13	15	13	1.1
13	5.0	12	6.4	16	.61	.31	1.3	16	8.6	12	13	.97
14	9.3	12	4.0	16	.47	.31	1.1	13	6.0	8.6	7.3	.78
15	7.0	13	11	17	.47	.28	10	16	12	8.6	4.6	.72
16	2.7	13	12	15	.42	.25	15	15	9.2	11	3.6	.61
17	1.6	11	10	11	.35	.22	11	13	5.1	13	3.2	.56
18	1.6	8.9	6.5	7.6	.31	.24	7.3	6.9	7.7	6.5	2.4	.51
19	4.8	6.8	5.1	4.9	.28	.48	9.8	3.8	12	12	1.8	.47
20	4.6	5.9	6.7	3.0	.28	1.1	10	2.6	14	14	1.5	.42
21	4.7	9.5	3.4	2.1	.28	5.0	8.9	1.9	12	15	1.4	.42
22	14	14	2.3	1.6	.25	16	15	1.5	9.9	10	1.4	.47
23	13	12	1.8	1.3	.25	13	15	1.2	8.1	12	1.4	.51
24	7.5	14	1.4	1.0	.25	6.7	14	1.1	4.4	6.6	7.7	.76
25	12	14	1.1	.87	.22	3.2	14	6.6	3.0	5.9	14	1.0
26	6.9	14	1.9	.74	.22	1.9	10	6.3	2.2	11	13	1.2
27	15	9.6	1.9	.63	.22	1.3	e4.5	8.4	1.7	16	16	9.3
28	9.9	7.1	1.4	.53	.22	13	e2.5	11	1.4	14	16	15
29	4.7	16	7.9	.49	---	15	e1.5	11	1.2	8.0	10	13
30	2.6	15	13	.87	---	15	e1.2	12	9.8	7.8	12	11
31	1.7	---	5.7	.80	---	14	---	14	---	4.4	11	---
TOTAL	135.81	356.0	257.4	121.78	21.70	129.55	211.60	237.30	282.4	320.7	285.6	123.50
MEAN	4.38	11.9	8.30	3.93	.77	4.18	7.05	7.65	9.41	10.3	9.21	4.12
MAX	15	16	15	17	3.0	16	15	16	16	16	16	15
MIN	.42	1.2	1.1	.49	.22	.17	.90	.90	1.2	4.4	1.4	.42
AC-FT	269	706	511	242	43	257	420	471	560	636	566	245

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1995, BY WATER YEAR (WY)

MEAN	5.66	7.93	6.95	6.09	5.44	8.17	9.41	7.49	8.64	10.7	8.61	5.71
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	2.43	.77	.53	.77	1.69	2.23	2.18	3.30	2.67	2.66	.19
(WY)	1985	1969	1981	1981	1995	1974	1992	1992	1984	1984	1973	1965

SUMMARY STATISTICS	FOR 1994 CALENDAR YEAR		FOR 1995 WATER YEAR		WATER YEARS 1919 - 1995	
ANNUAL TOTAL	3015.28		2483.34			
ANNUAL MEAN	8.26		6.80		7.58	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	16	Jul 17	17	Jan 15	49	Nov 2 1967
LOWEST DAILY MEAN	.42	Oct 9	.17	Mar 2	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.51	Oct 5	.22	Feb 24	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	5980		4930		5490	
10 PERCENT EXCEEDS	14		15		17	
50 PERCENT EXCEEDS	8.9		6.5		5.2	
90 PERCENT EXCEEDS	1.1		.51		.72	

e Estimated

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	3.9	e.30	4.1	6.8	12	16	7.9	2.6	14	4.9	.25
2	7.4	2.4	e.27	2.2	2.8	12	e13	3.2	1.5	12	11	.31
3	9.4	1.6	e.25	1.3	1.6	e14	e5.0	1.7	1.3	6.2	9.5	.39
4	4.5	1.3	e.22	.90	1.1	e13	e2.5	1.2	1.4	8.8	4.0	.33
5	2.6	1.0	e.22	.61	.72	e10	e1.7	.97	4.9	13	3.6	.39
6	1.8	.84	.22	.47	.56	5.3	e1.2	.84	3.9	14	2.3	4.3
7	1.4	.92	.20	.39	.47	7.4	e.95	.78	11	7.1	5.2	6.2
8	1.1	2.0	.20	1.5	.39	3.1	e.80	.66	8.4	3.5	4.8	3.6
9	4.9	1.3	.17	1.4	.31	1.8	e1.5	.56	9.3	2.7	2.0	2.0
10	12	4.2	.17	.84	.28	1.2	9.9	.51	4.0	15	1.2	1.2
11	12	14	.15	.66	.25	1.2	11	.42	2.3	16	1.5	1.0
12	7.5	7.3	.15	.51	.22	.84	6.2	.39	1.3	12	14	3.1
13	5.5	3.2	.13	.39	.21	.56	3.1	.35	.90	10	16	9.4
14	8.3	2.0	.15	.31	.40	.58	6.4	.35	.66	6.7	8.8	6.4
15	12	1.5	.17	.28	14	1.2	16	.39	.56	3.7	5.1	13
16	5.9	1.1	6.8	.28	15	9.0	16	.39	.56	2.7	6.3	7.6
17	3.6	1.0	12	.41	9.1	11	12	3.1	2.7	3.4	6.9	3.4
18	5.4	.84	13	3.1	5.2	13	12	12	13	3.1	4.4	6.5
19	11	.72	6.2	9.0	4.1	12	15	14	12	2.6	3.0	7.6
20	14	.61	2.8	3.2	14	6.3	15	8.8	7.4	5.0	2.4	3.0
21	9.2	.56	1.7	1.6	16	2.6	16	3.9	3.5	2.6	1.4	1.6
22	14	.51	1.0	.90	15	1.5	14	1.9	2.4	1.8	.97	1.0
23	11	e.47	.78	.61	16	1.2	8.5	1.3	1.9	1.2	.78	.92
24	8.2	e.42	.61	.51	15	8.1	4.9	1.1	7.9	.90	.61	.90
25	11	e.38	.47	.61	16	6.9	3.9	1.2	11	.72	.56	.72
26	12	e.33	1.3	.61	13	2.7	2.8	2.9	7.0	1.7	.47	.61
27	6.4	e.28	.84	.51	11	1.5	4.5	3.2	9.8	1.8	.42	.51
28	3.3	e.30	.61	2.1	15	1.2	6.0	4.4	9.7	1.6	.39	.42
29	3.3	e.28	.47	7.9	15	7.6	3.1	3.2	9.1	1.6	.31	.35
30	11	e.30	.39	9.2	---	12	2.1	4.6	12	3.6	.31	.31
31	8.2	---	3.4	14	---	14	---	7.4	---	7.6	.28	---
TOTAL	234.6	55.56	55.34	70.40	209.51	194.78	231.05	93.61	163.98	186.62	123.40	87.31
MEAN	7.57	1.85	1.79	2.27	7.22	6.28	7.70	3.02	5.47	6.02	3.98	2.91
MAX	14	14	13	14	16	14	16	14	13	16	16	13
MIN	1.1	.28	.13	.28	.21	.56	.80	.35	.56	.72	.28	.25
AC-FT	465	110	110	140	416	386	458	186	325	370	245	173

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1996, BY WATER YEAR (WY)

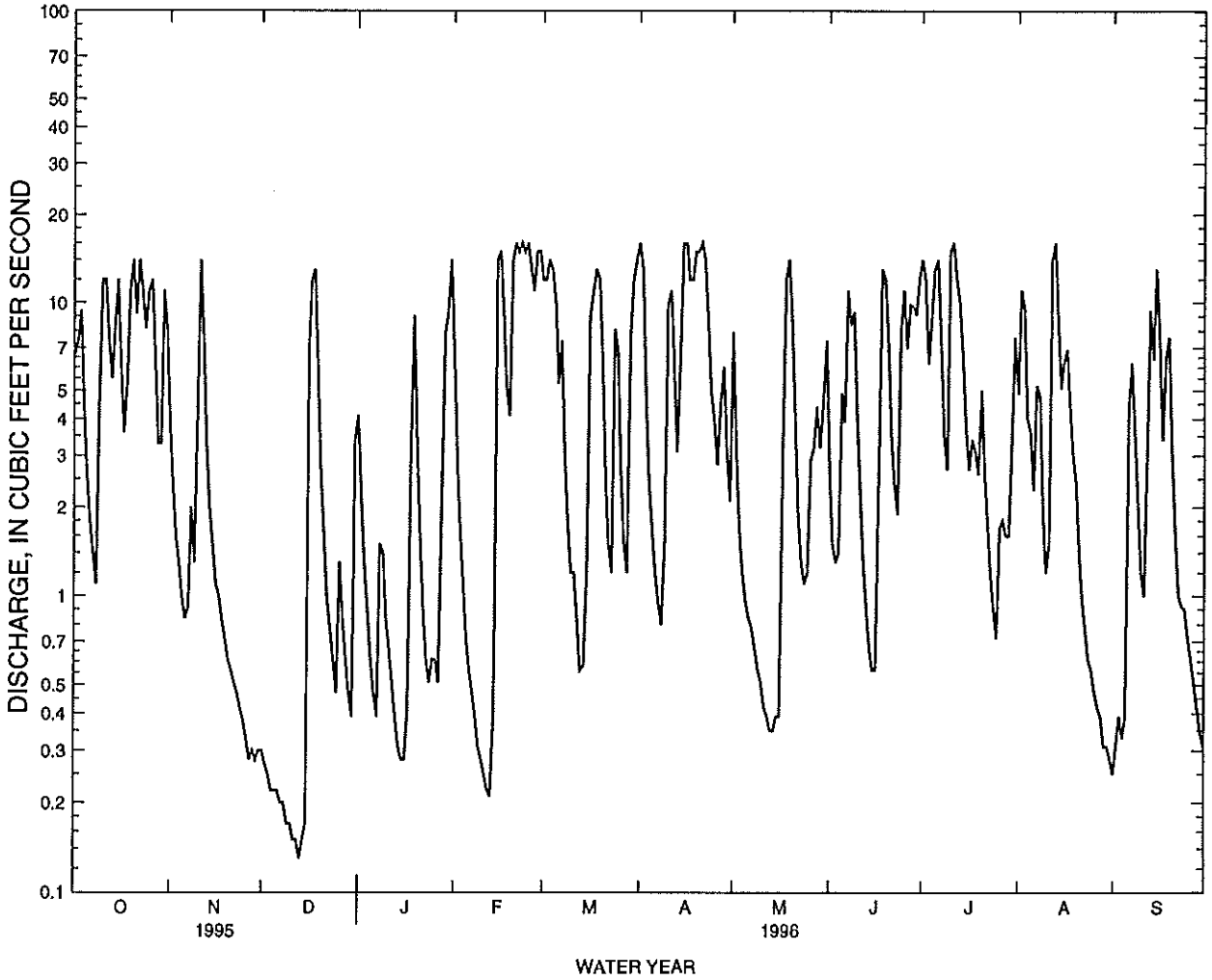
MEAN	5.73	7.74	6.78	5.97	5.50	8.11	9.35	7.35	8.54	10.5	8.47	5.62
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	1.85	.77	.53	.77	1.69	2.23	2.18	3.30	2.67	2.66	.19
(WY)	1985	1996	1981	1981	1995	1974	1992	1992	1984	1984	1973	1965

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1919 - 1996	
ANNUAL TOTAL	2079.63		1706.16			
ANNUAL MEAN	5.70		4.66		7.49	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	17	Jan 15	16	Feb 21	49	Nov 2 1967
LOWEST DAILY MEAN	.13	Dec 13	.13	Dec 13	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.16	Dec 9	.16	Dec 9	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	4120		3380		5420	
10 PERCENT EXCEEDS	14		13		17	
50 PERCENT EXCEEDS	3.3		2.6		5.0	
90 PERCENT EXCEEDS	.31		.35		.70	

e Estimated

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKU DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued



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HAWAII, ISLAND OF HAWAII

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi upstream from Alakahi Stream, and 3.6 mi north of Kamuela.

PERIOD OF RECORD.--April 1968 to current year.

REVISED RECORDS.--WDR HI-94-1: 1982-90.

GAGE.--Stevens digital water-stage recorder and concrete, Columbus-type control. Elevation of gage is 3,890 ft above mean sea level, from topographic map.

REMARKS.--Records good for the entire year. Ditch diverts water from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

AVERAGE DISCHARGE.--28 years (water years 1969-96), 5.22 ft^3/s (3,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, August 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s, April 1; no flow, December 25, 28-30, January 6, 7, 14-17, 22-27, February 5-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	2.2	.02	1.1	4.8	11	26	5.3	.76	11	2.4	.01
2	4.7	.97	.02	.21	1.4	11	9.9	2.3	.15	8.8	6.8	.01
3	6.2	.45	.01	.01	.41	14	4.5	.97	.04	4.0	6.1	.01
4	2.5	.21	.01	.01	.07	14	2.9	.50	.09	6.7	2.2	.01
5	.97	.07	.01	.01	.00	9.7	2.0	.24	1.3	9.5	1.7	.01
6	.41	.02	.01	.00	.00	5.0	1.3	.11	.89	13	.83	1.7
7	.17	.05	.01	.00	.00	6.6	.75	.06	6.0	5.2	2.2	3.0
8	.05	.29	.01	.02	.00	3.1	.43	.04	4.6	2.3	2.5	1.4
9	2.0	.05	.01	.02	.00	1.6	1.3	.03	5.8	1.5	.58	.25
10	7.4	2.2	.01	.01	.00	1.0	6.8	.02	2.0	15	.06	.01
11	7.7	9.6	.01	.01	.00	.89	8.0	.02	.50	16	.12	.01
12	4.6	4.5	.01	.01	.00	.46	4.5	.02	.07	10	9.5	.53
13	3.1	1.5	.01	.01	.00	.23	2.2	.02	.01	8.0	13	5.8
14	6.5	.67	.01	.00	.00	.22	4.5	.02	.01	4.8	6.4	3.8
15	9.3	.37	.01	.00	8.6	.76	19	.02	.01	2.5	3.3	9.6
16	3.8	.12	3.1	.00	11	6.5	19	.02	.01	1.5	4.1	5.3
17	2.1	.06	8.7	.00	5.9	9.5	12	.25	.67	2.0	4.3	1.7
18	3.4	.02	9.0	.67	2.6	14	10	6.9	8.1	1.8	2.7	3.9
19	8.3	.02	3.8	4.5	1.7	12	17	10	7.8	1.3	1.6	5.2
20	11	.02	1.2	.83	11	5.3	17	6.0	4.3	2.7	1.0	1.5
21	7.0	.02	.30	.04	13	2.4	19	2.1	1.5	1.1	.36	.36
22	11	.02	.02	.00	12	1.3	15	.65	.68	.58	.06	.02
23	8.5	.02	.01	.00	16	.86	8.3	.18	.36	.18	.02	.01
24	5.9	.02	.01	.00	17	6.2	4.6	.09	4.0	.03	.01	.01
25	9.1	.02	.00	.00	23	5.3	3.5	.08	6.8	.02	.01	.01
26	9.9	.02	.01	.00	12	2.4	2.5	.84	3.8	.37	.01	.01
27	4.4	.02	.01	.00	9.9	1.1	3.5	1.0	5.8	.32	.01	.01
28	2.0	.02	.00	.36	17	.79	4.7	1.5	5.8	.09	.01	.01
29	1.8	.02	.00	4.9	18	7.1	2.4	.95	6.7	.10	.01	.01
30	8.7	.02	.00	6.8	---	11	1.4	1.4	8.8	.75	.01	.01
31	5.7	---	.92	12	---	17	---	3.3	---	3.4	.01	---
TOTAL	162.40	23.59	27.25	31.52	185.38	182.31	233.98	44.93	87.35	134.54	71.91	44.21
MEAN	5.24	.79	.88	1.02	6.39	5.88	7.80	1.45	2.91	4.34	2.32	1.47
MAX	11	9.6	9.0	12	23	17	26	10	8.8	16	13	9.6
MIN	.05	.02	.00	.00	.00	.22	.43	.02	.01	.02	.01	.01
AC-FT	322	47	54	63	368	362	464	89	173	267	143	88

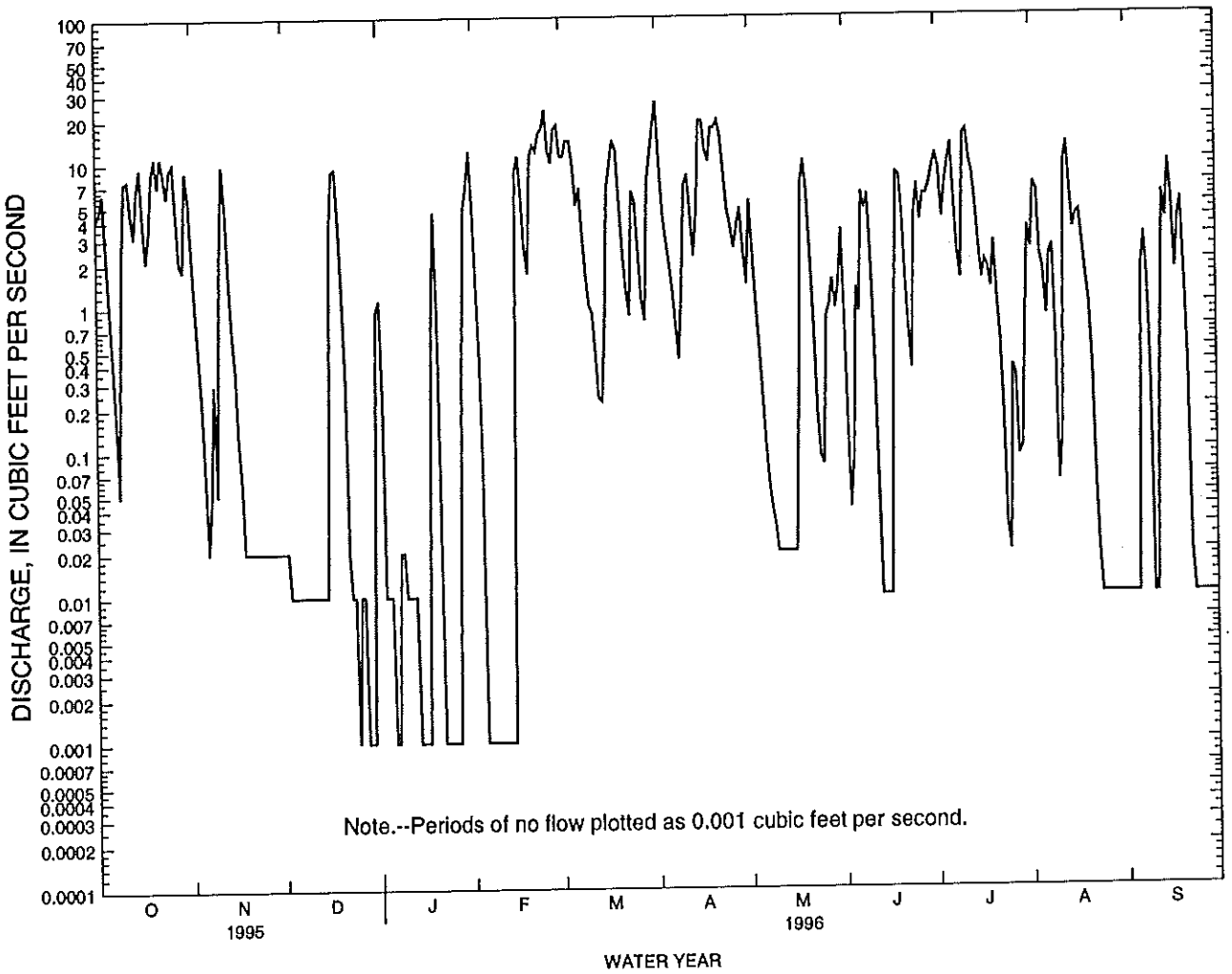
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1996, BY WATER YEAR (WY)

MEAN	3.39	4.59	4.24	3.80	2.99	5.93	7.52	5.42	6.08	7.88	6.60	3.93
MAX	9.75	12.0	12.0	10.6	14.5	23.2	17.7	14.0	13.8	15.8	15.7	10.5
(WY)	1984	1973	1971	1979	1969	1973	1970	1970	1993	1982	1982	1992
MIN	.000	.79	.17	.088	.062	.76	.44	1.00	.55	.49	.55	.33
(WY)	1985	1996	1981	1981	1980	1984	1992	1992	1980	1980	1980	1984

HAWAII, ISLAND OF HAWAII

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1968 - 1996	
ANNUAL TOTAL	1745.96		1229.37			
ANNUAL MEAN	4.78		3.36		5.22	
HIGHEST ANNUAL MEAN					9.22	1994
LOWEST ANNUAL MEAN					1.85	1980
HIGHEST DAILY MEAN	25	Jan 15	26	Apr 1	41	Aug 18 1972
LOWEST DAILY MEAN	.00	Mar 15	.00	Dec 25	.00	Oct 11 1968
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 12	.00	Feb 5	.00	Oct 11 1968
ANNUAL RUNOFF (AC-FT)	3460		2440		3780	
10 PERCENT EXCEEDS	13		10		13	
50 PERCENT EXCEEDS	2.0		1.0		3.0	
90 PERCENT EXCEEDS	.01		.01		.01	



HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04′27″, long 155°40′25″, 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.--Stevens digital and graphic water-stage recorders. Elevation of gage is 3,900 ft above mean sea level, from topographic map.

REMARKS.--Records fair. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--32 years (water years 1965-96), 7.67 ft^3/s (5,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,330 ft^3/s, November 18, 1979, gage height, 12.80 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 12.80 ft; 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)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 25	0230	*280	*5.44	No other peaks greater than base discharge.			

Minimum discharge, 0.22 ft^3/s, February 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	2.0	.32	1.0	2.9	9.2	96	3.5	1.1	15	2.8	.51
2	3.8	1.4	.32	.82	1.3	8.7	13	1.7	.91	7.5	11	.53
3	5.4	1.1	.32	.61	.97	28	2.7	1.2	.81	2.2	6.6	.54
4	2.1	.92	.32	.48	.76	19	1.8	.96	.85	9.3	2.1	.56
5	1.4	.79	.31	.39	.59	6.5	1.4	.82	1.5	8.8	1.7	.57
6	1.1	.71	.29	.37	.47	2.3	1.2	.69	1.3	30	1.4	.57
7	.98	.75	.29	.35	.40	2.9	1.0	.65	3.9	3.0	2.2	1.4
8	.86	.94	.28	.83	.36	1.7	.88	.57	3.4	1.5	2.5	1.4
9	1.6	.78	.27	.95	.32	1.3	1.1	.54	3.9	1.3	1.4	1.2
10	8.1	3.7	.27	.68	.31	1.1	3.0	.50	1.4	45	1.1	.90
11	7.3	14	.27	.55	.28	1.1	4.2	.47	.97	37	1.3	.79
12	2.9	4.0	.27	.43	.26	.95	2.6	.43	.73	8.1	17	1.1
13	1.9	1.6	.27	.39	.24	.82	1.7	.43	.56	5.4	28	3.9
14	19	1.1	.28	.36	.35	.86	5.5	.40	.47	2.9	5.0	3.4
15	11	.89	.30	.31	17	1.3	54	.47	.40	1.8	2.3	9.0
16	3.0	.73	4.9	.31	22	8.8	44	.47	.39	1.4	3.3	3.9
17	2.3	.67	14	.36	4.2	11	15	1.0	1.6	1.7	2.8	1.8
18	3.9	.59	9.2	1.2	1.9	30	5.8	9.5	15	1.8	2.0	2.9
19	15	.56	2.7	4.4	1.5	18	50	13	7.6	1.4	1.6	3.7
20	17	.52	1.3	1.4	21	3.0	30	4.6	2.7	1.7	1.5	1.7
21	7.1	.48	1.0	.95	29	1.7	40	1.7	1.4	1.3	1.2	1.3
22	11	.44	.73	.63	17	1.3	16	1.2	1.1	1.1	1.0	1.0
23	6.9	.41	.57	.44	38	1.1	4.6	.91	1.1	.93	.88	.94
24	3.9	.40	.46	.40	42	2.5	2.3	.78	4.5	.77	.79	.91
25	16	.37	.40	.35	91	2.4	1.9	.81	8.3	.69	.72	.81
26	10	.35	.43	.32	12	1.6	1.5	1.4	2.4	1.2	.68	.75
27	3.3	.34	.39	.36	17	1.3	2.2	1.7	5.0	1.4	.63	.68
28	1.7	.35	.35	.79	30	1.2	3.2	1.6	5.7	1.1	.59	.62
29	1.4	.34	.34	3.5	39	15	1.8	1.3	19	1.2	.56	.61
30	8.3	.34	.32	19	---	21	1.3	1.4	9.1	1.6	.54	.57
31	5.3	---	.51	32	---	57	---	2.0	---	3.7	.54	---
TOTAL	186.54	41.57	41.98	74.93	392.11	262.63	409.68	56.70	107.09	201.79	105.73	48.56
MEAN	6.02	1.39	1.35	2.42	13.5	8.47	13.7	1.83	3.57	6.51	3.41	1.62
MAX	19	14	14	32	91	57	96	13	19	45	28	9.0
MIN	.86	.34	.27	.31	.24	.82	.88	.40	.39	.69	.54	.51
AC-FT	370	82	83	149	778	521	813	112	212	400	210	96

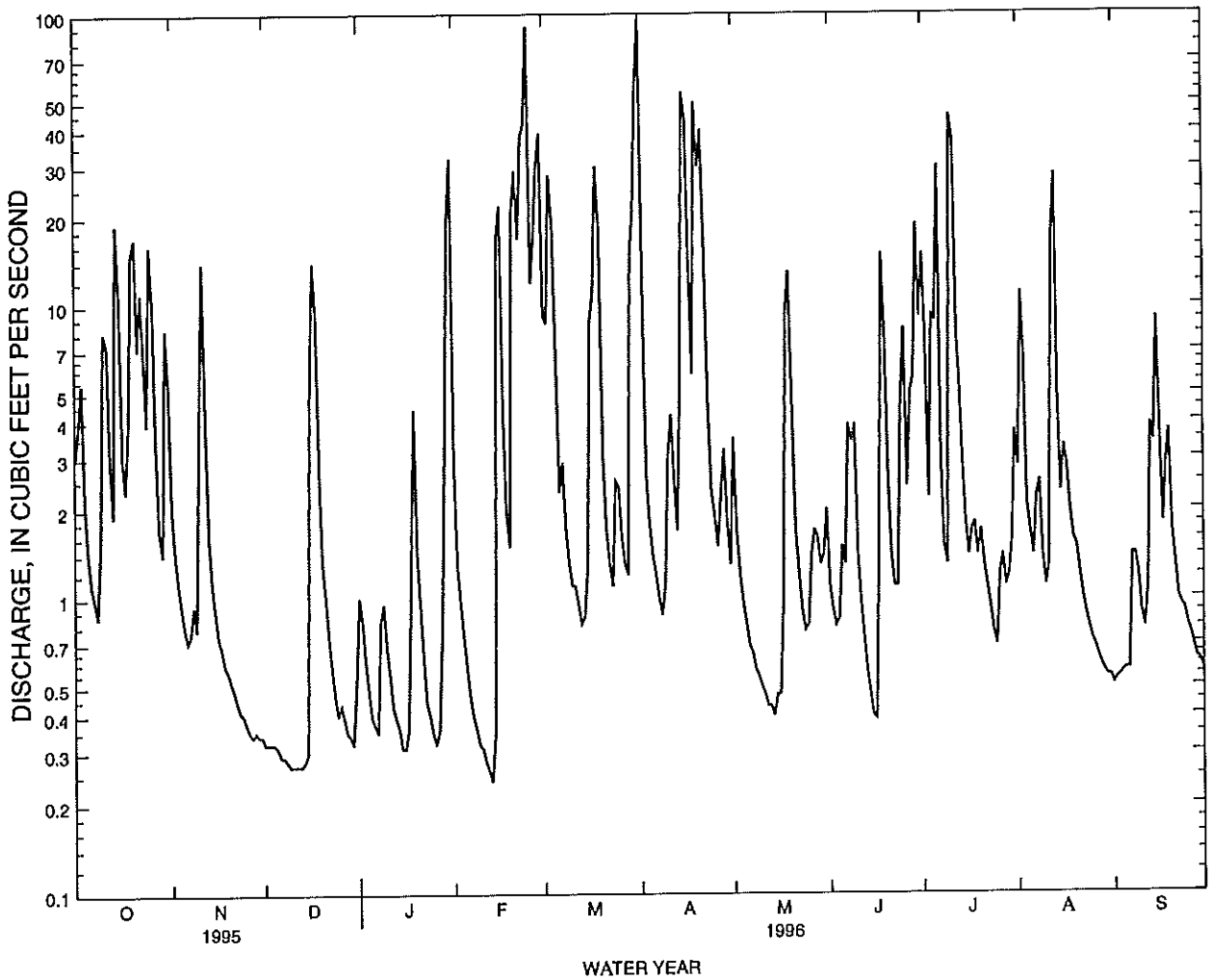
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1996, BY WATER YEAR (WY)

MEAN	4.82	7.86	7.08	7.73	5.73	10.1	11.6	6.88	7.53	10.0	8.11	4.77
MAX	13.5	26.5	16.7	26.4	18.6	37.9	31.6	16.8	21.7	18.7	15.9	17.8
(WY)	1984	1980	1971	1979	1969	1980	1986	1990	1994	1978	1970	1992
MIN	.31	1.07	.54	.46	.40	1.27	.82	1.83	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1993	1983	1992	1996	1985	1981	1971	1965

HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1964 - 1996	
ANNUAL TOTAL	2467.29		1929.31			
ANNUAL MEAN	6.76		5.27		7.67	
HIGHEST ANNUAL MEAN					13.4	1994
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	83	Jan 15	96	Apr 1	338	Nov 18 1979
LOWEST DAILY MEAN	.21	Jun 29	.24	Feb 13	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.27	Dec 8	.27	Dec 8	.04	September 22 1965
ANNUAL RUNOFF (AC-FT)	4890		3830		5560	
10 PERCENT EXCEEDS	20		15		19	
50 PERCENT EXCEEDS	1.7		1.3		3.1	
90 PERCENT EXCEEDS	.34		.36		.56	



HAWAII, ISLAND OF HAWAII

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03′31″, long 155°37′40″, 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 current year.

REVISED RECORDS.--WDR HI-94-1: 1981.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft above mean sea level, from topographic map.

REMARKS.--Records for 1975-1983 poor. Records for 1984-1990, published in WDR: HI-84-1 to HI-90-1 are unreliable and should not be used. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Records for current year good, except for periods of no gage height record which is poor.

AVERAGE DISCHARGE.--11 years (water years 1975-83, 1995-96), 9.36 ft^3/s (6,780 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, 28 ft^3/s, April 1 and April 15 1996; minimum daily discharge, 0.05 ft^3/s, December 30, 1995.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	7.3	.52	1.4	11	17	28	5.4	2.9	6.9	5.1	.39
2	9.3	4.0	.48	1.1	4.4	16	16	4.8	1.9	5.6	7.2	.39
3	12	2.7	.44	.88	2.5	19	13	3.5	1.8	5.0	5.4	.42
4	7.1	2.1	.43	.62	1.7	26	8.2	2.5	2.5	7.7	4.7	.46
5	3.6	1.7	.39	.47	1.2	12	5.6	2.0	5.4	6.0	4.1	.57
6	2.5	1.4	.39	.39	.96	5.4	4.2	1.7	3.5	8.0	3.0	1.1
7	2.0	1.5	.39	.35	.84	13	3.2	1.5	5.5	5.2	3.5	4.5
8	1.6	2.1	.39	1.4	.74	7.6	2.6	1.4	5.7	4.9	4.4	2.7
9	2.9	1.6	.35	1.6	.66	4.6	3.7	1.3	7.6	4.2	2.7	1.6
10	11	7.0	.34	.96	.61	3.5	12	1.2	4.9	7.5	1.7	.91
11	12	17	.31	.65	.54	3.3	14	1.1	3.0	7.8	2.0	.71
12	9.7	12	.31	.46	.48	2.6	11	.97	1.9	5.9	10	.81
13	6.7	5.1	.29	.35	.46	2.1	5.6	.93	1.4	5.6	7.6	10
14	13	3.0	.29	.29	1.5	2.3	11	.88	1.1	5.4	4.9	6.9
15	16	2.3	.32	.23	20	4.3	28	1.4	.98	5.1	4.4	16
16	12	1.7	4.2	.23	19	14	20	1.3	.90	4.1	4.6	12
17	6.8	1.4	11	.31	14	15	13	3.9	.96	4.3	4.6	4.3
18	10	1.3	12	3.9	7.1	18	12	8.4	5.2	4.7	4.2	6.9
19	17	1.2	8.2	13	6.4	16	18	6.8	4.6	3.5	3.5	12
20	17	1.2	3.3	3.1	21	13	10	5.2	4.3	4.4	2.9	3.9
21	13	1.0	1.8	1.0	19	6.7	13	4.5	3.8	3.4	2.0	2.0
22	16	.90	1.1	.42	17	4.3	7.4	2.9	2.7	2.6	1.4	1.2
23	13	.77	.80	.26	19	3.5	6.0	1.9	2.1	1.8	1.1	.96
24	11	.72	.66	.21	20	16	5.3	1.6	4.0	1.4	.90	.93
25	14	.66	.56	.59	11	13	5.2	2.2	5.1	1.2	.79	.77
26	16	.62	.62	.42	.71	7.2	5.0	4.8	5.2	2.1	.71	.66
27	11	.57	.52	.41	6.6	4.2	5.4	4.5	5.9	3.3	.64	.56
28	5.7	.57	.24	6.8	24	7.0	5.5	4.0	5.6	1.9	.57	.48
29	5.3	.56	.06	14	23	20	5.0	3.3	7.2	1.8	.51	.42
30	19	.52	.05	12	---	19	4.5	2.9	5.5	2.7	.48	.37
31	15	---	.32	18	---	23	---	4.5	---	3.7	.43	---
TOTAL	321.2	84.49	51.07	85.80	255.40	338.6	301.4	93.28	113.14	137.7	100.03	94.91
MEAN	10.4	2.82	1.65	2.77	8.81	10.9	10.0	3.01	3.77	4.44	3.23	3.16
MAX	19	17	12	18	24	26	28	8.4	7.6	8.0	10	16
MIN	1.6	.52	.05	.21	.46	2.1	2.6	.88	.90	1.2	.43	.37
AC-FT	637	168	101	170	507	672	598	185	224	273	198	188

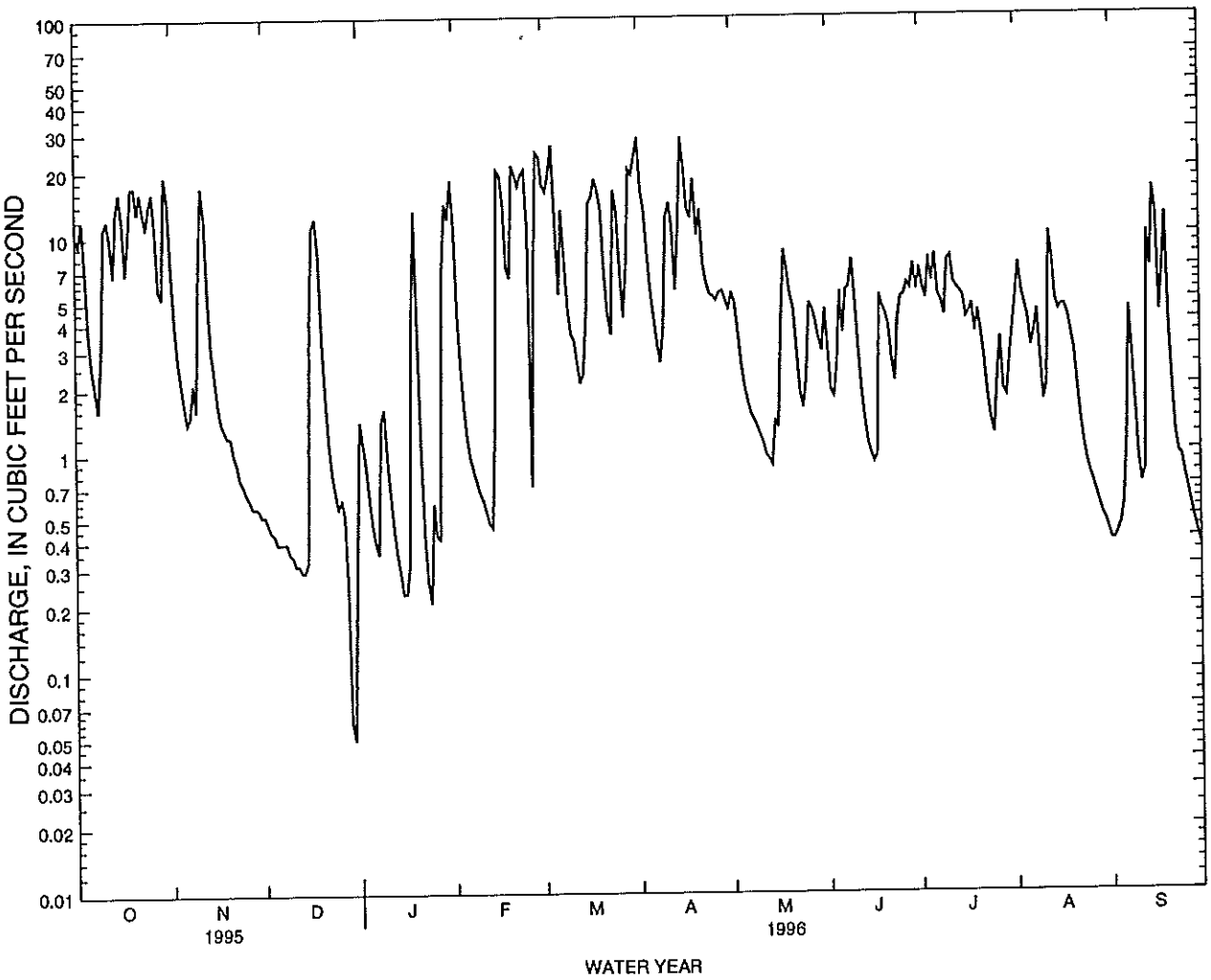
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1996, BY WATER YEAR (WY)

MEAN	7.42	9.56	7.21	5.39	5.35	12.2	13.0	10.4	8.65	13.7	11.4	7.71
MAX	12.9	17.4	12.6	9.93	11.4	19.7	21.7	20.2	15.6	26.0	19.6	16.9
(WY)	1976	1977	1979	1978	1975	1982	1977	1983	1983	1978	1978	1982
MIN	1.18	2.82	.79	.31	.63	3.61	2.76	2.65	3.03	2.84	2.23	2.95
(WY)	1975	1996	1981	1981	1995	1995	1981	1981	1981	1981	1979	1981

HAWAII, ISLAND OF HAWAII

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1975 - 1996		
ANNUAL TOTAL	2549.63		1977.02				
ANNUAL MEAN	6.99		5.40		9.36		
HIGHEST ANNUAL MEAN					14.1		1982
LOWEST ANNUAL MEAN					3.80		1981
HIGHEST DAILY MEAN	27	Apr 23	28	Apr 1	48	Apr 6	1977
LOWEST DAILY MEAN	.05	Dec 30	.05	Dec 30	.00	Oct 1	1974
ANNUAL SEVEN-DAY MINIMUM	.15	Feb 20	.32	Dec 9	.00	Oct 1	1974
ANNUAL RUNOFF (AC-FT)	5060		3920		6780		
10 PERCENT EXCEEDS	17		14		24		
50 PERCENT EXCEEDS	5.1		3.5		5.8		
90 PERCENT EXCEEDS	.35		.46		.49		



HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02′53″, long 155°37′17″, Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge, and 4.0 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft above mean sea level, from topographic map.

REMARKS.--Records rated good. Ditch diverts water from above into Waimea Reservoir for use in vicinity of Kamuela. Although the shift curve for 1995 was found slightly askew, no revisions were made and there was no downgrade in accuracy. It was felt that the daily discharges would not change by much and that 95 percent of daily discharges are within 5 percent of the true discharges.

AVERAGE DISCHARGE.--19 years (water years 1978-96), 1.66 ft^3/s (1,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s, April 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 17 ft^3/s, February 20; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	.00	.00	.00	8.0	.00	.35	.00	.00	.00	.00	.00
2	1.4	.00	.00	.00	2.8	.00	.04	.00	.00	.00	.00	.00
3	2.9	.00	.00	.00	1.4	.01	.03	.00	.00	.00	.00	.00
4	2.3	.00	.00	.00	.67	.00	.02	.00	.00	.00	.00	.00
5	1.1	.00	.00	.00	.13	.00	.02	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.22
8	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00
9	.06	.00	.00	.00	.00	.00	.01	.00	.01	.00	.00	.00
10	1.4	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
11	2.5	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
12	3.7	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
13	1.9	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.18
14	.00	.00	.00	.00	.11	.00	.03	.00	.00	.00	.22	.00
15	.00	.00	.00	.00	7.2	.00	.06	.00	.00	.00	.00	.59
16	.18	.00	.17	.00	9.7	.00	.03	.00	.00	.00	.00	5.4
17	.38	.00	.00	.00	10	.00	.03	.00	.00	.13	.00	1.3
18	.00	.00	1.7	.81	5.3	.00	.02	.00	.00	.00	.00	.97
19	.00	.00	2.4	3.2	4.5	.00	.04	.00	.00	.00	.00	5.5
20	.00	.00	.55	.00	17	.00	.01	.00	.00	.00	.00	1.1
21	.00	.00	.00	.00	7.2	.00	.01	.00	.00	.00	.00	.03
22	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.96	4.8	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	1.5	1.2	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	6.3	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	13	---	.00	---	.00	---	.00	.00	---
TOTAL	23.02	0.00	4.82	25.77	81.06	0.01	0.82	0.00	0.01	0.13	0.22	15.29
MEAN	.74	.000	.16	.83	2.80	.000	.027	.000	.000	.004	.007	.51
MAX	5.2	.00	2.4	13	17	.01	.35	.00	.01	.13	.22	5.5
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	46	.00	9.6	51	161	.02	1.6	.00	.02	.3	.4	30

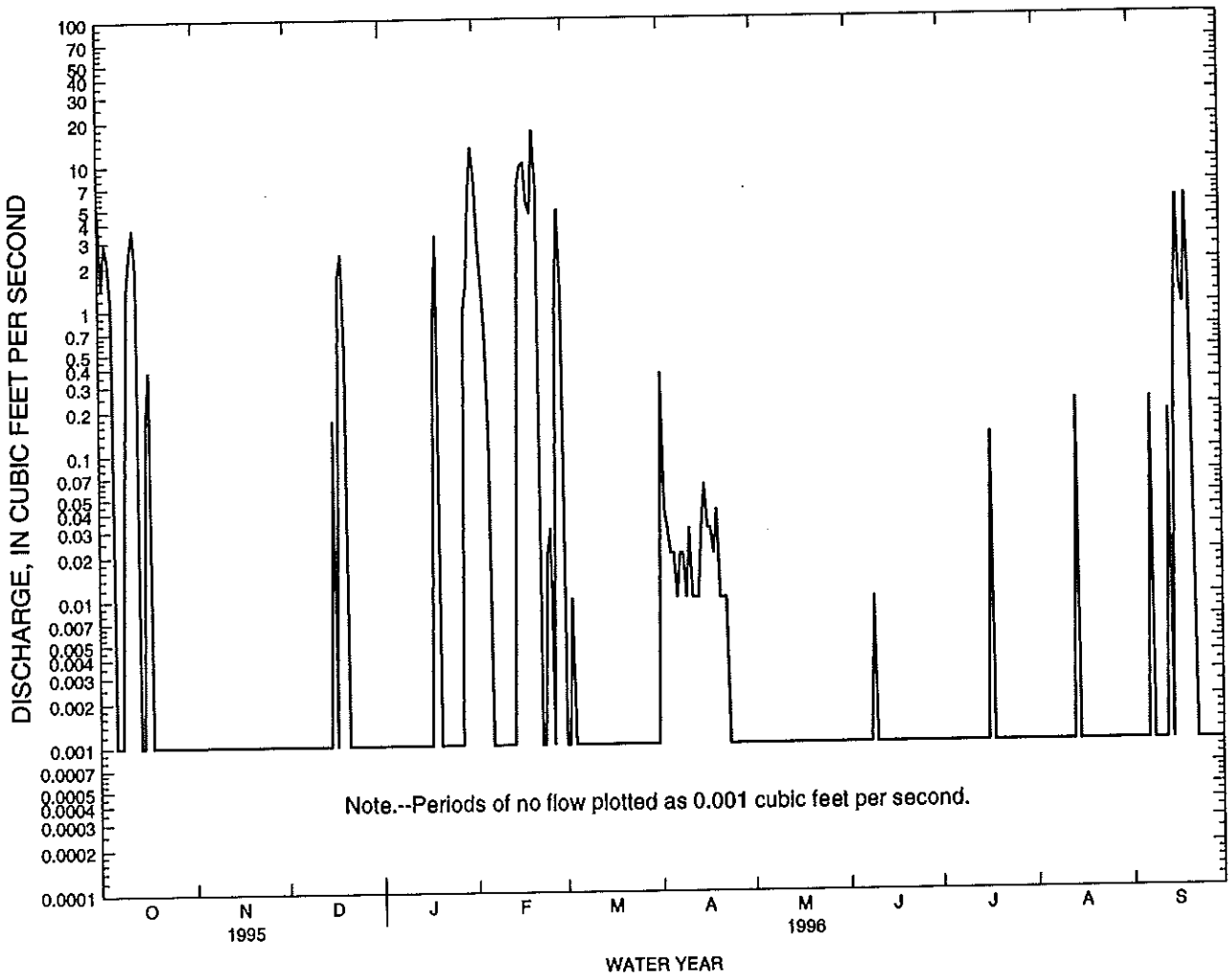
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1996, BY WATER YEAR (WY)

MEAN	1.38	2.27	1.55	1.52	1.08	2.37	2.51	1.63	1.76	1.70	1.48	.64
MAX	6.36	10.1	5.46	8.23	4.56	15.2	13.9	9.55	11.6	9.04	10.8	4.44
(WY)	1986	1988	1988	1987	1988	1985	1986	1986	1986	1978	1985	1985
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1985	1990	1989	1989	1993	1989	1993	1983	1983	1980	1984	1984

HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1995 CALENDAR YEAR		FOR 1996 WATER YEAR		WATER YEARS 1978 - 1996		
ANNUAL TOTAL	83.22		151.15				
ANNUAL MEAN	.23		.41		1.66		
HIGHEST ANNUAL MEAN					6.79		1986
LOWEST ANNUAL MEAN					.007		1990
HIGHEST DAILY MEAN	8.1	Mar 29	17	Feb 20	42	Apr 16	1985
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 6	.00	Oct 1	1977
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 18	.00	Oct 1	1977
ANNUAL RUNOFF (AC-FT)	165		300		1200		
10 PERCENT EXCEEDS	.00		.61		5.6		
50 PERCENT EXCEEDS	.00		.00		.00		
90 PERCENT EXCEEDS	.00		.00		.00		



HAWAII, ISLAND OF HAWAII

16756000 KOHAKOHAU STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

THE RECORDS FOR WATER YEARS 1992-96 WERE NOT COMPUTED
AT THE TIME OF PUBLICATION

HAWAII, ISLAND OF HAWAII

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02′28″, long 155°39′05″, 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 current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since February 27, 1963. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply benchmark).

REMARKS.--Records good except for discharges less than 2.0 ft^3/s, which are poor. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--35 years (water years 1957-91), 1.67 ft^3/s (1,210 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s, November 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/s on basis of slope-conveyance study; maximum gage height, 4.65 ft, October 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR (Water year 1991).--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 09	0400	114	2.82	Mar. 12	2200	136	2.93
Dec. 24	2230	94	2.69	Aug. 07	1730	190	3.18
Jan. 27	2400	*368	*3.72				

Minimum daily discharge, 0.31 ft^3/s, March 2, 3.

