

付録

付録 A. 水質データ

付録 A.1 河川水質の分析結果 (図表)

Table 1 Water Quality Analysis, Bagmati River, November 1999

S.N.	PARAMETERS	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
1	Flow Rate (m ³ /sec)	1.43	0.79	1.33	1.06	1.26	1.4	1.58	1.64	2	5.17	6.49	6.37	7.31	8.84	10.43	10.91	11.95
2	Velocity (m/sec)	0.34	0.5	0.69	0.62	0.62	0.55	0.42	0.52	0.5	0.58	0.62	0.74	0.82	0.60	0.77	0.97	0.59
3	Temperature °C	11	17	16	16	16	15	15	14	13	13	14	15	14	15	17	16	16
4	PH	6.5	6.55	6.65	6.7	6.65	6.6	6.7	6.8	6.75	7.1	7.15	7.25	7.22	7.34	7.32	7.6	7.48
5	Conductivity (µ mhos/cm)	19	28	41	55	74	128	112	200	188	195	203	303	348	414	347	282	264
6	Turbidity (NTU)	2	15	25	18	17	120	33	47.5	50	20	60	42.5	60	80	50	40	22.5
7	Total Suspended Solids (mg/l)	5.31	15.5	28	29.25	26.67	128.13	43.75	55	53.33	24	60	37.5	75	70	57	45.33	28
8	Color (Chromaticity Unit)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Total Hardness (mg/l)	7	9	13	16	15	25	24	40	36	75	47	67	71	87	84	79	81
10	Total alkalinity (mg/l)	15.3	12.75	28.05	22.95	28.05	45.9	40.8	71.4	66.3	91.8	73.95	102	119.85	145.35	122.4	109.65	96.9
11	Chloride (mg/l)	0.99	0.99	2.98	2.98	9.43	6.45	8.94	18.37	15.4	9.93	13.4	24.33	19.86	23.83	21.35	14.4	12.41
12	Fluoride (mg/l)	-	-	-	-	0.26	-	0.66	-	0.66	-	-	-	-	-	-	-	0.85
13	Boron (mg/l)	-	-	-	-	-	-	NDX(<10)	-	NDX(<10)	-	-	-	-	-	-	-	0.55
14	Phenol (mg/l)	-	-	-	-	0.069	-	0.003	-	0.0025	-	-	-	-	-	-	-	0.026
15	Orthophosphate (mg/l)	0.123	0.146	0.153	0.184	0.268	0.705	0.66	1.724	1.78	0.958	1.34	3.22	3.83	3.98	2.432	1.96	1.11
16	Total Phosphate (mg/l)	0.14	0.291	0.283	0.456	0.536	1.471	1.624	3.486	3.41	1.8	2.39	4.635	6.512	5.21	4.79	2.206	1.96
17	Ammonical - N (mg/l)	0.026	0.046	0.06	0.308	1.13	3.22	2.96	4.75	6.913	2.5	4.83	9.17	7.91	11.33	7.7	5.7	3.14
18	Nitrite - N (mg/l)	NDX(<0.01)	NDX(<0.01)	0.0016	0.003	0.005	0.03	0.005	0.04	0.055	0.096	0.14	0.0016	0.008	0.011	0.005	0.03	0.17
19	Nitrate - N (mg/l)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	NDX(<0.05)	0.66	0.595	0.1	2	2.75	0.475	1.975	3.25
20	Total -N (TKN) (mg/l)	0.7	0.42	3.5	2.1	4.2	12.6	5.88	11.2	10.27	3.5	3.27	13.77	16.1	21	11.2	8.4	4.9
21	Dissolved Oxygen (mg/l)	8.9	8.42	7.58	8.08	7.5	3.98	6.06	5.16	5.4	7.77	5.3	4.24	3.23	1.37	1.68	3.46	6.1
22	BOD ₅ (mg/l)	1.28	2.08	2.92	4.7	10.75	28.6	17.85	31.1	28.72	11.8	23.7	37.4	57.25	65.5	37.2	31.25	13.2
23	COD (mg/l)	2.5	7	11.5	13	25	61.5	42.5	66	77	23.5	50	94	156	160	76	52	16
24	Sulphate (mg/l)	2.35	0.29	0.29	1.175	2.35	2.35	8.23	16.17	4.14	8.82	6.75	8.57	5.3	5.58	3.82	4.113	4.99
25	Total Coliforms (MPN Index/100ml)	1100	3900	240x10 ³	240x10 ³	240x10 ³	1100x10 ³	460x10 ³	1100x10 ³	1100x10 ³	1100x10 ³	240x10 ³	1100x10 ³	1100x10 ³	1100x10 ³	460x10 ³	460x10 ³	460x10 ³
26	E. Coli (MPN Index/100ml)	460	3900	240x10 ³	240x10 ³	240x10 ³	1100x10 ³	460x10 ³	1100x10 ³	1100x10 ³	1100x10 ³	240x10 ³	1100x10 ³	1100x10 ³	100x10 ³	460x10 ³	460x10 ³	93x10 ³
27	Total dissolved Solids (mg/l)	2	4	26	18	48	62	41	78	85	101	119	156	157	194	146	131	129
28	Calcium (mg/l)	2.4	3.6	3.2	4.87	3.2	6.41	5.61	11.62	9.62	25.25	14.03	20.04	21.24	26.45	25.65	24.45	24.45
29	Magnesium (mg/l)	0.24	0.24	0.97	0.97	1.7	2.18	2.43	2.67	2.91	2.91	2.91	4.13	4.37	5.1	4.86	4.37	4.86
30	Sodium (mg/l)	2.48	3.14	4.3	4.9	6.7	10.05	8.25	13.35	14.3	8.25	5.6	17	14.45	19.9	16.12	10.25	8.72
31	Potassium (mg/l)	0.35	0.65	1.04	1.98	3.14	3.75	3.09	5.4	2.71	4.3	4.72	6.4	7.72	7.88	6.46	5.12	4.41
32	Lead (mg/l)	-	-	-	-	-	-	NDX(<0.01)	-	NDX(<0.01)	-	-	-	-	-	-	-	NDX(<0.01)
33	Cadmium (mg/l)	-	-	-	-	-	-	NDX(<0.001)	-	NDX(<0.001)	-	-	-	-	-	-	-	NDX(<0.001)
34	Chromium (mg/l)	-	-	-	-	-	-	NDX(<0.02)	-	NDX(<0.02)	-	-	-	-	-	-	-	NDX(<0.02)
35	Copper (mg/l)	-	-	-	-	-	-	NDX(<0.01)	-	NDX(<0.01)	-	-	-	-	-	-	-	0.012
36	Zinc (mg/l)	-	-	-	-	-	-	0.029	-	0.042	-	-	-	-	-	-	-	0.028
37	Iron (mg/l)	0.06	0.64	1.02	0.98	0.62	4.38	1.94	1.7	1.82	1.26	1.8	1.61	1.2	1.8	1.57	1.4	1.41
38	Manganese (mg/l)	<0.1	0.012	0.014	0.03	0.36	0.11	0.08	0.13	0.12	0.12	0.14	0.19	0.26	0.54	0.22	0.17	0.21
39	Aluminium (mg/l)	-	-	-	-	-	-	NDX(<0.01)	-	NDX(<0.01)	-	-	-	-	-	-	-	NDX(<0.01)
40	Mercury (mg/l)	-	-	-	-	-	-	NDX(<0.001)	-	NDX(<0.001)	-	-	-	-	-	-	-	NDX(<0.001)

Source: NESS Survey, 1999.

