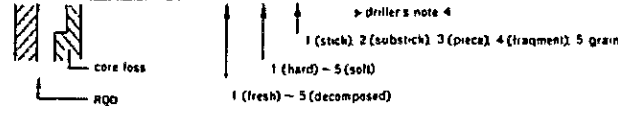


GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No R - 1 (SHEET 6 OF 6)

LOCATION Dam Right Abutment DEPTH OF HOLE 102.0 m COMMENCED Mar - 25 - 1979
 ELEVATION 222.7 m DEPTH OF OVERBURDEN 5.3 m COMPLETED Apr - 4 - 1979
 COORDINATE 1682 549 8N 490 391 E LENGTH OF ROCK DRILLING 96.7 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 70 ° TOTAL LENGTH OF CORE 98.64 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE N85°E CORE RECOVERY 96.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION				WATER PRESSURE TEST
10.0m			0 → 100 %									128.7 m	
1	Calc SS.				gy - dark gry.				102.0		NO Test	Supply	126.9
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													



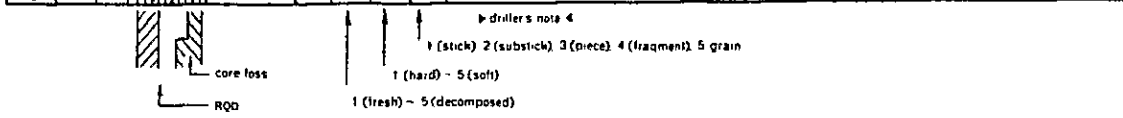
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-2 (SHEET 1 OF 4)

LOCATION Dam Right Abutment DEPTH OF HOLE 70.0 m COMMENCED Mar - 7 - 1979
 ELEVATION 285.0 m DEPTH OF OVERBURDEN 2.5 m COMPLETED Mar - 20 - 1979
 COORDINATE 1682 546.1 N 490 323.9 E LENGTH OF ROCK DRILLING 67.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 9.0 ° TOTAL LENGTH OF CORE 63.82 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
				CEMENTATION KIND OF BIT CASING	COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0m			0-100%									0m	285.0 m
0-2.5	O.B.	△											
2.5-3.0													
3.0-10.0	LIMESTONE.				brn.	4	5	5					
10.0-17.4													
17.4-20.0					blk.	3	2	3					



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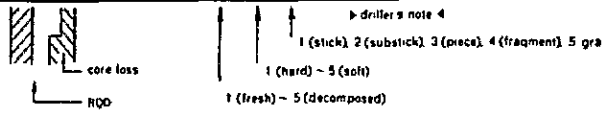
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-2 (SHEET 2 OF 4)

LOCATION Dom Right Abutment DEPTH OF HOLE 70.0 m COMMENCED Mar - 7 - 1979
 ELEVATION 285.0 m DEPTH OF OVERBURDEN 3.5 m COMPLETED Mar - 20 - 1979
 COORDINATE 1682 546.1 N 490 323.9 E LENGTH OF ROCK DRILLING 67.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 63.82 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA TION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHER ING	HARD NESS	CORE CUTTING					
20.0			0-100								20.0	265.0	
1-9	CONGLOMERATE.				reddish.	3-4	3				Lu = 4.6		
											Supply Leakage		
30.0					brn.	3	4				NO Test		
1-2	SANDSTONE.										Lu = 18.3		
											NO Leakage		
30.0-31.65													
31.65-32.2													
32.2-33.5													
33.5-34.8					brn-gry.	4-3	3	4					
34.8-35.0													
35.0-38.5					brn-gry.	4-3	3	4			Lu = 22.0		
38.5-38.6													
38.6-40.0													



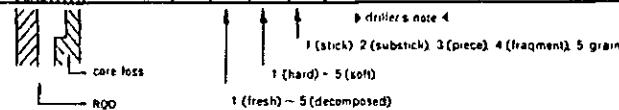
GEOLOGIC LOG OF DRILL HOLE

Upper Quoe Yai PROJECT

HOLE No R-2 (SHEET 3 OF 4)

LOCATION Dom Right Abutment DEPTH OF HOLE 70.0 m COMMENCED Mar- 7-1979
 ELEVATION 285.0 m DEPTH OF OVERBURDEN 2.5 m COMPLETED Mar- 20-1979
 COORDINATE 1682 546.1N 470 323.9 E LENGTH OF ROCK DRILLING 67.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 63.82 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE		DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER		
4.0m			0 → 100 %									4.0m	245.0
1	Calcareous SANDSTONE.		100 %		brn. gry.	4 3	3	4	41.3 core loss. 42.0	NO Test	NO Leakage	Supply	
2					brn. gry.	4 3	3	4	42.6 core loss. 43.0				
3													
4									43.5 core loss. 44.6				
5									44.6 core loss. 45.2				
6					brn. gry.	4 3	3	4	45.8 core loss. 46.0				
7					reddish brn.	4	3 4	5	all cores gravelly and wetkd.				
8									48.0				
9									Generally good, but brn. cracks remark.				
50									Core length 5-10cm. cracky zone (c-4-5) at 48.5-49, 50.5-51.				
1													
2					brn ~ gry.								
3													
4						3							
5													
6													
7													
8													
9													
60					gry ~ red. brn.							60	225.0



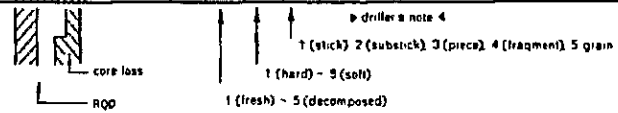
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No R-2 (SHEET 4 OF 4)

LOCATION Dam Right Abutment DEPTH OF HOLE 70.0 m COMMENCED Mar - 7 - 1979
 ELEVATION 285.0 m DEPTH OF OVERBURDEN 2.5 m COMPLETED Mar - 20 - 1979
 COORDINATE 1682 546 1 N 490 323 9 E LENGTH OF ROCK DRILLING 67.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 63.82 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE			DEPTH	ELEVATION					
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER							
6.0m			0 - 100 %							LUGEON	20 (min)	4.0	6.0m	225.0 m					
1	Calcareous SANDSTONE.				gry-red brn.	3	3	3		61.8	LU = 18.7	Supply NO Leakage	1						
2															2				
3																3			
4					brn.	3	3	3	Recemented shd. zone. cracks brn. and coated by seams.							4			
5																		5	
6																		6	
7																		7	
8																		8	
9																		9	
70.0															70.0			70.0	215.0



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GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

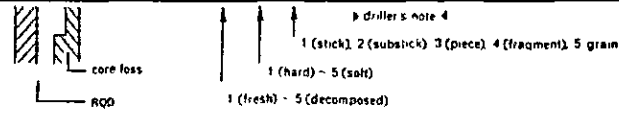
HOLE No R-3 (SHEET 1 of 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 100.0 m COMMENCED Feb. 11 - 1979
 ELEVATION 379.8 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Mar. 3 - 1979
 COORDINATE E 682 531.8 N 490 207.4 E LENGTH OF ROCK DRILLING 97.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 96.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0m			0 → 100%									0	379.8	
1		△			brn.				withd. breccia or talus deposit?				1	
2		△			brn.								2	
3		△			brn.								3	
4									NO CORE.				4	
5											Supply		5	
6					brn.				Fault breccia.		Leakage		6	
7													7	
8					blk.	3	2	2	Cracks brn. solution at 7.4.				8	
9													9	
10									Recent shd. zone. very hard. Many solution cracks 16~164 soft breccia.				10	
11													11	
12					brn.	3	1	3					12	
13													13	
14													14	
15													15	
16													16	
17													17	
18					blk.	3	2		Many solution spaces filled by soil (19.9, 20.5, 22.0, 23.7).				18	
19													19	
20									Core loss. 19.9				20	359.8

LIMESTONE.

O.B.



