

Daily Mean Water Level and Flow at IHA04 on Kibos River (unit: H=m, Q=m³/s) * * * denotes estimated value by interpo

1989	H	Q	1990	H	Q	1991	H	Q	1992	H	Q	1993	H	Q
1-Jan	0.20	0.59	1-Jan	0.43	3.62	1-Jan	0.32	1.22	1-Jan	0.24	0.84	1-Jan	0.27	1.12
2-Jan	0.19	0.54	2-Jan	0.56	5.70	2-Jan	0.36	2.32	2-Jan	0.26	1.02	2-Jan	0.27	1.12
3-Jan	0.20	0.59	3-Jan	0.61	6.61	3-Jan	0.46	4.05	3-Jan	0.27	1.12	3-Jan	0.27	1.12
4-Jan	0.23	0.76	4-Jan	0.50	4.68	4-Jan	0.47	4.20	4-Jan	0.25	0.93	4-Jan	0.27	1.12
5-Jan	0.26	1.02	5-Jan	0.57	5.87	5-Jan	0.34	2.01	5-Jan	0.25	0.93	5-Jan	0.27	1.12
6-Jan	0.23	0.76	6-Jan	0.76	9.68	6-Jan	0.29	1.35	6-Jan	0.25	0.93	6-Jan	0.26	1.02
7-Jan	0.21	0.65	7-Jan	0.67	7.78	7-Jan	0.29	1.35	7-Jan	0.24	0.84	7-Jan	0.27	1.12
8-Jan	0.21	0.65	8-Jan	0.60	6.42	8-Jan	0.31	1.59	8-Jan	0.24	0.84	8-Jan	0.36	2.32
9-Jan	0.20	0.59	9-Jan	0.51	4.84	9-Jan	0.30	1.46	9-Jan	0.25	0.93	9-Jan	0.29	1.35
10-Jan	0.19	0.54	10-Jan	0.49	4.52	10-Jan	0.30	1.46	10-Jan	0.25	0.93	10-Jan	0.28	1.23
11-Jan	0.19	0.54	11-Jan	0.48	4.36	11-Jan	0.27	1.12	11-Jan	0.25	0.93	11-Jan	0.29	1.35
12-Jan	0.19	0.54	12-Jan	0.44	3.75	12-Jan	0.30	1.46	12-Jan	0.35	2.16	12-Jan	0.30	1.46
13-Jan	0.22	0.70	13-Jan	0.41	3.21	13-Jan	0.26	1.02	13-Jan	0.30	1.46	13-Jan	0.30	1.46
14-Jan	0.25	0.93	14-Jan	0.40	3.02	14-Jan	0.26	1.02	14-Jan	0.30	1.46	14-Jan	0.30	1.46
15-Jan	0.25	0.93	15-Jan	0.40	3.02	15-Jan	0.26	1.02	15-Jan	0.27	1.12	15-Jan	0.30	1.46
16-Jan	0.25	0.93	16-Jan	0.39	2.83	16-Jan	0.26	1.02	16-Jan	0.25	0.93	16-Jan	0.30	1.46
17-Jan	0.24	0.84	17-Jan	0.37	2.48	17-Jan	0.25	0.93	17-Jan	0.24	0.84	17-Jan	0.33	1.85
18-Jan	0.24	0.84	18-Jan	0.37	2.48	18-Jan	0.24	0.84	18-Jan	0.25	0.93	18-Jan	0.30	1.46
19-Jan	0.24	0.84	19-Jan	0.37	2.48	19-Jan	0.23	0.76	19-Jan	0.24	0.84	19-Jan	0.32	1.72
20-Jan	0.24	0.84	20-Jan	0.36	2.32	20-Jan	0.23	0.76	20-Jan	0.24	0.84	20-Jan	0.40	3.02
21-Jan	0.24	0.84	21-Jan	0.35	2.16	21-Jan	0.23	0.76	21-Jan	0.23	0.76	21-Jan	0.30	1.46
22-Jan	0.24	0.84	22-Jan	0.35	2.16	22-Jan	0.23	0.76	22-Jan	0.23	0.76	22-Jan	0.31	1.59
23-Jan	0.24	0.84	23-Jan	0.34	2.01	23-Jan	0.23	0.76	23-Jan	0.23	0.76	23-Jan	0.30	1.46
24-Jan	0.24	0.84	24-Jan	0.34	2.01	24-Jan	0.23	0.76	24-Jan	0.23	0.76	24-Jan	0.27	1.12
25-Jan	0.24	0.84	25-Jan	0.34	2.01	25-Jan	0.22	0.70	25-Jan	0.22	0.70	25-Jan	0.30	1.46
26-Jan	0.24	0.84	26-Jan	0.34	2.01	26-Jan	0.23	0.76	26-Jan	0.22	0.70	26-Jan	0.30	1.46
27-Jan	0.24	0.84	27-Jan	0.32	1.72	27-Jan	0.27	1.12	27-Jan	0.21	0.65	27-Jan	0.38	2.65
28-Jan	0.25	0.93	28-Jan	0.34	2.01	28-Jan	0.27	1.12	28-Jan	0.21	0.65	28-Jan	0.34	2.01
29-Jan	0.24	0.84	29-Jan	0.30	1.46	29-Jan	0.24	0.84	29-Jan	0.21	0.65	29-Jan	0.31	1.59
30-Jan	0.37	2.48	30-Jan	0.30	1.46	30-Jan	0.26	1.02	30-Jan	0.21	0.65	30-Jan	0.33	1.85
31-Jan	0.27	1.12	31-Jan	0.33	1.86	31-Jan	0.29	1.35	31-Jan	0.21	0.65	31-Jan	0.29	1.35
1-Feb	0.24	0.84	1-Feb	0.30	1.46	1-Feb	0.28	1.23	1-Feb	0.26	1.02	1-Feb	0.27	1.12
2-Feb	0.24	0.84	2-Feb	0.30	1.46	2-Feb	0.24	0.84	2-Feb	0.24	0.84	2-Feb	0.28	1.23
3-Feb	0.24	0.84	3-Feb	0.30	1.46	3-Feb	0.25	0.93	3-Feb	0.24	0.84	3-Feb	0.29	1.35
4-Feb	0.24	0.84	4-Feb	0.31	1.59	4-Feb	0.24	0.84	4-Feb	0.24	0.84	4-Feb	0.29	1.35
5-Feb	0.28	1.23	5-Feb	0.35	2.16	5-Feb	0.24	0.84	5-Feb	0.24	0.84	5-Feb	0.30	1.46
6-Feb	0.69	8.19	6-Feb	0.39	2.83	6-Feb	0.24	0.84	6-Feb	0.24	0.84	6-Feb	0.32	1.72
7-Feb	0.38	2.65	7-Feb	0.36	2.32	7-Feb	0.24	0.84	7-Feb	0.26	1.02	7-Feb	0.35	2.16
8-Feb	0.32	1.72	8-Feb	0.31	1.59	8-Feb	0.24	0.84	8-Feb	0.26	1.02	8-Feb	0.30	1.46
9-Feb	0.32	1.72	9-Feb	0.32	1.72	9-Feb	0.23	0.76	9-Feb	0.26	1.02	9-Feb	0.30	1.46
10-Feb	0.47	4.20	10-Feb	0.33	1.86	10-Feb	0.27	1.12	10-Feb	0.29	1.35	10-Feb	0.30	1.46
11-Feb	0.38	2.65	11-Feb	0.30	1.46	11-Feb	0.27	1.12	11-Feb	0.24	0.84	11-Feb	0.46	4.05
12-Feb	0.32	1.72	12-Feb	0.30	1.46	12-Feb	0.23	0.76	12-Feb	0.24	0.84	12-Feb	0.40	3.02
13-Feb	0.30	1.46	13-Feb	0.30	1.46	13-Feb	0.24	0.84	13-Feb	0.30	1.46	13-Feb	0.37	2.48
14-Feb	0.28	1.23	14-Feb	0.31	1.59	14-Feb	0.24	0.84	14-Feb	0.39	2.83	14-Feb	0.34	2.01
15-Feb	0.28	1.23	15-Feb	0.30	1.46	15-Feb	0.24	0.84	15-Feb	0.39	2.83	15-Feb	0.30	1.46
16-Feb	0.28	1.23	16-Feb	0.30	1.46	16-Feb	0.24	0.84	16-Feb	0.24	0.84	16-Feb	0.30	1.46
17-Feb	0.28	1.23	17-Feb	0.30	1.46	17-Feb	0.24	0.84	17-Feb	0.25	0.93	17-Feb	0.30	1.46
18-Feb	0.26	1.02	18-Feb	0.44	3.75	18-Feb	0.21	0.65	18-Feb	0.27	1.12	18-Feb	0.30	1.46
19-Feb	0.26	1.02	19-Feb	0.40	3.02	19-Feb	0.22	0.70	19-Feb	0.29	1.35	19-Feb	0.30	1.46
20-Feb	0.25	0.93	20-Feb	0.34	2.01	20-Feb	0.22	0.70	20-Feb	0.28	1.23	20-Feb	0.29	1.35
21-Feb	0.25	0.93	21-Feb	0.37	2.48	21-Feb	0.24	0.84	21-Feb	0.28	1.23	21-Feb	0.29	1.35
22-Feb	0.25	0.93	22-Feb	0.50	4.68	22-Feb	0.23	0.76	22-Feb	0.27	1.12	22-Feb	0.27	1.12
23-Feb	0.46	4.05	23-Feb	0.39	2.83	23-Feb	0.34	2.01	23-Feb	0.27	1.12	23-Feb	0.27	1.12
24-Feb	0.32	1.72	24-Feb	0.55	5.52	24-Feb	0.28	1.23	24-Feb	0.27	1.12	24-Feb	0.27	1.12
25-Feb	0.30	1.46	25-Feb	0.79	10.35	25-Feb	0.27	1.12	25-Feb	0.27	1.12	25-Feb	0.38	2.65
26-Feb	0.28	1.23	26-Feb	0.64	7.18	26-Feb	0.24	0.84	26-Feb	0.26	1.02	26-Feb	0.44	3.75
27-Feb	0.27	1.12	27-Feb	0.57	5.87	27-Feb	0.23	0.76	27-Feb	0.26	1.02	27-Feb	0.45	3.90
28-Feb	0.25	0.93	28-Feb	0.53	5.18	28-Feb	0.23	0.76	28-Feb	0.23	0.76	28-Feb	0.44	3.75
1-Mar	0.24	0.84	1-Mar	0.52	5.01	1-Mar	0.22	0.70	1-Mar	0.23	0.76	1-Mar	0.35	2.16
2-Mar	0.25	0.93	2-Mar	0.46	4.05	2-Mar	0.22	0.70	2-Mar	0.23	0.76	2-Mar	0.33	1.85
3-Mar	0.25	0.93	3-Mar	0.48	4.36	3-Mar	0.22	0.70	3-Mar	0.23	0.76	3-Mar	0.32	1.72
4-Mar	0.24	0.84	4-Mar	0.48	4.36	4-Mar	0.21	0.65	4-Mar	0.23	0.76	4-Mar	0.31	1.59
5-Mar	0.24	0.84	5-Mar	0.66	7.58	5-Mar	0.22	0.70	5-Mar	0.21	0.65	5-Mar	0.30	1.46
6-Mar	0.24	0.84	6-Mar	0.53	5.18	6-Mar	0.21	0.65	6-Mar	0.22	0.70	6-Mar	0.29	1.35
7-Mar	0.24	0.84	7-Mar	0.51	4.84	7-Mar	0.21	0.65	7-Mar	0.23	0.76	7-Mar	0.30	1.46
8-Mar	0.24	0.84	8-Mar	0.47	4.20	8-Mar	0.21	0.65	8-Mar	0.23	0.76	8-Mar	0.28	1.23
9-Mar	0.23	0.76	9-Mar	0.47	4.20	9-Mar	0.21	0.65	9-Mar	0.23	0.76	9-Mar	0.28	1.23
10-Mar	0.24	0.84	10-Mar	0.49	4.52	10-Mar	0.21	0.65	10-Mar	0.21	0.65	10-Mar	0.27	1.12
11-Mar	0.24	0.84	11-Mar	0.52	5.01	11-Mar	0.39	2.83	11-Mar	0.21	0.65	11-Mar	0.27	1.12
12-Mar	0.23	0.76	12-Mar	0.46	4.05	12-Mar	0.25	0.93	12-Mar	0.21	0.65	12-Mar	0.27	1.12
13-Mar	0.25	0.93	13-Mar	0.58	6.05	13-Mar	0.55	5.52	13-Mar	0.20	0.59	13-Mar	0.27	1.12
14-Mar	0.26	1.02	14-Mar	0.60	6.42	14-Mar	0.36	2.32	14-Mar	0.18	0.50	14-Mar	0.26	1.02
15-Mar	0.29	1.35	15-Mar	0.76	9.68	15-Mar	0.30	1.46	15-Mar	0.18	0.50	15-Mar	0.27	1.12
16-Mar	0.25	0.93	16-Mar	0.76	9.68	16-Mar	0.27	1.12	16-Mar	0.18	0.50	16-Mar	0.26	1.02
17-Mar	0.24	0.84	17-Mar	0.69	8.19	17-Mar	0.25	0.93	17-Mar	0.19	0.54	17-Mar	0.26	1.02
18-Mar	0.34	2.01	18-Mar	0.62	6.80	18-Mar	0.24	0.84	18-Mar	0.21	0.65	18-Mar	0.31	1.59

Daily Mean Water Level and Flow at HHA04 on Kibos River (unit: H- m, Q- m³/s) * * * denotes estimated value by interpo

1989	H	Q	1990	H	Q	1991	H	Q	1992	H	Q	1993	H	Q
19-Mar	0.34	2.01	19-Mar	0.73	9.03	19-Mar	0.23	0.76	19-Mar	0.26	1.02	19-Mar	0.27	1.12
20-Mar	0.37	2.48	20-Mar	0.54	5.35	20-Mar	0.23	0.76	20-Mar	0.25	0.93	20-Mar	0.27	1.12
21-Mar	0.30	1.46	21-Mar	0.52	5.01	21-Mar	0.23	0.76	21-Mar	0.21	0.65	21-Mar	0.27	1.12
22-Mar	0.30	1.46	22-Mar	0.52	5.01	22-Mar	0.23	0.76	22-Mar	0.21	0.65	22-Mar	0.26	1.02
23-Mar	0.32	1.72	23-Mar	0.49	4.52	23-Mar	0.22	0.70	23-Mar	0.20	0.59	23-Mar	0.28	1.23
24-Mar	0.30	1.46	24-Mar	0.45	3.90	24-Mar	0.23	0.76	24-Mar	0.21	0.65	24-Mar	0.34	2.01
25-Mar	0.31	1.59	25-Mar	0.45	3.90	25-Mar	0.36	2.32	25-Mar	0.21	0.65	25-Mar	0.27	1.12
26-Mar	0.35	2.16	26-Mar	0.45	3.90	26-Mar	0.32	1.72	26-Mar	0.20	0.59	26-Mar	0.26	1.02
27-Mar	0.34	2.01	27-Mar	0.43	3.62	27-Mar	0.34	2.01	27-Mar	0.20	0.59	27-Mar	0.26	1.02
28-Mar	0.41	3.75	28-Mar	0.44	3.75	28-Mar	0.34	2.01	28-Mar	0.20	0.59	28-Mar	0.26	1.02
29-Mar	0.67	7.78	29-Mar	0.44	3.75	29-Mar	0.25	0.93	29-Mar	0.20	0.59	29-Mar	0.26	1.02
30-Mar	0.52	5.01	30-Mar	0.45	3.90	30-Mar	0.52	5.01	30-Mar	0.23	0.76	30-Mar	0.25	0.93
31-Mar	0.70	8.39	31-Mar	0.55	5.52	31-Mar	0.34	2.01	31-Mar	0.24	0.84	31-Mar	0.25	0.93
1-Apr	0.47	4.20	1-Apr	0.58	6.05	1-Apr	0.33	1.86	1-Apr	0.26	1.02	1-Apr	0.24	0.84
2-Apr	0.40	3.02	2-Apr	0.50	4.68	2-Apr	0.31	1.59	2-Apr	0.22	0.70	2-Apr	0.24	0.84
3-Apr	0.41	3.21	3-Apr	0.60	6.42	3-Apr	0.31	1.59	3-Apr	0.23	0.76	3-Apr	0.24	0.84
4-Apr	0.38	2.65	4-Apr	0.56	5.70	4-Apr	0.33	1.86	4-Apr	0.23	0.76	4-Apr	0.24	0.84
5-Apr	0.40	3.02	5-Apr	0.58	6.05	5-Apr	0.42	3.41	5-Apr	0.26	1.02	5-Apr	0.24	0.84
6-Apr	0.44	3.75	6-Apr	0.76	9.68	6-Apr	0.60	6.42	6-Apr	0.31	1.59	6-Apr	0.23	0.76
7-Apr	0.59	6.24	7-Apr	0.64	7.18	7-Apr	0.63	6.99	7-Apr	0.37	2.48	7-Apr	0.23	0.76
8-Apr	0.53	5.18	8-Apr	0.61	6.61	8-Apr	0.56	5.70	8-Apr	0.40	3.02	8-Apr	0.22	0.70
9-Apr	0.59	6.24	9-Apr	0.59	6.24	9-Apr	0.38	2.65	9-Apr	0.46	4.05	9-Apr	0.21	0.65
10-Apr	0.79	10.35	10-Apr	0.58	6.05	10-Apr	0.37	2.48	10-Apr	0.44	3.75	10-Apr	0.21	0.65
11-Apr	0.70	8.39	11-Apr	0.62	6.80	11-Apr	0.38	2.65	11-Apr	0.34	2.01	11-Apr	0.22	0.70
12-Apr	0.62	6.80	12-Apr	0.62	6.80	12-Apr	0.47	4.20	12-Apr	0.29	1.35	12-Apr	0.22	0.70
13-Apr	0.58	6.05	13-Apr	0.58	6.05	13-Apr	0.40	3.02	13-Apr	0.26	1.02	13-Apr	0.22	0.70
14-Apr	0.52	5.01	14-Apr	0.53	5.18	14-Apr	0.41	3.21	14-Apr	0.24	0.84	14-Apr	0.23	0.76
15-Apr	0.45	3.90	15-Apr	0.67	7.78	15-Apr	0.36	2.32	15-Apr	0.23	0.76	15-Apr	0.23	0.76
16-Apr	0.47	4.20	16-Apr	0.66	7.58	16-Apr	0.34	2.01	16-Apr	0.23	0.76	16-Apr	0.23	0.76
17-Apr	0.43	3.62	17-Apr	0.58	6.05	17-Apr	0.34	2.01	17-Apr	0.22	0.70	17-Apr	0.23	0.76
18-Apr	0.42	3.41	18-Apr	0.55	5.52	18-Apr	0.33	1.86	18-Apr	0.21	0.65	18-Apr	0.23	0.76
19-Apr	0.40	3.02	19-Apr	0.52	5.01	19-Apr	0.30	1.46	19-Apr	0.22	0.70	19-Apr	0.23	0.76
20-Apr	0.37	2.48	20-Apr	0.52	5.01	20-Apr	0.30	1.46	20-Apr	0.21	0.65	20-Apr	0.23	0.76
21-Apr	0.41	3.21	21-Apr	0.50	4.68	21-Apr	0.37	2.48	21-Apr	0.29	1.35	21-Apr	0.23	0.76
22-Apr	0.35	2.16	22-Apr	0.56	5.70	22-Apr	0.30	1.46	22-Apr	0.37	2.48	22-Apr	0.24	0.84
23-Apr	0.51	4.84	23-Apr	0.50	4.68	23-Apr	0.29	1.35	23-Apr	0.34	2.01	23-Apr	0.24	0.84
24-Apr	0.41	3.21	24-Apr	0.43	3.62	24-Apr	0.30	1.46	24-Apr	0.34	2.01	24-Apr	0.25	0.93
25-Apr	0.43	3.62	25-Apr	0.49	4.52	25-Apr	0.31	1.59	25-Apr	0.29	1.35	25-Apr	0.25	0.93
26-Apr	0.41	3.21	26-Apr	0.53	5.18	26-Apr	0.34	2.01	26-Apr	0.32	1.72	26-Apr	0.25	0.93
27-Apr	0.37	2.48	27-Apr	0.53	5.18	27-Apr	0.30	1.46	27-Apr	0.34	2.01	27-Apr	0.34	2.01
28-Apr	0.39	2.83	28-Apr	0.53	5.18	28-Apr	0.44	3.75	28-Apr	0.59	6.24	28-Apr	0.33	1.86
29-Apr	0.47	4.20	29-Apr	0.54	5.35	29-Apr	0.42	3.41	29-Apr	0.59	6.24	29-Apr	0.27	1.12
30-Apr	0.57	5.87	30-Apr	0.50	4.68	30-Apr	0.38	2.65	30-Apr	0.53	5.18	30-Apr	0.27	1.12
1-May	0.45	3.90	1-May	0.46	4.05	1-May	0.37	2.48	1-May	0.48	4.36	1-May	0.27	1.12
2-May	0.44	3.75	2-May	0.45	3.90	2-May	0.37	2.48	2-May	0.56	5.70	2-May	0.31	1.59
3-May	0.41	3.21	3-May	0.53	5.18	3-May	0.37	2.48	3-May	0.57	5.87	3-May	0.29	1.35
4-May	0.39	2.83	4-May	0.48	4.36	4-May	0.36	2.32	4-May	0.59	6.24	4-May	0.32	1.72
5-May	0.38	2.65	5-May	0.51	4.84	5-May	0.33	1.86	5-May	0.53	5.18	5-May	0.35	2.16
6-May	0.38	2.65	6-May	0.48	4.36	6-May	0.30	1.46	6-May	0.46	4.05	6-May	0.30	1.46
7-May	0.35	2.16	7-May	0.45	3.90	7-May	0.30	1.46	7-May	0.39	2.83	7-May	0.35	2.16
8-May	0.45	3.90	8-May	0.42	3.41	8-May	0.35	2.16	8-May	0.41	3.21	8-May	0.32	1.72
9-May	0.45	3.90	9-May	0.45	3.90	9-May	0.41	3.21	9-May	0.59	6.24	9-May	0.30	1.46
10-May	0.55	5.52	10-May	0.47	4.20	10-May	0.34	2.01	10-May	0.53	5.18	10-May	0.30	1.46
11-May	0.52	5.01	11-May	0.58	6.05	11-May	0.34	2.01	11-May	0.52	5.01	11-May	0.30	1.46
12-May	0.50	4.68	12-May	0.52	5.01	12-May	0.33	1.86	12-May	0.38	2.65	12-May	0.32	1.72
13-May	0.49	4.52	13-May	0.56	5.70	13-May	0.33	1.86	13-May	0.56	5.70	13-May	0.42	3.41
14-May	0.73	9.03	14-May	0.54	5.35	14-May	0.35	2.16	14-May	0.43	3.62	14-May	0.40	3.02
15-May	0.61	6.61	15-May	0.49	4.52	15-May	0.34	2.01	15-May	0.42	3.41	15-May	0.37	2.48
16-May	0.55	5.52	16-May	0.46	4.05	16-May	0.35	2.16	16-May	0.60	6.42	16-May	0.37	2.48
17-May	0.52	5.01	17-May	0.46	4.05	17-May	0.36	2.32	17-May	0.49	4.52	17-May	0.38	2.65
18-May	0.52	5.01	18-May	0.47	4.20	18-May	0.34	2.01	18-May	0.49	4.52	18-May	0.40	3.02
19-May	0.51	4.84	19-May	0.49	4.52	19-May	0.33	1.86	19-May	0.48	4.36	19-May	0.43	3.62
20-May	0.49	4.52	20-May	0.46	4.05	20-May	0.46	4.05	20-May	0.48	4.36	20-May	0.41	3.21
21-May	0.46	4.05	21-May	0.45	3.90	21-May	0.36	2.32	21-May	0.40	3.02	21-May	0.37	2.48
22-May	0.53	5.18	22-May	0.46	4.05	22-May	0.37	2.48	22-May	0.38	2.65	22-May	0.34	2.01
23-May	0.56	5.70	23-May	0.49	4.52	23-May	0.52	5.01	23-May	0.37	2.48	23-May	0.32	1.72
24-May	0.56	5.70	24-May	0.49	4.52	24-May	0.52	5.01	24-May	0.39	2.83	24-May	0.43	3.62
25-May	0.55	5.52	25-May	0.62	6.80	25-May	0.58	6.05	25-May	0.38	2.65	25-May	0.47	4.20
26-May	0.53	5.18	26-May	0.62	6.80	26-May	0.61	6.61	26-May	0.36	2.32	26-May	0.38	2.65
27-May	0.67	7.78	27-May	0.80	10.58	27-May	0.52	5.01	27-May	0.34	2.01	27-May	0.34	2.01
28-May	0.53	5.18	28-May	0.57	5.87	28-May	0.46	4.05	28-May	0.34	2.01	28-May	0.34	2.01
29-May	0.53	5.18	29-May	0.59	6.24	29-May	0.52	5.01	29-May	0.32	1.72	29-May	0.34	2.01
30-May	0.52	5.01	30-May	0.51	4.84	30-May	0.43	3.62	30-May	0.33	1.86	30-May	0.32	1.72
31-May	0.52	5.01	31-May	0.55	5.52	31-May	0.40	3.02	31-May	0.43	3.62	31-May	0.41	3.21
1-Jun	0.49	4.52	1-Jun	0.52	5.01	1-Jun	0.40	3.02	1-Jun	0.37	2.48	1-Jun	0.38	2.65
2-Jun	0.46	4.05	2-Jun	0.55	5.52	2-Jun	0.44	3.75	2-Jun	0.34	2.01	2-Jun	0.46	4.05
3-Jun	0.52	5.01	3-Jun	0.52	5.01	3-Jun	0.42	3.41	3-Jun	0.34	2.01	3-Jun	0.39	2.83

