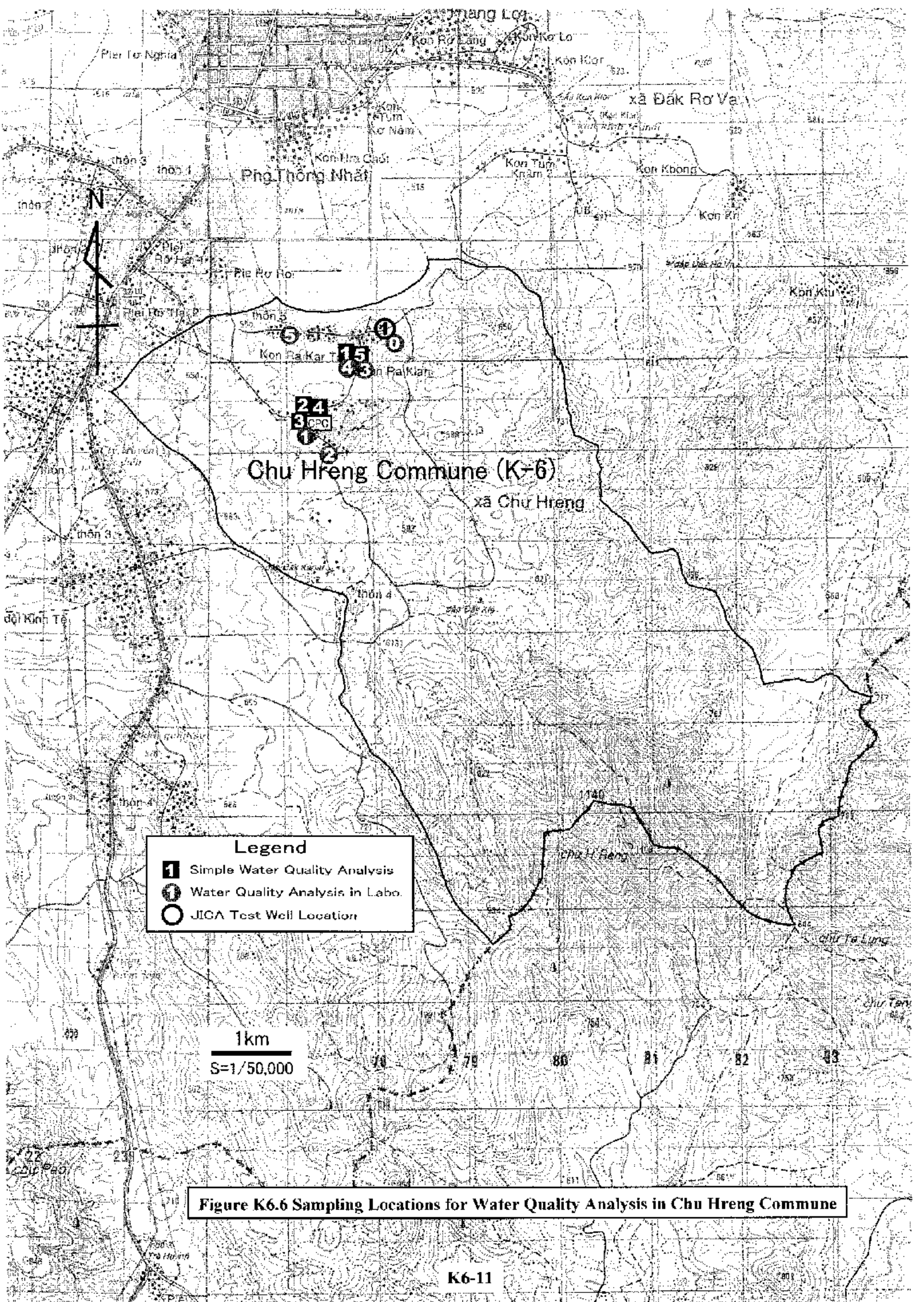


Figure K6.5 Sampling Locations for Water Quality Analysis in Sa Nghia Commune

Table K6. 5 Data Sheet : Result of Water Quality Analysis

Location	Sa Nghia Commune (K-5)											
	K-5-0		K-5-1		K-5-2		K-5-3		K-5-4		K-5-5	
Sample No.	13		4		12		15		24		30	
Location No.	13		4		12		15		24		30	
Name	Ya Xia River		Mr. Hung		Mr. Goi		Mr. Duc		Mr. Trung		Mr. Can	
Type	River		Dug Well		Dug Well		Dug Well		Dug Well		Dug Well	
Latitude / Longitude	14°23.630 / 107°48.705		14°23.767 / 107°49.033		14°23.670 / 107°48.723		14°24.004 / 107°48.895		14°24.200 / 107°48.779		14°24.874 / 107°48.126	
Elevation	535		567		549		542		555		554	
Date	5-Jun-01		16-May-01		16-May-01		16-May-01		16-May-01		16-May-01	
Time	8:00		9:15		10:45		11:50		14:30		15:40	
Flow Quantity	-		-		-		-		-		-	
Well Depth GL-(m)	-		10.65		10.75		4.06		4.91		5.26	
Groundwater Table GL-(m)	-		8.15		9.84		2.05		2.56		4.14	
Water Temperature (°C)	25.6		25.6		25.9		25.3		25.6		25.9	
pH	7.15		4.95		5.99		5.20		4.67		5.09	
Ec (μ S/cm)	68.8		23.3		108.8		53.8		84.9		78.2	
DO (mg/l)	3.64		2.58		2.42		2.27		1.65		2.55	
TDS (mg/l)	51.037		9.824		62.496		24.241		34.972		62.517	
Ca ²⁺ (mg/l)	4.62		0.44		8.10		2.16		1.88		8.10	
Mg ²⁺ (mg/l)	2.151	1	0.255	0	2.454	-	0.535	1	1.361	-	2.491	-
Na ⁺ (mg/l)	3.45		1.61		3.91		4.37		6.44		3.45	
K ⁺ (mg/l)	4.095		0.624		2.964		1.365		1.131		6.630	
HCO ₃ ⁻ (mg/l)	33.49		0.73		40.20		0.73		0.85		23.61	
Cl ⁻ (mg/l)	0.496		0.355		0.213		4.615		11.786		8.591	
SO ₄ ²⁻ (mg/l)	2.75		5.81		4.66		10.46		11.52		9.65	
Total Fe (mg/l)	4.58	2	0.64	0.2	0.28	-	0.58	0.2	0.71	-	0.20	-
NO ₂ -N (mg/l)	0.005	<0.02	<0.001	<0.02	<0.001	-	<0.001	<0.02	<0.001	-	0.010	-
NO ₃ -N (mg/l)	0.12	<1	8.22	2	9.36	-	8.44	3	9.58	-	9.22	-
NH ₄ ⁺ (mg/l)	0.059	0	0.072	-	0.017	-	0.036	-	0.018	-	0.025	-
PO ₄ ³⁻ (mg/l)	<0.01	<0.2	0.04	-	0.06	-	0.04	-	0.04	-	0.04	-
COD/KMnO ₄ (mg/l)	7.082	10	0.551	5	0.315	-	0.630	10	0.472	-	0.866	-
F (mg/l)	0.1900	0	0.1007	-	0.0847	-	0.0905	-	0.0452	-	0.0705	-
As (mg/l)	0.0010	<0.2, (0.00)	0.0036	<0.2, (0.00)	0.0040	-	0.0037	<0.2	0.0040	-	0.0048	-
Mn ²⁺ (mg/l)	0.0150	<0.5	0.0975	<0.5	0.0577	-	0.0545	<0.5	0.0427	-	0.1070	-
Coliform (MPN/100ml)	16,000	-	920	-	280	-	540	-	920	-	540	-

*Left Column : by Laboratory Test, Right Column : by Simple Test **As () : by Hironaka Kit



Legend

- 1** Simple Water Quality Analysis
- 1** Water Quality Analysis in Labo.
- 0** JICA Test Well Location

1km
S=1/50,000

Figure K6.6 Sampling Locations for Water Quality Analysis in Chu Hreng Commune

Table K6. 6 Data Sheet : Result of Water Quality Analysis

Location	Chu Hreng Commune (K-6)											
	K-6-0		K-6-1		K-6-2		K-6-3		K-6-4		K-6-5	
Sample No.	18		1		4		15		16		30	
Location No.	18		1		4		15		16		30	
Name	Dak Lai River		CPC's Well		Mr. Do		Public Well		Spring - 2		Mr. Thanh	
Type	River		Dug Well		Dug Well		Dug Well		Spring		Dug Well	
Latitude / Longitude	14°19.471 / 108°01.151		14°18.908 / 108°00.504		14°18.689 / 108°00.687		14°19.321 / 108°00.950		14°19.334 / 108°00.855		14°19.417 / 108°00.551	
Elevation	527		560		560		540		531		549	
Date	4-Jun-01		17-May-01		17-May-01		17-May-01		17-May-01		17-May-01	
Time	12:00		8:45		9:40		11:20		13:40		15:25	
Flow Quantity	500~600 l/min		-		-		-		30~40 l/min		-	
Well Depth GL-(m)	-		11.49		11.05		10.05		-		8.94	
Groundwater Table GL-(m)	-		11.03		9.90		7.86		-		6.44	
Water Temperature (°C)	33.2		25.8		25.3		25.2		25.0		25.5	
pH	7.60		5.82		5.98		5.99		6.12		6.27	
Ec (μ S/cm)	89.4		80.8		105.0		254		56.7		209	
DO (mg/l)	3.04		2.79		3.46		2.00		3.39		1.75	
TDS (mg/l)	68.223		12.600		74.431		147.258		30.623		171.641	
Ca ²⁺ (mg/l)	2.46		0.86		6.58		23.26		2.16		24.06	
Mg ²⁺ (mg/l)	5.346	2	0.158	-	2.892	-	3.596	2	2.479	-	4.787	2
Na ⁺ (mg/l)	5.06		0.69		8.97		14.72		1.43		11.96	
K ⁺ (mg/l)	3.822		3.198		3.354		7.410		3.354		3.666	
HCO ₃ ⁻ (mg/l)	48.25		0.67		35.81		40.26		6.16		115.29	
Cl ⁻ (mg/l)	0.351		4.047		1.420		27.868		0.355		1.846	
SO ₄ ²⁻ (mg/l)	2.94		2.98		15.41		30.14		14.69		10.03	
Total Fe (mg/l)	3.02	1	0.37	-	0.27	-	0.25	0.2	0.27	-	0.30	0.2
NO ₂ -N (mg/l)	0.005	<0.02	<0.001	-	<0.001	-	0.080	<0.02	0.020	-	0.010	<0.02
NO ₃ -N (mg/l)	0.06	<1	9.56	-	9.36	-	8.66	15	4.34	-	1.74	2
NH ₄ ⁺ (mg/l)	0.073	0	0.014	-	0.012	-	0.017	-	0.020	-	0.017	-
PO ₄ ³⁻ (mg/l)	<0.01	<0.2	0.04	-	0.18	-	0.04	-	0.04	-	0.04	-
COD/KMnO ₄ (mg/l)	2.518	10	0.708	-	0.708	-	0.787	20	0.391	-	0.787	10
F (mg/l)	0.0800	0	0.0707	-	0.1808	-	0.0768	-	0.0853	-	0.1888	-
As (mg/l)	0.0010	<0.2, (0.00)	0.0044	-	0.0042	-	0.0041	<0.2, (0.00)	0.0038	-	0.0082	<0.2
Mn ²⁺ (mg/l)	0.0210	<0.5	0.1100	-	0.1171	-	0.1177	<0.5	0.0375	-	0.4070	<0.5
Coliform (MPN/100ml)	2,800		920		540		240		920		240	

*Left Column : by Laboratory Test, Right Column : by Simple Test **As () : by Hironaka Kit

Table K6. 7 Data Sheet : Result of Simple Water Quality Analysis of Bo Y Commune (K-1)

