

4-46

												WHO Guideline Value for Drinking Water (mg/L)																	
												200		0.3	0.1	1.5	0.01			250	250	50	1.5					1000	
Ser. No.	Test Well No.	Lab No.	Village No.	Sample Type	Sampling date	Water Temp (Field) (deg-C)	ORP (Field) (mV)	pH	EC (mS/m)	Calcium (Ca) (mg/L)	Magnesium (Mg) (mg/L)	Sodium (Na) (mg/L)	Potassium (K) (mg/L)	Total Iron (Fe) (mg/L)	Manganese (Mn) (mg/L)	Ammonia (NH4) (mg/L)	Arsenic (As) (mg/L)	Carbonate (CO3) (mg/L)	Bicarbonate (HCO3) (mg/L)	Dissolved gascarbon-dioxide (CO2) (mg/L)	Chloride (Cl) (mg/L)	Sulfate (SO4) (mg/L)	Nitrate (NO3) (mg/L)	Fluoride (F) (mg/L)	Silica (SiO2) (mg/L)	Total Hardness as CaCO3 (mg/L)	Perma-nent Hardness as CaCO3 (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Appearance of water at time Analysis
1	1	44544	035G	Raw water	25-Sep-01	30.4	75	7.66	71.5	65.28	19.23	73.57	2.30	0.04	0.23	0.03	0	0.0	457.04	16	7.51	0.00	0.10	0.26	33.20	242.0	0	427	Insoluble matter
2	1	45001	035G	Raw water	13-Dec-01	29.7	19	7.46	66.5	62.40	19.52	69.00	2.00	0.10	0.38	0.36	0	0.0	437.34	24	5.83	0.50	0.31	0.26	34.30	236.0	0	409	Clear
3	2	44545	045G	Raw water	25-Sep-01	30.6	139	7.68	45.0	53.44	7.94	24.40	1.30	0.05	0.44	0.05	0	0.0	228.52	8	13.05	9.59	3.20	0.17	31.80	166.0	0	259	Insoluble matter
4	2	45002	045G	Raw water	13-Dec-01	30.4	37	7.34	37.8	47.20	7.35	24.83	2.00	0.06	0.23	0.50	0	0.0	222.61	16	7.12	4.10	0.00	0.15	33.90	148.0	0	237	Small amount of insoluble matter
5	3	44547	061G	Raw water	25-Sep-01	29.8	-26	7.68	67.8	70.00	11.75	53.80	4.60	0.72	1.60	0.31	0.002	0.0	390.06	13	14.24	3.25	0.23	0.18	45.50	223.0	0	399	Small amount of precipitated iron
6	4	44548	072G	Raw water	26-Sep-01	29.7	147	7.38	52.2	59.20	14.36	24.83	1.10	0.03	0.35	0.02	0	0.0	281.71	19	3.16	13.98	0.00	1.87	73.40	206.8	0	331	Small amount of insoluble matter
7	5	44549	082G	Raw water	26-Sep-01	30.6	-61	7.89	76.9	26.56	5.18	159.00	5.60	0.05	1.60	0.19	0.006	0.0	470.83	10	3.96	3.87	0.24	1.53	36.10	87.6	0	479	Small amount of insoluble matter
8	6	44550	005G	Raw water	26-Sep-01	30.3	-62	7.60	58.2	72.96	13.11	24.60	1.10	0.39	0.75	0.05	0.005	0.0	330.96	13	13.05	0.00	0.20	0.24	41.80	236.0	0	331	Small amount of insoluble matter
9	7	44551	162G	Raw water	25-Sep-01	30.0	10	11.28	165.0	5.60	0.88	218.00	7.40	0.12	0.01	0.00	0.005	110.6	0.00	0	25.71	26.81	0.31	0.72	32.30	17.6	0	464	Small amount of insoluble matter
10	7	45003	162G	Raw water	13-Dec-01	29.4	10	8.55	84.7	4.80	3.41	198.84	2.30	0.22	0.04	0.48	0.004	38.8	431.43	2	16.22	12.60	0.44	0.70	19.00	26.0	0	510	Small amount of insoluble matter
11	8	44552	168G	Raw water	25-Sep-01	29.4	160	7.56	122.0	130.40	45.84	42.76	2.50	0.07	0.08	0.00	0.001	0.0	425.52	19	160.57	7.73	11.02	0.26	42.50	514.0	165.29	653	Small amount of insoluble matter
12	8	45004	168G	Raw water	13-Dec-01	29.6	128	7.28	120.0	132.00	51.13	37.42	2.30	0.09	0.02	0.30	0	0.0	429.46	36	170.46	4.00	8.96	0.21	44.10	540.0	188	662	Clear
13	9	44541	189G	Raw water	26-Sep-01	29.2	87	7.68	71.5	43.52	8.61	106.90	7.10	0.09	0.56	0.02	0.004	0.0	413.70	14	12.66	9.67	0.17	1.82	33.00	144.0	0	428	Small amount of insoluble matter
