

3.3 Data of Core Drilling Work

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Geologic Log of Drillholes:

1. Se Kong No. 4 Dam Site

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SK-2	3 sheets
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XK-1	5 sheets
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XN-5	3 sheets
XN-6	3 sheets

List of Core Drilling

Project	Drillhole Number	Length (m)	Coordinates	
			N	E
Se Kong No. 4	SK-1	100	1,715,122	692,132
	SK-2	60	1,715,512	692,112
	SK-3	100	1,715,808	692,102
Xe Kaman No. 1	XK-1	100	1,654,608	732,180
	XK-2	60	1,654,826	732,279
	XK-3	100	1,654,937	732,330
Xe Namnoy Midstream	XN-1	80	1,663,482	673,317
	XN-2	40	1,663,766	673,584
	XN-3	60	1,663,921	673,730
	XN-4	80	1,664,760	672,460
	XN-5	60	1,664,870	672,760
	XN-6	60	1,664,840	672,980
Total	12 holes	900		

Standard of Classification for Drilled Core

Weathering		Hardness		Crack spacing	
1	Very fresh. No weathering of mineral component.	1	Very hard. Broken into knifeedged pieces by strong hammer blow.	1	Over 30 cm
2	Fresh. Some minerals are weathered slightly. Usually no brown crack.	2	Hard. Broken into pieces by strong hammer blow.	2	10 - 30 cm
3	Fairly fresh. Some minerals are weathered. Cracks are stained and with weathered material.	3	Brittle. Broken into pieces by medium hammer blow.	3	3 - 10 cm
4	Weathered. Fresh portions still remain partially.	4	Very brittle. Easy broken into pieces by medium hammer blow.	4	1 - 3 cm
5	Strongly weathered. Most minerals are weathered and altered to second minerals.	5	Soft. Able to dig with hammer.	5	Under 1 cm

This standard has been used by EPDC.

Standard of Rock Mass Evaluation

Class	Rock Mass Condition
a.	Fresh, sound, cracky in part
b.	Weathered, brittle, cracky
c.	Strongly weathered, soft or very cracky

Relatiion of Rock Mass Evaluation and Classification for Drilled Core

		Grade of Weathering and Hardness				
		1	2	3	4	5
Grade of Crack Spacing	1	a		b	c	
	2					
	3					
	4					
	5					

GEOLOGIC LOG OF DRILL HOLE

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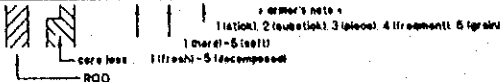
Se Kong River Basin PROJECT

HOLE No. SK-1

(SHEET 1 of 5)

LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0	a	COMMENCED	1-1-1994
ELEVATION	265.7	DIRECTION OF HOLE	90'		COMPLETED	25-1-1994
COORDINATE	X: E692132	CORE RECOVERY	99.7	%	DRILLED BY	Thongsay
	Y: N1715122	DRILLING MACHINE	KT-100		LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax						
265.70	0m	Tuff	△	0 = 100%						SOIL with ang. gravel								0m
	1		×		yellow	3	3	4		Sandy loess Color changed yellowish SILT fill cracks Broken with hammer blow								1
	2		×		grey	2	2	3		Cracks stained to brown								2
	3		×		grey	2	2	3		Green lupilli up to 5cm								3
	4		×		grey	3	3	3		5.5 to 5.8m purple								4
	5		×		grey	2	2	2		6.5m: brown stain 10cm thick 6.8m: clay 2cm thick								5
	6		×															6
	7		×															7
	8		×															8
	9		×															9
	10	Tuff	×							20cm green grey block at 8.5m								10
	11		×															11
	12		×															12
	13		×															13
	14		×															14
	15		×															15
	16		×															16
	17		×															17
	18		×															18
	19		×															19
265.70	20		×															20



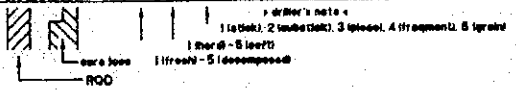
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. SK-1		(SHEET 2 of 5)	
LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0 m	COMMENCED	1-1-1994
ELEVATION	265.7 m	DIRECTION OF HOLE	90°	COMPLETED	25-1-1994
COORDINATE	X:E692132	CORE RECOVERY	99.7 %	DRILLED BY	
	Y:N1715122	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEOH	P _{max}						
245.70	20m			0 + 100%														20m
	1					P. 87	N			Sandy TUFF								1
	2									Lapilli (up to 2cm across) rich Purplish matrix	Lu=0.3	7.87						2
	3									Crack stained from 22.9m to 24.5m Solution vein from 23.3m to 24.3m								3
	4					ppixgrey+green	N			Opening up to 0.5cm across								4
	5																	5
	6								2									6
	7					greenish grey	3			Dissolved stained vein at from 25.1m to 25.3m and from 25.5m to 25.7m up to 0.5cm wide	Lu=0.9	7.93	5.43				8.2m (27.00m)	7
	8									29.8-30.0m purple fine 28.7-28.9m purple fine							2.5m (27.70m)	8
	9									White spot up to 2mm across Green irregular net in purple fine layer between 28.2m and 28.5m							5m (30.10m)	9
	30	Tuff							2									30
	1								3									1
	2									Fine sandy	Lu=1	7.97	5.47					2
	3																	3
	4					reddish purple	N											4
	5																	5
	6																	6
	7																	7
	8					greenish red	N			Greenish sandy with some fine purplish layer from 10cm to 20cm thick at 4cm interval	Lu=0	8.09						8
	9									Some calcite vein at 80° upward fining								9
225.70	40																	40



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GEOLOGIC LOG OF DRILL HOLE

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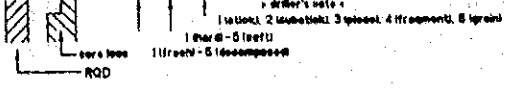
Se-Kong River Basin PROJECT

HOLE No. SK-1

(SHEET 3 of 5)

LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0	COMMENCED	1-1-1994
ELEVATION	285.7	DIRECTION OF HOLE	90°	COMPLETED	25-1-1994
COORDINATE	X: 6692132	CORE RECOVERY	99.7	DRILLED BY	
	Y: N1715122	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O G	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEDON	P _{max}						
228.70	40m			0 → 100%														40m
	1		×							Coarse sandy TUFF and medium grained sandy Tuff								
	2		×															
	3		×															
	4		×															
	5		×															
	6		×															
	7		×															
	8		×															
	9		×															
	50	Tuff	×															
	1		×															
	2		×															
	3		×															
	4		×															
	5		×															
	6		×															
	7		×															
	8		×															
	9		×															
	60		×															
	1		×															
	2		×															
	3		×															
	4		×															
	5		×															
	6		×															
	7		×															
	8		×															
	9		×															
	37m		×															



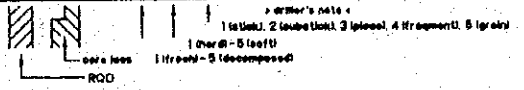
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. SK-1	(SHEET 4 of 5)
LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0 m COMMENCED 1-1-1994
ELEVATION	265.7 m	DIRECTION OF HOLE	90° COMPLETED 25-1-1994
COORDINATE	X: E692132	CORE RECOVERY	99.7 % DRILLED BY _____
	Y: N1715122	DRILLING MACHINE	KT-100 LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	P _{max}						
205.70	60m			0 → 100%														60m
	1		X															1
	2		X															2
	3		X															3
	4		X															4
	5		X															5
	6		X															6
	7		X															7
	8		X															8
	9		X															9
	10		X															10
	11		X															11
	12		X															12
	13		X															13
	14		X															14
	15		X															15
	16		X															16
	17		X															17
	18		X															18
	19		X															19
	20		X															20
	21		X															21
	22		X															22
	23		X															23
	24		X															24
	25		X															25
	26		X															26
	27		X															27
	28		X															28
	29		X															29
	30		X															30



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GEOLOGIC LOG OF DRILL HOLE

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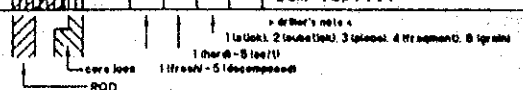
Se Kong River Basin PROJECT

HOLE No. SK-1

(SHEET 5 of 5)

LOCATION	Se Kong No.4 Dam site	DEPTH OF HOLE	100.0 m	COMMENCED	1-1-1994
ELEVATION	265.7 m	DIRECTION OF HOLE	90°	COMPLETED	25-1-1994
COORDINATE	X: E692132	CORE RECOVERY	99.7 %	DRILLED BY	
	Y: N1715122	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	P.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEOM	Pmax						
185.70	80m			0 → 100%														80m
	1		×															1
	2		×															2
	3		×															3
	4		×															4
	5		×															5
	6		×															6
	7		×															7
	8		×															8
	9		×															9
	90	Tuff	×															90
	1		×															1
	2		×															2
	3		×															3
	4		×															4
	5		×															5
	6		×															6
	7		×															7
	8		×															8
	9		×															9
165.70	100		×															100



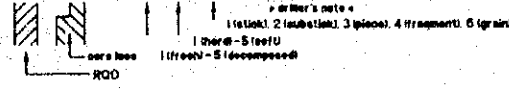
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. SK-2		(SHEET 1 of 3)	
LOCATION	Se Kong No.4 Dam site	DEPTH OF HOLE	60.0 m	COMMENCED	17-12-1993
ELEVATION	146.4 m	DIRECTION OF HOLE	90°	COMPLETED	30-12-1994
COORDINATE	X: 6692112	CORE RECOVERY	92.8 %	DRILLED BY	Thongsay
	Y: N1715512	DRILLING MACHINE	KT-100	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}						
146.40	0m			0 → 100%														0m
	1	Topsoil	△							SOIL with angular gravel								1
	2	Topsoil	△															2
	3	Topsoil	△															3
	4	Basalt	▽		grey	3	3	3		With irregular shale lens Crack stained Easily broken by hammer								4
	5	Sh	▨		black	4	4	2		Sandy SHALE								5
	6	Basalt	▽		grey	3	3	3		Black round spot(1mm) Broken along hair cracks								6
	7	Basalt	▽		grey	3	3	3										7
	8	Shale	▨		black	2	4	3		Sandy SHALE Easily broken by hands Sheared Some portion easily broken by fingers	Lu=1.8	5.32	3.32					8
	9	Shale	▨		black	3	3	3										9
	10	Sandstone	•••		d. grey	2	2	3		SANDSTONE with lamina No core from 12.5m to 12.8m	Lu=1.75	5.25	—					10
	11	Sandstone	•••		d. grey	2	2	3		White spot								11
	12	Sh	▨		grey	4	4	5		SHALE quartz vein, striation, luster No core from 14.0m to 14.8m								12
	13	Sandstone/shale	•••		d. grey	3	3	4		m.g. SANDSTONE and SHALE SANDSTONE is hard but SHALE is easily broken								13
	14	Sandstone/shale	•••		d. grey	2	3	4		No core from 15.85m to 16.1m, from 16.4m to 17.4m, from 18.3m to 18.5m	Lu=2.5	7.8	5.3					14
	15	Sandstone/shale	•••		d. grey	2	3	4		Sheared from 19.0m to 19.8m								15
126.40	20	Sh	▨		grey	2	2	3										20