Location	Bo Y Commune (K-1)			
	1	2	3	4
No.				
Name	Rivulet	House-1	Reservoir	House-2
Type	Rivulet	Dug Well	Reservoir	Dug well
Latitude	N14°40.318	N14°40.218	N14°40.059	-
Longitude	E107°36.255	E107°36.201	E107°36.401	-
Elevation	689	670	660	-
Date	27-Feb-01	27-Feb-01	27-Feb-01	27-Feb-01
Time	10:30	10:45	11:00	-
Flow Quantity	40~50 l/min	-	-	-
Well Depth GL-(m)	-	6.60	-	-
Groundwater Table GL-(m)	-	4.64	-	-
Water Temperature (°C)	20.7	21.6	26.7	-
pH	7.23	5.96	7.89	-
Ec (μ S/cm)	46.4	14.18	62.2	20.6
DO (mg/l)	4.55	3.10	5.98	2.88
Mg ²⁺ (mg/l)	0.5	0.5	1.5	1
Fe ²⁺ +Fe ³⁺ (mg/l)	0.2	0.2	0.2	0.5
NO ₂ -N (mg/l)	<0.02	<0.02	<0.02	<0.02
NO ₃ -N (mg/l)	<1	<1	<1	<1
NH ₄ ⁺ (mg/l)	0	0	0	5
PO ₄ ³⁻ (mg/l)	<0.2	<0.2	<0.2	<0.2
COD (mg/l)	5	5	5	-
F (mg/l)	0	0	0.5	2
As (mg/l)	<0.2	<0.2, (0.00)	<0.2	<0.2
Mn ²⁺ (mg/l)	<0.5	<0.5	<0.5	-
Coliform				+
Location No.	102	103	99	-

*As () : by Hironaka Kit

Table K6. 8 Data Sheet : Result of Simple Water Quality Analysis of Dak Su Commune (K-2)

Location	DaK Su Commune (K-2)			
	1	2	3	4
No.	House-1	Rivulet	House-2	House-3
Name	House-1	Rivulet	House-2	House-3
Type	Dug Well	Rivulet	Dug well	Dug well
Latitude	N14°42.337	N14°42.734	-	-
Longitude	E107°40.687	E107°39.950	-	-
Elevation	694	671	-	-
Date	27-Feb-01	27-Feb-01	-	-
Time	14:45	15:10	-	-
Flow Quantity	-	-	-	-
Well Depth GL-(m)	13.73	-	-	-
Groundwater Table GL-(m)	13.11	-	-	-
Water Temperature (°C)	24.1	28.6	24	-
pH	5.57	6.35	5.42	-
Ec (μ S/cm)	45.8	29.2	21.8	19.32
DO (mg/l)	2.82	5.37	2.44	3.71
Mg ²⁺ (mg/l)	0.5	0	1	1
Fe ²⁺ +Fe ³⁺ (mg/l)	0.2	0.2	0.2	0.5
NO ₂ -N (mg/l)	<0.02	<0.02	<0.02	<0.02
NO ₃ -N (mg/l)	<1	<1	2	2
NH ₄ ⁺ (mg/l)	0	0	0.5	0.5
PO ₄ ³⁻ (mg/l)	<0.2	<0.2	<0.2	<0.2
COD (mg/l)	30	10	-	-
F (mg/l)	0	0	0.5	0.5
As (mg/l)	<0.2, (0.00)	<0.2	<0.2	<0.2
Mn ²⁺ (mg/l)	<0.5	<0.5	-	-
Coliform			+	+
Location No.	25	30	-	-

*As () : by Hironaka Kit

Table K6. 9 Data Sheet : Result of Simple Water Quality Analysis of Dak Ui Commune (K-3)

Location	DaK Ui Commune (K-3)				
	1	2	3	4	5
No.					
Name	Bamboo System Intake	Bamboo System Outlet	Stream	Post Office	House-1
Type	Bamboo System	Bamboo System	Stream	Dug Well	Dug Well
Latitude	N14°34.033	N14°34.008	N14°32.501	N14°34.593	-
Longitude	E108°00.053	E108°00.180	E107°58.058	E108°00.354	-
Elevation	695	685	656	662	-
Date	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01
Time	10:00	9:40	11:00	11:20	-
Flow Quantity	-	-	-	-	-
Well Depth GL-(m)	-	-	-	4.30	-
Groundwater Table GL-(m)	-	-	-	3.15	-
Water Temperature (°C)	20.4	20.9	23.6	23.0	22.5
pH	7.59	8.12	7.30	5.56	5.44
Ec (μ S/cm)	139.3	140.0	82.4	27.8	29.1
DO (mg/l)	5.98	7.05	3.46	2.68	2.05
Mg ²⁺ (mg/l)	3	3	3	0	1
Fe ²⁺ +Fe ³⁺ (mg/l)	<0.2	<0.2	<0.2	<0.2	<0.2
NO ₂ -N (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02
NO ₃ -N (mg/l)	<1	<1	<1	<1	<1
NH ₄ ⁺ (mg/l)	0	0	0	0	0.2
PO ₄ ⁵⁻ (mg/l)	<0.2	<0.2	<0.2	<0.2	<0.2
COD (mg/l)	5	5	15	10	-
F (mg/l)	0.7	1	0	0	0.5
As (mg/l)	<0.2	<0.2, (0.00)	<0.2	<0.2	<0.2
Mn ²⁺ (mg/l)	<0.5	<0.5	<0.5	<0.5	-
Coliform					+
Location No.	106	105	107	25	-

*As () : by Hironaka Kit

Table K6. 10 Data Sheet : Result of Simple Water Quality Analysis of Dak Hring Commune (K-4)

Location	DaK Hring Commune (K-4)						
	1	2	3	4	5	6	7
No.							
Name	Bamboo System Outlet	Stream	Spring-1	Spring-2	House-1	House-2	House-3
Type	Bamboo System	Stream	Spring	Spring	Dug Well	Dug Well	Dug Well
Latitude	N14°35.442	N14°35.128	N14°34.605	N14°35.218	N14°35.461	-	-
Longitude	E107°56.605	E107°55.944	E107°55.264	E107°54.949	E107°54.575	-	-
Elevation	615	610	649	652	667	-	-
Date	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01	28-Feb-01
Time	14:30	14:55	15:20	15:45	16:10	-	-
Flow Quantity	-	-	-	-	-	-	-
Well Depth GL-(m)	-	-	-	-	16.70	-	-
Groundwater Table GL-(m)	-	-	-	-	15.20	-	-
Water Temperature (°C)	24.6	32.5	24.5	30.6	27.5	28.8	25.2
pH	5.76	6.39	4.82	6.81	6.11	-	-
Ec (μ S/cm)	6.53	18.80	22.70	11.88	42.6	102.6	66
DO (mg/l)	5.83	4.28	1.30	5.70	6.78	6.66	5.71
Mg ²⁺ (mg/l)	0	0	-	0	0	1	-
Fe ²⁺ +Fe ³⁺ (mg/l)	<0.2	<0.2	-	<0.2	<0.2	0.5	-
NO ₂ -N (mg/l)	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02
NO ₃ -N (mg/l)	<1	<1	-	<1	<1	2	<1
NH ₄ ⁺ (mg/l)	0	0	-	0	0	0.3	0.5
PO ₄ ³⁻ (mg/l)	<0.2	<0.2	-	<0.2	<0.2	<0.2	-
COD (mg/l)	50	20-50	-	10	10	-	-
F (mg/l)	0	0	-	0	0	1	0.5
As (mg/l)	<0.2	<0.2	-	<0.2	<0.2, (0.00)	<0.2	-
Mn ²⁺ (mg/l)	<0.5	<0.5	-	<0.5	<0.5	-	-
Coliform							
Location No.	39	40	20	41	4	-	-

*As () : by Hironaka Kit

Table K6. 11 Data Sheet : Result of Simple Water Quality Analysis in Sa Nghia Commune (K-5)

Location	Sa Nghia Commune (K-5)				
	1	2	3	4	5
No.					
Name	Hoa Binh	Mr. Can	Public Well	Anh Dung House	Anh Dung House
Type	Stream	Dug Well	Dug Well	Dug Well	Dug well
Latitude	N14°24.829	N14°24.874	N14°23.778	N14°24.148	-
Longitude	E107°48.149	E107°48.126	E107°49.112	E107°48.081	-
Elevation	551	554	575	555	-
Date	1-Mar-01	1-Mar-01	1-Mar-01	1-Mar-01	1-Mar-01
Time	10:00	10:25	11:00	11:25	-
Flow Quantity	-	-	-	-	-
Well Depth GL-(m)	-	5.26	10.82	8.80	-
Groundwater Table GL-(m)	-	4.50	10.72	8.70	-
Water Temperature (°C)	26.9	24.6	25.3	24.8	26.0
pH	6.73	5.34	5.09	6.48	-
Ec (μ S/cm)	30.1	34.6	18.73	228	46.0
DO (mg/l)	7.34	3.03	3.84	3.20	4.71
Mg ²⁺ (mg/l)	0.5	0	0	0.5	0.5
Fe ²⁺ +Fe ³⁺ (mg/l)	<0.2	<0.2	<0.2	<0.2	1
NO ₂ -N (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02
NO ₃ -N (mg/l)	<1	1	<1	<1	<1
NH ₄ ⁺ (mg/l)	0	0	0.3	0	0.5
PO ₄ ³⁻ (mg/l)	<0.2	<0.2	<0.2	<0.2	<0.2
COD (mg/l)	50	10	5	10	-
F (mg/l)	0.5	0	0.7	0	1
As (mg/l)	<0.2	<0.2	<0.2	<0.2, (0.00)	<0.2
Mn ²⁺ (mg/l)	<0.5	<0.5	<0.5	0.7	-
Coliform					+
Location No.	31	30	5	39	-

*As () : by Hironaka Kit

Table K6. 12 Data Sheet : Result of Simple Water Quality Analysis in Chu Hreng Commune (K-6)

Location	Chu Hreng Commune (K-6)				
	1	2	3	4	5
No.	Spring-2	Spring-1	CPCS Well	House-1	Public Well
Name	Spring	Spring	Dug Well	Dug well	Dug well
Type	N14°19.334	N14°18.975	N14°18.908	-	N14°19.321
Latitude	E108°00.855	E108°00.632	E108°00.504	-	E108°00.950
Longitude	531	545	560	-	540
Elevation	26-Feb-01	26-Feb-01	26-Feb-01	26-Feb-01	26-Feb-01
Date	15:00	15:25	15:50	-	-
Time	120~150 l/min	-	-	-	-
Flow Quantity	-	-	11.44	-	-
Well Depth GL-(m)	-	-	10.39	-	-
Groundwater Table GL-(m)	23.6	27.6	28.3	25	25.7
Water Temperature (°C)	6.46	5.00	6.20	-	5.84
pH	49.6	62.8	122.7	211	162.7
Ec (μ S/cm)	6.31	5.08	4.37	-	3.41
DO (mg/l)	0.5	1	1.5	2	5
Mg ²⁺ (mg/l)	0.2	0.2	0.7	0.2	0.2
Fe ²⁺ +Fe ³⁺ (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02
NO ₂ -N (mg/l)	<1	3	<1	8	8
NO ₃ -N (mg/l)	0	0	0	10	10
NH ₄ ⁺ (mg/l)	<0.2	<0.2	<0.2	<0.2	<0.2
PO ₄ ³⁻ (mg/l)	10	5	5	-	-
COD (mg/l)	0	0	0	0.5	0.3
F (mg/l)	<0.2	<0.2	<0.2, (0.00)	<0.2	<0.2
As (mg/l)	<0.5	<0.5	<0.5	-	-
Mn ²⁺ (mg/l)					
Coliform					
Location No.	16	13	1	-	15

*As () : by Hironaka Kit

Table K6. 13 KẾT QUẢ PHÂN TÍCH DIOXIN TRONG MẪU NƯỚC
(của trung tâm nước sạch và vệ sinh môi trường nông thôn)

1. Phương pháp phân tích: Sắc kí khí- khối phổ (GC/MS)
2. Kết quả phân tích 15 đồng phân độc của dioxin và furan:

N ^o	Hợp chất	Nồng độ
1	2,3,7,8- TeCDD (4Cl)	Không tìm thấy
2	1,2,3,7,8- PeCDD (5Cl)	Không tìm thấy
3	1,2,3,4,7,8-HxCDD (6Cl)	Không tìm thấy
4	1,2,3,6,7,8-HxCDD	Không tìm thấy
5	1,2,3,7,8,9-HxCDD	Không tìm thấy
6	1,2,3,4,6,7,8- HpCDD (7Cl)	Không tìm thấy
7	2,3,7,8-TeCDF (4Cl)	Không tìm thấy
8	1,2,3,7,8- PeCDF (5Cl)	Không tìm thấy
9	2,3,4,7,8-PeCDF	Không tìm thấy
10	1,2,3,4,7,8- HxCDF (6Cl)	Không tìm thấy
11	1,2,3,6,7,8-HxCDF	Không tìm thấy
12	1,2,3,7,8,9-HxCDF	Không tìm thấy
13	2,3,4,6,7,8- HxCDF	Không tìm thấy
14	1,2,3,4,6,7,8-HpCDF (7Cl)	Không tìm thấy
15	1,2,3,4,7,8,9-HpCDF	Không tìm thấy
16	OCDD (8Cl)	Không tìm thấy
17	OCDF	Không tìm thấy