Table 2 Water Quality Analysis, Bagmati River, June 1999

S.N.	PARAMETERS	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17
1	Flow Rate (m ³ /sec)	1.98	3.31	3.4	3.3	3.99	5.83	1.79	5.83	2.46	1.014	1.73	2.86	3.23	3.23	3.63	1.03	
2	Velocity (m/sec)	0.56	0.7	0.98	0.39	0.403	0.8	0.81	0.81	0.8	0.14	0.55	0.39	0.95	0.29	0.44	0.109	
3	Temperature (°C)	19	23	25	27	27	24	23	23	31	30	29	28	28	29	28	27	
4	pH	7.2	6.8	6.85	6.7	6.67	6.74	7.01	7.01	7	7.26	7.2	7.24	7.3	7.14	7.1	7.38	
5	Conductivity (µmhos/cm)	20	29	42	53	63	103	99	195	203	382	420	513	552	585	561	460	
6	Turbidity (NTU)	3	45	130	300	230	310	360	60	180	45	40	60	75	90	90	155	
7	Total Suspended Solids (mg/l)	3.4	50.8	264.4	636	465	543	601	67.6	241	46.7	48	85	93	171.43	151.43	148.88	
8	Color (Chromaticity Unit)	-	-	-	-	-	-	-	-	1.3	1.52	1.4	2.2	2.85	2.1	2.08	2.08	
9	Total Hardness (mg/l)	5	9	20	15	18	25	24	40	37	76	84	108	97	115	117	108	
10	Total alkalinity (mg/l)	12.7	15.23	17.77	22.84	22.84	30.46	27.92	71.06	182.74	126.9	139.6	182.74	40.81	200.5	195.43	158.9	
11	Chloride (mg/l)	1	10	2	1.5	2	6.96	6.96	16.9	15.91	33.3	35.8	38.77	41.25	50.7	42.25	33.8	
12	Fluoride (mg/l)	-	-	-	-	0.75	0.86	0.86	-	0.48	-	-	-	-	-	-	0.88	
13	Boron (mg/l)	-	-	-	-	0.47	0.63	0.63	-	ND	-	-	-	-	-	-	ND	
14	Phenol (mg/l)	-	-	-	-	0.006	0.006	0.006	-	0.005	-	-	-	-	-	-	0.002	
15	Orthophosphate (mg/l)	0.09	0.08	0.14	0.13	0.02	0.2	0.22	1.65	1.12	3.27	3.11	2.86	8.12	8.03	5.41	2.85	
16	Total Phosphate (mg/l)	0.2	0.29	0.82	1.76	0.39	0.34	1.53	3.65	3.98	5.21	5.82	9.37	10	10.01	8.07	5.71	
17	Ammonical - N (mg/l)	ND (<0.05)	ND (<0.05)	0.06	0.18	0.3	0.42	1.24	1.5	6.5	9.5	15.25	21.13	20.5	18.25	14.7	11.25	
18	Nitrate - N (mg/l)	ND (<0.01)	ND (<0.01)	0.03	0.67	0.12	0.93	0.67	0.03	0.017	0.01	ND (<0.01)	ND	ND	ND	0.01	0.154	
19	Nitrite - N (mg/l)	0.18	0.73	1.13	1.53	1.03	2.8	1.43	1.43	0.05	0.17	0.15	0.63	0.3	0.19	0.205	0.91	
20	Total -N (TKN) (mg/l)	0.92	1.39	1.62	3.12	3.12	2.08	3.81	2.08	0.93	1.317	15.71	35.18	27.72	24.6	21.71	12.82	
21	Dissolved Oxygen (mg/l)	7.58	7.69	6.26	5.84	5.4	4	5.05	3.33	1.88	NI	NI	NI	NI	NI	NI	2.92	
22	BOD ₅ (mg/l)	<1.0	5.25	7.6	5.85	7.7	15.2	17.7	16.9	34.5	71	77.5	98	119	68	48.8	17.7	
23	COD (mg/l)	0.5	10.5	30	32	46	30	42	30	73.33	160	80	105	385	208	260	266	
24	Sulphate (mg/l)	0.83	0.55	0.55	1.92	8.5	7.13	4.67	6.31	10.69	8.57	16.18	10.15	1.71	5.35	9.87	18.1	
25	Total Coliform (MPN Index/100ml)	300	2300	1100+ x 5	21500	21500	460 x 10 ³	1100 ³ x 10 ³	240 x 10 ³	460 x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 50	1100 ³ x 50	1100 ³ x 100	
26	E. Coli (MPN Index/100ml)	186	2380	1100+ x 5	11500	21500	240 x 10 ³	1100 ³ x 10 ³	43 x 10 ³	460 x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 10 ³	1100 ³ x 50	1100 ³ x 50	1100 ³ x 100	
27	Total dissolved Solids (mg/l)	46	58	73	48	48	86	96	112	72	196	234	246	280	290	262	224	
28	Calcium (mg/l)	1.6	2.4	4	3.6	4.4	6.8	6.8	9.6	11.2	21.6	22.8	25.2	22.8	34	33.2	32.8.0	
29	Magnesium (mg/l)	0.24	0.73	2.43	2.2	0.35	0.4	1.7	3.88	2.19	5.35	6.56	10.94	9.72	7.3	8.28	6.58	
30	Sodium (mg/l)	1.88	2.52	3.17	3.94	4.04	7.02	6.65	10.52	11	22	23.1	28.7	30.5	30.11	30.5	29.7	
31	Potassium (mg/l)	0.47	0.93	1.87	2.49	2.3	4.04	3.48	5.18	5.96	7.3	7.83	11.48	12.72	13.63	11.84	8.7	
32	Lead (mg/l)	-	-	-	-	ND (<0.01)	-	0.008	-	ND	-	-	-	-	-	-	ND	
33	Cadmium (mg/l)	-	-	-	-	ND (<0.001)	-	ND (<0.001)	-	ND	-	-	-	-	-	-	ND	
34	Chromium (mg/l)	-	-	-	-	0.022	-	0.029	-	ND	-	-	-	-	-	-	ND	
35	Copper (mg/l)	-	-	-	-	0.006	-	0.011	-	0.014	-	-	-	-	-	-	0.01	
36	Zinc (mg/l)	-	-	-	-	0.073	-	0.097	-	0.096	-	-	-	-	-	-	0.06	
37	Iron (mg/l)	0.12	1.26	6.27	13.8	12.35	16.86	17.58	2.9	8.41	2.85	1.98	3.42	3.25	3.19	4.21	4.8	
38	Manganese (mg/l)	-	-	-	-	0.37	-	0.13	-	0.13	-	-	-	-	-	-	0.3	
39	Aluminium (mg/l)	-	-	-	-	0.006	-	0.0053	-	0.0064	-	-	-	-	-	-	0.0075	
40	Mercury (mg/l)	-	-	-	-	ND (<0.001)	-	0.0021	-	ND	-	-	-	-	-	-	ND	

Source: NESS Survey 1999.

Table 3 Water Quality Status of Hanumante River, November, 1999

S.N.	PARAMETERS	H4	H3	H2	H1
1	Flow Rate (m ³ /sec)	0.04	0.72	0.86	2.48
2	Velocity (m/sec)	0.26	0.37	0.49	0.42
3	Temperature °C	14	14	14	16
4	PH	7.25	7.25	7.3	7.65
5	Conductivity (μ mhos/Cm)	236	245	266	257
6	Turbidity (NTU)	17	11	13.5	13.5
7	Total Suspended Solids (mg/l)	21.11	7.56	10.75	11.75
8	Color (Chromacity Unit)	-	-	-	-
9	Total Hardness (mg/l)	96	90	92	104
10	Total alkalinity (mg/l)	96.9	107.1	114.75	117.3
11	Chloride (mg/l)	9.43	8.44	12.41	10.43
12	Fluoride (mg/l)	-	-	-	0.04
13	Boron (mg/l)	-	-	-	ND<.10
14	Phenol (mg/l)	-	-	-	0.002
15	Orthophosphate (mg/l)	0.17	1.29	1.68	0.993
16	Total Phosphate (mg/l)	0.5	1.58	2.55	1.75
17	Ammonical - N (mg/l)	0.19	3.66	3.98	2.816
18	Nitrite -N (mg/l)	0.055	0.084	0.04	0.048
19	Nitrate -N (mg/l)	0.208	0.133	ND<.05	0.04
20	Total -N (TKN) (mg/l)	1.05	4.2	4.9	3.85
21	Dissolved Oxygen (mg/l)	7.53	3.53	2.09	7.77
22	BOD ₅ (mg/l)	5.3	9.7	12.75	7.3
23	COD (mg/l)	12	22	28.5	23
24	Sulphate (mg/l)	11.31	1.175	5.48	5.58
25	Total Coliform (MPN Index/100ml)	120 x 10 ³	230 x 10 ³	550 x 10 ³	230 x 10 ³
26	E. Coli (MPN Index/100ml)	120 x 10 ³	230 x 10 ³	230 x 10 ³	230 x 10 ³
27	Total dissolved Solids (mg/l)	166	146	165	112
28	Calcium (mg/l)	29.66	30.46	29.65	32.46
29	Magnesium (mg/l)	5.35	3.4	4.37	5.6
30	Sodium (mg/l)	8.5	9	9.95	8.05
31	Potassium (mg/l)	2.35	4.23	5.5	4.31
32	Lead (mg/l)	-	-	-	ND<.01
33	Cadmium (mg/l)	-	-	-	ND<.001
34	Chromium (mg/l)	-	-	-	ND<.02
35	Copper (mg/l)	-	-	-	ND<.01
36	Zinc (mg/l)	-	-	-	0.015
37	Iron (mg/l)	1.5	0.94	1.3	1.27
38	Manganese (mg/l)	0.11	0.15	0.19	0.17
39	Aluminum (mg/l)	-	-	-	ND<.01
40	Mercury (mg/l)	-	-	-	ND<.001

Source: NESS Survey, 1999.

Table 4 Water Quality Analysis, Hanumanta River, June 1999

S.N.	PARAMETERS	H4	H3	H2	H1
1	Flow Rate (m ³ /sec)	0.0072	0.45	0.94	0.83
2	Velocity (m/sec)	0.28	0.27	0.59	0.13
3	Temperature °C	24	28	24	24
4	pH	6.72	7.3	7.17	7.1
5	Conductivity (μ mhos/Cm)	567	399	358	276
6	Turbidity (NTU)	140	90	120	525
7	Total Suspended Solids (mg/l)	217	53	73	386
8	Color (Chromacity Unit)	-	-	-	1.93
9	Total Hardness (mg/l)	213	130	122	88
10	Total alkalinity (mg/l)	134.51	134.51	116.8	86.3
11	Chloride (mg/l)	45.23	22.37	21.37	17.9
12	Fluoride (mg/l)	-	-	-	0.88
13	Boron (mg/l)	-	-	-	ND
14	Phenol (mg/l)	-	-	-	0.002
15	Orthophosphate (mg/l)	0.22	2.15	1.81	1.38
16	Total Phosphate (mg/l)	3.12	3.47	3.17	3.06
17	Ammonical - N (mg/l)	0.43	5.8	4.92	4.5
18	Nitrite -N (mg/l)	0.97	0.81	0.48	3.85
19	Nitrate -N (mg/l)	11.33	3.46	4.92	3.1
20	Total -N (TKN) (mg/l)	3.12	4.85	7.28	10.05
21	Dissolved Oxygen (mg/l)	2.17	3.19	2.85	2.8
22	BOD ₅ (mg/l)	21.9	14	10.25	27
23	COD (mg/l)	30	15	24	55
24	Sulphate (mg/l)	61.98	24.96	13.72	24
25	Total Coliform (MPN Index/100ml)	93 x 10 ³	1100 ⁺ x 10 ³	240 x 10 ³	150 x 10 ³
26	E. Coli (MPN Index/100ml)	93 x 10 ³	1100 ⁺ x 10 ³	240 x 10 ³	43 x 10 ³
27	Total dissolved Solids (mg/l)	368	266	260	222
28	Calcium (mg/l)	53.2	37.6	35.6	27.2
29	Magnesium (mg/l)	19.44	8.75	8.02	5.1
30	Sodium (mg/l)	24.84	16.31	14.38	9.04
31	Potassium (mg/l)	7.48	7.85	8.73	6.95
32	Lead (mg/l)	-	-	-	ND (<0.01)
33	Cadmium (mg/l)	-	-	-	ND
34	Chromium (mg/l)	-	-	-	ND
35	Copper (mg/l)	-	-	-	0.015
36	Zinc (mg/l)	-	-	-	0.088
37	Iron (mg/l)	9.06	2.77	3.43	14.56
38	Manganese (mg/l)	-	-	-	0.47
39	Aluminum (mg/l)	-	-	-	0.0043
40	Mercury (mg/l)	-	-	-	ND

Source: NESS Survey, 1999.