Daily Mean Water Level and Flow at HHA04 on Kibos River (unit: H=m, Q =m³/s) *** denotes estimated value by interpo

1989	H	Q	1990	H	Q	1991	H	Q	1992	H	Q	1993	H	Q
4-Jun	0.49	4.52	4-Jun	0.53	5.18	4-Jun	0.40	3.02	4-Jun	0.37	2.48	4-Jun	0.37	2.48
5-Jun	0.43	3.62	5-Jun	0.49	4.52	5-Jun	0.41	3.21	5-Jun	0.42	3.41	5-Jun	0.43	3.62
6-Jun	0.49	4.52	6-Jun	0.45	4.05	6-Jun	0.42	3.41	6-Jun	0.43	3.62	6-Jun	0.49	4.52
7-Jun	0.52	5.01	7-Jun	0.46	4.05	7-Jun	0.38	2.65	7-Jun	0.38	2.65	7-Jun	0.44	3.75
8-Jun	0.46	4.05	8-Jun	0.49	4.52	8-Jun	0.36	2.32	8-Jun	0.32	1.72	8-Jun	0.62	6.80
9-Jun	0.45	3.90	9-Jun	0.50	4.68	9-Jun	0.35	2.16	9-Jun	0.34	2.01	9-Jun	0.50	4.68
10-Jun	0.43	3.62	10-Jun	0.55	5.52	10-Jun	0.35	2.16	10-Jun	0.35	2.16	10-Jun	0.47	4.20
11-Jun	0.40	3.02	11-Jun	0.59	6.24	11-Jun	0.37	2.48	11-Jun	0.34	2.01	11-Jun	0.42	3.41
12-Jun	0.39	2.83	12-Jun	0.55	5.52	12-Jun	0.36	2.32	12-Jun	0.42	3.41	12-Jun	0.42	3.41
13-Jun	0.42	3.41	13-Jun	0.48	4.36	13-Jun	0.36	2.32	13-Jun	0.39	2.83	13-Jun	0.56	5.70
14-Jun	0.45	3.90	14-Jun	0.49	4.52	14-Jun	0.34	2.01	14-Jun	0.36	2.32	14-Jun	0.56	5.70
15-Jun	0.59	6.24	15-Jun	0.46	4.05	15-Jun	0.49	4.52	15-Jun	0.44	3.75	15-Jun	0.55	5.52
16-Jun	0.72	8.81	16-Jun	0.44	3.75	16-Jun	0.37	2.48	16-Jun	0.45	3.90	16-Jun	0.53	5.18
17-Jun	0.53	5.18	17-Jun	0.43	3.62	17-Jun	0.41	3.21	17-Jun	0.51	4.84	17-Jun	0.50	4.68
18-Jun	0.48	4.36	18-Jun	0.43	3.62	18-Jun	0.37	2.48	18-Jun	0.51	4.84	18-Jun	0.49	4.52
19-Jun	0.46	4.05	19-Jun	0.43	3.62	19-Jun	0.37	2.48	19-Jun	0.44	3.75	19-Jun	0.55	5.52
20-Jun	0.45	3.90	20-Jun	0.42	3.41	20-Jun	0.37	2.48	20-Jun	0.56	5.70	20-Jun	0.59	6.24
21-Jun	0.44	3.75	21-Jun	0.43	3.62	21-Jun	0.35	2.16	21-Jun	0.46	4.05	21-Jun	0.49	4.52
22-Jun	0.41	3.21	22-Jun	0.40	3.02	22-Jun	0.43	3.62	22-Jun	0.52	5.01	22-Jun	0.44	3.75
23-Jun	0.40	3.02	23-Jun	0.40	3.02	23-Jun	0.37	2.48	23-Jun	0.49	4.52	23-Jun	0.42	3.41
24-Jun	0.40	3.02	24-Jun	0.40	3.02	24-Jun	0.37	2.48	24-Jun	0.47	4.20	24-Jun	0.50	4.68
25-Jun	0.39	2.83	25-Jun	0.39	2.83	25-Jun	0.38	2.65	25-Jun	0.44	3.75	25-Jun	0.54	5.35
26-Jun	0.38	2.65	26-Jun	0.37	2.48	26-Jun	0.36	2.32	26-Jun	0.48	4.36	26-Jun	0.49	4.52
27-Jun	0.41	3.21	27-Jun	0.41	3.21	27-Jun	0.35	2.16	27-Jun	0.44	3.75	27-Jun	0.44	3.75
28-Jun	0.39	2.83	28-Jun	0.40	3.02	28-Jun	0.33	1.86	28-Jun	0.43	3.62	28-Jun	0.50	4.68
29-Jun	0.38	2.65	29-Jun	0.39	2.83	29-Jun	0.34	2.01	29-Jun	0.40	3.02	29-Jun	0.44	3.75
30-Jun	0.38	2.65	30-Jun	0.54	5.35	30-Jun	0.33	1.86	30-Jun	0.41	3.21	30-Jun	0.47	4.20
1-Jul	0.37	2.48	1-Jul	0.44	3.75	1-Jul	0.34	2.01	1-Jul	0.40	3.02	1-Jul	0.43	3.62
2-Jul	0.39	2.83	2-Jul	0.39	2.83	2-Jul	0.31	1.59	2-Jul	0.42	3.41	2-Jul	0.43	3.62
3-Jul	0.38	2.65	3-Jul	0.40	3.02	3-Jul	0.30	1.46	3-Jul	0.43	3.62	3-Jul	0.40	3.02
4-Jul	0.37	2.48	4-Jul	0.42	3.41	4-Jul	0.32	1.72	4-Jul	0.41	3.21	4-Jul	0.39	2.83
5-Jul	0.40	3.02	5-Jul	0.41	3.21	5-Jul	0.30	1.46	5-Jul	0.40	3.02	5-Jul	0.41	3.21
6-Jul	0.36	2.32	6-Jul	0.40	3.02	6-Jul	0.34	2.01	6-Jul	0.36	2.32	6-Jul	0.37	2.48
7-Jul	0.38	2.65	7-Jul	0.37	2.48	7-Jul	0.33	1.86	7-Jul	0.40	3.02	7-Jul	0.35	2.16
8-Jul	0.41	3.21	8-Jul	0.36	2.32	8-Jul	0.34	2.01	8-Jul	0.36	2.32	8-Jul	0.35	2.16
9-Jul	0.44	3.75	9-Jul	0.36	2.32	9-Jul	0.30	1.46	9-Jul	0.35	2.16	9-Jul	0.35	2.16
10-Jul	0.41	3.21	10-Jul	0.36	2.32	10-Jul	0.30	1.46	10-Jul	0.41	3.21	10-Jul	0.38	2.65
11-Jul	0.43	3.62	11-Jul	0.36	2.32	11-Jul	0.30	1.46	11-Jul	0.46	4.05	11-Jul	0.36	2.32
12-Jul	0.37	2.48	12-Jul	0.35	2.16	12-Jul	0.30	1.46	12-Jul	0.41	3.21	12-Jul	0.35	2.16
13-Jul	0.34	2.01	13-Jul	0.36	2.32	13-Jul	0.31	1.59	13-Jul	0.37	2.48	13-Jul	0.37	2.48
14-Jul	0.33	1.86	14-Jul	0.36	2.32	14-Jul	0.32	1.72	14-Jul	0.36	2.32	14-Jul	0.42	3.41
15-Jul	0.35	2.16	15-Jul	0.37	2.48	15-Jul	0.31	1.59	15-Jul	0.36	2.32	15-Jul	0.38	2.65
16-Jul	0.42	3.41	16-Jul	0.37	2.48	16-Jul	0.30	1.46	16-Jul	0.36	2.32	16-Jul	0.34	2.01
17-Jul	0.40	3.02	17-Jul	0.38	2.65	17-Jul	0.30	1.46	17-Jul	0.37	2.48	17-Jul	0.34	2.01
18-Jul	0.37	2.48	18-Jul	0.37	2.48	18-Jul	0.30	1.46	18-Jul	0.36	2.32	18-Jul	0.33	1.86
19-Jul	0.34	2.01	19-Jul	0.36	2.32	19-Jul	0.29	1.35	19-Jul	0.35	2.16	19-Jul	0.32	1.72
20-Jul	0.32	1.72	20-Jul	0.35	2.16	20-Jul	0.29	1.35	20-Jul	0.35	2.16	20-Jul	0.34	2.01
21-Jul	0.33	1.86	21-Jul	0.34	2.01	21-Jul	0.29	1.35	21-Jul	0.45	3.90	21-Jul	0.35	2.16
22-Jul	0.37	2.48	22-Jul	0.34	2.01	22-Jul	0.29	1.35	22-Jul	0.40	3.02	22-Jul	0.34	2.01
23-Jul	0.36	2.32	23-Jul	0.35	2.16	23-Jul	0.28	1.23	23-Jul	0.35	2.16	23-Jul	0.35	2.16
24-Jul	0.35	2.16	24-Jul	0.33	1.86	24-Jul	0.28	1.23	24-Jul	0.33	1.86	24-Jul	0.34	2.01
25-Jul	0.34	2.01	25-Jul	0.33	1.86	25-Jul	0.27	1.12	25-Jul	0.32	1.72	25-Jul	0.34	2.01
26-Jul	0.34	2.01	26-Jul	0.33	1.86	26-Jul	0.27	1.12	26-Jul	0.35	2.16	26-Jul	0.32	1.72
27-Jul	0.33	1.86	27-Jul	0.33	1.86	27-Jul	0.27	1.12	27-Jul	0.43	3.62	27-Jul	0.30	1.46
28-Jul	0.32	1.72	28-Jul	0.32	1.72	28-Jul	0.27	1.12	28-Jul	0.39	2.83	28-Jul	0.30	1.46
29-Jul	0.31	1.59	29-Jul	0.32	1.72	29-Jul	0.27	1.12	29-Jul	0.38	2.65	29-Jul	0.30	1.46
30-Jul	0.31	1.59	30-Jul	0.33	1.86	30-Jul	0.27	1.12	30-Jul	0.33	1.86	30-Jul	0.30	1.46
31-Jul	0.33	1.86	31-Jul	0.32	1.72	31-Jul	0.33	1.86	31-Jul	0.32	1.72	31-Jul	0.30	1.46
1-Aug	0.43	3.62	1-Aug	0.30	1.46	1-Aug	0.29	1.35	1-Aug	0.31	1.59	1-Aug	0.30	1.46
2-Aug	0.34	2.01	2-Aug	0.41	3.21	2-Aug	0.29	1.35	2-Aug	0.30	1.46	2-Aug	0.30	1.46
3-Aug	0.35	2.16	3-Aug	0.48	4.36	3-Aug	0.27	1.12	3-Aug	0.30	1.46	3-Aug	0.30	1.46
4-Aug	0.33	1.86	4-Aug	0.32	1.72	4-Aug	0.28	1.23	4-Aug	0.45	3.90	4-Aug	0.34	2.01
5-Aug	0.31	1.59	5-Aug	0.40	3.02	5-Aug	0.28	1.23	5-Aug	0.42	3.41	5-Aug	0.30	1.46
6-Aug	0.31	1.59	6-Aug	0.34	2.01	6-Aug	0.28	1.23	6-Aug	0.36	2.32	6-Aug	0.30	1.46
7-Aug	0.37	2.48	7-Aug	0.34	2.01	7-Aug	0.27	1.12	7-Aug	0.34	2.01	7-Aug	0.30	1.46
8-Aug	0.42	3.41	8-Aug	0.34	2.01	8-Aug	0.27	1.12	8-Aug	0.33	1.86	8-Aug	0.30	1.46
9-Aug	0.42	3.41	9-Aug	0.33	1.86	9-Aug	0.27	1.12	9-Aug	0.33	1.86	9-Aug	0.30	1.46
10-Aug	0.35	2.16	10-Aug	0.33	1.86	10-Aug	0.27	1.12	10-Aug	0.31	1.59	10-Aug	0.32	1.72
11-Aug	0.35	2.16	11-Aug	0.41	3.21	11-Aug	0.27	1.12	11-Aug	0.30	1.46	11-Aug	0.32	1.72
12-Aug	0.33	1.86	12-Aug	0.35	2.16	12-Aug	0.28	1.23	12-Aug	0.61	6.61	12-Aug	0.30	1.46
13-Aug	0.34	2.01	13-Aug	0.33	1.86	13-Aug	0.27	1.12	13-Aug	0.43	3.62	13-Aug	0.30	1.46
14-Aug	0.40	3.02	14-Aug	0.29	1.35	14-Aug	0.28	1.23	14-Aug	0.39	2.83	14-Aug	0.30	1.46
15-Aug	0.36	2.32	15-Aug	0.30	1.46	15-Aug	0.44	3.75	15-Aug	0.37	2.48	15-Aug	0.30	1.46
16-Aug	0.40	3.02	16-Aug	0.30	1.46	16-Aug	0.37	2.48	16-Aug	0.36	2.32	16-Aug	0.32	1.72
17-Aug	0.38	2.65	17-Aug	0.35	2.16	17-Aug	0.30	1.46	17-Aug	0.35	2.16	17-Aug	0.31	1.59
18-Aug	0.41	3.21	18-Aug	0.32	1.72	18-Aug	0.32	1.72	18-Aug	0.35	2.16	18-Aug	0.30	1.46
19-Aug	0.45	3.50	19-Aug	0.34	2.01	19-Aug	0.41	3.21	19-Aug	0.34	2.01	19-Aug	0.30	1.46

Daily Mean Water Level and Flow at IHA04 on Kibos River (unit: H=m, Q=m³/s) * * * denotes estimated value by Interpo