3. Kết luận : Mẫu nước không chứa dioxin.

Xác nhận của trường

Hà nội, ngày 6 tháng 5 năm 2001

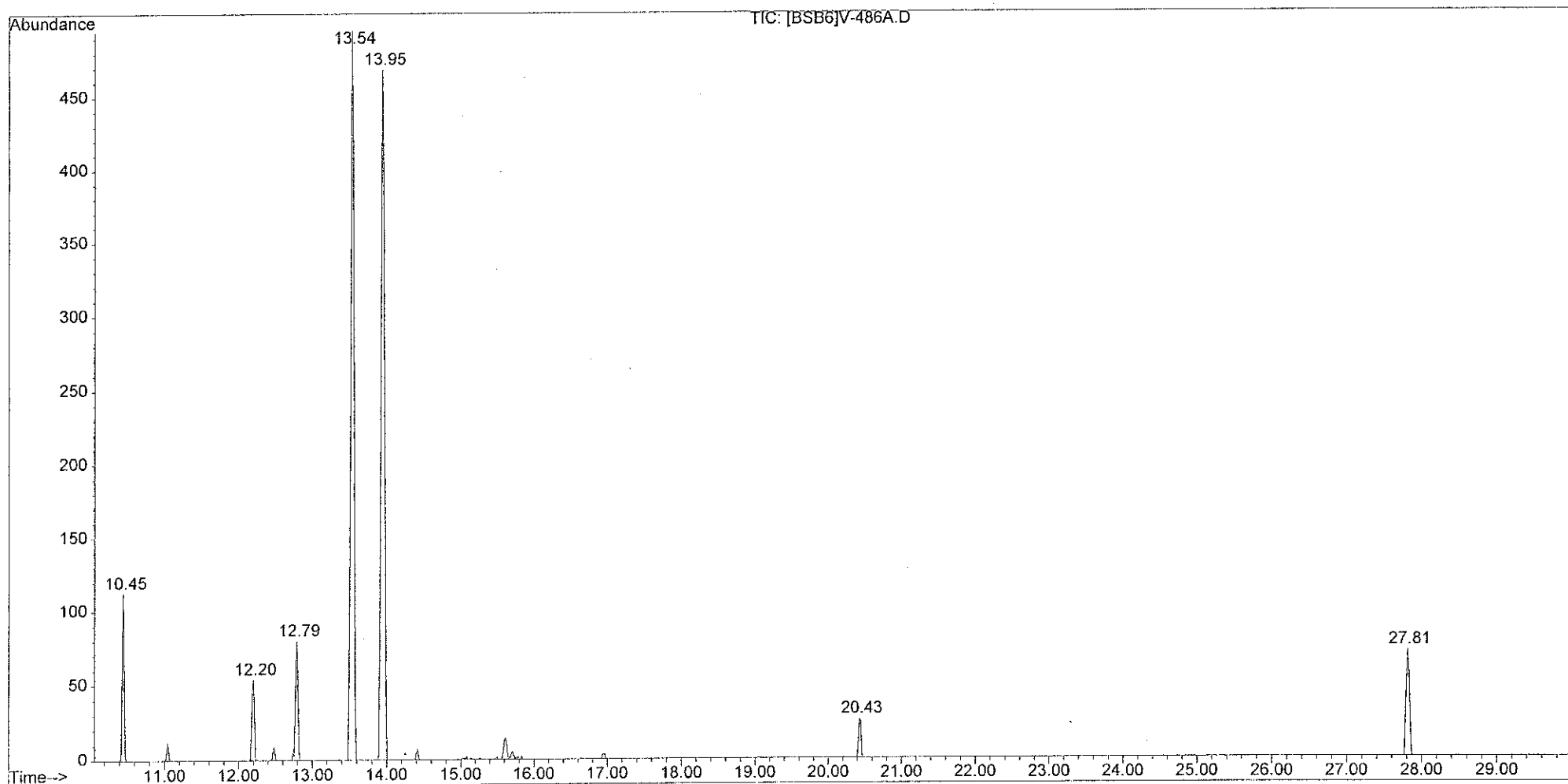
Phụ trách phân tích



PBS, TS. Nguyễn Trọng Nguyễn

H. Ducmeur
GS, TS Nguyễn Đức Huệ

File : C:\HPCHEM\1\DATA\BSB\V-486A.D
Operator : [BSB6]TRINH KHAC SAU
Acquired : 21 Jun 01 2:51 pm using AcqMethod RECDIO
Instrument : GC/MS Ins
Sample Name: Water M1 (Dr.Hue), 4L, ~US. EPA-8280 *Nhau f.*
Misc Info : 13C12-2520(4-8ng)+37Cl(2.5ng), 1/10ul, EMV=1706
Vial Number: 1



K6-20

Figure K6. 7 Dioxin Analysis

BỘ Y TẾ
VIỆN VSDT -TN

Table K6.14 CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
ĐỘC LẬP-TU DO-HẠNH PHÚC

PHIẾU KIỂM NGHIỆM NƯỚC

Nơi gửi mẫu : JICA

Ngày gửi mẫu : 08/05/2001

Ngày trả lời kết quả : 7/6/2001

KHM	K ⁺	Na ⁺	Ca ⁺⁺	Mg ⁺⁺	Cl ⁻	SO ₄ ⁻	HCO ₃ ⁻	TDS	NO ₂ -N	NO ₃ -N	NH ₄	PO ₄ ³⁻	COD	TotalFe	As	F ⁻	Mn ⁺⁺	STT
	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	
D 7-1	3.705	23.00	17.84	1.446	18.496	11.86	69.60	145.943	0.030	2.69	0.100	0.05	0.393	3.40	0.0039	0.4215	0.1716	24
D 7-2	3.315	15.53	10.96	2.381	12.141	5.52	58.44	108.280	0.010	1.47	0.140	0.12	0.472	3.50	0.0084	0.2675	0.0565	25
D 7-3	2.652	16.10	9.76	2.722	23.608	1.10	45.69	101.634	0.010	0.81	0.160	0.04	4.249	4.50	0.0023	0.0746	1.2990	26
D 7-4	7.020	14.95	21.36	6.853	22.330	2.16	96.44	171.113	0.030	0.53	1.700	0.04	1.023	4.30	0.0032	0.0935	3.2851	27
D 7-5	0.468	2.07	1.58	0.450	0.639	6.86	3.05	15.121	<0.001	0.29	1.320	0.04	0.079	3.10	0.0034	0.0335	0.0506	28
D 6	2.652	9.20	21.60	11.676	0.213	8.21	155.37	208.916	0.010	0.02	0.072	<0.01	0.630	0.65	0.0046	0.0857	0.0755	29
K 1-1	0.546	2.07	8.38	6.500	0.426	3.84	52.03	73.795	<0.001	0.01	0.058	0.05	3.230	0.45	0.0050	0.0707	0.1411	30
K 1-2	2.418	1.15	3.10	2.940	0.142	3.55	25.50	38.800	<0.001	0.03	0.044	<0.01	3.390	0.53	0.0037	0.1808	0.0302	31
K 1-3	1.053	2.76	13.14	8.080	0.284	3.02	83.51	111.850	<0.001	0.02	0.050	<0.01	1.260	0.16	0.0029	0.0659	0.0350	32
K 1-4	5.460	3.68	2.82	0.571	3.621	16.03	1.28	33.465	<0.001	5.82	0.040	<0.01	1.180	0.68	0.0033	0.1373	0.0375	33
K 1-5	11.310	3.68	17.84	2.685	0.497	6.14	81.80	123.957	0.010	0.13	0.070	0.05	0.551	0.52	0.0026	0.2081	0.0735	34
K 2-1	0.195	0.46	0.86	0.401	0.284	4.32	0.85	7.374	<0.001	0.09	0.066	<0.01	0.708	0.15	0.0039	0.0420	0.0375	35
K 2-2	1.326	1.61	8.38	1.057	0.355	7.30	30.20	50.219	<0.001	0.18	0.062	<0.01	0.315	0.14	0.0035	0.1006	0.0424	36
K 2-3	1.131	0.46	1.88	1.276	0.284	7.97	2.99	15.988	<0.001	0.34	0.061	<0.01	0.787	0.13	0.0035	0.0601	0.0326	37
K 2-4	0.273	0.69	0.78	0.753	0.355	5.57	0.61	9.029	<0.001	1.02	0.081	<0.01	0.236	0.16	0.0028	0.0768	0.2201	38
K 2-5	0.624	1.61	1.88	0.389	1.775	6.86	0.73	13.874	0.010	2.43	0.065	<0.01	0.472	0.29	0.0036	0.0870	0.0318	39



KHOA YHLĐ-VSMT

LABO CHẤT LƯỢNG NƯỚC

Nguyễn xuân Tâm

Bùi vĩnh Diên

BỘ Y TẾ
VIỆN VSDT - TN

Table K6.15

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

PHIẾU KIỂM NGHIỆM NƯỚC

Nơi gửi mẫu : JICA

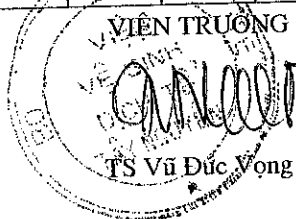
Ngày gửi mẫu : 17/05/2001

Ngày trả lời kết quả : 7/6/2001

KHM	K ⁺ mg/l	Na ⁺ mg/l	Ca ⁺⁺ mg/l	Mg ⁺⁺ mg/l	Cl ⁻ mg/l	SO ₄ ⁻ mg/l	HCO ₃ ⁻ mg/l	TDS mg/l	NO ₂ -N mg/l	NO ₃ -N mg/l	NH ₄ mg/l	PO ₄ ³⁻ mg/l	COD mg/l	TotalFe mg/l	As mg/l	F ⁻ mg/l	Mn ⁺⁺ mg/l	STT
K 3-1	1.209	4.83	14.88	7.679	0.213	6.96	84.18	119.951	<0.001	0.02	0.070	<0.01	1.259	0.28	0.0033	0.0851	0.0427	40
K 3-2	1.053	2.07	2.90	0.437	0.284	4.90	11.59	23.230	<0.001	0.16	0.060	<0.01	0.551	0.14	0.0026	0.0658	0.1505	41
K 3-3	1.911	3.68	13.88	8.602	0.213	5.66	91.74	125.694	<0.001	0.02	0.031	0.09	1.810	1.05	0.0031	0.0677	0.0455	42
K 3-4	2.340	4.37	2.74	0.486	3.550	4.75	12.75	30.987	<0.001	0.35	0.045	<0.01	0.630	0.22	0.0034	0.0843	0.0375	43
K 3-5	1.755	2.76	2.16	4.398	0.213	6.10	30.93	48.309	<0.001	0.74	0.044	<0.01	0.551	0.21	0.0033	0.0647	0.0377	44
K 4-1	1.170	1.61	0.80	0.656	0.852	3.50	6.41	14.997	<0.001	0.71	0.064	<0.01	0.393	0.99	0.0037	0.0905	0.0305	45
K 4-2	0.195	0.92	1.44	0.437	0.071	6.58	0.79	10.432	<0.001	0.32	0.061	<0.01	0.393	0.44	0.0036	0.0452	0.0375	46
K 4-3	0.468	0.92	1.38	0.571	0.568	7.49	0.98	12.371	<0.001	1.11	0.110	<0.01	0.787	0.18	0.0039	0.0707	0.0425	47
K 4-4	1.053	0.46	5.42	0.705	0.355	2.74	17.69	28.419	<0.001	0.20	0.042	<0.01	0.551	0.29	0.0035	0.0608	0.0427	48
K 4-5	0.195	0.23	0.22	0.267	0.142	2.26	0.67	3.981	<0.001	0.22	0.041	<0.01	0.236	0.21	0.0039	0.1000	0.0529	49
G 3	2.964	7.13	14.16	11.591	0.213	4.46	127.19	167.707	<0.001	0.06	0.036	0.14	0.157	0.20	0.0043	0.0841	0.1420	50
G 3	2.964	7.13	14.38	11.190	0.213	3.89	126.88	166.645	<0.001	0.05	0.029	0.14	0.236	0.40	0.0042	0.1280	0.1101	51
G 3	2.886	7.13	14.44	11.069	0.213	4.13	129.32	169.186	<0.001	0.07	0.026	0.14	0.393	0.30	0.0040	0.1007	0.0975	52
G 3-1	0.897	1.15	5.06	3.997	0.284	4.13	34.77	50.286	<0.001	0.04	0.023	0.16	0.315	0.25	0.0037	0.0860	0.0355	53
G 3-2	0.546	0.46	0.72	0.450	0.426	4.27	0.67	7.545	<0.001	0.17	0.032	0.04	0.944	0.44	0.0039	0.0841	0.0385	54
G 3-3	0.195	0.46	1.38	0.522	0.639	6.14	0.55	9.889	0.010	0.11	0.022	0.04	0.472	0.29	0.0034	0.1007	0.0475	55
G 3-4	1.014	0.92	3.62	3.548	0.355	5.28	23.79	38.527	<0.001	0.05	0.021	0.09	0.472	0.13	0.0047	0.0601	0.0975	56