14	10	44543	197G	Raw water	26-Sep-01	29.9	130	7.70	40.0	31.68	3.63	47.62	1.90	0.10	0.04	0.00	0.073	0.0	232.46	7	1.98	0.00	0.14	0.21	49.50	84.0	0	252	Small amount of insoluble matter
15	10	45005	197G	Raw water	14-Dec-01	29.2	39	7.53	44.6	38.40	6.36	51.39	2.50	0.64	0.74	1.00	0.096	0.0	283.68	13	3.56	0.30	0.00	0.24	48.80	122.0	0	293	Small amount of insoluble matter
16	10	45006	197G	Filtered water	14-Dec-01	28.3	36	7.50	38.3	34.40	4.90	42.83	4.50	0.14	0.01	0.42	0.047	0.0	224.58	11	11.87	0.20	2.29	0.20	44.90	106.0	0	257	Clear
17	11	44559	008M	Raw water	03-Oct-01	29.5	186	6.27	11.0	7.84	5.65	4.83	1.30	0.03	0.01	0.00	0	0.0	57.13	49	2.37	0.09	3.03	0.07	46.12	42.8	0	99	Clear
18	12	44560	015M	Raw water	04-Oct-01	29.6	4	7.70	88.7	60.80	65.20	21.38	3.20	0.05	0.35	0.00	0	0.0	445.22	14	62.88	14.80	0.23	0.17	56.82	420.0	55.14	505	Clear
19	13	44561	019M	Raw water	03-Oct-01	29.2	186	6.80	18.9	14.88	8.86	8.51	1.70	0.07	0.08	0.01	0	0.0	96.53	24	6.33	0.79	1.62	0.01	39.57	73.6	0	130	Small amount of precipitated iron
20	14	44564	046M	Raw water	03-Oct-01	29.9	-18	7.52	83.8	119.20	26.15	22.53	0.50	0.14	0.08	0.05	0.001	0.0	490.53	24	20.17	0.18	0.00	0.42	37.60	405.0	3.01	469	Clear

Figure 4.3.1 (2/2) Results of Laboratory Chemical Analysis of Groundwater Taken from JICA Test Wells

												WHO Guideline Value for Drinking Water (mg/L)																									
												200		0.3		0.1		1.5		0.01				250		250		50		1.5						1000	
Ser. No.	Test Well No.	Lab No.	Village No.	Sample Type	Sampling date	Water Temp. (Field) (deg-C)	ORP (Field) (mV)	pH	EC (mS/m)	Calcium (Ca) (mg/L)	Magnesium (Mg) (mg/L)	Sodium (Na) (mg/L)	Potassium (K) (mg/L)	Total Iron (Fe) (mg/L)	Manganese (Mn) (mg/L)	Ammonia (NH ₄) (mg/L)	Arsenic (As) (mg/L)	Carbonate (CO ₃) (mg/L)	Bicarbonate (HCO ₃) (mg/L)	Dissolved gas carbon dioxide (CO ₂) (mg/L)	Chloride (Cl) (mg/L)	Sulfate (SO ₄) (mg/L)	Nitrate (NO ₃) (mg/L)	Fluoride (F) (mg/L)	Silica (SiO ₂) (mg/L)	Total Hardness as CaCO ₃ (mg/L)	Permanent Hardness as CaCO ₃ (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Appearance of water at time Analysis								
21	15	44565	055M	Raw water	03-Oct-01	28.8	173	6.63	14.5	10.72	6.14	7.82	3.40	0.03	0.00	0.00	0	0.0	80.77	30	2.37	0.00	0.00	0.14	72.60	52.0	0	143	Clear								
22	16	44566	082M	Raw water	04-Oct-01	28.4	226	5.80	3.0	2.24	1.07	2.30	0.10	0.02	0.05	0.00	0	0.0	15.78	40	0.79	0.00	0.00	0.00	9.40	10.0	0	24	Clear								
23	17	44562	101M	Raw water	04-Oct-01	28.0	80	7.26	39.7	26.24	23.36	17.01	4.70	0.53	0.26	0.00	0	0.0	232.46	20	2.77	0.00	0.00	0.12	84.30	161.6	0	274	Clear								
24	18	44563	115M	Raw water	04-Oct-01	27.5	124	6.76	18.6	14.24	8.38	8.51	3.20	0.01	0.00	0.09	0	0.0	102.44	28	2.37	0.00	0.00	0.13	70.66	70.0	0	158	Clear								
25	19	44558	126M	Raw water	04-Oct-01	29.1	210	5.60	3.8	2.88	0.88	3.90	0.80	0.03	0.03	0.00	0.002	0.0	18.52	74	2.37	0.00	1.27	0.00	14.85	108	0	36	Clear								
