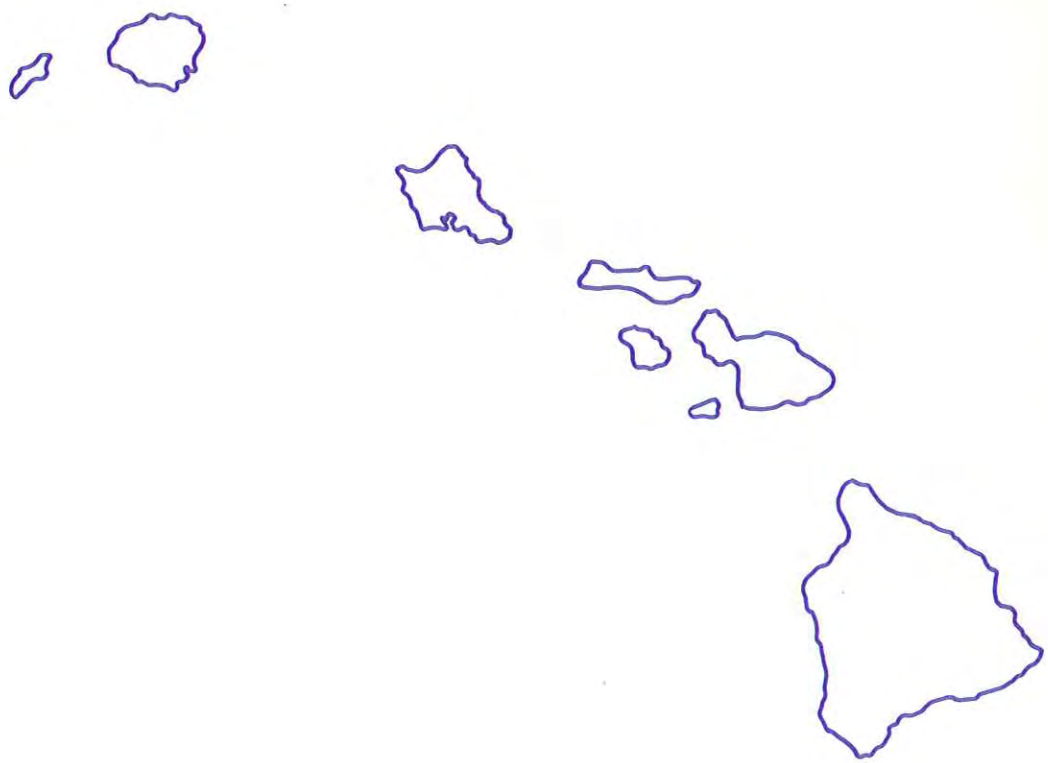
Water Resources Data Hawaii and other Pacific Areas Water Year 1991

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI–91–1
Prepared in cooperation with the State of Hawaii
Department of Land and Natural Resources,
Division of Water Resource Management
and with other agencies

CALENDAR FOR WATER YEAR 1991

1990

OCTOBER

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

NOVEMBER

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

DECEMBER

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

1991

JANUARY

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

FEBRUARY

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

MARCH

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

APRIL

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

MAY

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

JUNE

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

JULY

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

AUGUST

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

SEPTEMBER

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

Water Resources Data Hawaii and other Pacific Areas Water Year 1991

Volume 1. Hawaii

by Iwao Matsuoka, Vaughn E. Kunishige, and Marty G. Lum

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-91-1
Prepared in cooperation with the State of Hawaii
Department of Land and Natural Resources,
Division of Water Resource Management
and with other agencies

U.S DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in Hawaii
and other Pacific Areas write to
District Chief, Water Resources Division
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1992

PREFACE

This volume of the annual hydrologic data report of Hawaii and other Pacific Areas 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, and the Trust Territories. 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. Hydrologic data for Hawaii and other Pacific Areas are contained in two volumes:

Volume 1. Hawaii
Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa.

This report is the culmination of a concerted effort by dedicated 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 Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Eugene S. Capellas
Lodie P. Celebrado
Leonora L. Fukuda
James K. Kanno
Frank M. Romualdo
Roy I. Taogoshi

This report was prepared in cooperation with the State of Hawaii, the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, American Samoa, and with other agencies under the general supervision of William Meyer, District Chief, Hawaii.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-92-306	2.	3. Recipient's Accession No.

4. Title and Subtitle
Water Resources Data for Hawaii and other Pacific Areas, Water Year 1991. Volume 1, Hawaii

5. Report Date
October 92

6.

7. Author(s)
I. Matsuoka, M.G.H.S. Lum, and V. E. Kunishige

8. Performing Organization Rept. No.
USGS-WRD-HI-91-1

9. Performing Organization Name and Address
U.S. Geological Survey, Water Resources Division
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Geological Survey, Water Resources Division
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

13. Type of Report & Period Covered
Annual - Oct. 1, 1990 to Sept. 30, 1991

14.

15. Supplementary Notes
Prepared in cooperation with the State of Hawaii and with other agencies.

16. Abstract (Limit: 200 words)

Water resources data for the 1991 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams and springs; and water levels and water quality in wells. This report, volume 1, contains discharge records for 83 gaging stations; water quality for 16 gaging stations, 26 partial-record flow stations, and 128 wells; and water levels for 34 observation wells. Also included are 107 crest-stage partial record stations, and 6 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

17. Document Analysis a. Descriptors
*Hawaii, *Hygrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Chemical analyses, Sediments, Water termperatures, Sampling sites, Water levels, Water analyses.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
No restriction on distribution This report may be purchased from: National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	292
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

CONTENTS

	Page
Preface	III
List of surface-water and water-quality stations, in downstream order, for which records are published in this volume	VI
List of ground-water stations for which water-level and water-quality records are published in this volume	VIII
Introduction	1
Cooperation	1
Summary of hydrologic conditions	2
Special networks and programs	4
Downstream order and station number	4
Numbering system for wells and miscellaneous sites	4
Explanation of stage and water-discharge records	17
Collection and computation of data	17
Accuracy of field data and computed results	19
Records of discharge collected by agencies other than the Geological Survey	19
Other data available	19
Publications	19
Explanation of water-quality records	20
Collection and examination of data	20
Water analysis	20
Water temperature	20
Sediment	20
Publications	21
Explanation of ground-water level records	21
Collection of the data	21
Publications	22
Access to WATSTORE data	22
Definition of terms	23
Publications on techniques of water-resources investigations	30
Hydrologic-data station records	33
Discharge at partial-record stations and miscellaneous sites	169
Low-flow partial-record stations	169
Crest-stage partial-record stations	170
Measurements at miscellaneous sites	179
Analyses of samples collected at water-quality partial-record stations	180
Ground-water records	215
Index	279

ILLUSTRATIONS

Figure 1.	Graphs showing discharge during 1990 water year compared with median discharge for period 1951-80 for four representative gaging stations	3
2.	Map of Kauai showing locations of gaging, water-quality, and partial-record stations	5
3.	Map of Kauai showing locations of observation wells and ground-water quality sampling sites	6
4.	Map of Oahu showing locations of gaging, water-quality, and partial-record stations	7
5.	Map of Oahu showing locations of observation wells and ground-water quality sampling sites	8
6.	Map of Molokai showing locations of gaging, water-quality, and partial-record stations	9
7.	Map of Molokai showing locations of observation wells and ground-water quality sampling sites	10
8.	Map of Maui showing locations of gaging, water-quality, and partial-record stations	11
9.	Map of Maui showing locations of observation wells and ground-water quality sampling sites	12
10.	Map of Hawaii showing locations of gaging, water-quality, and partial-record stations	13
11.	Map of Hawaii showing locations of observation wells and ground-water quality sampling sites	14
12.	Sketch showing system for numbering wells and miscellaneous sites	15
13.	Sketch showing local well numbering system	15
14.	Map of Hawaii showing system for numbering local well numbers	16
15.	Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu	186

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

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

	Station Number	Page
HAWAII		
ISLAND OF KAUAI		
Kawaikoi Stream (head of Waimea River) near Waimea (d)	16010000	33
Waimea River:		
Waialae Stream at altitude 3,820 ft, near Waimea (dct)	16019000	34
Waimea River near Waimea (dcmts)	16031000	36
Makaweli River near Waimea (d)	16036000	40
Hanapepe River below Manuahi Stream, near Eleele (d)	16049000	41
Wailua River:		
South Fork Wailua River near Lihue (d)	16060000	42
North Fork Wailua River:		
North Wailua ditch below Waikoko Stream, near Lihue (d)	16061200	43
Stable storm ditch near Lihue (d)	16062000	44
East Branch of North Fork Wailua River near Lihue (d)	16068000	45
Wailua ditch near Kapaa (d)	16069000	46
North Fork Wailua River near Kapaa (d)	16071000	47
Opaekaa Stream:		
Left Branch Opaekaa Stream near Kapaa (d)	16071500	48
Kapaa Stream:		
Makaleha Stream:		
Makaleha ditch near Kealia (d)	16077000	49
Kapahi ditch near Kealia (d)	16079000	50
Anahola Stream:		
Anahola ditch above Kaneha Reservoir, near Kealia (d)	16088000	51
Lower Anahola ditch near Kealia (d)	16091000	52
Kilauea Stream:		
Halaulani Stream at altitude 400 ft, near Kilauea (d)	16097500	53
Hanalei River near Hanalei (d)	16103000	54
Wainiha River near Hanalei (d)	16108000	55
ISLAND OF OAHU		
Kaukonahua Stream (head of Kiikii Stream):		
North Fork Kaukonahua Stream above Right Branch, near Wahiawa (d)	16200000	56
South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa (d)	16208000	57
Makaha Stream near Makaha (d)	16211600	58
Waikele Stream:		
Kipapa Stream near Wahiawa (d)	16212800	59
Waikele Stream at Waipahu (dcmts)	16213000	60
Waiawa Stream near Pearl City (d)	16216000	66
Halawa Stream:		
North Halawa Stream near Aiea (dts)	16226000	67
North Halawa Stream near Honolulu (dcmts)	16226200	69
Kalihi Stream near Honolulu (dct)	16229000	76
Kalihi Stream at Kalihi (dcmts)	16229300	78
Nuuanu Stream below reservoir 2 wasteway, near Honolulu (d)	16232000	81
Waiakeakua Stream (head of Manoa Stream) at Honolulu (d)	16240500	82
Maunawili Stream:		
Makawao Stream near Kailua (d)	16254000	83
Kaneohe Stream:		
Kamooalii Stream:		
Right Branch Kamooalii Stream near Kaneohe (dcmts)	16265600	84
Luluku Stream at altitude 220 ft, near Kaneohe (dcmts)	16270900	90
Kamooalii Stream below Luluku Stream, near Kaneohe (dcmts)	16272200	97
Kapunahala Stream:		
South Fork Kapunahala Stream at Kaneohe (dcmts)	16273950	104
Haiku Stream near Heeia (dcmts)	16275000	110
Kahaluu Stream near Ahuimanu (d)	16283200	117
Waihee Stream:		
South Fork Waihee Stream near Heeia (d)	16283600	118
North Fork Waihee Stream near Heeia (d)	16283700	119
Waihee Stream near Kahaluu (d)	16284200	120
Waikane Stream at altitude 75 ft, at Waikane (d)	16294900	121
Kahana Stream at altitude 30 ft, near Kahana (d)	16296500	122
Punaluu Stream:		
Punaluu ditch near Punaluu (d)	16302000	123
Punaluu Stream near Punaluu (d)	16303000	124
Kaluanui Stream near Punaluu (d)	16304200	125
Waimea River:		
Kamananui Stream at Pupukea Military Road, near Maunawai (d)	16325000	126
Kamananui Stream at Maunawai (d)	16330000	127
Paukauila Stream:		
Opaeula Stream near Wahiawa (d)	16345000	128

	Station number	Page
HAWAII--Continued		
ISLAND OF MOLOKAI		
Halawa Stream near Halawa (dcmts)	16400000	129
Pelekunu Stream:		
Pilipililau Stream near Pelekunu (d)	16404200	132
Waikolu Stream:		
Molokai tunnel at east portal (d)	16405100	133
Molokai tunnel at west portal (d)	16405300	134
Waikolu Stream at altitude 900 ft, near Kalaupapa (d)	16405500	135
Waikolu Stream below pipeline crossing, near Kalaupapa (d)	16408000	136
Kaunakakai Gulch at Kaunakakai (d)	16414000	137
Papio Gulch at Halawa (d)	16419500	138
ISLAND OF MAUI		
Oheo Gulch at dam near Kipahulu (d)	16501200	139
Hanawi Stream near Nahiku (d)	16508000	140
West Wailuaiki Stream near Keanae (d)	16518000	141
Honopou Stream near Huelo (d)	16587000	142
Kakipi Gulch:		
Opana Gulch:		
Opana tunnel at Kailiili (d)	16599500	143
Iao Stream at Kepaniwai Park, near Wailuku (d)	16604500	144
Waihee River at dam, near Waihee (d)	16614000	145
Kahakuloa Stream near Honokohau (dcmts)	16618000	146
Honokohau Stream near Honokohau (d)	16620000	149
ISLAND OF HAWAII		
Waiakea Stream (head of Wailoa River) near Mountain View (d)	16700000	150
Olaa flume Spring near Kaumana (d)	16700900	151
Lyman Springs No. 2 near Piihonua (d)	16700950	152
Wailuku River at Piihonua (d)	16704000	153
Wailuku River at Hilo (dcmts)	16713000	154
Honolii Stream near Papaikou (dcmts)	16717000	156
Kawainui Stream (head of Wailoa Stream) near Kamuela (d)	16720000	158
Kawaiki Stream near Kamuela (d)	16720300	159
Upper Hamakua ditch below Kawaiki Stream, near Kamuela (d)	16720500	160
Upper Hamakua ditch above Alakahi Stream, near Kamuela (d)	16724800	161
Waipio Stream (continuation of Kawainui Stream):		
Alakahi Stream near Kamuela (d)	16725000	162
Upper Hamakua ditch above Waimea Reservoir diversion, near Kamuela (d)	16726000	163
Upper Hamakua ditch above Puukapu Reservoir, near Kamuela (d)	16727000	164
Kohakohau Stream near Kamuela (d)	16756000	165
Waikoloa Stream at Marine Dam, near Kamuela (d)	16758000	166
Hauani Gulch (head of Lanimaumau Stream) near Kamuela (d)	16759000	167
Hilea Gulch tributary near Honuapo (d)	16764000	168

GROUND-WATER STATIONS FOR WHICH WATER-LEVEL AND WATER-QUALITY RECORDS ARE PUBLISHED IN THIS VOLUME

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

			Page
HAWAII			
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	215
(2-0044-13)	220018159444702	(ctw)	216
(2-0044-14)	220019159444801	(w)	217
(2-0044-15)	220016159442701	(ctw)	218
(2-0120-01)	220136159205501	(ct)	268
(2-0120-02)	220134159205401	(w)	219
(2-0145-10)	220148159453501	(ct)	268
(2-0145-11)	220148159453502	(w)	219
(2-0320-01)	220354159205601	(ctw)	220
(2-0320-03)	220354159205602	(ctw)	221
(2-0345-04)	220341159453901	(ctw)	222
(2-0545-01)	220530159450401	(ct)	268
(2-0818-02)	220826159185401	(ct)	268
(2-1020-03)	221038159203801	(ctw)	223
(2-1125-01)	221141159252501	(ct)	268
(2-1125-02)	221141159252502	(ct)	268
(2-1126-01)	221150159264501	(ctw)	224
(2-1126-02)	221151159265001	(ct)	268
(2-1229-03)	221201159293401	(ct)	268
(2-1232-01)	221247159324801	(ctw)	225
(2-1333-01)	221318159335901	(ctw)	226
(2-5426-03)	215434159263301	(w)	227
(2-5427-01)	215454159274201	(ctw)	228
(2-5427-02)	215455159274201	(ct)	268
(2-5526-01)	215536159263501	(w)	229
(2-5530-02)	215528159303001	(ct)	268
(2-5530-03)	215535159302601	(ct)	268
(2-5534-03)	215522159342601	(ctw)	230
(2-5634-01)	215607159344301	(w)	231
(2-5635-01)	215635159355001	(ct)	268
(2-5840-01)	215803159401201	(w)	231
(2-5842-02)	215854159424601	(ct)	269
(2-5842-03)	215843159422901	(ctw)	232
(2-5843-01)	215857159430101	(w)	233
(2-5921-01)	215958159214301	(ctw)	234
(2-5923-01)	215901159235301	(ct)	269
(2-5923-07)	215901159235201	(ctw)	238
(2-5939-01)	215906159395601	(ctw)	239
(2-5943-01)	215937159434201	(ctw)	240
ISLAND OF OAHU			
(3-1646-01)	211646157465201	(ct)	270
(3-1851-19A)	211832157515501	(ct)	270
(3-1851-19B)	211832157515502	(ct)	270
(3-1959-05)	211907157594701	(w)	241
(3-2101-03)	212154158015201	(w)	241
(3-2103-03)	212133158035501	(ct)	270
(3-2153-02)	212106157533701	(ct)	270
(3-2153-05)	212123157535501	(w)	242
(3-2255-35)	212259157554201	(ct)	270
(3-2256-10)	212238157561101	(w)	242
(3-2256-12)	212238157561102	(ct)	270
(3-2300-11)	212343158001001	(ct)	270
(3-2300-18)	212340158001901	(ctw)	243
(3-2301-09,10)	212358158010901	(ct)	270
(3-2358-22)	212342157584301	(ct)	270
(3-2358-29)	212343157584701	(ct)	270
(3-2359-05)	212336157591801	(ct)	270
(3-2448-01)	212422157485601	(ct)	270
(3-2550-01)	212556157500301	(ct)	270
(3-2558-10)	212506157582301	(ct)	270
(3-2600-04)	212659158004102	(w)	243
(3-2603-01)	212617158033801	(ct)	270
(3-2800-01)	212803158000701	(ct)	271
(3-2809-06)	212828158092001	(ct)	271
(3-2812-01)	212859158124301	(ct)	271
(3-2901-07)	212927158014801	(ctw)	244
(3-2901-09)	212945158014301	(ct)	271
(3-2911-02)	212939158112301	(ct)	271
(3-3213-06)	213224158135901	(ct)	271
(3-3251-01)	213243157510001	(ct)	271

Page

HAWAII--Continued
ISLAND OF OAHU--Continued
(3-3352-01) 213327157524401 (ct) 245
(3-3405-02) 213427158055501 (ct) 271
(3-3407-25) 213411158074501 (ct) 271
(3-3407-30) 213444158075501 (ct) 271
(3-3410-08) 213446158104901 (ctw) 246
(3-3506-03,04) 213512158061601 (ct) 271
(3-3605-03) 213636158053701 (ct) 271
(3-3605-21) 213636158053702 (ct) 271
(3-3655-01) 213656157550401 (ct) 271
(3-3956-04) 213902157561601 (ct) 271
(3-4100-01) 214157158000101 (ct) 271
(3-4101-03) 214125158013401 (w) 246
(3-4258-04) 214233157583501 (ct) 271
ISLAND OF MOLOKAI
(4-0448-02) 210425156483001 (w) 247
(4-0449-01) 210402156495801 (ctw) 248
(4-0457-01) 210419156570501 (ctw) 249
(4-0601-01) 210605157012001 (ctw) 250
(4-0700-01) 210711157000501 (w) 251
(4-0801-01) 210856157011201 (c) 272
(4-0801-02) 210857156010701 (c) 272
(4-0901-01) 210903157013001 (c) 272
ISLAND OF MAUI
(6-3806-01) 203835156065001 (ct) 273
(6-3904-01) 203908156041201 (w) 252
(6-3925-01) 203912156255901 (w) 252
(6-3926-03) 203947156261201 (ct) 273
(6-4600-01) 204601156001501 (c) 273
(6-4600-03) 204633156003201 (ct) 273
(6-4627-14) 204635156270101 (ct) 273
(6-4824-01) 204827156242201 (w) 253
(6-4831-01) 204818156310301 (w) 253
(6-4928-02) 204909156281401 (w) 254
(6-4937-01) 204931156371201 (ct) 273
(6-5021-01) 205014156212701 (ct) 273
(6-5130-01) 205140156304501 (w) 254
(6-5130-02) 205154156303801 (w) 255
(6-5224-02) 205243156243201 (ct) 273
(6-5330-09) 205329156305502 (ct) 273
(6-5330-10) 205329156305501 (ct) 273
(6-5330-11) 205330156305401 (ct) 273
(6-5332-05) 205312156321401 (ct) 273
(6-5339-01) 205322156394501 (ct) 273
(6-5340-01) 205343156401101 (ct) 273
(6-5419-01) 205412156193801 (w) 255
(6-5430-03) 205419156304401 (w) 256
(6-5430-05) 205405156305401 (ctw) 257
(6-5431-01) 205437156310501 (w) 258
(6-5631-01) 205617156311101 (w) 258
(6-5631-02) 205651156313201 (w) 259
(6-5640-01) 205651156401001 (ct) 273
(6-5838-01) 205837156384601 (ct) 274
(6-5838-02) 205838156383101 (ct) 274
(6-5838-04) 205848156383601 (ct) 274
(6-5840-01) 205856156400101 (w) 259
ISLAND OF HAWAII
(8-0632-01) 190602155325901 (w) 260
(8-0831-02) 190832155310901 (ct) 275
(8-1128-02) 191108155281701 (ct) 275
(8-1129-01) 191114155294801 (ct) 275
(8-2653-01) 192646155532001 (ct) 275
(8-2753-01) 192738155534201 (ct) 275
(8-2753-02) 192731155534101 (ct) 275
(8-2783-01) 192728154530101 (ctw) 261
(8-2986-01) 192924154564701 (ct) 275
(8-2986-02) 192923154564701 (ct) 275
(8-3080-02) 193017154502101 (ctw) 262
(8-3185-01) 193113154555801 (ct) 275
(8-3389-01) 193339154594801 (w) 263
(8-3557-01) 193510155570801 (ct) 275

			Page
HAWAII--Continued			
ISLAND OF HAWAII--Continued			
(8-3557-02)	193505155570801	(ct)	275
(8-3557-03)	193508155570701	(ct)	275
(8-3557-04)	193505155570701	(ct)	275
(8-3557-05)	193502155572301	(ct)	275
(8-3802-03)	193805155020201	(ct)	275
(8-4003-01)	194037155035301	(ct)	276
(8-4203-04)	194222155035101	(w)	263
(8-4203-06)	194222155034801	(ct)	276
(8-4304-01)	194337155041801	(ct)	276
(8-4858-02)	194818155582301	(ct)	276
(8-5005-01)	195035155054501	(ct)	276
(8-5005-02)	195043155053801	(ct)	276
(8-5005-05)	195051155051501	(ct)	276
(8-5546-01)	195546155462001	(ct)	276
(8-5548-01)	195546155480301	(ct)	276
(8-5745-01)	195724155455301	(ct)	276
(8-5745-02)	195722155455201	(ct)	276
(8-5745-03)	195728155455401	(ct)	276
(8-5946-01)	195929155462501	(ct)	276
(8-5946-02)	195912155464201	(ct)	276
(8-5946-03)	195939155464201	(ct)	276
(8-5948-01)	195947155485801	(ctw)	264
(8-6147-01)	200132155471001	(w)	266
(8-6148-02)	200121155480801	(ct)	277
(8-7652-01)	201603155521801	(ctw)	267
Keawewai Spring	200850155383601	(ct)	278

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1991

Volume 1

INTRODUCTION

Water resources data for the 1991 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams, ditches, and springs; and water-levels and water quality of wells. This report, Volume 1, contains discharge records for 83 gaging stations; water quality for 16 gaging stations, 26 partial-record flow stations, and 128 wells; and water levels for 34 observation wells. Also included are 107 crest-stage partial-record stations, and 6 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge (or stage) of streams, and contents (or stage) of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." Through water year 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202.

Beginning with the 1961 water year (fiscal year for Hawaii) and continuing through water year 1974, streamflow data have been released by the Geological Survey in annual reports on a state-boundary bases. Water-quality records beginning with the 1964 water year, and ground-water data since the 1971 water year have been similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a state-boundary basis. These official Survey reports carry 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-90-1." For archiving and general distribution, the reports for water years 1971-74 are also indentified 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. Beginning with the 1990 water year, all water-data reports are available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

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) 541-2655. A limited number of CD-ROM discs will be available for sale by the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

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 Survey are:

Hawaii Department of Land and Natural Resources, Division of Water Resource Management, Rae Loui, Deputy for Water Resources Management.
Hawaii Department of Transportation, Rex Johnson, Director.
City and County of Honolulu, Board of Water Supply, Kazu Hayashida, Manager and Chief Engineer.
City and County of Honolulu, Department of Public Works, Michael Street, Director and Chief Engineer.

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

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 B. P. Bishop Estate.

SUMMARY OF HYDROLOGIC CONDITIONS

Runoff during the 1991 year was excessive (upper 25 percent of record) at the index stations on the islands of Kauai, Oahu, and Maui. The monthly mean flow for all index stations was normal for the months of April and July, and excessive for the months of November, March, and August. The data for the index station (Waiakea Stream near Mountain View, Hawaii) on the island of Hawaii is being reviewed and was not included in the summary.

The annual mean discharge at East Branch of North Fork Wailua River near Lihue, Kauai was 131 percent of the 1951-80 annual median, 143 percent at Kalihi Stream near Honolulu, Oahu, and 198 percent at Honopou Stream near Huelo, Maui.

Monthly and yearly mean discharges of the three index stations are compared with their medians in figure 1.

Dissolved-solids concentrations at the five NASQAN (National Stream Quality Accounting Network) stations showed no significant change during the 1991 water year from the previous year. Samples collected every other month showed dissolved-solids concentrations ranged from 11 to 269 mg/L (milligrams per liter) during 1991. Waikele Stream at Waipahu, Oahu, had the highest concentration values and Halawa Stream at Halawa, Molokai, had the lowest concentration values. Records for stations on the island of Hawaii are being reviewed for later publication.

Average dissolved-oxygen concentrations ranged from 80 to 104 percent saturation. Waimea River at Waimea, Kauai, was lowest at 80 percent and Kalihi Stream at Kalihi, Oahu was highest at 104 percent.

Concentrations of trace metals in the samples were less than the maximum contaminant levels established by EPA (Environmental Protection Agency). Fecal coliform densities decreased at two of the NASQAN stations in Hawaii and increased at the other three. Fecal coliform density for Kalihi Stream at Kalihi, Oahu, was almost three times greater in the six samples collected in 1991 than in samples from the previous year. The geometric-mean values were:

NASQAN Station	Fecal Coliform (colonies per 100 milliliters) 1990	1991
Waimea River at Waimea, Kauai	480	450
Waikele Stream at Waipahu, Oahu	5,500	8,200
Kalihi Stream at Kalihi, Oahu	3,400	10,000
Halawa Stream near Halawa, Molokai	380	500
Kahakuloa Stream at Kahakuloa, Maui	69	17

Analyses of water samples taken at more than 135 basal water-table wells generally did not show significant changes in chloride concentration.

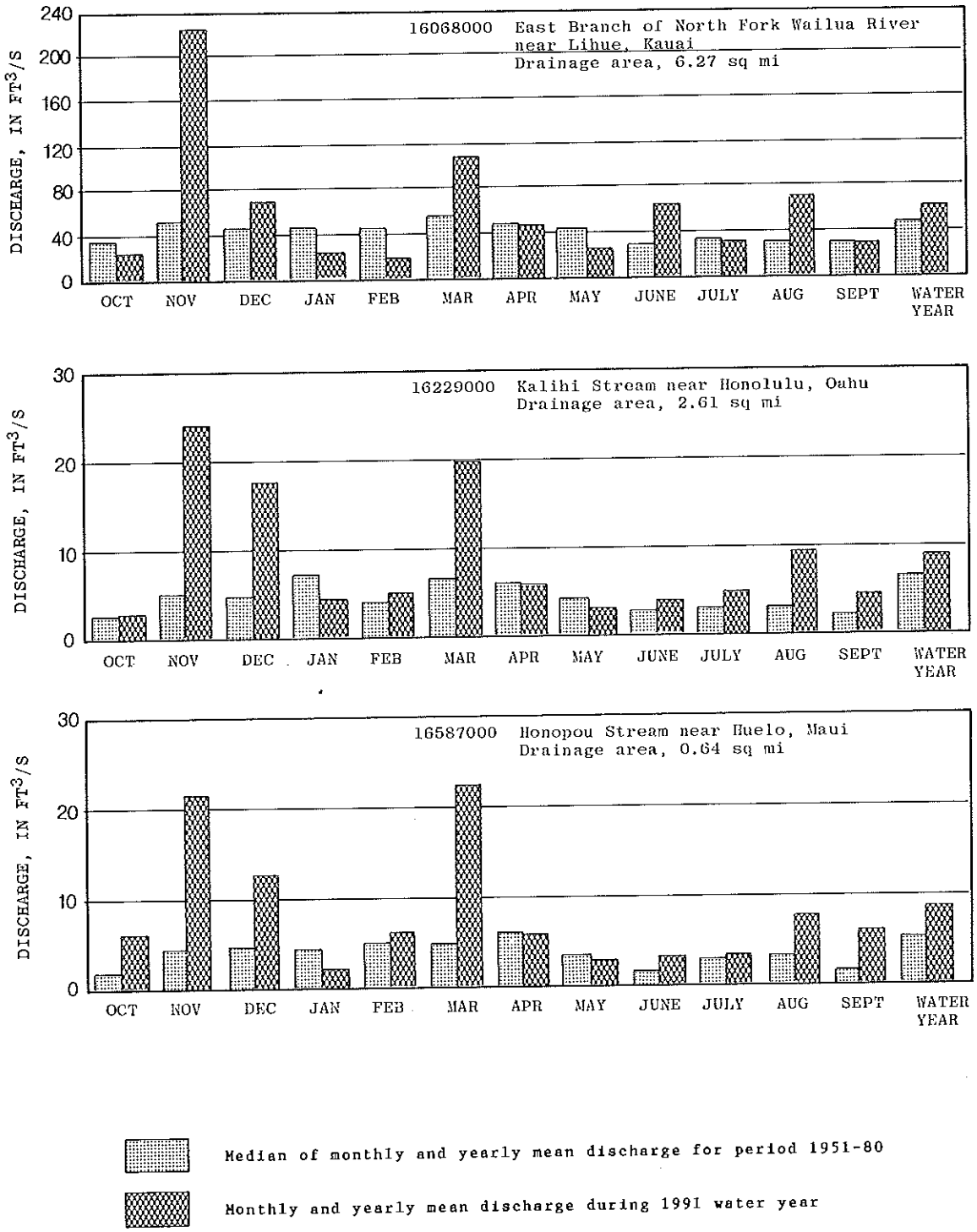


Figure 1.--Discharge during 1991 water year compared with median discharge for period 1951-80 for three representative gaging stations.

SPECIAL NETWORKS AND PROGRAMS

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

National stream-quality accounting network is an accounting network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on the river-basin accounting units designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in stream quality.

DOWNSTREAM ORDER AND STATION NUMBER

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

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station inidcated downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the 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 sstation, such as 16200000 which appears just to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "200000." In this report, the records are listed in downstream order by islands. Locations of the stations are shown in figures 2, 4, 6, 8, and 10.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

Miscellaneous downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits is a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and a miscellaneous site are the same, assign sequential numbers "01," "02," etc. as one would for wells. See figure 12.

Beginning in 1971, the local well-numbering system for Hawaii was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00" of latitude, and 60 was added to the minutes of latitude in areas more than 20°00" of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00" of longitude, and 60 was added to the minutes of longitudes more than 156°00" longitude. See figures 13 and 14.

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 dug within the grid as 01 and increase chronologically, with few exceptions, to the latest dug.

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.

Well locations on the islands of Kauai, Oahu, Molokai, Maui, and Hawaii are shown in figures 3, 5, 7, 9, and 11.

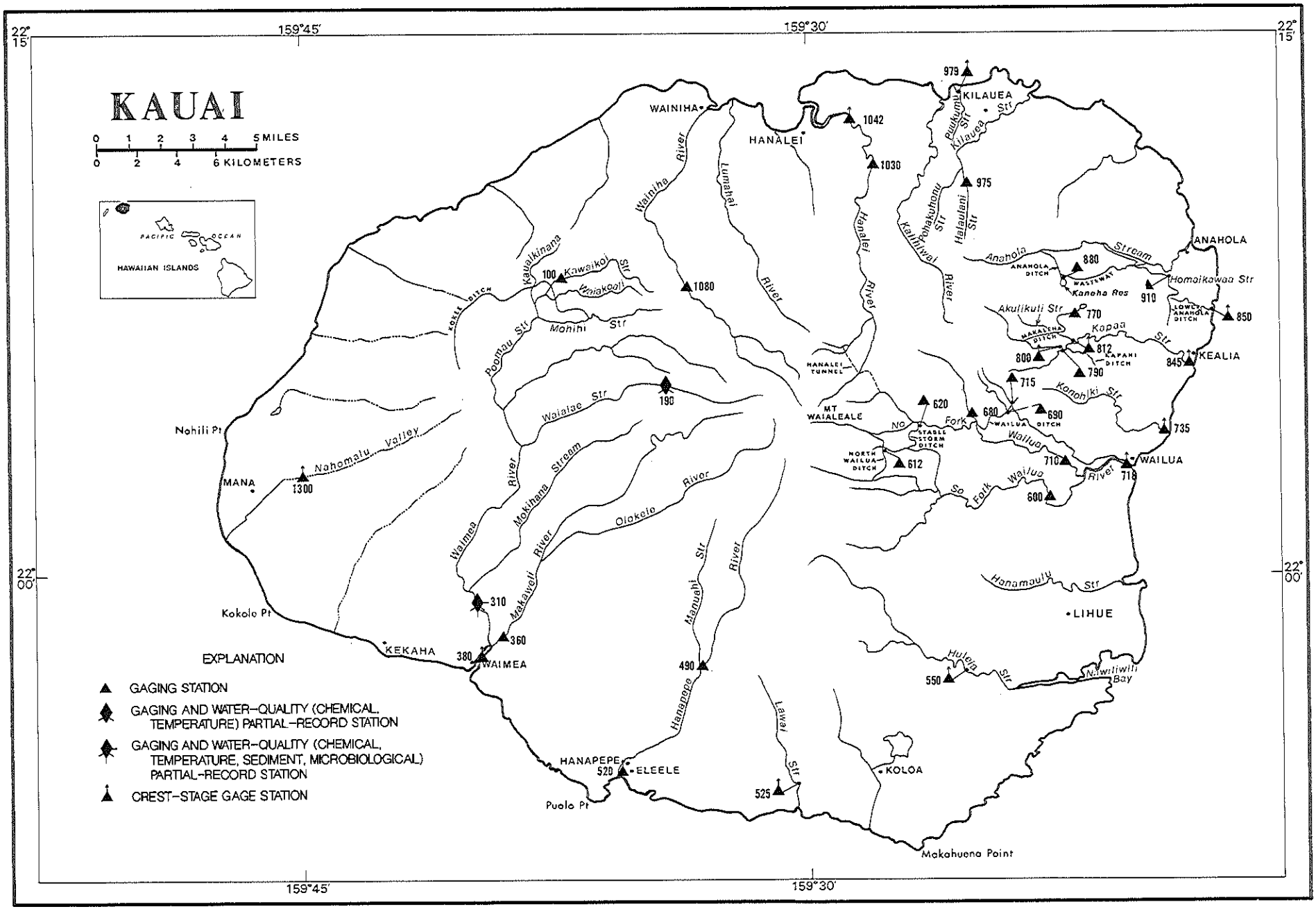


Figure 2.--Locations of gaging, water-quality, and partial-record stations on Kauai.

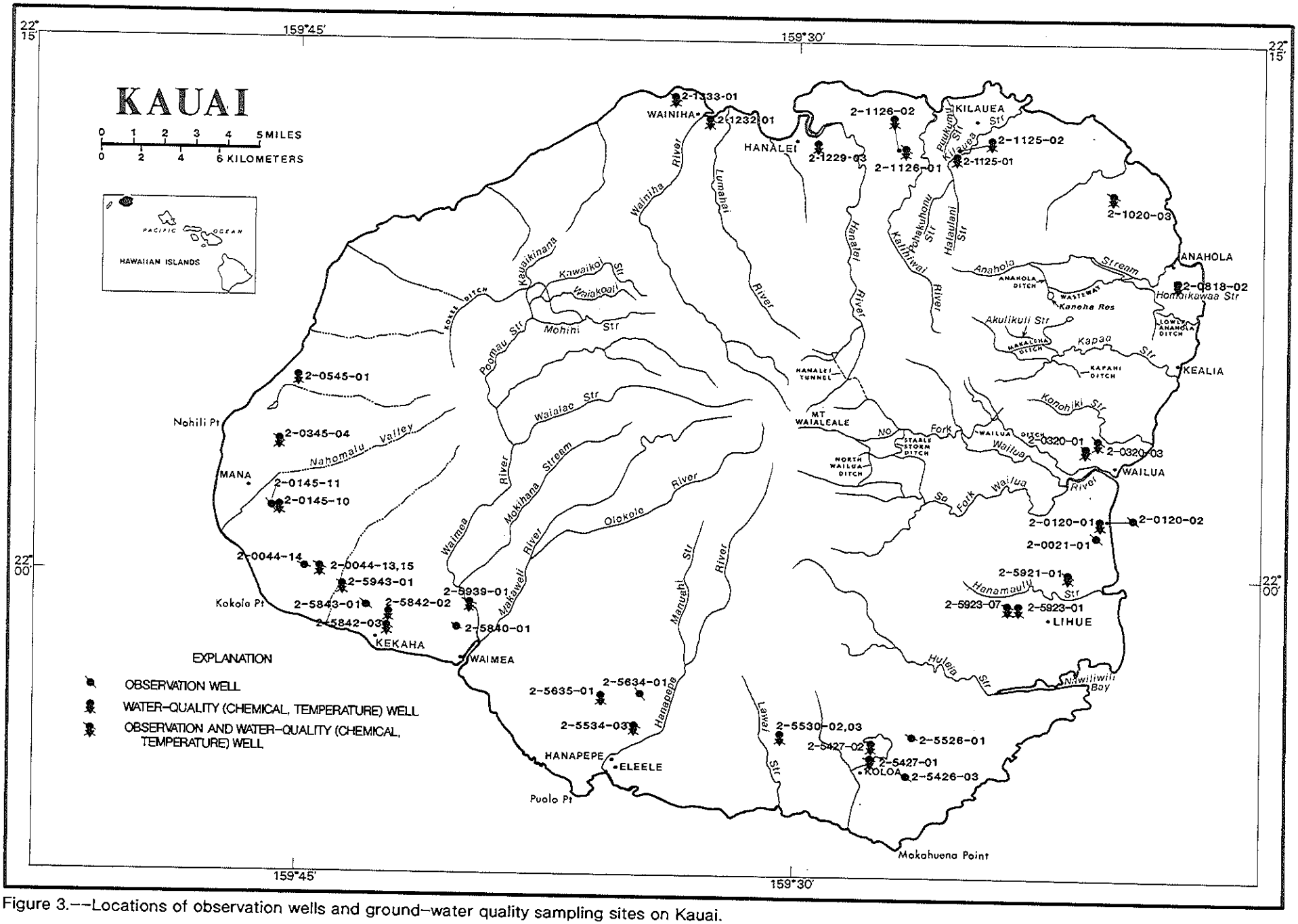


Figure 3.--Locations of observation wells and ground-water quality sampling sites on Kauai.

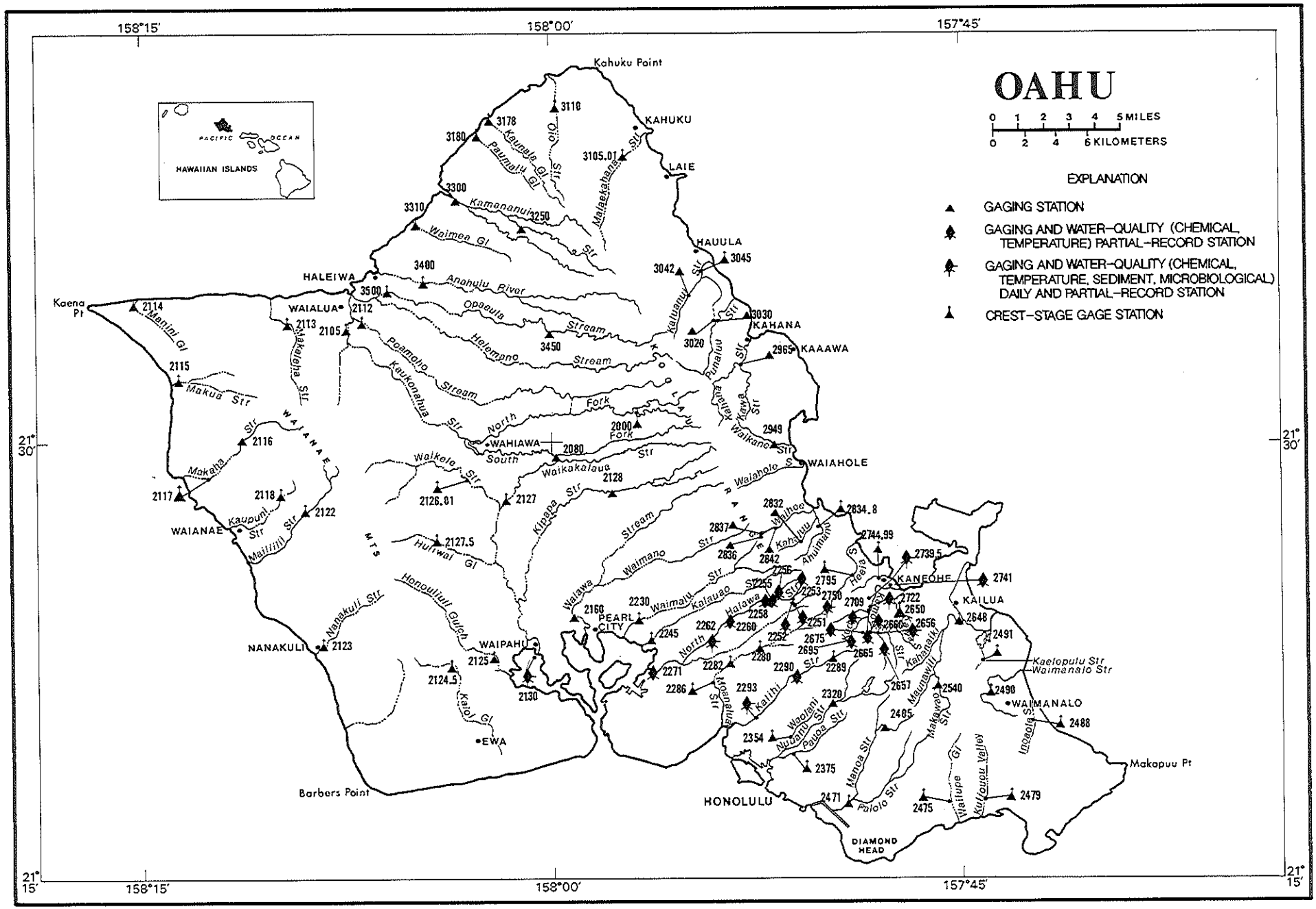


Figure 4.--Locations of gaging, water-quality, and partial-record stations on Oahu.

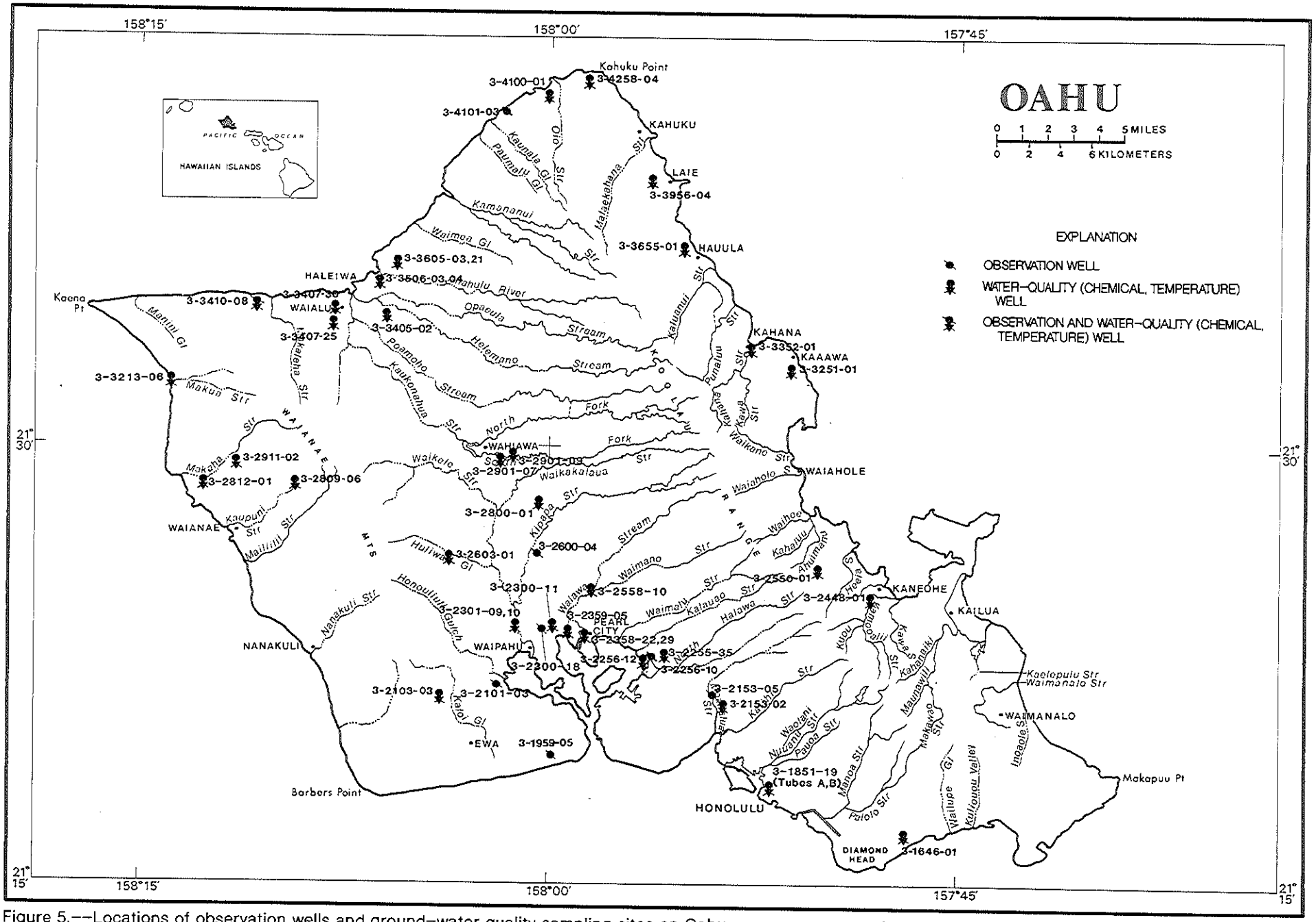


Figure 5.--Locations of observation wells and ground-water quality sampling sites on Oahu.

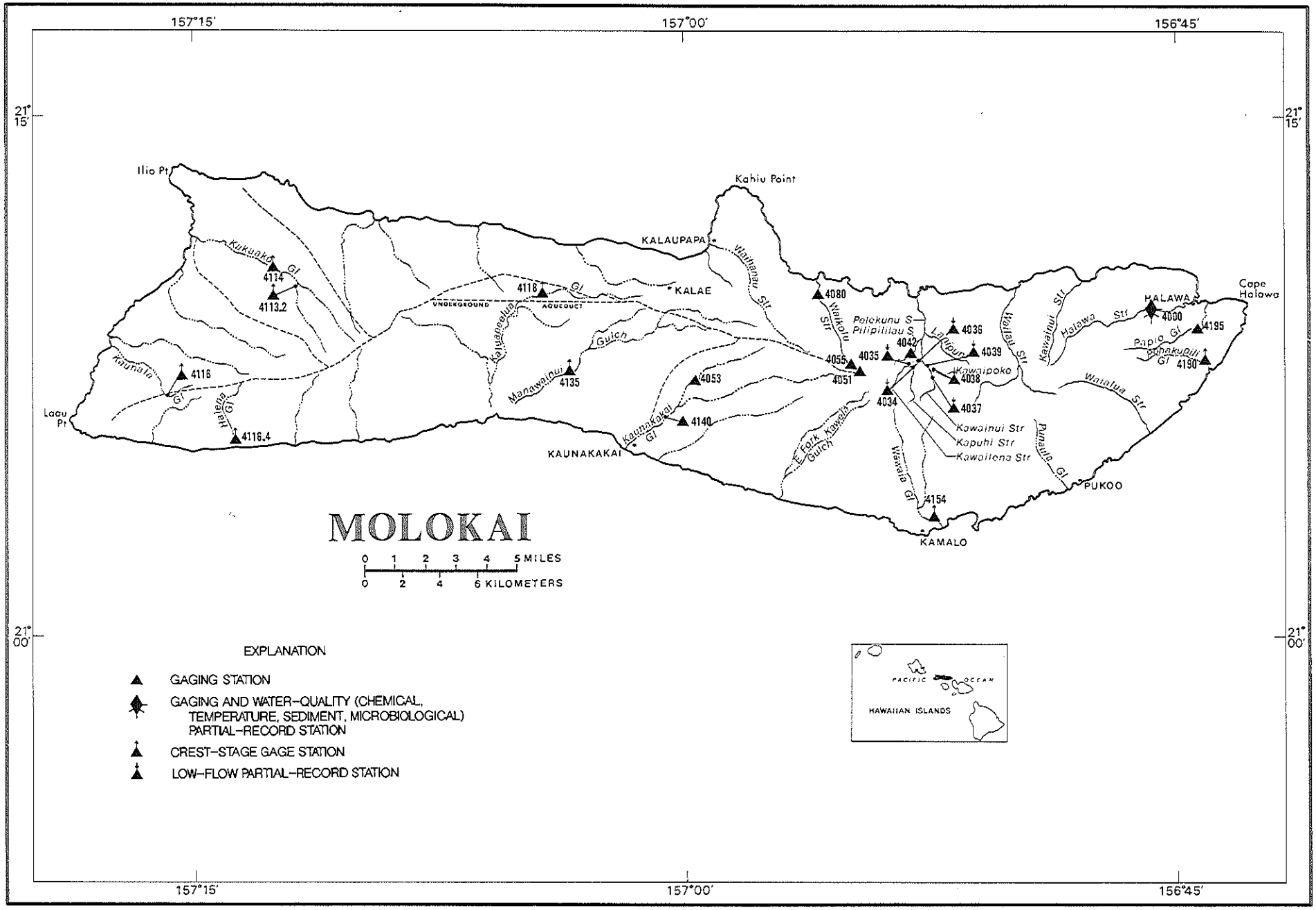


Figure 6.--Locations of gaging, water-quality, and partial-record stations on Molokai.

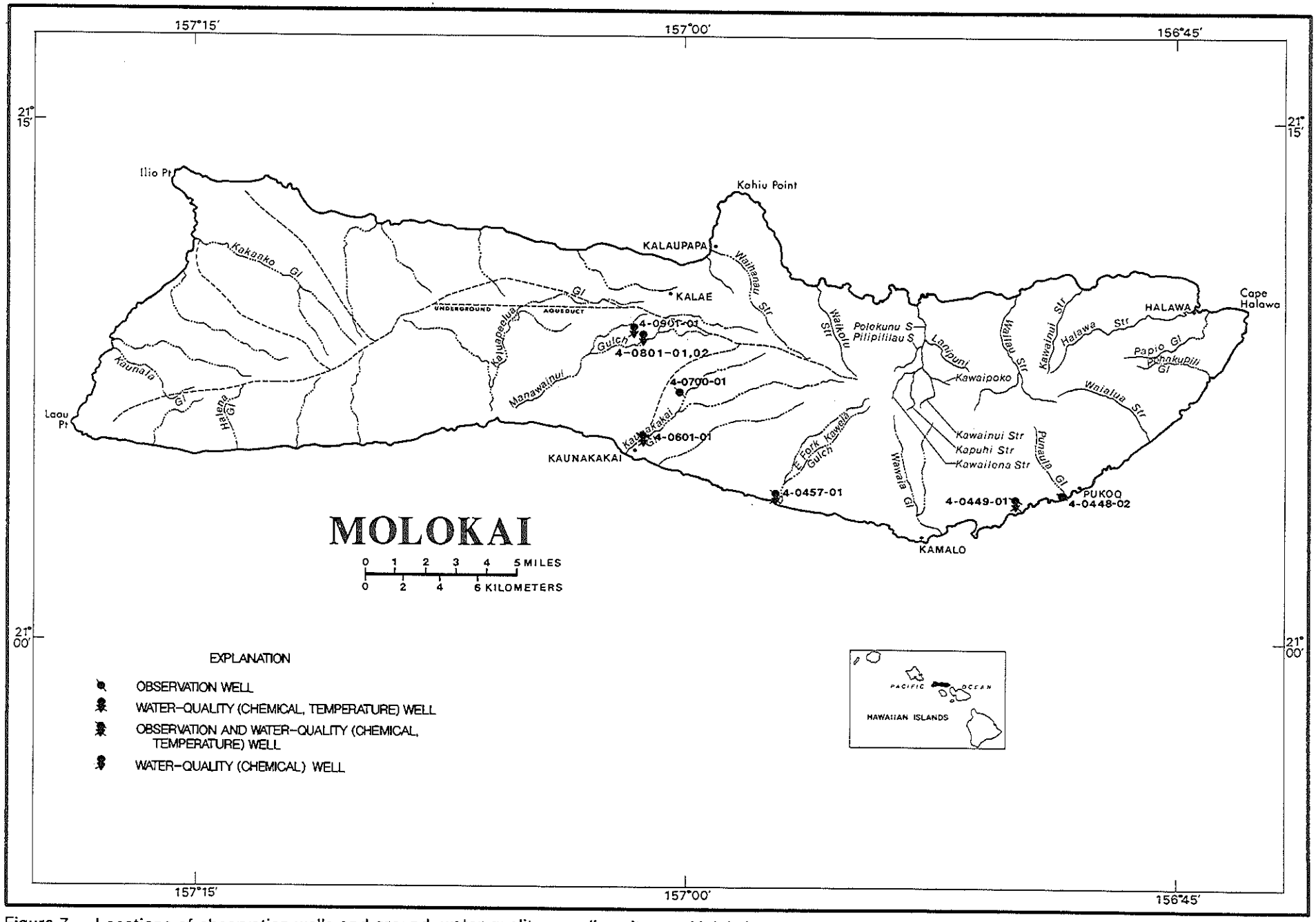


Figure 7.--Locations of observation wells and ground-water quality sampling sites on Molokai.

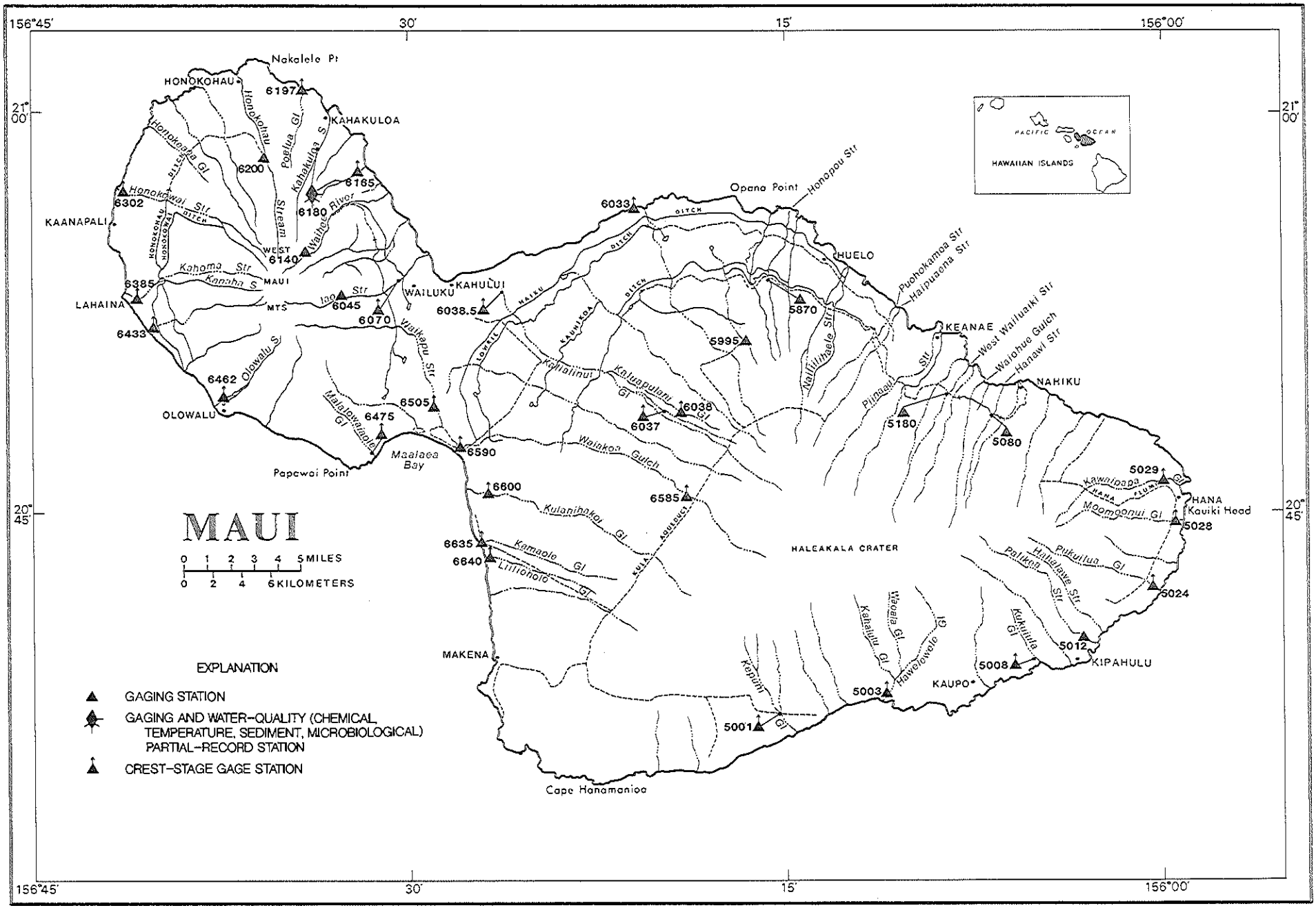


Figure 8.--Locations of gaging, water-quality, and partial-record stations on Maui.

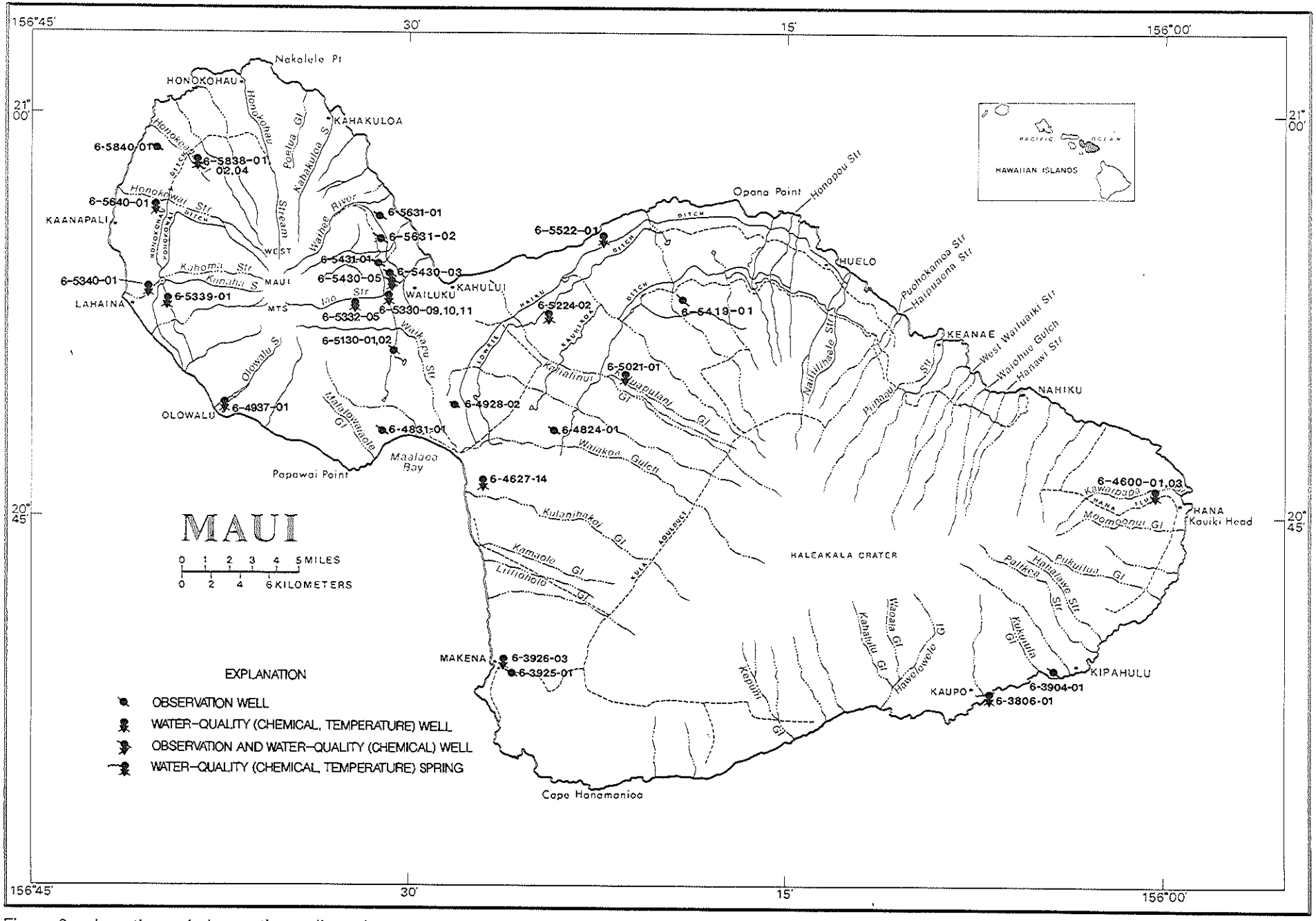


Figure 9.--Locations of observation wells and ground-water quality sampling sites on Maui.

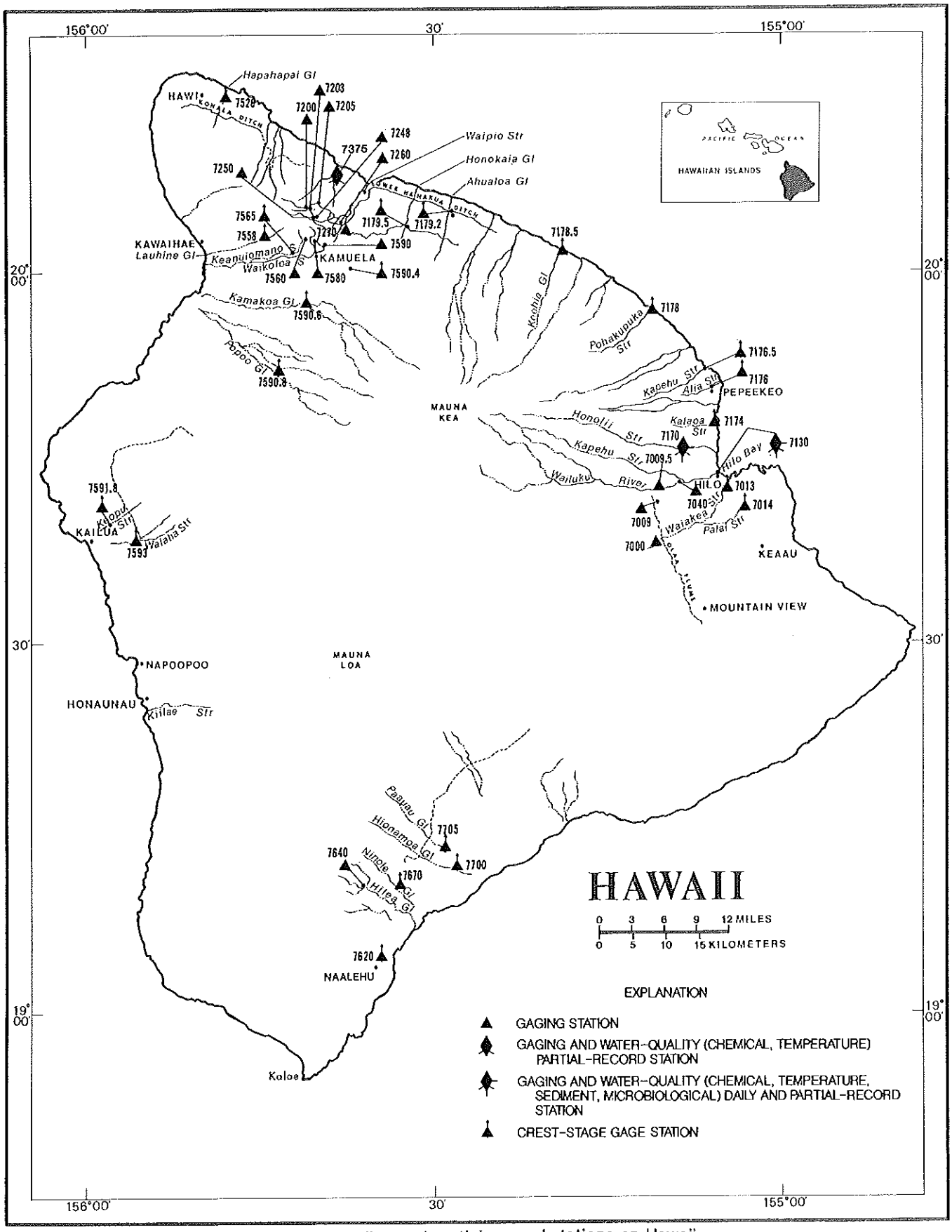


Figure 10.--Locations of gaging, water-quality, and partial-record stations on Hawaii.

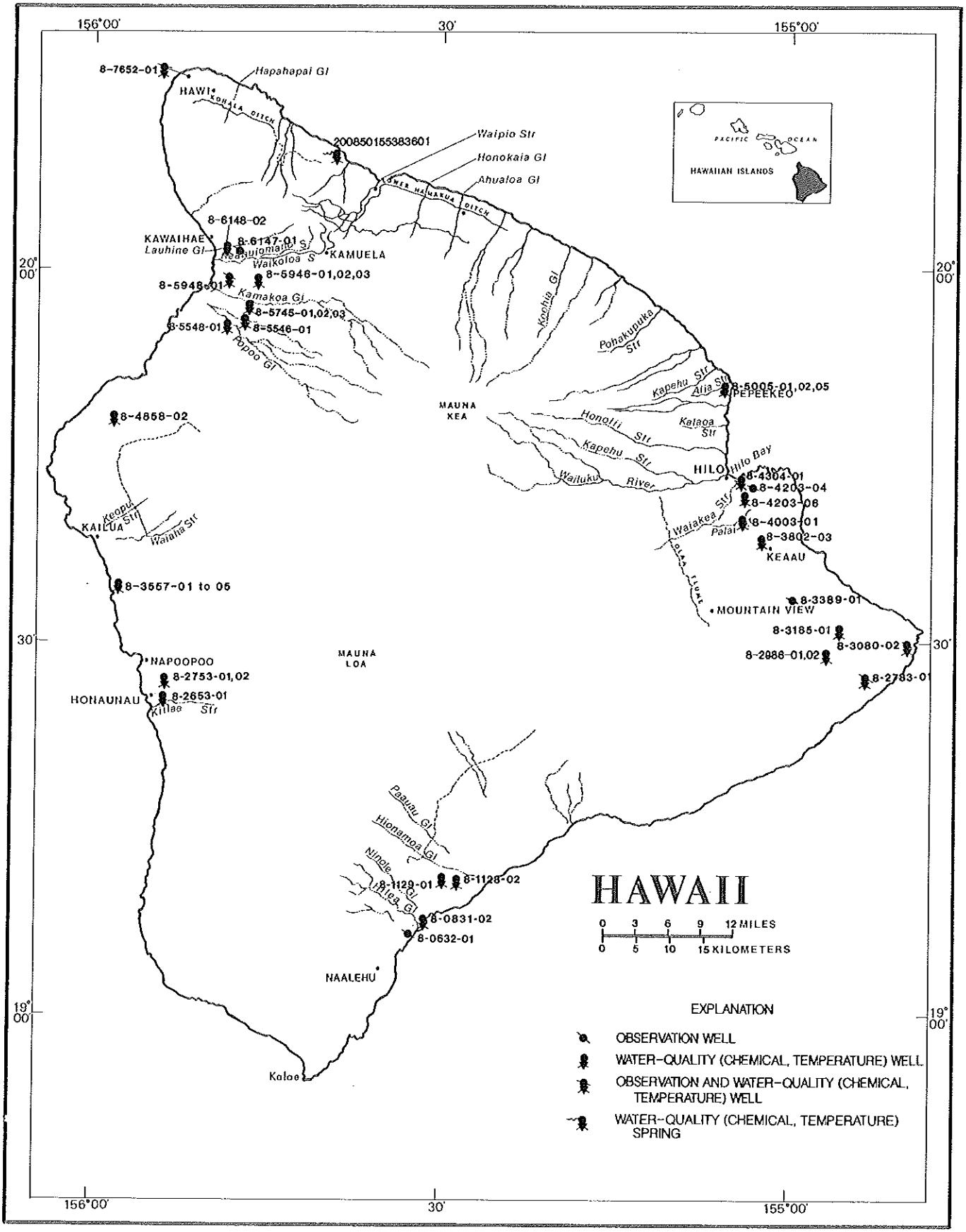


Figure 11.--Locations of observation wells and ground-water quality sampling sites on Hawaii.

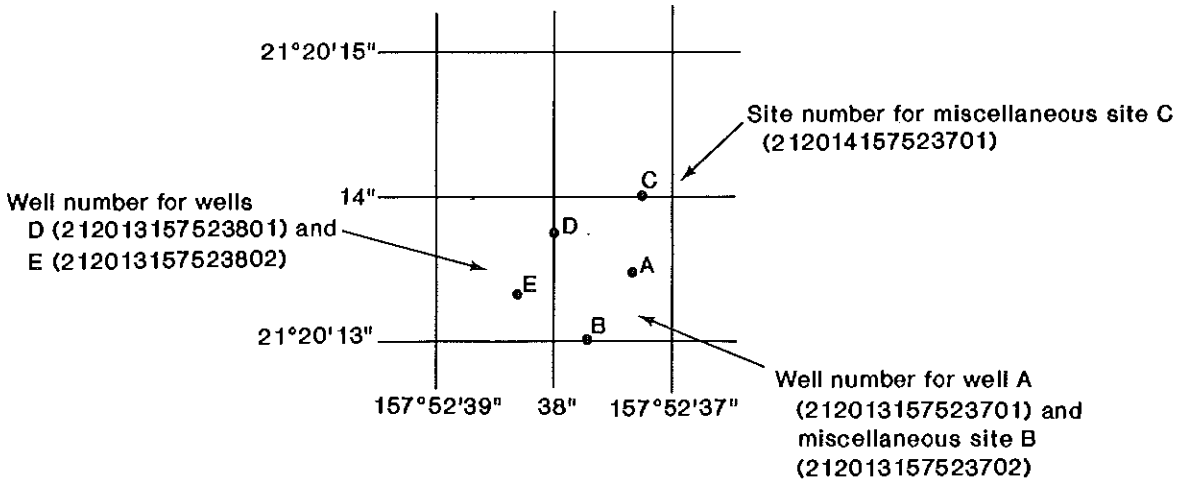


Figure 12.--Sketch showing system for numbering wells and miscellaneous sites.

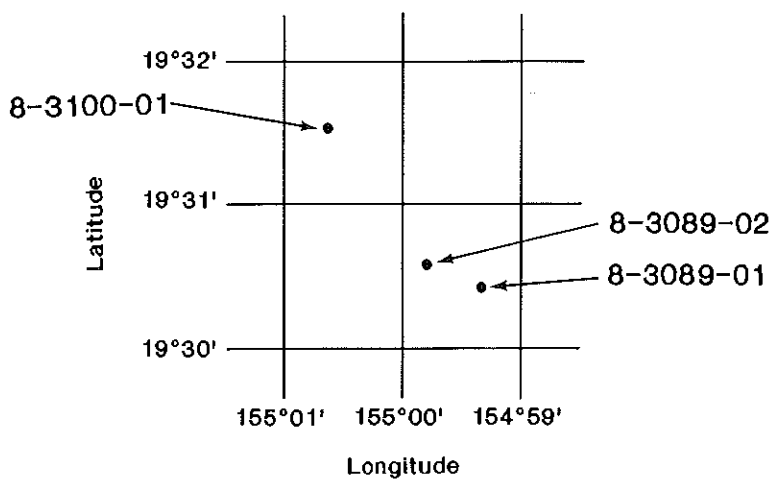


Figure 13.--Sketch showing local well numbering system.

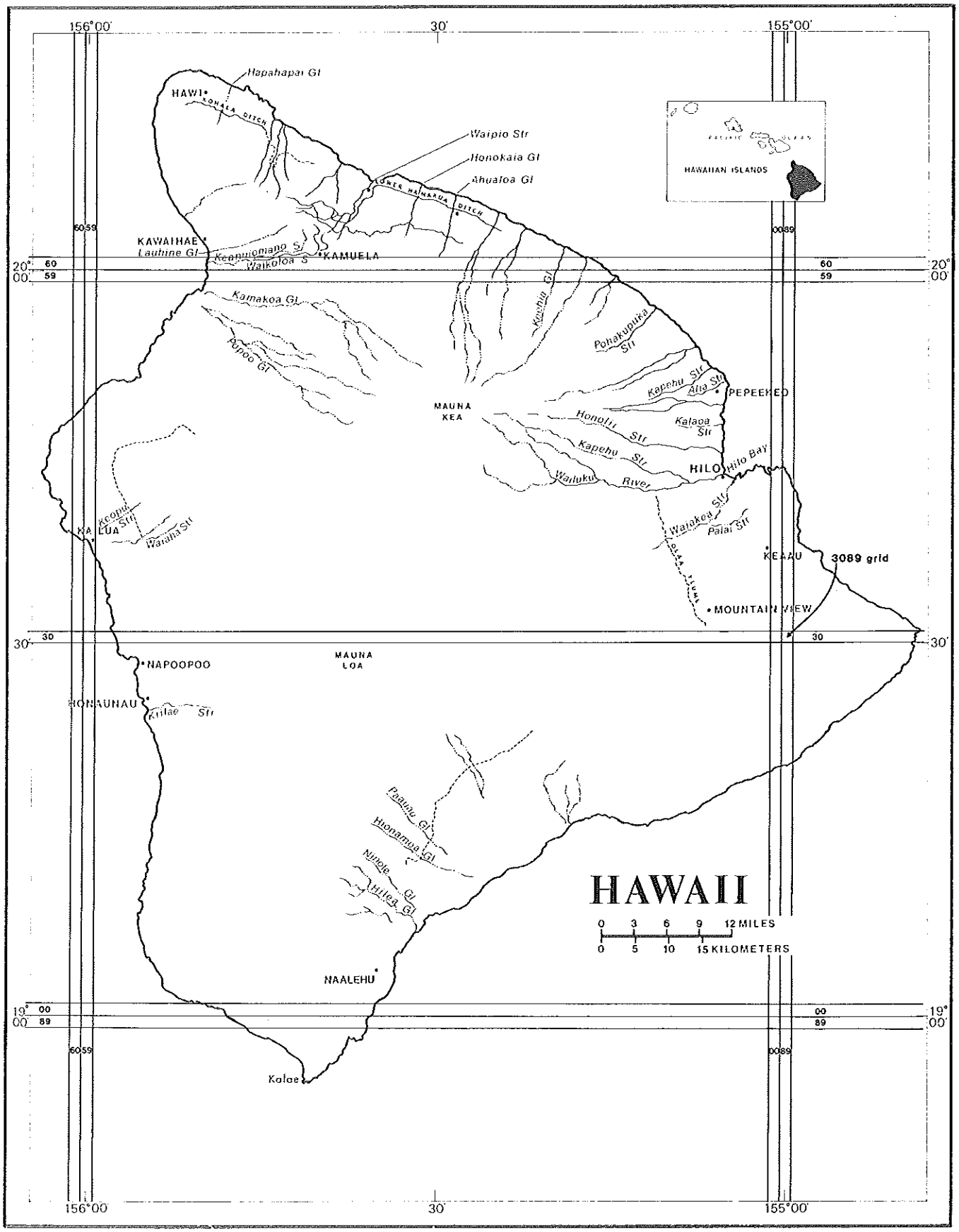


Figure 14.--Map of Hawaii showing system for numbering local well numbers.

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

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

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.

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

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging station on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging station gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharge were revised. If the drainage area has been revised, the report in which the revised figures was first published is given.

The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE", it is not given for stations having fewer than 5 complete years of record or for station where changes to water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (lino headed "IN"), or in acre-feet (line headed "AC-FT"). In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharge are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected.

For most gaging station on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published for all reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

Accuracy of field data and computed results

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

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

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, 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 of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Records of discharge collected by agencies other than the Geological Survey

The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of water-data sites not published by the Geological Survey. Information on records available at specific sites can be obtained upon request.