Table 5 Water Quality Analysis, Manahara River, November 1999

S.N.	PARAMETERS	M1	M2	M3	M4	M5
1	Flow Rate (m ³ /sec)	0.96	1.35	1.14	3.03	3.88
2	Velocity (m/sec)	0.4	0.42	0.38	0.6	0.59
3	Temperature °C	18	18	14	14	13
4	PH	6.9	6.8	6.8	6.85	7.2
5	Conductivity (μ mhos/Cm)	48	62	89	90	200
6	Turbidity (NTU)	9.5	24.5	31.5	28.5	260
7	Total Suspended Solids (mg/l)	8.13	28.25	51.43	41.5	29.75
8	Color (Chromacity Unit)	-	-	-	-	-
9	Total Hardness (mg/l)	16	16	24	26	77
10	Total alkalinity (mg/l)	22.95	22.95	30.6	33.15	86.7
11	Chloride (mg/l)	2.48	2.97	3.97	5.46	8.44
12	Fluoride (mg/l)	-	-	0.035	-	-
13	Boron (mg/l)	-	-	ND<.1	-	-
14	Phenol (mg/l)	-	-	0.003	-	-
15	Orthophosphate (mg/l)	0.14	0.2	0.23	0.23	0.713
16	Total Phosphate (mg/l)	0.184	0.352	0.483	0.513	1.44
17	Ammonical - N (mg/l)	0.06	0.133	0.235	0.17	18.33
18	Nitrite -N (mg/l)	ND<.001	0.0054	0.091	0.03	0.173
19	Nitrate -N (mg/l)	0.73	1	1.33	0.866	0.183
20	Total -N (TKN) (mg/l)	0.98	1.4	0.98	1.12	2.38
21	Dissolved Oxygen (mg/l)	8.8	7.18	7.49	7.52	7.79
22	BOD ₅ (mg/l)	1	1.7	10.5	3.55	7.25
23	COD (mg/l)	1	3.5	13.5	15.5	21
24	Sulphate (mg/l)	1.75	3.29	8.39	8.23	3.53
25	Total Coliform (MPN Index/100ml)	115 x 10 ²	45 x 10 ²	215 x 10 ²	465 x 10 ²	550 x 10 ³
26	E. Coli (MPN Index/100ml)	115 x 10 ²	45 x 10 ²	115 x 10 ²	215 x 10 ²	550 x 10 ³
27	Total dissolved Solids (mg/l)	53	17	30	69	112
28	Calcium (mg/l)	4	5.61	6.87	7.21	24.04
29	Magnesium (mg/l)	1.46	0.48	1.7	1.94	4.13
30	Sodium (mg/l)	2.83	5.5	7.21	7.2	8.15
31	Potassium (mg/l)	0.95	1.31	1.82	1.82	1.82
32	Lead (mg/l)	-	-	ND<.001	-	-
33	Cadmium (mg/l)	-	-	ND<.001	-	-
34	Chromium (mg/l)	-	-	ND<.002	-	-
35	Copper (mg/l)	-	-	ND<.001	-	-
36	Zinc (mg/l)	-	-	0.023	-	-
37	Iron (mg/l)	0.65	1.25	2.76	1.88	1.7
38	Manganese (mg/l)	0.02	0.042	0.062	0.062	0.14
39	Aluminum (mg/l)	-	-	ND<.001	-	-
40	Mercury (mg/l)	-	-	ND<.001	-	-

Source: NESS Survey, 1999.

Table 6 Water Quality Analysis, Manohara River, June 1999

S.N.	PARAMETERS	M1	M2	M3	M4	M5
1	Flow Rate (m ³ /sec)	0.36	0.71	0.61	1.27	2.51
2	Velocity (m/sec)	0.17	0.68	0.44	0.38	0.32
3	Temperature °C	25	25	25	25	24
4	PH	6.61	6.78	7.15	7.1	7.05
5	Conductivity (μ mhos/Cm)	85	94	145	193	246
6	Turbidity (NTU)	12	12.5	30	200	575
7	Total Suspended Solids (mg/l)	12.66	18.8	32.5	195	446
8	Color (Chromacity Unit)	-	-	0.85	1.28	1.93
9	Total Hardness (mg/l)	28	93	43	60	72
10	Total alkalinity (mg/l)	33	33	50.76	63.45	76.14
11	Chloride (mg/l)	3.5	4.47	7.46	9.94	14.91
12	Fluoride (mg/l)	-	-	1.04	-	-
13	Boron (mg/l)	-	-	0.25	-	-
14	Phenol (mg/l)	-	-	0.012	-	-
15	Orthophosphate (mg/l)	0.15	0.13	0.37	0.5	0.57
16	Total Phosphate (mg/l)	0.32	0.28	1.1	1.96	3.52
17	Ammonical - N (mg/l)	0.09	ND (<0.05)	0.26	0.84	3.63
18	Nitrite -N (mg/l)	0.01	ND (<0.01)	0.56	1.34	3.01
19	Nitrate -N (mg/l)	1.13	1.56	1.56	4.55	2.8
20	Total -N (TKN) (mg/l)	1.16	2.08	1.39	7.97	8.32
21	Dissolved Oxygen (mg/l)	6.52	6.13	4.73	3.96	4.1
22	BOD ₅ (mg/l)	3.3	2.94	9	24.5	38
23	COD (mg/l)	19	5	10	40	73.33
24	Sulphate (mg/l)	2.5	2.75	9.46	17.28	18.51
25	Total Coliform (MPN Index/100ml)	460 x 5	2300	150 X 10 ³	460 X 10 ³	460 X 10 ³
26	E. Coli (MPN Index/100ml)	2300	2300	210 X 10 ³	150 X 10 ³	210 X 10 ³
27	Total dissolved Solids (mg/l)	80	84	102	144	154
28	Calcium (mg/l)	7.6	8	11.6	17.6	18
29	Magnesium (mg/l)	2.2	2.2	3.4	3.89	6.56
30	Sodium (mg/l)	5.95	6.44	8.2	9.2	10.1
31	Potassium (mg/l)	1.85	2.12	3.16	5.8	6.6
32	Lead (mg/l)	-	-	ND	-	-
33	Cadmium (mg/l)	-	-	ND	-	-
34	Chromium (mg/l)	-	-	ND	-	-
35	Copper (mg/l)	-	-	ND<0.01	-	-
36	Zinc (mg/l)	-	-	0.062	-	-
37	Iron (mg/l)	0.72	0.97	1.69	7.15	16.92
38	Manganese (mg/l)	-	-	0.15	-	-
39	Aluminum (mg/l)	-	-	0.0075	-	-
40	Mercury (mg/l)	-	-	ND	-	-

Source: NESS Survey, 1999.

Table 7 Water Quality Status of Dhobi Khola, November 1999

S.N.	PARAMETERS	D3	D2	D1
1	Flow Rate (m ³ /sec)	0.2	0.47	0.89
2	Velocity (m/sec)	0.3	0.47	0.53
3	Temperature °C	17	17	15
4	pH	7.2	6.95	7.03
5	Conductivity (μ mhos/Cm)	82	212	686
6	Turbidity (NTU)	23	50	85
7	Total Suspended Solids (mg/l)	33.64	42	88
8	Color (Chromacity Unit)	-	-	-
9	Total Hardness (mg/l)	21	48	83
10	Total alkalinity (mg/l)	30.6	71.4	188.7
11	Chloride (mg/l)	2.97	17.38	102.78
12	Fluoride (mg/l)	-	0.29	0.56
13	Boron (mg/l)	-	ND<.1	0.21
14	Phenol (mg/l)	-	0.001	0.07
15	Orthophosphate (mg/l)	0.24	1.024	9.35
16	Total Phosphate (mg/l)	0.513	2.78	11.72
17	Ammonical - N (mg/l)	0.13	5.26	24.08
18	Nitrite -N (mg/l)	0.016	0.0016	0.003
19	Nitrate -N (mg/l)	0.561	0.133	0.233
20	Total -N (TKN) (mg/l)	3.15	8.05	31.5
21	Dissolved Oxygen (mg/l)	7.9	4.27	1.19
22	BOD ₅ (mg/l)	4.5	52.5	155
23	COD (mg/l)	8	68	194
24	Sulphate (mg/l)	1.76	ND<1.0	13.41
25	Total Coliform (MPN Index/100ml)	9 x 10 ³	23 x 10 ³	1100 x 10 ³
26	E. Coli (MPN Index/100ml)	7 x 10 ³	23 x 10 ³	1100 x 10 ³
27	Total dissolved Solids (mg/l)	72	135	334
28	Calcium (mg/l)	6.01	14.03	23.25
29	Magnesium (mg/l)	1.46	3.16	6.07
30	Sodium (mg/l)	5.5	13.5	59.1
31	Potassium (mg/l)	1.34	5.2	11.2
32	Lead (mg/l)	-	<0.01	ND<.01
33	Cadmium (mg/l)	-	ND<0.001	ND<.001
34	Chromium (mg/l)	-	ND<0.02	ND<.02
35	Copper (mg/l)	-	ND<0.01	0.014
36	Zinc (mg/l)	-	0.054	0.12
37	Iron (mg/l)	1.35	1.83	1.92
38	Manganese (mg/l)	0.03	0.16	0.3
39	Aluminum (mg/l)	-	ND<0.01	ND<.01
40	Mercury (mg/l)	-	ND<0.001	ND<.001

Source: NESS Survey, 1999.

Table 8 Water Quality Status of Dhobi Khola, June 1999

S.N.	PARAMETERS	D3	D2	D1
1	Flow Rate (m ³ /sec)	0.99	1.5	0.18
2	Velocity (m/sec)	1.46	0.6	0.23
3	Temperature °C	27	27	28
4	pH	7.03	6.82	7.17
5	Conductivity (μ mhos/Cm)	89	163	705
6	Turbidity (NTU)	90	250	110
7	Total Suspended Solids (mg/l)	132	274	145
8	Color (Chromacity Unit)	-	-	2.98
9	Total Hardness (mg/l)	26	410	99
10	Total alkalinity (mg/l)	33	40.61	236.03
11	Chloride (mg/l)	5.96	12.43	66.62
12	Fluoride (mg/l)	-	0.82	1.18
13	Boron (mg/l)	-	ND (<0.1)	ND
14	Phenol (mg/l)	-	0.014	0.021
15	Orthophosphate (mg/l)	0.14	0.28	11.73
16	Total Phosphate (mg/l)	0.65	1.27	22.46
17	Ammonical - N (mg/l)	0.32	2.2	31.2
18	Nitrite -N (mg/l)	0.16	0.55	ND (<0.01)
19	Nitrate -N (mg/l)	1.83	2.33	0.78
20	Total -N (TKN) (mg/l)	1.62	2.43	40.54
21	Dissolved Oxygen (mg/l)	5.88	5.21	Nil
22	BOD ₅ (mg/l)	15.5	19.9	129
23	COD (mg/l)	21	40	233
24	Sulphate (mg/l)	62	8.5	19.33
25	Total Coliform (MPN Index/100ml)	46500	460 x 10 ³	1100+x 10 ³
26	E. Coli (MPN Index/100ml)	11500	460 x 10 ³	1100+ x 10 ³
27	Total dissolved Solids (mg/l)	62	128	322
28	Calcium (mg/l)	6.8	11.6	20
29	Magnesium (mg/l)	2.2	2.92	11.91
30	Sodium (mg/l)	6.3	7.35	46.5
31	Potassium (mg/l)	3.14	5.52	19.71
32	Lead (mg/l)	-	ND (<0.01)	ND
33	Cadmium (mg/l)	-	ND (<0.001)	ND
34	Chromium (mg/l)	-	0.014	ND
35	Copper (mg/l)	-	0.004	0.018
36	Zinc (mg/l)	-	0.054	0.176
37	Iron (mg/l)	1.4	9.15	3.8
38	Manganese (mg/l)	-	0.22	0.4
39	Aluminum (mg/l)	-	0.12	0.0032
40	Mercury (mg/l)	-	ND (<0.001)	ND

Source: NESS Survey, 1999.