26	20	44557	127M	Raw water	04-Oct-01	27.8	-40	7.37	67.6	112.00	8.88	20.69	1.00	1.07	0.30	0.03	0	0.0	417.64	29	3.56	0.18	0.00	0.11	34.40	316.0	0	388	Insoluble matter								
27	21	44460	171M	Raw water	28-Aug-01	28.3	201	6.05	6.5	4.16	2.82	2.76	4.10	0.03	0.08	0.00	0	0.0	34.82	50	2.37	0.00	0.00	0.16	44.80	22.0	0	79	Clear								
28	21	44569	171M	Raw water	02-Oct-01	28.5	206	6.18	6.5	4.16	2.24	2.95	3.90	0.02	0.00	0.00	0	0.0	35.46	37	1.58	0.00	0.00	0.05	41.40	19.6	0	74	Clear								
29	22	44570	214M	Raw water	27-Sep-01	28.5	-2	6.85	22.0	16.86	10.42	8.66	4.30	3.64	0.47	0.00	0.003	0.0	122.14	28	2.77	0.97	0.00	0.25	72.50	85.2	0	182	Insoluble matter								
30	23	44556	248M	Raw water	28-Sep-01	28.4	-31	6.94	35.5	28.16	12.86	22.30	2.30	2.88	1.60	0.00	0.002	0.0	187.15	34	4.75	5.36	0.00	0.47	54.30	123.2	0	227	Small amount of precipitated iron								
31	23	45007	248M	Raw water	18-Dec-01	28.6	-39	6.89	34.1	29.60	13.16	23.22	2.40	2.76	1.60	0.65	0.027	0.0	197.00	64	5.14	3.20	3.29	0.43	48.90	128.0	0	231	Small amount of precipitated iron								
32	23	45008	248M	Filtered water	18-Dec-01	28.7	27	6.86	34.2	30.40	13.64	22.76	2.80	0.22	1.60	0.60	0.014	0.0	198.97	44	5.14	2.50	2.14	0.41	49.50	132.0	0	229	Small amount of insoluble matter								
33	24	44572	264M	Raw water	02-Oct-01	28.3	199	5.85	9.1	4.48	1.17	7.58	5.60	0.02	0.17	0.05	0	0.0	21.67	49	12.66	2.56	0.00	0.00	36.89	16.0	0	82	Small amount of insoluble matter								
34	25	44573	269M	Raw water	03-Oct-01	29.1	135	6.43	14.1	8.00	5.36	11.04	2.50	0.38	0.23	0.01	0.003	0.0	70.92	42	6.72	0.26	0.00	0.12	65.30	42.0	0	135	Small amount of insoluble matter								
35	26	44571	273M	Raw water	03-Oct-01	28.2	6	7.65	60.3	48.80	27.76	38.60	1.50	0.11	0.28	0.00	0.002	0.0	360.51	13	7.51	0.18	0.00	0.12	58.58	236.0	0	362	Small amount of insoluble matter								
36	27	44567	321M	Raw water	08-Oct-01	30.5	755	6.93	44.0	32.32	20.06	22.53	3.20	2.17	0.03	0.00	0.005	0.0	236.40	44	14.24	0.35	0.06	0.00	32.93	163.2	0	244	Small amount of precipitated iron								
37	27	45009	321M	Raw water	19-Dec-01	29.6	-27	6.93	42.0	30.40	25.31	23.45	2.80	1.65	0.13	0.48	0.004	0.0	273.83	51	5.93	1.20	0.00	0.13	41.90	180.0	0	268	Small amount of precipitated iron								
38	27	45010	321M	Filtered water	19-Dec-01	28.1	53	7.12	42.6	32.00	25.31	23.45	3.20	0.17	0.11	0.52	0	0.0	275.80	33	5.54	0.30	0.00	0.14	41.90	184.0	0	268	Clear								
39	28	44568	337M	Raw water	02-Oct-01	28.4	-33	7.30	52.0	34.88	28.79	22.76	4.10	0.20	0.36	0.00	0.001	0.0	307.32	25	6.33	0.00	0.03	0.18	84.54	208.6	0	335	Clear								
40	28	44554	363M	Raw water	11-Oct-01	28.0	138	6.75	19.7	16.64	6.14	11.95	5.40	0.02	0.02	0.02	0	0.0	102.44	29	4.75	0.00	0.10	0.19	82.60	66.8	0	178	Clear								
41	30	44555	376M	Raw water	28-Sep-01	28.4	107	7.04	225.0	168.00	125.11	119.55	19.50	0.32	4.30	0.00	0	0.0	403.85	59	365.61	177.15	239.90	0.49	68.00	934.0	603.04	1507	Small amount of insoluble matter								

Figure 4.3.2 (1/4) Results of Laboratory Chemical Analysis of Groundwater Taken from Existing Wells