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GEOLOGIC LOG OF DRILL HOLE

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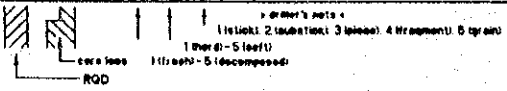
Se Kong River Basin PROJECT

HOLE No. SK-2

(SHEET 2 of 3)

LOCATION <u>Se Kong No.4 Damsite</u>	DEPTH OF HOLE <u>60.0</u> m	COMMENCED <u>17-12-1993</u>
ELEVATION <u>146.4</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>30-12-1994</u>
COORDINATE <u>X: E692112</u>	CORE RECOVERY <u>92.8</u> %	DRILLED BY _____
<u>Y: NJ715512</u>	DRILLING MACHINE <u>KT-100</u>	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HANDNESS	CRACK SPACING	ROCK EVALUATION		LU	Pmax	Pc						
120.40	20m			0-100%															20m
	1	Sandstone	•••••	100%	grey	2	2	2	2	Medium grained SANDSTONE with SHALE lamina. Irregular dark lens 20cm across at 20.8m	Lu=3	7.73	5.23						20.76m 40-240 21-159
	2				blk	2	5	4	Hard sheared slate from 21.0m to 21.3m										
	3				grey	2	3	No core from 21.85m to 22.3m											
	4				grey	2	3		Lamina at 20'										
	5				grey	1	1	Easily separate into 1cm pieces											
	6				grey	3	4		Sheared from 26.5m to 26.6m										
	7				grey	2	3	Shoared from 27.3m to 27.4m											
	8				blk	2	2		Sandy SHALE										
	9				grey	2	3	m. grained SANDSTONE with shale lamina											
	10				grey	3	3		15cm black shale band at 40' at 30.3m, sheared										
	1	Sandstone	•••••	100%	grey	2	1	4		32.2m to 33.2m shale dom. 10cm black clay at 32.4m lam at 50'	Lu=3.16	7.6							1.8m (30.00m)
	2				grey	1	4	Bottom surface irregular											
	3				grey	3	3		Downward coarsening from 1m SHALE to f.m.g. 5m 10cm clay+brecc. at 34.4m										
	4				dark grey	2	2	SANDSTONE with irregular shale lamina											
	5				dark grey	2	2		SANDSTONE with irregular shale lamina										
	6				dark grey	2	2	SANDSTONE with irregular shale lamina											
	7				dark grey	2	2		SANDSTONE with irregular shale lamina										
	8				dark grey	2	2	SANDSTONE with irregular shale lamina											
	9				dark grey	2	2		SANDSTONE with irregular shale lamina										
	10				dark grey	2	2	SANDSTONE with irregular shale lamina											
109.40	40																		



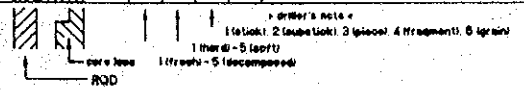
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. SK-2		(SHEET 3 of 3)	
LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	17-12-1993
ELEVATION	146.4 m	DIRECTION OF HOLE	90°	COMPLETED	30-12-1994
COORDINATE	X:EG92112	CORE RECOVERY	92.8 %	DRILLED BY	
	Y:N1715512	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	R.W.I. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEOH	Pmax						
106.40	40m	Shale	Sp	0 = 100%	Dark grey/black													40m
	1	Shale	Sp		black					Sandy SHALE with sandstone lamina Lamina at 50'								1
	2	Shale	Sp		d. grey					Medium grained SANDSTONE with shale lamina								2
	3	Shale	Sp		black					SHALE With sandstone lamina Pyllite lens at 43.7m Lamina at 60'								3
	4	Shale	Sp		black					SHALE With sandstone lamina Pyllite lens at 43.7m Lamina at 60'								4
	5	Sandstone	Sp		d. grey					Medium grained SANDSTONE								5
	6	Sandstone	Sp		d. grey					Medium grained SANDSTONE								6
	7	Sandstone	Sp		d. grey					Medium grained SANDSTONE								7
	8	Shale	Sp		dark grey/black					SHALE dominant with Sandstone lamina	Lug=5.4	7.76	5.26					8
	9	Shale	Sp		dark grey/black					SHALE dominant with Sandstone lamina								9
	50	Shale	Sp		dark grey/black					SANDSTONE from 49.25m to 49.7m								50
	1	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								1
	2	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								2
	3	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								3
	4	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								4
	5	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								5
	6	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								6
	6	Shale	Sp		dark grey/black					51.7m to 53.7m pure SHALE								6
	7	Sandstone	Sp		grey					Medium grained SANDSTONE Brecciated at 58.5m to 59.2m	Lug=9.4	7.96						7
	8	Sandstone	Sp		grey					Medium grained SANDSTONE Brecciated at 58.5m to 59.2m								8
	9	Sandstone	Sp		grey					Irregular carbonaceous shale lamina Lamina at 70' at 56.1m 50' at 56.5m 30' at 59.3m	Lug=15.78	7.88						9
96.40	60																	60



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GEOLOGIC LOG OF DRILL HOLE

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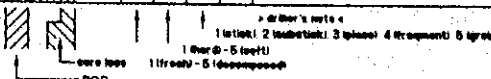
Se Kong River Basin PROJECT

HOLE No. SK-3

(SHEET 1 of 5)

LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0	COMMENCED	27-1-1994
ELEVATION	244.2	DIRECTION OF HOLE	90°	COMPLETED	9-2-1994
COORDINATE	X: E692102	CORE RECOVERY	97.5 %	DRILLED BY	Thongsay
	Y: N1715808	DRILLING MACHINE	KT-100	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	Pc						
244.20	0m		△	0-4 100%															0m
	1	Talus	△							TALUS deposits									1
	2		×							Fine TUFF - lapilli TUFF Fragmental core									2
	3		×			light brownish grey	3	3	3	Crack stained									3
	4		×				1	1	1	Rock inside stained in some portion									4
	5		×				4	4	4	10cm thick lapilli TUFF at 30' at 7.0m									5
	6		×																6
	7		×																7
	8	Tuff	×			pp-light grey				Fine TUFF, very hard and spark like chert 10cm lapilli TUFF at 40' at 7.3m									8
	9		×			grey	3		2	Sandy TUFF, white spot									9
	10		×			pp-grey			3	Fine TUFF									10
	11		×						3										11
	12		×			grey	2	2	2	Sandy TUFF Solution along cracks but no calcareous (no Hcl reaction)	Lu=3.63	5.55	3.65						12
	13		×																13
	14		×							Fine TUFF Solution along cracks but not calcareous									14
	15		×																15
	16	Tuff breccia	△			light brown	2	2	2	TUFF BRECCIA Pale brown fragment and pale matrix Pale grey matrix between 15.7m and 16.5m								4m (14.85m)	16
	17		△				3	1	1	Bruciated - calcareous									17
	18		△						3	Brown cracks	Lu=5.2	5.98	3.88						18
	19		△																19
224.20	20		△																20



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GEOLOGIC LOG OF DRILL HOLE

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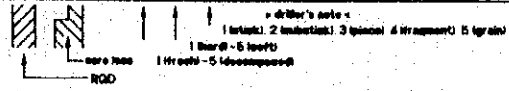
Se Kong River Basin PROJECT

HOLE No. SK-3

(SHEET 2 of 5)

LOCATION	Se Kong No.4 Dam site	DEPTH OF HOLE	100.0 m	COMMENCED	27-1-1994
ELEVATION	244.2 m	DIRECTION OF HOLE	90°	COMPLETED	9-2-1994
COORDINATE	X: E692102	CORE RECOVERY	97.5 %	DRILLED BY	
	Y: N1715808	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax						
224.20	20m	Tb	△	0 → 100%														20m
	1		×		light brown	2	2	2		Some as above Sandy TUFF	Lu=9.8	8.07						1
	2		×		light brown	2	2	2	2									2
	3		×		grey	2	2	2										3
	4		×		grey	2	2	2										4
	5		×		grey	2	2	2										5
	6		×		grey	2	2	2										6
	7		×		light brown	3	3	3		2-6cm Quartz vein at 26.8m	Lu=0.83	8.17						7
	8		×		light brown	3	3	3		2-6cm Quartz vein at 26.8m								
	9		×		grey	2	2	2										9
	30		×		grey	2	2	2										30
	1		×		grey	2	2	2		Few cracks stained calcite thin vein and net of veins	Lu=0.8	8.12						1
	2		×		grey	2	2	2										
	3		×		grey	2	2	2										3
	4		×		grey	2	2	2										4
	5		×		grey	2	2	2										5
	6		×		grey	2	2	2										6
	7		×		grey	2	2	2										7
	8		×		grey	2	2	2										8
	9		×		grey	2	2	2										9
	40		×		grey	2	2	2										40