Table 9 Water Quality Status of Bishnumati Khola, November 1999

S.N.	PARAMETERS	Bi5	Bi4	Bi3	Bi2	Bi1
1	Flow Rate (m ³ /sec)	0.1	1.47	1.27	1.68	2.6
2	Velocity (m/sec)	0.31	0.6	0.65	0.63	0.57
3	Temperature °C	18	18	15	15	15
4	pH	7.56	7.48	7.36	7.31	7.31
5	Conductivity (μ mhos/Cm)	77	145	271	403	436
6	Turbidity (NTU)	50	47.5	62.5	90	95
7	Total Suspended Solids (mg/l)	91.88	63.75	59.33	101.43	160
8	Color (Chromacity Unit)	-	-	-	-	-
9	Total Hardness (mg/l)	19	42	74	163	89
10	Total alkalinity (mg/l)	28.05	51	91.8	137.7	155.55
11	Chloride (mg/l)	2.48	3.97	11.42	26.31	26.31
12	Fluoride (mg/l)	-	-	-	0.32	0.4
13	Boron (mg/l)	-	-	-	0.89	0.24
14	Phenol (mg/l)	-	-	-	0.043	0.05
15	Orthophosphate (mg/l)	0.28	0.25	0.67	4.07	5.52
16	Total Phosphate (mg/l)	0.64	0.41	1.4	8.09	6.62
17	Ammonical - N (mg/l)	0.12	0.33	3.03	10.83	11
18	Nitrite -N (mg/l)	0.013	0.021	0.0075	0.006	0.0075
19	Nitrate -N (mg/l)	1.63	4.75	ND<0.05	ND<0.05	1.625
20	Total -N (TKN) (mg/l)	1.4	1.75	5.25	18.55	24.5
21	Dissolved Oxygen (mg/l)	7.43	6.87	4.27	2.43	1.35
22	BOD ₅ (mg/l)	5	10.2	31.25	62.6	85
23	COD (mg/l)	35	65	134	150	242
24	Sulphate (mg/l)	0.58	7.05	5.87	5.58	5.3
25	Total Coliform (MPN Index/100ml)	9000	240 x 10 ³	460 x 10 ³	1100 x 10 ³	1100 x 10 ³
26	E. Coli (MPN Index/100ml)	3000	240 x 10 ³	460 x 10 ³	1100 x 10 ³	1100 x 10 ³
27	Total dissolved Solids (mg/l)	69	168	155	192	205
28	Calcium (mg/l)	5.21	13.23	23.24	25.65	27.25
29	Magnesium (mg/l)	1.5	2.19	3.9	24.06	5.1
30	Sodium (mg/l)	5	6.5	10.65	19.5	21.25
31	Potassium (mg/l)	1.5	2.2	3.53	7.05	8
32	Lead (mg/l)	-	-	-	ND<.01	0.015
33	Cadmium (mg/l)	-	-	-	ND<.001	ND <0.001
34	Chromium (mg/l)	-	-	-	ND<.02	ND <0.02
35	Copper (mg/l)	-	-	-	0.02	0.02
36	Zinc (mg/l)	-	-	-	0.093	0.1
37	Iron (mg/l)	2.9	2.13	3.1	1.84	2.16
38	Manganese (mg/l)	0.046	0.085	0.2	0.27	0.26
39	Aluminum (mg/l)	-	-	-	ND<.01	ND <0.01
40	Mercury (mg/l)	-	-	-	ND<.001	ND <0.001

Source: NESS Survey, 1999

Table 10 Water Quality Analysis, Bishnumati River, June 1999

S.N.	PARAMETERS	Bi5	Bi4	Bi3	Bi2	Bi1
1	Flow Rate (m ³ /sec)	0.95	5.43	7.24	10.27	0.86
2	Velocity (m/sec)	0.84	0.64	0.83	1	0.56
3	Temperature °C	27	25	24	21	28
4	pH	7.2	7.2	7.3	7.3	7.2
5	Conductivity (μ mhos/Cm)	83	102	270	208	768
6	Turbidity (NTU)	115	395	250	460	100
7	Total Suspended Solids (mg/l)	170	447	303	606	127
8	Color (Chromacity Unit)	-	-	-	-	2.98
9	Total Hardness (mg/l)	35	39	103	64	150
10	Total alkalinity (mg/l)	27.92	30.46	91.37	68.53	266.5
11	Chloride (mg/l)	7.46	8.95	15.41	12.43	63.62
12	Fluoride (mg/l)	-	-	-	0.89	1.17
13	Boron (mg/l)	-	-	-	0.2	ND
14	Phenol (mg/l)	-	-	-	0.0012	0.056
15	Orthophosphate (mg/l)	0.27	0.15	0.46	0.82	10.22
16	Total Phosphate (mg/l)	0.69	1.06	1.66	2.76	15.32
17	Ammonical - N (mg/l)	1.46	0.76	1	2.4	33.5
18	Nitrite -N (mg/l)	0.13	0.65	1.57	0.83	ND (<0.01)
19	Nitrate -N (mg/l)	1.53	2.27	2.66	1.9	0.49
20	Total -N (TKN) (mg/l)	2.77	4.5	4.85	6.58	39.15
21	Dissolved Oxygen (mg/l)	5.7	5.81	5.34	5.85	Nil
22	BOD ₅ (mg/l)	87.5	17.5	20.9	23.3	138
23	COD (mg/l)	126	18	40	37	175
24	Sulphate (mg/l)	2.5	10.7	14.13	15.91	21.39
25	Total Coliform (MPN Index/100ml)	43 x 10 ³	43 x 10 ³	1100 x 10 ³	460 x 10 ³	1100+ x 10 ³
26	E. Coli (MPN Index/100ml)	23 x 10 ³	23 x 10 ³	240 x 10 ³	460 x 10 ³	1100+ x 10 ³
27	Total dissolved Solids (mg/l)	104	80	178	130	344
28	Calcium (mg/l)	8	10.4	33.6	18.8	40
29	Magnesium (mg/l)	3.65	3.16	4.62	4.13	12.15
30	Sodium (mg/l)	3.35	5.51	8.47	5.78	43
31	Potassium (mg/l)	2.91	5.19	5.01	6.94	17.33
32	Lead (mg/l)	-	-	-	0.008	ND
33	Cadmium (mg/l)	-	-	-	ND (<0.001)	ND (< 0.001)
34	Chromium (mg/l)	-	-	-	0.032	ND (<0.02)
35	Copper (mg/l)	-	-	-	0.014	0.022
36	Zinc (mg/l)	-	-	-	0.087	0.13
37	Iron (mg/l)	4.21	13.99	8.69	17.38	3.5
38	Manganese (mg/l)	-	-	-	0.29	0.57
39	Aluminum (mg/l)	-	-	-	0.0015	0.01
40	Mercury (mg/l)	-	-	-	0.0024	ND (<0.001)

Source, NESS Survey, 1999.

Table 11 Water Quality Status of Balkhu/Nakhu/Tukuha/Kodku/Godavari Khola,
November 1999

S.N	PARAMETERS	Ba2	Ba1	N1	T1	K1	G1
1	Flow Rate (m ³ /sec)	0.5	0.48	1.81	0.38	0.61	0.31
2	Velocity (m/sec)	0.35	0.27	1	0.65	0.7	0.31
3	Temperature °C	16	16	16	15	15	17
4	pH	8.55	8.05	9.12	7.18	7.2	8.1
5	Conductivity (μ mhos/Cm)	233	271	174	902	259	196
6	Turbidity (NTU)	7	10.5	8	250	17.5	8
7	Total Suspended Solids (mg/l)	10	10.4	20	268.3	13.39	16.1
8	Color (Chromacity Unit)	-	-	-	-	-	-
9	Total Hardness (mg/l)	109	116	82	125	112	108
10	Total alkalinity (mg/l)	112.2	122.4	91.8	252.45	130.05	114.75
11	Chloride (mg/l)	4.47	6.95	3.48	104.77	9.43	3.48
12	Fluoride (mg/l)	-	-	-	-	-	-
13	Boron (mg/l)	-	-	-	-	-	-
14	Phenol (mg/l)	-	-	-	-	-	-
15	Orthophosphate (mg/l)	0.196	0.27	0.104	18.02	0.47	ND<10
16	Total Phosphate (mg/l)	0.221	0.588	0.245	20.84	0.923	0.103
17	Ammonical - N (mg/l)	0.05	0.51	0.19	42	3	0.06
18	Nitrite -N (mg/l)	0.02	0.043	0.01	0.005	0.088	0.003
19	Nitrate -N (mg/l)	0.97	1.73	0.48	0.208	0.76	0.5
20	Total -N (TKN) (mg/l)	1.05	2.1	0.7	62.3	4.55	0.7
21	Dissolved Oxygen (mg/l)	8.53	8.4	9.76	0.94	8.61	12.01
22	BOD ₅ (mg/l)	3.3	12.4	3.02	261	5	2.06
23	COD (mg/l)	7	18	4	475	7.5	8.5
24	Sulphate (mg/l)	2.35	1.763	2.056	11.16	ND<1	3.23
25	Total Coliform (MPN Index/100ml)	93 x 10 ³	460 x 10 ³	1100 ⁺	1100 ⁺ x 10 ³	1100 ⁺ x 10 ²	5500
26	E. Coli (MPN Index/100ml)	93 x 10 ³	460 x 10 ³	1100 ⁺	1100 ⁺ x 10 ³	1100 ⁺ x 10 ²	2300
27	Total dissolved Solids (mg/l)	137	146	93	369	141	122
28	Calcium (mg/l)	34.87	37.67	26.85	32.46	36.07	38.07
29	Magnesium (mg/l)	5.35	5.35	3.65	10.7	5.35	3.16
30	Sodium (mg/l)	4.51	4.9	3	51	6.63	2.86
31	Potassium (mg/l)	1.42	2.04	0.65	16.06	3.55	0.81
32	Lead (mg/l)	-	-	-	-	-	-
33	Cadmium (mg/l)	-	-	-	-	-	-
34	Chromium (mg/l)	-	-	-	-	-	-
35	Copper (mg/l)	-	-	-	-	-	-
36	Zinc (mg/l)	-	-	-	-	-	-
37	Iron (mg/l)	0.41	0.65	0.43	4.3	1.26	0.57
38	Manganese (mg/l)	0.08	0.072	0.03	0.42	0.11	0.06
39	Aluminum (mg/l)	-	-	-	-	-	-
40	Mercury (mg/l)	-	-	-	-	-	-

Source: NESS Survey, 1999.