Other data available

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

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

Publications

In each water-supply paper entitled, "Surface Water Supply of the United States" there is a list of numbers of preceding water-supply papers containing streamflow information for the area covered by that report. In addition, there is a list of numbers of water-supply papers containing detailed information on major floods in the area. Records for stations in Hawaii and other Pacific areas for the period October 1959 to September 1965, are in Water-Supply Paper 1937.

Two series of summary reports entitled, "Compilation of Records of Surface Waters of the United States" have been published; the first series covers the entire period of record through September 1950 (June 1950, for Hawaii), and the second series covers the period October 1950 to September 1960 (July 1950 to June 1960, for Hawaii and other Pacific areas). These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some record not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station. Records for stations in Hawaii and other Pacific areas are compiled in Water-Supply Paper 1319 through June 1950, in 1739 and 1751 for July 1950 to June 1960, in 1937 for October 1959 to September 1965, and 2137 for October 1966 to September 1970.

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

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

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

The descriptive heading for water-quality records gives periods of record for the various types of water-quality data (chemical, specific conductance, biological determination, water temperatures, sediment discharge), period of record, and extremes of pertinent data, and general remarks.

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

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water-Resources Investigations listed on a following page.

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.

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.

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 district office.

Historical and current (1991) dissolved trace-element concentrations are reported herein for water that was collected, processed, and analyzed by using either ultraclean or other than ultraclean techniques. If ultraclean techniques were used, then those concentrations are reported in nanograms per liter (ng/L). If other than ultraclean techniques were used, then those concentrations are reported in micrograms per liter (µg/L) and could reflect contamination introduced during some phase of the procedure

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. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published.

Sediment

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

During periods of rapidly changing flow or rapidly changing 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 time 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 loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. 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 the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

Publications

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

Water year	WSP No.	Water year	WSP No.	Water year	WSP No.
1964	1966	1967	2016	1970	2160
1965	1966	1968	2016		
1966	1996	1969	2150		

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic network of observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitiude and (2) a local number that is provided for local needs. See figure 13.

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

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 for every fifth day and the end of each month (eom). To show the intraday variation in the ground-water levels caused by local pumping and tidal fluctuations, instantaneous maximum and minimum water levels are given with the mean water levels for the day.

Water levels are reportd 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.

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nation was issued (Water-Supply Papers 777, 817, 840, 845, and 886). From 1940 through 1974, separate Water-Supply Papers were issued for 6 sections of the United States. Water-level data for Hawaii are in the Water-Supply Papers listed below each report containing one or more calendar years (January-December) of data. Data in this report are for the 12-month water year ending September 30.

Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.
1935	777	1942	949	1949	1161	1956-60	1770
1936	817	1943	991	1950	1170	1961-65	1855
1937	840	1944	1021	1951	1196	1966-70	2010
1938	845	1945	1028	1952	1226	1971-74	2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

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 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 temerature.

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 requestor 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 22092

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 and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. 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). A limited number of CD-ROM discs will be available for sale by the Books and Open-file Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

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 withing 24 hours when incubated at 35°C ± 0.5°C on M-Endoagar (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 milliliter 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 bacterial 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 milliliters of 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, 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, (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 (G.H.) 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 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 sorbed per unit mass (gram) of sediment.

Microgram per liter ($\mu G/L$, $\mu g/L$) 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.

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} radio-active 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.

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).

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 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 sum of the suspended-sediment discharge and the bedload discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

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

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

Specific conductance is a measure of the ability of a water to conduct an electrical current. 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 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.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration 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 insolution after the part of a respresentative 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 comparibility 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 day.

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 dissolved 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 diggerent 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 Nephelometric turbidity units (NTU).

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, Books and Open-File Reports Section, Federal Center, Box 25425, 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."

1-D1. *Water temperature--influential factors, field measurement, and data presentation,* by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

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

2-E1. *Application of borehole geophysics to water-resources investigations,* by W. S. Keys and L. M. McCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

2-E2. *Borehole geophysics applied to ground-water investigations,* by W. Scott Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells,* by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

3-A1. *General field and office procedures for indirect discharge measurements,* by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

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.

3-A4. *Measurement of peak discharge at width contractions by idirect methods,* by H. F. Matthai: USGS-TWRI Book 3, Chapter A4. 1967. 44 pages.

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

3-A6. *General procedure for gaging streams,* by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. *Stage measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3. Chapter A7. 1968. 28 pages.

3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel in streams by dye tracing,* by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

3-A10. *Discharge ratings at gaging stations,* by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. *Measurement of discharge by moving-boat method,* by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A12. *Fluorometric procedures for dye tracing,* by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.

3-A13. *Computation of continuous records of streamflow,* by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge,* by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels,* by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. *Measurement of discharge using tracers,* by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. *Acoustic velocity meter systems,* by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-A18. *Determination of stream reaeration coefficients by use of tracers,* by F. A. Kilpatrick, R. E. Rathburn, N. Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. *Levels of streamflow gaging stations,* by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 pages.

3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

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

3-B3. *Type curves for selected problems of flow to wells in confined aquifers,* by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B4. *Regression modeling of ground-water flow,* by Richard L. Cooley and Richard L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

3-B5. *Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction,* by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. *The principle of superposition and its application in ground-water hydraulics,* by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-C1. *Fluvial sediment concepts,* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. *Field methods for measurement of fluvial sediment,* by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge,* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. *Some statistical tools in hydrology,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. *Low-flow investigations,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply,* by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. *Computation of rate and volume of stream depletion by wells,* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments,* by M. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy,* by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. *Methods for the determination of organic substances in water and fluvial sediments,* edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples,* by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments,* by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments,* by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

5-C1. *Laboratory theory and methods for sediment analysis,* by H. P. Guy: USGS-TWRI Book 5, Chapter C1. 1969. 58 pages.

6-A1. *A modular three-dimensional finite-difference ground-water flow model,* by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments,* by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

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. Schaffrannek, 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.

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, 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.--74 years (water years 1912, 1914, 1920-91), 34.9 ft^3/s (25,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s, Jan. 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, Sept. 21, 22, 1953.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 20	0400	2,360	8.07	Mar. 12	0830	*2,700	*8.50

Minimum discharge, 2.2 ft^3/s, Nov. 10-12.

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	4.3	5.2	9.8	22	8.8	26	23	17	8.2	7.4	72	9.9
2	3.9	3.7	8.8	19	21	17	30	13	7.2	6.8	39	8.1
3	3.7	3.1	8.2	17	74	20	28	12	19	6.2	49	7.4
4	3.5	2.8	7.7	16	40	15	45	24	18	5.8	199	6.9
5	10	2.6	7.3	14	23	11	33	21	11	5.6	51	6.6
6	5.2	2.5	6.9	13	15	28	27	18	14	5.3	18	6.4
7	3.9	2.4	6.5	12	11	147	18	13	150	5.0	12	6.2
8	3.6	2.4	150	12	10	315	17	20	87	4.9	498	6.0
9	3.3	2.3	112	11	15	96	26	31	91	5.0	90	6.3
10	3.2	2.2	33	10	9.9	260	22	15	48	6.8	31	6.3
11	46	2.2	19	9.8	8.1	137	27	11	18	7.2	17	9.4
12	13	2.4	24	9.3	9.3	680	53	9.6	17	8.3	15	11
13	7.1	87	145	9.0	19	155	17	8.8	27	7.8	14	8.2
14	4.9	119	72	8.5	14	57	14	8.5	41	6.0	13	5.9
15	3.9	38	27	8.1	13	42	12	8.0	26	5.3	11	5.7
16	3.4	37	17	7.8	11	87	39	7.6	16	5.3	10	5.3
17	3.2	139	32	7.6	7.9	85	26	7.1	16	36	10	5.0
18	3.3	74	132	7.5	8.8	293	15	6.6	13	12	15	4.6
19	3.0	246	234	9.1	130	141	12	6.5	10	13	9.9	13
20	3.0	354	322	7.3	194	126	35	6.3	13	7.5	11	16
21	3.2	38	215	6.9	71	50	206	6.3	14	5.7	11	9.8
22	3.1	143	331	6.8	26	45	77	6.2	11	5.0	11	15
23	2.8	210	349	28	16	116	54	6.0	8.3	4.8	7.5	19
24	2.9	106	115	21	71	38	23	6.0	7.7	5.8	10	8.2
25	5.7	42	134	18	30	133	18	6.4	7.8	7.1	25	6.0
26	5.7	24	55	10	16	514	16	8.2	12	7.0	130	5.4
27	3.8	18	51	114	13	384	14	26	31	6.7	72	4.8
28	5.3	15	66	61	28	91	13	43	25	5.1	22	4.3
29	6.3	13	45	18	---	44	13	38	10	8.5	13	4.1
30	30	11	37	11	---	32	20	17	7.9	13	27	4.0
31	10	---	35	9.6	---	27	---	12	---	8.4	14	---
TOTAL	214.2	1747.8	2807.2	534.3	913.8	4212	973	439.1	785.1	244.3	1527.4	234.8
MEAN	6.91	58.3	90.6	17.2	32.6	136	32.4	14.2	26.2	7.88	49.3	7.83
MAX	46	354	349	114	194	680	206	43	150	36	498	19
MIN	2.8	2.2	6.5	6.8	7.9	11	12	6.0	7.2	4.8	7.5	4.0
AC-FT	425	3470	5570	1060	1810	8350	1930	871	1560	485	3030	466

CAL YR 1990 TOTAL 16817.4 MEAN 46.1 MAX 900 MIN 2.2 AC-FT 33360
WTR YR 1991 TOTAL 14633.0 MEAN 40.1 MAX 680 MIN 2.2 AC-FT 29020

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.

WATER-DISCHARGE RECORDS

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, from topographic map.

REMARKS.--Records good except for estimated daily discharge, which are fair. No diversion upstream.

AVERAGE DISCHARGE.--50 years (water years 1921-31, 1953-91), 22.1 ft^3/s (16,010 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 20	0430	*2,090	*5.68	No other peak greater than base discharge.			

Minimum discharge, 2.0 ft^3/s, Nov. 11, 12.

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	2.7	4.7	4.5	8.7	3.0	3.7	8.4	20	6.0	4.0	4.0	6.3
2	9.7	3.3	4.1	8.0	6.3	3.3	7.6	7.6	6.8	3.4	13	5.1
3	5.9	3.1	4.0	7.0	28	3.2	6.8	5.5	55	3.1	6.6	4.5
4	3.3	3.2	3.6	5.3	17	3.1	6.4	5.8	16	2.9	117	4.0
5	2.8	3.8	3.4	4.4	14	2.9	8.9	5.2	7.2	2.8	92	3.6
6	2.6	12	3.2	4.0	7.3	3.2	11	4.8	6.8	2.6	11	3.6
7	2.4	4.5	3.1	4.5	5.0	49	6.8	4.0	47	2.6	6.6	3.5
8	17	3.0	15	4.8	3.5	97	25	4.0	34	2.5	211	4.1
9	6.8	2.5	43	4.6	3.2	26	64	12	38	2.7	88	3.6
10	3.6	2.3	15	3.8	2.9	117	14	8.0	19	3.8	19	3.5
11	27	2.1	19	3.4	2.8	139	66	5.2	32	4.4	9.0	3.2
12	9.5	2.7	26	3.3	9.2	200	72	5.8	12	9.1	6.9	3.2
13	5.1	85	180	3.3	15	38	11	4.8	7.2	5.1	12	3.2
14	3.4	117	117	3.3	6.2	19	7.6	3.8	17	3.5	8.0	2.9
15	2.8	22	39	3.3	74	12	6.4	3.2	27	3.4	5.9	2.7
16	2.5	58	18	3.3	8.4	30	6.8	3.0	9.1	4.5	5.4	2.5
17	2.6	173	10	3.3	5.3	34	8.4	2.9	6.2	57	7.6	2.5
18	2.9	384	25	3.2	5.3	241	6.4	2.6	5.0	9.0	12	2.3
19	2.5	521	47	2.7	9.4	208	5.0	2.6	4.1	12	6.5	2.9
20	3.2	448	110	2.4	83	159	5.0	2.4	3.7	5.3	5.6	3.4
21	5.2	55	210	2.4	53	50	18	2.6	3.7	3.6	4.9	3.3
22	17	235	396	2.3	12	41	24	2.4	3.4	3.1	4.1	48
23	5.4	83	292	3.2	6.6	141	24	2.3	3.3	2.9	4.2	13
24	5.3	26	85	3.2	12	22	12	2.4	14	2.8	8.7	9.9
25	7.8	18	74	3.0	8.1	58	12	2.6	9.6	7.4	63	5.1
26	4.5	11	30	2.7	5.3	191	16	2.6	23	14	128	3.3
27	3.1	8.5	29	38	4.4	141	12	3.5	33	5.8	61	2.9
28	3.1	6.9	25	29	3.9	36	12	10	24	3.4	17	2.6
29	3.0	6.0	14	7.4	---	16	7.6	8.4	6.8	3.2	9.0	2.6
30	39	5.5	9.9	5.0	---	12	13	11	4.9	5.0	34	3.3
31	10	---	9.0	3.3	---	9.6	---	11	---	5.3	9.3	---
TOTAL	221.7	2310.1	1863.8	186.1	414.1	2106.0	504.1	172.0	484.8	200.2	990.3	164.6
MEAN	7.15	77.0	60.1	6.00	14.8	67.9	16.8	5.55	16.2	6.46	31.9	5.49
MAX	39	521	396	38	83	241	72	20	55	57	211	48
MIN	2.4	2.1	3.1	2.3	2.8	2.9	5.0	2.3	3.3	2.5	4.0	2.3
AC-FT	440	4580	3700	369	821	4180	1000	341	962	397	1960	326

CAL YR 1990 TOTAL 9664.4 MEAN 26.5 MAX 521 MIN 1.7 AC-FT 19170
WTR YR 1991 TOTAL 9617.8 MEAN 26.4 MAX 521 MIN 2.1 AC-FT 19080

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 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	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	SODIUM AD-SORP-TION RATIO
OCT 23...	1015	5.3	31	6.4	16.5	8	1.3	1.2	3.5	47	0.5
JAN 04...	1030	5.0	29	6.6	11.5	5	0.68	0.78	3.5	59	0.7
MAR 29...	1005	16	23	6.2	14.0	4	0.52	0.67	2.8	59	0.6
JUN 12...	1025	12	25	6.0	15.5	5	0.81	0.63	2.9	56	0.6
SEP 05...	1050	3.5	30	6.1	18.0	5	0.72	0.88	3.5	57	0.7

DATE	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)
OCT 23...	0.30	5.0	<1.0	4.8	<0.10	3.4	--	--	440	2
JAN 04...	0.30	4.1	<1.0	6.1	<0.10	6.7	--	--	120	2
MAR 29...	0.20	2.7	<1.0	4.6	<0.10	4.0	--	--	200	5
JUN 12...	0.20	2.5	0.70	4.0	0.10	2.5	14	0.02	500	7
SEP 05...	0.30	4.2	0.50	5.5	<0.10	6.2	20	0.03	220	<1

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

16031000 WAIMEA RIVER NEAR WAIMEA
(National stream-quality accounting network station)

LOCATION.--Lat 21°59'02", long 159°39'47", 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.

WATER-DISCHARGE RECORDS

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.

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

REMARKS.--Records good. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--50 years (water years 1911-17, 1945-68, 1970-72, 1976-91), 128 ft^3/s (92,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft^3/s, Feb. 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 Apr. 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 height 19.05 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 7,100 ft3/s, Nov. 20, gage height 11.55 ft, no peak greater than base discharge of 8,700 ft3/s; minimum 7.7 ft3/s, Oct. 16, 17.

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	9.1	14	25	91	10	59	98	49	28	15	19	19
2	9.2	9.4	24	75	11	56	81	45	19	13	83	16
3	15	8.7	19	59	160	46	77	23	160	12	35	13
4	12	8.5	12	40	92	46	72	21	186	12	262	13
5	9.8	8.9	11	23	91	37	63	28	55	12	342	12
6	9.6	10	11	20	55	31	77	25	21	12	62	12
7	9.1	15	10	17	28	189	58	21	159	12	25	13
8	8.9	10	67	17	18	667	49	15	201	12	850	13
9	27	8.7	233	16	15	264	202	22	109	12	358	14
10	11	8.5	89	14	13	644	103	44	146	12	151	13
11	24	8.7	30	13	12	654	56	26	60	15	41	13
12	57	10	50	12	34	1690	312	19	69	15	22	14
13	16	71	382	12	61	547	84	16	27	24	17	14
14	11	454	322	12	54	236	54	14	29	16	25	13
15	8.9	133	134	11	156	152	39	12	56	14	17	13
16	8.1	60	72	11	74	205	33	12	51	14	14	13
17	7.9	492	28	11	35	235	56	12	20	86	14	13
18	8.3	833	140	11	30	902	44	12	15	51	18	13
19	8.6	1460	296	11	38	1020	32	13	14	20	23	13
20	11	2020	753	10	342	822	29	12	13	23	15	16
21	12	340	698	9.9	436	391	136	13	13	15	15	18
22	12	1080	1620	9.6	122	488	237	13	14	13	14	21
23	24	1120	1950	10	66	1130	123	26	13	12	14	128
24	11	310	876	15	117	454	70	15	13	13	14	23
25	12	181	735	14	127	327	52	10	32	14	103	23
26	14	99	341	12	72	1770	51	11	20	19	252	16
27	11	67	214	136	53	1150	57	11	54	27	243	14
28	10	53	262	186	52	469	40	18	107	17	91	13
29	9.9	42	192	61	---	219	39	48	33	14	31	13
30	40	29	127	20	---	156	28	31	17	16	72	14
31	65	---	123	12	---	124	---	34	---	22	43	---
TOTAL	502.4	8964.4	9846	971.5	2374	15180	2452	671	1754	584	3285	556
MEAN	16.2	299	318	31.3	84.8	490	81.7	21.6	58.5	18.8	106	18.5
MAX	65	2020	1950	186	436	1770	312	49	201	86	850	128
MIN	7.9	8.5	10	9.6	10	31	28	10	13	12	14	12
AC-FT	997	17780	19530	1930	4710	30110	4860	1330	3480	1160	6520	1100

CAL YR 1990 TOTAL 60443.9 MEAN 166 MAX 6730 MIN 7.9 AC-FT 119900
WTR YR 1991 TOTAL 47140.3 MEAN 129 MAX 2020 MIN 7.9 AC-FT 93500

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-74, November 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	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 16...	1000	8.3	142	7.9	23.0	1.5	767	5.3	61	200
DEC 12...	1000	52	92	7.9	19.5	1.4	767	6.7	72	360
FEB 12...	1000	25	150	8.1	22.5	1.5	764	6.0	69	650
APR 09...	0900	324	60	7.6	20.0	2.7	766	9.1	100	910
JUN 11...	1030	47	80	8.0	21.5	4.6	768	6.8	76	620
JUL 26...	0900	21	140	8.1	25.5	1.1	764	8.4	102	300

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3
OCT 16...	210	57	0	7.5	9.4	8.4	24	0.5	0.70	71
DEC 12...	500	31	12	4.2	4.9	5.0	26	0.4	0.50	23
FEB 12...	1300	58	2	7.7	9.5	9.4	26	0.5	0.70	69
APR 09...	1100	16	2	2.2	2.5	4.6	38	0.5	0.30	17
JUN 11...	410	28	1	3.8	4.4	5.6	30	0.5	0.40	33
JUL 26...	230	50	0	6.5	8.2	7.5	24	0.5	0.60	62

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD 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, 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)
OCT 16...	0	58	1.3	12	<0.10	24	95	98	0.13
DEC 12...	0	19	0.60	5.0	<0.10	18	76	50	0.10
FEB 12...	0	57	1.6	11	<0.10	24	95	98	0.13
APR 09...	0	14	1.2	6.8	<0.10	11	42	37	0.06
JUN 11...	0	27	1.2	7.4	0.10	14	74	53	0.10
JUL 26...	0	51	1.2	11	<0.10	22	99	88	0.13

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)
OCT										
16...	<0.100	<0.100	0.020	0.010	0.20	--	0.010	--	<0.010	<0.010
DEC										
12...	<0.050	<0.050	0.050	<0.050	<0.20	--	0.020	--	0.010	<0.010
FEB										
12...	<0.100	<0.100	0.020	<0.010	0.30	--	<0.010	0.06	<0.010	<0.010
APR										
09...	<0.050	<0.050	0.030	0.020	0.30	--	0.030	0.03	<0.010	<0.010
JUN										
11...	<0.050	<0.050	0.040	0.030	0.40	--	0.030	--	0.020	<0.010
JUL										
26...	<0.050	<0.050	<0.010	<0.010	0.30	<0.20	<0.010	--	<0.010	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
16...	1000	<10	1	3	<0.5	2.0	1	<3	2	56	<1
FEB											
12...	1000	20	<1	3	<0.5	2.0	1	<3	<1	100	<1
APR											
09...	0900	80	<1	<2	<0.5	<1.0	<1	<3	1	140	1
JUL											
26...	0900	20	<1	<2	<0.5	<1.0	2	<3	<1	100	<1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
16...	<4	10	0.3	<10	3	<1	<1.0	46	<6	5
FEB										
12...	<4	12	<0.1	<10	1	<1	<1.0	49	<6	7
APR										
09...	<4	3	<0.1	<10	2	<1	<1.0	14	<6	<3
JUL										
26...	<4	12	<0.1	<10	6	<1	<1.0	40	<6	4

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM R BK)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
09...	0915	10.0	60	7.6	20.0	766	9.0	98
09...	0916	25.0	60	7.6	20.0	766	9.1	100
09...	0917	40.0	60	7.6	20.0	766	9.1	100
09...	0918	55.0	60	7.6	20.0	766	9.2	101
09...	0919	70.0	60	7.7	20.0	766	9.1	100
09...	0920	85.0	62	7.6	20.0	766	9.1	100

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16...	1000	3	0.07	100
DEC 12...	1000	1	0.14	100
FEB 12...	1000	4	0.27	100
APR 09...	0900	11	9.6	82
JUN 11...	1030	5	0.64	100
JUL 26...	0900	3	0.17	100

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. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft3/s capacity ditch diverts water from upstream of the station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--48 years, 87.5 ft^3/s (63,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s, Jan. 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. 18	0530	*7,720	*10.01	Nov. 22	2030	4920	8.35

Minimum discharge, 11 ft^3/s, Oct. 7, 16, Sep. 11, 12, 15-18.

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	12	19	27	44	19	15	63	118	86	16	15	17
2	73	18	35	39	44	15	55	30	79	15	21	15
3	21	18	28	36	201	14	53	25	97	14	16	14
4	14	16	22	27	38	14	50	23	89	14	392	13
5	17	21	21	25	33	14	76	20	31	13	526	12
6	12	64	20	26	27	15	43	19	16	13	45	29
7	11	17	20	45	20	66	32	18	194	22	23	17
8	271	15	31	32	19	294	200	17	130	16	774	15
9	40	14	112	22	18	209	499	40	101	14	501	13
10	17	13	35	20	17	417	109	32	53	28	126	12
11	37	13	52	19	17	684	475	21	114	16	35	11
12	25	14	125	19	36	1020	773	52	35	41	24	11
13	19	326	834	18	44	201	112	18	19	16	62	12
14	15	753	597	18	29	86	73	17	56	33	21	12
15	12	88	314	17	817	51	60	17	119	17	18	11
16	11	179	98	16	75	121	64	16	25	15	17	11
17	16	901	38	16	50	98	42	16	18	243	25	11
18	13	3160	33	15	48	937	29	17	16	28	18	11
19	53	2780	52	15	78	1800	25	16	18	26	16	12
20	20	2590	170	15	321	1330	33	16	19	16	15	14
21	25	654	534	16	318	391	65	16	16	15	14	14
22	134	1330	2230	18	75	405	73	16	17	14	14	126
23	25	941	1610	19	26	934	111	18	14	14	20	53
24	20	305	652	18	30	314	68	17	68	13	61	16
25	21	190	521	16	25	305	111	16	31	53	207	23
26	17	122	275	16	19	650	241	16	143	61	527	17
27	15	67	224	97	18	475	68	16	120	18	190	14
28	14	36	199	64	16	227	64	23	84	15	41	13
29	14	32	88	28	---	122	30	18	20	14	82	13
30	40	28	69	21	---	89	60	72	17	24	154	14
31	38	---	56	20	---	76	---	100	---	16	22	---
TOTAL	1072	14724	9122	817	2478	11389	3757	876	1845	873	4022	576
MEAN	34.6	491	294	26.4	88.5	367	125	28.3	61.5	28.2	130	19.2
MAX	271	3160	2230	97	817	1800	773	118	194	243	774	126
MIN	11	13	20	15	16	14	25	16	14	13	14	11
AC-FT	2130	29210	18090	1620	4920	22590	7450	1740	3660	1730	7980	1140

CAL YR 1990 TOTAL 47775.8 MEAN 131 MAX 3410 MIN 8.8 AC-FT 94760
WTR YR 1991 TOTAL 51551 MEAN 141 MAX 3160 MIN 11 AC-FT 102300

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 Jan. 22, 1921, nonrecording gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

REMARKS.--Records good. Koula ditch diverts 3.0 mi upstream for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--67 years (water years 1918-20, 1928-91), 85.8 ft^3/s (62,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s, Apr. 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. 18	0700	*11,700	*9.70	Mar. 19	0430	4,760	6.92
Nov. 22	1930	3,630	6.20				

Minimum discharge, 16 ft^3/s, Oct. 19, 20.

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	20	21	39	43	23	28	84	98	79	25	18	22
2	116	22	47	41	32	19	81	31	96	21	18	21
3	26	34	35	39	48	19	64	24	122	20	18	20
4	29	21	33	38	28	26	41	21	59	19	182	19
5	23	23	30	36	25	27	46	20	30	19	246	19
6	18	36	30	35	24	34	29	19	22	19	40	37
7	18	20	29	40	27	43	27	19	158	27	21	21
8	607	19	35	39	30	125	126	19	97	20	505	35
9	105	19	62	33	19	199	446	25	106	20	315	21
10	31	19	36	31	19	151	139	23	60	37	81	21
11	46	19	38	31	29	348	619	20	121	20	37	19
12	27	20	81	30	34	545	498	23	47	34	25	19
13	19	404	468	30	41	165	94	19	31	19	70	19
14	18	931	362	29	43	89	63	18	46	41	24	19
15	17	166	215	28	347	46	46	18	126	22	21	20
16	17	345	95	27	29	63	35	18	40	22	20	19
17	22	1440	54	27	21	56	31	18	27	221	29	19
18	18	3690	43	26	24	715	25	18	22	32	22	19
19	69	1680	39	26	35	2070	24	17	23	26	20	19
20	52	1180	43	26	190	1250	30	19	22	19	21	19
21	25	342	237	26	210	254	38	19	38	19	19	39
22	158	1310	1160	25	74	278	41	18	26	18	19	96
23	27	517	644	25	27	516	68	18	31	18	20	28
24	26	205	246	24	28	207	45	18	78	18	30	18
25	25	149	225	24	32	202	86	19	43	61	152	18
26	18	94	104	24	29	307	171	19	152	54	284	20
27	18	52	96	31	30	188	64	23	123	20	117	18
28	19	47	76	25	31	147	78	22	96	18	44	18
29	19	43	58	23	---	115	31	21	34	20	69	18
30	54	41	51	23	---	100	58	47	26	29	120	20
31	51	---	46	23	---	91	---	81	---	19	36	---
TOTAL	1738	12909	4757	928	1529	8423	3228	792	1981	977	2643	720
MEAN	56.1	430	153	29.9	54.6	272	108	25.5	66.0	31.5	85.3	24.0
MAX	607	3690	1160	43	347	2070	619	98	158	221	505	96
MIN	17	19	29	23	19	19	24	17	22	18	18	18
AC-FT	3450	25600	9440	1840	3030	16710	6400	1570	3930	1940	5240	1430

CAL YR 1990 TOTAL 43116 MEAN 118 MAX 3690 MIN 16 AC-FT 85520
WTR YR 1991 TOTAL 40625 MEAN 111 MAX 3690 MIN 17 AC-FT 80580

16060000 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 Nov. 18, 1918, at site 0.3 mi upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft downstream from present site at datum 2.50 ft higher and July 1, 1957, to June 23, 1958, at present datum.

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

AVERAGE DISCHARGE.--74 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-91), 117 ft^3/s (84,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s, Apr. 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, Aug. 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. 18	0600	*45,640	*20.47	Mar. 20	0630	9.520	15.74
Nov. 22	2030	5,820	14.51				

Minimum discharge, 7.1 ft^3/s, Jan. 23-25, Mar. 5, 6.

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	11	45	97	106	13	9.8	114	149	127	55	54	156
2	365	54	117	99	12	8.8	33	59	180	50	54	111
3	142	67	101	94	85	8.1	30	42	452	31	49	93
4	98	43	77	86	52	7.9	29	40	302	26	319	71
5	102	30	69	78	30	7.4	28	33	143	26	592	59
6	72	63	63	75	19	7.3	41	24	71	21	155	112
7	64	55	51	61	14	14	32	18	200	41	97	85
8	578	47	61	48	12	99	146	14	222	35	834	109
9	158	44	107	31	11	247	841	20	232	21	783	64
10	79	35	86	22	9.7	223	315	21	176	50	270	54
11	93	31	71	21	8.9	384	703	16	221	30	155	45
12	73	31	143	21	11	500	836	40	121	55	108	40
13	58	632	447	23	16	124	283	19	76	29	152	34
14	49	1680	391	20	10	62	208	12	87	95	75	31
15	40	457	252	22	192	37	120	11	185	57	63	32
16	34	2610	147	19	34	71	49	9.9	86	37	81	25
17	57	3770	93	18	19	62	63	9.3	62	217	85	23
18	45	9430	80	17	15	649	32	9.4	43	58	67	22
19	219	1400	79	17	24	2510	24	8.7	36	46	54	13
20	120	1180	106	13	155	2490	32	8.3	35	29	67	16
21	82	567	244	12	263	446	47	11	107	36	49	17
22	151	1660	779	10	94	369	95	17	75	20	47	85
23	40	766	1030	7.9	41	873	110	8.7	94	15	61	58
24	32	361	416	7.1	34	355	73	8.2	120	14	116	16
25	42	251	380	12	25	443	124	9.5	107	109	273	12
26	25	189	217	13	14	982	206	8.9	170	92	403	20
27	14	150	180	44	10	520	106	8.5	127	47	237	18
28	15	127	174	46	11	377	124	15	153	30	139	11
29	11	107	150	22	---	273	59	14	64	26	183	14
30	72	95	135	16	---	214	97	47	48	104	1120	17
31	144	---	120	14	---	178	---	132	---	88	316	---
TOTAL	3085	25977	6463	1095.0	1234.6	12551.3	5000	843.4	4122	1590	7058	1463
MEAN	99.5	866	208	35.3	44.1	405	167	27.2	137	51.3	228	48.8
MAX	578	9430	1030	106	263	2510	841	149	452	217	1120	156
MIN	11	30	51	7.1	8.9	7.3	24	8.2	35	14	47	11
AC-FT	6120	51530	12820	2170	2450	24900	9920	1670	8180	3150	14000	2900

CAL YR 1990 TOTAL 69850.4 MEAN 191 MAX 9430 MIN 4.4 AC-FT 138500
WTR YR 1991 TOTAL 70482.3 MEAN 193 MAX 9430 MIN 7.1 AC-FT 139800

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

LOCATION.--Lat 22°03'34", long 159°28'00", Hydrologic Unit 20070000, on left bank 380 ft downstream from Waikoko Stream, 8.1 mi west of Wailua, and 8.4 mi northwest of Lihue.

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

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--26 years, 22.5 ft^3/s (16,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s, Oct. 11, 1966; no flow for many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 38 ft^3/s, Aug. 30; minimum daily, no flow for many days.

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	e21	e20	.27	.76	.00	.00	.02	.12	.15	.11	17	15
2	e27	e24	1.5	.27	.12	.00	.02	.07	.20	.12	16	11
3	e22	e24	.54	.25	.08	.00	.02	.07	.64	.12	15	9.3
4	e20	e20	.18	.25	1.2	.00	.02	.07	.15	.12	24	7.5
5	e19	e22	.12	.48	.03	.00	.00	.07	.08	.12	24	7.0
6	e19	e25	.09	.78	.00	.00	.00	.07	.07	.12	20	14
7	e19	e29	.07	1.3	.00	.00	.13	.07	.14	.13	7.5	8.5
8	e24	e23	.91	1.8	.00	.08	.45	.08	.16	.12	.86	13
9	e21	e21	1.4	1.0	.00	.51	.57	.09	.21	.12	1.1	6.6
10	e20	e20	.50	.84	.00	.10	.20	.09	.12	.14	.34	5.1
11	e21	e20	1.3	.79	.00	.39	.63	.09	.18	.12	.33	4.4
12	e20	e20	4.7	.76	.00	.25	.37	.12	.10	.18	11	4.0
13	e20	e30	9.8	.73	.00	.04	.06	.09	.09	.12	27	3.6
14	e19	e28	7.2	.94	.00	.01	.06	.09	.11	.28	23	3.5
15	e19	e27	5.6	.78	.07	.01	.06	.09	.14	.12	24	3.4
16	e19	e25	1.4	.71	.01	.02	.06	.09	.12	.10	23	3.1
17	e20	e15	.51	.68	.00	.01	.09	.09	.12	.23	24	2.9
18	e20	e10	.44	.68	.00	.84	.09	.09	.12	.27	23	10
19	e22	e9.8	1.1	.66	.00	1.3	.09	.09	.12	.15	24	24
20	e21	e9.6	2.0	.64	.17	1.2	.10	.09	.12	.02	26	23
21	e20	e9.0	5.6	.64	.11	.05	.11	.11	.19	.10	25	22
22	e21	e9.6	15	.64	.02	.04	.11	.10	.14	.00	25	25
23	e19	e9.0	15	.64	.00	.56	.12	.10	.17	1.3	28	25
24	e19	e8.4	4.6	.64	.00	.05	.10	.10	.20	2.5	30	23
25	e19	e8.0	4.2	.64	.00	.43	.11	.10	.15	12	32	24
26	e18	e6.8	.80	.60	.00	.34	.12	.10	.21	17	34	24
27	e18	.18	.90	1.9	.00	.12	.10	.11	.17	17	31	23
28	e18	.10	1.3	.78	.00	.08	.11	.12	.14	14	28	23
29	e18	.08	1.6	.01	---	.08	.08	.12	.10	16	31	22
30	e20	.18	1.3	.01	---	.03	.12	.13	.10	20	38	22
31	e24	---	1.2	.00	---	.02	---	.19	---	18	25	---
TOTAL	627	473.74	91.13	21.60	1.81	6.56	4.12	3.01	4.71	120.71	658.13	411.9
MEAN	20.2	15.8	2.94	.70	.065	.21	.14	.097	.16	3.89	21.2	13.7
MAX	27	30	15	1.9	1.2	1.3	.63	.19	.64	20	38	25
MIN	18	.08	.07	.00	.00	.00	.00	.07	.07	.00	.33	2.9
AC-FT	1240	940	181	43	3.6	13	8.2	6.0	9.3	239	1310	817

CAL YR 1990 TOTAL 6729.87 MEAN 18.4 MAX 30 MIN .07 AC-FT 13350
WTR YR 1991 TOTAL 2424.42 MEAN 6.64 MAX 38 MIN .00 AC-FT 4810

e Estimated

16062000 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, by barometer.

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

AVERAGE DISCHARGE.--54 years (water years 1938-91), 10.3 ft^3/s (7,460 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 52 ft^3/s, Feb. 21; no flow on many days.

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	.18	.18	.00	.00	27	27	.22	.50	39	.50	.32	e.20
2	.37	.19	.00	.00	29	27	.22	.50	43	.50	.34	e.20
3	.06	.17	.00	.00	35	27	.22	.50	51	.50	.30	e.20
4	.00	.15	.00	.00	38	e26	.22	.50	47	.50	.39	e.20
5	.00	.13	.00	.00	32	e26	.22	.50	25	.50	.46	e.20
6	.00	.16	.00	.00	29	e25	.18	.44	1.2	.50	.39	e.20
7	.00	.15	.00	.00	27	e25	.15	.39	1.2	.50	.39	e.20
8	.15	.13	.00	.00	27	e25	.22	.39	1.3	.44	.41	e.15
9	.14	.08	.00	.00	26	e9.0	.32	.39	1.2	.39	.36	e.15
10	.10	.08	.00	.00	26	e1.0	1.6	.39	1.2	.39	.27	e.15
11	.10	.08	.00	.00	25	e1.0	2.1	.39	1.1	.39	.22	e.15
12	.05	.08	.00	.00	28	e1.1	1.7	.39	1.1	.39	e.22	e.15
13	.05	.34	.00	.00	26	e.90	1.3	.39	.92	.39	e.15	e.15
14	.01	.50	.00	.00	30	e.90	1.1	.39	.75	.41	.08	e.15
15	.00	.30	.00	.00	44	e.80	.74	.39	.77	.30	.08	e.15
16	.00	.71	.00	.00	34	e.80	.74	.39	.64	.30	.08	e4.4
17	.03	2.2	.00	.00	29	e.80	.74	.39	.62	.27	.13	11
18	.00	5.2	.00	.00	29	e1.0	.67	.39	.62	.22	.15	9.2
19	.10	.08	.00	.00	35	e1.2	.62	.39	.64	.22	.15	5.0
20	.01	.08	.00	.00	50	e1.4	.62	.35	.62	.22	.12	5.3
21	.02	.04	.00	.00	52	e.90	.62	.30	.66	.22	e.08	4.2
22	.27	.06	.00	.00	41	.90	.62	.30	.74	.22	e.08	10
23	.13	.04	.00	.00	35	1.0	.62	.30	.62	.22	e.15	6.8
24	.11	.00	.00	13	35	.65	.62	.30	.62	.22	.27	4.8
25	.08	.00	.00	26	31	.62	.62	.30	e.50	.32	.33	4.0
26	.03	.00	.00	25	29	.57	.62	.30	.50	.30	.33	3.6
27	.01	.00	.00	43	28	.40	.62	8.7	.57	.30	.30	3.3
28	.00	.00	.00	35	28	.39	.62	21	.62	.30	.30	3.9
29	.01	.00	.00	29	---	.33	.55	20	.52	.30	.35	3.4
30	.13	.00	.00	28	---	.30	.50	34	.50	.35	e.76	4.3
31	.30	---	.00	27	---	.26	---	37	---	.30	e.20	---
TOTAL	2.44	11.13	0.00	226.00	905	234.22	19.91	130.86	224.73	10.88	8.16	85.80
MEAN	.079	.37	.000	7.29	32.3	7.56	.66	4.22	7.49	.35	.26	2.86
MAX	.37	5.2	.00	43	52	27	2.1	37	51	.50	.76	11
MIN	.00	.00	.00	.00	25	.26	.15	.30	.50	.22	.08	.15
AC-FT	4.8	22	.00	448	1800	465	39	260	446	22	16	170

CAL YR 1990 TOTAL 224.71 MEAN .62 MAX 38 MIN .00 AC-FT 446
WTR YR 1991 TOTAL 1859.13 MEAN 5.09 MAX 52 MIN .00 AC-FT 3690

e Estimated

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 Dec. 31, 1914, nonrecording gage at site 725 ft downstream at different datum. Dec. 31, 1914 to May 10, 1934, water-stage recorder at site 75 ft upstream at present datum.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--76 years (water years 1913-14, 1916-17, 1920-91), 48.6 ft^3/s (35,210 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 18	0500	*3,980	*7.75	Aug. 30	0600	2,500	6.45
Jun. 3	1330	2,810	6.73				

Minimum discharge, 13 ft^3/s, Mar. 2-6.

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	26	22	38	33	15	14	44	41	36	34	24	59
2	115	31	38	31	16	13	40	30	64	30	30	49
3	35	29	35	29	17	13	36	28	415	28	27	45
4	33	25	32	28	16	13	35	26	131	27	99	42
5	31	30	31	27	16	13	37	25	59	27	89	39
6	26	39	29	26	15	13	33	24	47	30	44	57
7	24	44	27	26	15	16	30	23	78	27	33	37
8	39	30	99	34	15	40	39	23	80	25	276	42
9	27	27	89	26	15	109	82	25	80	27	121	32
10	24	25	50	23	14	99	51	26	58	28	60	30
11	29	23	38	22	14	112	132	24	78	25	47	28
12	24	23	44	22	14	135	92	25	49	39	41	27
13	23	299	132	22	14	49	50	23	43	27	51	26
14	21	558	84	21	14	37	41	21	51	67	36	25
15	20	164	80	20	22	31	41	20	66	34	33	25
16	19	1100	53	20	15	39	40	19	44	30	33	23
17	25	1130	43	19	14	33	48	19	41	51	35	22
18	21	1410	51	18	14	194	34	19	35	30	31	21
19	33	342	90	18	17	464	31	18	32	31	29	22
20	22	329	125	17	53	623	35	18	42	26	29	25
21	21	161	84	17	48	114	53	21	48	26	26	22
22	25	297	148	17	20	73	47	18	39	24	25	23
23	20	184	241	19	17	222	51	17	35	24	32	22
24	22	111	116	17	16	76	35	18	43	22	53	20
25	21	81	103	17	15	121	34	20	40	40	69	19
26	19	66	66	17	14	219	50	19	59	34	127	18
27	18	56	56	39	14	191	36	18	54	25	87	18
28	18	49	48	18	14	129	40	22	47	22	54	18
29	18	44	43	17	---	77	32	19	36	23	81	17
30	26	40	39	16	---	61	36	27	33	40	422	17
31	36	---	35	16	---	51	---	38	---	27	87	---
TOTAL	861	6769	2187	692	503	3394	1385	714	1963	950	2231	870
MEAN	27.8	226	70.5	22.3	18.0	109	46.2	23.0	65.4	30.6	72.0	29.0
MAX	115	1410	241	39	53	623	132	41	415	67	422	59
MIN	18	22	27	16	14	13	30	17	32	22	24	17
AC-FT	1710	13430	4340	1370	998	6730	2750	1420	3890	1880	4430	1730

CAL YR 1990 TOTAL 22380 MEAN 61.3 MAX 1410 MIN 14 AC-FT 44390
WTR YR 1991 TOTAL 22519 MEAN 61.7 MAX 1410 MIN 13 AC-FT 44670

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 Feb. 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.--54 years (water years 1938-91), 16.0 ft^3/s (11,590 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, 25 ft^3/s, Jan. 16-20; minimum daily, 0.17 ft3/s, Nov. 28 to Dec. 2, Aug. 9-11.

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	6.3	19	.17	9.4	16	16	14	12	20	22	2122	
2	6.3	19	.17	9.2	16	16	14	12	20	22	2222	
3	6.2	20	.33	8.9	17	16	14	12	22	22	2222	
4	6.2	20	13	8.6	17	16	14	13	23	22	2222	
5	6.1	20	20	8.3	17	16	14	13	23	22	2222	
6	6.0	20	19	8.0	16	16	14	13	23	22	2222	
7	6.0	20	17	7.8	16	16	15	13	23	22	1222	
8	5.9	12	15	17	16	16	15	13	23	22	.21	22
9	5.8	6.3	6.4	21	16	16	15	13	23	22	.17	22
10	5.6	6.3	5.2	21	16	16	15	18	23	22	.17	22
11	5.5	6.3	14	11	16	16	16	22	23	22	.17	22
12	5.2	6.3	15	1.1	16	17	16	22	23	22	1521	
13	5.1	2.9	17	1.0	16	17	16	21	23	22	2321	
14	5.0	.32	18	1.0	16	17	16	21	23	22	2221	
15	4.7	.28	19	16	16	17	16	21	23	22	2221	
16	4.4	.52	19	25	16	17	16	21	23	22	2121	
17	3.7	.50	20	25	16	17	17	21	23	22	2021	
18	2.0	.57	20	25	16	17	17	21	22	22	1920	
19	1.1	.35	20	25	16	18	17	21	22	22	1820	
20	.70	.28	21	25	16	18	17	21	22	22	1820	
21	.48	.28	14	22	16	17	17	20	22	22	1820	
22	.57	.28	11	18	16	17	17	20	22	22	1820	
23	4.4	.31	11	19	16	16	17	20	22	22	1820	
24	7.3	.26	11	19	16	16	14	20	22	22	1820	
25	7.8	.23	11	17	16	16	12	20	22	21	1919	
26	8.5	.20	11	16	16	16	12	20	22	21	1919	
27	9.2	.18	11	16	16	16	12	20	22	21	2019	
28	9.9	.17	10	16	16	15	12	20	22	21	2019	
29	15	.17	10	16	---	15	12	20	22	21	2020	
30	19	.17	9.9	16	---	15	12	20	22	21	2120	
31	19	---	9.7	16	---	15	---	20	---	21	21	---
TOTAL	198.95	183.17	398.87	465.3	451	505	445	564	670	675	533.72	624
MEAN	6.42	6.11	12.9	15.0	16.1	16.3	14.8	18.2	22.3	21.8	17.2	20.8
MAX	19	20	21	25	17	18	17	22	23	22	23	22
MIN	.48	.17	.17	1.0	16	15	12	12	20	21	.17	19
AC-FT	395	363	791	923	895	1000	883	1120	1330	1340	1060	1240

CAL YR 1990 TOTAL 5270.03 MEAN 14.4 MAX 34 MIN .00 AC-FT 10450
WTR YR 1991 TOTAL 5714.01 MEAN 15.7 MAX 25 MIN .17 AC-FT 11330

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, from topographic map.

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

AVERAGE DISCHARGE.--39 years, 124 ft^3/s (89,840 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft^3/s, Nov. 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, Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges 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. 18	0600	*15,000	*11.80	Jun. 3	1400	4,290	7.16
Mar. 20	0700	5,160	7.74				

Minimum discharge, 9.6 ft3/s, Mar. 5, 6.

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	56	40	134	100	13	10	134	126	68	81	37	145
2	298	60	154	94	16	10	113	85	123	68	47	115
3	104	52	126	90	43	10	99	76	765	63	38	100
4	84	43	106	86	30	9.9	92	74	271	62	191	86
5	79	44	100	83	18	9.9	96	69	119	72	312	80
6	63	88	96	80	15	10	94	67	109	61	99	126
7	57	73	91	89	14	10	82	61	203	83	79	85
8	267	44	191	94	14	40	151	60	196	59	612	89
9	95	37	213	60	14	164	359	74	198	59	587	69
10	65	31	127	51	14	160	168	73	141	70	202	67
11	81	31	92	48	14	199	453	67	178	54	143	61
12	65	39	128	47	14	314	377	78	116	87	117	59
13	64	530	319	50	13	77	153	59	98	62	137	55
14	57	1220	237	45	13	44	119	53	112	181	88	54
15	52	340	203	45	172	31	111	48	156	88	80	54
16	48	2480	128	42	19	44	112	46	102	71	78	49
17	66	2790	96	40	11	34	131	49	90	117	82	37
18	52	4080	112	39	11	369	92	47	76	73	74	35
19	167	1090	179	38	15	1340	82	43	79	74	62	26
20	62	1080	246	36	81	1630	93	41	85	62	45	29
21	60	505	217	36	129	370	118	45	105	66	39	26
22	144	914	634	35	29	239	124	42	88	52	38	47
23	45	642	842	39	14	620	129	38	83	49	50	33
24	46	350	346	35	11	250	102	40	116	46	102	21
25	41	260	308	18	11	357	113	44	103	91	149	20
26	30	220	192	16	11	667	167	44	157	76	282	e21
27	20	191	165	75	11	496	117	42	145	44	162	e18
28	19	172	142	26	11	334	122	22	134	39	97	e13
29	18	150	125	16	---	224	88	20	91	36	180	e11
30	41	133	115	14	---	179	113	38	79	75	1040	e10
31	136	---	107	13	---	153	---	72	---	50	246	---
TOTAL	2482	17729	6271	1580	781	8404.8	4304	1743	4386	2171	5495	1641
MEAN	80.1	591	202	51.0	27.9	271	143	56.2	146	70.0	177	54.7
MAX	298	4080	842	100	172	1630	453	126	765	181	1040	145
MIN	18	31	91	13	11	9.9	82	20	68	36	37	10
AC-FT	4920	35170	12440	3130	1550	16670	8540	3460	8700	4310	10900	3250

CAL YR 1990 TOTAL 53444.4 MEAN 146 MAX 4080 MIN 7.1 AC-FT 106000
WTR YR 1991 TOTAL 56987.8 MEAN 156 MAX 4080 MIN 9.9 AC-FT 113000

e Estimated

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. No diversion upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--31 years, 2.69 ft^3/s (1,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft^3/s, Jan. 31, 1975, gage height, 5.58 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, Sept. 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. 16	0830	*422	*4.46	Jun. 3	1400	116	2.72
Mar. 20	0630	88	2.48				

Minimum discharge, 0.86 ft^3/s, Nov. 6, 7, 9-12, Mar. 6.

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	1.3	.99	4.8	3.1	1.3	1.0	3.7	2.5	1.6	2.3	1.3	3.2
2	1.5	1.2	4.4	3.0	1.4	.94	3.5	2.3	1.9	2.2	1.3	2.9
3	1.3	1.1	4.2	2.9	1.6	.93	3.3	2.2	18	2.1	1.3	2.7
4	1.3	1.0	4.0	2.9	1.3	.93	3.0	2.2	4.3	2.2	2.2	2.6
5	1.4	.96	3.7	2.8	1.3	.93	2.9	2.1	2.9	2.1	2.4	2.4
6	1.3	.93	3.5	2.7	1.3	.97	2.8	2.1	2.5	2.1	1.8	2.4
7	1.2	1.0	3.4	2.7	1.3	.91	2.7	2.0	2.6	2.0	1.6	2.3
8	1.2	.94	3.6	2.7	1.3	1.1	2.8	2.0	2.7	1.9	6.8	2.2
9	1.2	.87	3.5	2.6	1.3	1.0	3.3	2.1	3.4	1.9	3.7	2.1
10	1.2	.86	3.3	2.4	1.3	1.1	3.3	2.1	2.7	1.8	2.7	2.0
11	1.2	.86	3.1	2.3	1.3	1.3	4.4	2.0	2.6	1.8	2.4	2.0
12	1.2	.89	3.2	2.3	1.3	2.2	3.6	1.9	2.5	1.8	2.3	2.0
13	1.2	3.5	3.8	2.6	1.3	1.3	3.0	1.9	2.4	1.7	2.4	1.9
14	1.2	7.4	3.4	2.2	1.2	1.1	2.9	1.8	2.5	1.7	2.2	1.9
15	1.1	3.5	3.3	2.2	1.2	1.0	2.8	1.8	3.0	1.7	2.1	1.9
16	1.1	99	3.0	2.1	1.2	1.1	2.7	1.8	2.7	1.6	2.1	1.8
17	1.1	55	2.9	2.1	1.2	1.0	2.9	1.8	2.5	1.7	2.0	1.8
18	1.1	66	2.9	2.0	1.2	2.4	2.6	1.7	2.4	1.6	1.9	1.8
19	1.0	20	2.9	2.0	1.2	12	2.6	1.7	2.4	1.6	2.0	1.8
20	1.0	16	3.5	1.9	1.5	26	2.9	1.7	2.7	1.6	2.0	1.9
21	1.1	11	3.6	1.9	1.7	5.7	2.8	1.7	3.1	1.5	1.8	1.8
22	1.0	24	4.2	1.9	1.3	4.8	2.7	1.6	2.8	1.5	1.8	1.7
23	1.0	17	9.0	1.9	1.2	9.4	2.7	1.6	2.5	1.5	1.9	1.6
24	1.0	11	6.0	1.9	1.2	5.3	2.5	1.6	2.9	1.3	2.0	1.5
25	1.0	9.1	6.3	1.8	1.1	4.4	2.4	1.6	2.7	1.6	2.2	1.5
26	.93	7.6	4.5	1.8	1.1	6.3	2.7	1.6	2.7	1.6	3.2	1.5
27	.97	6.7	4.2	2.0	1.1	6.5	2.5	1.6	2.7	1.4	2.9	1.5
28	.95	6.0	3.9	1.7	1.0	6.3	2.4	1.6	2.7	1.3	2.4	1.4
29	.99	5.6	3.6	1.7	---	5.2	2.4	1.5	2.5	1.3	2.7	1.4
30	1.0	5.1	3.5	1.6	---	4.4	2.5	1.5	2.4	1.7	8.1	1.3
31	1.1	---	3.3	1.6	---	4.0	---	1.6	---	1.4	3.9	---
TOTAL	35.14	385.10	122.5	69.3	35.7	121.51	87.3	57.2	95.3	53.5	79.4	58.8
MEAN	1.13	12.8	3.95	2.24	1.27	3.92	2.91	1.85	3.18	1.73	2.56	1.96
MAX	1.5	99	9.0	3.1	1.7	26	4.4	2.5	18	2.3	8.1	3.2
MIN	.93	.86	2.9	1.6	1.0	.91	2.4	1.5	1.6	1.3	1.3	1.3
AC-FT	70	764	243	137	71	241	173	113	189	106	157	117

CAL YR 1990 TOTAL 1208.62 MEAN 3.31 MAX 99 MIN .58 AC-FT 2400
WTR YR 1991 TOTAL 1200.75 MEAN 3.29 MAX 99 MIN .86 AC-FT 2380

16077000 MAKALEHA DITCH NEAR KEALIA

LOCATION.--Lat 22°07'06", long 159°22'04", Hydrologic Unit 20070000, on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 mi northwest of Kealia, and 4.0 mi northwest of Kapaa.

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

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

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

AVERAGE DISCHARGE.--54 years (water years 1938-91), 6.66 ft^3/s (4,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s, Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s, Nov. 16; minimum daily, 0.11 ft^3/s, Dec. 6, 7.

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	5.8	8.1	.19	.26	3.8	7.5	.52	.43	.34	.40	.20	.40
2	10	9.4	.17	.23	3.7	6.4	.44	.40	.35	.38	.20	.38
3	8.9	9.9	.16	.22	3.6	4.8	.40	.38	4.7	.40	.17	.34
4	9.8	9.1	.14	.21	3.6	5.5	.37	.40	1.9	.34	.27	.31
5	10	10	.14	.20	3.4	7.0	.35	.38	.83	.34	.33	.26
6	9.0	8.9	.11	.20	3.1	5.4	.34	.38	.54	.33	.32	.27
7	8.2	11	.11	.19	3.0	4.9	.34	.38	.48	.34	.26	.26
8	9.4	6.3	.13	.19	2.8	12	.36	.38	.45	.30	1.5	.24
9	9.2	3.1	.14	.20	2.7	9.7	.39	.38	.49	.27	1.2	.23
10	8.2	4.3	.16	1.2	2.7	11	.49	.38	.49	.26	.68	.21
11	9.6	6.8	.14	3.8	2.6	10	.85	.38	.45	.25	.47	.20
12	8.6	7.5	.14	3.7	2.6	6.6	.98	.38	.41	.26	.37	.22
13	9.0	18	.20	4.0	2.4	.81	.68	.38	.38	.26	.33	.25
14	7.8	11	.22	3.7	2.3	.70	.55	.38	.38	.27	.28	.26
15	7.2	2.2	.23	3.7	2.2	.64	.49	.38	.40	.26	.26	.21
16	6.8	18	.22	3.6	2.0	.63	.46	.38	.40	.25	.24	.20
17	9.0	17	.20	3.6	1.9	.60	.46	.41	.41	.23	.20	.21
18	7.6	13	.23	3.5	1.9	.68	.43	.40	.40	.20	.18	.20
19	8.4	3.5	.30	3.3	4.7	3.2	.41	.42	.39	.21	.22	.22
20	8.5	4.2	.66	3.2	11	11	.42	.40	.59	.18	.21	.26
21	8.8	3.2	.61	3.1	10	2.8	.44	.51	.76	.18	.17	.24
22	11	4.7	.78	3.0	7.3	1.4	.44	.49	.71	.17	.17	.23
23	8.7	6.2	2.4	3.1	6.6	2.4	.51	.42	.58	.17	.18	.22
24	11	2.3	2.0	3.1	5.3	1.8	.49	.46	.54	.16	.18	.23
25	9.8	1.1	1.6	3.1	4.7	1.1	.46	.42	.49	.26	.20	.24
26	8.2	.65	.99	3.0	7.7	1.4	.50	.39	.47	.29	.25	.24
27	7.4	.41	.70	4.1	7.6	2.5	.45	.38	.47	.23	.28	.23
28	7.1	.32	.55	3.9	7.6	2.7	.44	.39	.46	.22	.33	.26
29	7.2	.26	.43	3.9	---	1.8	.42	.37	.45	.19	.37	.24
30	8.9	.22	.36	3.7	---	1.0	.43	.37	.42	.26	.62	.23
31	11	---	.31	3.7	---	.68	---	.35	---	.20	.53	---
TOTAL	270.1	200.66	14.72	76.90	122.8	128.64	14.31	12.35	20.13	8.06	11.17	7.49
MEAN	8.71	6.69	.47	2.48	4.39	4.15	.48	.40	.67	.26	.36	.25
MAX	11	18	2.4	4.1	11	12	.98	.51	4.7	.40	1.5	.40
MIN	5.8	.22	.11	.19	1.9	.60	.34	.35	.34	.16	.17	.20
AC-FT	536	398	29	153	244	255	28	24	40	16	22	15

CAL YR 1990 TOTAL 1876.17 MEAN 5.14 MAX 22 MIN .11 AC-FT 3720
WTR YR 1991 TOTAL 887.33 MEAN 2.43 MAX 18 MIN .11 AC-FT 1760

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 Nov. 26, 1936, at site 61 ft upstream at datum 2.52 ft higher.

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

AVERAGE DISCHARGE.--73 years (water years 1918-20, 1922-91), 6.16 ft^3/s (4,460 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s, Apr. 17, Jul. 17; minimum daily, 0.12 ft3/s, Dec. 2, 3.

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	.19	3.7	.15	.42	.60	3.5	5.5	.70	16	13	16	7.1
2	.22	7.6	.12	1.3	.75	4.1	18	.65	20	13	18	6.9
3	.23	7.9	.12	1.4	5.6	5.3	18	.70	15	14	.68	6.9
4	.24	5.7	3.3	1.4	8.7	5.0	19	.61	1.1	14	.91	6.6
5	.29	9.2	18	1.4	8.6	3.3	20	.60	.54	12	.48	6.4
6	.29	5.9	17	1.3	8.4	5.0	13	3.5	.50	15	.30	6.6
7	.29	2.6	15	1.2	8.2	5.1	2.8	1.5	.58	15	.29	5.6
8	.29	2.4	11	1.1	8.8	.73	2.6	.97	.56	14	2.9	1.8
9	.29	2.4	.42	1.1	8.8	.71	2.4	9.7	.60	11	.52	.28
10	.30	3.4	.29	1.0	8.7	.64	2.3	18	.55	.67	8.1	.23
11	.33	.43	.29	.91	8.7	.67	3.0	16	5.5	.58	20	.23
12	.35	.42	.29	.93	8.9	.75	2.0	5.5	11	.52	19	.23
13	4.0	2.7	.50	.43	10	.51	1.7	4.9	.24	.50	15	.26
14	4.3	3.1	.23	4.3	10	.46	1.4	3.8	.23	.51	2.2	5.6
15	3.8	.81	1.9	7.8	13	.50	1.1	.80	.26	.42	1.3	15
16	3.5	8.3	.29	9.7	9.4	.57	8.5	.80	.24	5.4	.95	14
17	7.2	8.2	2.2	6.0	8.6	.60	21	.80	1.5	21	7.1	12
18	6.1	5.5	.90	.52	8.9	1.5	18	.71	4.3	17	17	12
19	6.6	1.4	.92	3.7	9.4	4.3	16	.70	3.7	19	15	13
20	4.2	2.3	.82	1.4	8.2	5.2	7.6	.70	2.7	16	16	16
21	4.2	.42	.39	.99	.53	.23	.69	.71	4.6	17	14	3.8
22	7.3	2.6	.66	.76	4.6	.58	.61	.63	.50	6.6	13	6.8
23	4.0	1.1	1.4	.62	6.2	4.0	.71	.60	.49	11	4.7	14
24	6.8	.19	.43	.55	6.7	1.6	.58	7.9	.50	13	.62	11
25	5.5	.19	.40	.50	6.9	2.2	.60	12	.50	11	.55	11
26	3.9	.15	.34	.50	3.6	3.9	.69	14	.55	1.2	.95	11
27	3.4	.15	.35	.63	3.5	3.0	.62	13	.44	.81	.53	10
28	3.3	.15	.35	.49	3.6	1.7	.70	14	.42	.67	3.3	11
29	3.2	.15	.35	.50	---	1.1	.70	2.0	.42	12	17	11
30	4.6	.15	.35	.50	---	1.1	.70	1.4	11	19	12	10
31	8.6	---	.37	.54	---	1.1	---	4.6	---	17	7.2	---
TOTAL	97.81	89.21	79.13	53.89	197.88	68.95	190.50	142.48	104.52	311.88	235.58	236.33
MEAN	3.16	2.97	2.55	1.74	7.07	2.22	6.35	4.60	3.48	10.1	7.60	7.88
MAX	8.6	9.2	18	9.7	13	5.3	21	18	20	21	20	16
MIN	.19	.15	.12	.42	.53	.23	.58	.60	.23	.42	.29	.23
AC-FT	194	177	157	107	392	137	378	283	207	619	467	469

CAL YR 1990 TOTAL 1694.54 MEAN 4.64 MAX 21 MIN .05 AC-FT 3360
WTR YR 1991 TOTAL 1808.16 MEAN 4.95 MAX 21 MIN .12 AC-FT 3590

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 bench mark). Dec. 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 sta. 16087000).

AVERAGE DISCHARGE.--67 years (water years, 1923-25, 1928-91), 4.42 ft^3/s (3,200 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 47 ft^3/s, Nov. 14; minimum daily, no flow for many days.

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	5.4	3.0	5.9	.00	2.3	1.8	3.9	10	8.3	6.6	9.2	.00
2	3.6	5.2	6.6	.00	2.3	1.6	5.0	4.6	4.5	4.0	11	.00
3	3.2	6.4	6.0	.00	2.6	1.6	5.3	4.5	23	3.7	8.9	.00
4	9.1	4.7	4.6	.00	2.3	1.5	7.5	3.9	5.1	3.3	20	.00
5	8.5	7.7	4.3	.00	2.2	1.5	6.2	3.6	4.4	3.1	7.1	.00
6	4.6	6.4	4.0	.00	2.0	1.5	5.2	3.4	9.2	3.0	.00	.05
7	3.3	14	3.7	1.4	1.9	2.7	4.2	3.1	21	2.9	.00	.00
8	5.6	4.1	13	4.0	1.9	13	14	3.3	21	2.8	.49	.00
9	3.6	3.1	14	2.7	1.9	11	21	4.7	15	5.8	.17	.00
10	2.8	2.8	9.7	2.1	1.8	18	7.1	6.2	14	5.4	.00	.00
11	5.2	2.5	8.1	2.0	1.8	14	11	4.6	10	3.8	.00	.00
12	4.8	2.9	9.9	2.2	4.2	16	6.8	3.7	7.7	16	.00	.00
13	3.4	41	14	5.3	3.7	4.6	2.9	3.1	7.6	5.1	.01	.00
14	2.9	47	12	2.6	2.5	3.9	2.2	3.7	9.5	6.1	.00	.00
15	2.5	28	11	2.4	8.2	3.1	3.9	2.8	11	4.8	.00	.00
16	2.2	24	8.5	2.5	2.1	6.7	7.0	2.6	7.9	3.7	.00	.00
17	15	.67	6.6	2.2	1.7	3.5	7.0	2.6	6.6	9.2	.00	.00
18	4.3	.45	11	2.1	2.2	22	4.5	2.5	4.7	4.3	.00	.00
19	11	.15	16	4.0	9.9	32	4.6	3.5	4.3	6.3	.00	.00
20	3.6	.43	14	2.3	20	18	8.4	2.6	5.8	3.6	.00	.00
21	4.2	.08	5.1	2.2	12	3.4	17	7.1	11	4.6	.00	.00
22	3.9	.43	.10	2.0	3.7	2.3	16	3.5	5.1	3.3	.00	.00
23	3.0	.35	.13	4.2	2.7	6.5	12	2.7	8.6	3.0	.00	.00
24	4.7	.11	.07	3.0	2.4	2.7	6.8	5.0	12	2.9	.07	.00
25	5.8	.10	.06	3.0	2.2	6.4	8.1	5.3	6.2	11	.13	.00
26	3.0	.10	.05	2.4	1.9	9.8	18	2.9	15	8.6	.24	.00
27	2.4	4.2	.05	14	1.8	8.7	11	2.8	11	3.9	.14	.00
28	2.4	5.7	.05	3.5	1.9	6.0	6.4	6.2	8.6	3.2	.02	.00
29	2.3	5.4	.02	2.9	---	3.3	5.5	3.0	5.4	5.6	.09	.00
30	6.5	5.1	.00	2.6	---	2.0	7.6	6.0	4.9	16	.26	.00
31	12	---	.00	2.4	---	1.5	---	8.9	---	6.8	.00	---
TOTAL	154.8	226.07	188.53	80.00	106.1	230.6	246.1	132.4	288.4	172.4	57.82	0.05
MEAN	4.99	7.54	6.08	2.58	3.79	7.44	8.20	4.27	9.61	5.56	1.87	.002
MAX	15	47	16	14	20	32	21	10	23	16	20	.05
MIN	2.2	.08	.00	.00	1.7	1.5	2.2	2.5	4.3	2.8	.00	.00
AC-FT	307	448	374	159	210	457	488	263	572	342	115	.1

CAL YR 1990 TOTAL 2608.85 MEAN 7.15 MAX 47 MIN .00 AC-FT 5170
WTR YR 1991 TOTAL 1883.27 MEAN 5.16 MAX 47 MIN .00 AC-FT 3740

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

LOCATION.--Lat 22°08′14", long 159°19′31", Hydrologic Unit 20070000, on left bank 100 ft downstream from last wasteway, 1.5 mi southwest of mouth of Anahola Stream, and 2.8 mi northwest of Kealia.

PERIOD OF RECORD.--December 1936 to September 1983, October 1984 to current year.

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

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

AVERAGE DISCHARGE.--53 years (water years 1938-83, 1986-91), 2.52 ft^3/s (1,830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft^3/s, June 1, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.00 ft^3/s; minimum daily discharge, no flow for entire year.

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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1990 TOTAL 0.01 MEAN .000 MAX .01 MIN .00 AC-FT .02
WTR YR 1991 TOTAL 0.00 MEAN .000 MAX .00 MIN .00 AC-FT .00

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 Pohakuhonu Stream and 2.3 mi south of Kilauea.

DRAINAGE AREA.--1.9 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. No diversion upstream.

AVERAGE DISCHARGE.--33 years (water years 1959-91), 12.0 ft^3/s (8,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft^3/s, July 23, 1989, gage height, 7.69 ft; minimum, 1.8 ft^3/s, Sept. 6-8, 1968.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 18	0400	836	5.09	Aug. 8	0800	696	4.74
Jun. 3	1300	828	5.07	Aug. 30	0530	*1,190	*5.84

Minimum discharge, 5.4 ft^3/s, Feb. 10-12, 17, 18, Mar. 3-7.

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	7.6	7.6	8.4	7.8	5.7	5.6	9.3	12	12	7.2	7.1	13
2	7.3	7.6	8.9	7.5	5.8	5.5	8.8	9.0	9.4	6.8	8.0	10
3	6.9	7.5	8.3	7.3	5.8	5.5	8.4	8.6	76	6.6	7.3	9.4
4	21	6.9	7.9	7.2	5.6	5.4	8.2	8.2	15	6.5	38	8.5
5	11	9.6	7.6	7.1	5.5	5.4	8.5	7.9	11	6.3	55	8.3
6	8.4	8.9	7.5	7.0	5.5	5.4	8.0	7.7	10	6.3	15	24
7	7.5	8.1	7.3	7.4	5.5	5.6	7.6	7.5	22	6.2	9.9	10
8	7.8	7.0	11	7.2	5.5	11	15	7.6	21	6.1	138	9.2
9	7.2	6.5	21	6.9	5.5	20	23	8.4	14	6.5	38	8.4
10	6.7	6.3	12	6.7	5.4	25	13	12	18	6.7	17	7.9
11	7.1	6.1	9.9	6.6	5.4	27	66	11	14	6.4	12	7.3
12	7.0	6.5	11	6.5	6.5	29	22	9.4	12	11	9.8	7.1
13	6.6	121	30	6.8	6.2	10	12	8.1	10	7.2	12	6.9
14	6.4	102	21	6.4	5.7	8.7	9.6	7.7	11	7.7	8.8	6.9
15	6.1	30	16	6.4	7.5	7.7	9.5	7.3	15	6.8	8.0	6.9
16	5.9	232	11	6.3	5.7	9.5	11	7.1	10	6.5	7.8	6.5
17	12	137	9.5	6.2	5.4	7.9	14	7.1	10	8.0	7.4	6.3
18	7.2	194	9.4	6.2	5.7	38	9.0	7.0	8.7	6.7	7.5	6.2
19	12	43	17	6.2	6.5	76	8.3	7.0	8.2	6.7	7.4	7.0
20	7.0	83	12	6.0	22	102	9.4	6.8	8.2	6.8	7.6	7.4
21	7.0	29	20	6.0	15	18	20	7.6	9.0	7.4	6.7	7.2
22	6.5	52	34	6.0	7.1	12	25	7.0	8.3	6.3	6.5	6.4
23	6.3	68	28	6.8	6.3	31	15	6.8	8.4	6.6	13	6.4
24	6.5	25	19	6.5	6.1	12	10	7.4	10	6.3	31	6.0
25	6.8	16	19	6.6	5.9	37	11	7.6	8.5	12	27	5.9
26	6.2	12	11	6.1	5.7	44	24	6.8	10	8.7	37	5.8
27	5.9	11	10	9.6	5.6	49	12	6.8	9.1	7.1	23	5.8
28	6.1	9.7	9.3	6.2	5.7	27	10	7.2	8.7	6.6	13	5.7
29	6.3	9.2	8.7	5.9	---	16	9.4	6.8	7.6	6.8	27	5.6
30	15	8.7	8.3	5.8	---	12	10	7.9	7.3	15	109	5.5
31	15	---	8.1	5.7	---	10	---	8.9	---	7.9	21	---
TOTAL	256.3	1271.2	422.1	206.9	189.8	678.2	427.0	248.2	402.4	229.7	735.8	237.5
MEAN	8.27	42.4	13.6	6.67	6.78	21.9	14.2	8.01	13.4	7.41	23.7	7.92
MAX	21	232	34	9.6	22	102	66	12	76	15	138	24
MIN	5.9	6.1	7.3	5.7	5.4	5.4	7.6	6.8	7.3	6.1	6.5	5.5
AC-FT	508	2520	837	410	376	1350	847	492	798	456	1460	471

CAL YR 1990 TOTAL 5522.7 MEAN 15.1 MAX 232 MIN 5.2 AC-FT 10950
WTR YR 1991 TOTAL 5305.1 MEAN 14.5 MAX 232 MIN 5.4 AC-FT 10520

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, annual maximum, water years 1962-63, 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). Jan. 1, 1912, to Nov. 20, 1919, nonrecording gage at site 0.2 mi upstream at different datum. Jan. 26 to Dec. 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 (sta. 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream upstream to North Branch of North Fork Wailua River for irrigation. China ditch upstream diverts for irrigation of taro in vicinity of Hanalei.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--28 years (water years 1964-91), 222 ft^3/s (160,800) acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft^3/s, Apr. 19, 1974, gage height, 14.28 ft, from rating curve extended above 9,600 ft^3/s; minimum, 31 ft^3/s, Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 18	unknown	*21,700	*13.64	Aug. 8	unknown	14,200	11.80

Minimum discharge, 98 ft^3/s, Feb. 11, 12.

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	126	145	e115	145	104	111	e150	e250	e240	e130	e180	e180
2	591	151	e140	139	105	108	e130	e140	e240	e115	e180	e140
3	157	150	e130	135	123	107	e160	e130	e510	e110	e170	e130
4	197	136	137	130	108	106	195	e140	e220	e108	e760	e130
5	168	160	132	127	104	105	188	e130	e170	e107	e830	e120
6	137	242	126	123	103	107	169	e130	e150	e105	e240	e270
7	126	179	121	138	102	172	150	e110	e400	e150	e160	e130
8	439	130	469	159	102	e490	286	e130	e410	e115	e1800	e140
9	168	117	428	126	101	e500	e410	e170	e330	e120	e780	e120
10	138	110	240	117	99	e830	e190	e170	e250	e170	331	e125
11	202	107	207	115	99	e920	e900	e160	e280	e110	230	e125
12	146	110	278	112	104	e1130	e490	e150	e180	e250	196	e122
13	133	971	933	124	107	e420	e200	e120	e170	e120	221	e110
14	122	1410	685	110	106	e280	e150	e115	e220	e180	168	e108
15	113	378	518	109	940	e230	e140	e110	e270	e140	163	e108
16	109	1940	267	108	141	e340	e200	e108	e170	e140	162	e107
17	168	e2600	279	106	117	e340	e200	e110	e150	e390	160	e105
18	118	e5080	371	106	120	e1180	e130	e108	e120	e150	e160	e103
19	483	e3400	706	107	300	e1690	e120	e105	e130	e190	e120	e120
20	140	e2400	667	104	724	e1700	e160	e104	e140	e110	e130	e130
21	134	e570	812	104	439	e340	e370	e108	e150	e120	e120	e120
22	210	e1100	1750	103	187	e230	e370	e110	e120	e110	e110	e270
23	126	e880	1120	117	151	e630	e270	e108	e120	e110	e170	e130
24	130	e380	461	112	142	e260	e210	e110	e210	e103	e320	e120
25	125	e250	421	117	130	e650	e250	e115	e150	e190	e460	e115
26	111	e170	245	108	121	e1350	e380	e110	e310	e190	e660	e107
27	107	e150	211	340	116	e1270	e230	e130	e300	e113	e410	e115
28	107	e140	190	134	120	e480	e210	e160	e200	e108	e220	e108
29	108	e120	170	110	---	e240	e150	e140	e140	e130	e410	e101
30	203	e114	160	106	---	e190	e210	e300	e120	e220	e1220	e101
31	460	---	153	105	---	e170	---	e230	---	e130	e270	---
TOTAL	5802	23790	12642	3896	5215	16676	7368	4311	6570	4534	11511	3910
MEAN	187	793	408	126	186	538	246	139	219	146	371	130
MAX	591	5080	1750	340	940	1700	900	300	510	390	1800	270
MIN	107	107	115	103	99	105	120	104	120	103	110	101
AC-FT	11510	47190	25080	7730	10340	33080	14610	8550	13030	8990	22830	7760

CAL YR 1990 TOTAL 108898 MEAN 298 MAX 5080 MIN 84 AC-FT 216000
WTR YR 1991 TOTAL 106225 MEAN 291 MAX 5080 MIN 99 AC-FT 210700

e Estimated

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 powerplant 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.

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--36 years (water years 1953-55, 1959-91), 142 ft^3/s (102,880 acre-ft/yr).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft, from floodmarks, discharge, about 40,000 ft^3/s, from unit-discharge study.

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. 18	0500	4,270	5.47	Apr. 11	2100	3,750	5.28
Dec. 22	0430	3.950	5.36	Aug. 8	0930	3,700	5.26
Mar. 26	0430	*4,370	*5.50				

Minimum, 45 ft^3/s, Nov. 12.

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	74	61	67	73	67	57	74	164	161	79	126	79
2	189	73	92	71	74	56	76	81	158	65	127	69
3	65	81	83	70	105	56	83	77	166	63	114	68
4	80	77	63	69	86	55	86	92	122	62	584	63
5	67	114	61	68	79	54	130	79	99	68	490	64
6	59	186	58	68	70	73	93	78	88	62	139	130
7	61	65	56	113	67	188	82	69	297	112	89	71
8	366	54	249	106	65	423	284	85	243	64	979	88
9	83	50	297	71	64	392	304	119	222	79	445	68
10	72	48	147	68	64	696	112	104	137	120	141	71
11	147	47	155	67	63	735	483	99	197	71	105	66
12	82	53	224	66	78	809	371	99	96	182	85	70
13	69	630	751	66	87	224	103	70	100	82	138	60
14	59	1150	453	65	125	147	82	68	138	122	79	61
15	53	178	305	65	641	119	82	58	187	92	79	61
16	50	382	122	65	81	201	120	58	97	92	88	59
17	105	1110	109	64	68	190	116	63	92	284	98	57
18	63	2630	247	64	68	967	77	62	72	96	102	55
19	157	2170	470	64	134	1340	72	56	78	117	74	86
20	60	1670	573	64	427	947	116	56	83	71	83	89
21	57	229	882	64	278	181	282	57	103	80	75	65
22	225	483	2050	64	95	129	204	62	77	64	70	215
23	61	272	820	91	72	387	183	59	70	69	105	82
24	90	162	266	80	78	125	143	66	157	65	157	63
25	77	102	236	74	68	328	170	70	100	140	300	62
26	56	80	134	68	61	1150	222	68	230	138	442	59
27	56	70	122	205	59	986	137	88	222	72	266	56
28	60	66	98	117	59	248	127	115	131	69	128	55
29	64	63	82	77	---	120	88	93	81	94	207	54
30	214	62	80	69	---	91	138	164	77	140	477	54
31	162	---	78	68	---	83	---	171	---	77	105	---
TOTAL	3083	12418	9430	2404	3283	11557	4640	2650	4081	2991	6497	2200
MEAN	99.5	414	304	77.5	117	373	155	85.5	136	96.5	210	73.3
MAX	366	2630	2050	205	641	1340	483	171	297	284	979	215
MIN	50	47	56	64	59	54	72	56	70	62	70	54
AC-FT	6120	24630	18700	4770	6510	22920	9200	5260	8090	5930	12890	4360

CAL YR 1990 TOTAL 67912 MEAN 186 MAX 2630 MIN 47 AC-FT 134700
WTR YR 1991 TOTAL 65234 MEAN 179 MAX 2630 MIN 47 AC-FT 129400

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, from topographic map.