KHOA YHLĐ-VSMT

LABO CHẤT LƯỢNG NƯỚC



Nguyễn xuân Tâm

Bùi Vĩnh Điền

BỘ Y TẾ
VIỆN VSDT -TN

Table K6.16

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
ĐỘC LẬP-TU DO-HẠNH PHÚC

PHIẾU KIỂM NGHIỆM NƯỚC

Nơi gửi mẫu : JICA

Ngày gửi mẫu : 19/05/2001

Ngày trả lời kết quả : 7/6/2001

KHM	K ⁺ mg/l	Na ⁺ mg/l	Ca ⁺⁺ mg/l	Mg ⁺⁺ mg/l	Cl ⁻ mg/l	SO ₄ ⁻ mg/l	HCO ₃ ⁻ mg/l	TDS mg/l	NO ₂ -N mg/l	NO ₃ -N mg/l	NH ₄ mg/l	PO ₄ ³⁻ mg/l	COD mg/l	TotalFe mg/l	As mg/l	F ⁻ mg/l	Mn ⁺⁺ mg/l	STT
K 5-1	0.624	1.61	0.44	0.255	0.355	5.81	0.73	9.824	<0.001	8.22	0.072	0.04	0.551	0.64	0.0036	0.1007	0.0975	57
K 5-2	2.964	3.91	8.10	2.454	0.213	4.66	40.20	62.496	<0.001	9.36	0.017	0.06	0.315	0.28	0.0040	0.0847	0.0577	58
K 5-3	1.365	4.37	2.16	0.535	4.615	10.46	0.73	24.241	<0.001	8.44	0.036	0.04	0.630	0.58	0.0037	0.0905	0.0545	59
K 5-4	1.131	6.44	1.88	1.361	11.786	11.52	0.85	34.972	<0.001	9.58	0.018	0.04	0.472	0.71	0.0040	0.0452	0.0427	60
K 5-5	6.630	3.45	8.10	2.491	8.591	9.65	23.61	62.517	0.010	9.22	0.025	0.04	0.866	0.20	0.0048	0.0705	0.1007	61
K 6-1	3.198	0.69	0.86	0.158	4.047	2.98	0.67	12.600	<0.001	9.56	0.014	0.04	0.708	0.37	0.0044	0.0707	0.1100	62
K 6-2	3.354	8.97	6.58	2.892	1.420	15.41	35.81	74.431	<0.001	9.36	0.012	0.18	0.708	0.27	0.0042	0.1808	0.1171	63
K 6-3	7.410	14.72	23.26	3.596	27.868	30.14	40.26	147.258	0.080	8.66	0.017	0.04	0.787	0.25	0.0041	0.0768	0.1177	64
K 6-4	3.354	1.43	2.16	2.479	0.355	14.69	6.16	30.623	0.020	4.34	0.020	0.04	0.391	0.27	0.0038	0.0853	0.0375	65
K 6-5	3.666	11.96	24.06	4.787	1.846	10.03	115.29	171.641	0.010	1.74	0.017	0.04	0.787	0.30	0.0082	0.1888	0.4070	66
G 1-1	0.273	0.69	0.88	1.932	0.710	7.06	3.97	15.506	<0.001	0.11	0.149	<0.01	0.236	0.23	0.0041	0.1077	0.0987	67
G 1-2	0.117	0.46	1.38	1.543	0.284	8.74	1.40	13.923	<0.001	0.52	0.033	0.04	0.315	0.18	0.0039	0.0475	0.0427	68
G 1-3	0.078	0.69	1.58	0.413	0.213	3.36	3.97	10.299	<0.001	0.30	0.042	<0.01	0.157	0.11	0.0043	0.0945	0.0777	69
G 1-4	0.078	0.69	1.30	0.134	0.071	4.37	1.34	7.983	<0.001	0.25	0.078	<0.01	0.630	0.07	0.0030	0.1800	0.2000	70
G 1-5	0.078	0.46	0.72	0.450	0.639	2.83	1.53	6.704	<0.001	0.02	0.035	<0.01	0.236	0.07	0.0029	0.0674	0.1750	71
G 3-5	2.652	10.12	16.12	8.128	0.213	19.73	89.79	146.753	<0.001	<0.01	0.033	<0.01	0.866	1.50	0.0029	0.1375	0.1070	72

VIỆN TRƯỞNG



TS Vũ Đức Vọng

KHOA YHLD-VSMT

Nguyễn xuân Tâm

LABO CHẤT LƯỢNG NƯỚC



Bùi vĩnh Diên

**Table K6.17 CÔNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
ĐỘC LẬP-TU DO-HẠNH PHÚC**

PHIẾU KIỂM NGHIỆM NƯỚC

Sampl. No.	Type	Temp. (°C)	pH	Ec (µ S/cm)	DO (mg/l)	TDS (mg/l)	Ca ²⁺ (mg/l)	Mg ²⁺ (mg/l)	Na ⁺ (mg/l)	K ⁺ (mg/l)	HCO ₃ ⁻ (mg/l)	Cl ⁻ (mg/l)	SO ₄ ²⁻ (mg/l)	Total Fe (mg/l)	NO ₃ -N (mg/l)	NO ₂ -N (mg/l)	NH ₄ ⁺ (mg/l)	PO ₄ ³⁻ (mg/l)	COD/KMnO ₄ (mg/l)	F (mg/l)	As (mg/l)	Mn ²⁺ (mg/l)	Coliform* (MPN/100ml)
K-1-0	Drilling Well	26.8	7.25	183.6	2.23	151.457	16.20	7.557	9.89	2.028	111.75	0.142	3.897	3.55	<0.001	0.01	0.028	0.09	0.315	0.0300	0.0010	0.1000	11
K-2-0	Drilling Well	24.1	7.23	178.7	1.75	151.873	16.28	8.432	9.66	1.950	112.61	1.985	0.96	2.64	<0.001	0.01	0.031	0.07	0.157	0.0100	0.0010	0.0650	17
K-3-0	Drilling Well	24.7	7.19	864	1.17	597.608	151.38	10.753	6.44	0.663	184.71	0.496	243.18	3.49	0.005	0.03	0.046	0.04	0.630	1.3200	0.0050	0.1211	33
K-4-0	River	26.7	7.13	66.6	3.15	50.979	5.12	3.074	2.30	1.833	36.66	0.071	1.92	1.88	0.002	0.11	0.035	<0.01	3.226	0.2100	0.0010	0.0050	130
K-5-0	River	25.6	7.15	68.8	3.64	51.037	4.62	2.151	3.45	4.095	33.49	0.496	2.75	4.58	0.005	0.12	0.059	<0.01	7.082	0.1900	0.0010	0.0150	180
K-6-0	River	33.2	7.60	89.4	3.04	68.223	2.46	5.346	5.06	3.822	48.25	0.351	2.94	3.02	0.005	0.06	0.073	<0.01	2.518	0.0800	0.0010	0.0210	2800
G-1-0	Drilling Well	27.5	7.32	198.7	1.16	170.062	4.34	2.807	31.97	2.535	124.32	0.915	3.19	0.82	0.030	0.06	0.052	0.03	0.157	0.6600	0.0010	0.0130	33
G-2-0	Drilling Well	28.1	7.00	338	3.04	211.444	24.72	12.758	12.65	4.062	142.62	0.993	13.10	0.21	0.002	0.19	0.074	0.10	0.157	0.2900	0.0032	0.1950	0
G-3-0	Drilling Well	27.0	7.20	61.7	2.56	166.645	14.38	11.900	7.13	2.964	126.88	0.213	3.89	0.40	<0.001	0.05	0.029	0.14	0.236	0.1007	0.0040	0.0975	34
G-4-0	Drilling Well	29.2	7.59	273	5.55	225.997	10.80	13.171	22.43	4.095	155.18	0.355	19.97	0.36	0.010	0.01	0.179	0.07	0.079	0.8000	0.0022	0.1740	5
G-5-0	Drilling Well	28.6	7.29	656	2.28	568.373	24.20	20.679	94.30	17.550	410.47	0.071	1.10	0.47	0.001	0.01	0.147	0.06	0.079	0.2900	0.0026	0.0630	23
G-6-0	Drilling Well	27.3	6.98	775	1.25	195.322	40.40	13.940	34.96	1.521	57.26	158.350	7.28	3.10	<0.001	9.09	0.138	0.04	0.779	0.0870	0.0034	0.0672	46
G-7-0	Drilling Well	27.0	7.18	501	1.42	426.749	42.12	23.219	28.75	1.989	311.34	15.775	3.55	2.07	0.002	0.01	0.098	0.05	0.866	0.2200	0.0010	0.2860	43
D-1-0	Drilling Well	25.3	6.43	153.0	2.63	125.028	8.80	7.946	9.66	1.833	93.88	1.407	1.50	0.11	0.001	0.06	0.035	0.06	0.079	0.1300	0.0010	0.0111	31
D-2-0	Drilling Well	26.4	6.42	100.6	2.56	64.614	4.92	3.900	5.29	1.599	39.10	0.780	9.02	0.39	0.002	0.02	0.049	0.12	0.157	<0.0001	0.0010	0.0410	11
D-3-0	Drilling Well	26.5	7.99	553	1.77	495.166	3.98	3.159	126.50	1.443	309.88	0.284	13.92	0.12	<0.001	0.60	0.103	0.08	0.551	0.2800	0.0060	0.0120	22
D-4-0	Drilling Well	25.9	7.85	401	1.59	335.710	2.52	0.620	94.30	3.354	215.70	3.332	15.90	3.76	0.080	0.12	0.071	0.14	0.630	0.6700	0.0010	0.0390	33
D-5-0	Drilling Well	27.7	6.93	558	2.35	340.127	70.96	6.051	12.88	1.356	240.65	0.355	7.87	0.82	0.020	0.06	0.233	0.06	0.236	<0.0001	0.0040	1.1110	8
D-6-0	Drilling Well	28.0	6.23	145.6	1.92	208.916	21.60	11.676	9.20	2.652	155.37	0.213	8.21	0.65	0.010	0.02	0.072	<0.01	0.630	0.0857	0.0046	0.0755	0
D-7-0	Drilling Well	28.1	6.54	186.0	2.02	126.073	9.04	6.282	11.96	3.042	86.56	0.071	9.12	4.09	0.011	0.01	0.293	0.03	0.236	0.0500	0.0010	0.3590	43
Total	nos.	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	max	33.2	7.99	864	5.55	597.608	151.38	23.219	126.50	17.550	410.47	158.350	243.18	4.58	0.080	9.09	0.293	0.14	7.082	1.3200	0.0060	1.1110	2800
	min	24.1	6.23	61.7	1.16	50.979	2.46	0.620	2.30	0.663	33.49	0.071	0.96	0.11	<0.001	0.01	0.028	<0.01	0.079	<0.0001	0.0010	0.0050	0
	average	27.2	7.13	318	2.35	236.570	23.94	8.771	26.94	3.219	149.83	9.333	18.66	1.83	0.009	0.53	0.092	0.059	0.940	0.2752	0.0023	0.1436	175
Standard 505 of MOH	-	-	-	-	1,000	-	-	-	-	-	250	400	0.5	0	10	3.0	-	-	1.5	0.05	0.1	-	-

*tests were conducted in the first field survey and F/S.