Table12 Water Quality Status of Balkhu/Nakhu/Tukucha/Kodku/Godavari Khoja, June 1999

S.N.	PARAMETERS	Ba2	Ba1	N1	T1	K1	G1
1.	Flow Rate (m ³ /sec)	0.017	1.5	0.12	0.22	0.13	0.1
2.	Velocity (m/sec)	0.16	0.81	0.27	0.64	0.043	0.31
3.	Temperature °C	31	30	30	29	26	27
4.	pH	7.7	7.02	8.1	7.2	7.2	7.75
5.	Conductivity (μ mhos/Cm)	420	780	299	1313	685	370
6.	Turbidity (NTU)	42.5	57.5	26.25	180	85	45
7.	Total Suspended Solids (mg/l)	82.58	80	36.13	248	99	65.5
8.	Color (Chromacity Unit)	0.9	2.3	0.78	4.83	2.85	0.95
9.	Total Hardness (mg/l)	168	229	131	156	180	185
10.	Total alkalinity (mg/l)	147.2	294.41	126.9	210.65	71.06	276
11.	Chloride (mg/l)	26.84	61.63	9.94	146.13	48.21	9.44
12.	Fluoride (mg/l)	-	-	-	-	-	-
13.	Boron (mg/l)	-	-	-	-	-	-
14.	Phenol (mg/l)	-	-	-	-	-	-
15.	Orthophosphate (mg/l)	0.31	3.27	0.33	23.5	3.98	0.23
16.	Total Phosphate (mg/l)	1.27	7.15	0.98	27.58	7.35	0.51
17.	Ammonical - N (mg/l)	0.06	16	0.12	49	23.5	0.18
18.	Nitrite -N (mg/l)	0.12	ND	0.071	0.056	ND	0.12
19.	Nitrate -N (mg/l)	1.56	0.3	1.26	1.8	0.26	0.34
20.	Total -N (TKN) (mg/l)	1.73	28.4	1.39	69.3	28.07	1.16
21.	Dissolved Oxygen (mg/l)	6.2	1.52	8.18	Nil	Nil	8.45
22.	BOD ₅ (mg/l)	8.4	69	4.4	379	66	5.7
23.	COD (mg/l)	50	240	40.5	430	120	46.7
24.	Sulphate (mg/l)	22.21	13.71	18.17	21.94	1.23	10.15
25.	Total Coliform (MPN Index/100ml)	1100+x50	1100+x10 ²	1100+ x 50	1100+x10 ³	1100+x10 ³	9 x 10 ³
26.	E. Coli (MPN Index/100ml)	1100+ x 50	1100+x10 ²	1100+ x 50	1100+x10 ³	1100+x10 ³	9 x 10 ³
27.	Total dissolved Solids (mg/l)	256	404.6	194	622	35.4	190
28.	Calcium (mg/l)	54	64.8	36.8	38	55.6	58
29.	Magnesium (mg/l)	8.02	16.53	9.5	14.8	9.97	9.72
30.	Sodium (mg/l)	15.25	38.4	7.15	117.2	31.2	6.5
31.	Potassium (mg/l)	4.3	13.77	2.8	36.54	12.57	2.15
32.	Lead (mg/l)	-	-	-	-	-	-
33.	Cadmium (mg/l)	-	-	-	-	-	-
34.	Chromium (mg/l)	-	-	-	-	-	-
35.	Copper (mg/l)	-	-	-	-	-	-
36.	Zinc (mg/l)	-	-	-	-	-	-
37.	Iron (mg/l)	ND(<0.1)	3.61	1.19	5.2	4.91	2.48
38.	Manganese (mg/l)	-	-	-	-	-	-
39.	Aluminum (mg/l)	-	-	-	-	-	-
40.	Mercury (mg/l)	-	-	-	-	-	-

Source: NESS Survey, 1999.

Table 13 Water Quality Status of Bagmati River System in Kathmandu Valley

River	Site No.	Location	NOV., 1999	June 1999	CEMAT Apr/May 1999 (4)	NSET1998 Oct., (2)	NSET1998 Feb. (2)	Dry Season '90-'93 (3)	Wet Season '90-'93 (3)	Dry '96/'97/'98 (5)	Wet '96/'97/'98 (5)	NESS May 1995 (6)
			WQI (1)	WQI (1)	WQI (4)	WQI (2)	WQI (2)	WQI (3)	WQI (3)	WQI (5)	WQI (5)	
Bagmati	B1	Sundarjal	4	4	-	-	-	3.5 (4)	3.6 (4)	-	-	-
	B2	Nayapati	4	5	4	-	-	-	-	-	-	-
	B3	Gokarna	4	6	15	-	-	3.6 (5)	4.4 (5)	9.4 (8)	4.0 (2)	-
	B4	Jopati Upstream Bridge	5	5	15	-	-	-	-	-	-	-
	B5	Jopati Down Stream, bridge	9	7	-	-	-	-	-	-	-	-
	B6	Gaurighat	14	11	18	-	-	8.4 (5)	5.4 (5)	>18.0 (16)	10.6 (12)	15
	B7	Pashupati Upstream Bridge	14	12	18	-	-	-	-	-	-	-
	B8	Minblawan Down stream Bridge	14	13	18	-	-	-	-	-	-	-
	B9	Upstream Confluence Manahara	16	18	18	-	-	-	-	-	-	-
	B10	Down stream. Confluence Manahara	10	-	18	-	-	-	-	-	-	-
	B11	Up stream Confluence Dhoobikhola	12	>18	18	-	-	-	-	-	-	-
	B12	Down Stream Confluence Dhoobikhola	16	>18	18	-	-	-	-	-	-	-
	B13	Up Stream Confluence with Bishnumati	18	>18	18	-	-	10.0 (5)	7.6 (5)	>18.0 (16)	13.9 (10)	-
	B14	Down Stream With Bishnumati	18	>18	18	-	-	14.0 (5)	10.6 (5)	>18.0 (10)	13.1 (10)	15
	B15	Sundarjalat	16	>18	18	-	-	12.2 (5)	8.2 (4)	-	-	-
	B16	Down Stream Naktou	11	>18	18	-	-	10.4 (5)	7.2 (4)	-	-	-
	B17	Khokana	11	>18	18	-	-	-	-	-	-	-
Hanumante	H4	Kharyang North Dhaktipur	14	13	18	-	-	-	-	-	-	-
	H3	Amiko Cross West Dhaktipur	14	14	18	18	-	-	-	-	-	-
	H2	Hanumante South Thimi	16	12	-	-	-	-	-	-	-	-
	H1	Up Stream Confluence with Manuhara	9	14	-	-	-	12.0 (1)	5.0 (2)	-	-	-
Godavari	G1	Up Stream Before Confluence Hanumante	4	4	-	-	-	-	-	-	-	-
	M1	Manuhara, Saraukok	3	5	15	-	-	-	-	-	-	-
	M2	Manuhara, Changu Narayan	4	5	-	-	-	-	-	-	-	-
	M3	Up Stream Before Confluence Hanumante	7	8	-	-	-	-	-	-	-	-
	M4	Down Stream After Confluence Hanumante	5	12	-	-	-	8.0 (5)	5.1 (7)	-	-	15
Kodku	M5	Up Stream Before Confluence Bagmati	10	14	11	-	-	-	-	-	-	-
	K1	Up Stream Before Confluence Mano	8	>18	-	-	-	-	-	-	-	-
	D3	Dhoobikhola, Lasuntar	5	10	-	-	-	-	-	-	-	-
Dhoobikhola	D2	Dhoobikhola, Hadigam	16	13	-	-	-	12.8 (5)	10.4 (5)	-	-	-
	D1	Up Stream Before Confluence Bagmati	18	>18	-	-	-	-	-	-	-	-
	T1	Takucha, Before Confluence Bagmati	18	>18	-	-	-	15.0 (1)	14.5 (2)	-	-	-
	B15	Bishnumati, East of Tokka	4	12	18	-	-	-	-	-	-	-
Tukucha	B14	North of Ringroad Balaju	6	11	18	-	-	-	-	-	-	-
	B13	Naya Bazar South of Bridge	14	11	13	-	-	-	-	-	-	-
	B12	Kalimati Bridge	18	>18	18	-	-	13.6 (5)	10.8 (5)	-	-	-
	B11	Up Stream before Confluence Bagmati	18	>18	18	-	-	-	-	-	-	-
Baikhu	Ba2	Baikhu Khola South Kalanki	5	6	-	-	-	-	-	-	-	-
	Ba1	Up Stream Before Confluence Bagmati	8	>18	-	-	-	-	-	-	-	-
	N1	Naktou Khola Before Bagmati	4	4	7	-	-	6.0 (1)	4.0 (2)	-	-	-

(1) NESS, derived from the present result (Annex 2); (2) Stanley report, derived from the result of Pradhananga, Karnacharya and BBWMSIP; (3) NESS 1997/98 derived from the results of Bagmati River monitoring result; (4) CEMAT, derived from surface water analysis monitoring results; (5) NESS data, 1995;(2) NSET, Mudyapur Thimi Environmental Mapping, 1998; The figure in brackets after WQI denotes the number of determination.