1989	H	Q	1990	H	Q	1991	H	Q	1992	H	Q	1993	H	Q
20-Aug	0.44	3.75	20-Aug	0.32	1.72	20-Aug	0.39	2.83	20-Aug	0.32	1.72	20-Aug	0.32	1.72
21-Aug	0.43	3.62	21-Aug	0.31	1.59	21-Aug	0.37	2.48	21-Aug	0.34	2.01	21-Aug	0.30	1.46
22-Aug	0.47	4.20	22-Aug	0.31	1.59	22-Aug	0.38	2.65	22-Aug	0.34	2.01	22-Aug	0.33	1.86
23-Aug	0.43	3.62	23-Aug	0.38	2.65	23-Aug	0.39	2.83	23-Aug	0.37	2.48	23-Aug	0.34	2.01
24-Aug	0.42	3.41	24-Aug	0.32	1.72	24-Aug	0.39	2.83	24-Aug	0.34	2.01	24-Aug	0.36	2.32
25-Aug	0.44	3.75	25-Aug	0.35	2.16	25-Aug	0.37	2.48	25-Aug	0.32	1.72	25-Aug	0.34	2.01
26-Aug	0.50	4.68	26-Aug	0.34	2.01	26-Aug	0.38	2.65	26-Aug	0.32	1.72	26-Aug	0.30	1.46
27-Aug	0.76	9.68	27-Aug	0.30	1.46	27-Aug	0.34	2.01	27-Aug	0.32	1.72	27-Aug	0.30	1.46
28-Aug	0.62	6.80	28-Aug	0.34	2.01	28-Aug	0.30	1.46	28-Aug	0.32	1.72	28-Aug	0.32	1.72
29-Aug	0.37	2.48	29-Aug	0.32	1.72	29-Aug	0.30	1.46	29-Aug	0.38	2.65	29-Aug	0.37	2.48
30-Aug	0.66	7.58	30-Aug	0.30	1.46	30-Aug	0.30	1.46	30-Aug	0.34	2.01	30-Aug	0.30	1.46
31-Aug	0.72	8.81	31-Aug	0.33	1.86	31-Aug	0.30	1.46	31-Aug	0.39	2.83	31-Aug	0.31	1.59
1-Sep	0.61	6.61	1-Sep	0.35	2.16	1-Sep	0.42	3.41	1-Sep	0.41	3.21	1-Sep	0.30	1.46
2-Sep	0.57	5.87	2-Sep	0.34	2.01	2-Sep	0.44	3.75	2-Sep	0.58	6.05	2-Sep	0.31	1.59
3-Sep	0.58	6.05	3-Sep	0.30	1.46	3-Sep	0.43	3.62	3-Sep	0.48	4.36	3-Sep	0.30	1.46
4-Sep	0.52	5.01	4-Sep	0.30	1.46	4-Sep	0.39	2.83	4-Sep	0.41	3.21	4-Sep	0.30	1.46
5-Sep	0.43	3.62	5-Sep	0.30	1.46	5-Sep	0.35	2.16	5-Sep	0.40	3.02	5-Sep	0.58	6.05
6-Sep	0.52	5.01	6-Sep	0.30	1.46	6-Sep	0.32	1.72	6-Sep	0.38	2.65	6-Sep	0.36	2.32
7-Sep	0.52	5.01	7-Sep	0.30	1.46	7-Sep	0.33	1.86	7-Sep	0.37	2.48	7-Sep	0.33	1.86
8-Sep	0.54	5.35	8-Sep	0.30	1.46	8-Sep	0.37	2.48	8-Sep	0.49	4.52	8-Sep	0.32	1.72
9-Sep	0.52	5.01	9-Sep	0.34	2.01	9-Sep	0.35	2.16	9-Sep	0.70	8.39	9-Sep	0.40	3.02
10-Sep	0.51	4.84	10-Sep	0.32	1.72	10-Sep	0.36	2.32	10-Sep	0.58	6.05	10-Sep	0.35	2.16
11-Sep	0.47	4.20	11-Sep	0.30	1.46	11-Sep	0.34	2.01	11-Sep	0.59	6.24	11-Sep	0.33	1.86
12-Sep	0.45	3.90	12-Sep	0.30	1.46	12-Sep	0.32	1.72	12-Sep	0.55	5.52	12-Sep	0.30	1.46
13-Sep	0.43	3.62	13-Sep	0.33	1.86	13-Sep	0.32	1.72	13-Sep	0.56	5.70	13-Sep	0.30	1.46
14-Sep	0.45	3.90	14-Sep	0.30	1.46	14-Sep	0.33	1.86	14-Sep	0.61	6.61	14-Sep	0.28	1.23
15-Sep	0.45	3.90	15-Sep	0.31	1.59	15-Sep	0.32	1.72	15-Sep	0.50	4.68	15-Sep	0.27	1.12
16-Sep	0.41	3.21	16-Sep	0.30	1.46	16-Sep	0.35	2.16	16-Sep	0.47	4.20	16-Sep	0.28	1.23
17-Sep	0.41	3.21	17-Sep	0.31	1.59	17-Sep	0.28	1.23	17-Sep	0.46	4.05	17-Sep	0.28	1.23
18-Sep	0.55	5.52	18-Sep	0.30	1.46	18-Sep	0.27	1.12	18-Sep	0.44	3.75	18-Sep	0.30	1.46
19-Sep	0.48	4.36	19-Sep	0.30	1.46	19-Sep	0.27	1.12	19-Sep	0.42	3.41	19-Sep	0.30	1.46
20-Sep	0.46	4.05	20-Sep	0.29	1.35	20-Sep	0.27	1.12	20-Sep	0.40	3.02	20-Sep	0.30	1.46
21-Sep	0.46	4.05	21-Sep	0.30	1.46	21-Sep	0.26	1.02	21-Sep	0.39	2.83	21-Sep	0.30	1.46
22-Sep	0.55	5.52	22-Sep	0.30	1.46	22-Sep	0.26	1.02	22-Sep	0.39	2.83	22-Sep	0.30	1.46
23-Sep	0.52	5.18	23-Sep	0.37	2.48	23-Sep	0.28	1.23	23-Sep	0.38	2.65	23-Sep	0.30	1.46
24-Sep	0.50	4.68	24-Sep	0.34	2.01	24-Sep	0.38	2.65	24-Sep	0.37	2.48	24-Sep	0.31	1.59
25-Sep	0.49	4.52	25-Sep	0.31	1.59	25-Sep	0.27	1.12	25-Sep	0.36	2.32	25-Sep	0.33	1.86
26-Sep	0.46	4.05	26-Sep	0.31	1.59	26-Sep	0.27	1.12	26-Sep	0.36	2.32	26-Sep	0.31	1.59
27-Sep	0.42	3.41	27-Sep	0.31	1.59	27-Sep	0.27	1.12	27-Sep	0.34	2.01	27-Sep	0.31	1.59
28-Sep	0.31	1.59	28-Sep	0.32	1.72	28-Sep	0.30	1.46	28-Sep	0.33	1.86	28-Sep	0.28	1.23
29-Sep	0.36	2.32	29-Sep	0.30	1.46	29-Sep	0.30	1.46	29-Sep	0.37	2.48	29-Sep	0.41	3.21
30-Sep	0.41	3.21	30-Sep	0.29	1.35	30-Sep	0.29	1.35	30-Sep	0.49	4.52	30-Sep	0.30	1.46
1-Oct	0.46	4.05	1-Oct	0.37	2.48	1-Oct	0.30	1.46	1-Oct	0.37	2.48	1-Oct	0.30	1.46
2-Oct	0.35	2.16	2-Oct	0.34	2.01	2-Oct	0.27	1.12	2-Oct	0.37	2.48	2-Oct	0.30	1.46
3-Oct	0.39	2.83	3-Oct	0.40	3.02	3-Oct	0.27	1.12	3-Oct	0.37	2.48	3-Oct	0.30	1.46
4-Oct	0.40	3.02	4-Oct	0.36	2.32	4-Oct	0.29	1.35	4-Oct	0.37	2.48	4-Oct	0.30	1.46
5-Oct	0.44	3.75	5-Oct	0.30	1.46	5-Oct	0.27	1.12	5-Oct	0.37	2.48	5-Oct	0.30	1.46
6-Oct	0.38	2.65	6-Oct	0.30	1.46	6-Oct	0.24	0.84	6-Oct	0.37	2.48	6-Oct	0.30	1.46
7-Oct	0.41	3.21	7-Oct	0.31	1.59	7-Oct	0.24	0.84	7-Oct	0.37	2.48	7-Oct	0.30	1.46
8-Oct	0.44	3.75	8-Oct	0.27	1.12	8-Oct	0.24	0.84	8-Oct	0.37	2.48	8-Oct	0.30	1.46
9-Oct	0.44	3.75	9-Oct	0.27	1.12	9-Oct	0.24	0.84	9-Oct	0.37	2.48	9-Oct	0.30	1.46
10-Oct	0.40	3.02	10-Oct	0.26	1.02	10-Oct	0.24	0.84	10-Oct	0.37	2.48	10-Oct	0.30	1.46
11-Oct	0.47	4.20	11-Oct	0.30	1.46	11-Oct	0.24	0.84	11-Oct	0.37	2.48	11-Oct	0.30	1.46
12-Oct	0.46	4.05	12-Oct	0.28	1.23	12-Oct	0.48	4.36	12-Oct	0.37	2.48	12-Oct	0.30	1.46
13-Oct	0.45	3.90	13-Oct	0.28	1.23	13-Oct	0.52	5.01	13-Oct	0.37	2.48	13-Oct	0.30	1.46
14-Oct	0.62	6.80	14-Oct	0.27	1.12	14-Oct	0.66	7.58	14-Oct	0.37	2.48	14-Oct	0.30	1.46
15-Oct	0.52	5.01	15-Oct	0.27	1.12	15-Oct	0.54	5.35	15-Oct	0.37	2.48	15-Oct	0.30	1.46
16-Oct	0.47	4.20	16-Oct	0.27	1.12	16-Oct	0.68	7.98	16-Oct	0.37	2.48	16-Oct	0.30	1.46
17-Oct	0.44	3.75	17-Oct	0.27	1.12	17-Oct	0.55	5.52	17-Oct	0.37	2.48	17-Oct	0.30	1.46
18-Oct	0.44	3.75	18-Oct	0.29	1.35	18-Oct	0.53	5.18	18-Oct	0.37	2.48	18-Oct	0.30	1.46
19-Oct	0.45	3.90	19-Oct	0.33	1.86	19-Oct	0.56	5.70	19-Oct	0.37	2.48	19-Oct	0.30	1.46
20-Oct	0.56	5.70	20-Oct	0.37	2.48	20-Oct	0.56	5.70	20-Oct	0.37	2.48	20-Oct	0.30	1.46
21-Oct	0.53	5.18	21-Oct	0.34	2.01	21-Oct	0.53	5.18	21-Oct	0.37	2.48	21-Oct	0.30	1.46
22-Oct	0.45	3.90	22-Oct	0.30	1.46	22-Oct	0.55	5.52	22-Oct	0.37	2.48	22-Oct	0.30	1.46
23-Oct	0.44	3.75	23-Oct	0.29	1.35	23-Oct	0.50	4.68	23-Oct	0.37	2.48	23-Oct	0.30	1.46
24-Oct	0.44	3.75	24-Oct	0.27	1.12	24-Oct	0.48	4.36	24-Oct	0.37	2.48	24-Oct	0.30	1.46
25-Oct	0.42	3.41	25-Oct	0.30	1.46	25-Oct	0.47	4.20	25-Oct	0.37	2.48	25-Oct	0.30	1.46
26-Oct	0.46	4.05	26-Oct	0.30	1.46	26-Oct	0.57	5.87	26-Oct	0.37	2.48	26-Oct	0.30	1.46
27-Oct	0.46	4.05	27-Oct	0.30	1.46	27-Oct	0.56	5.70	27-Oct	0.37	2.48	27-Oct	0.30	1.46
28-Oct	0.45	3.90	28-Oct	0.41	3.21	28-Oct	0.43	3.62	28-Oct	0.37	2.48	28-Oct	0.30	1.46
29-Oct	0.46	4.05	29-Oct	0.40	3.02	29-Oct	0.39	2.83	29-Oct	0.37	2.48	29-Oct	0.30	1.46
30-Oct	0.53	5.18	30-Oct	0.37	2.48	30-Oct	0.37	2.48	30-Oct	0.37	2.48	30-Oct	0.30	1.46
31-Oct	0.47	4.20	31-Oct	0.32	1.72	31-Oct	0.37	2.48	31-Oct	0.37	2.48	31-Oct	0.30	1.46
1-Nov	0.44	3.75	1-Nov	0.30	1.46	1-Nov	0.37	2.48	1-Nov	0.35	2.16	1-Nov	0.28	1.23
2-Nov	0.43	3.62	2-Nov	0.30	1.46	2-Nov	0.36	2.32	2-Nov	0.30	1.46	2-Nov	0.28	1.23
3-Nov	0.43	3.62	3-Nov	0.33	1.86	3-Nov	0.34	2.01	3-Nov	0.32	1.72	3-Nov	0.27	1.12
4-Nov	0.43	3.62	4-Nov	0.44	3.75	4-Nov	0.37	2.48	4-Nov	0.34	2.01	4-Nov	0.32	1.72

Daily Mean Water Level and Flow at 111A04 on Kibos River (unit: H=m, Q=m³/s) * * * denotes estimated value by interpo

1989	H	Q	1990	H	Q	1991	H	Q	1992	H	Q	1993	H	Q
5-Nov	0.40	3.02	5-Nov	0.38	2.65	5-Nov	0.37	2.48	5-Nov	0.41	3.21	5-Nov	0.30	1.46
6-Nov	0.41	3.21	6-Nov	0.34	2.01	6-Nov	0.37	2.48	6-Nov	0.40	3.02	6-Nov	0.30	1.46
7-Nov	0.40	3.02	7-Nov	0.35	2.16	7-Nov	0.37	2.48	7-Nov	0.39	2.83	7-Nov	0.31	1.59
8-Nov	0.36	2.32	8-Nov	0.38	2.65	8-Nov	0.40	3.02	8-Nov	0.37	2.48	8-Nov	0.29	1.35
9-Nov	0.37	2.48	9-Nov	0.34	2.01	9-Nov	0.39	2.83	9-Nov	0.36	2.32	9-Nov	0.35	2.16
10-Nov	0.36	2.32	10-Nov	0.38	2.65	10-Nov	0.39	2.83	10-Nov	0.34	2.01	10-Nov	0.34	2.01
11-Nov	0.39	2.83	11-Nov	0.37	2.48	11-Nov	0.36	2.32	11-Nov	0.34	2.01	11-Nov	0.39	2.83
12-Nov	0.37	2.48	12-Nov	0.36	2.32	12-Nov	0.35	2.16	12-Nov	0.34	2.01	12-Nov	0.35	2.16
13-Nov	0.37	2.48	13-Nov	0.34	2.01	13-Nov	0.34	2.01	13-Nov	0.34	2.01	13-Nov	0.31	1.59
14-Nov	0.40	3.02	14-Nov	0.33	1.86	14-Nov	0.33	1.86	14-Nov	0.34	2.01	14-Nov	0.30	1.46
15-Nov	0.36	2.32	15-Nov	0.33	1.86	15-Nov	0.33	1.86	15-Nov	0.36	2.32	15-Nov	0.30	1.46
16-Nov	0.34	2.01	16-Nov	0.30	1.46	16-Nov	0.34	2.01	16-Nov	0.38	2.65	16-Nov	0.30	1.46
17-Nov	0.36	2.32	17-Nov	0.30	1.46	17-Nov	0.33	1.86	17-Nov	0.39	2.83	17-Nov	0.30	1.46
18-Nov	0.40	3.02	18-Nov	0.30	1.46	18-Nov	0.31	1.59	18-Nov	0.37	2.48	18-Nov	0.30	1.46
19-Nov	0.39	2.83	19-Nov	0.30	1.46	19-Nov	0.31	1.59	19-Nov	0.34	2.01	19-Nov	0.29	1.35
20-Nov	0.39	2.83	20-Nov	0.30	1.46	20-Nov	0.30	1.46	20-Nov	0.34	2.01	20-Nov	0.27	1.12
21-Nov	0.36	2.32	21-Nov	0.30	1.46	21-Nov	0.34	2.01	21-Nov	0.35	2.16	21-Nov	0.27	1.12
22-Nov	0.36	2.32	22-Nov	0.28	1.23	22-Nov	0.39	2.83	22-Nov	0.30	1.46	22-Nov	0.27	1.12
23-Nov	0.37	2.48	23-Nov	0.27	1.12	23-Nov	0.37	2.48	23-Nov	0.30	1.46	23-Nov	0.27	1.12
24-Nov	0.52	5.01	24-Nov	0.27	1.12	24-Nov	0.35	2.16	24-Nov	0.31	1.59	24-Nov	0.27	1.12
25-Nov	0.46	4.05	25-Nov	0.26	1.02	25-Nov	0.34	2.01	25-Nov	0.30	1.46	25-Nov	0.26	1.02
26-Nov	0.47	4.20	26-Nov	0.26	1.02	26-Nov	0.32	1.72	26-Nov	0.30	1.46	26-Nov	0.25	0.93
27-Nov	0.43	3.62	27-Nov	0.26	1.02	27-Nov	0.30	1.46	27-Nov	0.34	2.01	27-Nov	0.26	1.02
28-Nov	0.40	3.02	28-Nov	0.29	1.35	28-Nov	0.30	1.46	28-Nov	0.31	1.59	28-Nov	0.25	0.93
29-Nov	0.38	2.65	29-Nov	0.30	1.46	29-Nov	0.30	1.46	29-Nov	0.30	1.46	29-Nov	0.24	0.84
30-Nov	0.38	2.65	30-Nov	0.29	1.35	30-Nov	0.30	1.46	30-Nov	0.32	1.72	30-Nov	0.24	0.84
1-Dec	0.37	2.48	1-Dec	0.64	7.18	1-Dec	0.30	1.46	1-Dec	0.34	2.01	1-Dec	0.39	2.83
2-Dec	0.34	2.01	2-Dec	0.46	4.05	2-Dec	0.30	1.46	2-Dec	0.30	1.46	2-Dec	0.37	2.48
3-Dec	0.34	2.01	3-Dec	0.40	3.02	3-Dec	0.29	1.35	3-Dec	0.30	1.46	3-Dec	0.32	1.72
4-Dec	0.34	2.01	4-Dec	0.27	1.12	4-Dec	0.30	1.46	4-Dec	0.32	1.72	4-Dec	0.27	1.12
5-Dec	0.32	1.72	5-Dec	0.26	1.02	5-Dec	0.30	1.46	5-Dec	0.30	1.46	5-Dec	0.26	1.02
6-Dec	0.34	2.01	6-Dec	0.26	1.02	6-Dec	0.29	1.35	6-Dec	0.32	1.72	6-Dec	0.35	2.16
7-Dec	0.36	2.32	7-Dec	0.26	1.02	7-Dec	0.29	1.35	7-Dec	0.34	2.01	7-Dec	0.32	1.72
8-Dec	0.36	2.32	8-Dec	0.27	1.12	8-Dec	0.28	1.23	8-Dec	0.30	1.46	8-Dec	0.32	1.72
9-Dec	0.36	2.32	9-Dec	0.27	1.12	9-Dec	0.29	1.35	9-Dec	0.30	1.46	9-Dec	0.30	1.46
10-Dec	0.37	2.48	10-Dec	0.26	1.02	10-Dec	0.27	1.12	10-Dec	0.30	1.46	10-Dec	0.29	1.35
11-Dec	0.36	2.32	11-Dec	0.37	2.48	11-Dec	0.27	1.12	11-Dec	0.28	1.23	11-Dec	0.27	1.12
12-Dec	0.37	2.48	12-Dec	0.58	6.05	12-Dec	0.27	1.12	12-Dec	0.27	1.12	12-Dec	0.27	1.12
13-Dec	0.35	2.16	13-Dec	0.48	4.36	13-Dec	0.27	1.12	13-Dec	0.27	1.12	13-Dec	0.28	1.23
14-Dec	0.35	2.16	14-Dec	0.40	3.02	14-Dec	0.27	1.12	14-Dec	0.27	1.12	14-Dec	0.35	2.16
15-Dec	0.33	1.86	15-Dec	0.33	1.86	15-Dec	0.27	1.12	15-Dec	0.29	1.35	15-Dec	0.27	1.12
16-Dec	0.33	1.86	16-Dec	0.33	1.86	16-Dec	0.29	1.35	16-Dec	0.29	1.35	16-Dec	0.29	1.35
17-Dec	0.34	2.01	17-Dec	0.30	1.46	17-Dec	0.35	2.16	17-Dec	0.29	1.35	17-Dec	0.30	1.46
18-Dec	0.37	2.48	18-Dec	0.30	1.46	18-Dec	0.27	1.12	18-Dec	0.28	1.23	18-Dec	0.24	0.84
19-Dec	0.37	2.48	19-Dec	0.39	2.83	19-Dec	0.28	1.23	19-Dec	0.27	1.12	19-Dec	0.24	0.84
20-Dec	0.34	2.01	20-Dec	0.34	2.01	20-Dec	0.28	1.23	20-Dec	0.28	1.23	20-Dec	0.24	0.84
21-Dec	0.41	3.21	21-Dec	0.32	1.72	21-Dec	0.29	1.35	21-Dec	0.32	1.72	21-Dec	0.27	1.12
22-Dec	0.35	2.16	22-Dec	0.31	1.59	22-Dec	0.29	1.35	22-Dec	0.31	1.59	22-Dec	0.25	0.93
23-Dec	0.41	3.21	23-Dec	0.30	1.46	23-Dec	0.27	1.12	23-Dec	0.31	1.59	23-Dec	0.24	0.84
24-Dec	0.40	3.02	24-Dec	0.31	1.59	24-Dec	0.29	1.35	24-Dec	0.30	1.46	24-Dec	0.26	1.02
25-Dec	0.37	2.48	25-Dec	0.30	1.46	25-Dec	0.27	1.12	25-Dec	0.30	1.46	25-Dec	0.24	0.84
26-Dec	0.49	4.52	26-Dec	0.29	1.35	26-Dec	0.27	1.12	26-Dec	0.30	1.46	26-Dec	0.24	0.84
27-Dec	0.43	3.62	27-Dec	0.29	1.35	27-Dec	0.26	1.02	27-Dec	0.30	1.46	27-Dec	0.23	0.76
28-Dec	0.41	3.21	28-Dec	0.29	1.35	28-Dec	0.26	1.02	28-Dec	0.31	1.59	28-Dec	0.24	0.84
29-Dec	0.40	3.02	29-Dec	0.29	1.35	29-Dec	0.26	1.02	29-Dec	0.30	1.46	29-Dec	0.23	0.76
30-Dec	0.40	3.02	30-Dec	0.29	1.35	30-Dec	0.26	1.02	30-Dec	0.29	1.35	30-Dec	0.21	0.65
31-Dec	0.48	4.36	31-Dec	0.27	1.12	31-Dec	0.25	0.93	31-Dec	0.28	1.23	31-Dec	0.21	0.65

Daily Mean Water Level and Flow at H1A14 on Awach River (unit: H=m, Q=m³/s) * * * denotes estimated value by interpolation