Tay Nguyen Institute of Hygiene and Epidemiology
 Department of Microbiology - Water Laboratory

Table K6. 18(1) Microbiological Result (Total coliforms)

131 water samples
 from JICA

Method: MPN - Medium: Mac Conkey
 Analyst: Nguyen The Vinh
 Answer date: July 10th 2001

No	Sample	MPN / 100ml	No	Sample	MPN / 100ml
1	D-6-1	17	31	K-4-3	280
2	D-6-2	13	32	K-4-4	180
3	D-6-3	920	33	K-4-5	140
4	D-6-4	23	34	K-3-1	2,400
5	D-6-5	00	35	K-3-2	1,600
6	D-2-1	540	36	K-3-3	3,500
7	D-2-2	5,400	37	K-3-4	920
8	D-2-3	02	38	K-3-5	540
9	D-2-4	33	39	K-2-1	920
10	G-5-1	00	40	K-2-2	540
11	D-5-1	00	41	K-2-3	1,600
12	D-5-2	1,600	42	K-2-4	1,600
13	D-5-3	540	43	K-2-5	920
14	D-5-4	46	44	G-3 (date: May 11 th)	920
15	D-3-1	94	45	K-1-1	5,400
16	D-1-1	00	46	K-1-2	920
17	D-1-2	920	47	K-1-3	920
18	D-1-3	23	48	K-1-4	280
19	D-3-2	350	49	K-1-5	1,600
20	D-3-3	180	50	G6 (date: May 23 rd)	250
21	D-3-4	540	51	D-4-1	541
22	D-3-5	540	52	D-4-2	920
23	D-5-5	350	53	D-4-3	220
24	D-7-1	00	54	D-4-4	180
25	D-7-2	00	55	D-4-5	350
26	D-7-3	00	56	G-4-1	170
27	D-7-4	07	57	G-4-2	3,500
28	D-7-5	240	58	G-4-3	16,000
29	K-4-1	350	59	G-4-4	3,500
30	K-4-2	220	60	G-4-5	16,000

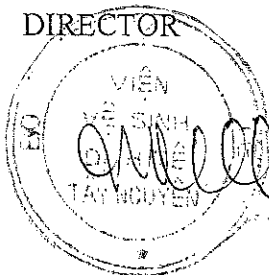
Table K6. 18(2) Microbiological Result (Total coliforms)

No	Sample	MPN / 100ml	No	Sample	MPN / 100ml
61	G-1-1	9,200	97	K-6-5	240
62	G-1-2	3,500	98	K-5-1	920
63	G-1-3	1,600	99	K-5-2	280
64	G-1-4	260	100	K-5-3	540
65	G-1-5	5,400	101	K-5-4	920
66	G-7-1	1,800	102	K-5-5	540
67	G-7-2	1,100	103	D-1-0	1,600
68	G-7-3	1,300	104	D-6-0	920
69	G-7-4	2,200	105	G-1-0	350
70	G-7-5	2,800	106	K-4-0	5,400
71	G-6-1	790	107	K-6-0	2,800
72	G-6-2	920	108	K-5-0	16,000
73	G-6-3	1,600	109	G-7-0	2,800
74	G-6-4	540	110	D-3-0	540
75	G-6-5	1,700	111	K-1-0	540
76	G-5-2	490	112	D-7-0	70
77	G-5-3	140	113	K-2-0	920
78	G-5-4	280	114	D-5-0	240
79	G-5-5	350	115	D-2-0	49
80	G-3-1	170	116	D-4-0	130
81	G-3-2	920	117	K-3-0	13
82	G-3-3	110	118	D-7-0	70
83	G-3-4	27	119	D-3-0	49
84	G-3-5	280	120	D-1-0	33
85	G-2-1	49	121	D-5-0	1,600
86	G-2-2	140	122	D-6-0	140
87	G-2-3	220	123	G-3-0	920
88	G-2-4	920	124	K-2-0	33
89	G-2-5	240	125	G-1-0	240
90	D-1-5	1,600	126	K-1-0	33
91	D-2-5	340	127	G-2-0	00
92	D-1-4	330	128	G-4-0	05
93	K-6-1	920	129	G-7-0	17
94	K-6-2	540	130	G-5-0	23
95	K-6-3	240	131	G-6-0	110
96	K-6-4	920	Total: 131 samples		

DIRECTOR

HEAD OF DEPARTMENT

CHIEF OF LABORATORY



TS. DS. VŨ ĐỨC VỌNG

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TS. Đào Xuân Vinh

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Nguyễn Thế Vinh

Table K6.19 Result of Water Quality Analysis for Existing Water Resources

Sampl. No.	Type	Temp. (°C)	pH	Ec (µ S/cm)	DO (mg/l)	TDS (mg/l)	Ca ²⁺ (mg/l)	Mg ²⁺ (mg/l)	Na ⁺ (mg/l)	K ⁺ (mg/l)	HCO ₃ ⁻ (mg/l)	Cl ⁻ (mg/l)	SO ₄ ²⁻ (mg/l)	Total Fe (mg/l)	NO ₂ -N (mg/l)	NO ₃ -N (mg/l)	NH ₄ ⁺ (mg/l)	PO ₄ ³⁻ (mg/l)	COD/KMnO ₄ (mg/l)	F (mg/l)	As (mg/l)	Mn ²⁺ (mg/l)	Coliform (MPN/100ml)
Water Quality Standard (TCXD 233 : 1999)	Class A		6.8-7.5 (6.5-8.5)									<25 (<25)	<25 (<25)	<0.3 (<0.3)	0 (<0.1)	0 (<0)	0 (<0.2)	0 (0)		0.5-1.0 (0.5-1.0)	0 (0)	<0.05 (<0.2)	0 (<20)
	Class B		6.0-8.0 (6.0-9.0)									<200 (<200)	<250 (<250)	<10 (<1)	<0.1 (<1)	<6 (<6)	<3 (<0.5)	<1.5 (<1.5)		0.5-1.0-1.5 (<1.5)	<0.050 (<0.050)	<2 (<0.5)	<20 (<100)
	Class C		4.5-8.5 (>9 or <6)									<400 (<400)	<400 (<400)	<50 (<2)	<2 (<2)	<10 (<10)	<30 (<1)	<2 (<2)		<2 (<2)	<0.100 (<0.100)	<3 (<1)	<100 (<200)
	Exceeding Class C		>4.5 or <3.5																		>2 (<1)	>3 (<1)	>100 (<200)
WHO Guideline		-	-			1,000						250	250	0.3	3	50	1.5			1.5	0.01	0.5, 0.1	0
K-1-1	Gravity Flow System	24.7	8.23	126.8	2.38	73.795	8.38	6.500	2.07	0.546	52.03	0.426	3.84	0.45	<0.001	0.01	0.058	0.05	3.230	0.0707	0.0050	0.1411	5400
K-1-2	Gravity Flow System	23.6	6.59	42.1	3.32	38.800	3.10	2.940	1.15	2.418	25.50	0.142	3.55	0.53	<0.001	0.03	0.044	<0.01	3.390	0.1808	0.0037	0.0302	920
K-1-3	Gravity Flow System	24.2	8.17	126.9	3.59	111.850	13.14	8.080	2.76	1.053	83.51	0.284	3.02	0.16	<0.001	0.02	0.050	<0.01	1.260	0.0659	0.0029	0.0350	920
K-1-4	Dug Well	24.6	5.32	84.6	2.69	33.465	2.82	0.571	3.68	5.460	1.28	3.621	16.03	0.68	<0.001	5.82	0.040	<0.01	1.180	0.1373	0.0033	0.0375	280
K-1-5	Dug Well	24.7	6.79	168.4	2.06	123.957	17.84	2.685	3.68	11.310	81.80	0.497	6.14	0.52	0.010	0.19	0.070	<0.01	0.551	0.2081	0.0026	0.0735	1600
K-2-1	Dug Well	25.4	5.35	13.14	2.65	7.374	0.86	0.401	0.46	0.195	0.85	0.284	4.32	0.15	<0.001	0.09	0.066	<0.01	0.708	0.0420	0.0039	0.0375	920
K-2-2	Dug Well	24.8	6.07	61.1	3.37	50.219	8.38	1.057	1.61	1.326	30.20	0.355	7.30	0.14	<0.001	0.18	0.062	<0.01	0.315	0.1006	0.0035	0.0424	540
K-2-3	Dug Well	23.7	5.27	23.5	2.56	15.988	1.88	1.276	0.46	1.131	2.99	0.284	7.97	0.13	<0.001	0.34	0.006	<0.01	0.787	0.0601	0.0035	0.0326	1600
K-2-4	Dug Well	24.2	4.93	18.94	2.97	9.029	0.78	0.753	0.69	0.273	0.61	0.355	5.57	0.16	<0.001	1.02	0.081	<0.01	0.236	0.0768	0.0028	0.2201	1600
K-2-5	Dug Well	24.3	5.50	47.0	2.77	13.874	1.88	0.389	1.61	0.624	0.73	1.775	6.86	0.29	0.010	2.43	0.065	<0.01	0.472	0.0870	0.0036	0.0318	920
K-3-1	Stream	24.4	7.59	132.2	3.85	119.951	14.88	7.679	4.83	1.209	84.18	0.213	6.96	0.28	<0.001	0.02	0.070	<0.01	1.259	0.0851	0.0033	0.0427	2400
K-3-2	Dug Well	25.4	5.57	45.3	1.58	23.230	2.90	0.437	2.07	1.053	11.59	0.284	4.90	0.14	<0.001	0.16	0.060	<0.01	0.551	0.0658	0.0026	0.1505	1600
K-3-3	Gravity Flow System	24.1	7.59	142.3	3.78	125.694	13.88	8.602	3.68	1.911	91.74	0.213	5.66	1.05	<0.001	0.02	0.031	0.09	1.810	0.0677	0.0031	0.0455	3500
K-3-4	Dug Well	25.3	5.72	50.9	2.21	30.987	2.74	0.486	4.37	2.340	12.75	3.550	4.75	0.22	<0.001	0.35	0.045	<0.01	0.630	0.0843	0.0034	0.0375	920
K-3-5	Dug Well	25.3	5.88	68.0	2.95	48.309	2.16	4.398	2.76	1.755	30.93	0.213	6.10	0.21	<0.001	0.74	0.044	<0.01	0.551	0.0647	0.0033	0.0377	540
K-4-1	Dug Well	24.4	5.54	24.3	2.55	14.997	0.80	0.656	1.61	1.170	6.41	0.852	3.50	0.99	<0.001	0.71	0.064	<0.01	0.393	0.0905	0.0037	0.0305	350
K-4-2	Dug Well	26.7	5.38	22.0	3.14	10.432	1.44	0.437	0.92	0.195	0.79	0.071	6.58	0.44	<0.001	0.32	0.061	<0.01	0.393	0.0452	0.0036	0.0375	220
K-4-3	Dug Well	25.8	5.19	20.3	3.26	12.371	1.38	0.571	0.92	0.468	0.98	0.568	7.49	0.18	<0.001	1.11	0.110	<0.01	0.787	0.0707	0.0039	0.0425	280
K-4-4	Dug Well	25.3	5.46	33.7	2.65	28.419	5.42	0.705	0.46	1.053	17.69	0.355	2.74	0.29	<0.001	0.20	0.042	<0.01	0.551	0.0608	0.0035	0.0427	380
K-4-5	Dug Well	25.0	4.55	13.10	3.15	3.981	0.22	0.267	0.23	0.195	0.67	0.142	2.26	0.21	<0.001	0.22	0.041	<0.01	0.236	0.1000	0.0039	0.0529	140
K-5-1	Dug Well	25.6	4.95	23.3	2.58	9.824	0.44	0.255	1.61	0.624	0.73	0.355	5.81	0.64	<0.001	8.22	0.072	0.04	0.551	0.1007	0.0036	0.0975	920
K-5-2	Dug Well	25.9	5.99	108.8	2.42	62.496	8.10	2.454	3.91	2.964	40.20	0.213	4.66	0.28	<0.001	9.36	0.017	0.06	0.315	0.0847	0.0040	0.0577	280
K-5-3	Dug Well	25.3	5.20	53.8	2.27	24.241	2.16	0.535	4.37	1.365	0.73	4.615	10.46	0.58	<0.001	8.44	0.036	0.04	0.630	0.0905	0.0037	0.0545	540
K-5-4	Dug Well	25.6	4.67	84.9	1.65	34.972	1.88	1.361	6.44	1.131	0.85	11.786	11.52	0.71	<0.001	9.38	0.018	0.04	0.472	0.0452	0.0040	0.0427	920
K-5-5	Dug Well	25.9	5.09	78.2	2.55	62.517	8.10	2.491	3.45	6.630	23.61	8.591	9.65	0.20	0.010	9.22	0.025	0.04	0.866	0.0705	0.0048	0.1070	540
K-6-1	Dug Well	25.8	5.82	80.8	2.79	12.600	0.86	0.158	0.69	3.198	0.67	4.047	2.98	0.37	<0.001	9.56	0.014	0.04	0.708	0.0707	0.0044	0.1100	920
K-6-2	Dug Well	25.3	5.98	105.0	3.46	74.431	6.58	2.892	8.97	3.354	35.81	1.420	15.41	0.27	<0.001	9.36	0.012	0.18	0.708	0.1808	0.0042	0.1171	540
K-6-3	Dug Well	25.2	5.99	254	2.00	147.258	23.26	3.596	14.72	7.410	40.26	27.868	30.14	0.25	0.080	8.66	0.017	0.04	0.787	0.0768	0.0041	0.1177	240
K-6-4	Spring	25.0	6.12	56.7	3.39	30.623	2.16	2.479	1.43	3.354	6.16	0.355	14.69	0.27	0.020	4.34	0.020	0.04	0.391	0.0853	0.0038	0.0375	920
K-6-5	Dug Well	25.5	6.27	209	1.75	171.641	24.06	4.787	11.96	3.666	115.29	1.846	10.03	0.30	0.010	1.74	0.017	0.04	0.787	0.1888	0.0082	0.4070	240
G-1-1	Dug Well	25.1	5.65	11.33	2.57	15.506	0.88	1.932	0.69	0.273	3.97	0.710	7.06	0.23	<0.001	0.11	0.149	<0.01	0.236	0.1077	0.0041	0.0987	5200
G-1-2	Dug Well	25.4	5.50	13.32	3.12	13.923	1.38	1.543	0.46	0.117	1.40	0.284	8.74	0.18	<0.001	0.52	0.033	0.04	0.315	0.0475	0.0039	0.0427	1500
G-1-3	Dug Well	25.5	4.86	24.8	2.83	10.299	1.58	0.413	0.69	0.078	3.97	0.213	3.36	0.11	<0.001	0.30	0.042	<0.01	0.157	0.0945	0.0043	0.0777	1600
G-1-4	Dug Well	25.5	5.22	15.80	2.88	7.983	1.30	0.134	0.69	0.078	1.34	0.071	4.37	0.07	<0.001	0.25	0.078	<0.01	0.630	0.1800	0.0030	0.2000	260
G-1-5	Dug Well	26.2	6.24	128.7	1.73	6.704	0.72	0.450	0.46	0.078	1.53	0.639	2.83	0.07	<0.001	0.02	0.035	<0.01	0.236	0.0674	0.0029	0.1750	5400
G-2-1	Dug Well	26.9	5.89	42.0	3.17	38.337	2.84	3.791	2.07	0.780	20.13	0.710	8.02	0.21	<0.001	0.97	0.037	0.05	0.236	0.1800	0.0051	0.1100	49
G-2-2	Dug Well	26.6	5.04	26.7	2.86	14.276	1.82	0.522	1.84	0.234	3.17	2.272	4.42	0.35	<0.001	0.52	0.022	0.04	0.315	0.0855	0.0034	0.0427	140
G-2-3	Dug Well	27.0	5.83	57.2	3.02	36.842	3.18	2.564	2.76	0.936	19.83	2.201	5.38	0.20	<0.001	1.19	0.014	0.08	0.157	0.2012	0.0030	0.0577	220
G-2-4	Dug Well	27.1	5.16	33.1	2.89	20.733	0.58	2.333	2.07	0.273	6.77	2.130	6.58	0.17	<0.001	1.09	0.046	0.04	0.630	0.1875	0.0027	0.0672	920
G-2-5	Dug Well	26.3	5.46	23.3	3.13	13.460	0.44	1.227	1.38	0.234	7.44	1.633	1.10	0.53	<0.001	0.14	0.040	0.09	0.630	0.0677	0.0031	0.0307	240