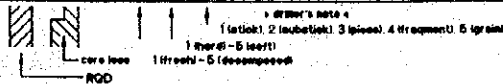
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. SK-3		(SHEET 4 of 5)	
LOCATION	Se Kong No.4 Damsite	DEPTH OF HOLE	100.0 m	COMMENCED	27-1-1994
ELEVATION	244.2 m	DIRECTION OF HOLE	90°	COMPLETED	9-2-1994
COORDINATE	X:E692102	CORE RECOVERY	97.5 %	DRILLED BY	
	Y:N1715808	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH								
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}	P _c		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)		
184.20	60m			97.5																	60m	
	1									Lapilli Tuff or coarse TUFF	Lu=0.87	10.06										1
	2																					2
	3																					3
	4																					4
	5																					5
	6	Lapilli Tuff				grey			2													6
	7																					7
	8																					8
	9																					9
	70								2	Few stained cracks	Lu=0.8	10.98	7.88									70
	1																					1
	2																					2
	3									73.4m to 73.6m purple	Lu=6.8	10.74	8.24									3
	4									Sandy lamina at 60' cut by calcite vein at 50'												4
	5									Fine TUFF Calcite vein cutting the lamina at 73.8m Bluish spot(not sharp) HCl reaction												5
	6									Lined calcite spot at 30' at 75.1m												6
	7	Tuff				purplish grey				No stained cracks below 76m Reddish vein from 75m to 79m	Lu=3.8	10.55	8.1									7
	8																					8
	9																					9
184.20	80					grey				Sandy below 77.7m												80



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GEOLOGIC LOG OF DRILL HOLE

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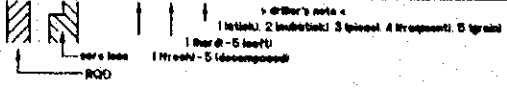
Se Kong River Basin PROJECT

HOLE No. SK-3

(SHEET 5 of 5)

LOCATION	Se Kong No.4 Dam site	DEPTH OF HOLE	100.0	COMMENCED	27-1-1994
ELEVATION	244.2	DIRECTION OF HOLE	90°	COMPLETED	9-2-1994
COORDINATE	X:E692102	CORE RECOVERY	97.5	DRILLED BY	
	Y:N1715808	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	B.W.L (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON						
164.20	80m			0 = 100%													80m
	1	Tuff	XX		grey	2	2		Sandy TUFF								1
	2		XX		1. ppl	2	3		Laminated fine TUFF	Lu=2.7	10.61	8.1					2
	3		XX														3
	4		XX														4
	5		XX														5
	6		XX														6
	7	Lapilli Tuff	XX						Lapilli TUFF and coarse grained TUFF with veins of calcite								7
	8		XX						Broken vein at 91.7m	Lu=10.1	12.17	8.7					8
	9		XX		grey	2			Upward fining								9
	90		XX			2			minor fault cut a red vein								90
	1		XX														1
	2		XX														2
	3		XX						Fine TUFF	Lu=2.8	11.4						3
	4		XX						Black shale band below 95.8m								4
	5		XX														5
	6		XX						Black shale intrude into grey tuff and core appeared bracciated								6
	7		XX														7
	8		XX		grey/dark grey					Lu=0.8	11.2						8
	9		XX						This hole has few purple layers which are dominant in SK-1								9
144.20	100		XX						End of Hole 100.0m								100



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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT

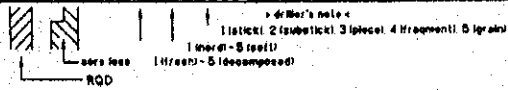
BOLE No. XK-1

(SHEET 1 of 5)

LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0	COMMENCED	5-3-1994
ELEVATION	266.4	DIRECTION OF HOLE	90°	COMPLETED	15-3-1994
COORDINATE	X: 6732180	CORE RECOVERY	94.4	DRILLED BY	Thongsay
	Y: N1654608	DRILLING MACHINE	KT-100	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH					
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax	Pc		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN
266.40	0m		△	0 → 100%															0m
	1	Talus	△		light reddish grey					Talus deposit red, gray, clayey wethered SANDSTONE fragments									
	2		△																
	3		△																
	4		△																
	5		△																
	6		△																
	7		△																
	8		△																
	9		△																
	10		△																
	10	Shale				reddish grey				Strongly wethered SHALE No sandstone fragment from 9.5m to 11.0m									
	11					reddish grey	5	5	5										
	12					reddish grey													
	13					l. b	4	4	4		Pale grey SANDSTONE from 12.9m to 13.5m								
	14																		
	15										No core from 13.5m to 15.4m								
	16																		
	17					Lb	3~4	3~4	4		Sheared and reconsolidated from 15.4m to 15.7m								
	18																		
	19					l. br	4	3	4		Core loss from 15.7m to 16.5m Stained cracks								
	20																		
	21								No core from 17.2m to 18.3m										
	22				lb		4	4											
	23								No core from 18.7m to 19.7m										
	24																		
266.40	20					4	3~4	4											

4.8m
(Final)



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GEOLOGIC LOG OF DRILL HOLE

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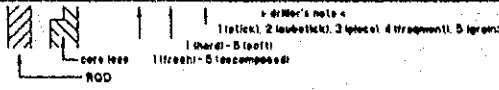
Se Kong River Basin PROJECT

HOLE No. XK-1

(SHEET 2 of 5)

LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0	COMMENCED	5-3-1994
ELEVATION	266.4	DIRECTION OF HOLE	90°	COMPLETED	15-3-1994
COORDINATE	X: E732180	CORE RECOVERY	94.4	DRILLED BY	
	Y: N1654608	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax							Pc
246.40	20m			0 → 100%												X		20m	
	1				greenish grey	4	3	4	0	Alternation of greenish grey and purplish grey medium grained SANDSTONE at 80° to 90°								1	
	2																		2
	3																		3
	4										24.3-24.7m purple band								4
	5																	5	
	6				purplish grey	2	1			Stained cracks few below 28m	Lu=0.64	5.43	1					6	
	7																		
	8									Calcite vein, weak HCl reaction								8	
	9																	9	
	10																	10	
	11									A boundary between purple coarse grained SANDSTONE and purple medium grained SANDSTONE continues from 31.7m to 33.5m							5.38m (30.50m)	11	
	12																	12	
	13				grey	3	3			Calcite vein	Lu=0.32	7.84						13	
	14																	14	
	15				grey	2				35.0-37.0m Pale green fine matrix with gravel and red fragment supposed to be altered zone along sheared zone								15	
	16																	16	
	17																	17	
	18				purplish grey	3	3		b	Sheared and recondolidated lens at 60° to 70° like whist. from 37.0m to 40.0m	Lu=0.42	9.14	5.64					18	
	19									Easily broken to flat fragments								19	
226.40	40																	40	



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GEOLOGIC LOG OF DRILL HOLE

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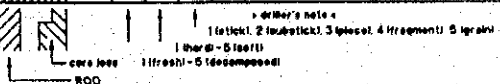
Se Kong River Basin PROJECT

BOLE No. XK-1

(SHEET 3 of 5)

LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0 m	COMMENCED	5-3-1994
ELEVATION	266.4 m	DIRECTION OF HOLE	90°	COMPLETED	15-3-1994
COORDINATE	X: 6732180	CORE RECOVERY	94.4 %	DRILLED BY	
	Y: N1654608	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax							Pc
226.40	40m			0 = 100%														40m	
	1	Sandstone																1	
	2																		2
	3																		3
	4																		4
	5																		5
	6																		6
	7																		7
	8																		8
	9																		9
	50		Conglomerate																50
	1																		1
	2																		2
	3																		3
	4																		4
	5																		5
	6																		6
	7																		7
	8																		8
	9																		9
	60																	60	



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GEOLOGIC LOG OF DRILL HOLE

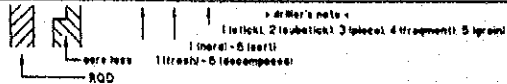
Se Kong River Basin PROJECT

HOLE No. XK-1

(SHEET 4 of 5)

LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0	COMMENCED	5-3-1994
ELEVATION	266.4	DIRECTION OF HOLE	90°	COMPLETED	15-3-1994
COORDINATE	X: E732180	CORE RECOVERY	94.4	DRILLED BY	
	Y: N1654608	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt. H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax							Pc
206.40	60m			100%														60m	
	1	Conglomerate								CONGLOMERATE Gravel up to 5cm across	Lug=1.11	8.44	5.94					1	
	2																	20cm gravel at 61.5m	2
	3																	Purple medium to coarse grained SANDSTONE	3
	4	Sandstone								70.4-72.5m granule CONGLOMERATE	Lug=0.97	8.53	---					4	
	5																		5
	6																		6
	7																		7
	8																		8
	9																		9
	10		10																
	11	Sandstone								Lug=1.8	8.47	5.97						11	
	12																	Lamina at 80' at 73.2m	12
	13																		13
	14																		14
	15																	Few veins	15
	16																	Gravel at 76.6m	16
	17																	5cm purplish grey sandstone	17
	18	5cm shale gravel at 77.7m	18																
	19	Purple SHALE from 79.7m to 79.8m								Lug=0.76	9.33	6.83					19		
	20																	20	



GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. XK-1		(SHEET 5 of 5)	
LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0 m	COMMENCED	5-3-1994
ELEVATION	266.4 m	DIRECTION OF HOLE	90°	COMPLETED	15-3-1994
COORDINATE	X: E732180	CORE RECOVERY	94.4 %	DRILLED BY	
	Y: N1654608	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH								
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING		ROCK EVALUATION	LUCEON	Pmax							Pc	DEPTH RESULT						
186.40	80m			0 - 100%														80m								
	1	Sandstone	.	.	purplish grey	2	2	3	n	Course grained SANDSTONE	Lu=1.09	Pmax= 8.59	Pc= 6.09					1								
	2									5cm purple siltstone gravel at 53.3m															2	
	3																									3
	4																									4
	5																									5
	6																									6
	7																									7
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1 (solid) - 5 (solid)
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GEOLOGIC LOG OF DRILL HOLE

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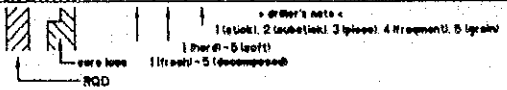
Se Kong River Basin PROJECT

HOLE No. XK-2

(SHEET 1 of 3)

LOCATION <u>Xe Kaman Dam site</u>	DEPTH OF HOLE <u>60.0</u> m	COMMENCED <u>24-2-1994</u>
ELEVATION <u>132.7</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>5-3-1994</u>
COORDINATE <u>X: E732279</u>	CORE RECOVERY <u>98.3</u> %	DRILLED BY <u>Thongsay</u>
<u>Y: N1654826</u>	DRILLING MACHINE <u>D-900</u>	LOGGED BY <u>Hoshino</u>