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-3 (SHEET 3 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 100.0 m COMMENCED Feb-11-1979
 ELEVATION 379.8 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Mar-3-1979
 COORDINATE 1682 5318 N 490 2074 E LENGTH OF ROCK DRILLING 97.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 96.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
4.0m			0-100								0	4.0m	339.8
1					blk.	3	2	3-4	40.9 41.0				
2									Core loss.				
3									Cavernous zone. Remark redeposit lime at 40.7-42.15 42.7-42.8. Brecciated at 40.1, 42.3, 43.0				
4													
5													
6													
7									Generally good, but shd. at 43.1-43.5, 44.3-44.5, 44.9, 46-46.2, 47.7-47.85, 51, 51.8-52, 52.1-52.5. Core loss at 43.1-43.2, Solution at 45.2, 46.15.				
8													
9													
50													
1													
2									52.5				
3									Brecciated at 52.5-52.65. Solution at 52.65-54.0.				
4									54.0				
5									all cracks brn. or coated by graphite.				
6									Brecciated SH at 57.6, 59.4-59.5, 60.5-60.6, 62.4-62.8.				
7									Cracky at 54-54.5.				
8													
9													
60												60	319.8

LIMESTONE.

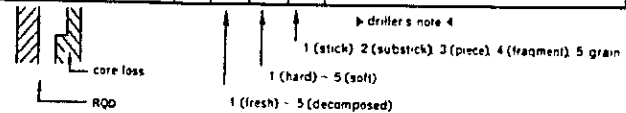
Supply
NO Leakage

Lu=25.7

Lu=23.3

Lu=23.6

Lu=5.0



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yaj PROJECT HOLE No R-3 (SHEET 4 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 100.0 m COMMENCED Feb. 11 - 1979

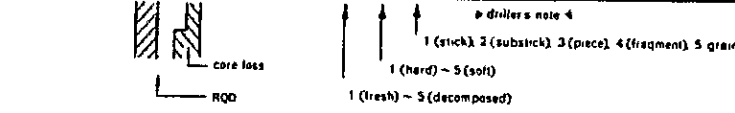
ELEVATION 379.8 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Mar. 3 - 1979

COORDINATE 1682 531 8N 490 207.4 E LENGTH OF ROCK DRILLING 97.0 m DRILLED BY FONDISA

ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 96.0 m LOGGED BY Y. Fukutake

BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA TION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION		
					COLOR	WEATHER ING	HARD NESS	CORE CUTTING						DESCRIPTION	
60m			100%								60m	319.8			
1	LIMESTONE.				blk.	3	2	3							
2															
3															
4					63.5										
5					65.6										
6	LIMESTONE.				blk.	3	2	3							
7															
8															
9															
70															
1	CONGLOMERATE.				blk.	3	2	3							
2															
3															
4															
5					75.0										
6															
7	CONGLOMERATE.				blk.	3	2	3							
8															
9															
80															
80															



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-3 (SHEET 5 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 100.0 m COMMENCED Feb. 11 - 1979
 ELEVATION 379.8 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Mar. 3 - 1979
 COORDINATE 1682 531 8N 490 207.4E LENGTH OF ROCK DRILLING 97.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 96.0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
80m			0-100%										80m	299.8m
1													1	
2													2	
3													3	
4													4	
5													5	
6													6	
7													7	
8													8	
9													9	
90													90	
100													100	279.8

CONGLOMERATE.

brn.

83.5
 shd. in general, but recent.
 NO remarkable wethd. material in cracks.

Lu = 11.8

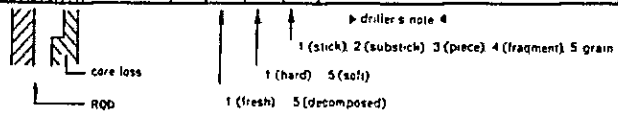
Lu = 4.1

Lu = 2.1

Lu = 0.4

Supply
 No Leakage

100.0



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Ya PROJECT

HOLE No R-4 (SHEET 1 OF 3)

LOCATION Dam Right Abutment DEPTH OF HOLE 50.0 m COMMENCED Jan - 21 - 1979
 ELEVATION 416.7 m DEPTH OF OVERBURDEN 1.7 m COMPLETED Feb - 9 - 1979
 COORDINATE 1682 518 ON 490 1272E LENGTH OF ROCK DRILLING 48.3 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 42.86 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 85.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
0m			0-100%									0	416.7	
0-1.7	O.B.								Overburden.					
1.7-8.5	Calc. SS. & SH alt.				5	5	5		Fault breccia. Original rock calc. ss (yellow) and SH alt.		NO TEST			
8.5-10.0					5	5	5		Core loss. 8.0		Supply			
10.0-10.5					brn.	3	2	3	Massive calc. ss Remarkable solution.					
10.5-10.9									Breccia. Core loss.					
10.9-11.4									Core loss 11.4					
11.4-13.0					light brn.	3	4	5	Wethd. and cracky. all cracks filled by soil.					
13.0-13.6									Core loss. 13.4					
13.6-14.0									Core loss. 14.0					
14.0-15.0	Calcareous SANDSTONE.				light brn.	3	3	5						
15.0-15.8									Brecciated. Core loss.					
15.8-16.8					light brn.	5	5	5	Brecciated.					
16.8-17.4						3	3	3						
17.4-18.05									Core loss. Brecciated					
18.05-19.0									Core loss.					
19.0-20.0					blk.				Breccia.					

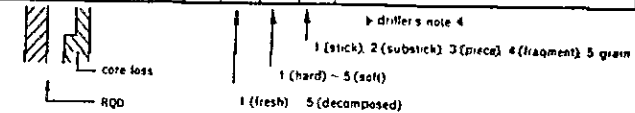
drillers note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Ya) PROJECT HOLE No R-4 (SHEET 2 OF 3)

LOCATION Dam Right Abutment DEPTH OF HOLE 50.0 m COMMENCED Jan - 21 - 1979
 ELEVATION 416.7 m DEPTH OF OVERBURDEN 1.7 m COMPLETED Feb - 9 - 1979
 COORDINATE 1682 518 ON 490 127 2 E LENGTH OF ROCK DRILLING 48.3 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 42.86 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 85.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA TION OF KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHER ING	HARD- NNESS	CORE CUTTING					
2.0m			0 = 100										
0												2.0m	396.7
1	Calc. SS.				blk.	3	3	4	Core loss. 20.6		Leakage		
2	Calc. SS.				blk.	5	5	5	all cracks filled by soil. 21.0 Cracks wetd. 21.7				
3	Calc. SS.				blk.	5	5	5	Brecciated. 22.65				
4	CONGLOMERATE.				brn.	3		2	Cataclastic. all cracks wetd. and filled by soil. 23.9 - 24.0		Supply		
5	CONGLOMERATE.				reddish brn.	3	4	3	Somewhat shd all cracks brn. 24.8				
6	CONGLOMERATE.				reddish brn.				Cracks slightly wetd. and brn. 27.3		No Leakage		
7	CONGLOMERATE.				reddish brn.								
8	CONGLOMERATE.				reddish brn.								
9	CONGLOMERATE.				reddish brn.								
10	CONGLOMERATE.				reddish brn.								
11	SANDSTONE.				gry ~ brn.	3	3	3	all cracks brn. and filled by seam. Brecciated at 29.5, 31.0. Solution at 33.1~33.15. 34.5				
12	SANDSTONE.				gry ~ brn.	3	1	4					
13	SANDSTONE.				gry ~ brn.								
14	SANDSTONE.				gry ~ brn.								
15	SANDSTONE.				gry ~ brn.								
16	SANDSTONE.				gry ~ brn.								
17	SANDSTONE.				gry ~ brn.								
18	SANDSTONE.				gry ~ brn.								
19	SANDSTONE.				gry ~ brn.								
20	SANDSTONE.				gry ~ brn.								
21	SANDSTONE.				gry ~ brn.								
22	SANDSTONE.				gry ~ brn.								
23	SANDSTONE.				gry ~ brn.								
24	SANDSTONE.				gry ~ brn.								
25	SANDSTONE.				gry ~ brn.								
26	SANDSTONE.				gry ~ brn.								
27	SANDSTONE.				gry ~ brn.								
28	SANDSTONE.				gry ~ brn.								
29	SANDSTONE.				gry ~ brn.								
30	SANDSTONE.				gry ~ brn.								
31	SANDSTONE.				gry ~ brn.								
32	SANDSTONE.				gry ~ brn.								
33	SANDSTONE.				gry ~ brn.								
34	SANDSTONE.				gry ~ brn.								
35	SANDSTONE.				gry ~ brn.								
36	SANDSTONE.				gry ~ brn.								
37	SANDSTONE.				gry ~ brn.								
38	SANDSTONE.				gry ~ brn.								
39	SANDSTONE.				gry ~ brn.								
40	SANDSTONE.				gry ~ brn.								376.7