Year	H	Q	Year	H	Q	Year	H	Q	Year	H	Q	Year	H	Q	
1974	1-Jan	0.16	0.22	1975	1-Jan	0.19	0.31	1976	1-Jan	0.23	0.45	1977	1-Jan	0.17	0.25
	2-Jan	0.15	0.19		2-Jan	0.18	0.28		2-Jan	0.28	0.66		2-Jan	0.20	0.34
	3-Jan	0.20	0.34		3-Jan	0.16	0.22		3-Jan	0.32	0.86		3-Jan	0.23	0.45
	4-Jan	0.15	0.19		4-Jan	0.16	0.22		4-Jan	*0.26	0.57		4-Jan	0.74	4.48
	5-Jan	0.22	0.41		5-Jan	*0.16	0.22		5-Jan	0.19	0.31		5-Jan	0.33	0.92
	6-Jan	*0.22	0.41		6-Jan	0.15	0.19		6-Jan	0.18	0.28		6-Jan	0.28	0.66
	7-Jan	0.22	0.41		7-Jan	0.15	0.19		7-Jan	0.29	0.71		7-Jan	0.35	1.03
	8-Jan	0.35	1.03		8-Jan	0.15	0.19		8-Jan	0.22	0.41		8-Jan	0.35	1.03
	9-Jan	0.34	0.97		9-Jan	0.15	0.19		9-Jan	0.21	0.38		9-Jan	*0.32	0.86
	10-Jan	0.27	0.62		10-Jan	0.23	0.45		10-Jan	0.21	0.38		10-Jan	0.29	0.71
	11-Jan	0.20	0.34		11-Jan	0.19	0.31		11-Jan	*0.24	0.49		11-Jan	0.25	0.53
	12-Jan	0.19	0.31		12-Jan	*0.21	0.38		12-Jan	0.27	0.62		12-Jan	0.23	0.45
	13-Jan	*0.20	0.34		13-Jan	0.23	0.45		13-Jan	0.21	0.38		13-Jan	0.22	0.41
	14-Jan	0.20	0.34		14-Jan	0.19	0.31		14-Jan	0.19	0.31		14-Jan	0.21	0.38
	15-Jan	0.20	0.34		15-Jan	0.18	0.28		15-Jan	0.18	0.28		15-Jan	0.24	0.49
	16-Jan	0.18	0.28		16-Jan	0.16	0.22		16-Jan	0.17	0.25		16-Jan	*0.22	0.41
	17-Jan	0.18	0.28		17-Jan	0.16	0.22		17-Jan	0.16	0.22		17-Jan	0.19	0.31
	18-Jan	0.16	0.22		18-Jan	0.15	0.19		18-Jan	*0.16	0.22		18-Jan	0.37	1.15
	19-Jan	0.15	0.19		19-Jan	*0.15	0.19		19-Jan	0.15	0.19		19-Jan	0.28	0.66
	20-Jan	*0.15	0.19		20-Jan	0.14	0.17		20-Jan	0.15	0.19		20-Jan	0.24	0.49
	21-Jan	0.14	0.17		21-Jan	0.15	0.19		21-Jan	0.14	0.17		21-Jan	0.22	0.41
	22-Jan	0.13	0.15		22-Jan	0.33	0.92		22-Jan	0.14	0.17		22-Jan	0.21	0.38
	23-Jan	0.13	0.15		23-Jan	0.19	0.31		23-Jan	0.14	0.17		23-Jan	*0.20	0.34
	24-Jan	0.13	0.15		24-Jan	0.16	0.22		24-Jan	0.13	0.15		24-Jan	0.19	0.31
	25-Jan	0.12	0.13		25-Jan	0.15	0.19		25-Jan	*0.13	0.15		25-Jan	0.23	0.45
	26-Jan	0.11	0.11		26-Jan	*0.15	0.19		26-Jan	0.13	0.15		26-Jan	0.22	0.41
	27-Jan	*0.11	0.11		27-Jan	0.14	0.17		27-Jan	0.12	0.13		27-Jan	0.20	0.34
	28-Jan	0.12	0.13		28-Jan	0.20	0.34		28-Jan	0.12	0.13		28-Jan	0.19	0.31
	29-Jan	0.12	0.13		29-Jan	0.16	0.22		29-Jan	0.12	0.13		29-Jan	0.18	0.28
	30-Jan	0.11	0.11		30-Jan	0.16	0.22		30-Jan	0.11	0.11		30-Jan	*0.24	0.49
	31-Jan	0.11	0.11		31-Jan	0.16	0.22		31-Jan	0.11	0.11		31-Jan	0.30	0.76
	1-Feb	0.12	0.13		1-Feb	0.16	0.22		1-Feb	*0.11	0.11		1-Feb	0.27	0.62
	2-Feb	0.11	0.11		2-Feb	*0.15	0.19		2-Feb	0.11	0.11		2-Feb	0.32	0.86
	3-Feb	*0.11	0.11		3-Feb	0.15	0.19		3-Feb	0.12	0.13		3-Feb	0.26	0.57
	4-Feb	0.11	0.11		4-Feb	0.16	0.22		4-Feb	0.12	0.13		4-Feb	0.42	1.47
	5-Feb	0.11	0.11		5-Feb	0.14	0.17		5-Feb	*0.16	0.22		5-Feb	0.32	0.86
	6-Feb	0.12	0.13		6-Feb	0.13	0.15		6-Feb	0.20	0.34		6-Feb	*0.39	1.27
	7-Feb	0.12	0.13		7-Feb	0.13	0.15		7-Feb	0.31	0.81		7-Feb	0.45	1.68
	8-Feb	0.10	0.09		8-Feb	0.26	0.57		8-Feb	*0.21	0.38		8-Feb	0.40	1.34
	9-Feb	0.10	0.09		9-Feb	*0.22	0.41		9-Feb	0.11	0.11		9-Feb	0.33	0.92
	10-Feb	*0.10	0.09		10-Feb	*0.18	0.28		10-Feb	0.15	0.19		10-Feb	0.29	0.71
	11-Feb	0.09	0.07		11-Feb	0.15	0.19		11-Feb	0.14	0.17		11-Feb	0.27	0.62
	12-Feb	0.10	0.09		12-Feb	0.42	1.47		12-Feb	0.20	0.34		12-Feb	0.26	0.57
	13-Feb	0.10	0.09		13-Feb	0.23	0.45		13-Feb	0.15	0.19		13-Feb	*0.24	0.49
	14-Feb	0.10	0.09		14-Feb	0.53	2.32		14-Feb	0.21	0.38		14-Feb	0.22	0.41
	15-Feb	0.10	0.09		15-Feb	0.23	0.45		15-Feb	*0.19	0.31		15-Feb	0.30	0.76
	16-Feb	0.12	0.13		16-Feb	*0.20	0.34		16-Feb	0.17	0.25		16-Feb	0.23	0.45
	17-Feb	*0.12	0.13		17-Feb	0.17	0.25		17-Feb	0.17	0.25		17-Feb	0.20	0.34
	18-Feb	0.13	0.15		18-Feb	0.16	0.22		18-Feb	0.16	0.22		18-Feb	0.21	0.38
	19-Feb	0.13	0.15		19-Feb	0.15	0.19		19-Feb	0.15	0.19		19-Feb	0.31	0.81
	20-Feb	0.11	0.11		20-Feb	0.14	0.17		20-Feb	0.14	0.17		20-Feb	*0.27	0.62
	21-Feb	0.10	0.09		21-Feb	0.13	0.15		21-Feb	0.14	0.17		21-Feb	0.23	0.45
	22-Feb	0.10	0.09		22-Feb	0.13	0.15		22-Feb	*0.14	0.17		22-Feb	0.28	0.66
	23-Feb	0.09	0.07		23-Feb	*0.13	0.15		23-Feb	0.13	0.15		23-Feb	0.28	0.66
	24-Feb	*0.09	0.07		24-Feb	0.12	0.13		24-Feb	0.12	0.13		24-Feb	0.25	0.53
	25-Feb	0.09	0.07		25-Feb	0.12	0.13		25-Feb	0.13	0.15		25-Feb	0.24	0.49
	26-Feb	0.08	0.06		26-Feb	0.13	0.15		26-Feb	0.12	0.13		26-Feb	0.23	0.45
	27-Feb	0.08	0.06		27-Feb	0.16	0.22		27-Feb	0.12	0.13		27-Feb	*0.23	0.45
	28-Feb	0.07	0.04		28-Feb	0.15	0.19		28-Feb	0.12	0.13		28-Feb	0.22	0.41
	1-Mar	0.08	0.06		1-Mar	0.14	0.17		1-Mar	0.12	0.13		1-Mar	0.21	0.38
	2-Mar	0.12	0.13		2-Mar	*0.13	0.15		2-Mar	0.12	0.13		2-Mar	0.20	0.34
	3-Mar	*0.22	0.41		3-Mar	0.12	0.13		3-Mar	0.12	0.13		3-Mar	0.19	0.31
	4-Mar	0.32	0.86		4-Mar	0.12	0.13		4-Mar	0.12	0.13		4-Mar	0.19	0.31
	5-Mar	0.25	0.53		5-Mar	0.14	0.17		5-Mar	0.11	0.11		5-Mar	0.18	0.28
	6-Mar	0.20	0.34		6-Mar	0.17	0.25		6-Mar	0.11	0.11		6-Mar	*0.21	0.38
	7-Mar	0.15	0.19		7-Mar	0.15	0.19		7-Mar	*0.11	0.11		7-Mar	0.24	0.49
	8-Mar	0.13	0.15		8-Mar	0.18	0.28		8-Mar	0.11	0.11		8-Mar	0.49	1.99
	9-Mar	0.12	0.13		9-Mar	*0.19	0.31		9-Mar	0.10	0.09		9-Mar	0.62	3.16
	10-Mar	*0.12	0.13		10-Mar	0.20	0.34		10-Mar	0.09	0.07		10-Mar	0.49	1.99
	11-Mar	0.12	0.13		11-Mar	0.16	0.22		11-Mar	0.08	0.06		11-Mar	0.43	1.54
	12-Mar	0.11	0.11		12-Mar	0.14	0.17		12-Mar	0.08	0.06		12-Mar	0.37	1.15
	13-Mar	0.11	0.11		13-Mar	0.13	0.15		13-Mar	0.08	0.06		13-Mar	*0.34	0.97
	14-Mar	0.10	0.09		14-Mar	0.13	0.15		14-Mar	*0.08	0.06		14-Mar	0.31	0.81
	15-Mar	0.10	0.09		15-Mar	0.21	0.38		15-Mar	*0.07	0.04		15-Mar	0.29	0.71
	16-Mar	0.09	0.07		16-Mar	*0.19	0.31		16-Mar	*0.07	0.04		16-Mar	0.27	0.62
	17-Mar	*0.09	0.07		17-Mar	0.18	0.28		17-Mar	0.07	0.04		17-Mar	0.25	0.53
	18-Mar	0.09	0.07		18-Mar	0.38	1.21		18-Mar	0.07	0.04		18-Mar	0.25	0.53

Daily Mean Water Level and Flow at IHA14 on Awach River (unit: H=m, Q=m³/s) * * denotes estimated value by interpolation

1974	H	Q	1975	H	Q	1976	H	Q	1977	H	Q	1978	H	Q	1979	H	Q
5-Nov	0.62	3.16	5-Nov	0.30	0.76	5-Nov	0.17	0.25	5-Nov	0.31	0.81	5-Nov	*0.27	0.62	5-Nov	0.30	0.76
6-Nov	0.41	1.40	6-Nov	0.28	0.66	6-Nov	0.19	0.31	6-Nov	*0.33	0.92	6-Nov	0.27	0.62	6-Nov	0.26	0.57
7-Nov	0.37	1.15	7-Nov	0.30	0.76	7-Nov	*0.18	0.28	7-Nov	0.35	1.03	7-Nov	0.25	0.53	7-Nov	0.22	0.41
8-Nov	0.34	0.97	8-Nov	0.28	0.66	8-Nov	0.16	0.22	8-Nov	0.40	1.34	8-Nov	0.25	0.53	8-Nov	*0.35	1.03
9-Nov	0.30	0.76	9-Nov	*0.28	0.66	9-Nov	0.16	0.22	9-Nov	0.33	0.92	9-Nov	0.24	0.49	9-Nov	0.48	1.91
10-Nov	*0.32	0.86	10-Nov	0.27	0.62	10-Nov	0.18	0.28	10-Nov	0.32	0.86	10-Nov	0.23	0.45	10-Nov	0.40	1.34
11-Nov	0.33	0.92	11-Nov	0.28	0.66	11-Nov	0.20	0.34	11-Nov	0.30	0.76	11-Nov	0.23	0.45	11-Nov	*0.37	1.15
12-Nov	0.32	0.85	12-Nov	0.28	0.66	12-Nov	0.15	0.19	12-Nov	0.31	0.81	12-Nov	*0.29	0.71	12-Nov	0.34	0.97
13-Nov	0.31	0.81	13-Nov	0.27	0.62	13-Nov	0.14	0.17	13-Nov	*0.32	0.86	13-Nov	0.34	0.97	13-Nov	0.29	0.71
14-Nov	0.31	0.81	14-Nov	0.31	0.81	14-Nov	*0.14	0.17	14-Nov	0.33	0.92	14-Nov	0.31	0.81	14-Nov	0.27	0.62
15-Nov	0.30	0.76	15-Nov	0.28	0.66	15-Nov	0.13	0.15	15-Nov	0.30	0.81	15-Nov	0.30	0.76	15-Nov	0.25	0.53
16-Nov	0.39	1.27	16-Nov	*0.28	0.66	16-Nov	0.17	0.25	16-Nov	0.53	2.32	16-Nov	0.28	0.66	16-Nov	*0.24	0.49
17-Nov	*0.34	0.97	17-Nov	0.27	0.62	17-Nov	0.16	0.22	17-Nov	0.45	1.68	17-Nov	0.27	0.62	17-Nov	0.23	0.45
18-Nov	0.28	0.66	18-Nov	0.27	0.62	18-Nov	0.15	0.19	18-Nov	0.45	1.68	18-Nov	0.25	0.53	18-Nov	*0.23	0.45
19-Nov	0.28	0.66	19-Nov	0.25	0.53	19-Nov	0.18	0.28	19-Nov	0.62	3.16	19-Nov	*0.30	0.76	19-Nov	0.22	0.41
20-Nov	0.27	0.62	20-Nov	0.26	0.57	20-Nov	0.16	0.22	20-Nov	*0.59	2.87	20-Nov	0.36	1.09	20-Nov	0.23	0.45
21-Nov	0.27	0.62	21-Nov	0.32	0.86	21-Nov	*0.20	0.34	21-Nov	0.55	2.50	21-Nov	0.34	0.97	21-Nov	0.23	0.45
22-Nov	0.25	0.53	22-Nov	0.29	0.71	22-Nov	0.24	0.49	22-Nov	0.52	2.24	22-Nov	0.30	0.76	22-Nov	0.24	0.49
23-Nov	0.25	0.53	23-Nov	*0.27	0.62	23-Nov	0.19	0.31	23-Nov	0.58	2.77	23-Nov	0.28	0.66	23-Nov	0.25	0.53
24-Nov	*0.30	0.76	24-Nov	0.25	0.53	24-Nov	0.21	0.38	24-Nov	0.68	3.79	24-Nov	0.27	0.62	24-Nov	0.27	0.62
25-Nov	0.35	1.03	25-Nov	0.23	0.45	25-Nov	0.39	1.27	25-Nov	0.64	3.37	25-Nov	0.25	0.53	25-Nov	*0.27	0.62
26-Nov	0.30	0.76	26-Nov	0.23	0.45	26-Nov	0.23	0.45	26-Nov	0.59	2.87	26-Nov	*0.25	0.53	26-Nov	0.26	0.57
27-Nov	0.30	0.76	27-Nov	0.22	0.41	27-Nov	0.20	0.34	27-Nov	*0.59	2.87	27-Nov	0.24	0.49	27-Nov	0.25	0.53
28-Nov	0.23	0.45	28-Nov	0.21	0.38	28-Nov	*0.23	0.45	28-Nov	0.58	2.77	28-Nov	0.23	0.45	28-Nov	0.24	0.49
29-Nov	0.25	0.53	29-Nov	0.21	0.38	29-Nov	0.25	0.53	29-Nov	0.54	2.41	29-Nov	0.22	0.41	29-Nov	*0.28	0.66
30-Nov	0.23	0.45	30-Nov	*0.21	0.38	30-Nov	0.27	0.62	30-Nov	0.50	2.07	30-Nov	0.22	0.41	30-Nov	*0.32	0.86
1-Dec	*0.23	0.45	1-Dec	0.21	0.38	1-Dec	0.25	0.53	1-Dec	0.40	1.34	1-Dec	0.22	0.41	1-Dec	0.36	1.09
2-Dec	0.23	0.45	2-Dec	0.21	0.38	2-Dec	0.59	2.87	2-Dec	0.46	1.76	2-Dec	0.20	0.34	2-Dec	*0.38	1.21
3-Dec	0.22	0.41	3-Dec	0.22	0.41	3-Dec	0.32	0.86	3-Dec	0.42	1.47	3-Dec	*0.21	0.38	3-Dec	0.39	1.27
4-Dec	0.22	0.41	4-Dec	0.21	0.38	4-Dec	0.26	0.57	4-Dec	*0.41	1.40	4-Dec	0.21	0.38	4-Dec	0.35	1.03
5-Dec	0.23	0.45	5-Dec	0.22	0.41	5-Dec	*0.24	0.49	5-Dec	0.39	1.27	5-Dec	0.21	0.38	5-Dec	0.31	0.81
6-Dec	0.28	0.66	6-Dec	0.40	1.34	6-Dec	0.22	0.41	6-Dec	0.39	1.27	6-Dec	0.20	0.34	6-Dec	0.30	0.76
7-Dec	0.23	0.45	7-Dec	*0.33	0.92	7-Dec	0.20	0.34	7-Dec	0.35	1.03	7-Dec	0.20	0.34	7-Dec	0.29	0.71
8-Dec	*0.23	0.45	8-Dec	0.26	0.57	8-Dec	0.19	0.31	8-Dec	0.35	1.03	8-Dec	0.19	0.31	8-Dec	0.28	0.66
9-Dec	0.22	0.41	9-Dec	0.31	0.81	9-Dec	0.18	0.28	9-Dec	0.35	1.03	9-Dec	0.20	0.34	9-Dec	*0.28	0.66
10-Dec	0.35	1.03	10-Dec	0.26	0.57	10-Dec	0.17	0.25	10-Dec	0.37	1.15	10-Dec	*0.19	0.31	10-Dec	0.27	0.62
11-Dec	0.24	0.49	11-Dec	0.25	0.53	11-Dec	0.17	0.25	11-Dec	*0.36	1.09	11-Dec	0.18	0.28	11-Dec	0.26	0.57
12-Dec	*0.29	0.71	12-Dec	*0.28	0.66	12-Dec	*0.16	0.22	12-Dec	*0.35	1.03	12-Dec	*0.23	0.45	12-Dec	*0.25	0.53
13-Dec	0.33	0.92	13-Dec	0.30	0.76	13-Dec	*0.15	0.19	13-Dec	0.34	0.97	13-Dec	0.28	0.66	13-Dec	0.24	0.49
14-Dec	0.25	0.53	14-Dec	*0.26	0.57	14-Dec	0.14	0.17	14-Dec	0.32	0.86	14-Dec	0.30	0.76	14-Dec	0.23	0.45
15-Dec	*0.24	0.49	15-Dec	0.23	0.45	15-Dec	0.14	0.17	15-Dec	0.32	0.86	15-Dec	0.31	0.81	15-Dec	0.23	0.45
16-Dec	0.22	0.41	16-Dec	0.28	0.66	16-Dec	0.14	0.17	16-Dec	0.33	0.92	16-Dec	0.28	0.66	16-Dec	*0.23	0.45
17-Dec	0.22	0.41	17-Dec	0.33	0.92	17-Dec	0.13	0.15	17-Dec	0.31	0.81	17-Dec	*0.29	0.71	17-Dec	0.22	0.41
18-Dec	0.22	0.41	18-Dec	0.24	0.49	18-Dec	0.13	0.15	18-Dec	*0.30	0.76	18-Dec	0.30	0.76	18-Dec	0.28	0.66
19-Dec	0.22	0.41	19-Dec	0.23	0.45	19-Dec	*0.13	0.15	19-Dec	0.29	0.71	19-Dec	0.24	0.49	19-Dec	0.25	0.53
20-Dec	0.21	0.38	20-Dec	0.22	0.41	20-Dec	0.13	0.15	20-Dec	0.28	0.66	20-Dec	0.23	0.45	20-Dec	0.23	0.45
21-Dec	0.20	0.34	21-Dec	*0.21	0.38	21-Dec	0.12	0.13	21-Dec	0.29	0.71	21-Dec	0.29	0.71	21-Dec	0.22	0.41
22-Dec	*0.20	0.34	22-Dec	0.20	0.34	22-Dec	0.20	0.34	22-Dec	0.30	0.76	22-Dec	*0.33	0.92	22-Dec	0.21	0.38
23-Dec	0.19	0.31	23-Dec	0.19	0.31	23-Dec	0.21	0.38	23-Dec	0.30	0.76	23-Dec	0.36	1.09	23-Dec	*0.21	0.38
24-Dec	0.18	0.28	24-Dec	0.19	0.31	24-Dec	0.16	0.22	24-Dec	0.36	1.09	24-Dec	*0.38	1.21	24-Dec	0.20	0.34
25-Dec	*0.21	0.38	25-Dec	*0.19	0.31	25-Dec	*0.16	0.22	25-Dec	*0.34	0.97	25-Dec	*0.40	1.34	25-Dec	*0.22	0.41
26-Dec	*0.24	0.49	26-Dec	*0.18	0.28	26-Dec	*0.15	0.19	26-Dec	*0.32	0.86	26-Dec	*0.42	1.47	26-Dec	*0.24	0.49
27-Dec	0.28	0.66	27-Dec	0.18	0.28	27-Dec	*0.14	0.17	27-Dec	*0.30	0.76	27-Dec	0.44	1.61	27-Dec	0.25	0.53
28-Dec	0.23	0.45	28-Dec	*0.14	0.17	28-Dec	0.14	0.17	28-Dec	0.28	0.66	28-Dec	0.36	1.09	28-Dec	0.24	0.49
29-Dec	0.23	0.45	29-Dec	0.11	0.11	29-Dec	0.14	0.17	29-Dec	0.27	0.62	29-Dec	0.34	0.97	29-Dec	0.25	0.53
30-Dec	0.20	0.34	30-Dec	*0.11	0.11	30-Dec	*0.15	0.19	30-Dec	0.27	0.62	30-Dec	0.30	0.76	30-Dec	*0.24	0.49
31-Dec	0.19	0.31	31-Dec	0.11	0.11	31-Dec	*0.16	0.22	31-Dec	0.27	0.62	31-Dec	0.30	0.76	31-Dec	0.23	0.45