												WHO Guideline Value for Drinking Water (mg/L)																		
					200.00		0.30	0.10	1.50	0.01									250.00	250.00	50.00	1.50					1000			
Ser. No.	Lab No.	Village No.	Province	Well Type	Sampling date	Water Temp. (Field) (deg-C)	ORP (Field) (mV)	pH	EC (mS/cm)	Calcium (Ca) (mg/L)	Magnesium (Mg) (mg/L)	Sodium (Na) (mg/L)	Potassium (K) (mg/L)	Total Iron (Fe) (mg/L)	Manganese (Mn) (mg/L)	Ammonia (NH ₄) (mg/L)	Arsenic (As) (mg/L)	Carbonate (CO ₃) (mg/L)	Bicarbonate (HCO ₃) (mg/L)	Dissolved gas carbon dioxide (CO ₂) (mg/L)	Chloride (Cl) (mg/L)	Sulfate (SO ₄) (mg/L)	Nitrate (NO ₃) (mg/L)	Fluoride (F) (mg/L)	Silica (SiO ₂) (mg/L)	Total Hardness as CaCO ₃ (mg/L)	Permanent Hardness as CaCO ₃ (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Appearance of water at time Analysis	
1	44414	R005G	Kg Chhnang	DW	09-Aug-01	30.1	157	7.61	89.1	64.96	40.51	78.20	1.30	0.10	0.00	0.00	0.004	0.0	556.78	22	17.01	10.84	1.25	0.69	41.50	328.8	0	531	Small amount of insoluble matters	
2	44426	R035G	Kg Chhnang	DW	11-Aug-01	27.3	305	6.66	12.2	5.60	0.98	14.71	4.30	0.55	0.00	0.01	0	0.0	17.46	6	25.31	0.10	2.55	0.08	12.60	18.0	4	75	Small amount of insoluble matters	
3	44423	R045G	Kg Chhnang	DW	11-Aug-01	28.2	211	6.35	109.0	27.36	3.34	177.00	14.80	0.04	0.39	0.29	0	0.0	34.92	25	222.67	33.06	127.94	0.26	18.20	82.0	53	643	Small amount of insoluble matters	
4	44408	R061G	Kg Chhnang	DW	11-Aug-01	28.2	239	6.18	16.1	8.32	0.40	17.69	5.50	0.55	0.10	0.10	0	0.0	21.34	23	24.92	9.68	0.29	0.04	15.70	22.4	5	94	Small amount of insoluble matters	
5	44402	R085G	Kg Chhnang	DW	10-Aug-01	27.7	203	6.58	26.3	20.16	1.97	21.62	12.40	3.20	1.44	1.54	0.003	0.0	77.60	33	29.66	5.01	0.73	0.12	17.10	58.4	0	153	Precipitated iron	
6	44427	R071G	Kg Chhnang	DW	08-Aug-01	28.3	210	6.42	11.0	7.20	1.18	13.33	1.40	0.01	0.00	0.00	0	0.0	19.40	12	19.78	0.00	12.02	0.09	11.20	22.8	7	76	Clear	
7	44435	R017G	Kg Chhnang	DW	08-Aug-01	26.3	210	7.75	210.0	71.20	18.04	377.00	38.00	0.03	0.00	0.00	0.005	0.0	655.72	18	216.54	196.65	30.42	0.86	85.00	256.0	0	1360	Insoluble matters	
8	44422	R082G	Kg Chhnang	DW	10-Aug-01	27.4	158	6.92	32.0	26.08	1.88	18.62	20.80	0.62	0.17	0.12	0	0.0	89.24	17	41.13	7.38	1.53	0.11	18.90	73.2	0.07	181	Small amount of insoluble matters	
9	44412	R137G	Kg Chhnang	DW	10-Aug-01	28.6	202	6.47	18.1	18.56	0.99	13.54	1.70	0.07	0.07	0.11	0	0.0	48.50	26	26.50	0.00	1.85	0.02	14.70	50.4	11	102	Small amount of insoluble matters	
10	44403	R162G	Kg Chhnang	DW	06-Aug-01	29.1	138	6.86	14.2	18.40	2.74	6.55	0.80	0.05	0.37	0.06	0	0.0	58.20	13	7.12	0.00	8.20	0.02	12.90	57.2	10	86	Small amount of insoluble matters	
11	44421	R197G	Kg Chhnang	DW	07-Aug-01	28.3	249	5.91	25.3	15.68	3.13	16.55	10.40	0.05	0.07	1.96	0	0.0	9.70	19	37.18	4.59	42.67	0.05	23.60	52.0	44	161	Insoluble matters	
12	44424	S001G	Kg Chhnang	DW	07-Aug-01	28.1	209	6.32	42.9	8.48	3.02	68.97	20.00	1.70	0.36	3.06	0.002	0.0	40.74	31	67.63	53.00	2.78	0.57	52.60	33.6	0.21	302	Small amount of precipitated iron	