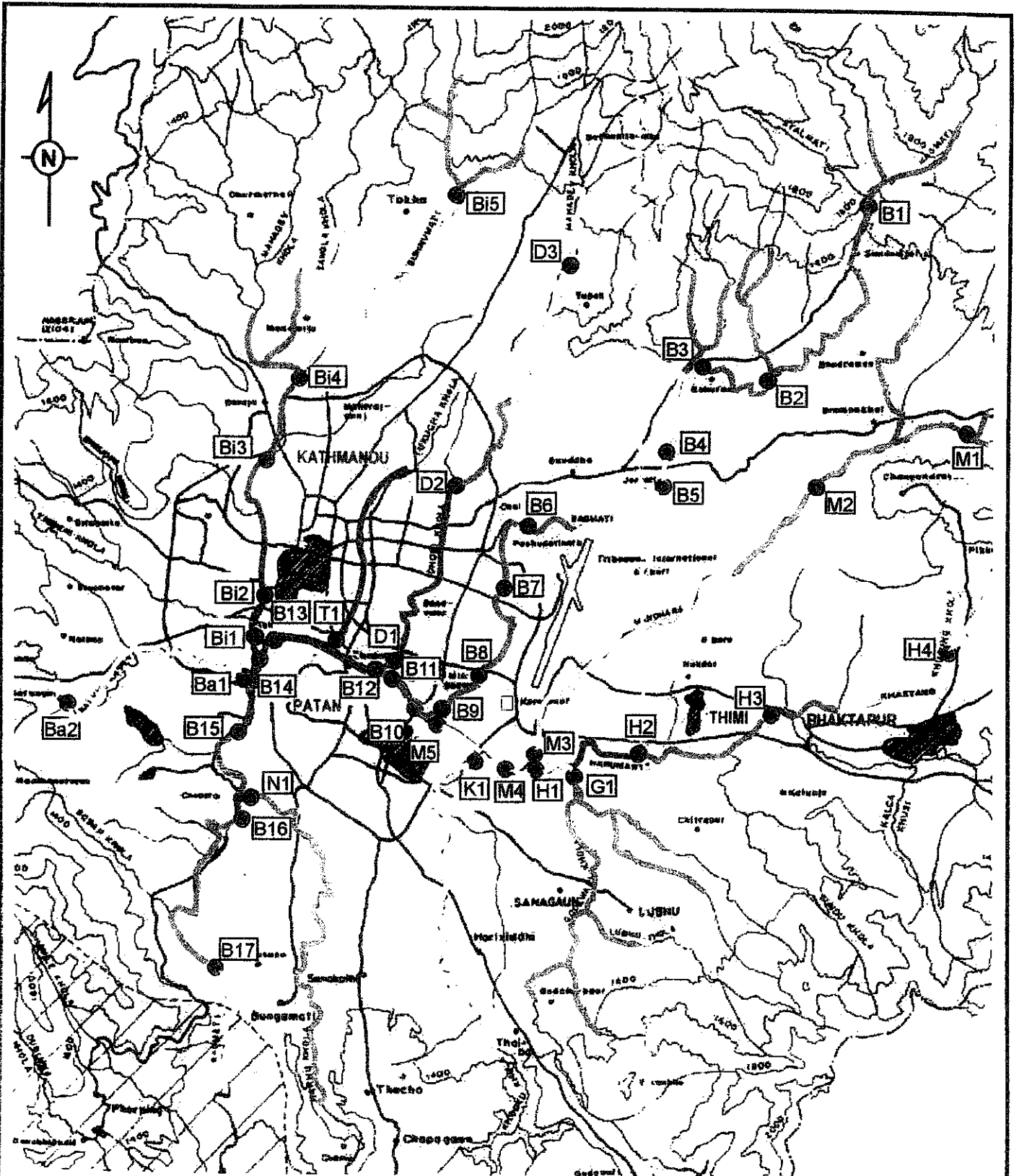


Figure 1 Water Quality of Kathmandu Valley System in November 1999

LEGENDS:

Water Quality Index (WQI)	Water Quality	Color Code
3.0 to 4.5	Excellent	
4.6 to 7.5	Good	
7.6 to 10.5	Fair	
10.6 to 13.5	Bad	
13.6 to 15.0	Very Bad	

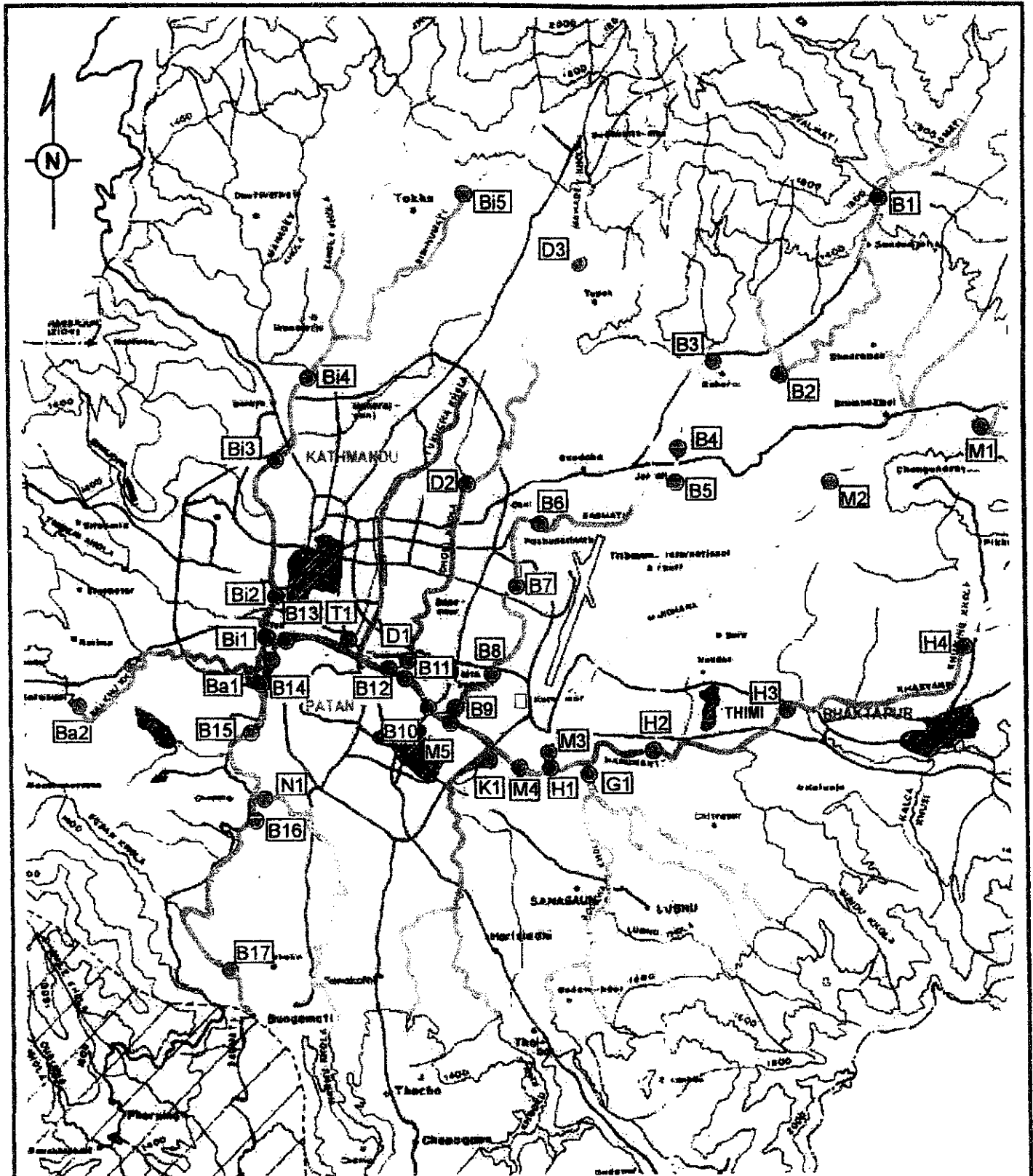


Figure 2 Water Quality of Kathmandu Valley System in June 1999 (Onset of Monsoon)

LEGENDS:

Water Quality Index (WQI)	Water Quality	Color Code
3.0 to 4.5	Excellent	
4.6 to 7.5	Good	
7.6 to 10.5	Fair	
10.6 to 13.5	Bad	
13.6 to 15.0	Very Bad	