Table K6.20 Result of Simple Water Quality Analysis for Existing Water

Sampl. No.	Type	Temp. (°C)	pH	Ec (µ S/cm)	DO (mg/l)	Mg ²⁺ (mg/l)	Fe ²⁺ +Fe ³⁺ (mg/l)	NO ₂ -N (mg/l)	NO ₃ -N (mg/l)	NH ₄ ⁺ (mg/l)	PO ₄ ³⁻ (mg/l)	COD/KMnO ₄ (mg/l)	F (mg/l)	As (mg/l)	Mn ²⁺ (mg/l)	Coliform (MPN/100ml)
Water Quality Standard (TCXD 233 : 1999)	Class A	-	6.8-7.5 (6.5-8.5)				<0.3 (<0.3)	0 (<0.1)	0 (0)	0 (<0.2)	0 (0)		0.5-1.0 (0.5-1.0)	0 (0)	<0.05 (<0.2)	0 (<20)
	Class B		6.0-8.0 (6.0-9.0)				<10 (<1)	<0.1 (<1)	<6 (<6)	<5 (<0.5)	<1.5 (<1.5)		0-0.5 or 1.0-1.5 (<1.5)	<0.050 (<0.050)	<2 (<0.5)	<20 (<100)
	Class C		4.5-8.5 (>9 or <6)				<50 (<2)	<2 (<2)	<10 (<10)	<30 (<1)	<2 (<2)		<2 (<2)	<0.100 (<0.100)	<3 (<1)	<100 (<200)
	Exceeding Class C								10=				>2 (>2)		>3 (>1)	
WHO Guideline		-	-				0.3	3	50	1.5			1.5	0.01	0.5, 0.1	0
K-1-1	Rivulet	20.7	7.23	46.4	4.55	0.5	0.2	<0.02	<1	0	<0.2	5	0	<0.2	<0.5	
K-1-2	Dug Well	21.6	5.96	14.18	3.10	0.5	0.2	<0.02	<1	0	<0.2	5	0	<0.2, (0.00)	<0.5	
K-1-3	Reservoir	26.7	7.89	62.2	5.98	1.5	0.2	<0.02	<1	0	<0.2	5	1	<0.2	<0.5	
K-1-4	Dug well	-	-	20.6	2.88	1	0.5	<0.02	<1	5	<0.2	-	2	<0.2	-	+
K-2-1	Dug Well	24.1	5.57	45.8	2.82	0.5	0.2	<0.02	<1	0	<0.2	30	0	<0.2, (0.00)	<0.5	
K-2-2	Rivulet	28.6	6.35	29.2	5.37	0	0.2	<0.02	<1	0	<0.2	10	0	<0.2	<0.5	
K-2-3	Dug well	24.0	5.42	21.8	2.44	1	0.2	<0.02	2	1	<0.2	-	1	<0.2	-	+
K-2-4	Dug well	-	-	19.32	3.71	1	0.5	<0.02	2	1	<0.2	-	1	<0.2	-	+
K-3-1	Bamboo System	20.4	7.59	139.3	5.98	3	<0.2	<0.02	<1	0	<0.2	5	1	<0.2	<0.5	
K-3-2	Bamboo System	20.9	8.12	140.0	7.05	3	<0.2	<0.02	<1	0	<0.2	5	1	<0.2, (0.00)	<0.5	
K-3-3	Stream	23.6	7.30	82.4	3.46	3	<0.2	<0.02	<1	0	<0.2	15	0	<0.2	<0.5	
K-3-4	Dug Well	23.0	5.56	27.8	2.68	0	<0.2	<0.02	<1	0	<0.2	10	0	<0.2	<0.5	
K-3-5	Dug Well	22.5	5.44	29.1	2.05	1	<0.2	<0.02	<1	0	<0.2	-	1	<0.2	-	+
K-4-1	Bamboo System	24.6	5.76	6.53	5.83	0	<0.2	<0.02	<1	0	<0.2	50	0	<0.2	<0.5	
K-4-2	Stream	32.5	6.39	18.80	4.28	0	<0.2	<0.02	<1	0	<0.2	20-50	0	<0.2	<0.5	
K-4-3	Spring	24.5	4.82	22.7	1.30	-	-	-	-	-	-	-	-	-	-	-
K-4-4	Spring	30.6	6.81	11.88	5.70	0	<0.2	<0.02	<1	0	<0.2	10	0	<0.2	<0.5	
K-4-5	Dug Well	27.5	6.11	42.6	6.78	0	<0.2	<0.02	<1	0	<0.2	10	0	<0.2, (0.00)	<0.5	
K-4-6	Dug Well	28.8	-	102.6	6.66	1	0.5	<0.02	2	0	<0.2	-	1	<0.2	-	-
K-4-7	Dug Well	25.2	-	66.0	5.71	-	-	<0.02	<1	1	-	-	1	-	-	-
K-5-1	Stream	26.9	6.73	30.1	-	1	<0.2	<0.02	<1	0	<0.2	50	1	<0.2	<0.5	
K-5-2	Dug Well	24.6	5.34	34.6	-	0	<0.2	<0.02	1	0	<0.2	10	0	<0.2	<0.5	
K-5-3	Dug Well	25.3	5.09	18.73	-	0	<0.2	<0.02	<1	0	<0.2	5	1	<0.2	<0.5	
K-5-4	Dug Well	24.8	6.48	228	-	1	<0.2	<0.02	<1	0	<0.2	10	0	<0.2, (0.00)	0.7	
K-5-5	Dug well	26.0	-	46.0	-	1	1	<0.02	<1	1	<0.2	-	1	<0.2	-	+
K-6-1	Spring	23.6	6.46	49.6	-	1	0.2	<0.02	<1	0	<0.2	10	0	<0.2	<0.5	
K-6-2	Spring	27.6	5.00	62.8	-	1	0.2	<0.02	3	0	<0.2	5	0	<0.2	<0.5	
K-6-3	Dug Well	28.3	6.20	122.7	-	2	0.7	<0.02	<1	0	<0.2	5	0	<0.2, (0.00)	<0.5	
K-6-4	Dug well	25.0	-	211	-	2	0.2	<0.02	8	10	<0.2	-	1	<0.2	-	-
K-6-5	Dug well	25.7	5.84	162.7	-	5	0.2	<0.02	8	10	<0.2	-	0	<0.2	-	-
G-1-1	Dug Well	25.5	4.85	13.21	5.25	0	0.2	<0.02	1	1	<0.2	30	2	<0.2, (0.00)	<0.5	
G-1-2	Dug Well	25.1	5.23	13.87	3.45	1	0.5	<0.02	2	-	-	30	-	<0.2	<0.5	
G-1-3	Dug Well	25.2	5.12	16.03	2.76	1	0.5	<0.02	1	-	-	50	-	<0.2	<0.5	
G-2-1	Dug Well	26.6	5.30	22.6	-	0	0.2	<0.02	1	0	<0.2	100	0	<0.2, (0.00)	<0.5	
G-2-2	Dug Well	26.3	5.80	46.4	-	1	0.2	<0.02	2	0	<0.2	100	0	<0.2	<0.5	
G-2-3	Dug Well	26.0	5.21	28.8	-	0	0.2	<0.02	2	0	<0.2	100	0	<0.2	<0.5	
G-3-1	Dug Well	26.7	4.87	11.32	5.12	1	<0.2	<0.02	<1	0	<0.2	7	0	<0.2	<0.5	
G-3-2	Dug well	25.3	-	81.8	6.20	1	<0.2	<0.02	<1	0	<0.2	-	2	-	-	+
G-3-3	Dug well	26.0	-	26.0	4.90	0	<0.2	<0.02	<1	7	<0.2	-	1	<0.2	-	+
G-3-4	Dug well	27.7	-	19.35	4.85	1	0.5	<0.02	<1	3	<0.2	-	-	<0.2	-	+
G-4-1	Drilling Well	26.1	4.93	12.06	4.98	0	<0.2	<0.02	<1	0	<0.2	10	0	<0.2, (0.00)	<0.5	
G-4-2	Spring	27.6	5.31	9.91	4.06	0	0.5	<0.02	<1	0	<0.2	50	0	<0.2	<0.5	
G-4-3	Dug Well	25.2	4.95	14.39	3.13	0	<0.2	<0.02	<1	0	<0.2	5	0	<0.2	<0.5	
G-4-4	Dug Well	25.4	4.89	26.7	4.57	0	<0.2	<0.02	<1	0	<0.2	5	0	<0.2	<0.5	
G-5-1	Dug Well	24.6	5.03	9.50	4.29	0	0.7	<0.02	<1	0	<0.2	50	3	<0.2, (0.00)	<0.5	
G-5-2	Spring	24.9	5.16	8.67	4.66	1	<0.2	<0.02	<1	0	<0.2	50	2	<0.2	<0.5	
G-5-3	Dug Well	-	-	10.40	5.72	1	1	<0.02	<1	0	<0.2	-	1	<0.2	-	+
G-5-4	Dug Well	26.0	-	10.94	5.20	1	0.2	<0.02	<1	-	<0.2	-	1	<0.2	-	+
G-5-5	Dug Well	25.3	-	31.3	5.99	1	0.2	<0.02	<1	-	<0.2	-	-	<0.2	-	++
G-6-1	Dug Well	26.0	6.94	1250	2.87	7	0.2	<0.02	<1	0	<0.2	10	0	<0.2	<0.5	
G-6-2	Drilling Well (HP)	27.1	6.66	200	3.23	1	10	<0.02	<1	0	0.5	50	1	<0.2, (0.00)	<0.5	
G-6-3	Dug well	-	6.53	-	-	1	1	-	-	0	0.2	-	0	<0.2	-	No
D-1-1	Dug Well	24.8	5.94	255	4.22	-	0.2	-	-	0.3	0.2	-	0.5	<0.2, (0.00)	-	
D-1-2	Spring	22.9	7.70	95.6	6.83	-	0.5	-	-	-	-	-	5	<0.2, (0.00)	-	
D-1-3	Spring	24.7	6.26	84.4	4.35	-	0.2	-	-	-	-	-	-	<0.2	-	
D-1-4	Dug Well	24.7	5.79	-	6.47	-	0.2	-	-	2	0.2	-	-	<0.2	<0.5	
D-1-5	Dug Well	21.0	6.46	157.4	6.00	-	<0.2	-	-	10	0.2	-	-	<0.2	<0.5	
D-1-6	Dug Well	22.5	-	149.5	5.40	-	0.2	-	-	10	0.2	-	-	<0.2	<0.5	
D-2-1	Drilling Well	26.2	5.65	29.4	2.41	0	<0.2	<0.02	<1	0.3	<0.2	100	0	<0.2	<0.5	
D-2-2	Drilling Well	26.5	7.41	206	4.54	1.5	<0.2	<0.02	<1	0.3	0.2	50	0	<0.2, (0.00)	<0.5	
D-2-3	Drilling Well	26.5	7.17	203	3.68	-	-	-	-	-	-	-	-	-	-	
D-2-4	Dug Well	25.1	6.36	71.5	4.54	1.5	<0.2	<0.02	<1	0.3	<0.2	100	0	<0.2, (0.00)	<0.5	
D-2-5	Drilling well	25.4	7.03	135.4	5.71	1	0.5	<0.02	<1	0	0.2	-	0	<0.2	-	+
D-2-6	Dug well	23.3	7.88	121.0	6.36	-	0.5	<0.02	2	0	1	-	0	<0.2	-	++++
D-3-1	Dug Well	25.2	6.33	262	2.84	5	0.2	<0.02	10	0.3	0.7	70	1	<0.2, (0.00)	<0.5	
D-3-2	Rivulet	24.9	8.15	467	8.31	-	0.2	0.070	10	-	<0.2	-	-	<0.2	-	
D-3-3	Drilling Well	24.5	7.76	356	2.71	-	0.2	<0.02	<1	-	0.2	-	1	<0.2	-	
D-3-4	Dug well	24.3	-	500	4.80	1	0.2	-	-	0	0.5	-	-	<0.2	-	
D-4-1	Spring	24.8	6.80	173.6	5.45	3	<0.2	<0.02	5	0	0.3	5	1	<0.2, (0.00)	<0.5	