REVISIONS.--Revised daily discharges, in cubic feet per second, for periods in water years 1969, 1977, 1979, and 1987, are given below. These figures supersede those published in the annual report for water years 1969, 1977, 1979, and 1987. All daily discharges less than 2.0 ft^3/s, for the period of record, have been downgraded to poor. All annual minimum daily discharge for water years 1967-90 are subject to considerable error and should not be used for regional hydrologic studies of low-flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
DAILY MEAN VALUES

Nov. 25	e.10	Dec. 5	e4.0	Dec. 13	e23	Dec. 21	e.35
Nov. 26	e.15	Dec. 6	e1.3	Dec. 14	e5.0	Dec. 22	e.33
Nov. 27	e.10	Dec. 7	e.70	Dec. 15	e1.8	Dec. 23	e.30
Nov. 28	e.50	Dec. 8	e.40	Dec. 16	e4.0	Dec. 24	e.27
Nov. 29	e2.0	Dec. 9	e.22	Dec. 17	e7.0	Dec. 25	e.25
Nov. 30	e.70	Dec. 10	e.15	Dec. 18	e1.5	Dec. 26	e.27
Dec. 1	e.15	Dec. 11	e.11	Dec. 19	e.80	Dec. 28	e.30
Dec. 2	e.30	Dec. 12	e.50	Dec. 20	e.40	Dec. 29	e.23
Dec. 4	e7.2						

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Nov. 1968	4.51	.15	2.0	.00	8.9
Dec. 1968	63.58	2.05	23	.11	126
CAL YR 1968	511.83	1.40	32	.00	1,020
WTR YR 1969	738.80	2.02	31	.00	1,470

e Estimated

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
DAILY MEAN VALUES

Mar. 25	.92	Mar. 29	1.9	Apr. 2	.22	Apr. 18	.55
Mar. 26	.55	Mar. 30	.50	Apr. 3	2.3	Apr. 19	.45
Mar. 27	.37	Mar. 31	.41	Apr. 16	.83	Apr. 20	5.7
Mar. 28	2.4	Apr. 1	.28	Apr. 17	.67		

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Mar. 1977	46.42	1.50	7.6	.08	92
Apr. 1977	187.71	6.26	42	.22	372
CAL YR 1976	459.67	1.26	26	.06	912
WTR YR 1977	629.80	1.73	42	.02	1,250

HAWAII, ISLAND OF HAWAII

16759000 HAUANI GULCH NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
DAILY MEAN VALUES

Jan. 9	e2.2	Jan. 18	e8.1	Jan. 27	e.96	Feb. 5	e.60
Jan. 10	e29	Jan. 19	e4.9	Jan. 28	e.79	Feb. 6	e.70
Jan. 11	e61	Jan. 20	e69	Jan. 29	e2.4	Feb. 7	e11
Jan. 12	e53	Jan. 21	e23	Jan. 30	e.86	Feb. 8	e7.0
Jan. 13	e53	Jan. 22	e4.8	Jan. 31	e.67	Feb. 9	e4.0
Jan. 14	e35	Jan. 23	e2.1	Feb. 1	e.5	Feb. 10	e7.1
Jan. 15	e8.0	Jan. 24	e1.8	Feb. 2	e1.6	Feb. 11	e4.6
Jan. 16	e2.2	Jan. 25	e1.4	Feb. 3	e2.5	Feb. 12	e3.5
Jan. 17	e1.3	Jan. 26	e1.1	Feb. 4	e.71	Mar. 27	.50

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Jan.1979	368.49	11.9	69	.20	731
Feb. 1979	128.41	4.59	29	.54	255
Mar. 1979	74.29	2.40	35	.50	147
CAL YR 1978	601.58	1.65	73	.08	1,190
WTR YR 1979	1,025.50	2.81	73	.07	2,030

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
DAILY MEAN VALUES

Feb. 3	.55	Feb. 12	.34	Feb. 21	.72	Mar. 2	.50
Feb. 4	.50	Feb. 13	.50	Feb. 22	.55	Mar. 3	.88
Feb. 5	.45	Feb. 14	.55	Feb. 23	.50	Mar. 4	.50
Feb. 6	.45	Feb. 15	.45	Feb. 24	.45	Mar. 5	.41
Feb. 7	.45	Feb. 16	.61	Feb. 25	.88	Mar. 6	.37
Feb. 8	.41	Feb. 17	4.0	Feb. 26	.67	Mar. 7	.41
Feb. 9	.37	Feb. 18	3.9	Feb. 27	.45	Mar. 8	1.2
Feb. 10	.37	Feb. 19	1.9	Feb. 28	.41	Mar. 9	.82
Feb. 11	.34	Feb. 20	1.7	Mar. 1	.37	Mar. 10	.50

MONTH	TOTAL	MEAN	MAX	MIN	AC-FT
Feb. 1987	23.92	.85	4.0	.34	47
Mar. 1987	16.28	.53	1.2	.36	32
CAL YR 1986	1,020.04	2.79	104	.12	2,020
WTR YR 1987	879.45	2.41	37	.28	1,740

e Estimated

HAWAII, ISLAND OF HAWAII

16759000 HAUANI GULCH NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	Nov.	JUN	JUL	AUG	SEP
1	1.6	.82	.65	.61	.61	.33	8.4	2.3	1.2	1.4	3.8	.70
2	1.2	.77	.61	.58	.55	.31	2.1	1.0	1.6	1.2	1.5	.67
3	2.2	.72	.58	.55	.52	.31	3.2	.88	1.2	.93	3.4	4.5
4	1.9	.69	.56	.53	.48	.32	4.5	1.7	1.0	.85	4.7	3.8
5	2.0	.67	.61	.51	.45	.35	22	2.5	.97	.77	2.6	1.1
6	1.2	.64	.82	.73	.43	.54	8.5	1.0	.92	.70	8.2	.86
7	1.0	.58	.99	.88	.41	2.8	2.7	1.3	4.5	.69	56	.88
8	.96	.55	17	.75	.41	6.3	3.0	1.4	1.5	.65	4.1	1.5
9	.90	.54	64	.57	.40	5.1	1.2	.96	1.1	.64	2.7	.95
10	.88	.53	5.8	2.4	.37	1.5	.94	.82	.88	5.0	1.8	2.8
11	4.9	.50	1.6	1.2	.37	4.8	.84	.77	.82	5.1	1.2	1.7
12	2.0	.50	1.1	.72	.37	24	.82	.73	.85	1.2	5.2	1.5
13	1.5	.52	1.3	.59	2.8	38	1.1	1.5	.99	2.7	2.6	1.8
14	2.1	13	1.7	.54	3.8	52	.80	9.7	1.9	1.7	1.2	.88
15	6.6	5.1	.96	.58	.69	28	.78	11	5.7	2.2	.95	.80
16	5.7	1.7	.77	1.3	.51	19	.74	2.3	1.2	1.7	.86	.95
17	2.7	1.0	.70	1.1	.43	26	.69	2.0	2.0	1.0	.97	.96
18	3.5	17	6.1	.61	.39	4.4	.67	1.6	2.1	3.2	1.1	.73
19	1.9	7.3	1.8	.53	.40	2.4	.70	1.2	1.1	2.2	.91	.70
20	1.3	3.6	3.0	.51	.56	2.0	.67	.86	.81	1.4	1.0	.70
21	1.1	1.6	1.3	.49	.89	1.3	.62	.78	.73	.95	.78	.60
22	1.1	1.0	1.6	.46	.70	.98	.62	.73	.68	.94	.70	.55
23	2.1	5.0	3.3	1.2	.41	.83	.89	.69	.66	.90	.63	.55
24	1.6	3.0	7.2	.61	.39	.75	2.8	.66	.67	1.7	.61	.53
25	1.3	1.3	3.1	.51	.54	.69	1.8	.60	4.8	1.5	.58	.50
26	1.1	.95	1.0	.46	.38	.63	1.3	1.3	5.3	3.3	.55	.50
27	1.0	.83	.83	41	.34	1.0	1.3	2.4	1.6	.98	10	.47
28	.90	.77	.83	30	.32	1.1	4.9	4.4	3.1	.93	4.7	.44
29	1.6	.72	.78	1.7	---	1.2	3.4	7.2	1.9	13	1.8	.45
30	4.5	.70	.69	.82	---	2.7	7.7	2.4	1.6	16	.91	.41
31	.99	---	.64	.69	---	2.9	---	1.5	---	2.4	.78	---
TOTAL	63.33	72.60	131.92	93.73	18.92	232.54	89.68	68.18	53.38	77.83	126.83	33.48
MEAN	2.04	2.42	4.26	3.02	.68	7.50	2.99	2.20	1.78	2.51	4.09	1.12
MAX	6.6	17	64	41	3.8	52	22	11	5.7	16	56	4.5
MIN	.88	.50	.56	.46	.32	.31	.62	.60	.66	.64	.55	.41
AC-FT	126	144	262	186	38	461	178	135	106	154	252	66

CAL YR 1990 TOTAL 971.31 MEAN 2.66 MAX 64 MIN .09 AC-FT 1930
WTR YR 1991 TOTAL 1062.42 MEAN 2.91 MAX 64 MIN .31 AC-FT 2110

HAWAII, ISLAND OF HAWAII

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

RECORDS BEING REVIEWED

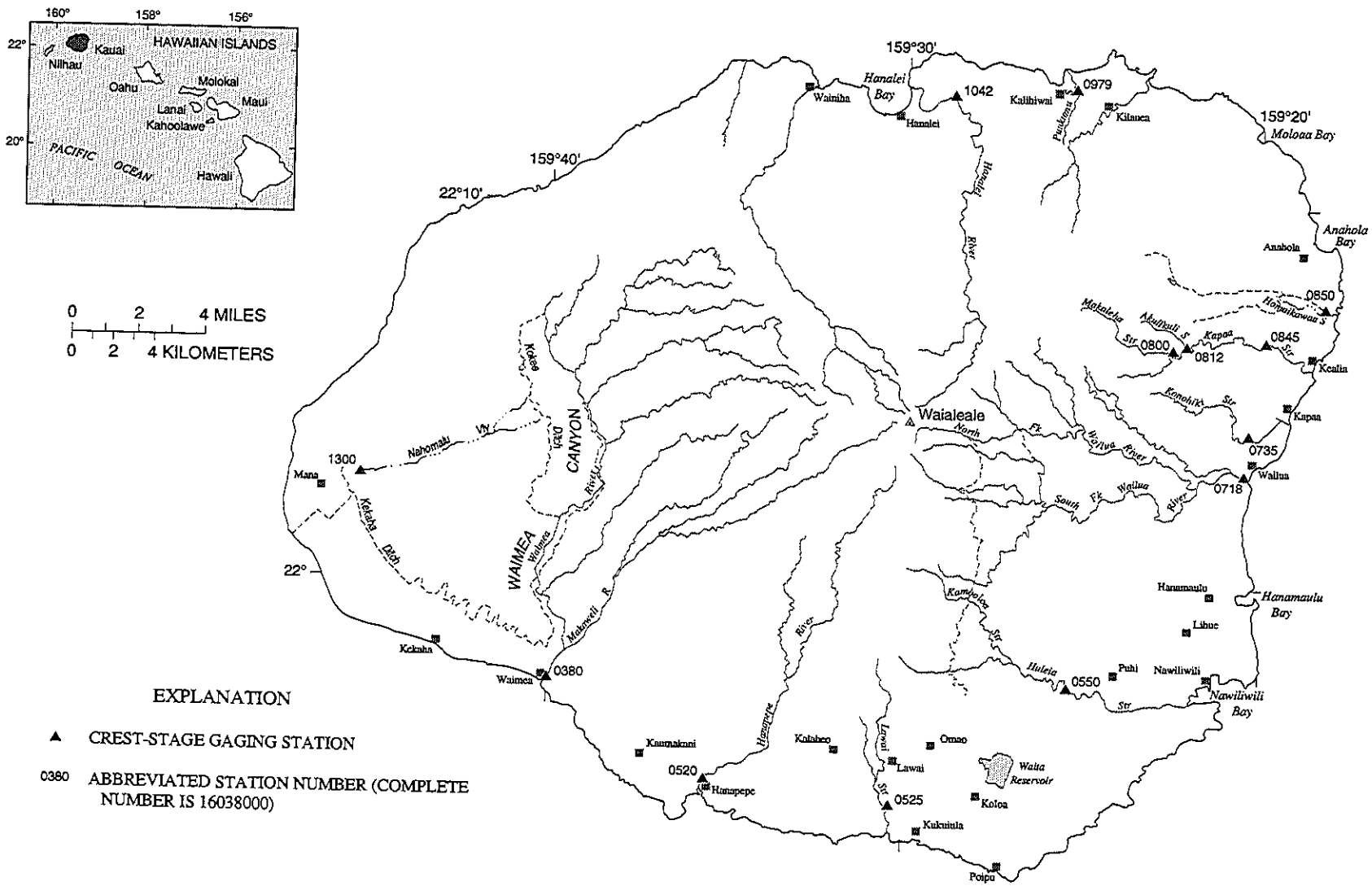


Figure 10. Locations of crest-stage gaging stations on Kauai.

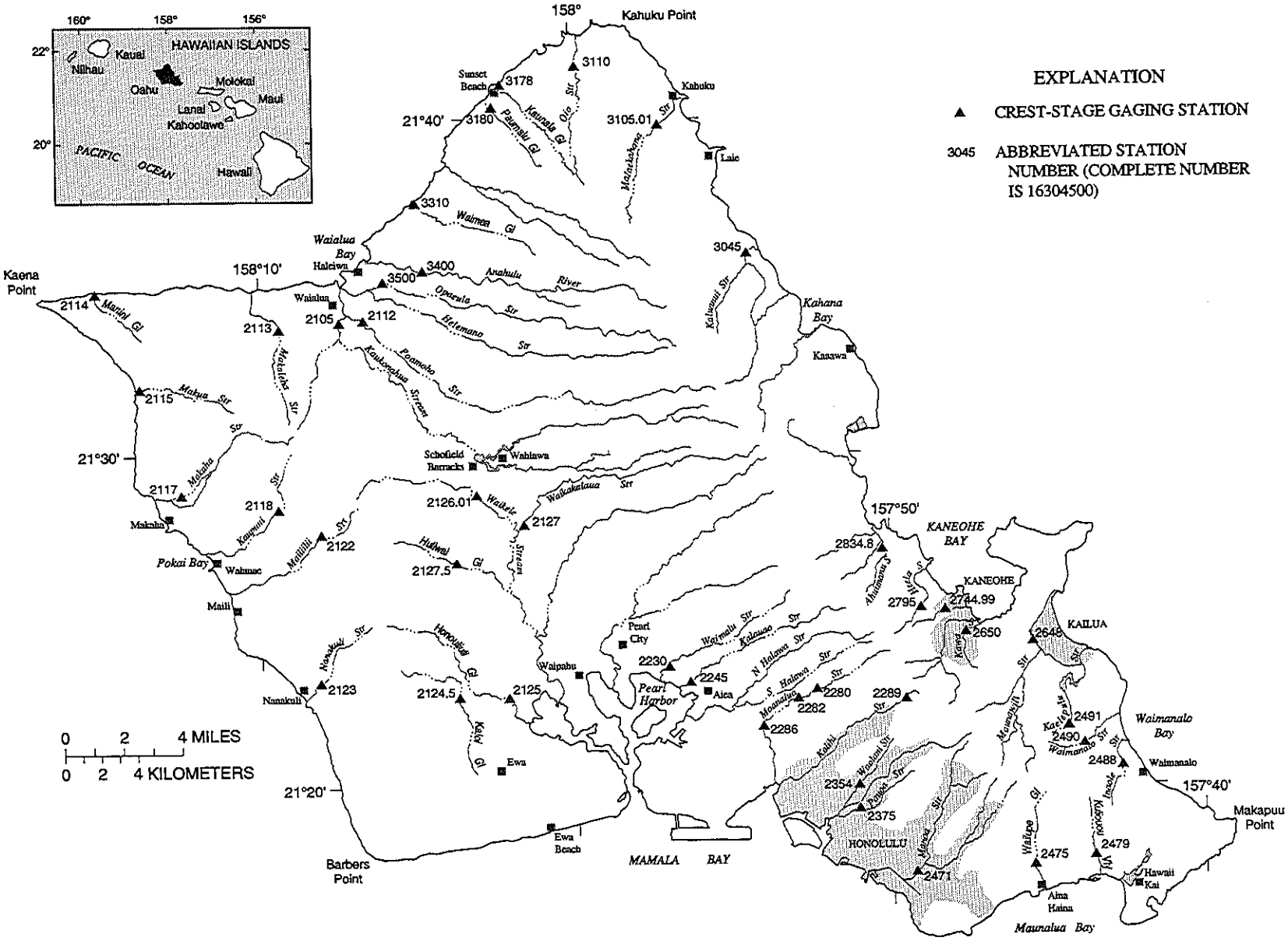


Figure 11. Locations of crest-stage gaging stations on Oahu.

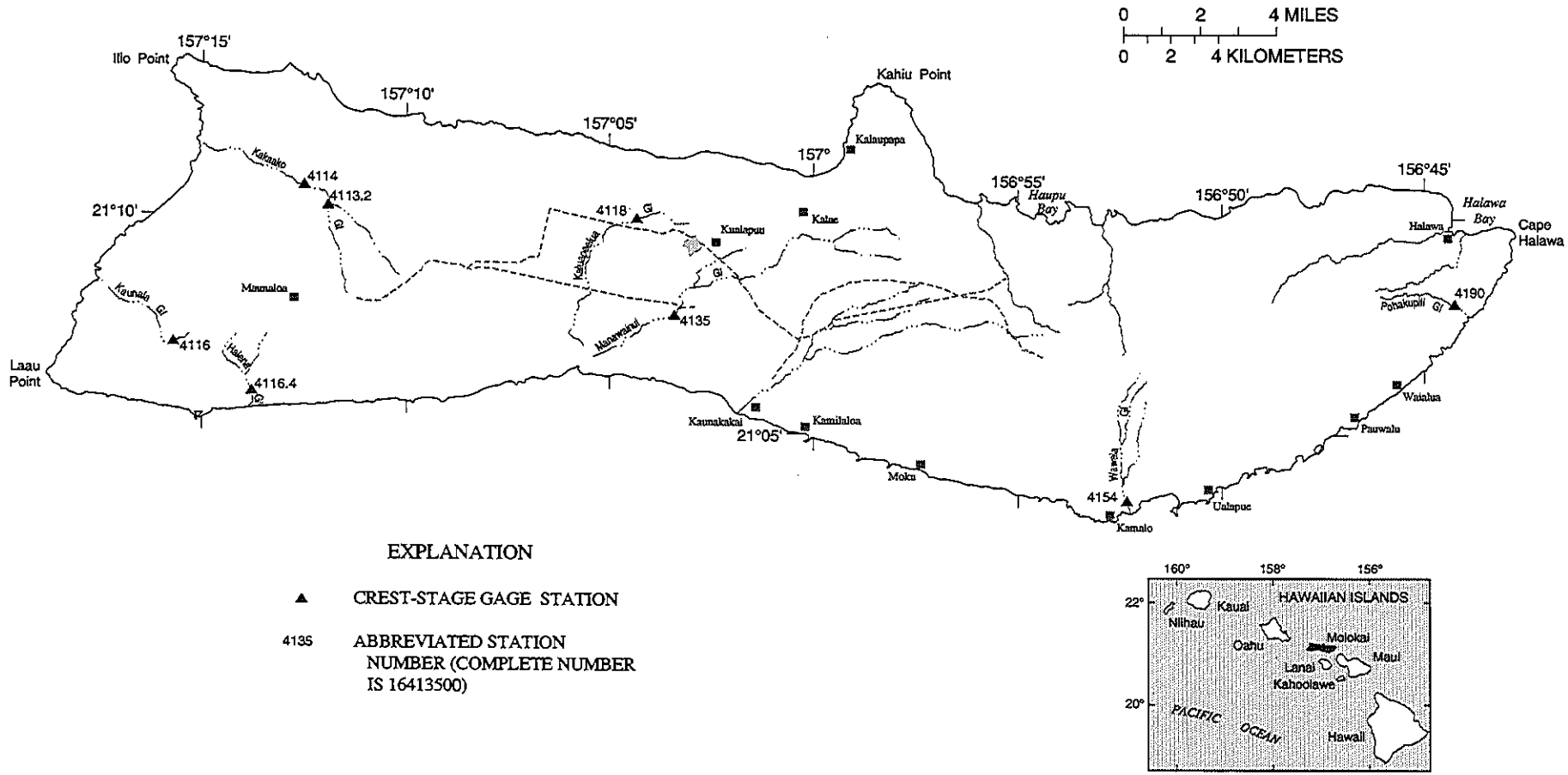


Figure 12. Locations of crest-stage gaging stations on Molokai.

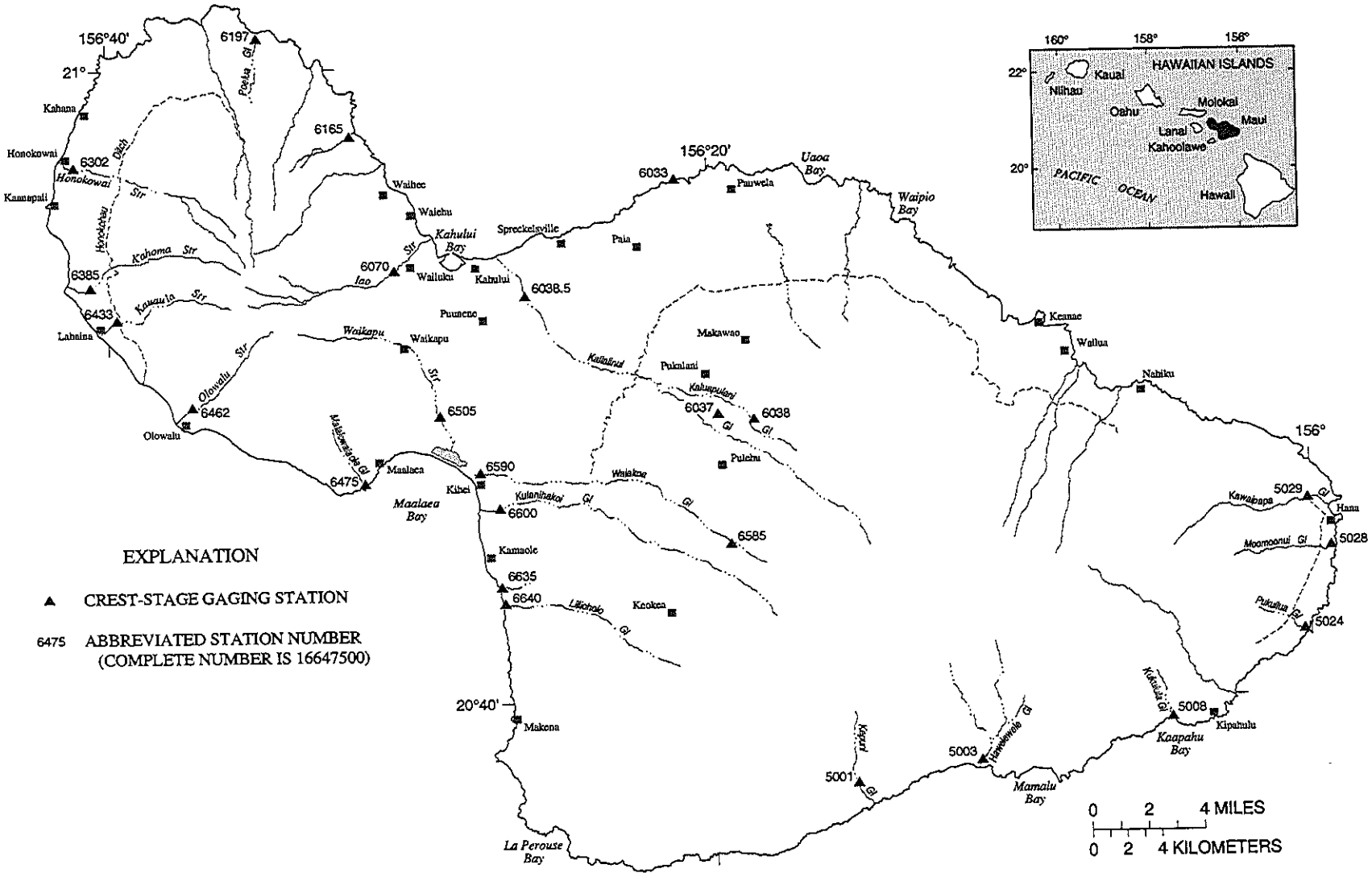


Figure 13. Locations of crest-stage gaging stations on Maui.

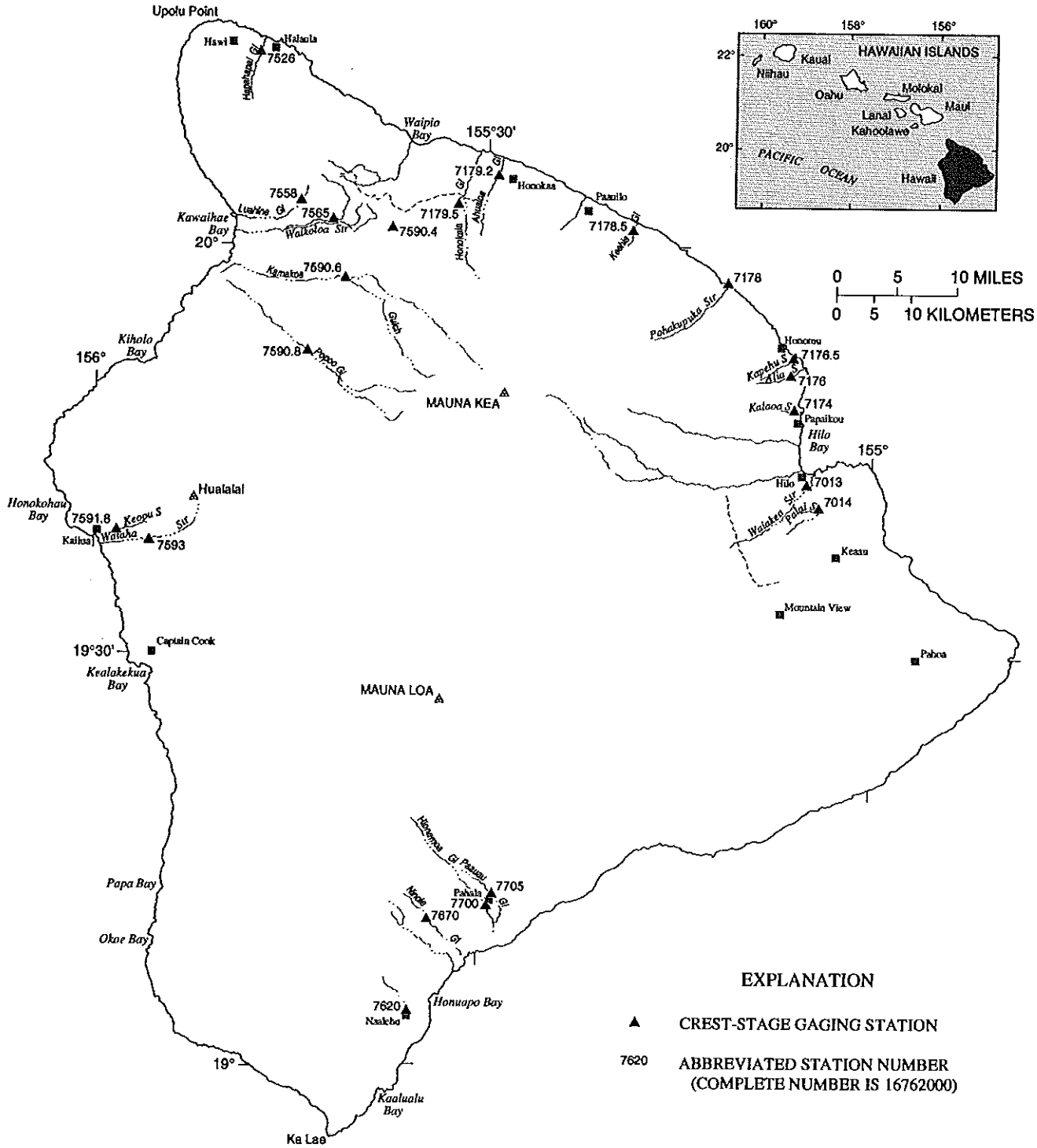


Figure 14. Locations of crest-stage gaging stations on Hawaii.

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 crest-stage partial-record stations are presented in the following table. Discharge measurements made at miscellaneous sites are given in a separate table.

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.

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				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	1944-96b	11-03-95	7.97	-	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	1950-96b	06-30-96	5.03	-	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≠ 1973-96	11-09-95	4.98	1,540	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≠, 1971-96	11-03-95	16.97	12,000	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	1962-96b	11-03-95	7.92	-	11-26-70	8.57	-
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, 1970-96	11-03-95	10.94	490	12-14-91	16.92	2,530
16080000 Kapaa Str at Kapahi ditch intake nr Kapaa	Lat 22°06′15″, long 159°22′29″, on right bank at Kapahi ditch intake, 3.8 mi northwest of Kapaa, and 4.3 mi northwest of Wailua.	3.86	1936-85≠, 1986-96	11-03-95	4.37	4,830	12-14-91	5.66	9,660
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	1964-96	11-03-95	7.55	700	12-14-91	11.40	1,550

≠ Operated as a continuous-record gaging station
b Gage height only

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi²)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft³/s)	Date	Gage height (ft)	Dis-charge (ft³/s)
			Island of Kauai--Continued						
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	1962-96	11-03-95	17.21	15,900	12-14-91	23.11	30,330
16085000 Homaikawaa Str nr Kealia	Lat 22°07′23″, long 159°18′12″, at culvert on Highway 56, 1.6 mi southeast of Anahola School, and 1.6 mi north of Kealia.	0.85	1964-96	Destroyed by flood of 2-14-91.			12-14-91	-	e3,800
16097900 Puukumu Str nr Kilauea	Lat 22°13′01″, 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, 1971-96	11-03-95	14.77	1,240	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	1963-96b	11-03-95	13.82	-	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≠, 1972-96	11-03-95	6.01	684	04-15-72	7.15	2,120
			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, 1968-96	01-25-96	19.50	2,050	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	1967-96	01-25-96	11.28	1,200	04-19-74	24.0	7,340
16211300 Makaleha Str nr Waialua	Lat 21°33′49″, long 158°09′21″, 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of sugar mill at Waialua.	4.15	1958-63, 1964-65≠ 1966-96	01-25-96	4.92	e500	11-13-65	7.41	3,640
16211400 Manini Gulch at Kaena	Lat 21°34′50″, long 158°15′12″, 180 ft upstream from Highway 99, 1.7 mi west of Camp Erdman, and 2.0 mi east of Kaena Point.	1.08	1974-96	01-25-96	12.78	174	01-01-88	19.61	1,000
16211500 Makua Str at Makua	Lat 21°31′59″, long 158°13′49″, on left bank 20 ft upstream from old concrete highway ford, 140 ft downstream from Farrington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-96	01-24-96	8.86	e380	02-07-76	a8.00	3,220
16211700 Makaha Str at Makaha	Lat 21°28′47″, long 158°12′31″, 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-96	01-24-96	8.31	e350	02-07-76	16.40	4,310

≠ Operated as a continuous-record gaging station
a At old gage datum
b Gage height only
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Oahu--Continued									
16211800 Kaupuni Str at altitude 372 ft, nr Waianae	Lat 21°28′20″, long 158°09′26″, at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72≠, 1973-96	06-13-96	4.03	e600	01-06-82	7.82	3,640
16212200 Mailiilii Str nr Waianae	Lat 21°27′34″, long 158°08′05″, at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery nr Waianae.	1.51	1958-96	06-13-96	2.68	e100	01-06-82	7.20	2,460
16212300 Nanakulti Str at Nanakuli	Lat 21°23′08″, long 158°08′11″, 0.7 mi upstream from Highway 90 and 0.6 mi northeast of Nanakuli Post Office.	3.98	1968-96	06-13-96	24.95	e300	02-07-76	26.20	3,320
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	1968-96	06-13-96	3.18	115	01-08-80	7.45	724
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	1956-96	06-13-96	1.33	87	01-06-82	10.28	3,500
16212601 Waikele Str at Wheeler Field	Lat 21°28′44″, long 158°03′07″, at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-96	01-25-96	5.53	248	01-06-82	22.50	1,850
16212700 Waikakalaua Str nr Wahiawa	Lat 21°27′50″, long 158°01′38″, 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	7.49	1958-96	01-25-96	7.51	1,000	04-15-63	16.50	4,830
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.	0.84	1974-96	01-25-96	-	e103	02-10-79	8.36	600
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 northwest of Aiea High School.	5.97	1952-70≠, 1973-96	01-25-96	3.12	1,550	01-05-68	6.82	8,020
16224500 Kalauao Str at Moanalua Road, at Aiea	Lat 21°23′07″, long 157°56′22″, on left bank at downstream side 1984-96 of Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	2.59	1957-82≠,	01-25-96	-	e1,000	05-14-63	6.63	2,580
16228000 Moanalua Str nr Honolulu	Lat 21°22′53″, long 157°52′22″, on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78≠, 1979-96	01-25-96	6.97	1,030	11-18-30	11.58	4,580
16228200 Moanalua Str 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	1969-96	01-25-96	4.97	1,280	03-18-80	9.97	4,860

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi²)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft³/s)	Date	Gage height (ft)	Dis-charge (ft³/s)
			Island of Oahu--Continued						
16228600 Moanalua Str at Tripler Hospital	Lat 21°21′52″, long 157°54′05″, on right bank 0.5 mi west of Tripler Hospital and 1.6 mi northeast of Aliamanu School.	4.44	1971-96	01-25-96	14.94	e1,500	03-08-80	21.0	6,200
16228900 Kalihi Str nr Kaneohe	Lat 21°22′35″, long 157°49′32″, on right bank 800 ft down- stream from Likelike Highway and 2.8 mi south-west of Castle High School in Kaneohe.	0.60	1967-71≠, 1972-96	01-25-96	4.64	1,000	01-08-80	5.60	1,700
16235400 Waolani Str at Honolulu	Lat 21°20′00″, long 157°51′04″, at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.28	1958-96	11-01-95	1.41	227	05-14-63	6.14	2,500
16237500 Pauoa Str at Hono-lulu	Lat 21°19′18″, long 157°51′03″, at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-96	01-25-96	0.36	185	05-14-63	4.65	2,200
16247100 Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17′24″, long 157°49′17″, on left bank at Kaimuki High School, 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of dis-charge into Ala Wai Canal.	10.6	1968-96	01-25-96	5.82	1,610	12-18-67	12.6	10,100
16247500 Wailupe Gulch at Aina Haina	Lat 21°17′46″, long 157°45′29″, at Ani Street bridge and 1.0 mi upstream from Kalanianaole High-way in Aina Haina.	2.35	1958-96	12-01-95	1.09	308	12-18-67	5.72	3,600
16247900 Kuliouou Valley at Kuliouou	Lat 21°17′50″, long 157°43′35″, at Kuliouou, 300 ft downstream of sin-gle-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-96	01-25-96	29.83	1,420	12-31-87	36.55	4,700
16248800 Inoaole Str at Waimanalo	Lat 21°29′31″, long 157°42′40″, 30 ft upstream from culvert on Hihimanu Street and 0.8 mi northwest of Waimanalo Post Office.	1.21	1958-96	01-25-96	-	e375	05-07-81	7.55	1,600
16249000 Waimanalo Str at Waimanalo	Lat 21°21′12″, long 157°43′52″, on right bank 40 ft upstream from Highway 72 and 2.3 mi northeast of Waimanalo Post Office.	2.16	1967-70≠, 1971-96	01-25-96	7.85	1,500	11-26-70	10.0	4,560
16249100 Kaelepulu Str trib-utary 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	1963-96	01-25-96	7.04	423	12-31-87	7.53	467
16264800 Kawainui Canal at Kailua	Lat 21°24′15″, long 157°45′28″, at head of canal and 1.2 mi northwest of Kailua Post Office.	11.0	1957-60, 1963-64, 1967-96b	01-25-96	2.62	-	01-12-75	5.82	-
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 north-east of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-96	01-25-96	12.59	2,776	02-01-69	17.90	5,290

≠ Operated as a continuous-record gaging station
b Gage height only
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
	Island of Oahu--Continued								
16274499 Keaahala Str at Kamehameha Highway, at Kaneohe	Lat 21°25′12″, long 157°48′15″, 35 ft upstream from bridge on Kamehameha Highway in Kaneohe.	0.62	1959-96	01-25-96	4.24	438	05-02-65	11.50	2,750
16279500 Heeia Str at Kaneohe	Lat 21°25′17″, long 157°49′01″, 60 ft downstream from culvert on Kahekili Highway, 0.7 mi west of Kaneohe Post Office, and 0.8 mi southwest of Heeia.	1.80	1965-66, 1968-96	01-25-96	-	e800	05-02-65	9.50	5,600
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	1963-96	01-25-96	5.68	e500	02-01-69	11.8	7,300
16304500 Kaluanui Stream, at Hauula, Oahu	Lat 21°35′57″, long 157°54′24″, Kaluanui on left downstream wingwall of Str at concrete bridge, 1.2 mi southeast Hauula of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-96	01-25-96	4.51	e2,000	01-06-82	6.95	4,920
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	1958-96	01-25-96	7.31	e800	04-15-63	12.10	4,640
16311000 Oio Str nr Kahuku	Lat 21°41′32″, long 157°59′48″, 0.6 mi southwest of junction of plantation road and Highway 83 and 2.7 mi west of Kahuku Hospital.	2.13	1958-96	01-25-96	4.32	e100	05-02-65	8.13	1,390
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 nr Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-96	01-24-96	4.11	e130	11-20-90	6.01	450
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	1968-96	01-24-96	4.35	e250	04-19-74	4.97	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	1968-96	01-24-96	3.16	136	03-18-80	11.2	2,030
16340000 Anahulu River nr Haleiwa	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 Haleiwa.	13.5	1958-96	01-25-96	8.25	3,400	04-19-74	15.8	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	1956-96	01-18-96	13.79	1,870	04-19-74	20.7	7,600

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
			Island of Molokai						
16411320 Kakaako Gulch abv Kamakahi Gulch, nr Mauna Loa	Lat 21°10′11″, long 157°11′56″, 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-96	08-31-96	-	e2	11-12-65	4.80	670
16411400 Kakaako Gulch nr Mauna Loa	Lat 21°10′39″, long 157°12′31″, on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-96	08-31-96	-	e30	02-11-89	8.47	2,860
16411600 Kaunala Gulch nr Mauna Loa	Lat 21°07′01″, long 157°15′43″, at Sand Haul Road, 3.2 mi east east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	0.28	1964-96	08-31-96	-	e2	12-25-84	3.87	151
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	1965-96	08-31-96	2.55	308	01-11-74	8.20	2,920
16411800 Kaluapeelua Gulch at Hoolehua	Lat 21°09′55″, long 157°04′22″, 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-96	No flow.			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	1965-96	03-31-96	-	e170	04-04-89	-	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	1964-96	12-31-95	1.34	429	04-13-65	2.61	1,250
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	1964-96	02-28-96	5.14	51	11-04-66	8.93	989
			Island of Maui						
16500100 Kepuni Gulch nr Kahikinui House	Lat 20°37′21″, long 156°15′16″, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72≠, 1973-96	03-04-96	3.98	74	09-18-94	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	1967-96	03-04-96	7.96	2,070	01-08-80	15.10	13,600
16500800 Kukuiula Gulch nr Kipahulu	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≠, 1969-96	09-07-96	5.05	338	03-31-82	13.76	5,950

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
	Island of Maui--Continued								
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	1963-96	09-07-96	2.38	81	01-23-65	9.30	788
16502800 Moomoonui Gulch at 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	1963-96	09-07-96	12.35	820	11-26-92	14.71	2,480
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	1965-96	09-07-96	7.93	5,470	08-01-82	11.03	16,880
16603300 Unnamed gulch at Maliko Bay	Lat 20°56′26″, long 156°21′04″, at Hana Highway, 0.5 mi west of Maliko Bay, and 1.3 mi north of Hamakuapoko.	0.43	1963-96	01-18-96	1.58	8.7	03-27-79	17.28	171
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	1967-96	03-03-96	3.61	94	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	1963-96	03-31-96	1.69	33	07-23-64	9.90	306
16603850 Kalialinui Gulch nr Kahului	Lat 20°52′47″, long 156°26′06″, 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital, and 2.5 mi southeast of Kahului Post Office.	17.9	1967-96	03-31-96	5.52	366	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≠, 1952-96	03-31-96	5.38	3,960	12-03-50	6.21	7,540
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 norhtwest of Waihee.	0.12	1964-96	03-31-96	-	e1	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	1965-96	12-31-95	5.40	99	03-16-68	15.22	1,760
16630200 Honokowai Str at Honokowai	Lat 20°56′58″, long 156°41′07″, 0.5 mi southeast of Honokowai, and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-96	03-31-96	-	e370	08-01-82	11.0	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≠ 1990-96a	03-31-96	-	e714	07-11-65	11.03	2,490

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi²)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft³/s)	Date	Gage height (ft)	Dis-charge (ft³/s)
Island of Maui--Continued									
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, 1964-96	03-31-96	3.37	224	05-13-60	7.9	2,660
16646200 Olowalu Str at Olowalu	Lat 20°49′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≠, 1973-96	12-30-95	3.18	220	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 north of McGregor Point, and 1.2 mi southwest of Maalaea.	0.64	1964-96	12-30-95	4.04	24	01-10-80	12.95	350
16650500 Waikapu Str nr Kihei	Lat 20°49′02″, long 156°29′00″, at railroad bridge beside Lower Maalaea Road, 2.5 mi northeast of Maalaea, and 2.5 mi northwest of Kihei.	6.97	1963-96	03-31-96	-	e200	11-04-88	8.69	1,170
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	0.98	1964-96	03-31-96	2.39	55	01-28-71	8.23	409
16659000 Waiakoa Gulch at Kihei	Lat 20°47′14″, long 156°27′41″, 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-96	03-03-96	6.05	152	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≠, 1971-96	03-03-96	-	e18	01-28-71	9.40	4,460
16663500 Kamaole Gulch at Kamaole	Lat 20°43′36″, long 156°27′02″, at Kihei Road, 350 ft upstream from mouth, and 0.2 mi south of Kamaole.	4.28	1972-96	No flow.	-		03-17-82	9.01	291
16664000 Liilioholo Gulch at Kamaole	Lat 20°43′04″, long 156°26′55″, on upstream side of Kihei Road, 300 ft upstream from mouth, and 0.8 mi south of Kamaole.	4.12	1972-96	No flow.	-		02-11-82	13.73	526
Island of Hawaii									
16701300 Waiakea Str at Hilo	Lat 19°42′38″, long 155°05′02″, 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1968-91, 1993-96	02-25-96	4.32	374	08-12-94	10.90	3,670
16701400 Palai Str at Hilo	Lat 19°40′56″, long 155°04′04″, at Highway 11, 300 ft south of Palai Street intersection, and 3.5 mi southeast of Hilo Post Office.	5.08	1965-90, 1994-96	Records being reviewed.					
16717400 Kalaoa Mauka Str nr Hilo	Lat 19°48′07″, long 155°06′03″, at culvert on Highway 19, 1.0 mi north of Papaikou, and 5.1 mi north of Hilo Post Office.	0.24	1963-96	Records being reviewed.					

≠ Operated as a continuous-record gaging station
a At a different datum
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Island of Hawaii--Continued						
16717600 Alia Str nr Hilo	Lat 19°50′38″, long 155°06′21″, on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72≠, 1973-90, 1994-96	02-25-96	unknown	a-	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	1963-90, 1994-96	02-25-96	9.85	1,055	02-20-79	29.93	3,320
16717800 Pohakupuka Str nr Papaaloa	Lat 19°57′20″, long 155°11′20″, right bank 200 ft downstream from Highway 19, 2.8 mi northwest of Honohina, and 3.0 mi southwest of Papaaloa.	2.76	1963-80≠, 1983-96	Records being reviewed.					
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, 1993-96	02-25-96	5.08	185	03-18-80	9.10	500
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.	2.27	1963-90 1995-96	02-25-96	2.38	a-	11-18-79	17.68	3,160
16717950 Honokaia Gulch tributary nr Honokaa	Lat 20°02′58″, long 155°32′19″, at culvert 4.8 mi southwest of Honokaa Hospital, and 5.5 mi southeast of Kukuihaele.	2.42	1963-96	No peak above base elevation of 1.03 ft or base discharge of 10.5 ft^3/s.			01-14-79	7.65	385
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, 1995-96	No peak above base elevation of 4.63 ft or base discharge of 40.6 ft^3/s.			01-09-80	11.42	426
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 1994-96	01-31-96	2.99	104	04-07-89	5.33	277
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≠, 1973-90, 1995-96	02-25-96	5.46	a-	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 northeast of Waimea.	0.27	1963-91, 1994-96	06-09-96	2.64	88	12-26-83	3.70	400
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	1963-91, 1994-96	No peak above base elevation of 2.43 ft or base discharge of 8.71 ft^3/s.			04-20-68	6.71	1,210
16759080 Popoo Gulch nr Waikii	Lat 19°52′11″, long 155°43′51″, at bridge on Highway 19, 2.0 mi north of Keamuku, and 5.2 mi west of Waikii.	33.1	1963-90, 1995-96	No peak above base elevation of 4.26 ft or base discharge of 644 ft^3/s.			11-28-73	9.20	3,720

≠ Operated as a continuous-record gaging station
a Discharge not determined
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1996

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 1996 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
			Island of Hawaii--Continued						
16759180 Keopu Str nr Kailua	Lat 19°38′54″, long 155°58′15″, at county road bridge, 1.9 mi east of Kailua, and 2.3 mi northwest of Holualoa Post Office.	2.61	1962, 1965-90, 1995-96	No peak above base elevation of 9.13 ft or base discharge of 532 ft^3/s.			02-11-82	11.82	e800
16759300 Waiaha Str at Luawai, nr Holualoa	Lat 19°38′12″, long 155°55′45″, on right bank at Luawai, 1.8 mi northeast of Holualoa School and 4.2 mi southeast of Honokohau School.	8.74	1961-71≠, 1972-90, 1995-96	09-01-96	2.75	56	02-11-82	9.06	3,550
16762000 Alapai Gulch at Naalehu	Lat 19°04′00″, long 155°35′19″, at debris catchment outlet of Naalehu Watershed Protection Project and 0.2 mi upstream from Highway 11 at Naalehu.	2.87	1963-96	Records being reviewed.					
16767000 Ninole Gulch nr Punaluu	Lat 19°10′44″, long 155°33′46″, on right bank 300 ft downstream from forest-reserve boundary, 4.6 mi northwest of Punaluu, and 6.0 mi north of Honuapo.	15.5	1966-82≠, 1983-96	Records being reviewed.					
16770000 Hionamoa Gulch at Pahala	Lat 19°11′45″, long 155°29′11″, at bridge, 0.6 mi southwest of Pahala and 4.1 mi north of Punaluu.	9.41	1963-90, 1994-96	Records being reviewed.					
16770500 Paauau Gulch at Pahala	Lat 19°12′39″, long 155°28′48″, on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79≠, 1980-96	Records being reviewed.					