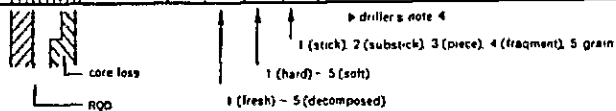
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-4 (SHEET 3 of 3)

LOCATION	Dam Right Abutment	DEPTH OF HOLE	50.0 m	COMMENCED	Jan. 21, 1979
ELEVATION	416.7 m	DEPTH OF OVERBURDEN	1.7 m	COMPLETED	Feb. 9, 1979
COORDINATE	1682 518 ON 490 1272E	LENGTH OF ROCK DRILLING	48.3 m	DRILLED BY	FONDISA
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	42.86 m	LOGGED BY	Y Fukutake
BEARING OF ANGLE HOLE		CORE RECOVERY	85.7 %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION								
4.0m			0-100%										4.0m	376.7			
1	LS. and Calc. SS.	CGL.	0-100%		blk.	3	4		LS. and brn. Calc. SS. Many solution cracks at 39.3, 42.4-42.5, 45-45.7. Brecciated at 42.0-42.2 42.9-43.5, 44-45.0.			Leakage	1				
2															2		
3																3	
4																4	
5												Core loss.				5	
6																6	
7																7	
8												Core loss.				8	
9									red.	3	3	3	Somewhat brecciated. Cracks wetd. and filled by seam.			9	
50												50	366.7				



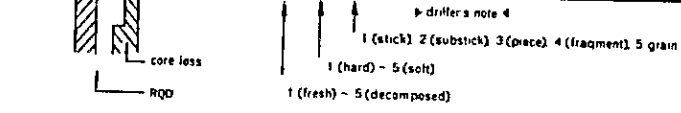
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Ya PROJECT

HOLE No R - 5 (SHEET 1 of 5)

LOCATION <u>Dam Right Abutment</u>	DEPTH OF HOLE <u>90.0</u> m	COMMENCED <u>Mar - 20 - 1979</u>
ELEVATION <u>256.7</u> m	DEPTH OF OVERBURDEN <u>2.0</u> m	COMPLETED <u>Apr - 2 - 1979</u>
COORDINATE <u>1682 618 IN 490 373 8E</u>	LENGTH OF ROCK DRILLING <u>88.0</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE <u>84.99</u> m	LOGGED BY <u>Y Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>94.4</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0			0 → 100									256.7	
0 - 2.0	Talus.	△											
2.0 - 6.0		○			4					NO Test	Supply Leakage		
6.0 - 17.6		○			3					Lu=18.3			
17.6 - 21.5		○			3					Lu=21.4			
21.5 - 84.99		○			3					Lu=18.5	NO Leakage		
84.99		○										236.7	



ELECTRIC POWER DEVELOPMENT CO., LTD
TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No R - 5 (SHEET 2 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 90.0 m COMMENCED Mar. 20 - 1979
 ELEVATION 256.7 m DEPTH OF OVERBURDEN 2.0 m COMPLETED Apr - 2 - 1979
 COORDINATE 1682 618 IN 490 373 BE LENGTH OF ROCK DRILLING 88.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 84.99 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 94.4 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BITTING CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
2.0m			0 - 100									0	2.0m	236.7
1						3	3	3	2	21.5			1	
2													2	
3													3	
4													4	
5													5	
6													6	
7						3	3	3	2	32~35.0 (brecciated)			7	
8						4	4						8	
9													9	
30													30	
1													1	
2													2	
3													3	
4													4	
5													5	
6													6	
7						5	5	5		Strongly wetd. poor core recovery. Fault zone (?)			7	
8													8	
9													9	
40													40	216.7

CONGLOMERATE.

Calc. SS.

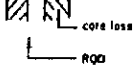
brn ~ reddish brn.

Lu = 17.5

Lu = 16.8

Lu = 8.6

NO Test



driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Uppe Quae Yai PROJECT

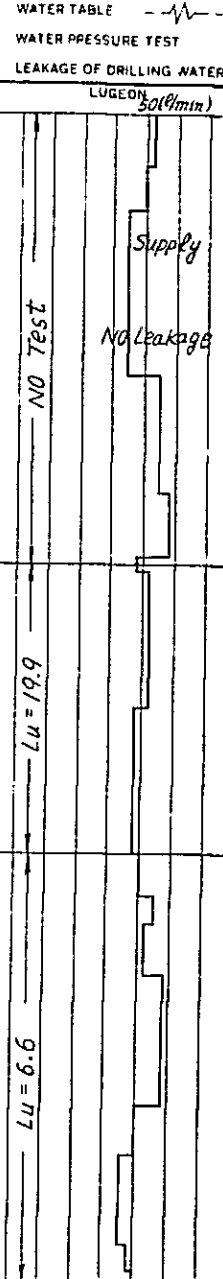
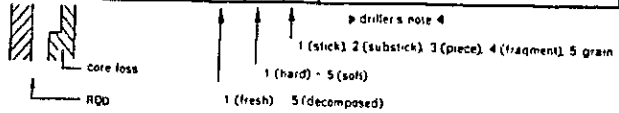
HOLE No R - 5 (SHEET 3 OF 5)

LOCATION <u>Dam Right Abutment</u>	DEPTH OF HOLE <u>90.0</u> m	COMMENCED <u>Mar - 20 - 1979</u>
ELEVATION <u>256.7</u> m	DEPTH OF OVERBURDEN <u>2.0</u> m	COMPLETED <u>Apr - 2 - 1979</u>
COORDINATE <u>1682 618 IN 490 373.8 E</u>	LENGTH OF ROCK DRILLING <u>88.0</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>84.99</u> m	LOGGED BY <u>Y. Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>94.4</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	GRAIN	CUTTING						
4.0m			0-100												
1					brn-red brz	4	4	5		Mainly gravelly cores and all cores wetd. Core loss at 40~40.6.					216.7
2										Core loss.					
3															
4															
5					brn.	4	3	4		strongly wetd. and all cracks filled by seam.					
6						4	4	5							
7															
8															
9						4	3	4		Core length 3-10cm. all cracks wetd. and filled by seam.					
50						4				Core loss.					
1						4	3	4							
2															
3															
4															
5															
6															
7															
8															
9						3	4	5		No brn. cracks but shd. as a whole and remarkable white seam. gravelly core.					
60															196.7

SANDSTONE.

