

CHAPTER 2

**Water Pollution Control Master Plan
for
the Upper Manyame River Basin**

SECTION 3 ENVIRONMENTAL MANAGEMENT AND WATER POLLUTION STATUS

3.5 Water Pollution Status in the Study Area

Table 3.5.1 Guideline for Safe Sampling in Zimbabwe

1. Take care when sampling from:
 - fast-flowing rivers
 - deep lakes
 - contaminated water
2. Avoid direct skin contact with the water:
 - wear a plastic gauntlet which covers the hand and lower arm
 - wear long plastic boots
 - wipe outside of bottle or sampler with cloth soaked in disinfectant
3. When sampling simultaneously for microbiological and chemical analyses, the microbiological sample should be taken first as this will reduce the risk of contamination being introduced at the sampling point.
4. Hold sampling bottle by the lower part and submerge it to about 30cm or to mid-depth.
 - In streams, stand facing upstream with bottle in front of you. Never sample close to the bank.
 - When sampling from a bridge, attach a weight to the bottle and lower it with a string.
5. Proper labeling of samples is essential; labels should be water proof and include.
 - time, date and location; sampler's name; any preservative added; and type of analysis required.

Table 3.5.2 Summary of Water Quality Data of Upper Manyame River Basin by CHDW (Year 1995)

Public Water Bodies	Sample Point	Season	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L
Manyame River	Upstream	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	7.17	130.0	130.0	50.0	0.09	4.48	#DIV/0!	#DIV/0!
		Rain	Ave.	-	6.55	14.4	0.140	#DIV/0!	0.007	7.17	130.0	130.0	50.0	0.09	4.48	#DIV/0!	#DIV/0!
		Total	Ave.	-	6.55	14.4	0.140	#DIV/0!	0.007	7.17	130.0	130.0	50.0	0.09	4.48	#DIV/0!	#DIV/0!
	Below Seko Dam	Dry	Ave.	-	1.60	39.0	0.170	#DIV/0!	0.012	6.76	130.0	300.0	110.0	0.51	1.65	4.27	0.77
		Rain	Ave.	-	12.90	17.0	3.000	#DIV/0!	0.020	6.59	140.0	300.0	100.0	0.35	3.30	3.54	0.90
		Total	Ave.	-	7.25	28.0	1.585	#DIV/0!	0.016	6.68	135.0	300.0	105.0	0.43	2.48	3.90	0.83
	Newroad Bridge	Dry	Ave.	-	1.60	35.0	0.080	0.003	0.029	6.93	80.0	572.5	97.5	1.21	5.94	0.51	0.33
		Rain	Ave.	-	3.55	30.0	0.250	#DIV/0!	0.021	6.71	390.0	300.0	70.0	0.35	7.53	0.48	0.09
		Total	Ave.	-	2.25	33.3	0.123	0.003	0.026	6.85	183.3	481.7	88.3	0.93	6.47	0.50	0.24
Skyline Bridge	Dry	Ave.	-	4.20	75.0	0.648	0.112	0.067	6.89	127.5	367.5	66.0	2.24	4.39	0.15	0.04	
	Rain	Ave.	-	6.20	19.0	0.200	0.015	0.021	8.07	70.0	200.0	50.0	0.34	1.75	0.95	0.04	
	Total	Ave.	-	4.60	63.8	0.558	0.093	0.057	7.13	116.0	334.0	62.8	1.86	3.86	0.35	0.04	
Below Lake Chivero	Dry	Ave.	-	3.90	101.0	#DIV/0!	0.004	0.013	7.04	110.0	710.0	144.0	0.33	5.13	0.18	0.23	
	Rain	Ave.	-	18.60	87.0	#DIV/0!	0.005	0.005	7.49	150.0	840.0	156.0	#DIV/0!	3.85	4.47	0.72	
	Total	Ave.	-	8.80	96.3	#DIV/0!	0.004	0.010	7.19	123.3	753.3	148.0	0.33	4.70	1.61	0.39	
Musitwi River	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Rain	Ave.	-	6.25	15.4	0.180	#DIV/0!	0.017	7.26	135.0	202.5	45.0	0.37	5.88	#DIV/0!	#DIV/0!	
	Total	Ave.	-	6.25	15.4	0.180	#DIV/0!	0.017	7.26	135.0	202.5	45.0	0.37	5.88	#DIV/0!	#DIV/0!	
Rowa River	Dry	Ave.	-	14.30	79.4	4.325	0.552	0.047	7.39	130.0	545.0	85.0	1.63	6.18	#DIV/0!	#DIV/0!	
	Rain	Ave.	-	14.30	79.4	4.325	0.552	0.047	7.39	130.0	545.0	85.0	1.63	6.18	#DIV/0!	#DIV/0!	
	Total	Ave.	-	14.30	79.4	4.325	0.552	0.047	7.39	130.0	545.0	85.0	1.63	6.18	#DIV/0!	#DIV/0!	
Nyatsime River	Dry	Ave.	-	1.73	50.5	0.100	0.027	0.070	6.97	145.0	582.5	153.0	2.00	7.81	0.25	0.10	
	Rain	Ave.	-	8.50	77.5	0.270	0.028	0.018	7.10	210.0	750.0	125.0	0.15	4.20	0.41	0.06	
	Total	Ave.	-	3.98	59.5	0.168	0.027	0.052	7.01	166.7	638.3	143.7	1.39	6.61	0.31	0.09	
Below Works	Dry	Ave.	-	24.06	106.0	73.000	0.609	0.853	7.02	415.5	920.0	133.3	8.21	0.20	0.85	0.08	
	Rain	Ave.	-	13.80	90.0	32.350	0.390	0.069	6.97	315.0	930.0	145.0	5.10	#DIV/0!	0.95	0.10	
	Total	Ave.	-	20.64	100.7	59.450	0.536	0.461	7.00	382.0	923.3	137.2	7.17	0.20	0.89	0.09	

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.2 Summary of Water Quality Data of Upper Manyame River Basin by CHDW (Year 1995) (cont'd)

Public Water Bodies	Sample Point	Season	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L	
Makarwisi River	Mutare RD	Dry	Ave.	-	26.50	19.0	0.340	#DIV/0!	0.006	6.48	140.0	290.0	95.0	0.04	0.75	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	4.90	361.0	0.120	#DIV/0!	0.016	6.63	30.0	130.0	50.0	0.20	4.35	#DIV/0!	#DIV/0!	
		Total	Ave.	-	15.70	190.0	0.230	#DIV/0!	0.011	6.56	85.0	210.0	72.5	0.12	2.55	#DIV/0!	#DIV/0!	
	L. Kariba	Dry	Ave.	-	4.80	261.0	0.650	0.128	#DIV/0!	0.027	6.22	60.0	1000.0	1000.0	0.21	5.50	#DIV/0!	#DIV/0!
		Rain	Ave.	-	3.60	45.0	11.500	0.005	0.027	4.43	#DIV/0!	1860.0	830.0	2.20	6.95	#DIV/0!	#DIV/0!	
		Total	Ave.	-	4.20	153.0	6.075	0.067	0.027	5.33	60.0	1430.0	915.0	1.21	6.23	#DIV/0!	#DIV/0!	
	Msasa RD	Dry	Ave.	-	16.87	83.0	2.833	0.035	0.076	6.78	113.3	836.7	842.0	1.70	0.45	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	6.60	37.0	13.000	0.006	0.009	5.48	20.0	1950.0	260.0	4.84	#DIV/0!	#DIV/0!	#DIV/0!	
		Total	Ave.	-	14.30	71.5	5.375	0.028	0.053	6.45	90.0	1115.0	696.5	2.49	0.45	#DIV/0!	#DIV/0!	
	Widd RD	Dry	Ave.	-	9.17	63.0	0.213	0.008	0.014	6.89	120.0	1200.0	473.3	0.16	3.60	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	3.70	37.0	#DIV/0!	#DIV/0!	0.015	6.16	10.0	700.0	240.0	0.24	3.95	#DIV/0!	#DIV/0!	
		Total	Ave.	-	7.80	56.5	0.213	0.008	0.015	6.71	92.5	1075.0	415.0	0.19	3.78	#DIV/0!	#DIV/0!	
	Hartfield RD	Dry	Ave.	-	3.10	81.0	0.507	0.077	0.041	7.10	146.7	810.0	459.0	0.17	1.13	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	4.80	51.0	0.297	0.008	0.020	6.56	123.3	540.0	260.0	0.96	3.23	#DIV/0!	#DIV/0!	
		Total	Ave.	-	3.95	66.0	0.402	0.049	0.028	6.83	135.0	675.0	359.5	0.56	2.18	#DIV/0!	#DIV/0!	
	Cripps RD	Dry	Ave.	-	2.50	77.3	0.403	0.146	0.002	7.20	196.7	790.0	443.3	0.76	2.50	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	3.60	67.7	0.703	0.074	0.048	6.85	130.0	720.0	295.0	0.29	2.63	#DIV/0!	#DIV/0!	
		Total	Ave.	-	3.05	72.5	0.553	0.110	0.036	7.03	163.3	753.0	369.2	0.52	2.57	#DIV/0!	#DIV/0!	
	Boshoff RD	Dry	Ave.	-	2.80	81.0	0.395	0.099	0.034	7.34	190.0	813.3	445.3	0.15	3.22	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	4.43	65.0	0.277	0.084	0.018	6.94	136.7	666.7	291.7	0.58	2.73	#DIV/0!	#DIV/0!	
		Total	Ave.	-	3.62	73.0	0.324	0.093	0.026	7.14	163.3	740.0	368.5	0.35	2.98	#DIV/0!	#DIV/0!	
	Beatrice RD	Dry	Ave.	-	4.47	80.3	0.125	0.019	0.019	7.40	166.7	793.3	459.3	0.28	5.15	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	5.73	69.7	0.270	0.070	0.048	7.12	113.3	613.3	296.7	0.47	4.63	#DIV/0!	#DIV/0!	
		Total	Ave.	-	5.10	75.0	0.173	0.049	0.034	7.26	140.0	703.3	368.0	0.38	4.84	#DIV/0!	#DIV/0!	
Amalinda	Dry	Ave.	-	4.50	85.0	1.100	0.031	0.009	7.32	173.3	813.3	444.0	0.40	3.12	#DIV/0!	#DIV/0!		
	Rain	Ave.	-	4.60	67.7	0.170	0.056	0.017	7.05	123.3	716.7	286.7	0.60	3.67	#DIV/0!	#DIV/0!		
	Total	Ave.	-	4.55	76.3	0.480	0.047	0.013	7.18	148.3	765.0	365.3	0.50	3.39	#DIV/0!	#DIV/0!		
At Manyame	Dry	Ave.	-	10.45	129.0	7.900	0.980	0.004	7.40	285.0	1115.0	635.0	0.71	4.70	#DIV/0!	#DIV/0!		
	Rain	Ave.	-	10.70	149.0	6.400	0.250	0.015	7.48	270.0	1250.0	430.0	1.65	3.80	#DIV/0!	#DIV/0!		
	Total	Ave.	-	10.53	135.7	7.400	0.615	0.010	7.42	280.0	1160.0	566.7	1.02	4.25	#DIV/0!	#DIV/0!		