≠ Operated as a continuous-record gaging station
a Discharge not determined
e Estimated

Discharge measurements made at miscellaneous sites during water year 1996

Station no.	Station name	Location	Measured previously (water years)	Date	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.	1924-87≠, 1988-95	10-31-95 03-01-96 04-23-96 08-20-96	301 308 247 110
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.	1919-85≠, 1986-95	10-31-95 03-01-96 04-23-96 08-02-96	160 147 13.4 145
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.	1911-26≠, 1931-85≠, 1986-95	11-01-95 03-05-96 04-18-96 08-01-96	69 3.79 78 15.5
16594000	Haiku 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 Haiku.	1911≠, 1914≠, 1916-28≠, 1931-85≠, 1986-95	11-01-95 03-05-96 04-18-96 08-01-96	30.6 3.37 90.7 1.28

≠ Operated as a continuous-record gaging station

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

Water-quality partial-record stations are particular sites where chemical-quality, and/or sediment data are collected systematically over a period of years for use in hydrologic analyses. A schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figure 15 and the data are listed in downstream order.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU

16227100 HALAWA STREAM BELOW H1 (LAT 21°23'46" LONG 157°55'57")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVEO (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
11...	1039	0.91	335	9.7	29.5	27.0	1.0	765	11.9	150	--
NOV											
20...	1141	1.3	410	9.3	28.5	31.5	0.60	764	9.4	128	--
JAN											
16...	1035	0.31	520	9.0	26.0	25.0	0.70	767	11.4	137	--
FEB											
12...	1400	0.22	716	9.5	24.0	28.0	1.0	762	10.0	128	600
MAR											
05...	0955	21	300	8.7	21.0	20.0	4.5	760	11.2	124	--
APR											
24...	0935	0.20	500	9.2	26.5	29.5	2.0	766	11.0	144	--
MAY											
14...	0915	0.06	730	9.1	28.5	28.0	1.5	766	12.2	155	K4000

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
12...	1400	130	27	15	73	54	3	3.5	54	33	160

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
FEB											
12...	1400	0.20	22	369	366	0.50	18	--	<0.050	0.50	0.030
MAY											
14...	0915	--	--	--	--	--	8	0.130	0.130	0.50	0.060

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
FEB											
12...	1400	110	20	<1	<100	6.0	<10	<1	<1	<1	<3.0

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16227100 HALAWA STREAM BELOW H1--Continued

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB 12...	6	150	27	<1	<10	<4	20	<1.0	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
FEB 12...	1	1.0	<1	<1	<1	<1.0	230	14	<10	6.3	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DISUL-FOTON UNFILT RECOVER (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 12...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	0.020	<0.010	<0.010	<0.010

DATE	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 12...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 12...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

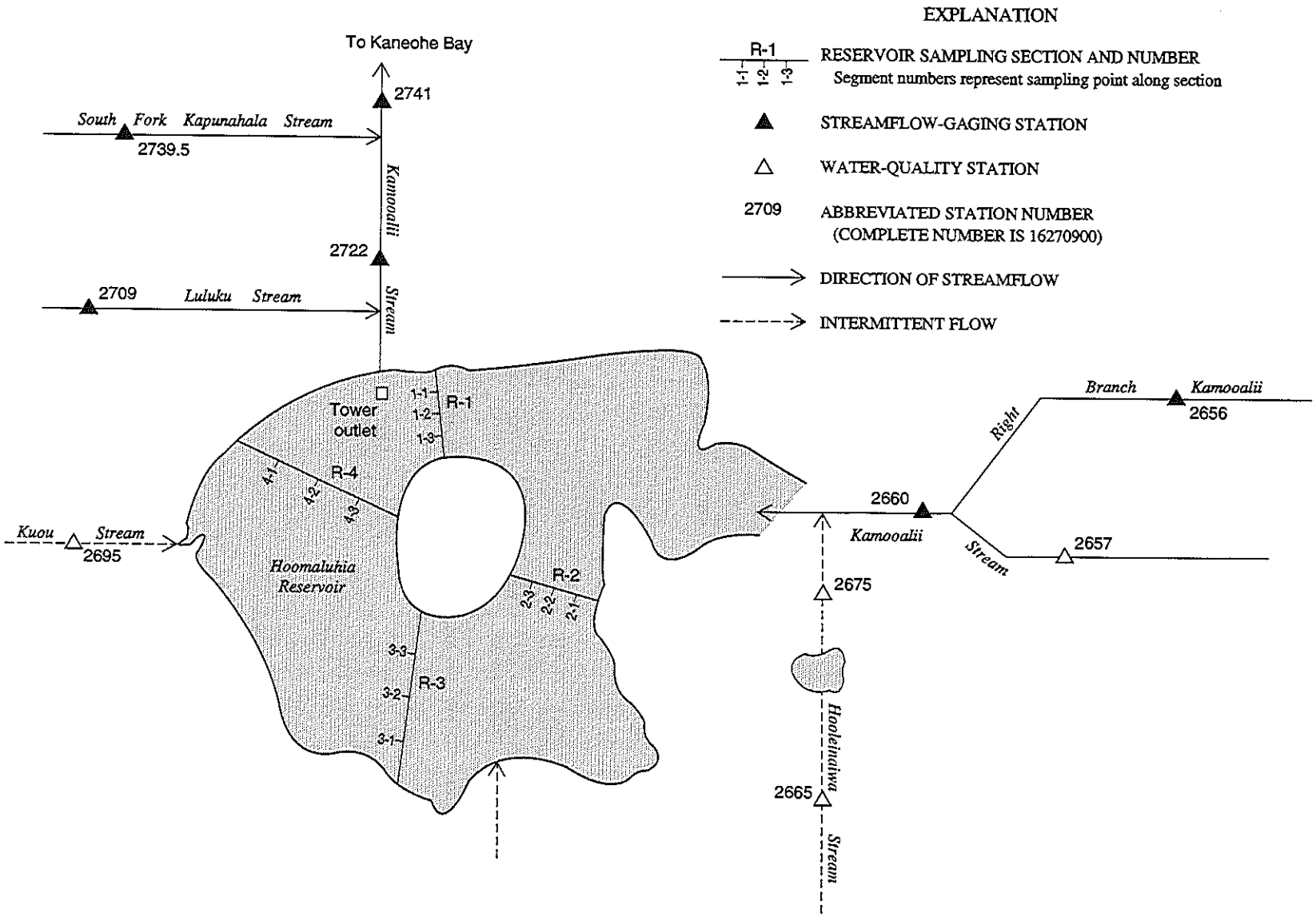


Figure 15. Diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16265700 KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEOHE (LAT 21°23'12" LONG 157°47'56")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT										
11...	1100	0.17	219	6.6	26.0	22.5	0.30	759	4.3	50
NOV										
20...	1205	1.3	200	4.5	--	23.0	2.2	759	7.4	87
DEC										
13...	0930	0.93	214	7.3	25.0	22.0	1.5	763	7.4	85
JAN										
16...	1400	0.71	221	7.0	23.5	21.0	0.40	758	7.0	79
FEB										
13...	1320	1.1	261	7.4	22.5	20.5	0.20	758	8.8	98
MAR										
06...	1445	2.1	250	7.2	24.0	21.0	0.40	754	8.1	92
APR										
24...	1500	0.67	265	7.1	25.0	22.5	0.20	759	7.8	91
MAY										
15...	1300	0.57	267	6.9	25.0	22.5	0.30	763	7.6	88

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
13...	0930	1600	1	0.160	0.160	<0.20	0.020
FEB							
13...	1320	K29	1	0.220	0.220	<0.20	<0.010
MAY							
15...	1300	580	1	0.590	0.590	<0.20	0.030

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16266500 HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE, OAHU (LAT 21°23'06" LONG 157°48'16")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT										
11...	1300	0.08	154	6.2	25.5	23.5	0.40	759	5.2	61
NOV										
21...	1350	0.24	166	6.7	25.0	--	0.40	755	7.2	--
DEC										
12...	1320	0.12	160	6.8	25.0	22.5	0.40	760	6.2	72
JAN										
16...	1140	0.21	165	6.8	24.5	22.0	0.30	759	7.4	85
FEB										
13...	1125	0.38	181	6.9	21.5	21.0	0.20	758	7.6	86
MAR										
05...	1410	0.82	187	6.8	22.0	21.5	0.30	753	7.3	84
APR										
24...	1400	0.22	167	6.9	25.0	23.0	0.20	760	7.5	88
MAY										
14...	1415	0.11	156	6.7	26.5	23.0	0.20	761	6.9	81

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
12...	1320	K20	<1	0.110	0.110	<0.20	<0.010
FEB							
13...	1125	K17	<1	0.150	0.150	<0.20	<0.010
MAY							
14...	1415	K37	1	0.120	0.120	<0.20	0.020

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16267500 HOOLEINAIWA STREAM ABOVE CONFLUENCE WITH KAMOOALII STREAM, NEAR KANEOHE, OAHU

(LAT 21°23'18" LONG 157°48'18")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT										
11...	1415	0.45	198	7.2	26.0	24.0	1.8	758	6.7	80
NOV										
21...	1215	1.0	192	7.2	25.5	--	3.1	757	7.3	--
DEC										
12...	1215	0.66	195	7.3	26.0	23.0	3.4	761	7.2	84
JAN										
16...	1020	0.67	193	7.2	24.5	21.5	2.3	761	7.2	82
FEB										
13...	1005	0.86	198	7.4	21.0	20.5	3.4	760	7.4	82
MAR										
05...	1215	1.9	186	7.4	22.5	22.0	3.8	755	8.0	92
APR										
24...	1200	0.65	192	7.5	24.5	25.0	1.7	762	8.8	107
MAY										
14...	1125	0.63	191	7.2	26.0	24.0	2.4	763	7.3	87

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
12...	1215	K62	<1	--	<0.050	<0.20	<0.010
FEB							
13...	1005	K19	2	--	<0.050	<0.20	<0.010
MAY							
14...	1125	140	1	0.070	0.070	<0.20	0.020

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16269500 KUOU STREAM AT ALTITUDE 220 FT NEAR KANEOHE, OAHU

(LAT 21°23′30″ LONG 157°48′44″)

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT										
11...	1215	0.01	312	7.4	25.0	23.0	0.90	758	7.2	85
NOV										
20...	1430	0.10	359	6.7	--	23.0	33	757	7.4	87
DEC										
13...	1020	0.08	277	7.2	24.5	23.0	21	761	7.7	90
JAN										
17...	1400	0.05	391	7.2	24.0	22.0	0.40	757	8.2	95
FEB										
20...	1350	E0.05	385	6.8	21.5	21.0	0.20	759	5.9	67
MAR										
05...	1215	0.07	277	6.8	25.0	21.5	0.20	754	8.2	94
APR										
24...	1220	E0.00	361	7.2	30.0	27.0	0.20	762	10.6	133
MAY										
15...	1115	E0.02	358	6.6	26.0	22.5	0.20	761	3.2	37

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
13...	1020	5100	15	0.130	0.130	0.40	0.070
FEB							
20...	1350	300	<1	0.270	0.270	<0.20	<0.010
MAY							
15...	1115	1600	1	0.430	0.430	<0.20	0.020

< Actual value is known to be less than the value shown
E Estimated
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16274100 KANEOHE STREAM BELOW KAMEHAMEHA HWY, OAHU (LAT 21°24'54" LONG 157°48'03")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
12...	1017	8.2	190	8.8	25.5	24.0	4.0	764	9.7	115	--
NOV											
21...	1007	14	190	8.5	25.0	23.5	5.4	761	9.6	113	--
JAN											
17...	1013	11	205	8.4	25.0	22.0	1.2	766	9.9	113	--
FEB											
12...	1135	11	200	8.8	22.5	21.5	3.0	766	9.5	107	880
MAR											
06...	0950	18	200	8.2	25.0	21.0	3.0	759	9.2	104	--
APR											
24...	1030	9.8	211	9.1	26.5	27.5	1.9	766	10.8	136	--
MAY											
15...	1045	10	207	9.3	26.5	26.5	2.1	768	10.3	127	K1700

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
12...	1135	66	14	7.5	15	32	0.8	1.7	65	9.6	18

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
FEB											
12...	1135	<0.10	21	127	127	0.17	20	0.270	0.270	<0.20	<0.010
MAY											
15...	1045	--	--	--	--	--	6	0.190	0.190	0.30	0.030

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
FEB											
12...	1135	170	130	<1	<100	4.0	<10	<1	<1	<1	<3.0

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

16274100 KANEOHE STREAM BELOW KAMEHAMEHA HWY, OAHU--Continued

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB											
12...	1	400	250	<1	<10	<4	30	13	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
FEB											
12...	1	<1.0	<1	<1	<1	<1.0	91	<6	<10	1.5	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	CHLOR-PYRIPOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DISUL-FOTON UNFILT RECOVER (UG/L)	2, 4-DP TOTAL (UG/L)
FEB											
12...	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.040	<0.010	<0.010

DATE	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB											
12...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
12...	<0.010	<0.010	<0.100	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212335157482601 HOOMALUHIA RES SEC 1-1 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1048	1.00	188	7.4	21.5	760	6.6	75
14...	1049	3.00	190	7.4	21.5	760	6.6	75
14...	1050	5.00	190	7.4	21.5	760	6.6	75
14...	1052	7.00	190	7.4	21.5	760	6.6	75
14...	1054	8.00	190	7.4	21.5	760	6.5	74
MAR								
06...	1006	1.00	154	7.2	21.0	755	6.3	71
06...	1008	3.00	154	7.2	21.0	755	6.2	70
06...	1009	5.00	156	7.2	21.0	755	6.0	68
06...	1010	7.00	156	7.2	20.5	755	5.8	65
06...	1011	8.00	156	7.2	20.5	755	5.6	63

212335157482602 HOOMALUHIA RES SEC 1-2 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1037	1.00	188	7.4	21.5	760	6.6	75
14...	1039	3.00	190	7.4	21.5	760	6.6	75
14...	1040	5.00	190	7.4	21.5	760	6.5	74
14...	1041	7.00	188	7.4	21.5	760	6.5	74
14...	1043	9.00	192	7.4	21.5	760	5.9	67
MAR								
06...	1014	1.00	154	7.3	21.0	755	6.4	73
06...	1015	3.00	154	7.3	21.0	755	6.4	73
06...	1016	5.00	154	7.3	21.0	755	6.4	73
06...	1017	7.00	154	7.3	21.0	755	6.2	70
06...	1025	9.00	158	7.3	20.5	755	5.8	65

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
FEB										
14...	1022	1.00	188	7.4	21.5	5.0	760	6.6	75	K720
14...	1027	3.00	188	7.4	21.5	--	760	6.6	75	--
14...	1029	5.00	188	7.4	21.5	--	760	6.6	75	--
14...	1030	7.00	188	7.4	21.5	4.9	760	6.6	75	K620
14...	1032	9.00	190	7.4	21.5	--	760	6.2	70	--
14...	1033	11.0	214	7.3	21.5	5.1	760	5.2	59	K690
14...	1035	--	188	7.4	21.5	5.1	760	6.1	69	--
MAR										
06...	1030	1.00	156	7.3	21.0	6.3	755	6.8	77	--
06...	1031	3.00	156	7.4	21.0	--	755	6.6	75	--
06...	1032	5.00	158	7.4	21.0	--	755	6.4	73	--
06...	1033	7.00	156	7.3	21.0	9.4	755	5.9	67	--
06...	1034	9.00	158	7.3	20.5	--	755	5.7	64	--
06...	1035	11.0	156	7.3	20.5	27	755	5.7	64	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
14...	1035	58	11	7.3	12	30	0.7	1.9	60	7.2	15

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
FEB											
14...	1022	--	--	--	--	--	6	0.340	0.340	<0.20	<0.010
14...	1030	--	--	--	--	--	3	0.340	0.340	<0.20	<0.010
14...	1033	--	--	--	--	--	6	0.390	0.390	<0.20	0.010
14...	1035	<0.10	16	108	107	0.15	--	--	--	--	--

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB											
14...	1035	210	20	<1	<100	6.0	<10	<1	<1	<1	<3.0

< Actual value is known to be less than the value shown
K Results based on colony count outside the acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE, OAHU--Continued

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB 14...	3	430	74	<1	<10	<4	100	67	0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)
FEB 14...	1	<1.0	<1	<1	<1	<1.0	87	<6	<10	<0.010	<0.100

DATE	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	P,P'-DDD UNFILT RECOVER (UG/L)	DDE, TOTAL (UG/L)	P,P'-DDT UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DISUL-FOTON UNFILT RECOVER (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, I TOTAL (UG/L)
FEB 14...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)
FEB 14...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	PCNS UNFILT RECOVER (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 14...	<0.100	<0.010	<0.100	<0.100	<0.010	<0.010	<1.00	<0.010	<0.010

< Actual value is known to be less than the value shown

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212331157482501 HOOMALUHIA RES SEC 2-1 NR KANEOHE, OAHU (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1410	1.00	188	7.5	21.5	760	6.8	77
14...	1411	3.00	188	7.5	21.5	760	6.8	77
14...	1412	5.00	188	7.5	21.5	760	6.8	77
14...	1413	7.00	188	7.5	21.5	760	6.8	77
14...	1414	8.00	190	7.5	21.5	760	6.8	77
MAR								
06...	1334	1.00	160	7.5	22.0	753	7.4	86
06...	1335	3.00	164	7.5	22.0	753	7.3	85
06...	1336	5.00	164	7.5	22.0	753	7.2	83
06...	1338	7.00	164	7.4	21.5	753	7.0	80
06...	1340	8.00	164	7.4	21.5	753	6.7	77

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE, OAHU (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1416	1.00	190	7.5	21.5	760	6.8	77
14...	1417	3.00	192	7.5	21.5	760	6.8	77
14...	1418	5.00	190	7.5	21.5	760	6.8	77
14...	1419	7.00	190	7.5	21.5	760	6.8	77
14...	1420	9.00	188	7.5	21.5	760	6.8	77
14...	1421	11.0	196	7.5	21.5	760	6.5	74
MAR								
06...	1325	1.00	160	7.5	22.0	753	7.3	85
06...	1327	3.00	164	7.5	22.0	753	7.3	85
06...	1328	5.00	164	7.5	22.0	753	7.3	85
06...	1329	7.00	162	7.5	21.5	753	6.9	79
06...	1330	9.00	162	7.4	21.5	753	6.6	76
06...	1332	11.0	166	7.4	21.0	753	6.4	73

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212331157482503 HOOMALUHIA RES SEC 2-3 NR KANEOHE, OAHU (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1422	1.00	190	7.5	21.5	760	6.7	76
14...	1423	3.00	190	7.5	21.5	760	6.7	76
14...	1424	5.00	190	7.5	21.5	760	6.7	76
14...	1425	7.00	186	7.5	21.5	760	6.8	77
14...	1426	9.00	186	7.5	21.5	760	6.8	77
MAR								
06...	1316	1.00	160	7.5	22.0	753	7.4	86
06...	1319	3.00	164	7.5	22.0	753	7.4	86
06...	1321	5.00	162	7.5	21.5	753	7.2	83
06...	1322	7.00	162	7.5	21.5	753	7.0	80
06...	1323	9.00	164	7.4	21.5	753	6.9	79

212329157483101 HOOMALUHIA RES SEC 3-1 NR KANEOHE, OAHU (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1152	1.00	184	7.5	21.5	760	7.0	79
14...	1154	3.00	184	7.5	21.5	760	6.9	79
14...	1155	5.00	186	7.5	21.5	760	6.9	79
14...	1156	7.00	186	7.5	21.5	760	6.9	78
14...	1157	8.00	186	7.5	21.5	760	6.9	78
MAR								
06...	1110	1.00	160	7.5	21.5	755	7.5	86
06...	1111	3.00	162	7.5	21.5	755	7.5	86
06...	1112	5.00	162	7.5	21.5	755	7.4	85
06...	1114	7.00	162	7.5	21.5	755	7.4	85
06...	1115	8.00	162	7.5	21.5	755	7.4	85

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE, OAHU (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB									
14...	1131	1.00	184	7.5	21.5	5.1	760	7.0	79
14...	1135	3.00	184	7.5	21.5	--	760	7.0	80
14...	1141	5.00	186	7.5	21.5	5.4	760	7.0	79
14...	1142	7.00	184	7.5	21.5	--	760	7.0	79
14...	1145	9.00	184	7.6	21.5	--	760	7.0	79
14...	1150	10.0	184	7.5	21.5	4.9	760	7.0	79
MAR									
06...	1100	1.00	160	7.5	21.5	5.5	755	7.6	87
06...	1101	3.00	160	7.5	21.5	--	755	7.6	87
06...	1103	5.00	160	7.5	21.5	7.0	755	7.5	86
06...	1104	7.00	160	7.5	21.5	--	755	7.4	85
06...	1105	9.00	162	7.4	21.5	--	755	7.2	82
06...	1107	10.0	162	7.4	21.5	8.5	755	7.1	81

DATE	TIME	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
FEB							
14...	1131	K1400	1	0.300	0.300	<0.20	<0.010
14...	1141	K890	5	0.300	0.300	<0.20	<0.010
14...	1150	K860	4	0.300	0.300	<0.20	<0.010

< Actual value is known to be less than the value shown
K Results based on colony count outside acceptance range (non-ideal colony count)

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212329157483103 HOOMALUHIA RES SEC 3-3 NR KANEOHE, OAHU (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1106	1.00	182	7.5	21.5	760	7.1	80
14...	1108	3.00	182	7.5	21.5	760	7.0	80
14...	1117	5.00	184	7.5	21.5	760	7.0	79
14...	1123	7.00	184	7.5	21.5	760	7.0	80
14...	1127	9.00	184	7.5	21.5	760	7.0	80
14...	1128	11.0	184	7.5	21.5	760	7.0	79
MAR								
06...	1049	1.00	160	7.5	21.5	755	7.6	87
06...	1051	3.00	160	7.5	21.5	755	7.6	87
06...	1052	5.00	160	7.5	21.5	755	7.6	87
06...	1053	7.00	160	7.5	21.5	755	7.5	86
06...	1055	9.00	162	7.5	21.5	755	7.3	84
06...	1056	11.0	162	7.4	21.5	755	7.2	82

212335157483001 HOOMALUHIA RES SEC 4-1 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1232	1.00	184	7.6	21.5	760	6.9	78
14...	1233	3.00	184	7.6	21.5	760	6.9	78
14...	1235	5.00	186	7.5	21.5	760	6.6	75
14...	1236	7.00	186	7.5	21.5	760	6.5	74
14...	1237	8.00	186	7.5	21.5	760	6.5	74
MAR								
06...	1301	1.00	160	7.5	21.5	755	7.3	84
06...	1303	3.00	162	7.5	21.5	755	7.3	84
06...	1304	5.00	162	7.5	21.5	755	7.2	82
06...	1305	7.00	162	7.5	21.5	755	7.2	82
06...	1306	8.00	160	7.4	21.5	755	6.9	79

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1239	1.00	184	7.6	21.5	760	6.8	77
14...	1240	3.00	184	7.6	21.5	760	6.8	77
14...	1241	5.00	186	7.6	21.5	760	6.8	77
14...	1242	7.00	186	7.6	21.5	760	6.8	77
14...	1243	9.00	186	7.5	21.5	760	6.8	77
MAR								
06...	1252	1.00	160	7.5	21.5	755	7.3	84
06...	1253	3.00	160	7.5	21.5	755	7.3	84
06...	1255	5.00	158	7.4	21.0	755	6.7	76
06...	1257	7.00	160	7.4	21.0	755	6.2	70
06...	1259	9.00	160	7.4	21.0	755	6.2	70

212335157483003 HOOMALUHIA RES SEC 4-3 NR KANEOHE, OAHU (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB								
14...	1245	1.00	186	7.6	21.5	760	6.9	78
14...	1246	3.00	186	7.5	21.5	760	6.9	78
14...	1247	5.00	186	7.5	21.5	760	6.8	77
14...	1248	7.00	186	7.5	21.5	760	6.9	78
14...	1249	9.00	184	7.6	21.5	760	6.8	77
14...	1250	11.0	186	7.5	21.5	760	6.8	77
MAR								
06...	1243	1.00	158	7.4	21.5	755	7.2	82
06...	1244	3.00	158	7.4	21.5	755	7.1	81
06...	1245	5.00	156	7.4	21.0	755	6.6	75
06...	1246	7.00	156	7.4	21.0	755	6.4	73
06...	1247	9.00	158	7.3	21.0	755	6.0	68
06...	1249	11.0	158	7.3	21.0	755	5.7	65

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)
MAR				
06...	1500	158	21.5	6.6
06...	1600	160	21.5	6.9
06...	1700	162	21.5	7.0
06...	1800	162	21.5	6.7
06...	1900	164	21.5	6.8
06...	2000	162	21.5	7.5
06...	2100	162	21.5	7.1
06...	2200	162	21.5	7.1
06...	2300	162	21.5	7.2
06...	2400	162	21.5	7.2
07...	0100	162	21.5	7.0
07...	0200	160	21.0	7.0
07...	0300	162	21.0	7.0
07...	0400	160	21.0	6.9
07...	0500	162	21.0	6.9
07...	0600	162	21.0	6.8
07...	0700	162	21.0	6.7
07...	0800	164	21.0	6.8
07...	0900	164	21.0	6.8
07...	1000	164	21.0	6.9
07...	1100	164	21.0	6.9
07...	1200	164	21.0	6.9
07...	1300	166	21.0	6.8
07...	1400	168	21.0	6.9

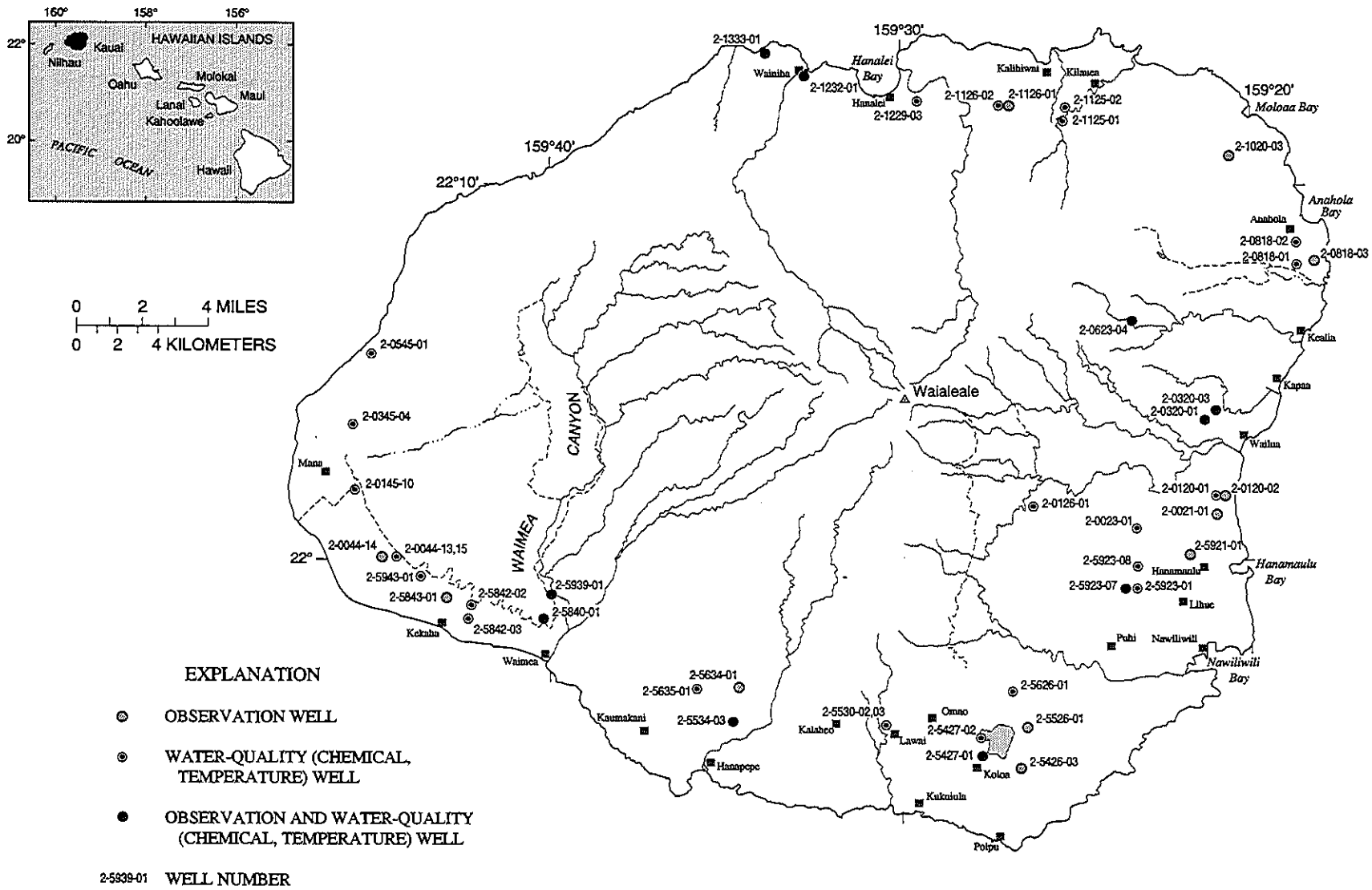


Figure 16. Locations of observation wells and ground-water quality sampling wells on Kauai.

GROUND-WATER LEVELS

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01

LOCATION.--Lat 22°00'57", long 159°21'04", Hydrologic Unit 20070000, 1.0 mi southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table, depth 276 ft, casing diameter 8-in., cased to 196 ft.

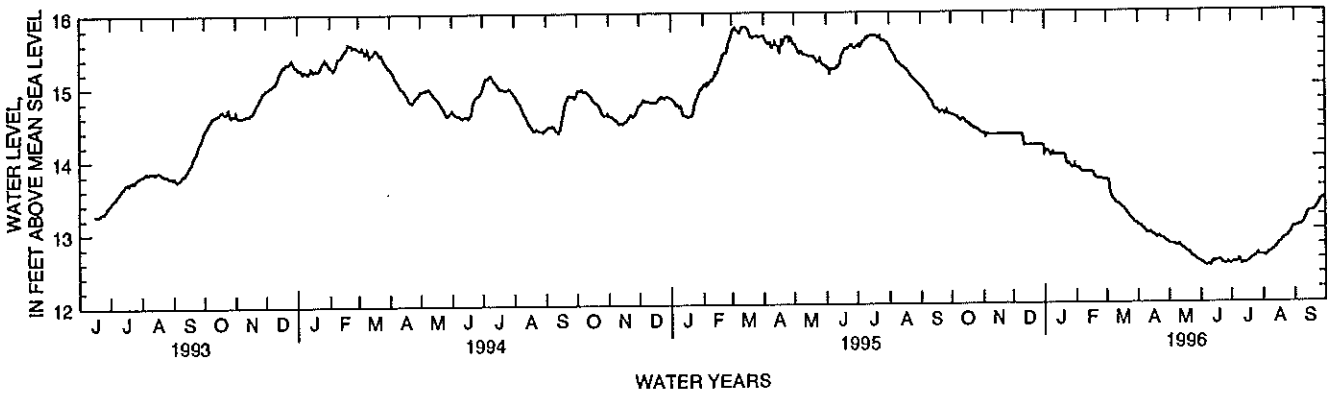
DATUM.--Elevation of land surface datum is 166 ft. Measuring point: Top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements June 1980 to June 1993.
Water-level recorder, June 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.86 ft above mean sea level, March 3, 1995; lowest measured, 12.65 ft above mean sea level, October 28, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.60	14.34	14.32	14.06	13.86	13.69	13.06	12.81	12.55	12.53	12.64	13.03
2	14.60	14.34	14.32	14.08	13.85	13.68	13.06	12.80	12.54	12.54	12.64	13.03
3	14.60	14.30	14.32	14.10	13.85	13.68	13.06	12.80	12.53	12.55	12.63	13.03
4	14.59	14.32	14.32	14.10	13.85	13.55	13.05	12.80	12.52	12.55	12.64	13.04
5	14.58	14.33	14.32	14.08	13.81	13.47	13.02	12.80	12.51	12.54	12.65	13.05
6	14.57	14.32	14.32	14.06	13.80	13.47	13.01	12.79	12.50	12.54	12.67	13.05
7	14.57	14.32	14.32	14.04	13.80	13.42	13.01	12.79	12.50	12.56	12.68	13.05
8	14.55	14.32	14.32	14.06	13.80	13.41	12.99	12.78	12.51	12.58	12.68	13.06
9	14.54	14.32	14.32	14.07	13.80	13.39	12.96	12.78	12.51	12.57	12.69	13.08
10	14.52	14.32	14.32	14.04	13.80	13.37	12.95	12.78	12.50	12.54	12.71	13.11
11	14.53	14.32	14.23	14.04	13.80	13.36	12.95	12.79	12.51	12.52	12.71	13.14
12	14.54	14.32	14.17	14.04	13.80	13.36	12.95	12.77	12.55	12.53	12.73	13.18
13	14.54	14.32	14.17	14.04	13.80	13.35	12.96	12.75	12.56	12.54	12.74	13.21
14	14.53	14.32	14.17	14.04	13.80	13.33	12.95	12.74	12.55	12.53	12.76	13.23
15	14.50	14.32	14.17	14.04	13.80	13.32	12.93	12.74	12.56	12.53	12.78	13.24
16	14.49	14.32	14.17	14.04	13.79	13.31	12.93	12.73	12.56	12.54	12.80	13.24
17	14.48	14.32	14.17	14.04	13.79	13.30	12.92	12.71	12.56	12.55	12.81	13.24
18	14.47	14.32	14.17	14.04	13.74	13.29	12.91	12.69	12.57	12.56	12.82	13.24
19	14.47	14.32	14.17	14.04	13.73	13.27	12.89	12.69	12.57	12.57	12.84	13.25
20	14.44	14.32	14.17	14.04	13.71	13.25	12.89	12.69	12.57	12.59	12.85	13.26
21	14.43	14.32	14.17	14.02	13.71	13.23	12.91	12.68	12.55	12.60	12.87	13.27
22	14.43	14.32	14.17	13.92	13.70	13.21	12.90	12.65	12.53	12.60	12.88	13.30
23	14.41	14.32	14.17	13.91	13.70	13.19	12.89	12.63	12.53	12.61	12.88	13.32
24	14.41	14.32	14.17	13.92	13.70	13.17	12.88	12.63	12.52	12.62	12.89	13.34
25	14.40	14.32	14.17	13.91	13.70	13.16	12.88	12.62	12.52	12.63	12.91	13.37
26	14.40	14.32	14.17	13.89	13.70	13.14	12.88	12.61	12.52	12.65	12.93	13.39
27	14.39	14.32	14.17	13.87	13.69	13.12	12.86	12.59	12.54	12.66	12.94	13.40
28	14.37	14.32	14.17	13.86	13.69	13.10	12.84	12.58	12.53	12.64	12.96	13.42
29	14.36	14.32	14.17	13.87	13.69	13.09	12.84	12.57	12.53	12.64	13.00	13.42
30	14.35	14.32	14.17	13.90	---	13.09	12.82	12.56	12.52	12.64	13.02	13.44
31	14.34	---	14.16	13.86	---	13.08	---	12.56	---	12.64	13.02	---
MEAN	14.48	14.32	14.22	14.00	13.77	13.32	12.94	12.71	12.53	12.58	12.80	13.21
MAX	14.60	14.34	14.32	14.10	13.86	13.69	13.06	12.81	12.57	12.66	13.02	13.44
MIN	14.34	14.30	14.16	13.86	13.69	13.08	12.82	12.56	12.50	12.52	12.63	13.03



220019159444801. Local number 2-0044-14.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 12-in., cased to 164 ft.

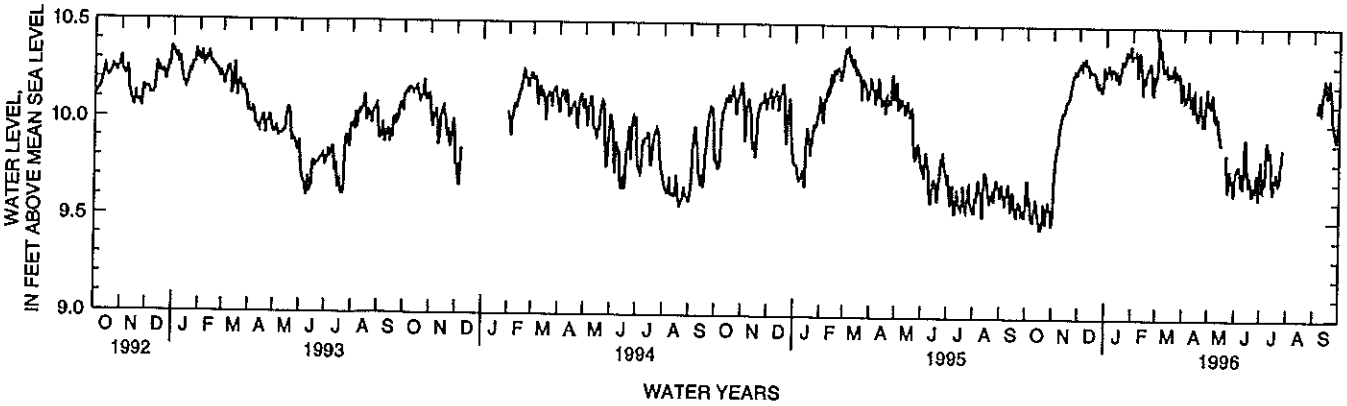
DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Top of standpipe, 11.49 ft above mean sea level. Prior to June 1979, nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements, 1937 to 1962 (measured by Kekaha Sugar Co.).
Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, December 20, 1937; lowest measured, 7.52 ft above mean sea level, August 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.70	9.52	10.30	10.25	10.35	10.26	10.19	10.10	9.76	9.82	---	---
2	9.71	9.69	10.31	10.27	10.36	10.33	10.13	10.12	9.77	9.68	---	---
3	9.59	9.76	10.30	10.28	10.36	10.46	10.14	10.09	9.78	9.67	---	---
4	9.63	9.82	10.29	10.31	10.36	10.40	10.13	10.15	9.79	9.74	---	---
5	9.60	9.86	10.33	10.29	10.37	10.38	10.15	10.16	9.79	9.70	---	10.07
6	9.52	9.88	10.33	10.27	10.34	10.39	10.21	10.11	9.77	9.73	---	10.10
7	9.51	9.90	10.32	10.26	10.25	10.32	10.23	10.04	9.69	9.89	---	10.13
8	9.50	9.96	10.33	10.29	10.36	10.30	10.17	10.03	9.72	9.92	---	10.08
9	9.50	9.99	10.31	10.29	10.37	10.28	10.10	10.06	9.76	9.87	---	10.07
10	9.56	10.01	10.31	10.28	10.36	10.28	10.16	10.02	9.68	9.84	---	10.13
11	9.58	10.04	10.31	10.28	10.30	10.29	10.12	10.04	9.74	9.84	---	10.15
12	9.60	10.06	10.29	10.24	10.24	10.30	10.07	9.97	9.89	9.87	---	10.18
13	9.59	10.06	10.27	10.25	10.16	10.27	10.16	9.95	9.93	9.73	---	10.21
14	9.54	10.06	10.28	10.28	10.25	10.25	10.17	9.91	9.91	9.67	---	10.24
15	9.51	10.08	10.27	10.24	10.22	10.27	10.12	9.90	9.78	9.65	---	10.22
16	9.49	10.11	10.27	10.22	10.22	10.27	10.06	---	9.69	9.70	---	10.15
17	9.46	10.12	10.27	10.26	10.26	10.27	10.04	---	9.70	9.73	---	10.15
18	9.46	10.12	10.27	10.27	10.27	10.25	10.03	---	9.74	9.71	---	10.22
19	9.47	10.13	10.26	10.30	10.29	10.28	10.03	---	9.71	9.76	---	10.24
20	9.51	10.15	10.25	10.33	10.29	10.29	10.11	---	9.67	9.71	---	10.21
21	9.59	10.18	10.21	10.33	10.30	10.30	10.16	9.85	9.64	9.70	---	10.15
22	9.58	10.20	10.20	10.31	10.32	10.25	10.13	9.71	9.67	9.71	---	10.10
23	9.49	10.22	10.22	10.33	10.29	10.26	10.05	9.66	9.68	9.73	---	10.02
24	9.49	10.25	10.22	10.34	10.20	10.27	10.00	9.68	9.67	9.80	---	9.99
25	9.55	10.25	10.19	10.38	10.16	10.25	10.00	9.77	9.73	9.82	---	9.96
26	9.58	10.27	10.19	10.36	10.16	10.24	10.00	9.73	9.74	9.88	---	9.94
27	9.60	10.26	10.17	10.37	10.26	10.27	10.10	9.71	9.71	---	---	9.92
28	9.56	10.26	10.19	10.36	10.23	10.22	10.15	9.73	9.62	---	---	9.95
29	9.56	10.27	10.22	10.36	10.24	10.13	10.19	9.66	9.66	---	---	10.02
30	9.48	10.29	10.30	10.41	---	10.15	10.13	9.64	9.77	---	---	10.08
31	9.49	---	10.25	10.34	---	10.22	---	9.68	---	---	---	---
MEAN	9.55	10.06	10.27	10.30	10.28	10.28	10.11	---	9.74	---	---	---
MAX	9.71	10.29	10.33	10.41	10.37	10.46	10.23	---	9.93	---	---	---
MIN	9.46	9.52	10.17	10.22	10.16	10.13	10.00	---	9.62	---	---	---



220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, 0.3 mi southwest of Wailua County Golf Course, and 1.6 mi south southwest of Wailua River Mouth. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 312 ft, casing diameter 6-in., cased to 60 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point is the top of 10-in. plastic pipe, 11.36 ft above mean sea level. Prior to June 24, 1980 measuring point was the top of 6-in. steel casing, 11.93 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1973 to 1980, 1987 to current year.
Water quality: Occasional measurements 1982 to 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.79 ft above mean sea level, February 21, 1974; lowest measured, 8.08 ft above mean sea level, October 12, 1978.

REMARKS.--Well affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	10.73	JAN 4	11.36	FEB 15	10.99	APR 8	10.05	JUN 12	8.71	JUL 26	9.95	AUG 30	10.30

220354159205601. Local number, 2-0320-01.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 240 ft, casing diameter 8-in., cased to 193 ft.

DATUM.--Elevation of land-surface datum is 155 ft. Measuring point: Top edge of steel pump-base at 1" breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements, February 1960, June 1973 to current year.
Water quality: 1960, 1966, 1972-80, 1985-89, 1991, 1993.

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, 20.04 ft above mean sea level, February 17, 1960; lowest measured, 0.55 ft below mean sea level, August 11, 1995.

REMARKS.--Water used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	.52	DEC 14	.58	FEB 14	.50	APR 9	.48	JUN 7	2.52	JUL 23	1.65

220354159205602. Local number, 2-0320-03.

LOCATION.--Lat 22°03′54″, long 159°20′56″, Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 302 ft; casing diameter 14-in., cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top edge of steel pump base at 1" breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements, August 1976 to current year.
Water quality: Occasional measurements, 1972, 1976 to current year.

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, 0.28 ft above mean sea level, August 11, 1995.

REMARKS.--Water is used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	.79	DEC 14	.85	FEB 14	.64	APR 9	.42	JUN 6	2.79	JUL 23	1.95

220621159232101. Local number 2-0623-04.

LOCATION.--Lat 22°06′11″, long 159°23′21″, Hydrologic Unit 20070000, 1.3 mi northeast of Kapahi Reservoir, and at the end of Kahuna Road. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled well; depth 1,023 ft, casing diameter 12-in., cased to 168 ft above mean sea level.

DATUM.--Elevation of land surface datum is 518 ft. Measuring point: Top of 3/4-in. pipe on concrete pump base, 516.35 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements April 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 471.35 ft above mean sea level, July 23, 1996; lowest measured, 407.74 ft above mean sea level, October 20, 1995.

REMARKS.--Water is used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	407.74	DEC 14	457.64	FEB 14	469.08	APR 9	458.24	JUN 6	445.39	JUL 23	471.35

220825159185301. Local number 2-0818-03.

LOCATION.--Lat 22°08′25″, long 159°18′53″, Hydrologic Unit 20070000, 1.3 mi southwest of Kahala Point, and 0.2 mi south of Anahola School. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table; depth 466 ft, casing diameter 12-in., cased to 290 ft above mean sea level.

DATUM.--Elevation of land surface datum is 267 ft. Measuring point: Top of west side of 4 1/2-in. pipe at 268.99 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements October 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.03 ft above mean sea level, February 14, 1992; lowest measured, 9.26 ft above mean sea level, December 14, 1995.

REMARKS.--Water for future public supply. Water level affected by nearby wells.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	10.67	DEC 14	9.26	FEB 14	10.99	APR 9	11.00	JUN 7	11.42	JUL 23	11.64

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10′38″, long 159°20′38″, Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point, and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 700 ft.

DATUM.--Elevation of land-surface datum 358 ft. Measuring point is the top of temporary metal girder over well opening, elevation 358.52 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to 1991.

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 measured, 66.17 ft above mean sea level, November 6, 1973.

REMARKS.--Pump is in process of being replaced. Well unused at this time.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	89.39	DEC 8	92.47	FEB 9	97.34	APR 11	101.64	JUN 10	105.60	JUL 24	108.88

221150159264501. Local number, 2-1126-01.

LOCATION.--Lat 22°11′50″, long 159°26′45″, Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal, and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 763 ft; casing diameter 14-in., cased to 435 ft.

DATUM.--Elevation of land-surface datum 348 ft. Measuring point is the top of 3/4-in. pipe, in 1-in. hole on southside of pump base, after removing airline connection, 349.64 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1977 to current year.

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.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	5.49	DEC 8	6.99	FEB 9	7.98	APR 11	8.72	JUN 10	8.10	JUL 24	7.35

221247159324801. Local number, 2-1232-01.

LOCATION.--Lat 22°12′47″, long 159°32′48″, Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point, and 1.5 mi southeast of Haena Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 188 ft; casing diameter 6-in., cased to 140 ft.

DATUM.--Elevation of land-surface datum is 65 ft. Measuring point is the top of 1-in. pipe 0.06 ft above flange, 66.56 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1975 to current year.

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 measured, 4.69 ft above mean sea level, August 6, 1993.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	7.98	DEC 14	9.73	FEB 14	10.31	APR 9	8.32	JUN 7	7.09	JUL 23	7.52

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13′18″, long 159°33′59″, Hydrologic Unit 20070000, 0.6 mi south southwest of Haena Point, and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 159 ft; casing diameter 8-in., cased to 104 ft.

DATUM.--Elevation of land-surface datum 83 ft. Measuring point is the top of pump base 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 current year.

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, 1.45 ft above mean sea level, August 26, 1986.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	8.40	DEC 12	8.95	FEB 14	9.65	APR 9	9.25	JUN 7	9.16	JUL 23	9.25

215434159263301. Local number, 2-5426-03.

LOCATION.--Lat 21°54′34″, long 159°26′33″, Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 318 ft; casing diameter 12-in., cased to 176 ft.

DATUM.--Elevation of land-surface datum is 221 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.--Occasional measurements of water level 1972 to current year.

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.

REMARKS.--Water used for irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	23.92	DEC 18	24.54	FEB 26	24.86	APR 10	24.99	JUN 10	24.94	JUL 22	24.90

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 22°54'54", long 159°27'42", Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir, and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 456 ft; casing diameter 12-in., cased to 263 ft.

DATUM.--Elevation of land surface datum is 245 ft. Measuring point is the bottom edge of the east side opening on pump base 246.77 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-94 (The minimum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level, July 15, 1974; lowest water level measured, 27.97 ft above mean sea level, October 6, 1988.

REMARKS.--Water used for public supply. Water level affected by nearby well.

REVISIONS.--All water level readings from March 29, 1990 to August 10, 1995 to be revised, with 0.28 ft being added to measurements. Error in measuring point elevation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR. 29	34.94	MAY 03	35.25	JUL. 17	32.25	AUG. 23	33.17

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 13	35.41	FEB. 07	35.54	APR. 11	35.41	JUN. 06	35.10	AUG. 08	35.12

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 24	35.43	DEC. 12	35.65	FEB. 13	36.10	APR. 02	35.41	JUN. 04	35.45	AUG. 13	34.91

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 08	34.91	FEB. 11	35.37	APR. 01	35.21	JUN. 24	35.30	AUG. 05	35.25

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 14	34.65	DEC. 09	34.86	FEB. 07	34.89	JUN. 09	34.89	AUG. 04	34.70

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 11	34.36	DEC.07	34.79	MAR. 02	35.28	APR. 04	34.43	JUN. 21	34.53	AUG. 10	34.64

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	35.02	DEC 13	35.25	FEB 13	35.16	APR 10	34.97	JUN 6	34.82	JUL 22	34.82

215536159263501. Local number, 2-5526-01.

LOCATION.--Lat 21°55′36″, long 159°26′35″, Hydrologic Unit 20070000, 3.7 mi north of Makahuena Point, and 2.5 mi southeast of Knudsen Gap. Owner: McBryde Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 1,010 ft; casing diameter 20-in., cased to 400 ft.

DATUM.--Elevation of land-surface is 355 ft. Measuring point is the top of 1-in. hole on top of pipe flange, southeast side of pump, 355.28 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1977 to current year.
Water quality: Occasional measurements 1977 to current year.

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, 108.83 ft above mean sea level, June 4, 1992; lowest measured, 25.28 ft above mean sea level, April 5, 1984.

REMARKS.--Water used for sugar cane irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	104.00	DEC 13	104.16	FEB 26	105.29	APR 10	102.08	JUN 6	103.99	JUL 22	105.32

215803159401201. Local number, 2-5840-01.

LOCATION.--Lat 21°58′03″, long 159°40′12″, Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park, and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 190 ft, casing diameter 8-in., cased to 167 ft.

DATUM.--Elevation of land-surface datum is 167 ft. Measuring point is the top of 1-in. hole on pump base, 168.08 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1973 to current year.
Water quality: Occasional measurements 1972-89, 94.

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, 13.10 ft above mean sea level, January 26, 1989; lowest measured, 6.58 ft above mean sea level, July 19, 1990.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	8.62	DEC 13	8.98	FEB 13	8.84	APR 10	8.64	JUN 6	8.55	JUL 22	8.74

215857159430101. Local number, 2-5843-01.

LOCATION.--Lat 21°58′57″, long 159°43′01″, Hydrologic Unit 20070000, 2.7 mi east northeast from Kokole Point, and 1.4 mi north northwest of Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 53 ft, casing diameter 15 ft, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point is the top west side of concrete shaft 57.70 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972, 1985 to current year.
Water quality: One measurement in 1972.

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, 9.52 ft above mean sea level, February 5, 1990; lowest measured, 7.82 ft above mean sea level, April 25, 1988.