Daily Mean Water Level and Flow at HHA14 on Awach River (unit: H-m, Q-m³/s) * * * denotes estimated value by interpolation

1980	H	Q	1981	H	Q	1982	H	Q	1983	H	Q	1984	H	Q	1985	H	Q
5-Nov	0.27	0.62	5-Nov	0.27	0.62	5-Nov	0.72	4.24	5-Nov	*0.31	0.81	5-Nov	0.20	0.34	5-Nov	0.33	0.92
6-Nov	0.26	0.57	6-Nov	0.26	0.57	6-Nov	0.70	4.01	6-Nov	*0.30	0.76	6-Nov	0.18	0.28	6-Nov	0.35	1.03
7-Nov	0.27	0.62	7-Nov	0.24	0.49	7-Nov	*0.68	3.79	7-Nov	0.30	0.76	7-Nov	0.21	0.38	7-Nov	0.30	0.76
8-Nov	0.27	0.62	8-Nov	*0.24	0.49	8-Nov	0.66	3.58	8-Nov	0.30	0.76	8-Nov	0.20	0.34	8-Nov	0.30	0.76
9-Nov	*0.27	0.62	9-Nov	0.23	0.45	9-Nov	0.60	2.96	9-Nov	0.28	0.66	9-Nov	0.25	0.53	9-Nov	0.29	0.71
10-Nov	0.27	0.62	10-Nov	0.31	0.81	10-Nov	0.51	2.15	10-Nov	0.27	0.62	10-Nov	*0.23	0.45	10-Nov	0.27	0.62
11-Nov	0.27	0.62	11-Nov	0.30	0.76	11-Nov	0.48	1.91	11-Nov	0.26	0.57	11-Nov	*0.21	0.38	11-Nov	0.26	0.57
12-Nov	0.26	0.57	12-Nov	0.29	0.71	12-Nov	0.52	2.24	12-Nov	*0.26	0.57	12-Nov	0.20	0.34	12-Nov	0.25	0.53
13-Nov	0.26	0.57	13-Nov	0.27	0.62	13-Nov	0.50	2.07	13-Nov	*0.27	0.62	13-Nov	0.19	0.31	13-Nov	0.27	0.62
14-Nov	0.31	0.81	14-Nov	0.26	0.57	14-Nov	*0.60	2.96	14-Nov	0.27	0.62	14-Nov	0.32	0.86	14-Nov	0.26	0.57
15-Nov	0.27	0.62	15-Nov	*0.26	0.57	15-Nov	0.70	4.01	15-Nov	0.27	0.62	15-Nov	0.54	2.41	15-Nov	0.24	0.49
16-Nov	*0.27	0.62	16-Nov	0.25	0.53	16-Nov	0.61	3.06	16-Nov	0.26	0.57	16-Nov	*0.45	1.68	16-Nov	0.26	0.57
17-Nov	0.27	0.62	17-Nov	0.24	0.49	17-Nov	0.56	2.59	17-Nov	0.26	0.57	17-Nov	0.35	1.03	17-Nov	0.26	0.57
18-Nov	0.27	0.62	18-Nov	0.23	0.45	18-Nov	0.41	1.40	18-Nov	0.26	0.57	18-Nov	*0.35	1.03	18-Nov	0.24	0.49
19-Nov	0.27	0.62	19-Nov	0.24	0.49	19-Nov	0.45	1.68	19-Nov	0.40	1.34	19-Nov	*0.35	1.03	19-Nov	0.23	0.45
20-Nov	0.27	0.62	20-Nov	0.23	0.45	20-Nov	0.40	1.34	20-Nov	*0.38	1.21	20-Nov	0.35	1.03	20-Nov	0.22	0.41
21-Nov	0.31	0.81	21-Nov	0.22	0.41	21-Nov	*0.40	1.34	21-Nov	0.35	1.03	21-Nov	0.36	1.09	21-Nov	0.21	0.38
22-Nov	0.31	0.81	22-Nov	*0.23	0.45	22-Nov	0.39	1.27	22-Nov	0.35	1.03	22-Nov	0.34	0.92	22-Nov	0.21	0.38
23-Nov	*0.29	0.71	23-Nov	0.24	0.49	23-Nov	0.40	1.34	23-Nov	0.34	0.97	23-Nov	0.33	0.92	23-Nov	0.21	0.38
24-Nov	0.27	0.62	24-Nov	0.24	0.49	24-Nov	0.68	3.79	24-Nov	0.30	0.76	24-Nov	*0.33	0.92	24-Nov	0.20	0.34
25-Nov	0.25	0.53	25-Nov	0.22	0.41	25-Nov	0.65	3.47	25-Nov	0.30	0.76	25-Nov	*0.34	0.97	25-Nov	0.19	0.31
26-Nov	0.25	0.53	26-Nov	0.20	0.34	26-Nov	0.60	2.96	26-Nov	*0.30	0.76	26-Nov	0.35	1.03	26-Nov	0.19	0.31
27-Nov	0.24	0.49	27-Nov	0.19	0.31	27-Nov	0.55	2.50	27-Nov	*0.29	0.71	27-Nov	0.61	3.06	27-Nov	0.19	0.31
28-Nov	0.24	0.49	28-Nov	0.18	0.28	28-Nov	*0.70	4.01	28-Nov	0.29	0.71	28-Nov	*0.50	2.07	28-Nov	0.17	0.25
29-Nov	0.23	0.45	29-Nov	*0.21	0.38	29-Nov	0.85	5.88	29-Nov	0.27	0.62	29-Nov	0.40	1.34	29-Nov	0.17	0.25
30-Nov	*0.23	0.45	30-Nov	0.24	0.49	30-Nov	0.98	7.78	30-Nov	0.39	1.27	30-Nov	*0.40	1.34	30-Nov	0.17	0.25
1-Dec	0.22	0.41	1-Dec	0.20	0.34	1-Dec	0.95	7.32	1-Dec	0.30	0.76	1-Dec	*0.40	1.34	1-Dec	0.17	0.25
2-Dec	0.21	0.38	2-Dec	0.19	0.31	2-Dec	1.00	8.09	2-Dec	0.29	0.71	2-Dec	*0.39	1.27	2-Dec	0.17	0.25
3-Dec	0.20	0.34	3-Dec	0.18	0.28	3-Dec	0.92	6.87	3-Dec	0.32	0.86	3-Dec	*0.39	1.27	3-Dec	0.16	0.22
4-Dec	0.20	0.34	4-Dec	0.17	0.25	4-Dec	0.90	6.58	4-Dec	*0.31	0.81	4-Dec	0.39	1.27	4-Dec	0.20	0.34
5-Dec	0.19	0.31	5-Dec	0.17	0.25	5-Dec	*0.83	5.61	5-Dec	0.30	0.76	5-Dec	0.36	1.09	5-Dec	0.19	0.31
6-Dec	0.18	0.28	6-Dec	*0.17	0.25	6-Dec	0.76	4.72	6-Dec	0.28	0.66	6-Dec	0.33	0.92	6-Dec	0.18	0.28
7-Dec	*0.21	0.38	7-Dec	0.17	0.25	7-Dec	0.75	4.60	7-Dec	0.27	0.62	7-Dec	0.32	0.86	7-Dec	0.25	0.53
8-Dec	0.24	0.49	8-Dec	0.17	0.25	8-Dec	0.74	4.48	8-Dec	0.26	0.57	8-Dec	*0.46	1.76	8-Dec	0.25	0.53
9-Dec	0.30	0.76	9-Dec	0.17	0.25	9-Dec	0.66	3.58	9-Dec	0.26	0.57	9-Dec	0.59	2.87	9-Dec	0.23	0.45
10-Dec	0.26	0.57	10-Dec	0.16	0.22	10-Dec	0.63	3.26	10-Dec	*0.26	0.57	10-Dec	0.50	2.07	10-Dec	0.22	0.41
11-Dec	0.28	0.66	11-Dec	0.16	0.22	11-Dec	0.60	2.96	11-Dec	*0.25	0.53	11-Dec	0.45	1.68	11-Dec	0.24	0.49
12-Dec	*0.27	0.62	12-Dec	*0.16	0.22	12-Dec	*0.62	3.16	12-Dec	*0.24	0.49	12-Dec			12-Dec	0.30	0.76
13-Dec	0.25	0.53	13-Dec	*0.16	0.22	13-Dec	*0.63	3.26	13-Dec	*0.23	0.45	13-Dec			13-Dec	0.29	0.71
14-Dec	*0.23	0.45	14-Dec	0.16	0.22	14-Dec	0.64	3.37	14-Dec	0.23	0.45	14-Dec			14-Dec	0.24	0.49
15-Dec	0.20	0.34	15-Dec	0.15	0.19	15-Dec	0.59	2.87	15-Dec	0.23	0.45	15-Dec			15-Dec	0.21	0.38
16-Dec	0.20	0.34	16-Dec	0.15	0.19	16-Dec	0.57	2.68	16-Dec	0.21	0.38	16-Dec			16-Dec	0.20	0.34
17-Dec	0.19	0.31	17-Dec	0.16	0.22	17-Dec	0.56	2.59	17-Dec	*0.21	0.38	17-Dec			17-Dec	0.18	0.28
18-Dec	0.18	0.28	18-Dec	0.20	0.34	18-Dec	0.53	2.32	18-Dec	*0.21	0.38	18-Dec			18-Dec	0.18	0.28
19-Dec	0.17	0.25	19-Dec	0.18	0.28	19-Dec	*0.51	2.15	19-Dec	0.21	0.38	19-Dec			19-Dec	0.19	0.31
20-Dec	0.16	0.22	20-Dec	*0.21	0.38	20-Dec	0.49	1.99	20-Dec	0.21	0.38	20-Dec			20-Dec	0.20	0.34
21-Dec	*0.18	0.28	21-Dec	0.24	0.49	21-Dec	0.45	1.68	21-Dec	0.22	0.41	21-Dec			21-Dec	0.19	0.31
22-Dec	0.19	0.31	22-Dec	0.22	0.41	22-Dec	0.50	2.07	22-Dec	0.23	0.45	22-Dec			22-Dec	0.18	0.28
23-Dec	0.18	0.28	23-Dec	0.18	0.28	23-Dec	0.44	1.61	23-Dec	0.24	0.49	23-Dec			23-Dec	0.17	0.25
24-Dec	0.16	0.22	24-Dec	0.16	0.22	24-Dec	0.44	1.61	24-Dec	*0.24	0.49	24-Dec			24-Dec	0.18	0.28
25-Dec	*0.16	0.22	25-Dec	*0.16	0.22	25-Dec	*0.42	1.47	25-Dec	*0.24	0.49	25-Dec			25-Dec	0.17	0.25
26-Dec	*0.16	0.22	26-Dec	*0.15	0.19	26-Dec	*0.40	1.34	26-Dec	*0.25	0.53	26-Dec			26-Dec	0.17	0.25
27-Dec	0.16	0.22	27-Dec	*0.14	0.17	27-Dec	*0.39	1.27	27-Dec	*0.25	0.53	27-Dec			27-Dec	0.16	0.22
28-Dec	*0.16	0.22	28-Dec	0.14	0.17	28-Dec	0.38	1.21	28-Dec	0.25	0.53	28-Dec			28-Dec	0.16	0.22
29-Dec	0.16	0.22	29-Dec	0.13	0.15	29-Dec	0.36	1.09	29-Dec	0.24	0.49	29-Dec			29-Dec	0.16	0.22
30-Dec	0.15	0.19	30-Dec	0.12	0.13	30-Dec	0.35	1.03	30-Dec	0.24	0.49	30-Dec			30-Dec	0.15	0.19
31-Dec	*0.15	0.19	31-Dec	0.12	0.13	31-Dec	0.34	0.97	31-Dec	*0.24	0.49	31-Dec			31-Dec	0.15	0.19

Daily Mean Water Level and Flow at HHA14 on Awach River (unit: H=m, Q=m³/s) * * * denotes estimated value by interpolation

1986	H	Q	1987	H	Q	1988	H	Q	1989	H	Q	1990	H	Q	1991	H	Q
5-Nov			5-Nov	*0.39	1.27	5-Nov	0.22	0.41	5-Nov	*0.27	0.62	5-Nov	0.43	1.54	5-Nov	0.42	1.47
6-Nov			6-Nov	*0.42	1.47	6-Nov	0.21	0.38	6-Nov	0.30	0.76	6-Nov	0.36	1.09	6-Nov	0.45	1.68
7-Nov			7-Nov	*0.45	1.68	7-Nov	0.21	0.38	7-Nov	0.31	0.81	7-Nov	0.36	1.09	7-Nov	0.45	1.68
8-Nov			8-Nov	*0.48	1.91	8-Nov	0.20	0.34	8-Nov	0.19	0.31	8-Nov	0.32	0.86	8-Nov	0.40	1.34
9-Nov			9-Nov	*0.51	2.15	9-Nov	0.19	0.31	9-Nov	0.18	0.28	9-Nov	0.30	0.76	9-Nov	*0.40	1.34
10-Nov			10-Nov	*0.53	2.32	10-Nov	0.21	0.38	10-Nov	0.18	0.28	10-Nov	*0.29	0.71	10-Nov	*0.40	1.34
11-Nov			11-Nov	*0.56	2.59	11-Nov	0.20	0.34	11-Nov	*0.21	0.38	11-Nov	*0.28	0.66	11-Nov	0.40	1.34
12-Nov			12-Nov	0.60	2.96	12-Nov	0.19	0.31	12-Nov	*0.24	0.49	12-Nov	0.28	0.66	12-Nov	0.35	1.03
13-Nov			13-Nov	0.58	2.77	13-Nov	0.18	0.28	13-Nov	*0.27	0.62	13-Nov	0.22	0.41	13-Nov	0.29	0.71
14-Nov			14-Nov	0.54	2.41	14-Nov	0.18	0.28	14-Nov	0.29	0.71	14-Nov	0.25	0.53	14-Nov	0.31	0.81
15-Nov			15-Nov	*0.54	2.41	15-Nov	0.17	0.25	15-Nov	0.25	0.53	15-Nov	0.26	0.57	15-Nov	0.38	1.21
16-Nov			16-Nov	0.53	2.32	16-Nov	0.18	0.28	16-Nov	0.24	0.49	16-Nov	0.25	0.53	16-Nov	*0.37	1.15
17-Nov			17-Nov	0.47	1.83	17-Nov	0.18	0.28	17-Nov	0.23	0.45	17-Nov	*0.27	0.62	17-Nov	*0.36	1.09
18-Nov			18-Nov	0.50	2.07	18-Nov	0.17	0.25	18-Nov	*0.26	0.57	18-Nov	*0.29	0.71	18-Nov	0.35	1.03
19-Nov			19-Nov	0.47	1.83	19-Nov	0.26	0.57	19-Nov	*0.30	0.76	19-Nov	0.30	0.76	19-Nov	0.35	1.03
20-Nov			20-Nov	0.47	1.83	20-Nov	0.30	0.76	20-Nov	*0.34	0.97	20-Nov	0.29	0.71	20-Nov	0.32	0.86
21-Nov			21-Nov	0.43	1.54	21-Nov	0.26	0.57	21-Nov	0.38	1.21	21-Nov	0.28	0.66	21-Nov	0.30	0.76
22-Nov			22-Nov	*0.39	1.27	22-Nov	0.34	0.97	22-Nov	0.36	1.09	22-Nov	0.26	0.57	22-Nov	0.30	0.76
23-Nov			23-Nov	*0.35	1.03	23-Nov	0.36	1.09	23-Nov	0.32	0.86	23-Nov	0.26	0.57	23-Nov	*0.30	0.76
24-Nov			24-Nov	0.40	1.34	24-Nov	0.32	0.86	24-Nov	0.32	0.86	24-Nov	*0.26	0.57	24-Nov	*0.30	0.76
25-Nov			25-Nov	0.35	1.03	25-Nov	0.30	0.76	25-Nov	*0.31	0.81	25-Nov	*0.26	0.57	25-Nov	0.30	0.76
26-Nov			26-Nov	0.35	1.03	26-Nov	0.29	0.71	26-Nov	*0.30	0.76	26-Nov	0.26	0.57	26-Nov	0.31	0.81
27-Nov	0.24		27-Nov	0.34	0.97	27-Nov	0.26	0.57	27-Nov	0.30	0.76	27-Nov	0.25	0.53	27-Nov	0.29	0.71
28-Nov			28-Nov	0.34	0.97	28-Nov	0.22	0.41	28-Nov	0.36	1.09	28-Nov	0.26	0.57	28-Nov	0.28	0.66
29-Nov			29-Nov	*0.32	0.86	29-Nov	0.20	0.34	29-Nov	0.31	0.81	29-Nov	0.26	0.57	29-Nov	*0.25	0.53
30-Nov			30-Nov	0.30	0.76	30-Nov	0.20	0.34	30-Nov	0.30	0.76	30-Nov	0.26	0.57	30-Nov	*0.22	0.41
1-Dec			1-Dec	0.30	0.76	1-Dec	0.20	0.34	1-Dec	0.32	0.86	1-Dec	*0.26	0.57	1-Dec	*0.20	0.34
2-Dec			2-Dec	0.28	0.66	2-Dec	0.19	0.31	2-Dec	*0.36	1.09	2-Dec	*0.26	0.57	2-Dec	0.18	0.28
3-Dec			3-Dec	0.26	0.57	3-Dec	*0.19	0.31	3-Dec	*0.40	1.34	3-Dec	0.26	0.57	3-Dec	0.15	0.19
4-Dec			4-Dec	0.26	0.57	4-Dec	*0.18	0.28	4-Dec	0.44	1.61	4-Dec	0.23	0.45	4-Dec	0.12	0.13
5-Dec			5-Dec	0.25	0.53	5-Dec	0.17	0.25	5-Dec	0.42	1.47	5-Dec	0.24	0.49	5-Dec	0.13	0.15
6-Dec			6-Dec	*0.25	0.53	6-Dec	0.17	0.25	6-Dec	0.40	1.34	6-Dec	0.22	0.41	6-Dec	0.13	0.15
7-Dec			7-Dec	0.26	0.57	7-Dec	0.17	0.25	7-Dec	0.40	1.34	7-Dec	0.22	0.41	7-Dec	*0.13	0.15
8-Dec			8-Dec	0.26	0.57	8-Dec	0.16	0.22	8-Dec	0.40	1.34	8-Dec	*0.23	0.45	8-Dec	*0.14	0.17
9-Dec			9-Dec	0.25	0.53	9-Dec	0.16	0.22	9-Dec	*0.40	1.34	9-Dec	*0.24	0.49	9-Dec	0.14	0.17
10-Dec			10-Dec	0.25	0.53	10-Dec	0.16	0.22	10-Dec	*0.41	1.40	10-Dec	0.24	0.49	10-Dec	0.16	0.22
11-Dec			11-Dec	0.33	0.92	11-Dec	0.15	0.19	11-Dec	0.42	1.47	11-Dec	0.24	0.49	11-Dec	0.15	0.19
12-Dec			12-Dec	*0.31	0.81	12-Dec	0.15	0.19	12-Dec	*0.38	1.21	12-Dec	*0.23	0.45	12-Dec	*0.17	0.25
13-Dec			13-Dec	*0.29	0.71	13-Dec	0.15	0.19	13-Dec	0.34	0.97	13-Dec	0.22	0.41	13-Dec	0.20	0.34
14-Dec			14-Dec	0.27	0.62	14-Dec	0.16	0.22	14-Dec	0.34	0.97	14-Dec	0.24	0.49	14-Dec	*0.21	0.38
15-Dec			15-Dec	0.26	0.57	15-Dec	0.16	0.22	15-Dec	0.34	0.97	15-Dec	*0.27	0.62	15-Dec	*0.22	0.41
16-Dec	0.21		16-Dec	0.26	0.57	16-Dec	0.16	0.22	16-Dec	*0.32	0.86	16-Dec	*0.29	0.71	16-Dec	0.23	0.45
17-Dec			17-Dec	0.25	0.53	17-Dec	0.16	0.22	17-Dec	*0.30	0.76	17-Dec	0.31	0.81	17-Dec	0.25	0.53
18-Dec			18-Dec	0.24	0.49	18-Dec	0.16	0.22	18-Dec	0.29	0.71	18-Dec	0.29	0.71	18-Dec	0.23	0.45
19-Dec			19-Dec	0.24	0.49	19-Dec	0.15	0.19	19-Dec	0.27	0.62	19-Dec	0.28	0.66	19-Dec	0.21	0.38
20-Dec			20-Dec	*0.23	0.45	20-Dec	0.16	0.22	20-Dec	0.36	1.09	20-Dec	0.27	0.62	20-Dec	*0.20	0.34
21-Dec			21-Dec	0.22	0.41	21-Dec	0.20	0.34	21-Dec	0.30	0.76	21-Dec	0.26	0.57	21-Dec	*0.20	0.34
22-Dec	0.25		22-Dec	0.21	0.38	22-Dec	0.18	0.28	22-Dec	0.30	0.76	22-Dec	*0.27	0.62	22-Dec	*0.20	0.34
23-Dec			23-Dec	0.21	0.38	23-Dec	0.16	0.22	23-Dec	*0.33	0.92	23-Dec	*0.28	0.66	23-Dec	0.20	0.34
24-Dec			24-Dec	0.20	0.34	24-Dec	0.17	0.25	24-Dec	*0.36	1.09	24-Dec	0.29	0.71	24-Dec	0.23	0.45
25-Dec			25-Dec	*0.20	0.34	25-Dec	0.15	0.19	25-Dec	*0.39	1.27	25-Dec	*0.28	0.66	25-Dec	*0.21	0.38
26-Dec			26-Dec	*0.19	0.31	26-Dec	0.18	0.28	26-Dec	*0.42	1.47	26-Dec	*0.27	0.62	26-Dec	*0.19	0.31
27-Dec			27-Dec	*0.18	0.28	27-Dec	0.16	0.22	27-Dec	0.46	1.76	27-Dec	0.26	0.57	27-Dec	0.17	0.25
28-Dec			28-Dec	0.18	0.28	28-Dec	0.15	0.19	28-Dec	0.42	1.47	28-Dec	0.25	0.53	28-Dec	*0.17	0.25
29-Dec			29-Dec	0.18	0.28	29-Dec	0.22	0.41	29-Dec	0.40	1.34	29-Dec	*0.25	0.53	29-Dec	*0.17	0.25
30-Dec			30-Dec	0.17	0.25	30-Dec	0.20	0.34	30-Dec	*0.51	2.15	30-Dec	*0.24	0.49	30-Dec	0.17	0.25
31-Dec			31-Dec	0.17	0.25	31-Dec	*0.20	0.34	31-Dec	*0.62	3.16	31-Dec	0.23	0.45	31-Dec	0.16	0.22