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.2 Summary of Water Quality Data of Upper Manyame River Basin by CHDW (Year 1995) (cont'd)

Public Water Bodies	Sample Point	Season	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L	
Marimba River	Bulawayo RD	Dry	Ave.	-	7.07	81.7	0.200	0.023	0.029	7.25	140.0	666.7	186.7	0.23	6.12	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	3.10	98.0	#DIV/0!	0.007	0.009	7.24	170.0	830.0	200.0	0.25	5.63	#DIV/0!	#DIV/0!	
		Total	Ave.	-	5.48	88.2	0.200	0.015	0.022	7.25	152.0	732.0	192.0	0.24	5.92	#DIV/0!	#DIV/0!	
	Westwood RD	Dry	Ave.	-	6.20	103.0	0.315	#DIV/0!	0.012	0.012	7.17	236.7	886.7	253.3	0.90	4.38	#DIV/0!	#DIV/0!
		Rain	Ave.	-	6.60	110.0	0.285	0.012	0.014	7.09	225.0	1020.0	240.0	2.70	5.00	#DIV/0!	#DIV/0!	
		Total	Ave.	-	6.36	105.8	0.300	0.012	0.013	7.14	232.0	940.0	248.0	1.62	4.54	#DIV/0!	#DIV/0!	
	Kambuzuma RD	Dry	Ave.	-	3.67	96.3	0.860	0.030	0.011	7.30	220.0	848.3	210.0	1.17	4.94	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	4.65	105.0	0.975	0.016	0.015	7.22	192.5	940.0	205.0	0.55	4.00	#DIV/0!	#DIV/0!	
		Total	Ave.	-	4.06	99.8	0.937	0.020	0.012	7.27	209.0	885.0	208.0	0.92	4.56	#DIV/0!	#DIV/0!	
	Above Crow.	Dry	Ave.	-	5.43	117.0	0.260	0.036	0.047	7.46	220.0	950.0	210.0	0.95	5.20	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	8.75	112.0	#DIV/0!	0.008	0.014	7.36	220.0	950.0	247.5	0.53	3.78	#DIV/0!	#DIV/0!	
		Total	Ave.	-	6.76	115.0	0.260	0.022	0.034	7.42	220.0	950.0	225.0	0.78	4.63	#DIV/0!	#DIV/0!	
	Below Crow.	Dry	Ave.	-	5.83	143.0	0.490	0.033	0.046	7.54	266.7	1096.7	200.0	0.71	6.27	#DIV/0!	#DIV/0!	
		Rain	Ave.	-	9.50	151.0	0.190	0.024	0.018	7.59	230.0	1205.0	215.0	0.52	5.33	#DIV/0!	#DIV/0!	
		Total	Ave.	-	7.30	146.2	0.415	0.030	0.035	7.56	252.0	1140.0	206.0	0.64	5.89	#DIV/0!	#DIV/0!	
	At Lake	Dry	Ave.	-	2.60	117.0	#DIV/0!	#DIV/0!	0.020	0.020	7.64	370.0	1010.0	230.0	0.41	6.50	#DIV/0!	#DIV/0!
		Rain	Ave.	-	6.75	161.0	0.290	0.030	0.015	7.61	255.0	1252.5	215.0	0.82	5.75	#DIV/0!	#DIV/0!	
		Total	Ave.	-	5.37	146.3	0.290	0.030	0.017	7.62	293.3	1171.7	220.0	0.68	6.00	#DIV/0!	#DIV/0!	

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.2 Summary of Water Quality Data of Upper Manyame River Basin by CHDW (Year 1995) (cont'd)

Public Water Bodies	Sample Point	Season	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L
Soke Dam	Top	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Rain	Ave.	-	5.60	13.0	0.050	0.002	0.003	7.67	40.0	#DIV/0!	36.0	0.06	#DIV/0!	1.02	0.48
		Total	Ave.	-	5.60	13.0	0.050	0.002	0.003	7.67	40.0	#DIV/0!	36.0	0.06	#DIV/0!	1.02	0.48
Lake Chivero	Bottom	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Rain	Ave.	-	17.40	13.0	0.440	0.003	0.001	6.85	54.0	#DIV/0!	40.0	0.18	#DIV/0!	2.35	0.64
		Total	Ave.	-	17.40	13.0	0.440	0.003	0.001	6.85	54.0	#DIV/0!	40.0	0.18	#DIV/0!	2.35	0.64
Lake Chivero	Top	Dry	Ave.	-	7.20	83.0	0.085	0.013	0.020	7.54	165.0	#DIV/0!	126.0	0.41	#DIV/0!	0.13	0.05
		Rain	Ave.	-	5.60	87.0	0.100	0.004	0.002	8.71	170.0	#DIV/0!	140.0	0.40	#DIV/0!	0.16	0.07
		Total	Ave.	-	6.67	84.3	0.090	0.010	0.014	7.93	166.7	#DIV/0!	130.7	0.40	#DIV/0!	0.14	0.05
Lake Chivero	Middle	Dry	Ave.	-	5.90	85.0	0.105	0.014	0.010	7.63	165.0	#DIV/0!	127.0	0.25	#DIV/0!	0.09	0.11
		Rain	Ave.	-	6.70	89.0	0.105	0.007	0.002	8.47	174.0	#DIV/0!	140.0	0.64	#DIV/0!	0.16	0.07
		Total	Ave.	-	6.17	86.3	0.105	0.011	0.007	7.91	168.0	#DIV/0!	131.3	0.38	#DIV/0!	0.11	0.10
Lake Chivero	Bottom	Dry	Ave.	-	6.00	85.0	0.245	0.032	0.016	8.49	164.0	#DIV/0!	130.0	0.43	#DIV/0!	0.34	0.07
		Rain	Ave.	-	7.70	91.0	0.110	0.007	0.001	8.58	176.0	#DIV/0!	132.0	0.38	#DIV/0!	0.50	0.09
		Total	Ave.	-	6.57	87.0	0.200	0.024	0.011	8.52	168.0	#DIV/0!	130.7	0.41	#DIV/0!	0.39	0.07
Lake Manyame	Top	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Rain	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Total	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Lake Manyame	Bottom	Dry	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Rain	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
		Total	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.3 Summary of Water Quality Data of Manyame River (cont'd)

Sample Point	Sampling Year	Items	m ³ /day	ppm	mg/L	mg/L	mg/L	mg/L		mg/L	uS/cm		mg/L	mg/L	mg/L	mg/L
			Flow	Oxygen Absorbed	Chloride	Ammonia Nitrogen	Nitrite	Nitrate	pH	T-Alkalinity	Electric Conductivity	Total Hardness	Phosphate	Dissolved Oxygen	Iron (Fe)	Manganese (Mn)
at Manyame	1992	Min.	-	2.40	53.0	0.050	0.016	0.005	7.40	78.0	500.0	95.0	0.030	3.40	0.11	0.06
		Ave.	-	3.70	59.8	0.790	0.029	0.013	7.65	100.0	552.5	100.8	0.035	7.25	0.24	0.31
		Max.	-	5.80	84.0	1.540	0.043	0.018	7.79	120.0	620.0	106.0	0.042	10.10	0.39	0.64
	1993	Min.	-	0.40	33.0	0.040	0.008	0.023	7.25	80.0	220.0	82.0	0.016	7.10	0.09	0.01
		Ave.	-	2.72	46.2	0.246	0.008	0.040	7.59	89.2	356.0	107.6	0.049	8.72	0.60	0.15
		Max.	-	4.80	59.0	0.740	0.008	0.055	8.09	100.0	450.0	136.0	0.100	10.00	2.04	0.35
	1994	Min.	-	2.20	52.0	0.120	0.004	0.008	6.98	80.0	450.0	0.1	0.044	1.25	0.08	0.14
		Ave.	-	3.56	66.2	0.228	0.032	0.044	7.08	101.4	515.0	82.7	0.993	4.11	0.55	0.60
		Max.	-	5.00	87.0	0.490	0.060	0.110	7.19	135.0	560.0	126.0	3.900	8.20	0.96	1.06
	1995	Min.	-	2.60	55.0	0.140	0.004	0.003	6.88	100.0	560.0	128.0	0.130	1.00	0.07	0.09
		Ave.	-	7.82	84.3	0.145	0.015	0.009	7.12	125.0	721.7	162.0	0.761	3.70	1.83	0.97
		Max.	-	18.60	123.0	0.150	0.036	0.013	7.49	150.0	840.0	260.0	2.520	7.00	5.09	4.40
	1996	Min.	-	5.80	51.0	0.120	0.000	0.000	6.73	150.0	390.0	120.0	0.100	5.55	1.24	0.12
		Ave.	-	5.80	51.0	0.120	#DIV/0!	#DIV/0!	6.73	150.0	390.0	120.0	0.100	5.55	1.24	0.12
		Max.	-	5.80	51.0	0.120	0.000	0.000	6.73	150.0	390.0	120.0	0.100	5.55	1.24	0.12

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.4 Summary of Water Quality Data of Musitwi River, Manyame River Upstream

Sample Point	Sampling Year	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
MUSITWI	1991	Min.	-	1.00	4.0	0.050	0.005	0.011	6.40	36.0	90.0	26.0	0.020	5.60
		Ave.	-	2.80	5.5	0.283	0.005	0.025	7.25	44.0	95.5	27.3	0.223	7.63
		Max.	-	4.20	7.0	0.720	0.005	0.050	8.03	60.0	102.0	30.0	0.800	11.30
	1992	Min.	-	1.20	10.0	0.100	0.000	0.024	6.99	52.0	130.0	50.0	0.024	3.90
		Ave.	-	1.73	22.3	0.115	#DIV/0!	0.027	7.23	84.0	240.0	64.3	0.618	4.87
		Max.	-	2.20	32.0	0.130	0.000	0.030	7.46	120.0	430.0	75.0	1.640	6.00
	1993	Min.	-	3.00	19.0	0.200	0.009	0.013	6.69	70.0	100.0	22.0	0.050	4.40
		Ave.	-	4.90	40.0	0.200	0.009	0.051	7.04	75.0	102.5	29.0	0.105	4.80
		Max.	-	6.80	61.0	0.200	0.009	0.089	7.38	80.0	105.0	36.0	0.160	5.20
	1994	Min.	-	4.00	11.0	0.240	0.005	0.011	6.69	60.0	90.0	30.0	0.210	4.40
		Ave.	-	8.80	17.0	6.413	0.005	0.015	6.96	150.0	276.7	78.3	0.517	6.45
		Max.	-	17.20	23.0	11.000	0.005	0.020	7.20	290.0	620.0	150.0	0.720	8.50
	1995	Min.	-	5.30	19.9	0.000	0.000	0.016	7.40	220.0	325.0	30.0	0.680	5.85
		Ave.	-	5.30	19.9	#DIV/0!	#DIV/0!	0.016	7.40	220.0	325.0	30.0	0.680	5.85
		Max.	-	5.30	19.9	0.000	0.000	0.016	7.40	220.0	325.0	30.0	0.680	5.85
	1996	Min.	-	7.20	11.0	0.180	0.000	0.017	7.11	50.0	80.0	60.0	0.050	5.90
		Ave.	-	7.20	11.0	0.180	#DIV/0!	0.017	7.11	50.0	80.0	60.0	0.050	5.90
		Max.	-	7.20	11.0	0.180	0.000	0.017	7.11	50.0	80.0	60.0	0.050	5.90
Manyame(US)	1991	Min.	-	1.80	4.0	0.090	0.005	0.003	6.54	55.0	110.0	40.0	0.020	4.00
		Ave.	-	2.55	7.5	0.140	0.008	0.058	7.20	78.3	152.3	46.3	0.083	6.25
		Max.	-	3.00	13.0	0.170	0.011	0.160	7.53	130.0	210.0	57.0	0.230	8.10
	1992	Min.	-	2.00	7.0	0.100	0.000	0.028	7.13	56.0	120.0	50.0	0.100	4.30
		Ave.	-	2.10	16.0	0.100	#DIV/0!	0.028	7.22	83.0	125.0	57.5	0.125	4.75
		Max.	-	2.20	25.0	0.100	0.000	0.028	7.31	110.0	130.0	65.0	0.150	5.20
	1993	Min.	-	1.60	6.0	0.180	0.039	0.040	6.80	50.0	75.0	36.0	0.080	1.10
		Ave.	-	3.68	26.4	0.207	0.039	0.069	6.99	78.0	128.0	54.0	0.153	3.92
		Max.	-	5.20	77.0	0.250	0.039	0.124	7.31	100.0	195.0	74.0	0.280	6.50
	1994	Min.	-	2.60	17.0	0.150	0.000	0.010	6.55	80.0	100.0	30.0	0.140	4.80
		Ave.	-	3.87	19.7	1.875	#DIV/0!	0.113	6.94	90.0	133.3	56.7	0.190	5.47
		Max.	-	5.00	21.0	3.600	0.000	0.240	7.36	100.0	150.0	75.0	0.280	6.80
	1995	Min.	-	1.70	11.0	0.000	0.016	0.066	6.93	90.0	180.0	70.0	0.014	1.30
		Ave.	-	3.80	15.4	#DIV/0!	0.016	0.066	7.04	150.0	195.0	70.0	0.075	2.38
		Max.	-	5.90	19.9	0.000	0.016	0.066	7.14	210.0	210.0	70.0	0.136	3.45
	1996	Min.	-	7.20	9.0	0.140	0.000	0.007	7.19	50.0	80.0	30.0	0.050	5.50
		Ave.	-	7.20	9.0	0.140	#DIV/0!	0.007	7.19	50.0	80.0	30.0	0.050	5.50
		Max.	-	7.20	9.0	0.140	0.000	0.007	7.19	50.0	80.0	30.0	0.050	5.50