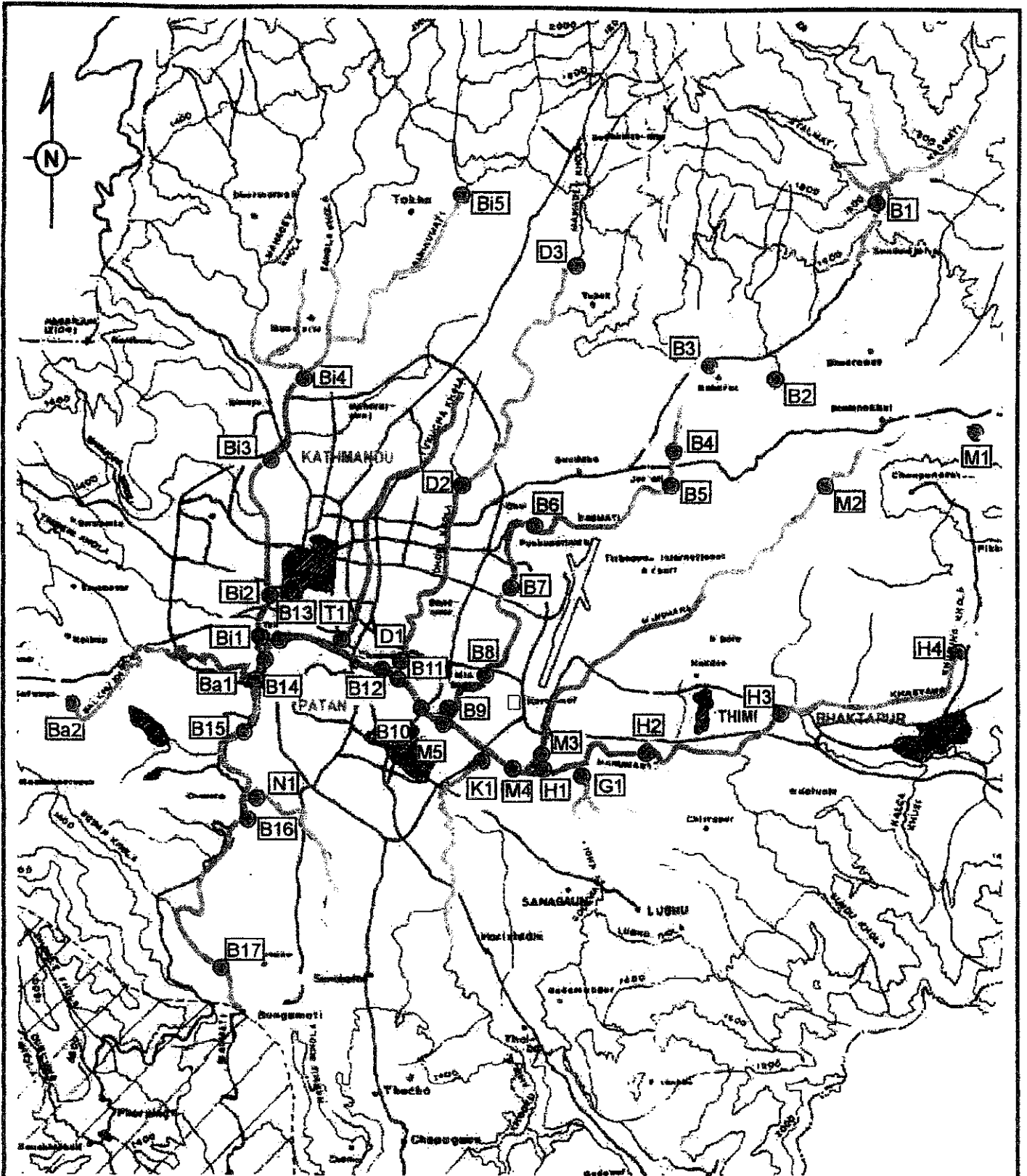

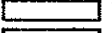





Figure 3 Water Quality of Kathmandu Valley System in Dry Season of 1996, 1997 and 1998

LEGENDS:

Water Quality Index (WQI)	Water Quality	Color Code
3.0 to 4.5	Excellent	
4.6 to 7.5	Good	
7.6 to 10.5	Fair	
10.6 to 13.5	Bad	
13.6 to 15.0	Very Bad	

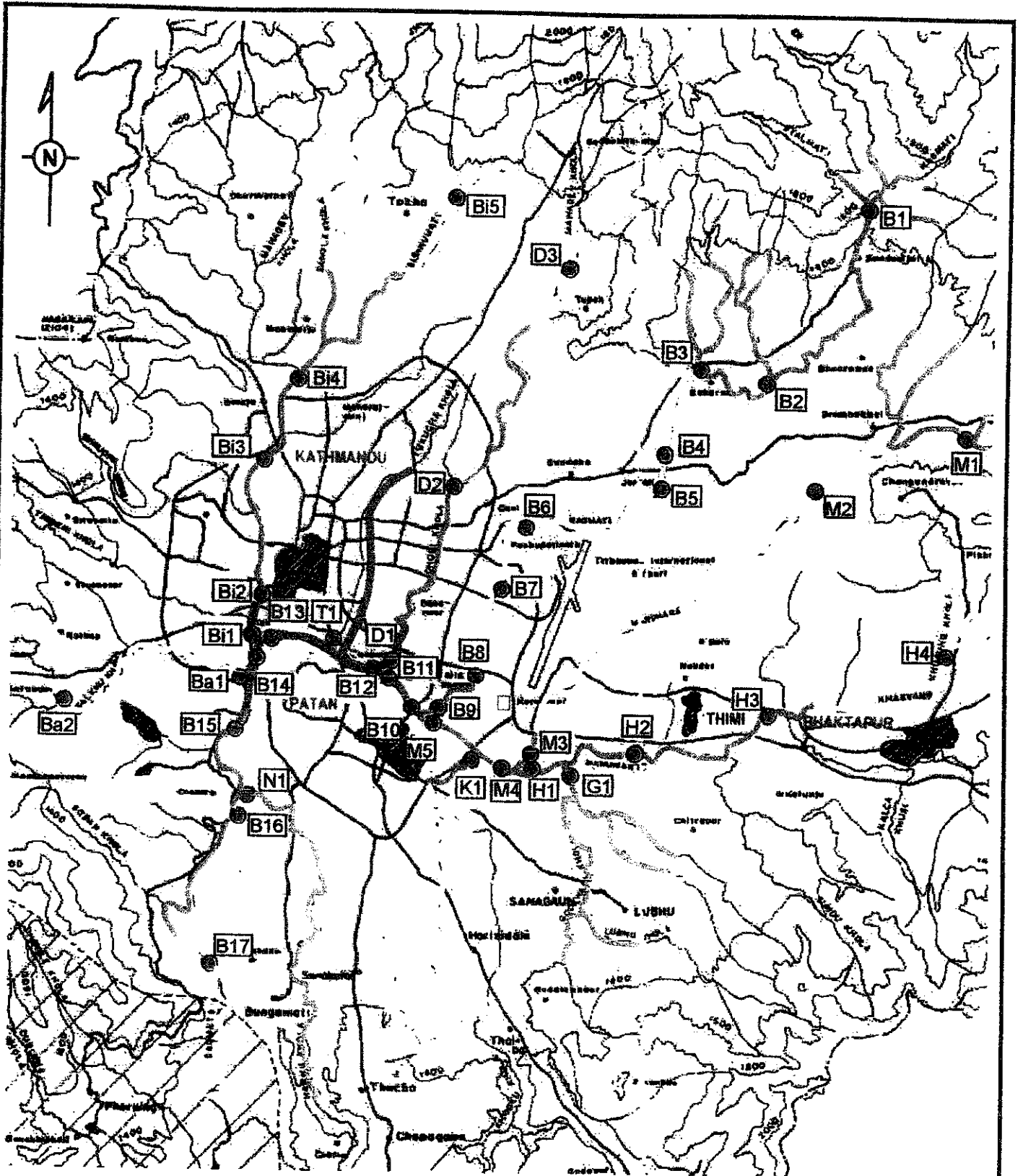

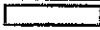
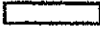




Figure 4 Water Quality of Kathmandu Valley System in Wet Season of 1996, 1997 and 1998

LEGENDS:

Water Quality Index (WQI)	Water Quality	Color Code
3.0 to 4.5	Excellent	
4.6 to 7.5	Good	
7.6 to 10.5	Fair	
10.6 to 13.5	Bad	
13.6 to 15.0	Very Bad	

付録 A. 2 NWSC による水質分析結果

(1) 化学分析

- Mahankal Chaur 浄水場
- Bansbari 浄水場
- Manohara 浅井戸
- Bode 配水池
- Balkhu 川
- Manohara 浅井戸
- Bode 配水池
- Bode No 2 井戸
- Lokanthale 浄水場
- Sainbu 水源、配水地

(2) 生物学的分析

- Balkhu 川 (2ヶ所)
- Manohara 川、浅井戸
- Lokanthale 浄水

(3) マノハラ川浅井戸及び Bode 深井戸

(4) カトマンズ盆地 NWSC 水道システムの給水栓での水質分析結果

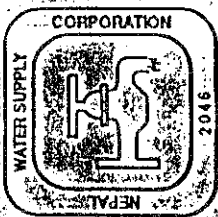
NEPAL WATER SUPPLY CORPORATION

Research And Quality Control Section

CENTRAL LABORATORY, KIRTIPUR

Chemical & Bacteriological

Year: _____
Month: _____



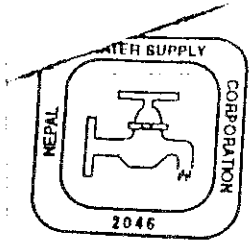
Water Quality Analysis Report

S. No.	Date of Sampling	Location of Sampling	Chemical Analysis (Results As mg/l.)										Bacteriological Analysis Results As MPN/100 ml.		Remarks	Any other Parameters	
			Appearance Turbidity (NTU)	Colour O Hazen	pH	Total Alkalinity	Total Iron	Total Ammonia	Chloride	Residual Chlorine (mg/l)		Coliforms	Faecal Coliforms				
										Free	Total						
1	05/11/13	W.T.P.	clear/5	5	6.8	111.10	2.2	10.0	9.6								
		Mahankalokar															
		Raw water															
		(MH+GK)															
2	05/11/13	Do. S. Res	clear/5	5	7.2	84.84	1.6	1.04	7.68								
3	05/11/13	Do. S. Res	clear/5	5	7.3	34.34	0.3	0.02	7.68								
4	05/11/14	W.T.P.	clear/10	10	6.5	101.0	3.0	5.6	9.6								
		Mahankalokar															
		Boring before B-2.															
5	05/11/13	Do. S. Res	clear/5	5	7.1	52.52	0.01	0.02	5.76								
6																	
7																	

Checked by _____

Prepared by _____

Chief _____
Central Laboratory
Date _____



NEPAL WATER SUPPLY CORPORATION
 (Research and Quality Control Section)
CENTRAL LABORATORY
Kirtipur.

Report on Chemical Analysis of Water

Name and Address of Sender..... N.W.S.C
 Source of Sample..... Treated water
 Location of Sample..... Mahankalchaur
 Date and Time of Sample Collection..... 05.10.10
 Date of Receipt.....
 Date of Analysis.....
 Lab No..... 660 M

Parameters	Unit	Result	Normal Level
1. Appearance	—	<u>clear</u>	—
2. Turbidity	NTU	<u>5</u>	(5 — 25)
3. Colour	°Hazen	<u>5</u>	(5 — 50)
4. Temperature	°C	<u>13</u>	—
5. pH	—	<u>7.2</u>	(6.5 — 9.2)
6. Electrical Conductivity	uS/mS/cm	<u>34.0</u>	(400—1250)
7. Total Alkalinity	as CaCO ₃	<u>12.12</u>	—
8. P.P.H. Alkalinity	as CaCO ₃	<u>NIL</u>	—
9. PH 4.5 Alkalinity	as CaCO ₃	<u>12.12</u>	—
10. Total Hardness	as CaCO ₃	<u>10.10</u>	(100—500)
11. Calcium Hardness	as CaCO ₃	/	—
12. Magnesium Hardness	as CaCO ₃	/	—
13. Calcium	as Ca.	/	(75 — 200)
14. Magnesium	as Mg.	/	(<30—150)
15. Total Iron	as Fe.	<u>0.10</u>	(0.1 — 1)
16. Manganese	as Mn.	/	(0.05—0.5)
17. Silica	as SiO ₂	/	—
18. Total Ammonia	as N.	<u>0.02</u>	(0.05— 1.5)
19. Nitrite	as N.	/	—
20. Nitrate	as N.	/	(up to 10)
21. Orthophosphate	as P	/	—
22. Chloride	as Cl.	<u>5.76</u>	(up to 250)

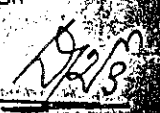
Comments :

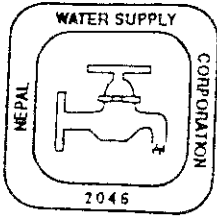
Remarks : This report is based on the sample submitted to this Laboratory.