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

AVERAGE DISCHARGE.--68 years (water years 1914-24, 1927-52, 1961-91), 16.6 ft^3/s (12,030 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s, Oct. 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, Mar. 2, 13, 1941.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 20	0845	*3,670	*10.28	(a)	--	2,740	8.74
Dec. 21	2300	1,810	7.18				

Minimum discharge, 0.85 ft^3/s, Feb. 10-12.

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	17	5.7	7.3	6.3	1.5	1.4	e4.5	12	47	53	6.5	8.6
2	43	20	37	5.8	1.4	1.3	e4.5	5.9	70	11	11	14
3	54	20	13	5.4	2.0	1.2	e4.5	5.3	56	8.4	31	7.0
4	31	7.2	7.8	5.0	1.9	1.1	e3.9	6.3	12	13	58	26
5	20	12	6.2	4.8	1.3	.99	9.5	4.4	32	6.1	15	6.6
6	12	8.5	5.6	4.8	1.2	e1.8	4.4	3.9	23	5.4	9.5	6.1
7	12	40	5.2	34	1.1	e19	3.3	3.8	16	106	9.5	5.9
8	15	19	27	7.5	1.0	e20	60	3.9	15	8.6	202	7.7
9	8.1	5.9	114	4.9	.94	e62	59	45	11	6.6	37	4.9
10	6.8	5.1	14	4.9	.89	e8.1	11	14	7.0	116	11	4.9
11	8.7	4.6	11	4.4	.85	e19	29	6.8	9.6	42	14	12
12	7.6	24	10	3.9	1.0	e66	8.7	4.9	6.6	35	11	16
13	9.8	230	95	3.5	4.7	e34	5.9	4.1	6.5	12	51	6.7
14	5.7	285	42	3.3	27	e11	5.6	3.6	5.2	13	8.9	5.5
15	5.1	52	26	5.4	21	e8.1	10	3.5	7.6	15	8.0	4.2
16	34	275	13	3.7	2.2	e29	12	3.2	4.8	42	6.8	3.8
17	47	148	9.6	4.3	1.4	e28	6.1	3.9	5.8	60	6.5	3.4
18	15	152	89	3.1	3.9	e102	5.9	3.5	4.7	11	11	3.2
19	30	184	38	2.7	17	e340	4.1	2.8	4.5	14	10	4.8
20	8.4	343	18	2.4	55	e203	3.6	2.6	7.7	32	6.9	4.9
21	8.6	30	82	2.3	21	e242	4.4	2.5	4.5	11	5.2	16
22	5.7	20	177	2.2	4.4	e37	5.7	2.5	3.7	9.7	4.8	5.9
23	19	22	51	2.2	3.0	e92	4.7	2.3	4.1	7.5	31	3.2
24	6.8	15	21	2.3	2.6	e28	17	3.8	4.7	6.6	7.3	2.9
25	9.5	12	20	2.1	2.2	e17	54	6.5	40	11	10	4.3
26	5.4	11	13	1.9	1.9	e13	69	3.8	17	21	12	2.7
27	4.8	9.3	11	22	1.7	e13	18	2.6	56	6.1	15	2.4
28	6.5	8.4	9.9	3.7	1.6	e9.0	12	2.2	41	5.4	10	2.2
29	6.3	10	8.6	2.1	---	e7.0	6.8	2.8	8.5	18	109	4.6
30	59	7.8	7.5	1.8	---	e5.6	18	35	21	62	106	4.6
31	9.3	---	6.8	1.6	---	e5.0	---	35	---	9.5	11	---
TOTAL	531.1	1986.5	996.5	164.3	185.68	1425.59	465.1	242.4	552.5	777.9	845.9	205.0
MEAN	17.1	66.2	32.1	5.30	6.63	46.0	15.5	7.82	18.4	25.1	27.3	6.83
MAX	59	343	177	34	55	340	69	45	70	116	202	26
MIN	4.8	4.6	5.2	1.6	.85	.99	3.3	2.2	3.7	5.4	4.8	2.2
AC-FT	1050	3940	1980	326	368	2830	923	481	1100	1540	1680	407

CAL YR 1990 TOTAL 8157.49 MEAN 22.3 MAX 343 MIN .29 AC-FT 16180
WTR YR 1991 TOTAL 8378.47 MEAN 23.0 MAX 343 MIN .85 AC-FT 16620

a Sometime during period Mar. 19-21.
e Estimated

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.

REMARKS.--Records good. Prior to 1960, diversions from reservoirs upstream for use at Schofield Barracks.

AVERAGE DISCHARGE.--29 years (water years, 1961-62, 1965-91), 22.2 ft^3/s (16,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft^3/s, Apr. 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)
Nov. 20	1030	*2,420	*7.22	Mar. 20	0245	1,690	6.10
Dec. 22	0300	1,340	5.51	Mar. 21	0445	1,880	6.41
Mar. 19	1615	1,630	6.00				

Minimum discharge, 1.8 ft^3/s, Feb. 18, Mar. 5, 6.

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	25	7.4	12	15	3.0	2.6	12	27	16	68	11	13
2	41	28	34	14	2.8	2.3	12	11	20	19	15	19
3	24	12	15	13	3.5	2.1	12	8.8	62	12	45	11
4	66	9.5	12	11	3.4	2.0	11	12	17	10	41	17
5	39	6.3	10	11	2.8	1.9	20	8.1	33	8.5	24	9.2
6	19	5.6	8.4	10	2.5	2.5	13	7.0	79	7.4	12	7.5
7	14	15	7.7	31	2.3	30	8.7	6.4	59	41	10	7.3
8	12	36	39	13	2.2	32	28	6.8	38	11	156	11
9	11	6.6	250	9.4	2.2	103	108	19	22	7.6	61	6.8
10	9.3	4.9	40	9.1	2.1	12	25	14	15	160	17	7.2
11	14	4.4	18	8.0	2.1	30	75	9.0	14	59	20	20
12	12	21	15	7.5	2.4	110	18	6.1	13	54	20	30
13	20	307	108	6.9	2.8	54	12	5.4	9.9	20	46	17
14	9.5	476	81	6.4	5.8	17	11	5.0	8.9	14	14	11
15	7.4	64	28	6.5	10	12	29	4.7	8.8	16	11	7.8
16	6.6	228	22	6.6	3.6	47	40	4.5	8.3	57	11	6.3
17	47	173	16	6.0	2.2	45	20	4.3	10	93	9.8	5.5
18	9.7	182	155	5.7	6.5	174	11	4.2	7.7	25	9.5	5.1
19	29	244	97	5.2	18	615	9.2	3.9	6.9	17	12	5.0
20	15	492	46	4.7	90	357	8.6	4.0	7.9	17	14	8.7
21	14	70	71	4.5	64	430	15	3.8	9.4	15	7.9	29
22	9.1	44	342	4.3	9.3	60	18	4.5	6.9	14	6.8	14
23	25	44	117	4.2	5.7	156	15	3.5	8.4	14	24	5.8
24	13	32	61	4.3	4.6	45	9.4	3.2	8.1	10	8.5	4.5
25	9.3	25	52	4.0	3.8	33	16	16	9.9	17	12	15
26	7.9	21	34	3.8	3.2	27	42	13	31	16	13	5.9
27	5.9	18	29	30	2.8	27	13	11	61	9.3	27	4.0
28	18	16	27	8.8	2.7	20	18	7.7	75	7.5	23	3.6
29	11	17	24	4.6	---	16	12	15	16	33	111	4.3
30	47	14	19	3.6	---	15	22	21	26	103	150	12
31	16	---	17	3.2	---	13	---	37	---	19	19	---
TOTAL	606.7	2623.7	1807.1	275.3	266.3	2493.4	663.9	306.9	708.1	974.3	961.5	323.5
MEAN	19.6	87.5	58.3	8.88	9.51	80.4	22.1	9.90	23.6	31.4	31.0	10.8
MAX	66	492	342	31	90	615	108	37	79	160	156	30
MIN	5.9	4.4	7.7	3.2	2.1	1.9	8.6	3.2	6.9	7.4	6.8	3.6
AC-FT	1200	5200	3580	546	528	4950	1320	609	1400	1930	1910	642

CAL YR 1990 TOTAL 11402.30 MEAN 31.2 MAX 492 MIN .39 AC-FT 22620
WTR YR 1991 TOTAL 12010.7 MEAN 32.9 MAX 615 MIN 1.9 AC-FT 23820

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 bench mark).

REMARKS.--Records good. Honolulu Board of Water Supply wells upstream of gage were put into production this year. Recording rain gage located at station.

AVERAGE DISCHARGE.--32 years, 1.97 ft^3/s (1,430 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft^3/s, Jan. 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, Nov. 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)
Dec. 19	1730	*124	*2.99				

Minimum discharge, 0.04 ft^3/s, Sep. 18.

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	.85	.90	1.1	1.4	1.1	2.0	1.4	1.3	1.0	.59	.24	.27
2	.86	.90	1.0	1.2	.95	1.8	1.3	1.2	1.0	.44	.27	.29
3	.85	.86	.95	1.1	1.6	1.7	1.3	1.3	1.7	.32	.25	.28
4	.83	.85	.90	.93	1.2	1.6	1.1	1.3	1.1	.28	.22	.25
5	.83	.84	.88	.82	1.1	1.5	1.1	1.3	.89	.25	.19	.24
6	.78	.82	.85	.71	1.0	1.5	.93	.88	.68	.22	.17	.23
7	.77	.82	.82	.66	.98	2.5	.80	.54	.82	.19	.18	.22
8	.77	.82	2.1	.70	.92	3.9	.82	.70	.80	.17	3.1	.22
9	.92	.82	3.3	.48	.93	3.7	2.9	1.1	.48	.16	.97	.18
10	1.1	.82	1.8	.42	.90	2.4	1.7	.92	.49	.19	.46	.16
11	1.0	.82	1.4	.45	.90	2.1	2.5	.65	.47	.19	.33	.15
12	1.0	.87	1.3	.43	5.3	4.0	2.2	.57	.40	.21	.27	.16
13	1.1	1.8	1.5	.47	7.6	4.5	1.7	.52	.36	.21	.25	.14
14	1.1	1.4	1.4	.49	3.3	2.8	1.6	.53	.30	.19	.23	.14
15	1.0	1.2	1.3	.49	2.6	2.4	1.5	.77	.26	.16	.20	.12
16	1.1	1.1	1.2	.41	2.1	2.3	1.4	1.2	.24	.26	.17	.12
17	1.0	6.6	1.1	.43	2.0	2.2	1.3	1.2	.22	.50	.15	.12
18	1.0	4.2	3.8	.46	1.9	3.0	1.3	1.2	.24	.44	.15	.12
19	1.0	3.0	24	.49	1.7	16	1.3	1.2	.23	.39	.15	.15
20	2.9	2.7	7.9	.50	4.5	14	1.2	1.1	.23	.34	.10	.11
21	1.2	1.8	3.7	.53	3.0	16	1.3	1.1	.22	.30	.10	.44
22	1.1	1.4	3.1	.53	2.1	4.6	1.1	1.2	.19	.27	.09	.35
23	1.1	6.5	10	.44	1.8	6.6	1.2	1.3	.19	.26	.07	.29
24	1.1	3.8	7.8	.56	4.0	3.6	1.4	1.3	.19	.24	.10	.29
25	1.1	2.0	12	.74	3.0	3.0	1.4	1.2	.19	.27	.11	.26
26	1.1	1.6	4.9	.66	2.3	2.7	1.4	1.1	.25	.23	.10	.24
27	.90	1.4	3.4	6.2	2.0	2.4	1.4	1.1	.23	.16	.09	.21
28	.94	1.3	3.1	2.0	2.7	2.1	1.4	.99	.21	.15	.11	.19
29	.91	1.2	2.6	1.6	---	1.8	1.3	.98	.19	.16	.13	.19
30	.90	1.2	1.9	1.3	---	1.6	1.3	.96	.21	.15	.18	.19
31	.90	---	1.6	1.2	---	1.5	---	1.0	---	.25	.25	---
TOTAL	32.01	54.34	112.70	28.80	63.48	121.8	42.55	31.71	13.98	8.14	9.38	6.32
MEAN	1.03	1.81	3.64	.93	2.27	3.93	1.42	1.02	.47	.26	.30	.21
MAX	2.9	6.6	24	6.2	7.6	16	2.9	1.3	1.7	.59	3.1	.44
MIN	.77	.82	.82	.41	.90	1.5	.80	.52	.19	.15	.07	.11
AC-FT	63	108	224	57	126	242	84	63	28	16	19	13

CAL YR 1990 TOTAL 1153.63 MEAN 3.16 MAX 124 MIN .25 AC-FT 2290
WTR YR 1991 TOTAL 525.21 MEAN 1.44 MAX 24 MIN .07 AC-FT 1040

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, 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.--34 years, 11.2 ft^3/s (8,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft^3/s, Mar. 21, 1990, gage height, 12.67 ft, from rating curve extended above 5,680 ft^3/s on basis of the shape of the rating.

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. 13	1530	1,510	8.10	Mar. 19	1445	1,680	8.38
Nov. 20	0930	2,910	10.08	Mar. 20	0015	2,350	9.37
Dec. 18	0445	988	7.02	Mar. 21	0345	*6,370	*12.67
Dec. 22	0130	1,430	7.94				

Minimum discharge, 0.32 ft^3/s, Feb. 10, Mar. 5, 6.

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	5.7	15	5.7	5.8	.83	.88	e4.4	5.3	1.8	50	3.3	7.2
2	14	47	25	5.4	.81	.67	4.0	2.9	3.5	11	2.4	7.6
3	4.1	5.6	7.1	5.3	1.3	.47	3.9	2.2	17	4.9	2.3	5.3
4	14	3.7	5.0	4.5	1.5	.40	3.4	2.7	7.0	3.6	11	6.3
5	14	3.0	4.0	4.5	.96	.34	3.9	2.4	9.4	2.7	7.8	4.0
6	4.9	3.0	3.2	4.2	.63	.37	4.2	1.7	27	2.4	2.7	2.9
7	3.6	4.5	2.9	16	.49	1.4	2.7	1.4	14	18	2.1	2.5
8	2.9	9.7	15	5.9	.44	6.2	29	1.4	16	4.8	95	2.3
9	2.5	3.0	94	3.8	.42	43	80	4.2	6.1	2.5	47	1.9
10	2.4	2.1	21	3.3	.37	4.2	25	5.3	4.1	74	8.1	2.0
11	2.6	1.7	9.3	2.6	.38	3.2	47	2.1	5.1	12	6.2	11
12	2.4	14	7.1	2.4	.77	40	12	1.4	2.4	14	5.6	7.7
13	2.5	289	22	3.6	4.4	19	7.0	1.1	1.7	6.3	15	6.7
14	2.2	214	29	7.9	4.3	6.1	10	.94	1.4	6.0	4.7	4.4
15	1.8	32	12	6.2	10	3.7	13	.83	1.2	4.9	3.7	5.3
16	1.6	135	8.8	3.9	2.1	14	14	.75	1.2	5.7	3.1	2.9
17	1.7	154	6.2	3.4	.96	6.9	7.3	.67	1.1	21	2.4	1.7
18	1.5	147	104	2.9	4.3	57	5.1	.63	1.0	6.3	3.5	1.3
19	39	139	64	1.8	7.5	529	4.1	.57	.82	4.7	3.2	2.5
20	14	351	31	1.4	21	298	3.7	.54	.72	3.8	3.4	5.1
21	11	98	87	1.2	33	781	3.2	.52	1.7	2.9	3.3	8.2
22	4.2	56	247	1.1	4.9	314	4.7	.61	.85	10	2.0	7.2
23	3.7	30	80	1.2	2.6	377	3.7	.54	.84	6.0	9.7	2.2
24	4.4	15	35	1.3	1.8	227	2.7	.48	2.2	2.7	3.2	1.4
25	2.6	9.3	37	1.1	1.4	146	3.0	.91	5.3	7.2	3.0	2.6
26	2.7	7.5	18	.92	1.0	86	36	1.1	16	5.0	5.6	1.8
27	1.8	6.6	13	19	.90	e42	5.8	1.1	23	2.8	10	.89
28	2.5	6.1	9.8	4.9	.83	e19	6.7	.80	26	1.7	7.2	.73
29	3.8	11	8.1	1.8	---	e11	3.7	.50	6.3	1.7	118	3.2
30	33	5.6	6.8	1.2	---	e7.5	5.1	.60	3.5	37	147	9.7
31	11	---	6.4	.97	---	e5.8	---	1.8	---	7.0	13	---
TOTAL	218.1	1818.4	1024.4	129.49	109.89	3051.13	358.3	47.99	208.23	342.6	554.5	128.52
MEAN	7.04	60.6	33.0	4.18	3.92	98.4	11.9	1.55	6.94	11.1	17.9	4.28
MAX	39	351	247	19	33	781	80	5.3	27	74	147	11
MIN	1.5	1.7	2.9	.92	.37	.34	2.7	.48	.72	1.7	2.0	.73
AC-FT	433	3610	2030	257	218	6050	711	95	413	680	1100	255

CAL YR 1990 TOTAL 5684.25 MEAN 15.6 MAX 351 MIN .00 AC-FT 11270
WTR YR 1991 TOTAL 7991.55 MEAN 21.9 MAX 781 MIN .34 AC-FT 15850

e Estimated

16213000 WAIKELE STREAM AT WAIPAHU
(National stream-quality accounting network station)

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.

WATER-DISCHARGE RECORDS

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. Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.

REMARKS.--Records good. Diversions upstream for irrigation of sugarcane in vicinity of Waipahu.

AVERAGE DISCHARGE.--38 years (water years 1953-59, 1961-91), 39.0 ft^3/s (28,260 acre-ft/yr). The figure published in the water year 1990 report was in error; the correct figure is 37 years (water years 1953-59, 1961-90), 38.5 ft^3/s (27,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s, Nov. 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 Feb. 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)
Nov. 13	1730	1,400	4.86	Mar. 19	1630	2,680	6.18
Nov. 20	1130	2,600	6.10	Mar. 21	0330	*11,740	*12.12
Dec. 22	0330	1,580	5.05				

Minimum discharge, 16 ft^3/s, Oct. 16-19.

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	42	26	26	33	24	23	34	32	24	64	28	35
2	38	73	42	31	24	23	33	31	24	59	23	29
3	27	33	39	30	30	23	33	27	28	30	23	31
4	32	23	29	30	25	22	32	26	54	29	25	30
5	54	20	26	29	24	21	32	26	30	29	37	35
6	29	19	24	28	24	21	32	26	63	28	30	24
7	23	18	23	36	23	22	32	33	53	39	24	25
8	21	27	23	39	23	25	50	28	66	40	161	24
9	19	27	223	30	23	100	228	26	42	28	101	22
10	18	21	100	28	24	43	56	28	34	98	43	21
11	18	19	43	27	25	31	154	28	55	62	31	22
12	19	26	34	26	28	97	64	25	31	40	27	33
13	18	366	43	25	25	82	42	25	26	35	33	34
14	19	407	74	26	27	41	38	25	24	28	31	26
15	18	98	42	32	32	32	47	24	24	27	24	25
16	18	158	39	27	27	35	60	23	23	27	23	25
17	16	349	32	25	25	49	47	23	23	46	25	22
18	16	324	197	25	24	82	36	23	23	38	25	21
19	27	278	197	24	30	1010	33	23	24	29	22	20
20	95	658	121	23	41	766	31	23	22	27	22	22
21	27	119	91	23	87	2590	30	23	22	27	22	34
22	29	69	587	23	36	140	30	24	25	25	20	46
23	21	61	260	22	29	244	30	27	28	36	22	28
24	21	50	119	22	26	115	28	23	25	28	24	24
25	23	40	114	22	25	97	28	25	24	25	20	23
26	19	36	71	22	25	72	61	23	33	28	22	28
27	19	32	55	88	23	66	40	24	45	24	33	24
28	20	30	48	43	23	47	35	26	73	22	32	22
29	19	32	50	28	---	41	34	24	42	22	161	36
30	43	29	39	25	---	39	31	24	28	54	275	36
31	47	---	36	24	---	36	---	23	---	48	58	---
TOTAL	855	3468	2847	916	802	6035	1461	791	1038	1142	1447	827
MEAN	27.6	116	91.8	29.5	28.6	195	48.7	25.5	34.6	36.8	46.7	27.6
MAX	95	658	587	88	87	2590	228	33	73	98	275	46
MIN	16	18	23	22	23	21	28	23	22	22	20	20
AC-FT	1700	6880	5650	1820	1590	11970	2900	1570	2060	2270	2870	1640

CAL YR 1990 TOTAL 18550 MEAN 50.8 MAX 658 MIN 16 AC-FT 36790
WTR YR 1991 TOTAL 21629 MEAN 59.3 MAX 2590 MIN 16 AC-FT 42900

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-72. April 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981.
WATER TEMPERATURE: April 1973 to September 1981.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

INSTRUMENTATION.--Water-quality monitor April 1973 to September 1981. Automatic pumping sediment sampler since July 1972.

REMARKS.--In addition to the sediment record, water-quality samples are collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm, Dec. 1, 1980; minimum, 30 micromhos/cm, Apr. 19, 1974.
WATER TEMPERATURES: Maximum, 30.0°C, May 6, 1973; minimum, 16.0°C, Mar. 16, 1976.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 1 mg/L, Mar. 16, 20-22, 1989, July 10, 1990.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons, Apr. 19, 1974; minimum daily, 0.06 ton, Mar. 21, 22, 1989.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,020 mg/L (estimated), Mar. 21; minimum daily mean, 4 mg/L, June 1.
SEDIMENT DISCHARGE: Maximum daily, 30,900 tons (estimated), Mar. 21; minimum daily, 0.28 ton, Oct. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)	NITRO-GEN DIS-SOLVED (MG/L AS N)
OCT											
10...	0930	18	380	6.8	26.5	22.5	5.1	767	6.9	79	--
DEC											
17...	1000	33	278	7.3	27.0	21.5	2.9	766	8.2	92	--
FEB											
12...	0900	27	382	6.8	22.5	22.0	6.2	765	7.4	84	--
APR											
22...	0940	30	360	7.0	28.0	22.5	1.8	768	10.2	117	--
JUN											
17...	1050	23	440	7.0	32.0	24.5	2.1	767	8.6	103	--
JUL											
18...	1000	38	270	7.3	--	23.0	1.4	764	7.4	86	--
18...	1030	38	--	--	--	--	3.6	--	--	--	--
18...	1400	38	295	7.5	30.5	25.0	16	764	7.2	87	--
23...	0950	36	340	7.4	--	23.5	4.4	766	7.4	87	1.4

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
10...	12000	1300	62	2	10	9.0	53	64	3	2.2	73
DEC											
17...	7700	1400	48	3	8.2	6.8	37	61	2	1.7	55
FEB											
12...	6600	3700	67	6	11	9.6	53	62	3	2.3	74
APR											
22...	10000	3500	68	11	12	9.2	47	59	2	2.2	70
JUN											
17...	4600	1200	71	6	12	10	56	62	3	2.3	79
JUL											
18...	--	--	46	5	8.2	6.3	35	61	2	1.8	51
18...	--	--	46	--	8.0	6.2	36	62	2	1.8	--
18...	--	14000	48	4	8.5	6.4	37	62	2	1.9	--
23...	11000	1600	62	15	11	8.4	42	59	2	1.8	57

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	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)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT											
10...	0	60	14	76	<0.10	54	258	261	0.35	1.40	1.30
DEC											
17...	0	45	15	52	<0.10	37	179	189	0.24	0.900	0.900
FEB											
12...	0	60	18	76	0.10	55	254	268	0.35	1.30	1.30
APR											
22...	0	57	14	64	0.10	47	222	235	0.30	1.20	1.10
JUN											
17...	0	64	16	79	0.20	57	269	279	0.37	1.50	1.50
JUL											
18...	0	42	9.7	45	0.10	31	195	166	0.27	0.820	0.840
18...	--	--	10	48	0.10	31	196	172	0.27	0.820	0.840
18...	0	44	10	49	0.10	33	188	173	0.26	--	--
23...	0	47	13	65	0.10	39	206	213	0.28	0.910	0.900

DATE	TIME	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)
OCT											
10...	0930	0.050	0.050	--	0.50	--	1.9	0.150	0.52	0.140	0.170
DEC											
17...	1000	0.050	0.040	--	<0.20	--	--	0.110	0.37	0.090	0.110
FEB											
12...	0900	0.040	0.030	--	0.40	--	1.7	0.180	0.52	0.180	0.160
APR											
22...	0940	0.040	0.040	--	0.30	--	1.5	0.140	0.46	0.130	0.140
JUN											
17...	1050	0.070	0.060	--	0.30	--	1.8	0.210	0.55	0.190	0.180
JUL											
18...	1000	0.030	0.030	--	0.20	--	1.0	0.140	0.31	0.120	0.100
18...	1030	0.030	0.020	--	0.20	--	1.0	0.140	0.31	0.130	0.100
23...	0950	0.040	0.030	0.47	0.30	0.50	1.2	0.110	0.37	0.100	0.110

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
10...	0930	<10	<1	6	<0.5	<1.0	1	<3	<1	46	<1
FEB											
12...	0900	10	<1	6	<0.5	<1.0	1	<3	1	46	<1
APR											
22...	0940	<10	<1	5	<0.5	<1.0	<1	<3	<1	40	<1
JUL											
23...	0950	<10	<1	5	<0.5	<1.0	2	<3	1	31	<1

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	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)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
10...	<4	70	<0.1	<10	<1	<1	<1.0	74	33	<3
FEB										
12...	<4	70	<0.1	<10	<1	<1	<1.0	78	31	3
APR										
22...	<4	72	<0.1	<10	1	<1	<1.0	84	26	<3
JUL										
23...	<4	49	0.1	<10	3	<1	<1.0	75	22	9

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLE LOC-ATION, CROSS SECTION (FT FM R BK)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
APR								
22...	0940	6.0	360	6.9	22.5	768	10.1	116
22...	0942	13.5	360	6.9	22.5	768	10.2	117
22...	0944	27.0	360	7.0	22.5	768	10.2	117
22...	0946	40.5	365	7.0	22.5	768	10.1	116
22...	0948	48.0	370	7.0	22.5	768	10.1	116

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					APR				
10...	0930	7	0.34	100	22...	0940	3	0.24	100
DEC					JUN				
17...	1000	5	0.44	100	17...	1050	5	0.31	100
FEB					JUL				
12...	0900	9	0.66	100	23...	0950	7	0.68	100

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	42	25	2.9	26	17	1.2	26	9	.64
2	38	19	2.0	73	113	30	42	11	1.5
3	27	18	1.3	33	36	3.5	39	15	1.6
4	32	15	1.3	23	11	.70	29	10	.75
5	54	20	2.8	20	10	.54	26	11	.75
6	29	19	1.5	19	11	.54	24	11	.75
7	23	15	.92	18	9	.46	23	7	.41
8	21	8	.42	27	10	.80	23	7	.44
9	19	6	.31	27	14	.97	223	164	126
10	18	10	.49	21	11	.63	100	52	18
11	18	7	.34	19	12	.64	43	11	1.3
12	19	7	.33	26	18	1.3	34	7	.66
13	18	7	.34	366	344	788	43	9	1.2
14	19	9	.47	407	176	199	74	13	2.5
15	18	8	.36	98	23	5.7	42	11	1.2
16	18	7	.32	158	66	42	39	9	1.0
17	16	7	.31	349	287	320	32	7	.65
18	16	6	.28	324	305	309	197	176	129
19	27	11	1.1	278	217	170	197	129	69
20	95	123	37	658	946	2620	121	54	19
21	27	53	4.0	119	128	45	91	57	29
22	29	19	1.5	69	98	18	587	671	1360
23	21	15	.82	61	230	39	260	180	131
24	21	10	.61	50	42	5.8	119	142	47
25	23	13	.79	40	20	2.2	114	80	25
26	19	13	.65	36	14	1.3	71	e68	13
27	19	12	.59	32	12	1.0	55	e45	6.7
28	20	12	.65	30	10	.84	48	e33	4.2
29	19	10	.50	32	10	.86	50	e38	5.6
30	43	20	2.8	29	10	.77	39	e19	2.0
31	47	31	4.1	---	---	---	36	e17	1.6
TOTAL	855	---	71.80	3468	---	4609.75	2847	---	2001.45
		JANUARY			FEBRUARY			MARCH	
1	33	e15	1.4	24	12	.74	23	e7	.41
2	31	e14	1.2	24	10	.64	23	e6	.38
3	30	e13	1.0	30	13	1.1	23	e6	.37
4	30	e10	.81	25	16	1.1	22	e6	.36
5	29	e9	.70	24	12	.74	21	e6	.34
6	28	e9	.68	24	10	.61	21	e7	.37
7	36	e21	2.5	23	9	.57	22	e8	.45
8	39	e19	2.1	23	9	.54	25	e9	.64
9	30	e12	.98	23	8	.46	100	e116	46
10	28	e9	.67	24	7	.48	43	e29	3.5
11	27	e8	.59	25	8	.56	31	e21	1.7
12	26	e7	.51	28	10	.77	97	e74	28
13	25	e7	.47	25	9	.61	82	e75	17
14	26	e7	.49	27	9	.66	41	e37	4.2
15	32	e14	1.2	32	11	1.0	32	e23	2.0
16	27	e9	.67	27	11	.80	35	e23	2.4
17	25	e8	.52	25	e10	.64	49	e26	3.5
18	25	e8	.52	24	e11	.71	82	e62	30
19	24	e7	.42	30	e20	1.7	1010	e955	4330
20	23	e6	.38	41	e27	3.5	766	e611	1680
21	23	e6	.37	87	e101	27	2590	e2020	30900
22	23	e6	.37	36	e37	3.7	140	101	42
23	22	e7	.45	29	e13	1.0	244	205	206
24	22	7	.39	26	e9	.66	115	107	35
25	22	6	.35	25	e9	.60	97	59	16
26	22	7	.39	25	e8	.55	72	57	11
27	88	290	131	23	e8	.48	66	25	4.5
28	43	70	9.5	23	e7	.45	47	21	2.7
29	28	23	1.8	---	---	---	41	18	2.0
30	25	17	1.1	---	---	---	39	16	1.7
31	24	22	1.4	---	---	---	36	12	1.1
TOTAL	916	---	164.93	802	---	52.37	6035	---	37373.62

e Estimated

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	34	8	.73	32	6	.52	24	4	.29
2	33	8	.76	31	6	.54	24	5	.29
3	33	9	.80	27	5	.40	28	11	.94
4	32	12	1.0	26	6	.39	54	16	2.3
5	32	13	1.1	26	7	.50	30	8	.68
6	32	9	.82	26	7	.48	63	6	1.1
7	32	7	.64	33	15	1.4	53	14	2.1
8	50	26	6.7	28	21	1.6	66	16	2.8
9	228	222	186	26	15	1.1	42	10	1.2
10	56	57	8.4	28	10	.78	34	8	.74
11	154	179	81	28	7	.51	55	16	2.2
12	64	60	11	25	5	.33	31	19	1.6
13	42	17	1.9	25	5	.31	26	20	1.4
14	38	12	1.2	25	10	.63	24	21	1.4
15	47	12	1.6	24	9	.61	24	15	.95
16	60	12	2.0	23	5	.34	23	19	1.2
17	47	13	1.6	23	7	.40	23	33	2.0
18	36	12	1.2	23	6	.39	23	33	2.1
19	33	13	1.2	23	7	.46	24	24	1.6
20	31	13	1.1	23	8	.51	22	27	1.6
21	30	9	.78	23	8	.51	22	44	2.6
22	30	6	.51	24	8	.56	25	39	2.6
23	30	11	.89	27	9	.61	28	24	1.8
24	28	9	.73	23	7	.46	25	21	1.4
25	28	5	.41	25	18	1.2	24	24	1.5
26	61	11	1.9	23	19	1.2	33	46	4.5
27	40	12	1.3	24	10	.65	45	66	8.0
28	35	10	.93	26	11	.76	73	48	9.5
29	34	9	.86	24	11	.71	42	31	3.6
30	31	6	.50	24	8	.54	28	24	1.8
31	---	---	---	23	5	.31	---	---	---
TOTAL	1461	---	319.56	791	---	19.71	1038	---	65.79
		JULY			AUGUST			SEPTEMBER	
1	64	50	9.9	28	132	9.9	35	130	12
2	59	109	16	23	117	7.3	29	145	11
3	30	92	7.7	23	139	8.7	31	194	16
4	29	39	3.0	25	258	18	30	172	14
5	29	40	3.2	37	299	29	35	144	13
6	28	43	3.2	30	499	40	24	218	14
7	39	48	5.4	24	359	24	25	262	18
8	40	74	7.9	161	886	713	24	379	24
9	28	51	3.9	101	230	59	22	486	29
10	98	170	66	43	173	20	21	514	29
11	62	203	33	31	132	11	22	749	45
12	40	268	29	27	90	6.6	33	638	58
13	35	225	22	33	75	6.7	34	348	32
14	28	276	21	31	70	5.9	26	311	22
15	27	296	21	24	42	2.8	25	332	22
16	27	145	10	23	52	3.2	25	250	17
17	46	119	15	25	88	6.0	22	160	9.6
18	38	62	6.5	25	68	4.7	21	265	15
19	29	61	4.7	22	52	3.1	20	380	21
20	27	81	6.0	22	97	5.9	22	352	21
21	27	96	6.8	22	87	5.3	34	470	46
22	25	95	6.5	20	59	3.2	46	375	45
23	36	83	8.1	22	107	6.5	28	299	22
24	28	64	4.9	24	91	6.0	24	333	21
25	25	49	3.3	20	41	2.3	23	267	16
26	28	43	3.2	22	64	4.1	28	233	18
27	24	34	2.3	33	64	5.7	24	240	16
28	22	54	3.2	32	47	4.0	22	306	18
29	22	87	5.2	161	291	173	36	414	42
30	54	120	18	275	584	521	36	463	44
31	48	160	20	58	226	38	---	---	---
TOTAL	1142	---	375.9	1447	---	1753.9	827	---	730.6
YEAR	21629		47539.38						

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.

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

REMARKS.--Records fair. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--39 years, 34.7 ft^3/s (25,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft^3/s, revised, Oct. 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.

REVISIONS.--The maximum discharge for the water years 1982 to 1989 have been revised to 27,900 ft^3/s, Oct. 28, 1981, and the gage height for the water years 1983 to 1989 have been revised to 22.46 ft. as a result of typographical error.

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. 13	1200	6,360	12.88	Mar. 19	1530	8,800	14.56
Nov. 14	0230	2,550	9.13	Mar. 21	0500	*27,600	*22.36
Nov. 16	2300	2,460	9.01	Mar. 23	1400	2,910	9.58
Nov. 20	1030	7,410	13.65	Aug. 8	0700	3,000	9.69
Dec. 18	0600	3,450	10.65	Aug. 29	0830	3,220	9.96
Dec. 22	0300	4,530	12.12				

Minimum discharge, 1.4 ft^3/s, Oct.13, 27.

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	17	7.1	5.0	6.2	2.3	2.3	5.1	6.1	2.0	45	5.3	12
2	12	67	27	4.9	2.3	2.5	5.0	4.6	2.0	20	3.0	6.6
3	6.5	8.9	15	4.1	4.4	2.3	5.0	3.3	4.3	8.2	2.4	5.7
4	17	5.1	7.1	3.7	2.5	2.3	4.5	2.9	8.4	4.6	15	3.9
5	27	2.3	4.6	3.4	2.3	2.3	4.4	2.8	3.3	7.9	14	4.8
6	9.7	2.2	3.6	3.0	2.3	2.3	5.3	2.7	23	9.1	5.0	2.7
7	5.0	2.3	3.0	12	2.3	2.4	4.5	2.6	31	15	3.0	2.3
8	3.0	6.4	3.4	12	2.3	2.4	22	2.5	26	13	334	2.1
9	2.0	3.4	127	6.3	2.3	29	246	2.5	13	5.2	76	2.1
10	1.7	1.9	49	4.1	2.3	12	42	3.6	7.4	162	19	2.1
11	1.7	1.7	21	3.3	2.3	96	69	2.6	24	34	9.9	2.6
12	1.7	15	12	2.9	2.6	259	43	2.1	9.9	24	7.2	10
13	1.7	1630	20	2.6	2.5	58	27	2.0	4.8	12	19	8.9
14	1.7	962	43	5.0	2.8	26	19	1.9	3.4	7.9	9.2	6.0
15	1.6	94	22	5.9	8.1	14	20	1.8	2.8	5.8	4.1	5.2
16	1.6	637	17	3.4	4.0	16	24	1.9	2.6	4.7	2.9	3.2
17	1.6	638	10	3.1	2.7	18	22	1.9	2.4	27	2.4	2.4
18	1.6	412	247	2.5	3.0	197	13	1.9	2.4	15	2.3	2.1
19	1.6	427	148	2.3	5.1	2450	9.5	1.9	2.3	7.0	2.3	2.0
20	18	1100	89	2.2	29	838	8.0	1.9	2.3	5.9	2.3	2.0
21	3.3	84	295	2.2	118	4430	7.1	1.8	2.3	3.9	2.2	6.9
22	1.9	43	1030	2.2	19	158	6.7	1.9	2.3	2.9	2.2	13
23	1.7	35	316	2.1	8.8	396	6.4	2.0	2.3	2.8	2.1	4.8
24	1.6	23	80	2.2	5.1	99	6.0	2.0	2.3	2.8	2.3	2.7
25	1.6	15	80	2.1	3.7	43	5.9	2.0	2.3	2.4	2.1	2.3
26	1.6	10	45	2.2	2.9	27	53	2.1	12	2.3	2.8	2.1
27	1.6	7.7	27	26	2.5	20	13	2.1	20	2.7	5.6	2.1
28	1.6	6.7	19	10	2.4	15	6.9	2.0	48	2.5	7.6	2.0
29	1.6	13	15	3.9	---	10	5.5	2.0	20	2.3	506	3.4
30	6.5	8.0	10	2.6	---	8.0	4.3	2.0	7.8	35	370	6.4
31	12	---	7.8	2.3	---	6.2	---	2.0	---	16	28	---
TOTAL	168.7	6268.7	2798.5	150.7	249.8	9244.0	713.1	75.4	296.6	508.9	1469.2	134.4
MEAN	5.44	209	90.3	4.86	8.92	298	23.8	2.43	9.89	16.4	47.4	4.48
MAX	27	1630	1030	26	118	4430	246	6.1	48	162	506	13
MIN	1.6	1.7	3.0	2.1	2.3	2.3	4.3	1.8	2.0	2.3	2.1	2.0
AC-FT	335	12430	5550	299	495	18340	1410	150	588	1010	2910	267

CAL YR 1990 TOTAL 15504.5 MEAN 42.5 MAX 1630 MIN 1.6 AC-FT 30750
WTR YR 1991 TOTAL 22078.0 MEAN 60.5 MAX 4430 MIN 1.6 AC-FT 43790

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, from topographic map.

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

AVERAGE DISCHARGE.--41 years (water years 1930-32, 1954-91), 5.05 ft^3/s (3,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s, Feb. 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)
Dec. 18	0430	*1,320	*10.80	No other peak greater than base discharge.			

Minimum discharge, 0.02 ft^3/s for several days.

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	1.5	8.3	.87	1.7	.31	.15	1.1	1.6	.03	16	2.1	3.0
2	.75	11	4.3	1.5	.24	.09	1.0	.87	.03	4.4	1.2	1.9
3	.57	1.0	2.0	1.3	.21	.06	.89	.58	13	1.7	1.2	1.2
4	7.8	.45	1.1	1.1	.13	.04	.77	.54	4.6	.84	5.7	4.4
5	5.5	.25	.77	1.1	.10	.03	1.1	.36	2.7	.37	3.1	.90
6	1.7	.11	.61	.96	.08	.03	.90	.26	7.8	.21	1.3	.42
7	.76	.06	.46	6.8	.06	.05	.67	.18	17	1.0	.67	.29
8	.46	.04	7.4	3.1	.05	.07	6.9	.13	9.1	.53	46	.22
9	.26	.04	42	1.6	.03	8.9	34	1.3	3.4	.23	23	.17
10	.14	.03	13	1.2	.03	6.5	9.6	1.3	1.5	21	4.7	.14
11	.11	.02	4.5	.89	.03	50	19	.68	7.6	6.1	2.7	.33
12	.06	10	2.5	.74	.05	35	7.6	.37	2.5	4.3	1.8	.59
13	.04	85	4.9	.66	9.5	15	3.4	.24	1.3	1.7	3.5	.93
14	.03	78	5.3	.58	3.6	5.4	2.1	.20	.67	1.0	1.1	.50
15	.03	20	3.6	.54	5.5	2.7	2.1	.09	.35	.64	.51	.46
16	.03	81	2.5	.47	1.7	5.8	2.2	.06	.23	.57	.24	.28
17	.03	85	1.6	.41	.63	4.6	1.7	.04	.16	2.4	.17	.17
18	.03	66	101	.37	13	34	1.1	.03	.09	1.5	.11	.10
19	4.2	57	84	.34	4.4	178	.83	.03	.06	.95	.14	1.3
20	3.4	96	46	.28	19	83	.67	.02	.04	4.5	.97	1.2
21	.45	24	60	.24	19	83	.62	.03	.03	1.5	.19	16
22	.24	10	127	.21	5.2	20	.64	.02	.03	.44	.12	13
23	.16	10	55	.18	2.2	57	.45	.02	.03	.23	.51	2.0
24	.08	5.5	29	.16	1.3	25	.36	.02	.02	.16	.25	.71
25	.05	3.4	24	.14	.73	10	.36	.04	.02	1.2	.52	.34
26	.03	2.3	13	.12	.43	5.5	12	.05	.54	.29	.26	.25
27	.03	1.7	7.5	17	.31	5.0	2.3	.05	2.6	.18	5.9	.14
28	.03	1.4	5.1	3.7	.23	3.0	1.3	.03	8.6	.12	3.7	.09
29	.02	1.8	3.6	1.1	---	2.1	.91	.05	2.6	2.6	81	.05
30	.03	1.2	2.7	.60	---	1.8	1.1	.04	2.1	23	38	.07
31	.04	---	2.2	.38	---	1.3	---	.03	---	4.6	7.0	---
TOTAL	28.56	660.60	657.51	49.47	88.05	643.12	117.67	9.26	88.73	104.26	237.66	51.15
MEAN	.92	22.0	21.2	1.60	3.14	20.7	3.92	.30	2.96	3.36	7.67	1.70
MAX	7.8	96	127	17	19	178	34	1.6	17	23	81	16
MIN	.02	.02	.46	.12	.03	.03	.36	.02	.02	.12	.11	.05
AC-FT	57	1310	1300	98	175	1280	233	18	176	207	471	101

CAL YR 1990 TOTAL 2716.56 MEAN 7.44 MAX 127 MIN .00 AC-FT 5390
WTR YR 1991 TOTAL 2736.04 MEAN 7.50 MAX 178 MIN .02 AC-FT 5430

PERIOD OF RECORD.--Water year 1991.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	GAGE HEIGHT (FEET)	TEMPER-ATURE WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV					
17...	1640	5.82	21.0	83	78

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.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 160 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--8 Years, 9.42 ft^3/s (4,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft^3/s, Dec. 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)
Dec. 18	0445	*1,780	*12.02	Mar. 19	1430	1,010	10.92

Minimum discharge, 0.01 ft^3/s, May 15-23.

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	1.7	7.5	.91	.46	.38	.21	1.4	1.2	.06	19	1.8	3.4
2	.82	12	3.9	.39	.32	.13	1.2	.66	.06	4.9	1.2	2.2
3	.68	1.4	2.1	.33	.32	.10	1.0	.39	14	1.8	1.2	1.6
4	6.8	.57	1.3	.28	.21	.08	.89	.32	5.3	.79	5.7	4.9
5	5.7	.33	.88	.26	.16	.07	1.1	.23	2.3	.38	3.3	1.3
6	2.1	.14	.65	.24	.13	.07	1.0	.14	7.9	.16	1.3	.56
7	1.0	.07	.48	5.6	.12	.14	.77	.09	20	.64	.64	.35
8	.67	.05	6.9	3.2	.11	.14	6.8	.06	11	.51	64	.27
9	.42	.04	44	1.6	.10	8.0	47	.67	3.9	.18	31	.23
10	.23	.04	15	1.1	.09	5.5	11	.96	1.7	23	5.5	.24
11	.16	.03	5.7	.92	.08	64	23	.39	9.3	6.6	2.7	.37
12	.12	9.4	3.0	.75	.21	44	9.0	.19	3.0	4.3	1.8	.52
13	.11	109	5.5	.65	8.1	18	3.3	.10	1.3	1.7	3.4	.82
14	.09	100	6.6	.58	2.9	6.5	2.0	.05	.69	.88	1.1	.53
15	.08	26	4.3	.52	5.7	3.2	1.8	.02	.35	.58	.52	.50
16	.07	94	2.9	.41	1.8	5.8	1.8	.02	.18	.43	.22	.37
17	.08	101	1.9	.37	.91	4.7	1.4	.01	.13	2.0	.13	.26
18	.06	81	137	.33	16	43	.86	.01	.07	1.3	.09	.19
19	2.6	69	105	.26	4.9	279	.55	.01	.04	.68	.06	.86
20	4.2	102	47	.20	19	145	.47	.01	.04	4.3	.69	1.2
21	.54	24	69	.19	20	129	.38	.02	.05	1.6	.17	20
22	.24	11	176	.18	4.9	S28	.43	.02	.04	.44	.09	18
23	.12	11	77	.16	2.1	97	.33	.03	.06	.20	.29	2.2
24	.10	5.7	37	.14	1.4	39	.27	.04	.08	.12	.24	.87
25	.07	3.6	28	.12	.92	15	.25	.06	.08	.84	.38	.51
26	.06	2.3	14	.11	.55	8.2	14	.08	.08	.28	.26	.39
27	.05	1.6	6.2	20	.41	6.8	2.4	.10	1.7	.10	4.2	.27
28	.06	1.3	3.4	3.7	.32	3.9	1.2	.08	9.1	.06	3.7	.16
29	.05	1.7	2.0	1.3	---	2.8	.79	.11	2.8	2.0	113	.11
30	.04	1.2	1.2	.72	---	2.2	.76	.13	1.3	26	53	.13
31	.04	---	.66	.47	---	1.7	---	.09	---	4.9	8.4	---
TOTAL	29.06	776.97	809.48	45.54	92.14	961.24	137.15	6.29	96.61	110.67	310.08	63.31
MEAN	.94	25.9	26.1	1.47	3.29	31.0	4.57	.20	3.22	3.57	10.0	2.11
MAX	6.8	109	176	20	20	279	47	1.2	20	26	113	20
MIN	.04	.03	.48	.11	.08	.07	.25	.01	.04	.06	.06	.11
AC-FT	58	1540	1610	90	183	1910	272	12	192	220	615	126

CAL YR 1990 TOTAL 3190.74 MEAN 8.74 MAX 176 MIN .00 AC-FT 6330
WTR YR 1991 TOTAL 3438.54 MEAN 9.42 MAX 279 MIN .01 AC-FT 6820

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.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,230 mg/L (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990.
SEDIMENT DISCHARGE: Maximum daily, 4,730 tons (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,190 mg/L, Aug. 8; 1 mg/L on several days.
SEDIMENT DISCHARGE: Maximum daily, 1,260 tons, Mar. 19; less than 0.01 tons on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	GAGE HEIGHT (FEET)	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
NOV												
07...	1300	--	0.06	195	7.6	--	24.0	0.50	755	7.2	86	--
12...	0948	7.21	52	--	--	--	21.5	--	--	--	--	--
13...	0823	7.75	116	--	--	--	22.0	--	--	--	--	--
13...	1110	8.68	271	--	--	--	22.0	--	--	--	--	--
16...	1145	7.98	147	--	--	--	22.5	--	--	--	--	--
17...	1420	7.77	118	--	--	--	21.0	--	--	--	--	--
17...	1710	8.40	213	--	--	--	21.0	--	--	--	--	--
DEC												
18...	0930	8.00	151	120	7.5	--	20.0	59	763	8.8	97	--
18...	1050	7.78	120	--	--	--	20.0	--	--	--	--	--
19...	1225	7.91	111	--	--	--	20.5	--	--	--	--	--
JAN												
24...	1230	--	0.17	220	6.7	--	20.5	0.50	759	8.1	90	--
27...	0948	7.94	143	--	--	--	20.5	--	--	--	--	--
FEB												
18...	0735	7.20	61	--	--	--	--	--	--	--	--	--
MAR												
11...	0015	7.52	90	--	--	--	--	--	--	--	--	--
11...	1435	8.05	158	--	--	--	20.0	--	--	--	--	--
11...	1455	8.11	166	--	--	--	--	--	--	--	--	--
19...	1015	8.47	229	100	7.1	20.0	19.0	110	762	9.2	99	840
APR												
09...	0205	7.33	75	--	--	--	--	--	--	--	--	--
30...	1255	5.94	1.1	160	7.4	--	24.0	1.6	763	8.6	102	--
MAY												
20...	1340	5.62	0.05	215	7.2	--	23.0	0.30	763	7.1	83	110
JUN												
23...	1440	8.40	217	--	--	--	--	--	--	--	--	--
26...	1150	5.68	0.04	230	7.6	23.0	23.0	0.30	765	6.6	77	--
JUL												
01...	1029	7.00	48	--	--	--	--	--	--	--	--	--
29...	1115	5.63	0.07	205	7.7	26.0	23.5	1.2	760	7.4	87	--
AUG												
08...	0700	8.37	213	--	--	--	--	--	--	--	--	--
08...	0955	7.37	76	--	--	--	23.0	--	--	--	--	--
09...	0910	7.31	69	--	--	--	--	--	--	--	--	--
26...	1215	5.75	0.19	180	8.0	--	25.0	1.1	762	7.4	90	K280
29...	0550	7.05	46	--	--	--	--	--	--	--	--	--
SEP												
23...	1355	6.04	2.0	140	8.2	29.5	25.0	2.2	757	7.5	91	--
24...	0825	5.87	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptable range (non-ideal colony count).

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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)	FLUORIDE, DISSOLVED (MG/L AS F)
MAR 19...	1015	23	3.9	3.2	11	50	1	0.90	18	3.8	19	<0.10
AUG 26...	1215	50	8.1	7.2	16	40	1	1.2	55	6.1	19	0.10

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)
DEC 18...	0930	--	--	--	--	<1	0.200	0.030	<0.20	0.030	--
MAR 19...	1015	14	76	67	0.10	292	0.110	0.020	<0.20	0.140	0.09
MAY 20...	1340	--	--	--	--	4	<0.050	<0.010	<0.20	<0.010	--
AUG 26...	1215	23	95	114	0.13	2	<0.050	0.010	<0.20	0.020	--

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
MAR 19...	1015	180000	160	<1	<1	<100	<2	<10	<0.5	<1	<1.0	78
AUG 26...	1215	130	30	<1	<1	<100	<2	<10	<0.5	<1	<1.0	<1

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
MAR 19...	1	20	<3	30	1	23000	180	2	1	<10	<4	570
AUG 26...	<1	<1	<3	1	<1	270	140	1	<1	<10	<4	50

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR 19...	12	<0.10	<0.1	<1	<10	37	1	<1	<1	<1	<1.0	25
AUG 26...	38	0.10	<0.1	2	<10	<1	<1	<1	<1	<1	<1.0	52

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)
JAN												
24...	1230	--	--	--	--	--	<0.010	--	<0.1	--	<0.01	<0.010
MAR												
19...	1015	<6	40	4	11	<1	<0.010	--	<0.1	--	<0.01	<0.010
AUG												
26...	1215	<6	<10	8	2.3	<1	<0.010	--	<0.1	--	<0.01	<0.010
SEP												
24...	0825	--	--	--	--	--	<0.010	<0.1	<0.1	<1.0	--	<0.010

DATE	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
JAN											
24...	--	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.01	<0.01
MAR											
19...	--	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.01	<0.01
AUG											
26...	--	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.01	<0.01
SEP											
24...	<0.1	<0.010	<0.1	<0.010	<0.1	--	--	<0.010	<0.1	--	--

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)
JAN											
24...	<0.01	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--
MAR											
19...	<0.01	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--
AUG											
26...	<0.01	<0.010	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--
SEP											
24...	--	<0.010	<0.1	<0.010	<0.1	--	--	<0.010	<0.1	<0.010	<0.1

DATE	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)
JAN											
24...	<0.010	--	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01
MAR											
19...	<0.010	--	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01
AUG											
26...	<0.010	--	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01
SEP											
24...	<0.010	<0.1	--	<0.01	<0.1	--	--	<0.01	<0.1	<0.10	--

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
JAN											
24...	<0.1	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
MAR											
19...	<0.1	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG											
26...	<0.1	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP											
24...	<0.1	2	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV				
12...	0948	120	17	87
13...	0823	549	172	76
13...	1110	1660	1220	90
16...	1145	248	98	79
17...	1420	104	33	88
17...	1710	693	399	55
DEC				
18...	1050	61	20	40
19...	1225	54	16	92
JAN				
27...	0948	3560	1380	92
FEB				
18...	0735	1410	232	99
MAR				
11...	0015	1430	349	97
11...	1435	1190	507	87
11...	1455	939	421	95
APR				
09...	0205	210	43	95
JUN				
23...	1440	487	285	65
JUL				
01...	1029	970	126	100
AUG				
08...	0700	3840	2210	90
08...	0955	973	200	98
09...	0910	668	124	94
29...	0550	1530	189	82

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	1.7	5	.02	7.5	55	6.8	.91	2	<.01
2	.82	e4	.01	12	45	2.3	3.9	8	.13
3	.68	e4	.01	1.4	7	.03	2.1	2	.01
4	6.8	9	.25	.57	e7	.01	1.3	1	<.01
5	5.7	3	.05	.33	e6	.01	.88	3	.01
6	2.1	e1	.01	.14	e6	<.01	.65	e3	<.01
7	1.0	e1	<.01	.07	6	<.01	.48	e2	<.01
8	.67	e1	<.01	.05	e6	<.01	6.9	e77	7.0
9	.42	e1	<.01	.04	e6	<.01	44	56	7.5
10	.23	e1	<.01	.04	e5	<.01	15	3	.11
11	.16	e1	<.01	.03	e5	<.01	5.7	15	.20
12	.12	e1	<.01	9.4	47	3.5	3.0	16	.14
13	.11	e2	<.01	109	423	261	5.5	5	.08
14	.09	e2	<.01	100	141	40	6.6	5	.09
15	.08	e2	<.01	26	12	1.0	4.3	4	.04
16	.07	e2	<.01	94	336	124	2.9	3	.02
17	.08	2	<.01	101	199	66	1.9	2	.01
18	.06	e2	<.01	81	80	19	137	221	168
19	2.6	10	.52	69	98	20	105	137	54
20	4.2	e44	1.2	102	253	99.8	47	41	5.6
21	.54	e8	.01	24	112	6.5	69	198	169
22	.24	e6	<.01	11	121	3.8	176	219	148
23	.12	e5	<.01	11	13	.39	77	67	19
24	.10	e4	<.01	5.7	2	.02	37	21	2.2
25	.07	3	<.01	3.6	2	.02	28	24	2.4
26	.06	e3	<.01	2.3	2	.01	14	6	.25
27	.05	e4	<.01	1.6	1	<.01	6.2	3	.06
28	.06	e4	<.01	1.3	1	<.01	3.4	4	.04
29	.05	e4	<.01	1.7	1	.01	2.0	3	.02
30	.04	e5	<.01	1.2	2	.01	1.2	2	.01
31	.04	e5	<.01	---	---	---	.66	e2	<.01
TOTAL	29.06	---	2.30	776.97	---	654.29	809.48	---	583.97
		JANUARY			FEBRUARY			MARCH	
1	.46	e2	<.01	.38	e10	.01	.21	e9	<.01
2	.39	e2	<.01	.32	e8	.01	.13	e9	<.01
3	.33	e2	<.01	.32	e7	.01	.10	e9	<.01
4	.28	e3	<.01	.21	e6	<.01	.08	e9	<.01
5	.26	e3	<.01	.16	e6	<.01	.07	e9	<.01
6	.24	e3	<.01	.13	e5	<.01	.07	e8	<.01
7	5.6	e12	.26	.12	e4	<.01	.14	e8	<.01
8	3.2	3	.03	.11	e4	<.01	.14	e8	<.01
9	1.6	e3	.01	.10	e3	<.01	8.0	20	.60
10	1.1	3	.01	.09	e3	<.01	5.5	36	5.0
11	.92	e3	.01	.08	e2	<.01	64	220	67
12	.75	e3	.01	.21	e2	<.01	44	19	2.3
13	.65	e3	.01	8.1	19	.50	18	6	.32
14	.58	e3	.01	2.9	9	.07	6.5	4	.07
15	.52	e4	<.01	5.7	10	.16	3.2	3	.03
16	.41	e4	<.01	1.8	e8	.04	5.8	e8	.16
17	.37	e4	<.01	.91	e6	.01	4.7	4	.05
18	.33	e4	<.01	16	577	137	43	150	44
19	.26	e4	<.01	4.9	47	.96	279	1140	1260
20	.20	e4	<.01	19	38	2.0	145	e727	359
21	.19	e4	<.01	20	27	1.7	129	e439	494
22	.18	e5	<.01	4.9	11	.15	S28	10	.81
23	.16	e5	<.01	2.1	e11	.06	97	313	204
24	.14	5	<.01	1.4	e10	.04	39	16	1.9
25	.12	e6	<.01	.92	e10	.02	15	8	.35
26	.11	e7	<.01	.55	e10	.02	8.2	10	.22
27	20	286	71	.41	e10	.01	6.8	10	.19
28	3.7	17	.18	.32	e10	.01	3.9	8	.09
29	1.3	e15	.05	---	---	---	2.8	4	.03
30	.72	e13	.02	---	---	---	2.2	8	.05
31	.47	e11	.01	---	---	---	1.7	10	.05
TOTAL	45.54	---	71.79	92.14	---	142.87	961.24	---	2440.30

< Actual value is known to be less than the value shown.
e Estimated

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	1.4	e9	.03	1.2	e4	.01	.06	e4	<.01
2	1.2	e8	.02	.66	e4	.01	.06	e5	<.01
3	1.0	e7	.02	.39	e5	<.01	14	158	19
4	.89	e7	.02	.32	e5	<.01	5.3	21	.65
5	1.1	e6	.02	.23	e5	<.01	2.3	e10	.10
6	1.0	e6	.02	.14	e6	<.01	7.9	15	.51
7	.77	e5	.01	.09	e6	<.01	20	43	3.1
8	6.8	25	2.4	.06	e6	<.01	11	23	.98
9	47	79	18	.67	e7	.01	3.9	7	.13
10	11	12	.44	.96	e7	.02	1.7	5	.03
11	23	27	3.8	.39	e7	.01	9.3	29	1.3
12	9.0	4	.10	.19	e8	<.01	3.0	9	.13
13	3.3	2	.02	.10	e8	<.01	1.3	e8	.04
14	2.0	3	.02	.05	e9	<.01	.69	e8	.02
15	1.8	2	.01	.02	e9	<.01	.35	e7	.01
16	1.8	2	.01	.02	e10	<.01	.18	e7	<.01
17	1.4	3	.01	.01	e10	<.01	.13	e7	<.01
18	.86	e3	.01	.01	e11	<.01	.07	e6	<.01
19	.55	e3	<.01	.01	11	<.01	.04	e6	<.01
20	.47	e3	<.01	.01	12	<.01	.04	e6	<.01
21	.38	e3	<.01	.02	e10	<.01	.05	e5	<.01
22	.43	e4	<.01	.02	e8	<.01	.04	e5	<.01
23	.33	e4	<.01	.03	e6	<.01	.06	e5	<.01
24	.27	e4	<.01	.04	e5	<.01	.08	e4	<.01
25	.25	e4	<.01	.06	e4	<.01	.08	e4	<.01
26	14	e24	1.8	.08	e3	<.01	.08	4	<.01
27	2.4	4	.03	.10	e2	<.01	1.7	e23	.32
28	1.2	e4	.01	.08	2	<.01	9.1	63	1.9
29	.79	e4	.01	.11	e2	<.01	2.8	13	.16
30	.76	4	.01	.13	e3	<.01	1.3	e12	.06
31	---	---	---	.09	e4	<.01	---	---	---
TOTAL	137.15	---	26.89	6.29	---	0.32	96.61	---	28.57
		JULY			AUGUST			SEPTEMBER	
1	19	70	7.3	1.8	e12	.08	3.4	e16	.19
2	4.9	32	.69	1.2	e12	.05	2.2	e14	.09
3	1.8	10	.06	1.2	e10	.04	1.6	e12	.05
4	.79	e8	.02	5.7	e20	.52	4.9	e22	.51
5	.38	e8	.01	3.3	25	.33	1.3	e13	.05
6	.16	e7	<.01	1.3	12	.05	.56	e12	.02
7	.64	e7	.01	.64	e11	.02	.35	e11	.01
8	.51	e7	.01	64	1190	521	.27	e9	.01
9	.18	e6	<.01	31	e81	11	.23	e8	<.01
10	23	80	9.4	5.5	20	.40	.24	e18	.01
11	6.6	43	1.1	2.7	11	.11	.37	52	.05
12	4.3	20	.37	1.8	10	.05	.52	e45	.06
13	1.7	11	.06	3.4	15	.18	.82	e33	.07
14	.88	e14	.03	1.1	e10	.03	.53	e24	.03
15	.58	e19	.03	.52	e8	.01	.50	e18	.02
16	.43	e25	.03	.22	e7	<.01	.37	e13	.01
17	2.0	e33	.25	.13	e6	<.01	.26	e10	.01
18	1.3	e44	.17	.09	e5	<.01	.19	e7	<.01
19	.68	e59	.11	.06	e4	<.01	.86	11	.03
20	4.3	e78	1.1	.69	e12	.02	1.2	e9	.03
21	1.6	75	.45	.17	e9	<.01	20	294	149
22	.44	e23	.03	.09	e7	<.01	18	215	26
23	.20	e6	<.01	.29	e10	.01	2.2	13	.08
24	.12	2	<.01	.24	e9	.01	.87	e12	.03
25	.84	e4	.01	.38	e9	.01	.51	e11	.02
26	.28	e6	<.01	.26	e11	.01	.39	e11	.01
27	.10	e10	<.01	4.2	27	.39	.27	e10	.01
28	.06	e16	<.01	3.7	71	.82	.16	e9	<.01
29	2.0	24	.18	113	893	471	.11	e9	<.01
30	26	82	9.7	53	e164	51	.13	e8	<.01
31	4.9	31	.64	8.4	e23	.60	---	---	---
TOTAL	110.67	---	31.83	310.08	---	1057.80	63.31	---	176.45
YEAR	3438.54		5217.58						

< Actual value is known to be less than the value shown.
e Estimated

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.

WATER-DISCHARGE RECORDS

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

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. Prior to Oct. 12, 1923, at datum 2.00 ft lower.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--77 years (water years 1915-91), 6.65 ft^3/s (4,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s, Nov. 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, Oct. 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)
Dec. 18	0400	*2,840	*10.43	Aug. 29	2300	955	7.95
Mar. 19	1400	1,560	9.01				

Minimum discharge, 1.2 ft^3/s, on Nov. 11.

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	4.7	1.7	5.2	6.0	2.3	2.6	6.3	4.0	1.8	12	2.3	5.4
2	3.1	8.2	5.7	5.9	2.2	2.4	5.9	3.3	1.7	5.3	2.2	4.9
3	3.9	2.4	5.1	5.7	2.7	2.2	5.6	3.1	6.4	3.4	2.2	4.1
4	6.1	1.9	4.7	5.2	2.2	2.2	5.2	3.4	2.6	2.6	9.9	4.4
5	4.0	2.1	4.3	5.4	2.1	2.2	5.3	2.8	7.2	2.6	3.9	3.5
6	3.1	1.9	3.9	4.7	2.0	2.2	4.6	2.7	6.6	2.2	2.5	3.3
7	2.6	1.7	3.7	13	1.9	2.8	4.4	2.6	11	11	2.3	3.0
8	2.4	1.6	7.0	6.1	1.9	3.5	11	2.5	6.0	2.9	51	2.9
9	2.2	1.5	18	5.3	1.8	12	22	5.8	3.8	2.4	9.9	2.8
10	2.2	1.4	5.4	4.8	1.7	3.3	6.0	3.5	3.0	23	4.4	3.1
11	2.0	1.3	4.2	4.7	1.8	11	8.0	2.7	13	5.2	3.7	3.0
12	2.0	22	3.9	4.4	3.2	25	5.6	2.5	3.5	6.5	3.3	2.7
13	1.9	92	4.8	3.9	4.4	9.8	4.9	2.4	2.8	3.7	3.7	2.5
14	1.7	58	4.3	3.7	6.0	5.4	4.4	2.3	2.5	3.1	2.9	2.8
15	1.6	13	6.3	3.7	4.3	5.9	7.6	2.1	2.2	2.8	2.5	2.5
16	1.7	152	4.0	3.5	2.6	9.0	5.9	2.0	2.1	3.2	2.5	2.4
17	6.5	79	3.6	4.0	2.4	5.9	4.8	2.0	2.2	3.6	2.2	2.2
18	2.1	60	67	3.5	18	31	4.3	1.9	2.2	2.5	2.1	2.3
19	4.8	47	71	3.3	8.6	212	3.9	1.9	2.0	3.7	2.0	4.4
20	2.9	67	26	2.9	28	73	3.7	1.9	2.0	2.3	2.0	5.7
21	2.1	24	38	3.0	12	40	3.6	1.9	2.2	2.2	2.0	27
22	1.9	16	102	3.0	5.8	20	3.6	16	1.8	2.5	1.9	11
23	2.7	15	34	3.0	4.5	51	3.3	3.7	2.1	2.1	2.3	3.9
24	2.0	11	21	2.8	4.5	17	3.1	2.4	2.3	1.9	1.8	3.1
25	1.8	9.2	26	2.6	3.6	13	5.3	2.2	2.6	3.6	1.8	3.0
26	1.6	7.9	13	2.6	3.3	11	9.2	2.0	2.3	2.2	2.1	2.7
27	1.6	7.2	12	7.2	3.0	9.4	4.0	2.0	3.4	1.8	7.3	2.6
28	1.9	6.6	9.4	3.6	2.8	8.3	3.6	1.9	5.4	1.6	2.9	2.4
29	1.6	6.7	8.1	2.9	---	7.7	3.4	1.9	2.4	2.4	102	2.3
30	3.2	5.7	7.1	2.7	---	7.5	4.5	2.0	2.5	13	44	2.3
31	1.9	---	6.4	2.4	---	6.9	---	1.8	---	3.0	7.3	---
TOTAL	83.8	725.0	535.1	135.5	139.6	615.2	173.0	93.2	111.6	140.3	292.9	128.2
MEAN	2.70	24.2	17.3	4.37	4.99	19.8	5.77	3.01	3.72	4.53	9.45	4.27
MAX	6.5	152	102	13	28	212	22	16	13	23	102	27
MIN	1.6	1.3	3.6	2.4	1.7	2.2	3.1	1.8	1.7	1.6	1.8	2.2
AC-FT	166	1440	1060	269	277	1220	343	185	221	278	581	254

CAL YR 1990 TOTAL 2856.31 MEAN 7.83 MAX 152 MIN .57 AC-FT 5670
WTR YR 1991 TOTAL 3173.4 MEAN 8.69 MAX 212 MIN 1.3 AC-FT 6290

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 this station for 1969, 1973 water years. Quality of water samples obtained at the gage.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	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	SODIUM AD-SORP-TION RATIO
JAN											
02...	1130	6.1	147	6.5	19.0	36	6.3	4.8	14	46	1
MAR											
29...	1210	7.7	140	7.2	20.0	34	5.9	4.7	15	48	1
JUN											
28...	1000	16	112	7.3	21.0	27	4.7	3.6	10	44	0.8
AUG											
30...	0940	39	83	7.8	22.0	18	3.6	2.3	8.1	47	0.8

DATE	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)
JAN										
02...	0.60	29	5.3	29	<0.10	11	89	0.12	85	27
MAR										
29...	0.70	26	6.9	27	<0.10	12	88	0.12	89	10
JUN										
28...	1.2	23	3.9	18	0.20	7.7	63	0.09	240	6
AUG										
30...	0.90	19	2.8	13	<0.10	9.0	51	0.07	150	<1

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

16229300 KALIHI STREAM AT KALIHI
(National stream-quality accounting network station)

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.

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records fair. Diversion of natural streamflow upstream of gage is indicated during the period Sep. 8, 9, 14-17.

AVERAGE DISCHARGE.--29 years, 10.7 ft^3/s (7,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s, Apr. 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)
Dec. 18	0430	*6,420	9.45	Aug. 29	2300	1,110	4.22
Mar. 19	1400	1,620	4.99				

Minimum discharge, 0.18 ft^3/s, Sep. 14.

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	9.3	2.1	6.0	e7.0	2.8	3.8	8.4	7.2	2.8	15	2.9	6.1
2	3.7	9.8	7.6	e6.7	2.6	3.6	8.3	5.5	2.6	6.9	3.1	5.4
3	4.6	2.8	6.6	e6.5	5.8	3.4	7.5	5.4	10	4.1	3.1	4.4
4	7.2	2.3	5.4	e6.2	2.8	3.3	7.2	6.8	3.9	3.3	11	4.9
5	5.0	2.7	4.8	e6.0	2.7	3.2	8.5	5.1	11	3.5	4.8	3.8
6	3.8	2.5	4.5	e5.7	2.5	3.8	6.8	5.3	12	2.9	3.0	3.2
7	3.2	2.2	4.3	e16	2.4	10	6.5	5.0	18	12	2.8	3.0
8	2.8	2.0	16	e6.8	2.3	13	22	5.8	10	3.5	79	2.2
9	2.6	1.9	74	e6.0	2.3	35	48	11	5.9	3.0	14	1.0
10	2.6	1.8	13	e5.5	2.3	8.6	13	6.7	4.1	30	6.5	2.6
11	2.8	1.8	8.0	e5.3	2.5	20	12	5.5	45	6.8	5.6	3.5
12	2.7	38	6.2	e4.9	6.9	82	9.1	4.8	7.5	8.1	5.2	3.1
13	2.9	133	15	e4.5	6.3	33	7.4	4.2	4.8	4.0	5.5	2.3
14	2.4	102	12	e4.3	9.2	13	6.6	4.0	3.7	3.6	4.3	1.7
15	2.3	21	12	e4.1	7.7	13	12	3.8	3.2	3.5	4.0	.61
16	2.4	278	6.9	e3.9	3.7	19	10	3.6	3.1	5.0	3.8	.49
17	10	138	5.5	e4.2	3.1	16	7.5	3.5	3.2	7.9	3.7	.78
18	2.6	93	244	e3.7	29	68	6.5	3.5	2.9	3.5	3.6	1.8
19	3.3	86	195	e3.5	19	340	6.4	3.3	2.7	4.4	3.5	5.0
20	4.4	120	63	e3.3	61	145	5.9	3.4	2.6	3.2	3.5	5.4
21	2.5	35	65	e3.3	27	80	6.6	4.5	3.1	3.0	3.1	24
22	2.2	21	154	e3.3	11	29	6.0	18	2.5	3.2	3.0	19
23	3.9	19	66	e3.3	7.5	93	5.2	5.1	3.2	2.7	3.7	4.3
24	2.4	13	37	e3.0	8.0	33	5.1	3.5	4.7	2.5	3.0	3.5
25	2.2	11	51	e3.0	5.6	20	5.9	3.6	3.7	3.9	3.1	3.4
26	2.0	9.1	24	e3.0	4.7	16	15	4.1	3.2	2.8	4.6	3.0
27	1.9	8.0	18	e10	4.4	14	6.5	4.1	6.7	2.5	15	2.8
28	2.7	7.3	e12	e4.0	4.2	12	6.0	3.0	8.0	2.4	5.2	2.9
29	2.2	7.8	e10	e3.0	---	10	5.4	3.9	3.7	2.8	124	2.9
30	3.1	6.6	e9.0	3.2	---	10	9.5	4.1	3.4	15	63	2.9
31	2.4	---	e8.0	3.0	---	8.9	---	3.3	---	3.4	9.6	---
TOTAL	108.1	1178.7	1163.8	156.2	249.3	1162.6	290.8	160.6	201.2	178.4	410.2	129.98
MEAN	3.49	39.3	37.5	5.04	8.90	37.5	9.69	5.18	6.71	5.75	13.2	4.33
MAX	10	278	244	16	61	340	48	18	45	30	124	24
MIN	1.9	1.8	4.3	3.0	2.3	3.2	5.1	3.0	2.5	2.4	2.8	.49
AC-FT	214	2340	2310	310	494	2310	577	319	399	354	814	258

CAL YR 1990 TOTAL 4877.6 MEAN 13.4 MAX 278 MIN 1.1 AC-FT 9670
WTR YR 1991 TOTAL 5389.88 MEAN 14.8 MAX 340 MIN .49 AC-FT 10690

e Estimated

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)	NITRO-GEN DIS-SOLVED (MG/L AS N)
OCT											
10...	1310	2.5	210	8.1	28.0	24.5	2.2	765	8.9	106	--
FEB											
12...	1230	1.8	265	7.6	23.0	22.0	2.0	764	8.7	99	--
APR											
22...	1250	4.1	385	8.5	25.0	24.5	1.0	765	9.1	109	--
AUG											
12...	1030	4.5	218	7.3	28.0	23.5	1.5	762	8.5	100	0.31

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3
OCT											
10...	5300	4300	57	4	11	7.2	21	44	1	1.3	65
FEB											
12...	6600	17000	77	7	16	9.0	24	40	1	1.4	86
APR											
22...	23000	1700	64	10	13	7.7	23	43	1	1.1	66
AUG											
12...	13000	43000	59	5	12	7.0	20	42	1	1.2	66

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD 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, 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)
OCT											
10...	0	54	8.5	37	0.10	17	114	136	0.16	0.100	0.100
FEB											
12...	0	69	9.8	35	<0.10	16	143	154	0.19	0.100	0.100
APR											
22...	0	54	7.9	32	<0.10	15	140	133	0.19	0.190	0.160
AUG											
12...	0	54	6.7	28	0.20	15	118	123	0.16	0.110	0.110

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT										
10...	<0.010	<0.010	--	0.40	--	0.50	0.040	0.06	0.030	0.020
FEB										
12...	0.020	0.010	--	0.40	--	0.50	1.00	0.12	0.040	0.030
APR										
22...	0.030	0.020	--	0.30	--	0.49	0.050	0.06	0.020	0.020
AUG										
12...	0.020	0.020	0.18	0.20	0.20	0.31	0.060	0.09	0.030	0.020

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
10...	1310	20	<1	4	<0.5	<1.0	<1	<3	1	210	1
FEB											
12...	1230	<10	<1	7	<0.5	<1.0	<1	<3	3	170	<1
APR											
22...	1250	<10	<1	4	<0.5	<1.0	<1	<3	1	110	<1
AUG											
12...	1030	10	<1	4	<0.5	2.0	<1	<3	2	130	<1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
10...	<4	8	<0.1	<10	<1	<1	<1.0	89	<6	4
FEB										
12...	<4	17	<0.1	<10	<1	<1	<1.0	130	<6	4
APR										
22...	<4	7	<0.1	<10	<1	<1	<1.0	99	<6	4
AUG										
12...	<4	8	<0.1	<10	<1	<1	<1.0	89	<6	4

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM R BK)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
22...	1250	4.0	390	8.5	24.0	765	9.0	107
22...	1252	8.5	388	8.5	24.0	765	9.1	108
22...	1254	17.0	385	8.5	24.0	765	9.1	108
22...	1256	25.5	388	8.5	24.0	765	9.1	108
22...	1258	30.0	380	8.5	24.0	765	9.2	109

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
10...	1310	3	0.02	100
FEB				
12...	1230	4	0.02	100
APR				
22...	1250	1	0.01	100
AUG				
12...	1030	3	0.04	100

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

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 current year.

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 631.71 ft above mean sea level. Prior to Sep. 7, 1915, nonrecording gage at same site at datum 0.03 ft lower and Sep. 7, 1915, to Mar. 31, 1918, at same datum.

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 in drainage area.