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.5 Summary of Water Quality Data of Ruwa River

Sample Point	Sampling Year	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
WIDD RD	1991	Min.	0	2.20	20.0	0.10	0.008	0.008	6.45	50.0	170.0	32.0	0.10	1.0
		Ave.	#DIV/0!	3.80	36.3	0.16	0.008	0.014	6.87	50.7	243.3	44.0	0.16	2.1
		Max.	0	6.20	64.0	0.22	0.008	0.019	7.10	52.0	360.0	64.0	0.26	3.0
	1992	Min.	0	4.40	40.0	0.08	0.013	0.002	6.75	80.0	190.0	75.0	0.12	0.3
		Ave.	#DIV/0!	7.65	88.8	2.42	0.017	0.032	6.95	128.5	532.5	83.8	0.37	1.1
		Max.	0	11.60	125.0	9.20	0.020	0.060	7.25	150.0	690.0	90.0	0.48	1.9
	1993	Min.	0	2.40	25.0	0.11	0.010	0.010	6.88	60.0	95.0	38.0	0.11	2.3
		Ave.	#DIV/0!	7.88	61.4	27.38	0.015	0.098	7.18	124.0	285.0	69.6	0.44	5.2
		Max.	0	13.20	93.0	135.00	0.020	0.160	7.35	210.0	500.0	136.0	1.30	7.0
	1994	Min.	0	1.40	33.0	0.11	0.006	0.059	6.70	50.0	140.0	37.0	0.12	1.5
		Ave.	#DIV/0!	5.60	39.0	1.71	0.006	0.353	7.06	90.0	226.3	63.0	0.62	4.4
		Max.	0	12.00	47.0	3.30	0.006	0.800	7.79	110.0	275.0	90.0	1.74	6.8
	1995	Min.	0	5.40	67.0	2.20	0.090	0.026	7.02	130.0	460.0	86.0	1.44	4.6
		Ave.	#DIV/0!	12.50	103.4	5.35	0.595	0.053	7.33	175.0	705.0	103.0	2.10	5.3
		Max.	0	19.60	139.9	8.50	1.100	0.080	7.64	220.0	950.0	120.0	2.76	6.0
	1996	Min.	0	9.00	19.0	0.15	0.003	0.014	7.14	40.0	140.0	50.0	0.50	6.4
		Ave.	#DIV/0!	9.00	19.0	0.15	0.003	0.014	7.14	40.0	140.0	50.0	0.50	6.4
		Max.	0	9.00	19.0	0.15	0.003	0.014	7.14	40.0	140.0	50.0	0.50	6.4

Note: #DIV/0! indicates that there is no data available to calculate.

**Table 3.5.6 Summary of Water Quality Data of Nyatsime River
(Upstream and Downstream of Zengeza STW)**

Sample Point	Sampling Year	Items	m ³ /day	ppm	mg/L	mg/L	mg/L	mg/L		mg/L	µS/cm		mg/L	mg/L	mg/L	mg/L
			Flow	Oxygen Absorbed	Chloride	Ammonia Nitrogen	Nitrite	Nitrate	pH	T-Alkalinity	Electric Conductivity	Total Hardness	Phosphate	Dissolved Oxygen	Iron (Fe)	Manganese (Mn)
Upstream of STW	1991	Min.	-	3.20	5.0	0.030	0.000	0.000	6.85	40.0	80.0	26.0	0.022	3.40	1.66	0.02
		Ave.	-	3.67	9.7	2.808	#DIV/0!	#DIV/0!	7.33	41.7	88.3	40.5	0.051	5.33	5.72	0.05
		Max.	-	4.60	15.0	8.250	0.000	0.000	7.77	45.0	95.0	55.0	0.100	6.50	7.86	0.07
	1992	Min.	-	2.60	11.0	0.200	0.005	0.023	6.82	44.0	40.0	22.0	0.080	3.99	3.06	0.12
		Ave.	-	37.53	30.3	8.855	0.005	0.027	7.06	134.7	320.0	52.0	2.189	4.20	9.94	0.69
		Max.	-	104.80	42.0	26.000	0.005	0.030	7.30	310.0	790.0	100.0	6.400	4.70	23.26	1.76
	1993	Min.	-	2.80	9.0	0.085	0.006	0.050	6.86	30.0	50.0	20.0	0.080	0.60	1.17	0.02
		Ave.	-	6.07	15.7	2.468	0.033	0.190	7.28	66.7	375.0	29.5	0.200	3.45	1.78	0.02
		Max.	-	10.40	21.0	4.850	0.060	0.470	7.62	110.0	700.0	39.0	0.320	6.30	2.38	0.02
	1994	Min.	-	0.40	1.8	0.190	0.775	0.007	7.02	44.0	150.0	24.0	0.092	1.80	0.72	0.04
		Ave.	-	7.60	27.7	12.464	0.775	0.297	7.46	143.0	503.3	36.0	0.482	5.33	1.84	0.14
		Max.	-	21.00	79.0	49.000	0.775	1.075	8.21	420.0	1170.0	45.0	1.010	8.50	2.73	0.34
	1995	Min.	-	1.00	41.0	0.030	0.006	0.031	6.62	90.0	290.0	85.0	0.034	3.00	0.09	0.02
		Ave.	-	5.25	65.5	6.408	0.039	0.062	7.05	186.7	683.3	143.7	2.546	6.23	0.21	0.10
		Max.	-	14.20	122.0	31.500	0.095	0.107	7.41	350.0	1200.0	262.0	7.200	9.00	0.51	0.23
	1996	Min.	-	2.80	23.0	0.300	0.007	0.002	6.79	60.0	300.0	80.0	0.040	5.40	0.32	0.03
		Ave.	-	3.10	28.0	0.300	0.017	0.003	6.92	65.0	350.0	85.0	0.110	6.05	0.53	0.03
		Max.	-	3.40	33.0	0.300	0.028	0.005	7.04	70.0	400.0	90.0	0.180	6.70	0.73	0.03
Downstream STW	1991	Min.	-	10.60	21.0	2.650	0.035	0.016	7.20	140.0	320.0	30.0	0.310	0.60	0.55	0.02
		Ave.	-	21.90	65.0	8.463	0.635	0.502	8.17	442.5	990.0	96.7	2.190	0.65	2.24	0.05
		Max.	-	36.60	110.0	19.750	1.250	1.420	9.07	800.0	1650.0	140.0	5.400	0.70	5.21	0.10
	1992	Min.	-	2.80	10.0	0.140	0.015	0.066	6.98	40.0	80.0	46.0	0.084	2.50	0.07	0.08
		Ave.	-	23.77	79.6	25.834	1.199	0.152	7.76	447.7	689.3	93.1	4.915	3.15	1.16	0.21
		Max.	-	40.40	137.0	60.000	3.400	0.270	8.65	860.0	1855.0	141.0	13.800	3.80	3.54	0.32
	1993	Min.	-	4.80	3.0	0.230	0.007	0.018	6.89	30.0	60.0	23.0	0.200	0.10	0.16	0.06
		Ave.	-	17.84	51.2	27.275	0.384	0.047	7.67	336.4	822.5	88.0	2.547	2.90	0.69	0.33
		Max.	-	39.20	97.0	100.00	1.350	0.086	8.99	732.0	1600.0	118.0	7.040	5.00	1.64	0.87
	1994	Min.	-	2.80	4.5	10.000	0.005	0.048	6.91	86.0	850.0	38.0	0.650	1.40	0.75	0.04
		Ave.	-	13.80	64.6	33.625	0.406	0.618	7.31	306.5	1030.0	86.3	5.078	1.80	1.83	0.11
		Max.	-	33.00	99.7	58.000	1.475	1.405	7.67	530.0	1190.0	121.0	12.040	2.40	3.74	0.18
	1995	Min.	-	8.00	49.0	1.800	0.029	0.010	6.72	90.0	550.0	100.0	0.560	0.20	0.04	0.05
		Ave.	-	21.01	113.7	59.300	0.537	0.603	7.03	383.7	983.3	145.5	7.230	1.33	0.65	0.08
		Max.	-	26.70	159.0	79.000	0.760	1.695	7.21	590.0	1650.0	230.0	11.200	3.60	1.54	0.11
	1996	Min.	-	5.80	23.0	2.700	0.019	0.003	6.73	80.0	210.0	60.0	0.200	0.00	1.06	0.10
		Ave.	-	11.20	39.0	16.350	0.036	0.010	7.08	115.0	410.0	75.0	1.700	#DIV/0!	1.46	0.13
		Max.	-	16.60	55.0	30.000	0.052	0.017	7.43	150.0	610.0	90.0	3.200	0.00	1.85	0.16

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.7 Summary of Water Quality Data of Mukuvisi River (cont'd)