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH					
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	P _{max}							P _c	DEPTH RESULT			
132.70	0m			0 → 100%														0m					
	1	Sandstone	[Pattern]	[Pattern]						purplish grey													
	2																						
	3																						
	4																						
	5																						
	6																						
	7																						
	8																						
	9																						
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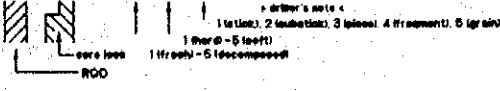
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. XK-2		(SHEET 2 of 3)	
LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	24-2-1994
ELEVATION	132.7 m	DIRECTION OF HOLE	90°	COMPLETED	5-3-1994
COORDINATE	X: E732279	CORE RECOVERY	98.3 %	DRILLED BY	
	Y: N1654826	DRILLING MACHINE	D-900	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Dpt.H)	DEPTH																	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	Pc							DEPTH RESULT																
112.70	20m			0 → 100%															20m																	
	1	Sandstone	[Pattern]	[Pattern]	purplish grey	2	2	2	2	2	Medium grained SANDSTONE	Lu=3.59	5.65	3.65					(20.10m)	1																
	2										3																								2	
	3																																			3
	4																																			4
	5																																			5
	6																																			6
	7																																			7
	8																																			8
	9																																			9
	20																																			30
	1																		1																	
	2																		2																	
	3																		3																	
	4																		4																	
	5																		5																	
	6																		6																	
	7																		7																	
	8																		8																	
	9																		9																	
92.70	40																		40																	



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GEOLOGIC LOG OF DRILL HOLE

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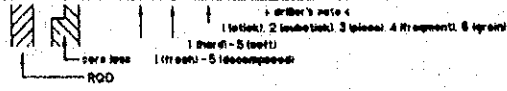
Se Kong River Basin PROJECT

HOLE No. XK-2

(SHEET 3 of 3)

LOCATION <u>Xe Kaman Damsite</u>	DEPTH OF HOLE <u>60.0</u> m	COMMENCED <u>24-2-1994</u>
ELEVATION <u>132.7</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>5-3-1994</u>
COORDINATE <u>X: E732279</u>	CORE RECOVERY <u>98.3</u> %	DRILLED BY _____
<u>Y: N1654826</u>	DRILLING MACHINE <u>D-900</u>	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	L O G	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	CEMENTATION	DRELL WATER RETURN	G. W. L (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LU	Pmax	Pc						
92.70	40m			0-100%													X		40m
	1									Laminated coarse grained SANDSTONE									1
	2									Medium grained SANDSTONE with granule									2
	3										Lu=2.01	6.11	5.61						3
	4									Lamina at 65' at 41.3m									4
	5									Sheared zone 2cm thick, greenish in color at 45' at 45.2m									5
	6																		6
	7																		7
	8										Lu=5.13	6.18	5.65						8
	9									Granule gravel dense between 52.1m and 53.3m								5.3m (at 50m)	9
	50	Sandstone				purplish grey	2	2	2	0									50
	1																		1
	2																		2
	3									1 to 2cm vein at 75' at 54.4m	Lu=10.04	8.19	5.89						3
	4																		4
	5									Veins in this hole has HCl reaction									5
	6																		6
	7									1cm thick greenish shale at 50' at 57.2m	Lu=5.29	8.14	5.64						7
	8																		8
	9																		9
72.70	60									End of Hole 60.0m									60



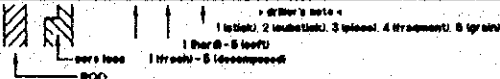
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. XK-3	(SHEET 1 of 5)
LOCATION	Xe Kaman Damsite	DEPTH OF HOLE	100.0 m COMMENCED 15-2-1994
ELEVATION	256.0	DIRECTION OF HOLE	90° COMPLETED 25-2-1994
COORDINATE	X: E732330	CORE RECOVERY	99.6 % DRILLED BY Thongsay
	Y: N1654937	DRILLING MACHINE	KT-100 LOGGED BY Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH					
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}	P _c		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN
256.00	0m		△	0 = 100%															0m
	1	Talus	△		redbrown					Talus deposits									1
	2		△																2
	3		△							Coarse grained SANDSTONE									3
	4		△							Gravelly portion and sandy portion coexist									4
	5		△																5
	6		△		yellowish brown	3	2			6.6-8.0m grey wandy									6
	7		△							Cracks stained									7
	8		△																8
	9		△																9
	10		△																10
	11	Sandstone	△							Fine grained SANDSTONE Purple fine green sandy									11
	12		△							Irregular SANDSTONE lens 0.5cm to 1cm gravel from 11.2m to 11.8m									12
	13		△																13
	14		△																14
	15		△							Coarse grained SANDSTONE with gravel									15
	16		△							Solution along cracks, but no HCl reaction									16
	17		△																17
	18		△																18
	19		△							Coarse to medium grained SANDSTONE									19
	20		△																20



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GEOLOGIC LOG OF DRILL HOLE

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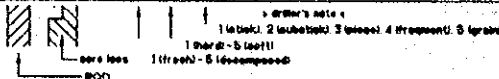
Se Kong River Basin PROJECT

HOLE No. XK-3

(SHEET 2 of 5)

LOCATION	Ye Kaman Damsite	DEPTH OF HOLE	100.0 m	COMMENCED	15-2-1994
ELEVATION	256.0 m	DIRECTION OF HOLE	90°	COMPLETED	25-2-1994
COORDINATE	X: E732330	CORE RECOVERY	99.6 %	DRILLED BY	
	Y: N1654937	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	S.W.L (Opt.H)	DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LOGEDN	Pmax	PC							DEPTH RESULT		
296.00	20m			0 + 100%															20m			
	1	Sandstone	[Pattern]	[Pattern]	br	3	2	3		Bottom surface at 80'												
	2				purplish grey	2	2					Purplish fine SANDSTONE with 2-3cm thick greenish medium grained sandstone bands, wound and vertical	Lu=11.45	6.59	4.59							
	3																					
	4											Purplish SANDSTONE										
	5																					
	6							grey	3	3	3	SANDSTONE stained to brown										
	7	Conglomerate	[Pattern]	[Pattern]	grey					Purple f.g. SANDSTONE / green m.g. SANDSTONE 1-3cm alt. at 70' Cracks stained from 26.4m to 27.3m	Lu=13.39	5.18	3.18									
	8											Purplish irregular shaped shale gravel from 29.3m to 30.0m up to 10cm across										
	9											Most cracks stained										
	10	Conglomerate	[Pattern]	[Pattern]						Granule Conglomerate from 30.9m to 31.6m												
	11																					
	12	Sandstone	[Pattern]	[Pattern]	grey					Purple f.g. SANDSTONE with green p.g. sandstone bands at 85'	Lu=15.3	7.05	5.05									
	13											1-6cm green sheared zone at 10' to 20' with stained crack on the top surface										
	14											Granule CONGLOMERATE including 2cm shale gravels										
	15																					
	16																					
	17									Coarse grained SANDSTONE	Lu=8.5	6	6									
	18									Solution from 37.9m to 38.2m, 38.8m, 39.0m to 39.4m												
	19									No HCl reaction												
216.00	40																		40			



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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT HOLE No. XK-3 (SHEET 3 of 5)

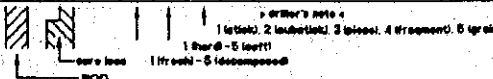
LOCATION Xe Kaman Damsite DEPTH OF HOLE 100.0 m COMMENCED 15-2-1994

ELEVATION 256.0 m DIRECTION OF HOLE 90° COMPLETED 25-2-1994

COORDINATE X:E732330 CORE RECOVERY 99.6 % DRILLED BY _____

Y:N1654937 DRILLING MACHINE KT-100 LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGEON	P _{max}	P _c							DEPTH RESULT		
216.00	40m	Sandstone		0-100%						Granule CONGLOMERATE or Coarse grained SANDSTONE									40m			
	1				3																	1
	2				3																	2
	3				3																	3
	4				3																	4
	5				3																	5
	6				3																	6
	7				3																	7
	8				3																	8
	9				3																	9
	50									Granule CONGLOMERATE from 44.9m to 46.4m										50		
	51																			51		
	52																			52		
	53																			53		
	54																			54		
	55																			55		
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	58																			58		
	59																			59		
	60																			60		



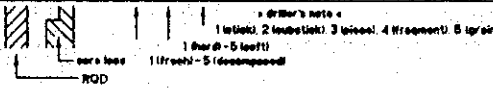
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GEOLOGIC LOG OF DRILL HOLE

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Se Kong River Basin PROJECT		HOLE No. XK-3	(SHEET 5 of 5)
LOCATION	Xe Kaman Dam site	DEPTH OF HOLE	100.0 m
ELEVATION	256.0 m	DIRECTION OF HOLE	90°
COORDINATE	X: E732330	CORE RECOVERY	99.6 %
	Y: N1654937	DRILLING MACHINE	KT-100
		COMMENCED	15-2-1994
		COMPLETED	25-2-1994
		DRILLED BY	
		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	p.w.l. (Opt.H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax							Pc
178.00	80m			0 = 100%															80m
	1																		1
	2				purplish grey			2			Lu=3.15	8.97	6.97						2
	3																		3
	4							2	2	1									4
	5																		5
	6									3									6
	6				grn														6
	7																		7
	8							3	2	3	Lu=3.65	9.8	7.8						8
	9																		9
	90									3									90
	1	Sandstone																	1
	2																		2
	3																		3
	4				purplish grey			2	2		Lu=6.43	8.07	6.97						4
	5																		5
	6																		6
	7																		7
	8																		8
	9																		9
156.00	100										Lu=6.27	9.83							100



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GEOLOGIC LOG OF DRILL HOLE

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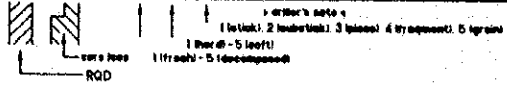
Se Kong River Basin PROJECT