AVERAGE DISCHARGE.--75 years (water years 1915-16, 1918-20, 1922-91), 7.05 ft^3/s (5,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft^3/s, Jan. 16, 1921, gage height, 8.74 ft, from floodmarks, from rating curve extended above 420 ft^3/s by test of model of station site; minimum, 0.09 ft^3/s, Sep. 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. 16	1530	535	4.58	Dec. 22	0400	368	4.14
Nov. 20	0230	244	3.46	Mar. 19	1400	*677	*4.84
Dec. 18	0430	638	4.77	Aug. 8	0430	372	4.16
Dec. 19	0830	264	3.59	Aug. 29	2230	567	4.64

Minimum discharge, 1.3 ft^3/s, Nov. 4.

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	3.2	1.9	9.6	11	6.6	4.1	9.9	11	4.3	7.6	3.8	4.3
2	2.6	3.5	11	11	6.0	3.8	10	11	4.5	4.8	4.2	4.0
3	2.6	2.3	10	11	6.6	3.4	9.9	11	11	3.9	4.4	3.8
4	2.9	1.8	8.6	10	6.1	3.3	9.2	12	5.9	3.5	7.4	3.9
5	3.3	2.1	8.5	11	5.9	3.3	9.1	11	6.4	3.3	5.1	3.8
6	2.6	1.8	8.3	10	5.8	4.5	8.8	10	6.5	3.3	3.5	3.3
7	2.5	1.8	8.0	13	5.8	5.0	8.7	10	6.1	9.2	3.8	3.1
8	2.4	1.7	8.9	9.5	5.6	5.3	15	10	6.0	4.2	42	3.1
9	2.2	1.7	17	8.9	5.4	13	23	11	4.8	3.7	5.4	3.6
10	2.1	1.6	8.4	8.8	5.2	5.7	9.9	10	4.4	20	4.2	3.9
11	2.2	1.6	8.0	8.7	5.1	8.1	10	9.9	11	6.1	4.3	4.0
12	2.1	15	7.8	8.4	6.1	11	9.2	9.7	5.6	6.6	4.5	4.5
13	2.2	46	8.3	8.4	6.3	8.1	8.9	9.3	5.3	4.7	4.9	3.8
14	2.1	37	8.2	8.3	7.0	6.0	8.8	9.1	5.1	4.4	4.7	3.5
15	2.0	10	8.3	8.5	6.9	6.1	9.3	9.1	4.6	4.3	4.8	3.6
16	2.2	168	7.7	8.6	4.8	7.0	11	9.0	3.9	4.3	4.6	3.6
17	4.6	98	7.1	8.5	4.6	6.8	8.8	8.9	4.0	4.5	4.7	3.5
18	2.1	86	51	8.2	12	14	8.4	8.8	3.8	4.1	4.5	3.4
19	2.3	103	51	7.9	5.8	137	8.3	8.8	3.8	4.2	4.6	4.5
20	2.1	136	17	7.9	17	54	8.2	8.5	3.8	3.8	4.7	3.9
21	2.0	82	22	7.8	8.1	32	8.1	8.4	3.7	3.8	4.1	8.9
22	1.9	70	82	7.6	5.6	18	8.0	10	3.6	4.0	4.0	9.8
23	3.1	66	30	7.4	5.2	43	7.9	6.1	3.7	3.7	5.0	3.8
24	2.1	63	21	7.4	5.3	27	8.0	5.0	4.9	3.6	4.8	3.6
25	2.1	57	21	7.2	5.0	19	11	4.7	4.4	3.9	4.1	3.3
26	2.1	38	16	7.3	4.6	17	14	4.9	3.8	3.7	3.7	3.4
27	2.0	13	15	9.2	4.7	15	8.0	4.8	4.3	3.4	5.4	3.3
28	2.1	11	14	7.2	4.5	12	8.0	4.3	6.1	3.2	3.6	3.3
29	2.1	10	13	7.0	---	11	7.8	4.3	4.0	3.6	43	3.2
30	2.3	9.8	13	7.0	---	10	11	4.7	3.7	8.5	19	3.3
31	2.0	---	12	7.1	---	9.7	---	4.8	---	4.1	5.1	---
TOTAL	74.1	1140.6	531.7	269.8	177.6	523.2	296.2	260.1	153.0	156.0	231.9	121.0
MEAN	2.39	38.0	17.2	8.70	6.34	16.9	9.87	8.39	5.10	5.03	7.48	4.03
MAX	4.6	168	82	13	17	137	23	12	11	20	43	9.8
MIN	1.9	1.6	7.1	7.0	4.5	3.3	7.8	4.3	3.6	3.2	3.5	3.1
AC-FT	147	2260	1050	535	352	1040	588	516	303	309	460	240

CAL YR 1990 TOTAL 3180.44 MEAN 8.71 MAX 168 MIN .96 AC-FT 6310
WTR YR 1991 TOTAL 3935.2 MEAN 10.8 MAX 168 MIN 1.6 AC-FT 7810

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 bench mark). Prior to May 20, 1914, nonrecording gage at site 200 ft upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft higher than present datum.

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

AVERAGE DISCHARGE.--73 years (water years 1914-20, 1926-91), 5.10 ft^3/s (3,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s, Jan. 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)
Nov. 16	1100	318	3.26	Mar. 19	1330	*345	*3.35
Feb. 18	1615	342	3.34	Aug. 8	0300	321	3.27

Minimum discharge, 2.4 ft^3/s, Nov. 11, 12.

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	4.5	3.6	4.2	4.6	3.4	3.4	4.8	4.3	3.1	19	3.6	3.8
2	3.3	5.7	5.1	4.5	3.4	3.4	4.7	3.8	3.2	8.8	3.6	4.8
3	3.4	3.3	4.3	4.4	3.9	3.3	4.6	3.7	4.6	4.5	3.4	3.7
4	9.2	2.8	3.9	4.3	3.4	3.3	4.5	5.4	3.3	4.0	9.0	6.0
5	5.0	2.9	3.8	4.7	3.3	3.2	4.9	3.6	4.6	3.4	4.6	3.6
6	3.7	4.0	3.6	4.6	3.3	3.6	4.3	3.5	5.0	3.2	3.9	3.4
7	3.2	3.7	3.6	11	3.3	5.6	4.2	3.4	7.4	5.6	3.4	3.4
8	3.0	2.7	7.2	5.0	3.3	7.9	16	3.5	5.4	3.2	45	3.4
9	2.9	2.5	13	4.5	3.2	15	15	6.3	4.0	3.2	8.0	3.3
10	2.9	2.5	4.8	4.3	3.2	5.4	7.9	3.8	3.4	21	4.6	3.3
11	3.0	2.4	4.3	4.4	3.3	9.0	5.6	3.6	9.1	5.3	5.7	3.5
12	3.0	13	3.8	4.2	4.6	13	4.5	3.4	3.7	7.3	4.3	4.9
13	2.9	53	4.7	4.0	5.3	7.8	4.2	3.3	3.5	4.2	4.6	3.5
14	2.7	32	4.4	3.9	7.1	5.0	4.1	3.2	3.2	3.7	3.8	3.4
15	2.6	9.6	4.7	4.1	4.7	6.7	7.8	3.2	3.1	3.7	3.5	3.9
16	4.6	75	3.8	3.9	3.6	10	7.2	3.2	3.1	4.8	3.5	3.9
17	12	33	3.6	4.2	3.4	8.5	4.5	3.2	3.0	4.5	3.4	4.0
18	3.4	19	10	3.8	18	13	4.2	3.2	3.0	3.7	3.3	3.8
19	3.6	14	23	3.7	6.8	84	4.0	3.1	3.5	5.2	3.6	7.6
20	3.0	20	12	3.6	22	27	3.9	3.1	3.3	4.1	3.5	3.7
21	2.9	8.4	13	3.6	8.5	14	3.9	3.1	3.4	3.6	3.3	8.0
22	2.8	6.7	21	3.6	5.1	8.5	3.9	3.2	3.0	3.7	3.2	5.4
23	5.1	6.2	13	3.6	4.3	25	3.7	3.0	3.7	3.5	4.7	3.4
24	3.0	5.5	9.4	3.6	4.3	8.8	3.7	3.1	4.8	3.5	3.2	3.4
25	4.7	5.1	10	3.6	3.9	6.7	10	3.0	3.5	4.0	3.2	4.5
26	4.9	4.8	6.8	3.5	3.8	6.3	9.0	3.2	4.3	4.1	4.5	3.2
27	3.3	4.6	6.2	7.6	3.7	5.9	4.5	3.4	6.2	3.2	9.5	3.2
28	3.0	4.5	5.6	3.9	3.6	5.3	4.1	3.0	9.4	3.2	6.5	3.1
29	3.2	5.0	5.2	3.6	---	5.1	3.9	3.2	3.8	5.1	28	3.0
30	3.6	4.4	4.9	3.5	---	4.9	5.4	3.4	7.0	17	8.5	3.0
31	3.0	---	4.7	3.4	---	4.7	---	3.2	---	4.2	4.4	---
TOTAL	121.4	359.9	227.6	135.2	149.7	333.3	173.0	108.6	131.6	177.5	207.3	121.1
MEAN	3.92	12.0	7.34	4.36	5.35	10.8	5.77	3.50	4.39	5.73	6.69	4.04
MAX	12	75	23	11	22	84	16	6.3	9.4	21	45	8.0
MIN	2.6	2.4	3.6	3.4	3.2	3.2	3.7	3.0	3.0	3.2	3.2	3.0
AC-FT	241	714	451	268	297	661	343	215	261	352	411	240

CAL YR 1990 TOTAL 2064.9 MEAN 5.66 MAX 75 MIN 2.4 AC-FT 4100
WTR YR 1991 TOTAL 2246.2 MEAN 6.15 MAX 84 MIN 2.4 AC-FT 4460

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, from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft upstream at different datums.

REMARKS.--Records good. Maunawili ditch diverts 1.5 mi upstream for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--35 years (water years 1914-15, 1959-91), 5.19 ft^3/s (3,760 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s, Feb. 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, Sept. 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)
Nov. 13	0900	539	5.48	Mar. 23	1230	1,010	6.77
Mar. 19	1900	*2,670	*9.52				

Minimum discharge, 1.2 ft^3/s, Aug. 16-19.

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	2.5	4.5	6.2	5.4	3.8	4.1	7.2	4.1	4.3	3.1	2.0	2.2
2	2.2	8.7	6.0	5.5	3.7	4.1	6.7	3.5	4.4	3.3	1.9	1.8
3	1.9	3.1	4.9	5.8	4.7	4.4	6.5	3.9	3.6	2.8	1.8	1.7
4	2.7	2.5	4.6	5.2	4.2	4.3	6.3	5.0	2.8	2.3	2.3	2.0
5	2.1	2.4	4.0	5.4	4.0	3.9	6.4	4.1	3.4	2.2	2.4	1.8
6	2.0	3.1	3.5	5.2	3.8	4.1	7.2	3.7	3.3	2.1	1.8	1.6
7	1.9	2.7	3.4	5.5	3.6	3.9	7.0	4.0	3.3	2.2	2.0	1.6
8	2.0	2.3	3.9	4.8	3.5	3.7	7.6	3.7	3.2	2.1	3.9	1.9
9	2.0	2.2	3.9	4.1	3.4	5.6	28	3.5	3.4	2.3	2.4	1.9
10	2.0	2.2	3.8	4.4	3.3	4.4	7.2	3.4	3.1	3.3	1.8	1.7
11	2.0	2.3	3.8	4.7	3.3	4.3	6.0	4.1	2.7	2.9	2.1	1.8
12	2.0	12	3.7	4.7	5.4	5.6	6.1	4.4	2.8	2.9	2.5	2.2
13	2.0	58	3.9	4.7	8.5	5.1	6.2	3.7	2.6	1.9	2.0	2.1
14	1.9	11	4.0	4.0	5.2	4.2	5.9	3.6	3.1	2.1	1.6	1.6
15	1.9	7.5	3.8	3.8	4.1	5.3	7.1	3.7	3.4	1.9	1.8	1.7
16	1.9	35	3.7	3.6	4.0	5.6	6.6	3.4	3.5	1.9	1.8	1.8
17	3.4	37	3.6	4.2	3.3	4.6	5.3	3.2	3.5	1.9	1.6	1.5
18	2.3	30	5.0	3.6	6.1	5.0	5.3	3.7	3.4	1.7	1.7	1.7
19	2.1	13	12	3.6	4.0	233	4.8	4.3	2.6	1.8	1.4	2.0
20	2.1	20	6.5	3.8	9.0	51	4.8	3.9	3.5	1.8	1.7	2.0
21	2.2	11	5.3	3.6	5.3	27	4.8	3.9	3.4	2.1	1.8	3.4
22	2.2	8.7	8.5	3.3	4.3	17	4.3	4.0	2.4	2.0	1.9	4.4
23	2.3	8.1	22	3.3	4.4	108	4.6	3.6	2.8	2.4	2.3	2.4
24	2.2	7.6	11	3.4	4.5	21	4.3	3.9	3.0	2.1	1.6	2.1
25	2.1	7.3	11	3.3	3.9	15	4.7	4.3	2.4	2.5	1.8	2.1
26	2.1	5.7	8.2	2.9	4.1	13	5.3	4.4	2.4	2.2	1.6	2.1
27	2.1	5.2	7.8	22	4.2	13	4.5	4.6	2.3	1.9	2.0	2.0
28	2.1	5.6	7.0	5.2	4.2	11	4.5	4.4	2.3	2.2	1.9	1.7
29	2.5	5.6	6.3	5.2	---	8.4	4.6	4.0	2.3	2.3	3.9	1.7
30	2.5	4.9	6.0	4.7	---	7.4	4.7	4.5	2.9	2.7	2.8	1.7
31	2.0	---	5.6	4.1	---	7.2	---	4.4	---	2.2	2.4	---
TOTAL	67.2	329.2	192.9	153.0	125.8	614.2	194.5	122.9	92.1	71.1	64.5	60.2
MEAN	2.17	11.0	6.22	4.94	4.49	19.8	6.48	3.96	3.07	2.29	2.08	2.01
MAX	3.4	58	22	22	9.0	233	28	5.0	4.4	3.3	3.9	4.4
MIN	1.9	2.2	3.4	2.9	3.3	3.7	4.3	3.2	2.3	1.7	1.4	1.5
AC-FT	133	653	383	303	250	1220	386	244	183	141	128	119

CAL YR 1990 TOTAL 1993.5 MEAN 5.46 MAX 82 MIN 1.8 AC-FT 3950
WTR YR 1991 TOTAL 2087.6 MEAN 5.72 MAX 233 MIN 1.4 AC-FT 4140

16265600 RIGHT BRANCH KAHOOALII 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, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--8 years (water years 1984-91) 1.62 ft^3/s (1,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft^3/s, Nov. 10, 1986, gage height, 11.65 ft from rating curve extended above 100 ft^3/s on basis of slope-conveyance 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)
Mar. 19	1900	*936	*9.98	No other peak greater than base discharge.			

Minimum discharge, 0.34 ft^3/s, Oct. 9.

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	.40	2.1	1.0	.80	.90	.71	.73	.75	1.0	2.0	.51	.50
2	.42	2.3	1.2	.80	.89	.65	.74	.78	1.1	1.2	.50	.50
3	.45	.41	1.0	.80	1.7	.65	.72	.88	1.0	.99	.47	.50
4	.61	.41	1.0	.80	.88	.70	.69	1.0	.96	.96	.62	.50
5	.43	.43	1.0	.97	.90	.66	.70	.85	1.3	.79	.48	.50
6	.43	.42	1.0	.81	.82	.67	.74	.93	1.1	.76	.47	.49
7	.42	.43	1.0	2.0	.73	.82	.72	.88	2.5	1.0	.48	.52
8	.39	.44	1.5	.80	.78	.90	1.6	.89	1.1	.73	2.8	.49
9	.37	.51	.94	.79	.77	1.7	7.7	1.1	1.1	.72	1.0	.50
10	.41	.55	.93	.84	.80	1.2	1.0	.87	1.1	1.3	.53	.53
11	.43	.50	.93	.93	.81	5.2	1.4	.89	1.1	.77	.52	.51
12	.43	20	.91	.84	3.5	1.9	.96	.86	1.1	.91	.51	.49
13	.42	64	.92	.84	1.5	.90	.82	.93	.98	.65	.66	.50
14	.41	2.3	1.1	.86	.72	.83	.75	.93	.85	.63	.53	.52
15	.40	.93	1.1	.82	.73	1.1	2.7	.87	.91	.60	.50	.55
16	.39	6.5	1.1	.84	.74	1.2	1.0	.91	.97	.61	.55	.50
17	2.7	37	1.0	1.0	.75	.83	.82	1.0	1.0	.60	.50	.51
18	.40	8.0	3.3	.84	4.0	2.5	.83	1.2	1.0	.57	.51	.47
19	.65	1.1	9.7	.81	.62	153	.83	1.3	.92	.55	.52	.69
20	.39	8.1	2.5	.87	1.6	29	.76	1.6	.98	.56	.50	.52
21	.65	.79	.89	.86	.57	12	.87	1.6	1.2	.53	.51	4.0
22	.40	1.0	6.0	.86	.60	1.4	.77	4.4	.65	.52	.50	.94
23	.41	1.4	10	.90	.56	48	.83	1.4	.60	.53	.53	.49
24	.41	.86	2.4	.91	.95	1.3	.84	1.3	.69	.57	.49	.46
25	.42	.95	7.0	.91	.57	.93	1.1	1.2	.64	.87	.49	.45
26	.43	1.0	.74	.91	.65	.86	.98	1.2	.89	.48	.54	.51
27	.47	.98	1.3	15	.66	.99	.76	1.3	1.2	.48	.74	.51
28	.52	1.1	.76	.78	.69	.80	.76	1.2	2.3	.44	.52	.50
29	.59	1.1	.68	.72	---	.80	.77	1.2	.97	.52	4.3	.52
30	.68	1.1	.68	.85	---	.79	.81	1.2	.94	1.2	1.5	.54
31	.41	---	.74	.92	---	.89	---	1.1	---	.49	.51	---
TOTAL	16.34	166.71	64.32	41.68	29.39	273.88	34.70	36.52	32.15	23.53	23.79	19.21
MEAN	.53	5.56	2.07	1.34	1.05	8.83	1.16	1.18	1.07	.76	.77	.64
MAX	2.7	64	10	15	4.0	153	7.7	4.4	2.5	2.0	4.3	4.0
MIN	.37	.41	.68	.72	.56	.65	.69	.75	.60	.44	.47	.45
AC-FT	32	331	128	83	58	543	69	72	64	47	47	38

CAL YR 1990 TOTAL 635.36 MEAN 1.74 MAX 64 MIN .37 AC-FT 1260
WTR YR 1991 TOTAL 762.22 MEAN 2.09 MAX 153 MIN .37 AC-FT 1510

16265600 RIGHT BRANCH OF 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 were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,230 mg/L, Apr. 19, 1984; minimum daily mean, 1 mg/L on several days in 1988.
SEDIMENT DISCHARGE: Maximum daily mean, 966 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 318 mg/L, Apr. 2; minimum daily mean, 2 mg/L on several days.
SEDIMENT DISCHARGE: Maximum daily mean, 266 tons, Mar. 19; minimum daily, less than 0.01 ton on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	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)
NOV										
08...	1210	0.43	260	6.3	24.0	1.6	756	5.2	62	--
DEC										
20...	1430	0.80	270	6.7	23.0	5.0	757	5.4	63	--
JAN										
25...	1000	0.83	220	6.5	23.0	3.2	756	5.5	65	--
MAR										
22...	1050	1.5	295	7.3	23.0	2.4	761	5.1	60	K230
MAY										
02...	1300	0.97	220	6.8	25.5	1.6	761	6.9	85	--
21...	1430	1.3	190	7.0	23.5	1.5	759	7.1	84	430
JUN										
26...	1405	0.94	215	6.8	26.0	1.1	762	6.5	80	--
JUL										
29...	1020	1.4	215	7.1	24.0	5.5	759	5.4	64	--
AUG										
27...	1040	0.74	175	6.1	24.0	3.5	758	4.9	59	2800
SEP										
23...	1400	0.46	240	6.5	25.0	1.6	754	6.3	77	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
22...	1050	100	23	11	21	30	0.9	1.7	81	32	22	<0.10
AUG												
27...	1040	63	14	6.9	18	38	1	1.2	57	12	22	<0.10

< Actual value is known to be less than the value shown.
K Results based on colony count outside acceptable range (non-ideal colony count).

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1430	--	--	--	--	<1	0.600	0.070	<0.20	--	0.010	0.03
MAR												
22...	1050	18	161	178	0.22	4	0.530	0.050	<0.20	--	0.020	0.06
MAY												
21...	1430	--	--	--	--	<1	0.470	<0.010	<0.20	--	0.030	--
AUG												
27...	1040	19	122	128	0.17	<1	0.420	0.140	0.30	0.72	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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
22...	1050	70	<10	<1	<1	<100	14	<10	<0.5	<1	<1.0
AUG											
27...	1040	200	<10	<1	<1	<100	6	<10	0.7	<1	<1.0

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR										
22...	1	<1	3	<3	2	1	370	100	1	1
AUG										
27...	2	<1	<1	<3	3	1	660	99	2	<1

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)
MAR										
22...	<10	<4	150	150	<0.10	<0.1	<1	<10	1	2
AUG										
27...	<10	<4	120	110	0.10	<0.1	1	<10	3	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
MAR										
22...	<1	1	<1	<1.0	130	<6	50	18	0.8	<1
AUG										
27...	<1	<1	<1	<1.0	92	<6	10	10	1.2	<1

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

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
MAR 22...	1050	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
AUG 27...	1040	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
SEP 24...	0935	<0.010	<0.1	<0.1	<1.0	--	<0.010	7.1	<0.010	6.4	<0.010

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 22...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
AUG 27...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
SEP 24...	1.9	--	--	<0.010	0.5	--	--	--	<0.010	<2.0

DATE	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 22...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
AUG 27...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
SEP 24...	<0.010	<0.1	--	--	<0.010	<2.0	<0.010	<1.0	<0.010	<0.1

DATE	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)
MAR 22...	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01	<0.1
AUG 27...	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01	<0.1
SEP 24...	--	<0.01	<10	--	--	<0.01	<0.1	<0.10	--	<0.1

DATE	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 22...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG 27...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP 24...	11	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

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

16265600 RIGHT BRANCH OF KAHOOALII STREAM NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	.40	6	.01	2.1	e47	.59	1.0	42	.12
2	.42	5	<.01	2.3	72	.53	1.2	81	.29
3	.45	12	.02	.41	16	.02	1.0	27	.07
4	.61	27	.05	.41	16	.02	1.0	24	.07
5	.43	7	.01	.43	13	.02	1.0	21	.06
6	.43	6	.01	.42	9	.01	1.0	21	.06
7	.42	5	.01	.43	14	.02	1.0	27	.07
8	.39	5	<.01	.44	8	.01	1.5	e40	.19
9	.37	3	<.01	.51	7	.01	.94	32	.08
10	.41	6	.01	.55	6	.01	.93	20	.05
11	.43	8	.01	.50	10	.01	.93	24	.06
12	.43	6	.01	20	e62	15	.91	27	.07
13	.42	4	<.01	64	e137	75	.92	48	.12
14	.41	3	<.01	2.3	19	.15	1.1	e52	.15
15	.40	4	<.01	.93	10	.02	1.1	e59	.18
16	.39	9	.01	6.5	76	1.7	1.1	49	.14
17	2.7	e36	.67	37	e145	27	1.0	54	.15
18	.40	20	.02	8.0	58	2.8	3.3	e61	.62
19	.65	e37	.08	1.1	10	.04	9.7	e78	3.9
20	.39	19	.02	8.1	67	3.6	2.5	e32	.35
21	.65	e28	.07	.79	6	.01	.89	13	.03
22	.40	15	.02	1.0	e9	.05	6.0	e54	1.8
23	.41	19	.02	1.4	26	.11	10	e89	5.4
24	.41	12	.01	.86	9	.02	2.4	e28	.39
25	.42	11	.01	.95	6	.02	7.0	e40	2.2
26	.43	9	.01	1.0	7	.02	.74	11	.02
27	.47	18	.02	.98	58	.15	1.3	130	.57
28	.52	16	.02	1.1	89	.25	.76	29	.07
29	.59	9	.03	1.1	73	.21	.68	18	.03
30	.68	e20	.05	1.1	50	.15	.68	18	.03
31	.41	5	.00	---	---	---	.74	17	.03
TOTAL	16.34	---	1.26	166.71	---	127.55	64.32	---	17.37
		JANUARY			FEBRUARY			MARCH	
1	.80	12	.03	.90	6	.02	.71	9	.02
2	.80	12	.03	.89	6	.01	.65	9	.02
3	.80	13	.03	1.7	e20	.20	.65	10	.02
4	.80	16	.03	.88	5	.01	.70	8	.02
5	.97	15	.04	.90	5	.01	.66	9	.02
6	.81	12	.02	.82	8	.02	.67	12	.02
7	2.0	e28	.21	.73	8	.02	.82	9	.02
8	.80	15	.03	.78	6	.01	.90	10	.04
9	.79	18	.04	.77	8	.02	1.7	e25	.19
10	.84	13	.03	.80	9	.02	1.2	e15	.08
11	.93	42	.11	.81	11	.02	5.2	e35	1.7
12	.84	20	.05	3.5	e31	.78	1.9	e29	.18
13	.84	14	.03	1.5	21	.14	.90	e15	.04
14	.86	20	.05	.72	9	.02	.83	13	.03
15	.82	13	.03	.73	9	.02	1.1	26	.07
16	.84	12	.03	.74	15	.03	1.2	27	.10
17	1.0	13	.04	.75	13	.02	.83	15	.03
18	.84	10	.02	4.0	e31	.91	2.5	e35	.28
19	.81	14	.03	.62	e17	.04	153	e315	266
20	.87	12	.03	1.6	e28	.16	29	99	22
21	.86	9	.02	.57	7	.01	12	e59	4.5
22	.86	8	.02	.60	8	.01	1.4	e6	.03
23	.90	12	.03	.56	6	.01	48	e106	46
24	.91	9	.02	.95	e16	.06	1.3	8	.04
25	.91	9	.02	.57	7	.01	.93	3	.01
26	.91	9	.02	.65	8	.01	.86	7	.02
27	15	e65	7.5	.66	11	.02	.99	27	.08
28	.78	19	.04	.69	8	.02	.80	8	.02
29	.72	8	.02	---	---	---	.80	5	.01
30	.85	5	.01	---	---	---	.79	9	.02
31	.92	6	.02	---	---	---	.89	9	.02
TOTAL	41.68	---	8.63	29.39	---	2.63	273.88	---	341.63

< Actual value is known to be less than the value shown.
e Estimated

16265600 RIGHT BRANCH OF KAMOOALII STREAM NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	.73	5	.01	.75	6	.01	1.0	4	.01
2	.74	318	.67	.78	5	.01	1.1	e14	.05
3	.72	5	.01	.88	9	.02	1.0	7	.02
4	.69	6	.01	1.0	e14	.04	.96	3	.01
5	.70	8	.01	.85	8	.02	1.3	e25	.11
6	.74	7	.01	.93	9	.02	1.1	16	.05
7	.72	13	.03	.88	11	.02	2.5	e38	.48
8	1.6	e39	.24	.89	10	.02	1.1	9	.02
9	7.7	e63	2.3	1.1	e21	.07	1.1	5	.02
10	1.0	11	.03	.87	10	.02	1.1	5	.02
11	1.4	44	.18	.89	5	.01	1.1	3	.01
12	.96	e15	.04	.86	5	.01	1.1	5	.01
13	.82	7	.02	.93	5	.01	.98	6	.02
14	.75	7	.02	.93	5	.01	.85	6	.01
15	2.7	47	.37	.87	6	.01	.91	6	.01
16	1.0	16	.04	.91	7	.02	.97	e7	.02
17	.82	8	.02	1.0	10	.03	1.0	e10	.03
18	.83	6	.01	1.2	11	.04	1.0	e10	.05
19	.83	6	.01	1.3	8	.03	.92	9	.02
20	.76	6	.01	1.6	e28	.18	.98	9	.02
21	.87	e13	.03	1.6	e16	.10	1.2	e15	.05
22	.77	7	.02	4.4	e44	1.6	.65	9	.02
23	.83	6	.01	1.4	17	.06	.60	9	.01
24	.84	6	.01	1.3	19	.07	.69	20	.04
25	1.1	e13	.06	1.2	5	.02	.64	9	.02
26	.98	10	.04	1.2	3	.01	.89	8	.02
27	.76	7	.01	1.3	4	.01	1.2	6	.02
28	.76	7	.01	1.2	4	.01	2.3	e40	.31
29	.77	5	.01	1.2	5	.02	.97	e12	.03
30	.81	5	.01	1.2	6	.02	.94	9	.02
31	---	---	---	1.1	5	.01	---	---	---
TOTAL	34.70	---	4.25	36.52	---	2.53	32.15	---	1.53
		JULY			AUGUST			SEPTEMBER	
1	2.0	e26	.25	.51	2	<.01	.50	3	<.01
2	1.2	e10	.05	.50	3	<.01	.50	4	<.01
3	.99	6	.02	.47	2	<.01	.50	3	<.01
4	.96	4	.01	.62	e11	.02	.50	5	.01
5	.79	2	<.01	.48	4	<.01	.50	4	.01
6	.76	2	<.01	.47	4	<.01	.49	4	.01
7	1.0	18	.06	.48	5	.01	.52	5	.01
8	.73	3	.01	2.8	e46	.45	.49	3	<.01
9	.72	3	<.01	1.0	e24	.11	.50	4	<.01
10	1.3	e27	.12	.53	3	<.01	.53	3	<.01
11	.77	e14	.03	.52	2	<.01	.51	4	<.01
12	.91	e12	.06	.51	2	<.01	.49	7	.01
13	.65	3	<.01	.66	4	.01	.50	4	.01
14	.63	3	<.01	.53	4	.01	.52	5	.01
15	.60	2	<.01	.50	7	.01	.55	6	.01
16	.61	4	.01	.55	17	.02	.50	4	.01
17	.60	4	.01	.50	5	.01	.51	5	.01
18	.57	4	.01	.51	5	.01	.47	7	.01
19	.55	4	.01	.52	4	.01	.69	e19	.04
20	.56	3	<.01	.50	4	<.01	.52	e8	.01
21	.53	2	<.01	.51	4	<.01	4.0	e36	1.4
22	.52	4	.01	.50	5	.01	.94	17	.10
23	.53	4	.01	.53	9	.01	.49	4	<.01
24	.57	9	.02	.49	4	<.01	.46	3	<.01
25	.87	e16	.10	.49	5	.01	.45	3	<.01
26	.48	3	<.01	.54	5	.01	.51	4	.01
27	.48	2	<.01	.74	25	.06	.51	4	<.01
28	.44	2	<.01	.52	18	.03	.50	3	<.01
29	.52	9	.01	4.3	e53	.98	.52	2	<.01
30	1.2	e20	.12	1.5	e17	.14	.54	2	<.01
31	.49	2	<.01	.51	5	.01	---	---	---
TOTAL	23.53	---	1.04	23.79	---	2.04	19.21	---	1.81
YEAR	762.22		512.27						

< Actual value is known to be less than the value shown.
e Estimated

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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1960-63 (low-flow measurements), 1965-71, 1971-84 (annual maximum), April 1984 to current year. Prior to April 1984, the station was located 400 ft upstream.

GAGE.--Water-stage recorder and wooden control. Elevation of gage is 200 ft (from Corps of Engineers).

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

AVERAGE DISCHARGE.--11 years (water years 1968-71, 1985-91), 1.41 ft^3/s (1,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft^3/s, Nov. 26, 1970 (gage height, 6.18 ft for datum and site then in use), from rating curve extended above 10 ft^3/s on basis of slope-area measurement at gage height 6.09 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)
Dec. 18	0415	242	2.09	Aug. 30	0530	*247	*2.14

Minimum discharge, 0.53 ft^3/s, Oct. 11 and Feb. 10.

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	1.2	1.5	2.0	1.8	1.2	1.3	2.6	1.6	1.6	2.8	1.8	2.0
2	1.4	2.9	2.2	1.6	1.2	1.3	2.3	1.5	1.7	1.8	1.5	1.6
3	1.3	1.2	2.2	1.5	1.3	1.3	2.4	1.7	2.0	2.1	1.8	1.6
4	1.2	1.4	1.9	1.5	1.2	1.4	2.3	1.9	1.9	2.1	1.8	1.6
5	1.0	1.1	2.0	1.5	1.1	1.3	2.2	1.7	1.7	2.0	1.6	1.4
6	1.2	1.4	1.8	1.4	1.2	1.3	2.2	1.8	1.5	1.6	1.9	1.6
7	1.0	1.1	1.8	1.7	1.2	1.4	2.0	2.1	1.8	1.9	1.9	1.7
8	.99	1.4	2.3	1.9	.96	1.4	2.5	2.3	2.0	1.7	3.8	1.3
9	.98	1.1	2.0	1.4	.62	1.6	3.0	2.3	2.1	1.9	2.2	1.4
10	1.1	.99	2.0	1.4	.61	1.5	2.4	2.1	1.8	2.0	1.6	1.5
11	.92	.96	1.6	1.4	.61	2.1	2.7	1.9	1.6	2.1	1.9	1.5
12	1.0	3.7	1.2	1.3	1.2	2.1	2.2	1.8	1.5	2.0	1.6	1.4
13	1.1	10	2.0	1.3	1.6	1.5	2.0	1.8	1.6	1.7	1.8	1.5
14	.94	3.7	1.9	1.3	1.3	1.4	2.1	1.5	1.8	1.5	1.5	1.4
15	.97	2.1	1.3	1.3	1.4	1.5	2.5	1.4	1.7	1.5	1.6	1.4
16	1.1	5.3	1.2	1.3	1.1	1.6	2.4	1.3	1.8	1.9	1.7	1.4
17	1.6	11	1.4	1.3	1.4	1.4	2.1	1.3	1.8	1.6	1.6	1.5
18	1.0	5.8	5.1	1.2	3.8	2.6	1.8	1.2	1.8	1.9	1.4	1.7
19	2.9	3.0	6.7	1.1	1.5	27	1.8	1.2	1.8	1.8	1.6	1.9
20	1.4	4.3	3.9	1.1	2.0	11	1.9	1.2	1.6	1.9	1.6	1.8
21	1.4	2.4	2.1	1.1	1.5	6.0	1.9	1.6	1.6	1.7	1.5	4.0
22	1.1	2.1	3.6	1.1	1.4	3.0	2.2	2.9	1.6	1.9	1.4	2.0
23	1.3	2.4	4.6	1.1	1.3	9.8	2.0	1.6	1.4	1.7	1.5	1.7
24	1.2	2.1	3.0	1.3	1.5	3.1	1.9	1.4	1.6	1.6	1.3	1.7
25	1.2	2.5	5.3	1.2	1.3	2.7	2.0	1.5	1.5	2.1	1.5	1.6
26	1.2	2.2	2.2	1.2	1.3	2.8	2.0	1.6	1.8	1.9	1.4	1.5
27	1.0	2.0	2.0	3.6	1.3	2.4	1.8	1.5	2.0	1.7	1.7	1.5
28	1.1	2.0	1.8	1.5	1.3	2.4	2.0	1.4	2.0	1.6	1.6	1.4
29	1.1	2.2	1.7	1.3	---	2.4	1.7	1.5	2.0	1.8	12	1.3
30	1.3	1.6	1.8	1.3	---	2.4	1.6	1.5	1.8	2.5	12	1.5
31	1.2	---	1.7	1.2	---	2.6	---	1.7	---	2.0	2.1	---
TOTAL	37.40	85.45	76.3	44.2	37.40	105.6	64.5	51.8	52.4	58.3	74.2	49.4
MEAN	1.21	2.85	2.46	1.43	1.34	3.41	2.15	1.67	1.75	1.88	2.39	1.65
MAX	2.9	11	6.7	3.6	3.8	27	3.0	2.9	2.1	2.8	12	4.0
MIN	.92	.96	1.2	1.1	.61	1.3	1.6	1.2	1.4	1.5	1.3	1.3
AC-FT	74	169	151	88	74	209	128	103	104	116	147	98

CAL YR 1990 TOTAL 590.48 MEAN 1.62 MAX 11 MIN .68 AC-FT 1170
WTR YR 1991 TOTAL 736.95 MEAN 2.02 MAX 27 MIN .61 AC-FT 1460

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 were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L, July 22, 1987; minimum daily mean, 1 mg/L, Apr. 2, 4, 5, 1991.
SEDIMENT DISCHARGE: Maximum daily, 342 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 504 mg/L, Mar. 19; minimum daily mean, 1 mg/L, Apr. 2, 4, 5.
SEDIMENT DISCHARGE: Maximum daily, 66 tons, Mar. 19; minimum daily, 0.01 ton on several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
NOV											
09...	1320	1.1	160	6.7	--	21.0	1.4	757	8.0	90	--
DEC											
18...	1240	1.4	160	7.2	--	20.5	7.4	762	8.4	93	--
JAN											
25...	1435	1.2	160	7.0	--	21.5	4.2	754	8.1	93	--
MAR											
20...	1120	12	108	7.5	--	20.0	63	759	8.8	97	4100
APR											
30...	1045	1.7	157	7.9	--	22.0	45	760	8.3	95	--
MAY											
20...	1220	0.98	165	7.5	--	22.5	1.5	761	8.3	96	470
JUN											
26...	1535	1.8	157	7.7	24.0	21.0	1.1	763	8.8	99	--
JUL											
29...	1510	1.8	150	7.5	--	21.0	1.6	757	8.2	93	--
AUG											
27...	1335	1.6	130	7.8	--	22.0	2.0	757	8.4	97	2300
SEP											
23...	1250	1.8	155	6.8	--	21.5	0.70	755	8.6	98	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
20...	1120	21	4.5	2.4	6.5	36	0.6	3.0	22	4.5	9.0	0.20
AUG												
27...	1335	45	8.9	5.4	13	38	0.8	1.1	50	1.9	17	<0.10

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
18...	1240	--	--	--	--	<1	0.400	0.020	<0.20	--	<0.010	--
MAR												
20...	1120	10	52	54	0.07	145	0.210	0.040	0.30	0.51	0.200	0.28
MAY												
20...	1220	--	--	--	--	8	0.110	<0.010	0.30	0.41	0.030	0.03
AUG												
27...	1335	28	93	105	0.13	<1	0.130	0.010	0.20	0.33	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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
20...	1120	6300	170	7	3	<100	<2	<10	<0.5	<1	<1.0
AUG											
27...	1335	260	30	<1	<1	<100	<2	<10	<0.5	<1	<1.0

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR										
20...	30	3	4	<3	10	3	8600	230	6	1
AUG										
27...	1	<1	<1	<3	1	<1	300	24	<1	<1

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)
MAR										
20...	<10	<4	140	7	<0.10	<0.1	<1	<10	13	1
AUG										
27...	<10	<4	10	5	0.10	<0.1	2	<10	1	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
MAR										
20...	<1	<1	<1	<1.0	29	<6	30	5	9.9	<1
AUG										
27...	<1	<1	<1	<1.0	55	8	<10	<3	0.7	<1

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
MAR 20...	1120	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
AUG 27...	1335	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
SEP 24...	1030	<0.010	<0.1	<0.1	<1.0	--	<0.010	<0.1	<0.010	<0.1	<0.010

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 20...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
AUG 27...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
SEP 24...	<0.1	--	--	<0.010	<0.1	--	--	--	<0.010	<0.1

DATE	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 20...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
AUG 27...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
SEP 24...	<0.010	<0.1	--	--	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1

DATE	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)
MAR 20...	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01	<0.1
AUG 27...	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01	<0.1
SEP 24...	--	<0.01	<1.0	--	--	<0.01	<0.1	<0.10	--	<0.1

DATE	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 20...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG 27...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP 24...	<1	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

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

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

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
JAN				
27...	0915	667	31	85
FEB				
07...	1140	508	1.5	99
MAR				
19...	1540	692	94	60
19...	2310	1720	201	47
AUG				
29...	0705	2100	403	74

16270900 LULUKU STREAM AT ALTITUDE 220 FT NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	1.2	e12	.04	1.5	29	.18	2.0	16	.08
2	1.4	e14	.05	2.9	75	1.1	2.2	22	.14
3	1.3	e13	.05	1.2	14	.04	2.2	11	.06
4	1.2	e12	.04	1.4	23	.08	1.9	12	.06
5	1.0	e11	.03	1.1	16	.05	2.0	8	.05
6	1.2	e10	.03	1.4	12	.05	1.8	10	.05
7	1.0	e9	.02	1.1	12	.04	1.8	11	.05
8	.99	e8	.02	1.4	8	.03	2.3	12	.07
9	.98	e7	.02	1.1	6	.02	2.0	10	.05
10	1.1	e7	.02	.99	e4	.01	2.0	7	.04
11	.92	e6	.02	.96	e5	.01	1.6	6	.03
12	1.0	e6	.02	3.7	127	4.5	1.2	e10	.04
13	1.1	e7	.02	10	142	12	2.0	33	.18
14	.94	e7	.02	3.7	18	.23	1.9	e22	.11
15	.97	e8	.02	2.1	11	.06	1.3	e7	.03
16	1.1	e8	.02	5.3	94	1.9	1.2	e7	.02
17	1.6	10	.04	11	183	11	1.4	e9	.03
18	1.0	e15	.04	5.8	18	.48	5.1	232	16
19	2.9	250	6.2	3.0	4	.03	6.7	240	11
20	1.4	e39	.17	4.3	36	.78	3.9	111	2.9
21	1.4	e12	.04	2.4	3	.02	2.1	20	.11
22	1.1	e13	.04	2.1	11	.06	3.6	103	2.6
23	1.3	e14	.05	2.4	22	.15	4.6	92	1.8
24	1.2	e14	.04	2.1	5	.03	3.0	130	2.5
25	1.2	e13	.04	2.5	4	.03	5.3	65	2.7
26	1.2	e13	.04	2.2	5	.03	2.2	8	.05
27	1.0	e13	.03	2.0	6	.03	2.0	e18	.11
28	1.1	e12	.04	2.0	9	.05	1.8	e5	.02
29	1.1	e16	.06	2.2	16	.09	1.7	4	.02
30	1.3	e40	.15	1.6	11	.05	1.8	6	.03
31	1.2	15	.05	---	---	---	1.7	6	.02
TOTAL	37.40	---	7.47	85.45	---	33.13	76.3	---	40.95
		JANUARY			FEBRUARY			MARCH	
1	1.8	4	.02	1.2	e23	.08	1.3	e15	.05
2	1.6	4	.02	1.2	e22	.07	1.3	e14	.05
3	1.5	6	.03	1.3	e26	.10	1.3	e14	.05
4	1.5	9	.04	1.2	e16	.05	1.4	e13	.05
5	1.5	12	.05	1.1	e17	.05	1.3	e12	.04
6	1.4	9	.03	1.2	e18	.06	1.3	e15	.05
7	1.7	33	.15	1.2	188	.58	1.4	e20	.08
8	1.9	267	2.6	.96	e33	.10	1.4	e27	.10
9	1.4	30	.11	.62	e12	.02	1.6	e39	.21
10	1.4	57	.21	.61	e8	.01	1.5	e29	.18
11	1.4	17	.07	.61	e15	.02	2.1	e85	.61
12	1.3	10	.04	1.2	e42	.19	2.1	e72	.44
13	1.3	10	.03	1.6	e41	.18	1.5	e17	.07
14	1.3	31	.11	1.3	e27	.10	1.4	e15	.06
15	1.3	37	.13	1.4	e13	.05	1.5	e19	.08
16	1.3	449	1.5	1.1	e9	.03	1.6	e34	.15
17	1.3	121	.49	1.4	e12	.05	1.4	e27	.11
18	1.2	e7	.02	3.8	138	4.8	2.6	e67	.50
19	1.1	e8	.02	1.5	e64	.26	27	504	66
20	1.1	e9	.03	2.0	e88	.49	11	83	5.4
21	1.1	e10	.03	1.5	e45	.19	6.0	35	.96
22	1.1	e11	.03	1.4	e29	.11	3.0	e5	.04
23	1.1	e12	.04	1.3	e23	.08	9.8	179	21
24	1.3	e13	.05	1.5	62	.30	3.1	49	.40
25	1.2	15	.05	1.3	e19	.07	2.7	24	.18
26	1.2	e15	.05	1.3	e18	.06	2.8	6	.05
27	3.6	372	6.6	1.3	e17	.06	2.4	4	.03
28	1.5	52	.22	1.3	e16	.06	2.4	22	.15
29	1.3	e27	.10	---	---	---	2.4	63	.41
30	1.3	e26	.09	---	---	---	2.4	8	.06
31	1.2	e24	.08	---	---	---	2.6	3	.02
TOTAL	44.2	---	13.04	37.40	---	8.22	105.6	---	97.58

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	2.6	2	.02	1.6	e45	.19	1.6	e25	.11
2	2.3	1	.01	1.5	e37	.15	1.7	e26	.12
3	2.4	2	.01	1.7	e35	.16	2.0	e27	.14
4	2.3	1	.01	1.9	e33	.17	1.9	e28	.14
5	2.2	1	.01	1.7	e32	.14	1.7	e28	.13
6	2.2	2	.01	1.8	e31	.15	1.5	e29	.12
7	2.0	4	.02	2.1	e54	.34	1.8	e30	.15
8	2.5	e51	.51	2.3	e56	.42	2.0	e31	.17
9	3.0	e83	1.6	2.3	e51	.34	2.1	e32	.18
10	2.4	e36	.24	2.1	e55	.33	1.8	e33	.16
11	2.7	e83	.64	1.9	e16	.08	1.6	34	.14
12	2.2	e17	.10	1.8	e10	.05	1.5	e33	.13
13	2.0	e7	.04	1.8	e7	.03	1.6	e32	.14
14	2.1	e8	.04	1.5	e4	.02	1.8	e30	.15
15	2.5	e66	.57	1.4	e5	.02	1.7	e29	.14
16	2.4	e53	.38	1.3	e5	.02	1.8	e28	.13
17	2.1	e17	.09	1.3	e6	.02	1.8	e27	.13
18	1.8	e9	.05	1.2	e7	.02	1.8	e26	.13
19	1.8	e9	.04	1.2	e8	.03	1.8	e25	.12
20	1.9	e10	.05	1.2	9	.03	1.6	e25	.11
21	1.9	e12	.06	1.6	e13	.06	1.6	e24	.10
22	2.2	e13	.08	2.9	172	6.2	1.6	e23	.10
23	2.0	e15	.08	1.6	e27	.12	1.4	e22	.08
24	1.9	e17	.09	1.4	e22	.08	1.6	e21	.09
25	2.0	e28	.16	1.5	e20	.08	1.5	e20	.08
26	2.0	e26	.14	1.6	e21	.09	1.8	e20	.09
27	1.8	e16	.08	1.5	e22	.09	2.0	19	.10
28	2.0	e12	.06	1.4	e22	.08	2.0	155	1.5
29	1.7	e16	.07	1.5	e23	.09	2.0	e20	.11
30	1.6	52	.23	1.5	e24	.10	1.8	e24	.12
31	---	---	---	1.7	e24	.11	---	---	---
TOTAL	64.5	---	5.49	51.8	---	9.81	52.4	---	5.11
		JULY			AUGUST			SEPTEMBER	
1	2.8	e75	.83	1.8	e28	.14	2.0	e24	.13
2	1.8	e16	.08	1.5	e25	.10	1.6	e20	.09
3	2.1	e15	.08	1.8	e22	.10	1.6	e16	.07
4	2.1	e15	.09	1.8	e19	.09	1.6	e13	.05
5	2.0	e16	.08	1.6	18	.08	1.4	e11	.04
6	1.6	e16	.07	1.9	e21	.11	1.6	e15	.06
7	1.9	e17	.09	1.9	e28	.14	1.7	e16	.08
8	1.7	e18	.08	3.8	163	4.2	1.3	e10	.04
9	1.9	e18	.09	2.2	e55	.41	1.4	e13	.05
10	2.0	e19	.10	1.6	e35	.15	1.5	e18	.07
11	2.1	e18	.10	1.9	e31	.16	1.5	e26	.11
12	2.0	e17	.09	1.6	e27	.12	1.4	e30	.12
13	1.7	e16	.08	1.8	e24	.11	1.5	e30	.12
14	1.5	e15	.06	1.5	e21	.08	1.4	e15	.06
15	1.5	e15	.06	1.6	e18	.08	1.4	e16	.06
16	1.9	e14	.07	1.7	e16	.07	1.4	e21	.08
17	1.6	e13	.06	1.6	e14	.06	1.5	e27	.11
18	1.9	e12	.06	1.4	e12	.05	1.7	e41	.18
19	1.8	e12	.06	1.6	11	.05	1.9	e45	.24
20	1.9	e11	.06	1.6	e11	.05	1.8	e91	.46
21	1.7	e11	.05	1.5	e12	.05	4.0	e180	12
22	1.9	e10	.05	1.4	e12	.04	2.0	36	.22
23	1.7	e10	.05	1.5	e22	.13	1.7	22	.10
24	1.6	e10	.04	1.3	e13	.05	1.7	20	.09
25	2.1	e46	.27	1.5	e12	.05	1.6	13	.06
26	1.9	e30	.15	1.4	e12	.05	1.5	e10	.04
27	1.7	e27	.12	1.7	13	.06	1.5	e11	.04
28	1.6	e24	.10	1.6	e46	.21	1.4	e11	.04
29	1.8	e21	.10	12	385	30	1.3	e11	.04
30	2.5	e58	.45	12	362	56	1.5	e12	.05
31	2.0	e34	.19	2.1	e41	.24	---	---	---
TOTAL	58.3	---	3.86	74.2	---	93.23	49.4	---	14.90
YEAR	736.95		332.79						

e Estimated

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.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--14 years, 11.6 ft^3/s (8,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft^3/s, Dec. 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)
Nov. 13	0930	710	4.22	Mar. 19	0530	*366	*3.43

Minimum discharge, 1.0 ft^3/s, Oct. 11.

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	7.4	11	14	12	8.8	8.1	14	10	8.7	14	7.1	8.4
2	7.1	28	15	12	8.6	7.8	14	9.9	8.5	8.4	6.8	7.9
3	7.2	8.6	14	12	11	7.8	14	10	9.7	8.3	7.1	7.4
4	8.1	7.6	13	12	8.6	7.8	14	11	8.9	7.8	7.7	7.8
5	6.7	7.2	13	13	8.1	7.6	14	9.7	9.5	7.6	7.0	7.1
6	6.5	7.6	12	12	8.2	7.6	13	9.7	9.3	7.2	6.8	7.2
7	6.2	7.5	12	17	7.9	8.2	13	9.9	12	9.3	6.8	7.3
8	6.2	7.1	13	13	7.7	8.1	15	10	11	7.3	19	6.8
9	6.1	6.7	13	12	7.3	12	31	11	9.2	7.1	11	6.7
10	7.7	6.5	12	11	7.2	9.1	14	10	8.7	9.8	7.5	7.0
11	7.0	6.5	11	12	7.2	19	20	9.7	8.5	8.6	7.4	7.2
12	4.5	55	11	11	12	19	13	9.4	8.3	8.8	7.0	7.1
13	6.1	143	12	11	17	11	12	9.3	8.3	7.5	7.4	7.0
14	7.3	29	11	11	9.6	9.2	12	9.1	8.0	7.4	6.7	6.9
15	8.8	14	10	11	9.0	9.8	18	8.6	7.7	7.0	6.8	6.9
16	2.0	68	10	11	8.3	11	14	8.7	7.8	7.4	6.7	6.5
17	14	114	10	12	8.8	9.2	12	8.6	8.5	7.2	6.3	6.5
18	6.5	70	37	11	20	16	12	8.9	8.0	7.2	6.1	6.6
19	18	23	55	10	13	329	12	8.9	7.8	7.3	6.5	8.5
20	13	46	24	9.7	17	118	11	9.5	7.5	7.3	6.5	9.1
21	8.5	21	16	9.7	12	54	12	10	7.5	7.1	6.3	19
22	6.9	17	29	9.6	9.9	21	11	23	7.2	7.3	6.0	19
23	7.5	20	39	9.8	9.3	116	11	13	7.1	7.1	7.0	7.8
24	6.7	16	23	10	11	25	11	9.3	7.5	7.0	6.2	7.5
25	6.6	15	35	9.9	9.1	19	12	8.9	7.5	8.8	6.3	7.2
26	6.6	14	17	9.6	8.6	18	13	8.9	7.6	7.2	6.2	6.8
27	6.3	14	16	40	8.4	17	11	8.9	7.9	6.7	8.0	6.6
28	6.6	14	15	13	8.3	16	11	8.6	10	6.4	6.9	6.6
29	6.8	15	13	9.5	---	15	11	8.5	7.9	7.2	50	6.4
30	8.6	14	13	9.0	---	15	11	8.5	7.4	12	47	6.4
31	6.9	---	13	8.8	---	15	---	8.7	---	7.6	10	---
TOTAL	234.4	826.3	551	374.6	281.9	966.3	406	308.2	253.5	246.9	314.1	239.2
MEAN	7.56	27.5	17.8	12.1	10.1	31.2	13.5	9.94	8.45	7.96	10.1	7.97
MAX	18	143	55	40	20	329	31	23	12	14	50	19
MIN	2.0	6.5	10	8.8	7.2	7.6	11	8.5	7.1	6.4	6.0	6.4
AC-FT	465	1640	1090	743	559	1920	805	611	503	490	623	474

CAL YR 1990 TOTAL 4902.7 MEAN 13.4 MAX 143 MIN 2.0 AC-FT 9720
WTR YR 1991 TOTAL 5002.4 MEAN 13.7 MAX 329 MIN 2.0 AC-FT 9920

16272200 KAHOOALII 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 were also collected at this site. Construction of houses (Brookview Subdivision) is also going on this year at this site, on right bank.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L, Mar. 18, 1980; minimum daily mean, 1 mg/L on several days in 1988, 1990, 1991.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons, Mar. 18, 1980; minimum daily, 0.01 ton, Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 569 mg/L, Dec. 18; minimum daily mean, 1 mg/L, Sep. 28.
SEDIMENT DISCHARGE: Maximum daily, 505 tons, Mar. 19; minimum daily, 0.02 ton, Sep 28.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
NOV											
09...	1545	6.0	195	6.8	--	25.5	0.60	758	8.4	103	--
DEC											
19...	1215	88	--	--	--	--	--	--	--	--	--
26...	1015	17	170	7.3	--	21.0	31	757	8.1	92	--
JAN											
24...	1345	9.2	200	7.4	--	23.0	2.6	757	8.6	101	--
MAR											
19...	2045	530	--	--	--	--	--	--	--	--	--
21...	1300	35	125	7.2	26.0	21.5	120	761	9.0	102	2000
APR											
30...	1330	11	196	8.2	--	25.5	3.2	762	8.2	100	--
MAY											
20...	1130	8.4	205	8.1	--	26.5	2.0	764	8.8	109	K160
JUN											
26...	1030	8.8	200	8.0	--	25.5	1.5	766	8.7	106	--
JUL											
31...	1125	7.3	200	8.2	--	26.5	1.8	762	8.5	106	--
AUG											
26...	1130	6.3	160	8.4	--	27.0	2.0	763	8.8	110	K240
SEP											
23...	1000	8.0	180	6.4	--	25.5	1.7	757	8.4	103	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
21...	1300	38	7.8	4.4	8.9	33	0.6	1.8	32	9.2	12	0.20
AUG												
26...	1130	57	9.8	7.9	15	36	0.9	1.2	60	3.6	20	0.10

K Results based on colony count outside the acceptable range (non-ideal colony count).

16272200 KAHOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
26...	1015	--	--	--	--	12	0.400	0.050	0.30	0.70	0.070	0.06
MAR												
21...	1300	11	66	75	0.09	50	0.310	0.050	0.20	0.51	0.200	0.12
MAY												
20...	1130	--	--	--	--	6	0.360	0.020	0.30	0.66	0.020	--
AUG												
26...	1130	21	107	115	0.15	2	0.250	0.040	<0.20	--	<0.010	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
21...	1300	4400	70	<1	<1	<100	3	<10	<0.5	<1	<1.0
AUG											
26...	1130	260	<10	<1	<1	<100	4	<10	<0.5	<1	<1.0

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR										
21...	25	<1	5	<3	5	1	9100	110	5	<1
AUG										
26...	<1	<1	<1	<3	2	1	460	17	1	<1

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)
MAR										
21...	<10	<4	110	20	<0.10	<0.1	<1	<10	15	1
AUG										
26...	<10	<4	60	9	0.10	0.1	2	<10	2	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
MAR										
21...	<1	<1	<1	<1.0	46	<6	10	<3	4.3	<1
AUG										
26...	<1	<1	<1	<1.0	79	<6	<10	5	1.9	<1

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
MAR											
21...	1300	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
AUG											
26...	1130	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
SEP											
24...	1000	<0.010	<0.1	<0.1	4.0	--	<0.010	0.4	<0.010	0.3	<0.010

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR										
21...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
AUG										
26...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	0.01	<0.010	--
SEP										
24...	1.4	--	--	<0.010	0.2	--	--	--	<0.010	<0.1

DATE	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR										
21...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
AUG										
26...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
SEP										
24...	<0.010	<0.1	--	--	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1

DATE	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)
MAR										
21...	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01	<0.1
AUG										
26...	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01	<0.1
SEP										
24...	--	<0.01	<1.0	--	--	<0.01	<0.1	<0.10	--	<0.1

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 21...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG 26...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP 24...	<1	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 19...	1215	86	20	85	MAR 19...	2045	193	276	84

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	7.4	9	.18	11	e44	1.1	14	6	.23
2	7.1	5	.10	28	e29	2.5	15	10	.42
3	7.2	7	.13	8.6	10	.23	14	6	.20
4	8.1	8	.17	7.6	9	.18	13	5	.20
5	6.7	5	.09	7.2	9	.18	13	4	.15
6	6.5	6	.10	7.6	7	.15	12	4	.15
7	6.2	7	.12	7.5	5	.10	12	3	.11
8	6.2	6	.10	7.1	8	.15	13	5	.17
9	6.1	5	.09	6.7	16	.30	13	5	.18
10	7.7	e6	.12	6.5	5	.08	12	6	.19
11	7.0	4	.10	6.5	4	.08	11	7	.22
12	4.5	e3	.04	55	51	16	11	11	.33
13	6.1	e5	.08	143	140	116	12	19	.59
14	7.3	7	.14	29	66	5.3	11	7	.21
15	8.8	3	.11	14	35	1.3	10	6	.16
16	2.0	e3	.02	68	e75	18	10	5	.14
17	14	9	.39	114	140	73	10	5	.15
18	6.5	4	.08	70	70	16	37	569	139
19	18	e17	2.1	23	42	2.6	55	e71	13
20	13	17	.65	46	e52	7.4	24	e37	2.5
21	8.5	7	.16	21	33	1.8	16	25	1.1
22	6.9	5	.10	17	23	1.1	29	93	9.7
23	7.5	8	.16	20	21	1.1	39	e52	6.9
24	6.7	9	.16	16	17	.73	23	e29	1.8
25	6.6	6	.11	15	12	.50	35	e40	5.1
26	6.6	7	.13	14	11	.43	17	25	1.1
27	6.3	11	.20	14	8	.30	16	21	.90
28	6.6	21	.37	14	7	.27	15	20	.83
29	6.8	19	.35	15	6	.26	13	14	.52
30	8.6	10	.22	14	4	.16	13	16	.56
31	6.9	24	.44	---	---	---	13	12	.40
TOTAL	234.4	---	7.31	826.3	---	267.30	551	---	187.21
		JANUARY			FEBRUARY			MARCH	
1	12	11	.35	8.8	12	.29	8.1	20	.44
2	12	15	.47	8.6	19	.44	7.8	30	.64
3	12	9	.30	11	12	.39	7.8	43	.91
4	12	9	.27	8.6	12	.28	7.8	27	.58
5	13	8	.28	8.1	10	.23	7.6	12	.25
6	12	7	.24	8.2	7	.16	7.6	9	.17
7	17	12	.55	7.9	36	.75	8.2	15	.34
8	13	16	.57	7.7	23	.49	8.1	42	.94
9	12	16	.51	7.3	19	.38	12	65	2.4
10	11	13	.38	7.2	19	.37	9.1	15	.38
11	12	7	.23	7.2	19	.37	19	e31	2.0
12	11	9	.28	12	e32	1.1	19	36	1.8
13	11	9	.26	17	25	1.1	11	26	.82
14	11	7	.22	9.6	29	.76	9.2	17	.43
15	11	10	.31	9.0	24	.58	9.8	16	.43
16	11	11	.32	8.3	18	.41	11	21	.63
17	12	9	.29	8.8	18	.42	9.2	17	.43
18	11	13	.37	20	e24	2.1	16	20	.88
19	10	23	.62	13	13	.46	329	326	505
20	9.7	23	.61	17	35	1.6	118	152	66
21	9.7	24	.63	12	33	1.1	54	79	15
22	9.6	24	.62	9.9	29	.77	21	39	2.2
23	9.8	20	.52	9.3	27	.67	116	123	64
24	10	17	.47	11	39	1.1	25	45	3.2
25	9.9	19	.51	9.1	43	1.0	19	29	1.5
26	9.6	20	.53	8.6	35	.82	18	19	.92
27	40	e64	9.9	8.4	16	.36	17	13	.59
28	13	23	.85	8.3	15	.34	16	11	.46
29	9.5	11	.30	---	---	---	15	9	.38
30	9.0	17	.40	---	---	---	15	10	.42
31	8.8	15	.37	---	---	---	15	11	.43
TOTAL	374.6	---	22.53	281.9	---	18.84	966.3	---	674.57

e Estimated

16272200 KAHOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	14	8	.30	10	10	.27	8.7	6	.14
2	14	6	.22	9.9	11	.30	8.5	6	.14
3	14	5	.17	10	12	.31	9.7	6	.16
4	14	3	.12	11	14	.39	8.9	7	.16
5	14	4	.15	9.7	12	.31	9.5	5	.12
6	13	4	.13	9.7	13	.34	9.3	7	.18
7	13	4	.15	9.9	16	.43	12	e13	.48
8	15	12	.55	10	19	.53	11	e7	.22
9	31	e21	2.8	11	13	.39	9.2	5	.13
10	14	8	.31	10	12	.33	8.7	6	.13
11	20	25	1.4	9.7	10	.26	8.5	6	.15
12	13	11	.42	9.4	8	.21	8.3	6	.14
13	12	8	.26	9.3	7	.19	8.3	7	.15
14	12	9	.31	9.1	8	.21	8.0	5	.10
15	18	e13	.65	8.6	7	.17	7.7	9	.19
16	14	12	.47	8.7	7	.17	7.8	12	.25
17	12	13	.43	8.6	11	.25	8.5	10	.23
18	12	8	.27	8.9	7	.16	8.0	8	.18
19	12	9	.27	8.9	5	.12	7.8	8	.17
20	11	13	.39	9.5	7	.18	7.5	10	.21
21	12	20	.63	10	8	.21	7.5	58	1.2
22	11	21	.65	23	e33	4.2	7.2	23	.45
23	11	35	1.1	13	21	.89	7.1	7	.14
24	11	51	1.5	9.3	8	.19	7.5	9	.19
25	12	24	.75	8.9	6	.15	7.5	16	.32
26	13	12	.44	8.9	6	.14	7.6	11	.22
27	11	10	.29	8.9	5	.12	7.9	14	.30
28	11	8	.22	8.6	4	.10	10	21	.56
29	11	9	.26	8.5	6	.14	7.9	16	.35
30	11	13	.38	8.5	6	.14	7.4	18	.36
31	---	---	---	8.7	5	.12	---	---	---
TOTAL	406	---	15.99	308.2	---	11.92	253.5	---	7.72
		JULY			AUGUST			SEPTEMBER	
1	14	e27	1.1	7.1	e6	.12	8.4	18	.41
2	8.4	16	.36	6.8	e11	.21	7.9	e11	.24
3	8.3	13	.28	7.1	e12	.23	7.4	6	.12
4	7.8	20	.43	7.7	e17	.35	7.8	4	.09
5	7.6	15	.32	7.0	21	.41	7.1	3	.06
6	7.2	11	.21	6.8	14	.26	7.2	3	.06
7	9.3	12	.30	6.8	12	.22	7.3	3	.05
8	7.3	e11	.22	19	e30	2.0	6.8	2	.04
9	7.1	e10	.20	11	10	.30	6.7	3	.05
10	9.8	e9	.24	7.5	6	.12	7.0	7	.13
11	8.6	e9	.21	7.4	5	.09	7.2	8	.15
12	8.8	e10	.25	7.0	4	.08	7.1	3	.05
13	7.5	e8	.15	7.4	5	.10	7.0	4	.08
14	7.4	e10	.20	6.7	5	.10	6.9	4	.07
15	7.0	e17	.32	6.8	6	.12	6.9	2	.04
16	7.4	e9	.18	6.7	13	.24	6.5	3	.05
17	7.2	e9	.17	6.3	12	.20	6.5	3	.06
18	7.2	e10	.19	6.1	6	.10	6.6	10	.17
19	7.3	e8	.16	6.5	7	.13	8.5	20	.46
20	7.3	e7	.13	6.5	16	.28	9.1	10	.23
21	7.1	e11	.21	6.3	14	.23	19	e17	3.0
22	7.3	e11	.22	6.0	6	.11	19	12	1.0
23	7.1	e10	.20	7.0	9	.17	7.8	3	.07
24	7.0	e14	.26	6.2	10	.16	7.5	4	.09
25	8.8	e19	.44	6.3	7	.12	7.2	6	.11
26	7.2	e16	.31	6.2	6	.10	6.8	6	.11
27	6.7	e13	.24	8.0	7	.15	6.6	3	.05
28	6.4	e11	.20	6.9	9	.17	6.6	1	.02
29	7.2	e11	.21	50	68	13	6.4	2	.03
30	12	e16	.50	47	e66	17	6.4	2	.04
31	7.6	e13	.27	10	33	.96	---	---	---
TOTAL	246.9	---	8.68	314.1	---	37.83	239.2	---	7.13
YEAR	5002.4		1267.03						

e Estimated

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE

LOCATION.--Lat 21°24'21", long 157°48'31", Hydrologic Unit 20060000, on right bank 0.8 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.

REMARKS.-- Records fair.

AVERAGE DISCHARGE.--4 years, 2.64 ft^3/s (1,910 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft^3/s, Dec. 31, 1987, gage height, 5.18 ft, from rating curve extended above 8.7 ft^3/s; minimum, 1.5 ft^3/s, July 18, 19, 1989.

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)
Mar. 19	1415	*118	*4.05	No other peak greater than base discharge.			

Minimum discharge, 1.7 ft^3/s, Oct. 3, 4, 11, 12, 15.

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	1.8	3.5	2.3	2.2	2.5	2.2	2.5	2.2	2.2	2.8	2.0	2.0
2	1.9	4.5	2.4	2.2	2.3	2.2	2.5	2.2	2.5	2.2	2.1	2.0
3	1.8	2.3	2.1	2.3	2.5	2.2	2.5	2.2	2.4	2.2	2.1	2.0
4	1.9	2.2	2.1	2.3	2.3	2.2	2.5	2.2	2.2	2.3	2.2	2.1
5	1.8	2.2	2.1	2.5	2.3	2.2	2.5	2.2	2.2	2.2	2.1	2.0
6	1.8	2.2	2.1	2.4	2.3	2.2	2.4	2.2	2.2	2.3	2.2	2.0
7	1.8	2.2	2.1	2.8	2.3	2.3	2.4	2.2	2.3	2.3	2.2	2.0
8	1.8	2.1	2.4	2.4	2.3	2.4	2.8	2.3	2.2	2.2	3.5	2.0
9	1.8	2.1	2.1	2.2	2.3	2.6	3.6	2.4	2.2	2.2	3.0	2.0
10	1.9	2.1	2.0	2.2	2.3	2.7	2.6	2.3	2.2	2.4	2.7	2.0
11	1.8	2.1	2.1	2.3	2.3	3.3	2.5	2.2	2.2	2.3	2.6	2.1
12	1.8	5.9	2.0	2.3	3.1	3.1	2.5	2.2	2.2	2.3	2.5	2.1
13	1.8	12	2.0	2.4	2.9	2.5	2.5	2.2	2.2	2.2	2.6	2.1
14	1.8	3.4	2.1	2.4	2.3	2.3	2.5	2.2	2.2	2.1	2.5	2.1
15	1.8	2.5	2.0	2.3	2.3	2.4	2.7	2.2	2.2	2.1	2.5	2.0
16	1.8	3.8	2.1	2.3	2.3	2.6	2.9	2.2	2.2	2.1	2.4	2.0
17	2.2	11	2.1	2.4	2.3	2.3	2.5	2.2	2.2	2.2	2.4	2.1
18	1.8	5.7	5.1	2.3	5.0	3.0	2.4	2.2	2.2	2.2	2.3	2.1
19	4.7	2.9	5.7	2.3	2.5	26	2.4	2.2	2.2	2.2	2.3	2.5
20	2.3	4.4	3.9	2.2	3.1	8.7	2.4	2.3	2.2	2.1	2.3	2.7
21	2.4	2.7	2.3	2.2	2.5	5.0	2.5	2.2	2.2	2.2	2.3	4.5
22	2.2	2.6	3.2	2.1	2.3	2.5	2.4	3.6	2.2	2.2	2.2	2.3
23	2.3	2.7	4.8	2.2	2.3	8.7	2.5	2.3	2.2	2.2	2.3	2.1
24	2.1	2.3	3.6	2.2	2.5	3.1	2.5	2.2	2.3	2.2	2.2	2.1
25	2.1	2.3	5.3	2.1	2.2	2.8	2.5	2.2	2.2	2.3	2.2	2.1
26	2.0	2.3	2.7	2.1	2.2	2.9	2.5	2.3	2.2	2.1	2.2	2.0
27	2.1	2.3	2.6	5.8	2.2	2.7	2.4	2.2	2.1	2.1	2.2	2.0
28	2.1	2.3	2.3	2.5	2.2	2.6	2.4	2.2	2.4	2.1	2.1	2.0
29	2.3	2.4	2.3	2.3	---	2.6	2.4	2.2	2.2	2.2	5.0	2.0
30	2.5	2.4	2.3	2.3	---	2.5	2.4	2.3	2.3	2.2	3.6	2.0
31	2.1	---	2.3	2.5	---	2.5	---	2.2	---	2.0	2.1	---
TOTAL	64.3	103.4	84.5	75.0	69.9	117.3	76.1	70.4	66.9	68.7	76.9	65.0
MEAN	2.07	3.45	2.73	2.42	2.50	3.78	2.54	2.27	2.23	2.22	2.48	2.17
MAX	4.7	12	5.7	5.8	5.0	26	3.6	3.6	2.5	2.8	5.0	4.5
MIN	1.8	2.1	2.0	2.1	2.2	2.2	2.4	2.2	2.1	2.0	2.0	2.0
AC-FT	128	205	168	149	139	233	151	140	133	136	153	129

CAL YR 1990 TOTAL 890.0 MEAN 2.44 MAX 13 MIN 1.6 AC-FT 1770
WTR YR 1991 TOTAL 938.4 MEAN 2.57 MAX 26 MIN 1.8 AC-FT 1860

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 September 1991.

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

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,010 mg/L, Mar. 19; minimum daily mean, 19 mg/L, Dec. 13.
SEDIMENT DISCHARGE: Maximum daily, 117 tons, Mar. 19; minimum daily, 0.10 tons on several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
NOV											
08...	1350	2.1	200	7.7	--	23.0	3.4	757	7.8	92	--
DEC											
20...	1415	2.8	215	7.5	--	22.0	20	759	8.1	93	--
JAN											
24...	1340	2.2	200	7.8	--	21.5	5.7	757	8.4	96	--
MAR											
19...	1005	E20	160	7.9	19.5	20.5	71	764	8.7	96	K46000
MAY											
01...	1345	2.4	185	7.7	--	24.0	3.5	766	8.2	97	--
20...	1045	2.1	195	7.8	--	22.5	3.5	763	8.5	98	700
JUN											
04...	1400	2.1	188	7.9	--	23.0	3.0	761	8.3	97	--
JUL											
30...	1345	2.1	200	8.0	--	23.0	4.0	762	8.3	97	--
AUG											
27...	1300	2.2	200	7.8	--	23.5	3.0	761	8.2	97	8800
SEP											
23...	1300	3.0	215	7.7	--	23.5	2.7	757	7.7	91	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
19...	1005	40	9.6	3.9	12	38	0.8	2.2	35	8.0	19	0.20
AUG												
27...	1300	57	12	6.5	17	39	1	1.3	63	3.2	21	<0.10

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1415	--	--	--	--	18	0.100	0.060	<0.20	--	0.040	--
MAR												
19...	1005	11	81	87	0.11	144	0.500	0.030	0.30	0.80	0.290	0.12
MAY												
20...	1045	--	--	--	--	13	0.055	<0.010	0.70	0.76	0.040	--
AUG												
27...	1300	30	125	129	0.17	1	<0.050	0.100	<0.20	--	0.030	--

< Actual value is known to be less than the value shown.
E Estimated.
K Results based on colony count outside acceptable range (non-ideal colony count).