Notes : The above values are expressed as mg/L, unless otherwise specified and except PH

Prepared by S. N. S. S.

Date :


 Chief
 (Central Laboratory)
 Date: 05/10/10
CHIEF



NEPAL WATER SUPPLY CORPORATION
 (Research and Quality Control Section)
CENTRAL LABORATORY
 Kirtipur.

Report on Chemical Analysis of Water

Name and Address of Sender..... W. T. P. BANSBARI
 Source of Sample..... BIO-RAW IN-PUT
 Location of Sample..... BANSBARI
 Date and Time of Sample Collection..... 2056/11/18
 Date of Receipt..... "
 Date of Analysis..... "
 Lab No..... 762

Parameters	Unit	Result	Normal Level
1. Appearance	—	<u>Clear</u>	—
2. Turbidity	NTU	<u>10</u>	(5 — 25)
3. Colour	°Hazen	<u>2.5</u>	(5 — 50)
4. Temperature	°C	<u>16</u>	—
5. pH	—	<u>6.7</u>	(6.5 — 9.2)
6. Electrical Conductivity	µS /mS/ cm	<u>160.0</u>	(400—1250)
7. Total Alkalinity	as CaCO ₃	<u>80.80</u>	—
8. P.P.H. Alkalinity	as CaCO ₃	<u>Nil</u>	—
9. PH 4.5 Alkalinity	as CaCO ₃	<u>80.80</u>	—
10. Total Hardness	as CaCO ₃	<u>50.50</u>	(100 — 500)
11. Calcium Hardness	as CaCO ₃	<u>30.30</u>	—
12. Magnesium Hardness	as CaCO ₃	<u>20.20</u>	—
13. Calcium	as Ca.	<u>12.13</u>	(75 — 200)
14. Magnesium	as Mg.	<u>4.90</u>	(<30—150)
15. Total Iron	as Fe.	<u>1.5</u>	(0.1 — 1)
16. Manganese	as Mn.	<u>/</u>	(0.05—0.5)
17. Silica	as SiO ₂	<u>/</u>	—
18. Total Ammonia	as N.	<u>2.8</u>	(0.05— 1.5)
19. Nitrite	as N.	<u>/</u>	—
20. Nitrate	as N.	<u>/</u>	(up to 10)
21. Orthophosphate	as P	<u>/</u>	—
22. Chloride	as Cl.	<u>9.6</u>	(up to 250)

Comments :

Remarks : This report is based on the sample submitted to this Laboratory.

Notes : The above values are expressed as mg/L, unless otherwise specified, and except PH

Prepared by

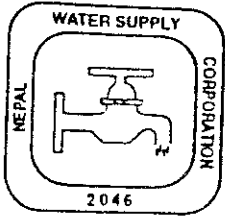
Date

[Handwritten Signature]

[Handwritten Signature]
 Microbiologist

Chief
 (Central Laboratory)

Date



NEPAL WATER SUPPLY CORPORATION
 (Research and Quality Control Section)
CENTRAL LABORATORY

Kirtipur.

Report on Chemical Analysis of Water

Name and Address of Sender..... W. T. P. BANSBARI
 Source of Sample..... BIO-RAW OUT-PUT
 Location of Sample..... BANSBARI
 Date and Time of Sample Collection..... 2056/11/18
 Date of Receipt..... 32
 Date of Analysis..... 32
 Lab No..... 763

Parameters	Unit	Result	Normal Level
1. Appearance	—	<u>clear</u>	—
2. Turbidity	NTU	<u>5</u>	(5 — 25)
3. Colour	°Hazen	<u>5</u>	(5 — 50)
4. Temperature	°C	<u>16</u>	—
5. pH	—	<u>6.9</u>	(6.5 — 9.2)
6. Electrical Conductivity	µS/cm	<u>168.0</u>	(400 — 1250)
7. Total Alkalinity	as CaCO ₃	<u>82.82</u>	—
8. P.P.H. Alkalinity	as CaCO ₃	<u>Nil</u>	—
9. pH 4.5 Alkalinity	as CaCO ₃	<u>82.82</u>	—
10. Total Hardness	as CaCO ₃	<u>54.54</u>	(100 — 500)
11. Calcium Hardness	as CaCO ₃	<u>50.30</u>	—
12. Magnesium Hardness	as CaCO ₃	<u>24.24</u>	—
13. Calcium	as Ca	<u>12.13</u>	(75 — 200)
14. Magnesium	as Mg	<u>5.88</u>	(<30 — 150)
15. Total Iron	as Fe	<u>1.0</u>	(0.1 — 1)
16. Manganese	as Mn	<u>/</u>	(0.05 — 0.5)
17. Silica	as SiO ₂	<u>/</u>	—
18. Total Ammonia	as N	<u>0.56</u>	(0.05 — 1.5)
19. Nitrite	as N	<u>/</u>	—
20. Nitrate	as N	<u>/</u>	(up to 10)
21. Orthophosphate	as P	<u>/</u>	—
22. Chloride	as Cl	<u>9.6</u>	(up to 250)

Comments :

Remarks : This report is based on the sample submitted to this Laboratory.

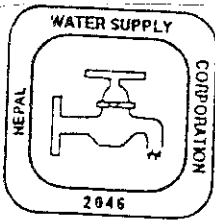
Notes : The above values are expressed as mg/l, unless otherwise specified and except pH

Prepared by

Date

Chief
 (Central Laboratory)

Date



NEPAL WATER SUPPLY CORPORATION
 (Research and Quality Control Section)
CENTRAL LABORATORY
Kirtipur.

Report on Chemical Analysis of Water

Name and Address of Sender..... W.T.P. SANSBARI
 Source of Sample..... SURFACE RAW WATER
 Location of Sample..... SANSBARI
 Date and Time of Sample Collection..... 2056/11/13
 Date of Receipt..... "
 Date of Analysis..... "
 Lab No..... 764

Parameters	Unit	Result	Normal Level
1. Appearance	—	<u>Clear</u>	—
2. Turbidity	NTU	<u>5</u>	(5 — 25)
3. Colour	°Hazen	<u>5</u>	(5 — 50)
4. Temperature	°C	<u>16</u>	—
5. pH	—	<u>6.8</u>	(6.5 — 9.2)
6. Electrical Conductivity	µS/mS/ cm	<u>450</u>	(400—1250)
7. Total Alkalinity	as CaCO ₃	<u>24.24</u>	—
8. P.P.H. Alkalinity	as CaCO ₃	<u>Nil</u>	—
9. PH 4.5 Alkalinity	as CaCO ₃	<u>24.24</u>	—
10. Total Hardness	as CaCO ₃	<u>20.20</u>	(100 — 500)
11. Calcium Hardness	as CaCO ₃	<u>10.10</u>	—
12. Magnesium Hardness	as CaCO ₃	<u>10.10</u>	—
13. Calcium	as Ca.	<u>4.04</u>	(75 — 200)
14. Magnesium	as Mg.	<u>2.55</u>	(<30—150)
15. Total Iron	as Fe.	<u>0.01</u>	(0.1 — 1)
16. Manganese	as Mn.	<u>/</u>	(0.05—0.5)
17. Silica	as SiO ₂	<u>/</u>	—
18. Total Ammonia	as N.	<u>0.02</u>	(0.05— 1.5)
19. Nitrite	as N.	<u>/</u>	—
20. Nitrate	as N.	<u>/</u>	(up to 10)
21. Orthophosphate	as P	<u>/</u>	—
22. Chloride	as Cl.	<u>9.6</u>	(up to 250)

Comments :

Remarks : This report is based on the sample submitted to this Laboratory.

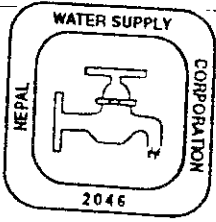
Notes : The above values are expressed as mg/l, unless otherwise specified and except PH.

Prepared by

[Handwritten Signature]

Date :

Chief
 (Central Laboratory)
[Handwritten Signature]
 Microbiologist



NEPAL WATER SUPPLY CORPORATION
 (Research and Quality Control Section)
CENTRAL LABORATORY

Kirtipur.

Report on Chemical Analysis of Water

Name and Address of Sender..... W. T. P. BANSBARI
 Source of Sample..... SETTLED WATER
 Location of Sample..... BANSBARI
 Date and Time of Sample Collection..... 2056/11/18
 Date of Receipt..... "
 Date of Analysis..... "
 Lab No..... 765

Parameters	Unit	Result	Normal Level
1. Appearance	—	<u>clear</u>	—
2. Turbidity	NTU	<u>45</u>	(5 — 25)
3. Colour	°Hazen	<u>45</u>	(5 — 50)
4. Temperature	°C	<u>16</u>	—
5. pH	—	<u>6.9</u>	(6.5 — 9.2)
6. Electrical Conductivity	✓ $\mu\text{S/mS/cm}$	<u>73.0</u>	(400—1250)
7. Total Alkalinity	as CaCO_3	<u>34.34</u>	—
8. P.P.H. Alkalinity	as CaCO_3	<u>Nil</u>	—
9. P ^H 4.5 Alkalinity	as CaCO_3	<u>34.34</u>	—
10. Total Hardness	as CaCO_3	<u>40.40</u>	(100—500)
11. Calcium Hardness	as CaCO_3	<u>20.20</u>	—
12. Magnesium Hardness	as CaCO_3	<u>20.20</u>	—
13. Calcium	as Ca.	<u>8.08</u>	(75 — 200)
14. Magnesium	as Mg.	<u>4.90</u>	(<30—150)
15. Total Iron	as Fe.	<u>0.01</u>	(0.1 — 1)
16. Manganese	as Mn.	<u>/</u>	(0.05—0.5)
17. Silica	as SiO_2	<u>/</u>	—
18. Total Ammonia	as N.	<u>0.02</u>	(0.05—1.5)
19. Nitrite	as N.	<u>/</u>	—
20. Nitrate	as N.	<u>/</u>	(up to 10)
21. Orthophosphate	as P	<u>/</u>	—
22. Chloride	as Cl.	<u>7.68</u>	(up to 250)

Comments :

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Prepared by

Date

Chief
(Central Laboratory)

Date

Microbiologist