13	44401	S006G	Kg Chhnang	DW	18-Aug-01	30.2	105	7.60	66.7	38.24	7.43	113.57	3.50	0.66	0.10	0.38	0.006	0.0	405.46	16	7.12	1.04	0.68	0.42	28.40	126.0	0	401	Insoluble matters	
14	44459	R019M	Kg Cham	DW	29-Aug-01	27.2	401	4.84	17.7	7.04	4.38	9.66	10.70	0.06	1.16	0.48	0	0.0	3.88	90	19.78	0.00	47.80	0.13	5.80	35.6	32	108	Clear	
15	44463	R055M	Kg Cham	DW	30-Aug-01	28.5	251	5.33	1.8	1.60	0.78	1.15	0.30	0.29	0.08	0.00	0	0.0	7.76	58	2.37	0.00	0.00	0.13	8.20	7.2	1	19	Clear	
16	44446	R082M	Kg Cham	DW	29-Aug-01	27.8	308	5.50	1.6	1.12	0.78	0.69	0.10	0.02	0.07	0.05	0	0.0	5.82	28	1.88	0.00	0.17	0.03	3.00	6.0	1	11	Clear	
17	44447	R093M	Kg Cham	DW	29-Aug-01	27.9	278	5.55	3.4	1.44	0.88	3.68	1.50	0.04	0.04	0.18	0	0.0	9.70	44	5.93	0.00	0.07	0.03	6.80	7.2	0	25	Clear	
18	44455	R101M	Kg Cham	DW	30-Aug-01	27.3	173	6.15	6.4	4.16	3.99	2.30	0.20	0.43	0.05	0.00	0	0.0	32.98	37	2.77	0.00	0.00	0.13	24.60	26.8	0	55	Small amount of insoluble matters	
19	44405	R124M	Kg Cham	DW	16-Aug-01	27.5	299	6.42	34.4	13.44	7.11	25.55	23.60	2.22	0.14	0.07	0.001	0.0	75.66	46	47.86	7.78	7.42	0.19	34.90	62.8	1	208	Small amount of precipitated iron	
20	44454	R126M	Kg Cham	DW	29-Aug-01	27.3	243	6.30	10.1	7.52	2.15	6.67	2.70	0.15	0.08	1.83	0	0.0	15.52	12	9.48	1.21	26.42	0.15	10.30	27.6	15	76	Large amount of insoluble matters	

Figure 4.3.2 (2/4) Results of Laboratory Chemical Analysis of Groundwater Taken from Existing Wells

												WHO Guideline Value for Drinking Water (mg/L)																								
						200.00		0.30		0.10		1.50		0.01		Carbonate (CO ₃)		Bicarbonate (HCO ₃)		Dissolved gascarbon-dioxide (CO ₂)		250.00		250.00		50.00		1.50						1000		
Ser. No.	Lab No.	Village No.	Province	Well Type	Sampling date	Water Temp. (Field)	ORP (Field)	pH	EC	Calcium (Ca)	Magne-sium (Mg)	Sodium (Na)	Potassium (K)	Total Iron (Fe)	Mangan-ese (Mn)	Ammonia (NH ₄)	Arsenic (As)	Carbonate (CO ₃)	Bicarb-onate (HCO ₃)	Dissolved gascarbon-dioxide (CO ₂)	Chloride (Cl)	Sulfate (SO ₄)	Nitrate (NO ₃)	Fluoride (F)	Silica (SiO ₂)	Total Hardness as CaCO ₃	Perma-nent Hardness as CaCO ₃	Total Dissolved Solids (TDS)	Appearance of water at time Analysis							
					(deg-C)	(mV)			(mS/m)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)						
21	44462	R171M	Kg Cham	DW	28-Aug-01	27.8	263	5.84	18.7	6.72	3.02	18.16	11.00	0.02	0.24	0.00	0	0.0	17.46	64	32.83	4.68	14.15	0.14	15.80	28.2	15	115	Clear							
22	44457	R207M	Kg Cham	DW	31-Aug-01	28.7	118	7.12	91.3	72.00	21.47	77.25	16.50	0.11	0.13	0.05	0.032	0.0	291.00	35	81.08	83.30	6.53	0.40	36.50	268.0	30	539	Clear							
23	44421	R248M	Kg Cham	DW	17-Aug-01	27.5	32	7.28	124.0	138.80	48.74	45.50	0.80	0.03	0.01	0.00	0	0.0	531.56	45	77.52	73.52	22.64	0.43	36.00	551.0	115	707	Clear							
24	44411	R264M	Kg Cham	DW	21-Aug-01	28.3	212	5.54	7.5	3.52	2.05	5.02	4.40	0.25	0.03	0.15	0	0.0	13.58	63	8.31	2.68	3.18	0.04	40.50	17.2	6	77	Clear							
25	44437	R345M(A)	Kg Cham	DW	17-Aug-01	28.8	172	6.65	10.8	7.36	3.90	7.58	1.10	0.08	0.09	0.00	0	0.0	34.82	13	6.33	1.04	12.53	0.11	61.40	34.4	6	119	Clear							