REMARKS.--Well used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	8.33	DEC 13	9.23	FEB 13	9.23	APR 10	8.65	JUN 6	8.39	JUL 22	8.59

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59′58″, long 159°21′43″, Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park, and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 540 ft, casing diameter 14-in., cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point: Top of 1-in. pipe, northeast side of flange after removing the plug, elevation 302.66 above mean sea level.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to July 1992. Occasional measurements, October 1992 to current year.

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, 17.69 ft above mean sea level, November 26, 1985; lowest measured, 11.99 ft above mean sea level, July 23, 1996.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	15.17	DEC 14	14.28	FEB 14	13.66	APR 9	12.93	JUN 7	12.33	JUL 23	11.99

215901159235201. Local number, 2-5923-07.

LOCATION.--Lat 21°59′01″, long 159°23′52″, Hydrologic Unit 20070000, 4.2 mi northwest of Ninini Point, and 3.4 mi west from Lihue Airport terminal. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water-table well; depth 200 ft, casing diameter 12-in., cased to 200 ft.

DATUM.--Elevation of land surface is 364 ft. Measuring point is the top of 1-in. pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1985 to current year.
Water quality: Occasional measurements 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 226.86 ft above mean sea level, December 8, 1989; lowest water level measured, 213.17 ft above mean sea level, June 7, 1991.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	215.70	DEC 14	216.78	FEB 14	217.26	APR 9	215.24	JUN 7	217.13	JUL 23	219.87

215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59′06″, long 159°39′56″, Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park, and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 40 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 current year.

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, 10.43 ft above mean sea level, January 14, 1988; lowest water level measured, 8.71 ft below mean sea level, March 9, 1981.

REMARKS.--Water is presently unused.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	9.19	DEC 13	9.58	FEB 15	9.44	APR 10	9.31	JUN 6	9.18	JUL 22	10.08

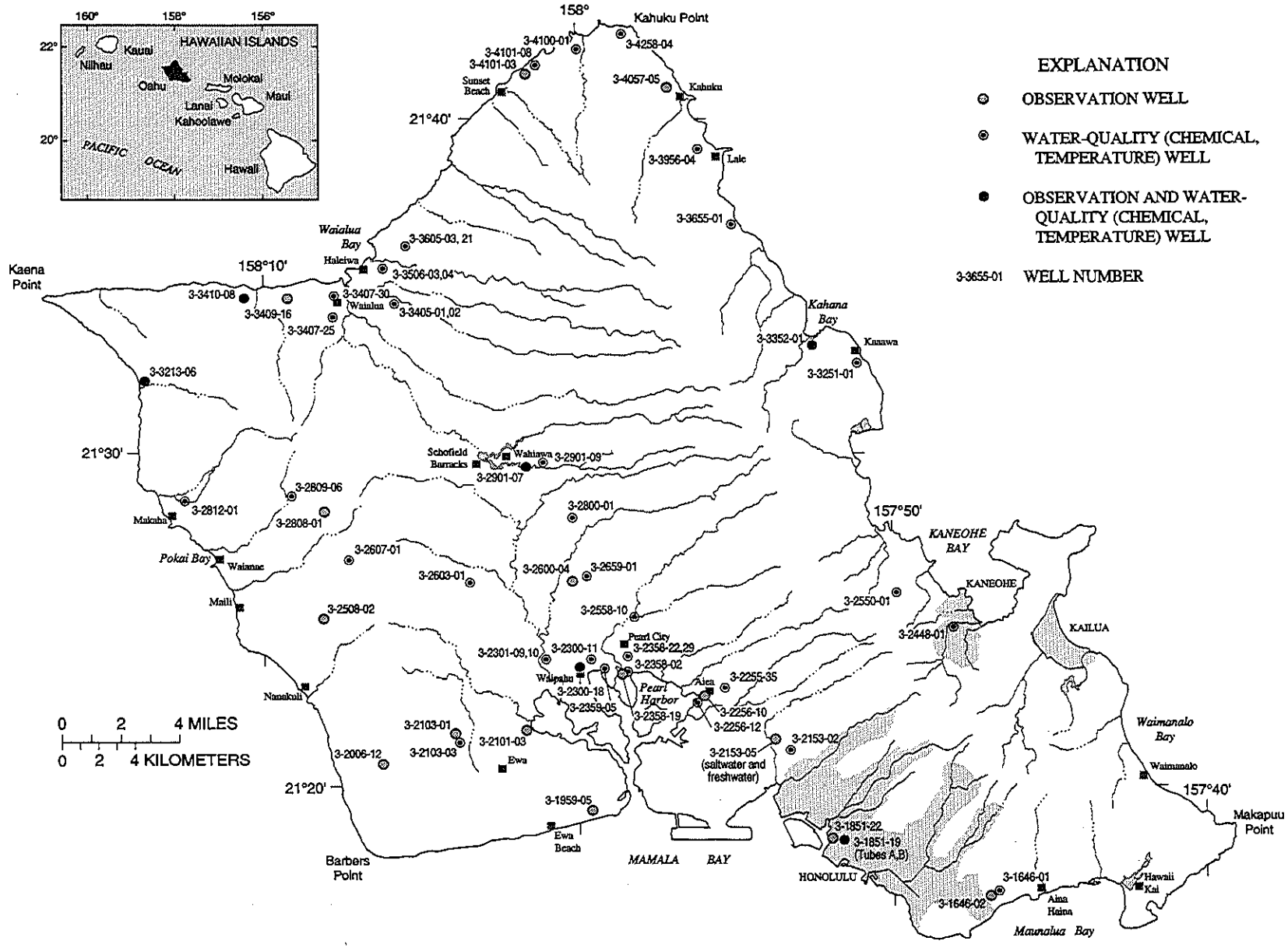


Figure 17. Locations of observation wells and ground-water quality sampling wells on Oahu.

211646157465202. Local number, 3-1646-02.

LOCATION.--Lat 21°16′46″, long 157°46′52″, Hydrologic Unit 20060000, at Waialae Golf Course. Owner: Bishop Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled well, depth 131 ft, casing diameter 4-in., cased to 100 ft.

DATUM.--Elevation of land-surface datum is 18 ft. Measuring point is top of casing, 13.84 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--Occasional measurements, September 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.63 ft above mean sea level, January 27, 1983; lowest, 7.00 ft above mean sea level, June 10, 1986, July 23, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 04	7.58	MAY 31	7.38	AUG 27	7.45

211832157515501. Local number, 3-1851-19 Tube A.

LOCATION.--Lat 21° 1832″, long 157° 5155″, Hydrologic Unit 20060000, corner of Richards and Halekauwila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 1/2-in. galvanized pipe at 1,043 ft depth. Tube A is the pipe closer to Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, April 1969, March 1973 to current year.
Water quality: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.16 ft above mean sea level, August 13, 1974; lowest, 5.53 ft above mean sea level, September 25, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 7	6.71	MAY 31	6.74	AUG 27	a--

a-- unable to read water levels, no flow.

211832157515501. Local number, 3-1851-19 Tube B.

LOCATION.--Lat 21°18′32″, long 157°51′55″, Hydrologic Unit 20060000, corner of Richards and Halekawila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 1/2-inch galvanized pipe at 988 feet depth. Tube B is the pipe furthest from Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, April 1969, March 1973 to current year.
Water quality: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.16 ft above mean sea level, February 3, 1983; lowest, 13.54 ft above mean sea level, October 20, 1993.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 07	17.64	MAY 31	15.54	AUG 27	14.63

211828157515801. Local number, 3-1851-22.

LOCATION.--Lat 21° 1828″, long 157° 5158″, Hydrologic Unit 20060000, northeast corner of the mini-park at the intersection of Richards Street and Ala Moana Boulevard. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 3-in PVC pipe, depth 1,142 ft, bottom 60 ft slotted.

DATUM.--Elevation of land-surface datum is 7 ft. Measuring point: Edge of manhole cover, 7.30 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Water-level recorder, June 1983 to November 1986,
Occasional measurements, December 1982 to current year.
Water quality: 1982, 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.74 ft above mean sea level, April 12, 1991; lowest, 15.97 ft, above mean sea level, September 11-13, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 7	20.75	MAY 31	19.76	AUG 27	18.92

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19′06″, long 157°59′46″, Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: Hawaii Institute of Geophysics.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-in. PVC casing, 6.40 ft above mean sea level.

REMARKS.--October 2, 1990 to December 31, 1990, September 19, 1993 to October 21, 1993, February 16, 1994 to March 3, 1994, June 9, 1994 to July 26, 1994.

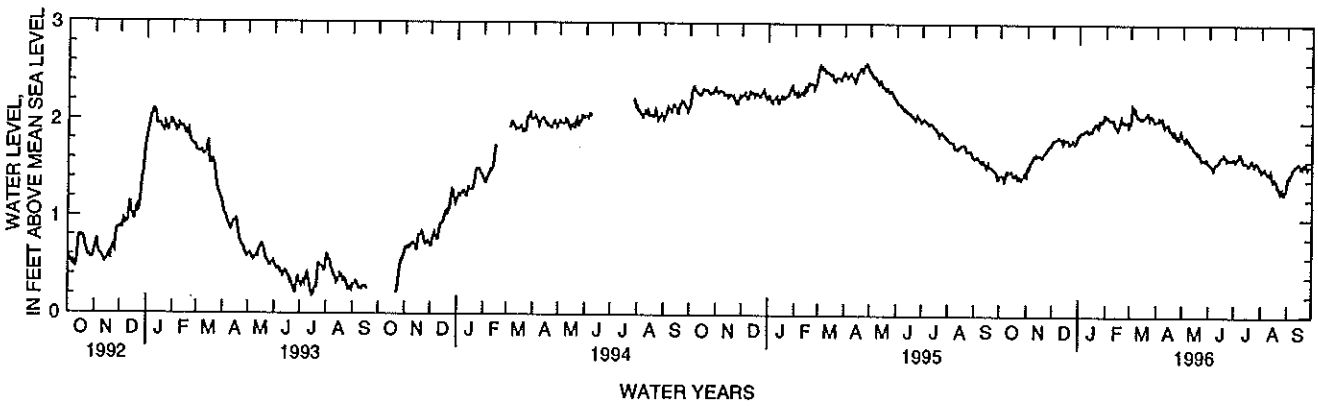
REMARKS.--Geophysical log and water-quality records are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, December 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.38 ft above mean sea level, January 17, 1969; lowest, 2.81 ft below mean sea level, August 25, 1977.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.45	1.51	1.80	1.86	2.04	1.99	2.02	1.85	1.58	1.63	1.50	1.41
2	1.45	1.53	1.81	1.88	2.06	2.05	2.02	1.83	1.57	1.61	1.51	1.44
3	1.45	1.52	1.81	1.89	2.05	2.17	2.04	1.82	1.56	1.62	1.51	1.45
4	1.45	1.55	1.82	1.90	2.04	2.16	2.02	1.81	1.56	1.63	1.53	1.44
5	1.42	1.58	1.82	1.90	2.03	2.13	2.02	1.84	1.54	1.63	1.53	1.47
6	1.40	1.59	1.82	1.90	2.02	2.16	2.03	1.82	1.52	1.65	1.50	1.48
7	1.43	1.60	1.83	1.90	2.02	2.10	2.04	1.82	1.54	1.68	1.50	1.51
8	1.48	1.63	1.84	1.92	2.02	2.08	2.01	1.81	1.56	1.68	1.48	1.53
9	1.49	1.65	1.83	1.92	2.03	2.06	1.97	1.78	1.58	1.66	1.48	1.54
10	1.47	1.64	1.83	1.91	2.03	2.06	1.95	1.77	1.58	1.63	1.47	1.55
11	1.48	1.64	1.83	1.92	1.98	2.05	1.96	1.77	1.58	1.60	1.48	1.56
12	1.49	1.66	1.81	1.90	1.96	2.05	1.97	1.76	1.59	1.59	1.50	1.56
13	1.49	1.65	1.79	1.90	1.95	2.04	1.98	1.74	1.61	1.59	1.45	1.57
14	1.49	1.65	1.82	1.91	1.94	2.05	1.98	1.72	1.63	1.59	1.42	1.58
15	1.46	1.65	1.80	1.92	1.93	2.04	1.95	1.71	1.64	1.59	1.40	1.58
16	1.45	1.66	1.82	1.91	1.95	2.04	1.92	1.71	1.65	1.58	1.41	1.57
17	1.44	1.65	1.82	1.94	1.98	2.05	1.92	1.70	1.65	1.56	1.42	1.54
18	1.45	1.64	1.82	1.96	2.01	2.06	1.92	1.68	1.65	1.56	1.40	1.55
19	1.46	1.64	1.80	1.97	2.04	2.07	1.89	1.69	1.67	1.57	1.39	1.56
20	1.44	1.66	1.78	1.99	2.01	2.08	1.88	1.69	1.66	1.60	1.34	1.54
21	1.42	1.68	1.79	1.99	2.00	2.09	1.91	1.66	1.64	1.61	1.33	1.56
22	1.44	1.68	1.78	1.96	2.01	2.07	1.90	1.63	1.62	1.60	1.33	1.58
23	1.44	1.69	1.79	1.95	2.01	2.04	1.85	1.61	1.63	1.57	1.29	1.58
24	1.42	1.71	1.79	1.97	1.99	2.07	1.84	1.61	1.63	1.56	1.28	1.55
25	1.41	1.72	1.81	2.01	1.99	2.07	1.86	1.61	1.62	1.58	1.31	1.53
26	1.42	1.74	1.80	2.00	2.00	2.06	1.85	1.62	1.62	1.59	1.32	1.54
27	1.43	1.75	1.78	2.00	2.01	2.05	1.84	1.61	1.62	1.58	1.28	1.55
28	1.45	1.75	1.79	2.02	1.97	2.02	1.88	1.61	1.62	1.57	1.27	1.55
29	1.47	1.76	1.79	2.02	1.99	2.01	1.90	1.62	1.62	1.56	1.29	1.55
30	1.45	1.78	1.85	2.08	---	2.01	1.86	1.60	1.63	1.53	1.30	1.55
31	1.44	---	1.84	2.04	---	2.02	---	1.59	---	1.53	1.35	---
MEAN	1.45	1.65	1.81	1.95	2.00	2.06	1.94	1.71	1.61	1.60	1.41	1.53
MAX	1.49	1.78	1.85	2.08	2.06	2.17	2.04	1.85	1.67	1.68	1.53	1.58
MIN	1.40	1.51	1.78	1.86	1.93	1.99	1.84	1.59	1.52	1.53	1.27	1.41



211907157594701. Local number, 3-1959-05.

Record of water-level data for water year 1996 was not completed at the time of publication.

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21′54″, long 158°01′52″, Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of Ewa Hospital. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well was modified in January 1958 and May 1982.

DATUM.--Elevation of land-surface datum is 15 ft. Measuring point: Top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1978-81, are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.2 ft, above mean sea level (below petcock then in use), September 2, and October 19, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 05	17.64	MAY 20	17.08	AUG 14	16.77

212132158035701. Local number, 3-2103-01.

LOCATION.--Lat 21°21′32″, long 158°03′57″, Hydrologic Unit 20060000, 1 mi east of Makakilo, and 2 mi north of Barbers Point Naval Air Station. owner: U.S. Navy.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 206 ft, casing diameter 6-in., cased to 17 ft.

DATUM.--Elevation of land-surface datum is 210 ft. Measuring point: Top of 6-in. pipe. Elevation: 211.70 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Water level recorder, September 1966 to December 1971.
Occasional measurements, August 1942 to December 1942, January 1953 to September 1967, September 1972 to current year.
Water quality: 1942, 1953-68.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.81 ft above mean sea level, February 20, 1957; lowest, 14.25 ft above mean sea level, July 5, 1978, September 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 05	15.04	APR 16	14.78	MAY 21	14.62	JUL 18	14.72

212123157535501. Local number, 3-2153-05 Freshwater well.

LOCATION.--Lat 21°21′23″, long 157°53′55″, Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 6-in. PVC casing, cased to 24 ft, perforated from 24 to 1,246 ft. Well was modified and deepened August 1980. The well is a combination of a 3-in. PVC (salt water) and a 6-in. PVC (fresh water), encased in a 12-in. steel casing.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 3-in. PVC casing, 37.90 ft above mean sea level.

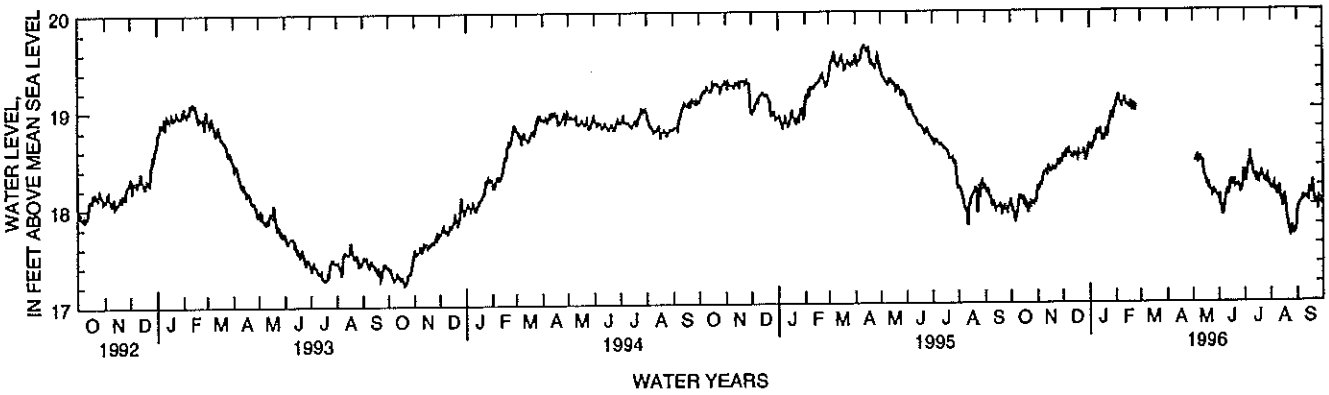
REMARKS.--Geophysical logs are available in files of district office. Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--Water-level recorder, March 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level, January 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.06	18.19	18.52	18.63	19.04	---	---	---	18.05	18.32	18.17	17.92
2	17.96	18.18	18.53	18.62	19.08	---	---	---	18.11	18.23	18.16	17.96
3	17.98	18.17	18.53	18.57	19.11	---	---	18.45	17.99	18.27	18.16	17.99
4	17.96	18.22	18.49	18.62	19.14	---	---	18.46	17.99	18.36	18.20	18.01
5	17.88	18.23	18.58	18.61	19.07	---	---	18.49	17.90	18.41	18.22	18.02
6	17.83	18.22	18.53	18.66	19.05	---	---	18.50	17.90	18.40	18.15	18.03
7	17.88	18.28	18.55	18.70	19.05	---	---	18.43	17.93	18.54	18.16	18.05
8	17.91	18.31	18.57	18.66	19.03	---	---	18.45	18.02	18.45	18.11	18.09
9	18.00	18.34	18.54	18.74	19.06	---	---	18.49	18.10	18.44	18.10	18.05
10	18.06	18.35	18.53	18.78	19.07	---	---	18.49	18.11	18.38	18.14	18.06
11	18.10	18.35	18.50	18.75	19.11	---	---	18.45	18.16	18.33	18.19	18.07
12	18.10	18.37	18.51	18.73	19.08	---	---	18.43	18.10	18.30	18.15	18.06
13	18.08	18.31	18.50	18.73	19.03	---	---	18.44	18.13	18.29	18.06	18.09
14	18.05	18.41	18.55	18.79	19.03	---	---	18.31	18.24	18.30	18.02	18.03
15	18.10	18.39	18.52	18.76	19.04	---	---	18.29	18.25	18.23	17.98	18.17
16	18.03	18.36	18.53	18.67	19.04	---	---	18.28	18.24	18.31	17.99	18.13
17	18.05	18.35	18.51	18.72	19.00	---	---	18.22	18.19	18.26	18.10	18.10
18	18.00	18.37	18.49	18.67	19.06	---	---	18.23	18.22	18.22	18.03	18.18
19	18.02	18.39	18.55	18.73	19.06	---	---	18.19	18.26	18.27	17.98	18.24
20	17.95	18.36	18.53	18.73	18.98	---	---	18.21	18.19	18.31	17.85	18.11
21	17.93	18.40	18.52	18.79	18.98	---	---	18.17	18.20	18.33	17.82	18.02
22	18.01	18.36	18.52	18.70	19.05	---	---	18.15	18.20	18.31	17.76	18.04
23	18.03	18.39	18.53	18.79	19.00	---	---	18.15	18.19	18.27	17.72	18.04
24	17.98	18.41	18.55	18.84	18.97	---	---	18.10	18.21	18.25	17.69	18.04
25	18.04	18.43	18.58	18.87	19.04	---	---	18.11	18.19	18.26	17.72	17.94
26	18.04	18.47	18.54	18.94	---	---	---	18.14	18.14	18.22	17.78	18.07
27	18.04	18.41	18.46	18.93	---	---	---	18.12	18.15	18.27	17.74	18.06
28	18.02	18.45	18.52	18.96	---	---	---	18.13	18.17	18.29	17.70	18.04
29	18.06	18.48	18.49	18.89	---	---	---	18.10	18.25	18.22	17.71	18.01
30	18.03	18.44	18.61	18.99	---	---	---	18.08	18.36	18.23	17.72	18.03
31	18.13	---	18.63	19.00	---	---	---	---	---	18.19	17.77	---
MEAN	18.01	18.35	18.53	18.76	---	---	---	---	18.14	18.31	17.97	18.06
MAX	18.13	18.48	18.63	19.00	---	---	---	---	18.36	18.54	18.22	18.24
MIN	17.83	18.17	18.46	18.57	---	---	---	---	17.90	18.19	17.69	17.92



212123157535503. Local number, 3-2153-05 Saltwater well.

LOCATION.--Lat 21°21′23″, long 157°53′55″, Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 3-in. PVC casing, cased to 46 ft, where it becomes 3/4-in. PVC pipe; two 5/8-in. holes at elevation 1,190 ft. Well was modified and deepened August 1980, and used to monitor water level (salt). The well is a combination of a 3-in. PVC (salt water) and a 6-in. PVC (fresh water), encased in a 12-in. steel casing.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in. PVC casing, 37.90 ft above mean sea level.

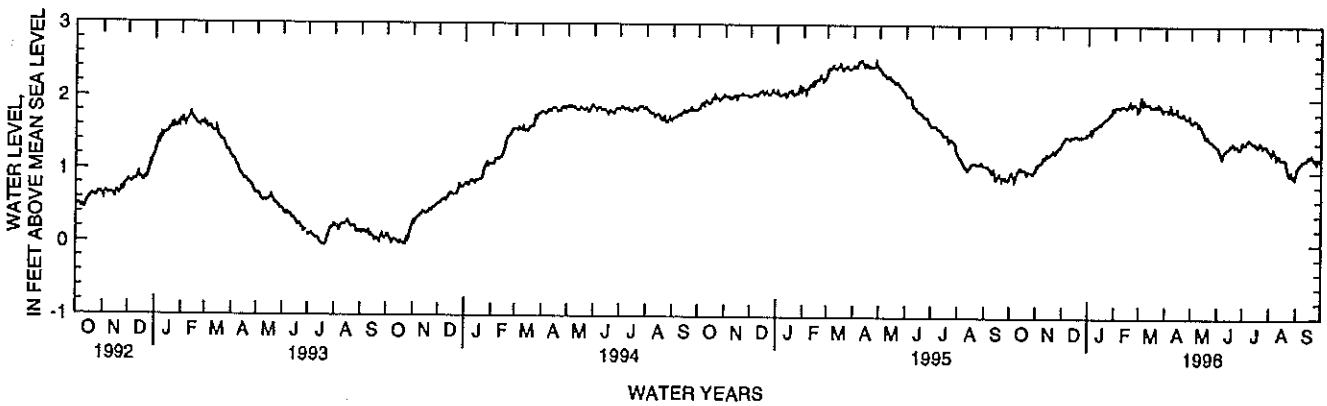
REMARKS.--Geophysical logs are available in files of district office. Prior to October 1993, unpublished records in files of the U.S. Geological Survey. No record March 5, 1991 to April 8, 1991.

PERIOD OF RECORD.--Water-level recorder, March 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.45 ft above mean sea level, January 9, 1983; lowest, 1.45 ft below mean sea level, October 24, 1981.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.97	1.08	1.41	1.53	1.85	1.88	1.87	1.70	1.36	1.42	1.30	1.02
2	.99	1.10	1.43	1.54	1.89	1.94	1.87	1.70	1.34	1.39	1.28	1.07
3	.99	1.09	1.44	1.54	1.90	2.04	1.87	1.69	1.30	1.39	1.26	1.08
4	.96	1.11	1.45	1.57	1.90	1.99	1.84	1.70	1.28	1.40	1.29	1.10
5	.91	1.12	1.48	1.53	1.90	1.95	1.84	1.72	1.23	1.42	1.32	1.12
6	.88	1.13	1.48	1.55	1.89	2.00	1.86	1.72	1.21	1.43	1.30	1.13
7	.91	1.13	1.48	1.59	1.90	1.95	1.90	1.71	1.23	1.45	1.27	1.14
8	.96	1.15	1.48	1.62	1.89	1.94	1.86	1.70	1.28	1.45	1.23	1.16
9	.99	1.20	1.47	1.62	1.90	1.94	1.83	1.65	1.30	1.45	1.20	1.17
10	1.01	1.19	1.46	1.62	1.91	1.94	1.83	1.64	1.30	1.43	1.22	1.17
11	1.03	1.19	1.48	1.63	1.91	1.94	1.84	1.67	1.32	1.42	1.24	1.17
12	1.05	1.22	1.48	1.64	1.91	1.94	1.84	1.65	1.33	1.41	1.23	1.17
13	1.05	1.24	1.48	1.65	1.90	1.94	1.86	1.63	1.33	1.41	1.19	1.18
14	1.03	1.22	1.48	1.66	1.90	1.91	1.87	1.59	1.34	1.41	1.19	1.20
15	1.04	1.23	1.48	1.67	1.89	1.90	1.82	1.57	1.35	1.39	1.19	1.22
16	1.03	1.24	1.49	1.66	1.89	1.90	1.80	1.55	1.38	1.40	1.19	1.23
17	1.03	1.24	1.50	1.68	1.92	1.90	1.80	1.50	1.37	1.37	1.19	1.21
18	1.02	1.25	1.49	1.69	1.92	1.90	1.80	1.48	1.38	1.36	1.19	1.22
19	1.02	1.27	1.49	1.71	1.95	1.90	1.78	1.48	1.40	1.36	1.18	1.24
20	.98	1.29	1.48	1.72	1.91	1.92	1.78	1.49	1.39	1.40	1.12	1.22
21	.97	1.29	1.48	1.73	1.90	1.92	1.81	1.46	1.36	1.41	1.07	1.19
22	1.00	1.26	1.48	1.74	1.91	1.90	1.81	1.45	1.37	1.40	1.02	1.19
23	1.00	1.27	1.49	1.74	1.94	1.90	1.78	1.44	1.37	1.37	.98	1.18
24	1.00	1.30	1.48	1.75	1.94	1.93	1.76	1.43	1.37	1.35	.97	1.16
25	1.00	1.31	1.49	1.77	1.93	1.92	1.76	1.43	1.34	1.36	1.00	1.14
26	.99	1.33	1.49	1.78	1.93	1.90	1.74	1.42	1.33	1.37	1.01	1.17
27	.98	1.33	1.49	1.80	1.90	1.90	1.74	1.41	1.34	1.36	.97	1.18
28	.98	1.34	1.49	1.80	1.85	1.85	1.76	1.39	1.34	1.37	.94	1.17
29	1.00	1.36	1.49	1.82	1.86	1.84	1.77	1.38	1.37	1.35	.94	1.16
30	1.02	1.38	1.52	1.89	---	1.85	1.73	1.37	1.42	1.32	.93	1.16
31	1.02	---	1.51	1.85	---	1.87	---	1.36	---	1.32	.96	---
MEAN	.99	1.23	1.48	1.68	1.90	1.92	1.81	1.55	1.33	1.39	1.14	1.16
MAX	1.05	1.38	1.52	1.89	1.95	2.04	1.90	1.72	1.42	1.45	1.32	1.24
MIN	.88	1.08	1.41	1.53	1.85	1.84	1.73	1.36	1.21	1.32	.93	1.02



212238157561101. Local number, 3-2256-10.

LOCATION.--Lat 21°22′38″, long 157°56′11″, Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 173 ft, casing diameter 12 in., cased to 143 ft.

DATUM.--Elevation of land-surface datum is 10 ft. Measuring point: Top of 10-in. stilling pipe for water-level recorder, 26.15 ft above mean sea level.

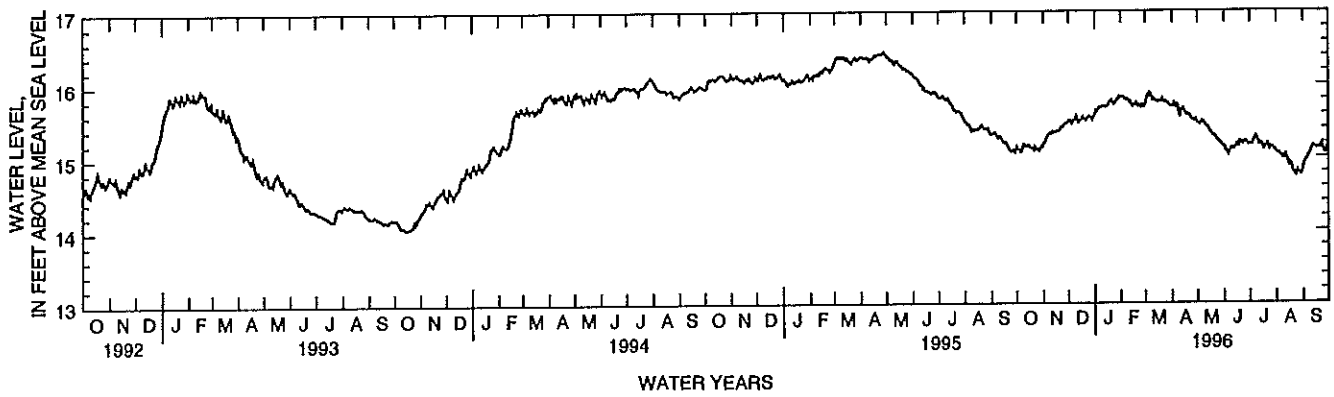
REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.

PERIOD OF RECORD.--
Water level: Occasional measurements, January 1928 to February 1931, September 1934 to August 1966.
Water-level recorder, September 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, January 16, 1928; lowest, 12.97 ft above mean sea level, October 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.14	15.18	15.50	15.59	15.82	15.73	15.70	15.47	15.14	15.18	15.07	14.85
2	15.12	15.20	15.49	15.64	15.83	15.76	15.71	15.46	15.13	15.17	15.06	14.89
3	15.11	15.21	15.49	15.63	15.83	15.84	15.73	15.46	15.08	15.17	15.05	14.92
4	15.11	15.24	15.50	15.64	15.83	15.85	15.70	15.45	15.08	15.18	15.05	14.95
5	15.09	15.28	15.47	15.65	15.81	15.84	15.69	15.46	15.06	15.21	15.04	14.96
6	15.08	15.29	15.48	15.68	15.79	15.88	15.71	15.49	15.04	15.25	15.03	14.98
7	15.09	15.31	15.50	15.68	15.79	15.87	15.72	15.48	15.07	15.26	15.02	15.01
8	15.15	15.33	15.51	15.69	15.80	15.83	15.70	15.48	15.10	15.28	15.01	15.03
9	15.17	15.33	15.53	15.69	15.79	15.79	15.60	15.45	15.12	15.26	14.98	15.05
10	15.16	15.32	15.56	15.69	15.78	15.80	15.57	15.44	15.11	15.22	14.98	15.08
11	15.15	15.33	15.53	15.70	15.76	15.79	15.60	15.42	15.12	15.18	15.02	15.10
12	15.16	15.35	15.49	15.70	15.77	15.78	15.66	15.41	15.11	15.17	15.03	15.13
13	15.15	15.34	15.48	15.69	15.75	15.77	15.67	15.41	15.12	15.19	14.98	15.14
14	15.15	15.34	15.50	15.70	15.72	15.77	15.67	15.38	15.14	15.19	14.96	15.13
15	15.16	15.35	15.51	15.70	15.70	15.77	15.64	15.36	15.15	15.18	14.92	15.13
16	15.15	15.35	15.52	15.70	15.71	15.76	15.61	15.34	15.18	15.14	14.89	15.13
17	15.13	15.36	15.53	15.71	15.72	15.77	15.59	15.33	15.18	15.11	14.92	15.12
18	15.13	15.36	15.55	15.74	15.72	15.77	15.58	15.31	15.16	15.11	14.91	15.13
19	15.13	15.36	15.53	15.76	15.74	15.76	15.59	15.30	15.21	15.13	14.88	15.13
20	15.13	15.37	15.52	15.77	15.72	15.76	15.58	15.30	15.21	15.16	14.82	15.12
21	15.11	15.38	15.51	15.78	15.70	15.79	15.57	15.29	15.20	15.18	14.79	15.12
22	15.14	15.41	15.52	15.76	15.72	15.76	15.57	15.27	15.18	15.18	14.79	15.15
23	15.12	15.41	15.54	15.73	15.71	15.76	15.54	15.25	15.18	15.13	14.76	15.18
24	15.11	15.42	15.55	15.73	15.70	15.75	15.52	15.23	15.21	15.11	14.75	15.14
25	15.12	15.43	15.56	15.74	15.69	15.76	15.52	15.22	15.21	15.14	14.78	15.09
26	15.10	15.45	15.56	15.76	15.72	15.75	15.51	15.21	15.21	15.14	14.81	15.07
27	15.09	15.46	15.54	15.78	15.70	15.74	15.50	15.20	15.20	15.13	14.79	15.05
28	15.11	15.46	15.54	15.80	15.69	15.73	15.51	15.19	15.18	15.12	14.77	15.06
29	15.14	15.47	15.52	15.80	15.71	15.72	15.52	15.17	15.17	15.10	14.76	15.13
30	15.15	15.47	15.55	15.83	---	15.71	15.48	15.16	15.18	15.09	14.76	15.17
31	15.14	---	15.56	15.82	---	15.70	---	15.15	---	15.09	14.78	---
MEAN	15.13	15.35	15.52	15.72	15.75	15.78	15.61	15.34	15.15	15.17	14.91	15.07
MAX	15.17	15.47	15.56	15.83	15.83	15.88	15.73	15.49	15.21	15.28	15.07	15.18
MIN	15.08	15.18	15.47	15.59	15.69	15.70	15.48	15.15	15.04	15.09	14.75	14.85



212318157583401. Local number, 3-2358-19.

Record of water-level data for water year 1996 was not completed at the time of publication.

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23′40″, long 158°00′19″, Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1,400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,090 ft, casing diameter 12-in., cased to 38 ft. Well was deepened May 1980 and modified February 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of casing, 27.73 ft above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--

Water level: Water-level recorder, August 1970 to January 1973. Occasional measurements, October 1987 to current year.
Water quality: 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985-86, 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 22.40 ft above mean sea level, January 4, 1983; lowest 14.01 ft above mean sea level, September 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 05	17.64	MAY 20	17.18	AUG 14	16.83

212501158080701. Local number, 3-2508-02.

LOCATION.--Lat 21°25′01″, long 158°08′07″, Hydrologic Unit 20060000, 2.2 mi northeast from the intersection of Farrington Highway and Lualualei Naval Ammunition Depot, 0.4 mi southeast of entrance to Lualualei Naval Ammunition Depot, located inside the Depot. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Located at the bottom of a 30-degree inclined 6.8 ft by 7.8 ft shaft, 340 feet long.

DATUM.--Elevation of land-surface datum is 180 ft. Measuring point: Top of concrete above well, elevation; 13.16 feet above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, October 1972 to current year.
Water quality: 1971-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.40 ft above mean sea level, October 3, 1972; lowest, 10.15 ft above mean sea level, March 8, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 16	10.28	MAY 21	10.30	JUL 18	10.30

212659158004102. Local number, 3-2600-04.

LOCATION.--Lat 21°26′59″, long 158°00′41″, Hydrologic Unit 20060000, 30 ft south of Waiahole ditch, and 1.1 mi. east southeast of Kipapa School in Mililani. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 815 ft, casing diameter 16 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum is 665 ft. Measuring point: Top of 16-in. casing, 666.62 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Water-level recorder, October 1983 to September 10, 1987.
Occasional measurements, October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.49 ft above mean sea level, April 5, 1989; lowest 16.74 ft above mean sea level, September 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	a--	MAY 17	a--

a-- unable to make a measurement

212813158080201. Local number, 3-2808-01.

LOCATION.--Lat 21°28′13″, long 158°08′04″, Hydrologic Unit 20060000, inside Lualualei Naval Ammunition Depot, 1000 ft west from the intersection of Kolekole Road and Radford Street, at Building 492, 3.3 miles north from the entrance of the depot. Owner: U.S. Navy.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Depth 535 ft, cased to 182 ft, diameter is 12-in to 185 ft, then 3-in to 535 ft.

DATUM.--Elevation of land-surface datum is 347 ft. Measuring point: On pump 2 ft above base. Remove 1/2-in nipple, elevation 437.45 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, June 1973 to current year.
Water quality: 1972-88.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 441.81 ft above mean sea level, February 28, 1983; lowest, 420.78 ft above mean sea level, October 24, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 16	430.65	MAY 21	430.15	JUL 18	430.33

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29′27″, long 158°01′48″, Hydrologic Unit 20060000, across the main gate of Wheeler AFB, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary 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 51 ft. Measuring point: Top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Water-level recorder, November 1938 to current year.
Water quality: 1966-72, 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft above mean sea level, May 12, 1969; lowest, 269.52 ft above mean sea level, December 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	--	--	273.35	272.90	273.35	273.07	273.04	272.66	272.33	272.84	272.49	272.70
10	--	--	273.37	273.34	273.48	273.34	273.35	272.86	272.97	272.72	272.62	272.90
15	--	--	273.38	273.35	272.99	273.43	273.34	272.57	272.87	272.78	272.50	272.87
20	--	a--	273.29	273.40	273.40	273.10	273.31	272.61	272.91	272.82	272.12	272.87
25	--	273.31	273.35	273.38	273.36	272.50	272.47	273.08	272.80	272.72	272.66	272.71
EOM	--	273.35	273.37	273.43	273.36	273.05	273.29	273.06	272.83	272.66	272.65	272.27

a-- No record October 01 to November 24, clock stopped.

NON-PUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	273.54	NOV 06	273.40	DEC 04	273.49	JAN 08	273.48	FEB 06	273.47	APR 03	273.57
APR 06	273.56	JUN 03	273.05	JUL 01	272.93	AUG 22	272.71	SEP 10	272.90		

213224158135901. Local number, 3-3213-06.

LOCATION.--Lat 21°32′24″, long 158°13′59″, Hydrologic Unit 20060000, along Farrington Highway, 1.2 mi north of Makua Cave, and 1 mi southeast of Yokohama Bay. Owner: U.S. Air Force.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary 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: Top of 6-in. casing, elevation: 26.47 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, October 1972 to current year.
Water quality: 1967, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.92 ft above mean sea level, January 2, 1975; lowest, 6.49 ft above mean sea level, July 15, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR 16	6.70	MAY 21	6.66	JUL 18	6.72

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33′27″, long 157°52′44″, Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 441 ft, casing diameter 10-in., cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements, April 1935 to 1990, 1992 to current year.
Water quality: 1935 to 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, March 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 14	14.51	MAY 28	14.36	JUL 18	13.53

213438158091101. Local number, 3-3409-16.

LOCATION.--Lat 21°34′36″, long 158°09′12″, Hydrologic Unit 20060000, 1.6 mi west of Waialua High School, 2.6 mi east of Mokuleia Beach Park along Farrington Highway. Owner: J. Mendonca.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 518 ft, cased to 440 ft, diameter 10-in. to 8-in.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Chiseled 1 1/2-in. square on concrete, 3.7 ft in front of door of well shelter, elevation: 8.48 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
Water level: Occasional measurements, December 1924 to current year.
Water quality: 1924-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, January 16, 1969; lowest, 16.75 ft above mean sea level, August 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 12	17.71	MAY 17	17.70	JUL 22	17.96

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34′46″, long 158°10′49″, Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 447 ft, casing diameter 1 in., cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 12-in. stilling well, 20.53 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

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: 1929 to 1985, 1989 to 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 19.98 ft above mean sea level, January 5, 1969; lowest 16.08 ft above mean sea level, August 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 12	18.29	MAY 17	18.22	JUL 19	18.15

214053157570401. Local number, 3-4057-05.

LOCATION.--Lat 21°40′53″, long 157°57′04″, Hydrologic Unit 20060000, 0.4 mi northeast of Kahuku Hospital, and 500 ft north of Kahuku High School.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 397 ft, 12-in. metal casing, cased to 172 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point: Top of 10-in. stand pipe, elevation; 16.01 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

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: 1908, 1911-16, 1924-78.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.12 ft above mean sea level, January 1916; lowest, 8.00 ft above mean sea level, October 5, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 23	13.07	MAR 14	13.15	MAY 28	13.02	JUL 17	13.03

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41′25″, long 158°01′34″, Hydrologic Unit 20060000, 1,500 ft northeast of University of Hawaii agriculture experiment station in Waialee, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, casing diameter 8 in., cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point: Top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of 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 ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 23	13.33	MAR 14	13.24	MAY 28	13.20	JUL 17	13.40

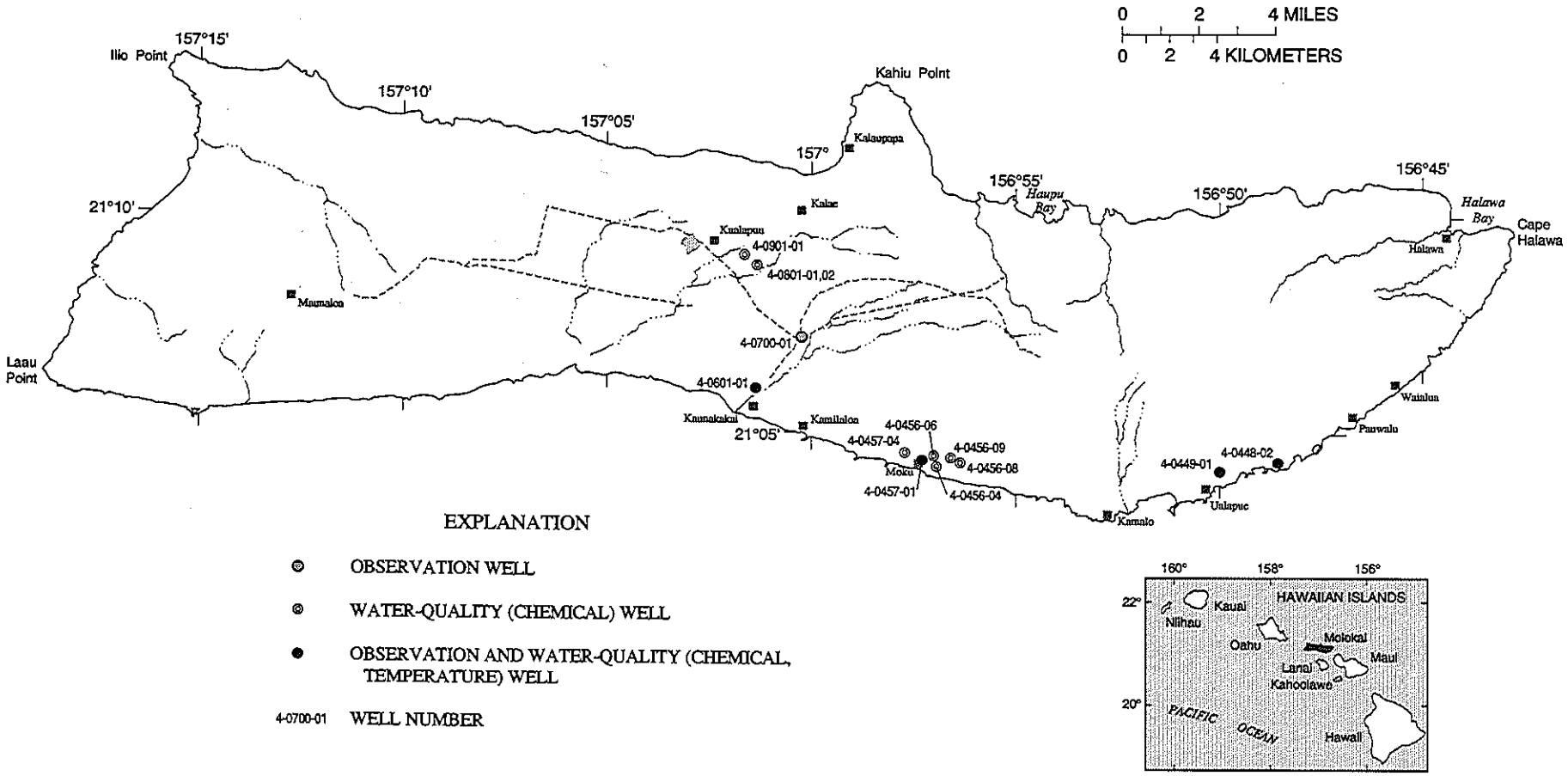


Figure 18. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Molokai.

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 6 ft, depth 22 ft.

DATUM.--Elevation of land surface datum is 19 ft. Measuring point: Top of 2" x 2" 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: 1970-73, 1993 to current year.

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 ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	4.22	FEB 05	4.16	MAR 25	4.13	MAY 15	3.92	JUL 11	4.09	SEP 16	4.18	DEC 13	4.36

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal 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: Top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
Water level: Occasional measurements, 1938-39, 1941-63, November 1972 to current year.
Water quality: 1948, 1952-56, 1970-91, 1993 to current year.

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, Sepember 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	2.93	FEB 05	3.19	MAR 25	3.10	MAY 15	2.77	JUL 11	3.16	SEP 16	3.17	DEC 13	3.35

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04′19″, long 156°57′05″, Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal 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: Top of steel plate, 37.36 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply. Water level taken after pump turned off for half hour.

PERIOD OF RECORD.--
Water level: Occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.
Water quality: 1948, 1954-56, 1960, 1962, 1971, 1973-91, 1993 to current year.

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 ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	2.11	FEB 05	1.96	MAR 25	1.87	MAY 15	1.87	JUL 11	2.00	SEP 16	2.11	DEC 13	2.12

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06′05″, long 157°01′20″, Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, casing diameter 12-in., cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point: 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: 1954 to current year.

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 ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	2.85	FEB 09	2.72	MAR 29	2.64	MAY 16	2.62	JUL 11	2.65	SEP 17	2.88	DEC 13	2.86

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", long 157°00'05", Hydrologic Unit 20050000, 2.3 mi northeast of Kakahaia Fishpond, and 0.5 mi northeast of Kaunakakai, and 2.4 mi north of Kamiloloa. Owner: Kaluakoi Corporation.

AQUIFER.--East Molokai Volcanic Series.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,080 ft, casing diameter 20-in., cased to 956 ft, perforated from 956 to 1,056 ft.