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)
MAR											
19...	1005	7200	40	4	1	<100	3	<10	<0.5	<1	<1.0
AUG											
27...	1300	150	<10	<1	<1	<100	3	<10	<0.5	<1	<1.0

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)
MAR										
19...	40	<1	6	<3	8	1	14000	46	12	1
AUG										
27...	2	<1	<1	<3	1	<1	780	170	1	<1

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)
MAR										
19...	<10	<4	340	55	<0.10	<0.1	<1	<10	13	<1
AUG										
27...	<10	<4	90	84	0.10	<0.1	3	<10	1	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR										
19...	<1	<1	<1	<1.0	54	<6	40	9	14	<1
AUG										
27...	<1	<1	<1	<1.0	66	7	10	<3	1.3	<1

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
MAR											
19...	1005	<0.010	--	0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
AUG											
27...	1300	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
SEP											
24...	1100	<0.010	1.2	<0.1	180	--	<0.010	12	<0.010	1.3	<0.010

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

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR										
19...	--	<0.01	<0.01	0.010	--	<0.01	<0.01	<0.01	<0.010	--
AUG										
27...	--	<0.01	<0.01	0.010	--	<0.01	<0.01	<0.01	<0.010	--
SEP										
24...	1.5	--	--	0.010	6.3	--	--	--	<0.010	<0.1

DATE	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR										
19...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
AUG										
27...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
SEP										
24...	<0.010	<0.1	--	--	<0.010	0.7	<0.010	<1.0	<0.010	<0.1

DATE	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)
MAR										
19...	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01	<0.1
AUG										
27...	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01	<0.1
SEP										
24...	--	<0.01	<10	--	--	<0.01	<0.1	<0.10	--	<0.1

DATE	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR										
19...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG										
27...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP										
24...	5	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

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

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	1.8	e25	.12	3.5	e94	3.2	2.3	e40	.25
2	1.9	e24	.12	4.5	e130	3.5	2.4	e39	.25
3	1.8	e24	.11	2.3	e42	.26	2.1	e38	.22
4	1.9	e23	.12	2.2	e36	.21	2.1	e37	.22
5	1.8	e23	.11	2.2	e32	.19	2.1	e36	.21
6	1.8	e22	.11	2.2	e28	.16	2.1	e35	.20
7	1.8	e22	.11	2.2	e24	.14	2.1	e34	.19
8	1.8	e21	.11	2.1	22	.13	2.4	e43	.30
9	1.8	e21	.10	2.1	e24	.14	2.1	e36	.21
10	1.9	e20	.10	2.1	e28	.16	2.0	e30	.17
11	1.8	20	.10	2.1	e33	.18	2.1	e26	.14
12	1.8	e21	.10	5.9	148	6.3	2.0	e22	.12
13	1.8	e22	.11	12	249	18	2.0	19	.10
14	1.8	e22	.11	3.4	e57	.61	2.1	e21	.11
15	1.8	e23	.11	2.5	e40	.27	2.0	e24	.13
16	1.8	e24	.12	3.8	e106	2.3	2.1	e28	.16
17	2.2	e30	.21	11	486	28	2.1	e33	.18
18	1.8	e20	.10	5.7	e165	3.8	5.1	221	11
19	4.7	165	9.0	2.9	44	.35	5.7	249	8.6
20	2.3	e51	.32	4.4	e123	2.4	3.9	106	2.4
21	2.4	e60	.42	2.7	e54	.39	2.3	e38	.24
22	2.2	e41	.24	2.6	e52	.36	3.2	e84	1.7
23	2.3	e39	.25	2.7	e51	.38	4.8	140	3.2
24	2.1	e38	.22	2.3	e49	.31	3.6	113	2.8
25	2.1	e36	.20	2.3	e48	.30	5.3	187	7.1
26	2.0	e35	.19	2.3	e47	.29	2.7	98	.71
27	2.1	e33	.19	2.3	e45	.28	2.6	e90	.64
28	2.1	e32	.18	2.3	e44	.28	2.3	e84	.53
29	2.3	e53	.96	2.4	e43	.28	2.3	e78	.48
30	2.5	e46	.33	2.4	e42	.27	2.3	e72	.44
31	2.1	e37	.22	---	---	---	2.3	e66	.40
TOTAL	64.3	---	14.79	103.4	---	73.44	84.5	---	43.40
		JANUARY			FEBRUARY			MARCH	
1	2.2	e62	.36	2.5	e34	.23	2.2	e37	.22
2	2.2	e57	.35	2.3	e36	.23	2.2	e37	.22
3	2.3	e53	.33	2.5	e45	.33	2.2	e37	.22
4	2.3	e49	.31	2.3	e38	.23	2.2	e37	.22
5	2.5	e45	.30	2.3	e38	.23	2.2	e36	.22
6	2.4	e42	.27	2.3	e37	.23	2.2	e36	.22
7	2.8	e58	.53	2.3	e37	.23	2.3	e36	.22
8	2.4	e36	.23	2.3	e37	.23	2.4	e41	.27
9	2.2	e37	.22	2.3	e37	.22	2.6	e53	.41
10	2.2	e37	.22	2.3	e36	.22	2.7	e66	1.0
11	2.3	e38	.23	2.3	e36	.22	3.3	e100	1.3
12	2.3	e38	.24	3.1	e68	.79	3.1	e62	.55
13	2.4	e39	.25	2.9	e58	.50	2.5	e46	.31
14	2.4	e44	.31	2.3	e40	.25	2.3	e43	.27
15	2.3	e41	.25	2.3	e41	.25	2.4	e40	.25
16	2.3	e42	.26	2.3	e42	.26	2.6	e50	.37
17	2.4	e44	.28	2.3	e43	.27	2.3	e42	.26
18	2.3	e45	.29	5.0	186	11	3.0	e66	.62
19	2.3	e47	.29	2.5	e46	.31	26	1010	117
20	2.2	e49	.30	3.1	e71	.68	8.7	637	31
21	2.2	e50	.29	2.5	e44	.30	5.0	225	9.5
22	2.1	e52	.30	2.3	e41	.25	2.5	46	.31
23	2.2	e54	.31	2.3	e39	.24	8.7	397	29
24	2.2	55	.32	2.5	e46	.33	3.1	e63	.52
25	2.1	e49	.28	2.2	e38	.23	2.8	e54	.41
26	2.1	e42	.24	2.2	e38	.22	2.9	e53	.41
27	5.8	154	4.9	2.2	e38	.22	2.7	e53	.38
28	2.5	33	.22	2.2	e37	.22	2.6	e53	.37
29	2.3	e28	.18	---	---	---	2.6	e52	.36
30	2.3	e30	.19	---	---	---	2.5	e52	.36
31	2.5	e32	.21	---	---	---	2.5	e52	.35
TOTAL	75.0	---	13.26	69.9	---	18.92	117.3	---	197.12

e Estimated

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	2.5	e51	.35	2.2	e40	.24	2.2	e36	.22
2	2.5	e51	.35	2.2	e39	.24	2.5	e45	.36
3	2.5	e51	.34	2.2	e39	.23	2.4	e39	.25
4	2.5	e50	.34	2.2	e38	.23	2.2	41	.24
5	2.5	e50	.34	2.2	e37	.22	2.2	e43	.25
6	2.4	e50	.32	2.2	e37	.22	2.2	e42	.25
7	2.4	e49	.32	2.2	e36	.22	2.3	e42	.26
8	2.8	e65	.62	2.3	e36	.22	2.2	e41	.24
9	3.6	e111	1.7	2.4	e35	.22	2.2	e41	.24
10	2.6	28	.20	2.3	e34	.21	2.2	e40	.24
11	2.5	e28	.19	2.2	e34	.20	2.2	e40	.23
12	2.5	e32	.21	2.2	e33	.20	2.2	e39	.23
13	2.5	e36	.24	2.2	e33	.20	2.2	e39	.23
14	2.5	e40	.27	2.2	e32	.19	2.2	e38	.22
15	2.7	e55	.48	2.2	e32	.19	2.2	e38	.22
16	2.9	e60	.57	2.2	e31	.18	2.2	e37	.22
17	2.5	e44	.29	2.2	e31	.18	2.2	e37	.22
18	2.4	e44	.29	2.2	e30	.18	2.2	e36	.22
19	2.4	e44	.29	2.2	e29	.18	2.2	e36	.21
20	2.4	e44	.29	2.3	e41	.27	2.2	e36	.21
21	2.5	e44	.30	2.2	e36	.22	2.2	e35	.21
22	2.4	e44	.29	3.6	391	13	2.2	e35	.20
23	2.5	e44	.29	2.3	e41	.26	2.2	e34	.20
24	2.5	e44	.29	2.2	e40	.24	2.3	e37	.25
25	2.5	e47	.33	2.2	e39	.24	2.2	e34	.21
26	2.5	e45	.31	2.3	e42	.26	2.2	e33	.19
27	2.4	e43	.28	2.2	e38	.23	2.1	32	.18
28	2.4	e42	.28	2.2	e38	.22	2.4	e46	.39
29	2.4	e42	.27	2.2	e37	.23	2.2	e37	.22
30	2.4	e41	.26	2.3	e37	.22	2.3	e38	.23
31	---	---	---	2.2	e37	.22	---	---	---
TOTAL	76.1	---	10.90	70.4	---	19.56	66.9	---	7.04
		JULY			AUGUST			SEPTEMBER	
1	2.8	e61	.57	2.0	e33	.18	2.0	e36	.20
2	2.2	e38	.23	2.1	e33	.19	2.0	e36	.19
3	2.2	e37	.23	2.1	e34	.19	2.0	e36	.20
4	2.3	e37	.23	2.2	e34	.20	2.1	e36	.21
5	2.2	e37	.22	2.1	e35	.20	2.0	e37	.20
6	2.3	e36	.22	2.2	e35	.21	2.0	e37	.20
7	2.3	e36	.22	2.2	e36	.21	2.0	e37	.20
8	2.2	e36	.22	3.5	e74	.92	2.0	e37	.20
9	2.2	e35	.21	3.0	e62	.52	2.0	e37	.20
10	2.4	e35	.23	2.7	e51	.37	2.0	e37	.20
11	2.3	e35	.21	2.6	e50	.35	2.1	e37	.21
12	2.3	e34	.21	2.5	e48	.33	2.1	e37	.21
13	2.2	e36	.22	2.6	e48	.33	2.1	e37	.22
14	2.1	e36	.21	2.5	e46	.31	2.1	e38	.21
15	2.1	e35	.20	2.5	e45	.30	2.0	e38	.21
16	2.1	e35	.20	2.4	e44	.29	2.0	e38	.21
17	2.2	e35	.20	2.4	e43	.28	2.1	e38	.21
18	2.2	e34	.20	2.3	e42	.26	2.1	e38	.21
19	2.2	e34	.20	2.3	e41	.25	2.5	e40	.28
20	2.1	e34	.19	2.3	e40	.24	2.7	e56	.45
21	2.2	e33	.19	2.3	e39	.24	4.5	162	8.7
22	2.2	e33	.20	2.2	e38	.23	2.3	e40	.26
23	2.2	e32	.19	2.3	e40	.26	2.1	25	.14
24	2.2	e34	.21	2.2	e38	.23	2.1	e24	.14
25	2.3	e43	.33	2.2	e36	.22	2.1	e25	.14
26	2.1	e35	.20	2.2	e35	.20	2.0	e26	.14
27	2.1	e39	.22	2.2	37	.23	2.0	e27	.15
28	2.1	e43	.25	2.1	e34	.19	2.0	e28	.16
29	2.2	43	.24	5.0	167	5.3	2.0	e29	.16
30	2.2	e45	.30	3.6	e100	1.9	2.0	e30	.16
31	2.0	e32	.17	2.1	e36	.21	---	---	---
TOTAL	68.7	---	7.12	76.9	---	15.34	65.0	---	14.57
YEAR	938.4		435.46						

e Estimated

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 Apr. 28, 1914, nonrecording gage and Apr. 28, 1914, to Oct. 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).--43 years (water years 1944-77, 1984-91), 2.23 ft^3/s (1,620 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, Sept. 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)
Nov. 13	0900	440	3.20	Feb. 18	1630	512	3.29
Dec. 18	0400	*743	*3.53	Mar. 19	2300	*743	*3.53

Minimum discharge, 1.5 ft^3/s, Nov 11, 12.

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	1.8	4.3	2.3	2.1	1.7	1.8	2.5	1.9	2.0	3.8	1.8	2.2
2	1.8	4.8	2.3	2.1	1.7	1.8	2.5	1.8	2.0	2.4	1.7	2.0
3	1.7	2.5	2.3	2.1	1.8	1.8	2.4	1.8	1.9	1.9	1.7	1.9
4	2.0	2.1	2.2	2.1	1.7	1.7	2.3	1.8	2.0	1.8	1.7	1.9
5	2.0	1.9	2.2	2.1	1.7	1.7	2.3	1.8	1.8	1.7	1.7	1.8
6	1.8	1.8	2.1	2.0	1.7	1.8	2.3	1.8	1.9	1.7	1.7	1.8
7	1.7	1.7	2.1	2.1	1.6	1.7	2.2	1.8	2.0	1.8	1.8	1.8
8	1.6	1.6	2.6	2.1	1.6	1.8	2.7	1.8	1.9	1.7	11	1.7
9	1.6	1.6	2.1	2.0	1.6	1.8	5.8	1.9	1.8	1.7	5.7	1.7
10	1.7	1.6	2.0	2.1	1.6	2.2	2.7	1.8	1.7	2.1	2.3	1.7
11	1.7	1.5	2.0	2.0	1.7	5.6	2.9	1.8	1.8	2.1	2.0	1.8
12	1.7	11	2.0	2.0	2.1	3.3	2.5	1.8	1.7	1.9	1.8	1.7
13	1.7	51	2.0	1.9	3.2	2.7	2.3	1.8	1.7	1.8	1.8	1.7
14	1.8	10	1.9	1.9	2.2	2.5	2.2	1.8	1.7	1.8	1.7	1.7
15	1.8	5.1	1.8	1.9	1.9	2.5	2.2	1.8	1.7	1.8	1.8	1.7
16	1.7	13	1.8	1.8	1.8	2.5	2.2	1.9	1.7	1.8	1.8	1.7
17	1.8	29	1.8	1.9	1.7	2.5	2.1	1.8	1.7	1.7	1.9	1.7
18	1.8	17	26	1.8	13	4.6	2.0	1.8	1.7	1.7	1.8	1.6
19	2.4	6.2	16	1.8	3.2	113	2.0	1.8	1.7	1.8	1.8	1.9
20	2.0	14	5.8	1.8	3.6	55	2.0	1.7	1.8	2.0	1.8	2.0
21	1.9	4.4	4.2	1.8	3.1	23	2.0	1.7	1.7	1.8	1.8	9.3
22	1.8	3.4	10	1.8	2.4	6.5	1.9	3.0	1.7	1.7	1.7	3.5
23	1.9	3.1	7.0	1.8	2.1	19	1.9	1.9	1.8	1.7	1.7	2.1
24	1.8	2.8	4.8	1.7	2.0	6.3	1.9	1.8	1.8	1.7	1.7	1.9
25	1.8	2.6	6.3	1.8	1.9	4.7	2.0	1.7	1.8	1.8	1.7	1.7
26	1.7	2.5	3.4	1.7	1.9	4.2	2.0	1.7	1.8	1.7	1.8	1.7
27	1.7	2.4	2.9	6.1	1.8	3.7	1.9	1.8	1.8	1.7	1.7	1.7
28	1.8	2.4	2.6	2.2	1.8	3.1	1.9	1.8	1.8	1.7	1.7	1.6
29	1.8	2.5	2.4	2.0	---	2.9	1.9	1.8	1.7	1.7	24	1.6
30	1.9	2.4	2.3	1.8	---	2.7	1.9	1.9	1.8	3.0	16	1.6
31	1.9	---	2.2	1.7	---	2.6	---	2.0	---	2.1	2.9	---
TOTAL	56.1	210.2	131.4	64.0	68.1	291.0	69.4	57.3	53.9	59.6	106.0	62.7
MEAN	1.81	7.01	4.24	2.06	2.43	9.39	2.31	1.85	1.80	1.92	3.42	2.09
MAX	2.4	51	26	6.1	13	113	5.8	3.0	2.0	3.8	24	9.3
MIN	1.6	1.5	1.8	1.7	1.6	1.7	1.9	1.7	1.7	1.7	1.7	1.6
AC-FT	111	417	261	127	135	577	138	114	107	118	210	124

CAL YR 1990 TOTAL 1087.1 MEAN 2.98 MAX 51 MIN 1.4 AC-FT 2160
WTR YR 1991 TOTAL 1229.7 MEAN 3.37 MAX 113 MIN 1.5 AC-FT 2440

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 were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L (estimated), Apr. 8, 1989; minimum daily mean, 1 mg/L, on many days in 1984, 1988, 1989, 1990, 1991.
SEDIMENT DISCHARGE: Maximum daily, 1,800 tons (estimated), Apr. 8, 1989; minimum daily, less than 0.01 ton on many days in 1984, 1988, 1989, 1990, 1991.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,720 mg/L, Mar. 19; minimum daily mean, 1 mg/L on many days.
SEDIMENT DISCHARGE: Maximum daily, 1,210 tons, Mar. 19; minimum daily, less than 0.01 tons on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	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)
NOV										
08...	1000	1.6	160	7.9	21.0	0.50	754	8.7	99	--
DEC										
18...	1350	4.4	155	7.5	20.5	8.0	756	8.6	96	--
JAN										
25...	1025	1.7	152	7.7	19.0	1.0	753	8.8	96	--
MAR										
19...	1300	33	128	7.5	19.5	500	758	8.8	96	2100
19...	1310	123	--	--	--	--	--	--	--	--
23...	1220	77	--	--	--	--	--	--	--	--
MAY										
01...	0945	1.9	141	7.4	20.5	1.0	759	8.9	99	--
21...	1145	1.7	150	7.8	21.0	0.50	757	8.6	97	150
JUN										
04...	0850	1.9	148	7.8	20.5	0.50	757	8.6	96	--
JUL										
29...	1015	1.7	150	7.9	20.5	6.1	758	8.8	98	--
AUG										
27...	0915	1.7	150	7.6	21.5	0.40	757	8.5	97	170
29...	0630	110	--	--	--	--	--	--	--	--
30...	0630	100	--	--	--	--	--	--	--	--
SEP										
23...	0900	2.3	160	7.5	21.0	0.60	753	8.3	94	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
19...	1300	34	7.5	3.7	11	40	0.8	1.1	18	5.7	21	0.20
AUG												
27...	0915	44	8.2	5.6	12	37	0.8	0.90	47	1.4	17	0.10

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
18...	1350	--	--	--	--	<1	0.200	0.020	<0.20	--	<0.010	--
MAR												
19...	1300	12	71	73	0.10	201	0.240	0.030	0.30	0.54	0.160	0.12
MAY												
21...	1145	--	--	--	--	11	0.096	<0.010	<0.20	--	0.030	0.03
AUG												
27...	0915	27	90	100	0.12	<1	0.110	<0.010	<0.20	--	0.020	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
19...	1300	16000	50	<1	<1	100	3	<10	<0.5	<1	<1.0
AUG											
27...	0915	20	<10	<1	<1	<100	<2	<10	<0.5	<1	<1.0

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVEO (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR										
19...	55	<1	20	<3	25	1	21000	72	3	<1
AUG										
27...	<1	<1	<1	<3	<1	<1	80	44	<1	<1

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)
MAR										
19...	<10	<4	530	7	<0.10	<0.1	<1	<10	43	<1
AUG										
27...	<10	<4	10	6	0.10	0.1	2	<10	<1	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
MAR										
19...	<1	<1	<1	<1.0	39	<6	40	8	6.8	<1
AUG										
27...	<1	<1	<1	<1.0	51	<6	<10	<3	0.5	<1

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)
MAR 19...	1300	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
AUG 27...	0915	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--	<0.010
SEP 24...	1130	<0.010	<0.1	<0.1	<1.0	--	<0.010	0.8	<0.010	0.8	<0.010

DATE	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 19...	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010	--
AUG 27...	--	<0.01	0.01	<0.010	--	<0.01	<0.01	0.02	<0.010	--
SEP 24...	0.5	--	--	<0.010	<0.1	--	--	--	<0.010	<0.1

DATE	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)
MAR 19...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
AUG 27...	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010	--
SEP 24...	<0.010	<0.1	--	--	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1

DATE	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)
MAR 19...	<0.01	<0.01	--	<0.01	<0.01	<0.01	--	<0.10	<0.01	<0.1
AUG 27...	<0.01	<0.01	--	<0.01	--	<0.01	--	<0.10	<0.01	<0.1
SEP 24...	--	<0.01	<1.0	--	--	<0.01	<0.1	<0.10	--	<0.1

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR										
19...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
AUG										
27...	--	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP										
24...	12	<1.0	<0.1	<1.00	--	--	<1	<10	--	--

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
MAR					AUG				
19...	1310	3360	1120	63	29...	0630	2010	597	65
23...	1220	1380	287	66	30...	0630	2890	780	89

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	1.8	3	.01	4.3	e26	1.2	2.3	3	.02
2	1.8	e21	.11	4.8	e33	.83	2.3	1	.01
3	1.7	5	.02	2.5	10	.07	2.3	1	.01
4	2.0	1	.01	2.1	2	.01	2.2	12	.07
5	2.0	1	.01	1.9	1	<.01	2.2	3	.02
6	1.8	1	<.01	1.8	1	<.01	2.1	1	.01
7	1.7	1	<.01	1.7	1	<.01	2.1	1	.01
8	1.6	1	<.01	1.6	1	<.01	2.6	46	.70
9	1.6	1	<.01	1.6	1	<.01	2.1	2	.01
10	1.7	1	<.01	1.6	1	<.01	2.0	1	.01
11	1.7	e3	.02	1.5	2	.01	2.0	1	.01
12	1.7	1	<.01	11	e119	13	2.0	1	.01
13	1.7	1	<.01	51	608	248	2.0	2	.01
14	1.8	1	<.01	10	48	1.8	1.9	10	.05
15	1.8	2	.01	5.1	12	.17	1.8	1	.01
16	1.7	8	.04	13	e800	54	1.8	1	<.01
17	1.8	2	.01	29	618	101	1.8	1	<.01
18	1.8	1	<.01	17	e256	20	26	894	463
19	2.4	e13	.16	6.2	20	.35	16	e272	28
20	2.0	11	.06	14	255	37	5.8	e95	1.6
21	1.9	1	.01	4.4	28	.33	4.2	e51	.61
22	1.8	1	<.01	3.4	19	.18	10	e189	23
23	1.9	1	<.01	3.1	14	.12	7.0	241	5.2
24	1.8	1	<.01	2.8	13	.10	4.8	e200	2.8
25	1.8	1	<.01	2.6	9	.06	6.3	e207	5.5
26	1.7	1	<.01	2.5	3	.02	3.4	e100	.93
27	1.7	1	<.01	2.4	7	.05	2.9	e74	.58
28	1.8	e1	<.01	2.4	2	.01	2.6	e55	.39
29	1.8	1	.01	2.5	2	.02	2.4	e41	.27
30	1.9	6	.03	2.4	11	.07	2.3	e31	.19
31	1.9	2	.01	---	---	---	2.2	e23	.14
TOTAL	56.1	---	0.68	210.2	---	478.46	131.4	---	533.19
		JANUARY			FEBRUARY			MARCH	
1	2.1	e19	.11	1.7	e1	<.01	1.8	2	.01
2	2.1	e17	.10	1.7	e1	<.01	1.8	1	<.01
3	2.1	e15	.08	1.8	e1	<.01	1.8	1	<.01
4	2.1	e13	.08	1.7	e1	<.01	1.7	1	<.01
5	2.1	e12	.06	1.7	e1	<.01	1.7	1	<.01
6	2.0	e10	.06	1.7	e1	<.01	1.8	1	<.01
7	2.1	e9	.05	1.6	e1	<.01	1.7	1	<.01
8	2.1	e8	.05	1.6	1	<.01	1.8	1	<.01
9	2.0	e7	.04	1.6	1	.01	1.8	1	<.01
10	2.1	e6	.03	1.6	1	.01	2.2	e3	.05
11	2.0	e6	.03	1.7	3	.02	5.6	e58	3.6
12	2.0	e5	.03	2.1	e14	.12	3.3	2	.02
13	1.9	e4	.02	3.2	e34	.36	2.7	2	.01
14	1.9	e4	.02	2.2	45	.26	2.5	2	.02
15	1.9	e3	.02	1.9	19	.10	2.5	48	.32
16	1.8	e3	.02	1.8	3	.01	2.5	38	.26
17	1.9	e3	.01	1.7	22	.10	2.5	29	.20
18	1.8	e2	.01	13	e209	81	4.6	e81	1.8
19	1.8	e2	.01	3.2	e9	.08	113	1720	1210
20	1.8	e2	.01	3.6	e11	.23	55	885	401
21	1.8	e2	.01	3.1	16	.14	23	e298	53
22	1.8	e1	.01	2.4	1	.01	6.5	18	.35
23	1.8	e1	.01	2.1	1	.01	19	275	56
24	1.7	e1	<.01	2.0	2	.01	6.3	33	.57
25	1.8	e1	<.01	1.9	1	.01	4.7	32	.40
26	1.7	1	<.01	1.9	1	<.01	4.2	e15	.20
27	6.1	e128	12	1.8	2	.01	3.7	9	.10
28	2.2	3	.02	1.8	10	.05	3.1	2	.02
29	2.0	1	.01	---	---	---	2.9	1	.01
30	1.8	e1	<.01	---	---	---	2.7	1	.01
31	1.7	e1	<.01	---	---	---	2.6	2	.01
TOTAL	64.0	---	12.95	68.1	---	82.63	291.0	---	1728.04

< Actual value is known to be less than the value shown.
e Estimated

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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	2.5	1	.01	1.9	1	<.01	2.0	1	.01
2	2.5	1	.01	1.8	1	<.01	2.0	1	<.01
3	2.4	6	.04	1.8	1	<.01	1.9	1	<.01
4	2.3	3	.02	1.8	1	<.01	2.0	e1	.01
5	2.3	8	.05	1.8	1	<.01	1.8	1	<.01
6	2.3	10	.06	1.8	1	<.01	1.9	1	<.01
7	2.2	2	.01	1.8	1	<.01	2.0	1	<.01
8	2.7	e5	.08	1.8	1	<.01	1.9	2	.01
9	5.8	e22	.72	1.9	1	<.01	1.8	8	.04
10	2.7	2	.01	1.8	1	<.01	1.7	2	.01
11	2.9	7	.07	1.8	1	<.01	1.8	1	<.01
12	2.5	2	.01	1.8	1	<.01	1.7	1	<.01
13	2.3	1	.01	1.8	1	<.01	1.7	1	<.01
14	2.2	1	.01	1.8	1	<.01	1.7	1	<.01
15	2.2	1	.01	1.8	1	<.01	1.7	1	<.01
16	2.2	1	.01	1.9	1	<.01	1.7	1	<.01
17	2.1	1	.01	1.8	1	<.01	1.7	1	<.01
18	2.0	1	.01	1.8	e1	<.01	1.7	1	<.01
19	2.0	1	.01	1.8	1	.01	1.7	1	<.01
20	2.0	1	<.01	1.7	1	.01	1.8	1	<.01
21	2.0	1	<.01	1.7	1	<.01	1.7	1	<.01
22	1.9	1	<.01	3.0	e10	.33	1.7	2	.01
23	1.9	1	<.01	1.9	1	<.01	1.8	1	.01
24	1.9	1	<.01	1.8	1	<.01	1.8	1	<.01
25	2.0	1	<.01	1.7	1	<.01	1.8	1	<.01
26	2.0	1	<.01	1.7	1	<.01	1.8	6	.03
27	1.9	1	<.01	1.8	1	<.01	1.8	3	.01
28	1.9	1	<.01	1.8	1	<.01	1.8	1	<.01
29	1.9	1	<.01	1.8	1	<.01	1.7	1	<.01
30	1.9	1	<.01	1.9	1	<.01	1.8	1	<.01
31	---	---	---	2.0	1	<.01	---	---	---
TOTAL	69.4	---	1.27	57.3	---	0.63	53.9	---	0.35
		JULY			AUGUST			SEPTEMBER	
1	3.8	e5	.09	1.8	6	.03	2.2	18	.11
2	2.4	1	.01	1.7	1	.01	2.0	9	.05
3	1.9	1	<.01	1.7	1	<.01	1.9	11	.05
4	1.8	1	<.01	1.7	1	<.01	1.9	e20	.11
5	1.7	5	.02	1.7	1	<.01	1.8	16	.08
6	1.7	4	.02	1.7	1	<.01	1.8	6	.03
7	1.8	1	<.01	1.8	2	.01	1.8	1	<.01
8	1.7	e1	<.01	11	e141	17	1.7	4	.02
9	1.7	1	<.01	5.7	e21	.75	1.7	8	.04
10	2.1	e1	.01	2.3	1	.01	1.7	4	.02
11	2.1	1	.01	2.0	1	<.01	1.8	4	.02
12	1.9	1	.01	1.8	1	<.01	1.7	8	.04
13	1.8	2	.01	1.8	1	<.01	1.7	1	.01
14	1.8	3	.01	1.7	1	<.01	1.7	1	<.01
15	1.8	2	.01	1.8	1	<.01	1.7	1	<.01
16	1.8	1	<.01	1.8	1	<.01	1.7	1	<.01
17	1.7	1	<.01	1.9	1	<.01	1.7	1	<.01
18	1.7	1	<.01	1.8	1	<.01	1.6	1	<.01
19	1.8	1	<.01	1.8	1	<.01	1.9	1	<.01
20	2.0	e4	.03	1.8	1	<.01	2.0	2	.01
21	1.8	6	.03	1.8	1	<.01	9.3	107	21
22	1.7	1	.01	1.7	1	<.01	3.5	58	.61
23	1.7	2	.01	1.7	1	<.01	2.1	8	.05
24	1.7	1	<.01	1.7	5	.02	1.9	1	.01
25	1.8	1	<.01	1.7	2	.01	1.7	1	<.01
26	1.7	1	<.01	1.8	1	<.01	1.7	1	<.01
27	1.7	1	<.01	1.7	1	<.01	1.7	1	<.01
28	1.7	1	<.01	1.7	1	<.01	1.6	1	<.01
29	1.7	1	<.01	24	360	53	1.6	1	<.01
30	3.0	e5	.12	16	198	39	1.6	1	<.01
31	2.1	2	.01	2.9	45	.36	---	---	---
TOTAL	59.6	---	0.56	106.0	---	110.40	62.7	---	22.39
YEAR	1229.7		2971.55						

< Actual value is known to be less than the value shown.
e Estimated

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, 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, from topographic map. Honolulu Board of Water Supply).

REMARKS.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pumps and/or diverts small amount of water from the stream.

AVERAGE DISCHARGE.--8 years, 3.49 ft^3/s (2,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 608 ft^3/s, Mar. 19, 1991, gage height, 5.76 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)
Dec. 18	0400	488	5.29	Mar. 19	2230	*608	*5.76

Minimum discharge, 3.4 ft^3/s, for several days in Oct. and Nov.

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	3.6	e10	e4.4	4.6	4.3	4.1	5.0	4.8	4.7	4.9	4.0	4.5
2	3.6	e18	e4.4	4.5	4.2	4.1	5.0	4.8	4.8	4.4	3.9	4.2
3	3.7	e7.0	e4.4	4.4	4.6	4.1	5.1	4.8	8.2	4.3	3.9	4.0
4	6.3	e4.3	e4.4	4.5	4.3	4.0	5.1	4.6	5.1	e4.3	4.5	4.6
5	4.3	e3.8	e4.2	4.5	4.3	4.0	5.1	4.7	4.9	e4.3	4.0	3.9
6	3.9	e3.7	e4.2	4.4	4.2	3.9	5.0	4.6	4.9	e4.2	3.8	3.8
7	3.7	e3.6	e4.2	4.7	4.1	4.0	5.0	4.6	5.1	e4.2	3.8	3.8
8	3.6	e3.5	e5.4	4.5	4.2	4.0	6.4	4.6	5.3	e4.1	10	3.8
9	3.6	e3.5	e4.2	4.4	4.2	4.3	10	4.8	4.8	4.1	7.8	3.8
10	3.6	e3.5	e4.2	4.4	4.2	4.1	5.5	4.6	4.6	5.9	4.4	3.8
11	3.6	e3.4	e4.2	4.4	4.1	13	5.9	4.5	4.7	4.3	4.1	3.8
12	3.6	e10	4.2	4.4	5.5	6.3	5.3	4.5	4.6	4.1	3.9	3.8
13	3.5	e58	4.3	4.3	5.4	4.8	5.1	4.5	4.6	4.1	4.3	3.7
14	3.4	e15	4.3	4.4	4.7	4.4	5.0	4.5	4.7	4.1	3.9	3.8
15	3.4	e6.2	4.3	4.4	4.4	4.3	5.1	4.5	4.5	4.1	3.8	3.7
16	3.4	e18	4.3	4.3	4.3	4.3	5.0	4.6	4.5	4.1	3.8	3.6
17	3.4	e43	4.3	4.3	4.3	4.2	4.9	4.6	4.5	4.0	3.7	3.6
18	3.5	e25	31	4.3	8.7	5.2	4.9	4.6	4.5	4.0	3.8	3.6
19	e17	e7.0	14	4.3	5.0	97	4.8	4.5	4.5	4.0	3.8	3.8
20	e9.0	e17	7.1	4.3	6.0	56	4.9	4.6	4.5	3.9	3.8	4.3
21	e4.5	e11	7.3	4.3	5.7	45	4.9	4.6	4.5	3.9	3.7	11
22	e3.8	e5.6	14	4.3	4.7	9.6	4.8	5.8	4.4	3.9	3.7	6.4
23	e3.7	e5.0	13	4.3	4.5	22	4.8	4.7	4.5	3.9	3.7	4.2
24	e3.7	e4.5	8.7	4.3	4.4	8.4	4.8	4.5	4.6	3.9	3.7	3.9
25	e3.5	e4.4	7.9	4.3	4.3	6.6	4.9	4.5	4.7	4.0	3.7	3.7
26	e3.4	e4.3	6.0	4.3	4.2	5.9	5.4	4.5	4.8	3.9	3.7	3.6
27	e3.4	e4.3	5.5	11	4.1	5.7	4.8	4.5	4.5	3.8	3.8	3.6
28	e3.4	e4.5	5.2	5.1	4.1	5.4	4.8	4.5	4.7	3.8	3.7	3.6
29	e3.4	e5.0	5.0	4.5	---	5.3	4.8	4.6	4.4	3.9	37	3.8
30	e4.0	e4.4	4.8	4.3	---	5.2	4.9	4.6	4.4	7.4	18	3.6
31	e3.6	---	4.7	4.3	---	5.1	---	4.6	---	4.2	5.5	---
TOTAL	134.1	316.5	208.1	143.3	131.0	364.3	157.0	143.7	143.5	132.0	179.2	125.3
MEAN	4.33	10.5	6.71	4.62	4.68	11.8	5.23	4.64	4.78	4.26	5.78	4.18
MAX	17	58	31	11	8.7	97	10	5.8	8.2	7.4	37	11
MIN	3.4	3.4	4.2	4.3	4.1	3.9	4.8	4.5	4.4	3.8	3.7	3.6
AC-FT	266	628	413	284	260	723	311	285	285	262	355	249

CAL YR 1990 TOTAL 2015.0 MEAN 5.52 MAX 58 MIN 3.4 AC-FT 4000
WTR YR 1991 TOTAL 2178.0 MEAN 5.97 MAX 97 MIN 3.4 AC-FT 4320

e Estimated

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 current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

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

AVERAGE DISCHARGE.--29 years, 1.36 ft^3/s (985 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s, Oct. 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)
Nov. 13	unknown	54	2.24	Mar. 19	2245	88	2.66
Dec. 18	0400	97	2.75	Mar. 21	0330	*402	*4.37

Minimum discharge, 0.47 ft^3/s on Oct. 2-4, 9-11.

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	.60	1.9	e.70	.70	.78	.83	.91	.91	.91	1.1	.85	.75
2	.58	2.3	e.90	.70	.80	.85	.91	.91	.91	.91	.85	.75
3	.56	.63	.75	.70	.88	.85	.91	.91	1.1	.91	.85	.75
4	1.0	.60	e.65	.70	.80	.85	.88	.91	.91	.90	1.1	.75
5	.53	e.70	e.65	.70	.80	.85	.87	.91	.92	.91	.88	.75
6	.51	.60	e.62	.70	.80	.85	.85	.91	.96	.90	.85	.75
7	.51	.60	e.62	.72	.80	.85	.85	.91	.98	.91	.85	.75
8	.51	.60	e.70	.70	.80	.85	e.95	.91	.99	.88	2.0	.75
9	.50	.60	e.65	.70	.80	.85	e1.3	.91	.91	.87	1.5	.75
10	.50	.60	e.62	.72	.80	.85	e.85	.91	.91	1.4	.90	.75
11	.51	.60	.60	.71	.80	2.0	e.95	.91	.91	.91	.85	.75
12	.51	e1.4	.60	.71	.93	1.1	e.85	.91	.91	.91	.85	.75
13	.51	e5.0	.61	.70	.88	.85	e.85	.91	.91	.91	.94	.75
14	.51	e1.8	.61	.70	.81	.85	e.85	.91	.91	.91	.85	.75
15	.51	e.85	.62	.70	e.75	.85	e.85	.91	.91	.91	.85	.75
16	.51	e3.0	.65	.70	.80	.85	e.88	.91	.91	.91	.85	.75
17	.51	e2.8	.65	.71	.80	.85	.91	.91	.91	.91	.85	.75
18	.51	e2.0	3.6	.70	.98	1.3	.91	.91	.91	.91	.85	.75
19	2.5	e1.0	1.0	.70	.82	13	.91	.91	.91	.91	.85	.75
20	.68	e2.8	.69	.70	1.3	3.6	.91	.91	.92	.91	.81	.75
21	.60	e.95	1.5	.70	.94	7.7	.91	.91	.92	.91	.85	1.0
22	.60	e.70	2.3	.70	.82	1.2	.91	.92	.92	.91	.84	.79
23	.61	e.80	1.5	.70	.80	3.0	.91	.91	.94	.91	.85	.75
24	.60	e.90	.89	.72	.80	1.1	.91	.91	.92	.91	.85	.75
25	.60	e.65	.82	.70	.80	1.0	.93	.91	.92	.91	.84	.74
26	.60	e.65	.74	.73	.80	.98	1.3	.91	1.0	.91	.82	.74
27	.60	e.65	.70	1.4	.80	.98	.91	.91	.91	.91	.85	.70
28	.60	e.65	.70	.80	.80	.93	.91	.91	.91	.91	.85	.71
29	.60	e.90	.70	.75	---	.93	.91	.91	.91	.91	5.1	.71
30	.79	e.65	.70	.76	---	.91	.91	.91	.91	1.4	2.0	.71
31	.60	---	.70	.77	---	.91	---	.91	---	.87	.79	---
TOTAL	19.86	37.88	27.74	22.80	23.49	53.37	27.66	28.22	27.87	29.25	33.82	22.60
MEAN	.64	1.26	.89	.74	.84	1.72	.92	.91	.93	.94	1.09	.75
MAX	2.5	5.0	3.6	1.4	1.3	13	1.3	.92	1.1	1.4	5.1	1.0
MIN	.50	.60	.60	.70	.75	.83	.85	.91	.91	.87	.79	.70
AC-FT	39	75	55	45	47	106	55	56	55	58	67	45

CAL YR 1990 TOTAL 192.96 MEAN .53 MAX 5.0 MIN .24 AC-FT 383
WTR YR 1991 TOTAL 354.56 MEAN .97 MAX 13 MIN .50 AC-FT 703

e Estimated

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26′48″, 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 current year.

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 diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--29 years, 1.54 ft^3/s (1,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s, Feb. 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)
Dec. 18	0400	56	1.86	Mar. 21	0300	*129	*2.41
Mar. 19	2215	55	1.84				

Minimum discharge, 0.98 ft^3/s, Oct. 8-10.

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	1.0	1.7	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.5	1.3	1.5
2	1.0	2.0	1.3	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.5
3	1.0	1.1	1.2	1.1	1.3	1.3	1.3	1.4	1.5	1.4	1.3	1.5
4	1.3	1.0	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5
5	1.0	1.1	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5
6	1.0	1.0	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.5
7	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.5
8	1.0	1.0	1.2	1.1	1.3	1.3	1.5	1.4	1.4	1.4	2.1	1.5
9	1.0	1.0	1.1	1.1	1.3	1.3	1.8	1.4	1.4	1.6	1.8	1.4
10	1.0	1.0	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.7	1.4	1.5
11	1.0	1.0	1.1	1.1	1.3	2.0	1.4	1.4	1.4	1.4	1.3	1.5
12	1.0	1.7	1.1	1.2	1.4	1.6	1.3	1.4	1.4	1.4	1.3	1.5
13	1.0	4.9	1.1	1.2	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.5
14	1.0	1.9	1.1	1.2	1.3	1.4	1.3	1.4	1.4	1.4	1.3	1.5
15	1.0	1.1	1.1	1.2	1.3	1.4	1.3	1.4	1.4	1.4	1.3	1.5
16	1.0	2.9	1.1	1.2	1.3	1.4	1.3	1.4	1.4	1.4	1.3	1.4
17	1.0	2.7	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.4
18	1.0	2.1	2.9	1.2	1.4	1.7	1.4	1.4	1.4	1.4	1.3	1.4
19	2.3	1.4	1.5	1.2	1.3	8.0	1.4	1.4	1.4	1.4	1.3	1.5
20	1.1	2.7	1.2	1.2	1.6	2.7	1.4	1.4	1.4	1.4	1.3	1.5
21	1.0	1.2	1.6	1.2	1.4	5.0	1.4	1.4	1.4	1.4	1.3	1.7
22	1.0	1.1	2.1	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.3	e1.5
23	1.1	1.2	1.7	1.2	1.3	2.5	1.4	1.4	1.4	1.4	1.3	e1.4
24	1.0	1.1	1.3	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.3	e1.4
25	1.0	1.1	1.3	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.3	e1.4
26	1.0	1.1	1.1	1.2	1.3	1.3	1.6	1.4	1.5	1.4	1.3	e1.4
27	1.0	1.1	1.1	1.5	1.3	1.3	1.4	1.4	1.4	1.3	1.3	e1.4
28	1.0	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.3	e1.4
29	1.0	1.3	1.1	1.3	---	1.3	1.4	1.4	1.4	1.4	4.8	e1.4
30	1.2	1.1	1.1	1.3	---	1.3	1.4	1.4	1.4	1.7	2.7	e1.4
31	1.0	---	1.1	1.3	---	1.3	---	1.4	---	1.4	1.5	---
TOTAL	33.0	45.7	39.3	36.9	37.1	55.2	41.4	43.4	42.2	43.9	47.2	44.0
MEAN	1.06	1.52	1.27	1.19	1.32	1.78	1.38	1.40	1.41	1.42	1.52	1.47
MAX	2.3	4.9	2.9	1.5	1.6	8.0	1.8	1.4	1.5	1.7	4.8	1.7
MIN	1.0	1.0	1.1	1.1	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.4
AC-FT	65	91	78	73	74	109	82	86	84	87	94	87

CAL YR 1990 TOTAL 323.12 MEAN .89 MAX 4.9 MIN .53 AC-FT 641
WTR YR 1991 TOTAL 509.3 MEAN 1.40 MAX 8.0 MIN 1.0 AC-FT 1010

e Estimated

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, from topographic map.

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

AVERAGE DISCHARGE.--17 years, 6.33 ft^3/s (4,590 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 1	1900	303	5.07	Mar. 21	0415	*1,530	*7.93
Nov. 13	0930	486	5.72	Mar. 23	1200	342	5.22
Dec. 18	0400	525	5.84	Aug. 29	0700	290	5.02
Mar. 20	0100	832	6.63				

Minimum discharge, 5.0 ft^3/s, Oct. 17.

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	5.7	17	6.3	6.4	6.3	6.4	7.6	7.1	6.8	7.2	6.2	7.0
2	5.6	29	6.8	6.3	6.3	6.4	7.6	7.0	6.8	6.8	6.2	6.5
3	5.6	7.5	6.4	6.3	6.8	6.4	7.6	7.0	7.2	6.7	6.1	6.3
4	7.3	6.4	6.3	6.3	6.4	6.4	7.6	7.0	6.9	6.5	6.8	6.2
5	6.0	6.1	6.3	6.3	6.3	6.4	7.6	7.0	6.9	6.3	6.3	6.1
6	5.7	5.8	6.3	6.3	6.3	6.4	7.6	7.0	7.0	6.3	6.2	6.1
7	5.6	5.7	6.2	6.3	6.3	6.4	7.7	7.0	7.2	6.3	6.1	6.0
8	5.6	5.6	6.3	6.3	6.3	6.4	8.7	7.0	7.1	6.3	13	5.9
9	5.5	5.5	6.2	6.3	6.3	6.5	16	7.0	6.9	6.3	8.8	5.9
10	5.5	5.4	6.1	6.3	6.3	6.4	8.0	6.9	6.8	8.0	6.8	5.9
11	5.5	5.5	6.1	6.3	6.3	14	8.3	6.9	6.8	6.5	6.5	6.0
12	5.4	12	6.1	6.3	6.7	7.9	7.7	6.8	6.9	6.5	6.3	6.0
13	5.4	69	6.1	6.3	6.7	6.7	7.5	6.9	6.9	6.4	6.4	5.9
14	5.4	21	6.1	6.3	6.4	6.6	7.4	6.9	7.0	6.3	6.2	6.1
15	5.4	8.8	6.1	6.3	6.3	6.5	7.6	6.8	7.0	6.3	6.1	5.9
16	5.3	29	6.1	6.3	6.3	6.6	7.5	6.8	7.0	6.3	6.1	5.9
17	5.3	44	6.1	6.3	6.3	6.5	7.4	6.8	7.0	6.3	6.1	5.8
18	5.4	32	27	6.3	7.6	7.8	7.4	6.8	7.0	6.3	6.1	5.8
19	24	12	11	6.2	6.6	149	7.4	6.8	7.0	6.3	6.1	5.9
20	7.4	29	7.5	6.3	9.5	83	7.4	6.8	6.9	6.3	6.0	5.9
21	6.2	9.5	11	6.3	7.6	78	7.4	6.8	6.9	6.2	6.0	8.4
22	5.9	7.8	18	6.3	6.6	13	7.3	6.9	6.8	6.3	6.0	6.7
23	5.9	7.7	16	6.2	6.5	32	7.2	6.8	6.8	6.2	6.0	6.1
24	5.7	6.9	10	6.3	6.5	11	7.2	6.8	6.8	6.3	5.9	6.0
25	5.5	6.6	8.6	6.3	6.4	9.3	7.3	6.8	6.8	6.3	5.9	5.9
26	5.4	6.4	7.3	6.3	6.4	8.4	8.9	6.8	7.1	6.3	5.9	5.9
27	5.3	6.3	7.0	11	6.4	8.0	7.3	6.8	6.8	6.2	6.0	5.9
28	5.3	6.3	6.8	6.6	6.4	7.7	7.2	6.8	6.9	6.2	5.9	5.9
29	5.3	7.4	6.6	6.3	---	7.6	7.2	6.8	6.8	6.2	51	5.9
30	6.1	6.4	6.6	6.3	---	7.5	7.2	6.8	6.8	7.4	31	5.9
31	5.5	---	6.4	6.3	---	7.4	---	6.8	---	6.3	8.4	---
TOTAL	194.7	427.6	255.7	200.2	185.1	548.6	235.8	213.2	207.6	200.1	272.4	183.7
MEAN	6.28	14.3	8.25	6.46	6.61	17.7	7.86	6.88	6.92	6.45	8.79	6.12
MAX	24	69	27	11	9.5	149	16	7.1	7.2	8.0	51	8.4
MIN	5.3	5.4	6.1	6.2	6.3	6.4	7.2	6.8	6.8	6.2	5.9	5.8
AC-FT	386	848	507	397	367	1090	468	423	412	397	540	364

CAL YR 1990 TOTAL 2650.0 MEAN 7.26 MAX 69 MIN 5.0 AC-FT 5260
WTR YR 1991 TOTAL 3124.7 MEAN 8.56 MAX 149 MIN 5.3 AC-FT 6200

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.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft, from topographic map.

REMARKS.--Records good, except for the period of no gage-height record and for the period Mar. 29 to Sep. 30, which are poor.

AVERAGE DISCHARGE.--31 years (water years 1961-91), 14.1 ft^3/s (6,440 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, Feb. 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, Oct. 27, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 19	1930	1,740	6.65	Mar. 19	1500	2,300	7.35
Nov. 2	0430	915	5.31	Mar. 20	unknown	*7,510	*10.57
Nov. 13	1030	1,340	6.07	Aug. 8	0530	840	5.16
Nov. 18	0130	835	5.15	Aug. 29	0730	1,380	6.13

Minimum discharge, 1.7 ft^3/s, May 26.

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	3.6	53	7.6	7.2	3.9	4.8	7.3	2.9	2.2	46	4.5	7.2
2	4.3	158	13	6.8	3.9	4.6	6.8	2.5	2.1	8.1	4.3	11
3	3.9	16	7.4	6.6	4.8	4.6	6.2	2.4	27	4.9	3.9	6.0
4	7.0	10	6.6	6.3	4.1	4.5	5.7	2.4	4.8	4.0	10	5.4
5	5.3	8.1	6.0	6.1	3.8	4.4	5.5	2.3	6.2	3.7	6.1	4.8
6	3.3	9.3	5.8	5.8	3.8	4.3	4.9	2.3	6.8	3.4	4.3	4.5
7	3.0	8.3	5.5	7.0	3.7	4.5	4.6	2.3	5.2	3.5	3.9	4.4
8	2.9	7.4	11	5.7	3.6	4.6	16	2.3	7.7	3.2	95	4.2
9	2.8	5.4	13	5.4	3.7	9.3	23	2.8	4.9	3.2	15	4.1
10	2.7	5.0	7.2	5.3	3.7	4.5	14	2.4	4.6	33	4.6	3.9
11	2.8	4.7	5.9	5.2	3.7	4.3	5.3	2.3	4.0	8.0	3.5	5.5
12	3.1	29	5.6	8.0	5.4	8.1	3.2	2.2	3.8	9.7	3.5	4.5
13	2.8	262	6.2	5.7	8.3	5.8	2.8	2.1	3.8	5.4	5.9	4.2
14	2.7	86	6.5	16	7.1	4.6	2.9	2.1	3.6	4.7	3.0	4.5
15	2.6	24	5.7	6.6	5.2	4.3	3.2	2.1	3.7	4.5	2.8	3.8
16	2.6	51	5.8	5.5	4.5	5.5	3.1	2.1	3.7	4.3	2.5	3.6
17	2.8	163	5.5	5.5	9.2	4.5	2.7	2.1	4.2	4.6	2.4	3.4
18	2.6	156	76	5.4	37	8.1	2.4	2.1	3.8	3.9	2.4	3.4
19	70	51	26	4.8	16	580	2.3	2.1	4.0	3.8	2.6	4.3
20	9.4	66	15	4.6	12	e475	2.2	2.5	4.7	3.7	2.5	4.6
21	4.5	26	11	4.4	11	e150	2.2	2.0	3.8	4.4	2.3	17
22	3.8	19	24	4.4	6.8	e40	2.2	1.9	3.5	4.2	2.2	7.7
23	4.3	19	41	4.4	6.1	e115	2.1	1.9	3.8	3.8	2.9	4.7
24	3.6	14	18	4.4	5.8	e35	2.0	2.0	3.7	3.6	2.4	4.0
25	3.2	12	31	4.3	5.3	e23	2.1	2.0	4.1	3.8	2.7	3.9
26	3.1	10	14	4.1	5.1	e18	6.1	1.9	5.1	3.7	2.8	3.5
27	2.9	9.1	11	23	5.0	e14	2.8	1.9	6.2	3.4	3.8	3.4
28	3.1	8.6	11	5.6	4.8	e12	2.7	1.9	10	3.4	3.6	3.3
29	3.7	26	9.2	4.6	---	11	2.6	1.9	4.2	5.0	144	5.0
30	22	8.1	8.4	4.3	---	9.5	2.8	2.0	4.9	34	76	4.2
31	7.9	---	7.9	4.1	---	8.3	---	2.1	---	6.2	10	---
TOTAL	202.3	1325.0	427.8	197.1	197.3	1586.1	151.7	67.8	160.1	241.1	435.4	154.0
MEAN	6.53	44.2	13.8	6.36	7.05	51.2	5.06	2.19	5.34	7.78	14.0	5.13
MAX	70	262	76	23	37	580	23	2.9	27	46	144	17
MIN	2.6	4.7	5.5	4.1	3.6	4.3	2.0	1.9	2.1	3.2	2.2	3.3
AC-FT	401	2630	849	391	391	3150	301	134	318	478	864	305

CAL YR 1990 TOTAL 4661.6 MEAN 12.8 MAX 262 MIN 2.4 AC-FT 9250
WTR YR 1991 TOTAL 5145.7 MEAN 14.1 MAX 580 MIN 1.9 AC-FT 10210

e Estimated

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, from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--32 years (water years 1960-91), 37.7 ft^3/s (27,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft^3/s, Apr. 15, 1963, gage height, 8.10 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, Sept. 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)
Oct. 19	1930	2,510	5.77	Mar. 21	0330	1,940	5.17
Nov. 13	1430	1,990	5.22	Aug. 8	0600	1,680	4.88
Nov. 17	1400	2,070	5.31	Aug. 30	0700	2,040	5.28
Mar. 20	1000	*6,250	*8.60				

Minimum discharge, 19 ft^3/s, Feb. 8-10, May 26-30.

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	36	142	38	34	22	21	31	e27	30	112	26	38
2	44	300	82	32	21	20	29	e26	68	36	26	38
3	42	68	42	31	23	20	28	e25	165	30	24	30
4	56	49	39	31	21	20	27	e25	41	36	53	33
5	43	43	38	31	20	20	27	e24	47	27	33	27
6	37	92	36	30	20	20	25	e24	46	25	26	26
7	35	161	34	41	20	20	24	e23	32	121	25	25
8	37	130	49	33	19	21	62	e23	34	33	278	25
9	33	54	100	29	20	47	79	28	29	28	124	24
10	31	46	46	29	19	21	55	32	29	138	48	23
11	31	42	38	28	20	21	56	24	26	89	40	24
12	30	135	36	27	21	33	34	23	25	60	36	27
13	30	701	50	27	25	28	30	23	24	40	62	25
14	29	371	55	30	37	22	30	22	23	43	35	24
15	27	126	42	30	31	21	36	22	23	34	31	23
16	28	476	37	26	22	31	32	22	22	34	28	22
17	32	509	35	26	22	23	30	22	21	36	27	21
18	30	447	220	25	27	100	28	21	22	28	26	21
19	274	233	84	24	29	1330	27	21	22	27	26	21
20	79	370	55	23	42	1090	26	20	22	61	25	22
21	45	108	81	23	39	352	25	20	22	31	24	53
22	37	74	248	23	26	99	25	20	20	27	23	36
23	40	81	136	23	24	277	24	19	20	25	32	24
24	33	57	75	23	24	89	24	20	21	24	23	22
25	31	49	80	23	22	62	29	20	33	25	24	26
26	29	45	55	22	22	52	93	19	34	26	23	21
27	28	42	49	55	21	46	30	19	41	23	26	21
28	27	41	45	27	21	40	29	19	50	22	24	20
29	28	63	41	24	---	37	e25	20	27	34	243	22
30	148	41	38	23	---	34	e27	20	30	127	270	21
31	51	---	36	23	---	32	---	23	---	32	49	---
TOTAL	1481	5096	2040	876	680	4049	1047	696	1049	1434	1760	785
MEAN	47.8	170	65.8	28.3	24.3	131	34.9	22.5	35.0	46.3	56.8	26.2
MAX	274	701	248	55	42	1330	93	32	165	138	278	53
MIN	27	41	34	22	19	20	24	19	20	22	23	20
AC-FT	2940	10110	4050	1740	1350	8030	2080	1380	2080	2840	3490	1560

CAL YR 1990 TOTAL 18893 MEAN 51.8 MAX 701 MIN 17 AC-FT 37470
WTR YR 1991 TOTAL 20993 MEAN 57.5 MAX 1330 MIN 19 AC-FT 41640

e Estimated

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 for the year).

GAGE.--Water-stage recorder. Elevation of gage is 200 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--38 years, 7.47 ft^3/s (5,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft^3/s, Mar. 24; minimum daily, 2.2 ft^3/s, Mar. 19.

REVISIONS.--The maximum and minimum daily discharges for water year 1990 have been revised to 18 ft^3/s, Mar. 1, and 3.7 ft^3/s, Nov. 23, Feb. 27, Mar. 15.

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	13	12	8.8	16	9.0	e10	11	13	10	9.9	15	16
2	12	8.9	4.3	16	9.0	e7.0	9.2	15	13	12	13	14
3	13	13	7.1	16	10	e9.0	7.9	14	10	11	11	10
4	13	16	15	14	12	e11	7.1	12	7.0	14	8.7	7.7
5	11	14	16	11	8.6	e8.0	6.6	11	6.3	12	10	13
6	8.4	11	15	9.7	11	e7.4	9.4	9.2	5.4	13	16	15
7	10	4.8	12	8.0	14	e4.0	14	11	10	8.7	12	12
8	13	6.8	8.5	11	9.7	e4.0	12	13	12	12	9.2	9.7
9	13	14	8.0	14	9.6	e12	5.8	12	8.2	10	17	12
10	8.9	11	10	11	14	e8.9	4.8	9.2	8.2	7.0	17	13
11	8.9	9.6	8.8	12	10	e6.0	8.5	8.3	7.1	13	12	11
12	11	13	7.5	14	9.4	6.7	16	7.8	6.5	12	9.9	10
13	9.3	6.6	9.4	11	11	7.8	13	7.0	8.7	18	7.3	8.8
14	8.8	12	13	7.8	9.8	9.1	13	6.2	14	13	11	13
15	10	6.2	13	6.8	6.4	5.2	13	5.8	12	11	15	14
16	13	13	13	5.8	6.1	8.0	12	8.5	9.8	11	12	15
17	12	7.1	13	5.1	14	6.4	11	13	10	14	9.7	14
18	13	5.0	13	4.6	13	4.3	9.7	11	14	11	12	13
19	7.9	3.7	9.6	9.9	11	2.2	8.8	11	12	9.8	14	12
20	14	12	6.1	11	9.1	15	9.5	11	11	8.9	11	10
21	9.7	13	5.6	12	14	12	12	14	9.6	12	9.4	8.6
22	6.1	8.7	6.6	12	12	22	12	12	11	13	14	7.7
23	5.3	12	9.8	9.2	13	25	11	10	13	11	14	7.0
24	4.8	9.0	14	8.5	13	29	9.0	8.6	11	10	12	11
25	7.6	11	13	7.7	12	25	8.2	7.3	12	12	12	15
26	11	13	8.0	6.8	15	19	14	7.5	12	13	11	14
27	8.4	8.9	6.1	7.8	e15	14	14	7.1	9.0	16	7.4	15
28	9.1	9.0	4.5	7.7	e13	11	12	6.0	8.1	14	13	14
29	9.2	4.3	11	6.4	---	11	11	7.7	7.7	12	16	12
30	8.1	12	16	5.8	---	14	10	14	7.3	9.2	16	9.5
31	16	---	14	5.1	---	14	---	12	---	14	18	---
TOTAL	318.5	300.6	319.7	303.7	313.7	348.0	315.5	315.2	295.9	367.5	385.6	357.0
MEAN	10.3	10.0	10.3	9.80	11.2	11.2	10.5	10.2	9.86	11.9	12.4	11.9
MAX	16	16	16	16	15	29	16	15	14	18	18	16
MIN	4.8	3.7	4.3	4.6	6.1	2.2	4.8	5.8	5.4	7.0	7.3	7.0
AC-FT	632	596	634	602	622	690	626	625	587	729	765	708

CAL YR 1990 TOTAL 3429.5 MEAN 9.40 MAX 17 MIN 3.7 AC-FT 6800
WTR YR 1991 TOTAL 3940.9 MEAN 10.8 MAX 29 MIN 2.2 AC-FT 7820

e Estimated

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.--Water-stage recorder and masonry control. Elevation of gage is 212 ft, from topographic map.

REMARKS.--Records good except for estimated discharges, which are fair. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--38 years, 18.0 ft^3/s (13,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft^3/s, Mar. 20, 1991, gage height, 8.02 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 5.77 ft and 7.60 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 19	0330	980	3.50	Nov. 19	1700	1,180	3.83
Oct. 30	0430	1,020	3.57	Nov. 20	0800	2,180	5.17
Nov. 2	0300	1,030	3.58	Dec. 18	0430	1,030	3.58
Nov. 13	1000	932	3.42	Dec. 22	0800	1,030	3.58
Nov. 17	1330	1,760	4.65	Jan. 27	0830	1,080	3.67
Nov. 18	0200	1,120	3.74	Mar. 20	unknown	*6,900	*8.02

Minimum discharge, not determined.

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	8.6	47	15	14	15	11	e13	e9.0	e14	e44	e7.0	e11
2	23	113	28	14	14	13	e14	e7.0	e25	e14	e9.0	e13
3	9.2	25	17	13	15	10	e15	e7.0	e60	e13	e10	e14
4	12	14	9.6	14	11	6.8	e15	e9.0	e21	e12	e24	e17
5	12	14	8.5	16	14	10	e15	e10	e25	e10	e15	e9.0
6	12	19	8.2	17	12	9.6	e12	e12	e25	e8.0	e6.0	e7.0
7	9.7	59	10	22	8.9	13	e7.0	e9.0	e14	e48	e9.0	e9.0
8	11	27	19	21	12	13	e24	e7.0	e13	e13	e106	e11
9	6.9	14	36	13	12	18	e36	e11	e15	e13	e41	e9.0
10	10	15	15	15	8.4	8.1	e29	e15	e15	e55	e14	e7.0
11	10	15	14	15	12	e13	e26	e13	e15	e33	e16	e10
12	7.4	63	14	13	14	e18	e9.0	e12	e14	e24	e16	e12
13	9.3	332	20	15	15	e15	e11	e13	e12	e10	e29	e12
14	9.4	144	19	21	25	e11	e11	e14	e6.0	e16	e15	e8.0
15	8.1	54	20	19	21	e14	e13	e14	e8.0	e14	e9.0	e6.0
16	5.3	175	16	20	16	e16	e12	e12	e10	e14	e11	e5.0
17	7.3	277	15	20	8.3	e14	e13	e7.0	e9.0	e12	e12	e5.0
18	5.7	218	69	20	14	e46	e13	e8.0	e6.0	e12	e10	e6.0
19	145	126	38	14	14	e688	e13	e8.0	e8.0	e12	e8.0	e7.0
20	18	248	32	13	18	e537	e12	e7.0	e9.0	e27	e10	e10
21	24	45	49	12	12	e143	e9.0	e4.0	e10	e12	e12	e24
22	18	31	147	12	12	e28	e9.0	e6.0	e7.0	e9.0	e6.0	e18
23	19	32	76	15	10	e90	e10	e8.0	e5.0	e10	e10	e14
24	17	24	40	16	11	e17	e12	e9.4	e8.0	e11	e8.0	e9.0
25	13	19	38	16	10	e11	e15	e11	e13	e9.0	e9.0	e7.0
26	9.7	15	32	16	6.7	e14	e33	e10	e13	e9.0	e9.0	e5.0
27	11	16	30	45	7.3	e16	e10	e11	e19	e4.0	e15	e4.0
28	10	16	31	19	9.0	e17	e11	e12	e24	e6.0	e8.0	e4.0
29	9.8	30	22	18	---	e16	e10	e10	e14	e13	e81	e8.0
30	114	13	16	18	---	e11	e12	e4.0	e17	e50	e95	e10
31	17	---	16	19	---	e10	---	e8.0	---	e10	e14	---
TOTAL	602.4	2240	920.3	535	357.6	1857.5	444.0	297.4	454.0	547.0	644.0	291.0
MEAN	19.4	74.7	29.7	17.3	12.8	59.9	14.8	9.59	15.1	17.6	20.8	9.70
MAX	145	332	147	45	25	688	36	15	60	55	106	24
MIN	5.3	13	8.2	12	6.7	6.8	7.0	4.0	5.0	4.0	6.0	4.0
AC-FT	1190	4440	1830	1060	709	3680	881	590	901	1080	1280	577

CAL YR 1990 TOTAL 8030.5 MEAN 22.0 MAX 332 MIN 3.3 AC-FT 15930
WTR YR 1991 TOTAL 9190.2 MEAN 25.2 MAX 688 MIN 4.0 AC-FT 18230

e Estimated

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, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--24 years, 4.47 ft^3/s (3,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, Jan. 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)
Mar. 19	1645	*1120	*9.91	Mar. 20	0930	830	9.32

Minimum discharge, 0.10 ft^3/s, Feb. 10-12.

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	11	17	2.6	1.0	.22	.38	.85	1.1	6.8	21	1.4	e3.0
2	15	33	16	.90	.22	.30	.82	.65	3.4	2.2	8.8	e2.5
3	1.8	4.4	3.0	.76	8.4	.26	1.1	.50	3.6	1.9	3.7	e2.0
4	10	2.3	1.9	.67	.84	.19	1.0	1.4	1.4	3.6	17	e3.4
5	3.7	4.2	1.4	.67	.35	.15	2.6	.54	11	1.3	5.7	e1.5
6	2.0	2.9	1.1	.57	.23	.14	1.2	.37	6.2	.98	2.2	e1.2
7	2.8	3.4	.95	11	.17	.82	.64	.29	6.2	4.0	3.0	e1.0
8	1.8	1.8	14	9.9	.15	2.4	17	.26	3.0	1.0	58	e.90
9	1.2	1.1	16	1.0	.33	10	8.9	7.2	2.8	.70	22	e.90
10	.92	.93	2.8	2.6	.13	.88	2.5	1.9	2.2	24	3.5	e1.9
11	1.3	.83	1.4	2.4	.10	.76	12	.75	2.0	2.8	2.8	2.5
12	1.5	24	1.5	1.4	11	3.6	1.9	.91	1.9	4.4	4.4	4.1
13	2.2	102	8.3	.98	14	2.3	1.0	.47	.98	4.4	11	2.8
14	1.4	39	7.0	9.5	12	.57	1.8	.35	.89	4.8	1.8	4.1
15	.79	8.2	3.2	2.7	2.9	.39	2.1	.35	.77	2.2	1.3	1.2
16	.63	35	2.8	1.5	.89	13	1.8	.41	.64	3.0	1.0	.85
17	2.0	72	2.3	1.8	7.3	1.3	1.2	.46	1.5	5.6	1.5	.64
18	.79	58	22	.89	13	35	.92	.37	4.3	1.5	1.5	.55
19	29	32	16	.60	4.7	174	.61	.44	2.0	1.6	2.6	1.6
20	2.1	61	4.6	.40	10	107	.49	.18	2.5	4.2	1.7	2.1
21	3.4	9.0	15	.33	4.4	47	.45	.28	.92	1.4	15	13
22	1.2	5.4	48	.27	1.4	6.8	.88	.87	.63	2.8	17	4.5
23	5.9	18	32	.29	.94	35	.48	.23	1.0	1.3	3.7	1.1
24	1.6	6.2	13	1.0	6.4	5.8	.38	.29	1.9	3.3	2.1	.84
25	2.4	3.0	14	.85	1.4	3.2	5.2	.54	4.8	8.5	1.7	.76
26	1.0	2.2	4.7	.33	.71	3.4	12	.34	6.2	4.2	e.90	.60
27	.78	1.8	2.8	17	.53	5.5	1.9	.70	8.3	1.1	e1.1	.50
28	2.0	2.5	3.1	1.6	.45	2.3	3.4	.56	4.9	.89	e2.0	.50
29	1.2	17	2.5	.58	---	1.4	1.0	.23	1.3	6.0	e20	2.7
30	38	2.9	1.5	.36	---	1.2	2.2	1.6	1.3	24	e33	1.8
31	6.0	---	1.3	.27	---	.95	---	1.9	---	2.3	e8.0	---
TOTAL	155.41	571.06	266.75	74.12	103.16	465.99	88.32	26.44	95.33	150.97	259.40	65.04
MEAN	5.01	19.0	8.60	2.39	3.68	15.0	2.94	.85	3.18	4.87	8.37	2.17
MAX	38	102	48	17	14	174	17	7.2	11	24	58	13
MIN	.63	.83	.95	.27	.10	.14	.38	.18	.63	.70	.90	.50
AC-FT	308	1130	529	147	205	924	175	52	189	299	515	129

CAL YR 1990 TOTAL 2324.18 MEAN 6.37 MAX 102 MIN .03 AC-FT 4610
WTR YR 1991 TOTAL 2321.99 MEAN 6.36 MAX 174 MIN .10 AC-FT 4610

e Estimated

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.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Elevation of gage is 590 ft, from topographic map.

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

AVERAGE DISCHARGE.--28 years, 10.7 ft^3/s (7,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,810 ft^3/s, Nov. 20, 1990, gage height, 11.34 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurements at gage height 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)
Nov. 13	1100	1,210	7.77	Dec. 22	0100	1,800	8.52
Nov. 20	0830	*4,810	*11.34	Mar. 19	1830	3,450	10.10

Minimum discharge, 1.1 ft^3/s, June 24, 25.

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	3.8	3.4	10	9.3	2.6	2.2	7.8	6.9	2.5	12	3.1	3.8
2	39	5.2	24	8.4	2.5	2.1	8.0	3.8	4.5	4.9	2.6	4.3
3	6.2	3.1	11	8.0	5.1	2.0	7.5	3.1	3.5	2.2	5.5	4.2
4	5.9	2.6	9.0	7.4	3.3	2.0	7.1	3.2	4.6	1.7	18	3.0
5	6.9	2.1	8.4	7.0	2.5	1.9	7.5	2.9	5.6	1.5	11	2.6
6	3.3	2.3	7.7	6.7	2.3	1.9	6.8	2.7	22	1.4	4.1	2.5
7	2.6	1.8	7.3	27	2.2	2.2	5.5	2.7	4.9	3.4	3.2	2.4
8	2.1	1.8	18	20	2.1	4.8	14	2.7	4.8	2.7	86	2.5
9	1.9	1.7	55	7.4	2.2	8.3	24	4.3	3.2	1.5	27	2.3
10	1.8	1.5	14	6.3	2.1	3.3	6.2	7.0	3.1	40	7.3	2.3
11	2.2	1.4	9.3	5.6	2.1	2.7	7.4	3.3	1.8	7.2	5.1	2.4
12	2.0	26	8.3	5.3	2.2	6.8	6.5	2.7	2.3	5.7	4.5	2.6
13	1.9	317	20	5.0	13	12	4.8	2.4	1.8	3.9	10	3.4
14	2.2	149	16	4.7	4.7	3.3	4.4	2.3	1.5	3.7	4.8	2.6
15	1.7	32	10	4.7	7.4	2.4	4.7	2.2	1.3	3.6	3.7	2.7
16	1.6	35	9.9	4.4	3.0	10	5.2	2.2	1.3	3.3	3.5	2.2
17	1.7	112	7.8	4.4	2.3	5.1	4.9	2.1	1.4	13	3.1	1.9
18	1.7	82	33	4.1	3.5	89	4.3	2.1	2.3	4.5	2.9	1.8
19	3.8	117	33	3.8	5.6	565	4.0	2.1	2.3	3.0	2.7	1.9
20	3.2	e620	16	3.6	13	169	4.1	2.0	1.9	3.1	2.7	3.6
21	20	e84	136	3.4	14	85	3.7	2.0	2.6	2.5	2.7	6.8
22	4.7	33	302	3.1	4.1	32	4.5	2.0	1.4	2.5	2.8	10
23	2.2	116	116	3.2	3.0	75	4.1	2.0	1.3	2.1	2.7	6.3
24	4.1	50	54	3.3	8.7	29	3.4	1.9	1.2	2.0	2.5	2.6
25	1.9	21	37	3.5	5.5	20	3.7	1.9	1.5	5.8	2.4	2.1
26	2.3	16	24	3.0	3.0	18	26	2.2	6.0	3.9	2.6	1.9
27	1.5	14	18	36	2.5	18	5.4	1.9	8.7	3.1	5.2	1.7
28	1.3	12	17	6.1	2.4	13	4.2	1.9	6.8	2.1	5.9	1.6
29	1.6	14	15	3.8	---	11	3.8	1.9	3.1	1.9	36	1.7
30	43	11	12	3.1	---	9.9	4.0	2.0	1.8	23	32	1.6
31	8.2	---	10	2.8	---	8.8	---	2.2	---	6.4	6.1	---
TOTAL	186.3	1887.9	1068.7	224.4	126.9	1215.7	207.5	84.6	111.0	177.6	311.7	91.3
MEAN	6.01	62.9	34.5	7.24	4.53	39.2	6.92	2.73	3.70	5.73	10.1	3.04
MAX	43	620	302	36	14	565	26	7.0	22	40	86	10
MIN	1.3	1.4	7.3	2.8	2.1	1.9	3.4	1.9	1.2	1.4	2.4	1.6
AC-FT	370	3740	2120	445	252	2410	412	168	220	352	618	181

CAL YR 1990 TOTAL 6140.48 MEAN 16.8 MAX 620 MIN .27 AC-FT 12180
WTR YR 1991 TOTAL 5693.6 MEAN 15.6 MAX 620 MIN 1.2 AC-FT 11290

e Estimated

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.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map. Prior to May 13, 1965, at datum 2.00 ft higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft higher.

REMARKS.--Records fair except for the period of estimated discharges which are poor. Small diversion upstream.

AVERAGE DISCHARGE.--33 years, 19.0 ft^3/s (13,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, Nov. 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. 13	1200	2,140	6.52	Dec. 22	0200	Unknown	Unknown
Nov. 20	0930	*16,800	*15.84	Mar. 19	1930	Unknown	Unknown

Minimum discharge, estimated 0.70 ft^3/s, June 24.

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	2.8	6.5	e15	e13	e2.6	e2.1	e11	e9.4	e2.5	e19	e3.3	e4.3
2	75	5.3	e47	e11	e2.5	e2.0	e11	e4.3	e5.4	e6.0	e2.6	e5.1
3	14	5.8	e17	e10	e6.3	e1.9	e10	e3.3	e3.9	e2.1	e7.0	e4.9
4	6.4	3.3	e13	e9.2	e3.6	e1.9	e9.7	e3.5	e5.5	e1.5	e32	e3.2
5	9.8	2.7	e12	e8.7	e2.5	e1.8	e10	e3.0	e7.1	e1.3	e17	e2.6
6	5.0	2.6	e11	e8.1	e2.3	e1.8	e9.2	e2.8	e42	e1.2	e4.8	e2.5
7	3.1	2.1	e10	e55	e2.1	e2.1	e7.0	e2.8	e6.0	e3.7	e3.5	e2.4
8	2.2	1.7	e28	e35	e2.0	e5.9	e23	e2.8	e5.9	e2.8	e245	e2.5
9	1.6	1.6	e134	e9.4	e2.1	e12	e47	e5.1	e3.5	e1.3	e55	e2.3
10	1.3	1.4	e28	e7.6	e2.0	e3.6	e8.1	e9.5	e3.3	e91	e10	e2.3
11	1.5	1.1	e14	e6.7	e2.0	e2.8	e10	e3.6	e1.6	e9.9	e6.3	e2.4
12	1.7	52	e12	e6.0	e2.1	e9.2	e8.7	e2.8	e2.3	e7.3	e5.4	e2.6
13	1.4	754	e32	e5.4	e21	e19	e5.9	e2.4	e1.6	e4.5	e15	e3.7
14	1.5	424	e32	e5.1	e5.7	e3.6	e5.2	e2.3	e1.3	e4.2	e5.9	e2.6
15	1.3	62	e15	e4.9	e10	e2.4	e5.7	e2.1	e1.1	e4.0	e4.2	e2.8
16	1.0	50	e15	e4.6	e3.2	e15	e6.5	e2.1	e1.1	e3.6	e3.9	e2.1
17	1.0	314	e11	e4.8	e2.3	e6.3	e6.0	e2.0	e1.2	e21	e3.3	e1.8
18	.93	275	e55	e4.3	e3.9	e256	e5.1	e2.0	e2.3	e5.4	e3.0	e1.6
19	1.3	369	e82	e4.0	e7.1	e1700	e4.6	e2.0	e2.3	e3.2	e2.8	e1.8
20	4.3	e1800	e30	e3.6	e21	e587	e4.8	e1.9	e1.8	e3.3	e2.8	e4.0
21	27	e205	e94	e3.3	e23	e241	e4.2	e1.9	e2.6	e2.5	e2.8	e9.2
22	11	e71	e700	e3.3	e4.8	e68	e5.4	e1.9	e1.2	e2.5	e2.9	e15
23	3.2	e365	e302	e3.5	e3.2	e205	e4.8	e1.9	e1.0	e2.0	e2.8	e8.3
24	5.5	e121	e202	e3.6	e13	e60	e3.7	e1.8	e.90	e1.9	e2.5	e2.6
25	2.9	e40	e85	e3.9	e7.0	e37	e4.2	e1.8	e1.2	e7.5	e2.4	e2.0
26	2.7	e28	e47	e3.2	e3.2	e32	e52	e2.1	e7.8	e4.5	e2.6	e1.8
27	1.7	e23	e32	e79	e2.5	e32	e6.8	e1.8	e13	e3.3	e6.5	e1.5
28	1.2	e19	e30	e8.0	e2.4	e21	e4.9	e1.8	e9.2	e2.0	e7.6	e1.4
29	1.3	e23	e26	e4.3	---	e17	e4.3	e1.8	e3.3	e1.8	e79	e1.5
30	96	e17	e19	e3.3	---	e15	e4.6	e1.9	e1.6	e44	e68	e1.4
31	19	---	e15	e2.9	---	e13	---	e2.1	---	e8.5	e8.0	---
TOTAL	308.63	5046.1	2165	334.7	165.4	3377.4	303.4	90.5	143.50	276.8	617.9	102.2
MEAN	9.96	168	69.8	10.8	5.91	109	10.1	2.92	4.78	8.93	19.9	3.41
MAX	96	1800	700	79	23	1700	52	9.5	42	91	245	15
MIN	.93	1.1	10	2.9	2.0	1.8	3.7	1.8	.90	1.2	2.4	1.4
AC-FT	612	10010	4290	664	328	6700	602	180	285	549	1230	203

CAL YR 1990 TOTAL 13921.88 MEAN 38.1 MAX 1800 MIN .00 AC-FT 27610
WTR YR 1991 TOTAL 12931.53 MEAN 35.4 MAX 1800 MIN .90 AC-FT 25650

e Estimated

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 200600000, 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, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--32 years, 14.2 ft^3/s (10,290 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, Nov. 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)
Nov. 13	1200	1,220	7.00	Dec. 22	0300	1,270	7.13
Nov. 19	1830	1,400	7.41	Mar. 19	1830	2,180	8.95
Nov. 20	1000	*4,380	*13.20	Mar. 20	1100	1,560	7.72

Minimum discharge, 0.79 ft^3/s, Feb. 11-12.

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	8.9	6.7	6.2	6.2	1.5	1.7	4.0	7.8	14	31	4.2	5.6
2	65	34	24	5.6	1.3	1.5	3.9	4.1	10	11	3.0	7.6
3	8.4	7.4	8.8	5.1	10	1.3	4.0	2.8	11	4.3	14	6.8
4	17	7.0	5.7	4.6	5.3	1.2	4.2	3.5	9.2	5.4	22	4.3
5	23	7.7	6.4	4.3	2.7	1.1	4.2	4.1	7.8	4.4	22	5.2
6	6.8	7.7	4.4	4.1	1.7	1.1	6.8	2.4	34	2.7	5.7	3.9
7	6.8	4.3	3.9	23	1.3	2.9	3.6	2.0	29	9.0	4.9	2.9
8	6.2	3.9	33	14	1.1	11	29	1.9	10	6.5	153	4.4
9	4.8	3.3	177	6.3	.97	65	56	17	8.2	2.7	54	4.0
10	3.3	2.7	28	6.4	.88	6.8	7.7	13	7.1	74	9.1	2.8
11	3.8	2.3	9.1	5.5	.83	3.6	120	4.2	10	10	6.9	5.7
12	5.1	30	7.3	4.4	.98	8.4	14	5.3	6.9	11	8.9	4.9
13	5.9	307	46	3.6	18	17	6.2	2.8	3.9	6.6	24	11
14	5.5	212	35	3.0	28	4.6	5.0	2.0	2.8	9.2	6.8	6.7
15	3.2	30	23	3.8	29	2.7	7.3	1.8	2.5	5.8	4.4	5.7
16	2.4	133	18	3.2	5.1	32	8.0	1.8	2.5	5.2	3.8	3.1
17	7.5	263	8.4	3.3	2.7	10	7.5	1.6	2.6	20	3.4	2.2
18	5.7	194	60	3.8	35	125	4.5	1.6	4.4	6.8	3.0	1.9
19	69	174	61	2.8	21	544	3.8	1.5	5.0	3.8	4.0	2.7
20	8.6	550	23	2.2	38	301	3.4	1.2	4.5	3.7	3.3	8.2
21	4.2	39	107	1.9	20	193	2.9	1.6	5.7	5.9	3.5	31
22	6.5	20	343	1.7	6.3	22	3.4	2.1	2.8	4.0	2.5	14
23	5.1	35	99	1.8	3.8	92	3.5	1.8	2.5	5.1	4.5	4.8
24	9.4	25	50	2.0	7.1	22	2.6	1.3	3.5	2.9	5.7	2.5
25	3.9	12	40	4.3	9.2	11	2.6	1.0	7.5	23	2.5	2.0
26	5.5	9.2	18	2.7	3.4	8.9	54	2.0	15	8.7	5.0	1.8
27	2.8	7.8	12	57	2.3	12	7.3	2.0	16	5.2	13	1.6
28	2.5	7.1	10	8.4	1.9	9.8	9.5	3.2	17	2.8	8.2	1.3
29	3.5	15	13	3.8	---	6.3	5.4	2.1	6.7	2.4	125	1.5
30	152	7.3	7.9	2.2	---	5.1	6.9	1.5	3.4	36	87	3.8
31	21	---	7.1	1.7	---	4.5	---	8.7	---	9.3	9.8	---
TOTAL	483.3	2157.4	1295.2	202.7	259.36	1528.5	401.2	109.7	265.5	338.4	627.1	163.9
MEAN	15.6	71.9	41.8	6.54	9.26	49.3	13.4	3.54	8.85	10.9	20.2	5.46
MAX	152	550	343	57	38	544	120	17	34	74	153	31
MIN	2.4	2.3	3.9	1.7	.83	1.1	2.6	1.0	2.5	2.4	2.5	1.3
AC-FT	959	4280	2570	402	514	3030	796	218	527	671	1240	325

CAL YR 1990 TOTAL 7984.71 MEAN 21.9 MAX 550 MIN .27 AC-FT 15840
WTR YR 1991 TOTAL 7832.26 MEAN 21.5 MAX 550 MIN .83 AC-FT 15540

16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station)

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.