Sample Point	Sampling Year	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
	1991	Min.	-	2.40	15.0	0.250	0.032	0.007	5.80	10.0	155.0	500.0	0.12	1.50
		Ave.	-	2.70	63.0	0.433	0.081	0.035	7.25	99.0	208.3	667.5	0.88	1.78
		Max.	-	3.20	142.0	0.640	0.130	0.090	8.78	150.0	360.0	850.0	1.88	2.30
	1992	Min.	-	2.60	72.0	0.170	0.007	0.006	7.32	150.0	540.0	150.0	0.23	0.40
		Ave.	-	4.88	77.8	0.443	0.028	0.015	7.46	172.0	680.0	181.0	0.41	1.98
		Max.	-	7.20	89.0	0.710	0.058	0.037	7.57	220.0	850.0	275.0	0.64	3.20
	1993	Min.	-	1.40	43.0	0.180	0.006	0.004	6.95	40.0	450.0	150.0	0.10	1.50
		Ave.	-	3.43	62.3	0.282	0.042	0.210	7.24	131.7	510.0	210.3	0.54	3.70
		Max.	-	6.00	73.0	0.490	0.120	0.880	7.52	330.0	600.0	350.0	1.23	5.20
	1994	Min.	-	4.20	57.0	0.150	0.010	0.038	6.77	30.0	360.0	30.0	0.06	2.10
		Ave.	-	9.87	98.5	3.290	0.140	0.167	7.04	116.7	538.0	242.5	1.23	4.08
		Max.	-	17.60	152.0	8.800	0.250	0.380	7.42	230.0	740.0	620.0	4.54	5.20
	1995	Min.	-	1.80	27.0	0.240	0.010	0.005	6.87	50.0	650.0	152.0	0.12	0.45
		Ave.	-	6.52	81.7	1.180	0.040	0.018	7.30	161.7	788.3	367.8	0.52	2.69
		Max.	-	15.00	127.0	2.200	0.080	0.041	7.58	260.0	1000.0	1000.0	1.59	5.30
	1996	Min.	-	1.00	49.0	0.100	0.023	0.014	6.88	60.0	560.0	170.0	0.05	5.40
		Ave.	-	2.10	57.0	0.150	0.027	0.014	6.88	65.0	560.0	195.0	0.46	5.95
		Max.	-	3.20	65.0	0.200	0.031	0.014	6.88	70.0	560.0	220.0	0.88	6.50
At Manyame	1990	Min.	-	4.20	33.0	1.840	0.085	0.264	7.08	76.0	120.0	500.0	0.01	2.70
		Ave.	-	4.70	36.5	1.900	0.473	0.367	7.18	107.0	123.0	605.0	0.07	2.90
		Max.	-	5.20	40.0	1.960	0.860	0.470	7.27	138.0	126.0	710.0	0.13	3.10
	1991	Min.	-	6.20	60.0	1.940	0.005	0.007	6.92	110.0	108.0	750.0	0.52	1.30
		Ave.	-	8.25	76.8	8.635	0.093	0.041	7.30	177.5	147.0	772.5	0.91	3.05
		Max.	-	11.00	91.0	21.000	0.320	0.140	7.49	220.0	220.0	820.0	1.48	5.80
	1992	Min.	-	2.60	83.0	0.700	0.057	0.001	7.45	140.0	600.0	132.0	1.03	0.70
		Ave.	-	6.04	119.6	6.820	0.229	0.063	7.61	194.0	938.0	163.0	1.31	2.06
		Max.	-	10.20	137.0	18.000	0.350	0.200	7.95	260.0	1180.0	220.0	1.82	3.20
	1993	Min.	-	3.80	61.0	0.740	0.004	0.011	7.17	70.0	490.0	138.0	0.57	1.90
		Ave.	-	8.63	69.7	9.090	0.113	0.127	7.46	195.0	726.7	204.2	2.31	3.23
		Max.	-	14.80	111.0	19.000	0.210	0.290	7.65	270.0	1050.0	450.0	4.52	4.70
	1994	Min.	-	5.80	67.0	1.360	0.015	0.018	7.08	100.0	330.0	20.0	1.16	0.90
		Ave.	-	11.40	114.5	15.293	0.158	0.103	7.30	191.7	698.0	156.7	1.68	2.88
		Max.	-	17.80	207.0	28.500	0.450	0.230	7.59	280.0	1060.0	215.0	2.82	5.40
	1995	Min.	-	7.50	109.0	5.000	0.250	0.004	7.23	270.0	1050.0	150.0	0.18	3.80
		Ave.	-	11.10	129.0	9.800	0.615	0.406	7.52	282.5	1132.5	462.5	1.11	4.25
		Max.	-	13.40	149.0	17.000	0.980	1.200	7.80	300.0	1250.0	1100.0	1.65	4.70
1996	Min.	-	0.00	0.0	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.00	
	Ave.	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	Max.	-	0.00	0.0	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.00	

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.8 Summary of Water Quality Data of Marimba River

Sample Point	Sampling Year	Items	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
Bulawayo RD	1989	Min.	-	2.60	19.0	0.090	0.005	0.003	7.32	160.0	360.0	130.0	0.06	5.20
		Ave.	-	2.60	19.0	0.090	0.005	0.003	7.32	160.0	360.0	130.0	0.06	5.20
		Max.	-	2.60	19.0	0.090	0.005	0.003	7.32	160.0	360.0	130.0	0.06	5.20
	1990	Min.	-	3.20	15.0	0.360	0.020	0.026	7.19	80.0	220.0	110.0	0.02	5.50
		Ave.	-	6.10	29.0	0.360	0.020	0.036	7.24	160.0	390.0	195.0	0.09	6.20
		Max.	-	9.00	43.0	0.360	0.020	0.045	7.28	240.0	560.0	280.0	0.16	6.90
	1991	Min.	-	0.40	15.0	0.110	0.004	0.001	7.17	140.0	280.0	140.0	0.03	5.50
		Ave.	-	2.90	28.8	0.125	0.012	0.108	7.63	201.3	432.5	210.0	0.05	7.13
		Max.	-	5.00	40.0	0.140	0.020	0.410	7.83	270.0	510.0	244.0	0.06	8.20
	1992	Min.	-	1.60	27.0	0.100	0.005	0.004	7.65	180.0	500.0	195.0	0.04	3.70
		Ave.	-	3.37	36.7	0.130	0.019	0.122	7.78	227.1	550.0	247.6	0.14	5.53
		Max.	-	5.20	54.0	0.160	0.035	0.415	8.10	280.0	590.0	290.0	0.52	7.70
	1993	Min.	-	1.00	13.0	0.120	0.005	0.032	7.47	60.0	150.0	130.0	0.02	4.80
		Ave.	-	4.51	36.3	0.173	0.007	0.042	7.66	164.9	349.3	308.4	0.33	6.29
		Max.	-	9.40	73.0	0.250	0.008	0.060	7.93	240.0	450.0	980.0	1.41	7.70
	1994	Min.	-	2.40	19.0	0.130	0.007	0.019	7.03	40.0	175.0	66.0	0.14	4.60
		Ave.	-	3.70	39.5	0.588	0.051	0.050	7.33	138.0	401.3	170.3	0.19	6.10
		Max.	-	5.00	57.0	1.860	0.082	0.084	7.64	200.0	560.0	245.0	0.24	7.50
	1995	Min.	-	2.40	53.0	0.150	0.023	0.009	7.04	100.0	590.0	180.0	0.04	5.05
		Ave.	-	5.44	83.0	0.200	0.023	0.024	7.24	158.0	704.0	190.0	0.22	5.88
		Max.	-	9.00	117.0	0.250	0.023	0.048	7.56	200.0	860.0	210.0	0.60	6.90
	1996	Min.	-	2.10	37.0	0.110	0.002	0.008	7.14	110.0	460.0	190.0	0.12	5.90
		Ave.	-	2.35	58.0	0.110	0.005	0.009	7.28	135.0	630.0	195.0	0.26	6.35
		Max.	-	2.60	79.0	0.110	0.007	0.009	7.42	160.0	800.0	200.0	0.40	6.80
Westwood RD	1989	Min.	-	5.40	42.0	2.900	0.011	0.006	7.40	190.0	560.0	160.0	0.55	1.10
		Ave.	-	5.40	42.0	2.900	0.011	0.006	7.40	190.0	560.0	160.0	0.55	1.10
		Max.	-	5.40	42.0	2.900	0.011	0.006	7.40	190.0	560.0	160.0	0.55	1.10
	1990	Min.	-	6.80	21.0	1.440	0.010	0.018	7.09	110.0	450.0	180.0	0.34	2.40
		Ave.	-	7.70	44.0	1.440	0.069	0.038	7.22	180.0	615.0	220.0	0.53	2.40
		Max.	-	8.60	67.0	1.440	0.127	0.058	7.35	250.0	780.0	260.0	0.71	2.40
	1991	Min.	-	1.20	30.0	0.130	0.008	0.001	7.25	210.0	460.0	235.0	0.01	1.40
		Ave.	-	9.35	50.8	2.788	0.025	0.051	7.48	236.5	707.5	239.0	0.55	3.87
		Max.	-	24.60	74.0	8.800	0.048	0.190	7.73	266.0	1040.0	245.0	1.20	5.80
	1992	Min.	-	5.80	76.0	0.140	0.007	0.003	7.36	208.0	780.0	208.0	0.63	0.60
		Ave.	-	14.14	169.0	1.510	0.062	0.035	7.66	310.3	1402.9	304.7	1.98	4.53
		Max.	-	25.80	257.0	5.840	0.250	0.078	8.24	370.0	2000.0	370.0	4.08	11.10
	1993	Min.	-	1.80	31.0	0.450	0.006	0.008	6.88	150.0	450.0	170.0	0.05	0.60
		Ave.	-	8.34	61.4	4.778	0.548	0.250	7.39	203.1	657.0	248.9	0.55	3.93
		Max.	-	25.60	99.0	11.500	3.150	0.640	7.69	280.0	1000.0	340.0	0.94	6.80
1994	Min.	-	4.00	17.0	0.120	0.005	0.010	7.01	70.0	215.0	82.0	0.43	0.40	
	Ave.	-	7.60	70.0	0.308	0.074	0.031	7.23	192.5	645.0	200.5	0.96	2.20	
	Max.	-	11.80	99.0	0.460	0.145	0.076	7.40	280.0	860.0	260.0	1.22	3.60	
1995	Min.	-	2.20	69.0	0.160	0.012	0.010	7.08	200.0	770.0	120.0	0.48	2.25	
	Ave.	-	5.56	100.6	0.300	0.012	0.012	7.20	238.0	920.0	228.0	1.46	4.54	
	Max.	-	12.60	127.0	0.410	0.012	0.014	7.33	290.0	1090.0	300.0	4.00	6.05	
1996	Min.	-	2.80	53.0	0.160	0.009	0.008	7.01	140.0	600.0	200.0	0.56	4.80	
	Ave.	-	5.45	74.0	0.245	0.009	0.011	7.06	195.0	775.0	210.0	0.98	4.80	
	Max.	-	8.10	95.0	0.330	0.009	0.013	7.11	250.0	950.0	220.0	1.40	4.80	

Table 3.5.8 Summary of Water Quality Data of Marimba River (cont'd)