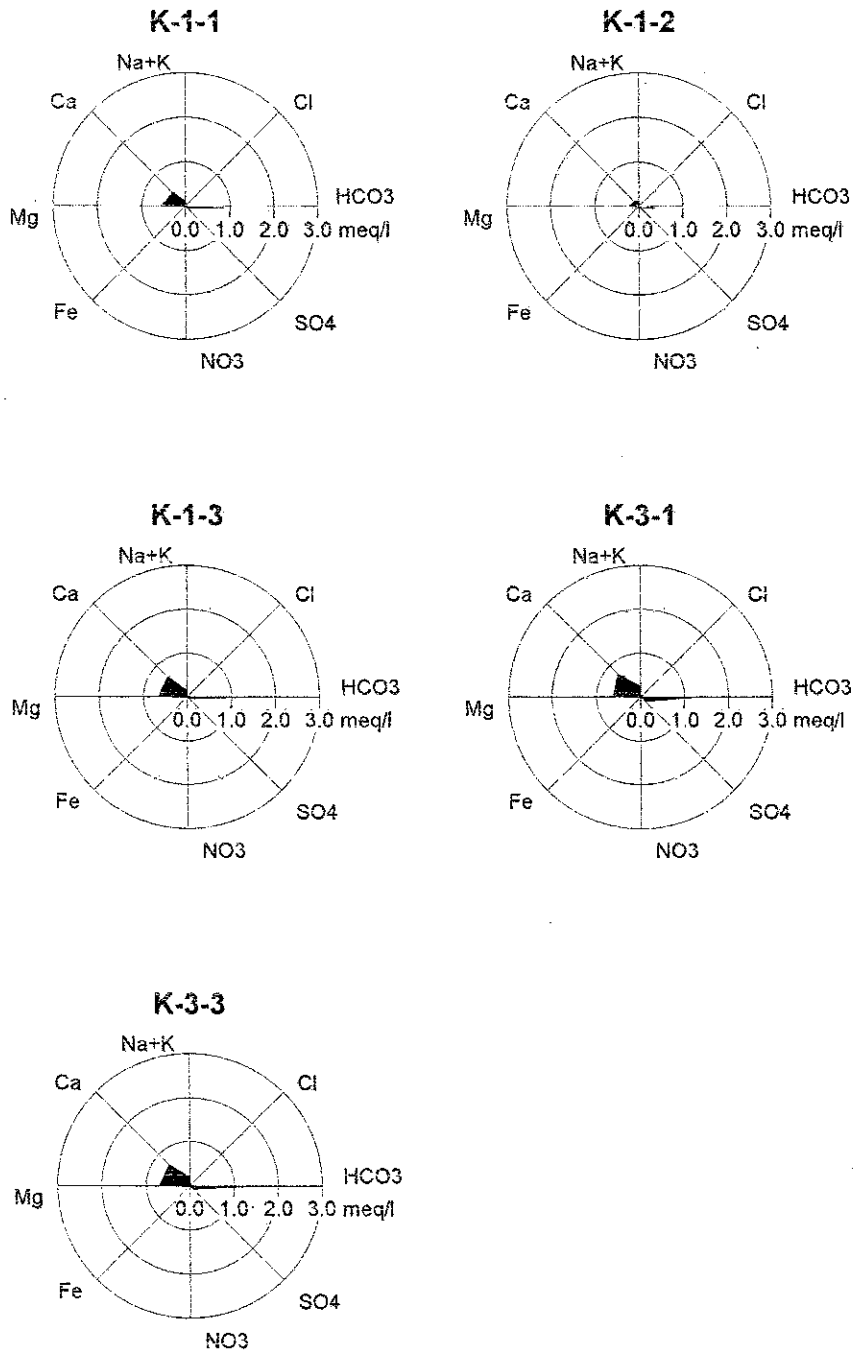


Figure K6. 8 Stiff Diagram of Water Samples from Surface Water

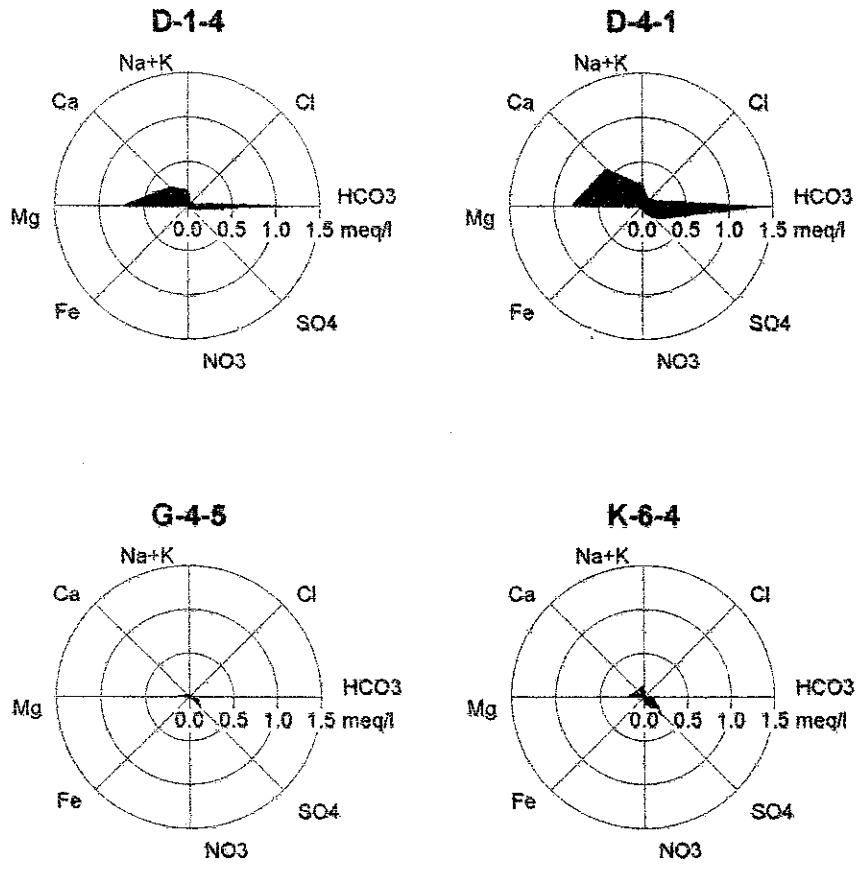


Figure K6. 9 Stiff Diagram of Water Samples from Spring Water

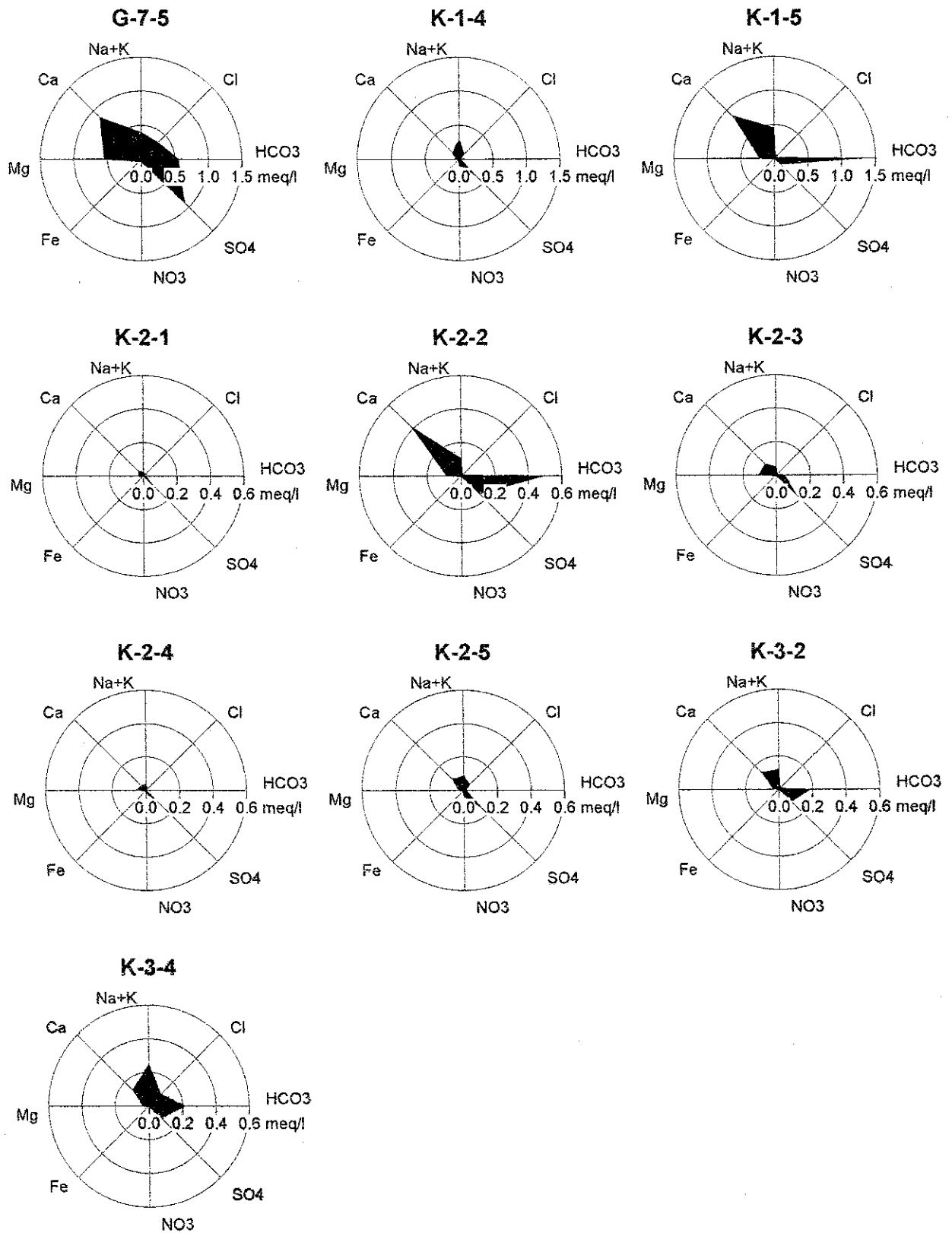


Figure K6. 10 Stiff Diagram of Water Samples from Shallow Well (Dug Well)