26	44443	R354M	Kg Cham	DW	16-Aug-01	27.6	162	7.00	37.9	22.88	19.18	17.24	1.20	0.02	1.71	0.00	0	0.0	83.12	15	40.74	14.43	18.25	0.15	43.00	136.0	60	226	Clear							
27	44441	R376M	Kg Cham	DW	14-Aug-01	28.8	108	7.42	378.0	218.40	86.88	317.30	244.00	0.18	0.88	2.80	0.006	0.0	622.74	38	690.15	253.80	232.40	0.58	62.40	844.0	434	2430	Small amount of insoluble matters							
28	44444	S015M	Kg Cham	DW	28-Aug-01	27.6	256	6.22	58.8	28.32	7.62	40.82	35.50	0.01	0.41	0.02	0	0.0	25.22	24	107.87	0.00	62.87	0.08	15.70	102.0	81	312	Clear							
29	44453	S019M	Kg Cham	DW	16-Aug-01	28.6	187	7.69	115.0	50.40	76.12	67.10	12.40	0.03	0.05	0.00	0	0.0	398.00	13	134.47	77.37	5.81	0.34	36.60	439.0	121	652	Clear							
30	44450	S024M	Kg Cham	DW	15-Aug-01	29.8	98	7.40	329.0	241.60	162.62	200.00	2.60	1.39	0.23	0.00	0.021	0.0	706.16	45	630.82	217.90	38.86	0.38	36.20	1272.0	683	1880	Small amount of precipitated iron							
31	44451	S040M	Kg Cham	DW	21-Aug-01	27.6	88	7.56	274.0	230.40	165.03	88.20	1.70	0.01	0.02	0.00	0	0.0	642.14	28	460.76	285.30	12.62	0.60	80.40	1254.0	728	1640	Clear							
32	44465	R301M(A)	Kg Cham	CW	31-Aug-01	27.6	-85	7.13	66.3	56.00	28.06	41.38	1.90	11.96	0.15	1.84	0.013	0.0	362.78	43	19.38	0.10	14.03	0.36	29.30	255.2	0	383	Precipitated iron							
33	44430	R321M	Kg Cham	CW	18-Aug-01	28.5	126	7.65	181.0	106.80	125.27	90.10	4.20	0.04	0.00	0.00	0	0.0	613.04	22	286.74	64.76	7.49	0.65	70.60	782.0	280	1060	Small amount of insoluble matters							
34	44432	S033M	Kg Cham	CW	15-Aug-01	29.4	72	7.93	72.5	36.64	25.90	87.36	1.30	0.03	0.00	0.10	0	0.0	463.66	8	1.98	0.00	0.22	1.20	17.80	198.0	0	401	Clear							
35	44433	R162G	Kg Chhnang	BH	06-Aug-01	29.5	127	7.75	54.4	70.80	20.50	15.40	0.70	0.00	0.00	0.00	0	0.0	320.10	9	10.28	0.00	0.26	0.25	40.60	261.0	0	316	Clear							
36	44409	R005G	Kg Chhnang	BH	08-Aug-01	30.2	14	7.38	282.0	256.80	77.59	227.14	2.10	0.57	0.04	0.00	0	0.0	483.06	32	235.32	711.00	33.69	0.86	41.60	860.0	564	1830	Clear							
37	44546	R045G	Kg Chhnang	BH	25-Sep-01	30.3	41	7.76	54.8	58.72	12.03	45.10	2.70	0.87	0.04	0.01	0	0.0	342.78	10	3.56	0.00	0.31	0.17	34.80	196.0	0	327	Insoluble matter							
38	44418	R045G	Kg Chhnang	BH	11-Aug-01	30.0	-142	7.75	54.1	56.48	13.19	44.60	1.00	5.42	0.04	0.00	0	0.0	341.44	10	4.35	0.00	0.02	0.30	34.80	195.2	0	328	Precipitated iron							
39	44413	R061G	Kg Chhnang	BH	11-Aug-01	29.8	174	7.00	43.0	28.48	5.38	46.40	4.40	0.06	0.00	0.11	0	0.0	138.68	22	47.06	3.57	12.42	0.18	26.00	93.2	0	243	Clear							
40	44434	R071G	Kg Chhnang	BH	08-Aug-01	28.9	95	6.88	12.8	11.04	2.83	10.58	2.00	0.47	0.00	0.00	0	0.0	60.14	13	4.75	0.00	3.89	0.17	81.60	39.2	0	147	Clear							

Figure 4.3.2 (3/4) Results of Laboratory Chemical Analysis of Groundwater Taken from Existing Wells

Ser. No.	Lab No.	Village No.	Province	Well Type	Sampling date	Water Temp (Field) (deg-C)	ORP (Field) (mV)	pH	EC (mS/m)	Calcium (Ca) (mg/L)	Magnesium (Mg) (mg/L)	WHO Guideline Value for Drinking Water (mg/L)														Total Hardness as CaCO ₃ (mg/L)	Permanent Hardness as CaCO ₃ (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Appearance of water at time Analysis