Sample Point:	Sampling Year	Items	m ³ /day	ppm	mg/L	mg/L	mg/L	mg/L		mg/L	Electric Conductivity μ S/cm	Total Hardness	Phosphate	Dissolved Oxygen
			Flow	Oxygen Absorbed	Chloride	Ammonia Nitrogen	Nitrite	Nitrate	pH	T-Alkalinity				
Kambuzuma RD	1989	Min.	-	5.60	42.0	1.240	0.150	0.020	7.48	170.0	560.0	280.0	0.70	1.50
		Ave.	-	5.60	42.0	1.240	0.150	0.020	7.48	170.0	560.0	280.0	0.70	1.50
		Max.	-	5.60	42.0	1.240	0.150	0.020	7.48	170.0	560.0	280.0	0.70	1.50
	1990	Min.	-	4.60	21.0	2.160	0.058	0.145	7.19	100.0	475.0	150.0	0.36	0.50
		Ave.	-	7.90	40.0	2.160	0.119	0.179	7.38	170.0	607.5	195.0	0.36	1.75
		Max.	-	11.20	59.0	2.160	0.180	0.212	7.57	240.0	740.0	240.0	0.36	3.00
	1991	Min.	-	1.00	35.0	0.250	0.013	0.001	7.40	210.0	580.0	210.0	0.19	1.30
		Ave.	-	5.10	57.8	0.730	0.028	0.060	7.60	267.5	715.0	226.5	0.43	3.18
		Max.	-	7.60	90.0	0.980	0.052	0.220	7.69	380.0	920.0	241.0	0.80	4.60
	1992	Min.	-	3.80	64.0	0.150	0.006	0.003	7.42	184.0	700.0	209.0	0.16	0.21
		Ave.	-	10.34	135.4	1.911	0.016	0.028	7.65	294.0	1295.7	297.7	0.91	2.29
		Max.	-	27.20	221.0	5.600	0.030	0.054	7.80	350.0	2400.0	486.0	1.84	6.50
	1993	Min.	-	2.20	30.0	0.150	0.011	0.007	7.10	120.0	350.0	144.0	0.04	0.30
		Ave.	-	4.94	53.9	1.812	0.114	0.212	7.41	191.4	562.9	218.4	0.56	2.56
		Max.	-	8.60	81.0	4.500	0.370	0.630	7.75	280.0	760.0	290.0	1.36	5.70
	1994	Min.	-	2.60	29.0	0.350	0.005	0.011	7.09	110.0	300.0	112.0	0.40	0.60
		Ave.	-	6.55	64.0	0.955	0.028	0.031	7.23	196.0	585.0	205.5	0.86	2.20
		Max.	-	10.80	117.0	1.540	0.072	0.063	7.48	264.0	710.0	265.0	1.20	4.00
	1995	Min.	-	0.50	69.0	0.090	0.012	0.008	7.18	185.0	760.0	190.0	0.24	3.15
		Ave.	-	3.66	96.6	0.797	0.021	0.013	7.28	225.0	859.0	208.0	0.90	4.83
		Max.	-	7.70	125.0	1.440	0.030	0.016	7.44	280.0	990.0	230.0	2.20	6.20
	1996	Min.	-	2.60	53.0	0.180	0.011	0.006	7.02	120.0	460.0	160.0	0.36	1.80
		Ave.	-	3.55	69.0	0.345	0.021	0.006	7.14	160.0	675.0	175.0	0.55	2.18
		Max.	-	4.50	85.0	0.510	0.030	0.006	7.26	200.0	890.0	190.0	0.74	2.55
Above Crow.	1989	Min.	-	15.20	130.0	0.540	0.083	0.012	7.61	200.0	1200.0	270.0	0.50	2.00
		Ave.	-	15.20	130.0	0.540	0.083	0.012	7.61	200.0	1200.0	270.0	0.50	2.00
		Max.	-	15.20	130.0	0.540	0.083	0.012	7.61	200.0	1200.0	270.0	0.50	2.00
	1990	Min.	-	8.20	27.0	0.320	0.040	0.022	7.48	180.0	540.0	160.0	0.16	4.50
		Ave.	-	11.10	82.0	0.335	0.064	0.034	7.64	215.0	850.0	220.0	0.33	4.85
		Max.	-	14.00	137.0	0.350	0.088	0.045	7.79	250.0	1160.0	280.0	0.49	5.20
	1991	Min.	-	3.40	65.0	0.130	0.014	0.017	7.41	120.0	330.0	220.0	0.21	0.80
		Ave.	-	7.45	93.5	0.945	0.056	0.137	7.71	229.5	755.0	393.8	0.67	4.75
		Max.	-	10.60	131.0	2.440	0.110	0.410	7.90	298.0	1150.0	850.0	1.08	7.60
	1992	Min.	-	4.00	65.0	0.110	0.005	0.005	7.20	200.0	650.0	195.0	0.58	2.00
		Ave.	-	9.88	129.7	2.670	0.090	0.056	7.73	296.3	1124.3	240.1	0.73	4.27
		Max.	-	22.60	179.0	15.000	0.180	0.195	8.17	360.0	1500.0	302.0	1.20	7.70
	1993	Min.	-	4.40	42.0	0.140	0.013	0.006	7.45	108.0	350.0	144.0	0.26	3.50
		Ave.	-	7.17	92.6	1.030	0.026	0.075	7.69	212.6	685.7	226.3	0.67	4.91
		Max.	-	9.40	143.0	4.800	0.039	0.174	8.00	320.0	870.0	300.0	0.96	6.30
	1994	Min.	-	4.40	51.0	0.800	0.010	0.002	7.28	120.0	375.0	116.0	0.65	1.50
		Ave.	-	9.50	108.0	1.615	0.044	0.097	7.49	211.0	802.5	239.0	1.04	4.05
		Max.	-	17.40	147.0	3.160	0.070	0.191	7.65	304.0	1100.0	300.0	1.56	6.00
	1995	Min.	-	4.00	85.0	0.110	0.008	0.011	7.26	210.0	850.0	200.0	0.22	1.75
		Ave.	-	5.22	114.2	0.255	0.038	0.043	7.43	220.0	942.0	217.0	0.82	5.70
		Max.	-	7.90	157.0	0.420	0.070	0.087	7.60	240.0	1100.0	255.0	1.80	7.65
	1996	Min.	-	5.70	67.0	0.940	0.005	0.001	7.20	100.0	480.0	180.0	0.56	0.45
		Ave.	-	9.25	78.0	0.940	0.028	0.016	7.29	165.0	690.0	210.0	0.73	3.33
		Max.	-	12.80	89.0	0.940	0.050	0.030	7.38	230.0	900.0	240.0	0.90	6.20

Table 3.5.8 Summary of Water Quality Data of Marimba River (cont'd)

Sample Point	Sampling Year	Items	m ³ /day	ppm	mg/L	mg/L	mg/L	mg/L		mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate	Dissolved Oxygen
				Oxygen Absorbed	Chloride	Ammonia Nitrogen	Nitrite	Nitrate	pH	T-Alkalinity				
Below Crow.	1989	Min.	-	11.80	72.0	0.920	0.100	0.105	7.67	210.0	750.0	280.0	0.54	1.90
		Ave.	-	11.80	72.0	0.920	0.100	0.105	7.67	210.0	750.0	280.0	0.54	1.90
		Max.	-	11.80	72.0	0.920	0.100	0.105	7.67	210.0	750.0	280.0	0.54	1.90
	1990	Min.	-	5.40	51.0	0.180	0.029	0.038	7.58	150.0	575.0	150.0	0.08	4.30
		Ave.	-	7.50	84.0	0.265	0.050	0.061	7.67	200.0	842.5	225.0	0.23	4.75
		Max.	-	9.60	117.0	0.350	0.071	0.083	7.76	250.0	1110.0	300.0	0.37	5.20
	1991	Min.	-	1.00	35.0	0.250	0.013	0.001	7.40	210.0	580.0	210.0	0.19	1.30
		Ave.	-	5.10	57.8	0.730	0.028	0.060	7.60	267.5	715.0	226.5	0.43	3.18
		Max.	-	7.60	90.0	0.980	0.052	0.220	7.69	380.0	920.0	241.0	0.80	4.60
	1992	Min.	-	5.40	100.0	0.760	0.020	0.032	7.46	200.0	990.0	140.0	0.24	1.40
		Ave.	-	9.83	141.3	3.421	0.088	0.359	7.72	237.7	1150.0	195.6	1.41	4.22
		Max.	-	22.20	191.0	12.500	0.200	1.500	7.89	270.0	1580.0	384.0	5.20	6.50
	1993	Min.	-	4.00	63.0	0.360	0.020	0.014	7.61	150.0	470.0	160.0	0.06	4.40
		Ave.	-	8.06	90.9	2.367	0.057	0.091	7.77	235.7	731.4	237.4	0.79	4.97
		Max.	-	12.80	145.0	7.500	0.110	0.160	7.93	340.0	960.0	316.0	1.34	6.70
	1994	Min.	-	5.40	53.0	0.560	0.060	0.010	7.46	140.0	450.0	130.0	0.76	5.10
		Ave.	-	10.65	112.5	4.660	0.188	0.055	7.57	197.0	831.3	218.8	1.04	5.97
		Max.	-	21.40	139.0	10.600	0.405	0.168	7.75	288.0	1090.0	320.0	1.30	7.60
	1995	Min.	-	2.60	113.0	0.200	0.023	0.029	7.42	230.0	1010.0	180.0	0.24	4.45
		Ave.	-	6.60	140.2	0.463	0.030	0.040	7.54	260.0	1106.0	200.0	0.75	6.12
		Max.	-	10.40	169.0	0.980	0.037	0.062	7.73	300.0	1210.0	210.0	1.60	7.50
	1996	Min.	-	4.80	59.0	0.190	0.020	0.005	7.24	120.0	480.0	170.0	0.34	4.65
		Ave.	-	8.75	101.0	0.425	0.045	0.013	7.47	165.0	840.0	195.0	0.59	5.18
		Max.	-	12.70	143.0	0.660	0.070	0.020	7.70	210.0	1200.0	220.0	0.84	5.70
At Lake	1989	Min.	-	11.80	71.0	0.860	0.152	0.023	7.79	210.0	840.0	160.0	0.26	4.90
		Ave.	-	11.80	71.0	0.860	0.152	0.023	7.79	210.0	840.0	160.0	0.26	4.90
		Max.	-	11.80	71.0	0.860	0.152	0.023	7.79	210.0	840.0	160.0	0.26	4.90
	1990	Min.	-	5.40	54.0	0.150	0.062	0.008	7.73	150.0	620.0	150.0	0.04	5.80
		Ave.	-	7.30	92.0	0.255	0.067	0.027	7.79	190.0	865.0	205.0	0.22	6.65
		Max.	-	9.20	130.0	0.360	0.072	0.045	7.84	230.0	1110.0	260.0	0.39	7.50
	1991	Min.	-	7.20	81.0	0.200	0.027	0.008	7.73	230.0	740.0	160.0	0.47	3.20
		Ave.	-	11.75	117.8	6.120	0.158	0.121	7.87	288.5	1025.0	183.3	1.69	4.85
		Max.	-	21.00	162.0	16.000	0.430	0.330	7.95	410.0	1310.0	212.0	4.08	6.40
	1992	Min.	-	2.20	116.0	0.190	0.009	0.003	7.56	196.0	900.0	136.0	0.55	1.60
		Ave.	-	7.60	146.4	3.346	0.048	0.139	7.88	235.4	1146.4	158.3	1.63	4.87
		Max.	-	15.20	171.0	11.500	0.132	0.496	8.18	290.0	1540.0	180.0	4.66	8.40
	1993	Min.	-	4.00	41.0	0.250	0.014	0.004	7.60	112.0	102.0	103.0	0.01	5.00
		Ave.	-	7.83	107.9	1.041	0.113	0.126	7.85	221.7	612.4	177.3	0.71	6.14
		Max.	-	10.40	171.0	4.200	0.230	0.370	8.31	330.0	820.0	226.0	1.24	8.50
	1994	Min.	-	5.40	85.0	0.100	0.014	0.005	7.55	190.0	610.0	142.0	0.74	6.00
		Ave.	-	7.80	106.0	1.003	0.073	0.080	7.72	228.5	815.0	199.3	1.30	7.58
		Max.	-	10.20	127.0	2.840	0.150	0.158	7.92	260.0	910.0	225.0	1.56	9.70
	1995	Min.	-	2.60	117.0	0.240	0.016	0.018	7.49	280.0	1010.0	180.0	0.41	6.15
		Ave.	-	6.23	148.3	0.240	0.016	0.021	7.63	323.3	1193.3	213.3	0.63	6.48
		Max.	-	10.10	177.0	0.240	0.016	0.026	7.76	370.0	1350.0	230.0	0.76	6.80
	1996	Min.	-	6.10	89.0	0.290	0.043	0.010	7.31	140.0	470.0	200.0	0.88	4.70
		Ave.	-	6.80	117.0	0.600	0.067	0.011	7.52	185.0	812.5	205.0	1.02	5.60
		Max.	-	7.50	145.0	0.910	0.090	0.012	7.72	230.0	1155.0	210.0	1.16	6.50

Table 3.5.10 Summary of Water Quality Data of Lake Chivero (cont'd)

Sample Point	Sampling Year	Items	m ³ /day	ppm	mg/L	mg/L	mg/L	mg/L		mg/L	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
			Flow	Oxygen Absorbed	Chloride	Ammonia Nitrogen	Nitrite	Nitrate	pH	T-Alkalinity	Electric Conductivity	Total Hardness	Phosphate	Dissolved Oxygen	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Albuminoid	
Bottom	1986	Min.	0	0.00	0.0	0.00	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1987	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1988	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1989	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1990	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1991	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1992	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
	1993	Min.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00
		Ave	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Max.	0	0.00	0.0	0.00	0.000	0.000	0.000	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	0.00	
1994	Min.	0	11.40	77.0	0.34	0.030	0.184	8.10	144.0	0.0	120.0	0.15	0.0	2.15	0.21	68.00	0.45		
	Ave	#DIV/0!	11.40	77.0	0.34	0.030	0.184	8.10	144.0	#DIV/0!	120.0	0.15	#DIV/0!	2.15	0.21	68.00	0.45		
Max.	0	11.40	77.0	0.34	0.030	0.184	8.10	144.0	0.0	120.0	0.15	0.0	2.15	0.21	68.00	0.45			
1995	Min.	0	5.00	64.0	0.11	0.004	0.001	7.81	152.0	0.0	114.0	0.34	0.0	0.13	0.04	70.00	0.50		
	Ave	#DIV/0!	8.15	77.8	0.36	0.015	0.016	8.38	160.8	#DIV/0!	123.0	0.72	#DIV/0!	1.17	0.12	78.67	0.50		
Max.	0	18.20	93.0	0.60	0.040	0.060	8.74	176.0	0.0	136.0	1.26	0.0	5.32	0.24	68.00	0.50			

Note: #DIV/0! indicates that there is no data available to calculate.