WATER-DISCHARGE RECORDS

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, from topographic map. Prior to June 25, 1923, at site 350 ft upstream at different datum. June 25, 1923 to July 18, 1932, and Nov. 17, 1937 to Feb. 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--67 years (water years 1918-31, 1939-91), 29.7 ft^3/s (21,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s, Feb. 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 Nov. 23, 1962.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 20	1500	1,940	8.35	Jan. 27	1100	*2,360	*8.94
Dec. 23	1600	2,080	8.55				

Minimum discharge, 2.6 ft^3/s, June 22.

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	35	110	36	10	6.0	4.9	5.9	20	31	48	36	8.4
2	8.8	27	107	8.6	5.5	3.9	7.5	7.0	43	51	21	8.4
3	178	25	29	7.9	31	3.9	5.9	5.5	53	56	38	6.5
4	116	11	26	9.4	6.9	3.6	7.4	5.2	12	24	57	76
5	19	25	19	30	5.1	3.3	20	4.8	40	7.0	14	11
6	12	15	11	49	4.6	8.0	6.6	4.2	18	7.1	20	7.3
7	8.2	18	25	142	4.3	32	5.2	4.0	39	19	74	6.1
8	15	8.0	63	77	4.0	177	97	22	12	5.5	51	6.3
9	7.0	6.8	146	14	18	201	137	43	7.4	5.3	16	7.8
10	6.2	6.2	17	13	4.5	17	84	10	5.6	149	11	22
11	12	15	16	15	3.8	9.5	39	5.4	6.5	160	34	21
12	6.6	262	46	13	3.7	60	11	4.4	4.6	13	29	22
13	13	142	29	51	240	33	7.9	7.4	4.7	21	24	27
14	7.2	147	32	75	34	14	12	8.5	4.0	27	9.1	18
15	5.5	42	14	63	13	17	32	4.5	3.5	27	7.6	11
16	258	115	14	15	7.2	33	61	3.8	3.4	35	6.7	7.5
17	244	121	10	17	6.0	37	12	4.0	3.3	63	5.9	5.4
18	25	353	9.3	12	13	60	7.4	6.8	4.2	11	5.4	5.0
19	107	194	35	8.3	17	428	6.2	39	3.7	15	5.3	37
20	86	247	49	7.2	59	153	6.0	9.9	4.4	16	5.3	118
21	15	67	60	6.6	19	29	8.0	5.6	3.1	11	5.1	48
22	11	35	109	6.3	7.1	15	7.3	5.6	2.7	7.3	4.5	8.0
23	56	184	225	21	5.4	118	7.9	5.0	12	6.0	7.9	6.2
24	12	71	238	14	16	31	11	3.8	3.6	27	4.3	118
25	18	23	30	8.4	26	17	66	3.2	37	28	4.4	11
26	15	17	130	6.0	5.4	20	23	3.9	47	34	15	7.0
27	12	44	23	250	4.5	15	30	17	19	7.2	91	5.9
28	8.4	24	47	26	4.3	9.1	14	8.7	35	5.6	102	5.3
29	9.0	21	42	9.0	---	7.8	14	22	6.6	177	248	4.9
30	112	32	13	7.4	---	9.1	43	18	26	211	39	4.4
31	13	---	29	6.5	---	6.8	---	26	---	26	11	---
TOTAL	1450.9	2408.0	1679.3	998.6	574.3	1576.9	795.2	338.2	495.3	1300.0	1002.5	650.4
MEAN	46.8	80.3	54.2	32.2	20.5	50.9	26.5	10.9	16.5	41.9	32.3	21.7
MAX	258	353	238	250	240	428	137	43	53	211	248	118
MIN	5.5	6.2	9.3	6.0	3.7	3.3	5.2	3.2	2.7	5.3	4.3	4.4
AC-FT	2880	4780	3330	1980	1140	3130	1580	671	982	2580	1990	1290

CAL YR 1990 TOTAL 14259.6 MEAN 39.1 MAX 482 MIN 3.0 AC-FT 28280
WTR YR 1991 TOTAL 13269.6 MEAN 36.4 MAX 428 MIN 2.7 AC-FT 26320

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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										
16...	1015	217	44	6.6	24.5	21.0	26	760	8.4	95
DEC										
03...	1345	30	39	6.9	23.5	20.0	7.4	757	8.2	91
FEB										
05...	1200	5.4	52	7.2	23.5	19.0	7.7	758	8.3	90
APR										
23...	1215	5.4	56	7.2	24.5	20.0	1.9	760	8.4	93
JUN										
04...	1030	11	43	6.8	23.0	21.5	4.5	758	8.7	99
AUG										
27...	1100	56	41	6.5	25.5	22.0	10	760	8.4	96

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)
OCT										
16...	5700	5600	5	2	0.69	0.86	5.8	68	1	0.60
DEC										
03...	290	1300	5	1	0.79	0.76	5.5	68	1	0.50
FEB										
05...	450	610	8	1	1.1	1.2	6.8	63	1	0.70
APR										
23...	29	300	9	3	1.6	1.3	7.5	61	1	0.70
JUN										
04...	170	520	5	1	0.88	0.80	5.7	67	1	0.50
AUG										
27...	4400	4100	5	3	0.70	0.84	5.4	67	1	0.50

DATE	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD 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, 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)
OCT										
16...	4	0	3	1.9	11	0.10	4.6	46	28	0.06
DEC										
03...	5	0	4	2.5	8.3	0.20	4.7	26	26	0.03
FEB										
05...	8	0	6	1.9	11	<0.10	7.7	11	35	0.02
APR										
23...	8	0	7	1.9	12	0.10	8.4	41	38	0.06
JUN										
04...	6	0	5	1.8	9.9	<0.10	4.0	47	27	0.06
AUG										
27...	3	0	3	1.5	8.8	<0.10	2.4	29	22	0.04

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)
OCT 16...	<0.100	<0.100	0.030	0.030	0.80	0.160	0.06	<0.010	0.020
DEC 03...	<0.100	<0.100	0.050	0.040	0.20	0.060	0.06	0.050	0.010
FEB 05...	<0.100	<0.100	0.020	0.010	0.40	0.020	0.06	0.020	0.010
APR 23...	<0.050	<0.050	0.030	0.010	<0.20	0.020	--	0.020	<0.010
JUN 04...	<0.050	<0.050	0.020	0.020	0.70	0.030	--	0.020	<0.010
AUG 27...	<0.050	<0.050	0.020	0.020	0.40	0.060	--	<0.010	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT 16...	1015	130	<1	7	<0.5	<1.0	<1	<3	1	140	<1
FEB 05...	1200	80	<1	12	<0.5	<1.0	<1	<3	1	120	2
APR 23...	1215	130	<1	10	<0.5	<1.0	<1	<3	<1	48	<1
AUG 27...	1100	160	<1	11	<0.5	1.0	<1	<3	<1	250	<1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT 16...	<4	5	0.4	<10	<1	<1	<1.0	12	<6	6
FEB 05...	<4	5	<0.1	<10	1	<1	<1.0	15	<6	<3
APR 23...	<4	4	<0.1	<10	<1	<1	<1.0	18	<6	99
AUG 27...	<4	4	<0.1	<10	<1	<1	<1.0	12	<6	3

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16...	1015	49	29	88
DEC 03...	1345	3	0.24	100
FEB 05...	1200	3	0.04	100
APR 23...	1215	4	0.06	100
JUN 04...	1030	2	0.06	100
AUG 27...	1100	15	2.3	98

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

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, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--23 years, 1.64 ft^3/s (1,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s, Jan. 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, Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 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)
Dec. 24	1600	145	3.13	Jan. 27	1030	*216	*3.35
Dec. 26	0030	151	3.15				

Minimum discharge, 0.72 ft3/s on several days

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	.80	.72	1.3	2.3	1.6	1.3	2.1	1.5	1.1	.84	.80	.89
2	.72	.72	1.3	2.2	1.6	1.3	2.1	1.4	1.1	.84	.76	.84
3	1.1	.72	1.2	2.0	2.2	1.3	2.0	1.4	1.0	.80	.80	.84
4	1.2	.76	1.2	2.0	1.6	1.2	2.0	1.6	.99	.76	.80	.87
5	.80	.80	1.1	2.0	1.5	1.5	2.0	1.4	.99	.76	.76	.80
6	.76	.72	1.0	2.0	1.4	1.4	2.0	1.3	1.0	.76	.76	.80
7	.76	.72	1.1	2.6	1.4	2.7	2.0	1.4	1.1	.80	5.2	.80
8	.72	.72	3.8	1.9	1.3	10	3.2	2.2	.99	.76	2.4	.76
9	.72	.72	8.1	1.8	1.7	9.1	3.5	1.6	.99	.76	1.2	.84
10	.91	.72	2.4	2.1	1.3	3.7	2.0	1.4	.94	1.1	.99	.89
11	1.2	.76	1.9	1.7	1.3	2.9	2.0	1.3	.94	1.3	.99	.95
12	.80	1.4	1.9	1.6	1.2	5.6	1.9	1.3	.89	.84	.97	.84
13	.80	1.4	3.3	1.6	3.0	4.3	1.9	1.3	.89	.80	.89	.84
14	.76	2.7	2.2	1.6	1.6	3.5	1.9	1.2	.89	.80	.84	.80
15	.72	1.2	1.8	1.6	1.4	3.8	1.8	1.2	.89	.84	.80	.76
16	1.9	1.6	1.6	1.5	1.3	4.0	1.8	1.2	.89	.94	.80	.76
17	2.7	2.8	1.6	1.4	1.3	4.0	1.7	1.2	.89	1.2	.80	.76
18	.94	5.1	1.6	1.4	1.5	4.0	1.6	1.2	.89	.89	.80	.76
19	.84	6.0	2.2	1.4	1.5	11	1.6	1.2	.84	.84	.80	1.2
20	.80	8.4	1.9	1.3	3.3	7.5	1.6	1.2	.84	.84	.80	1.1
21	.80	2.9	2.0	1.4	1.9	4.3	1.6	1.2	.84	.80	.76	.94
22	.80	1.9	2.6	1.4	1.5	3.5	1.6	1.2	.84	.80	.80	.84
23	.80	5.9	11	1.6	1.4	3.6	1.6	1.1	.94	.76	.76	.80
24	.76	3.5	11	1.3	2.2	3.0	1.6	1.1	.89	.89	.76	1.1
25	.72	2.1	4.2	1.3	1.9	2.8	1.6	1.2	.94	.80	.80	.84
26	.76	1.8	11	1.3	1.5	2.6	1.6	1.2	.94	.76	1.0	.80
27	.72	1.6	4.1	14	1.4	2.4	1.6	1.2	1.0	.72	1.6	.76
28	.72	1.5	3.8	2.8	1.4	2.4	1.5	1.2	.94	.72	1.2	.76
29	.76	1.4	3.0	2.0	---	2.3	1.6	1.3	.84	1.0	1.3	.76
30	.76	1.3	2.7	1.9	---	2.3	1.6	1.2	.94	1.1	.94	.76
31	.72	---	2.6	1.7	---	2.2	---	1.1	---	.80	.89	---
TOTAL	28.27	62.58	100.5	66.7	46.2	115.5	56.6	40.5	28.16	26.62	33.77	25.46
MEAN	.91	2.09	3.24	2.15	1.65	3.73	1.89	1.31	.94	.86	1.09	.85
MAX	2.7	8.4	11	14	3.3	11	3.5	2.2	1.1	1.3	5.2	1.2
MIN	.72	.72	1.0	1.3	1.2	1.2	1.5	1.1	.84	.72	.76	.76
AC-FT	56	124	199	132	92	229	112	80	56	53	67	50

CAL YR 1990 TOTAL 831.85 MEAN 2.28 MAX 63 MIN .72 AC-FT 1650
WTR YR 1991 TOTAL 630.86 MEAN 1.73 MAX 14 MIN .72 AC-FT 1250

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, from tunnel plans.

REMARKS.--Records good. Tunnel diverts 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.--25 years, 4.35 ft^3/s (3,150 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s, Dec. 9; minimum daily, 1.3 ft^3/s, Nov. 10-11, Sept. 29-30.

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	e3.7	3.0	3.4	4.1	4.3	5.7	4.1	7.3	4.4	6.1	3.8	1.8
2	e3.4	2.9	7.3	3.5	4.2	5.6	4.1	4.1	4.0	4.9	2.3	1.6
3	e3.6	2.7	4.1	3.3	12	5.6	4.1	3.7	4.2	4.7	2.1	1.5
4	e14	2.7	3.7	3.4	5.7	3.9	4.1	4.5	3.8	4.4	4.2	2.8
5	e5.0	3.4	4.3	4.7	4.6	5.0	5.0	4.4	3.6	3.9	2.5	2.1
6	e4.0	3.3	3.5	6.5	4.3	9.1	4.3	3.7	4.2	3.9	2.3	1.7
7	e3.6	2.9	3.2	20	4.1	18	4.0	3.8	9.5	3.8	19	1.5
8	e3.6	2.7	20	5.2	4.0	21	15	17	6.4	3.8	13	1.4
9	e2.7	2.4	31	4.0	6.2	28	15	9.8	5.9	3.7	6.8	1.4
10	e2.7	1.3	9.6	10	4.4	13	5.7	4.9	4.1	9.0	3.5	2.2
11	e15	1.3	5.0	4.6	4.0	6.5	4.6	3.9	3.7	14	4.3	7.7
12	e6.6	9.9	9.8	3.6	3.8	21	4.5	3.6	3.4	5.9	5.8	4.4
13	e6.0	19	19	3.2	21	15	4.1	3.5	3.3	4.5	4.3	3.6
14	e4.4	27	13	3.1	9.3	7.9	3.9	3.5	3.2	4.2	2.4	2.8
15	e4.0	10	5.6	3.1	5.6	17	3.9	3.5	3.1	4.2	1.9	2.0
16	e10	12	4.5	2.9	4.6	15	3.9	3.4	3.1	8.1	1.7	1.7
17	e25	15	3.9	2.9	4.3	17	3.9	3.4	3.1	7.3	1.6	1.4
18	e4.4	28	3.7	2.8	4.3	16	3.8	3.3	4.1	3.5	1.5	1.4
19	3.7	26	12	2.7	5.5	26	3.7	3.3	3.6	2.3	1.5	7.6
20	3.1	29	10	2.7	20	21	3.7	3.4	3.3	1.9	1.4	6.2
21	2.9	8.8	12	2.7	11	8.7	3.7	3.5	3.2	1.6	1.4	4.5
22	2.8	4.9	18	2.8	5.2	5.6	3.6	4.4	3.0	1.5	1.4	2.2
23	2.9	19	18	9.8	4.4	8.3	3.6	3.9	1.5	1.5	1.4	1.7
24	2.9	15	28	5.3	8.4	6.9	3.6	3.5	1.5	1.6	1.4	2.0
25	2.7	5.3	11	4.1	8.7	5.3	3.7	3.3	2.8	1.8	1.4	2.0
26	2.7	4.0	30	4.6	4.8	4.9	5.5	3.3	5.7	2.2	3.0	1.6
27	2.7	4.0	9.5	19	5.3	4.7	4.1	3.3	9.4	1.9	16	1.4
28	2.7	4.3	9.3	14	5.8	4.4	4.1	4.0	10	1.6	10	1.4
29	2.8	3.8	6.3	5.7	---	4.2	4.1	9.0	5.2	3.7	9.3	1.3
30	3.7	3.6	4.5	4.7	---	4.2	8.8	10	5.3	11	4.7	1.3
31	3.6	---	6.3	4.4	---	4.1	---	5.6	---	4.1	2.3	---
TOTAL	160.9	277.2	329.5	173.4	189.8	338.6	150.2	151.8	131.6	136.6	138.2	76.2
MEAN	5.19	9.24	10.6	5.59	6.78	10.9	5.01	4.90	4.39	4.41	4.46	2.54
MAX	25	29	31	20	21	28	15	17	10	14	19	7.7
MIN	2.7	1.3	3.2	2.7	3.8	3.9	3.6	3.3	1.5	1.5	1.4	1.3
AC-FT	319	550	654	344	376	672	298	301	261	271	274	151

CAL YR 1990 TOTAL 2682.90 MEAN 7.35 MAX 33 MIN .70 AC-FT 5320
WTR YR 1991 TOTAL 2254.0 MEAN 6.18 MAX 31 MIN 1.3 AC-FT 4470

e Estimated

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, from tunnel plans.

REMARKS.--Records excellent. Tunnel diverts 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.--26 years, 6.89 ft^3/s (4,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, Apr. 8, 9, 1986, Jan. 2, 26, 1988, and Mar. 3, 1989; minimum daily, 1.8 ft^3/s, Oct. 15, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 38 ft^3/s, Dec. 9; minimum daily, 3.8 ft^3/s, Sept. 17-18.

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	6.4	5.7	6.0	7.0	7.0	8.4	6.6	11	7.1	10	6.1	4.5
2	6.1	5.7	9.7	6.1	6.8	8.4	6.6	7.0	6.9	8.3	5.2	4.3
3	6.2	5.6	7.0	6.0	15	8.4	6.5	6.5	6.9	8.0	4.7	4.0
4	17	5.5	6.3	5.9	8.6	7.0	6.6	6.9	6.7	7.4	6.6	4.9
5	7.7	6.1	7.0	7.0	7.1	7.1	7.6	7.2	6.5	7.0	5.2	4.5
6	6.5	6.0	6.2	8.4	6.9	12	6.8	6.4	6.8	6.9	4.7	4.3
7	6.2	5.6	5.9	24	6.6	22	6.6	6.3	13	6.9	21	4.0
8	6.2	5.4	21	7.9	6.6	24	16	20	9.3	6.8	18	4.0
9	5.3	5.1	38	6.3	8.6	33	20	13	8.9	6.6	10	4.0
10	5.4	4.0	14	13	6.9	18	9.2	8.0	7.0	11	6.6	4.5
11	17	4.0	7.9	6.9	6.5	9.4	7.7	6.5	6.4	17	6.9	10
12	8.3	11	11	5.9	6.3	24	7.5	6.2	6.2	9.6	8.9	6.9
13	8.0	20	23	5.5	23	20	7.0	6.2	6.0	7.4	7.4	5.8
14	6.4	31	18	6.8	13	9.0	6.6	6.2	6.0	7.2	5.4	5.2
15	5.8	14	9.0	6.0	8.4	22	6.5	6.2	5.8	7.0	4.9	4.5
16	12	13	7.5	5.0	7.0	18	6.3	6.2	5.8	11	4.7	4.0
17	27	16	6.6	5.1	6.6	20	6.5	6.2	5.8	11	4.5	3.8
18	7.4	33	6.3	5.2	6.5	19	6.3	6.2	6.3	6.7	4.5	3.8
19	6.7	30	15	5.1	7.2	30	6.4	6.2	6.6	5.4	4.3	9.0
20	6.1	32	13	5.1	23	27	6.3	6.3	5.9	5.2	4.3	8.4
21	5.9	13	16	5.2	15	12	6.3	6.4	5.8	4.7	4.3	7.2
22	5.8	7.7	21	5.5	7.7	8.6	6.3	7.0	5.6	4.7	4.3	4.7
23	5.7	20	20	12	6.9	11	6.2	6.8	4.5	4.5	4.3	4.3
24	5.6	20	33	8.3	10	10	6.4	6.2	4.5	4.5	4.3	4.3
25	5.6	8.2	14	6.7	12	8.5	6.4	6.1	5.2	4.7	4.3	4.7
26	5.6	6.6	35	7.3	7.5	7.8	8.1	6.0	8.3	4.9	4.8	4.5
27	5.7	6.4	12	20	7.6	7.7	6.9	5.9	11	4.7	18	4.3
28	5.5	7.1	12	19	8.4	7.4	7.1	6.3	14	4.5	12	4.3
29	5.5	6.5	8.8	8.4	---	6.9	6.9	11	8.9	5.7	14	4.0
30	6.0	6.2	7.1	7.6	---	6.9	11	14	8.1	14	7.4	4.0
31	6.6	---	9.4	6.9	---	6.6	---	8.3	---	7.2	4.9	---
TOTAL	241.2	360.4	426.7	255.1	262.7	440.1	231.2	238.7	215.8	230.5	226.5	150.7
MEAN	7.78	12.0	13.8	8.23	9.38	14.2	7.71	7.70	7.19	7.44	7.31	5.02
MAX	27	33	38	24	23	33	20	20	14	17	21	10
MIN	5.3	4.0	5.9	5.0	6.3	6.6	6.2	5.9	4.5	4.5	4.3	3.8
AC-FT	478	715	846	506	521	873	459	473	428	457	449	299

CAL YR 1990 TOTAL 3846.3 MEAN 10.5 MAX 38 MIN 3.1 AC-FT 7630
WTR YR 1991 TOTAL 3279.6 MEAN 8.99 MAX 38 MIN 3.8 AC-FT 6510

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, from topographic map. Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

REMARKS.--Records good. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--30 years (water years 1961, 1963-91), 6.75 ft^3/s (4,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, Jan. 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 Oct. 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)
Dec. 23	2400	864	4.19	Jan. 27	1100	*1,070	*4.48
Dec. 26	0100	702	3.92				

Minimum discharge, 0.15 ft^3/s, Mar. 2-5.

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	.45	.90	1.0	1.4	1.2	.27	1.3	2.1	1.2	1.1	1.0	1.0
2	.45	.90	1.8	1.4	1.2	.21	1.3	1.2	1.2	1.1	.94	1.0
3	1.0	.90	1.0	1.4	4.3	.15	1.2	1.2	1.2	1.0	.96	1.0
4	5.9	.90	.90	1.4	1.2	.19	1.2	1.2	1.2	1.0	1.0	1.0
5	.55	.90	.90	1.6	.90	1.9	1.2	1.2	1.1	1.0	.96	.96
6	.55	1.0	.90	2.4	.65	1.5	1.2	1.2	1.1	1.0	.92	.90
7	.55	1.0	.90	7.5	.62	16	1.2	1.2	2.1	1.0	81	.90
8	.55	1.0	41	1.6	.67	110	11	13	1.2	1.0	10	.90
9	.65	1.0	66	1.6	1.1	80	26	3.5	1.0	1.0	2.1	.90
10	.65	.90	2.5	5.4	.63	5.4	1.4	1.2	1.0	3.5	1.1	.97
11	4.0	.90	1.2	1.4	.70	.80	1.3	1.2	1.0	8.4	1.2	3.6
12	.90	10	2.7	1.2	.62	28	1.3	1.2	1.0	1.1	2.1	1.0
13	.90	8.9	19	1.2	31	20	1.3	1.2	1.0	1.0	1.0	1.0
14	.65	18	4.0	1.2	1.9	13	1.3	1.2	1.0	1.0	1.0	1.0
15	.65	2.7	1.4	1.2	.68	14	1.2	1.2	1.0	1.0	1.0	1.0
16	13	5.2	1.4	1.0	.63	13	1.2	1.2	1.0	2.9	1.0	.96
17	17	14	1.2	1.0	.61	14	1.2	1.2	1.0	11	1.0	.90
18	2.4	30	1.2	1.0	.60	13	1.2	1.2	1.1	3.1	1.0	.90
19	.75	39	4.5	1.0	.82	74	1.2	1.2	1.1	1.0	1.0	5.3
20	.75	55	3.0	1.2	19	23	1.2	1.2	1.1	1.0	.97	1.6
21	.75	2.2	4.0	1.2	3.1	2.5	1.2	1.2	1.0	1.0	.90	1.1
22	.75	1.0	7.6	1.2	.62	1.3	1.2	1.2	1.0	1.0	.90	.98
23	.75	33	67	3.2	.59	6.5	1.2	1.2	1.0	1.0	.90	.90
24	.75	5.0	112	1.6	2.6	2.2	1.1	1.2	1.0	1.0	.90	.96
25	.65	1.0	3.1	1.2	1.6	1.2	1.0	1.2	1.0	1.0	.90	.90
26	.65	1.0	62	1.0	.56	1.2	1.2	1.1	1.0	1.0	1.1	.90
27	.65	1.0	2.2	100	.52	1.2	1.2	1.0	3.3	1.0	11	.90
28	.65	1.0	5.0	5.5	.37	1.2	1.2	1.1	3.4	1.0	9.0	.90
29	.65	1.0	1.6	1.0	---	1.2	1.2	2.2	1.1	2.1	6.0	.90
30	.75	1.0	1.6	1.0	---	1.3	2.5	3.1	1.1	7.8	1.3	.90
31	.75	---	2.0	1.2	---	1.3	---	1.2	---	1.1	1.0	---
TOTAL	60.05	240.30	424.60	155.2	78.99	449.52	72.4	54.7	37.5	63.2	145.15	36.13
MEAN	1.94	8.01	13.7	5.01	2.82	14.5	2.41	1.76	1.25	2.04	4.68	1.20
MAX	17	55	112	100	31	110	26	13	3.4	11	81	5.3
MIN	.45	.90	.90	1.0	.37	.15	1.0	1.0	1.0	1.0	.90	.90
AC-FT	119	477	842	308	157	892	144	108	74	125	288	72

CAL YR 1990 TOTAL 2614.29 MEAN 7.16 MAX 398 MIN .37 AC-FT 5190
WTR YR 1991 TOTAL 1817.74 MEAN 4.98 MAX 112 MIN .15 AC-FT 3610

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 current year. 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 Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream both to and from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--31 years (water years 1961-91), 16.9 ft^3/s (12,240. acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft^3/s, Apr. 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, Nov. 1, 2, 1926, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 27	1100	*1,380	*4.73	No other peak greater than base discharge			

Minimum discharge, 5.9 ft^3/s, Nov. 7-8.

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	8.8	7.6	8.1	12	9.7	9.9	12	13	10	7.6	12	12
2	8.7	7.6	8.9	11	9.6	9.7	12	11	10	7.4	11	11
3	12	7.4	7.6	11	15	9.6	12	11	10	7.6	29	11
4	19	7.4	7.8	11	10	9.5	12	12	10	7.6	16	11
5	9.9	7.4	7.5	12	9.6	13	12	11	10	7.5	13	11
6	9.2	7.2	7.7	13	9.5	12	12	11	9.9	7.2	12	11
7	8.8	7.0	7.5	27	9.4	43	12	11	11	7.2	184	11
8	8.9	6.8	78	13	9.3	246	22	26	10	7.4	38	11
9	8.8	7.0	188	12	11	238	54	15	9.5	7.4	17	11
10	9.2	7.4	17	18	9.3	26	13	12	9.5	10	14	11
11	12	7.8	12	12	9.2	14	12	11	9.5	19	13	15
12	9.6	39	12	11	9.2	52	12	11	9.4	9.4	14	11
13	9.2	32	35	11	82	43	11	11	9.4	8.9	13	11
14	9.1	41	14	11	18	50	11	11	9.4	8.9	12	11
15	8.5	15	10	11	12	44	11	11	9.3	9.2	12	10
16	28	14	9.9	11	11	32	11	11	9.3	12	12	10
17	39	25	9.6	11	10	39	11	11	9.3	24	11	10
18	12	49	9.4	11	10	31	11	11	9.4	14	11	10
19	9.4	64	13	11	15	122	11	11	9.3	12	11	16
20	8.8	91	12	10	83	44	11	11	9.2	12	11	12
21	8.8	15	14	10	18	17	11	11	9.1	11	11	11
22	8.4	11	16	11	12	15	11	11	9.0	11	11	10
23	8.1	54	131	13	11	24	11	11	9.9	11	11	10
24	7.9	19	186	11	14	17	11	10	9.7	12	11	10
25	7.9	10	19	10	13	13	12	10	8.9	11	11	10
26	7.9	9.4	103	10	11	13	11	10	8.1	10	11	9.9
27	7.9	9.6	16	147	11	13	11	10	9.5	10	25	9.9
28	7.6	9.3	19	21	10	13	13	10	10	10	28	9.8
29	7.6	8.9	13	11	---	12	12	11	7.9	15	21	9.7
30	7.6	8.4	12	10	---	12	13	12	8.4	26	13	9.7
31	7.6	---	13	9.9	---	12	---	10	---	12	12	---
TOTAL	336.2	605.2	1017.0	513.9	461.8	1248.7	401	359	283.9	345.3	631	327.0
MEAN	10.8	20.2	32.8	16.6	16.5	40.3	13.4	11.6	9.46	11.1	20.4	10.9
MAX	39	91	188	147	83	246	54	26	11	26	184	16
MIN	7.6	6.8	7.5	9.9	9.2	9.5	11	10	7.9	7.2	11	9.7
AC-FT	667	1200	2020	1020	916	2480	795	712	563	685	1250	649

CAL YR 1990 TOTAL 7727.9 MEAN 21.2 MAX 539 MIN 6.8 AC-FT 15330
WTR YR 1991 TOTAL 6530.0 MEAN 17.9 MAX 246 MIN 6.8 AC-FT 12950

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, from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--41 years (water years 1951-91), 1.90 ft^3/s (1,380 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s, Oct. 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)
Dec. 24	1700	*730	*5.80	Jan. 27	1300	508	5.27

Minimum discharge, no flow for many days.

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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	35	.00	.00	.00	.00	18	.00
9	.00	.00	36	.00	.00	88	.00	.00	.00	.00	.00	.00
10	.00	.00	4.3	.00	.00	15	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.70	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	5.3	.00	.00	.00	.00	.00	.00
13	.00	.00	1.3	.00	.00	25	.00	.00	.00	.00	.00	.00
14	.00	.00	1.0	.00	.00	1.9	.00	.00	.00	.00	.00	.00
15	.00	.00	.03	.00	.00	5.1	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	5.9	.00	.00	.00	.00	.00	.00
18	.00	4.3	.00	.00	.00	1.2	.00	.00	.00	.00	.00	.00
19	.00	21	.00	.00	.00	26	.00	.00	.00	.00	.00	.00
20	.00	26	.00	.00	.00	30	.00	.00	.00	.00	.00	.00
21	.00	4.9	.00	.00	.00	4.3	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
23	.00	16	50	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	5.9	184	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.03	22	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	72	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	15	57	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	6.4	16	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.83	.15	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.01	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	78.13	392.87	73.15	0.00	246.40	0.00	0.00	0.00	0.00	18.00	0.00
MEAN	.000	2.60	12.7	2.36	.000	7.95	.000	.000	.000	.000	.58	.000
MAX	.00	26	184	57	.00	88	.00	.00	.00	.00	18	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	155	779	145	.00	489	.00	.00	.00	.00	36	.00

CAL YR 1990 TOTAL 1943.58 MEAN 5.32 MAX 570 MIN .00 AC-FT 3860
WTR YR 1991 TOTAL 808.55 MEAN 2.22 MAX 184 MIN .00 AC-FT 1600

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, from topographic map.

REMARKS.--Records good except for estimated days which are fair. Diversion upstream for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--28 years, 0.90 ft^3/s (652 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, Apr. 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)
Nov. 20	1530	410	5.04	Mar. 23	1700	*716	*6.09
Dec. 24	0030	578	5.66				

Minimum discharge, 0.14 ft^3/s, Oct. 15, 16.

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	.26	2.1	e1.3	2.2	e2.1	.80	1.2	1.0	.65	.95	1.3	.42
2	.20	.64	e3.5	2.1	e1.9	.75	1.2	.85	.65	.95	.65	.38
3	3.1	.39	e1.2	2.1	e3.6	.75	1.2	.80	.90	.65	.55	.35
4	6.1	.35	1.0	2.1	e1.3	.70	1.1	.80	.65	.55	.80	1.4
5	.64	.32	1.0	2.1	e1.0	.70	1.3	.80	.76	.46	.55	.42
6	.32	.35	.90	2.0	1.0	.75	1.1	.75	.65	.38	.50	.32
7	.26	.26	2.2	5.5	.95	.75	1.0	.75	.60	.38	.50	.29
8	.20	.23	1.3	2.4	.90	2.8	1.5	.85	.55	.35	1.5	.26
9	.20	.20	2.5	2.2	1.0	8.3	1.9	1.0	.55	.38	.65	.23
10	.18	.20	1.0	2.1	.95	1.3	1.6	.95	.50	3.3	.46	.29
11	.18	.23	.90	2.1	.90	.95	1.3	.85	.55	5.1	.42	.29
12	.18	13	1.3	2.1	.85	1.2	1.2	.80	.50	.85	.63	.35
13	.18	6.0	1.4	2.0	6.4	1.0	1.0	.75	.55	.65	.60	.70
14	.16	2.6	.95	3.0	1.5	.90	6.5	.75	.50	.60	.42	.60
15	.14	1.2	.80	2.2	1.1	.80	1.6	.70	.46	.60	.38	.46
16	8.6	1.5	.80	2.1	1.0	.85	1.4	.70	.50	.55	.38	.42
17	19	1.9	.80	2.1	.95	.90	1.3	.70	.46	1.2	.35	.38
18	1.3	22	.75	2.0	.90	.85	1.2	.75	.46	.65	.35	.38
19	1.5	10	.90	2.0	.90	9.4	1.1	.75	.46	.50	.35	1.5
20	5.7	24	1.6	1.9	1.5	8.8	1.1	.80	.55	.46	.35	4.9
21	.79	4.5	1.8	1.9	1.0	2.0	1.0	.87	.50	.50	.32	2.6
22	.55	2.5	2.9	1.9	.90	1.3	1.0	.75	.46	.38	.32	.46
23	.99	6.5	18	1.9	.85	29	.90	.70	.60	.38	.35	.35
24	.47	2.7	36	1.9	.90	4.3	.95	.65	.50	.58	.35	6.5
25	.39	e2.0	5.2	1.9	1.0	2.2	.95	.60	.50	.99	.32	.92
26	.35	e1.7	4.3	1.9	.85	1.8	1.2	.60	.50	.55	.32	.50
27	.32	e1.9	2.9	11	.80	1.6	1.0	.60	.50	.46	1.2	.42
28	.29	e1.9	4.0	2.6	.80	1.5	1.0	.60	.60	.38	1.4	.38
29	.29	e1.6	3.7	2.4	---	1.3	.95	.60	.55	2.7	4.3	.35
30	1.4	e1.4	2.4	2.4	---	1.3	.85	.60	.55	8.4	.97	.29
31	.51	---	2.5	e2.2	---	1.3	---	.60	---	1.2	.46	---
TOTAL	54.75	114.17	109.80	78.3	37.80	90.85	40.60	23.27	16.71	36.03	22.00	27.11
MEAN	1.77	3.81	3.54	2.53	1.35	2.93	1.35	.75	.56	1.16	.71	.90
MAX	19	24	36	11	6.4	29	6.5	1.0	.90	8.4	4.3	6.5
MIN	.14	.20	.75	1.9	.80	.70	.85	.60	.46	.35	.32	.23
AC-FT	109	226	218	155	75	180	81	46	33	71	44	54

CAL YR 1990 TOTAL 663.72 MEAN 1.82 MAX 41 MIN .14 AC-FT 1320
WTR YR 1991 TOTAL 651.39 MEAN 1.78 MAX 36 MIN .14 AC-FT 1290

e Estimated

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 Sept. 30, 1983.

GAGE.--Water-stage recorder. Datum of gage is 420 ft above mean sea level (from topographic map).

REMARKS.--Records good. No diversion upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,820 ft^3/s, Jan. 27, 1991, from rating curve extended above 6,020 ft^3/s, on basis of slope-area measurement at gage height 7.35 ft; minimum, 0.54 ft^3/s, Sept. 19, 20, 1988.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 3,770 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 19	0630	4,720	6.84	Jan. 27	1430	*6,470	*7.50
Nov. 19	0530	6,410	7.48	Mar. 12	1830	3,950	6.49
Nov. 23	1400	3,850	6.44	Mar. 20	0230	5,120	7.00

Minimum discharge, 0.63 ft^3/s, Sep. 30.

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	158	129	31	3.2	1.9	2.6	5.8	52	165	3.5	13	5.3
2	19	268	97	2.9	1.9	2.2	4.4	7.2	146	5.8	5.9	4.2
3	17	53	21	2.6	18	1.0	3.8	4.3	94	7.9	4.6	25
4	70	9.7	15	3.1	4.1	1.1	3.7	3.0	14	8.3	76	227
5	66	228	10	6.1	2.7	2.2	3.2	2.4	12	4.4	6.6	11
6	7.5	67	5.5	14	1.8	2.6	2.8	2.1	53	2.4	5.2	5.7
7	19	341	4.1	61	1.5	52	2.5	1.9	215	37	695	4.1
8	25	25	67	19	1.3	599	423	3.3	20	5.8	301	4.9
9	6.4	6.6	520	13	1.1	1060	199	18	16	4.3	133	2.9
10	4.4	4.5	89	4.8	.93	379	304	26	6.5	15	15	2.7
11	167	26	30	3.9	.83	432	239	6.2	10	177	26	5.9
12	15	36	210	7.2	1.0	911	20	4.6	5.9	17	15	10
13	16	132	607	234	1.3	516	8.0	2.7	4.0	11	7.8	11
14	5.5	646	350	15	114	347	42	6.2	3.0	16	4.4	5.2
15	3.5	270	85	25	23	348	45	1.8	2.5	7.8	3.1	3.4
16	309	697	432	7.2	4.0	431	32	1.4	2.1	13	11	2.2
17	281	550	107	4.5	14	289	7.1	1.3	2.1	59	3.6	1.8
18	262	1460	17	3.0	204	431	4.6	1.2	1.8	9.4	78	1.5
19	1180	2220	250	2.3	116	2090	3.3	4.7	1.4	5.6	8.3	10
20	227	1570	154	1.9	441	1390	2.8	31	1.2	6.6	4.5	13
21	16	357	322	1.6	224	84	2.8	35	1.0	4.8	3.0	4.8
22	8.0	259	803	1.4	13	87	3.0	5.5	.91	3.0	2.3	2.7
23	83	493	108	1.3	5.4	125	11	3.2	1.4	2.4	2.5	2.1
24	21	69	341	1.1	3.3	171	54	4.1	1.3	4.2	1.9	2.2
25	8.0	22	43	1.0	2.5	53	92	3.9	20	2.1	60	2.1
26	9.5	17	9.8	.90	1.7	17	91	3.5	115	4.4	67	1.7
27	6.1	35	6.7	447	1.5	63	93	7.7	63	1.5	148	1.2
28	4.2	17	10	48	2.0	14	36	8.2	98	1.3	182	.80
29	4.5	9.5	4.9	5.1	---	7.7	26	72	8.1	13	625	.73
30	177	9.5	4.0	3.0	---	15	202	211	4.5	25	37	.67
31	14	---	3.6	2.1	---	7.4	---	222	---	9.4	8.7	---
TOTAL	3209.6	10026.8	4757.6	946.20	1207.76	9930.8	1966.8	757.4	1088.71	487.9	2554.4	375.80
MEAN	104	334	153	30.5	43.1	320	65.6	24.4	36.3	15.7	82.4	12.5
MAX	1180	2220	803	447	441	2090	423	222	215	177	695	227
MIN	3.5	4.5	3.6	.90	.83	1.0	2.5	1.2	.91	1.3	1.9	.67
AC-FT	6370	19890	9440	1880	2400	19700	3900	1500	2160	968	5070	745

CAL YR 1990 TOTAL 35261.81 MEAN 96.6 MAX 2220 MIN .81 AC-FT 69940
WTR YR 1991 TOTAL 37309.77 MEAN 102 MAX 2220 MIN .67 AC-FT 74000

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 Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--69 years (water years 1923-91), 24.1 ft^3/s (17,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, Jan. 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, Oct. 28 to Nov. 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. 19	0700	1,850	6.70	Mar. 12	2400	1,700	6.41
Nov. 19	0230	2,270	7.52	Mar. 19	2030	*2,320	*7.60
Jan. 27	1400	2,060	7.12	Aug. 7	1830	1,840	6.68
Mar. 9	2000	1,960	6.93				

Minimum discharge, 2.6 ft^3/s, Feb. 11-13.

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	71	8.7	11	7.5	3.3	3.2	17	19	11	4.8	37	6.7
2	13	8.6	10	7.2	3.2	3.0	12	8.5	10	5.5	12	5.9
3	47	8.2	11	7.0	3.1	2.9	11	6.9	8.9	6.2	29	9.3
4	69	7.0	17	6.9	3.0	2.9	11	15	6.5	4.5	21	31
5	78	15	12	7.9	3.0	13	23	9.2	6.7	4.0	6.9	8.5
6	11	9.1	19	38	2.9	16	27	6.4	16	3.8	16	6.3
7	9.2	9.7	11	23	2.9	52	10	6.0	82	5.2	772	5.8
8	7.8	6.8	195	8.2	2.8	510	80	19	11	4.0	99	6.4
9	7.1	6.1	593	6.7	2.8	808	61	10	8.5	3.8	16	5.3
10	28	5.7	63	22	2.7	151	35	6.9	6.3	26	9.3	5.7
11	192	25	20	8.2	2.7	155	12	6.2	6.3	65	8.3	10
12	45	40	101	6.3	2.6	501	9.5	5.4	6.4	13	8.2	25
13	23	25	195	15	219	432	8.2	6.4	6.3	8.6	7.4	28
14	23	288	183	7.0	69	259	14	12	7.1	6.8	5.7	6.6
15	17	87	26	5.8	9.0	217	14	6.2	5.0	6.7	5.0	6.2
16	71	49	14	5.3	4.8	249	26	5.3	4.5	9.5	4.8	5.3
17	70	113	10	4.9	4.4	225	8.1	4.8	7.2	11	5.1	4.9
18	58	549	34	4.6	30	117	6.8	4.4	6.2	6.6	23	4.5
19	384	783	151	4.4	65	774	6.2	4.2	4.4	5.4	6.3	5.6
20	35	953	74	4.2	243	429	5.9	4.0	4.0	4.7	5.8	5.4
21	11	49	135	4.1	87	34	5.8	3.9	3.9	4.5	5.0	4.4
22	9.4	87	183	3.9	8.4	20	6.1	3.8	3.7	4.3	9.2	4.1
23	21	24	94	4.2	5.9	21	6.6	3.7	3.8	4.2	6.2	3.9
24	17	20	120	3.9	4.8	19	9.7	3.7	3.7	7.6	5.0	3.8
25	14	14	25	3.7	4.2	16	9.2	4.2	8.8	5.6	7.5	3.7
26	10	16	13	3.6	3.8	16	9.2	6.0	26	5.8	14	3.6
27	8.8	46	10	183	3.6	22	7.8	16	13	4.2	52	3.5
28	8.0	20	9.4	8.5	3.4	16	25	20	19	3.8	55	3.4
29	19	12	8.7	4.0	---	15	22	20	7.0	13	83	3.3
30	49	11	8.2	3.6	---	20	56	20	5.3	19	13	3.2
31	11	---	7.9	3.4	---	13	---	18	---	17	8.2	---
TOTAL	1437.3	3295.9	2364.2	426.0	800.3	5132.0	555.1	285.1	318.5	294.1	1355.9	229.3
MEAN	46.4	110	76.3	13.7	28.6	166	18.5	9.20	10.6	9.49	43.7	7.64
MAX	384	953	593	183	243	808	80	20	82	65	772	31
MIN	7.1	5.7	7.9	3.4	2.6	2.9	5.8	3.7	3.7	3.8	4.8	3.2
AC-FT	2850	6540	4690	845	1590	10180	1100	565	632	583	2690	455

CAL YR 1990 TOTAL 16829.3 MEAN 46.1 MAX 953 MIN 3.2 AC-FT 33380
WTR YR 1991 TOTAL 16493.7 MEAN 45.2 MAX 953 MIN 2.6 AC-FT 32720

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 Oct. 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records fair. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--71 years (water years 1915, 1917, 1923-91), 35.7 ft^3/s (25,860 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 19	0330	3,220	9.27	Mar. 13	0130	2,760	8.77
Jan. 27	1400	2,720	8.72	Mar. 20	0030	2,760	8.77
Feb. 20	0400	2,430	8.37	Aug. 7	1830	3,470	9.52
Mar. 9	1930	*3,500	*9.55				

Minimum discharge, 3.1 ft^3/s, Feb. 12.

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	79	8.9	12	7.8	5.5	5.4	17	24	14	6.2	49	10
2	20	8.2	10	7.3	5.1	5.0	11	12	13	6.9	18	9.1
3	64	7.9	14	7.0	4.9	4.7	12	9.5	11	8.5	44	16
4	82	7.1	21	7.3	4.7	5.2	12	26	9.3	5.5	26	36
5	102	12	16	9.0	4.5	23	24	15	9.1	4.7	10	11
6	18	7.5	23	33	4.3	25	26	9.8	24	4.4	20	9.3
7	13	6.5	17	22	4.1	56	13	9.1	103	7.1	1210	8.7
8	10	5.9	208	9.7	3.9	706	57	24	16	4.9	97	9.2
9	9.1	5.5	787	7.9	3.9	1110	28	14	12	5.1	22	7.6
10	35	5.2	81	23	3.5	129	15	9.8	9.1	36	14	8.9
11	218	15	23	9.7	3.3	109	12	8.6	8.4	97	12	20
12	42	56	83	7.9	3.2	611	10	7.5	10	18	11	33
13	26	28	157	18	303	545	9.2	8.5	9.1	12	9.3	36
14	27	409	142	8.9	79	275	30	14	9.7	9.3	7.6	11
15	25	102	28	7.5	14	226	18	8.5	6.7	9.2	6.7	9.3
16	71	46	18	6.7	8.9	255	35	7.1	6.0	12	6.6	8.1
17	64	100	14	6.3	7.3	264	12	6.4	8.7	13	7.6	7.3
18	56	717	63	5.9	27	108	10	5.8	7.6	8.4	19	6.6
19	333	728	205	5.8	56	486	9.0	5.5	5.8	6.9	7.3	18
20	22	750	57	5.3	315	367	8.5	5.2	5.1	6.0	6.7	9.9
21	15	52	84	5.0	91	37	8.3	5.5	4.6	6.0	5.8	7.5
22	12	24	69	4.7	18	22	7.9	5.6	4.3	6.0	27	6.5
23	22	25	64	5.6	12	37	8.5	4.7	5.1	5.4	11	6.1
24	19	20	92	5.0	9.5	22	11	6.1	4.4	12	6.7	5.5
25	14	16	28	4.5	8.3	15	11	8.4	10	7.7	8.1	4.8
26	11	19	16	4.1	7.1	13	9.7	11	31	7.0	19	4.5
27	9.4	76	13	197	6.3	19	8.3	22	15	5.3	61	4.4
28	8.6	24	11	17	5.8	13	29	25	24	4.8	62	4.2
29	15	15	10	8.5	---	12	25	24	8.9	17	109	4.0
30	36	12	9.1	6.9	---	18	58	22	7.0	24	20	3.8
31	11	---	8.7	6.0	---	11	---	22	---	23	13	---
TOTAL	1489.1	3308.7	2383.8	480.3	1019.1	5534.3	545.4	386.6	411.9	399.3	1946.4	336.3
MEAN	48.0	110	76.9	15.5	36.4	179	18.2	12.5	13.7	12.9	62.8	11.2
MAX	333	750	787	197	315	1110	58	26	103	97	1210	36
MIN	8.6	5.2	8.7	4.1	3.2	4.7	7.9	4.7	4.3	4.4	5.8	3.8
AC-FT	2950	6560	4730	953	2020	10980	1080	767	817	792	3860	667

CAL YR 1990 TOTAL 18072.4 MEAN 49.5 MAX 787 MIN 4.2 AC-FT 35850
WTR YR 1991 TOTAL 18241.2 MEAN 50.0 MAX 1210 MIN 3.2 AC-FT 36180

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.

AVERAGE DISCHARGE.--80 years (water years 1912-91), 4.81 ft^3/s (3,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of 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. 18	2330	592	3.54	Mar. 8	2030	694	3.66
Nov. 19	0230	1,610	4.61	Mar. 20	0100	1,200	4.20
Dec. 9	0430	400	3.30	Aug. 7	1730	685	3.65
Feb. 18	2100	1,060	4.06	Sep. 20	1630	*2,050	*5.02
Feb. 20	0800	340	3.20				

Minimum discharge, 0.60 ft^3/s, Feb. 11-13.

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	5.4	1.9	3.5	2.5	.90	1.7	5.4	4.5	1.7	1.2	5.3	1.8
2	2.3	1.8	3.2	2.3	.81	1.6	3.2	2.4	4.6	1.2	2.8	1.6
3	4.8	1.7	3.2	2.2	1.4	1.5	3.2	2.1	2.8	3.3	10	5.1
4	3.6	2.5	3.5	2.1	.85	1.5	3.7	7.4	1.5	2.0	2.9	9.1
5	3.5	3.2	3.1	3.3	.79	2.1	5.7	2.4	1.6	1.1	1.5	2.1
6	2.0	1.6	7.7	5.0	.78	2.5	8.1	2.0	5.0	1.0	2.2	1.7
7	1.8	1.5	2.7	5.4	.69	5.7	4.8	2.1	13	1.1	110	1.7
8	1.7	1.4	36	2.0	.69	74	40	5.3	2.1	1.0	8.3	1.7
9	1.6	1.3	120	1.7	.69	93	8.1	3.6	2.1	1.0	4.2	1.5
10	2.0	1.3	11	5.7	.69	20	4.1	2.8	1.7	8.3	3.4	1.8
11	6.1	4.3	6.4	2.0	.67	11	3.6	2.2	2.8	21	3.3	6.2
12	2.4	18	17	1.6	.60	24	3.2	1.7	1.6	2.3	3.2	4.4
13	1.9	4.7	40	6.5	25	19	2.9	1.7	1.6	2.0	2.6	6.0
14	2.0	44	21	1.8	5.1	16	4.4	2.1	2.5	1.6	2.3	1.6
15	6.7	17	7.4	1.6	1.9	15	2.7	1.6	1.3	1.7	2.0	1.5
16	19	20	5.9	1.5	1.3	18	4.0	1.5	1.3	4.5	1.9	1.4
17	27	24	5.0	1.4	1.5	23	2.3	1.4	1.3	3.0	2.9	1.3
18	35	91	5.3	1.4	41	16	2.1	1.4	1.2	1.6	11	1.3
19	13	229	9.9	1.3	10	98	2.0	1.3	1.1	1.4	1.9	2.0
20	4.5	77	11	1.3	35	158	1.8	1.3	1.0	1.3	1.7	92
21	3.9	14	12	1.2	10	15	1.8	1.3	1.0	1.3	1.6	3.4
22	3.4	9.7	11	1.1	3.7	10	2.1	1.2	.96	1.2	1.6	2.6
23	3.5	23	12	1.7	3.0	15	2.9	1.1	1.1	1.1	1.4	2.0
24	3.2	16	11	1.2	2.9	7.7	3.3	1.1	.92	1.5	1.4	1.8
25	3.0	7.2	4.6	1.1	3.1	6.2	7.8	1.1	3.5	1.3	1.4	1.7
26	2.8	6.1	4.0	1.0	2.2	5.4	4.4	1.2	7.5	1.8	2.0	1.6
27	2.4	5.4	3.6	1.7	2.1	5.2	2.2	2.3	3.8	1.1	7.1	1.5
28	2.1	4.8	3.4	3.2	2.0	4.3	3.8	6.1	7.6	1.0	11	1.4
29	4.8	4.2	3.2	1.0	---	3.8	4.6	4.5	1.5	4.7	14	1.3
30	7.6	3.8	2.9	.92	---	5.4	17	5.5	1.4	5.3	2.5	1.3
31	2.2	---	3.0	.90	---	3.4	---	5.2	---	3.2	2.0	---
TOTAL	185.2	641.4	393.5	67.62	159.36	683.0	165.2	81.4	81.08	85.1	229.4	164.4
MEAN	5.97	21.4	12.7	2.18	5.69	22.0	5.51	2.63	2.70	2.75	7.40	5.48
MAX	35	229	120	6.5	41	158	40	7.4	13	21	110	92
MIN	1.6	1.3	2.7	.90	.60	1.5	1.8	1.1	.92	1.0	1.4	1.3
AC-FT	367	1270	781	134	316	1350	328	161	161	169	455	326

CAL YR 1990 TOTAL 3178.26 MEAN 8.71 MAX 229 MIN .85 AC-FT 6300
WTR YR 1991 TOTAL 2936.66 MEAN 8.05 MAX 229 MIN .60 AC-FT 5820

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, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--26 years, 3.23 ft^3/s (2,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s, Mar. 31, 1982, Apr. 12, 1986; minimum daily, 0.11 ft^3/s, Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15 ft^3/s, Mar. 9; minimum daily, 0.28 ft^3/s, Feb. 11-12.

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	7.7	2.2	4.8	3.0	e.41	3.2	5.6	6.2	2.2	1.4	3.5	2.5
2	6.0	2.1	4.5	2.6	e.39	3.1	5.0	3.6	2.0	1.2	2.0	2.2
3	5.4	2.0	4.6	2.3	e.45	2.9	4.8	2.9	3.3	1.1	2.8	2.0
4	7.5	1.9	3.2	2.3	e.40	2.8	4.5	5.0	2.5	.97	5.7	4.0
5	8.7	1.9	3.3	2.3	e.37	3.7	5.0	5.1	2.0	.90	2.5	2.3
6	5.5	1.7	3.8	e3.3	e.35	4.6	5.1	3.3	2.9	.83	2.2	1.9
7	4.0	1.6	2.9	e3.7	e.33	7.6	4.4	3.1	8.5	.76	12	1.7
8	3.4	1.5	5.5	2.4	e.31	11	6.7	5.1	5.0	.69	8.5	1.6
9	3.0	1.4	11	1.8	e.30	15	6.7	5.1	3.1	.76	6.4	1.5
10	3.5	1.3	8.0	3.9	e.29	10	5.3	4.3	2.4	1.9	5.0	1.5
11	11	1.5	6.0	2.1	e.28	9.5	4.5	3.2	2.1	7.4	3.8	2.0
12	7.1	2.5	6.3	1.6	e.28	14	4.3	2.9	1.9	3.9	3.3	3.0
13	5.6	2.3	8.9	2.2	e5.0	13	3.8	2.6	1.8	2.7	2.9	4.4
14	5.0	8.5	8.5	1.6	e2.0	12	3.8	2.6	1.6	2.6	2.5	2.1
15	3.9	8.3	6.3	1.2	e.80	12	3.7	2.4	1.4	1.9	2.4	1.6
16	3.8	6.2	5.6	.97	e.60	12	3.8	2.2	1.3	1.9	2.2	1.4
17	7.7	5.1	5.1	.80	e.66	12	3.6	2.1	1.2	1.9	2.1	1.2
18	6.3	12	5.6	.63	e11	10	3.2	2.0	1.2	1.5	2.4	1.1
19	6.2	13	7.0	e.62	e5.0	11	3.1	1.9	1.1	1.1	2.0	2.1
20	4.6	12	6.2	e.58	e10	12	3.0	1.8	1.0	.97	1.9	2.9
21	3.7	9.1	6.2	e.56	e8.6	9.7	2.6	1.8	.97	.90	1.8	2.0
22	3.2	7.7	5.7	e.52	6.5	8.5	2.5	1.7	.90	.83	2.4	1.7
23	3.2	9.1	6.2	e.78	5.1	8.5	2.5	1.6	.90	.76	3.0	1.7
24	3.3	9.0	7.5	e.56	4.5	8.3	2.5	1.5	.83	1.0	1.7	1.5
25	3.1	7.4	6.3	e.50	6.6	7.6	2.4	1.7	1.0	.97	1.6	1.5
26	2.8	6.8	5.1	e.47	4.6	6.9	2.3	2.0	2.3	.90	1.9	1.2
27	2.6	6.7	4.6	e.80	3.8	6.9	2.1	2.1	2.0	.69	5.0	1.0
28	2.4	6.5	4.3	e.94	3.4	6.5	2.6	2.5	3.1	.62	5.9	.97
29	2.5	5.8	3.9	e.50	---	6.0	4.0	2.9	1.9	.88	6.8	.90
30	3.2	5.3	3.5	e.46	---	6.0	7.4	2.5	1.9	2.3	5.7	.83
31	2.6	---	3.6	e.43	---	5.6	---	2.5	---	1.7	3.3	---
TOTAL	148.5	162.4	174.0	46.42	82.32	261.9	120.8	90.2	64.30	47.93	115.2	56.30
MEAN	4.79	5.41	5.61	1.50	2.94	8.45	4.03	2.91	2.14	1.55	3.72	1.88
MAX	11	13	11	3.9	11	15	7.4	6.2	8.5	7.4	12	4.4
MIN	2.4	1.3	2.9	.43	.28	2.8	2.1	1.5	.83	.62	1.6	.83
AC-FT	295	322	345	92	163	519	240	179	128	95	228	112

CAL YR 1990 TOTAL 1698.12 MEAN 4.65 MAX 13 MIN .94 AC-FT 3370
WTR YR 1991 TOTAL 1370.27 MEAN 3.75 MAX 15 MIN .28 AC-FT 2720

e Estimated

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, from topographic map.

REMARKS.--Records fair. No appreciable diversion upstream.

AVERAGE DISCHARGE.--8 years (1984-91), 67.9 ft^3/s (49,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft^3/s, Jan. 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.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/s, Dec. 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)
Nov. 14	2200	1,060	3.92	Mar. 9	0730	3,450	6.75
Nov. 19		3,800	7.08	Aug. 7	1600	1,400	4.44
Jan. 27	1130	*4,740	*7.85	Sep. 19	1430	3,920	7.19

Minimum discharge, 21 ft^3/s, Nov. 8-11.

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	80	28	e29	e28	46	34	e40	e52	57	40	139	46
2	52	27	e31	e27	42	33	e39	e37	138	47	85	38
3	108	26	e36	e27	65	32	e38	e35	137	112	120	72
4	132	26	e46	e33	45	31	e39	e58	92	66	110	134
5	141	27	e31	e74	40	58	e44	e44	69	41	58	57
6	55	25	e41	e60	38	49	e41	e35	76	34	64	46
7	41	23	e46	e42	37	66	e70	e42	149	34	474	42
8	36	22	e120	e38	36	322	e180	e72	64	31	220	41
9	31	21	e520	e36	34	678	e70	e76	49	33	128	39
10	41	21	e80	e40	34	259	e40	e44	42	124	86	38
11	65	64	e32	e38	33	124	e42	e49	34	229	103	103
12	44	84	e84	34	32	206	40	e37	49	89	82	67
13	34	72	e105	32	188	147	42	e40	34	60	75	59
14	36	368	e36	31	154	147	57	e38	42	48	53	42
15	34	281	e31	33	68	138	63	e37	28	46	46	39
16	120	135	e30	29	54	200	80	e48	26	101	42	34
17	258	e100	e29	28	49	269	40	40	27	66	47	33
18	162	e300	e30	27	45	155	34	37	24	44	75	34
19	97	e550	e50	26	88	237	32	33	24	37	52	244
20	61	e82	e56	26	230	e280	31	32	24	33	39	118
21	48	e35	e52	26	98	e100	29	30	24	32	36	74
22	40	e32	e98	26	64	e39	29	28	24	34	37	58
23	40	e72	e90	86	54	e42	46	28	26	29	39	59
24	36	e34	e450	31	97	e39	64	27	25	39	36	85
25	36	e30	e70	27	60	e37	126	27	92	30	36	49
26	53	e29	e32	26	44	e41	92	27	117	45	40	38
27	33	e31	e30	430	40	e39	71	39	75	29	94	36
28	29	e30	e35	106	37	e37	95	48	93	28	115	33
29	30	e31	e29	64	---	e36	76	59	45	148	200	31
30	59	e30	e28	53	---	e40	e86	85	47	210	76	30
31	30	---	e29	49	---	e37	---	97	---	94	53	---
TOTAL	2062	2636	2406	1633	1852	3952	1776	1381	1753	2033	2860	1819
MEAN	66.5	87.9	77.6	52.7	66.1	127	59.2	44.5	58.4	65.6	92.3	60.6
MAX	258	550	520	430	230	678	180	97	149	229	474	244
MIN	29	21	28	26	32	31	29	27	24	28	36	30
AC-FT	4090	5230	4770	3240	3670	7840	3520	2740	3480	4030	5670	3610

CAL YR 1990 TOTAL 26281 MEAN 72.0 MAX 680 MIN 21 AC-FT 52130
WTR YR 1991 TOTAL 26163 MEAN 71.7 MAX 678 MIN 21 AC-FT 51890

e Estimated

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 Dec. 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--7 years, 87.3 ft^3/s (63,250 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 9,660 ft^3/s, Jan. 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, 22 ft^3/s, Jan. 18-22, 24, 25, 1985.

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)
Nov. 11	2000	7,160	6.97	Mar. 9	0730	6,690	6.66
Nov. 14	2230	2,000	4.33	Aug. 7	1830	2,490	4.66
Nov. 19	0300	6,000	6.30	Sep. 19	1330	7,820	7.51
Jan. 27	1200	*8,220	*7.83				

Minimum discharge, 40 ft3/s, Mar. 3-5

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	81	50	52	50	46	42	55	53	57	51	134	52
2	71	55	56	49	46	42	54	49	180	64	84	51
3	161	49	61	49	67	42	53	48	118	185	185	120
4	142	50	83	60	46	41	54	94	77	62	74	181
5	114	53	55	135	45	63	62	50	56	47	53	56
6	54	48	75	126	45	54	56	47	61	46	64	52
7	51	47	78	102	44	61	52	57	119	46	559	53
8	52	46	203	64	44	571	251	100	56	44	101	52
9	57	45	553	52	44	729	97	103	52	53	98	51
10	83	45	71	68	44	88	52	60	57	203	58	52
11	70	439	58	53	43	54	58	68	51	415	72	102
12	58	208	148	51	43	175	57	49	51	72	70	69
13	56	81	192	53	233	70	56	54	49	66	59	59
14	57	570	65	59	90	78	76	53	50	52	54	52
15	59	191	56	58	48	64	65	50	44	53	52	51
16	215	172	54	50	45	107	95	65	44	112	52	48
17	444	113	52	50	44	180	51	52	46	68	64	47
18	187	751	55	48	45	86	49	65	44	50	68	48
19	70	656	92	48	118	435	48	51	43	47	65	493
20	55	168	94	47	205	236	49	46	43	49	53	75
21	52	64	94	47	63	60	48	46	42	47	50	56
22	51	57	184	48	47	54	48	45	42	47	55	53
23	58	133	161	66	45	58	56	45	45	47	56	62
24	53	62	339	49	66	54	73	45	43	68	51	136
25	52	55	60	47	47	53	145	44	118	53	51	55
26	77	53	60	46	43	57	67	45	121	60	57	51
27	52	56	54	509	43	56	57	52	69	46	101	51
28	50	55	65	57	42	52	93	56	99	46	163	50
29	51	58	52	49	---	51	60	55	47	360	364	49
30	116	56	51	47	---	56	89	59	69	274	67	49
31	53	---	52	47	---	50	---	82	---	97	54	---
TOTAL	2802	4486	3325	2284	1781	3819	2126	1788	1993	2930	3088	2376
MEAN	90.4	150	107	73.7	63.6	123	70.9	57.7	66.4	94.5	99.6	79.2
MAX	444	751	553	509	233	729	251	103	180	415	559	493
MIN	50	45	51	46	42	41	48	44	42	44	50	47
AC-FT	5560	8900	6600	4530	3530	7570	4220	3550	3950	5810	6130	4710

CAL YR 1990 TOTAL 32143 MEAN 88.1 MAX 765 MIN 37 AC-FT 63760
WTR YR 1991 TOTAL 32798 MEAN 89.9 MAX 751 MIN 41 AC-FT 65050

16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(National stream-quality accounting 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, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--42 years (1940-42, 1948-70, 1976-91), 17.9 ft^3/s (12,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, Jan. 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, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 11	2000	*2,120	*7.79	Mar. 9	0800	1,060	6.34
Nov. 19	0330	1,020	6.27	Sept. 19	1400	740	5.74
Jan. 27	1200	1,370	6.83				

Minimum discharge, 5.4 ft^3/s, June 22, 24.

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	25	8.1	7.5	8.8	7.0	7.4	7.5	11	8.5	12	51	8.0
2	9.7	16	8.5	8.3	6.9	7.3	7.7	7.3	20	13	14	7.3
3	43	8.3	8.2	8.1	14	7.1	7.5	6.9	16	64	28	16
4	53	7.6	17	10	7.7	7.1	7.5	32	9.7	18	23	67
5	17	9.6	11	58	7.0	7.5	11	10	10	8.1	8.7	10
6	9.5	7.5	28	45	6.8	9.2	8.2	7.3	11	6.8	9.5	7.6
7	8.2	7.0	31	40	6.6	20	7.7	7.1	21	7.2	139	6.8
8	7.7	6.8	44	17	6.6	157	57	25	13	6.4	29	7.9
9	7.1	6.6	133	10	7.5	210	40	18	8.3	6.4	17	7.4
10	14	6.4	16	16	6.7	26	9.8	9.9	8.3	67	10	7.2
11	23	114	11	12	6.4	13	8.2	7.5	9.2	170	9.0	26
12	11	83	22	9.2	6.5	51	7.7	7.1	7.2	16	15	22
13	10	19	64	9.1	138	18	8.7	6.9	7.9	16	10	15
14	10	117	15	10	27	12	16	8.2	10	10	7.8	8.1
15	8.0	46	10	13	10	15	13	8.7	6.6	8.2	7.3	9.0
16	105	77	8.9	8.9	8.4	24	31	8.1	6.0	23	7.1	6.8
17	162	32	8.2	8.7	7.8	47	9.0	7.5	5.9	13	7.0	6.3
18	33	254	8.0	8.0	12	30	7.7	12	6.5	8.0	12	6.1
19	18	194	29	7.7	42	165	7.3	13	5.7	6.9	9.5	92
20	11	67	53	7.5	80	95	7.1	6.9	5.5	7.3	7.5	24
21	9.3	18	47	7.5	27	17	7.1	6.6	5.5	6.6	6.6	9.2
22	8.5	12	49	7.4	11	13	6.9	6.7	5.4	6.3	6.4	7.2
23	10	59	39	11	8.8	18	6.9	6.1	6.0	6.0	8.5	6.9
24	10	32	110	12	19	13	9.7	5.9	5.4	17	6.4	16
25	8.1	10	17	10	14	13	21	5.8	25	10	6.3	7.7
26	17	9.0	19	7.6	8.5	11	15	5.8	45	9.9	7.0	6.2
27	11	9.2	11	115	7.9	11	8.0	6.3	12	6.4	27	5.9
28	8.0	9.5	18	15	7.6	9.4	10	6.4	26	6.2	55	5.8
29	7.5	9.5	11	8.6	---	8.8	13	12	7.5	115	101	5.7
30	39	11	9.3	7.5	---	10	19	8.9	16	123	19	5.7
31	9.8	---	10	7.2	---	8.7	---	16	---	25	9.4	---
TOTAL	723.4	1266.1	873.6	524.1	518.7	1061.5	396.2	306.9	350.1	818.7	674.0	436.8
MEAN	23.3	42.2	28.2	16.9	18.5	34.2	13.2	9.90	11.7	26.4	21.7	14.6
MAX	162	254	133	115	138	210	57	32	45	170	139	92
MIN	7.1	6.4	7.5	7.2	6.4	7.1	6.9	5.8	5.4	6.0	6.3	5.7
AC-FT	1430	2510	1730	1040	1030	2110	786	609	694	1620	1340	866

CAL YR 1990 TOTAL 8846.1 MEAN 24.2 MAX 272 MIN 6.4 AC-FT 17550
WTR YR 1991 TOTAL 7950.1 MEAN 21.8 MAX 254 MIN 5.4 AC-FT 15770

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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											
09...	1200	7.5	78	7.5	27.0	21.0	1.0	756	8.6	97	K19
DEC											
10...	1130	16	57	7.4	21.0	18.0	1.2	756	8.0	85	20
JAN											
29...	1130	8.6	72	7.9	21.5	17.5	1.4	756	8.3	87	26
APR											
01...	1130	7.7	85	7.8	22.5	19.0	0.30	757	8.6	93	K9
JUN											
18...	1140	6.8	83	8.1	24.5	21.5	3.0	753	8.5	98	K16
JUL											
25...	1010	9.0	62	7.9	27.0	21.5	1.5	754	8.8	101	K19

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
09...	650	21	0	4.0	2.7	7.7	43	0.7	0.80	29
DEC										
10...	540	13	1	2.4	1.8	6.1	48	0.7	0.60	15
JAN										
29...	390	20	0	3.7	2.5	7.1	43	0.7	0.90	28
APR										
01...	150	23	0	4.5	2.9	8.2	42	0.7	1.0	29
JUN										
18...	800	26	1	4.8	3.3	8.1	40	0.7	0.90	30
JUL										
25...	340	18	0	4.2	1.9	6.5	42	0.7	0.70	22

DATE	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD 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, 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)
OCT										
09...	0	24	1.8	10	<0.10	19	45	61	0.06	0.100
DEC										
10...	0	12	1.8	11	<0.10	11	41	42	0.06	<0.100
JAN										
29...	0	23	3.6	9.3	<0.10	18	53	60	0.07	0.200
APR										
01...	0	24	1.8	11	<0.10	20	52	64	0.07	0.076
JUN										
18...	0	25	2.1	11	<0.10	20	65	65	0.09	0.075
JUL										
25...	0	18	1.5	8.6	<0.10	14	43	49	0.06	0.066

< Actual value is known to be less than the value shown.
K Results baed on colony count outside the acceptable range (non-ideal colony count).

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)
OCT										
09...	0.100	<0.010	<0.010	0.40	--	0.50	<0.010	--	<0.010	<0.010
DEC										
10...	<0.100	0.020	0.020	0.40	--	--	<0.010	--	<0.010	<0.010
JAN										
29...	0.100	0.020	0.010	0.20	--	0.40	0.030	0.09	0.020	0.020
APR										
01...	0.053	<0.010	<0.010	<0.20	--	--	0.040	0.03	0.030	<0.010
JUN										
18...	0.067	<0.010	<0.010	0.40	--	0.48	0.010	0.06	<0.010	0.010
JUL										
25...	<0.050	0.030	<0.010	<0.20	0.40	--	<0.010	--	<0.010	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
09...	1200	20	<1	6	<0.5	<1.0	<1	<3	<1	9	<1
JAN											
29...	1130	50	<1	11	<0.5	<1.0	<1	<3	1	46	<1
APR											
01...	1130	20	<1	11	<0.5	<1.0	<1	<3	1	6	<1
JUL											
25...	1010	580	<1	11	<0.5	<1.0	2	<3	1	61	<1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
09...	<4	<1	<0.1	<10	6	<1	<1.0	28	<6	6
JAN										
29...	<4	2	0.3	<10	1	1	<1.0	25	<6	8
APR										
01...	<4	<1	0.3	<10	1	<1	<1.0	30	6	6
JUL										
25...	<4	<1	0.3	<10	<1	<1	<1.0	33	<6	22

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
09...	1200	2	0.04	100
DEC				
10...	1130	1	0.04	100
JAN				
29...	1130	3	0.07	100
APR				
01...	1130	1	0.02	100
JUN				
18...	1140	1	0.02	100
JUL				
25...	1010	2	0.05	100

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

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. Previous to Oct. 1990 at site 250 ft downstream.

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, Oct. 1990 to current year. Record since Oct. 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, from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum. Oct. 1, 1990 at site 250 ft downstream at datum 26.67 ft lower.

REMARKS.--Records fair. No diversion upstream. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau ditch.

AVERAGE DISCHARGE.--73 years (water years 1914-19, 1923-88, 1991) 39.6 ft^3/s (28,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Prior to Oct. 1990. Maximum discharge, 7,260 ft^3/s, revised, Jan. 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, Jan. 5, 1946.

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)
Nov. 19	0130	1,920	4.88	Mar. 19	2330	1,140	4.31
Jan. 27	1200	*2,380	5.14	Sept. 19	1400	1,380	4.52
Mar. 9	0830	1,520	4.61				

Minimum discharge, 20 ft^3/s, Sept. 28-30.

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	45	17	19	22	20	19	26	33	34	23	61	22
2	20	20	23	21	20	19	25	23	93	28	44	22
3	61	17	29	21	38	19	24	22	67	77	97	43
4	62	16	42	24	22	19	23	65	42	35	47	105
5	72	26	24	72	20	40	33	26	32	18	20	28
6	17	17	28	84	20	32	28	23	35	16	25	23
7	16	15	26	82	19	55	23	25	91	16	276	22
8	16	15	112	27	19	304	229	71	31	16	59	27
9	15	15	413	23	20	392	74	45	29	17	50	23
10	30	15	46	38	19	78	23	42	22	97	29	23
11	49	57	26	25	19	32	26	51	28	123	41	59
12	25	71	113	22	19	122	25	24	26	33	37	42
13	25	44	208	23	107	59	27	27	23	27	30	35
14	22	426	45	22	58	64	27	33	27	21	23	24
15	21	100	25	25	25	49	35	24	19	22	22	23
16	142	60	23	21	20	97	47	36	19	63	22	21
17	221	44	22	21	20	132	22	29	19	37	33	20
18	101	357	27	20	20	70	21	28	19	19	66	20
19	34	334	66	20	79	260	20	25	18	17	30	140
20	19	115	62	20	144	150	20	21	18	17	23	37
21	17	28	62	19	50	30	20	21	18	16	21	22
22	16	22	147	20	22	25	21	20	18	17	21	19
23	22	90	67	38	20	25	34	20	19	16	23	19
24	19	34	195	22	40	24	58	20	18	32	22	48
25	21	21	31	20	23	22	100	19	84	21	26	21
26	33	20	35	19	20	28	47	21	87	35	30	18
27	19	19	25	157	19	34	41	34	54	16	68	18
28	16	20	46	27	19	23	63	34	67	16	92	18
29	18	19	25	20	---	21	40	43	19	118	141	18
30	82	22	23	20	---	28	90	51	24	97	31	18
31	18	---	23	20	---	21	---	70	---	36	23	---
TOTAL	1294	2076	2058	1015	941	2293	1292	1026	1100	1142	1533	978
MEAN	41.7	69.2	66.4	32.7	33.6	74.0	43.1	33.1	36.7	36.8	49.5	32.6
MAX	221	426	413	157	144	392	229	71	93	123	276	140
MIN	15	15	19	19	19	19	20	19	18	16	20	18
AC-FT	2570	4120	4080	2010	1870	4550	2560	2040	2180	2270	3040	1940

WTR YR 1991 TOTAL 16748 MEAN 45.9 MAX 426 MIN 15 AC-FT 33220

HAWAII, ISLAND OF HAWAII

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

RECORDS BEING REVIEWED

16700900 OLAA FLUME SPRING NEAR KAUMANA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

RECORDS BEING REVIEWED

16704000 WAILUKU RIVER AT PIIHONUA

RECORDS BEING REVIEWED

16713000 WAILUKU RIVER AT HILO
(National stream-quality accounting network station)

RECORDS BEING REVIEWED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1977 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

WATER QUALITY RECORDS BEING REVIEWED

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

WATER QUALITY RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16720300 KAWAIKI STREAM NEAR KAHUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

RECORDS BEING REVIEWED

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAHUELA

RECORDS BEING REVIEWED

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16756000 KOHAKOHAU STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

RECORDS BEING REVIEWED

16759000 HAUANI GULCH NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

RECORDS BEING REVIEWED

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1991

Station No.	Station name	Location	Drainage area mi^2	Period of record	Measurements: Date	Measurements: Discharge (ft^3/s)
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07′50″, long 156°53′02″, 500 ft upstream from Kawailena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.51	1968-91	10-23-90 02-04-91 06-03-91 08-12-91	1.34 2.03 1.21 2.59
16403500	Kawailena Stream near Pelekunu	Lat 20°07′52″, long 156°53′05″, 800 ft upstream from mouth, 2.2 mi south of former village of Pelekunu, and 5.5 mi north of Kamalo.	0.65	1968-91	10-23-90 02-04-91 06-03-91 08-12-91	1.72 2.67 1.57 2.21
16403600	Kapuhi Stream near Pelekunu	Lat 21°07′57″, long 156°52′56″, on left bank 400 ft downstream from Kawailena Stream, 2.1 mi south of former village of Pelekunu, and 5.6 mi north of Kamalo.	1.20	1968-70≠, 1974-91	10-23-90 02-04-91 06-03-91 08-12-91	3.01 5.21 3.11 5.10
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07′46″, long 156°52′31″, 400 ft upstream from Kawaipoko Stream, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.79	1968-91	10-23-90 02-04-91 06-03-91 08-12-91	4.90 3.65 2.98 6.93
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07′48″, long 156°52′30″, 300 ft upstream from mouth, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.26	1968-91	10-23-90 02-04-91 06-03-91 08-12-91	1.41 0.62 1.14 2.10
16403900	Kawainui Stream near Pelekunu	Lat 21°07′59″, long 156°52′38″, 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.	1.17	1968-79≠, 1980-91	10-23-90 02-04-91 06-03-91 08-12-91	7.56 4.87 4.91 11.1

≠ Operated as a continuous-record gaging station.