HOLE No. XN-1

(SHEET 1 of 4)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	80.0	COMMENCED	3-12-1993
ELEVATION	752	DIRECTION OF HOLE	90°	COMPLETED	25-12-1993
COORDINATE	X: E673317	CORE RECOVERY	91.9	DRILLED BY	Thongsay
	Y: N1663482	DRILLING MACHINE	D-900	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H.)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	PC						
752.00	0m		△	0 + 100%															0m
	1	Topsoil	△																1
	2		∨							Strongly weathered BASALT Residual soil like Few hard fragments									2
	3		∨			reddish brown	5	5	5										3
	4		∨																4
	5		∨																5
	6		∨							BASALT									6
	7		∨							Fresh, hard, many pores up to 1cm across down to 10m									7
	8		∨							Core is 5 to 30cm long									8
	9		∨							Crack surface stained	Lu=0.85	5.97	3.97						9
	10	Basalt	∨							Brown but only surface									10
	11		∨																11
	12		∨			black	2	2	3		Lu=0.3	6.28	5.78						12
	13		∨																13
	14		∨																14
	15		∨																15
	16		∨																16
	17		∨																17
	18		∨								Lu=0.14	8.26							18
	19		∨																19
732.00	20		∨																20



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GEOLOGIC LOG OF DRILL HOLE

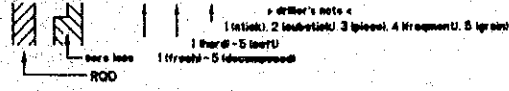
Se Kong River Basin PROJECT

HOLE No. XN-1

(SHEET 2 of 4)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	80.0 m	COMMENCED	3-12-1993
ELEVATION	752 m	DIRECTION OF HOLE	90°	COMPLETED	25-12-1993
COORDINATE	X: E673317	CORE RECOVERY	91.9 %	DRILLED BY	Thongsav
	Y: N1663482	DRILLING MACHINE	D-900	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING		ROCK EVALUATION	LUCEON	Pmax						
732.00	20m			0-100%														20m
	1		✓						BASALT									1
	2		✓															2
	3		✓															3
	4		✓															4
	5		✓															5
	6		✓															6
	7		✓															7
	8		✓															8
	9		✓															9
	30	Basalt	✓															30
	1		✓															1
	2		✓															2
	3		✓															3
	4		✓															4
	5		✓															5
	6		✓															6
	7		✓															7
	8		✓															8
	9		✓															9
	10		✓															10



GEOLOGIC LOG OF DRILL HOLE

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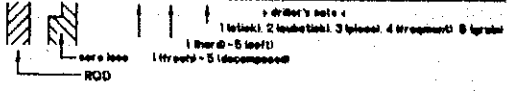
Se Kong River Basin PROJECT

HOLE No. XN-1

(SHEET 3 of 4)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	80.0 m	COMMENCED	3-12-1993
ELEVATION	752 m	DIRECTION OF HOLE	90°	COMPLETED	25-12-1993
COORDINATE	X: E673317	CORE RECOVERY	91.9 %	DRILLED BY	Thongsay
	Y: N1663482	DRILLING MACHINE	D-900	LOGGED BY	Moshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGGON	Pmax	Pc						
712.00	40m		✓	0 + 100%	black	2	2	3	b	BASALT									40m
	1		✓							Core loss from 41.1m to 41.9m									1
	2		✓							From 41.9m to 42.0m Silt, dark grey, hard shaly material broken by hands	Lu=40	4.8							2
	3		✓					3											3
	4		✓					2											4
	5		✓		black			1	4	Cracky									5
	6		✓					3	3	Brownish grey material on some crack surfaces Porous									6
	7		✓			2		4											7
	8	Basalt	✓							Pore is poor	Lu=50.7	4.18							8
	9		✓			1			3	Crack stained									9
	50		✓							Brown material at 51.4m									50
	1		✓																1
	2		✓		dark grey			2	4		Lu=47.7	4.23							2
	3		✓																3
	4		✓						3										4
	5		✓																5
	6		✓																6
	7	Sand	✓		grey					Silt and clay with basalt. Core loss above 57.3m fragment and sand (River Sand)	Lu=9.3	4.71							7
	8		✓																8
	9	Sandstone	✓		redpp1	5	5	5	c	Alternation of SANDSTONE and SHALE									9
692.00	60		✓							Silty and clayey									60



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GEOLOGIC LOG OF DRILL HOLE

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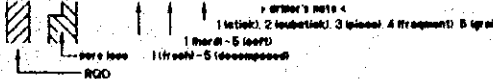
Se Kong River Basin PROJECT

HOLE No. XN-1

(SHEET 4 of 4)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	80.0	COMMENCED	3-12-1993
ELEVATION	752	DIRECTION OF HOLE	90°	COMPLETED	25-12-1993
COORDINATE	X: B673317	CORE RECOVERY	91.9 %	DRILLED BY	Thongsay
	Y: N1663482	DRILLING MACHINE	D-900	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	D.W.L (Dpt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGEN	P _{max}	P _c						
692.00	60m			0 → 100%															60m
	1	Sandstone			reddkpp1	5	5	5											1
	2	Sandstone			purple	4	4	4											2
	3																		3
	4	Sh			ppi	3	3	3											4
	5	Sh			grey	2	2	2											5
	6				reddish purple	2													6
	7				reddish purple	1	3												7
	8					3													8
	9	Sandstone			yellowish brown														9
	10					4	1												10
	11				yellowish brown	4													11
	12																		12
	13				ppixgrey														13
	14	Sandstone			grey	2													14
	15					1	1	2											15
	16				ppixgrey	3													16
	17																		17
	18																		18
	19	Sh				2	2	3											19
	20	Sh				3	4	5											20



GEOLOGIC LOG OF DRILL HOLE

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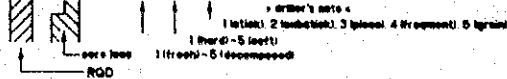
Se Kong River Basin PROJECT

HOLE No. XN-2

(SHEET 1 of 2)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	40.0	COMMENCED	26-12-1993
ELEVATION	711	DIRECTION OF HOLE	90°	COMPLETED	2-1-1994
COORDINATE	X: E673584	CORE RECOVERY	100 %	DRILLED BY	Thongsav
	Y: N1663766	DRILLING MACHINE	D-900	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	B.W.L. (Dpt.H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON							P _{max}
711.00	0m			0 = 100%													0m	
	1	Sandstone	[Pattern]	[Pattern]	purplish grey		4	b	Medium grained SANDSTONE and purplish grey fine grained SANDSTONE	---	---	---					1.2m (Final)	
	2																	Lamina at 5' to 10'
	3																	Above 1.4m split along lamina
	4																	Lamina at 30'
	5	Sh	[Pattern]	[Pattern]	grey	2	5	1	Culcareous below 4.5m (strong HCl reaction)	---	---	---						
	6																	10cm thick purple SHALE at 8.0m
	7																	Shale gravel below 8.3m
	8	Sandstone	[Pattern]	[Pattern]	grey	2	1	3	SHALE	---	---	---						
	9																	Medium grained SANDSTONE Lamina at 5'
	10	Shale	[Pattern]	[Pattern]	reddish purple	2	1	1	Vertical calcite vein	Lu=13.61	5.32	3.32					1.2m (10.10m)	
	11																	Strong HCl reaction below 14.1m down to the end of hole
	12																	Purple shale gravel up to 5cm across at 10.3m
	13	Sandstone	[Pattern]	[Pattern]	purplish grey	3	1	1	Calcareous SHALE White irregular lens and lamina	Lu=43.75	5.28	---					1.2m (14.8m)	
	14																	SANDSTONE with dense shale lamina (spacing less than 1cm)
	15	Sandstone	[Pattern]	[Pattern]	purplish grey	2	1	1	Laminated medium to fine grained SANDSTONE	Lu=0.94	5.28	3.28						
	16																	
691.00	20																20	



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GEOLOGIC LOG OF DRILL HOLE

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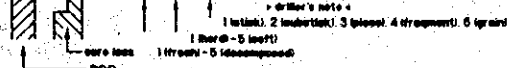
Se Kong River Basin PROJECT

HOLE No. XN-2

(SHEET 2 of 2)

LOCATION	Xe Nannoy Damsite	DEPTH OF HOLE	40.0	m	COMMENCED	26-12-1993
ELEVATION	711	DIRECTION OF HOLE	90°		COMPLETED	2-1-1994
COORDINATE	X: E673584	CORE RECOVERY	100	%	DRILLED BY	Thongsay
	Y: N1663766	DRILLING MACHINE	D-900		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc						
691.00	20m			0 + 100%															20m
	1	Sandstone										Lu=0.94	5.28	3.28					1
	2																		2
	3																		3
	4	Shale																	4
	5																		5
	6	Shale										Lu=0.25	7.23	5.23					6
	7																		7
	8																		8
	9	Shale																	9
	10																		10
	11																		11
	12																		12
	13																		13
	14																		14
	15																		15
	16																		16
	17																		17
	18																		18
	19																		19
	20																		20
	21																		21
	22																		22
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	30																		30
	31																		31
	32																		32
	33																		33
	34																		34
	35																		35
	36																		36
	37																		37
	38																		38
	39																		39
	40																		40



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GEOLOGIC LOG OF DRILL HOLE

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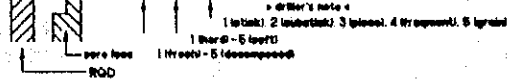
Se Kong River Basin PROJECT

HOLE No. XN-3

(SHEET 1 of 3)

LOCATION	Xe Namnoy Dam site	DEPTH OF HOLE	60.0	COMMENCED	2-12-1993
ELEVATION	753	DIRECTION OF HOLE	90°	COMPLETED	13-12-1993
COORDINATE	X: E673730	CORE RECOVERY	88.9 %	DRILLED BY	Thongsay
	Y: N1663921	DRILLING MACHINE	KT-100	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH						
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK BLOCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	P.W.L (Opt.H)
753.00	0m		△	0 + 100%																0m
	1	Talus	△		br					Topsoil										1
	2	Talus	△		brownish grey					Talus deposits										2
	3	Talus	△		brownish grey					Sandstone blocks										3
	4	Talus	△		brownish grey					Silt, clay and block										4
	5	Shale	△		purplish red	4	4	1	5	SHALE										5
	6	Shale	△		purplish red	3	4	5	c	Core recovery is about 30% from 4.8m to 6.4m mudcake like										6
	7	Shale	△		purplish red	3	4	5	c	Fragmental core with clay, core recovery 60% from 6.4m to 8.2m										7
	8	Shale	△		purplish red	3	4	5	c	Fragmental core with clay, core recovery 60% from 6.4m to 8.2m										8
	9	Shale	△		purplish red	3	4	5	c	Fragmental core with clay, core recovery 60% from 6.4m to 8.2m										9
	10	Sandstone	△		purplish grey	2	2	2	2	Medium grained SANDSTONE										10
	11	Sandstone	△		purplish grey	2	2	2	2	Stick core										11
	12	Sandstone	△		purplish grey	5	5	5	*	Coarse grained portion near 10.3m is broken by finger										12
	13	Sandstone	△		purplish grey	3	3	3		Brown crack below 13.7m										13
	14	Sandstone	△		purplish grey	3	3	3		Sandy SHALE Spotted sand above 16.8m										14
	15	Sandy shale	△		purplish red	4	4	4	1	Core recovery is about 30% below 15.8m										15
	16	Sandy shale	△		purplish red	4	4	4	1	Core recovery is about 30% below 15.8m										16
	17	Sandy shale	△		purplish red	4	4	4	1	Fragment core or mudcake core below 15.8m										17
	18	Sandy shale	△		purplish red	4	4	4	1	Fragment core or mudcake core below 15.8m										18
	19	Shale	△		pplshred	2	2	2	2	SHALE										19
	20	Shale	△		pplshred	3	3	3	4	Fragment with clay from 18.2m to 18.3m										20



