

HAWAII, ISLAND OF MAUI

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16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--40 years (water years 1966-2005), 3.13 ft³/s (2,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 24 ft³/s, April 10, 2004; minimum daily discharge, 0.11 ft³/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft³/s, Mar. 28-29; minimum daily discharge, 0.20 ft³/s, Nov. 13.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.52	0.57	7.3	1.3	0.98	2.1	10	2.1	0.65	1.3	1.8	1.8
2	5.9	0.35	6.4	2.9	2.0	1.7	10	2.0	0.59	1.3	1.8	1.4
3	1.8	0.26	3.9	2.2	2.5	1.6	10	1.9	0.59	1.4	1.7	1.2
4	0.89	0.23	5.5	1.5	2.5	1.4	7.5	1.8	0.56	1.2	1.9	1.1
5	0.62	0.21	5.6	1.3	1.6	1.4	6.6	1.8	0.79	1.0	1.8	1.0
6	0.46	1.4	6.3	1.1	1.2	1.3	6.5	1.7	0.78	0.88	1.6	1.1
7	0.36	1.3	9.9	0.95	0.97	1.2	6.7	1.7	3.3	0.82	1.5	2.8
8	0.32	0.65	6.6	0.87	0.84	1.1	5.9	1.6	1.6	4.6	6.2	2.2
9	0.28	0.49	6.4	3.8	0.75	1.8	5.6	1.9	1.5	6.6	4.8	1.8
10	0.25	0.36	6.9	2.8	0.69	10	5.0	1.6	2.4	5.7	3.0	2.4
11	0.32	0.28	4.5	1.7	0.96	7.1	4.4	1.4	4.5	4.5	2.3	1.6
12	0.54	0.23	3.4	1.2	8.3	6.3	4.0	1.3	6.8	6.9	2.0	1.3
13	1.1	0.20	2.8	0.97	8.0	5.3	4.2	1.3	3.5	5.8	1.8	2.2
14	1.8	5.9	2.4	0.85	3.3	3.8	3.7	1.3	1.9	4.1	1.8	9.4
15	0.72	11	2.2	0.79	2.3	4.9	3.6	1.1	1.5	6.5	1.8	10
16	0.45	9.6	2.0	0.72	1.9	4.4	3.3	1.1	1.2	5.7	2.0	7.7
17	0.34	4.8	1.9	0.66	1.7	3.1	3.0	0.99	1.1	4.3	1.7	6.4
18	0.44	6.2	1.8	0.61	1.5	2.8	2.9	0.98	0.94	4.6	1.5	4.8
19	1.6	3.5	1.7	0.59	1.4	2.5	2.7	1.6	0.86	3.6	1.9	3.9
20	1.5	2.4	1.7	0.58	1.3	2.4	3.5	2.2	4.2	3.2	2.3	3.4
21	0.77	1.9	1.6	0.72	1.2	2.2	3.7	2.7	6.3	4.2	1.6	3.0
22	0.51	1.7	1.5	1.0	1.2	2.1	3.5	1.7	3.9	4.4	1.4	2.8
23	0.47	1.5	1.4	0.67	1.2	2.0	3.4	1.2	3.7	3.3	1.3	3.8
24	0.40	1.4	1.4	0.56	1.1	1.9	3.2	1.0	2.8	2.7	1.3	3.7
25	0.33	1.2	1.3	0.52	1.4	1.9	3.0	0.93	2.4	2.3	1.7	2.6
26	0.94	1.1	1.2	0.48	7.9	7.4	2.8	0.87	1.8	2.1	1.6	2.5
27	0.56	1.0	1.2	6.0	6.5	8.3	2.6	0.84	1.7	2.0	1.3	2.3
28	0.36	1.0	1.2	2.7	3.1	12	2.4	0.78	1.4	2.1	1.2	2.4
29	0.32	1.0	1.2	1.6	---	12	2.4	0.73	1.3	2.8	1.2	2.9
30	0.28	1.2	1.0	1.2	---	9.4	2.2	0.69	1.4	2.1	1.1	8.6
31	0.35	---	0.98	0.97	---	9.3	---	0.65	---	1.9	1.1	---
TOTAL	25.50	62.93	103.18	43.81	68.29	134.7	138.3	43.46	65.96	103.90	60.0	102.1
MEAN	0.82	2.10	3.33	1.41	2.44	4.35	4.61	1.40	2.20	3.35	1.94	3.40
MAX	5.9	11	9.9	6.0	8.3	12	10	2.7	6.8	6.9	6.2	10
MIN	0.25	0.20	0.98	0.48	0.69	1.1	2.2	0.65	0.56	0.82	1.1	1.0
AC-FT	51	125	205	87	135	267	274	86	131	206	119	203

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2005, BY WATER YEAR (WY)

MEAN	1.82	3.23	3.97	3.55	3.61	4.66	5.06	3.37	2.11	2.53	2.13	1.56
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.62	7.42	6.38	8.17	4.98	5.69
(WY)	(1984)	(1968)	(1971)	(1989)	(1969)	(1982)	(2004)	(1987)	(1997)	(1997)	(1969)	(1992)
MIN	0.14	0.25	0.65	0.22	0.36	0.51	0.27	0.54	0.50	0.40	0.19	0.15
(WY)	(1985)	(1992)	(1977)	(1977)	(1978)	(1983)	(1992)	(2003)	(1999)	(1981)	(1974)	(1984)

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR				FOR 2005 WATER YEAR				WATER YEARS 1965 - 2005			
ANNUAL TOTAL	1,255.42				952.13				3.13			
ANNUAL MEAN	3.43				2.61				5.34			
HIGHEST ANNUAL MEAN									1969			
LOWEST ANNUAL MEAN									1981			
HIGHEST DAILY MEAN	24				Apr 10				24			
LOWEST DAILY MEAN	0.20				Nov 13				Apr 10, 2004			
ANNUAL SEVEN-DAY MINIMUM	0.22				Sep 5				0.11			
ANNUAL RUNOFF (AC-FT)	2,490				1,890				Nov 5, 1973			
10 PERCENT EXCEEDS	8.0				6.3				0.11			
50 PERCENT EXCEEDS	1.8				1.8				Nov 4, 1973			
90 PERCENT EXCEEDS	0.34				0.59				2,270			
									7.7			
									2.1			
									0.39			