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 or 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 made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1990

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu					
16228600	Moanalua Stream 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	1971-90	10-03-89	a13.84	950
16279500	Heeia Stream 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, 1968-90	10-03-89	a5.33	944
16310501	Malaekahana Stream at altitude 30 ft, near 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	1958-90	03-01-90	a4.18	e100
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-90	a03-01-90	3.19	e55
16318000	Paumalu Gulch at Sunset	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	1968-90	a07-09-90	3.29	e75

a Revised.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, 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	1944-91b	03-26-91	5.44	-
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	1950-91b	11-18-90	5.85	-
16052500	Lawai Stream near 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≠ 1973-91	11-18-90	3.84	920
16055000	Huleia Stream near 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≠, 1971-91	11-18-90	14.52	8,280
16071800	Wailua River near 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	1962-91b	08-30-91	5.37	-
16073500	Konohiki Stream near Kapaa	Lat 22°04′01″, long 159°20′21″, at culvert on private road, 1.8 m upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-91	11-18-90	8.40	142
16080000	Kapaa Stream at Kapahi ditch intake, near 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≠, 1986-91	11-18-90	4.51	5,260
16081200	Akulikuli Stream near 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	1964-91	11-18-90	7.20	590
16084500	Kapaa Stream at old highway crossing, near 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	1962-91	11-18-90	14.72	11,170
16085000	Homaikawaa Stream near 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	1964-91	11-18-90	-	e30
16097900	Puukumu Stream near 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, 1971-91	11-18-90	4.67	54
16104200	Hanalei River at Highway 56 bridge near 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	1963-91b	11-18-90	12.60	-
16130000	Nahomalu Valley near Hana	Lat 22°02′41″, long 159°45′17″, on left bank 1.1 mi northeast of Hana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71≠, 1972-91	11-20-90	-	e40

≠ 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 1991--Continued

Station no.	Station name	Location	Drainage area mi²	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft³/s)
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream 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, 1968-91	11-20-90	22.83	4,780
16211200	Poamoho Stream 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.	a12.7	1967-91	11-20-90	17.86	e1,650
16211300	Makaleha Stream near 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≠ 1966-91	11-20-90	5.47	448
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	1974-91	11-20-90	12.66	e50
16211500	Makua Stream 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	1958-91	03-19-90	6.23	e75
16211700	Makaha Stream 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 Makhaha Valley Road.	5.25	1966-91	12-19-90	8.14	126
16211800	Kaupuni Stream at altitude 372 ft, near 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≠, 1973-91	03-19-91	5.13	90
16212200	Mailiilii Stream near Waianae	Lat 21°27′34″, long 158°08′05″, at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery near Waianae.	1.51	1958-91	03-19-91	2.49	e75
16212300	Nanakuli Stream 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	1968-91	03-19-91	-	e80
16212450	Kaloi Gulch tributary near 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	1968-91	01-27-91	2.49	55
16212500	Honouliuli Stream near 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	1956-91	03-19-91	1.00	70
16212601	Waikele Stream 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, 1960-91	03-19-91	7.44	446
16212700	Waikakalaua Stream near 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	1958-91	03-19-91	14.26	3,360

≠ Operated as a continuous-record gaging station.
a Revised.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16212750	Kuliwai Gulch near 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	1974-91	03-19-91	11.72	e30
16223000	Waimalu Stream near 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≠, 1973-91	03-21-91	4.75	4,050
16224500	Kalauao Stream at Moanalua Road, at Aiea	Lat 21°23′07″, long 157°56′22″, on left bank at downstream side 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≠, 1984-91	12-18-90	5.90	1,830
16228000	Moanalua Stream near 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≠, 1979-91	12-18-90	7.95	1,340
16228200	Moanalua Stream near 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	1969-91	12-18-90	5.30	1,570
16228600	Moanalua Stream 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	1971-91	12-18-90	14.72	e1,800
16228900	Kalihi Stream near Kaneohe	Lat 21°22′35″, long 157°49′32″, on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	0.60	1967-71≠, 1972-91	12-18-90	3.20	360
16235400	Waolani Stream 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	1958-91	12-18-90	5.91	2,350
16237500	Pauoa Stream at Honolulu	Lat 21°19′18″, long 157°51′03″, at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-91	12-18-90	1.05	575
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 discharge into Ala Wai Canal.	a10.6	1968-91	03-19-91	86.87	2,480
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 Highway in Aina Haina.	2.35	1958-91	03-19-91	4.95	2,250
16247900	Kuliouou Valley at Kuliouou	Lat 21°17′50″, long 157°43′35″, at Kuliouou, 300 ft downstream of single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-91	03-19-91	c27.84	e500
16248800	Inoaole Stream 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	1958-91	03-19-91	7.35	980
16249000	Waimanalo Stream at Waimanalo	Lat 21°21′12″, long 157°43′52″, on right bank 40 ft upstream from Highway 72 and 2.3 mi northwest of Waimanalo Post Office.	2.16	1967-70≠, 1971-91	03-19-91	4.37	e1,600

≠ Operated as a continuous-record gaging station.
a Revised.
c Average of two readings.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft upstream from Kalanianaole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-91	03-19-91	5.26	262
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, 1967-91b		2.09	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-91	11-13-90	8.66	1,300
16274499	Keaahala Stream 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	1959-91	03-19-91	3.39	e500
16279500	Heeia Stream 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, 1968-91	03-19-91	5.61	1,210
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-91	03-19-91	-	e950
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-91	03-19-91	6.25	e2,200
16310501	Malaekahana Stream at altitude 30 ft, near 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	1958-91	03-19-91	11.64	e3,800
16311000	Oio Stream near 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	1958-91	03-19-91	-	e350
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-91	11-20-90	6.01	e450
16318000	Paumalu Gulch at Sunset	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	1968-91	11-20-90	5.82	e450

≠ 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 1991--Continued

Station no.	Station name	Location	Drainage area mi²	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16331000	Waimea Gulch near 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	1968-91	11-20-90	3.07	129
16340000	Anahulu River near 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	1958-91	11-20-90	13.53	10,100
16350000	Opaeula Stream near 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	1956-91	11-20-90	18.58	6,100
		Hawaii, Island of Molokai					
16411320	Kakaako Gulch above Kamakahi Gulch, near 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	1964-91	12-24-90	1.90	143
16411400	Kakaako Gulch near 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≠, 1973-91	-	-	e600
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07′01″, long 157°15′43″, at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	0.28	1964-91	12-24-90	0.92	10
16411640	Halena Gulch near 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	1965-91	12-24-90	4.59	1,020
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	1964-91	-	-	N.F.
16413500	Manawainui Gulch near 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	1965-91	12-24-90	-	e250
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	1964-91	12-24-90	1.54	545
16419000	Pohakupili Gulch near 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	1964-91	03-23-91	7.14	304
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near 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≠, 1973-91	01-27-91	7.49	768
16500300	Hawelewele Gulch near 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	1967-91	11-20-90	12.21	7,360
16500800	Kukuiula Gulch near 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≠, 1969-91	11-23-90	5.55	412

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Maui--Continued					
16502400	Pukuilua Gulch near 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	1963-91	11-23-90	5.25	314
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	1963-91	03-19-91	13.64	1,200
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	1965-91	03-19-91	9.93	10,790
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	1963-91	11-19-90	-	e1
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49′02″, long 156°19′44″, at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-91	01-27-91	-	e1
16603800	Kaluapulani Gulch tributary near 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	1963-91	01-27-91	1.25	16
16603850	Kalialinui Gulch near 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	1967-91	01-27-91	4.28	63
16607000	Iao Stream 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≠, 1952-91	01-27-91	5.67	4,520
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57′26″, long 156°31′41″, at Kahekili Highway, 0.6 mi east of Maluhia Camp, and 1.8 mi northwest of Waihee.	0.12	1964-91	03-09-91	-	e3
16619700	Poelua Gulch near 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	1965-91	03-09-91	7.70	244
16630200	Honokowai Stream 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, 1965-91	11-19-90	5.39	826
16638500	Kahoma Stream 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 Stream, and0.9 mi upstream from mouth.	5.22	1963-89≠ 1990-91	11-19-90	-	e1,400
16643300	Kauaula Stream near mouth, near 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, 1964-91	03-09-91	4.23	456
16646200	Olowalu Stream 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≠, 1973-91	03-09-91	4.71	866
16647500	Malalowaiaole Gulch near 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	1964-91	11-19-90	4.55	38

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991--Continued

Station no.	Station name	Location	Drainage area mi²	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16650500	Waikapu Stream near 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	1963-91	01-27-91	-	e850
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44′56″, long 156°19′22″, at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	0.98	1964-91	01-27-91	4.31	146
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	1963-91	01-27-91	6.95	330
16660000	Kulanihakoi Gulch near 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≠, 1971-91	12-24-90	-	e4
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	1972-91	12-24-90	-	e8
16664000	Liiliioholo 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	1972-91	12-24-90	-	e20
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream 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	Records being reviewed.		
16701400	Palai Stream 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	1965-91	Records being reviewed.		
16717400	Kalaoa Mauka Stream near 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	1963-91	Records being reviewed.		
16717600	Alia Stream near 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≠, 1973-91	Records being reviewed.		
16717650	Kapehu Stream near 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	1963-91	Records being reviewed.		
16717800	Pohakupuka Stream near Papaaloa	Lat 19°57′20″, long 155°11′20″, on 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≠, 1983-91	Records being reviewed.		
16717850	Keehia Gulch near 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	Records being reviewed.		
16717920	Ahualoa Gulch at Honokaa	Lat 20°05′12″, long 155°29′17″, at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-91	Records being reviewed.		

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1991--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Hawaii--Continued					
16717950	Honokaia Gulch tributary near 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	1963-91	Records being reviewed.		
16752600	Hapahapai Gulch at Kapaau	Lat 20°14′00″, long 155°48′00″, at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1963-91	Records being reviewed.		
16755800	Luahine Gulch near 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	1963-91	Records being reviewed.		
16756500	Keanuiomano Stream near Kamuela	Lat 201′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≠, 1973-91	Records being reviewed.		
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02′16″, long 155°38′08″, at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	0.27	1963-91	Records being reviewed.		
16759060	Kamakoa Gulch near 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	Records being reviewed.		
16759080	Popoo Gulch near 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	1963-91	Records being reviewed.		
16759180	Keopu Stream near 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, 1965-91	Records being reviewed.		
16759300	Waiaha Stream at Luawai, near 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≠, 1972-91	Records being reviewed.		
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	1963-91	Records being reviewed.		
16767000	Ninole Gulch near 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≠, 1983-91	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	1963-91	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≠, 1980-91	Records being reviewed.		

≠ Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1990

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Hawaii, Island of Oahu				
Waiahole	Pacific Ocean	Lat 21°29'05", long 157°50'57", 0.4 mi southwest of Waiahole School and 1.8 mi northwest of Kahaluu.	a3.76	1988-89	11-07-89	a6.34
					01-10-90	a5.37
					05-09-90	a5.64
					07-11-90	a5.86
					09-10-90	a5.06

a Revised.

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 figures 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU

16225100 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 1 (LAT 21°24'26" LONG 157°51'12")

DATE	TIME	GAGE HEIGHT (FEET)	DIS-CHARGE, INST. CUBIC FEET PER SECOND	TEMPER-ATURE WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
NOV						
13...	--	--	--	--	780	--
DEC						
18...	--	--	--	--	4840	--
19...	0745	4.20	--	18.5	63	--
19...	0825	3.98	--	18.5	24	--
JAN						
27...	--	--	--	--	1110	--
JUN						
28...	0910	3.54	0.61	19.0	2	0.00
JUL						
10...	0950	3.53	--	--	13	--
SEP						
21...	--	--	--	--	502	--

16225200 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 2 (LAT 21°24'31" LONG 157°51'15")

DATE	TIME	GAGE HEIGHT (FEET)	TEMPER-ATURE WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)
NOV				
13...	1530	4.68	21.0	39

16225300 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 3 (LAT 21°24'32" LONG 157°51'14")

DATE	SEDI-MENT, SUS-PENDED (MG/L)
NOV	
19...	507
DEC	
04...	490

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16225500 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 5 (LAT 21°24'35" LONG 157°51'42")

DATE	TIME	GAGE HEIGHT (FEET)	TEMPER-ATURE WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)
NOV				
15...	--	--	--	423
DEC				
19...	--	--	--	43
19...	0935	4.08	19.0	18
19...	1045	3.97	19.0	39
JUL				
10...	0910	--	--	64

16225600 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 6 (LAT 21°24'33" LONG 157°51'42")

DATE	TIME	TEMPER-ATURE WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)
NOV			
19...	--	--	1100
DEC			
04...	--	--	964
JUL			
10...	0915	21.0	302

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16225800 NORTH HALAWA STREAM NEAR KANEOHE (LAT 21°24'33" LONG 157°52'06")

DATE	TIME	GAGE HEIGHT (FEET)	TEMPERATURE WATER (DEG C)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)
JUL 01...	0850	3.43	20.0	--	--	--	--	--	--	--
SEP 24...	0800	2.73	--	<0.010	<0.1	<0.1	<1.0	<0.010	<0.1	<0.010

DATE	TIME	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDOSULFAN, TOTAL (UG/L)	ENDOSULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)
SEP 24...	0800	<0.1	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1

DATE	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	MIREX, TOTAL (UG/L)
SEP 24...	<0.010	<0.1	<0.010	<0.1	<0.010	<0.1	<0.01	<1.0	<0.01

DATE	MIREX, TOTAL IN BOTTOM MATERIAL (UG/KG)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG)	PERTHANE TOTAL (UG/L)	PERTHANE IN BOTTOM MATERIAL (UG/KG)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)
SEP 24...	<0.1	<0.10	<0.1	<1	<1.0	<0.1	<1.00	<1	<10

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
JUL 01...	0850	1170	99

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1 (LAT 21°22'17" LONG 157°55'57")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
NOV 07...	1050	0.46	480	9.2	--	29.5	3.8	760	10.4	137	--
DEC 21...	0920	0.63	222	6.9	--	22.0	20	765	9.2	105	--
JAN 24...	1050	0.68	725	8.8	--	23.5	2.4	765	11.9	140	--
MAR 19...	1345	E750	115	6.7	20.0	20.5	400	765	8.6	95	27000
APR 30...	1000	--	528	8.7	--	28.5	2.3	763	9.7	125	--
MAY 20...	1125	0.36	790	8.2	--	33.0	0.40	767	10.9	151	2600
JUN 26...	1000	0.28	725	9.0	25.5	28.0	1.0	769	9.9	126	--
JUL 29...	0925	0.42	700	8.9	25.0	27.0	5.2	764	9.5	119	--
AUG 26...	0930	0.28	675	9.4	--	31.0	2.4	765	11.0	148	K7600
SEP 23...	1130	2.8	240	9.8	30.0	33.5	1.2	761	10.7	151	--

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)
MAR 19...	1345	30	6.7	3.3	12	45	0.9	1.3	46	6.0	15
AUG 26...	0930	240	39	35	71	38	2	5.1	163	41	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 21...	0920	--	--	--	--	--	<1	0.300	0.020	<0.20	--	<0.010
MAR 19...	1345	0.20	12	70	85	0.09	--	0.220	0.020	0.30	0.52	0.050
MAY 20...	1125	--	--	--	--	--	<1	<0.050	<0.010	0.40	--	0.020
AUG 26...	0930	0.10	30	512	479	0.70	14	2.70	0.020	1.5	4.2	0.090

DATE	TIME	PHOS-PHATE, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)
MAR 19...	1345	0.18	550000	160	<1	<1	100	<2	<10	<0.5	<1
AUG 26...	0930	0.09	750	<10	<1	1	<100	12	<10	<0.5	<1

< Actual value is known to be less than the value shown.
E Estimated.
K Results based on colony count outside acceptable range (non-ideal colony count).

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR											
19...	<1.0	230	1	90	<3	130	2	76000	580	70	1
AUG											
26...	<1.0	1	<1	2	<3	8	4	1200	8	4	<1

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)
MAR											
19...	<10	<4	2000	18	<0.10	<0.1	<1	<10	140	1	3
AUG											
26...	<10	<4	40	<1	0.10	<0.1	3	<10	3	<1	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)
MAR											
19...	<1	<1	<1.0	40	<6	200	4	52	--	<0.010	0.1
AUG											
26...	<1	<1	<1.0	410	<6	10	12	6.6	<1	<0.010	<0.1

DATE	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)
MAR											
19...	0.02	<0.010	<0.010	0.010	<0.01	0.01	0.010	<0.01	<0.01	<0.01	<0.010
AUG											
26...	0.01	<0.010	<0.010	<0.010	<0.01	0.02	<0.010	<0.01	<0.01	<0.01	<0.010

DATE	ENDRIN, TOTAL (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)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)
MAR											
19...	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
AUG											
26...	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	NAPH-THA-LENES, POLY-CHLOR. TOTAL (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)	TRI-THION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 19...	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
AUG 26...	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

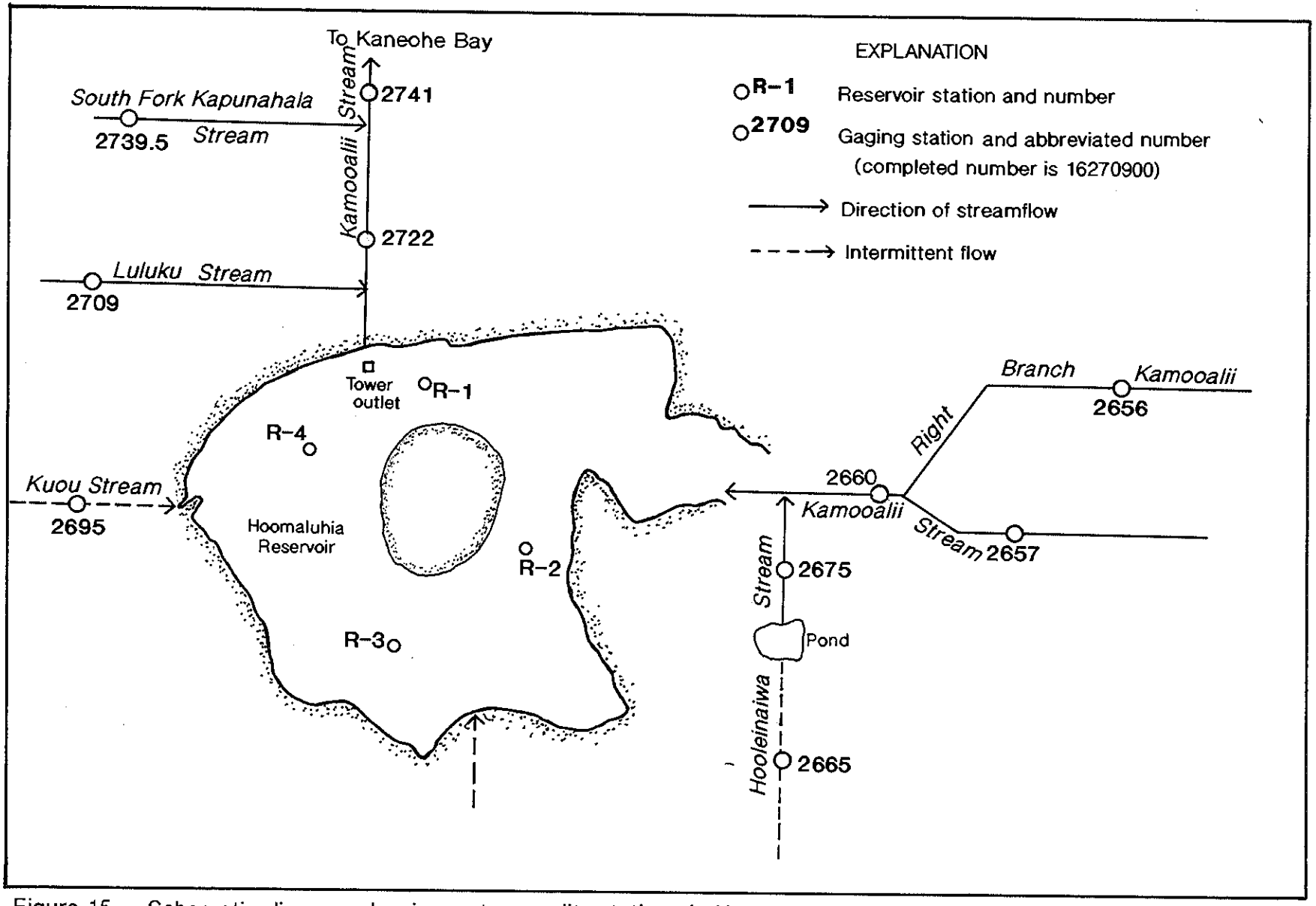


Figure 15.--Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16265700 - KAHOOALII 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 (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)
NOV											
06...	1205	0.47	225	7.2	--	23.5	3.6	754	7.5	89	--
DEC											
20...	1145	1.7	380	6.9	--	21.0	44	758	7.9	89	--
JAN											
24...	1445	1.3	225	6.6	--	21.0	5.8	755	7.6	86	--
MAR											
21...	1415	5.8	240	7.5	--	21.5	6.9	757	8.5	97	64
MAY											
01...	1120	2.0	230	7.2	--	22.0	61	765	7.9	90	--
21...	1245	1.7	217	7.0	--	22.0	400	760	7.5	86	1200
JUN											
27...	1005	0.98	295	6.9	22.5	22.0	13000	764	7.3	83	--
JUL											
29...	1330	0.77	250	8.1	--	23.0	5.5	759	7.5	88	--
AUG											
26...	1245	0.64	225	7.1	--	23.5	1.2	759	7.8	92	500
SEP											
24...	0945	0.85	230	7.6	26.5	22.5	1.0	761	7.4	86	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
21...	1415	74	13	10	17	33	0.9	1.6	74	6.6	22	<0.10

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1145	--	--	--	--	43	0.300	0.040	<0.20	--	<0.010	--
MAR												
21...	1415	25	132	140	0.18	6	0.180	<0.010	<0.20	--	0.030	0.09
MAY												
21...	1245	--	--	--	--	404	0.580	0.080	0.30	0.88	0.360	0.37
AUG												
26...	1245	--	--	--	--	4	0.260	<0.010	<0.20	--	0.020	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
21...	1415	530	20	<1	<1	<100	5	<10	<0.5	<1	<1.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16265700 - KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEOHE--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
MAR 21...	4	2	2	<3	2	1	1300	17	1	<1	<10

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR 21...	<4	30	21	<0.10	<0.1	<1	<10	2	<1	<1	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)
MAR 21...	<1	<1.0	92	<6	<10	<3	1.1	<1	<0.010	<0.1	<0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
MAR 21...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010

DATE	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)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)
MAR 21...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 21...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (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 (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	DXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV											
06...	1110	0.14	160	7.1	--	23.0	0.30	754	7.7	91	--
DEC											
20...	1110	0.84	185	7.0	--	22.0	1.5	757	7.7	89	--
JAN											
24...	1040	0.42	160	7.1	--	21.5	0.40	756	8.0	91	--
MAR											
20...	1145	6.2	140	6.2	--	20.0	35	757	8.3	92	840
MAY											
01...	1330	0.49	166	7.1	--	23.0	0.50	760	8.8	103	--
21...	1050	0.34	155	7.0	--	22.0	1.5	761	8.4	96	180
JUN											
27...	1130	0.22	160	7.0	--	22.5	0.30	761	7.2	83	--
JUL											
29...	1430	0.16	154	7.5	23.5	23.0	0.40	758	7.0	82	--
AUG											
27...	1150	0.19	158	7.3	--	23.0	1.4	759	6.4	75	3100
SEP											
23...	1045	0.21	160	7.0	--	23.0	0.60	754	6.9	81	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
20...	1145	33	7.4	3.5	7.7	33	0.6	1.2	26	10	9.8	0.20

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1110	--	--	--	--	<1	0.300	0.090	<0.20	--	0.020	--
MAR												
20...	1145	8.0	58	64	0.08	37	0.300	0.100	0.40	0.70	0.070	0.15
MAY												
21...	1050	--	--	--	--	3	0.150	<0.010	0.60	0.75	0.010	--
AUG												
27...	1150	--	--	--	--	<1	0.093	0.010	<0.20	--	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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
20...	1145	2800	20	<1	<1	<100	<2	<10	<0.5	<1	<1.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
MAR 20...	16	<1	2	<3	4	1	4600	24	<1	<1	<10

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR 20...	<4	90	35	0.30	<0.1	<1	<10	5	1	4	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)
MAR 20...	<1	<1.0	32	<6	20	4	3.0	<1	<0.010	<0.1	0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
MAR 20...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010

DATE	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)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)
MAR 20...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 20...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM ABOVE CONFLUENCE WITH KAMOOALII STR, NR KANEOHE (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 (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)
NOV											
06...	1000	0.72	195	7.3	--	23.0	5.4	756	7.5	88	--
DEC											
20...	1000	2.4	175	7.4	--	21.5	27	758	8.0	91	--
JAN											
24...	0930	1.0	195	7.6	20.5	20.5	4.0	757	8.1	91	--
MAR											
20...	1020	E150	65	7.0	--	20.0	550	760	8.6	95	9300
MAY											
01...	1105	1.1	193	7.3	--	25.0	4.5	764	7.8	94	--
21...	1015	0.75	195	6.9	--	22.0	4.0	764	7.8	89	210
JUN											
27...	1010	0.60	200	7.5	--	23.5	3.5	763	7.0	82	--
JUL											
29...	1330	0.58	203	7.4	25.0	23.5	2.9	760	6.4	76	--
AUG											
27...	1005	0.57	202	7.0	--	24.5	2.2	761	6.5	78	<280
SEP											
23...	1015	0.82	190	6.9	--	23.5	3.5	761	6.2	73	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
20...	1020	19	4.4	1.9	4.9	35	0.5	1.0	17	8.2	5.8	0.20

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1000	--	--	--	--	15	0.300	0.040	0.20	0.50	0.050	0.03
MAR												
20...	1020	5.4	40	43	0.05	168	0.200	0.100	0.40	0.60	0.120	0.09
MAY												
21...	1015	--	--	--	--	11	0.063	<0.010	<0.20	--	0.010	--
AUG												
27...	1005	--	--	--	--	4	<0.050	0.020	<0.20	--	<0.010	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
20...	1020	70000	140	<1	<1	<100	<2	<10	<0.5	<1	<1.0

< Actual value is known to be less than the value shown.
E Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM ABOVE CONFLUENCE WITH KAMOOALII STR, NR KANEOHE--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
MAR 20...	330	<1	<1	<3	1	1	96000	1000	10	<1	<10

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR 20...	<4	1600	45	0.20	<0.1	<1	<10	<1	1	5	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)
MAR 20...	<1	<1.0	17	<6	100	<3	25	<1	<0.010	<0.1	0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
MAR 20...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010

DATE	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)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)
MAR 20...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 20...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (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 (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)
NOV											
06...	1410	E0.02	325	7.1	--	23.0	1.5	753	7.7	91	--
DEC											
20...	1310	0.30	280	7.0	--	22.0	3.8	756	7.2	83	--
JAN											
24...	1140	0.04	315	7.0	--	21.0	2.4	756	6.1	69	--
MAR											
22...	0925	0.40	265	7.4	--	21.5	4.6	759	7.8	89	160
MAY											
02...	1445	0.05	290	7.5	--	22.5	1.0	760	7.6	88	--
21...	1345	0.02	300	7.4	--	22.0	0.60	758	8.2	94	160
JUN											
26...	1345	0.01	290	7.5	24.0	23.0	0.60	764	7.2	84	--
JUL											
30...	1340	0.03	260	7.2	--	23.0	15	758	8.2	96	--
AUG											
27...	1315	0.01	280	7.7	--	25.0	2.1	759	7.8	95	380
SEP											
23...	1105	E0.05	300	6.8	--	23.5	1.0	757	8.3	98	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
22...	0925	96	22	10	15	25	0.7	1.9	74	27	18	<0.10

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
20...	1310	--	--	--	--	7	0.500	0.040	0.20	0.70	0.040	--
MAR												
22...	0925	30	153	169	0.21	21	0.510	0.010	<0.20	--	0.020	0.09
MAY												
21...	1345	--	--	--	--	<1	0.320	<0.010	<0.20	--	<0.010	--
AUG												
27...	1315	--	--	--	--	4	0.150	0.020	<0.20	--	0.010	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
22...	0925	360	20	<1	<1	<100	3	<10	<0.5	<1	<1.0

< Actual value is known to be less than the value shown.
E Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
MAR 22...	3	<1	2	<3	3	<1	970	230	1	<1	<10

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR 22...	<4	80	70	<0.10	<0.1	<1	<10	2	1	<1	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)
MAR 22...	<1	<1.0	99	<6	20	12	1.5	<1	<0.010	<0.1	<0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
MAR 22...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010

DATE	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)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)
MAR 22...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 22...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY (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 (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)
NOV											
08...	1430	11	198	6.7	--	27.0	25	762	8.9	112	--
DEC											
26...	1415	24	200	7.3	--	23.0	25	758	7.8	92	--
JAN											
25...	1330	15	205	8.8	--	24.0	12	758	8.5	102	--
MAR											
22...	1015	31	195	7.8	--	23.5	38	761	8.4	99	1700
MAY											
01...	0920	15	192	8.4	--	24.5	2.5	769	9.4	112	--
21...	1000	14	210	8.5	--	24.0	3.4	764	9.6	114	8200
JUN											
26...	1300	12	200	9.1	--	28.0	2.6	768	8.8	112	--
JUL											
31...	1000	12	200	8.8	--	26.0	2.1	764	9.0	111	--
AUG											
26...	1030	11	205	8.8	--	26.0	4.6	765	8.8	108	2000
SEP											
24...	1055	13	190	8.5	29.5	26.5	3.0	766	8.6	107	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
MAR												
22...	1015	57	12	6.6	13	32	0.7	1.7	50	12	18	0.20
AUG												
26...	1030	60	11	7.8	16	36	0.9	1.1	55	3.4	22	<0.10

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
DEC												
26...	1415	--	--	--	--	11	0.600	0.030	<0.20	--	0.050	0.06
MAR												
22...	1015	16	104	110	0.14	26	0.650	0.020	0.20	0.85	0.100	0.09
MAY												
21...	1000	--	--	--	--	33	0.330	<0.010	0.30	0.63	0.020	--
AUG												
26...	1030	22	120	116	0.16	7	0.230	0.020	0.30	0.53	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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
MAR											
22...	1015	1300	10	<1	<1	<100	3	<10	<0.5	<1	<1.0
AUG											
26...	1030	390	20	<1	<1	<100	2	<10	<0.5	<1	<1.0

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY--Continued

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)
MAR											
22...	7	<1	2	<3	4	1	3100	18	2	<1	<10
AUG											
26...	<1	<1	1	<3	3	1	870	97	4	<1	<10

DATE	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)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)
MAR											
22...	<4	70	39	<0.10	<0.1	<1	<10	4	2	<1	<1
AUG											
26...	<4	70	8	0.10	0.1	2	<10	2	<1	<1	<1

DATE	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)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)
MAR											
22...	<1	<1.0	73	<6	<10	<3	2.2	<1	<0.010	0.1	0.01
AUG											
26...	<1	<1.0	82	<6	<10	<3	2.3	<1	<0.010	<0.1	<0.01

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
MAR										
22...	<0.010	<0.010	<0.010	<0.01	<0.01	0.050	<0.01	<0.01	<0.01	<0.010
AUG										
26...	<0.010	<0.010	<0.010	<0.01	<0.01	0.030	<0.01	<0.01	<0.01	<0.010

DATE	ENDRIN, TOTAL (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)	METHYL TRITHION, TOTAL (UG/L)
MAR										
22...	<0.010	<0.01	<0.01	<0.010	0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AUG										
26...	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY--Continued

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (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)	TRI-THION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAR 22...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
AUG 26...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157482601 HOOMALUHIA RES SEC 1-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1100	1.00	203	7.3	24.0	759	7.6	91
29...	1101	3.00	203	7.3	24.0	759	7.5	90
29...	1103	5.00	203	7.3	24.0	759	7.2	86
29...	1104	7.00	203	7.3	24.0	759	6.9	82
29...	1105	9.00	205	7.2	24.0	759	6.9	82
JUN								
28...	1039	1.00	195	7.4	25.5	762	7.1	87
28...	1040	3.00	195	7.4	25.0	762	7.1	86
28...	1041	5.00	195	7.4	25.0	762	7.2	87
28...	1042	7.00	195	7.4	25.0	762	7.1	86
28...	1043	8.00	195	7.4	25.0	762	6.9	84
JUL								
30...	0958	1.00	199	7.4	26.5	760	7.6	95
30...	1000	3.00	199	7.4	26.5	760	7.6	95
30...	1001	5.00	199	7.4	26.0	760	7.5	93
30...	1002	7.00	200	7.4	26.0	760	6.9	85
30...	1003	8.00	201	7.3	26.0	760	6.1	75
AUG								
28...	1038	1.00	197	7.4	26.0	759	6.8	85
28...	1040	3.00	197	7.4	26.0	759	6.8	84
28...	1042	5.00	197	7.3	26.0	759	6.8	84
28...	1044	7.00	197	7.3	26.0	759	6.9	86
28...	1046	8.00	197	7.3	26.0	759	6.8	84
SEP								
25...	1104	1.00	182	7.8	27.5	759	7.6	97
25...	1105	3.00	182	7.7	27.0	759	7.7	97
25...	1107	5.00	186	7.5	26.5	759	6.3	79
25...	1108	7.00	188	7.2	25.5	759	5.1	63
25...	1109	8.00	188	7.1	25.0	759	3.1	38

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157482602 HOOMALUHIA RES SEC 1-2 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1050	1.00	203	7.4	24.0	759	7.6	91
29...	1051	3.00	203	7.3	24.0	759	7.5	90
29...	1052	5.00	203	7.3	24.0	759	7.3	87
29...	1054	7.00	204	7.3	24.0	759	6.9	82
29...	1056	9.00	204	7.2	23.5	759	7.1	84
JUN								
28...	1032	1.00	195	7.4	25.5	762	7.2	88
28...	1033	3.00	195	7.4	25.5	762	7.3	89
28...	1034	5.00	195	7.4	25.0	762	7.3	89
28...	1035	7.00	195	7.4	25.0	762	7.4	90
28...	1036	9.00	196	7.4	25.0	762	6.8	82
JUL								
30...	0947	1.00	199	7.3	26.5	760	7.6	95
30...	0948	3.00	199	7.3	26.5	760	7.5	93
30...	0950	5.00	199	7.3	26.0	760	7.4	92
30...	0951	7.00	200	7.3	26.0	760	7.1	88
30...	0953	9.00	200	7.3	25.5	760	7.0	85
AUG								
28...	1025	1.00	198	7.4	26.0	759	6.9	86
28...	1028	3.00	198	7.4	26.0	759	6.8	84
28...	1030	5.00	198	7.3	26.0	759	6.8	84
28...	1033	7.00	198	7.3	26.0	759	6.7	83
28...	1035	9.00	198	7.3	26.0	759	6.6	82
SEP								
25...	1056	1.00	182	7.9	27.5	759	8.0	101
25...	1057	3.00	182	7.8	27.0	759	7.8	99
25...	1059	5.00	186	7.4	26.5	759	6.7	84
25...	1101	7.00	188	7.3	25.5	759	5.5	67
25...	1102	9.00	184	7.1	25.0	759	3.3	40

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (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./ 1100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
APR											
29...	1040	1.00	202	7.4	24.0	2.0	759	7.6	91	K19	--
29...	1041	3.00	203	7.4	24.0	--	759	7.6	91	--	--
29...	1042	5.00	203	7.4	24.0	--	759	7.1	85	--	--
29...	1043	7.00	204	7.3	24.0	2.5	759	6.7	80	K22	--
29...	1044	9.00	205	7.3	23.5	--	759	6.8	80	--	--
29...	1045	11.0	207	7.1	23.5	9.2	759	6.7	79	79	--
29...	1047	12.0	208	7.1	23.0	--	759	6.5	76	--	--
29...	1050	--	204	7.3	24.0	4.9	759	6.7	80	--	64
JUN											
28...	1012	1.00	195	7.1	25.5	2.5	762	7.4	90	--	--
28...	1014	3.00	195	7.2	25.5	--	762	7.3	89	--	--
28...	1016	5.00	195	7.2	25.0	--	762	7.2	88	--	--
28...	1017	7.00	195	7.2	25.0	2.0	762	7.3	89	--	--
28...	1018	9.00	195	7.2	25.0	--	762	7.1	86	--	--
28...	1019	11.0	195	7.2	24.0	25	762	6.5	78	--	--
JUL											
30...	0936	1.00	199	7.2	26.5	0.50	760	7.5	93	--	--
30...	0937	3.00	199	7.2	26.5	--	760	7.5	93	--	--
30...	0938	5.00	199	7.2	26.5	--	760	7.4	92	--	--
30...	0940	7.00	200	7.3	26.0	0.40	760	7.1	88	--	--
30...	0941	9.00	200	7.2	25.5	--	760	6.7	82	--	--
30...	0943	11.0	200	7.2	25.0	1.0	760	6.6	80	--	--
AUG											
28...	1010	1.00	197	7.3	26.0	2.0	759	7.4	92	52	--
28...	1013	3.00	197	7.3	26.0	--	759	7.2	89	--	--
28...	1015	5.00	198	7.3	26.0	--	759	7.1	88	--	--
28...	1017	7.00	198	7.4	26.0	2.5	759	7.0	87	44	--
28...	1020	9.00	198	7.3	26.0	--	759	6.4	79	--	--
28...	1022	11.0	199	7.3	25.0	1.7	759	6.1	74	>60	--
28...	1024	--	198	7.4	26.0	1.9	759	7.0	87	--	59
SEP											
25...	1031	1.00	180	7.9	27.5	0.60	759	8.0	103	--	--
25...	1039	3.00	180	7.7	27.0	--	759	7.6	95	--	--
25...	1041	5.00	182	7.4	26.5	--	759	6.2	77	--	--
25...	1046	7.00	180	7.4	25.5	1.0	759	4.9	61	--	--
25...	1048	9.00	196	7.2	25.0	--	759	5.6	69	--	--
25...	1051	11.0	190	7.1	24.5	3.5	759	3.5	42	--	--

DATE	TIME	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 DISSOLVEO (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
APR											
29...	1050	11	8.8	15	33	0.8	1.3	61	8.2	22	<0.10
AUG											
28...	1024	9.8	8.3	15	35	0.9	1.2	63	7.1	21	0.10

< Actual value is known to be less than the value shown.
> Actual value is known to be greater than the value shown.
K Results based on colony count outside the acceptable range (non-ideal colony count).

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
APR											
29...	1040	--	--	--	--	21	0.440	0.020	0.20	0.64	0.020
29...	1043	--	--	--	--	5	0.450	0.010	0.30	0.75	0.020
29...	1045	--	--	--	--	16	0.490	0.030	0.30	0.79	0.060
29...	1050	18	134	121	0.18	--	--	--	--	--	--
AUG											
28...	1010	--	--	--	--	1	0.340	0.010	0.30	0.64	0.030
28...	1017	--	--	--	--	3	0.340	0.010	0.40	0.74	0.020
28...	1022	--	--	--	--	23	0.450	0.020	0.30	0.75	0.030
28...	1024	19	116	119	0.16	--	--	--	--	--	--

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)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
APR											
29...	1050	270	<10	<1	<1	<100	5	<10	<0.5	<1	<1.0
AUG											
28...	1024	180	<10	<1	<1	<100	57	<10	<0.5	<1	<1.0

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (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)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)
APR											
29...	1	<1	<1	<3	4	1	600	13	3	<1	<10
AUG											
28...	<1	<1	1	<3	2	<1	320	7	3	<1	<10

DATE	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)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	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)
APR											
29...	<4	60	2	<0.10	<0.1	<1	<10	2	<1	<1	<1
AUG											
28...	<4	60	2	<0.10	<0.1	2	<10	2	<1	<1	<1

DATE	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)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)
APR											
29...	<1	<1.0	87	<6	<10	5	2.0	<1	<0.010	<0.1	<0.01
AUG											
28...	<1	<1.0	88	<6	<10	5	1.9	1	<0.010	<0.1	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
APR											
29...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	0.04	<0.010	<0.010
AUG											
28...	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010

DATE	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)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)
APR											
29...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.011	<0.10
AUG											
28...	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--	<0.011	<0.10

DATE	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)	TRI-THION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
APR								
29...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
AUG								
28...	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212331157482501 HOOMALUHIA RES SEC 2-1 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1400	1.00	201	7.4	25.0	759	8.1	98
29...	1401	3.00	201	7.4	25.0	759	8.1	98
29...	1402	5.00	201	7.4	24.5	759	8.1	98
29...	1404	7.00	200	7.4	24.5	759	7.9	95
29...	1405	9.00	206	7.2	23.5	759	6.8	80
JUN								
28...	1217	1.00	193	7.5	26.0	762	7.2	89
28...	1219	3.00	193	7.5	25.5	762	7.3	90
28...	1220	5.00	193	7.4	25.5	762	7.2	88
28...	1221	7.00	194	7.5	25.5	762	7.1	87
28...	1222	8.00	194	7.5	25.0	762	6.3	76
JUL								
30...	1048	1.00	199	7.3	26.5	760	7.6	95
30...	1049	3.00	198	7.4	26.5	760	7.5	93
30...	1050	5.00	198	7.4	26.0	760	7.4	92
30...	1052	7.00	194	7.4	26.0	760	6.9	86
30...	1054	8.00	195	7.3	26.0	760	6.3	78
AUG								
28...	1247	1.00	196	7.4	26.5	759	7.0	87
28...	1249	3.00	196	7.4	26.5	759	7.0	87
28...	1251	5.00	197	7.4	26.5	759	7.0	87
28...	1253	7.00	197	7.4	26.0	759	7.0	87
28...	1255	8.00	196	7.4	26.0	759	6.9	86
SEP								
25...	1137	1.00	182	7.8	27.5	759	7.8	100
25...	1138	3.00	182	7.9	27.5	759	8.0	101
25...	1140	5.00	180	7.5	26.5	759	6.5	81
25...	1142	7.00	176	7.1	25.5	759	3.1	38
25...	1143	8.00	186	7.1	25.0	759	3.7	45

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1408	1.00	201	7.4	24.5	759	8.1	98
29...	1409	3.00	201	7.4	24.5	759	8.1	98
29...	1410	5.00	202	7.4	24.5	759	8.0	97
29...	1411	7.00	202	7.3	24.5	759	7.9	95
29...	1412	9.00	206	7.2	23.5	759	6.7	79
29...	1414	11.0	207	7.2	23.0	759	6.3	74
JUN								
28...	1209	1.00	193	7.5	26.0	762	7.3	90
28...	1211	3.00	194	7.5	26.0	762	7.3	90
28...	1212	5.00	194	7.5	25.5	762	7.0	86
28...	1213	7.00	194	7.5	25.5	762	7.1	87
28...	1214	9.00	196	7.5	24.0	762	6.7	80
28...	1215	10.0	194	7.4	24.0	762	6.6	78
JUL								
30...	1039	1.00	199	7.3	26.5	760	7.6	95
30...	1041	3.00	199	7.3	26.5	760	7.6	95
30...	1042	5.00	199	7.3	26.0	760	7.5	93
30...	1043	7.00	198	7.3	26.0	760	7.0	87
30...	1044	9.00	201	7.3	24.5	760	6.7	81
30...	1045	11.0	200	7.2	24.5	760	6.7	81
AUG								
28...	1235	1.00	196	7.5	26.5	759	7.0	87
28...	1237	3.00	197	7.5	26.5	759	7.0	87
28...	1238	5.00	197	7.5	26.0	759	7.1	88
28...	1240	7.00	197	7.4	26.0	759	7.0	87
28...	1242	9.00	198	7.4	25.5	759	6.1	75
28...	1244	11.0	200	7.3	25.0	759	5.8	70
SEP								
25...	1125	1.00	182	7.9	27.5	759	8.1	103
25...	1126	3.00	182	7.9	27.5	759	8.0	102
25...	1131	5.00	178	7.4	26.5	759	6.3	79
25...	1132	7.00	176	7.1	25.5	759	4.1	50
25...	1133	9.00	186	7.1	24.5	759	3.8	46
25...	1135	11.0	186	7.1	24.5	759	3.2	38

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212331157482503 HOOMALUHIA RES SEC 2-3 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1416	1.00	201	7.4	25.0	759	8.2	99
29...	1417	3.00	201	7.4	25.0	759	8.2	99
29...	1418	5.00	201	7.4	24.5	759	8.1	98
29...	1419	7.00	202	7.3	24.5	759	7.5	90
29...	1420	9.00	205	7.2	23.5	759	6.2	73
JUN								
28...	1200	1.00	194	7.5	26.0	762	7.4	91
28...	1201	3.00	193	7.5	26.0	762	7.3	90
28...	1202	5.00	194	7.5	26.0	762	7.2	89
28...	1203	7.00	193	7.5	25.0	762	6.5	79
28...	1204	8.00	194	7.4	24.5	762	6.4	77
JUL								
30...	1031	1.00	198	7.1	26.5	760	7.6	95
30...	1032	3.00	199	7.2	26.5	760	7.7	96
30...	1034	5.00	199	7.2	26.0	760	7.6	94
30...	1036	7.00	200	7.2	26.0	760	6.4	79
30...	1037	9.00	201	7.2	25.0	760	6.6	80
AUG								
28...	1223	1.00	196	7.5	26.5	759	6.9	86
28...	1225	3.00	196	7.5	26.5	759	6.9	86
28...	1227	5.00	196	7.5	26.5	759	6.9	86
28...	1229	7.00	197	7.4	26.0	759	6.8	84
28...	1232	9.00	198	7.3	25.5	759	5.8	71
SEP								
25...	1116	1.00	182	8.0	27.5	759	8.1	104
25...	1117	3.00	182	7.9	27.5	759	8.0	102
25...	1119	5.00	180	7.4	26.5	759	6.2	78
25...	1121	7.00	174	7.2	25.5	759	4.1	50
25...	1123	9.00	190	7.1	25.0	759	4.0	49

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212329157483101 HOOMALUHIA RES SEC 3-1 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1136	1.00	202	7.3	24.5	759	7.6	92
29...	1137	3.00	202	7.3	24.5	759	7.6	92
29...	1138	5.00	202	7.3	24.5	759	7.6	91
29...	1139	7.00	202	7.3	24.5	759	7.5	90
29...	1140	9.00	201	7.3	24.5	759	7.4	89
JUN								
28...	1150	1.00	194	7.5	26.0	762	7.0	87
28...	1151	3.00	194	7.5	26.0	762	7.0	86
28...	1152	5.00	194	7.5	25.5	762	7.1	87
28...	1153	7.00	194	7.4	25.5	762	7.0	86
28...	1154	8.00	193	7.4	25.5	762	7.0	86
JUL								
30...	1116	1.00	197	7.4	26.5	760	7.4	93
30...	1117	3.00	197	7.5	26.5	760	7.4	93
30...	1118	5.00	197	7.4	26.5	760	7.1	89
30...	1119	7.00	197	7.4	26.5	760	7.0	87
30...	1121	8.00	201	7.4	26.0	760	5.2	64
AUG								
28...	1210	1.00	197	7.5	26.5	759	6.9	86
28...	1212	3.00	197	7.5	26.5	759	6.9	86
28...	1214	5.00	197	7.4	26.5	759	6.9	86
28...	1215	7.00	197	7.4	26.0	759	6.8	85
28...	1217	8.00	197	7.4	26.0	759	6.8	85
SEP								
25...	1212	1.00	184	8.0	28.5	759	8.0	103
25...	1213	3.00	182	8.0	28.0	759	8.2	105
25...	1215	5.00	178	7.3	27.0	759	6.2	78
25...	1217	7.00	172	7.0	25.0	759	2.6	32
25...	1218	8.00	172	7.0	25.0	759	2.1	26

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR									
29...	1125	1.00	202	7.3	24.5	2.0	759	7.6	92
29...	1128	3.00	202	7.3	24.5	--	759	7.6	92
29...	1129	5.00	202	7.3	24.5	--	759	7.6	91
29...	1130	6.00	202	7.3	24.5	2.0	759	7.5	90
29...	1131	7.00	202	7.3	24.5	--	759	7.4	89
29...	1132	9.00	203	7.2	24.0	--	759	7.1	85
29...	1133	10.0	203	7.2	24.0	3.0	759	6.6	79
JUN									
28...	1140	1.00	195	7.4	26.0	1.5	762	7.1	88
28...	1141	3.00	195	7.5	26.0	--	762	7.1	87
28...	1142	5.00	194	7.4	25.5	1.5	762	7.0	86
28...	1143	7.00	194	7.4	25.5	--	762	7.0	86
28...	1144	9.00	194	7.4	25.5	--	762	7.1	87
28...	1145	10.0	194	7.4	25.5	1.5	762	6.8	83
JUL									
30...	1110	1.00	197	7.4	26.5	0.70	760	7.4	93
30...	1111	3.00	197	7.4	26.5	--	760	7.4	92
30...	1112	5.00	197	7.4	26.5	0.80	760	7.3	91
30...	1113	7.00	197	7.4	26.5	--	760	6.9	86
30...	1114	9.00	198	7.4	25.5	--	760	5.7	70
30...	1115	10.0	198	7.4	25.5	1.4	760	5.7	70
AUG									
28...	1157	1.00	197	7.5	26.5	2.3	759	6.9	86
28...	1159	3.00	197	7.5	26.5	--	759	6.9	86
28...	1201	5.00	197	7.4	26.0	2.1	759	6.9	86
28...	1203	7.00	197	7.4	26.0	--	759	6.9	86
28...	1205	9.00	197	7.4	26.0	--	759	6.8	85
28...	1207	10.0	197	7.4	26.0	2.2	759	6.8	84
SEP									
25...	1201	1.00	182	8.0	28.0	1.0	759	8.0	103
25...	1202	3.00	182	8.0	27.5	--	759	8.2	105
25...	1205	5.00	180	7.4	27.0	1.1	759	7.2	90
25...	1207	7.00	172	7.1	25.5	--	759	3.4	42
25...	1208	9.00	174	7.0	25.0	--	759	2.3	28
25...	1209	10.0	170	7.0	24.5	9.5	759	1.9	23

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, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
APR								
29...	1125	K9	3	0.350	0.010	0.20	0.55	0.020
29...	1130	K14	9	0.410	0.010	0.40	0.81	0.020
29...	1133	K11	14	0.420	0.010	0.40	0.82	0.020
AUG								
28...	1157	13	2	0.310	0.020	0.30	0.61	0.020
28...	1201	21	2	0.330	0.020	0.50	0.83	0.020
28...	1207	20	6	0.320	0.010	0.30	0.62	0.020

K Results based on colony count outside acceptable range (non-ideal colony count).

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212329157483103 HOOMALUHIA RES SEC 3-3 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1119	1.00	202	7.4	24.5	759	7.7	93
29...	1120	3.00	202	7.4	24.5	759	7.6	92
29...	1121	5.00	203	7.3	24.5	759	7.6	91
29...	1122	7.00	203	7.3	24.0	759	7.6	91
29...	1124	9.00	203	7.3	24.0	759	7.0	84
29...	1148	11.0	212	7.1	23.5	759	4.0	47
JUN								
28...	1130	1.00	195	7.5	26.0	762	7.1	88
28...	1131	3.00	195	7.4	25.5	762	7.1	87
28...	1133	5.00	194	7.4	25.5	762	7.0	86
28...	1134	7.00	194	7.4	25.5	762	7.0	86
28...	1135	9.00	194	7.4	25.0	762	6.9	84
28...	1136	11.0	194	7.4	25.0	762	6.9	84
JUL								
30...	1100	1.00	197	7.4	26.5	760	7.4	92
30...	1102	3.00	197	7.5	26.5	760	7.4	92
30...	1103	5.00	198	7.5	26.5	760	7.3	91
30...	1104	7.00	197	7.4	26.5	760	7.1	88
30...	1105	9.00	200	7.4	26.0	760	5.8	72
30...	1106	11.0	203	7.3	25.5	760	3.7	45
AUG								
28...	1144	1.00	196	7.5	26.5	759	6.9	86
28...	1146	3.00	196	7.4	26.5	759	6.9	86
28...	1148	5.00	196	7.4	26.5	759	6.8	85
28...	1150	7.00	197	7.4	26.0	759	6.8	85
28...	1152	9.00	197	7.4	26.0	759	6.6	82
28...	1154	11.0	197	7.4	26.0	759	6.5	81
SEP								
25...	1151	1.00	180	7.9	28.0	759	8.0	103
25...	1152	3.00	180	7.9	27.5	759	8.1	103
25...	1153	5.00	182	7.7	27.0	759	7.5	95
25...	1156	7.00	172	7.1	25.5	759	3.9	47
25...	1157	9.00	174	7.0	25.0	759	2.2	27
25...	1159	11.0	168	7.0	24.5	759	2.0	24

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157483001 HOOMALUHIA RES SEC 4-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1326	1.00	202	7.4	24.5	759	8.0	97
29...	1327	3.00	202	7.4	24.5	759	8.0	97
29...	1328	5.00	202	7.4	24.5	759	8.0	97
29...	1329	7.00	203	7.3	24.5	759	7.8	94
29...	1330	8.00	203	7.3	24.5	759	7.4	89
JUN								
28...	1112	1.00	195	7.4	26.0	762	7.2	89
28...	1113	3.00	195	7.4	26.0	762	7.1	87
28...	1114	5.00	195	7.4	25.0	762	6.9	84
28...	1115	7.00	195	7.4	25.0	762	6.9	84
28...	1118	8.00	194	7.4	25.0	762	6.8	83
JUL								
30...	1142	1.00	198	7.5	26.5	760	7.6	95
30...	1143	3.00	199	7.5	26.5	760	7.6	95
30...	1144	5.00	198	7.5	26.5	760	7.6	95
30...	1145	7.00	196	7.5	26.0	760	6.9	86
30...	1146	8.00	192	7.5	26.0	760	5.9	73
AUG								
28...	1125	1.00	197	7.4	26.0	759	6.9	86
28...	1126	3.00	197	7.4	26.0	759	6.8	85
28...	1127	5.00	197	7.4	26.0	759	6.8	84
28...	1129	7.00	197	7.3	26.0	759	6.8	84
28...	1130	8.00	197	7.3	26.0	759	6.6	82
SEP								
25...	1224	1.00	182	7.9	28.0	759	8.0	103
25...	1226	3.00	182	7.5	27.0	759	7.2	91
25...	1229	5.00	180	7.3	26.5	759	5.6	70
25...	1231	7.00	180	7.0	25.5	759	1.6	20
25...	1233	8.00	182	7.0	25.0	759	2.1	25

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1332	1.00	202	7.4	24.5	759	8.0	97
29...	1334	3.00	202	7.4	24.5	759	8.0	96
29...	1335	5.00	202	7.4	24.5	759	7.9	95
29...	1336	7.00	202	7.3	24.5	759	7.6	91
29...	1337	9.00	204	7.2	24.0	759	6.3	75
29...	1339	10.0	206	7.1	23.5	759	5.2	62
JUN								
28...	1101	1.00	195	7.4	25.5	762	7.2	88
28...	1103	3.00	195	7.4	25.5	762	7.1	87
28...	1105	5.00	195	7.4	25.0	762	7.0	85
28...	1107	7.00	194	7.4	25.0	762	6.9	84
28...	1108	9.00	194	7.4	25.0	762	7.0	85
JUL								
30...	1135	1.00	198	7.5	26.5	760	7.7	96
30...	1136	3.00	198	7.5	26.5	760	7.6	95
30...	1137	5.00	198	7.5	26.5	760	7.6	95
30...	1138	7.00	198	7.5	26.0	760	6.9	86
30...	1139	9.00	201	7.4	25.5	760	4.3	53
AUG								
28...	1114	1.00	197	7.4	26.0	759	6.9	86
28...	1116	3.00	197	7.4	26.0	759	6.8	84
28...	1118	5.00	197	7.3	26.0	759	6.7	83
28...	1120	7.00	198	7.3	26.0	759	6.7	83
28...	1122	9.00	197	7.3	26.0	759	6.3	78
SEP								
25...	1234	1.00	182	7.9	28.0	759	8.0	103
25...	1236	3.00	182	7.7	27.5	759	7.9	100
25...	1238	5.00	182	7.3	26.0	759	5.1	64
25...	1239	7.00	184	7.2	25.5	759	4.9	60
25...	1241	9.00	180	7.1	25.0	759	3.3	40

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212335157483003 HOOMALUHIA RES SEC 4-3 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR								
29...	1342	1.00	202	7.3	24.5	759	8.0	97
29...	1343	3.00	202	7.3	24.5	759	8.0	97
29...	1344	5.00	202	7.3	24.5	759	7.8	94
29...	1346	7.00	203	7.3	24.0	759	7.6	91
29...	1347	9.00	204	7.2	24.0	759	6.1	73
29...	1349	11.0	210	7.1	23.5	759	5.8	69
29...	1350	12.0	209	7.0	23.5	759	5.7	67
JUN								
28...	1050	1.00	195	7.5	25.5	762	7.2	88
28...	1051	3.00	195	7.5	25.0	762	7.0	85
28...	1053	5.00	195	7.5	25.0	762	6.9	84
28...	1054	7.00	194	7.4	25.0	762	6.9	84
28...	1056	9.00	194	7.4	25.0	762	6.9	83
28...	1057	11.0	196	7.4	25.0	762	6.1	74
JUL								
30...	1128	1.00	198	7.5	26.5	760	7.8	97
30...	1129	3.00	198	7.5	26.5	760	7.7	96
30...	1130	5.00	198	7.5	26.5	760	7.5	93
30...	1131	7.00	198	7.5	26.0	760	7.1	88
30...	1132	9.00	201	7.4	26.0	760	5.3	65
30...	1133	11.0	201	7.4	25.5	760	5.1	62
AUG								
28...	1056	1.00	197	7.4	26.0	759	6.9	86
28...	1058	3.00	197	7.4	26.0	759	6.8	84
28...	1101	5.00	197	7.4	26.0	759	6.6	82
28...	1103	7.00	198	7.3	26.0	759	6.4	79
28...	1105	9.00	198	7.3	26.0	759	6.5	81
28...	1107	11.0	199	7.2	26.0	759	5.6	69
SEP								
25...	1243	1.00	182	7.9	28.0	759	8.1	104
25...	1245	3.00	182	7.8	27.0	759	7.3	92
25...	1246	5.00	180	7.3	26.0	759	5.9	73
25...	1248	7.00	184	7.2	25.5	759	4.9	60
25...	1249	9.00	180	7.1	25.0	759	3.2	39
25...	1250	11.0	176	7.0	24.5	759	1.9	23

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)
APR			
30...	1500	24.0	8.1
30...	1600	24.5	7.8
30...	1700	24.5	7.9
30...	1800	25.0	8.0
30...	1900	25.0	8.1
30...	2000	25.0	8.0
30...	2100	25.0	7.7
30...	2200	25.0	7.8
30...	2300	25.0	7.6
30...	2400	24.5	7.4
MAY			
01...	0100	24.5	7.3
01...	0200	25.0	7.3
01...	0300	24.5	7.4
01...	0400	24.5	7.2
01...	0500	24.5	7.2
01...	0600	24.5	7.1
01...	0700	24.5	7.0
01...	0800	24.0	7.1
01...	0900	24.0	7.3
01...	1000	24.0	7.7
01...	1100	24.0	7.8
01...	1200	24.0	7.8
01...	1300	24.5	8.0
01...	1400	25.0	8.2

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF HAWAII

16737500 - WAIMANU STREAM NEAR KAMUELA (LAT 20°08'16" LONG 155°38'33")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (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)
FEB 25...	1445	0.48	115	7.1	--	20.5	1.0	762	8.9	99	51
MAY 08...	1330	--	75	6.9	--	21.0	1.2	763	8.5	95	59
AUG 22...	1315	--	150	6.6	25.0	21.0	1.0	761	--	--	580

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)
FEB 25...	210	39	8.5	4.2	8.4	31	0.6	1.1	41	1.6	10	<0.10
MAY 08...	710	24	5.3	2.7	7.2	30	0.6	9.8	25	0.90	9.8	<0.10
AUG 22...	1000	37	8.4	3.9	13	42	0.9	1.5	40	3.9	26	<0.10

DATE	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)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)
FEB 25...	34	94	93	0.13	0.062	<0.010	0.30	0.36	0.040	0.09	70	20
MAY 08...	2.1	82	53	0.11	<0.050	<0.010	<0.20	--	0.020	--	140	50
AUG 22...	30	111	111	0.15	<0.050	<0.010	0.40	--	0.030	--	150	20

DATE	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
FEB 25...	<1	<1	<100	<2	<10	<0.5	<1	<1.0	2	1	<1	<3
MAY 08...	<1	<1	<100	<2	<10	<0.5	<1	<1.0	<1	<1	1	<3
AUG 22...	<1	<1	<100	2	<10	<0.5	<1	<1.0	3	2	<1	<3

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF HAWAII--Continued

16737500 - WAIMANU STREAM NEAR KAMUELA--Continued

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (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)	MERCURY DISSOLVED (UG/L AS HG)
FEB												
25...	1	1	430	350	1	<1	<10	<4	10	19	<0.10	0.1
MAY												
08...	2	1	280	240	1	<1	<10	<4	10	11	0.20	0.2
AUG												
22...	3	<1	600	250	2	<1	<10	<4	10	14	0.10	<0.1

DATE	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	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)	ZINC, DISSOLVED (UG/L AS ZN)
FEB												
25...	<1	<10	<1	<1	<1	<1	<1	<1.0	30	7	<10	7
MAY												
08...	<1	<10	2	<1	<1	<1	<1	<1.0	20	<6	<10	<3
AUG												
22...	2	<10	4	1	<1	<1	<1	<1.0	34	6	<10	7

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB												
25...	--	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
MAY												
08...	2.8	--	--	--	--	--	--	--	--	--	--	<0.01
AUG												
22...	1.5	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (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											
25...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY											
08...	<0.01	--	--	--	<0.01	--	--	--	--	--	--
AUG											
22...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TRITHION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB											
25...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
MAY											
08...	--	--	--	--	--	--	--	<0.01	--	--	<0.01
AUG											
22...	--	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00′57″, long 159°21′04″, Hydrologic Unit 20070000, 1.0 mi south 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 current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 15.71 ft above mean sea level, Nov. 19, 1982. Lowest measured, 12.88 ft above mean sea level, Aug. 14, 1991.

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	DATE	WATER LEVEL
OCT 9	14.51	DEC 19	13.92	FEB 8	13.60	APR 11	14.25	JUN 5	13.34	AUG 14	12.88

HAWAII, ISLAND OF KAUAI--Continued

220018159444702. Local number 2-0044-13

LOCATION.--Lat 22°00'18", long 159°44'47", 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 206 ft; casing diameter 12 in, cased to 165 ft.

DATUM.--Elevation of land surface datum is 8 ft. Measuring point: Top of standpipe 10.61 ft above mean sea level. From July 27, 1977 to Sept.10, 1981, before standpipe was extended, measuring point elevation at top of standpipe was at 9.11 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements July 1977 to current year.
WATER QUALITY: Occasional measurements October 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 10.19 ft above mean sea level, Nov. 9, 1983. Lowest measured 8.33 ft above mean sea level, Mar. 29, 1984.

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	DATE	WATER LEVEL
OCT 29	9.16	DEC 10	9.57	FEB 11	9.71	APR 8	9.60	JUN 3	9.08	AUG 5	9.39

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
30...	1300	520	22.0	94	09...	1200	520	22.0	88
DEC					JUN				
11...	1300	505	22.0	90	04...	1300	545	22.0	90
FEB					AUG				
12...	1100	520	22.0	86	06...	1400	520	22.0	86

HAWAII, ISLAND OF KAUAI--Continued

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 Volanic 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, Dec. 20, 1937; lowest measured, 7.52 ft above mean sea level, Aug. 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	9.01	9.38	9.71	9.79	9.68	9.44	9.49	9.18	9.25	9.44	9.54	9.64
10	8.97	9.28	9.53	9.77	9.78	9.26	9.48	9.24	9.30	9.42	9.61	9.61
15	9.09	9.25	9.50	9.64	9.74	9.27	9.34	9.21	9.28	9.48	9.59	9.67
20	9.21	9.59	9.50	9.33	9.78	9.30	9.24	9.15	9.41	9.54	9.60	9.68
25	9.21	9.68	9.76	9.34	9.76	9.58	9.27	9.10	9.36	9.49	9.58	9.66
EOM	9.19	9.74	9.75	9.55	9.77	9.67	9.18	9.15	9.41	9.48	9.61	9.68

WTR YEAR 1991 MAX 10.03 FEB. 24 MIN 8.80 OCT. 3, 4.

HAWAII, ISLAND OF KAUAI--Continued

220016159442701. Local number, 2-0044-15.

LOCATION.--Lat 22°00′16″, long 159°44′27″, Hydrologic Unit 20070000, 2.5 mi Northwest from Kekaha School and, 1.8 mi Northeast of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 63.1 ft, 12 ft concrete casing, cased to 63.1 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point is the south top of concrete ring at 57.84 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements 1973 to current year.
WATER QUALITY: Occasional measurements 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 11.73 ft above mean sea level, Jan. 24, 1978. Lowest water level measured 4.16 ft above mean sea level, May 10, 1977.

REMARKS.--Water used for irrigation of sugar cane.

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	DATE	WATER LEVEL
OCT 29	5.73	DEC 10	8.49	FEB 11	9.16	APR 8	8.98	JUN 3	6.25	AUG 5	8.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 29...	0840	1700	22.5	400	APR 08...	1030	910	23.0	190
DEC 10...	0900	1320	22.0	330	JUN 03...	0900	1650	22.5	210
FEB 11...	0855	900	22.5	180	AUG 05...	1040	850	23.5	160

220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, .3 mi southwest of Wailua County Golf Course and 1.6 mi south southwest of Wailua River Mouth. Owner: State of Hawaii, OOWALD.

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 ebove mean sea level, Feb. 21, 1974. Lowest measured 8.08 ft above mean sea level, Oct. 12, 1978.

REMARKS.--Well affected by pumping of nearby well.

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	DATE	WATER LEVEL
OCT 9	10.55	DEC 19	11.01	FEB 7	10.84	APR 11	11.09	JUN 5	10.35	AUG 4	10.08

220148159453502. Local number, 2-0145-11.

LOCATION.--Lat 22°01'48", long 159°43'35", Hydrologic Unit 20070000, 1.0 mi Southeast from Mana Camp and 3.3 mi north of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 31.5 ft, probably obstructed; casing diameter 12 in, cased depth unknown.

DATUM.--Elevation of land-surface datum is 29 ft. Measuring point is the top of steel pipe 29.23 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 24.18 ft above mean sea level, Jan 31, 1974; Lowest water level measured 17.52 ft above mean sea level, Sept. 6, 1978.

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	DATE	WATER LEVEL
OCT 29	24.08	DEC 10	23.63	FEB 11	22.64	APR 8	21.56	JUN 3	21.81	AUG 5	22.41

HAWAII, ISLAND OF KAUAI--Continued

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 breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Ocasional measurements, February 1960, June 1973 to current year.
WATER QUALITY: 1960, 1966, 1972-80, 1985-89, 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft above mean sea level, Feb. 17, 1960. Lowest measured, 3.31 ft below mean sea level, May 27, 1977.

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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	6.35	DEC 14	7.66	FEB 8	6.50	APR 12	5.87	JUN 7	5.59	AUG 7	5.30

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC 14...	0830	380	24.0	44	JUN 07...	0905	400	23.5	42

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, Dept. 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 breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements, Aug. 1976 to current year.
Water quality: Occasional measurements, 1972, 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, Nov. 19, 1982. Lowest water level measured, 0.35 ft below mean sea level, Sept. 22, 1979.

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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	6.62	DEC 14	7.64	FEB 8	6.80	APR 12	5.99	JUN 7	6.20	AUG 7	5.62

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 19...	0910	400	27.5	48	APR 12...	0830	375	25.0	42
FEB 08...	0900	385	24.0	29	AUG 02...	0830	390	27.0	43

HAWAII, ISLAND OF KAUAI--Continued

220341159453901. Local number, 2-0345-04.

LOCATION.--Lat 22°03'41", long 159°43'39", Hydrologic Unit 20070000, 1.7 mi north northeast from Mana Camp and 1.7 mi east southeast from Nohili Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artisian well; depth 66 ft, concrete casing, diameter 12 ft, cased to 66 ft.

DATUM.--Elevation of land-surface datum 57 ft. Measuring point is the top of concrete ring (south side) at 60.80 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft above mean sea level, Jan. 31, 1974. Lowest water level measured, 1.42 ft below mean sea level, Jan. 22, 1985.

REMARKS.--Water is used for irrigation of sugar cane.

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	DATE	WATER LEVEL
OCT 29	2.49	DEC 10	3.61	FEB 11	3.32	APR 8	3.67	JUN 3	2.88	AUG 5	2.69

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
29...	0915	1290	22.0	320	08...	0935	1090	22.0	250
DEC					JUN				
10...	0930	950	22.0	220	03...	0940	1070	22.5	240
FEB					AUG				
11...	0920	1210	22.0	300	05...	0950	1480	22.5	360

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit, 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 airvent pipe after removing 2 in. elbow on the southwest side of base, elevation 359.04 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level, Mar. 30, 1990. Lowest water level measured, 42.69 ft above mean sea level, Oct. 4, 1973.

REMARKS.--Water is used for public supply and truck farming irrigation.

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	DATE	WATER LEVEL
OCT 9	142.62	FEB 21	140.72	APR 12	141.06	JUN 5	136.80	AUG 26	132.61	SEP 25	131.49
DEC 17	142.28										

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
09...	1030	205	24.5	21	12...	1315	210	23.0	20
DEC					JUN				
17...	1140	200	23.0	21	05...	1300	210	23.5	20
FEB					AUG				
08...	1310	207	22.0	19	02...	1320	205	22.5	21

HAWAII, ISLAND OF KAUAI--Continued

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 pump opening .40 ft above 1 in. hole on southside of pump base, 349.31 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest weater level measured, 43.36 ft above mean sea level, June 3, 1974. Lowest water level measured, 9.24 ft below mean sea level, Aug. 10,1983.

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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	1.43	DEC 18	2.97	FEB 22	2.33	APR 5	3.15	JUN 13	0.41	AUG 22	-1.30

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC					AUG				
18...	0730	210	23.0	24	22...	0805	210	23.0	26
APR									
05...	0730	220	22.0	23					

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 .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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974. Lowest water level measured, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply.

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	DATE	WATER LEVEL
OCT 19	6.76	DEC 14	11.41	FEB 8	9.48	APR 12	11.04	JUN 7	8.88	AUG 2	7.64

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 19...	1220	150	26.5	20	APR 12...	1150	135	24.0	20
DEC 14...	1220	135	23.0	21	JUN 07...	1245	145	26.0	27
FEB 08...	1210	140	27.0	21	AUG 02...	1050	140	27.0	20

HAWAII, ISLAND OF KAUAI--Continued

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, .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 unthreaded hole after removing 1 in pipe, .22 ft above hole on pump base, 82.45 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level, Dec. 8, 1989. Lowest water level measured 4.37 ft below mean sea level, Jan. 13, 1975.

REMARKS.--Water used for public supply.

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	DATE	WATER LEVEL
OCT 19	8.30	DEC 14	8.58	FEB 8	9.72	APR 12	9.26	JUN 7	8.68	AUG 2	9.88

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 19...	1200	200	24.5	21	APR 12...	1100	205	22.0	21
DEC 14...	1150	205	21.0	22	JUN 07...	1215	215	22.0	21
FEB 08...	1130	215	22.0	22	AUG 02...	1120	195	27.5	24

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, Jan. 10, 1974. Lowest water level measured, 5.05 ft above mean sea level, Mar.10, 1975.

REMARKS.--Water used for irrigation and washing of sugar cane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	25.54	DEC 17	26.11	FEB 25	22.24	APR 22	26.15	JUN 10	26.12	AUG 26	26.00

HAWAII, ISLAND OF KAUAI--Continued

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 top of 1/2 in. pipe on pump base 246.07 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level, July 15, 1974. Lowest water level measured, 22.07 ft above mean sea level, Mar. 3, 1983.

REMARKS.--Water used for public supply. Water level affected by nearby well.

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	35.13	FEB 7	35.26	APR 11	35.13	JUN 6	34.82	AUG 8	34.84

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
APR 11...	0750	235	23.0	25	AUG 08...	0830	230	23.5	24
AUG 08...	0800	230	23.0	25					

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 1010 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, 355.28 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1977 to current year.
Water quality: Occasional measurements 1977 to 1990.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.07 ft above mean sea level, Jun. 28, 1990. Lowest water level measured, 22.67 ft below mean sea level, July 27, 1978.

REMARKS.--Water used for sugar cane irrigation.

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	DATE	WATER LEVEL
OCT 10	62.31	DEC 17	83.96	FEB 7	88.11	APR 22	92.87	JUN 6	93.91	AUG 1	98.71

HAWAII, ISLAND OF KAUAI--Continued

215522159342601. Local number, 2-5534-03.

LOCATION.--Lat 21°55'22", long 159°34'26", Hydrologic Unit 20070000, 1.9 mi north from Weli Point and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 108 ft; casing diameter 9 in, cased to 108 ft.

DATUM.--Elevation of land surface datum 78 ft. Measuring point is the top of pump base east side, 78.97 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level, Feb. 1, 1990. Lowest water level measured, 9.19 ft above mean sea level, Oct. 13, 1978.

REMARKS.--Water used for public supply.

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	DATE	WATER LEVEL
OCT 18	16.08	DEC 13	18.30	FEB 7	18.15	APR 11	18.30	JUN 6	17.65	AUG 1	17.55

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 18...	1000	270	27.0	31	APR 11...	1130	280	25.5	31
DEC 13...	0910	265	25.0	30	JUN 06...	1240	275	22.5	30
FEB 07...	0950	275	24.5	32	AUG 01...	1000	460	30.0	46

215607159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56'07", long 159°34'43", Hydrologic Unit 20070000, 2.7 mi north of Weli Point and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 508 ft, casing diameter 8 in., cased to 507 ft.

DATUM.--Elevation of land-surface datum is 439 ft. Measuring point: Top of casing 440.62 ft above mean sea level.

PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.70 ft above mean sea level, Sep. 15, 1991; lowest 15.87 ft above mean sea level, Nov. 1, 1989

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.75	16.95	17.18	17.38	17.42	17.03	16.92	17.19	17.30	17.43	17.56	17.61
10	16.79	16.97	17.18	17.40	17.37	16.97	16.96	17.23	17.28	17.46	17.60	17.61
15	16.76	17.00	17.24	17.42	17.26	16.94	16.98	17.20	17.29	17.49	17.60	17.64
20	16.80	17.02	17.24	17.38	17.21	16.97	16.98	17.25	17.32	17.53	17.60	17.55
25	16.85	17.09	17.34	17.44	17.15	16.94	17.08	17.27	17.32	17.51	17.59	17.48
EOM	16.88	17.15	17.35	17.41	17.14	16.93	17.13	17.28	17.37	17.53	17.62	17.50

WTR YEAR 1991 MAX 17.70 SEP. 15 MIN 16.69 OCT. 4, 5

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-table well; depth 190 ft; casing diameter 8 in, cased to 167 ft.

DATUM.--Elevation of land surface is 167 ft. Measuring point is the top of 1/2 in. hole above 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level, Jan. 26, 1989. Lowest water level measured, 5.26 ft above mean sea level, July 24, 1985.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	8.91	DEC 13	8.89	FEB 7	8.98

HAWAII, ISLAND OF KAUAI--Continued

215843159422901. Local number, 2-5842-03.

LOCATION.--Lat 21°58'43", long 159°42'28", Hydrologic Unit 20070000, 1.0 mi north of Oomano Point and 3.5 mi east of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 27 ft; diameter 15 ft; uncased.

DATUM.--Elevation of land surface is 46 ft. Measuring point is the top of H-Beam on east side of pump base, 22.96 ft above mean sea level. Obtained nearby elevation from Kekaha Sugar Co. Levels run to measuring point on June 15, 1972.