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GEOLOGIC LOG OF DRILL HOLE

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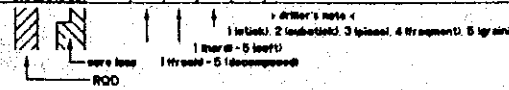
Se Kong River Basin PROJECT

HOLE No. XN-3

(SHEET 2 of 3)

LOCATION	Xe Namnov Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	2-12-1993
ELEVATION	753 m	DIRECTION OF HOLE	90°	COMPLETED	13-12-1993
COORDINATE	X: E673730	CORE RECOVERY	88.9 %	DRILLED BY	
	Y: N1663921	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGEOH	Pmax	Pc						
753.00	20m			0 + 100%															20m
	1	Sh																	1
	2	Sandstone																	2
	3																		3
	4	Shale																	4
	5																		5
	6																		6
	7																		7
	8	Sh																	8
	9																		9
	30	Shale																	30
	1																		1
	2	Sandstone																	2
	3																		3
	4	Sh																	4
	5																		5
	6	Sandstone																	6
	7																		7
	8																		8
	9																		9
713.00	40																		40



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GEOLOGIC LOG OF DRILL HOLE

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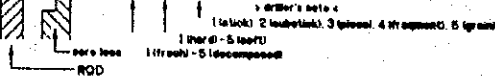
Se Kong River Basin PROJECT

HOLE No. XN-3

(SHEET 3 of 3)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	2-12-1993
ELEVATION	753 m	DIRECTION OF HOLE	90°	COMPLETED	13-12-1993
COORDINATE	X: E673730	CORE RECOVERY	88.9 %	DRILLED BY	
	Y: N1663921	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGION	Pmax						
713.00	40m			0 + 100%														40m
	1	Sandstone			grey		2			Laminated SANDSTONE with shale patch Shale band between 41.65m and 41.75m Calcareous								29.2m (41.20m)
	2									SHALE	Lu=1.43	8.01	6.01					
	3	Shale			ppled		2	1		SANDSTONE lamina between 44.0m and 44.3m Correlate to the depth around 18m of XN-2 Hole Calcareous								
	4						1											
	5						3											
	6				grey		2	2		Medium grained SANDSTONE With shale patch mic 10cm thick purple shale bed from 45.5m to 46.7m	Lu=2.53	7.93	5.93					29.5m (46.70m)
	7																	
	8				pxgy					Fine grained SANDSTONE								
	9																	
	50									Medium grained SANDSTONE Laminated								
	1	Sandstone								Laminated at 20' to 30'	Lu=1.82	8.05	6.05					
	2																	
	3				purplish grey			2										
	4																	
	5																	
	6																	
	7									5cm shale at 57.5m								28.5m (56.00m)
	8										Lu=2.37	10.49	7.99					
	9	Shale			ppixed			2		SHALE with calcite patch White irregular shaped patch up to 3cm								
693.00	60																	60



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Se Kong River Basin PROJECT HOLE No. XN-4 (SHEET 1 of 4)

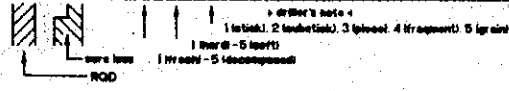
LOCATION Xe Namnoy Damsite DEPTH OF HOLE 80.00 m COMMENCED 3-1-1994

ELEVATION 754.00 m DIRECTION OF HOLE 90° COMPLETED 21-1-1994

COORDINATE X: E672460 CORE RECOVERY 76.6 % DRILLED BY Thongsay

Y: N1664760 DRILLING MACHINE D-900 LOGGED BY Hoshino

ELEVATION	DEPTH	ROCK NAME	L.O.G.	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEDON	Pmax						
754.00	0m			0 + 100%						Strongly weathered BASALT Residual soil								0m
	1				red	5												1
	2						5	5	0	Few hard fragments below 1.9m Strongly weathered								2
	3				brn grey	4												3
	4						5											4
	5									BASALT								5
	6								2	Cracks stained to yellowish brown or greenish grey								6
	7																	7
	8																	8
	9						2											9
	10	Basalt			dark grey													10
	11																	11
	12																	12
	13																	13
	14																	14
	15																	15
	16																	16
	17																	17
	18				black													18
	19				br	4	3			5cm thick black silt at 18.85m White coating on some pores No HCl reaction								19
	20				blk	2-3	2-3			No core from 19.2m to 19.7m								20



GEOLOGIC LOG OF DRILL HOLE

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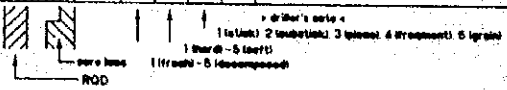
Se Kong River Basin PROJECT

HOLE No. XN-4

(SHEET 2 of 4)

LOCATION	Xe Namnoy Dam site	DEPTH OF HOLE	80.00	COMMENCED	3-1-1994
ELEVATION	754.00	DIRECTION OF HOLE	90'	COMPLETED	21-1-1994
COORDINATE	X: E672460	CORE RECOVERY	76.6	DRILLED BY	
	Y: N1664760	DRILLING MACHINE	D-900	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc						
754.00	20m			0 + 100%													X		20m
	1				br blk	2	2	3-2	3-2	b	BASALT								1
	2				br blk	2	2	3-2	3-2	b	Black silty from 21.6m to 21.7m								2
	3										5cm orange silt at 20.9m								3
	4										Porous above 21.4m								4
	5										Dry surface is dark grey below 23m								5
	6				black	1	1	3	3	b	Porous below 23.7m								6
	7										Pore 1cm across dense								7
	8										Black silty porous Basalt from 25.9m to 26.4m								8
	9										Below 27.4m core recovery is bad								9
	10										Very porous above 28.5m								10
	11				bl	2	2	3-2	3-2	b	White coat. at some cracks								11
	12																		12
	13				bl	2	2	3-2	3-2	b									13
	14										Porous								14
	15										Crack surfaces are white or yellow grey								15
	16										2-3, 2-3, 4								16
	17										No core from 27.4m to 27.9m								17
	18										from 28.0m to 28.4m								18
	19										from 29.2m to 30.1m								19
	20										from 30.7m to 31.6m								20
	21										from 32.4m to 33.8m								21
	22				black	2	2	3	3	b	from 34.0m to 35.5m								22
	23										from 36.8m to 37.4m								23
	24																		24
	25																		25
	26				black	1	1	3	3	b									26
	27																		27
	28																		28
	29				black	2	2	3	3	b									29
	30																		30
	31																		31
	32																		32
	33																		33
	34																		34
	35																		35
	36																		36
	37																		37
	38																		38
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GEOLOGIC LOG OF DRILL HOLE

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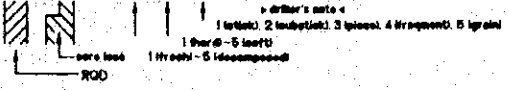
Se Kong River Basin PROJECT

HOLE No. XN-4

(SHEET 3 of 4)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	80.00 m	COMMENCED	3-1-1994
ELEVATION	754.00 m	DIRECTION OF HOLE	90°	COMPLETED	21-1-1994
COORDINATE	X: E672460	CORE RECOVERY	76.6 %	DRILLED BY	
	Y: N1664760	DRILLING MACHINE	D-900	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGEON	P _{max}	P _c		DEPTH RESULT	CASING	CEMENTATION
714.00	40m			0 = 100%						BASALT							40m
	1		✓		black	2	2	3	4	Pores are not dense and small							1
	2		✓		bl	3	3	4	4	Yellow green coat on some cracks							2
	3		✓		bl	3	3	4	4								3
	4		✓		bl	3	3	4	4	Breccia like at 40.4m							4
	5		✓		bl	3	3	4	4								5
	6		✓		bl	3	3	4	4	No core from 41.5m to 42.0m							6
	7		✓		bl	3	3	4	4	No core from 42.75m to 42.95m							7
	8		✓		bl	3	3	4	4	No core from 43.4m to 43.7m							8
	9		✓		bl	3	3	4	4	No core from 44.2m to 44.5m							9
	10		✓		bl	3	3	4	4	No core from 45.1m to 45.5m							10
	11		✓		bl	3	3	4	4	No core from 46.25m to 46.8m							11
	12		✓		bl	3	3	4	4	No core from 48.0m to 48.8m							12
	13		✓		bl	3	3	4	4								13
	14		✓		bl	3	3	4	4								14
	15		✓		bl	3	3	4	4								15
	16		✓		bl	3	3	4	4								16
	17		✓		bl	3	3	4	4								17
	18		✓		bl	3	3	4	4								18
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	24		✓		bl	3	3	4	4								24
	25		✓		bl	3	3	4	4								25
	26		✓		bl	3	3	4	4								26
	27		✓		bl	3	3	4	4								27
	28		✓		bl	3	3	4	4								28
	29		✓		bl	3	3	4	4								29
	30		✓		bl	3	3	4	4								30
	31		✓		bl	3	3	4	4								31
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	45		✓		bl	3	3	4	4								45
	46		✓		bl	3	3	4	4								46
	47		✓		bl	3	3	4	4								47
	48		✓		bl	3	3	4	4								48
	49		✓		bl	3	3	4	4								49
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	57		✓		bl	3	3	4	4								57
	58		✓		bl	3	3	4	4								58
	59		✓		bl	3	3	4	4								59
	60		✓		bl	3	3	4	4								60