Daily Mean Water Level and Flow at 11A14 on A

1992	W	Q	1993	W	Q
1-Jan	*0.16	0.22	1-Jan	*0.26	0.57
2-Jan	0.16	0.22	2-Jan	*0.24	0.49
3-Jan	0.16	0.22	3-Jan	*0.22	0.41
4-Jan	*0.16	0.22	4-Jan	0.21	0.38
5-Jan	*0.15	0.19	5-Jan	0.22	0.41
6-Jan	0.15	0.19	6-Jan	0.19	0.31
7-Jan	0.14	0.17	7-Jan	0.20	0.34
8-Jan	0.16	0.22	8-Jan	0.20	0.34
9-Jan	0.17	0.25	9-Jan	*0.21	0.38
10-Jan	0.16	0.22	10-Jan	*0.22	0.41
11-Jan	*0.16	0.22	11-Jan	0.23	0.45
12-Jan	*0.15	0.19	12-Jan	0.23	0.45
13-Jan	0.15	0.19	13-Jan	0.45	1.68
14-Jan	0.15	0.19	14-Jan	0.30	0.76
15-Jan	0.14	0.17	15-Jan	0.40	1.34
16-Jan	0.14	0.17	16-Jan	*0.42	1.47
17-Jan	0.13	0.15	17-Jan	*0.44	1.61
18-Jan	*0.13	0.15	18-Jan	0.47	1.83
19-Jan	*0.13	0.15	19-Jan	0.40	1.34
20-Jan	0.13	0.15	20-Jan	0.39	1.27
21-Jan	0.13	0.15	21-Jan	0.37	1.15
22-Jan	0.15	0.19	22-Jan	0.37	1.15
23-Jan	0.14	0.17	23-Jan	*0.36	1.09
24-Jan	0.14	0.17	24-Jan	*0.35	1.03
25-Jan	*0.14	0.17	25-Jan	0.35	1.03
26-Jan	*0.13	0.15	26-Jan	0.35	1.03
27-Jan	0.13	0.15	27-Jan	0.33	0.92
28-Jan	0.12	0.13	28-Jan	0.33	0.92
29-Jan	0.12	0.13	29-Jan	0.32	0.86
30-Jan	0.13	0.15	30-Jan	*0.33	0.92
31-Jan	0.13	0.15	31-Jan	*0.34	0.97
1-Feb	*0.13	0.15	1-Feb	0.36	1.09
2-Feb	*0.14	0.17	2-Feb	0.36	1.09
3-Feb	0.15	0.19	3-Feb	0.35	1.03
4-Feb	0.15	0.19	4-Feb	0.34	0.97
5-Feb	0.18	0.28	5-Feb	0.32	0.86
6-Feb	0.19	0.31	6-Feb	*0.31	0.81
7-Feb	0.19	0.31	7-Feb	*0.30	0.76
8-Feb	*0.21	0.38	8-Feb	0.30	0.76
9-Feb	*0.23	0.45	9-Feb	0.30	0.76
10-Feb	0.25	0.53	10-Feb	0.42	1.47
11-Feb	0.20	0.34	11-Feb	0.40	1.34
12-Feb	0.19	0.31	12-Feb	0.39	1.27
13-Feb	0.18	0.28	13-Feb	*0.39	1.27
14-Feb	0.18	0.28	14-Feb	*0.39	1.27
15-Feb	*0.18	0.28	15-Feb	0.39	1.27
16-Feb	*0.17	0.25	16-Feb	0.39	1.27
17-Feb	0.16	0.22	17-Feb	0.37	1.15
18-Feb	0.16	0.22	18-Feb	0.36	1.09
19-Feb	0.15	0.19	19-Feb	0.36	1.09
20-Feb	0.15	0.19	20-Feb	*0.34	0.97
21-Feb	0.14	0.17	21-Feb	*0.32	0.86
22-Feb	*0.14	0.17	22-Feb	0.30	0.76
23-Feb	*0.14	0.17	23-Feb	0.30	0.76
24-Feb	0.14	0.17	24-Feb	0.40	1.34
25-Feb	0.13	0.15	25-Feb	0.39	1.27
26-Feb	0.12	0.13	26-Feb	0.34	0.97
27-Feb	0.12	0.13	27-Feb	*0.36	1.09
28-Feb	0.12	0.13	28-Feb	*0.38	1.21
1-Mar	*0.13	0.15	1-Mar	0.40	1.34
2-Mar	0.13	0.15	2-Mar	0.42	1.47
3-Mar	0.15	0.19	3-Mar	0.38	1.21
4-Mar	0.15	0.19	4-Mar	0.38	1.21
5-Mar	0.14	0.17	5-Mar	0.37	1.15
6-Mar	0.14	0.17	6-Mar	*0.37	1.15
7-Mar	*0.14	0.17	7-Mar	*0.36	1.09
8-Mar	*0.13	0.15	8-Mar	0.35	1.03
9-Mar	0.13	0.15	9-Mar	0.34	0.97
10-Mar	0.13	0.15	10-Mar	0.34	0.97
11-Mar	0.12	0.13	11-Mar	0.32	0.86
12-Mar	0.12	0.13	12-Mar	0.30	0.76
13-Mar	0.13	0.15	13-Mar	*0.30	0.76
14-Mar	*0.13	0.15	14-Mar	*0.30	0.76
15-Mar	*0.13	0.15	15-Mar	0.30	0.76
16-Mar	0.13	0.15	16-Mar	0.30	0.76
17-Mar	0.14	0.17	17-Mar	0.29	0.71
18-Mar	0.14	0.17	18-Mar	0.29	0.71

Daily Mean Water Level and Flow at HHA14 on A

1992	H	Q	1993	H	Q
19-Mar	0.12	0.13	19-Mar	0.30	0.76
20-Mar	0.12	0.13	20-Mar	*0.34	0.97
21-Mar	*0.12	0.13	21-Mar	*0.37	1.15
22-Mar	*0.12	0.13	22-Mar	0.40	1.34
23-Mar	0.12	0.13	23-Mar	0.40	1.34
24-Mar	0.14	0.17	24-Mar	0.39	1.27
25-Mar	0.14	0.17	25-Mar	0.37	1.15
26-Mar	0.13	0.15	26-Mar	0.37	1.15
27-Mar	0.13	0.15	27-Mar	*0.37	1.15
28-Mar	*0.16	0.22	28-Mar	*0.36	1.09
29-Mar	*0.19	0.31	29-Mar	0.36	1.09
30-Mar	0.23	0.45	30-Mar	0.32	0.86
31-Mar	0.21	0.38	31-Mar	0.33	0.92
1-Apr	0.23	0.45	1-Apr	0.35	1.03
2-Apr	0.20	0.34	2-Apr	0.34	0.97
3-Apr	0.15	0.19	3-Apr	*0.34	0.97
4-Apr	*0.15	0.19	4-Apr	*0.34	0.97
5-Apr	*0.16	0.22	5-Apr	0.34	0.97
6-Apr	0.17	0.25	6-Apr	0.36	1.09
7-Apr	0.18	0.28	7-Apr	0.34	0.97
8-Apr	0.20	0.34	8-Apr	0.33	0.92
9-Apr	0.24	0.49	9-Apr	*0.33	0.92
10-Apr	0.27	0.62	10-Apr	*0.32	0.86
11-Apr	*0.27	0.62	11-Apr	*0.31	0.81
12-Apr	*0.28	0.66	12-Apr	*0.30	0.76
13-Apr	0.28	0.66	13-Apr	0.30	0.76
14-Apr	0.23	0.45	14-Apr	0.30	0.76
15-Apr	0.23	0.45	15-Apr	0.30	0.76
16-Apr	0.22	0.41	16-Apr	0.29	0.71
17-Apr	*0.22	0.41	17-Apr	*0.29	0.71
18-Apr	*0.21	0.38	18-Apr	*0.28	0.66
19-Apr	*0.21	0.38	19-Apr	0.28	0.66
20-Apr	*0.20	0.34	20-Apr	0.27	0.62
21-Apr	0.20	0.34	21-Apr	0.25	0.53
22-Apr	0.20	0.34	22-Apr	0.26	0.57
23-Apr	0.19	0.31	23-Apr	0.26	0.57
24-Apr	0.18	0.28	24-Apr	*0.27	0.62
25-Apr	*0.18	0.28	25-Apr	*0.28	0.66
26-Apr	*0.17	0.25	26-Apr	0.30	0.76
27-Apr	0.17	0.25	27-Apr	0.33	0.92
28-Apr	0.26	0.57	28-Apr	0.39	1.27
29-Apr	0.25	0.53	29-Apr	0.33	0.92
30-Apr	0.20	0.34	30-Apr	0.31	0.81
1-May	*0.28	0.66	1-May	*0.34	0.97
2-May	*0.36	1.09	2-May	*0.37	1.15
3-May	*0.44	1.61	3-May	0.41	1.40
4-May	*0.52	2.24	4-May	0.40	1.34
5-May	0.60	2.96	5-May	0.34	0.97
6-May	0.57	2.68	6-May	0.38	1.21
7-May	0.55	2.50	7-May	0.38	1.21
8-May	0.50	2.07	8-May	*0.37	1.15
9-May	*0.50	2.07	9-May	*0.36	1.09
10-May	*0.50	2.07	10-May	0.35	1.03
11-May	0.50	2.07	11-May	0.35	1.03
12-May	0.45	1.68	12-May	0.34	0.97
13-May	0.45	1.68	13-May	0.32	0.86
14-May	0.56	2.59	14-May	0.30	0.76
15-May	0.50	2.07	15-May	*0.33	0.92
16-May	*0.49	1.99	16-May	*0.36	1.09
17-May	*0.48	1.91	17-May	0.40	1.34
18-May	0.47	1.83	18-May	0.40	1.34
19-May	0.47	1.83	19-May	0.51	2.15
20-May	0.50	2.07	20-May	0.51	2.15
21-May	0.49	1.99	21-May	0.42	1.47
22-May	0.46	1.76	22-May	*0.41	1.40
23-May	*0.44	1.61	23-May	*0.40	1.34
24-May	*0.42	1.47	24-May	0.40	1.34
25-May	0.41	1.40	25-May	0.39	1.27
26-May	0.42	1.47	26-May	0.39	1.27
27-May	0.40	1.34	27-May	0.38	1.21
28-May	0.39	1.27	28-May	0.37	1.15
29-May	0.40	1.34	29-May	*0.37	1.15
30-May	*0.40	1.34	30-May	*0.38	1.21
31-May	*0.40	1.34	31-May	0.38	1.21
1-Jun	*0.40	1.34	1-Jun	*0.38	1.21
2-Jun	0.40	1.34	2-Jun	0.39	1.27
3-Jun	0.40	1.34	3-Jun	0.39	1.27

Daily Mean Water Level and Flow at HHA14 on A

1992	H	Q	1993	H	Q
4-Jun	0.39	1.27	4-Jun	0.40	1.34
5-Jun	0.39	1.27	5-Jun	*0.40	1.34
6-Jun	*0.39	1.27	6-Jun	*0.40	1.34
7-Jun	*0.38	1.21	7-Jun	0.40	1.34
8-Jun	0.37	1.15	8-Jun	0.47	1.83
9-Jun	0.35	1.03	9-Jun	0.50	2.07
10-Jun	0.35	1.03	10-Jun	0.61	3.06
11-Jun	0.37	1.15	11-Jun	0.80	5.22
12-Jun	0.39	1.27	12-Jun	*0.81	5.35
13-Jun	*0.39	1.27	13-Jun	*0.82	5.48
14-Jun	*0.40	1.34	14-Jun	0.83	5.61
15-Jun	0.41	1.40	15-Jun	0.76	4.72
16-Jun	0.40	1.34	16-Jun	0.70	4.01
17-Jun	*0.39	1.27	17-Jun	0.65	3.47
18-Jun	0.38	1.21	18-Jun	0.60	2.96
19-Jun	0.36	1.09	19-Jun	*0.58	2.77
20-Jun	*0.47	1.83	20-Jun	*0.57	2.68
21-Jun	*0.58	2.77	21-Jun	0.56	2.59
22-Jun	0.70	4.01	22-Jun	0.56	2.59
23-Jun	0.76	4.72	23-Jun	0.52	2.24
24-Jun	0.66	3.58	24-Jun	0.50	2.07
25-Jun	0.63	3.26	25-Jun	0.49	1.99
26-Jun	0.60	2.96	26-Jun	*0.49	1.99
27-Jun	*0.58	2.77	27-Jun	*0.48	1.91
28-Jun	*0.56	2.59	28-Jun	0.48	1.91
29-Jun	0.55	2.50	29-Jun	0.48	1.91
30-Jun	0.55	2.50	30-Jun	0.45	1.68
1-Jul	0.50	2.07	1-Jul	0.40	1.34
2-Jul	0.50	2.07	2-Jul	0.40	1.34
3-Jul	0.49	1.99	3-Jul	*0.43	1.54
4-Jul	*0.46	1.76	4-Jul	*0.46	1.76
5-Jul	*0.43	1.54	5-Jul	0.50	2.07
6-Jul	0.40	1.34	6-Jul	0.50	2.07
7-Jul	0.49	1.99	7-Jul	0.49	1.99
8-Jul	0.47	1.83	8-Jul	0.45	1.68
9-Jul	0.47	1.83	9-Jul	0.43	1.54
10-Jul	0.48	1.91	10-Jul	*0.42	1.47
11-Jul	*0.44	1.61	11-Jul	*0.41	1.40
12-Jul	*0.41	1.40	12-Jul	0.40	1.34
13-Jul	0.38	1.21	13-Jul	0.40	1.34
14-Jul	0.37	1.15	14-Jul	0.39	1.27
15-Jul	0.37	1.15	15-Jul	0.40	1.34
16-Jul	0.36	1.09	16-Jul	0.38	1.21
17-Jul	0.34	0.97	17-Jul	*0.36	1.09
18-Jul	*0.34	0.97	18-Jul	*0.34	0.97
19-Jul	*0.34	0.97	19-Jul	0.32	0.86
20-Jul	0.34	0.97	20-Jul	0.30	0.76
21-Jul	0.46	1.76	21-Jul	0.30	0.76
22-Jul	0.45	1.68	22-Jul	0.29	0.71
23-Jul	0.47	1.83	23-Jul	0.29	0.71
24-Jul	0.40	1.34	24-Jul	*0.27	0.62
25-Jul	*0.41	1.40	25-Jul	*0.26	0.57
26-Jul	*0.42	1.47	26-Jul	0.25	0.53
27-Jul	0.43	1.54	27-Jul	0.25	0.53
28-Jul	0.38	1.21	28-Jul	0.24	0.49
29-Jul	0.43	1.54	29-Jul	0.24	0.49
30-Jul	0.41	1.40	30-Jul	0.23	0.45
31-Jul	0.40	1.34	31-Jul	*0.23	0.45
1-Aug	*0.38	1.21	1-Aug	*0.23	0.45
2-Aug	*0.36	1.09	2-Aug	0.23	0.45
3-Aug	0.34	0.97	3-Aug	0.22	0.41
4-Aug	0.34	0.97	4-Aug	0.22	0.41
5-Aug	0.33	0.92	5-Aug	0.20	0.34
6-Aug	0.35	1.03	6-Aug	0.20	0.34
7-Aug	0.34	0.97	7-Aug	*0.21	0.38
8-Aug	*0.34	0.97	8-Aug	*0.22	0.41
9-Aug	*0.34	0.97	9-Aug	0.23	0.45
10-Aug	0.34	0.97	10-Aug	0.23	0.45
11-Aug	0.33	0.92	11-Aug	0.24	0.49
12-Aug	0.33	0.92	12-Aug	0.24	0.49
13-Aug	0.31	0.81	13-Aug	0.23	0.45
14-Aug	0.30	0.76	14-Aug	*0.23	0.45
15-Aug	*0.30	0.76	15-Aug	*0.23	0.45
16-Aug	*0.31	0.81	16-Aug	0.23	0.45
17-Aug	0.32	0.86	17-Aug	0.21	0.38
18-Aug	0.30	0.76	18-Aug	0.20	0.34
19-Aug	0.30	0.76	19-Aug	0.23	0.45

Daily Mean Water Level and Flow at HIA14 on A

1992	H	Q	1993	H	Q
20-Aug	0.34	0.97	20-Aug	0.24	0.49
21-Aug	0.33	0.92	21-Aug	*0.24	0.49
22-Aug	0.32	0.86	22-Aug	*0.25	0.53
23-Aug	0.31	0.81	23-Aug	0.25	0.53
24-Aug	0.30	0.76	24-Aug	0.23	0.45
25-Aug	0.31	0.81	25-Aug	0.23	0.45
26-Aug	0.32	0.86	26-Aug	0.22	0.41
27-Aug	0.34	0.97	27-Aug	0.21	0.38
28-Aug	0.35	1.03	28-Aug	*0.21	0.38
29-Aug	0.34	0.97	29-Aug	*0.22	0.41
30-Aug	0.33	0.92	30-Aug	0.22	0.41
31-Aug	0.32	0.86	31-Aug	0.21	0.38
1-Sep	0.34	0.97	1-Sep	0.35	1.03
2-Sep	0.34	0.97	2-Sep	0.30	0.76
3-Sep	0.30	0.76	3-Sep	0.30	0.76
4-Sep	0.30	0.76	4-Sep	*0.30	0.76
5-Sep	*0.30	0.76	5-Sep	*0.29	0.71
6-Sep	*0.30	0.76	6-Sep	0.29	0.71
7-Sep	0.30	0.76	7-Sep	0.29	0.71
8-Sep	0.39	1.27	8-Sep	0.27	0.62
9-Sep	0.40	1.34	9-Sep	0.27	0.62
10-Sep	0.39	1.27	10-Sep	0.26	0.57
11-Sep	0.43	1.54	11-Sep	*0.26	0.57
12-Sep	*0.44	1.61	12-Sep	*0.25	0.53
13-Sep	*0.46	1.76	13-Sep	0.24	0.49
14-Sep	0.48	1.91	14-Sep	0.24	0.49
15-Sep	0.73	4.36	15-Sep	0.23	0.45
16-Sep	0.64	3.37	16-Sep	0.23	0.45
17-Sep	0.60	2.96	17-Sep	0.24	0.49
18-Sep	0.54	2.41	18-Sep	*0.24	0.49
19-Sep	*0.49	1.99	19-Sep	*0.23	0.45
20-Sep	*0.44	1.61	20-Sep	0.23	0.45
21-Sep	0.40	1.34	21-Sep	0.23	0.45
22-Sep	0.40	1.34	22-Sep	0.23	0.45
23-Sep	0.39	1.27	23-Sep	0.24	0.49
24-Sep	0.40	1.34	24-Sep	0.22	0.41
25-Sep	0.40	1.34	25-Sep	*0.22	0.41
26-Sep	*0.40	1.34	26-Sep	*0.21	0.38
27-Sep	*0.40	1.34	27-Sep	0.21	0.38
28-Sep	0.40	1.34	28-Sep	0.20	0.34
29-Sep	0.39	1.27	29-Sep	0.21	0.38
30-Sep	0.38	1.21	30-Sep	0.21	0.38
1-Oct	0.34	0.97	1-Oct	0.22	0.41
2-Oct	0.35	1.03	2-Oct	*0.20	0.34
3-Oct	*0.35	1.03	3-Oct	*0.18	0.28
4-Oct	*0.34	0.97	4-Oct	*0.17	0.25
5-Oct	0.33	0.92	5-Oct	*0.16	0.22
6-Oct	0.40	1.34	6-Oct	0.15	0.19
7-Oct	0.44	1.61	7-Oct	0.15	0.19
8-Oct	0.40	1.34	8-Oct	0.14	0.17
9-Oct	0.40	1.34	9-Oct	*0.19	0.31
10-Oct	*0.40	1.34	10-Oct	*0.24	0.49
11-Oct	*0.39	1.27	11-Oct	*0.29	0.71
12-Oct	0.39	1.27	12-Oct	0.33	0.92
13-Oct	0.40	1.34	13-Oct	0.26	0.57
14-Oct	0.40	1.34	14-Oct	0.20	0.34
15-Oct	0.44	1.61	15-Oct	0.22	0.41
16-Oct	0.43	1.54	16-Oct	*0.21	0.38
17-Oct	*0.43	1.54	17-Oct	*0.20	0.34
18-Oct	*0.44	1.61	18-Oct	0.20	0.34
19-Oct	0.44	1.61	19-Oct	0.20	0.34
20-Oct	0.45	1.68	20-Oct	*0.18	0.28
21-Oct	0.45	1.68	21-Oct	0.17	0.25
22-Oct	0.43	1.54	22-Oct	0.16	0.22
23-Oct	0.42	1.47	23-Oct	*0.21	0.38
24-Oct	*0.41	1.40	24-Oct	*0.26	0.57
25-Oct	*0.40	1.34	25-Oct	0.32	0.86
26-Oct	0.39	1.27	26-Oct	0.16	0.22
27-Oct	0.38	1.21	27-Oct	0.15	0.19
28-Oct	0.40	1.34	28-Oct	0.15	0.19
29-Oct	0.41	1.40	29-Oct	0.14	0.17
30-Oct	0.40	1.34	30-Oct	*0.16	0.22
31-Oct	*0.40	1.34	31-Oct	*0.18	0.28
1-Nov	*0.40	1.34	1-Nov	0.20	0.34
2-Nov	0.40	1.34	2-Nov	0.20	0.34
3-Nov	0.39	1.27	3-Nov	0.18	0.28
4-Nov	0.40	1.34	4-Nov	0.19	0.31