PERIOD OF RECORD.--
Water level: Recording station 1973-79. Occasional measurements 1979 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.45 ft above mean sea level, Jan 16, 1974. Lowest water level measured, 2.58 ft below mean sea level, July 11, 1977.

REMARKS.--Water used for irregation and for cleaning sugar cane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL
FEB 11	5.71

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT					APR				
29...	1230	1060	24.0	240	08...	1310	980	24.0	210
DEC					JUN				
10...	1320	1480	24.5	370	03...	1240	915	24.5	190
FEB					AUG				
11...	1215	700	24.0	120	05...	1120	1000	24.5	220

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 artisian 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.52 ft above mean sea level, Feb. 5, 1990. Lowest water level measured, 8.32 ft below mean sea level, Dec. 16, 1985 and June 19, 1986.

REMARKS.--Well used as a standby for public supply.

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	DATE	WATER LEVEL
OCT 18	8.56	DEC 10	9.01	FEB 7	9.06	APR 11	8.75	JUN 6	8.54	AUG 8	8.72

HAWAII, ISLAND OF KAUAI--Continued

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 tee flange, elevation 303.77 ft, above mean sea level.

REMARKS.--Water level estimated from periodic measurements, December 1990 to February 1991. Water-level records during aquifer test, February 27 to March 4, are not equivalent.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recoarder, October 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.69 ft, Nov. 26, 1985. Lowest measured, 13.39 ft, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.69	14.50	14.33	e14.36	e14.10	13.80	e14.19	14.26	14.14	14.11	13.97	13.89
10	14.64	14.45	14.29	e14.34	e14.00	14.03	e14.20	14.24	14.13	14.10	13.97	13.83
15	14.62	14.42	14.36	e14.32	e13.91	14.01	14.20	14.22	14.16	14.06	13.96	13.81
20	14.61	14.40	e14.40	e14.29	e13.87	14.13	14.19	14.24	14.13	14.04	13.95	13.79
25	14.54	14.32	e14.40	e14.24	e13.83	e14.15	14.21	14.23	14.13	14.00	13.88	13.72
EOM	14.52	14.32	e14.39	e14.18	--	e14.18	14.27	14.22	14.16	13.98	13.90	13.71

WTR YEAR 1991 MAX 14.76 OCT 1, 4 MIN 13.65 SEP 30

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)
FEB												
13...	1035	--	--	420	--	24.5	--	--	--	--	--	--
13...	1130	26.23	--	420	7.7	24.5	--	--	--	55	--	7.7
13...	1210	66.23	--	425	--	24.5	--	--	--	--	--	--
13...	1250	111	--	425	7.8	24.5	--	--	--	55	--	7.8
13...	1310	166	--	425	--	25.0	--	--	--	--	--	--
13...	1350	206	--	415	7.6	25.0	--	--	--	52	--	7.4
27...	0915	--	120	420	--	25.5	--	--	--	--	--	--
27...	0950	--	120	438	--	25.5	--	--	--	--	--	--
27...	1025	--	120	440	--	26.0	--	--	--	--	--	--
27...	1330	--	100	455	7.6	26.0	3.9	--	--	70	--	10
28...	1325	--	120	450	--	26.5	--	--	--	--	--	--
28...	1430	--	120	450	--	26.5	--	--	--	--	--	--
28...	1500	--	120	455	--	26.5	--	--	--	--	--	--
28...	1800	--	120	458	--	26.5	--	--	--	--	--	--
MAR												
01...	0300	--	120	455	--	26.0	--	--	--	--	--	--
01...	0900	--	120	470	--	26.0	--	--	--	--	--	--
01...	1430	--	120	469	--	26.5	--	--	--	--	--	--
01...	2030	--	120	470	--	26.0	--	--	--	--	--	--
01...	2300	--	120	480	--	26.0	--	--	--	--	--	--
02...	0300	--	120	475	--	26.0	--	--	--	--	--	--
02...	1215	--	120	485	--	26.5	--	--	--	--	--	--
02...	1240	--	117	485	7.6	26.5	0.30	--	--	110	--	16
02...	1800	--	120	490	--	26.0	--	--	--	--	--	--
03...	0001	--	120	490	--	26.0	--	--	--	--	--	--
03...	1200	--	120	500	--	26.0	--	--	--	--	--	--
03...	1800	--	120	508	--	26.5	--	--	--	--	--	--
04...	0510	--	120	510	--	26.5	--	--	--	--	--	--
04...	0600	--	120	505	--	26.0	--	--	--	--	--	--
04...	1300	--	115	515	7.7	26.0	0.30	16	<1	130	18	19
04...	1305	--	120	515	--	26.0	--	--	--	--	--	--
04...	1450	--	120	535	--	26.0	--	--	--	--	--	--
04...	1610	--	120	520	--	26.5	--	--	--	--	--	--
04...	1700	--	120	525	--	26.5	--	--	--	--	--	--
04...	1740	--	120	515	--	26.0	--	--	--	--	--	--
04...	1830	--	120	515	--	26.0	--	--	--	--	--	--
04...	2110	--	120	520	--	26.0	--	--	--	--	--	--

< Actual value is known to be less than the value shown.
e Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF KAUAI--Continued

215958159214301 - 2-5921-01 W10 HANAMAULU--Continued

DATE	TIME	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFIDE TOTAL (MG/L AS S)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
FEB											
13...	1130	8.6	74	74	4	1.1	--	<0.5	35	19	0.20
13...	1250	8.7	75	74	4	1.1	--	<0.5	34	19	0.20
13...	1350	8.2	71	74	4	1.0	--	<0.5	35	19	0.20
27...	0915	--	--	--	--	--	--	--	--	25	--
27...	0950	--	--	--	--	--	--	--	--	28	--
27...	1025	--	--	--	--	--	--	--	--	31	--
27...	1330	11	68	67	4	1.1	--	<0.5	39	33	0.20
28...	1325	--	--	--	--	--	--	--	--	37	--
28...	1430	--	--	--	--	--	--	--	--	36	--
28...	1500	--	--	--	--	--	--	--	--	38	--
28...	1800	--	--	--	--	--	--	--	--	38	--
MAR											
01...	0300	--	--	--	--	--	--	--	--	44	--
01...	0900	--	--	--	--	--	--	--	--	45	--
01...	1430	--	--	--	--	--	--	--	--	45	--
01...	2030	--	--	--	--	--	--	--	--	54	--
01...	2300	--	--	--	--	--	--	--	--	48	--
02...	0300	--	--	--	--	--	--	--	--	58	--
02...	1215	--	--	--	--	--	--	--	--	56	--
02...	1240	16	57	54	2	1.3	--	<0.5	43	66	<0.10
02...	1800	--	--	--	--	--	--	--	--	57	--
03...	0001	--	--	--	--	--	--	--	--	59	--
03...	1200	--	--	--	--	--	--	--	--	60	--
03...	1800	--	--	--	--	--	--	--	--	62	--
04...	0510	--	--	--	--	--	--	--	--	64	--
04...	0600	--	--	--	--	--	--	--	--	64	--
04...	1300	20	54	47	2	1.3	112	<0.5	48	67	<0.10
04...	1305	--	--	--	--	--	--	--	--	64	--
04...	1450	--	--	--	--	--	--	--	--	63	--
04...	1610	--	--	--	--	--	--	--	--	68	--
04...	1700	--	--	--	--	--	--	--	--	66	--
04...	1740	--	--	--	--	--	--	--	--	69	--
04...	1830	--	--	--	--	--	--	--	--	66	--
04...	2110	--	--	--	--	--	--	--	--	68	--

DATE	TIME	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
FEB												
13...	1130	64	298	0.41	1.30	<0.010	0.40	1.7	0.230	0.71	--	--
13...	1250	63	298	0.41	1.30	<0.010	0.30	1.6	0.250	0.64	--	--
13...	1350	61	289	0.39	1.30	<0.010	0.30	1.6	0.260	0.64	--	--
27...	1330	66	309	0.42	1.20	<0.010	<0.20	--	0.240	0.61	--	--
MAR												
02...	1240	63	331	0.45	1.10	<0.010	1.4	2.5	0.180	0.46	--	--
04...	1300	72	348	0.47	1.10	<0.010	<0.20	--	0.160	0.40	20	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF KAUAI--Continued

215958159214301 - 2-5921-01 W10 HANAMAULU--Continued

DATE	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	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)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB												
13...	--	--	--	--	--	--	3400	<3	--	--	100	15
13...	--	--	--	--	--	--	2800	8	--	--	130	5
13...	--	--	--	--	--	--	2600	13	--	--	140	15
27...	--	--	--	--	--	--	550	25	--	--	10	8
MAR												
02...	--	--	--	--	--	--	<10	74	--	--	<10	4
04...	<100	<10	<1	4	<1	1	20	7	3	<10	<10	2

DATE	TIME	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALA-CHLOR TOTAL RECOVER (UG/L)	ALDRIN, TOTAL (UG/L)	AME-TRYNE TOTAL	ATRA-ZINE, TOTAL (UG/L)	BENZENE TOTAL (UG/L)
MAR												
04...	1300	<0.10	<1	2	<1	<1	70	<0.20	<0.010	<0.10	<0.10	<0.20

DATE	BROM-ACIL WATER WHLREC (UG/L)	BROMO-FORM TOTAL (UG/L)	BUTA-CHLOR WATER WHLREC (UG/L)	BUTYL-ATE WATER WHLREC (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	CARBOX-IN WATER WHOLE RECOV-ERABLE (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)
MAR												
04...	<0.2	<0.20	<0.1	<0.1	<0.20	<0.2	<0.1	<0.01	<0.20	<0.20	<0.20	<0.20

DATE	CHLORO-FORM TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	CYAN-AZINE TOTAL (UG/L)	CYCLO-ATE WATER WHOLE RECOV-ERABLE (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEETHYL ATRA-ZINE, WATER, WHOLE, TOTAL (UG/L)	DEF TOTAL (UG/L)	DE-ISO PROPYL ATRAZIN WATER, WHOLE, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
MAR											
04...	<0.20	<0.20	<0.20	<0.1	<0.010	<0.010	<0.010	<0.2	<0.01	<0.2	<0.01

DATE	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)
MAR											
04...	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF KAUAI--Continued

215958159214301 - 2-5921-01 W10 HANAMAULU--Continued

DATE	DI-ELDRIN TOTAL (UG/L)	DIPHEN-AMID WATER WHOLE RECOV-ERABLE (UG/L)	DI-SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L	HEPTA-CHLOR, TOTAL (UG/L)
MAR											
04...	<0.010	<0.1	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.20	<0.01	<0.010

DATE	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	HEXAZI-NONE WATER WHOLE RECOV-ERABLE (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	METOLA-CHLOR WATER WHOLE TOT.REC (UG/L)
MAR											
04...	<0.010	<0.2	<0.010	<0.01	<0.01	<0.20	<0.20	<0.20	<0.01	<0.01	<0.2

DATE	TIME	METRI-BUZIN WATER WHOLE TOT.REC (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHENOLS TOTAL (UG/L)	PHORATE TOTAL (UG/L)	PROME-TONE TOTAL (UG/L)	PROME-TRYNE TOTAL (UG/L)	PROPA-CHLOR WATER WHOLE RECOV. (UG/L)
FEB												
13...	1130	--	--	--	--	--	--	4	--	--	--	--
13...	1350	--	--	--	--	--	--	2	--	--	--	--
27...	1330	--	--	--	--	--	--	<1	--	--	--	--
MAR												
02...	1240	--	--	--	--	--	--	<1	--	--	--	--
04...	1300	<0.1	<0.01	<0.10	<0.01	<0.1	<0.1	1	<0.01	<0.2	<0.1	<0.1

DATE	TIME	PRO-PAZINE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	SIMA-ZINE TOTAL (UG/L)	SIME-TRYNE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	TER-BACIL WATER WHOLE RECOV. (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)
MAR												
04...	1300	<0.10	<0.01	<0.10	<0.1	<0.2	<0.2	<0.20	<0.20	<0.20	<1	<0.20

DATE	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TRI-THION, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	TRI-FLURA-LIN TOTAL RECOVER (UG/L)	VER-NOLATE WATER WHOLE RECOV. (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
MAR											
04...	<0.20	<0.2	<0.20	<0.20	<0.20	<0.01	<0.01	<0.10	<0.1	<0.20	<0.2

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

HAWAII, ISLAND OF KAUAI--Continued

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 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, Dec. 08, 1989. Lowest water level measured, 213.17 ft above mean sea level, Jun. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	216.23	DEC 14	214.57	FEB 20	214.46	APR 12	219.68	JUN 7	213.17	AUG 2	214.82
NOV 1	215.72	FEB 8	216.55								

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					JUN				
19...	0730	180	23.0	20	07...	0730	190	23.0	19
DEC					07...	0800	250	25.0	17
14...	0730	180	22.0	20	AUG				
FEB					02...	0735	185	24.0	19
08...	0730	190	21.5	20					
APR									
12...	0730	190	22.0	20					

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.43 ft above mean sea level, Jan. 14, 1988. Lowest water level measured 6.05 ft below mean sea level, Sept. 8, 1980.

REMARKS.--Water is used for public supply.

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	10.06	FEB 7	10.26	APR 11	9.91	JUN 6	9.76	AUG 8	9.53

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 18...	1045	725	24.0	160	JUN 06...	1150	260	23.5	22
DEC 13...	1010	165	22.0	18	AUG 01...	1045	440	23.5	73

HAWAII, ISLAND OF KAUAI--Continued

215937159434201. Local number, 2-5943-01.

LOCATION.--Lat 21°59'37", long 159°43'42", Hydrologic Unit 20070000, 2.2 mi northeast of Kokole Point and 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well. Well is a 45 degree inclined Maui type shaft from 59 ft to 16 ft elevation and a vertical pump 10 ft in diameter and 15 ft deep with a lateral tunnel extending into the hillside at the bottom of the shaft.

DATUM.--Elevation of land surface is 60 ft. Measuring point is the top of I-beam supporting pump platform, 13.61 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.62 ft above mean sea level, Oct. 16, 1989. Lowest water level measured, 0.07 ft above mean sea level, Sept 17, 1979.

REMARKS.--Water used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	8.97	DEC 10	9.44	FEB 11	9.69	APR 8	8.98	JUN 3	8.58	AUG 5	8.76

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT 29...	0820	920	24.0	180	APR 08...	0850	930	24.0	150
DEC 10...	0830	855	24.0	170	JUN 03...	0840	860	24.0	160
FEB 11...	0830	825	24.0	150	AUG 05...	0815	1080	24.0	220

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.--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, Jan. 17, 1969; lowest, 2.81 ft below mean sea level, Aug. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	e0.70	e0.60	e1.30	2.34	2.41	2.36	2.82	2.74	2.61	2.46	2.15	2.13
10	e0.65	e0.60	e1.50	2.26	2.49	2.41	3.05	2.79	2.74	2.42	2.27	2.27
15	e0.65	e0.80	e1.50	2.27	2.54	2.36	2.90	2.77	2.63	2.41	2.16	2.11
20	e0.70	e1.00	e1.60	2.22	2.54	2.66	2.84	2.66	2.60	2.42	2.34	2.00
25	e0.55	e1.30	e2.10	2.21	2.58	2.96	2.80	2.61	2.47	2.39	2.10	2.19
EOM	e0.55	e1.30	e2.30	2.35	2.53	2.87	2.79	2.63	2.46	2.23	2.14	2.06

WTR YEAR 1991 MAX 3.18 APR 10 MIN e0.50 NOV 8

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), Sept. 2, and Oct. 19, 1977.

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
DEC 20	17.75	JAN 10	18.02	APR 8	18.44	JUN 11	18.50

e Estimated

212123157535501. Local number, 3-2153-05.

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.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in. PVC casing, 37.90 ft, revised, above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, March 1981 to current year.
WATER QUALITY: 1985 to December 1986.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level, Jan. 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	18.39	18.22	18.83	19.74	19.91	20.05	e20.40	20.53	20.26	20.08	19.82	19.62
10	18.28	18.18	18.93	19.69	19.97	20.24	20.65	20.48	20.26	20.06	19.91	19.60
15	18.30	18.39	18.95	19.66	19.99	20.22	20.67	20.34	20.27	19.96	19.79	19.62
20	18.29	18.61	19.10	19.75	20.13	20.42	20.64	20.29	20.19	19.98	19.68	19.51
25	18.19	18.85	19.50	19.80	20.09	20.53	20.59	20.27	20.15	19.85	19.68	19.55
EOM	18.19	18.88	19.66	19.95	20.18	20.66	20.53	20.25	20.13	19.86	19.71	19.52

WTR YEAR 1991 MAX 20.84 APR 9, 11, 13 MIN 18.01 NOV 8

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-inch 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.-- 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, Jan. 16, 1928; lowest, 12.97 ft above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.26	15.10	15.75	16.68	16.82	16.93	17.39	17.40	17.19	17.08	16.72	16.61
10	15.16	15.14	15.84	16.66	16.90	17.06	17.61	17.46	17.24	17.00	16.74	16.58
15	15.17	15.27	15.95	16.68	16.93	17.00	17.52	17.37	17.24	16.95	16.64	16.59
20	15.09	15.59	16.08	16.74	17.05	17.11	17.45	17.33	17.18	16.93	16.70	16.44
25	15.11	15.83	16.45	16.65	17.09	17.47	17.39	17.27	17.09	16.84	16.59	16.45
EOM	15.13	15.71	16.65	16.74	17.02	17.54	17.40	17.22	17.08	16.75	16.57	16.51

WTR YEAR 1991 MAX 17.63 APR 10 MIN 15.01 NOV 7

e Estimated

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, November 1982 to July 1983, March 1984 to November 30, 1987. 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, Jan. 4, 1983; lowest 14.01 ft above mean sea level, Sept. 14, 1985.

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
JAN 10	18.67	APR 11	19.50	APR 19	19.30	JUN 11	19.13

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
JUL 18...	1315	615	25.0	--

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-inch casing, 666.62 ft. revised, 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, Apr. 5, 1989; lowest 16.74 ft above mean sea level, Sept.14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 20	21.05	JAN 29	22.11	AUG 13	22.70
JAN 10	21.87	APR 19	23.52		

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 x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point: Top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--Water-level recorder is located on the pump chamber floor at the bottom of shaft. Water from this well is used for public supply.

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, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	279.22	279.32	278.89	278.37	278.77	278.85	278.57	278.92	279.45	279.35	279.59	280.15
10	279.14	278.63	278.34	278.75	278.37	*278.59	278.61	278.63	279.06	279.71	279.96	280.05
15	278.77	278.94	278.44	278.76	278.87	*278.16	278.33	278.34	279.13	279.78	279.74	279.88
20	278.78	278.78	278.75	278.63	278.65	278.69	278.79	278.40	279.32	279.85	279.63	279.77
25	279.07	278.58	278.82	278.87	*278.08	278.62	278.80	278.83	279.48	279.97	279.79	280.06
EOM	278.88	278.86	278.44	278.81	*278.60	278.65	278.85	279.26	279.56	279.20	279.95	280.14

* Taken from operator's log book at Schofield shaft. Operators read the staff gage three a day at about midnight, 0830 hours, and 1630 hours. No record on these days, recorder malfunctioned.
Note: well being pumped throughout the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
23...	0900	180	22.0	18
JAN				
02...	1100	172	21.0	18
21...	0935	175	22.0	18
FEB				
21...	0935	175	22.0	18
APR				
19...	0930	175	22.0	18
JUL				
09...	0920	175	21.5	18
AUG				
12...	0835	175	21.5	18

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.
WATER QUALITY: 1935 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Mar. 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
JAN					MAY				
23...	1400	260	22.5	--	21...	1445	260	23.0	34
FEB					SEP				
22...	1500	260	22.5	34	26...	1435	255	22.5	33

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 inch, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 12-inch stilling well, 20.53 ft above mean sea level.

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 current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 19.98 ft above mean sea level, Jan. 5, 1969; lowest 16.08 ft above mean sea level, Aug.6, 1929.

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
OCT 12	19.13	JAN 4	19.27	FEB 7	19.22	AUG 8	19.24

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 12...	1155	750	21.5	--	FEB 07...	1055	750	21.5	--
JAN 04...	1200	750	21.5	--	AUG 08...	1350	750	22.0	--

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of UH 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, Nov. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 23	14.07	MAR 18	13.84	MAY 21	14.61	SEP 24	15.81

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 x 6 ft, depth 22 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point: Top of 2 x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

REMARKS.-- Water-quality records for 1970-1973 are available in files of district office.

PERIOD OF RECORD.-- Water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft above mean sea level, Feb. 8, 1977.

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	DATE	WATER LEVEL
OCT 15	4.32	FEB 5	4.51	APR 22	4.34	MAY 6	4.18	JUL 29	4.34	AUG 26	4.38
DEC 6	4.67	MAR 13	4.70								

HAWAII, ISLAND OF MOLOKAI--Continued

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 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 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, Jan. 19, 1950; lowest measured, 2.09 ft above mean sea level, Sept. 16, 1975.

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	DATE	WATER LEVEL
OCT 15	3.41	FEB 5	3.59	APR 22	3.50	JUN 5	3.37	JUL 26	3.53	AUG 26	3.63
DEC 6	3.66	MAR 13	3.57								

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT 15...	1355	310	20.5	APR 22...	1600	320	20.5
DEC 06...	1415	290	20.5	JUN 05...	1310	320	20.5
FEB 05...	1150	300	20.5	JUL 26...	1345	325	20.0
MAR 13...	1215	300	20.5	AUG 26...	1415	320	20.5

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 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, 37.37 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply.

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 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.78 ft above mean sea level, Feb. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	2.05	FEB 5	2.78	APR 25	1.87	JUN 5	1.91	JUL 29	1.97	AUG 26	2.11
DEC 4	2.04	MAR 13	2.00								

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT 15...	1500	300	23.0	APR 25...	0750	300	22.5
DEC 04...	1545	300	22.5	JUN 05...	1345	310	23.0
FEB 05...	1340	290	22.5	JUL 29...	1440	320	22.0
MAR 13...	1300	260	22.5	AUG 26...	1455	310	23.0

HAWAII, ISLAND OF MOLOKAI--Continued

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, Jan. 20, 1969; lowest measured, 1.60 ft above mean sea level, Dec. 5, 1964.

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	DATE	WATER LEVEL
OCT 16	2.83	FEB 8	2.87	APR 25	2.68	JUN 6	2.69	JUL 29	2.78	AUG 29	2.88
DEC 7	2.83	MAR 15	2.84								

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
16...	1440	310	23.5	26	25...	1355	280	23.5	14
DEC					JUN				
07...	1220	230	24.0	14	06...	1545	300	23.5	18
FEB					JUL				
08...	1030	280	23.5	14	29...	1545	320	24.0	21
MAR					AUG				
15...	0850	175	22.5	16	29...	1115	340	23.5	23

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", long 157°00'05", Hydrologic Unit 20050000, 2.3 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 1056 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, Apr. 27, 1988; lowest measured, 976.23 ft below land-surface datum, Sept. 10, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	975.44	FEB 8	975.28	APR 25	975.34	JUL 30	975.50

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 current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, Jun. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	2.45	JAN 9	2.04	APR 3	1.29	MAY 15	0.77	JUN 26	1.02	AUG 16	2.32
NOV 21	2.14	FEB 20	1.61								

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, Aug. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	0.10	JAN 24	0.01	APR 27	-0.01	JUL 5	-0.03

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, 594.75 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971, May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft above mean sea level, Jan. 27, 1977.

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	DATE	WATER LEVEL
OCT 29	4.43	JAN 28	4.45	APR 12	4.25	MAY 28	4.00	JUL 08	4.09	SEP 6	4.31
DEC 11	4.52	MAR 5	4.42								

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, Nov. 30, 1983; lowest measured, 4.74 ft above mean sea level, Mar. 16, 1977.

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	DATE	WATER LEVEL
OCT 5	5.50	JAN 22	5.48	APR 11	5.27	MAY 21	5.05	JUL 03	5.19	SEP 3	5.29
NOV 15	5.49	FEB 27	5.45								

HAWAII, ISLAND OF MAUI--Continued

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 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, Jan. 12, 1980; lowest measured, 3.05 ft above mean sea level, Mar. 5, 6, 1977.

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	DATE	WATER LEVEL
OCT 26	4.09	JAN 24	4.15	APR 9	3.90	MAY 21	3.66	JUL 5	3.71	SEP 3	3.18
NOV 19	4.10	FEB 27	4.11								

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, Oct. 13, 1982; lowest measured, 11.36 ft above mean sea level, Jan. 27, 1976.

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	DATE	WATER LEVEL
OCT 29	15.76	JAN 28	16.18	APR 12	16.00	MAY 28	15.13	JUL 8	15.05	SEP 6	15.19
DEC 11	15.53	MAR 5	14.86								

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 south- east 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, Jul. 15, 1987; lowest measured, 13.48 ft above mean sea level, Apr. 8, 1985.

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	DATE	WATER LEVEL
OCT 29	13.75	JAN 28	13.83	APR 12	13.65	MAY 28	13.52	JUL 8	13.52	SEP 6	13.57
DEC 11	13.78	MAR 5	13.73								

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 affected 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	5.26	DEC 11	5.31	JAN 28	5.52	MAR 5	5.35

HAWAII, ISLAND OF MAUI--Continued

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, Dec. 31, 1982; lowest measured, 14.40 ft above mean sea level, Sep. 04, 1991.

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	DATE	WATER LEVEL
OCT 24	16.39	JAN 23	16.90	APR 11	16.65	MAY 23	15.45	JUN 27	14.47	SEP 4	14.40
NOV 28	16.38	MAR 4	16.95								

HAWAII, ISLAND OF MAUI--Continued

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. revised, 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, 17.18 ft above mean sea level, Sept. 30, 1989; lowest measured, 13.04 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.21	13.57	14.20	15.02	15.16	15.04	14.26	13.74	13.15	12.48	12.09	12.09
10	14.11	13.48	14.39	15.01	15.11	15.03	14.67	13.59	13.07	12.40	12.25	11.92
15	13.91	13.76	14.35	15.01	15.11	14.94	14.57	13.90	12.94	12.39	12.35	e12.24
20	13.80	13.93	e14.72	15.97	15.15	15.12	14.44	13.79	12.82	12.44	12.19	e12.93
25	13.65	14.12	e14.89	14.94	15.18	15.13	14.29	13.56	12.69	12.35	12.24	e13.21
EOM	13.62	14.10	15.05	15.15	15.15	14.94	14.11	13.29	12.58	12.29	12.19	e13.28

WTR YEAR 1991 MAX 15.29 ft Feb. 22 MIN 11.88 ft Sept. 10-12

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE LAB (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC				
11...	j1000	200	204	14
11...	j1020	400	501	130
11...	j1045	500	479	130
11...	j1120	600	561	150
11...	j1150	675	1970	520
11...	j1235	750	5540	1800
11...	j1305	800	42200	16000
11...	j1340	825	47100	18000
11...	j1405	850	48900	18000
11...	j1445	900	50200	19000
11...	j1515	1000	53000	20000
APR				
03...	j0910	200	217	12
03...	j0930	400	506	120
03...	j0955	500	429	120
03...	j1020	600	613	150
03...	j1045	675	1940	540
03...	j1110	750	5930	1900
03...	j1140	800	40700	16000
03...	j1210	825	45200	18000
03...	j1235	850	46500	18000
03...	j1310	900	47800	19000
03...	j1350	1000	49000	19000
JUN				
13...	j0930	200	217	12
13...	j0953	400	214	12
13...	j1015	500	566	130
13...	j1040	600	696	180
13...	j1100	675	2020	560
13...	j1135	750	6130	2100
13...	j1215	800	40600	16000
13...	j1240	825	45000	18000
13...	j1305	850	45200	18000
13...	j1340	900	47200	19000
13...	j1420	1000	48000	19000
SEP				
04...	j1030	200	213	10
04...	j1055	400	212	10
04...	j1115	500	568	130
04...	j1140	600	721	180
04...	j1200	675	2100	740
04...	j1230	750	7450	2400
04...	j1300	800	41700	15000
04...	j1330	825	47600	18000
04...	j1405	850	48400	18000
04...	j1420	900	50000	19000
04...	j1500	1000	51000	19000

e Estimated
j Collected by non-USGS agency.

HAWAII, ISLAND OF MAUI--Continued

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, Jan. 2, 1983; lowest measured, 10.98 ft above mean sea level, Aug. 29, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.56	12.96	13.86	14.76	14.89	14.72	14.37	13.16	12.49	11.66	11.22	11.25
10	13.44	12.87	14.08	14.72	14.81	14.74	14.26	12.99	12.38	11.60	11.48	11.09
15	13.23	13.24	13.98	14.72	14.82	14.65	14.13	13.39	12.20	11.60	11.57	11.62
20	13.12	13.46	14.36	14.67	14.86	14.88	13.96	13.21	12.10	11.65	11.39	12.47
25	13.01	13.70	14.69	14.58	14.92	14.88	13.77	12.90	11.95	11.55	11.40	12.77
EOM	13.00	13.70	14.81	14.86	14.87	14.64	13.55	12.64	11.77	11.48	11.37	12.86

WTR YEAR 1991 MAX 15.04 ft Feb. 22 MIN 10.98 ft Aug. 29.

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, Dec. 6, 1982; lowest measured, 14.51 ft above mean sea level, Oct. 11, 1985.

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	DATE	WATER LEVEL
OCT 24	15.87	JAN 23	16.25	APR 11	16.09	MAY 23	15.58	JUN 27	15.10	SEP 4	14.73
NOV 28	15.81	MAR 4	16.32								

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, 12.05ft above mean sea level, Oct. 22, Nov. 2, 10-11, 1989. Lowest water level measured, 9.15ft Sept. 17, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	10.13	9.94	9.86	10.14	10.28	10.26	10.10	9.86	9.63	9.40	9.30	9.25
10	10.11	9.91	9.87	10.21	10.30	10.24	10.13	9.84	9.57	9.39	9.33	9.24
15	10.05	9.90	9.91	10.25	10.25	10.20	10.10	9.75	9.51	9.35	9.34	9.21
20	10.05	9.91	9.89	10.21	10.26	e10.33	10.04	9.73	9.49	9.33	9.29	9.25
25	10.00	9.91	10.02	10.26	10.32	e10.32	9.98	9.70	9.44	9.30	9.25	9.38
EOM	9.95	9.90	10.10	10.26	10.35	e10.14	9.91	9.66	9.43	9.30	9.25	9.44

WTR YEAR 1991 MAX 10.39 ft Mar. 1 MIN 9.15 ft Sept. 17

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar 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, 257.34 ft above mean sea level.

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 current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, Sept. 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 1990 TO SEPTEMBER 1991
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.21	3.20	-	-	3.17	3.05	2.95	2.94	3.04	3.18	3.25	3.27
10	3.17	3.21	-	-	3.18	3.01	3.09	3.01	3.00	3.15	3.36	3.29
15	3.13	3.20	-	-	3.09	3.02	3.04	2.91	3.00	3.19	3.35	3.29
20	3.21	3.23	-	-	3.14	3.09	2.98	2.90	3.10	3.19	3.26	3.26
25	3.19	3.23	-	3.21	3.23	3.00	2.95	2.89	3.05	3.15	3.24	3.26
EOM	3.15	-	-	3.22	3.19	2.96	2.90	3.00	3.15	3.21	3.23	3.22

WTR YEAR 1991 MAX 3.48ft Aug. 9-11, MIN 2.73ft May 16.

No G.H. record Nov. 28 - Jan. 22.

e Estimated (Based on station Waiehu Monitor Well 6-5430-05).

HAWAII, ISLAND OF 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: 1-in. hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of 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, Oct. 19, 1978; lowest measured, 0.21 ft above mean sea level, June 19, 1989.

REVISIONS.--The units for the minimum water level for the period of record reported for water years 1984 to 1990 have been revised to ft above mean sea level.

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	DATE	WATER LEVEL
DEC 12	1.32	FEB 1	1.55	MAR 18	0.46	MAY 29	0.52	JUL 8	1.21	SEP 23	0.79

HAWAII, ISLAND OF HAWAII--Continued

192728154530101. Local number, 8-2783-01.

LOCATION.--Lat 19°27'28", long 154°53'01", Hydrologic Unit 20010000, 0.8 mi southeast of Pawai crater in Keahialaka, and 1.9 mi north of Opihikao road junction, south Pahoa. Owner: State of Hawaii.

AQUIFER.--Hilina Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 319 ft, casing diameter 8 in., cased to 279 ft, perforated from 279 to 319 ft.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point: Top of casing, 273.00 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1962, 1972 to current year.

REVISED RECORDS.--WDR HI-91-1: 1984-90(The maximum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.55 ft above mean sea level, July 11, 1977; lowest measured, 0.97 ft above mean sea level, July 26, 1976.

CORRECTIONS.--The maximum water level for the period of record reported for water years 1984 to 1990 is 3.55 ft above mean sea level, July 11, 1977; the previously published figure was not the maximum.

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	DATE	WATER LEVEL
DEC 4	3.20	FEB 5	2.88	MAR 12	2.52	MAY 30	2.20	JUL 9	2.03	SEP 20	2.21

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
29...	1050	5000	56.0	1600
DEC				
04...	1105	4600	--	1400
FEB				
05...	1110	11200	53.0	3600
MAR				
12...	1020	5100	52.0	1600
MAY				
30...	1440	13000	55.0	4100
JUL				
09...	1000	14300	55.0	4800
SEP				
20...	0920	14000	54.0	4800

HAWAII, ISLAND OF HAWAII--Continued

193017154502101. Local number, B-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, Mar. 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 1990 TO SEPTEMBER 1991

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 4	4.59	MAR 12	4.54	SEP 20	4.24

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB					MAY				
05...	1200	960	25.0	120	29...	1405	910	25.0	100

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, Nov. 27, 1990; lowest measured, 15.99 ft above mean sea level, Apr. 25, 1978, Mar. 10, 1986.

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	DATE	WATER LEVEL
NOV 27	27.76	FEB 5	22.54	MAR 15	21.17	MAY 30	21.02	JUL 9	19.98	SEP 23	20.16
DEC 4	25.64										

194222155035101. Local number, 8-4203-04.

LOCATION.--Lat 19°42'22", long 155°03'51", Hydrologic Unit 20010000, 0.5 mi east of Hawaii Technical School, and 1.0 mi south of Hilo airport terminal. Owner: Hawaii Electric Light Company.

AQUIFER.--Kahuku Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 201 ft, casing diameter 16 in., cased to 63 ft.

DATUM.--Elevation of land-surface datum is 47 ft. Measuring point: Top of 3-in. nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.34 ft above mean sea level, Nov. 26, 1990; lowest measured, 5.80 ft above mean sea level, Mar. 12, 1986.

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	DATE	WATER LEVEL
NOV 26	11.34	FEB 6	7.91	MAR 25	9.64	MAY 31	7.41	JUL 10	7.22	SEP 24	7.64
DEC 5	9.91										

HAWAII, ISLAND OF HAWAII--Continued

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, casing 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, 4.58 ft above mean sea level, Oct. 23, 1978; lowest measured, 1.38 ft above mean sea level, Sep. 28, 1979.

REVISIONS.--The water level data for several water years have been revised, as shown in the tables below. They supersede figures published in data reports for 1976 to 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	a3.59	FEB 3	a3.17	MAY 27	a3.21	AUG 2	a3.46	SEP 20	a3.67

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	3.70	MAR 15	3.44	MAY 2	3.30	JUN 14	3.32	AUG 8	3.82

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	3.98	MAR 14	3.85	APR 28	3.90	JUN 28	4.10	AUG 23	4.37

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	4.58	JAN 15	4.14	APR 4	4.43	JUN 14	3.94	JUL 23	3.84	SEP 28	1.38

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	4.02	JAN 6	4.25	FEB 27	4.07	APR 18	4.02	JUN 17	3.66	SEP 15	1.85

a well being pumped

195947155485801 - 8-5948-01 HAPUNA PARK--Continued

The maximum and minimum water levels for many water years have been revised, as shown in the table below. They supersede figures published in data reports for 1976 to 1990.

WATER YEAR	DATE	MAXIMUM WATER LEVEL (FT)	DATE	MINIMUM WATER LEVEL (FT)
1976	Sep. 20, 1976	3.67	Mar. 20, 1973	2.82
1977	Aug. 8, 1977	3.82	Mar. 20, 1973	2.82
1978	Aug. 23, 1978	4.37	Mar. 20, 1973	2.82
1979	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1980	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1981	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1982	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1983	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1984	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1985	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1986	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1987	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1988	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1989	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38
1990	Oct. 23, 1978	4.58	Sep. 28, 1979	1.38

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 11	4.11	FEB 13	4.27	APR 23	4.33	JUL 1	3.94	SEP 19	4.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC					JUL				
11...	1255	1850	26.0	480	01...	1520	1800	26.0	470
FEB					SEP				
13...	1150	1800	26.0	470	19...	1245	1800	26.0	480
APR									
23...	1000	1820	26.0	480					

HAWAII, ISLAND OF HAWAII--Continued

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 982.8 ft, revised, 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, 4.82 ft above mean sea level, Sept. 20, 1976.

CORRECTIONS.--The station id number reported for water years 1975 to 1990 have been revised to 200132155471101; the previously published station id number of 200132155471001 is in error.

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
NOV 2	5.68	JAN 25	5.65	MAR 13	5.61	JUN 12	5.40	SEP 19	5.35

201603155521801. Local number, 8-7652-01.

LOCATION.--Lat 20°16′03″, long 155°52′18″, Hydrologic Unit 20010000, 0.3 mi west of Upolu Point Airfield, 3.1 mi northwest of Hawi, and 1.9 mi west of Hoea Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-in. steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1973 to current year.
WATER QUALITY: 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1988-90(The maximum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft above mean sea level, July 9, 1975, Jan. 16, 1980.

REVISIONS.--The maximum water level for the period of record reported for water years 1988 to 1990 have been revised to 3.09 ft above mean sea level, Aug. 22, 1974.

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 10	2.48	FEB 7	2.43	MAR 22	2.20	JUN 12	1.60	AUG 30	2.95

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC					JUN				
10...	1140	2200	21.0	580	12...	1215	2200	21.0	600
FEB					AUG				
07...	1015	2250	21.0	590	30...	0955	2100	21.0	580
MAR									
22...	1030	2200	21.0	590					

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI					
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	10-09-90	1420	825	26.0	150
				12-19-90	0900	790	23.5	150
				02-08-91	1420	820	25.5	140
				04-11-91	1345	810	25.5	140
				06-05-91	1400	810	25.5	140
				08-14-91	1315	815	26.5	140
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	10-29-90	1110	910	21.5	200
				12-10-90	1140	700	22.0	140
				02-12-91	1230	520	22.0	120
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-29-90	0950	775	24.0	150
				12-10-90	1000	750	23.0	150
				02-11-91	1010	990	24.0	160
				04-08-91	1000	800	23.5	160
				06-03-91	1010	780	24.0	140
				08-05-91	0915	780	24.0	150
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	10-19-90	1000	220	24.5	20
				12-14-90	0950	220	24.5	21
				02-08-91	0930	275	24.0	22
				04-12-91	0930	225	24.0	20
				06-07-91	0950	255	24.0	21
				08-02-91	0900	255	24.0	21
221141159252501	2-1125-01 N1 KILAUEA	22 11 41 N	159 25 25 W	10-19-90	1100	150	25.0	15
				02-08-91	1000	155	20.5	14
				06-07-91	1030	190	23.0	18
221141159252502	2-1125-02 N2 KILAUEA			12-14-90	1025	170	22.0	17
				04-12-91	1000	170	22.0	15
				08-02-91	0940	150	25.5	14
221151159265001	2-1126-02 KALIHIWAI	22 11 51 N	159 26 50 W	10-09-90	0930	370	23.0	27
				02-15-91	0740	215	22.5	24
				06-13-91	0750	200	22.5	26
221201159293401	2-1229-03 W73 HANALE	22 12 01 N	159 29 34 W	10-19-90	1305	230	23.5	29
				12-14-90	1100	230	23.5	28
				02-08-91	1050	230	25.0	28
				06-07-91	1130	235	23.5	28
				08-02-91	1020	235	23.0	28
215455159274201	2-5427-02 W16B KOLOA	21 54 55 N	159 27 42 W	10-18-90	0830	230	23.0	26
				12-13-90	0815	225	22.5	26
				02-07-91	0830	230	22.5	26
				06-06-91	0850	225	22.5	24
				08-01-91	0900	230	23.0	25
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-18-90	1320	240	23.0	29
				12-13-90	1300	245	23.0	29
				02-07-91	1330	250	23.0	29
				08-01-91	0915	250	23.0	28
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	10-18-90	1330	220	23.5	24
				12-13-90	1340	220	23.0	25
				02-07-91	1345	225	23.5	26
				04-11-91	1200	220	23.0	24
				06-06-91	1330	220	23.0	24
				08-05-91	1430	225	23.5	26
215635159355001	2-5635-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-10-90	1200	650	23.0	140
				12-17-90	0915	680	23.0	140
				02-11-91	1350	950	23.0	180
				04-22-91	0930	640	23.0	120
				06-05-91	1000	675	23.0	130
				08-05-91	1315	655	23.5	120

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued								
215854159424601	2-5842-02 S11 KEKAHA	21 58 54 N	159 42 46 W	10-29-90	1200	630	24.0	99
				12-10-90	1250	660	24.5	110
				02-11-91	1200	850	24.5	110
				04-08-91	1250	660	24.5	100
				06-03-91	1215	670	25.0	110
				08-05-91	1145	660	27.5	98
				08-05-91	1150	675	24.5	100
215901159235301	2-5923-01 KILOHANA A	21 59 01 N	159 23 53 W	10-19-90	0745	250	25.0	19
				12-14-90	0810	245	25.0	21
				02-08-91	0800	200	21.5	21
				04-12-91	0800	175	22.5	19
				08-02-91	0810	175	24.0	20

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF OAHU						
211646157465201	3-1646-01 W1-B WAIAL	21 16 46 N	157 46 52 W	01-11-91	0844	615	21.0	--
				04-12-91	1355	635	21.5	--
				06-13-91	1355	750	21.0	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	01-11-91	1535	31000	23.5	12000
				04-12-91	1435	31000	23.5	12000
				06-12-91	1525	32500	24.0	13000
				08-09-91	0750	35000	24.0	12000
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	01-11-91	1515	10000	23.5	--
				04-12-91	1450	10300	23.5	--
				06-12-91	1530	10400	24.0	--
				08-09-91	0755	11000	24.0	--
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	01-14-91	0825	1100	23.5	240
				04-12-91	0900	1100	23.5	240
				06-12-91	0900	1110	23.0	240
				08-09-91	0900	1150	23.0	240
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	01-11-91	0915	430	21.5	71
				04-11-91	1420	440	21.5	88
				06-12-91	1440	450	21.5	90
				08-08-91	1115	460	21.5	88
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	01-14-91	0935	1090	22.0	--
				04-12-91	1230	1000	21.5	--
				06-12-91	1140	1060	21.5	--
212238157561102	3-2256-12 W187-C	21 22 39 N	157 56 09 W	01-10-91	1135	735	23.0	200
				01-11-91	1425	780	23.5	210
				04-12-91	1125	770	23.5	200
				06-12-91	1045	785	23.0	220
				08-09-91	1100	840	23.5	220
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	01-11-91	1240	840	22.5	--
				04-11-91	1135	810	22.5	--
				06-11-91	1320	840	22.0	--
212358158010901	3-2301-09,10 W247-1J	21 23 58 N	158 01 09 W	01-11-91	1140	700	22.5	--
				04-11-91	1045	640	22.5	--
				06-11-91	1330	720	22.0	--
212342157584301	3-2358-22 W204-4	21 23 42 N	157 58 43 W	01-11-91	1220	1600	20.5	--
				04-11-91	1210	1250	21.0	--
				06-11-91	1245	2010	20.0	--
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	01-11-91	1210	3200	20.5	--
				04-11-91	1215	3550	20.5	--
				06-11-91	1250	4200	20.0	--
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	01-11-91	1200	2800	22.0	--
				04-11-91	1150	2950	22.5	--
				06-11-91	1255	2940	22.0	--
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	02-01-91	--	190	21.0	--
				02-01-91	1130	190	21.0	19
				09-26-91	1300	190	20.5	18
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	02-01-91	1300	135	23.0	18
				02-01-91	1520	135	23.0	--
				05-28-91	1130	135	23.0	18
				09-26-91	1340	180	23.5	18
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	01-11-91	1325	280	21.5	--
				04-11-91	1250	270	21.5	--
				06-11-91	1225	273	21.0	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	01-11-91	1100	327	23.0	46
				04-12-91	1045	330	22.5	49
				06-12-91	1000	335	22.5	46
				08-09-91	1000	352	22.5	49

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	01-29-91	1320	160	21.5	17
				04-18-91	0800	160	21.5	18
				06-11-91	1500	160	22.0	18
				08-13-91	1320	160	21.5	18
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	10-23-90	1405	370	23.0	--
				01-07-91	1245	380	22.5	--
				02-12-91	0920	380	22.5	--
				04-16-91	1045	385	22.5	--
				06-06-91	1430	390	22.5	--
				08-09-91	1000	390	22.5	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	12-12-90	1310	700	25.5	--
				02-04-91	1355	710	24.5	--
				04-12-91	1345	700	25.0	--
				06-06-91	1230	700	25.5	--
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	08-07-91	1415	200	22.5	21
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	10-09-90	1350	265	21.0	24
				12-12-90	1300	270	21.0	22
				04-12-91	0930	275	21.0	26
				08-09-91	1255	265	21.0	26
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	10-09-90	1420	910	23.5	210
				12-12-90	1330	900	23.5	210
				02-04-91	1415	910	23.0	210
				04-12-91	1425	910	23.0	210
				06-06-91	1335	910	23.0	210
				08-09-91	1410	910	23.0	210
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	01-23-91	1410	870	23.0	200
				04-02-91	0900	850	22.5	--
				05-21-91	1500	850	23.0	190
				09-26-91	1510	850	22.5	210
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	10-05-90	1420	440	22.5	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	01-04-91	1000	1500	23.0	--
				02-07-91	1120	1500	23.0	--
				08-13-91	1230	1500	23.0	--
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	10-12-90	1020	9900	24.5	3000
				04-18-91	1400	3700	24.5	850
				08-08-91	1405	5600	25.0	1500
213512158061601	3-3506-03 TO 04 W329 A-B W	21 35 12 N	158 06 16 W	10-10-90	1125	530	22.0	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	10-10-90	1420	2200	21.5	--
				02-15-91	1030	1700	21.5	--
				04-11-91	1120	1670	21.0	--
				08-12-91	1100	2000	21.0	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	10-10-90	1410	1520	21.5	--
				01-04-91	1405	1500	21.0	--
				02-15-91	1040	1430	21.5	--
				04-11-91	1135	1500	21.5	--
				08-12-91	1115	1480	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	02-22-91	1515	240	21.0	35
				03-18-91	1515	240	21.0	--
				05-21-91	1425	240	21.5	35
				09-24-91	1440	255	21.0	35
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	03-18-91	1505	530	21.0	--
				05-21-91	1400	530	21.0	--
				09-24-91	1345	410	21.5	70
214157158000101	3-4100-01 W338	21 41 57 N	158 00 01 W	01-23-91	1110	295	21.0	50
				09-28-91	0800	a312	--	53
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	01-23-91	1040	1900	22.0	500
				03-18-91	1300	1500	22.0	420
				09-24-91	1000	1600	26.0	480

a Laboratory conductance

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF MOLOKAI						
210856157011201	4-0801-01 W16	21 08 56 N	157 01 12 W	10-18-90	j1100	a345	--	74
				12-05-90	j1455	a361	--	80
				02-07-91	j1350	a352	--	77
				03-12-91	j0820	a361	--	75
				04-22-91	j0842	a343	--	72
				06-07-91	j0820	a364	--	78
				08-01-91	j0745	a390	--	84
				09-10-91	j1441	440	--	97
210857156010701	4-0801-02	21 08 57 N	157 01 07 W	09-11-91	j0900	370	--	74
210903157013001	4-0901-01 W17	21 09 03 N	157 01 30 W	10-18-90	j --	a279	--	48
				12-06-90	j0840	a282	--	56
				03-13-91	j0840	a310	--	58
				04-24-91	j1100	a320	--	56
				06-06-91	j0830	a302	--	59
				07-31-91	j0905	a294	--	57

a Laboratory conductance.
j Collected by non - USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF MAUI						
203835156065001	6-3806-01 PUNAHOU SPRINGS	20 38 35 N	156 06 50 W	01-09-91	1245	675	20.0	180
				04-03-91	1140	480	19.0	120
				06-26-91	1040	780	21.0	200
203947156261201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	10-26-90	1155	2700	18.5	700
				01-24-91	1325	3000	19.0	920
				04-09-91	1310	3250	18.0	950
				07-05-91	1115	3000	20.0	800
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-11-90	1325	370	--	84
				11-21-90	0800	360	--	84
				01-08-91	1515	300	--	59
				02-19-91	1340	280	--	39
				04-02-91	1420	290	--	54
				05-14-91	1425	300	--	54
				06-25-91	1410	330	--	65
				08-15-91	1430	350	--	70
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-11-90	1340	350	20.0	86
				11-21-90	0745	200	19.0	35
				01-09-91	0745	110	20.0	12
				02-20-91	0845	150	20.0	21
				04-03-91	0735	140	18.5	19
				05-14-91	1440	130	20.5	13
				06-25-91	1430	250	20.0	52
				08-15-91	1415	300	20.0	64
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	01-24-91	1520	1700	23.0	340
				02-27-91	1315	1600	24.0	330
				05-21-91	1215	1700	23.5	330
				09-03-91	1020	1750	23.5	330
204931156371201	6-4937-01 S10	20 49 31 N	156 37 12 W	10-05-90	1130	1150	24.5	300
				09-03-91	1100	1000	24.5	220
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	01-16-91	j0700	a2200	--	620
				04-30-91	j1500	a2180	--	610
				05-15-91	j1600	a2170	--	620
				05-31-91	j0730	a2230	--	620
				06-28-91	1030	2100	--	600
				07-12-91	0730	2100	--	620
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	05-28-91	1330	1300	23.5	280
				06-27-91	0840	1380	23.5	280
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 55 W	01-24-91	0850	975	22.5	260
				02-27-91	1225	875	22.5	230
				04-11-91	1505	900	22.0	220
				05-21-91	1320	1050	22.5	270
				07-02-91	0930	890	22.0	200
205329156305501	6-5330-10 W15B	20 53 29 N	156 30 55 W	02-27-91	1220	440	22.0	70
				04-11-91	1510	450	21.5	76
				05-21-91	1325	410	22.0	72
				09-04-91	1030	470	22.0	100
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	05-21-91	1315	370	22.5	56
				07-02-91	0935	460	22.0	76
205312156321401	6-5332-05 KEPANIWAI	20 53 12 N	156 32 14 W	01-11-91	0840	180	21.5	20
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	07-02-91	0940	625	21.5	100
205343156401101	6-5340-01 S5	20 53 43 N	156 40 11 W	10-05-90	0935	950	21.0	--
				11-13-90	0930	1300	21.0	--
				08-22-91	1030	950	22.0	220
205651156401001	6-5640-01 S36	20 56 51 N	156 40 10 W	08-22-91	1100	520	21.0	110

a Laboratory conductance.
j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued								
205837156384601	6-5838-01 NAPILI A	20 58 37 N	156 38 46 W	10-05-90	1230	620	20.0	160
				11-13-90	1120	625	20.0	150
				01-22-91	1240	625	20.5	160
				02-26-91	1220	600	20.5	150
				04-11-91	1030	675	20.0	160
				05-20-91	1140	650	21.0	150
				07-02-91	1245	675	20.5	160
				08-22-91	1325	650	21.0	160
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	10-05-90	1250	310	19.0	61
				05-20-91	1200	290	20.0	56
				07-02-91	1310	320	19.5	63
				08-22-91	1345	300	20.5	59
205848156383601	6-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-05-90	1300	625	19.5	170
				11-13-90	1145	625	19.5	160
				01-22-91	1310	530	20.0	130
				04-11-91	1100	490	19.5	110
				05-20-91	1215	510	20.5	110
				07-02-91	1330	480	20.0	110

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF HAWAII						
190832155310901	8-0831-02 NINOLE A	19 08 32 N	155 31 09 W	02-01-91	1040	780	18.5	190
				03-18-91	1030	750	18.0	190
				05-29-91	1050	760	18.0	190
				07-08-91	1040	730	18.0	180
				09-23-91	1125	710	18.0	180
191108155281701	8-1128-02 PALIHA	19 11 08 N	155 28 17 W	07-08-91	0955	138	19.0	14
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	05-29-91	1020	82	18.0	4.0
				07-08-91	1020	94	18.0	4.0
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	10-31-90	1525	340	19.5	66
				01-31-91	1305	340	19.5	69
				03-18-91	1325	350	19.5	69
				05-17-91	0850	320	19.5	62
				08-29-91	1545	355	19.5	70
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	10-31-90	1555	660	19.5	160
				03-18-91	1405	710	19.5	170
				05-17-91	0820	680	19.5	160
				08-29-91	1500	645	19.5	150
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	10-31-90	1540	1140	19.0	280
				01-31-91	1320	1150	19.0	280
				05-17-91	0835	1100	19.0	380
				08-29-91	1530	1040	19.0	270
192924154564701	8-2986-01 W9-5B	19 29 24 N	154 56 47 W	02-05-91	0940	129	22.0	6.5
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	02-05-91	0930	128	23.0	7.0
				03-12-91	0830	124	23.0	8.0
				07-09-91	1120	124	23.0	6.0
193113154555801	8-3185-01 W9-11 HAWN SHORE	19 31 13 N	154 55 58 W	12-04-90	1255	116	21.5	11
				05-30-91	1020	100	21.5	12
				07-09-91	1445	116	21.0	11
				09-23-91	1440	102	21.5	12
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	11-01-90	0825	465	20.0	94
				01-31-91	1035	370	20.0	71
				05-17-91	1110	275	20.0	46
				08-15-91	1330	275	20.0	47
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	11-01-90	0840	515	20.0	110
				03-19-91	1035	600	20.0	160
				05-17-91	1045	755	20.0	180
				08-15-91	1350	770	20.5	190
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	11-01-90	0805	355	20.0	66
				01-31-91	1025	335	20.0	60
				03-19-91	1100	215	20.0	28
				05-17-91	1100	240	20.5	37
				08-15-91	1335	230	20.5	33
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	01-31-91	1055	430	20.0	88
				03-19-91	1045	420	20.5	90
				05-17-91	1030	430	20.5	90
				08-15-91	1400	435	20.5	92
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	11-01-90	0940	850	20.0	200
				01-31-91	1120	840	20.0	230
				03-18-91	1520	880	20.0	220
				05-17-91	1005	940	20.0	240
				08-15-91	1255	1000	20.0	260
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	12-04-90	1420	86	19.0	5.0
				02-05-91	1335	86	19.0	4.5
				03-15-91	1005	85	19.0	5.0
				05-31-91	1150	72	19.0	4.0
				07-09-91	1540	82	19.0	4.5
				09-23-91	1535	82	19.0	3.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII--Continued					
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	12-05-90	0855	84	20.5	5.0
				02-06-91	0830	87	20.5	5.5
				03-15-91	1040	88	20.5	5.5
				05-31-91	1210	74	20.5	5.0
				07-10-91	0845	85	20.5	4.0
				09-24-91	0925	86	20.5	5.0
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	12-05-90	0930	103	22.0	6.5
				02-06-91	0920	97	24.0	7.5
				03-25-91	1320	82	23.0	7.5
				05-31-91	1405	80	24.0	6.0
				07-10-91	1500	100	24.0	7.0
				09-24-91	0955	93	24.5	7.0
194337155041801	8-4304-01 WAIAKEA DUG WELL	19 43 37 N	155 04 18 W	12-05-90	0950	40000	20.5	14000
				02-06-91	0940	40000	20.5	14000
				03-25-91	1335	39000	20.5	14000
				05-31-91	1430	41000	21.0	14000
				07-10-91	1530	42000	21.5	15000
				09-24-91	1020	44000	21.0	15000
194818155582301	8-4858-02 KONA VILLAGE	19 48 18 N	155 58 23 W	11-15-90	1445	2400	20.5	480
				03-19-91	1325	2300	20.5	450
				05-22-91	0945	2400	20.5	480
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	12-05-90	1325	200	22.5	14
				02-06-91	1105	220	22.0	13
				03-15-91	1445	202	21.5	14
				06-03-91	0950	203	21.5	13
				07-10-91	1245	202	21.0	13
				09-24-91	1120	200	21.5	12
195043155053801	8-5005-02 MAKAI	19 50 43 N	155 05 38 W	12-05-90	1320	205	22.5	16
				02-06-91	1055	210	22.5	15
				03-15-91	1455	200	23.0	16
				06-03-91	1005	203	23.0	16
				07-10-91	1300	215	22.5	16
				09-24-91	1110	195	22.5	15
195051155051501	8-5005-05 SALT WTR 3	19 50 51 N	155 05 15 W	12-05-90	1305	15500	18.5	5000
				02-06-91	1040	15500	18.5	5000
				03-15-91	1505	15800	18.5	5000
				06-03-91	1020	14800	18.5	4800
				07-10-91	1315	15000	18.5	4800
				09-24-91	1100	15800	18.5	5000
195546155462001	8-5546-01 WAIKOLOA WATER W	19 55 46 N	155 46 20 W	07-11-91	1305	535	28.5	84
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	07-11-91	1355	2250	28.5	600
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	09-17-91	1035	285	26.5	26
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	02-07-91	1205	305	26.0	27
				03-14-91	1005	300	26.5	28
				06-05-91	1225	290	26.5	27
				09-17-91	1015	295	26.5	28
195728155455401	8-5745-03 WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	12-11-90	1115	280	27.0	24
				02-07-91	1255	290	26.5	26
				06-05-91	1240	280	27.0	26
				07-11-91	1220	280	27.0	26
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	10-10-90	1015	500	26.5	92
				02-13-91	1035	520	26.0	92
				07-01-91	1425	500	26.0	88
				09-19-91	1155	520	26.0	96

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

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, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	12-20-90	0935	380	26.0	52
				02-13-91	1025	385	26.0	56
				04-19-91	1050	385	26.0	53
				07-01-91	1415	375	26.0	53
				09-19-91	1110	380	26.0	54
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	12-20-90	1005	500	26.0	82
				04-19-91	1110	500	26.0	86
				07-01-91	1445	535	26.0	98
				09-19-91	1125	530	26.0	98
200121155480801	8-6148-02 W14B	20 01 21 N	155 48 08 W	06-12-91	1035	1680	27.0	440

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

HAWAII, ISLAND OF HAWAII

200850155383601 - KEAWEWAI SPRING AT WAIMANU (LAT 20°08'50" LONG 155°38'36")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	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	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
FEB 25...	1515	180	19.5	65	12	8.4	12	29	0.6	0.50

DATE	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)
FEB 25...	72	2.4	16	<0.10	35	129	0.18	16	<1

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

INDEX

	Page
Access to WATSTORE data	22
Accuracy of field data and computed results	19
Acre-foot, definition of	23
Adenosine triphosphate, definition of	23
Ahualoa Gulch at Honokaa, Hawaii	177
Ahuimanu Stream near Kahaluu, Oahu	174
Akulikuli Stream near Kapaa, Kauai	171
Alakahi Stream near Kamuela, Hawaii	162
Alapai Gulch at Naalehu, Hawaii	178
Algae, definition of	23
Algal growth potential, definition of	23
Alia Stream near Hilo, Hawaii	177
Anahola ditch above Kaneha Reservoir, near Kealia, Kauai	51
Anahulu River near Haleiwa, Oahu	175
Annual 7-day minimum	25
Aquifer, definition of	23
Artesian, definition of	23
Ash mass, definition of	24
Bacteria, definition of	23
Benthic organisms, definition of	23
Biochemical oxygen demand, definition of	23
Biomass, definition of	24
Blue-green algae, definition of	26
Bottom material, definition of	24
Cells per volume, definition of	24
Chlorophyll, definition of	24
Coliform organisms, definition of	24
Collection and computation of data	17
Collection and examination of data	20
Collection of the data	21
Color unit, definition of	24
Contents, definition of	24
Continuing record station, definition of	24
Control, definition of	24
Control structure, definition of	24
Cooperation	1
Cubic foot per second, definition of	25
Cubic foot per second-day, definition of	25
Definition of terms	23
Diatoms, definition of	26
Discharge, definition of	25
Dissolved, definition of	25
Downstream order and station number	4
Drainage area, definition of	25
Drainage basin, definition of	25
Dry mass, definition of	24
Explanation of ground-water level records	21
Explanation of stage and water-discharge records	17
Explanation of water-quality records	20
Fecal-coliform bacteria, definition of	23
Fecal-streptococcal bacteria, definition of	23
Gage height, definition of	25
Gaging station, definition of	25
Green algae, definition of	26
Ground-water records	215-278
Haiku Stream near Heeia, Oahu	110-116
Halaulani Stream at altitude 400 ft, near Kilauea, Kauai	53
Halawa Stream,	
below H1, Oahu	183-185
near Halawa, Molokai	129-131
North Halawa Stream, miscellaneous site 1, Oahu	180
North Halawa Stream, miscellaneous site 2, Oahu	180
North Halawa Stream, miscellaneous site 3, Oahu	180
North Halawa Stream, miscellaneous site 5, Oahu	181
North Halawa Stream, miscellaneous site 6, Oahu	181
North Halawa Stream, near Aiea, Oahu	67-68
North Halawa Stream, near Honolulu, Oahu	69-75
North Halawa Stream, near Kaneohe, Oahu	182
Halena Gulch near Hauna Loa, Molokai	175
Hanalei River,	
at Highway 56 bridge, near Hanalei, Kauai	171
near Hanalei, Kauai	54
Hanapepe River,	
at Hanapepe, Kauai	171
below Manuahi Stream, near Eleele, Kauai	41
Hanawi Stream near Nahiku, Maui	140
Hapahapai Gulch at Kapaau, Hawaii	178
Hardness, definition of	25
Hauani Gulch near Kamuela, Hawaii	167
Hawaii, island of,	
crest-stage partial-record stations in	177-178
gaging-station records in	150-168
ground-water records in	260-267
water-quality records, at ground-water sites in	275-278
Hawelewele Gulch near Kaupo, Maui	175
Heeia Stream at Kaneohe, Oahu	170, 174
Hilea Gulch tributary near Honuapo, Hawaii	168
Hionamoa Gulch at Pahala, Hawaii	178
Homaikawaa Stream near Kealia, Kauai	171
Honokaia Gulch tributary near Honokaa, Hawaii	178
Honokohau Stream near Honokohau, Maui	149
Honokowai Stream at Honokowai, Maui	176
Honolii Stream near Papaikou, Hawaii	156-157
Honopou Stream near Huelo, Maui	142
Honouliuli Stream near Waipahu, Oahu	172
Hooleinaiwa Stream,	
above confluence with Kamooalii Stream, near Kaneohe, Oahu	191-192
at altitude 220 ft, near Kaneohe, Oahu	189-190
Hoomaluhia Reservoir,	
at Outlet near Kaneohe, Oahu	212
sec 1-1 near Kaneohe, Oahu	198
sec 1-2 near Kaneohe, Oahu	199
sec 1-3 near Kaneohe, Oahu	200-202
sec 2-1 near Kaneohe, Oahu	203
sec 2-2 near Kaneohe, Oahu	204
sec 2-3 near Kaneohe, Oahu	205
sec 3-1 near Kaneohe, Oahu	206
sec 3-2 near Kaneohe, Oahu	207
sec 3-3 near Kaneohe, Oahu	208
sec 4-1 near Kaneohe, Oahu	209
sec 4-2 near Kaneohe, Oahu	210
sec 4-3 near Kaneohe, Oahu	211

INDEX

Page

Huleia Stream near Lihue, Kauai..... 171
Huliwai Gulch near Kunia Camp, Oahu..... 173
Hydrologic bench-mark station,
definition of..... 4
Hydrologic unit, definition of..... 25

Iao Stream,
at Kepaniwai Park, near Wailuku, Maui..... 144
at Wailuku, Maui..... 176
Illustrations..... 3, 5-16, 186
Inoaole Stream at Waimanalo, Oahu..... 173
Instantaneous discharge, definition of..... 25
Introduction..... 1

Kaelepulu Stream tributary at Kailua, Oahu... 174
Kahakuloa Stream near Honokohau, Maui..... 146-148
Kahaluu Stream near Ahuimanu, Oahu..... 117
Kahana Stream at altitude 30 ft, near
Kahana, Oahu..... 122
Kahoma Stream at Lahaina, Maui..... 176
Kakaako Gulch,
above Kamakahi Gulch, near Mauna Loa,
Molokai..... 175
near Mauna Loa, Molokai..... 175
Kalaoa Mauka Stream near Hilo, Hawaii..... 177
Kalauao Stream at Moanalua Road, at
Aiea, Oahu..... 173
Kalialinui Gulch,
near Kahului, Maui..... 176
tributary near Pukalani, Maui..... 176
Kalihi Stream,
at Kalihi, Oahu..... 78-80
near Honolulu, Oahu..... 76-77
near Kaneohe, Oahu..... 173
Kaloi Gulch tributary near Honouliuli, Oahu.. 172
Kaluanui Stream,
at Hauula, Oahu..... 174
near Punaluu, Oahu..... 125
Kaluapeelua Gulch at Hoolehua, Molokai..... 175
Kaluapulani Gulch tributary near
Pukalani, Maui..... 176
Kamakoa Gulch near Waimea, Hawaii..... 178
Kamananui Stream,
at Maunawai, Oahu..... 127
at Pupukea Military Road, near
Maunawai, Oahu..... 126
Kamaole Gulch at Kamaole, Maui..... 177
Kamooalii Stream,
at altitude 200 ft, near Kaneohe, Oahu..... 187-188
below Luluku Stream, near Kaneohe, Oahu.... 97-103
right branch, near Kaneohe, Oahu..... 84-89
Kaneohe Stream below Kamehameha
Highway, Oahu..... 195-197
Kapaa Stream,
at Kapahi ditch intake, near Kapaa, Kauai.. 171
at old highway crossing, near
Kealia, Kauai..... 171
Kapahi ditch near Kealia, Kauai..... 50
Kapehu Stream near Pepeekeo, Hawaii..... 177
Kapuhi Stream,
at altitude 1,000 ft, near Pelekunu,
Molokai..... 169
near Pelekunu, Molokai..... 169
Kapunahala Stream, South Fork at Kaneohe,
Oahu..... 104-109

Page

Kauai, island of,
crest-stage partial-record stations in..... 171
gaging-station records in..... 33-55
ground-water records in..... 215-240
water-quality records,
at ground-water sites in..... 268-269
Kauaula Stream near mouth, near
Lahaina, Maui..... 176
Kaukonahua Stream,
at Waialua, Oahu..... 172
North Fork, above Right Branch, near
Wahiawa, Oahu..... 56
South Fork, at East Pump Reservoir, near
Wahiawa, Oahu..... 57
Kaunakakai Gulch at Kaunakakai, Molokai..... 137
Kaunala Gulch,
near Mauna Loa, Molokai..... 175
near Sunset Beach, Oahu..... 170, 174
Kaupuni Stream at altitude 372 ft, near
Waianae, Oahu..... 172
Kawa Stream at Kaneohe, Oahu..... 174
Kawaiki Stream near Kamuela, Hawaii..... 159
Kawaikoi Stream near Waimea, Kauai..... 33
Kawailena Stream near Pelekunu, Molokai..... 169
Kawainui Canal at Kailua, Oahu..... 174
Kawainui Stream,
at altitude 1,000 ft, near Pelekunu,
Molokai..... 169
near Kamuela, Hawaii..... 158
near Pelekunu, Molokai..... 169
Kawaipapa Gulch at Hana, Maui..... 176
Kawaipoko Stream near Pelekunu, Molokai..... 169
Keaahala Stream at Kamehameha Highway, at
Kaneohe, Oahu..... 174
Keanuiomano Stream near Kamuela, Hawaii..... 178
Keehia Gulch near Ookala, Hawaii..... 177
Keopu Stream near Kailua, Hawaii..... 178
Kepuni Gulch near Kahikinui house, Maui..... 175
Kipapa Stream near Wahiawa, Oahu..... 59
Kohakohau Stream near Kamuela, Hawaii..... 165
Konohiki Stream near Kapaa, Kauai..... 171
Kukuiula Gulch near Kipahulu, Maui..... 175
Kulanihakoi Gulch near Kihei, Maui..... 177
Kuliouou Valley at Kuliouou, Oahu..... 173
Kuou Stream at altitude 220 ft, near
Kaneohe, Oahu..... 193-194

Lawai Stream near Koloa, Kauai..... 171
Liilioholo Gulch at Kamaole, Maui..... 177
Lower Anahola ditch near Kealia, Kauai..... 52
Luahine Gulch near Waimea, Hawaii..... 178
Luluku Stream at altitude 220 ft, near
Kaneohe, Oahu..... 90-96
Lyman Springs No. 2 near Piihonua, Hawaii.... 152

Maiiiiii Stream near Waianae, Oahu..... 172
Makaha Stream,
at Makaha, Oahu..... 172
near Makaha, Oahu..... 58
Makaleha ditch near Kealia, Kauai..... 49
Makaleha Stream near Waialua, Oahu..... 172
Makawao Stream near Kailua, Oahu..... 83
Makaweli River near Waimea, Kauai..... 40
Makua Stream at Makua, Oahu..... 172

INDEX

Page

Malaekahana Stream at altitude 30 ft, near Kahuku, Oahu..... 170, 174
Malaiowaiaole Gulch near Maalaea, Maui..... 176
Manawainui Gulch near Kualapuu, Molokai..... 175
Manini Gulch at Kaena, Oahu..... 172
Manoa-Palolo Drainage Canal at Moiliili, Oahu..... 173
Maui, island of,
  crest-stage partial-record stations in..... 175-177
  gaging-station records in..... 139-149
  ground-water records in..... 252-259
  water-quality records,
    at ground-water sites in..... 273-274
Mean concentration, definition of..... 27
Mean discharge, definition of..... 25
Micrograms per gram, definition of..... 25
Micrograms per liter, definition of..... 25
Milligrams per liter, definition of..... 25
Moanalua Stream,
  at Tripler Hospital, Oahu..... 170, 173
  near Aiea, Oahu..... 173
  near Honolulu, Oahu..... 173
Molokai tunnel,
  at east portal, Molokai..... 133
  at west portal, Molokai..... 134
Molokai, island of,
  crest-stage partial-record stations in..... 175
  gaging-station records in..... 129-138
  ground-water records in..... 247-251
  low-flow partial-record stations in..... 169
  water-quality records,
    at ground-water sites in..... 272
Moomoonui Gulch at Hana, Maui..... 176

Nahomalu Valley near Mana, Kauai..... 171
Nanakuli Stream at Nanakuli, Oahu..... 172
National Stream Quality Accounting Network, definition of..... 4
Ninole Gulch near Punaluu, Hawaii..... 178
North Wailua ditch below Waikoko Stream, near Lihue, Kauai..... 43
Numbering system for wells and miscellaneous sites..... 4
Nuuanu Stream below reservoir 2 wasteway, near Honolulu, Oahu..... 81

Oahu, island of,
  crest-stage partial-record stations in..... 170, 172-175
  discharge measurements at miscellaneous sites in..... 179
  gaging-station records in..... 56-128
  ground-water records in..... 241-246
  water-quality records,
    at ground-water sites in..... 270-271
    at partial-record stations in..... 180-214
Oheo Gulch at dam near Kipahulu, Maui..... 139
Oio Stream near kahuku, Oahu..... 174
Olaa flume Spring near Kaumana, Hawaii..... 151
Olowalu Stream at Olowalu, Maui..... 176
Opaekaa Stream, Left Branch, near Kapaa, Kauai..... 48
Opaeula Stream,
  near Haleiwa, Oahu..... 175
  near Wahiawa, Oahu..... 128

Page

Opana tunnel at Kailiili, Maui..... 143
Organic mass, definition of..... 24
Other data available..... 19

Paauau Gulch at Pahala, Hawaii..... 178
Paiakuli Reservoir tributary near Waimea, Hawaii..... 178
Palai Stream at Hilo, Hawaii..... 177
Papio Gulch at Haleiwa, Molokai..... 138
Parameter code, definition of..... 26
Partial-record station, definition of..... 26
Particle size, definition of..... 26
Particle-size classification, definition of.. 26
Paumalu Gulch at Sunset Beach, Oahu..... 170, 174
Pauoa Stream at Honolulu, Oahu..... 173
Percent composition, definition of..... 26
Periphyton, definition of..... 26
Pesticides, definition of..... 26
Phytoplankton, definition of..... 26
Picocurie, definition of..... 26
Pilipililau Stream near Pelekunu, Molokai.... 132
Plankton, definition of..... 26
Poamoho Stream at Waialua, Oahu..... 172
Poelua Gulch near Kahakuloa, Maui..... 176
Pohakupili Gulch near Halawa, Molokai..... 175
Pohakupuka Stream near Papaaloa, Hawaii..... 177
Polychlorinated biphenyls, definition of..... 26
Popoo Gulch near Waikii, Hawaii..... 178
Publications..... 19, 21, 22
Publications on techniques of water-resources investigations..... 30-32
Pukuilua Gulch near Hana, Maui..... 176
Punaluu ditch near Punaluu, Oahu..... 123
Punaluu Stream near Punaluu, Oahu..... 124
Puukumu stream near Kilauea, Kauai..... 171

Records of discharge collected by agencies other than the Geological Survey..... 19
Recoverable from bottom material, definition of..... 24

Sediment..... 20
Sediment, definition of..... 27
Solute, definition of..... 27
Special Networks and Programs..... 4
Specific conductance, definition of..... 27
Stable storm ditch near Lihue, Kauai..... 44
Stage-discharge relation, definition of..... 27
Streamflow, definition of..... 27
Summary of Hydrologic Conditions..... 2
Suspended recoverable, definition of..... 27
Suspended sediment, definition of..... 27
Suspended, definition of..... 27
Suspended, total, definition of..... 28
Suspended-sediment concentration, definition of..... 27
Suspended-sediment discharge, definition of.. 27
Suspended-sediment load, definition of..... 27

Taxonomy, definition of..... 28
Time-weighted average, definition of..... 28
Tons per acre-foot, definition of..... 28
Tons per day, definition of..... 28
Total coliform bacteria, definition of..... 23
Total in bottom material, definition of..... 24

INDEX

	Page
Total load, definition of	28
Total, definition of	28
Total, recoverable, definition of	28
Total-sediment discharge, definition of	27
Turbidity, definition of	28
Unnamed Gulch,	
at Maliko Bay, Maui	176
at Maluhia Camp, Maui	176
Upper Hamakua ditch,	
above Alakahi Stream, near Kamuela, Hawaii	161
above Puukapu Reservoir, near Kamuela, Hawaii	164
above Waimea Reservoir diversion, near Kamuela, Hawaii	163
below Kawaiki Stream, near Kamuela, Hawaii	160
Waiaha Stream at Luawai, near Holualoa, Hawaii	178
Waiakea Stream,	
at Hilo, Hawaii	177
near Mountain View, Hawaii	150
Waiakeakua Stream at Honolulu, Oahu	82
Waiakoa Gulch,	
at Kihei, Maui	177
tributary near Waiakoa, Maui	177
Waialae Stream at altitude 3,820 ft, near Waimea, Kauai	34-35
Waiawa Stream near Pearl City, Oahu	66
Waihee River at dam, near Waihee, Maui	145
Waihee Stream,	
near Kahaluu, Oahu	120
North Fork, near Heeia, Oahu	119
South Fork, near Heeia, Oahu	118
Waikakalaua Stream near Wahiawa, Oahu	172
Waikane Stream at altitude 75 ft, at Waikane, Oahu	121
Waikapu Stream near Kihei, Maui	177
Waikele Stream,	
at Waipahu, Oahu	60-65
at Wheeler Field, Oahu	172
Waikoloa Stream at Marine Dam, near Kamuela, Hawaii	166
Waikolu Stream,	
at altitude 900 ft, near Kalaupapa, Molokai	135
below pipeline crossing, near Kalaupapa, Molokai	136
Wailua ditch near Kapaa, Kauai	46
Wailua River,	
East Branch of North Fork, near Lihue, Kauai	45
near Kapaa, Kauai	171
North Fork, near Kapaa, Kauai	47
South Fork, near Lihue, Kauai	42
Wailuku River,	
at Hilo, Hawaii	154-155
at Piihonua, Hawaii	153
Wailupe Gulch at Aina Haina, Oahu	173
Waimalu Stream near Aiea, Oahu	173
Waimanalo Stream at Waimanalo, Oahu	173
Waimanu Stream near Kamuela, Hawaii	213-214
Waimea Gulch near Kawailoa Camp, Oahu	175
Waimea River,	
at Waimea, Kauai	171
near Waimea, Kauai	36-39
Wainiha River near Hanalei, Kauai	55
Waolani Stream at Honolulu, Oahu	173
Water analysis	20
Water temperature	20
Wawaia Gulch at Kamalo, Molokai	175
WDR, definition of	28
Weighted average, definition of	28
West Wailuaiki Stream near Keanae, Maui	141
Wet mass, definition of	24
WRD, definition of	29
WSP, definition of	29