Calcareous



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-5 (SHEET 4 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 90.0 m COMMENCED Mar - 20 - 1979
 ELEVATION 256.7 m DEPTH OF OVERBURDEN 2.0 m COMPLETED Apr - 2 - 1979
 COORDINATE 1682 618 IN 490 373 BE LENGTH OF ROCK DRILLING 88.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 84.99 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 94.4 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA TION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHER ING	HARD NESS	CORE CUTTING					
6.0m			0-100%									6.0m	196.7
1	Calcareous SANDSTONE.				gry.	3 4 5		60.65	shd. zone. all core brecciated with clay.	Lu=5.2	Supply	NO Leakage	
2													
3													
4													
5													
6													
7													
8													
9													
7.0													
1	Calcareous SANDSTONE.				gry.	2 2		7.2.0	No wethd. cracks, but some cracks filled by white seam.	NO Test			
2													
3													
4													
5													
6													
7													
8													
1	Calcareous SANDSTONE.				gry.	3		77.0		Lu=14.3			
2													
3													
8													
1	Calcareous SANDSTONE.				gry.	1 1							
2													
80												80	176.7

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)
 core loss
 RQD

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-5 (SHEET 5 OF 5)

LOCATION <u>Dam Right Abutment</u>	DEPTH OF HOLE <u>90.0</u> m	COMMENCED <u>Mar - 20 - 1979</u>
ELEVATION <u>256.7</u> m	DEPTH OF OVERBURDEN <u>2.0</u> m	COMPLETED <u>Apr - 2 - 1979</u>
COORDINATE <u>1682 618 IN 490 373 8 E</u>	LENGTH OF ROCK DRILLING <u>88.0</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>84.99</u> m	LOGGED BY <u>Y Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>94.4</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						WATER TABLE
80m			0-100%									80m	176.7	
1	<i>Calcareous SANDSTONE.</i>	<i>gry.</i>												
2														
3														
4														
5														
6														
7														
8														
9														
90.0														90.0

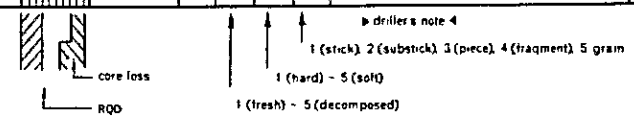
Generally shd., but fresh and hard. Many cracks may be made by drilling.

Supply NO leakage

Lu = 3.9

Lu = 56

90.0



> driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 (gram)
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

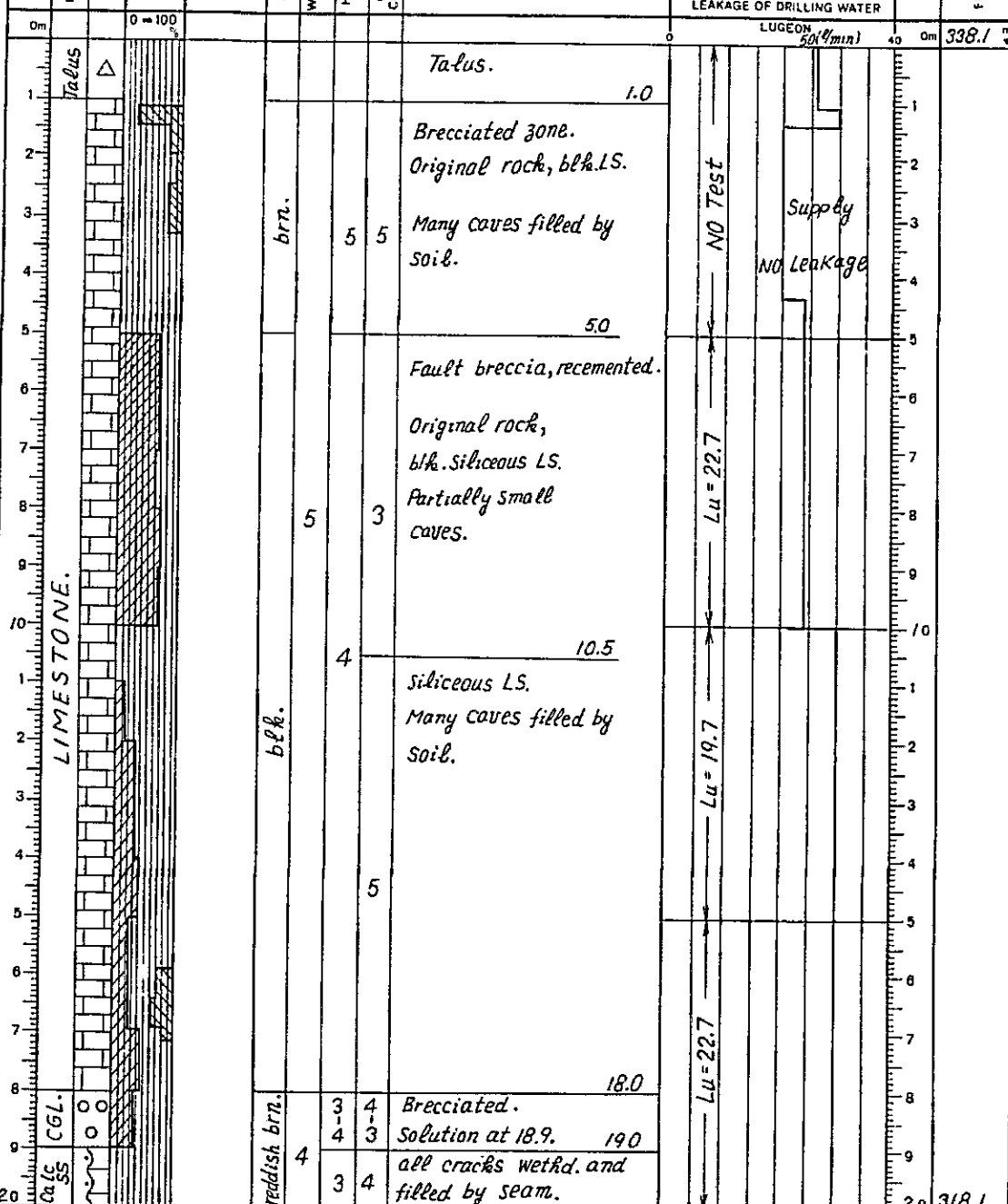
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-6 (SHEET 1 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 82.0 m COMMENCED Jan - 28 - 1979
 ELEVATION 338.1 m DEPTH OF OVERBURDEN 1.0 m COMPLETED Mar - 17 - 1979
 COORDINATE 1682 615 ON 490 2613E LENGTH OF ROCK DRILLING 81.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 77.32 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0			0 = 100									338.1	
0-1.0	Talus	△											
1.0-5.0					brn.	5	5				NO Test		
5.0-10.5						5	3				Supply		
10.5-18.0					blk.	4	5				NO Leakage		
18.0-19.0					reddish brn.	3	4						
19.0-20.0						4	3						



driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

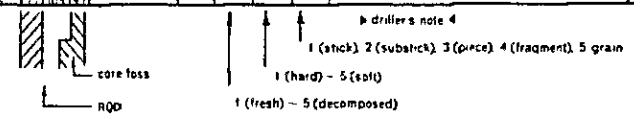
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R - 6 (SHEET 2 OF 5)

LOCATION Dam Right Abutment DEPTH OF HOLE 82.0 m COMMENCED Jan-28-1979
 ELEVATION 338.1 m DEPTH OF OVERBURDEN 1.0 m COMPLETED Mar-17-1979
 COORDINATE 1682 615.0N 490 261.3 E LENGTH OF ROCK DRILLING 81.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 77.32 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS	CORE CUTTING									
20.0			0 → 100 %									0	318.1				
1	Calcareous SANDSTONE.	[Log pattern]			brn ~ gry.	4	3	4	20.5	Cracks wethd. and coated by wethd. material. Cracksy at 21.8-22, 23~23.9, 26.6, 27.9. Solution at 23~23.9, 25.0.	LUGEON 50 (l/min)	Lu = 24.3	Supply	NO Leakage			
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
30						Calcareous SANDSTONE.	[Log pattern]								gry ~ brn.	3	3
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
40	Calcareous SANDSTONE.	[Log pattern]			reddish brn.	3	3	4	36.6	Cracks brn. Solution at 38.5, 44.0.	LUGEON	Lu = 19.6					
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
40								298.1									



ELECTRIC POWER DEVELOPMENT CO., LTD. TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

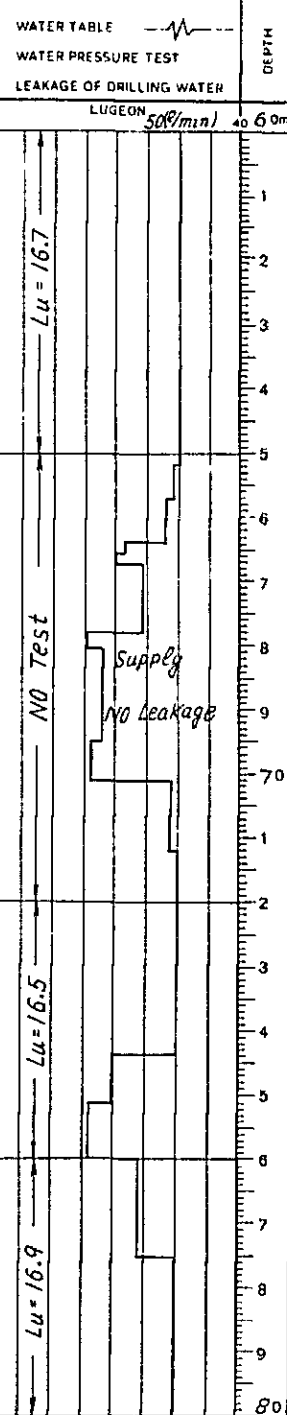
Upper Quee Yai PROJECT

HOLE No R-6 (SHEET 4 OF 5)