												200.00	0.30	0.10	1.50	0.01		250.00	250.00	50.00	1.50								
												Sodium (Na) (mg/L)	Potassium (K) (mg/L)	Total Iron (Fe) (mg/L)	Manganese (Mn) (mg/L)	Ammonia (NH ₄) (mg/L)	Arsenic (As) (mg/L)	Carbonate (CO ₃) (mg/L)	Bicarbonate (HCO ₃) (mg/L)	Dissolved gas carbon-dioxide (CO ₂) (mg/L)	Chloride (Cl) (mg/L)	Sulfate (SO ₄) (mg/L)	Nitrate (NO ₃) (mg/L)	Fluoride (F) (mg/L)	Silica (SiO ₂) (mg/L)				
41	44417	R111G	Kg Chhnang	BH	08-Aug-01	29.6	159	7.60	48.6	45.28	14.93	34.50	11.40	0.03	0.02	0.00	0.008	0.0	292.94	12	9.49	0.00	0.03	0.30	47.00	174.4	0	307	Clear
42	44407	R137G	Kg Chhnang	BH	10-Aug-01	28.0	42	6.84	31.8	38.84	6.85	13.88	3.70	0.65	0.18	0.00	0	0.0	178.48	41	7.12	0.00	0.00	0.20	71.80	127.6	0	232	Clear
43	44428	R189G	Kg Chhnang	BH	07-Aug-01	31.6	-55	7.14	71.6	33.92	9.57	89.66	39.50	0.41	0.17	0.00	0.003	0.0	225.04	28	64.07	30.61	23.48	0.74	61.20	124.0	0	464	Insoluble matters
44	44542	R197G	Kg Chhnang	BH	26-Sep-01	28.1	50	7.52	44.5	35.52	4.80	48.74	4.80	0.88	1.40	0.00	0.008	0.0	242.31	12	12.66	0.00	2.48	0.26	42.70	108.8	0	274	Insoluble matter
45	44416	R197G	Kg Chhnang	BH	07-Aug-01	29.0	48	7.70	39.0	30.72	4.02	44.60	1.80	0.12	0.03	0.13	0.075	0.0	234.74	8	7.12	0.00	0.03	0.28	52.30	93.2	0	257	Clear
46	44425	S001G	Kg Chhnang	BH	07-Aug-01	28.6	-55	7.79	45.6	47.84	4.43	44.60	3.80	0.38	0.06	0.00	0	0.0	273.54	7	3.16	0.00	0.00	0.21	49.30	137.6	0	288	Clear
47	44419	S003G	Kg Chhnang	BH	11-Aug-01	28.2	164	7.68	41.9	47.04	4.24	38.60	2.00	0.03	0.04	0.00	0.030	0.0	246.38	8	8.31	0.00	0.10	0.59	50.40	134.8	0	273	Clear
48	44445	O46M	Kg Cham	BH	30-Aug-01	27.8	28	7.30	79.3	122.40	18.62	18.39	0.60	0.55	0.23	0.00	0	0.0	481.12	39	15.82	1.22	0.00	0.59	33.10	382.0	0	449	Clear
49	44458	R009M	Kg Cham	BH	30-Aug-01	28.8	601	5.55	1.8	0.80	1.07	0.69	0.20	0.01	0.01	0.00	0	0.0	5.82	26	2.37	0.00	0.00	0.13	12.60	6.4	2	21	Clear
50	44464	R086M	Kg Cham	BH	29-Aug-01	28.7	277	5.20	1.8	1.12	0.78	2.07	0.00	0.01	0.01	0.00	0	0.0	5.82	59	2.77	0.00	1.23	0.13	5.60	6.0	1	17	Clear
51	44405	R124M	Kg Cham	BH	16-Aug-01	-	-	6.66	21.1	17.92	9.84	10.92	3.90	0.11	0.03	0.04	0	0.0	124.16	43	1.19	0.00	0.00	0.27	66.20	85.2	0	172	Clear
52	44461	R180M	Kg Cham	BH	28-Aug-01	29.4	-2	6.75	28.0	26.56	11.89	11.00	5.00	2.41	0.15	0.00	0.008	0.0	162.98	46	1.19	0.10	0.00	0.31	53.70	115.2	0	193	Small amount of insoluble matters
53	44466	R207M	Kg Cham	BH	31-Aug-01	28.6	-140	7.14	43.4	44.86	13.57	23.40	1.20	11.84	0.27	2.00	0.002	0.0	242.50	28	4.35	9.44	2.38	0.30	32.30	168.0	0	265	Precipitated iron
54	44436	R249M	Kg Cham	BH	17-Aug-01	28.7	-136	7.35	80.5	74.40	29.74	51.96	1.30	20.40	0.07	2.42	0.142	0.0	436.50	31	26.50	10.00	9.68	0.30	31.50	308.0	0	473	Large amount of precipitated iron
55	44438	R265M	Kg Cham	BH	21-Aug-01	28.1	175	6.83	24.7	16.64	11.59	14.84	4.00	0.04	0.00	0.00	0.002	0.0	129.89	24	9.89	0.00	1.08	0.21	80.40	89.2	0	209	Clear
56	44440	R321M	Kg Cham	BH	18-Aug-01	30.2	22	7.56	100.5	85.20	64.26	38.60	2.70	0.31	0.16	0.00	0	0.0	467.54	21	53.00	81.22	0.09	0.46	53.40	477.0	94	610	Clear