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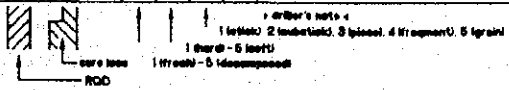
Se Kong River Basin PROJECT

HOLE No. XN-5

(SHEET 1 of 3)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	22-11-1993
ELEVATION	735 m	DIRECTION OF HOLE	90°	COMPLETED	2-12-1993
COORDINATE	X: E672760	CORE RECOVERY	91.5 %	DRILLED BY	Thongsay
	Y: N1664870	DRILLING MACHINE	D-900	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt. H)	DEPTH																		
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc							DEPTH RESULT																	
735.00	0m			0 + 100%															0m																		
	1	Shale			brown					SHALE No water drilling																											
	2																																				
	3																																				
	4																																				
	5																																				
	6																																				
	7																																				
	8	Sh Sandstone			px-grey	3	3	4	b	SANDSTONE Core recovery is about 50%																											
	9																																				
	10	Sh Sandstone			px	4	4	b		SHALE Broken by hand, alaky																											
	11																																				
	12	Sandstone			1. grey	3	3	3	b	Medium grained SANDSTONE Laminated																											
	13																																				
	14																																				
	15	Sandstone			purple grey	2	2	2	b	purple shale lenses of 0.5cm thick near 13.5m deep																											
	16																																				
	17	Sandstone			purple grey	2	2	2	b	Lamina at 20'																											
	18																																				
	19	Sandstone			1. grey	3	3	3	b	Purple grey lamina.																											
	20																																				



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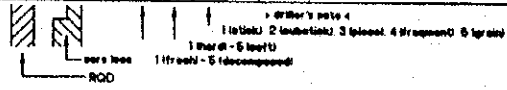
Se Kong River Basin PROJECT

HOLE No. XN-5

(SHEET 2 of 3)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	60.0	COMMENCED	22-11-1993
ELEVATION	735	DIRECTION OF HOLE	90'	COMPLETED	2-12-1993
COORDINATE	X: E672760	CORE RECOVERY	91.5 %	DRILLED BY	
	Y: N1664870	DRILLING MACHINE	D-900	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	S.W.L. (Dpt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LU=0.5	Pmax						
715.00	20m			0-100%														20m
	1	Shale			1. grey	2	2	2		20.3-20.5m gravel band Lamina from 15. to 20'	Lu=0.5	5.81	3.81					1
	2	Shale								SHALE Fragmental Low core recovery Soft in part								2
	3	Shale								No core from 21.35m to 22.75m								3
	4	Shale			1. grey	2	2	4		SANDSTONE between 23.3m and 23.6m Pale irregular lens No HCl reaction Laminated, sandy below 24.2m	Lu=0.5	5.89	3.88					4
	5	Shale								SANDSTONE Dark grey laminated Fragment with clay between 24.7m and 24.75m								5
	6	Sandstone			light grey	2	2											6
	7	Sandstone								Laminated thin (1cm thick) shale with clay film at 26.8m								7
	8	Sandstone								Dark shale patch at 27.3m	Lu=0.38	5.5	3.5					8
	9	Sandstone																9
	30	Shale			d. grey	2	1	3		SHALE Soft at 29.5m shows slaking Clay coat between 29.1m and 29.2m Irregular white lens or bands								30
	1	Sandstone								SANDSTONE								1
	2	Sandstone			grey	2				Laminated at 33.3m and 33.8m	Lu=1.28	6.6	4.8					2
	3	Sandstone																3
	4	Sandstone																4
	5	Shale			d. p. red	2				SHALE Wound lamina or irregular lens of sandstone rich								5
	6	Shale																6
	7	Shale								White irregular lenses show HCl strong reaction below 35.3m								7
	8	Shale			ppl. red	2				Purplish red shale between 38.2m and 38.5m								8
695.00	40																	40



EPDC
ELECTRIC POWER DEVELOPMENT CO., LTD.

GEOLOGIC LOG OF DRILL HOLE

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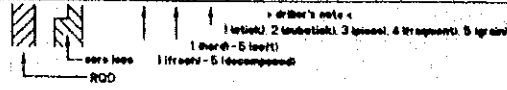
Se Kong River Basin PROJECT

HOLE No. XN-6

(SHEET 1 of 3)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	60.0	COMMENCED	22-11-1993
ELEVATION	735	DIRECTION OF HOLE	90°	COMPLETED	30-11-1993
COORDINATE	X: E672980	CORE RECOVERY	94.6 %	DRILLED BY	Thongsay
	Y: N1664840	DRILLING MACHINE	KT-100	LOGGED BY	Hoshino

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			DEPTH								
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUBEDON	P _{max}		P ₀	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	
735.00	0m			0 → 100%																0m	
	1	Ta	△		brn					Talus deposits											1
	2	Sh	△		5	5				Strongly weathered SHALE											2
	3				4	4				SANDSTONE											3
	4				4	4				Broken by hand											4
	5				4	4				No core from 2.45m to 3.0m											5
	6				3	3				Medium to coarse grained											6
	7																				7
	8	Sandstone																			8
	9									The sections 5.3-5.5m, 9.7-9.9m, 10.0-10.2m provide no core and supposed to be softened grey shale.	Lu=49.3										9
	10																				10
	11																				11
	12																				12
	13																				13
	14																				14
	15																				15
	16																				16
	17	Shale																			17
	18																				18
	19																				19
	20	Sandstone																			20
715.00	20																				20



EPDC
 ELECTRIC POWER DEVELOPMENT CO., LTD.

GEOLOGIC LOG OF DRILL HOLE

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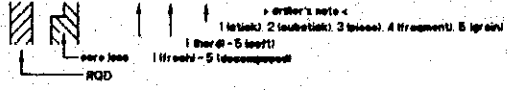
Se Kong River Basin PROJECT

HOLE No. XN-6

(SHEET 2 of 3)

LOCATION	Xe Namnoy Damsite	DEPTH OF HOLE	60.0 m	COMMENCED	22-11-1993
ELEVATION	735 m	DIRECTION OF HOLE	90°	COMPLETED	30-11-1993
COORDINATE	X: E672980	CORE RECOVERY	94.6 %	DRILLED BY	
	Y: N1664840	DRILLING MACHINE	KT-100	LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON						
715.00	20m			0 + 100%													20m
	1	Sandstone			light grey			1									1
	2							3									2
	3							2									3
	4	Shale			ppixred/dark red												4
	5																5
	6							2									6
	7																7
	8	Sandstone			light grey			1									8
	9							3									9
	30																30
	1							2									1
	2	Shale			ppixred/dark red												2
	3																3
	4							1									4
	5							1									5
	6							2									6
	7	Sandstone			ppixred												7
	8							1									8
	9	Sandstone			ppixgrey												9
	40							2									40



EPDC
ELECTRIC POWER DEVELOPMENT CO., LTD.

GEOLOGIC LOG OF DRILL HOLE

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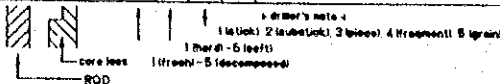
Se Kong River Basin PROJECT

HOLE No. XN-6

(SHEET 3 of 3)

LOCATION <u>Xe Namnoy Damsite</u>	DEPTH OF HOLE <u>60.0</u> m	COMMENCED <u>22-11-1993</u>
ELEVATION <u>735</u> m	DIRECTION OF HOLE <u>90°</u>	COMPLETED <u>30-11-1993</u>
COORDINATE <u>X: E672980</u>	CORE RECOVERY <u>94.6</u> %	DRILLED BY _____
<u>Y: N1664840</u>	DRILLING MACHINE <u>KT-100</u>	LOGGED BY _____

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEN	Pmax						
695.00	40m			0 = 100%														40m
	1	Ss. sh			ppix grey				8	Same as above								1
	2				pxred				2	SHALE								2
	3	Shale			dark. ppixred				2	Sandstone lens and lamina (up to 1cm thick) above 42.9m	L _u =0.16	6.13	4.13					3
	4								1									4
	5								3									5
	6	Sandstone			light grey				1	SANDSTONE Greenish Lamina at 5'	L _u =0.51	6.02						6
	7																	7
	8																	8
	9								1									9
	50								2								13.2m (49.60m)	50
	1																	1
	2								2	SHALE	L _u =1.84	6.12						2
	3	Shale			pxred/d. pxred					Dark purple SHALE with white irregular sandstone lens with strong HCl reaction above 54.0m								3
	4									Purple irregular band between 54.0m and 54.5m Purple SHALE below 55.7m								4
	5																	5
	6									SANDSTONE								6
	7	Sandstone			grey				1	Laminated Black patch							14m (49.30m)	7
	8									Erosion surface at 58.05m								8
	9									Lamina up to 10'								9
675.00	60									END OF HOLE								60



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3.4 Data of Environmental Impact and Compensation Survey

Table 1 Land Use Classification in the Project Areas

Table 2 Agricultural Land in the Reservoir Area

Table 3 Village in the Se Kong Reservoir

Table 4 Village in the Xe Kaman Reservoir

Table 5 Village in the Xe Namnoy Reservoir

Table 6 Wildlife in the Project Area

Table 7 Results of Water Quality Analysis (1)

Table 8 Results of Water Quality Analysis (2)

Table 9 Results of Water Quality Analysis (3)

Table 1 Land use classification in the Project Areas (Hectares)

Features	Xenamnoi		Sekong No 4		Xe kaman Nol	
	Catchment	Reservoir Elev. 780 m	Catchment	Reservoir Elev. 320 m	Catchment	Reservoir Elev. 300
I. Current Forest	53960	2912 (35.16)	323921	11974(55.14)	83570	16199(66.93)
Dry Dipterocarp	5700	1000	15680	4268	0	0
Dry Evergreen	0	0	27400	0	0	0
Mixed Deciduous	5520	452	280841	7706	83570	16107
Gallery forest	37240	1460	0	0	0	92
Coniferous and Mixed	0	0	0	0	0	0
Coniferous/broad leave	5500	0	0	0	0	0
II. Potential forest	920	72 (0.86)	75620	4052(18.65)	5680	1429(5.9)
Bamboo	0	0	70840	4002	2640	1080
Ray (Slush and burn cultivation)	920	72	4780	50	3040	349
III. Temporely Unstocked	0	3836(46.32)	59524	4531(20.86)	77700	6483(26.78)
IV. Rice paddy						
V. Others	22510	1460(17.63)	2840	1160(5.34)	1240	92(0.38)
Total	77390	8280	461905	21717	138190	24203

Notes: 1. The forest area in the reservoir is not include in the catchment area.
2. The number in parentheses shown the percentage of each land use type versus the reservoir area.