LOCATION <u>Dam Right Abutment</u>	DEPTH OF HOLE <u>82.0</u> m	COMMENCED <u>Jan - 28 - 1979</u>
ELEVATION <u>338.1</u> m	DEPTH OF OVERBURDEN <u>1.0</u> m	COMPLETED <u>Mar - 17 - 1979</u>
COORDINATE <u>1682 615 ON 490 2613 E</u>	LENGTH OF ROCK DRILLING <u>81.0</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>77.32</u> m	LOGGED BY <u>Y Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>96.7</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION			
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						DESCRIPTION		
60			0-100%								0	60m	278.1 m			
1	SANDSTONE.	Calcareous			gry.				61.0							
2					brn.	3	3									
3																
4												63.75				
5												Core loss 64.75				
6					brn.	3	3	5								
7												66.75				
8												Core loss 67.4				
9												Many cracks and filled by seam.				
10												Brecciated at 61.75-62.0, 69-70.25 (recement).				
11								Solution at 61.5, 63.7, 67.8, 71.2-71.5, 74-74.2, 75.7.								
12																
13																
14								core loss.								
15								core loss.								
16																
17																
18								76.0								
19								Cracks wethd., but no seam and no solution.								
20								Cracky zone at 77.5-77.7.								
21								core loss.								
22								78.3								
23								Cracks wethd., but no seam.								
24								Solution at 78.4-79.0.								
25																
26																
27																
28																
29																
30																
80													258.1			

core loss
 RQD
 driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) 5 (decomposed)



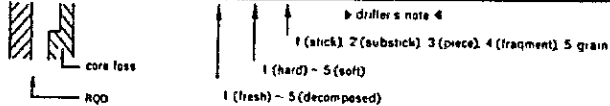
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No R - 6 (SHEET 5 OF 5)

LOCATION <u>Dam Right Abutment</u>	DEPTH OF HOLE <u>82.0</u> m	COMMENCED <u>Jan - 28 - 1979</u>
ELEVATION <u>338.1</u> m	DEPTH OF OVERBURDEN <u>1.0</u> m	COMPLETED <u>Mar - 17 - 1979</u>
COORDINATE <u>1682 6150N 490 261 3E</u>	LENGTH OF ROCK DRILLING <u>81.0</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>77.32</u> m	LOGGED BY <u>Y Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>96.7</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
80m			0 → 100%									80m	258.1
1	Ca le. SS.									Core loss.			
82					brk. grk.	3	3	4					256.1
2													
3													
4													
5													
6													
7													
8													
9													
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
0													



ELECTRIC POWER DEVELOPMENT CO., LTD.
TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-7 (SHEET 1 of 2)

LOCATION Dam Right Abutment DEPTH OF HOLE 35.0 m COMMENCED Jan 10 1979
 ELEVATION 476.7 m DEPTH OF OVERBURDEN 0.4 m COMPLETED Jan 14 1979
 COORDINATE 1682 662 7N 490 062 9E LENGTH OF ROCK DRILLING 34.6 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 34.85 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 99.6 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BITTING CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0.3			0-100									0	476.7
0.4		0-B										0	476.7
1												1	
2												2	
3												3	
4												4	
5												5	
6												6	
7												7	
8												8	
9												9	
10												10	
11												11	
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	
18												18	
19												19	
20												20	456.7

Dolomitic LIMESTONE.

Blk soil 0.4

Dolomitic LS. (partially Calc SS)

Cracks filled by seam.

Remarkable solution cracks at 3.7-4.25, 5.0, 5.5, 6.0, 7.0, 7.15, 7.6-7.7, 8.2, 10.9-11.1, 11.5-12.0, 13.15-13.4, 14.6-14.8, 17.0-17.2.

gry.

gry.

3

2

3

3

2

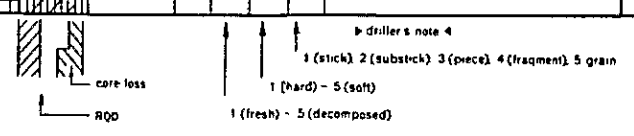
3

Core loss.

Leakage

Supply

NO Leakage



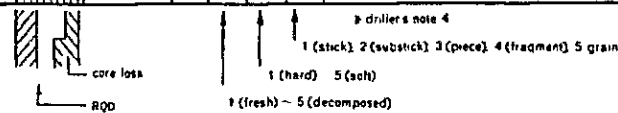
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yoi PROJECT

HOLE No R-7 (SHEET 2 OF 2)

LOCATION Dam Right Abutment DEPTH OF HOLE 35.0 m COMMENCED Jan - 10 - 1979
 ELEVATION 476.7 m DEPTH OF OVERBURDEN 0.4 m COMPLETED Jan - 14 - 1979
 COORDINATE 1682 6627N, 490 062 9E LENGTH OF ROCK DRILLING 34.6 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 34.85 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 99.6 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
20m			0 → 100					4-3	20.4			0	20m	256.7
1	Dolomitic LIMESTONE.				brn.	3	3	4-3	Fault zone. somewhat recent. 24~24.7 reddish SH.				1	
2														
3														
4														
5														
6														
7														
8							3	27.0	Generally good, but solution cracks at 270, 29.25, 30.2~30.4, 34.5, 35.0. Breccia at 33.3~33.7.			8		
9												9		
30												30		
1								2-2				1		
2												2		
3												3		
4												4		
35									35.0			35	241.7	



ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-8 (SHEET 1 OF 3)

LOCATION	Dam Right Abutment	DEPTH OF HOLE	45.0 m	COMMENCED	Jan - 17 - 1979
ELEVATION	426.7 m	DEPTH OF OVERBURDEN	1.25 m	COMPLETED	Jan - 22 - 1979
COORDINATE	1682 726 2 N 490 139 7 E	LENGTH OF ROCK DRILLING	43.75 m	DRILLED BY	FONDISA
ANGLE FROM HORIZONTAL	90°	TOTAL LENGTH OF CORE	44.35 m	LOGGED BY	Y. Fukutake
BEARING OF ANGLE HOLE		CORE RECOVERY	98.6 %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0m			0 = 100%								0	426.7 m	
1	O.B.	△										1	
2		○										2	
3		○										3	
4		○										4	
5		○										5	
6		○										6	
7		○										7	
8		○										8	
9		○										9	
10		○										10	
11		○										11	
12		○										12	
13		○										13	
14		○										14	
15		○										15	
16		○										16	
17		○										17	
18		○										18	
19		○										19	
20		○										20	406.7

CONGLOMERATE.

reddish brn.

Boulder (CGL) and overburden. 1.25

CGL (gravels; round to subangular).

Cracks wethd. and filled by seam.

Matrix wethd. and color change from red to yellowish brn.

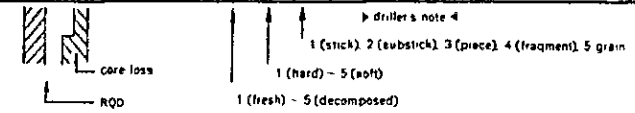
Cracky at 4.~4.2, 5.8, 6.5~6.9, 7.0~7.25, 7.9~8.1, 9.0~9.35, 10.0~10.35, 11.0~12.0, 13.9~14.5, 15~16.0.

Brecciated at 14.5~15.0 (recement) 15.5~17.0 (") 17.0~17.1 (soft) 18.9~19.1 (").