DATUM.--Measuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 975.25 ft below land-surface datum, April 27, 1988; lowest measured, 976.23 ft below land-surface datum, September 10, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	975.97	FEB 07	975.94	MAY 16	976.07	JUL 11	976.20

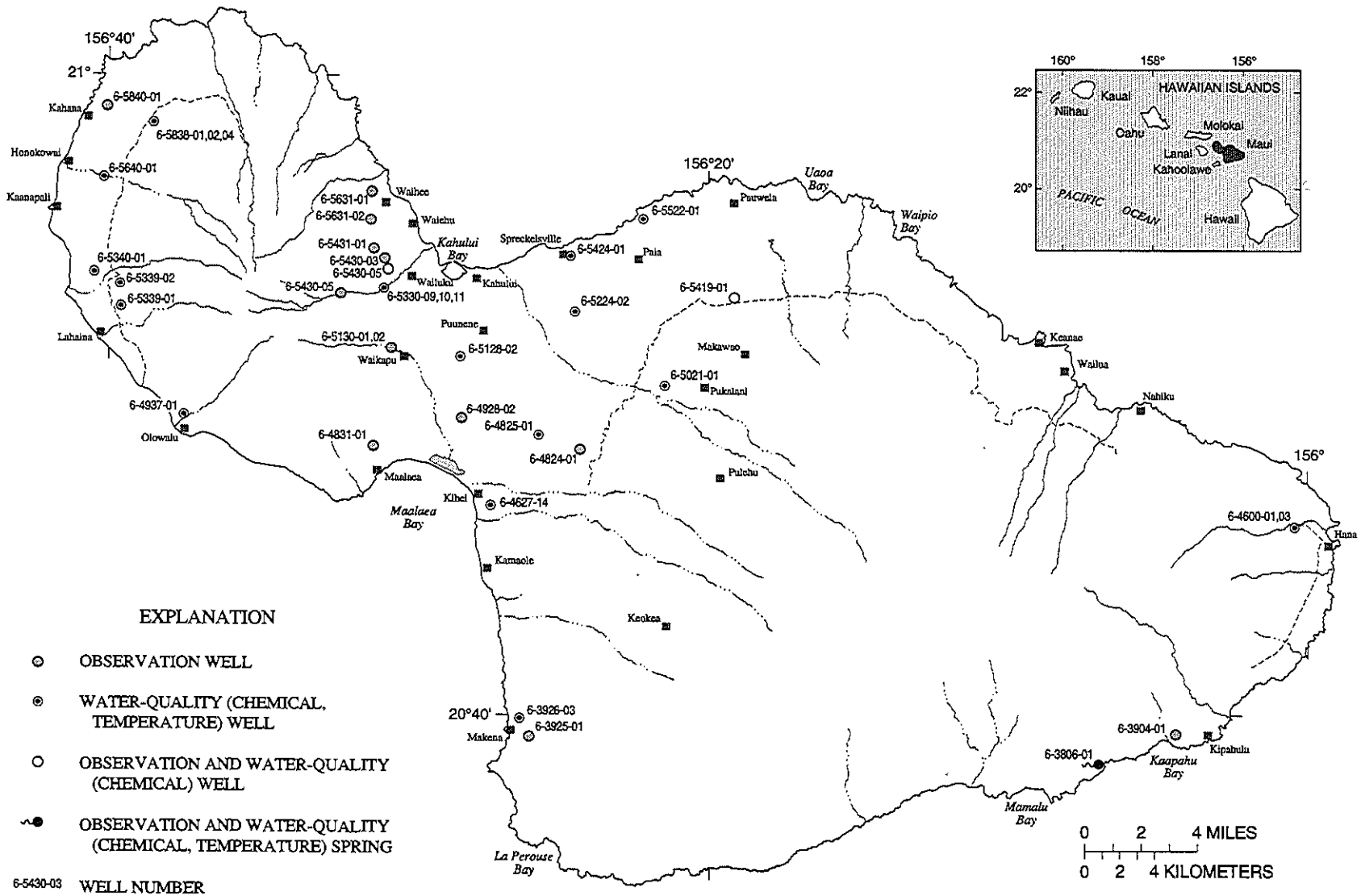


Figure 19. Locations of observation wells and ground-water quality sampling wells on Maui.

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39′08″, long 156°04′12″, Hydrologic Unit 20020000, 1,300 ft northwest of Kakanoni Point, and 0.7 mi west of Kipahulu School. Owner: Cordelia May.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4-in.

DATUM.--Elevation of land-surface datum is 133 ft. Measuring point: Top of 1-in. pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to November 1995 (Discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, June 29, 1988; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL
OCT 03	2.55

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39′12″, long 156°25′59″, Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, casing diameter 8-in., cased to 343 ft. perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 352 ft. Measuring point: 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, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	a--	JAN 10	0.13	APR 10	-0.18	AUG 13	-0.01

a- no measurement made, gate locks changed

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48′27″, long 156°24′22″, Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa gulch, and 4 mi east of Kihei. Owner: State of Hawaii.

AQUIFER.--Kula volcanic series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 647 ft, casing diameter 12-in., cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point: Top of 3-in. pipe attached to the steel casing cover, 594.74 ft above mean sea level (levels of December 10, 1993).

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; lowest measured, 3.65 ft above mean sea level, January 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 02	4.29	MAR 07	4.41	APR 19	4.37	JUN 21	3.99	AUG 15	4.27	JAN 17	4.39

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48′18″, long 156°31′03″, Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Piliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, casing diameter 8-in., cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point: Top of 8-in. casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974. Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, November 30, 1983; lowest measured, 4.74 ft above mean sea level, March 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	5.23	JAN 16	5.30	MAR 07	5.28	APR 08	5.21	JUN 20	4.95	AUG 09	5.21

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48′27″, long 156°28′14″, Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 ft x 9 ft vertical shaft, depth 53 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: Top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, January 12, 1980; lowest measured, 3.05 ft above mean sea level, March 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	3.76	JAN 10	3.99	FEB 16	3.73	APR 10	3.99	JUN 19	3.53	AUG 13	3.79

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51′40″, long 156°30′45″, Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 757 ft, casing diameter 8-in., cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point: Top of 6-in. pipe coupling, 551.33 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, 11.36 ft above mean sea level, January 27, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	12.67	MAR 07	11.66	MAY 28	12.32	JUL 01	12.59	AUG 28	12.84

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51′54″, long 156°30′38″, Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, casing diameter 20-in., cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point: Top of casing, 519.33 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, 12.53 ft above mean sea level, July 12, and August 24, 1995.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	12.41	MAR 07	12.41	MAY 28	12.20	JUL 01	12.12	AUG 26	12.13
JAN 17	12.34	APR 04	12.50						

205312156321402. Local number, 6-5332-04.

Record of water-level data for water year 1996 was not completed at the time of publication.

205412156193801. Local number, 6-5419-01.

LOCATION.--Lat 20°54′12″, long 156°19′38″, Hydrologic Unit 20020000, 0.9 mi south of Haiku Cannery, and 2 mi north west of Kaupakulua between the Haiku-Kokomo road and Maliko Gulch. Owner: State of Hawaii

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4-in., cased to 829 ft, perforated from 829 to 859 ft.

DATUM.--Elevation of land-surface datum is 828 ft. Measuring point: Top of 6-in. pipe coupling, 828.44 ft above mean sea level.

REMARKS.--Water level readings are affeeted by oil floating on top of the water.

PERIOD OF RECORD.--Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.60 ft above mean sea level, May 2, 1989; lowest measured, 4.36 ft above mean sea level, July 9, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	a--	JAN 18	a--	MAY 16	a--	JUL 12	a--	AUG 24	a--

a-- Pump being installed. Unable to make a measurement.

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54′19″, long 156°30′44″, Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal 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: Top of 1-in. galvanized pipe, 416.75 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, 11.50 ft above mean sea level, August 7, 1995.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 04	11.04	JAN 03	12.46	APR 02	12.82	JUL 01	10.80	AUG 26	9.96
NOV 21	11.54	FEB 12	13.34	MAY 29	11.70				

205405156305401. Local number, 6-5430-05.

LOCATION.--Lat 20°45′59″, long 156°30′56″, Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, casing diameter 10 in., cased to 400 ft.

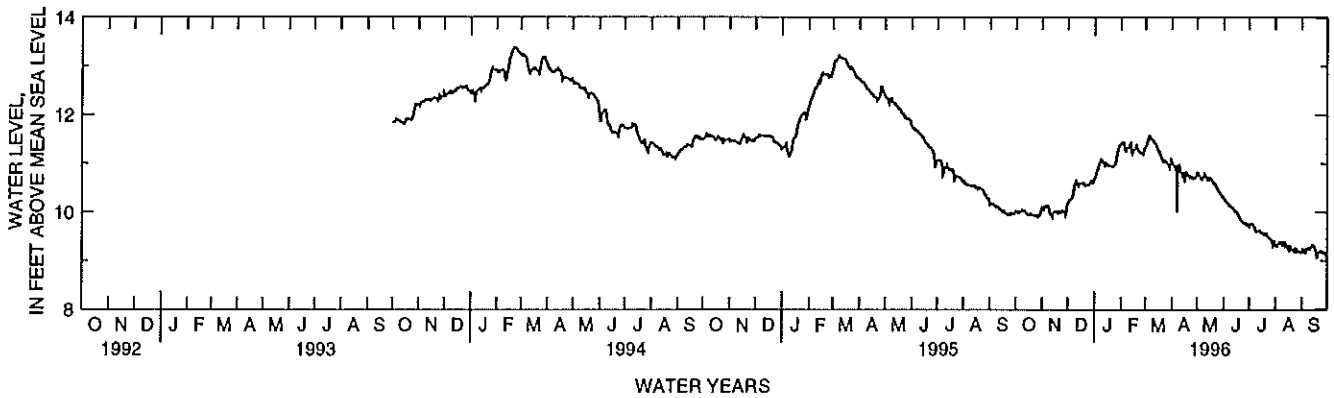
DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-in. casing, 380.84 ft, above mean sea level.

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, 9.00 ft above mean sea level, September 19, 1996.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.02	10.10	10.19	10.70	11.42	11.35	11.03	10.81	10.30	9.71	9.34	9.22
2	10.02	10.09	10.24	10.75	11.43	11.38	10.99	10.80	10.26	9.75	9.30	9.18
3	10.02	10.06	10.25	10.80	11.44	11.48	10.96	10.76	10.22	9.75	9.30	9.17
4	9.99	10.11	10.27	10.87	11.43	11.53	10.96	10.74	10.21	9.75	9.33	9.22
5	10.01	10.13	10.28	10.90	11.33	11.50	10.88	10.69	10.19	9.75	9.36	9.17
6	10.01	10.10	10.29	10.96	11.27	11.55	10.96	10.68	10.16	9.71	9.37	9.17
7	10.02	10.10	10.35	11.01	11.27	11.53	10.01	10.69	10.16	9.70	9.39	9.25
8	10.04	10.12	10.51	11.07	11.32	11.50	10.94	10.74	10.13	9.65	9.38	9.25
9	10.02	10.06	10.59	11.08	11.34	11.49	10.91	10.78	10.13	9.60	9.30	9.27
10	10.03	9.97	10.64	11.05	11.33	11.48	10.95	10.74	10.11	9.60	9.37	9.24
11	10.03	9.96	10.62	11.03	11.39	11.44	10.85	10.73	10.10	9.61	9.36	9.24
12	10.01	9.93	10.56	10.99	11.41	11.43	10.82	10.70	10.09	9.61	9.31	9.26
13	9.99	9.90	10.54	10.97	11.26	11.40	10.76	10.66	10.05	9.62	9.35	9.32
14	9.96	9.99	10.59	11.01	11.22	11.35	10.80	10.66	10.02	9.61	9.31	9.32
15	9.97	10.00	10.60	10.99	11.28	11.30	10.81	10.70	10.01	9.58	9.29	9.31
16	9.95	10.01	10.60	10.97	11.28	11.26	10.63	10.68	10.01	9.58	9.25	9.28
17	9.96	10.02	10.59	10.97	11.31	11.25	10.77	10.68	9.98	9.56	9.32	9.23
18	9.97	10.00	10.59	10.97	11.35	11.19	10.84	10.65	9.94	9.54	9.24	9.15
19	9.96	9.98	10.60	10.96	11.37	11.15	10.77	10.63	9.91	9.55	9.28	9.05
20	9.95	10.01	10.57	10.96	11.31	11.11	10.75	10.59	9.88	9.55	9.25	9.15
21	9.95	10.02	10.55	10.95	11.27	11.07	10.76	10.59	9.83	9.56	9.23	9.18
22	9.94	9.98	10.56	10.95	11.27	11.04	10.72	10.56	9.82	9.52	9.21	9.20
23	9.93	9.98	10.57	10.96	11.23	11.04	10.74	10.53	9.80	9.49	9.19	9.20
24	9.93	10.01	10.56	10.96	11.23	11.06	10.74	10.48	9.78	9.49	9.24	9.17
25	9.94	10.03	10.56	10.98	11.23	11.02	10.72	10.46	9.77	9.47	9.20	9.16
26	9.95	10.02	10.59	11.05	11.23	11.02	10.70	10.42	9.77	9.46	9.23	9.18
27	9.91	10.00	10.62	11.17	11.21	10.99	10.71	10.41	9.78	9.44	9.19	9.17
28	9.92	9.95	10.64	11.25	11.30	10.98	10.71	10.37	9.74	9.41	9.20	9.17
29	9.94	10.01	10.60	11.32	11.33	10.93	10.72	10.36	9.73	9.32	9.19	9.16
30	9.97	10.15	10.60	11.37	---	10.99	10.75	10.32	9.75	9.35	9.18	9.10
31	10.06	---	10.66	11.37	---	11.07	---	10.31	---	9.39	9.17	---
MEAN	9.98	10.03	10.52	11.01	11.31	11.25	10.79	10.61	9.99	9.57	9.28	9.20
MAX	10.06	10.15	10.66	11.37	11.44	11.55	11.03	10.81	10.30	9.75	9.39	9.32
MIN	9.91	9.90	10.19	10.70	11.21	10.93	10.01	10.31	9.73	9.32	9.17	9.05



205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54′37″, long 156°31′05″, Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal 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: Top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

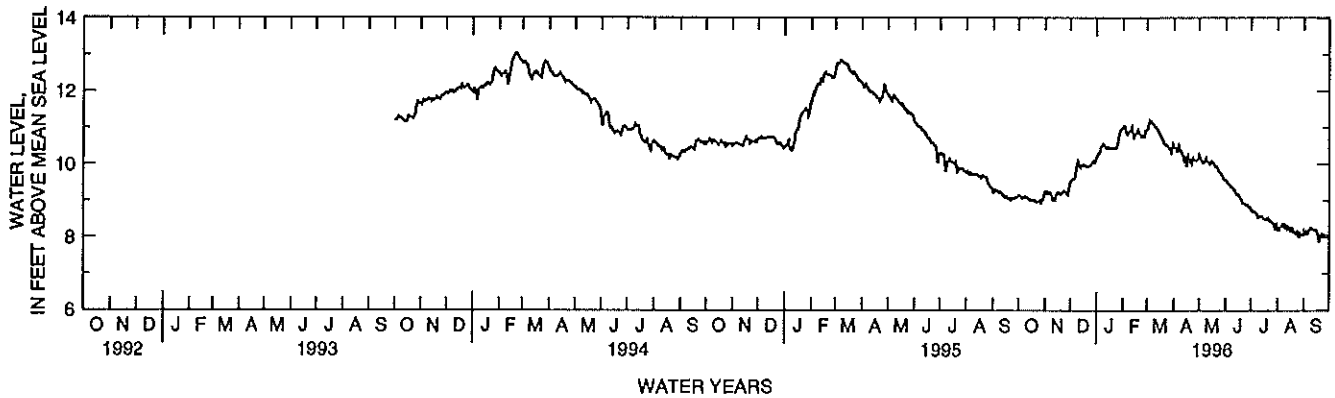
PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, January 2, 1983; lowest measured, 7.80 ft above mean sea level, August 19, 1996.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.14	9.25	9.49	10.19	11.00	10.95	10.52	10.25	9.57	8.74	8.24	8.15
2	9.14	9.23	9.55	10.23	11.03	10.98	10.44	10.20	9.55	8.74	8.20	8.08
3	9.13	9.19	9.57	10.27	11.04	11.10	10.44	10.15	9.49	8.70	8.21	8.10
4	9.10	9.24	9.58	10.29	11.01	11.18	10.42	10.10	9.46	8.70	8.26	8.15
5	9.07	9.24	9.60	10.34	10.86	11.14	10.34	10.05	9.45	8.71	8.30	8.10
6	9.07	9.19	9.60	10.41	10.83	11.16	10.45	10.04	9.42	8.68	8.33	8.10
7	9.09	9.20	9.68	10.49	10.82	11.13	10.50	10.05	9.38	8.66	8.35	8.19
8	9.11	9.21	9.91	10.54	10.89	11.11	10.39	10.12	9.37	8.60	8.33	8.21
9	9.08	9.14	10.01	10.55	10.91	11.05	10.35	10.16	9.35	8.55	8.23	8.24
10	9.09	9.03	10.08	10.54	10.91	11.03	10.36	10.10	9.32	8.55	8.33	8.22
11	9.09	9.04	10.02	10.50	10.99	11.02	10.26	10.07	9.29	8.56	8.30	8.22
12	9.06	9.01	9.93	10.44	11.03	10.99	10.22	10.05	9.27	8.56	8.23	8.20
13	9.03	9.01	9.91	10.44	10.76	10.94	10.13	10.00	9.21	8.57	8.29	8.20
14	9.01	9.17	9.95	10.47	10.73	10.89	10.20	10.00	9.17	8.57	8.23	8.21
15	9.03	9.19	9.98	10.47	10.81	10.85	10.20	10.07	9.16	8.52	8.24	8.20
16	9.00	9.21	9.99	10.44	10.81	10.80	9.94	10.04	9.17	8.52	8.15	8.17
17	9.00	9.22	9.95	10.44	10.86	10.76	10.17	10.05	9.12	8.50	8.27	8.10
18	9.02	9.19	9.95	10.44	10.91	10.70	10.23	10.00	9.08	8.48	8.14	8.01
19	8.99	9.18	9.97	10.43	10.94	10.68	10.15	9.98	9.03	8.49	8.21	7.87
20	9.01	9.21	9.95	10.44	10.86	10.61	10.08	9.93	9.01	8.50	8.18	8.03
21	8.98	9.22	9.93	10.44	10.82	10.55	10.11	9.94	8.93	8.52	8.13	8.05
22	8.96	9.21	9.95	10.45	10.81	10.53	10.04	9.91	8.93	8.45	8.10	8.09
23	8.97	9.23	9.96	10.45	10.76	10.51	10.15	9.86	8.92	8.43	8.09	8.07
24	8.98	9.26	9.96	10.45	10.78	10.53	10.17	9.81	8.90	8.45	8.14	8.05
25	8.98	9.23	9.98	10.46	10.76	10.49	10.12	9.78	8.87	8.42	8.06	8.02
26	9.01	9.24	10.01	10.56	10.79	10.45	10.10	e9.75	8.88	8.41	8.10	8.06
27	8.95	9.18	10.04	10.72	10.77	10.44	10.10	e9.73	8.88	8.38	8.05	8.05
28	8.97	9.16	10.08	10.85	10.92	10.41	10.11	e9.68	8.83	8.33	8.10	8.05
29	9.03	9.27	10.03	10.91	10.93	10.35	10.12	e9.63	8.81	8.21	8.07	8.03
30	9.09	9.45	10.03	10.94	---	10.49	10.15	9.59	8.82	8.29	8.06	7.96
31	9.21	---	10.11	10.96	---	10.56	---	9.57	---	8.34	8.06	---
MEAN	9.04	9.19	9.90	10.50	10.87	10.79	10.23	9.96	9.15	8.52	8.19	8.11
MAX	9.21	9.45	10.11	10.96	11.04	11.18	10.52	10.25	9.57	8.74	8.35	8.24
MIN	8.95	9.01	9.49	10.19	10.73	10.35	9.94	9.57	8.81	8.21	8.05	7.87

e Estimated



205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56′17″, long 156°31′11″, Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal 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: Top of 1.5-in. PVC pipe, 248.05 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, Decembeer 6, 1982; lowest measured, 12.42 ft above mean sea level, August 20, 1996.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 04	12.99	JAN 03	13.15	APR 02	13.22	JUL 01	12.68	AUG 20	12.42
NOV 21	12.85	FEB 12	13.33	MAY 28	12.92				

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56′51″, long 156°31′32″, Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, casing diameter 16-in., cased to 290 ft, perforated from 290 to 310 ft.

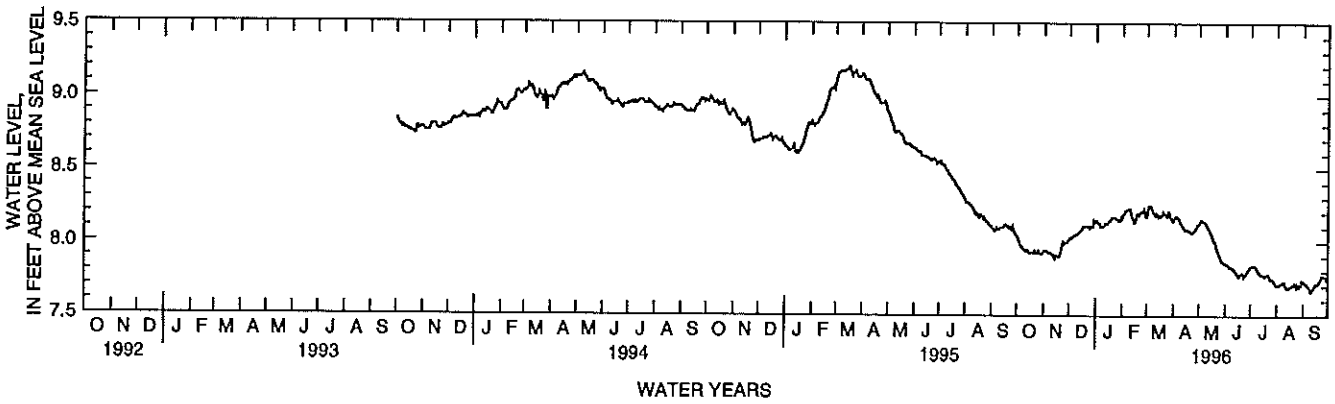
DATUM.--Elevation of land-surface datum is 281 ft. Measuring point: Top of 16-in. casing, 284.78 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, April 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.05 ft above mean sea level, October 22, November 2, 10, 11, 1989. Lowest water level measured, 7.61 ft above mean sea level, September 11, 1996.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.04	7.94	8.02	8.14	8.17	8.18	8.15	8.13	7.86	7.83	7.71	7.73
2	8.04	7.94	8.03	8.15	8.19	8.20	8.17	8.14	7.85	7.84	7.71	7.73
3	8.02	7.94	8.03	8.14	8.20	8.25	8.18	8.15	7.85	7.84	7.71	7.72
4	8.00	7.94	8.03	8.13	8.20	8.25	8.18	8.15	7.85	7.84	7.71	7.72
5	7.98	7.94	8.04	8.13	8.22	8.25	8.17	8.15	7.84	7.84	7.72	7.72
6	7.97	7.93	8.04	8.13	8.22	8.25	8.17	8.14	7.83	7.84	7.72	7.71
7	7.97	7.93	8.05	8.11	8.22	8.23	8.17	8.14	7.83	7.83	7.72	7.70
8	7.96	7.93	8.05	8.11	8.23	8.21	8.15	8.14	7.83	7.83	7.72	7.70
9	7.95	7.93	8.05	8.11	8.23	8.20	8.14	8.13	7.83	7.82	7.73	7.69
10	7.95	7.92	8.06	8.11	8.23	8.20	8.13	8.12	7.82	7.80	7.73	7.67
11	7.94	7.92	8.06	8.12	8.21	8.19	8.12	8.11	7.82	7.80	7.71	7.67
12	7.95	7.92	8.06	8.13	8.19	8.20	8.11	8.10	7.81	7.79	7.70	7.68
13	7.95	7.90	8.07	8.13	8.17	8.19	8.10	8.09	7.80	7.78	7.69	7.69
14	7.94	7.89	8.08	8.13	8.16	8.18	8.09	8.07	7.79	7.78	7.69	7.70
15	7.93	7.91	8.08	8.13	8.14	8.19	8.09	8.06	7.79	7.78	7.69	7.71
16	7.93	7.91	8.09	8.14	8.14	8.19	8.09	8.05	7.78	7.78	7.70	7.72
17	7.93	7.91	8.10	8.15	8.16	8.18	8.09	8.03	7.77	7.77	7.70	7.72
18	7.93	7.90	8.11	8.15	8.19	8.18	8.09	8.01	7.77	7.77	7.70	7.72
19	7.93	7.90	8.11	8.16	8.20	8.19	8.08	8.01	7.78	7.77	7.71	7.72
20	7.93	7.91	8.11	8.17	8.20	8.21	8.08	8.00	7.79	7.78	7.71	7.73
21	7.93	7.92	8.11	8.17	8.19	8.20	8.08	7.97	7.79	7.78	7.71	7.74
22	7.94	7.95	8.11	8.17	8.20	8.20	8.07	7.95	7.79	7.78	7.72	7.75
23	7.93	7.98	8.11	8.17	8.21	8.19	8.07	7.94	7.77	7.77	7.71	7.77
24	7.93	8.00	8.11	8.17	8.21	8.18	8.07	7.92	7.78	7.75	7.70	7.77
25	7.93	7.99	8.10	8.17	8.21	8.18	8.08	7.91	7.78	7.75	7.72	7.77
26	7.94	8.00	8.11	8.16	8.22	8.21	8.09	7.90	7.79	7.75	7.71	7.77
27	7.93	8.00	8.11	8.16	8.23	8.21	8.09	7.88	7.80	7.75	7.70	7.77
28	7.93	8.00	8.11	8.15	8.21	8.19	8.10	7.87	7.81	7.74	7.71	7.76
29	7.92	8.00	8.11	8.15	8.18	8.17	8.12	7.87	7.82	7.73	7.71	7.75
30	7.92	8.01	8.15	8.17	---	8.16	8.12	7.86	7.83	7.72	7.74	7.75
31	7.93	---	8.14	8.16	---	8.15	---	7.86	---	7.71	7.74	---
MEAN	7.95	7.94	8.08	8.14	8.20	8.20	8.11	8.03	7.81	7.79	7.71	7.72
MAX	8.04	8.01	8.15	8.17	8.23	8.25	8.18	8.15	7.86	7.84	7.74	7.77
MIN	7.92	7.89	8.02	8.11	8.14	8.15	8.07	7.86	7.77	7.71	7.69	7.67



205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58′56″, long 156°40′01″, Hydrologic Unit 20020000, on pineapple plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, casing diameter 8-in., 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: Top of 9-in. casing, 257.45 ft above mean sea level. Levels of August 11, 1993.

REMARKS.--Water-quality records for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water-level recorder, August 1975 to June 25, 1993. Occasional measurements, July 1993 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.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	3.23	JAN 16	3.10	FEB 20	2.96	APR 16	2.90	JUN 10	2.95	AUG 13	3.07

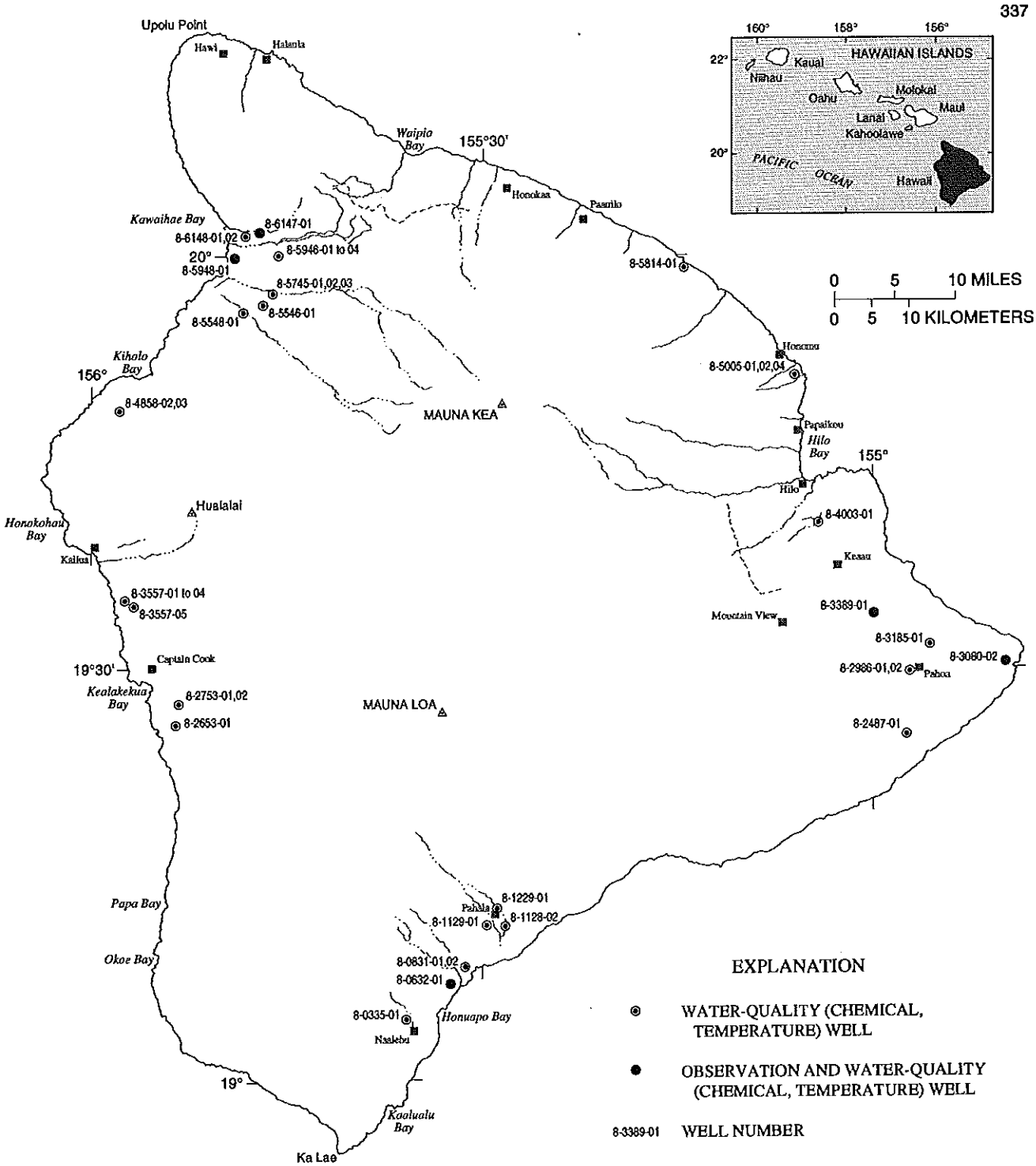


Figure 20. Locations of observation wells and ground-water quality sampling wells on Hawaii.

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06′02″, long 155°32′59″, Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14-in., cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 0.38 ft above 1-in. hole in pump base, 103.64 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of the district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

REVISED RECORDS.--WDR HI-91-1: 1984-90 (The units of the minimum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.39 ft above mean sea level, October 19, 1978; lowest measured, 0.21 ft above mean sea level, June 19, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	1.86	DEC 14	1.36	FEB 23	0.77
APR 19	0.29	JUNE 18	0.41	AUG 14	0.43

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30′17″, long 154°50′21″, Hydrologic Unit 20010000, 0.5 mi south of intersection of Highway 132 and Highway 137 near Pahoa. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, depth 46 ft, casing diameter 66-in., with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-in. hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--
Water level: Occasional measurements, March 1972 to current year.
Water quality: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.77 ft above mean sea level, March 2, 1989; lowest measured, 1.18 ft above mean sea level, June 3, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	4.51	FEB 21	4.58	APR 18	4.30	JUN 17	4.17	AUG 13	4.59

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33′39″, long 154°59′48″, Hydrologic Unit 20010000, 3.5 mi northwest of Pahoa airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8-in., cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.76 ft above mean sea level, revised, November 27, 1990; lowest measured, 9.92 ft above mean sea level, June 9, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	17.46	FEB 21	17.46	APR 18	18.20	JUNE 17	17.25	AUG 13	17.13

195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59′47″, long 155°48′58″, Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 268 ft, easing diameter 10-in., cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--
Water level: Occasional measurements, April 1970, March 1973 to current year.
Water quality: 1970, 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1976-80 (Water-level data), 1976-90 (Maximum and minimum water levels for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, August 29, 1994; lowest measured, 1.38 ft above mean sea level, September 28, 1979.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	4.63	JAN 09	a--	FEB 28	a--
APR 23	a--	JUNE 21	a--	AUG 16	a--

a-- No water level taken. Pump found running.

200132155471101. Local number, 8-6147-01.

LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,008 ft, casing diameter 8-in., cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft, but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point: Top of pipe coupling on casing cover 983.08 ft, revised, November 18, 1986, above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1963, June 1973 to current year.

REVISED RECORDS.--WRD HI-91-1: 1975-90 (Station ID number.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987; lowest measured, 4.66 ft above mean sea level, May 3, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 02	5.34	FEB 28	4.90	APR 23	5.16	JUN 21	5.63	AUG 16	5.80

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI						
220051159231801	2-0023-01	PUKAKI RESERVO	22 00 51 N	159 23 18 W	03-20-96	1050	308	25.5	24
					03-20-96	1150	318	25.0	24
					04-02-96	1140	313	25.5	24
					04-02-96	1700	344	25.0	24
					04-03-96	0800	434	25.0	23
					04-03-96	1700	496	26.0	24
					04-04-96	0800	658	26.0	23
					04-04-96	1700	800	26.5	27
					04-05-96	1100	908	27.0	25
					04-05-96	1700	955	27.0	27
					04-06-96	0800	1000	26.5	24
220018159444702	2-0044-13	W34 KEKAHA	22 00 18 N	159 44 47 W	10-24-95	1210	484	23.0	72
					01-04-96	0900	471	23.5	70
220016159442701	2-0044-15	S14 KEKAHA	22 00 16 N	159 44 27 W	10-24-95	0845	1290	22.5	305
220136159205501	2-0120-01	W7 WAILUA	22 01 36 N	159 20 55 W	10-25-95	1015	843	25.5	146
					01-12-96	1135	801	25.0	134
					02-15-96	1320	809	24.0	136
					04-08-96	1250	819	26.0	143
					06-12-96	1220	833	26.0	146
220126159261501	2-0126-01	NW KILOHANA	22 01 26 N	159 26 15 W	01-24-96	1615	913	30.0	16
					01-25-96	1700	693	29.0	15
					01-26-96	1700	626	28.5	16
					01-27-96	1700	593	28.5	15
					01-28-96	1600	583	28.5	15
					01-29-96	1700	576	28.5	18
					01-30-96	1600	570	28.0	16
					01-31-96	0800	566	27.0	17
220148159453501	2-0145-10	W45F MANA	22 01 48 N	159 45 35 W	10-24-95	1150	788	22.0	153
220354159205601	2-0320-01	W9-1A WAIL	22 03 54 N	159 20 56 W	10-20-95	a0850	--	--	--
220354159205602	2-0320-03	W9-1B WAIL	22 03 54 N	159 20 56 W	10-20-95	0850	400	24.0	46
					12-14-95	0840	403	24.0	46
					02-14-96	1025	422	23.5	56
					04-09-96	0915	419	24.0	55
					06-06-96	0955	393	24.0	47
					07-23-96	0900	418	24.0	54
220341159453901	2-0345-04	S16 SAKIMA	22 03 41 N	159 45 39 W	10-24-95	0930	225	23.5	569
220530159450401	2-0545-01	W59 KAULAU	22 05 30 N	159 45 07 W	01-12-96	0920	730	22.0	133
					02-13-96	1045	729	22.0	133
					04-05-96	0915	745	24.0	136
					06-06-96	1235	758	26.0	136
					07-22-96	1240	730	25.0	141
220621159232101	2-0623-04	KAPAA	22 06 21 N	159 23 21 W	10-20-95	1415	121	24.0	15
					12-14-95	1400	113	25.5	13
					02-14-96	1515	107	25.5	12
					04-09-96	1430	103	25.0	13
					06-07-96	1050	117	24.0	14
					07-23-96	1500	111	26.0	12
220827159185401	2-0818-01	W90A ANAHO	22 08 27 N	159 18 54 W	10-20-95	0940	222	24.5	21
					02-14-96	1130	224	23.5	22
					06-06-96	1130	247	24.0	26

a Pump being replaced, unable to collect sample

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued						
220826159185401	2-0818-02	W90B ANAHO	22 08 26 N	159 18 54 W	12-14-95	0940	285	24.0	23
					04-09-96	1010	245	24.0	23
					07-23-96	0950	280	24.0	23
221141159252501	2-1125-01	N1 KILAUEA	22 11 41 N	159 25 25 W	10-20-95	1015	180	24.0	19
					02-14-96	1245	162	22.5	16
					06-07-96	1205	177	25.0	18
221141159252502	2-1125-02	N2 KILAUEA	22 11 41 N	159 25 25 W	12-14-95	1020	158	24.5	16
					04-09-96	1115	159	24.5	15
					07-23-96	1040	160	25.0	15
221150159264501	2-1126-01	KALIHIWAI	22 11 50 N	159 26 45 W	12-08-95	0800	213	22.5	23
					04-11-96	0820	191	22.5	20
					06-10-96	0840	188	22.5	20
					07-24-96	0800	199	22.5	22
221151159265001	2-1126-02	KALIHIWAI	22 11 51 N	159 26 50 W	10-25-95	0840	197	22.5	22
					02-09-96	0800	210	22.5	22
221201159293401	2-1229-03	W73 HANALE	22 12 01 N	159 29 34 W	10-20-95	1240	256	23.5	35
					12-14-95	1245	258	25.0	36
					02-14-96	1415	257	23.5	36
					04-09-96	1330	228	23.5	27
					06-07-96	1430	229	25.0	36
					07-23-96	1115	257	24.0	36
221247159324801	2-1232-01	W67 WAINIH	22 12 47 N	159 32 48 W	10-20-95	1210	134	23.0	23
					12-14-95	1215	128	22.5	23
					02-14-96	1350	122	22.5	22
					04-09-96	1300	122	23.5	25
					06-07-96	1415	127	23.5	24
					07-23-96	1300	127	24.0	22
221318159335901	2-1333-01	W66 HAENA	22 13 18 N	159 33 59 W	10-20-95	a1110	--	--	--
					07-23-96	1205	215	22.0	21
215434159263301	2-5426-03	T16 KOLOA	21 54 34 N	159 26 33 W	05-02-96	0800	519	23.0	106
					06-06-96	0820	501	23.5	94
215454159274201	2-5427-01	W16A KOLOA	21 54 54 N	159 27 42 W	12-13-95	0800	236	22.5	26
					02-13-96	0755	237	22.0	28
					06-06-96	0850	233	22.5	27
215455159274201	2-5427-02	W16B KOLOA	21 54 55 N	159 27 42 W	10-19-95	1335	227	23.5	26
					04-10-96	0755	227	22.5	26
					07-22-96	0815	225	22.5	27
215536159263501	2-5526-01	KOLOA	21 55 36 N	159 26 35 W	10-23-95	b0835	--	--	--
215528159303001	2-5530-02	W23 LAWAI	21 55 28 N	159 30 30 W	10-23-95	b1400	--	--	--
					04-10-96	1240	283	24.0	32
					07-25-96	0820	283	23.0	34
215535159302601	2-5530-03	W22 LAWAI	21 55 35 N	159 30 26 W	10-24-95	1340	231	23.0	27
					12-13-95	1315	230	24.5	27
					02-15-96	1230	230	21.0	27
					04-08-96	0930	231	23.0	27
					06-11-96	1330	232	23.5	27
					07-25-96	0825	231	24.5	27

a Pump not working, unable to collect sample
b Well not being used for irrigation

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued						
215522159342601	2-5534-03	W25-1 HANA	21 55 22 N	159 34 26 W	10-19-95	0850	449	23.5	39
					12-13-95	1000	436	23.5	39
					02-13-96	1300	439	24.0	37
					05-02-96	0945	430	24.0	36
					06-06-96	0950	428	24.0	40
					07-22-96	1045	429	23.5	35
215630159265101	2-5626-01	PUAKUKUI	21 56 30 N	159 26 51 W	12-02-95	1600	259	24.0	28
					12-04-95	1700	503	23.5	28
					12-11-95	0800	257	23.5	28
215635159355001	2-5635-01	S7 HANAPEP	21 56 35 N	159 35 50 W	10-23-95	1035	650	23.0	121
215803159401201	2-5840-01	W26 WAIMEA	21 58 03 N	159 40 12 W	10-19-95	1000	973	24.0	227
					12-13-95	1215	686	24.0	141
					02-13-96	1215	821	24.0	177
					04-10-96	1115	940	24.5	212
					06-06-96	1100	1040	24.5	240
					07-22-96	1130	967	25.5	206
215854159424601	2-5842-02	S11 KEKAHA	21 58 54 N	159 42 46 W	10-24-95	1245	683	25.0	101
215843159422901	2-5842-03	S10 KEKAHA	21 58 43 N	159 42 29 W	10-24-95	1305	1500	24.5	352
215901159235301	2-5923-01	KILOHANA A	21 59 01 N	159 23 53 W	10-20-95	0800	259	24.0	19
					12-14-95	0740	274	24.5	19
					02-14-96	0745	274	23.0	19
					04-09-96	0800	268	24.5	21
					06-07-96	0810	254	25.0	19
					07-23-96	0740	255	24.5	23
215901159235201	2-5923-07	KILOHANA I	21 59 01 N	159 23 52 W	10-20-95	0745	163	24.0	19
					12-14-95	0730	231	24.0	26
					02-14-96	0730	172	22.5	20
					04-09-96	0750	167	23.5	21
					06-07-96	0750	170	24.0	19
					07-23-96	0735	171	23.5	21
215950159231601	2-5923-08	HANAMAULU TZ	21 59 50 N	159 23 16 W	10-05-95	1550	311	25.5	35
					10-05-95	1800	311	25.5	35
					10-07-95	0900	501	25.0	35
215906159395601	2-5939-01	S9 WAIMEA	21 59 06 N	159 39 56 W	10-19-95	1035	175	23.5	15
					12-13-95	1040	384	24.0	45
					02-15-96	1015	322	23.5	28
					04-10-96	1015	243	23.0	23
					06-06-96	1400	269	24.0	26
					07-25-96	0855	270	23.5	26
215937159434201	2-5943-01	S13 KEKAHA	21 59 37 N	159 43 42 W	10-24-95	0820	941	24.0	178

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
		HAWAII, ISLAND OF OAHU						
211646157465201	3-1646-01 W1-B WAIAL	21 16 46 N	157 46 52 W	04-04-96	1000	700	21.0	--
				05-31-96	1110	883	21.5	--
				08-27-96	0903	952	21.5	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	03-07-96	1140	23000	23.5	13100
				05-31-96	1211	31600	25.5	12100
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	03-07-96	1120	13500	24.0	--
				05-31-96	1230	16100	25.0	--
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	04-16-96	0910	995	23.0	237
				05-21-96	0936	1100	24.0	238
				07-18-96	0845	1100	23.5	230
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	04-04-96	1035	455	22.0	102
				05-21-96	1518	488	22.0	103
				08-14-96	1518	489	22.0	100
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	04-04-96	a1332	--	--	--
				05-20-96	1523	881	22.0	--
				08-27-96	a1030	--	--	--
212238157561102	3-2256-12 W187-C	21 22 39 N	157 56 09 W	11-30-95	1125	886	23.5	230
				04-19-96	1540	896	24.0	299
				05-31-96	1425	892	25.5	235
				08-01-96	1308	895	25.0	233
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	03-19-96	1415	580	21.5	--
				05-20-96	1322	682	22.5	--
				08-14-96	1300	677	22.0	--

a No sample collected, unable to get to the site

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued							
212340158001901	3-2300-18 W241	21 23 40 N	158 00 19 W	12-28-95	a1030	400	223
				12-28-95	a1050	500	673
				12-28-95	a1105	600	3710
				12-28-95	a1130	650	6200
				12-28-95	a1155	700	8010
				12-28-95	a1215	750	9780
				12-28-95	a1240	800	11100
				12-28-95	a1305	850	13000
				12-28-95	a1330	900	14300
				12-28-95	a1400	950	16000
				12-28-95	a1430	990	16300
				03-28-96	a1025	400	222
				03-28-96	a1045	500	664
				03-28-96	a1105	550	1670
				03-28-96	a1125	600	3690
				03-28-96	a1145	650	6070
				06-20-96	a1005	400	215
				06-20-96	a1025	500	670
				06-20-96	a1055	550	1660
				06-20-96	a1120	600	3660
				06-20-96	a1145	650	6020
				06-20-96	a1210	700	8090
				06-20-96	a1240	750	9840
				06-20-96	a1315	800	11300
				06-20-96	a1340	850	13100
				06-20-96	a1410	900	14600
				06-20-96	a1435	950	16100
				06-20-96	a1505	990	16800
				09-27-96	a0935	400	213
				09-27-96	a1000	500	649
				09-27-96	a1020	550	1640
				09-27-96	a1040	600	3560
				09-27-96	a1100	650	6000
				09-27-96	a1125	700	7840
				09-27-96	a1150	750	9730
				09-27-96	a1220	800	11000
				09-27-96	a1250	850	12900
				09-27-96	a1315	900	14500
				09-27-96	a1340	950	15900
				09-27-96	a1410	990	16500

a Collected by non-USGS agency

HAWAII, ISLAND OF OAHU--Continued

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
212358158010901	3-2301-09,10 W247-IJ	21 23 58 N	158 01 09 W	04-19-96	1436	863	25.0	--
				05-21-96	1028	861	24.5	--
				07-30-96	a1130	--	--	--
212332157582201	3-2358-02 W201	21 23 32 N	157 58 22 W	04-04-96	1410	1160	20.5	--
				05-20-96	1448	1320	20.5	--
				08-14-96	1400	1400	21.0	--
212342157584301	3-2358-22 W204-4	21 23 42 N	157 58 43 W	04-19-96	1240	1470	20.5	--
				05-20-96	1419	1440	20.5	--
				08-14-96	1330	1400	20.5	--
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	04-19-96	1230	3630	21.0	--
				05-20-96	1414	3170	20.5	--
				08-14-96	1320	2180	20.5	--
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	04-19-96	1250	2740	22.0	--
				05-20-96	1402	2670	22.0	--
				08-14-96	1310	2580	22.0	--
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	04-09-96	b1155	--	--	--
				05-28-96	b1518	--	--	--
				07-18-96	b1420	--	--	--
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	04-09-96	1215	135	23.0	18
				05-28-96	1506	134	23.5	18
				07-18-96	1405	135	22.5	19
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	04-05-96	0806	240	20.5	--
				05-21-96	0905	242	21.0	--
				08-27-96	0955	243	21.0	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	03-13-96	1225	340	22.0	47
				05-20-96	1230	338	24.0	47
				07-22-96	1220	337	23.0	47
212656158071801	3-2607-01 W277-97	21 26 56 N	158 07 18 W	04-16-96	1105	365	24.5	--
				05-21-96	1107	387	25.0	--
				07-18-96	0955	389	25.0	--

a Pump being repaired, unable to collect a sample
b No flow, unable to collect sample