Table 2 Agriculture Land in the Reservoir Areas

Features	Unit	Xe Namnoi	Sekong No 4	Sekaman Nol
Lowland Rice	Ha	0	0	0
Upland Rice	Ha	110	597	65
Coffee plantation	Ha	45	0	3
Tabacco	Ha	12	0	0
Maize	Ha	4	36	5
Potatoes	Ha	3	12	0
Cotton	Ha	4	6	0

Table 3 Villages in the Sekong Reservoir

No.	Village name	Province	District	Household	Population	Northing	Easting	Elev(m)	Map.No.	Remark
1	Ban pakkayong	Sekong	Lanam	26	190	17 16 500	186 93 200	160	D48-22	Surveyed
2	Ban hungtai	Sekong	Lanam	15	92	17 21 400	186 90 200	180	"-	
3	Ban hungkang	Sekong	Lanam	16	142	17 21 900	186 91 100	180	"-	
4	Ban hungnua	Sekong	Lanam	15	104	17 23 500	186 90 400	180	"-	
5	Ban houaylang	Sekong	Kaleum	25	162	17 23 300	186 99 700	240	"-	
6	Ban tangkat	Sekong	Kaleum	13	117	17 23 900	187 00 000	240	"-	
7	Ban sathong	Sekong	Kaleum	13	118	17 24 450	187 09 200	260	"-	
8	Ban hatvy	Sekong	Kaleum	28	338	17 29 400	186 90 900	200	"-	
9	Ban hanong	Sekong	Kaleum	23	155	17 33 000	186 98 100	280	D48-10	
10	Ban paktray	Sekong	Kaleum	20	99	17 34 000	186 96 200	240	"-	
11	Ban hatpe	Sekong	Kaleum	12	237	17 35 500	186 92 600	280	"-	
12	Ban pekphoung	Sekong	Kaleum	24	126	17 39 000	186 93 400	240	"-	
13	Ban trak	Sekong	Kaleum	21	133	17 38 400	186 90 100	240	"-	
14	Ban kongtrak	Sekong	Kaleum	27	255	17 41 200	186 88 200	240	"-	
15	Ban kaleum	Sekong	Kaleum	23	250	17 40 800	186 87 700	240	"-	
16	Ban bountan	Sekong	Kaleum	17	109	17 42 600	186 87 700	280	"-	
17	Ban kloung	Sekong	Kaleum	6	110	17 44 700	186 89 800	280	"-	
18	Ban tongkay	Sekong	Kaleum	15	98	17 42 300	186 82 900	240	"-	
19	Ban paksay	Sekong	Kaleum	28	85	17 42 700	186 81 100	280	"-	
20	Ban bak	Sekong	Kaleum	12	172	17 48 600	186 88 300	240	"-	
21	Ban longkong	Sekong	Kaleum	7	99	17 53 200	186 90 000	280	"-	
22	Ban ploynua	Sekong	Kaleum	17	45	17 50 400	186 88 200	280	"-	
23	Ban ploytai	Sekong	Kaleum	18	211	17 50 300	186 84 700	280	"-	
24	Ban kado	Sekong	Kaleum	17	110	17 51 900	187 01 500	280	"-	
	Total			438	3557					

Table 4 Villages in the Xe Kaman Reservoir

No.	Village name	Province	District	Household	Population	Northing	Eastings	Elev(m)	Map.No.	Remark
1	Ban hindam	Attapu	Sanexay	20	151	16 57 400	187 33 550	150	D48-35	
2	Ban donkhen 1	Attapu	Sanexay	8	93	16 63 300	187 39 500	140	-*-	
3	Ban donkhen 2	Attapu	Sanexay	10	103	16 63 300	187 39 550	140	-*-	
4	Ban donkhen 3	Attapu	Sanexay	7	75	16 63 700	187 40 150	140	-*-	
5	Ban daklom	Attapu	Sanexay	29	167	16 68 200	187 32 500	200	-*-	Surveyed
	Total			74	589					

Table 5 Villages in the Xenamnoy Reservoir

No.	Village name	Province	District	Household	Population	Northing	Easting	Elev(m)	Map.No.	Remark
1	Ban xenamnoy	Champasak	Paksong	24	108	16 95 800	186 72 400	760	D48-34	
2	Ban namtiang Ioum	Champasak	Paksong	25	150	16 63 500	186 76 900	760	"-	
3	Ban namkong	Champasak	Paksong	42	171	16 57 500	186 89 700	740	D48-46	Surveyed
4	Ban nonghom	Champasak	Paksong	26	150	16 52 500	186 70 300	760	"-	
5	Ban keokounmouang	Champasak	Paksong	21	89	16 55 900	186 74 500	740	"-	
6	Ban houaysoy	Champasak	Paksong	72	350	16 56 300	186 68 000	760	"-	
	Total			210	1018					

Table 6 Wildlife in the Project Area
(Interviewed with local residents)

Wildlife Habitat	Wildlife Species
<p>Se Kong No. 4 Area</p> <p>Regrowth and savannah forest, riparian vegetation and water.</p> <p>Dense forest cover in upper basin; declared as conserved areas (Vietnam border)</p>	<p>Common species</p> <p>Elephant, gaur, banteng, green peafowl, primates deer, wild pig, tiger, black bear python, birds.</p> <p>Rare species (in upper basin)</p> <p>Kouprey, wild water buffalo, rhinocers, gaur, banteng.</p> <p>Mekong dolphin (very rare in Se Kong river downstream area).</p>
<p>Xe Kaman No. 1 Area</p> <p>Regrowth and savannah forest, bamboo. Dense ever green and mixed deciduous species.</p>	<p>Common species</p> <p>Wild dog, tiger, leopard, python deer, birds.</p> <p>Rare species</p> <p>Some rare species expected in upper basin.</p>
<p>Xe Namnoy Area</p> <p>Regrowth and savannah forest, riparian vegetation and water.</p>	<p>Common species</p> <p>Deer, wild pig, tiger, black bear, python, birds.</p> <p>Rare species</p> <p>Not existed.</p>

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity.

Ministry of Agriculture - Forestry
Dept. of Irrigation & Micro Hydropower
Laboratory of W.Q.A.

Vientiane, 16/08/93
No. 086/WQA

RESULT OF WATER QUALITY ANALYSIS

Parameter	1	2	3	4
Date	20/7/93	30/7/93	31/7/93	1/8/93
pH	7.06	6.50	7.03	7.19
TSS	mg/l 33	12	50	126
Turbidity	ppm 4	3	7	12
Color	ppm 0	0	1	2
Conductivity	mS/m 4.57	0.50	3.60	4.30
Ca	meq/l 0.189	0.007	0.169	0.202
Mg	" 0.173	0.049	0.128	0.169
Na	" 0.075	0.010	0.061	0.072
K	" 0.026	0.006	0.028	0.028
Alkalinity	" 0.209	0.019	0.108	0.354
Cl	" 0.041	0.013	0.042	0.043
SO ₄	" 0.254	0.022	0.220	0.128
Tot. Hardness	" 0.371	0.049	0.297	0.371
Tot. Fe	mg/l 0.062	0.146	0.102	0.129
NH ₄ -N	" 0.027	0.015	0.017	0.018
PO ₄ -P	" 0.010	0.006	0.012	0.009
Tot. P	" 0.020	0.014	0.016	0.016
Si	" 5.3	1.8	4.4	5.5
COD _{Mn}	" 2.620	1.684	2.100	4.050
KMnO ₄	" 10.352	6.653	8.297	16.002

Laboratory of W.Q.A.



Laboratory of Water Quality Analysis
Vientiane, Lao PDR

Remark:

1. Xekong No.4
2. Xe Namnoy at Ban Latsasim
3. Xekong No.3
4. Xe Kaman No.1

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

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Ministry of agriculture & Forestry
Dept. of Irrigation
Laboratory of WQA

Vientiane, 24./01/94
No: .6./94/WQA

RESULT OF WATER QUALITY ANALYSIS

LOCATION: H E C
DATE OF SAMPLING: 6/01/94

<u>Parameter</u>		Sekong	Se Nam Noy	Sekhama
pH		6.77	6.51	7.21
Cond.	mS/m	3.55	1.10	6.7
Alk	meq/l	0.285	0.061	0.649
Hardness	"	0.340	0.106	0.589
Carbon dio.	mg/l	5.242	2.040	4.326

Laboratory of WQA



Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity.

Ministry of Agriculture - Forestry
Dept. of Irrigation
Laboratory of W.Q.A.

Vientiane, 25/2/1994
No. 18/94/WQA

RESULT OF WATER QUALITY ANALYSIS

Parameters	Xekong at Xekong town	Xekaman Old WL. station	Xe nam noy at B. Lasasin	Xe nam noy at Xe Katam
Date	29.1.94	30.1.94	26.1.94	27.1.94
Temperature	19	21	17	14.5
pH	7.34	7.43	6.55	6.64
TSS mg/l	6	8	2	8
Turbidity mg/l	0	0	1	0
Color mg/l	0	0	0	0
Conductivity mS/m	5.04	8.46	1.31	4.41
Ca meq/l	0.236	0.393	0.078	0.167
Mg meq/l	0.212	0.344	0.061	0.225
Alkalinity meq/l	0.320	0.819	0.052	0.408
Cl meq/l	0.073	0.109	0.038	0.027
SO4 meq/l	0.109	0.042	0.040	0.023
Tot. hardness meq/l	0.448	0.737	0.139	0.392
Tot. Fe mg/l	0.022	0.067	0.081	0.085
NH4-N mg/l	0.020	0.045	0.014	0.020
PO4-P mg/l	0.003	0.002	0.003	0.002
Tot.-P mg/l	0.004	0.003	0.004	0.003
Si mg/l	6.000	8.000	2.600	6.200
CODMn mg/l	0.475	0.467	0.554	0.316
KMnO4 mg/l	5.000	4.000	6.000	4.000

Laboratory of W.Q.A.



Laboratory of Water Quality Analysis
Vientiane, Lao PDR