Solution at 18.2~18.4, 19.5~20.0.

Supply

Leakage



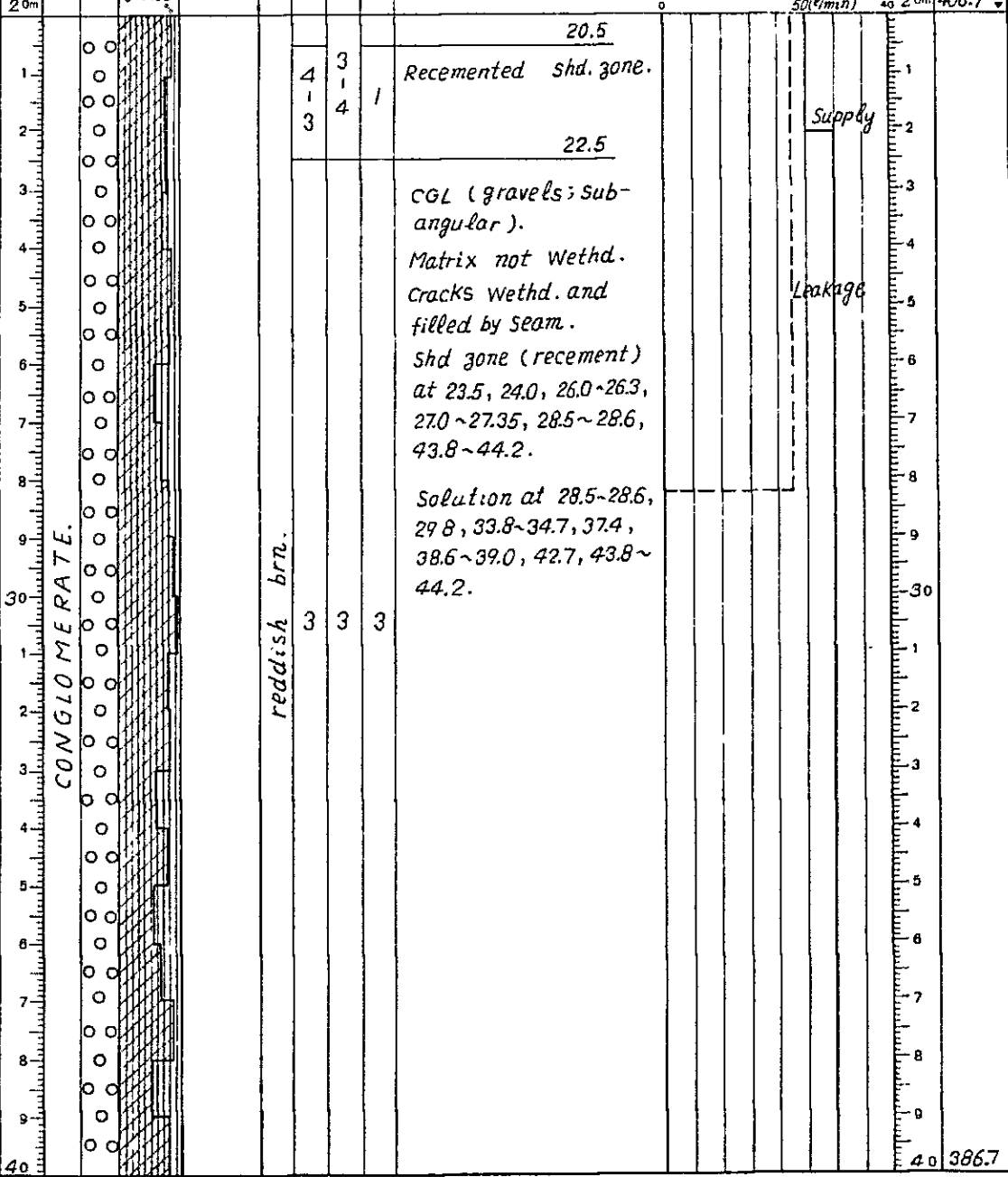
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-8 (SHEET 2 OF 3)

LOCATION Dam Right Abutment DEPTH OF HOLE 45.0 m COMMENCED Jan - 17 - 1979
 ELEVATION 426.7 m DEPTH OF OVERBURDEN 1.25 m COMPLETED Jan - 22 - 1979
 COORDINATE 1682 726 2N 490 139 7E LENGTH OF ROCK DRILLING 43.75 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 44.35 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.6 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
2.0m			100%									0	2.0m	406.7 m
1						4	3	1	Recemented shd. zone.					
2						3	4							
3														
4														
5														
6														
7														
8														
9														
30						3	3	3						
1														
2														
3														
4														
5														
6														
7														
8														
9														
40													40	386.7



driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 core loss
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)
 RQD

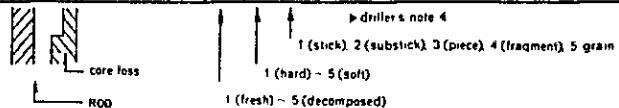
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No R-8 (SHEET 3 OF 3)

LOCATION Dam Right Abutment DEPTH OF HOLE 45.0 m COMMENCED Jan - 17 - 1979
 ELEVATION 426.7 m DEPTH OF OVERBURDEN 1.25 m COMPLETED Jan - 22 - 1979
 COORDINATE 1682 726 2N 490 139 7E LENGTH OF ROCK DRILLING 43.75 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 44.35 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.6 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE			DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS				
40.0m			0-100%							40.0m	386.7 m
1	CONGLOMERATE.	○			reddish brn						
2		○									
3		○									
4		○									
45.0							45.0			45.0m	381.7 m
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											



ELECTRIC POWER DEVELOPMENT CO. LTD
TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No P-1 (SHEET 1 OF 7)

LOCATION Penstock left bank DEPTH OF HOLE 140.0 m COMMENCED May - 25 - 1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun - 10 - 1979
 COORDINATE 1682 330.6N 490 750.0E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FON DISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA TION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHER ING	HARD NESS	CORE CUTTING					
0m			0 → 100 %									0m	403.2
0-3	Overburden	△			brn.								
3-4	Calcareous SANDSTONE.	○			brownish gry ~ gry.		3						
4-8	CGL.	○			brn.		3						
8-10	Calcareous SANDSTONE.	○			brn.		3						
10-15.8	CONGLOMERATE.	○			reddish brn - brn.		2						

driller's note 4
 1 (stick) 2 (subbatch) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

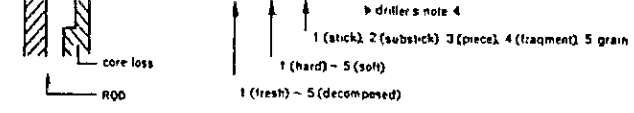
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P - 1 (SHEET 2 OF 7)

LOCATION Penstock, left bank DEPTH OF HOLE 140.0 m COMMENCED May - 21 - 1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun - 10 - 1979
 COORDINATE 1682 3306N 490 750.0 E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				DESCRIPTION
2.0m			0 → 100							2.0m	383.2	
1	CGL.					4	4	3	Ordinary cracks, no brn. seam at 20.0~20.5. Recemented breccia are deep weithd. from 20.5-21.0. 21.25 ~22.0. 22.0		1	
2											2	
3											3	
4											4	
5											5	
6										Supply	6	
7										No leakage	7	
8											8	
9											9	
30	SANDSTONE.										30	
1						3	3	2	Crackly zone at 31.0~31.3. Soluable caves at 35.4. Crystalline caves at 37.35~37.5.		1	
2											2	
3											3	
4											4	
5											5	
6											6	
7											7	
8											8	
9											9	
40	Calcareous SANDSTONE.										40	363.2



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GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-1 (SHEET 4 OF 7)

LOCATION Penstock, left bank DEPTH OF HOLE 140.0 m COMMENCED May - 25 - 1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun - 10 - 1979
 COORDINATE 1682 330 6N 490 7500E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0.6			0 → 100								0	406.0	343.2
1	SANDSTONE.					3	3						
2													
3													
4													
5													
6													
7													
8													
68.0	Calcareous					2	2						
69													
70													
71													
72													
73													
74													
75													
76													
77													
80.0											80	323.2	

Good core. all cracks are open cracks, coated with brown seam, but one open brown clay at 61.5.