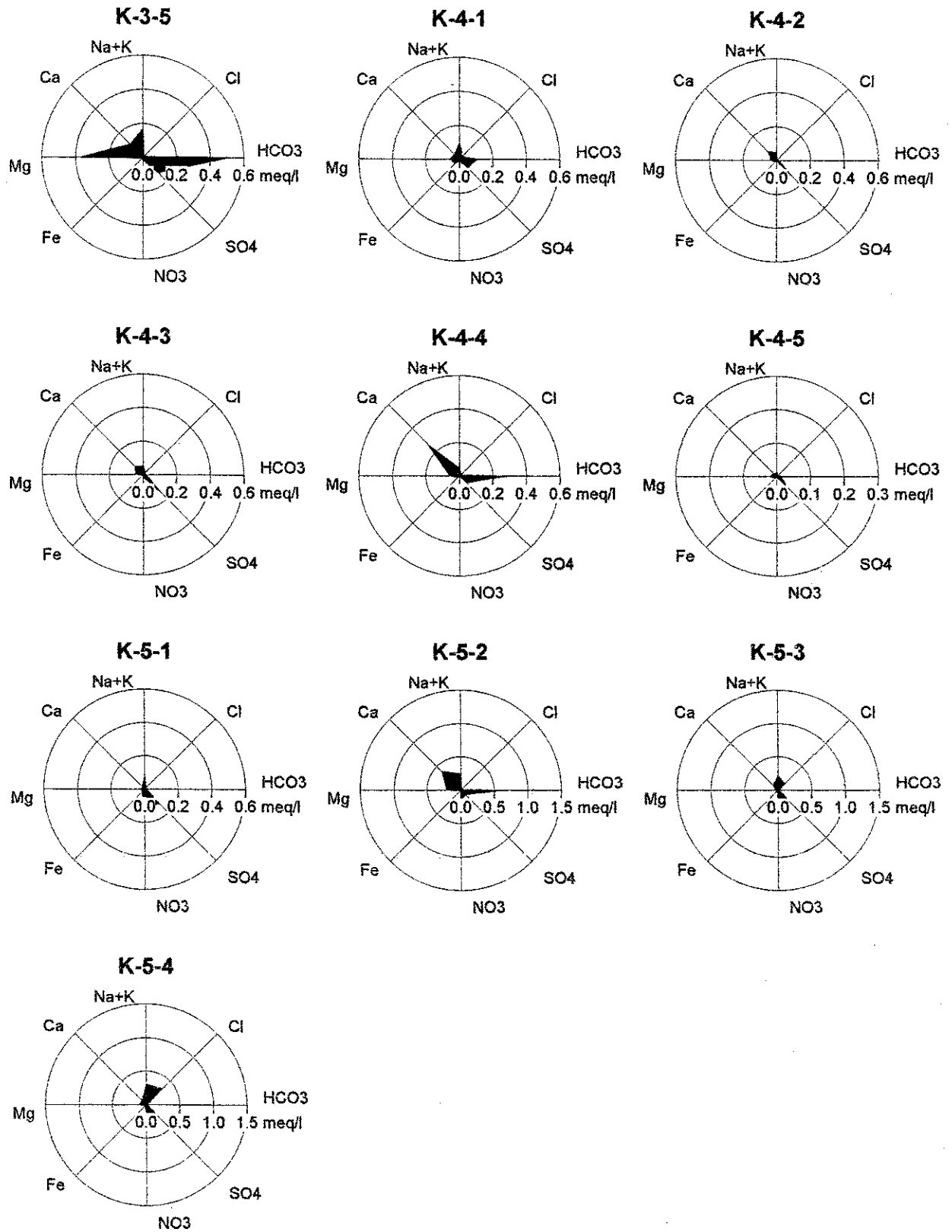


Figure K6. 11 Stiff Diagram of Water Samples from Shallow Well (Dug Well)

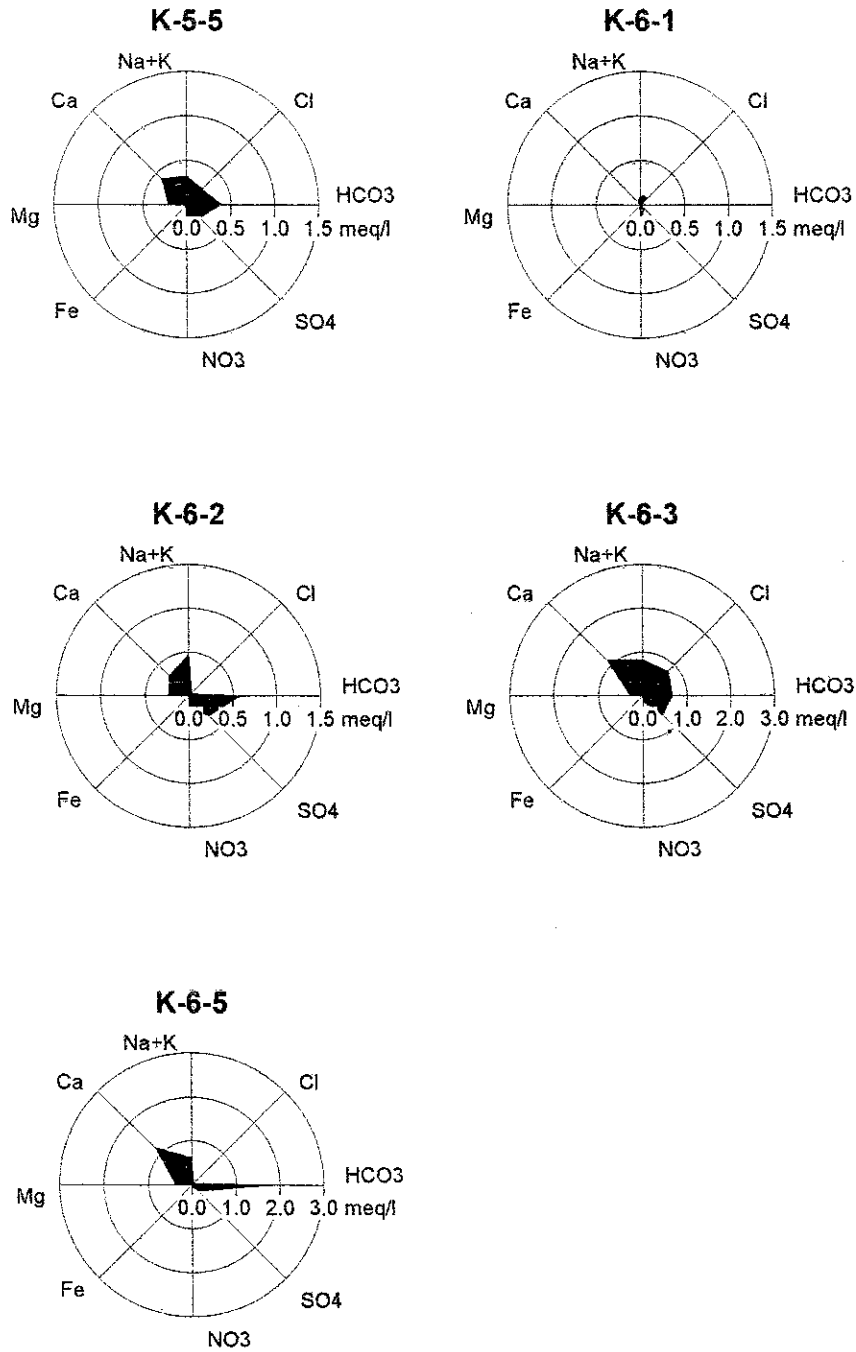


Figure K6. 12 Stiff Diagram of Water Samples from Shallow Well (Dug Well)

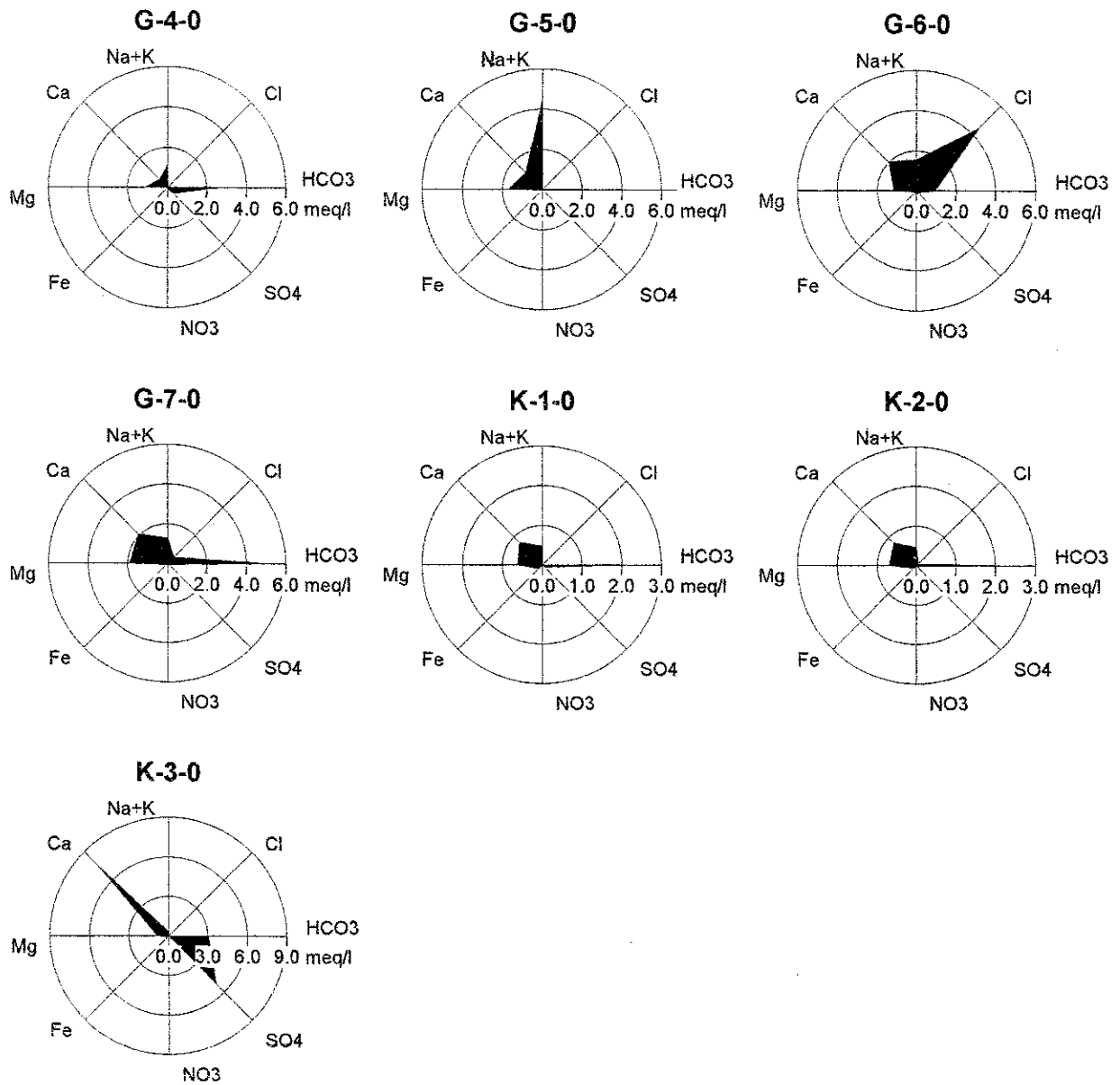


Figure K6. 13 Stiff Diagram of Water Samples from Test Well

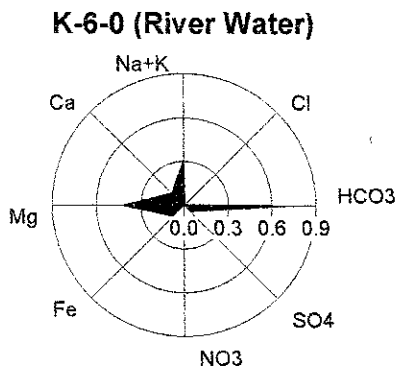
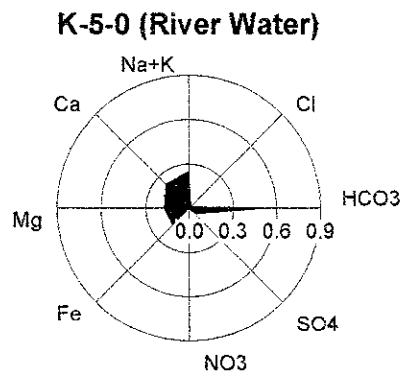
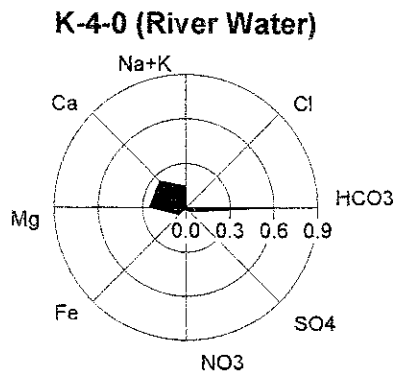


Figure K6. 14 Stiff Diagram of Water Samples from Alternative Water Resources