HAWAII, ISLAND OF OAHU--Continued

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	CHLO-RIDE, (MG/L AS CL)
212614157594301	3-2659-01 WAIPIO-HAUKA MON	21 26 14 N	157 59 43 W	12-27-95	a1015	400	58
				12-27-95	a1040	500	57
				12-27-95	a1110	600	139
				12-27-95	a1140	700	680
				12-27-95	a1200	800	1700
				12-27-95	a1235	900	8370
				12-27-95	a1305	1000	13000
				12-27-95	a1340	1100	15200
				12-27-95	a1415	1200	16300
				12-27-95	a1450	1300	17000
				03-27-96	a0935	400	64
				03-27-96	a1010	500	57
				03-27-96	a1035	600	76
				03-27-96	a1100	700	618
				03-27-96	a1135	800	1660
				03-27-96	a1205	825	2590
				03-27-96	a1235	850	4470
				03-27-96	a1305	875	6810
				03-27-96	a1335	900	8430
				03-27-96	a1410	1000	13000
				03-27-96	a1445	1100	15300
				03-27-96	a1520	1200	16500
				03-27-96	a1550	1300	16900
				06-19-96	a0950	400	55
				06-19-96	a1025	500	54
				06-19-96	a1055	600	32
				06-19-96	a1130	700	395
				06-19-96	a1205	800	1280
				06-19-96	a1240	825	2700
				06-19-96	a1305	850	4590
				06-19-96	a1340	875	6780
				06-19-96	a1415	900	8500
				06-19-96	a1450	1000	12900
				06-19-96	a1530	1100	15100
				09-25-96	a1020	400	57
				09-25-96	a1050	500	57
				09-25-96	a1115	600	78
				09-25-96	a1145	700	636
				09-25-96	a1215	800	1290
				09-25-96	a1250	825	2840
				09-25-96	a1325	850	4660
				09-25-96	a1400	875	6990
				09-26-96	a0940	900	8450
				09-26-96	a1020	1000	12900
				09-26-96	a1100	1100	15100
				09-26-96	a1140	1200	16300
				09-26-96	a1225	1300	16900

a Collected by non-USGS agency

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	05-17-96	1358	143	22.0	17
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	04-16-96	1420	365	22.0	--
				05-21-96	1425	389	22.0	--
				08-14-96	1000	400	22.5	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	04-16-96	1248	444	26.0	--
				04-29-96	1506	450	26.0	--
				05-21-96	1400	456	28.0	--
				07-18-96	1320	470	26.5	--
212927158014801	3-2901-07 S4	21 29 27 N	158 01 48 W	11-24-95	1145	166	21.0	20
				03-18-96	0830	175	22.0	19
				05-20-96	0336	171	22.5	20
				07-22-96	0906	169	21.0	19
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	03-13-96	a0810	--	--	--
				05-17-96	a1344	--	--	--
				07-10-96	a1345	--	--	--
				07-22-96	1320	196	22.0	22
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	04-16-96	1302	800	23.0	198
				05-21-96	1320	871	23.5	201
				07-18-96	1400	867	23.5	214
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	01-23-96	1500	890	22.5	253
				03-14-96	1507	970	22.0	265
213327157524401	3-3352-01 W405	21 33 27 N	157 52 43 W	01-23-96	1440	255	22.0	35
				03-14-96	1439	260	22.0	34
				05-28-96	1417	255	23.0	35
				07-18-96	1315	250	22.5	34
213429158055501	3-3405-01 W323-1	21 34 29 N	158 05 55 W	03-12-96	1520	380	21.5	--
				07-19-96	1500	--	--	--
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	05-17-96	1307	390	22.5	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	03-12-96	1025	1600	23.0	--
				05-17-96	0945	1760	23.1	--
				07-19-96	0900	1770	23.0	--

a Pump off, unable to collect sample

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	03-11-96	1448	4800	24.0	1390
				05-17-96	0920	6030	25.0	1820
				07-22-96	1340	6930	25.0	1990
213446158104901	3-3410-08 W286	21 34 46 N	158 10 49 W	03-12-96	1147	690	21.5	--
				05-17-96	0957	712	22.5	--
				07-19-96	1325	728	22.0	--
213512158061601	3-3506-03 TO 04 W329 A-B W	21 35 12 N	158 06 16 W	03-12-96	a1420	--	--	--
				05-17-96	a1246	--	--	--
				07-19-96	a1125	--	--	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	03-12-96	1310	1500	21.0	--
				05-17-96	1155	1540	21.0	--
				07-19-96	1000	1540	21.5	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	03-12-96	1330	1290	21.0	--
				05-17-96	1215	1360	21.5	--
				07-19-96	1022	1350	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	03-14-96	1417	240	21.0	33
				05-28-96	1350	241	33.0	33
				07-17-96	1355	237	21.5	33
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	07-17-96	1335	312	21.5	50
214157158000101	3-4100-01 W338	21 41 57 N	158 00 01 W	01-23-96	1200	280	20.0	49
				03-14-96	1130	310	20.0	50
				05-28-96	1127	317	21.5	54
				07-17-96	1025	317	20.5	55
214131158011601	3-4101-08 W337-6	21 41 31 N	158 01 16 W	03-14-96	1104	230	20.0	33
				05-28-96	a1107	--	--	--
				07-17-96	a1140	--	--	--
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	01-23-96	1305	1500	25.0	451
				03-14-96	1248	1580	24.0	453
				05-28-96	1226	1580	25.0	452
				07-17-96	1000	1570	25.0	445

a Pump off, unable to collect sample

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF MOLOKAI						
210425156483001	4-0448-02	S8	21 04 25 N	156 48 30 W	10-26-95	1410	346	24.5	20
					12-13-95	1210	344	24.0	20
					02-05-96	1415	347	24.5	20
					03-25-96	1255	350	24.0	20
					05-15-96	1050	342	24.0	20
					07-11-96	1130	334	24.5	19
					09-16-96	1330	336	25.0	19
210402156495801	4-0449-01	S6	21 04 02 N	156 49 58 W	10-26-95	1430	324	22.0	62
					12-13-95	1230	331	20.5	64
					02-05-96	1440	325	20.5	63
					03-25-96	1310	330	20.5	64
					05-15-96	1115	335	21.0	65
					07-11-96	1200	336	20.5	65
					09-16-96	1415	334	21.0	65
210414156565601	4-0456-04	KAWELA PLANTATION	21 04 14 N	156 56 56 W	10-26-95	a0735	--	--	22
					12-14-95	a0800	--	--	18
					01-31-96	a1325	--	--	30
					03-27-96	a0810	--	--	42
					05-14-96	a1035	--	--	25
					07-30-96	a0825	--	--	33
					09-16-96	a0955	--	--	181
210429156565106	4-0456-06	KAWELA PLANTATION	21 04 29 N	156 56 51 W	10-26-95	a0755	--	--	67
					12-14-95	a0810	--	--	65
					01-31-96	a1315	--	--	61
					03-27-96	a0805	--	--	75
					05-14-96	a1050	--	--	71
					07-30-96	a0810	--	--	70
					09-16-96	a0945	--	--	78
210419156562108	4-0456-08	KAWELA PLANTATION	21 04 19 N	156 56 21 W	10-26-95	a0815	--	--	105
					12-14-95	a0830	--	--	90
					01-31-96	a1255	--	--	79
					03-27-96	a0740	--	--	105
					05-14-96	a1105	--	--	425
					07-30-96	a0745	--	--	468
					09-16-96	a0925	--	--	118
210426156563509	4-0456-09	KAWELA PLANTATION	21 04 26 N	156 56 35 W	10-26-95	a0805	--	--	147
					12-14-95	a0820	--	--	132
					01-31-96	a1305	--	--	74
					03-27-96	a0755	--	--	137
					05-14-96	a1055	--	--	151
					07-30-96	a0755	--	--	152
					09-16-96	a0935	--	--	152
210419156570501	4-0457-01	S4	21 04 19 N	156 57 05 W	10-26-95	1500	486	23.0	111
					12-13-95	1320	507	23.0	119
					02-05-96	1600	570	23.5	136
					03-25-96	1405	620	23.0	149
					05-15-96	1245	647	23.5	150
					07-11-96	1230	613	23.5	144
					09-16-96	1450	652	23.5	156
210433156574201	4-0457-04	KAWELA PLANTATION	21 04 33 N	156 57 42 W	10-26-95	a0830	--	--	326
					12-14-95	a0845	--	--	327
					01-31-96	a1335	--	--	327
					03-27-96	a0830	--	--	325
					05-14-96	a1005	--	--	330
					07-30-96	a0840	--	--	331
					09-16-96	a1010	--	--	333

a Collected by non-USGS agency

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF MOLOKAI--Continued									
210605157012001	4-0601-01 W11		21 06 06 N	157 01 11 W	10-26-95	1100	330	24.0	31
					12-13-95	1420	334	24.0	33
					02-09-96	0840	325	24.0	34
					03-29-96	1030	229	23.5	15
					05-16-96	1800	278	23.5	18
					07-11-96	1020	295	24.5	25
					09-17-96	1440	343	24.5	34
210856157011201	4-0801-01 W16		21 08 56 N	157 01 12 W	12-14-95	1300	473	--	110
					02-01-96	0745	396	--	86
					03-11-96	a0950	--	--	83
					04-03-96	a1045	--	--	83
					07-11-96	a0655	--	--	90
					09-18-96	a0950	--	--	105
210857156010701	4-0801-02		21 08 57 N	157 01 07 W	10-27-95	a0735	--	--	82
					11-01-95	0730	383	--	83
					07-10-96	1045	--	--	66
					09-17-96	0950	--	--	71
210903157013001	4-0901-01 W17		21 09 03 N	157 01 30 W	12-01-95	a0900	315	--	64
					01-07-96	a0900	301	--	58
					02-06-96	a0930	316	--	64
					03-01-96	a0930	--	--	62
					04-01-96	a0900	--	--	56
					05-01-96	a0900	--	--	45
					06-01-96	a0900	--	--	45
					07-01-96	a1000	--	--	45
					08-01-96	a1000	--	--	52
					09-14-96	a1000	--	--	49

a Collected by non-USGS agency

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF MAUI						
203835156065001	6-3806-01	PUNAHOU SPRINGS	20 38 35 N	156 06 50 W	10-03-95	a1410	--	--	--
					11-08-95	1115	726	20.5	148
					02-15-96	1430	769	--	195
					04-11-96	1040	720	19.5	--
					08-12-96	1045	716	19.5	181
203947156261201	6-3926-03	WAILEA 8	20 39 47 N	156 26 13 W	10-16-95	a1130	--	--	--
					01-10-96	1120	2480	20.0	658
					04-10-96	1210	2650	19.0	703
					08-13-96	1230	3010	21.0	825
204601156001501	6-4600-01	W55	20 46 01 N	156 00 15 W	10-18-95	1340	414	24.5	90
204633156003201	6-4600-03	WAKIU B	20 46 36 N	156 00 30 W	10-18-95	1420	679	19.0	171
204635156270101	6-4627-14	W226	20 46 35 N	156 27 01 W	10-16-95	1050	1550	23.5	240
					01-10-96	1250	1520	24.0	234
					04-10-96	1055	1530	23.0	240
					08-13-96	1040	1510	24.0	233
204845156255001	6-4825-01	S15	20 48 45 N	156 25 50 W	11-02-95	1235	1250	24.0	198
					01-17-96	a1155	--	--	--
					03-07-96	a1040	--	--	--
					04-19-96	a1050	--	--	--
					06-20-96	a1115	--	--	--
					08-15-96	a1210	--	--	--
204931156371201	6-4937-01	S10	20 49 31 N	156 37 12 W	10-19-95	1200	932	24.0	178
205014156212701	6-5021-01	PUKALANI	20 50 14 N	156 21 27 W	10-11-95	1315	2050	21.0	571
					02-16-96	b1215	--	--	--
					04-23-96	b1215	2050	--	571
					08-15-96	b1325	--	--	578
205102156282501	6-5128-02	S16	20 51 02 N	156 28 25 W	11-02-95	a1225	--	--	--
					01-17-96	a1135	--	--	--
					04-19-96	a1020	--	--	--
					06-20-96	1100	1280	23.5	--
					08-15-96	a1155	--	--	--
205243156243201	6-5224-02	S22	20 52 43 N	156 24 32 W	11-02-95	a1425	--	--	--
					01-17-96	a1240	--	--	--
					03-07-96	a0850	--	--	--
					06-20-96	a1120	--	--	--
					08-15-96	a1400	--	--	--
205322156394501	6-5339-01	W291	20 53 22 N	156 39 45 W	10-16-95	a1115	--	--	--
					01-16-96	0945	670	21.0	122
					02-20-96	a0950	--	--	--
					04-16-96	a1105	--	--	--
					06-10-96	1000	575	21.0	91
					08-13-96	1020	526	21.5	73

a Pump off, unable to collect sample
b Collected by non-USGS agency

QUALITY OF GROUND WATER

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
205320156394501	6-5339-02 W292		20 53 20 N	156 39 45 W	10-16-95	1105	696	21.5	133
					01-16-96	0950	634	21.0	110
					02-20-96	0955	687	20.5	123
					04-16-96	a1100	--	--	--
					06-10-96	a1005	--	--	--
					08-13-96	1025	566	21.0	89
205329156305502	6-5330-09 W15A				10-04-95	a1030	--	--	--
					11-22-95	a0830	--	--	--
					02-12-96	a1015	--	--	--
					04-19-96	a0920	--	--	--
					06-20-96	a1120	--	--	--
					08-15-96	a1040	--	--	--
205329156305501	6-5330-10 W15B		20 53 29 N	156 30 55 W	10-04-95	a1025	--	--	--
					11-22-95	a0820	--	--	--
					02-12-96	a1020	--	--	--
					04-19-96	0925	329	22.0	48
					06-20-96	1125	426	22.0	73
					08-15-96	1045	440	22.0	82
205330156305401	6-5330-11 W15F		20 53 30 N	156 30 54 W	10-04-95	1020	680	22.5	143
					11-22-95	0840	607	22.0	123
					02-12-96	a1025	--	--	--
					04-19-96	0930	556	22.5	111
					06-21-96	1130	639	21.5	130
					08-15-96	1050	675	22.5	142
205343156401101	6-5340-01 S5		20 53 43 N	156 40 11 W	10-16-95	1215	1690	22.0	430
					01-16-96	a1030	--	--	--
					02-20-96	a1020	--	--	--
					04-16-96	1150	1120	22.0	264
					06-10-96	a1100	--	--	--
					08-13-96	1240	1460	21.5	365
205412156193801	6-5419-01 HAIKU		20 54 12 N	156 19 38 W	11-02-95	b1340	--	--	--
					01-17-96	a1345	--	--	--
					03-07-96	a0940	--	--	--
					06-21-96	a1000	--	--	--
					08-15-96	a1300	--	--	--
205416156244301	6-5424-01 S24		20 54 16 N	156 24 43 W	11-02-95	a1415	--	--	--
					01-17-96	a1250	--	--	--
					03-07-96	a0900	--	--	--
					06-20-96	a1130	--	--	--
					08-15-96	a1355	--	--	--

a Pump off, unable to collect sample
b Pump under construction, unable to collect sample

HAWAII, ISLAND OF MAUI--Continued

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	CHLO-RIDE, (MG/L AS CL)
205405156305401	6-5430-05	WAIEHU MONITOR W	20 54 59 N	156 30 54 W	10-05-95	0940	400	12
					10-05-95	1005	200	12
					10-05-95	1020	500	104
					10-05-95	1040	600	138
					10-05-95	1100	675	718
					10-05-95	1125	750	13100
					10-05-95	1155	800	17600
					10-05-95	1220	825	18300
					10-05-95	1245	850	18500
					10-05-95	1310	900	18800
					01-03-96	1030	400	103
					01-03-96	1050	200	12
					01-03-96	1110	500	95
					01-03-96	1150	600	111
					01-03-96	1210	675	643
					01-03-96	1235	750	13400
					01-03-96	1300	800	17500
					01-03-96	1330	825	18400
					01-03-96	1400	850	18500
					01-03-96	1425	900	18800
					07-02-96	1025	200	13
					07-02-96	1040	400	13
					07-02-96	1100	500	102
					07-02-96	1120	600	136
					07-02-96	1145	675	730
					07-02-96	1210	750	14300
					07-02-96	1235	800	17600
					07-02-96	1300	825	18400
					07-02-96	1330	850	18500
					07-02-96	1400	900	18700

QUALITY OF GROUND WATER

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
205511156222101	6-5522-01 S31		20 55 11 N	156 22 21 W	11-02-95	a1410	--	--	--
					01-17-96	a1310	--	--	--
					03-07-96	a0910	--	--	--
					04-19-96	a1200	--	--	--
					06-20-96	a1145	--	--	--
					08-15-96	a1340	--	--	--
205651156401001	6-5640-01 S36		20 56 51 N	156 40 10 W	10-16-95	1150	910	21.5	217
					01-16-96	a1050	--	--	--
					02-20-96	a1035	--	--	--
					04-16-96	1130	890	21.5	211
					06-10-96	a1150	--	--	--
					08-13-96	a1220	--	--	--
205837156384601	6-5838-01 NAPILI A		20 58 37 N	156 38 46 W	10-16-95	b1500	--	--	--
					01-16-96	b1235	--	--	--
					02-20-96	a1200	--	--	--
					04-16-96	a1445	--	--	--
					06-10-96	a1240	--	--	--
					08-13-96	a1400	--	--	--
205838156383101	6-5838-02 NAPILI B		20 58 38 N	156 38 31 W	10-16-95	1440	337	20.5	71
					01-16-96	a1245	--	--	--
					02-20-96	1215	323	20.0	66
					04-16-96	1455	355	21.0	74
					06-10-96	1250	386	20.0	83
					08-13-96	1400	405	20.0	90
205848156383601	6-5838-04 NAPILI		20 58 48 N	156 38 36 W	10-16-95	a1450	--	--	--
					01-16-96	a1300	--	--	--
					02-20-96	1230	490	20.0	111
					06-10-96	a1300	--	--	--
					08-13-96	a1400	--	--	--

a Pump off, unable to collect sample
b Pump being repaired, unable to collect sample

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
		HAWAII, ISLAND OF HAWAII						
190347155354301	8-0335-01 NAALEHU W1	19 03 47 N	155 35 43 W	10-02-95	a1245	--	--	--
				12-14-95	a1045	--	--	--
				02-23-96	a1105	--	--	--
				04-19-96	a1225	--	--	--
				06-18-96	a1230	--	--	--
				08-14-96	a1210	--	--	--
190602155325901	8-0632-01 W10-1	19 06 02 N	155 32 59 W	10-02-95	a1210	--	--	--
				12-14-95	a1120	--	--	--
				02-23-96	a1240	--	--	--
				04-19-96	a1140	--	--	--
				06-18-96	a1200	--	--	--
				08-14-96	a1135	--	--	--
190832155310801	8-0831-01 NINOLE TH1	19 08 32 N	155 31 08 W	10-02-95	a1140	--	--	--
190832155310901	8-0831-02 NINOLE A	19 08 32 N	155 31 09 W	10-02-95	a1140	--	--	--
				12-14-95	a1140	--	--	--
				02-23-96	a1125	--	--	--
				04-19-96	1255	700	19.0	168
				06-18-96	a1250	--	--	--
				08-14-96	a1225	--	--	--
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	10-02-95	1120	130	19.0	13
				12-14-95	a1230	--	--	--
				02-23-96	a1140	--	--	--
				04-19-96	a1330	--	--	--
				06-18-96	1115	135	20.0	16
				08-14-96	a1250	--	--	--
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	10-02-95	1050	97	18.0	6
				12-14-95	a1200	--	--	--
				02-23-96	1155	92	18.5	5
				04-19-96	a1310	--	--	--
				06-18-96	1255	95	19.0	5
				08-14-96	a1235	--	--	--
191219155291601	8-1229-01 PAHALA	19 12 25 N	155 29 22 W	10-02-95	1030	97	17.5	5
				12-14-95	1245	99	18.0	--
				02-23-96	a1325	--	--	--
				04-19-96	a1335	--	--	--
				06-18-96	1320	99	18.0	4
				08-14-96	a1300	--	--	--
192456154571901	8-2487-01 W9-7	19 24 57 N	154 57 18 W	12-13-95	a1115	--	--	--
				02-21-96	a1250	--	--	--
				04-18-96	a1240	--	--	--
				06-17-96	a1310	--	--	--
				08-13-96	a1325	--	--	--
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	10-11-95	1105	245	22.0	--
				01-08-96	a1400	--	--	--
				02-26-96	1300	240	20.0	43
				04-22-96	a1540	--	--	--
				06-20-96	1600	230	20.0	39
				08-15-96	a1345	--	--	--
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	10-11-95	a1050	--	--	--
				01-08-96	1330	725	20.0	173
				02-26-96	1235	655	20.0	159
				04-22-96	a1530	--	--	--
				08-15-96	a1330	--	--	--

a Pump off, unable to collect sample

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	10-11-95	a1100	--	--	--
				01-08-96	a1350	--	--	--
				02-26-96	a1255	--	--	--
				04-22-96	a1535	--	--	--
				06-21-96	a1555	--	--	--
				08-15-96	a1340	--	--	--
192924154564701	8-2986-01 W9-5B	19 29 24 N	154 56 47 W	12-13-95	1030	130	23.0	7
				02-21-96	a1230	--	--	--
				04-18-96	a1230	--	--	--
				06-17-96	a1255	--	--	--
				08-13-96	a1305	--	--	--
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	12-13-95	1035	130	23.0	7
				02-21-96	a1220	--	--	--
				04-18-96	a1225	--	--	--
				06-17-96	a1250	--	--	--
				08-13-96	a1300	--	--	--
193017154502101	8-3080-02 S9	19 30 17 N	154 50 21 W	12-13-95	a1245	--	--	--
				02-21-96	a1425	--	--	--
				04-18-96	a1420	--	--	--
				06-17-96	a1425	--	--	--
				08-13-96	a1440	--	--	--
193113154555801	8-3185-01 W9-11 HAWN SHORE	19 31 13 N	154 55 58 W	12-13-95	1325	125	21.5	15
				02-21-96	1445	125	21.5	15
				04-18-96	a1455	--	--	--
				06-17-96	a1445	--	--	--
				08-13-96	a1455	--	--	--
193339154594801	8-3389-01 W9-4	19 33 39 N	154 59 48 W	12-13-95	a1000	--	--	--
				02-21-96	a1150	--	--	--
				04-18-96	a1150	--	--	--
				06-17-96	a1220	--	--	--
				08-13-96	a1205	--	--	--
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	10-11-95	1140	460	20.0	101
				01-08-96	1450	490	20.5	104
				02-26-96	a1345	--	--	--
				04-22-96	1635	520	20.5	113
				06-20-96	a1650	--	--	--
				08-15-96	1445	350	20.5	70
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	10-11-95	1200	880	20.0	220
				01-08-96	1510	825	20.5	215
				02-26-96	1400	820	21.0	209
				04-22-96	1655	850	20.5	212
				06-20-96	1700	850	20.5	159
				08-15-96	1440	800	21.0	183
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	10-11-95	1150	385	20.0	78
				01-08-96	1500	390	20.5	82
				02-26-96	a1355	--	--	--
				04-22-96	1640	420	20.5	89
				06-20-96	a1655	--	--	--
				08-15-96	1455	255	20.5	41
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	10-11-95	1205	650	20.0	150
				01-08-96	1520	645	20.5	150
				02-26-96	1410	630	21.0	151
				04-22-96	1710	650	20.5	152
				06-20-96	1710	650	20.5	157
				08-15-96	1425	625	21.0	160

a Pump off, unable to collect sample

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	10-11-95	1220	1110	20.0	285
				01-09-96	1345	1060	20.5	268
				02-28-96	1155	900	20.0	242
				04-22-96	1735	1230	20.5	375
				06-20-96	1455	1300	20.5	339
				08-15-96	1515	1200	20.5	326
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	12-13-95	1405	85	21.0	5
				02-21-96	1520	75	20.5	5
				04-18-96	1525	85	21.0	5
				06-17-96	1530	85	20.5	6
				08-13-96	1530	75	21.0	5
194818155582301	8-4858-02 KOHA VILLAGE	19 48 18 N	155 58 23 W	10-06-95	1400	2400	21.0	499
				01-09-96	a1305	--	--	--
				02-27-96	a0940	--	--	--
				04-23-96	a0945	--	--	--
				06-21-96	a1220	--	--	--
				08-16-96	a1030	--	--	--
194820155582401	8-4858-03 KOHA VILLAGE 3	19 48 20 N	155 58 24 W	10-06-95	a1355	--	--	--
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	10-11-95	1555	200	21.0	13
195043155053801	8-5005-02 MAKAI	19 50 43 N	155 05 38 W	10-11-95	1545	240	22.0	25
195049155051601	8-5005-04 SALT WTR 2	19 50 49 N	155 05 16 W	10-11-95	1605	20000	18.0	6310
195546155462001	8-5546-01 WAIKOLOA WATER W	19 55 46 N	155 46 20 W	10-06-95	1200	620	28.5	99
				01-09-96	a1115	--	--	--
				02-27-96	1120	580	28.5	96
				04-23-96	1140	585	28.5	101
				06-21-96	1330	590	28.5	99
				08-16-96	1205	590	28.5	103
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	10-06-95	1125	2500	28.5	647
				01-09-96	1000	2400	28.5	639
				02-27-96	1000	2400	28.5	639
				04-23-96	1025	2350	28.5	633
				06-21-96	1145	2400	28.5	639
				08-16-96	a1055	--	--	--
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	10-06-95	a1240	--	--	--
				01-09-96	1035	290	27.0	29
				02-27-96	1040	282	27.0	28
				04-23-96	a1100	--	--	--
				06-21-96	a1255	--	--	--
				08-16-96	a1125	--	--	--
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	10-06-95	a1300	--	--	--
				01-09-96	a1055	--	--	--
				02-27-96	a1105	--	--	--
				04-23-96	a1125	--	--	--
				06-21-96	a1315	--	--	--
				08-16-96	1140	290	29.0	28

a Pump off, unable to collect sample

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
195728155455401	8-5745-03 WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	10-06-95	1245	290	27.0	26
				01-09-96	1045	280	27.0	27
				02-27-96	1050	280	27.0	27
				04-23-96	1105	275	27.0	27
				06-21-96	1305	280	27.0	29
				08-16-96	1130	280	27.0	29
195857155142301	8-5814-01 LAUPAHOEHO	19 58 57 N	155 14 23 W	10-11-95	a1505	--	--	--
				01-09-96	1645	320	20.0	60
				02-28-96	a1530	--	--	--
				04-23-96	a1555	--	--	--
				06-22-96	a1510	--	--	--
				08-16-96	a1450	--	--	--
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	10-06-95	1505	540	26.5	95
				01-09-96	0910	505	26.5	93
				02-28-96	1025	510	26.0	95
				04-23-96	1245	500	26.5	95
				06-21-96	1430	520	26.5	102
				08-16-96	1255	510	27.0	93
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	10-06-95	a1455	--	--	--
				01-09-96	a0900	--	--	--
				02-28-96	a1050	--	--	--
				04-23-96	1300	340	26.0	45
				06-21-96	1415	360	26.5	50
				08-16-96	1310	370	26.5	55
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	10-06-95	1520	570	26.5	105
				01-09-96	0850	540	26.5	102
				02-28-96	1040	535	26.5	104
				04-23-96	1230	535	26.5	103
				06-21-96	1440	520	26.5	--
				08-16-96	1245	520	27.0	98
195953155464701	8-5946-04 LALAMILO D	19 59 53 N	155 46 47 W	10-06-95	1535	550	26.0	100
195947155485801	8-5948-01 HAPUNA PRK	19 59 47 N	155 48 58 W	10-06-95	1600	2000	26.0	504
				01-09-96	1220	1950	26.0	509
				02-28-96	1410	1820	26.0	503
				04-23-96	1330	1900	26.0	511
				06-21-96	1455	1920	26.0	505
				08-16-96	1330	1950	26.0	519
200132155471101	8-6147-01 W16	20 01 32 N	155 47 11 W	01-02-96	a1420	--	--	--
				02-28-96	a1435	--	--	--
				04-23-96	a1355	--	--	--
				06-21-96	a1530	--	--	--
				08-16-96	a1355	--	--	--
200122155480901	8-6148-01 W14	20 01 22 N	155 48 09 W	01-02-96	a1445	--	--	--
				01-17-96	a1430	--	--	--
				02-28-96	a1425	--	--	--
				04-23-96	a1345	--	--	--
				06-21-96	a1515	--	--	--
				08-16-96	a1345	--	--	--
200121155480801	8-6148-02 W14B	20 01 21 N	155 48 08 W	01-02-96	a1445	--	--	--
				02-28-96	a1430	--	--	--
				04-23-96	a1350	--	--	--
				06-21-96	a1520	--	--	--
				08-16-96	a1350	--	--	--

a Pump off, unable to collect sample

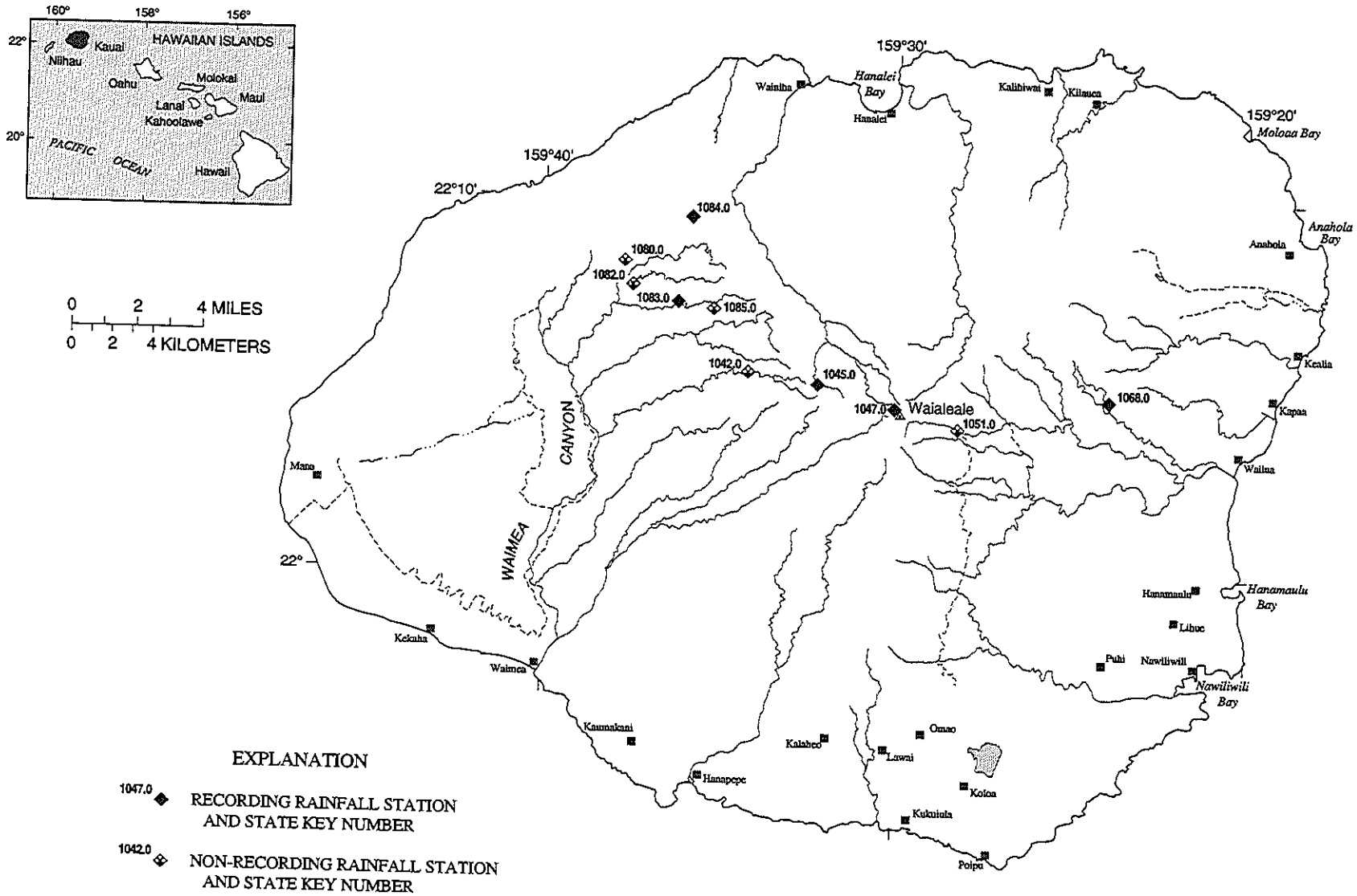


Figure 21. Locations of rainfall stations on Kauai.

RAINFALL RECORDS

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″, 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-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Nov. 30	34.6 estimated (a)
Nov. 30 to Dec. 31	9.4 estimated (b)
Jan. 01 to Mar. 26	25.6 estimated (b)
Mar. 26 to Jul. 09	20.4
Jul. 09 to Sep. 30	14.6 estimated (c)

WTR YR 1996 Total 104.6

(a) Estimated values based on accumulation rain can reading of 38.0 in. from August 30, 1995 to November 30, 1995.
(b) Estimated values based on accumulation rain can reading of 35.0 in. from November 30, 1995 to March 26, 1996.
(c) Estimated values based on accumulation rain can reading of 14.6 in. from July 9, 1996 to October 1, 1996.

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220504159321401. State Key Number 1045.0 Waialeale Trail rain gage near Lihue, Kauai.

LOCATION.--Lat 22°05′04″, long 159°32′14″, 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.--Electronic data logger (CR10) with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,560 ft from topographic map.

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.43	.01	.40	.00	.00	.00	.64	.00	.00	.21	.03	1.48
2	.20	1.38	.00	.00	.10	2.70	.00	.02	.00	.45	.03	.15
3	.32	7.90	.10	.00	.00	2.70	.00	.07	.00	.96	.10	.99
4	.31	.00	.80	.40	.00	.70	.00	.08	.00	1.39	.36	.14
5	.75	.00	.10	.10	.00	.00	.04	.00	.00	.14	.32	.27
6	1.36	.00	.20	.00	.00	.20	.01	.15	.53	.04	.28	1.95
7	.97	.00	.00	.00	.80	.00	.00	.06	1.09	.26	.06	3.45
8	3.09	.60	.40	.00	.30	.00	.01	.19	.47	.06	.01	1.10
9	.32	10.00	.00	2.00	.00	.00	.08	.00	.21	.10	.03	.10
10	.32	.00	.00	.10	.50	.00	.33	.04	.30	.18	.65	.45
11	.31	.00	.00	.00	.00	.00	.73	.00	.00	.42	.84	1.05
12	.43	.00	.10	.00	.00	.00	.01	.00	2.16	.30	.31	.91
13	.24	.40	.90	.00	.00	1.20	.01	.00	.86	.02	.00	.12
14	.05	.00	.10	.00	.80	.00	.04	.00	.04	.40	.01	.07
15	.04	.00	.00	.00	.80	.00	.00	.14	.11	.68	.12	.03
16	.01	.10	.10	.00	.10	.00	.01	.00	.62	1.35	.05	.14
17	.09	.00	.00	.50	.10	.10	.08	.00	.80	1.17	.11	.40
18	.47	.00	.10	.70	.00	.10	1.52	.00	2.00	.91	.02	.46
19	.26	.20	.00	.20	.20	.00	2.02	.00	.65	1.25	.00	.27
20	1.00	.00	.00	2.80	.00	.20	.01	.02	.59	.15	.03	.26
21	.69	.00	.00	.00	.60	.40	.00	.02	.43	.47	.00	.00
22	.10	.30	.10	.20	1.10	.60	.00	.00	.23	.58	.00	.00
23	.29	.00	.00	.00	1.10	.50	.00	.00	1.09	1.57	.02	.04
24	.22	.00	.10	1.00	1.70	.30	.01	.49	1.30	.38	.05	.00
25	1.03	5.20	1.00	2.30	7.10	.20	.13	.55	.56	.37	.01	.02
26	.38	4.50	.00	1.80	2.90	.00	.18	.07	.04	.38	.00	.00
27	.01	.80	.00	.10	3.70	.03	.11	.25	.15	.88	.00	.00
28	.79	.00	.00	.60	.10	.03	.41	.74	.37	.04	.00	.01
29	.11	.00	1.10	.00	.00	.26	.25	.37	.69	.00	.00	.15
30	1.20	.30	3.90	.70	---	.01	.09	.22	5.95	.07	1.00	.07
31	.32	---	.50	.00	---	.44	---	.02	---	.07	.36	---
TOTAL	16.11	31.69	10.00	13.50	22.00	10.67	6.72	3.50	21.24	15.25	4.80	14.08

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220427159300201. State Key Number 1047.0 Mount Waialeale rain gage near Lihue, Kauai.

LOCATION.--Lat 22°04′27″, long 159°30′02″, Hydrologic Unit 20070000, 9.2 mi south of Hanalei Bay and 11.6 mi west of Kapaa Beach Park.

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 (CR10) with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 5,150 ft from topographic map.

REMARKS.--Records fair. No daily record July 21 to September 30. Recorded rainfall read in hundredths of an inch.

PRECIPITATION, TOTAL, INCHES, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.44	.41	.50	.10	.00	1.80	7.24	.00	.00	1.30	---	---
2	1.26	3.13	.00	.00	.00	5.10	.00	.00	.00	2.30	---	---
3	2.06	10.93	.30	.00	.00	4.30	.02	.11	.04	1.60	---	---
4	1.20	.00	.70	.60	.00	.20	.01	.02	.01	1.40	---	---
5	1.74	.20	.10	.00	.00	.00	.07	.01	.06	.70	---	---
6	2.29	.00	.20	.00	.10	.10	.00	.19	1.08	.10	---	---
7	1.20	.10	.00	.40	.60	.00	.00	.06	1.92	.80	---	---
8	2.81	1.90	.40	.40	.40	.00	.00	.12	2.19	.30	---	---
9	.96	19.00	.00	2.90	.00	.00	.47	.00	.31	.40	---	---
10	.78	.30	.00	.10	.20	.00	1.03	.15	.86	.40	---	---
11	1.07	.40	.00	.00	.00	.10	2.22	.00	.02	1.00	---	---
12	2.43	.00	1.70	.00	.00	.00	.03	.00	.91	1.70	---	---
13	1.00	.20	3.70	.00	.00	.50	.04	.00	4.89	.10	---	---
14	.35	.10	.00	.20	1.60	.00	.14	.00	.54	1.40	---	---
15	.19	.00	.60	.00	1.90	.20	.00	.18	.40	1.00	---	---
16	.36	.10	.20	.00	.10	.40	.10	.00	1.86	1.20	---	---
17	.96	1.90	.30	.70	.10	.40	.29	.02	.81	1.60	---	---
18	1.49	.40	.60	.80	.00	.60	3.52	.07	2.15	1.10	---	---
19	.98	.50	.00	1.50	.30	.20	3.92	.12	1.48	1.30	---	---
20	1.71	.00	.00	3.90	.10	.00	.10	.47	1.46	.80	---	---
21	.78	.00	.00	.20	.60	.20	.02	.54	1.09	a---	---	---
22	.34	.30	.60	1.00	1.40	.20	.00	.01	.59	---	---	---
23	.70	.10	.10	.00	1.50	.10	.01	.14	1.23	---	---	---
24	.52	.00	.20	1.20	2.20	.20	.23	1.04	1.81	---	---	---
25	2.70	9.90	1.30	3.90	7.30	.00	.49	2.24	2.73	b---	---	---
26	2.40	7.20	.00	3.40	4.40	.00	.76	.39	.89	---	---	---
27	.04	1.00	.00	.80	4.00	.04	.65	1.17	.35	---	---	---
28	1.31	.20	.00	1.20	.00	.01	.15	1.70	1.77	---	---	---
29	.24	.20	1.50	.00	.10	1.39	.15	.61	2.47	---	---	---
30	2.31	1.50	4.60	.60	---	.47	.01	.55	7.14	---	---	---
31	1.80	---	.10	.00	---	1.99	---	.05	---	---	---	---
TOTAL	40.42	59.97	17.70	23.90	26.90	18.50	21.67	9.96	41.06	---	---	---

a. Total accumulated rainfall from July 21 (0001 hrs) to July 25 (0800 hrs) is 11.91 inches
b. Total accumulated rainfall from July 25 (0800 hrs) to September 30 (2400 hrs) is 65.00 inches

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220356159281401. State Key Number 1051.0 North Wailua ditch rain gage near Lihue, Kauai.

LOCATION.--Lat 22°03′56″, long 159°28′14″, 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-in. National Weather Service non-recording rain gage. Elevation of gage is 1,110 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall	Period	Rainfall
Oct. 01 to Oct. 02	2.53 estimated (a)	Apr. 01 to Apr. 08	.84
Oct. 02 to Oct. 09	7.20	Apr. 08 to Apr. 15	1.36
Oct. 09 to Oct. 16	2.15	Apr. 15 to Apr. 22	3.15
Oct. 16 to Oct. 23	3.14	Apr. 22 to Apr. 29	2.10
Oct. 23 to Oct. 30	4.27	Apr. 29 to May 06	.82
Oct. 30 to Nov. 06	11.61	May 06 to May 13	1.65
Nov. 06 to Nov. 13	13.15	May 13 to May 20	.30
Nov. 13 to Nov. 20	2.60	May 20 to May 27	2.60
Nov. 20 to Nov. 27	6.93	May 27 to Jun. 03	1.10
Nov. 27 to Dec. 04	2.30	Jun. 03 to Jun. 10	3.48
Dec. 04 to Dec. 11	4.40	Jun. 10 to Jun. 17	3.75
Dec. 11 to Dec. 18	2.20	Jun. 17 to Jun. 24	5.65
Dec. 18 to Dec. 26	2.45	Jun. 24 to Jul. 01	8.60
Dec. 26 to Dec. 31	2.90 estimated (b)	Jul. 01 to Jul. 08	3.48
Jan. 01 to Jan. 08	3.10 estimated (b)	Jul. 08 to Jul. 15	2.32
Jan. 08 to Jan. 15	1.50	Jul. 15 to Jul. 22	6.95
Jan. 15 to Jan. 22	4.00	Jul. 22 to Jul. 29	5.25
Jan. 22 to Jan. 29	8.55	Jul. 29 to Aug. 05	2.80
Jan. 29 to Feb. 05	.50	Aug. 05 to Aug. 12	5.65
Feb. 05 to Feb. 11	1.53	Aug. 12 to Aug. 19	.52
Feb. 11 to Feb. 20	1.14	Aug. 19 to Aug. 26	.20
Feb. 20 to Feb. 26	5.04	Aug. 26 to Sep. 03	6.10
Feb. 26 to Mar. 04	11.65	Sep. 03 to Sep. 09	14.00
Mar. 04 to Mar. 11	.35	Sep. 09 to Sep. 16	2.00
Mar. 11 to Mar. 18	.52	Sep. 16 to Sep. 23	2.42
Mar. 18 to Mar. 25	1.10	Sep. 23 to Sep. 30	.72
Mar. 25 to Apr. 01	4.30		

(a) Estimated values based on accumulation rain can reading of 7.23 in. from September 25, 1995 to October 2, 1995.
(b) No record, station vandalized.

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220443159235601. State Key Number 1068.0 Left Branch Opaekaa rain gage near Kapaa, Kauai.

LOCATION.--Lat 22°04′43″, long 159°23′56″, Hydrologic Unit 20070000, in USGS streamgage 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.--Electronic data logger (CR10) with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 470 ft from topographic map.

REMARKS.--Records good. Recorded rainfall read in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	1.59	.97	.00	.00	.70	.18	.00	.00	.21	.13	1.02
2	.19	1.15	.02	.00	.01	1.58	.00	.00	.00	.29	.24	.02
3	.61	8.02	.01	.00	.00	2.01	.05	.05	.06	.36	.22	.25
4	.32	.02	.27	.00	.00	.01	.00	.03	.01	.12	.39	.03
5	.31	.04	.00	.01	.00	.01	.00	.00	.02	.02	.28	.08
6	.16	.27	.02	.00	.00	.00	.01	.04	.21	.01	.35	.67
7	.19	.02	.00	.04	.16	.00	.00	1.28	.10	.12	.19	3.90
8	1.17	.36	.00	.01	1.45	.00	.00	.21	.60	.19	.00	.63
9	.06	6.65	.00	1.13	.01	.00	.09	.00	2.34	.01	.02	.28
10	.19	.07	.00	.00	.09	.00	.04	.03	1.74	.00	.53	.10
11	.10	.00	.00	.00	.00	.00	.42	.00	.23	.04	1.09	.08
12	.24	.00	.28	.00	.00	.00	.02	.00	.03	.11	.12	.20
13	.01	.10	.94	.00	.01	.41	.00	.00	.03	.01	.01	.02
14	.05	.01	.01	.11	.24	.00	.03	.00	.03	.25	.17	.03
15	.03	.00	.05	.00	.32	.00	.00	.05	.09	.29	.08	.08
16	.29	.03	.02	.00	.00	.00	.00	.00	.42	.15	.00	1.13
17	.15	.02	.00	.23	.00	.05	.02	.00	.03	.49	.03	.05
18	.21	.05	.03	.14	.00	.03	.48	.00	.21	.10	.06	.06
19	.12	.05	.01	.04	.05	.04	1.14	.02	.38	.23	.01	.06
20	.13	.04	.00	.30	.00	.11	.04	.22	.21	.01	.00	.07
21	.04	.00	.01	.85	.01	.06	.00	.05	.28	.17	.00	.09
22	.05	.06	.06	.02	.14	.09	.00	.09	.22	1.26	.00	.01
23	.10	.13	.03	.00	.05	.02	.00	.12	.38	.13	.00	.00
24	.29	.01	.50	2.06	.12	.04	.03	.19	.36	.94	.00	.00
25	.38	3.45	2.02	1.10	.19	.01	.03	.26	.32	.04	.00	.00
26	.94	1.25	.01	.30	.40	.00	.02	.10	.55	.08	.00	.00
27	.47	.28	.00	.18	3.60	.00	.87	.17	.16	.39	.00	.00
28	.26	.12	.01	.20	.01	.00	.39	.33	.50	.05	.04	.00
29	.07	.03	.09	.00	.00	.38	.49	.02	.34	.00	.01	.00
30	.28	.46	.87	.20	---	.01	.00	.01	1.06	.00	.28	.92
31	.34	---	.13	.00	---	.04	---	.06	---	.15	.88	---
TOTAL	7.76	24.28	6.36	6.92	6.86	5.60	4.35	3.33	10.91	6.22	5.13	9.78

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220817159374401. State Key Number 1080.0 Paukahana rain gage near Waimea, Kauai.

LOCATION.--Lat 22°08'17", long 159°37'44", 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.--Standard 8-in. National Weather Service accumulation rain gage. Elevation of gage is 3,700 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 24	1.4 estimated (a)
Oct. 24 to Jan. 08	>24.0 (b)
Jan. 08 to Feb. 12	11.7
Feb. 12 to Apr. 05	15.1
Apr. 05 to Jun. 07	2.6
Jun. 07 to Aug. 02	7.8
Aug. 02 to Oct. 25	-- (c)

220739159373001. State Key Number 1082.0 Waiakoali rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'39", long 159°37'30", 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-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Elevation of gage is 3,420 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 24	1.7 estimated (d)
Oct. 24 to Dec. 31	32.1 estimated (e)
Jan. 01 to Jan. 08	0.7 estimated (e)
Jan. 08 to Feb. 12	12.0
Feb. 12 to Apr. 05	15.8
Apr. 05 to Jun. 07	3.2
Jun. 07 to Aug. 02	8.6
Aug. 02 to Sep. 30	6.0 estimated (f)

WTR YR 1996 Total 80.1

> Actual value is known to be greater than the value shown.

(a) Estimated values based on accumulation rain can reading of 5.5 in. from August 16, 1995 to October 24, 1995.
(b) Rain can overflowed.
(c) No record, station vandalized.
(d) Estimated values based on accumulation rain can reading of 6.6 in. from August 16, 1995 to October 24, 1995.
(e) Estimated values based on accumulation rain can reading of 32.8 in. from October 24, 1995 to January 8, 1996.
(f) Estimated values based on accumulation rain can reading of 9.4 in. from August 2, 1996 to October 25, 1996.

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220713159361201. State Key Number 1083.0 Mohihi crossing rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07′13″, long 159°36′12″, 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.--Electronic data logger (CR10) with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 3,420 ft from topographic map.

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.00	.07	.02	.00	.00	.03	.01	.00	.04	.00	.26
2	.00	1.11	.00	.00	.11	1.09	.00	.03	.00	.23	.00	.47
3	.02	7.83	.11	.00	.00	2.13	.00	.00	.00	.14	.00	.10
4	.10	.03	.84	.22	.00	1.03	.00	.10	.00	.26	.03	.02
5	.13	.00	.04	.20	.00	.04	.00	.00	.00	.01	.11	.33
6	.22	.01	.11	.03	.00	.11	.00	.19	.18	.00	.14	.26
7	.83	.01	.00	.00	.28	.00	.00	.06	.33	.00	.00	1.26
8	1.58	.02	.26	.00	.15	.00	.00	.13	.00	.03	.01	.40
9	.07	4.72	.00	2.59	.01	.00	.01	.01	1.31	.01	.01	.00
10	.03	.01	.01	.00	.34	.00	.03	.00	.26	.01	.14	.04
11	.06	.00	.00	.00	.01	.00	.09	.00	.00	.04	.37	.34
12	.06	.02	.00	.00	.00	.00	.00	.00	.85	.08	.09	.34
13	.02	.35	.15	.00	.01	.17	.05	.00	1.05	.00	.00	.01
14	.01	.00	.01	.00	.51	.01	.04	.00	.06	.04	.00	.02
15	.01	.00	.00	.00	.45	.00	.00	.13	.01	.17	.02	.00
16	.00	.00	.00	.00	.01	.00	.00	.01	.06	.25	.05	.00
17	.00	.00	.03	.40	.00	.00	.03	.00	.09	.38	.04	.04
18	.05	.08	.01	.85	.00	.04	.10	.00	.43	.64	.00	.11
19	.05	.22	.00	.00	.13	.01	.60	.00	.11	.18	.00	.02
20	.18	.04	.00	.50	.01	.26	.01	.00	.07	.04	.00	.00
21	.09	.00	.00	.00	.05	.17	.00	.02	.03	.01	.00	.01
22	.04	.10	.03	.00	.25	.39	.00	.00	.00	.09	.00	.00
23	.12	.00	.01	.00	.05	.20	.00	.00	.44	.03	.00	.00
24	.03	.00	.08	1.17	.03	.12	.01	.06	.75	.23	.00	.01
25	.21	3.11	1.51	1.09	.56	.11	.04	.07	.01	.00	.00	.01
26	.13	3.28	.01	.19	.18	.01	.02	.00	.00	.00	.00	.00
27	.02	1.08	.00	.46	2.67	.01	.01	.06	.06	.28	.00	.00
28	.48	.00	.00	.26	.03	.00	.02	.18	.19	.04	.00	.00
29	.10	.00	.63	.00	.00	.10	.39	.03	.15	.00	.00	.22
30	.99	.07	3.20	1.18	---	.01	.03	.05	3.18	.02	.91	.38
31	.33	---	.58	.00	---	.00	---	.01	---	.06	.27	---
TOTAL	5.98	22.09	7.69	9.16	5.84	6.01	1.51	1.15	9.62	3.31	2.19	4.65

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220927159355001. State Key Number 1084.0 Kilohana rain gage near Hanalei, Kauai.