Daily Mean Water Level and Flow at HHA14 on A

1992	H	Q	1993	H	Q
5-Nov	0.40	1.34	5-Nov	0.19	0.31
6-Nov	0.37	1.15	6-Nov	*0.18	0.28
7-Nov	*0.37	1.15	7-Nov	*0.18	0.28
8-Nov	*0.36	1.09	8-Nov	0.17	0.25
9-Nov	0.36	1.09	9-Nov	0.16	0.22
10-Nov	0.36	1.09	10-Nov	0.16	0.22
11-Nov	0.35	1.03	11-Nov	0.15	0.19
12-Nov	0.34	0.97	12-Nov	0.15	0.19
13-Nov	0.42	1.47	13-Nov	*0.17	0.25
14-Nov	*0.41	1.40	14-Nov	*0.19	0.31
15-Nov	*0.40	1.34	15-Nov	0.21	0.38
16-Nov	0.40	1.34	16-Nov	0.20	0.34
17-Nov	0.40	1.34	17-Nov	0.20	0.34
18-Nov	0.35	1.03	18-Nov	0.20	0.34
19-Nov	0.38	1.21	19-Nov	0.19	0.31
20-Nov	0.40	1.34	20-Nov	*0.19	0.31
21-Nov	*0.40	1.34	21-Nov	*0.18	0.28
22-Nov	*0.40	1.34	22-Nov	0.18	0.28
23-Nov	0.40	1.34	23-Nov	0.18	0.28
24-Nov	0.39	1.27	24-Nov	0.17	0.25
25-Nov	0.39	1.27	25-Nov	0.17	0.25
26-Nov	0.39	1.27	26-Nov	0.16	0.22
27-Nov	0.37	1.15	27-Nov	*0.16	0.22
28-Nov	*0.35	1.03	28-Nov	*0.16	0.22
29-Nov	*0.33	0.92	29-Nov	0.16	0.22
30-Nov	*0.31	0.81	30-Nov	0.15	0.19
1-Dec	0.30	0.76	1-Dec	0.15	0.19
2-Dec	0.28	0.66	2-Dec	0.15	0.19
3-Dec	0.28	0.66	3-Dec	0.14	0.17
4-Dec	0.27	0.62	4-Dec	*0.16	0.22
5-Dec	*0.26	0.57	5-Dec	*0.18	0.28
6-Dec	*0.25	0.53	6-Dec	0.20	0.34
7-Dec	0.24	0.49	7-Dec	0.21	0.38
8-Dec	0.24	0.49	8-Dec	0.19	0.31
9-Dec	0.24	0.49	9-Dec	0.18	0.28
10-Dec	0.25	0.53	10-Dec	0.17	0.25
11-Dec	0.24	0.49	11-Dec	*0.17	0.25
12-Dec	*0.24	0.49	12-Dec	*0.17	0.25
13-Dec	*0.24	0.49	13-Dec	*0.16	0.22
14-Dec	0.24	0.49	14-Dec	0.16	0.22
15-Dec	0.24	0.49	15-Dec	0.16	0.22
16-Dec	0.25	0.53	16-Dec	0.15	0.19
17-Dec	0.28	0.66	17-Dec	0.15	0.19
18-Dec	0.26	0.57	18-Dec	*0.15	0.19
19-Dec	*0.26	0.57	19-Dec	*0.15	0.19
20-Dec	*0.25	0.53	20-Dec	0.15	0.19
21-Dec	0.25	0.53	21-Dec	0.15	0.19
22-Dec	0.25	0.53	22-Dec	0.14	0.17
23-Dec	0.25	0.53	23-Dec	0.14	0.17
24-Dec	0.24	0.49	24-Dec	0.13	0.15
25-Dec	*0.26	0.57	25-Dec	*0.13	0.15
26-Dec	*0.28	0.66	26-Dec	*0.13	0.15
27-Dec	*0.29	0.71	27-Dec	*0.14	0.17
28-Dec	0.30	0.76	28-Dec	0.14	0.17
29-Dec	*0.29	0.71	29-Dec	0.14	0.17
30-Dec	0.28	0.66	30-Dec	0.15	0.19
31-Dec	*0.27	0.62	31-Dec	0.14	0.17

APPENDIX-B

**EXISTING WATER SUPPLY
FACILITIES AND THEIR
EVALUATION**

APPENDIX B
EXISTING WATER SUPPLY FACILITIES
AND THEIR EVALUATION

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APPENDIX B
EXISTING WATER SUPPLY FACILITIES
AND THEIR EVALUATION

B1 Existing Water Supply Facilities

B1.1 Lake Intake and Rising Mains

The Lake Intake comprises of an old pump house which houses four centrifugal pumps drawing water through four suction pipes leading from the Lake and fitted with foot valves and strainers and secondly a new well intake fitted with four new centrifugal pump sets also fitted with foot valves and strainers.

A fifth centrifugal pump is installed in a shed with separate 200 mm diameter suction main leading from the lake and connected to the existing delivery pipe manifold of the four new pumps.

In addition, two bulk meters are installed in-line on the two rising mains which are not operating at present.

B1.1.2 Raw Water Pumps and Rising Mains

The existing 225 mm and 300 mm diameter meter asbestos-cement raw water mains were reinforced with a new 450 mm diameter steel main and connected half way between the Lake Intake Works and Lake Water Treatment Works, during the Immediate Measures Works Project carried out in 1988/89.

The existing two raw water mains then join again at the Treatment Works site to form a single 450 mm diameter steel main which flows into the inlet mixing/dosing splitter chamber at the New Treatment Works.

The existing four centrifugal pumps in the new intake were originally designed as submersible pumps as three duty and one stand by. At present all the four pumps are operating 24 hours a day to meet the demand.

There are four pumps available for use in the old pump house. These are all existing pumps which were re-installed after modifications during the Emergency Works Project. Three of the pumps are very old and although these have been operating successfully over the last couple of years, they are

beginning to show signs of wear in the motor couplings and bearings. The fourth pump is in a fairly good condition.

The fifth intake pump which was installed in the shed has broken down, yet again, the reason being that this pump is connected to the same delivery pipe manifold of the existing four submersible pumps and cannot pump against the pressure (head) of these four pumps at the Lake Intake Works.

Table B-1 Existing Water Pump Capacities at Lake Intake Works

Location	Pump No.	Pump Type	Speed (rpm)	Motor (kW)	Discharge at 27.5 m Head (L/s)
New Intake	1	CAPRARI - TYPE FR 411050	1700	22	50
	2	CAPRARI - TYPE XADK 54774	1700	30	50
	3	KSB - TYPE BDF 2001.D	2900	30	60
	4	KSB - TYPE D2505	1650	37	60
Old Intake	1	Modified ROVATTI - 54K 100/2	1450	37	60
	2	KSB ETANORN - 100 315	1450	19	50
	3	Modified ROVATTI - 54K 100/2	1450	37	60
	4	HARLAND - SDB 5/6	1700	30	60
In shed	5	HARLAND - SDB 5/6	1700	30	60

B1.2 Lake Water Treatment Works

B1.2.1 General

There are three sets of treatment and process units at the Lake WTW known as:-

1. New Treatment Works
2. Old Treatment Works commissioned in 1968 and
3. Very Old Treatment Works commissioned in 1956.

Major civil works and modifications were carried out in 1988-89 at the Lake WTW These included:-

1. Erection of a steel panel backwash tank adjacent to the New Works Units and fed from the treated water rising main.
2. The installation of dispersal cones to all sedimentation tanks and of lamella plates/tubes to the second and third sedimentation tanks of the New Works.
3. Inlet and dosing modifications so that all raw water enters in single splitter box, is chemically dosed by gravity dosers and proportionally sub-divided to flow into various Treatment Works Units.

4. Modifications to site pipework to convey the additional water between components.
5. Modifications to suction pipework of the New Treated Water Pumps to facilitate start up at a low water level in the clear reservoir, together with installation of pump priming system.

B1.2.2 New Treatment Works

(1) Inlet Dosing and Mixing Arrangements

All the raw water from the Lake Intake enters the new single inlet chemical dosing/mixing/splitter box where alum is dosed. It incorporates the chemical store and mixing tanks system beneath it. Transfers from the mixing tanks to day tanks used to be done by two electrically operated booster pumps which are not operational at present. Mixing used to be done by two electrically operated stirrers. At present one is operational and the other broken down.

Mixing is now done manually and dosing by gravity directly into the splitter box. The dosed water flows over proportionally sub-divided and suitable sized weirs towards the New, the Old and the Very Old Treatment Works Units.

(2) Sedimentation Tanks and Filters

There are three vertical flow sedimentation tanks and four rapid gravity filters.

The sedimentation tanks were fitted with dispersal cones to improve the upflow efficiency and sets of lamella tubes/plates installed to increase the throughput of these units. The lamella plates have since been removed due to corrosion but the dispersal cones are still in place.

The four rapid gravity filters are operating at full capacity and need replacement of the filter media. The back washing of the filters is not done under controlled conditions since substantial amount of sand is washed over during the backwashing process.

(3) New Elevated Backwash Steel Tank

There is a 200 m³ and 4.50 m high steel panel backwash tank installed in 1988 - 89 which is used for backwashing the new filters.

B1.2.3 Old Treatment Works

The Old Treatment Works was commissioned in 1968 and comprises of four vertical flow sedimentation tanks and four rapid gravity filters.

Dispersal cones were installed in all the sedimentation tanks during the Immediate Works Contract in 1988/89 to improve upflow efficiency of these tanks.

There is a chemical store adjacent to the Old Treatment Works.

Three of the process units are operating at full capacity and one is non functional.

B1.2.4 Very Old Treatment Works

The Very Old Treatment Works was commissioned in 1956 and comprises of four vertical flow sedimentation tanks and four rapid gravity filters.

Dispersal cones were installed in all the sedimentation tanks during the Immediate Works Contract in 1988/89 to improve upflow efficiency of these tanks.

All the process units are operating at full capacity.

B1.2.5 Storage Reservoirs

There are two clear water tanks (Reservoirs) at the Lake Treatment Works site and neither of the two has ever been full due to the demand.

B1.2.6 Old Elevated Steel Backwash Tank

The old elevated steel panel tank which backwashes the filters at the Old and Very Old Treatment Works is leaking badly and needs replacement or to be abandoned and scrapped and all the existing pipework connected to the New Steel Elevated Tank.

There is an abandoned and broken backwash pump which used to pump water to the Old Elevated Backwash Tank. This pump should be repaired and connected to the New Elevated Backwash Tank.

B1.2.7 Treated Water Pump Houses (High Lift Pumps)

There are two pump houses at the Treatment Works. The old pump house presently contains six centrifugal pumps and delivers water through two parallel 225 mm and 150 mm diameter pumping mains directly into distribution system. At present only four pumps are operational.

The new pump house contains eight pumps and all eight pumps are required to operate in order to meet the current demand. At present only six pumps are operational. Water is delivered through two parallel 225 mm diameter and 300 mm diameter pumping mains to the Watson Bank Service Reservoir for distribution.

B1.2.8 Site Works

All the site pipework and fittings are satisfactory.

The access road, street lighting and security lights at various process units including fencing and gate all need refurbishment and /or repairs.

B2 Evaluation of the Existing System for Rehabilitation

B2.1 Lake Intake Works and Rising Mains

B2.1.1 Lake Intake Works

The five suction pipes (two 9" diameter, two 6" diameter and one 8" diameter) leading from the Lake Intake to the Old pump house have serious problems of clogging the foot valves and the strainers with water hyacinth and its roots.

Serious thought and consideration have been given to address this problem by constructing some sort of retaining wall or chamber or coffer dam around the intake pipes to avoid water Hyacinth coming in contact with the suction pipes.

All the strainers and foot-valves need replacement and/or refurbishment including all the fittings associated with it.

The suction pipework including the foot valves and strainers at the new well intake (next to the old intake) are in good condition and functioning satisfactorily.

The penstock at the inlet to the New Intake Works cannot be closed for maintenance and/or repairs because it has holes drilled in it.

B2.1.2 Raw Water Pumps

There are four raw water pumps in the old pump house rated at 27.5 m head with pumping capacity of 50 to 60 L/s. Three of these pumps are very old and need replacement. The fourth pump is in a fairly good condition. All the electrical work including control panels starters etc, are very old and need replacement in the Old Pump House.

The fifth intake pump which was installed in the shed has broken down and needs replacement. The delivery pipework also needs modifications.

There are no suction valves to isolate the pumps and the motors for removal in the Old Pump House. Two 225 mm diameter and two 150 mm diameter sluice valves are required. Besides the above all the four delivery valves are leaking badly and need replacement together with the non-return valves. The size of all the sluice/gate valves and the non-return valves is 150 mm diameter.

There are two bulk flow meters and chambers on the two 225 mm diameter, raw water mains which are out of order and both need replacement.

There are four centrifugal pumps and motors at the New Intake. These pumps are operating satisfactorily. There are three 150 mm diameter, foot valves and strainers on the suction pipes and one 200 mm diameter. All the four sluice valves are leaking badly and need replacement. One non-return valve is not operational and needs replacement.

Since all the four pumps and motors are operating full time 24 hours a day, it would be advisable to have one similar pump and motor in store as standby or spare in case of emergency and/or breakdown. Both the New and the Old Intake Works pumps and motors including the electrical system have been checked by the Kenya Power and Lighting Company. They have advised that the intake motors consume too much electricity than necessary.

The Kenya Power and Lighting Company has advised to check and if necessary, correct the power factor by installation of capacitors between the pumps/motors and the existing transformer located outside the Intake Works compound.

Substantial savings could be made by reducing the electricity bill for the intake pumps by carrying out the above mentioned work.

B2.1.3 Rising Mains

At present the existing raw water rising mains are running to its full capacity. With increased treatment capacity at the Treatment Works, the existing rising mains should be duplicated from where the new 450 mm diameter steel main was connected half way between the Lake Intake Works and the Lake Treatment Works.

If the Treatment Works capacity is not increased and by carrying out the necessary repairs, modifications, additions and refurbishment, the existing raw water mains capacity could sustain the maximum design capacity of the Treatment Works of 20,500 m³/d.

B2.1.4 Stand-by Diesel Generator

At present there is no stand-by generator at the Intake Works for emergency in case of power failure. With all the proposed modifications and refurbishment, a 350 kW diesel generator would be required including diesel storage tank for a minimum of week's supply.

B2.1.5 Site Services at Intake Works

(1) Fencing & Gate

The existing fencing around the intake works is damaged and partly missing including the gate

The security at the Lake Intake Works could be improved by replacement of the fencing and gate, including the fence around the staff houses.

B2.1.6 Communications

At present there is no contact between the Intake Works and the Treatment Works or the Town Hall in case of an emergency or breakdown.

The installation of either a Radio Call System or telephone with connection to the Treatment Works, Town Hall and outside (suppliers of spares or electrical items) is recommended.

B2.2 Lake Water Treatment Works

B2.2.1 New Treatment Works

(1) Inlet Dosing and Mixing Chamber

All the raw water from the Lake Intake Works enters the New single inlet chemical dosing /mixing and splitter box where alum is dosed. To improve the flocculation and sedimentation process, pre-chlorination needs to be introduced at this chamber.

Additional chlorine mixing and dosing tanks including two FRN Type gravity dosers shall be provided adjacent to the inlet work.

The existing alum mixing and dosing tanks at the New Treatment Works need refurbishment. Transfer from the mixing tanks to the alum dosing tanks used to be done by two electrically operated booster pumps which are not working and need replacement.

The existing 300 mm diameter and 250 mm diameter sluice valves on the main before the inlet chamber are rusty and jammed and need replacement.

(2) Sedimentation Tanks and Filters

There are three vertical flow sedimentation tanks and four rapid gravity filters. The sedimentation tanks were fitted with lamella tubes/plates to increase the throughput of those units. The lamella plates have since been removed due to corrosion.

The new sets of lamella plates made of reinforced glass fibre should be installed with aluminium frame and support work.

The four rapid gravity filters which are operating at full capacity need the filter media replaced.

During back-washing process of the filters, substantial amount of sand is washed over. Flow control valves or flow gauges should be provided to avoid this unnecessary wastage of (sand) filter media.

The three 150 mm diameter de-sludging valves, three 50 mm diameter bleeder valves at the New sedimentation tanks are leaking badly and need replacement.

(3) New Elevated Backwash Steel Tank

The 200 cm.m elevated backwash steel tank needs cleaning and all the steel structure work painted and protected from corrosion.

B2.2.2 Old Treatment Works

The Old Treatment Works has four vertical flow sedimentation tanks and four rapid gravity filters.

One of the sedimentation tanks is not operating to its full capacity and needs to be looked into. The following valves which were installed in 1968 are leaking badly and need replacement and /or refurbishment.

These are:-

- | | |
|------------------------|------------------------|
| (a) De-sludging valves | - ϕ 100 mm - 4 No |
| (b) Bleeder Valves | - ϕ 50 mm - 4 No |

The four rapid gravity filters also need the filter media replaced, flow control valve on the backwash system installed and the following valves in the filter gallery replaced:-

- (c) Backwash inlet valve - ϕ 200 mm - 4 No
- (d) Clear Water outlet valve - ϕ 100 mm - 4 No
- (e) Backwash drainage valve - ϕ 200 mm - 4 No
- (f) Clear Water inlet valve - ϕ 150 mm - 4 No

There is only one existing air-blower for air-scour rated at 0.6 bars and motor capacity of 10 horse power

A second Air-blower as standby would be recommended.

B2.2.3 Very Old Treatment Works

The Very Old Treatment Works has four vertical flow sedimentation tanks and four rapid gravity filters.

The following valves which were installed in 1956 are leaking badly and need replacement in the filter gallery:-

These are:-

- (a) Filter drain valves - ϕ 200 mm - 4 No
- (b) Filter backwash valves - ϕ 200 mm - 4 No
- (c) Clear water outlet valves - ϕ 150 mm - 4 No
- (d) Filter inlet stop valves - ϕ 150 mm - 4 No

The eight pressure gauges on the filter mains are also out of order and need replacement.

The four rapid gravity filters also need the filter media replaced and the flow control valves on the backwash system installed to avoid sand being washed over during the backwash process.

B2.2.4 Storage Reservoirs

The existing two clear water reservoirs at the Lake Treatment Works do not have "level indicator" gauges and roof ventilation on the new tanks was not provided.

With increased capacity of the existing treatment plant, addition storage capacity shall also be required. There is adequate space available at the existing site for further expansion of the works including storage tanks.

B2.2.5 Treated Water Pump Houses

(1) Old High Lifted Pump House

The Old High Lift Pump House consist of six pumps rated between 19 L/s to 23 L/s at 77 meters to 94 meters head. Four of these pumps (MAKE : HARLAND) are very old including the delivery, suction and non-return valves which are leaking badly. The other two pumps (MAKE: KSB) are new pumps and operating satisfactorily, but all the valves are leaking and need replacement.

There are two bulk flow meters of 225 mm diameter and 150 mm diameter on the outlet mains from the Very Old Pump House. The 225 mm diameter meter is not operational and needs replacement.

The following valves which were installed in 1956 are leaking badly and need replacement.