Good core. open cracks are coated with brown seam at 68.55, 68.87, 69.57, 69.78, 70.05, 70.25, 70.33, 71.55, 71.7, 71.92, 72.0, 72.52, 72.75, 72.9, 73.0, 73.27, 73.48, 73.73, 73.95, 74.0, 74.32, 74.4, 74.72, 80.0.

Ordinary cracks, no brown seam at 74.0~79.0.

Cavernous zone at 73.75~74.3.

Calc SS are deep wethd. at 75.4~76.0.

LU = 2.7

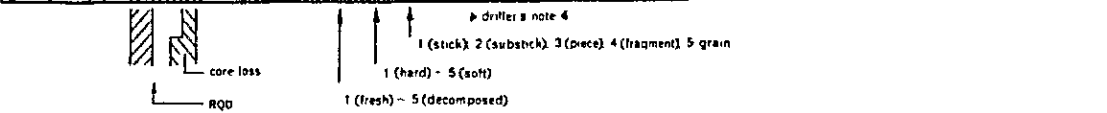
LU = 2.6

LU = 2.7

LU = 2.7

LU = 2.7

Supply
NO Leakage

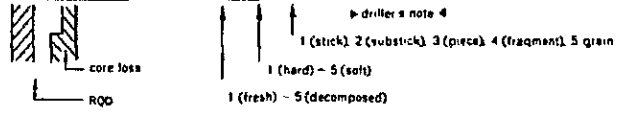


GEOLOGIC LOG OF DRILL HOLE

Upper Quee Ya; PROJECT HOLE No P - 1 (SHEET 5 OF 7)

LOCATION Penstock, left bank DEPTH OF HOLE 140.0 m COMMENCED May - 25 - 1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun - 10 - 1979
 COORDINATE 1682 3306N 490 7500E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0%

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION												
					COLOR	WEATHERING	HARDNESS	CORE CUTTING																	
0.0			0 → 100									0	323.2												
1	Calcareous SANDSTONE.				brownish gry.	2	2	2				LUGEON 50 (4/min)	40	80m											
2															all cracks are open cracks. coated with brown seam, except for a few dissolved cracks at 89.19, 89.6. Calc. SS are deep wethd at 85.0~85.72, 89.0~90.13, 91.0~91.7.	Lu = 1.9	Supply	NO Leakage							
3																			Lu = 1.5						
4																				Lu = 2.4					
5																					Lu = 2.1				
6																						92.0			
7																							open cracks are coated with brown seam at 92.38, 93.8~94.0, 94.9, 95.32, 95.57~96.1, 97.8~98.2. Dissolved cracks are coated with brown to reddish brown seam at 92.73, 94.7, 96.8~97.05, 97.58~97.78. Cavernous zone at 94.25~94.50. Calcareous SS are deep wethd. at 98.3~100.0.		
8																								100.0	
9																									100
10																									
	303.2																								



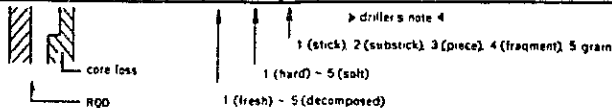
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-1 (SHEET 6 OF 7)

LOCATION Penstock, left bank DEPTH OF HOLE 140.0 m COMMENCED May-25-1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun-10-1979
 COORDINATE 1682 330.6N. 490 750.0 E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0%

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CAVING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION										
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						DESCRIPTION									
10.0m			0-100									10.0m	303.2										
1	Calcareous SANDSTONE.				brownish gfy.	3	3	2	<p>Open cracks are coated with brown seam at 100.0~105.0, 108.0~115.0.</p> <p>Ordinary cracks, no brown seam at 105.0~108.0.</p> <p>Soluable caves at 109.9~110.0.</p>	<p>50 (l/min)</p> <p>Lu=2.6</p>	<p>Supply</p> <p>No Leakage</p>	1	303.2										
2												2	2	2	2	2	2	2	2	2	2	2	2
3												3	3	3	3	3	3	3	3	3	3	3	3
4												4	4	4	4	4	4	4	4	4	4	4	4
5												5	5	5	5	5	5	5	5	5	5	5	5
6												6	6	6	6	6	6	6	6	6	6	6	6
7												7	7	7	7	7	7	7	7	7	7	7	7
8												8	8	8	8	8	8	8	8	8	8	8	8
9												9	9	9	9	9	9	9	9	9	9	9	9
110																							110
1	Calcareous SANDSTONE.				brownish gfy.	3	3	3	<p>115.0</p> <p>Open cracks are coated with brown seam at 115.0~118.14, 119.5~120.0.</p> <p>Dissolved cracks at 118.45, 118.55, 119.25~119.5.</p> <p>Crystalline cave at 119.57.</p>	<p>Lu=2.0</p>	<p>No Leakage</p>	1											
2												2	2	2	2	2	2	2	2	2	2	2	
3												3	3	3	3	3	3	3	3	3	3	3	3
4												4	4	4	4	4	4	4	4	4	4	4	4
5												5	5	5	5	5	5	5	5	5	5	5	5
120												120	283.2										

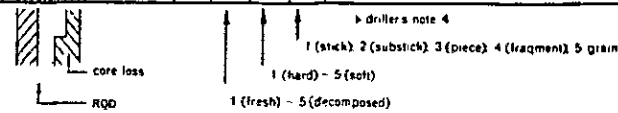


GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No P-1 (SHEET 7 OF 7)

LOCATION Penstock, left bank DEPTH OF HOLE 140.0 m COMMENCED May - 25 - 1979
 ELEVATION 403.2 m DEPTH OF OVERBURDEN 3.0 m COMPLETED Jun - 10 - 1979
 COORDINATE 1682 330 6N 490 7500E LENGTH OF ROCK DRILLING 137.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 140.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
120m			0-100									120m	283.2 m	
1	Calcareous SANDSTONE.				gry ~ brownish gry.	3	3	3	<p>Open cracks are Coated with brown seam at 120.0-126.1, 130.6~130.7, 132.0 - 134.2, 134.4-136.0, 139.0-139.5</p> <p>Dissolved cracks at 134.3~137.3.</p> <p>Ordinary cracks, no brown seam at 126.1-129.0, 129.0-130.6, 130.7-132.0, 136.0-137.1, 137.4-139.0, 139.5-140.0.</p> <p>Sheared zones with gouge and breccia at 129.6-129.7, 130.1-130.2</p> <p>Calc SS are deep wethd. at 123.0-123.2, 124.4-124.82, 134.7-135.0.</p>	<p>Lu=1.5</p> <p>Lu=0.6</p> <p>Lu=0.8</p> <p>Lu=0.3</p>	<p>Supply</p> <p>No Leakage</p>	1		
2												2		
3												3		
4												4		
5												5		
6												6		
7												7		
8												8		
9												9		
10												10		
130												130		
1												1		
2	2													
3	3													
4	4													
5	5													
6	6													
7	7													
8	8													
9	9													
140												140	263.2	



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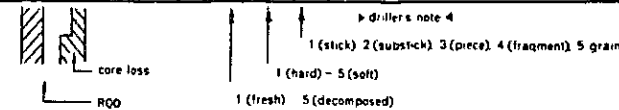
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No P-2 (SHEET 1 OF 9)

LOCATION Penstock left bank DEPTH OF HOLE 180.0 m COMMENCED May - 1 - 1979
 ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May - 15 - 1979
 COORDINATE 1682 274.2N. 490 653.3E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0m			0 → 100 %									0	380.8 m	
0.5 - 2.0	O.B.	△							Overburden					
2.0 - 18.0	Calcareous SANDSTONE.					white gry ~ brn.	3 3 3 1 1 1 2 2 2		Good Core, but cracks brn.					
18.0 - 20.0						dark gry.	2 2 3						360.8	