Table 3.5.12 Water Quality Data of Manyame River

Sample Point	Sampling Date	Flow m3/day	Oxygen Absorbed ppm	Chloride mg/l	Ammonia Nitrogen mg/l	Nitrite mg/l	Nitrate mg/l	pH	T-Alkalinity mg/l	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/l	Dissolved Oxygen mg/l	Iron (Fe) mg/l	Manganese (Mn) mg/l
below	9/1/91	-	NO SAMPLES												
NEW RD	9/1/91	-	4.80	16.0	0.050	0.0150	0.011	6.91	50.0	150.0	32.0	0.040	2.00	1.03	0.32
SKYLINE	9/1/91	-	11.60	18.0	4.300	STR	0.019	6.81	90.0	250.0	40.0	0.530	2.00	0.90	0.20
below	9/4/91	-	NO SAMPLES												
NEW RD	9/4/91	-	1.80	45.0	0.140	0.0115	0.0015	7.07	60.0	160.0	34.0	0.036	2.50	0.98	0.10
SKYLINE	9/4/91	-	5.60	15.0	0.380	0.350	0.055	7.54	90.0	260.0	34.0	0.684	5.10	0.38	0.02
below	2/7/91	-	1.20	11.0	0.090	TR	TR	7.15	30.0	132.0	50.0	0.012	5.70	0.58	0.03
NEW RD	2/7/91	-	2.00	24.0	0.290	TR	TR	7.40	60.0	190.0	50.0	0.400	3.00	0.13	0.14
SKYLINE	2/7/91	-	11.60	44.0	0.700	0.042	0.016	7.95	330.0	790.0	70.0	1.000	4.80	0.55	0.11
below	8/10/91	-	NO SAMPLES												
NEW RD	8/10/91	-	1.60	45.0	0.450	0.033	NIL	7.14	1210.0	250.0	51.0	0.036	3.10	0.69	0.24
SKYLINE	8/10/91	-	27.20	85.0	1.200	0.020	0.025	7.70	710.0	1400.0	97.0	7.200	NIL	0.88	0.24
below	14/1/92	-	3.20	20.0	0.120	NIL	NIL	7.86	90.0	190.0	80.0	0.020	7.40	0.77	0.24
NEW RD	14/1/92	-	2.80	27.0	0.370	0.015	0.003	7.07	70.0	180.0	50.0	0.042	4.10	0.95	0.24
SKYLINE	14/1/92	-	3.20	12.0	0.245	NIL	0.020	6.82	40.0	100.0	50.0	0.184	4.00	1.34	NIL
below	7/4/92	-	3.00	15.0	0.135	NIL	0.040	7.81	150.0	310.0	115.0	0.012	5.60	0.61	0.19
NEW RD	7/4/92	-	3.20	30.0	0.165	0.030	0.060	7.05	60.0	190.0	34.0	0.044	3.30	0.10	0.12
SKYLINE	7/4/92	-	10.80	62.0	9.500	0.040	0.110	7.23	280.0	810.0	90.0	0.780	4.40	NIL	NIL
below	7/7/92	-	NO SAMPLES												
NEW RD	7/7/92	-	3.00	30.0	3.350	NIL	0.015	7.22	50.0	210.0	35.0	0.630	5.70	0.25	0.09
SKYLINE	7/7/92	-	6.20	58.0	0.195	0.350	0.014	7.38	220.0	740.0	86.0	2.000	4.80	0.23	0.13
below	8/9/92	-	NO SAMPLES												
NEW RD	8/9/92	-	3.60	47.0	3.200	0.130	0.404	7.14	92.0	330.0	43.0	0.044	NIL	0.19	0.46
SKYLINE	8/9/92	-	8.40	97.0	0.320	0.130	0.045	7.08	268.0	1120.0	111.0	0.260	4.40	0.03	0.04
below	9/10/92	-	NO SAMPLES												
NEW RD	9/10/92	-	8.80	51.0	0.920	0.170	0.130	7.53	90.0	340.0	50.0	0.150	6.70	0.07	0.05
SKYLINE	9/10/92	-	3.20	113.0	0.760	0.130	0.530	7.74	320.0	1240.0	129.0	0.750	7.90	NIL	NIL
below	15/11/92	-	NO SAMPLES												
NEW RD	15/11/92	-	4.80	51.0	0.440	0.050	0.110	7.26	88.0	370.0	49.0	0.080	4.10	0.78	0.32
SKYLINE	15/11/92	-	12.80	131.0	0.960	0.130	0.470	7.74	390.0	390.0	140.0	1.968	6.30	0.24	0.06
below	15/12/92	-	NO SAMPLES												
NEW RD	15/12/92	-	5.20	41.0	2.550	0.029	0.081	7.30	76.0	140.0	27.0	0.136	7.10	2.35	0.13
SKYLINE	15/12/92	-	16.80	141.0	0.230	0.045	0.035	7.41	452.0	1360.0	140.0	3.940	1.60	0.47	NIL
below	15/1/93	-	5.20	9.0	0.070	STR	0.028	6.60	70.0	-	-	0.148	5.20	-	-
NEW RD	15/1/93	-	4.80	27.0	0.060	0.0125	0.1235	6.86	40.0	-	-	0.244	2.30	-	-
SKYLINE	15/1/93	-	6.40	17.0	1.400	STR	0.044	6.88	50.0	-	-	0.480	3.80	-	-

Table 3.5.12 Water Quality Data of Manyame River (cont'd)

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/l	Ammonia Nitrogen mg/l	Nitrite mg/l	Nitrate mg/l	pH	T-Alkalinity mg/l	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/l	Dissolved Oxygen mg/l	Iron (Fe) mg/l	Manganese (Mn) mg/l
below	21/4/93	-	9.00	9.0	0.055	0.008	0.014	6.49	40.0	100.0	41.0	0.020	5.90	1.50	0.43
NEW RD	21/4/93	-	3.80	29.0	0.295	0.024	0.019	6.66	30.0	150.0	38.0	0.158	2.30	1.03	0.21
SKYLINE	21/4/93	-	4.80	19.0	2.200	0.065	0.071	6.97	50.0	100.0	23.0	0.640	3.80	0.87	NIL
below	13/7/93	-	0.80	19.0	0.075	TR	0.144	7.54	50.0	100.0	32.0	0.040	8.80	0.50	NIL
NEW RD	13/7/93	-	1.60	27.0	0.090	TR	0.120	6.63	70.0	140.0	36.0	0.040	1.60	0.31	0.05
SKYLINE	13/7/93	-	6.00	49.0	0.245	0.110	0.078	7.58	220.0	470.0	72.0	2.480	1.10	0.49	0.03
below	11/9/93	-	NO SAMPLES												
NEW RD	11/9/93	-	25.00	74.0	100.000	1.350	NIL	7.76	550.0	1140.0	118.0	-	0.10	0.16	NIL
SKYLINE	11/9/93	-	8.60	64.0	28.000	1.580	0.050	7.88	290.0	800.0	94.0	-	5.70	0.06	0.03
below	29/11/93	-	2.00	21.0	0.115	NIL	0.030	7.12	60.0	200.0	46.0	-	6.00	3.40	0.25
NEW RD	29/11/93	-	2.20	33.0	2.000	TR	0.020	7.25	68.0	300.0	36.0	-	3.50	0.90	0.40
SKYLINE	29/11/93	-	10.20	92.0	0.090	0.210	0.140	7.60	372.0	950.0	104.0	-	6.00	0.37	0.11
below	8/3/94	-	1.40	3.60	0.110	NIL	0.025	7.00	44.0	-	28.0	0.032	6.10	1.00	NIL
NEW RD	8/3/94	-	3.80	5.85	2.000	TR	0.010	7.24	40.0	-	28.0	0.144	5.40	1.61	NIL
SKYLINE	8/3/94	-	1.40	6.00	0.900	0.100	0.008	7.26	44.0	-	32.0	0.036	4.30	1.15	TR
below	5/7/94	-	1.00	13.0	0.110	NIL	0.100	7.69	72.0	260.0	48.0	0.040	4.50	1.31	0.20
NEW RD	5/7/94	-	2.00	29.0	NIL	NIL	0.164	7.82	36.0	190.0	38.0	0.092	6.90	1.51	0.06
SKYLINE	5/7/94	-	3.00	33.0	4.640	0.188	1.452	7.81	160.0	450.0	61.0	1.348	0.50	0.20	0.03
below	13/9/94	-	2.60	19.0	0.540	TR	0.034	6.86	90.0	180.0	-	0.680	5.60	2.72	1.00
NEW RD	13/9/94	-	3.60	23.0	0.260	STR	0.060	7.27	70.0	160.0	-	0.184	8.90	0.38	0.17
SKYLINE	13/9/94	-	9.80	73.0	30.000	0.360	1.040	7.73	340.0	930.0	-	2.960	6.20	0.65	0.20
below	8/11/94	-	7.00	27.0	1.860	TR	0.014	7.00	130.0	290.0	80.0	0.760	3.50	5.52	0.71
NEW RD	8/11/94	-	4.00	67.4	8.000	0.011	0.025	6.99	90.0	200.0	30.0	0.580	5.80	0.52	0.104
SKYLINE	8/11/94	-	13.00	57.0	27.000	0.310	0.050	7.40	200.0	650.0	80.0	0.700	7.40	1.34	0.152
below	17/1/95	-	4.20	87.0	0.180	STR	TR	6.96	80.0	220.0	75.0	0.220	3.10	-	-
NEW RD	17/1/95	-	3.80	59.0	0.200	0.012	0.013	6.68	40.0	200.0	45.0	0.060	3.00	-	-
SKYLINE	17/1/95	-	7.40	39.0	4.100	0.020	0.010	6.88	70.0	220.0	50.0	1.820	1.10	-	-
below	11/4/95	-	1.60	39.0	0.170	NIL	0.012	6.76	130.0	300.0	110.0	0.510	1.65	4.27	0.77
NEW RD	11/4/95	-	1.50	35.0	0.020	NIL	0.035	6.86	70.0	200.0	50.0	0.060	2.95	0.31	0.07
SKYLINE	11/4/95	-	3.40	53.0	0.280	0.050	0.042	7.05	130.0	370.0	65.0	1.020	5.60	0.07	0.05
below	15/6/95	-	NO SAMPLING												
NEW RD	15/6/95	-	1.50	33.0	TR	TR	0.015	7.02	70.0	1200.0	120.0	3.800	8.30	0.58	0.78
SKYLINE	15/6/95	-	0.90	57.0	0.480	0.017	0.061	6.66	130.0	210.0	50.0	2.150	1.25	0.35	0.02
below	1/8/95	-	NO SAMPLING												
NEW RD	1/8/95	-	1.20	35.0	0.120	0.003	0.058	6.76	100.0	240.0	120.0	0.960	5.20	0.64	0.15
SKYLINE	1/8/95	-	5.60	107.0	1.520	0.250	0.020	6.70	130.0	590.0	105.0	2.000	7.00	0.03	0.04