57	44553	R365M(A)	Kg Cham	BH	27-Sep-01	26.7	-37	7.82	76.7	54.00	47.69	39.50	4.80	1.50	0.42	0.03	0	0.0	439.31	11	32.83	0.80	0.00	0.08	35.90	331.0	0	434	Insoluble matter
58	44439	R365M(A)	Kg Cham	BH	16-Aug-01	28.5	-81	7.78	76.9	54.40	50.37	27.10	4.70	1.32	0.12	0.00	0	0.0	430.68	11	40.74	0.78	0.00	0.16	35.80	343.0	0	428	Small amount of insoluble matters
59	44442	R376M	Kg Cham	BH	14-Aug-01	30.4	93	7.24	320.0	276.80	133.01	160.83	73.00	0.28	3.65	0.00	0	0.0	504.40	46	535.90	234.60	353.96	0.64	63.00	1238.0	825	2080	Clear
60	44420	S001M	Kg Cham	BH	14-Aug-01	30.2	-18	7.63	183.0	73.60	54.76	267.20	1.30	0.71	0.22	0.05	0	0.0	711.88	27	175.21	133.35	9.27	1.42	49.60	408.0	0	1120	Small amount of precipitated iron

Figure 4.3.2 (4/4) Results of Laboratory Chemical Analysis of Groundwater Taken from Existing Wells

												WHO Guideline Value for Drinking Water (mg/L)																			Appearance of water at time Analysis
					200.00		0.30		0.10		1.50		0.01				250.00		250.00		50.00		1.50				1000				
Ser. No.	Lab No.	Village No.	Province	Well Type	Sampling date	Water Temp (Field) (deg-C)	ORP (Field) (mV)	pH	EC (mS/m)	Calcium (Ca) (mg/L)	Magnesium (Mg) (mg/L)	Sodium (Na) (mg/L)	Potassium (K) (mg/L)	Total Iron (Fe) (mg/L)	Manganese (Mn) (mg/L)	Ammonia (NH ₄) (mg/L)	Arsenic (As) (mg/L)	Carbonate (CO ₃) (mg/L)	Bicarbonate (HCO ₃) (mg/L)	Dissolved gas carbon dioxide (CO ₂) (mg/L)	Chloride (Cl) (mg/L)	Sulfate (SO ₄) (mg/L)	Nitrate (NO ₃) (mg/L)	Fluoride (F) (mg/L)	Silica (SiO ₂) (mg/L)	Total Hardness as CaCO ₃ (mg/L)	Permanent Hardness as CaCO ₃ (mg/L)	Total Dissolved Solids (TDS) (mg/L)			
61	44404	S003M	Kg Cham	BH	14-Aug-01	30.4	-71	7.00	52.1	13.76	13.04	80.37	1.60	2.49	0.03	0.08	0.001	0.0	275.48	44	20.96	7.34	0.00	0.47	47.70	88.0	0	324	Small amount of precipitated iron		
62	44449	S013M	Kg Cham	BH	28-Aug-01	28.5	212	6.10	5.9	2.72	2.53	2.07	4.10	1.10	0.16	0.00	0	0.0	28.10	37	2.77	0.00	0.00	0.09	41.30	17.2	0	71	Clear		
63	44456	S024M	Kg Cham	BH	15-Aug-01	29.8	98	7.55	91.3	67.84	51.21	47.82	1.60	0.09	0.77	0.00	0	0.0	556.78	25	9.89	16.45	3.00	0.50	46.30	380.0	0	520	Clear		
64	44429	S033M	Kg Cham	BH	15-Aug-01	30.5	-68	7.61	82.2	43.04	33.29	46.90	1.10	0.40	0.08	0.00	0	0.0	389.94	15	0.79	0.00	0.00	1.19	16.90	244.4	0	396	Small amount of insoluble matters		
65	44415	S034M	Kg Cham	BH	15-Aug-01	31.6	119	7.32	161.0	132.00	75.98	68.97	6.60	0.05	0.05	0.00	0.001	0.0	372.48	29	306.51	50.45	19.90	0.33	67.40	642.0	337	912	Clear		
66	44410	S036M	Kg Cham	BH	16-Aug-01	29.7	69	7.24	51.8	21.28	23.35	35.82	4.70	0.41	0.01	0.20	0	0.0	120.28	11	64.86	19.96	16.51	0.19	41.10	149.2	51	288	Clear		
67	44448	S039M	Kg Cham	BH	30-Aug-01	28.2	268	5.23	1.5	1.60	0.49	0.69	0.10	0.02	0.00	0.18	0	0.0	5.82	55	1.98	0.00	0.00	0.05	6.70	6.0	1	15	Clear		
68	44452	S040M	Kg Cham	BH	21-Aug-01	28.7	-42	7.64	97.1	74.40	67.64	44.60	1.10	1.22	0.05	0.00	0	0.0	582.00	21	50.23	5.02	0.02	0.47	71.00	464.0	0	602	Small amount of insoluble matters		