LOCATION.--Lat 22°09'27", long 159°35'50", 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.--Electronic data logger (CR10) with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.01	.20	.07	.00	.00	.05	.01	.00	.19	.02	1.26
2	.03	.61	.00	.00	.17	1.30	.00	.03	.01	.44	.03	.03
3	.15	4.76	.03	.00	.00	2.10	.00	.02	.01	.31	.07	.07
4	.48	.03	.16	.06	.00	1.70	.00	.30	.00	.45	.09	.10
5	.23	.00	.00	.13	.00	.10	.00	.02	.00	.08	.26	.45
6	.74	.01	.01	.01	.00	.20	.00	.10	.66	.07	.17	.52
7	1.53	.00	.00	.05	.42	.00	.00	.39	3.48	.08	.01	1.13
8	1.54	.01	.03	.00	.04	.00	.22	1.39	1.18	.12	.01	.40
9	.17	2.71	.00	2.31	.01	.00	.09	.01	.44	.03	.04	.01
10	.13	.01	.00	.00	.85	.00	.07	.03	.18	.06	.43	.16
11	.11	.00	.00	.00	.01	.00	.41	.00	.03	.14	1.24	.76
12	.14	.02	.60	.00	.00	.00	.03	.00	.03	.48	.24	.97
13	.04	.91	.87	.00	.05	1.60	.17	.00	.99	.01	.00	.04
14	.01	.02	.00	.00	1.62	.00	.04	.00	.00	.30	.00	.01
15	.01	.03	.00	.00	.80	.00	.01	.41	.00	.44	.02	.00
16	.00	.07	.07	.00	.00	.00	.03	.00	.17	.43	.08	.01
17	.00	.02	.05	2.64	.10	.00	.43	.01	.30	.52	.09	.08
18	.32	.31	.00	7.84	.00	.20	.86	.00	1.32	.83	.00	.22
19	.10	.85	.00	.00	.20	.00	2.53	.00	.19	.63	.00	.02
20	.43	.07	.00	.47	.00	.80	.00	.00	.19	.51	.00	.02
21	.23	.00	.00	.00	.70	.70	.02	.00	.07	.04	.00	.00
22	.25	.08	.10	.02	1.00	.50	.01	.04	.04	.04	.01	.00
23	.23	.01	.01	.00	.00	.40	.00	.00	1.33	.05	.01	.00
24	.24	.00	.67	1.19	.00	.10	.03	.11	1.93	.00	.00	.02
25	.90	1.12	4.52	1.36	.50	.30	.09	.04	.05	.04	.00	.00
26	.88	.91	.01	.04	.20	.03	.05	.05	.13	.25	.00	.00
27	.07	.59	.00	2.68	2.70	.04	.01	.14	.14	.23	.00	.00
28	3.12	.01	.00	.74	.10	.27	.38	.51	1.01	.04	.04	.00
29	.27	.02	.15	.00	.00	1.28	1.10	.11	1.38	.00	.01	.03
30	2.32	.09	2.11	1.55	---	.03	.12	.06	2.37	.14	.21	.58
31	.65	---	.45	.00	---	.05	---	.01	---	.26	.36	---
TOTAL	15.36	13.28	10.04	21.16	9.47	11.70	6.75	3.79	17.63	7.21	3.44	6.89

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220703159351201. State Key Number 1085.0 Mohihi-Koaie divide rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07′03″, long 159°35′12″, 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-in. National Weather Service accumulation rain gage. Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Dec. 07	20.7 estimated (a)
Dec. 07 to Dec. 31	5.5 estimated (b)
Jan. 01 to Mar. 26	17.6 estimated (b)
Mar. 26 to Jul. 25	19.8
Jul. 25 to Sep. 30	9.8 estimated (c)

WTR YR 1996 Total 73.4

(a) Estimated values based on accumulation rain can reading of 22.8 in. from August 30, 1995 to December 7, 1995.
(b) Estimated values based on accumulation rain can reading of 23.1 in. from December 7, 1995 to March 26, 1996.
(c) Estimated values based on accumulation rain can reading of 9.8 in. from July 25, 1996 to October 1, 1996.

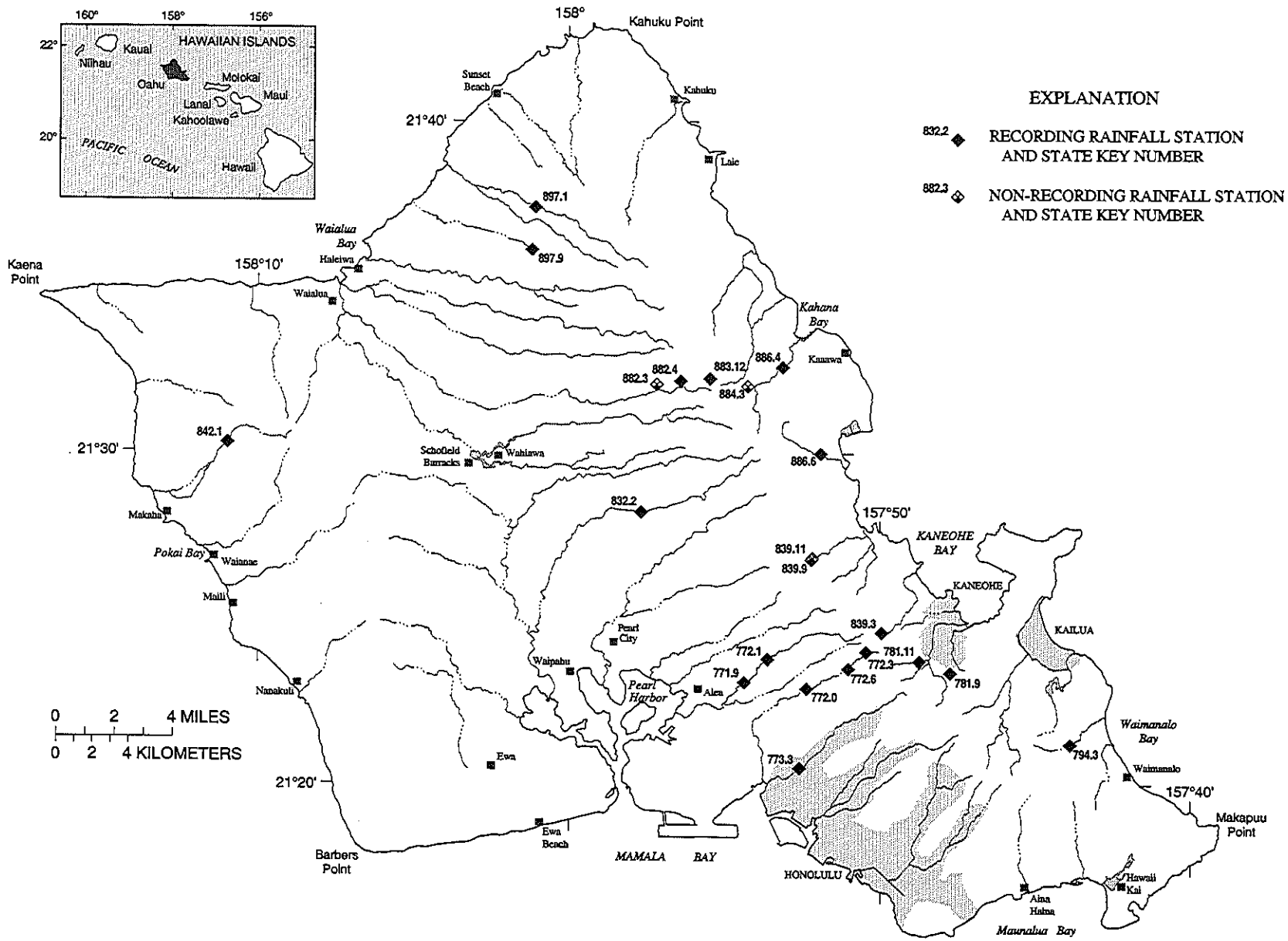


Figure 22. Locations of rainfall stations on Oahu.

RAINFALL RECORDS

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″, (Waipahu quadrangle, 1983, 1:24000), Hydrologic Unit 20060000, 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, February 1, 1983 to September 1996 (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 recording tipping-bucket attachment, housed in the shelter for gaging station 16226200. Elevation of gage is 180 ft above mean sea level from topographic map.

REMARKS.--Records fair. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.5	---	---	.0	.0	.0	.0	.0	.2	.1	.0
2	.0	.0	---	---	.0	.3	.0	.0	.0	.0	.0	.5
3	.0	2.3	---	---	.0	1.9	.5	.0	.0	.1	.0	.1
4	.0	.0	---	---	.0	.2	.2	.0	.0	.2	.0	.1
5	.0	.0	---	---	.0	.0	.0	.0	.0	.8	.2	.4
6	.1	.0	---	---	.0	.0	.0	.0	.3	.1	.1	.9
7	.8	.0	---	---	.0	.0	.0	.0	.2	.0	.0	1.2
8	.1	.3	---	b.0	.0	.0	.0	.0	.1	.0	.0	.0
9	.0	.1	---	.0	.0	.0	.0	.0	.1	.0	.0	.0
10	.0	a.0	---	.5	.0	.0	.1	.0	.0	.0	.1	.3
11	.0	---	---	.0	.0	.0	.2	.0	.0	.0	.1	.2
12	.0	---	---	.0	.0	.0	.1	.0	2.2	.0	.0	.1
13	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	.0	---	---	.0	.0	.0	.0	.0	.1	.6	.0	.0
16	.0	---	---	.0	.0	.0	.0	.0	.1	.2	.1	.0
17	.0	---	---	.0	.0	.1	.0	.0	.3	.2	.0	.1
18	.0	---	---	c.0	.0	.0	.2	.0	.7	.4	.0	.1
19	.0	---	---	d.0	.0	.0	.1	.0	.0	.3	.0	.0
20	.1	---	---	.0	.0	.1	.1	.1	.6	.1	.0	.0
21	.0	---	---	.0	.0	.0	.2	.0	.0	.0	.0	.0
22	.0	---	---	.0	.0	.0	.1	.0	.2	.0	.0	.0
23	.0	---	---	.0	.0	.0	.0	.0	1.4	.0	.0	.0
24	.0	---	---	.9	.0	.0	.0	.1	.0	.8	.0	.0
25	.1	---	---	.7	1.6	.0	.0	.2	.0	.0	.0	.0
26	.1	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	---	---	.4	.2	.0	.0	.0	.0	.1	.0	.0
28	.1	---	---	.0	.0	.0	.7	.2	.1	.0	.0	.0
29	.0	---	---	.0	.0	.0	.0	.2	2.1	.0	.0	.0
30	.0	---	---	1.0	---	.0	.0	.0	.0	.0	.0	.0
31	.8	---	---	.0	---	.6	---	.0	---	.0	4.6	---
TOTAL	2.2	---	---	---	1.8	3.2	2.5	0.8	8.5	4.1	5.3	4.0

a. Partial daily record from 0001 hrs to 1000 hrs.
b. Partial daily record from 1415 hrs to 2400 hrs. Total accumulated rainfall from Nov. 10 (1000 hrs) to Jan. 8 (1415 hrs) is 4.0 inches, clock stopped.
c. Partial daily record from 0001 hrs to 1100 hrs.
d. Partial daily record from 1245 hrs to 2400 hrs. Total accumulated rainfall from Jan. 18 (1100 hrs) to Jan. 19 (1245 hrs) is 0.3 inches, clock stopped.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU

212253157522201. State Key Number 772.0 Moanalua rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°22′53″, long 157°52′22″, Hydrologic Unit 20060000, 1.8 mi northeast of Tripler Hospital, and 5.0 mi north of Honolulu Post Office.

PERIOD OF RECORD.--Accumulated-rainfall station, June 1926 (revised) to December 8, 1964. Continuous-record station, December 8, 1964 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 attached to a 7 5/16-in. rain can with float-type recorder system. Housed with recording crest-gage. Elevation of the gage is 340 ft above mean sea level from topographic map.

REMARKS.--Records good for periods when the recorder was in operation. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	1.3	.0	.0	---	---	---	.0	.0	.1	.2	.0
2	.0	.0	.0	.0	---	---	---	.0	.0	.6	.0	.7
3	.2	2.0	.0	.0	---	---	---	.0	.0	.2	.0	.4
4	.0	.0	.0	.5	---	---	---	.0	.0	.6	.1	.5
5	.1	.0	.0	.7	---	---	---	.0	.0	1.4	.0	.9
6	.4	.0	.2	.0	---	---	---	.0	.4	.7	.3	1.7
7	1.6	.4	.4	.1	---	---	---	.0	.6	.1	.2	2.6
8	.7	.9	.0	.1	---	---	---	.0	.2	.0	.0	.1
9	.3	.2	.2	.7	---	---	---	.0	.2	.1	.1	.0
10	.2	.0	.1	.2	---	---	---	.0	.0	.0	.3	.5
11	.4	.0	.0	.0	---	---	---	.0	.0	.0	.6	.6
12	.3	.0	.0	.0	---	---	---	.0	.9	.2	.1	.4
13	.0	.7	.3	.0	---	---	---	.0	.0	.0	.1	.0
14	.1	.2	.0	.0	---	---	---	.0	.1	.1	.0	.0
15	.0	.0	.0	.0	---	---	---	.0	.4	.6	.0	.0
16	.0	.0	.0	.2	---	---	---	.1	.3	.2	.1	.0
17	.0	.1	.2	.1	---	---	---	.0	.4	.6	.0	.0
18	.1	.0	.1	.4	---	---	---	.0	1.4	1.3	.1	.2
19	.1	.0	.0	.5	---	---	---	.1	.2	1.0	.0	.1
20	.7	.0	.0	.3	---	---	---	.3	1.0	.7	.0	.4
21	.4	.0	.0	.3	---	---	---	.1	.3	.1	.0	.0
22	.0	.0	.0	a.0	---	---	---	.0	.3	.0	.0	.0
23	.1	.0	.0	---	---	---	---	.0	1.7	.0	.0	.0
24	.0	.1	.0	---	---	---	---	.7	.2	.1	.0	.0
25	.5	.0	.0	---	---	---	---	.5	.1	.0	.0	.0
26	.8	.1	.0	---	---	---	---	.2	.0	.1	.0	.0
27	.0	.2	.0	---	---	---	---	.1	.0	.0	.1	.0
28	.9	.3	.0	---	---	---	---	.7	.3	.0	.0	.0
29	.0	.4	.0	---	---	---	---	.2	3.4	.0	.0	.0
30	.2	1.0	1.5	---	---	---	b.0	.1	.3	.0	.2	.0
31	.8	---	.5	---	---	---	---	.0	---	.0	4.9	---
TOTAL	8.9	7.9	3.5	---	---	---	---	3.1	12.7	8.8	7.4	9.1

CAL YR 1995 TOTAL 72.9

a. Partial daily record from 0001 hrs to 1500 hrs.
b. Partial daily record from 1330 hrs to 2400 hrs. No record from January 22 (1500 hrs) to April 30 (1330 hrs), valve not closed.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212346157533701. State Key Number 772.1 North Halawa rain gage near Aiea, Oahu.

LOCATION.--Lat 21°23′46″(revised), long 157°53′37″, 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 6, 1929 to June 30, 1933, June 3, 1953 (revised) 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.

REMARKS.--Records good except for cumulative totals which are fair. Rainfall recorded in tenths of an inch. From April 4, 1996, data logger records in 0.083 in. increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	.10	.00	---	.00	.20	.00	.00	.00	.08	.00
2	---	b---	.00	.00	---	.37	.00	.00	.00	.17	.08	.17
3	---	---	.00	.00	---	1.68	.00	.00	.00	.00	.00	.08
4	a.00	---	.00	.50	---	.20	.50	.00	.00	.33	.00	.08
5	.00	---	.00	.60	---	.00	.00	.00	.00	.92	.08	.25
6	.60	---	1.00	.00	---	.00	.00	.00	.42	.17	.17	.67
7	.40	---	.10	.00	---	.00	.00	.00	.33	.08	.08	1.25
8	1.50	c.00	.00	.10	---	.00	.00	.00	.17	.00	.00	.00
9	.10	.00	.10	d.00	---	.00	.00	.00	.08	.00	.00	.00
10	.10	.00	.00	---	---	.00	.17	.00	.00	.00	.17	.25
11	.20	.00	.00	---	---	.00	.08	.00	.00	.00	.17	.42
12	.20	.00	.00	---	---	.00	.00	.00	.75	.00	.08	.33
13	.00	.30	.10	---	---	.00	.00	.00	.00	.00	.00	.00
14	.00	.10	.00	---	---	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	---	---	.00	.00	.00	.25	.42	.00	.00
16	.00	.00	.00	---	---	.00	.00	.00	.25	.25	.00	.00
17	.00	.10	.10	---	---	.25	.00	.00	.33	.17	.00	.00
18	.10	.00	.00	---	---	.00	.33	.00	1.00	.33	.00	.08
19	.10	.00	.00	---	---	.00	.08	.00	.17	.42	.00	.00
20	.40	.00	.00	---	---	.15	.00	.08	.58	.17	.00	.00
21	.20	.00	.00	---	---	.00	.33	.00	.08	.00	.00	.00
22	.00	.00	.00	---	---	.00	.08	.00	.50	.00	.00	.00
23	.00	.00	.00	---	---	.00	.00	.00	1.25	.00	.00	.00
24	.00	.00	.00	---	---	.00	.00	.17	.00	.42	.00	.00
25	.20	.00	.00	---	---	.00	.08	.17	.00	.00	.00	.00
26	.40	.10	.00	---	---	.00	.00	.00	.00	.00	.00	.00
27	---	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00
28	---	.20	.00	---	---	.00	.08	.25	.00	.00	.00	.00
29	---	.20	.00	---	e.00	.00	.00	.17	1.67	.00	.00	.00
30	---	.90	1.10	---	---	.00	.00	.00	.17	.00	.00	.00
31	---	---	.70	---	---	1.00	---	.00	---	.00	4.25	---
TOTAL	---	---	3.30	---	---	3.65	1.93	0.84	8.00	3.85	5.16	3.58

a. Partial daily record from 1251 hrs to 2400 hrs. Total accumulated rainfall from Aug. 24 (1052 hrs) to Oct. 4 (1251 hrs) is 3.0 inches, recorder stopped.
b. Total accumulated rainfall from Oct. 27 (0001 hrs) to Nov. 2 (1304 hrs) is 3.5 inches, recorder stopped.
c. Partial daily record from 1307 hrs to 2400 hrs. Total accumulated rainfall from Nov. 2 (1304 hrs) to Nov. 8 (1307 hrs) is 3.9 inches, recorder stopped.
d. Partial daily record from 0001 hrs to 0915 hrs.
e. Partial daily record from 0923 hrs to 2400 hrs. Total accumulated rainfall from Jan. 9 (0915 hrs) to Feb. 29 (0923 hrs) is 8.42 inches, recorder stopped.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

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″, (Kaneohe quadrangle, 1959, 1:24000), 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 25, 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. can with recorder. Elevation of gage is 1,000 ft above mean sea level from topographic map.

REMARKS.--Records good except for the period of no record, which is poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	---	.1	.0	.0	.1	1.6	.0	.0	.0	.3	.0
2	.0	---	.0	.0	.2	.8	.2	.0	.0	.6	.1	.4
3	.0	---	.0	.0	.0	2.8	.0	.0	.0	.2	.0	.2
4	.3	---	.0	.7	.0	.1	.6	.0	.0	.7	.3	.4
5	.3	---	.1	.7	.0	.0	.2	.0	.0	1.9	.1	.8
6	.8	---	.1	.0	.0	.0	.0	.0	.5	1.2	.4	1.1
7	3.1	---	.4	1.1	1.3	.0	.0	.0	.8	.1	.4	1.8
8	.9	---	.0	1.0	.1	.0	.0	.0	.4	.1	.0	.4
9	.1	---	.3	.8	.0	.0	.0	.0	1.5	.2	.2	.0
10	.4	---	.0	.4	.2	.0	1.1	.0	.0	.0	.7	.4
11	.5	---	.0	.0	.0	.0	.5	.0	.0	.0	1.1	.3
12	.3	---	.3	.0	.0	.0	.1	.0	.7	.4	.1	.7
13	.0	---	1.0	.0	.0	.0	.0	.0	.8	.5	.3	.0
14	.1	---	.0	.0	.7	.0	.2	.0	.0	.2	.0	.0
15	.1	---	.0	.0	.0	.0	.0	.0	.3	.1	.0	.0
16	.0	---	.0	.4	.0	.1	.0	.2	.2	.3	.0	.0
17	.1	---	.2	.0	.0	.2	.3	.0	.4	.7	.0	.0
18	.0	---	.0	.7	.0	.0	.7	.0	1.2	.8	.0	.1
19	.1	---	.1	.8	.0	.0	.3	.2	.2	.7	.1	.0
20	1.3	---	.0	.5	.0	.2	.6	1.1	.8	.8	.0	.3
21	.8	---	.0	.4	.0	.0	.6	.3	.2	.6	.0	.0
22	.0	---	.0	.0	.1	.0	.0	.0	.4	.1	.0	.0
23	.0	---	.0	.3	.0	.1	.0	.2	2.0	.0	.0	.1
24	.0	b.0	.0	1.2	.5	.0	.1	.9	.3	.5	.0	.0
25	.7	.0	.6	5.1	1.1	.0	.4	.5	.0	.0	.0	.0
26	a.2	.1	.1	.1	.8	.0	.3	.8	.0	.8	.0	.0
27	---	.2	.0	1.0	1.3	.0	.0	.2	.0	.5	.1	.0
28	---	.4	.0	.3	1.8	.0	1.8	1.2	.4	.0	.0	.0
29	---	.4	.0	.0	.1	.3	.0	.3	2.5	.0	.0	.0
30	---	1.2	1.9	.3	---	.3	.0	.2	.6	.0	.4	.0
31	---	---	1.7	.0	---	1.8	---	.0	---	.0	.0	---
TOTAL	---	---	6.9	15.8	8.2	6.8	9.6	6.1	14.2	12.0	4.6	7.0

a. Partial daily record from 0001 hrs to 1630 hrs.
b. Partial daily record from 0930 hrs to 2400 hrs. Total accumulated rainfall from Oct 26 (1630 hrs) to Nov. 24 (0930 hrs) is greater than 36 inches, rain can overflowed.

RAINFALL RECORDS

HAWAII, ISLANDOF OAHU--Continued

212329157510501. State key Number 772.6 Moanalua rain gage near Kaneohe, Oahu.

LOCATION.--Lat 21°23′29″, long 157°51′05″, (Kaneohe quadrangle, 1959, 1:24000), Hydrologic Unit 20060000, in USGS streamgage station 16227500, on left bank 3.3 mi northeast of Tripler Hospital, and 3.6 mi southwest of Kaneohe Post Office.

PERIOD OF RECORD.--Continuous-record station, August 29, 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 attached to 7 5/16-in. rain can with a digital recorder. Elevation of gage is 660 ft above mean sea level from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.1	---	.1	.0	.0	.0	1.5	.0	.0	.1	.3	.0
2	.0	---	.0	.0	.1	.9	.2	.0	.0	.8	.1	.7
3	.0	---	.1	.0	.0	2.9	.0	.0	.0	.2	.1	.2
4	.2	---	.0	.7	.0	.2	.6	.0	.0	.7	.2	.4
5	.3	---	.0	.9	.0	.0	.2	.0	.0	2.0	.1	1.5
6	.0	---	.1	.0	.0	.0	.0	.0	.6	1.1	.5	1.7
7	2.2	---	.5	.6	.7	.0	.0	.0	.9	.1	.4	2.3
8	.8	---	.0	.7	.1	.0	.0	.0	.4	.2	.0	.2
9	.1	---	.3	1.1	.0	.0	.0	.0	.6	.1	.2	.0
10	.5	---	.0	.4	.2	.0	1.2	.0	.0	.1	.7	.5
11	.6	---	.0	.0	.0	.0	.6	.0	.0	.0	.9	.4
12	.4	---	.2	.0	.0	.0	.1	.0	.1	.4	.0	.6
13	.1	---	.7	.0	.0	.0	.0	.0	.4	.1	.3	.0
14	.0	---	.0	.0	1.0	.0	.3	.0	.1	.2	.0	.0
15	.0	---	.0	.0	.2	.0	.0	.0	.2	.4	.0	.0
16	.0	---	.0	.4	.0	.0	.0	.3	.2	.4	.1	.1
17	.0	---	.3	.0	.0	.2	.3	.0	.5	.7	.0	.0
18	.1	---	.0	.5	.0	.0	.9	.0	1.4	1.3	.0	.4
19	.1	---	.1	1.3	.0	.0	.3	.2	.2	.9	.0	.0
20	1.4	---	.0	.8	.0	.2	.5	.9	1.0	.9	.0	.3
21	.7	---	.0	.5	.0	.0	.6	.1	.3	.5	.0	.0
22	.0	---	.0	.1	.1	.1	.1	.0	.5	.0	.0	.0
23	.1	---	.0	.2	.1	.1	.0	.1	1.9	.0	.0	.1
24	.0	a.0	.0	.6	.5	.0	.0	.8	.3	.6	.0	.0
25	.6	.0	.2	3.2	2.3	.0	.3	.7	.1	.0	.0	.0
26	---	.1	.2	.2	1.2	.0	.3	.7	.0	.6	.0	.1
27	---	.2	.0	1.1	1.0	.0	.0	.2	.0	.3	.1	.0
28	---	.4	.0	.5	1.0	.0	.7	1.2	.3	.0	.0	.0
29	---	.4	.0	.0	.0	.4	.0	.3	3.3	.0	.0	.0
30	---	1.7	1.8	.4	---	.1	.1	.1	.4	.0	.0	.0
31	---	---	.8	.0	---	1.7	---	.0	---	.0	2.6	---
TOTAL	---	---	5.4	14.2	8.5	6.8	8.8	5.6	13.7	12.7	6.6	9.5

a. Partial daily record from 1100 hrs to 2400 hrs. Total accumulated rainfall from Oct 26 (0001 hrs) to Nov. 24 (1100 hrs) is greater than 36 inches, rain can overflowed.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212029157523601. State Key Number 773.3 Kalihi rain gage at Kalihi, Oahu.

LOCATION.--Lat 21°20′29″, long 157°52′36″, Hydrologic Unit 20060000, in USGS streamgage 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 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 with tipping-bucket attachment. A CR10 data logger records rainfall at 30 min. intervals. Elevation of gage is 70 ft above mean sea level from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.20	.20	.00	.00	.00	.00	---	---	.10	.00	.10
2	---	.00	.10	.00	.10	.30	.00	---	---	.10	.00	.10
3	---	.80	.00	.00	.00	1.20	.00	---	---	.10	.00	.40
4	---	.00	.00	.30	.00	.00	.30	---	---	.20	.00	.20
5	---	.00	.00	.50	.00	.00	.10	---	---	.30	.00	.20
6	---	.00	.10	.00	.00	.00	---	---	---	.10	.30	.40
7	---	.10	.00	.00	.00	.00	---	---	---	.10	.00	.70
8	---	.10	.10	.00	.00	.00	---	---	---	.00	.00	.30
9	---	.00	.00	.30	.00	.00	---	---	---	.00	.00	.00
10	---	.00	.00	.70	.30	.00	---	---	---	.00	.00	.10
11	---	.00	.00	.00	.00	.00	---	---	---	.00	.10	.20
12	---	.00	.00	.00	.00	.00	---	---	---	.10	.00	.00
13	a.00	.10	.10	.00	.00	.00	---	---	b.50	.00	.00	.00
14	.00	.00	.00	.00	.10	.00	---	---	.10	.00	.00	.00
15	.00	.00	.00	.00	.10	.00	---	---	.30	.50	.10	.00
16	.00	.00	.00	.00	.00	.00	---	---	.20	.00	.00	.00
17	.00	.00	.00	.10	.00	.10	---	---	.10	.20	.00	.00
18	.00	.00	.00	.20	.00	.00	---	---	.40	.60	.10	.10
19	.00	.00	.00	.30	.00	.00	---	---	.10	.40	.00	.10
20	.10	.00	.00	.10	.00	.10	---	---	.30	.40	.00	.00
21	.00	.00	.00	.00	.00	.00	---	---	.10	.10	.00	.00
22	.00	.00	.00	.00	.00	.00	---	---	.10	.00	.00	.00
23	.00	.00	.00	.10	.00	.00	---	---	.70	.00	.00	.00
24	.00	.00	.00	.80	.10	.00	---	---	.10	.00	.00	.00
25	.10	.00	.00	.00	.20	.00	---	---	.00	.00	.00	.00
26	.20	.10	.00	.00	.20	.00	---	---	.00	.00	.10	.00
27	.00	.10	.00	.00	.50	.00	---	---	.00	.20	.00	.00
28	.20	.00	.00	.00	.00	.00	---	---	.00	.00	.00	.00
29	.00	.10	.00	.00	.00	.00	---	---	.30	.00	.00	.00
30	.00	.40	.90	.00	---	.00	---	---	.00	.00	1.10	.00
31	.70	---	.40	.10	---	.10	---	---	---	.00	1.90	---
TOTAL	---	2.00	1.90	3.50	1.60	1.80	---	---	---	3.50	3.70	2.90

a. Partial daily record from 1130 hrs to 2400 hrs. Total accumulated rainfall from Oct. 1 (0001 hrs) to Oct. 13 (1130 hrs) is 1.3 inches.
b. Partial daily record from 0915 hrs to 2400 hrs. No record from Apr. 6 (0001 hrs) to June 13 (0915 hrs), rain catchment hose was plugged.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212342157484401. State Key Number 781.11 Luluku rain gage at altitude 220 ft near Kaneohe, Oahu.

LOCATION.--Lat 21°23′42″, long 157°48′44″, Hydrologic Unit 20060000, in USGS streamgage station 16270900 on right bank, 0.5 mi upstream from mouth, 1.4 mi southwest of Castle High School, and 1.9 mi south of Kaneohe Post Office.

PERIOD OF RECORD.--Continuous-record station, April 1984 to current year. Station was relocated 400 ft downstream in 1984. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service tipping-bucket rain gage. Elevation of gage is 220 ft above mean sea level from topographic map (revised).

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	3.0	1.0	.0	.0	.2	.1	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.3	1.4	.1	.0	.0	.1	.0	.0
3	.0	.4	.0	.0	.0	2.8	.0	.0	.0	.2	.2	.1
4	.1	.1	.0	.6	.0	.1	.2	.0	.0	.1	.2	.1
5	.0	.0	.0	.7	.0	.0	.1	.0	.0	.8	.0	.8
6	.3	.0	.0	.0	.0	.0	.0	.0	.1	.0	.1	.5
7	1.1	.1	.1	.8	1.9	.0	.0	.0	.3	.7	.1	.2
8	.3	1.4	.1	.3	.2	.0	.0	.3	.2	.1	.0	.2
9	.0	.9	.2	.4	.0	.0	.0	.1	3.3	.3	.1	.0
10	.1	.0	.0	.3	.1	.0	.2	.0	.1	.0	.1	.1
11	.2	.0	.0	.0	.0	.0	.1	.0	.6	.0	.6	.3
12	.0	.2	.1	.0	.0	.0	.3	.0	.0	.3	.0	.1
13	.0	1.3	.4	.0	.0	.0	.0	.0	.1	.0	.0	.1
14	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0
16	.0	.0	.0	.1	.0	.0	.0	.0	.1	.1	.0	.0
17	.0	.0	.1	.1	.0	.0	.0	.0	.2	.1	.0	.0
18	.0	.2	.0	.2	.0	.0	.3	.0	.4	.3	.0	.1
19	.0	.0	.0	.2	.0	.0	.1	.0	.0	.5	.0	.0
20	.2	.2	.0	.1	.0	.2	.1	.4	.3	.0	.0	.1
21	.2	.1	.0	.0	.0	.2	.1	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.1	.0	.0	.2	.1	.0	.0
23	.0	.0	.0	.4	.0	.0	.0	.0	.9	.0	.0	.0
24	.0	.0	.0	1.1	.2	.0	.0	.2	.0	.0	.0	.2
25	.2	.0	.3	7.9	.1	.0	.0	.3	.0	.0	.0	.0
26	.0	.0	.1	.0	.3	.0	.0	.4	.0	.3	.0	.0
27	.0	.4	.0	1.4	1.6	.0	.0	.1	.0	.7	.2	.0
28	.7	.0	.0	.2	.6	.0	1.5	.3	.1	.0	.0	.0
29	.0	.1	.0	.0	.0	.0	.1	.0	.9	.0	.0	.0
30	.4	.8	1.2	.2	---	.2	.0	.1	.1	.0	.0	.0
31	.9	---	.6	.1	---	.7	---	.0	---	.0	5.9	---
TOTAL	4.7	9.9	4.2	15.1	5.3	5.9	3.3	2.2	7.9	4.8	7.5	2.9

WTR YR 1996 Total 73.7

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212322157474401. State Key Number 781.9 Right Branch Kamooalii rain gage near Kaneohe, Oahu.

LOCATION.--Lat 21°23'22", long 157°47'44", Hydrologic Unit 20060000, in USGS streamgage station 16265600 on left bank, 0.3 mi south of Hawaiian Memorial Park Cemetery, 1.0 mi northwest of Pali Golf Course, and 1.3 mi south of Castle High School.

PERIOD OF RECORD.--Continuous-record station, February 1983 to current year. Prior to 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage attached to a tipping-bucket counter and recorder. Elevation of gage is 210 ft above mean sea level from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	1.2	1.9	.0	.0	.0	.0	---	---	---	---	---
2	.0	.0	.0	.0	.1	.6	a.0	---	---	---	---	---
3	.1	.2	.0	.0	.0	1.0	---	---	---	---	---	---
4	.0	.1	.0	.5	.0	.0	---	---	---	---	---	---
5	.0	.0	.0	.8	.0	.0	---	---	---	---	---	---
6	.3	.0	.0	.0	.0	.1	---	---	---	---	---	---
7	.8	.0	.2	.0	.3	.0	---	---	---	---	---	---
8	.2	.6	.0	.0	.3	.0	---	---	---	---	---	---
9	.1	.2	.0	.0	.0	.0	---	---	---	---	---	---
10	.1	.0	.0	.9	.0	.0	---	---	---	---	---	---
11	.0	.0	.0	.0	.0	.0	---	---	f---	---	---	---
12	.1	.1	.0	.0	.0	.0	---	---	---	---	---	---
13	.0	1.0	.2	.0	.0	.0	---	---	---	---	---	---
14	.0	.3	.2	.0	.0	.0	---	---	---	---	---	---
15	.0	.0	.0	.0	.0	.0	---	c---	---	---	---	---
16	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
17	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
18	.0	.3	.0	.3	.0	.0	---	---	---	---	---	---
19	.0	.0	.0	.1	.0	.0	---	---	g---	h---	---	---
20	.0	.3	.0	.0	.0	.0	---	---	---	---	i---	---
21	.1	.3	.0	.0	.0	.0	---	d---	---	---	---	---
22	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
23	.0	.0	.0	.3	.0	.0	---	---	---	---	---	---
24	.0	.0	.0	1.6	.0	.0	b---	---	---	---	---	---
25	.1	.0	.8	11.9	.0	.0	---	---	---	---	---	---
26	.2	.0	.0	.0	.1	.0	---	---	---	---	---	---
27	.0	.4	.0	.8	.7	.0	---	---	---	---	---	---
28	.5	.2	.0	.2	.0	.0	---	e---	---	---	---	---
29	.0	.0	.0	.0	.0	.0	---	---	---	---	---	---
30	.0	.6	1.8	.3	---	.0	---	---	---	---	---	j---
31	1.6	---	.3	.0	---	.3	---	---	---	---	---	---
TOTAL	4.2	5.8	5.4	17.7	1.5	2.0	---	---	---	---	---	---

a. Partial daily record from 0001 hrs to 1351 hrs.
b. Total accumulated rainfall from Apr. 2 (1351 hrs) to Apr. 24 (1219 hrs) is 1.2 inches.
c. Total accumulated rainfall from Apr. 24 (1219 hrs) to May 15 (1312 hrs) is 2.5 inches.
d. Total accumulated rainfall from May 15 (1312 hrs) to May 21 (0837 hrs) is 0.2 inches.
e. Total accumulated rainfall from May 21 (0837 hrs) to May 28 (0919 hrs) is 0.5 inches.
f. Total accumulated rainfall from May 28 (0919 hrs) to June 11 (1509 hrs) is 4.1 inches.
g. Total accumulated rainfall from June 11 (1509 hrs) to June 19 (1414 hrs) is 0.3 inches.
h. Total accumulated rainfall from June 19 (1414 hrs) to July 19 (1509 hrs) is 4.8 inches.
i. Total accumulated rainfall from July 19 (1509 hrs) to Aug. 20 (0924 hrs) is 2.4 inches.
j. Total accumulated rainfall from Aug. 20 (0924 hrs) to Oct. 16 (0930 hrs) is 7.5 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212114157435001. State Key Number 794.3 Waimanalo rain gage at Waimanalo, Oahu.

LOCATION.--Lat 21°21′14″, long 157°43′50″, Hydrologic Unit 20060000, in USGS streamgage station 16249000, 260 ft downstream from Kalanianaole Highway, and 2.3 mi northwest of Waimanalo Post Office.

PERIOD OF RECORD.--Continuous-record station, January 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 gage attached to a tipping-bucket counter and recorder. Elevation of gage is 20 ft above mean sea level from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Nov. 07 to Jan. 11	9.5
Jan. 11 to Jan. 25	11.9
Jan. 25 to Apr. 09	9.2
Apr. 09 to Jun. 20	7.1
Jun. 20 to Oct. 15	4.2

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212813157574001. State Key Number 832.2 Kipapa rain gage near Wahiawa, Oahu.

LOCATION.--Lat 21°28′13″, long 157°57′50″, 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 was housed in the same shelter with USGS streamgage station 16212800, but was relocated to a new shelter 15 ft downstream on January 19, 1994.

PERIOD OF RECORD.--Continuous-record station, January 2, 1957 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. storage can with a float-type recorder system. Elevation of gage is 690 ft above mean sea level from topographic map.

REMARKS.--Records good for period when the recorder was in operation and poor for period of no record. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	---	---	---	---	.0	.0	.0	.0	.3	.0	.0
2	.0	---	---	---	---	.4	.2	.0	.0	.7	.1	.5
3	.0	---	---	---	---	3.7	.0	.0	.0	.1	.0	.6
4	.0	---	---	---	---	.3	.2	.2	.0	.4	.0	.1
5	.1	---	---	---	---	.0	.1	.0	.1	.7	.1	.6
6	a.0	---	---	---	---	.0	.0	.0	.5	.3	.1	.6
7	---	---	---	---	---	.0	.0	.0	.9	.1	.1	2.3
8	---	---	---	---	---	.0	.0	.0	.0	.0	.0	.0
9	---	---	---	b	---	.0	.0	.0	.7	.1	.0	.1
10	---	---	---	---	---	.0	.3	.0	.0	.0	.3	.3
11	---	---	---	---	---	.0	.5	.0	.0	.1	.5	.4
12	---	---	---	---	---	.2	.0	.0	.7	.0	.0	.1
13	---	---	---	---	---	.0	.0	.0	.0	.1	.0	.0
14	---	---	---	---	---	.0	.1	.1	.0	.0	.0	.0
15	---	---	---	---	---	.0	.0	.0	.4	.7	.0	.0
16	---	---	---	---	---	.1	.0	.2	.4	.7	.1	.0
17	---	---	---	---	---	.2	.3	.0	.3	.6	.0	.5
18	---	---	---	---	---	.0	.8	.0	.8	1.3	.1	.0
19	---	---	---	---	---	.0	.2	.1	.3	1.3	.0	.0
20	---	---	---	---	---	.1	.1	.2	.9	.0	.0	.1
21	---	---	---	---	---	.0	.4	.0	.2	.0	.0	.0
22	---	---	---	---	---	.0	.1	.1	.1	.0	.0	.0
23	---	---	---	---	---	.1	.0	.1	1.8	.0	.0	.0
24	---	---	---	---	---	.0	1.0	.4	.1	.0	.0	.0
25	---	---	---	---	---	.0	.0	.3	.0	.0	.0	.0
26	---	---	---	---	---	.0	.0	.1	.0	.0	.0	.0
27	---	---	---	---	---	.0	.0	.0	.0	.2	.0	.0
28	---	---	---	---	---	.0	.0	.1	.2	.0	.0	.0
29	---	---	---	---	c.0	.0	.0	.3	1.2	.0	.0	.0
30	---	---	---	---	---	.0	.0	.0	.5	.0	.8	.0
31	---	---	---	---	---	.7	---	.0	---	.1	1.1	---
TOTAL	---	---	---	---	---	5.8	4.3	2.2	10.1	7.8	3.3	6.2

a. Partial daily record from 0001 hrs to 1200 hrs.
b. Total accumulated rainfall from Oct. 6 (1200 hrs) to Jan. 9 (1130 hrs) is 14.3 inches, recorder stopped.
c. Partial daily record from 1300 hrs to 2400 hrs. Total accumulated rainfall from Jan. 9 (1130 hrs) to Feb. 29 (1230 hrs) is 8.3 inches, recorder not in service.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212650157521001. State Key Number 839.11 Waihee rain gage at ridge crossing near Heeia, Oahu.

LOCATION.--Lat 21°26′50″, long 157°52′10″, Hydrologic Unit 20060000, approximately 1,000 ft downstream from USGS streamgage station 16283600.

PERIOD OF RECORD.--Accumulated-rainfall station, October 13, 1963 to September 1996 (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. Elevation of gage is 400 ft above mean sea level from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Nov. 06 to Jan. 10	17.6
Jan. 10 to Apr. 17	22.5
Apr. 17 to Jun. 27	17.5
Jun. 27 to Oct. 08	22.1

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212434157495601. State Key Number 839.3 Haiku rain gage near Heeia, Oahu.

LOCATION.--Lat 21°24′34″, long 157°49′56″, approximately 1,600 ft inside of security fence at Haiku, on the right side of roadway.

PERIOD OF RECORD.--Continuous-record station, December 2, 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 receiver and 7 5/16-in. storage can with a float-type system attached to a digital recorder. Elevation of gage is 195 ft above mean sea level from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	1.7	1.2	.1	.0	.1	.2	.0	.0	.0	.1	.0
2	.0	.0	.0	.0	.4	1.0	.4	.0	.0	.3	.1	.1
3	.0	.7	.0	.0	.0	2.9	.0	.0	.0	.0	.1	.1
4	.1	.1	.0	.9	.0	.3	.5	.0	.0	.4	.3	.3
5	.1	.0	.0	.5	.0	.1	.6	.0	.0	1.1	.0	.4
6	.2	.1	.3	.0	.1	.0	.0	.4	.2	.4	.2	.9
7	1.9	.3	.4	.5	2.0	.0	.0	.0	.3	.1	.0	.8
8	.3	1.0	.0	.7	.2	.0	.0	.4	.2	.0	.0	.2
9	.1	.9	.1	.6	.0	.0	.0	.0	2.0	.1	.1	.0
10	.0	.0	.0	.9	.2	.0	.3	.0	.0	.0	.3	.1
11	.2	.1	.0	.0	.0	.0	.2	.0	.4	.0	.4	.2
12	.3	.5	.2	.0	.0	.0	.1	.0	.2	.0	.1	.2
13	.0	2.4	.5	.0	.0	.0	.0	.0	.5	.0	.1	.0
14	.0	.9	.1	.0	.2	.0	.0	.0	.0	.2	.0	.0
15	.0	.1	.0	.0	.0	.0	.0	.0	.2	.3	.0	.0
16	.0	.0	.0	.2	.0	.0	.0	.0	.1	.1	.0	.0
17	.0	.3	.2	.0	.0	.1	.0	.0	.2	.3	.0	.2
18	.0	.0	.0	.2	.0	.1	.2	.0	.6	.1	.0	.1
19	.0	.0	.1	.5	.0	.0	.1	.0	.1	.3	.0	.0
20	.3	.1	.0	.1	.0	.1	.2	.4	.3	.1	.0	.2
21	.2	.1	.0	.0	.0	.1	.3	.1	.1	.1	.0	.0
22	.0	.1	.0	.1	.0	.1	.0	.0	.3	.4	.0	.0
23	.0	.0	.0	.3	.0	.0	.0	.0	1.5	.0	.0	.0
24	.0	.0	.0	.7	.0	.0	.1	.3	.2	.1	.0	.1
25	.4	.0	.9	7.8	.1	.0	.0	.3	.0	.0	.0	.0
26	.0	.3	.1	.1	.3	.0	.0	.3	.0	.6	.0	.0
27	.0	.3	.0	1.1	1.1	.0	.0	.1	.0	.5	.0	.0
28	.9	.3	.0	.2	1.3	.0	1.1	.4	.2	.0	.0	.0
29	.1	.2	.0	.0	.0	.0	.0	.1	1.3	.0	.0	.0
30	.1	.8	2.5	.4	---	.2	.0	.1	.5	.0	.0	.0
31	1.0	---	.5	.0	---	1.4	---	.0	---	.0	3.0	---
TOTAL	6.2	11.3	7.1	15.9	5.9	6.5	4.3	2.9	9.4	5.5	4.8	3.9

CAL YR 1995 Total 73.7
WTR YR 1996 Total 83.7

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212647157521201. State Key Number 839.9 South Fork Waihee rain gage near Heeia, Oahu.

LOCATION.--Lat 21°26′47″, long 157°52′12″, Hydrologic Unit 20060000, 50 ft north of streamgage station 16283600, on side of a hill about 40 ft above station.

PERIOD OF RECORD.--Accumulated-rainfall station, October 13, 1963 to September 1996 (discontinued). Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

REVISED RECORDS.--WDR HI-94-1: 1993 (Station ID).

GAGE.--Standard 8-in. National Weather Service collector with standard 8-in. can, 24 in. tall. Elevation of gage is 640 ft above mean sea level from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Aug. 24 to Nov. 06	12.9
Nov. 06 to Jan. 10	12.5
Jan. 10 to Apr. 17	22.5
Apr. 17 to Jun. 27	9.2
Jun. 27 to Oct. 08	22.1

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213016158105901. State Key Number 842.1 Makaha rain gage near Makaha, Oahu.

LOCATION.--Lat 21°30′16″, long 158°10′59″, Hydrologic Unit 20060000, in USGS streamgage station 16211600, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 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 a digital recorder. A CR10 data logger was installed on February 28, 1996, replacing the digital recorder. Readings are taken every 30 min. Elevation of gage is 957 ft above mean sea level from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	1.7
2	.0	.0	.0	.0	.3	.4	.0	.0	.0	.0	.0	.0
3	.0	.4	.0	.0	.0	3.2	.0	.0	.0	.0	.0	.2
4	.0	.1	.0	1.0	.0	.3	.1	.0	.0	.0	.0	.1
5	.0	.0	.0	.8	.0	.2	.9	.0	.0	.1	.0	.0
6	.0	.0	.0	.0	.1	.0	.0	.0	.2	.1	.1	.3
7	.2	.0	.4	.3	.0	.0	.0	.0	.2	.1	.0	1.0
8	.2	.1	.1	.0	.0	.0	.0	.0	.6	.0	.0	.1
9	.0	.0	.2	.5	.0	.0	.0	.0	.8	.0	.0	.0
10	.0	.0	.0	.1	.5	.0	.2	.0	.1	.0	.1	.0
11	.0	.0	.0	.0	.0	.0	.1	.0	1.2	.1	.1	.0
12	.0	.2	.0	.0	.0	.0	.0	.0	.5	.0	.0	.0
13	.0	1.0	.1	.0	.1	.3	.0	.0	.4	.0	.0	.0
14	.0	.1	.0	.0	.4	.0	.2	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.2	.0	.0	.0	.1	.1	.0	.0
16	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.1	.2
17	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.1	.0
18	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0
19	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	.0	.2	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0
21	.1	.0	.0	.0	.0	.7	.0	.1	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0
23	.1	.0	.0	.0	.1	.3	.0	.0	.0	.6	.0	.0
24	.0	.0	.0	1.9	.0	.0	.0	.0	.0	.0	.0	.0
25	.0	.0	.0	.3	.0	.1	.1	.0	.1	.0	.0	.0
26	.6	.1	.0	.0	1.0	.0	.0	.3	.0	.0	.0	.0
27	.0	1.1	.0	.2	2.0	.0	.0	.0	.0	.1	.0	.0
28	.6	.0	.0	.0	.8	.0	.1	.0	.0	.0	.0	.0
29	.0	.0	.1	.0	.0	.0	.3	.0	.3	.0	.1	.0
30	.0	.1	.4	.6	---	.0	.2	.0	.0	.0	.2	.0
31	.2	---	.7	.0	---	.8	---	.0	---	.0	3.2	---
TOTAL	2.0	3.4	2.1	6.1	5.5	7.1	2.3	0.4	4.5	1.2	4.0	3.6

CAL YR 1995 Total 24.0
WTR YR 1996 Total 42.2

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213205157571001. State Key Number 882.3 Poamoho rain gage no. 3 near Wahiawa, Oahu.