Table 3.5.12 Water Quality Data of Manyame River (cont'd)

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/l	Ammonia Nitrogen mg/l	Nitrite mg/l	Nitrate mg/l	pH	T-Alkalinity mg/l	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/l	Dissolved Oxygen mg/l	Iron (Fe) mg/l	Manganese (Mn) mg/l	
below	26/9/95	-	NO SAMPLING													
NEW RD	26/9/95	-	2.20	37.0	0.100	TR	0.006	7.06	80.0	650.0	100.0	0.030	7.30	.	.	
SKYLINE	26/9/95	-	6.90	83.0	0.310	0.132	0.143	7.16	120.0	300.0	44.0	3.800	3.70	.	.	
below	7/11/95	-	NO SAMPLING													
NEW RD	7/11/95	-	1.80	39.0	TR	NIL	0.023	6.81	80.0	400.0	90.0	0.036	4.90	0.05	0.04	
SKYLINE	7/11/95	-	NO SAMPLING													
below	2/1/96	-	12.90	17.0	3.000	NIL	0.020	6.59	140.0	300.0	100.0	0.352	3.30	3.537	0.896	
NEW RD	2/1/96	-	5.30	21.0	0.250	NIL	0.019	6.61	700.0	200.0	50.0	0.672	10.15	0.912	0.14	
SKYLINE	2/1/96	-	6.20	19.0	0.200	0.0145	0.021	8.07	70.0	200.0	50.0	0.336	1.75	0.951	0.036	
below	2/4/96	-	11.00	13.0	STR	STR	TR	7.05	50.0	150.0	70.0	0.300	6.20	1.01	0.03	
NEW RD	2/4/96	-	16.40	11.0	NIL	TR	TR	7.09	40.0	150.0	80.0	0.180	6.00	0.58	NIL	
SKYLINE	2/4/96	-	6.80	9.0	STR	0.009	0.003	7.10	40.0	140.0	65.0	0.180	4.50	1.34	NIL	

Table 3.5.12 Water Quality Data of Manyame River (cont'd)

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity µS/cm	Total Hardness mg/L	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L
at Manyame	25/8/92	-	2.40	53.0	0.050	STR	0.005	7.65	78.0	500.0	95.0	0.042	10.10	NIL	NIL
at Manyame	25/9/92	-	5.80	59.0	TR	STR	STR	7.76	90.0	540.0	100.0	0.030	7.50	0.11	0.24
at Manyame	29/10/92	-	3.00	63.0	0.780	0.016	0.017	7.79	120.0	620.0	106.0	0.032	8.00	0.39	0.64
at Manyame	22/12/92	-	3.60	64.0	1.540	0.043	0.018	7.40	112.0	550.0	102.0	0.036	3.40	0.21	0.06
at Manyame	22/1/93	-	4.80	57.0	0.065	0.008	0.045	7.25	80.0	440.0	136.0	0.046	8.80	2.04	0.35
at Manyame	29/4/93	-	0.40	33.0	0.130	TR	0.055	7.38	90.0	220.0	82.0	0.016	7.80	0.16	0.09
at Manyame	19/7/93	-	2.60	37.0	0.740	NIL	0.037	7.54	80.0	340.0	110.0	0.100	9.90	0.09	0.01
at Manyame	23/9/93	-	2.00	59.0	0.040	TR	0.023	8.09	100.0	330.0	100.0	0.050	10.00	0.11	0.10
at Manyame	2/12/93	-	3.80	45.0	0.255	NIL	TR	7.68	96.0	450.0	110.0	0.032	7.10	0.60	0.20
at Manyame	15/3/94	-	4.00	54.0	0.145	0.004	0.008	7.19	80.0	-	-	0.060	3.10	0.37	TR
at Manyame	28/6/94	-	2.20	87.0	0.490	0.060	-	6.98	90.0	450.0	122.0	0.044	5.10	-	-
at Manyame	2/8/94	-	2.20	52.0	0.155	NIL	0.047	7.13	102.0	510.0	0.1	3.900	1.25	0.96	-
at Manyame	11/10/94	-	5.00	55.0	0.120	NIL	0.110	7.04	100.0	560.0	-	0.160	2.90	0.77	1.06
at Manyame	6/12/94	-	4.40	83.0	STR	NIL	0.010	7.05	135.0	540.0	126.0	0.800	8.20	0.08	0.14
at Manyame	3/1/95	-	8.20	77.0	0.150	NIL	TR	6.98	140.0	810.0	260.0	0.500	1.00	0.62	4.40
at Manyame	30/1/95	-	3.90	55.0	0.140	0.036	0.013	7.30	110.0	560.0	128.0	0.130	5.20	0.42	0.12
at Manyame	20/2/95	-	8.40	85.0	TR	0.007	0.003	6.88	130.0	700.0	140.0	2.520	1.90	5.09	0.10
at Manyame	28/6/95	-	2.60	79.0	TR	0.004	0.012	6.98	100.0	670.0	150.0	0.520	3.25	0.07	0.09
at Manyame	29/8/95	-	5.20	123.0	TR	NIL	0.013	7.10	120.0	750.0	138.0	0.136	7.00	0.29	0.36
at Manyame	24/10/95	-	18.60	87.0	TR	STR	0.005	7.49	150.0	840.0	156.0	NIL	3.85	4.47	0.72
at Manyame	30/4/96	-	5.80	51.0	0.120	STR	TR	6.73	150.0	390.0	120.0	0.100	5.55	1.24	0.12

Table 3.5.13 Water Quality Data of Musitwi River, Manyame River Upstream

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
MUSITWI	29/1/91	-	1.00	6.00	0.050	TR	0.011	6.40	40.0	90.00	26.0	0.040	5.60
MANYAME(US)	29/1/91	-	2.60	7.00	0.170	0.005	0.003	6.54	55.0	130.00	42.0	0.050	5.40
MUSITWI	23/4/91	-	4.20	5.00	0.080	NIL	0.015	7.16	40.0	90.00	26.0	0.020	5.70
MANYAME(US)	23/4/91	-	2.80	6.00	0.090	NIL	0.011	7.45	60.0	110.00	40.0	0.020	7.50
MUSITWI	16/7/91	-	2.00	4.00	TR	TR	TR	7.42	36.0	100.00	30.0	0.030	7.90
MANYAME(US)	16/7/91	-	1.80	4.00	TR	TR	TR	7.53	68.0	159.00	57.0	0.030	8.10
MUSITWI	22/10/91	-	4.00	7.00	0.720	0.005	0.050	8.03	60.0	102.00	-	0.800	11.30
MANYAME(US)	22/10/91	-	3.00	13.00	0.160	0.011	0.160	7.28	130.0	210.00	-	0.230	4.00
MUSITWI	18/1/92	-	2.20	32.00	0.100	STR	TR	7.46	52.0	130.00	50.0	0.024	6.00
MANYAME(US)	18/1/92	-	2.00	7.00	0.100	NIL	TR	7.31	56.0	120.00	50.0	0.100	4.30
MUSITWI	19/5/92	-	1.20	25.00	TR	TR	0.024	7.24	80.0	430.00	75.0	0.190	4.70
MANYAME(US)	19/5/92	-	2.20	25.00	TR	TR	0.028	7.13	110.0	130.00	65.0	0.150	5.20
MUSITWI	28/7/92	-	1.80	10.00	0.130	NIL	0.030	6.99	120.0	160.00	68.0	1.640	3.90
MANYAME(US)	28/7/92	-			NO SAMPLE								
MUSITWI	1/9/92	-			NO SAMPLE								
MANYAME(US)	1/9/92	-			NO SAMPLE								
MUSITWI	1/10/92	-			NO SAMPLE								
MANYAME(US)	1/10/92	-			NO SAMPLE								
MUSITWI	7/5/93	-			NO SAMPLE								
MANYAME(US)	7/5/93	-	3.60	9.00	0.190	NIL	0.058	6.82	50.0	75.00	36.0	0.088	3.90
MUSITWI	29/7/93	-			NO SAMPLE								
MANYAME(US)	29/7/93	-	1.60	17.00	TR	NIL	0.124	7.31	100.0	130.00	54.0	0.080	6.50
MUSITWI	4/8/93	-	6.80	61.00	0.200	STR	0.089	7.38	70.0	100.00	22.0	0.050	5.20
MANYAME(US)	4/8/93	-	4.60	77.00	0.180	STR	0.074	7.05	50.0	100.00	56.0	0.096	5.00
MUSITWI	14/10/93	-	3.00	19.00	TR	0.0085	0.0125	6.69	80.0	105.00	36.0	0.160	4.40
MANYAME(US)	14/10/93	-	3.40	23.00	TR	0.039	0.049	6.98	100.0	195.00	74.0	0.220	3.10
MUSITWI	13/12/93	-			NO SAMPLE								
MANYAME(US)	13/12/93	-	5.20	6.00	0.250	NIL	0.040	6.80	90.0	140.00	50.0	0.280	1.10

Table 3.5.13 Water Quality Data of Musitwi River, Manyame River Upstream

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
MUSITWI	24/3/94	-	4.00	23.00	11.000	TR	0.020	6.69	100.0	90.00	30.0	0.210	4.40
MANYAME(US)	24/3/94	-	5.00	21.00	3.600	TR	0.010	6.55	90.0	100.00	30.0	0.150	4.80
MUSITWI	19/7/94	-			NO SAMPLE								
MANYAME(US)	19/7/94	-			NO SAMPLE								
MUSITWI	8/9/94	-	5.20	17.00	0.240	NIL	0.015	6.98	60.0	120.00	55.0	0.620	8.50
MANYAME(US)	8/9/94	-	2.60	17.00	STR	NIL	0.0875	6.92	80.0	150.00	65.0	0.140	6.80
MUSITWI	2/11/94	-	17.20	11.00	8.000	0.005	0.011	7.20	290.0	620.00	150.0	0.720	NIL
MANYAME(US)	2/11/94	-	4.00	21.00	0.150	STR	0.240	7.36	100.0	150.00	75.0	0.280	4.80
MUSITWI	3/3/95	-			NO SAMPLE								
MANYAME(US)	3/3/95	-	1.70	11.00	TR	0.016	0.066	6.93	90.0	210.00	70.0	0.014	1.30
MUSITWI	22/5/95	-			NO SAMPLE								
MANYAME(US)	22/5/95	-			NO SAMPLE								
MUSITWI	6/12/95	-	5.30	19.85	TR	TR	0.016	7.40	220.0	325.00	30.0	0.680	5.85
MANYAME(US)	6/12/95	-	5.90	19.85	TR	NIL	TR	7.14	210.0	180.00	70.0	0.136	3.45
MUSITWI	27/2/96	-	7.20	11.00	0.160	NIL	0.017	7.11	50.0	80.00	60.0	0.050	5.90
MANYAME(US)	27/2/96	-	7.20	9.00	0.140	NIL	0.007	7.19	50.0	80.00	30.0	0.050	5.50