These are:-

- | | |
|-----------------------|------------------------|
| (a) Delivery valves | - ϕ 150 mm - 6 No |
| (b) Non-Return valves | - ϕ 150 mm - 6 No |
| (c) Suction valves | - ϕ 150 mm - 6 No |

All the existing old pumps need to be replaced with bigger and fewer pumps.

(2) New High Lift Pump House

The New High Lift Pump House consists of eight pumps rated between 24 L/s to 36 L/s at 77 metres to 87 metres head. Six of these pumps (MAKE: HARLAND) are very old and two are currently out of order due to lack of spares.

The other two pumps (MAKE: KSB) are new and operating satisfactorily. All the delivery, suction and non-return valves on these pumps are very old, leaking badly and need replacement.

There are two bulk meters of 225 mm and 300 mm diameters on the existing two outlet mains from the New High Lift Pump House. The 225 mm diameter meter is operating but needs servicing, but the 300 mm diameter flow meter is not operational and needs replacement.

The following valves which were installed in 1968 are leaking badly and need replacement and/or refurbishment.

These are:-

- (a) Delivery valves - ϕ 150 mm - 8 No
- (b) Non-Return valves - ϕ 150 mm - 8 No
- (c) Suction valves - ϕ 150 mm - 8 No

Table B-2 Existing Water Pump Capacities at Lake Treatment Work Old and New Pump House

Location	Pump No	Pump Type	Speed (rpm)	Motor (kW)	Discharge at 77 m Head (L/s)
Old Pump House	1	KSB - TYPE - MOVI 65/2	2900	37	23
	2	KSB - TYPE - MOVI 65/2	2900	37	23
	3	Harland Pump	1450	34	23
	4	Harland Pump	1450	40	23
	5	Harland Pump	1450	37	23
	6	Harland Pump	1450	37	23
New Pump House	1	Harland Pump	1450	37	35
	2	Harland Pump	1450	37	35
	3	Harland Pump	1450	37	35
	4	Harland - SDB 5/6	1450	37	35
	5	Harland - SDB 5/6	1450	37	35
	6	Harland - SDB 5/6	1450	37	35
	7	KSB - TYPE - MOVI 65/2	2950	37	24
	8	KSB - TYPE - MOVI 65/2	2950	37	24

B2.2.6 Chemical Buildings

All the chemical mixing tanks for chlorine, alum and soda ash are in very poor condition and state of repairs.

All the tanks in the Old, Very Old and New Treatment Works need repair and refurbishment including the replacement of all gravity dosers, mechanical stirrers, all dosing pipework, valves and fittings (to be replaced by PVC material).

A new gantry crane is required for loading/un-loading all the chemicals at the main chemical building. All the electrical wires, fittings and fixtures also need to be replaced as all the existing is corroded and not working. All the door handles and locks, window latches etc. are also rusted and need replacement.

B2.2.7 Site Works

(1) Fencing and Gate

The existing fencing at the Treatment Works site is damaged and needs to be replaced. The main gate needs painting and refurbishment/repairs.

(2) Street / Access Road Lighting and Security

The existing street/access road lightings have been damaged by vehicular traffic and needs replacement. All the security lights at various process units are also in need of rehabilitation.

(3) Health and Safety at Work

The operations staff at the Intake Works and Treatment Works are provided with overalls and gum boots. They have been observed to be working without gloves and goggles especially when handling chlorine and other chemicals.

All the "Health and Safety at work" regulations should be followed

(4) Communications

At present there is no contact between the Intake Works and the Treatment Works, Kibuye Reservoir site, Kajulu Water Works or the Town Hall in case of an emergency or breakdown.

The installation of either a Radio Call System or telephone with connection to the Treatment Works, or Town Hall and outside (supplies of spares or electrical items) is recommended.

(5) Staff Houses

All the existing Staff Houses are in poor condition and need complete refurbishment/repairs and painting etc.

Addition staff houses for operational staff should also be considered if the Treatment Plant is extended.

B2.2.8 Stand-by Diesel Generators

At present there is no stand-by generator at the Lake Treatment Works for emergency in case of power failure. With all the proposed rehabilitation and extension of the Lake Treatment Works, a 750 kW diesel generator would be required including diesel fuel storage tank for a minimum of week's supply.

B3 Kibuye Distribution Reservoir Site

B3.1 Reservoir No. 1 - (Sectional Steel Ground Level Tank)

This tank was built in 1925 at Ground Level. It is a twin compartment tank with a total capacity of 456 m³ and top water level (TWL) of 1196.00 m above MSL. (Each compartment being 228 m³ capacity).

Water stopped coming into this tank from Kajulu Water Works because all the water is used en-route. The tank is empty at present and needs complete refurbishment, cleaning, painting, protection and repairs of all the inlet, outlet, and scour valves.

B3.2 Reservoir No. 2 - (Sectional Steel Elevated Tank)

The existing sectional steel panel elevated tank was built in 1957. It has a capacity of 109 m³.

The steel tower frame including the tank panels are all rusted and very old. The municipal council plans to dismantle and scrape it.

B3.3 Reservoir No. 3 - (Sectional Steel Elevated Tank)

The existing sectional steel elevated tank was built in 1968. It has a capacity of 278 m³ with TWL 1212.00 m above MSL.

The condition of the tank and the steel tower is satisfactory. It needs painting and cleaning.

B3.4 Reservoirs No. 4 & 5 - (Reinforced Concrete Ground Level Tank)

These tanks were built in 1947 and 1950 respectively with different capacities of 455 m³ and 910 m³ each and the same TWL of 1196.00 m above MSL.

The structural condition of both these tanks is good but needs repainting of all the structural work, steel work and replacement of internal ladders with aluminium or GRP ladders.

B3.5 Reservoir No. 6 - (Reinforced Concrete Ground Level Tank)

This tank was built in 1980, has a capacity of 5,000 m³ and TWL 1193.43 m above MSL. The tank floor leaks badly and needs complete re-lining internally to make it water tight.

B3.6 Pump House

The existing pumphouse was built in 1982 to accommodate 4 new centrifugal pumps. This pumphouse is designed to boost water from the Kibuye ground level tanks into the distribution network to the east of Kibuye. Only three of the original four pumps are presently installed and operating.

The civil works at the pump house needs refurbishment and re-painting. All the existing pumps, including the delivery, suction and non-return valves need replacement. The electrical control panels are also in bad condition and need replacement and/or removal.

B3.7 Staff Houses

The existing staff houses need refurbishment and/or repairs including complete re-painting. There is no electricity at present in these staff houses and needs to be provided.

B3.8 Fencing, Gate and Access Road Works

The existing boundary fence is damaged and missing at places and needs to be replaced and the main gate repainted.

The access road into the works needs to be gravel surfaced to avoid very dusty conditions.

B4. Kajulu Water Treatment Works

B4.1 Intake Works

At present water is supplied from two intakes at Kajulu known as the Upper Intake and the Lower Intake. The weir level at upper intake is 1279.39 m above MSL and lower intake is 1272.59 m above MSL respectively.

There is an existing 150 mm diameter steel pipe approximately 300 m long from the upper intake terminating at the dosing/mixing chamber and an existing 225 mm diameter steel pipe approximately 60 m long from the Lower Intake to the dosing/mixing chamber at Kajulu Water Treatment Works.

To increase the capacity of the works, a new 250 mm diameter main should be laid parallel to the existing 225 mm diameter steel main from the lower intake.

B4.2 Kajulu Water Treatment Works

Raw water from the two intakes is delivered to the dosing/mixing chamber when alum is dosed. The dosed water then flows through a set of flocculation basins, and on to the sedimentation tank where the settled water is dosed with chlorine and soda ash.

After passing through the pressure filters, water is supplied direct into the distribution area of the upper zone of the Municipality.

B4.3 Proposed Rehabilitation / Modifications / Extensions Required at Kajulu Water Intake and Treatment Works to Increase the Current Capacity of 1,400 m³/day - 1,600 m³/day to 2,800 m³/day

- (1) Duplicate the existing 225 mm diameter steel main with a 250 mm diameter steel main from Lower Intake Works to the dosing / mixing chamber approximately 300 metres long
- (2) Raising the existing coagulation entry channel wall by 0.5 m. This is to contain the intermittent overflow splashes out of the coagulation channel due to wind currents.

- (3) Replacing the existing 30 metres long 150 mm diameter steel coagulated water inlet pipes by single 250 mm diameter steel pipe to the sedimentation basin.
- (4) Modifying the existing sedimentation basin by installing a dispersion cone at the bottom inlet and installing a polygonal weir board fitted with "V" notches to match the shape of the basin at the tank outlet, and improving the inter-connection fittings for the delivery main from the sedimentation basin to the pressure filters.
- (5) Installation of new set of pressure filters including interconnecting pipework, all control valves, new filter sand and gravel including all electrical work in a new Filter House next to the existing one.
- (6) Replacement of the 6" (150 mm) diameter bulk flow meter at the outlet from the filter units at Kajulu Water Works.
- (7) Refurbishment and repairs of all staff houses (eight Nos) including main gate, fencing and the access road.

B5. Watson Bank Reservoir Site

B5.1. Watson Bank Reservoir

The existing Watson Bank Reservoir is a ground level reinforced concrete tank of 2,270 m³ capacity. The ground level is 1181.10 m above MSL. The tank is in good condition.

B5.2 Refurbishment Work Required

- (1) The existing level flow indicator has broken down and needs replacement.
- (2) The access road and the surrounding areas around the tank needs clearing of all the rubbish and debris removed.
- (3) All the steel work like the access external ladder, access manhole covers all the exposed pipework, valves and fittings in the chambers needs cleaning and repainting.

B6 Existing Water Supply Survey

B6.1 Introduction

Existing Water Supply Survey is one of the field surveys under this Study and the survey results are reported in this Appendix. Survey was carried at sample points selected over the Study Area (Kisumu Municipality) during first field survey period. It was conducted directly by the JICA Study Team and GOK counterpart. Central part of Kisumu Municipality is served by piped water supply and peripheral areas rely on rural supplies which are sometime just the river or a well. Purpose of the survey was to investigate existing water supply conditions in the following two systems:

- Piped Water Supply System
- Rural Water Supplies

Survey area is within the Kisumu Municipality and 11 sample points for each different system, namely piped water supply area and rural water supply, as shown in Figure B-1, were selected.

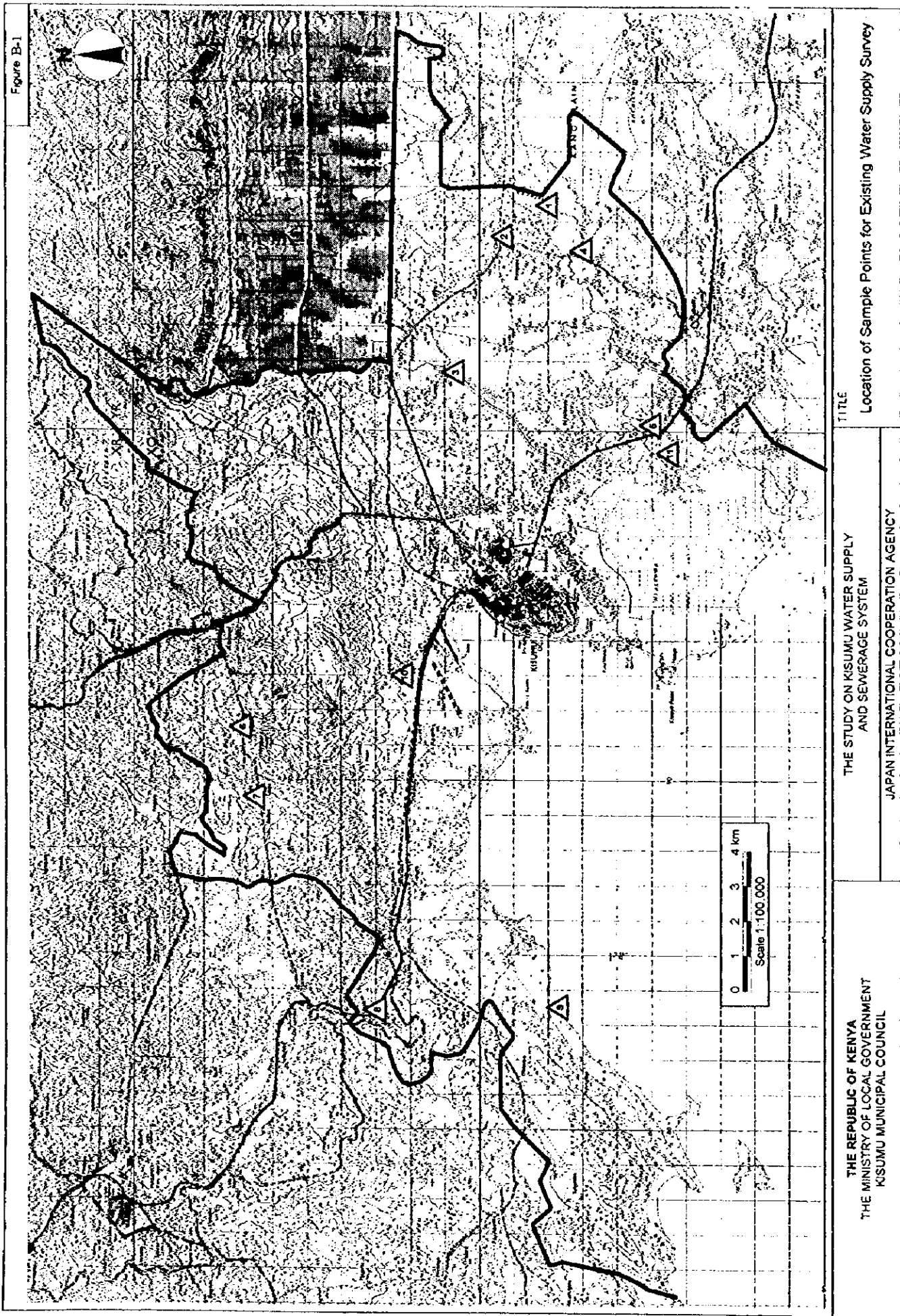


Figure B-1

B6.2 Results

Results of the survey are summarised in Tables B-1 and B-2. Discussion of the results are made in the following sections.

B6.2.1 Municipal Water Supply Area

(1) Water Quality

Residual chlorine was detected at only two of 11 sample points. Turbidity of 4 points were 2, but that of other points were 5 or 10. Therefore, only 2 of 11 points met with drinking quality standard.

(2) Residual Water Pressure

Residual water pressures of almost all points were very low, such as below 1 m (0.1kg/cm²), because the sample points was located at surroundings of downtown. As a reference, residual water pressures of additional 10 points in downtown area was from 4 to 6 m.

(3) Supply Condition

Only one point can receive water by piped water supply system for continuously 24 hours. Other points receive water only from 5 a.m. to 10 a.m. (8 points) or from 6 a.m. to 6 p.m. (1 point). Although this result does not present overall condition in Kisumu, it can be understood that Kisumu is faced with severe supply condition. Overall existing condition for Kisumu Water Supply System is mentioned in the Main Report.

(4) Alternative Sources during Water Suspension

River water or KIOSK can be used as alternative sources for 4 of 11 points. For other 7 points, however, there is no alternative sources.

Shallow well within the supply area can not be applied as alternative source, because of bad water quality. It is also difficult for population in service area to keep water from deep well, since there is not enough number of deep wells. Therefore, the population is obliged to use poor quality water from springs, shallow wells and rivers as alternative piped water.

(5) Health Condition

The result indicates that 3 of 11 samples (persons) have not suffered from diarrhea, typhoid, cholera and malaria. Three persons use water after boiling. Although other persons also know that boiled water is safe for drinking, they do not use boiled water because of high fuel expense.

(6) Service Pipes

Many consumers do not know the condition of service pipes. Service pipes belong to the consumers and should be maintained by the consumers. This is, therefore, due to lack of public relations. Information on pipe length for 4 points were obtained through the survey. Longest one is 200 m, and others are 10 to 25 m. The reason why the service pipes is needed to be long is that distance from house to available distribution pipeline is long, since distribution pipeline have not been developed or there is possibility of no water in nearest distribution pipelines. According to the hearing to population within existing piped water supply area, service pipes of 100 m long is not rare. It is, however, only for population of high income level. Other population buy water from KIOSKS or houses which receive water from piped system.

Leakage from service pipes have been detected at 4 points. Considering low residual water pressure (approximately 1 m), this result indicates that there are many leakages. In general, since length of service pipes is 50 % of total length of distribution pipelines and there are so many jointings, leakage from service pipes is 3 to 9 times of leakage from distribution pipelines. As the results, improvement of service pipes is urgent issue.

B6.2.2 Rural Water Supply Area

(1) Water Sources

The water sources of rural area is various such as river, stream, deep well, shallow well, the Lake Victoria and spring.

- a) The samples which obtain water from deep wells are located at Chigga and Buoye, and these deep wells are maintained well by catholic church. Depth of wells are approximately 40 m for Chiga and 25 m for Buoye respectively. Well at Buoye seems to be shallow well due to small quantity of well water. Water qualities of both wells are not deteriorated, but the electric conductivity is high at more than 400 μ S/cm. It seems that well water contains basic matter and there is no problem for drinking water. In addition, floride of more than 3.0 mg/L is contained in both water and floride impediment was observed at neighbouring children. Water

quality test is conducted once a month at Nairobi University by Chigga Church, and its deep well is maintained well. Bore hole is checked periodically. This system at Chigga covers about 5,000 persons of 1,000 families, and is organised mainly by women.

- b) Shallow well at Buoye maintained by church is dried up. Other shallow wells near sample point have not also enough water, and are unsuitable for drinking due to poor water quality, i.e. NH₄-N of 0.4 mg/l and turbidity of more than 30 degrees.
- c) There is no water quality problem except turbidity, if river has much water. Electric conductivity for small river and stream is very high compared with 100 for those upstream because of growth of algae and effect of wastewater. This is why it is no rain more than one month before survey. According to interview to population who use water of river and stream, flow rate becomes extremely small during dry season. River flowing through Aigo (Osiri) is dried up at the survey period. In this case, population take water from standing water which is only for several container of water.

(2) Distance to the Sources

Average distance to the sources is approximately 4 km. In the samples, children collect water 8 times a day using a 20 liters container.

(3) Alternative Sources

Six samples do not have alternative sources. Four samples have alternative sources, but 5 to 10 km away.

(4) Health Condition

The result indicates that all samples (persons) have suffered from diarrhea, typhoid, cholera and malaria. Although all persons know that boiled water is safe for drinking, they do not use boiled water because of high fuel expense.

Table B-1 Results of Survey on Existing Water Supply (1/2)

1. Piped Supply Area

Number of Sample Point		1	2	3	4	5	6	7	8	9	10	11	Manyata Deep well	Manyata Shallow well	
Date		30/9/97	30/9/97	30/9/97	30/9/97	30/9/97	1/10/97	1/10/97	1/10/97	1/10/97	1/10/97	1/10/97	2/10/97	2/10/97	
1 Water Quality	Ammonia ion	mg/l NIL	NIL	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	0.8	
	Residual Chlorine	mg/l 1.2	1.0	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil		
	Electrical Conductivity	µS/cm 210	210	199	200	187	183	185	189	189	185	186	186	440	550
	Ambient Temperature	°C 30.3	30.3	30.3	30.3	30.3	24.6	25.8	26.2	26.2	26.3	26.5	26.8	26.8	26.8
	Water Temperature	°C 26.2	27.9	28.8	29.5	24.6	26.6	27.4	27.9	27.9	26.6	28.5	28.5	21	25.5
	pH	7.0	7.0	7.2	7.0	7.5	7.5	7.5	7.5	7.5	7.3	7.0	7.3	8.1	8.0
	Total hardness	mg/l 70	70	40	30	30	30	40	30	30	30	30	40	25	50
	Turbidity	units 2	2	2	10	10	10	10	10	10	10	2	5	1	over 40
	Fluoride	mg/l 0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	3.2	1.2
	Pressure	m 1.1	1.1	1.4	0.8	very low	0.8	0.8	0.7	0.6	0.5	0.2	0.1	COD:4	COD:40
	Duration of distribution and water cut	6-9am 11times	5-9am rare	6-8am 11times	6-8am rare	6am-18 rare	6am-18 rare	6am-10 2 times/m	6am-10 3 times/m	6am-18 3 times/m	5am-10 2 times/m	6am-7 5 times/m	6am-7 2 times/m		
Alternative source during water cut	none	river-4km	Kiosk	river-near	none	none	Kiosk	Kiosk	Kiosk	none	none	none	none	none	
4 Health condition	Diarrhea	Yes	none	Yes	none	Yes	none	none	none	none	none	none	none	none	
	Typhoid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Cholera	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Malaria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
5 Meter condition	Working meter	Working	Working	no working	Working	irregular	irregular	no working	no working	Working	Working	Working	Working	Working	
	Location of meter	Outside	Outside	Outside	Outside	inside	Outside	Outside	Outside	Outside	Outside	Outside	Outside	Working	
	Frequency of meter reading	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	once a month	
6 Condition of service pipes	Total length	12 m	200 m	10 m	10 m	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	25m	
	Diameter	12.5 mm	37.5mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	12.5 mm	
	Leakage	nil	nil	leak	leak	leak	leak	leak	leak	leak	leak	leak	leak	leak	