LOCATION.--Lat 21°32′05″, long 157°57′10″, Hydrologic Unit 20060000, on right side of Poamoho Trail, and 0.2 mi northeast from trail marker.

PERIOD OF RECORD.--Accumulated-rainfall station, July 12, 1967 to current year. 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.--Record poor. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Aug. 29 to Nov. 22	32.5
Nov. 22 to Feb. 16	23.5
Feb. 16 to May 08	29.4
May 08 to July 05	21.3
July 05 to Oct. 10	26.9

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213211157562400. State Key Number 882.4 Poamoho rain gage no. 2 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'11", long 157°56'24", 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 Waihawa.

PERIOD OF RECORD.--Continuous-record station, June 8, 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 gage with a float-type system attached to a graphic recorder. Elevation of gage is 1,960 ft above mean sea level from topographic map.

REMARKS.--Record good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	2.45	.36	.00	.00	.09	1.59	.00	.00	.57	.17	.05
2	.40	.00	.00	.00	.20	2.27	.22	.00	.00	1.05	.01	.13
3	.35	1.15	.00	.00	.00	3.46	.00	.00	.00	.35	.11	.32
4	.32	.00	.00	.32	.02	.20	.18	.00	.00	.60	.31	.76
5	.53	.05	.00	.20	.00	.08	.05	.00	.24	1.55	.44	1.42
6	.33	.00	.00	.00	.00	.10	.01	.00	.27	.43	.51	1.12
7	1.17	.40	.35	.57	.56	.00	.00	.28	1.49	.46	.87	6.13
8	.67	3.80	.02	.40	.12	.00	.00	.12	.13	.04	.00	.14
9	.53	.80	.00	1.33	.04	.00	.14	.00	.81	.44	.10	.08
10	.32	.25	.00	.28	.15	.00	1.02	.02	.06	.16	.45	.33
11	1.28	.03	.00	.01	.00	.06	.67	.05	.00	.20	1.09	.54
12	1.20	.04	.43	.00	.00	1.02	.05	.01	.21	.29	.11	.39
13	.50	.88	1.12	.00	.00	.04	.06	.01	.00	.00	.47	.09
14	.27	.72	.00	.00	.90	.00	.26	.01	.11	.32	.12	.01
15	.28	.25	.00	.00	.38	.09	.07	.01	.22	.66	.02	.07
16	.02	.03	.06	.01	.05	.16	.06	.27	.89	1.08	.38	.07
17	.33	.67	.13	.10	.00	.47	.81	.02	.47	.34	.04	.05
18	.40	.08	.11	.70	.00	.21	.82	.00	1.10	1.11	.38	.35
19	.43	.00	.20	5.94	.03	.00	.60	.31	.11	1.21	.02	.09
20	.57	.00	.02	2.16	.02	.44	.37	.89	.83	.07	.16	.94
21	.70	.32	.02	.97	.05	.22	.38	.10	.47	1.62	.02	.02
22	.00	.05	.00	.19	.10	.11	.05	.00	.26	.04	.01	.29
23	.05	.10	.04	.54	.38	.60	.00	.20	.84	.00	.00	.11
24	.05	.00	.00	1.40	2.37	.01	.02	.69	.58	.02	.00	.58
25	.75	.00	.10	4.09	8.43	.00	.18	1.21	.18	.02	.01	.06
26	1.00	.03	.00	.05	3.22	.00	.70	.88	.13	.82	.00	.03
27	.05	.27	.00	.45	1.30	.00	.51	.02	.13	.40	.00	.00
28	1.30	.33	.01	.41	.40	.00	.01	.75	.88	.00	.00	.00
29	.10	.46	.07	.00	.00	.17	.10	.13	2.72	.09	.00	.00
30	1.00	1.00	1.62	.39	---	.02	.10	.34	1.78	.01	.08	.00
31	4.75	---	.58	.01	---	3.19	---	.00	---	.12	1.52	---
TOTAL	19.90	14.16	5.24	20.52	18.72	13.01	9.03	6.32	14.91	14.07	7.40	14.17

CAL YR 1995 Total 151.57
WTR YR 1996 Total 157.45

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213215157552800. State Key Number 883.12 Poamoho rain gage no. 1 near Wahiawa, Oahu.

LOCATION.--Lat 21°32′15″, long 157°55′28″, 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 rain gage with a float-type system attached to a graphic recorder. Elevation is 2,480 ft above mean sea level from topographic map.

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.37	.00	.05	.52	3.58	.00	.00	---	---	---
2	---	---	.00	.00	.20	3.08	.50	.00	.02	---	---	---
3	---	---	.00	.00	.02	4.10	.00	.00	1.37	---	---	---
4	---	---	.00	.30	.00	.29	.30	.17	b.00	---	---	---
5	---	---	.00	.40	.01	.06	.09	.00	---	c.03	---	---
6	---	---	.00	.15	.04	.15	.00	.03	---	.39	---	---
7	---	---	.58	1.24	1.13	.00	.11	.39	---	.20	---	---
8	---	---	.00	1.11	.72	.00	.01	.02	---	d.00	---	---
9	---	---	.00	.80	.00	.00	.00	.00	---	---	---	---
10	---	---	.00	.71	.15	.00	.79	.00	---	---	---	---
11	---	---	.00	.01	.03	.31	.56	.00	---	---	---	---
12	---	---	.40	.00	.01	.93	.00	.00	---	---	---	---
13	---	---	1.00	.00	.00	.00	.02	.00	---	---	---	---
14	---	---	.00	.00	.46	.00	.60	.06	---	---	---	---
15	---	---	.01	.00	.15	.10	.00	.00	---	---	---	---
16	---	---	.09	.00	.01	.07	.00	.29	---	---	---	---
17	---	---	.12	.09	.00	.19	.72	.00	---	---	---	---
18	---	---	.15	.39	.00	.16	.47	.00	---	---	---	---
19	---	---	.08	5.05	.00	.04	.23	.40	---	---	---	---
20	---	---	.05	2.05	.00	.99	.59	.83	---	---	---	---
21	---	---	.00	1.50	.00	.40	.20	.01	---	---	---	---
22	---	---	.09	.55	.00	.12	.02	.00	---	---	---	---
23	---	a.00	.01	.65	.27	.44	.00	.19	---	---	---	---
24	---	.00	.00	2.90	.78	.00	.08	.41	---	---	---	---
25	---	.00	.19	4.35	4.22	.04	.12	.89	---	---	---	---
26	---	.10	.01	.00	3.38	.01	.78	.91	---	---	---	---
27	---	.75	.00	.96	1.70	.00	.44	.09	---	---	---	---
28	---	.25	.00	.39	.94	.00	.86	.50	---	---	---	---
29	---	.41	.00	.00	.00	.30	.14	.16	---	---	---	---
30	---	.84	2.00	.42	---	.31	.02	.04	---	---	---	---
31	---	---	.60	.01	---	3.62	---	.00	---	---	---	---
TOTAL	---	---	6.75	24.03	14.27	16.23	11.23	5.39	---	---	---	---

a. Partial daily record from 1200 hrs to 2400 hrs. Total accumulated rainfall from Sept. 6 (1930 hrs) to Nov. 22 (1200 hrs) is 43.35 inches, recorder stopped.
b. Partial daily record from 0001 hrs to 0215 hrs.
c. Partial daily record from 1130 hrs to 2400 hrs. Total accumulated rainfall from June 4 (0215 hrs) to July 5 (1130 hrs) is 13.7 inches.
d. Partial daily record from 0001 hrs to 0345 hrs. Total accumulated rainfall from July 8 (0345 hrs) to Oct. 10 (1255 hrs) is 29.03 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213221157541501. State Key Number 884.3 Punaluu rain gage near Punaluu, Oahu.

LOCATION.--Lat 21°32′21″, long 157°54′15″, Hydrologic Unit 20060000, 4.9 mi south of Hauula School, and 1.5 mi south of USGS streamgage station on Punaluu Ditch 16302000.

PERIOD OF RECORD.--Accumulated-rainfall station, July 14, 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 with standard 8-in. can, and an auxiliary 3-in. diameter, 5 ft high measuring can. Elevation of gage is 750 ft above mean sea level from topographic map.

REMARKS.--Records fair. Cummulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Aug. 16 to Nov. 28	25.2
Nov. 28 to Jan. 24	17.6
Jan. 24 to Apr. 26	22.3
Apr. 26 to Jun. 28	16.6
Jun. 28 to Oct. 22	24.9

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213237157530701. State Key Number 886.4 Kahana rain gage at altitude 95 ft near Kahana, Oahu.

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank, 600 ft upstream from Kawa Stream, approximately 40 ft bankward from USGS streamgage station 16296500, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaawa.

PERIOD OF RECORD.--Accumulated-rainfall station, December 23, 1958 to May 11, 1961, February 19, 1990 to June 17, 1994. Continuous-record station, May 11, 1961 to February 19, 1990, June 17, 1994 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--A 3-in x 5 ft tall rain can from October 1, 1993 to June 17, 1994. Rain gage was relocated in new shelter on June 17, 1994. On June 6, 1996 a GS-93 data logger was installed with a float system using an 8-in. receiver and 7 5/16-in. diameter by 4-ft tall rain can takes readings at 30-min. intervals. Elevation of gage is 95 ft above mean sea level from topographic map.

REMARKS.--Records good except for the period of no daily record, October 29 to November 13 and September 28-30 which is poor.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.1	---	.8	.0	.0	.9	.4	.0	.0	.1	.2	.0
2	.1	---	.2	.0	.1	2.4	.5	.0	.0	.4	.0	.0
3	.3	---	.0	.0	.0	4.6	.0	.0	.0	.1	.1	.0
4	.3	---	.0	.2	.0	.2	.3	.4	.0	.2	.1	.3
5	.3	---	.0	.5	.0	.1	.3	.0	.0	.8	.1	.8
6	.1	---	.0	.1	.0	.0	.0	.1	.0	.3	.1	.3
7	.5	---	.2	.9	.9	.0	.0	.2	.7	.1	.2	1.2
8	.6	---	.0	.6	1.1	.0	.0	.5	.2	.0	.0	.2
9	.1	---	.0	1.2	.1	.0	.0	.0	1.5	.2	.0	.0
10	.0	---	.0	1.0	.0	.0	.6	.0	.0	.0	.2	.0
11	.3	---	.0	.0	.0	.1	.3	.0	.7	.1	.6	.2
12	.1	---	.6	.0	.0	.4	.0	.0	.0	.1	.1	.2
13	.0	b1.0	.9	.0	.0	.0	.0	.0	.2	.0	.3	.0
14	.0	.7	.0	.0	.1	.0	.1	.1	.0	.1	.0	.2
15	.2	.8	.0	.0	.0	.1	.0	.0	.1	.2	.0	.0
16	.0	.0	.0	.0	.0	.0	.0	.1	.5	.3	.1	.2
17	.1	.2	.0	.0	.0	.0	.8	.0	.2	.1	.1	.0
18	.1	.1	.0	.4	.0	.1	.5	.0	.9	.1	.0	.1
19	.2	.0	.0	1.3	.0	.0	.3	.2	.0	.3	.0	.0
20	.1	.3	.0	.0	.0	.4	.2	.1	.2	.0	.1	.4
21	.5	.6	.0	.1	.0	.7	.1	.1	.1	.3	.0	.0
22	.0	.1	.0	.3	.0	.1	.1	.1	.3	3.2	.0	.1
23	.0	.0	.0	.4	.2	.0	.0	.1	.3	1.7	.0	.1
24	.0	.7	.0	4.0	.1	.0	.1	.1	.2	1.3	.0	1.2
25	.5	.0	.2	2.8	.7	.0	.1	.2	.0	.0	.0	.2
26	.4	.0	.0	.1	.1	.0	.2	.3	.2	.5	.0	c.0
27	.0	.2	.0	.3	1.8	.0	.0	.1	.0	1.5	.0	---
28	a.6	.0	.0	.4	.7	.0	1.7	.4	.3	.0	.0	---
29	---	.2	.0	.0	.0	.1	.3	.1	1.3	.1	.0	---
30	---	.7	1.7	.3	---	.1	.0	.0	.4	.0	.0	---
31	---	---	.6	.0	---	1.1	---	.0	---	.0	1.9	---
TOTAL	---	---	5.2	14.9	5.9	11.4	6.9	3.2	8.3	12.1	4.2	---

a. Partial daily record from 0001 hrs to 2300 hrs.
b. Partial daily record from 1030 hrs to 2400 hrs. Total accumulated rainfall from Oct. 28 (2300 hrs) to Nov. 13 (1030 hrs) is 10.0 inches, recorder stopped.
c. Partial daily record from 0001 hrs to 1230 hrs. Total accumulated rainfall from Sept. 26 (1230 hrs) to Jan. 16 (1100 hrs) is greater than 32.0 inches, can overflowed.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

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", Hydrologic Unit 20060000, in USGS streamgage 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 18, 1960 (revised) to October 2, 1985, May 17, 1994 to current year. Accumulated-rainfall station, October 2, 1985 to May 17, 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 a digital recorder. A CR10 data logger was installed on June 12, 1996, replacing the digital recorder. Readings are taken every 30 min. 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, October 1-21, May 18 to September 30.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.2	.2	.7	.1	.0	.6	.1	.0	.0	.0	.1	.0
2	.0	.0	.6	.0	.1	2.5	.3	.0	.0	.3	.0	.0
3	.0	1.5	.0	.0	.0	3.2	.0	.0	.0	.1	.0	.0
4	.3	.0	.0	.3	.0	.8	.3	.3	.0	.1	.0	.0
5	.1	.0	.0	.4	.0	.0	.2	.0	.0	.3	.0	.5
6	.1	.0	.0	.0	.0	.0	.0	.4	.1	.4	.1	.1
7	.4	.0	.3	1.0	1.7	.0	.0	.0	.3	.1	.0	.2
8	.5	2.7	.0	.2	1.9	.0	.0	.6	.0	.0	.0	.3
9	.2	.4	.0	.6	.1	.0	.0	.0	1.8	.1	.0	.0
10	.2	.0	.0	.7	.1	.0	.6	.0	.1	.0	.0	.1
11	.2	.0	.0	.0	.0	.0	.1	.0	.2	.0	.2	.1
12	.0	.4	.3	.0	.0	.0	.0	.0	.6	.2	.0	.0
13	.1	2.1	.6	.0	.0	.0	.0	.0	.1	.6	.1	.0
14	.0	.2	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0
15	.1	.8	.0	.0	.1	.0	.0	.0	.3	.0	.0	.0
16	.0	.0	.0	.0	.0	.0	.0	.0	.4	.2	.0	.0
17	.0	.2	.1	.0	.0	.0	.3	.0	.0	.1	.0	.0
18	.0	.0	.0	.4	.0	.0	.3	.0	.5	.1	.0	.0
19	.1	.0	.0	.7	.0	.0	.1	.0	.0	.3	.0	.0
20	.0	.0	.0	.0	.0	.3	.0	.0	.2	.0	.0	.3
21	.2	.4	.0	.1	.0	.5	.1	.0	.1	.1	.0	.0
22	.0	.0	.1	.0	.0	.1	.0	.0	.3	.8	.0	.0
23	.0	.0	.0	.2	.0	.1	.0	.0	.3	.1	.0	.0
24	.0	.0	.0	1.1	.0	.0	.0	.0	.1	1.5	.0	.2
25	.5	.0	.0	2.8	.1	.0	.0	.1	.1	.0	.0	.0
26	.1	.0	.1	.2	.1	.0	.1	.1	.0	.2	.0	.0
27	.0	.1	.0	.7	1.2	.0	.0	.0	.1	1.3	.0	.0
28	.7	.0	.0	.3	1.7	.0	2.0	.4	.1	.0	.0	.1
29	.0	.1	.0	.0	.0	.0	.0	.0	.8	.1	.0	.0
30	.4	.2	2.0	.6	---	.0	.0	.1	.4	.0	.0	.0
31	.6	---	.6	.0	---	.6	---	.0	---	.0	2.6	---
TOTAL	5.0	9.3	5.4	10.4	7.2	8.7	4.5	2.0	6.9	7.1	3.1	1.9

WTR YR 1996 Total 71.5

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213725158010401. State Key Number 897.1 Kamananui rain gage at Pupukea Military Road near Maunawai, Oahu.

LOCATION.--Lat 21°37′25″, long 158°01′04″, Hydrologic Unit 20060000, on left bank, at USGS streamgage station 16325000, 75.0 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

PERIOD OF RECORD.--Continuous-record station, July 1, 1963 to current year. Prior to October 1992, unpublished records are in the files of the Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector attached to a tipping-bucket counter and graphic recorder. A CR10 data logger was installed on March 26,1996 to record rainfall at 30-min intervals. Elevation of gage is 590 ft above mean sea level from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.30	.10	.00	.00	.10	.70	.00	.00	.20	.00	.20
2	---	.00	.00	.00	.20	.60	.00	.00	.00	.70	.30	.00
3	a.10	1.30	.00	.00	.00	2.80	.00	.00	.00	.10	.00	.10
4	.00	.00	.00	.20	.00	.30	.00	.00	.00	.50	.00	.10
5	.10	.00	.00	.20	.00	.00	.00	.00	.10	.90	.20	.40
6	.30	.00	.00	.20	.00	.00	.00	.00	.10	.20	.50	.70
7	.80	.10	.00	.20	.10	.00	.00	.00	1.20	.40	.10	2.00
8	1.50	1.70	.10	.10	.10	.00	.00	.20	.00	.00	.00	.00
9	.00	.10	.00	.60	.00	.00	.00	.00	1.40	.10	.20	.10
10	.10	.00	.00	.10	.40	.00	.70	.00	.70	.00	.40	.30
11	.30	.00	.00	.00	.00	.00	.70	.00	.00	.00	.60	.40
12	.20	.20	.10	.00	.00	.00	.10	.00	.50	.20	.00	.30
13	.10	1.20	.50	.00	.00	.00	.00	.00	.50	.00	.20	.00
14	.00	.30	.00	.00	.30	.00	.10	.00	.00	.10	.00	.00
15	.00	.10	.00	.00	.20	.00	.00	.00	.30	.50	.00	.00
16	.00	.10	.00	.00	.00	.00	.00	.10	4.70	.30	.10	.00
17	.10	.00	.00	.00	.00	.10	.80	.00	1.10	.40	.00	.00
18	.10	.00	.00	.10	.00	.10	.90	.00	1.00	.90	.30	.10
19	.10	.00	.00	1.70	.00	.00	.40	.20	.30	.50	.10	.10
20	.60	.10	.00	.00	.00	.30	.40	.40	.40	.00	.00	.20
21	.20	.10	.00	.10	.00	b.10	.20	.00	.20	.10	.00	.00
22	.00	.00	.10	.00	.20	---	.20	.00	.20	.20	.00	.00
23	.00	.00	.00	.10	.10	---	.00	.10	.60	.00	.00	.00
24	.00	.00	.00	4.30	.20	---	.10	.30	.50	.00	.00	.10
25	.50	.00	.00	3.30	1.40	---	.10	.50	.00	.00	.00	.00
26	.10	.00	.00	.00	.50	c.00	.20	.20	.00	.30	.00	.00
27	.00	.80	.00	.00	2.40	.00	.00	.00	.10	.30	.00	.00
28	.80	.20	.00	.10	.70	.00	.10	.10	.20	.00	.00	.00
29	.00	.40	.00	.00	.00	.00	.50	.30	2.50	.00	.00	.00
30	.60	.10	1.30	.60	---	.00	.80	.10	1.10	.10	.00	.00
31	.30	---	1.60	.00	---	.40	---	.00	---	.00	1.00	---
TOTAL	---	7.10	3.80	11.90	6.80	---	7.00	2.50	17.70	7.00	4.00	5.10

a. Partial daily record from 1230 hrs to 2400 hrs. Total accumulated rainfall from Sept. 9 (0400 hrs) to Oct. 3 (1230 hrs) is 4.6 inches, recorder stopped.
b. Partial daily record from 0001 hrs to 1000 hrs.
c. Partial daily record from 1445 hrs to 2400 hrs. Total accumulated rainfall from Mar. 21 (1000 hrs) to Mar. 26 (1445 hrs) is 0.2 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

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″, 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 a 8-in. storage can with a recording float-type system. Elevation of gage is 1,160 ft above mean sea level from topographic map.

REMARKS.--Records good. Rainfall recorded in 0.12 of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.24	.12	.00	.00	.12	.36	.00	.00	.36	.12	.48
2	.00	.00	.36	.00	.36	.60	.12	.00	.00	.48	.00	.12
3	.36	1.68	.00	.00	.00	2.04	.00	.00	.00	.24	.00	.24
4	.12	.00	.00	.12	.00	.24	.00	.24	.00	.72	.00	.00
5	.12	.00	.00	.48	.00	.24	.00	.00	.12	.96	.12	.00
6	.36	.00	.00	.12	.00	.12	.00	.00	.12	.36	.24	.00
7	.96	.12	.00	.48	.12	.00	.00	.00	1.08	.96	.00	.00
8	.96	1.32	.00	.12	.12	.00	.00	.12	.00	.00	.00	.00
9	.12	.00	.00	.60	.00	.00	.00	.00	1.20	.00	.36	.12
10	.12	.00	.00	.12	.24	.00	.48	.00	.24	.12	.12	.00
11	.36	.00	.00	.00	.00	.12	.72	.00	.24	.00	.24	.00
12	.24	.12	.24	.00	.00	.00	.12	.00	.72	.36	.12	.00
13	.00	.84	.48	.00	.00	.00	.00	.00	.84	.00	.00	.00
14	.00	.36	.00	.00	.48	.00	.36	.00	.00	.12	.00	.00
15	.00	.00	.00	.00	.12	.00	.00	.00	.36	.36	.12	.00
16	.00	.00	.00	.00	.00	.12	.00	.36	.48	.72	.12	.00
17	.12	.00	.12	.12	.00	.24	.48	.00	.00	.24	.12	.00
18	.00	.00	.00	.12	.00	.12	.84	.00	.60	1.08	.00	.00
19	.24	.00	.00	1.20	.00	.00	.36	.00	.12	.72	.00	.00
20	.36	.12	.00	.00	.00	.36	.12	.36	.72	.00	.00	.00
21	.12	.00	.00	.12	.00	.24	.48	.00	.36	.00	.00	.00
22	.00	.00	.00	.00	.24	.12	.12	.00	.36	.48	.00	.00
23	.00	.00	.00	.00	.12	.36	.00	.00	.72	.12	.00	.00
24	.00	.00	.00	2.40	.24	.00	.12	.12	.36	.00	.00	.00
25	.24	.00	.00	3.00	.96	.00	.12	.36	.12	.00	.00	.00
26	.00	.00	.00	.00	.48	.00	.12	.00	.00	.24	.00	.00
27	.00	.60	.00	.00	1.68	.00	.00	.00	.00	.48	.00	.00
28	.84	.00	.00	.00	.48	.00	.00	.12	.36	.00	.00	.00
29	.00	.24	.00	.00	.12	.00	.48	.36	3.24	.00	.00	.00
30	.36	.24	.84	.36	---	.00	.84	.24	.84	.00	1.20	.00
31	1.32	---	1.32	.00	---	.60	---	.00	---	.00	.48	---
TOTAL	7.32	5.88	3.48	9.36	5.76	5.64	6.24	2.28	13.20	9.12	3.36	0.96

CAL YR 1995 TOTAL 65.52
WTR YR 1996 TOTAL 72.60

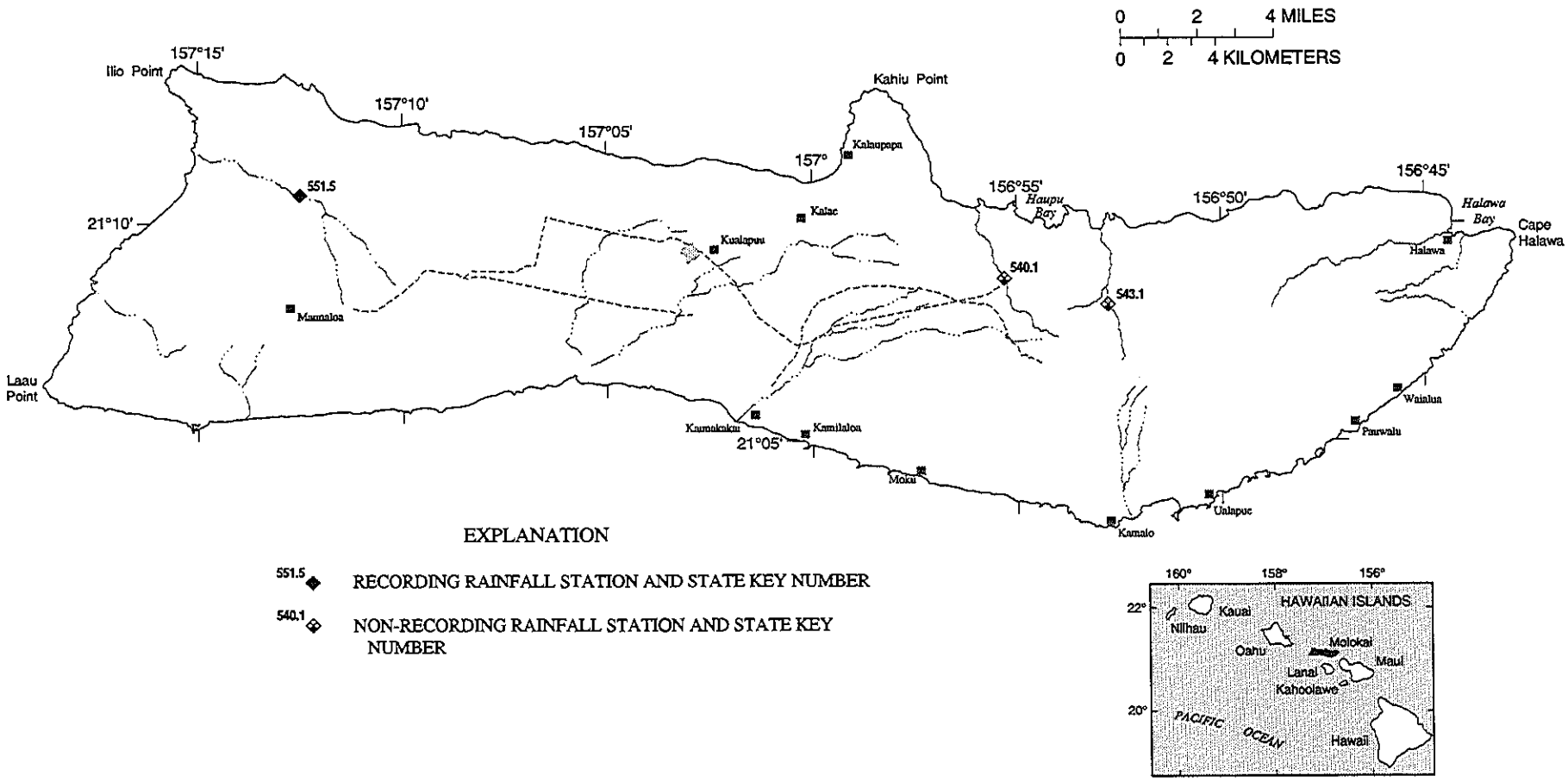


Figure 23. Locations of rainfall stations on Molokai.

RAINFALL RECORDS

HAWAII, ISLAND OF MOLOKAI

210843156551801. State Key Number 540.1 Waikolu rain gage at altitude 900 ft, near Kalaupapa, Molokai.

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on left bank near USGS streamgage station 16405500, 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

PERIOD OF RECORD.--1957 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.--Standard rain gage with reduced 1:2 catchment. Elevation of gage is 900 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

PERIOD	RAINFALL
Aug. 16 to Oct. 24	8.4
Oct. 24 to Dec. 12	19.8
Dec. 12 to Feb. 06	15.6
Feb. 06 to Mar. 26	14.4
Mar. 26 to May 14	15.0
May 14 to Jul. 10	12.0
Jul. 10 to Sep. 18	7.2
Sep. 18 to Nov. 05	1.2

210807156524601. State Key Number 543.1 Pelekunu rain gage at altitude 700 ft near Kalaupapa, Molokai.

LOCATION.--Lat 21°08'07", long 156°52'46", Hydrologic Unit 20050000, on Puu Hoi Ridge, 2.0 mi south of former village of Pelekunu, and 5.7 mi north of Kamalo.

PERIOD OF RECORD.--1968 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.--Standard rain gage with reduced 1:2 catchment. Elevation of gage is 700 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Aug. 22 to Dec. 06	20.8
Dec. 06 to Feb. 08	17.0
Feb. 08 to May 02	23.4
May 02 to Jul. 19	18.0
Jul. 19 to Oct. 25	6.2

RAINFALL RECORDS

HAWAII, ISLAND OF MOLOKAI--Continued

211039157123101. State Key Number 551.5 Kakaako rain gage near Mauna Loa, Molokai.

LOCATION.--Lat 21°10'39", long 157°12'31", Hydrologic Unit 20050000, in the USGS streamgage 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.--Standard 8-in. National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 380 ft from topographic map.

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	---	---	.0	.0	.0	.0	.0	.0	.0	---	---
2	.0	---	---	.0	.3	.2	.0	.0	.0	.0	---	---
3	.0	---	---	.0	.0	3.6	.0	.0	.0	.0	---	---
4	.0	---	---	.0	.0	.6	.0	.0	.0	.3	---	---
5	.0	---	---	.9	.0	.0	.3	.3	.0	.9	---	---
6	.0	---	---	.0	.0	.0	.0	.0	.0	.0	---	---
7	.0	---	---	.6	.1	.0	.0	.0	.1	.3	---	---
8	.0	---	---	.0	.0	.0	.0	.0	.0	c.0	---	---
9	.0	---	---	.0	.0	.0	.0	.0	1.5	---	---	---
10	.0	---	---	.6	.2	.0	.0	.0	.0	---	---	---
11	.0	---	b.0	.0	.0	.0	.0	.0	.2	---	---	---
12	.0	---	.0	.0	.0	.0	.3	.0	.0	---	---	---
13	.0	---	.0	.0	.0	.0	.0	.0	.0	---	---	---
14	.0	---	.0	.0	.2	.0	.0	.0	.0	---	---	---
15	.0	---	.0	.0	.0	.0	.0	.0	.1	---	---	---
16	.0	---	.0	.0	.0	.0	.0	.0	.2	---	---	d.0
17	.0	---	.0	.0	.0	.0	.0	.0	.0	---	---	.0
18	.0	---	.0	.1	.0	.0	.3	.0	.0	---	---	.0
19	.0	---	.0	.0	.0	.0	.0	.0	.0	---	---	.0
20	.0	---	.0	.0	.0	.0	.0	.0	.0	---	---	.0
21	.0	---	.0	.0	.0	.3	.0	.0	.0	---	---	.0
22	.0	---	.0	.0	.0	.0	.0	.0	.0	---	---	.0
23	a.2	---	.0	.2	.0	.1	.0	.0	.1	---	---	.0
24	---	---	.0	.1	.0	.0	.0	.0	.2	---	---	.0
25	---	---	2.0	1.0	.0	.0	.0	.0	.0	---	---	.0
26	---	---	.0	.2	.0	.0	.0	.0	.0	---	---	.0
27	---	---	.0	.0	1.4	.0	.8	.0	.0	---	---	.0
28	---	---	.0	.0	.7	.0	.0	.0	.0	---	---	.0
29	---	---	.0	.0	.0	.0	.1	.0	.3	---	---	.0
30	---	---	.2	.6	---	.0	.9	.0	.1	---	---	.0
31	---	---	2.3	.0	---	.5	---	.0	---	---	---	---
TOTAL	---	---	---	4.3	2.9	5.3	2.7	0.3	2.8	---	---	---

a. Partial daily record from 0001 hrs to 1440 hrs.
b. Partial daily record from 1525 hrs to 2400 hrs. Total accumulated rainfall from Oct. 23 (1440 hrs) to Dec. 11 (1525 hrs) is 1.3 inches.
c. Partial daily record from 0001 hrs to 1330 hrs.
d. Partial daily record from 1240 hrs to 2400 hrs. Total accumulated rainfall from July 8 (1330 hrs) to Sept. 16 (1240 hrs) is 1.9 inches.

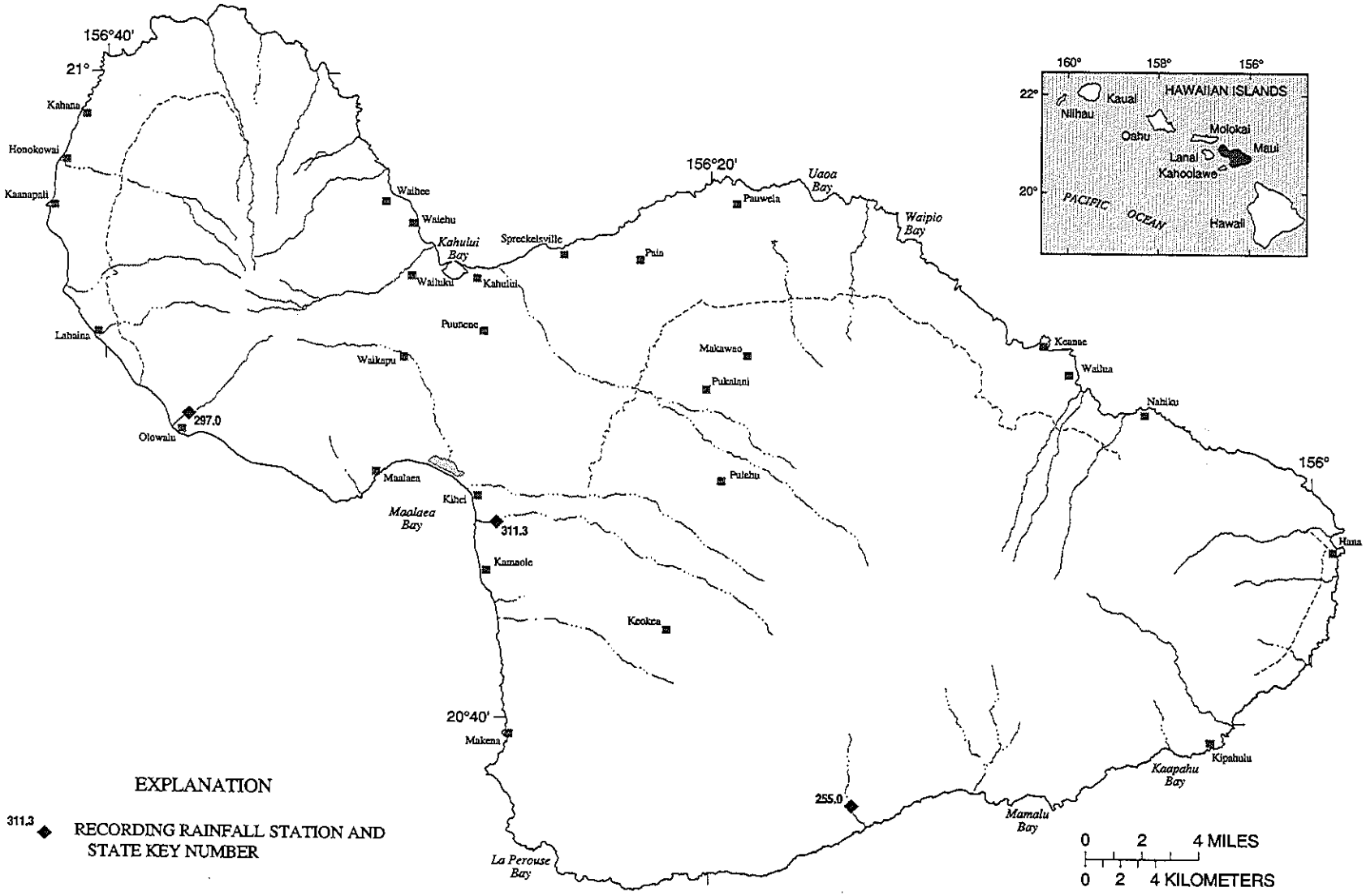


Figure 24. Locations of rainfall stations on Maui.

RAINFALL RECORDS

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", Hydrologic Unit 20020000, in USGS streamgage 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.--Standard 8-in. National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 740 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.3	.0	.0	.0	.0	.7	.0	.0	.0	.1
2	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0
3	.0	.0	.0	.0	.0	2.4	.0	.0	.0	.0	.0	.0
4	.0	.0	.0	.0	.0	1.4	.0	.0	.0	.0	.0	.0
5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.5
7	.0	.3	3.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.1	.0	1.7	.0	.0	.0	.0	1.3	.0	.0	.0
10	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
16	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6
17	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	.0	.0	.2	.1	.0	.1	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0
23	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	.0	.0	.0	1.8	.0	.0	.0	.0	.0	.0	.0	.2
26	.0	.0	.0	.7	.2	.0	.0	.0	.0	.1	.0	.0
27	.0	.1	.1	.0	2.2	.0	.0	.0	.0	.3	.0	.0
28	.0	.6	.0	.0	.2	.0	.1	.0	.0	.0	.0	.0
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	.0	.1	.8	1.6	---	.0	.1	.0	.0	.0	.2	.0
31	.0	---	1.2	.4	---	.0	---	.0	---	.0	.3	---
TOTAL	0.0	1.2	5.7	6.5	3.1	3.9	0.4	0.7	1.3	0.5	0.5	1.5

CAL YR 1995 Total 22.8
WTR YR 1996 Total 25.3

RAINFALL RECORDS

HAWAII, ISLAND OF MAUI--Continued

204923156371501. State Key Number 297.0 Olowalu rain gage at Olowalu, Maui.

LOCATION.--Lat 20°49′23″, long 156°37′15″, Hydrologic Unit 20020000, in USGS streamgage 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.--Standard 8-in. National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 130 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.0	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0
4	.0	.0	.0	.1	.0	.6	.0	.0	.0	.0	.0	.0
5	.0	.0	.0	.4	.0	.0	.7	.0	.0	.0	.0	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.6
8	.0	.0	.0	.0	.0	.0	.0	.4	.0	.0	.0	.0
9	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
10	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
17	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
26	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	.0	.0	.0	1.2	.0	.0	.0	.0	.0	.0	.0
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	.0	.0	1.3	.2	---	.0	.0	.0	.0	.0	.0	.0
31	.0	---	.6	.2	---	.0	---	.0	---	.0	.2	---
TOTAL	0.0	0.0	2.5	1.5	1.2	1.1	0.7	0.4	0.0	0.0	0.2	0.6

WTR YR 1996 Total 8.2

RAINFALL RECORDS

HAWAII, ISLAND OF MAUI--Continued

204606156270301. State Key Number 311.3 Kulanihakoi rain gage near Kihei, Maui.

LOCATION.--Lat 20°46′06″, long 156°27′03″, Hydrologic Unit 20020000, in USGS streamgage station 16660000 on right bank, 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast 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.--Standard 8-in. National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 35 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.0	.0	.0	.0	.0	.9	.0	.0	.0	.0	.0	.0
4	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0
5	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	.0	.0	1.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
26	.0	.0	.1	.3	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	.0	.0	.0	.7	.0	.0	.0	.0	.0	.0	.0
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	.0	.0	1.5	.6	---	.0	.0	.0	.0	.0	.0	.0
31	.0	---	1.0	.2	---	.0	---	.0	---	.0	.0	---
TOTAL	0.2	0.0	3.6	1.9	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0

CAL YR 1995 Total 9.8
WTR YR 1996 Total 7.7

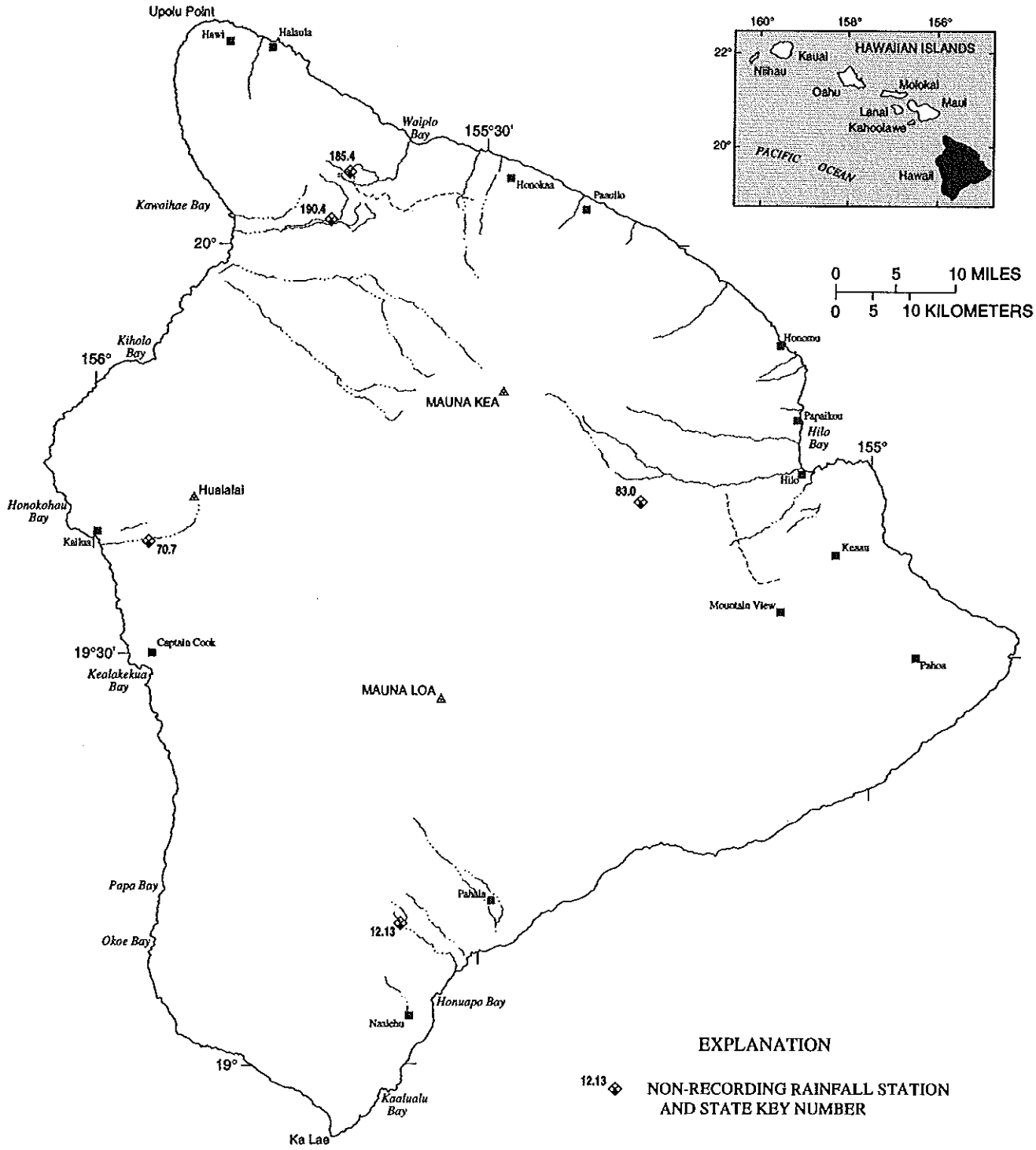


Figure 25. Locations of rainfall stations on Hawaii.

RAINFALL RECORDS

HAWAII, ISLAND OF HAWAII

191027155355801. State Key Number 12.13 Hilea Gulch Tributary rain gage near Honuapo, Hawaii.

LOCATION.--Lat 19°10′27″, long 155°35′58″, Hydrologic Unit 20010000, at USGS streamgage station 16764000, 6.6 mi northwest of Honuapo, and 6.7 mi west of Punaluu.

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 nonrecording rain gage. Elevation of gage is 2,940 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Dec. 01	15.5 estimate (a)
Dec. 01 to Dec. 31	6.0 estimate (b)
Jan. 01 to Feb. 07	12.5 estimate (b)
Feb. 07 to Apr. 15	21.5
Apr. 15 to Jun. 14	17.1
Jun. 14 to Aug. 09	18.6
Aug. 09 to Sep. 30	18.7 estimate (c)

WTR YR 1996 Total 109.9 inches

193812155554501. State Key Number 70.7 Waiaha rain gage at Luawai, near Holualoa, Hawaii.

LOCATION.--Lat 19°38′12″, long 155°55′45″, Hydrologic Unit 20010000, 20 ft downstream of recording crest gage Waiaha Stream at Luawai, near Holualoa (16759300) on right bank, 1.8 mi northeast of Holualoa School, and 4.2 mi southeast of Honokohau School.

PERIOD OF RECORD.--1960 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 nonrecording rain gage. Elevation of gage is 2,580 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Dec. 08	2.3 estimate (d)
Dec. 08 to Dec. 31	1.0 estimate (e)
Jan. 01 to Feb. 27	5.8 estimate (e)
Feb. 27 to May 15	8.6
May 15 to Jun. 22	5.7
Jun. 22 to Aug. 20	17.2
Aug. 20 to Sep. 30	10.4 estimate (f)

WTR YR 1996 Total 51.0 inches

a. Estimated value based on accumulation reading of 18.5 inches from Sept. 15 to Dec. 1, 1995.
b. Estimated value based on accumulation reading of 18.5 inches from Dec. 1, 1995 to Feb. 7, 1996.
c. Estimated value based on accumulation reading of 18.7 inches from Aug. 9 to Oct. 18, 1996.
d. Estimated value based on accumulation reading of 3.3 inches from Sept. 18 to Dec. 8, 1995.
e. Estimated value based on accumulation reading of 6.8 inches from Dec. 8, 1995 to Feb. 27, 1996.
f. Estimated value based on accumulation reading of 11.4 inches from Aug. 20 to Oct. 11, 1996.

194117155174801. State Key Number 83.0 Quarry at Saddle Road rain gage, Hawaii.

LOCATION.--Lat 19°41′17″, long 155°17′48″, 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 nonrecording rain gage. Elevation of gage is 4,140 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch. Some rain fell between September 12-30, 1995 and some fell between October 1-31, 1996.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Sept. 12 to Oct. 16	7.9
Oct. 16 to Feb. 01	14.0
Feb. 01 to Mar. 12	22.2
Mar. 12 to May 15	2.5
May 15 to July 05	2.4
July 05 to Aug. 30	2.0
Aug. 30 to Oct. 31	2.2

200517155404201. State Key Number 185.4 Upper Hamakua Ditch rain gage below Kawaiki Stream near Kamuela, Hawaii.

LOCATION.--Lat 20°05′17″, long 155°40′42″, Hydrologic Unit 20010000, 15 ft from USGS streamgage station 16720500 on right bank, and 800 ft downstream of Kawaiki Stream.

PERIOD OF RECORD.--1964 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 nonrecording rain gage. Elevation of gage is 4,020 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Dec. 05	37.6 estimate (a)
Dec. 05 to Dec. 31	6.0 estimate (b)
Jan. 01 to Feb. 13	6.9 estimate (b)
Feb. 13 to Apr. 09	44.9
Apr. 09 to Jun. 11	33.4
Jun. 11 to Aug. 06	27.4
Aug. 06 to Sep. 30	15.2 estimate (c)

WTR YR 1996 Total 171.4 inches

a. Actual reading Sep. 06 to Dec. 05 = 40.6 inches
b. Actual reading Dec. 05 to Feb. 13 = 12.9 inches
c. Actual reading Aug. 06 to Oct. 23 = 16.2 inches

RAINFALL RECORDS

HAWAII, ISLAND OF HAWAII--Continued

200148155420501. State Key Number 190.4 Keanuiomano rain gage near Kamuela, Hawaii.

LOCATION.--Lat 20°01′48″, long 155°42′05″, Hydrologic Unit 20010000, in USGS stream-gaging station 16756500 on left bank, 150 ft upstream from junction of State Highway 19 and 25, and 2.0 mi west of Kamuela.

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 nonrecording rain gage. 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 1995 TO SEPTEMBER 1996
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 13	0.0
Oct. 13 to Dec. 04	0.0
Dec. 04 to Dec. 31	0.0 estimate (a)
Jan. 01 to Feb. 15	5.4 estimate (a)
Feb. 15 to Apr. 10	7.4
Apr. 10 to Jun. 12	3.0
Jun. 12 to Aug. 08	0.2
Aug. 08 to Sep. 30	0.0

WTR YR 1996 Total 16.0 inches

a. Estimated value based on accumulation reading of 5.4 inches from Dec. 4, 1995 to Feb. 15, 1996.

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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