Table 3.5.14 Water Quality Data of Ruwa River

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
WIDD RD	29/1/91	-	6.20	25.00	0.220	0.008	0.008	6.45	50.0	170.00	32.0	0.260	3.00
WIDD RD	23/4/91	-	3.00	20.00	0.100	NIL	0.019	7.05	50.0	200.00	36.0	0.100	1.00
WIDD RD	16/7/91	-	2.20	64.00	TR	TR	TR	7.10	52.0	360.00	64.0	0.110	2.30
WIDD RD	22/10/91	-				NO SAMPLE							
WIDD RD	18/1/92	-	11.60	72.00	9.200	0.020	0.060	7.25	144.0	690.00	75.0	0.400	1.70
WIDD RD	19/5/92	-	4.40	40.00	0.190	0.013	0.002	6.75	80.0	190.00	90.0	0.120	1.90
WIDD RD	28/7/92	-	4.40	118.00	0.210	NIL	0.030	6.83	150.0	600.00	81.0	0.480	0.40
WIDD RD	1/9/92	-	10.20	125.00	0.080	NIL	0.036	6.95	140.0	650.00	89.0	0.470	0.30
WIDD RD	1/10/92	-				NO SAMPLE							
WIDD RD	7/5/93	-	6.40	25.00	0.2	NIL	0.120	7.15	60.0	95.00	38.0	0.112	7.00
WIDD RD	29/7/93	-	2.40	37.00	0.110	NIL	0.120	7.28	70.0	180.00	42.0	0.360	5.80
WIDD RD	4/8/93	-	6.80	67.00	0.210	0.010	0.160	7.35	100.0	150.00	52.0	0.280	5.80
WIDD RD	14/10/93	-	10.60	85.00	1.380	TR	0.0780	6.88	180.0	500.00	136.0	1.300	NIL
WIDD RD	13/12/93	-	13.20	93.00	135.0	0.02	0.010	7.24	210.0	500.00	80.0	0.160	2.30
WIDD RD	24/3/94	-	4.40	33.00	3.300	STR	TR	6.70	100.0	140.00	37.0	0.140	5.90
WIDD RD	19/7/94	-	1.40	37.00	STR	STR	0.800	7.02	50.0	260.00	50.0	0.472	1.50
WIDD RD	8/9/94	-	4.60	47.00	STR	0.006	0.059	6.74	100.0	275.00	90.0	1.740	3.50
WIDD RD	2/11/94	-	12.00	39.00	0.110	STR	0.200	7.79	110.0	230.00	75.0	0.120	6.80
WIDD RD	3/3/95	-	5.40	67.00	2.200	0.09	0.026	7.02	130.0	460.00	86.0	1.436	4.60

Table 3.5.14 Water Quality Data of Ruwa River (cont'd)

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L
WIDD RD	22/5/95	-				NO SAMPLE							
WIDD RD	6/12/95	-	19.60	139.85	8.500	1.100	0.080	7.64	220.0	950.00	120.0	2.760	5.95
WIDD RD	27/2/96	-	9.00	19.00	0.150	0.0033	0.014	7.14	40.0	140.00	50.0	0.500	6.40

**Table 3.5.15 Water Quality Data of Nyatsime River
(Upstream and Downstream of Zengeza STW)**

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity uS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L
Upstream of STW	9/1/91	-	4.60	5.00	0.095	STR	STR	6.85	40.0	80.0	-	0.030	3.40	7.85	0.05
Downstream of STW	9/1/91	-	12.80	21.00	8.250	0.620	1.420	7.20	140.0	390.0	-	0.310	0.70	2.23	0.05
Upstream of STW	9/4/91	-	3.20	15.00	0.080	NIL	TR	7.77	40.0	90.0	26.0	0.100	6.10	7.64	0.02
Downstream of STW	9/4/91	-	10.60	35.00	2.050	NIL	0.016	8.94	150.0	320.0	30.0	0.350	0.60	5.21	0.03
Upstream of STW	2/7/91	-	3.20	9.00	8.250	TR	TR	7.37	45.0	95.0	55.0	0.022	6.50	1.66	0.07
Downstream of STW	2/7/91	-	27.60	94.00	19.750	0.035	0.071	9.07	680.0	1650.0	120.0	2.700	NIL	0.55	0.10
Upstream of STW	8/10/91	-	DRY												
Downstream of STW	8/10/91	-	36.60	110.00	3.800	1.250	NIL	7.48	800.0	1600.0	140.0	5.400	NIL	0.97	0.02
Upstream of STW	14/1/92	-	104.80	42.00	26.000	NIL	TR	7.30	310.0	790.0	100.0	6.400	4.00	23.26	1.76
Downstream of STW	14/1/92	-	2.80	10.00	0.140	NIL	TR	7.15	50.0	80.0	60.0	0.084	3.80	3.54	0.08
Upstream of STW	7/4/92	-	2.60	38.00	0.365	NIL	0.030	6.82	50.0	40.0	22.0	0.088	3.90	3.06	0.12
Downstream of STW	7/4/92	-	15.40	37.00	14.250	NIL	NIL	7.88	200.0	600.0	60.0	2.500	NIL	1.53	0.32
Upstream of STW	7/7/92	-	NO SAMPLES												
Downstream of STW	7/7/92	-	40.40	106.00	4.600	0.710	NIL	8.16	630.0	480.0	77.0	7.280	NIL	0.37	NIL
Upstream of STW	8/9/92	-	NO SAMPLES												
Downstream of STW	8/9/92	-	34.80	119.00	50.000	1.850	0.066	7.89	664.0	1655.0	141.0	3.000	NIL	0.07	0.21
Upstream of STW	9/10/92	-	NO SAMPLES												
Downstream of STW	9/10/92	-	23.40	137.00	51.000	3.400	NIL	8.65	690.0	1700.0	130.0	7.140	NIL	0.56	0.20
Upstream of STW	15/11/92	-	NO SAMPLES												
Downstream of STW	15/11/92	-	37.60	137.00	60.000	0.020	0.270	7.64	860.0	1390.0	138.0	13.800	NIL	0.72	0.22
Upstream of STW	15/12/92	-	5.20	11.00	0.200	0.005	0.023	7.05	44.0	130.0	34.0	0.080	4.70	3.49	0.18
Downstream of STW	15/12/92	-	12.00	11.00	0.850	0.0145	0.119	6.98	40.0	120.0	46.0	0.600	2.50	1.36	NIL
Upstream of STW	15/1/93	-	10.40	21.00	4.850	0.060	0.470	7.62	110.0	-	-	0.320	0.60	-	-
Downstream of STW	15/1/93	-	4.80	3.00	0.870	0.0085	0.0855	6.89	40.0	-	-	0.200	3.60	-	-
Upstream of STW	21/4/93	-	5.00	9.00	0.085	0.006	0.051	6.86	30.0	50.0	20.0	0.200	-	2.38	NIL
Downstream of STW	21/4/93	-	5.60	13.00	0.230	0.007	0.046	7.14	30.0	60.0	23.0	0.400	5.00	1.64	NIL
Upstream of STW	13/7/93	-	2.80	17.00	-	NIL	0.050	7.35	60.0	700.0	39.0	0.080	6.30	1.17	0.02
Downstream of STW	13/7/93	-	14.60	69.00	-	0.170	0.018	7.56	330.0	490.0	93.0	7.040	NIL	0.25	0.06
Upstream of STW	15/9/93	-	NO SAMPLES												
Downstream of STW	15/9/93	-	25.00	74.00	100.000	1.350	NIL	7.76	550.0	1140.0	118.0	-	0.10	0.16	0.06
Upstream of STW	29/11/93	-	NO SAMPLES												
Downstream of STW	29/11/93	-	39.20	97.00	8.000	NIL	0.040	8.99	732.0	1600.0	118.0	-	NIL	0.70	0.87
Upstream of STW	8/3/94	-	0.40	1.80	0.365	TR	0.007	7.02	48.0	-	24.0	0.164	5.00	2.73	NIL
Downstream of STW	8/3/94	-	2.80	4.50	10.000	0.090	0.048	6.91	86.0	-	38.0	0.650	2.40	1.75	TR
Upstream of STW	5/7/94	-	2.00	13.00	0.190	NIL	0.087	8.21	44.0	190.0	39.0	0.092	8.50	1.86	0.04
Downstream of STW	5/7/94	-	9.40	99.70	58.000	1.475	1.405	7.27	530.0	1190.0	121.0	12.040	1.60	0.75	0.18
Upstream of STW	13/9/94	-	21.00	79.00	49.000	0.775	1.075	7.49	420.0	1170.0	-	1.010	1.80	0.72	0.05
Downstream of STW	13/9/94	-	10.00	87.00	22.500	0.055	0.105	7.40	180.0	850.0	-	6.680	1.40	3.74	NIL

**Table 3.5.15 Water Quality Data of Nyatsime River
(Upstream and Downstream of Zengeza STW) (cont'd)**

Sample Point	Sampling Date	Flow m ³ /day	Oxygen Absorbed ppm	Chloride mg/L	Ammonia Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	pH	T-Alkalinity mg/L	Electric Conductivity µS/cm	Total Hardness	Phosphate mg/L	Dissolved Oxygen mg/L	Iron (Fe) mg/L	Manganese (Mn) mg/L
Upstream of STW	8/11/94	-	7.00	17.00	0.300	NIL	0.019	7.13	60.0	150.0	45.0	0.680	6.00	2.03	0.34
Downstream of STW	8/11/94	-	33.00	67.00	44.000	0.005	0.915	7.67	430.0	1050.0	100.0	0.940	NIL	1.07	0.04
Upstream of STW	17/1/95	-	10.40	69.00	31.500	0.095	0.063	7.05	190.0	670.0	90.0	7.000	3.10	-	-
Downstream of STW	17/1/95	-	8.00	101.00	1.800	0.029	0.585	6.90	90.0	570.0	110.0	0.560	3.60	-	-
Upstream of STW	11/4/95	-	1.60	47.00	0.030	0.006	0.091	7.07	90.0	290.0	85.0	7.200	8.25	0.14	0.06
Downstream of STW	11/4/95	-	25.40	49.00	62.000	0.630	1.695	7.06	400.0	990.0	111.0	0.720	0.20	1.54	0.05
Upstream of STW	15/6/95	-	1.10	41.00	TR	0.015	0.048	7.06	110.0	360.0	150.0	0.150	9.00	0.10	0.02
Downstream of STW	15/6/95	-	20.25	93.00	79.000	0.690	NIL	7.14	112.0	550.0	100.0	10.300	NIL	0.16	0.07
Upstream of STW	1/8/95	-	1.00	45.00	0.160	0.018	0.032	6.62	160.0	480.0	115.0	0.630	8.80	0.51	0.23
Downstream of STW	1/8/95	-	26.70	123.00	72.000	0.660	NIL	6.72	560.0	1440.0	180.0	11.200	NIL	0.85	0.11
Upstream of STW	26/9/95	-	3.20	69.00	0.110	0.068	0.107	7.11	220.0	1200.0	262.0	0.034	5.20	-	-
Downstream of STW	26/9/95	-	23.90	159.00	79.000	0.4550	0.0100	7.14	590.0	700.0	142.0	10.600	0.20	-	-
Upstream of STW	7/11/95	-	14.20	122.00	0.240	0.029	0.031	7.41	350.0	1100.0	160.0	0.264	3.00	0.09	0.09
Downstream of STW	7/11/95	-	21.80	157.00	62.000	0.760	0.120	7.21	550.0	1650.0	230.0	10.000	NIL	0.04	0.10
Upstream of STW	2/1/96	-	2.80	33.00	0.300	0.0275	0.0045	6.79	70.0	400.0	90.0	0.040	5.40	0.734	0.028
Downstream of STW	2/1/96	-	5.60	23.00	2.700	0.019	0.017	6.73	80.0	210.0	60.0	0.200	NIL	1.854	0.104
Upstream of STW	2/4/96	-	3.40	23.00	STR	0.007	0.002	7.04	60.0	300.0	80.0	0.180	6.70	0.32	NIL
Downstream of STW	2/4/96	-	16.60	55.00	30.000	0.052	0.003	7.43	150.0	610.0	90.0	3.200	NIL	1.06	0.16