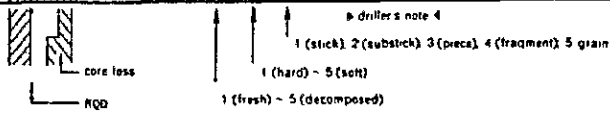


GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT **HOLE No P - 2 (SHEET 2 OF 9)**

LOCATION Penstock, left bank DEPTH OF HOLE 180 0 m COMMENCED May - 1 - 1979
 ELEVATION 380 8 m DEPTH OF OVERBURDEN 2 0 m COMPLETED May - 15 - 1979
 COORDINATE 1682 2742N 490 653 3E LENGTH OF ROCK DRILLING 178 0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 180 0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100 0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				WATER TABLE WATER PRESSURE TFST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION							
				CEMENTATION KIND OF CASING	COLOR	WEATHERING	HARDNESS				DESCRIPTION						
2.0m			0 - 100 %						2.0m	360.8 m							
1	<i>Calcareous SANDSTONE.</i>	<i>Calcareous SANDSTONE.</i>	<i>0 - 100 %</i>	<i>dark gray.</i>	<i>2</i>	<i>2</i>	<i>3</i>	<i>Banded structure. Very good core, but cracks brn.</i>	<i>LU=1.9</i>	<i>Supply Leakage</i>	1	360.8					
2											2	2	3	2	LU=2.1	2	360.8
3											2	2	3	2	LU=2.1	3	360.8
4											2	2	3	2	LU=2.1	4	360.8
5											2	2	3	2	LU=2.1	5	360.8
6											2	2	3	2	LU=2.1	6	360.8
7											2	2	3	2	LU=2.1	7	360.8
8											2	2	3	2	LU=2.1	8	360.8
9											2	2	3	2	LU=2.1	9	360.8
30																	
1										340.8							
2										340.8							
3										340.8							
4										340.8							
5										340.8							
6										340.8							
7										340.8							
8										340.8							
9										340.8							
40										340.8							



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GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT HOLE No P-2 SHEET 3 of 9

LOCATION Penstock left bank DEPTH OF HOLE 180.0 m COMMENCED May 1 1979

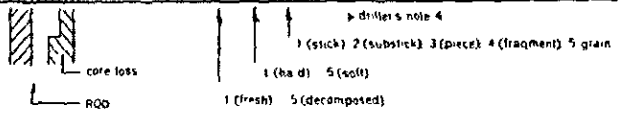
ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May 15 1979

COORDINATE 1682 274 2N 490 653 3E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA

ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y. Fukutake

BEARING OF ANGLE HOLE --- CORE RECOVERY 100.0

DEPTH	ROCK NAME	L.C.S	CORE RECOVERY	CEMENT & KIND OF BIT CANING	COLOR	WEATHERING	HARDNESS	CORE CUTTING	OBSERVATION OF CORE		DEPTH	ELEVATION
									DESCRIPTION	WATER TABLE WATER PRESSURE (FST) LEAKAGE OF DRILLING WATER		
4.0m			0-100							LUGEON 50 (8/min)	4.0m	340.8m
1	Calcareous SANDSTONE.								Banded structure. Very good core, but cracks brn.	Lu=1.7	1	
2								2				
3								3				
4								4				
5								5				
6								6			Supply	
7						2	3	7			Leakage	
8						1	2	8				
9						3	2	9				
50								50				
1	Calcareous SANDSTONE.								Lu=1.2	1		
2								2				
3								3				
4								4				
5								5				
6								6				
7								7				
8								8				
9								9				
60								60				
									Lu=2.3		320.8	



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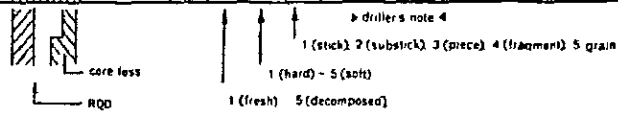
GEOLOGIC LOG OF DRILL HOLE

Upper Que Yai PROJECT

HOLE No P-2 (SHEET 4 OF 9)

LOCATION Penstock, left bank DEPTH OF HOLE 180.0 m COMMENCED May-1-1979
 ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May-15-1979
 COORDINATE 1682 274 2N 490 653 3E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0%

DEPTH	ROCK NAME	CG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
6.0m			0-100%									6.0m	320.8
1	Calcareous SANDSTONE.											1	
2												2	
3						2		3				3	
4						1		1				4	
5						3		2				5	
6												6	
7												7	
8												8	
9												9	
70.0												70.0	
1	Calcareous SANDSTONE.											1	
2												2	
3												3	
4												4	
5												5	
6												6	
7												7	
8												8	
9												9	
80.0												80.0	300.8



ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO JAPAN

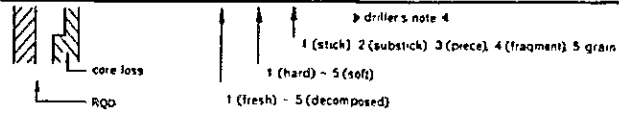
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No P-2 (SHEET 5 OF 9)

LOCATION <u>Penstock, left bank</u>	DEPTH OF HOLE <u>180.0 m</u>	COMMENCED <u>May - 1 - 1979</u>
ELEVATION <u>380.8 m</u>	DEPTH OF OVERBURDEN <u>2.0 m</u>	COMPLETED <u>May - 15 - 1979</u>
COORDINATE <u>1682 274 2N 490 653 3E</u>	LENGTH OF ROCK DRILLING <u>178.0 m</u>	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>180.0 m</u>	LOGGED BY <u>Y Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>100.0%</u>	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TFST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						DESCRIPTION
0m			0 - 100%									0	380.8 m	
1	Calcareous SANDSTONE.	[Log pattern]			2	2	2	2	Banded structure. Good core, no brn. cracks, but shd. as a whole.	LU = 2.3	Supply	Leakage	[Depth scale]	[Elevation scale]
2														
3														
4														
5														
6														
7														
8														
9														
10														
100												100	280.8	



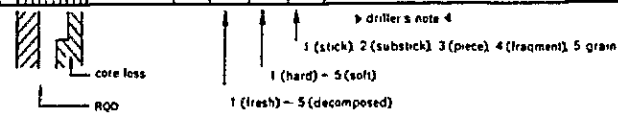
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-2 (SHEET 6 OF 9)

LOCATION Penstock, left bank DEPTH OF HOLE 180.0 m COMMENCED May - 1 - 1979
 ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May - 15 - 1979
 COORDINATE 1682 274 2N 490 653 3E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0%

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
100m			0 → 100									280.8	
1	SANDSTONE.				dark gry.	2	2	2	Banded structure. Good core, no brn. cracks, but shd. as a whole.	109.0	LU=1.8	Supply	Leakage
2													
3													
4													
5													
6													
7													
8													
9													
10													
11	Calcareous				gry ~ reddish brn.	3	3	3	Banded structure. Shd. as a whole. Some cracks brn. or coated by seam.	109.0	LU=1.6		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
120												260.8	



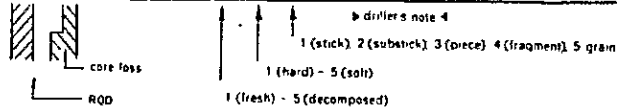
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-2 (SHEET 7 OF 9)

LOCATION <u>Penstock, left bank</u>	DEPTH OF HOLE <u>180.0 m</u>	COMMENCED <u>May - 1 - 1979</u>
ELEVATION <u>380.8 m</u>	DEPTH OF OVERBURDEN <u>2.0 m</u>	COMPLETED <u>May - 15 - 1979</u>
COORDINATE <u>1682 274 2N 490 653.3E</u>	LENGTH OF ROCK DRILLING <u>178.0 m</u>	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90°</u>	TOTAL LENGTH OF CORE <u>180.0 m</u>	LOGGED BY <u>Y. Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>100.0%</u>	

DEPTH	ROCK NAME	CORE RECOVERY	CEMENTATION KIND OF BITTING CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
				COLOR	WEATHERING	HARDNESS	NESS	CORE CUTTING					
12.0m		0-100%											
1	Calcareous SANDSTONE.			gry ~ reddish brn.		3	3		124.0	Banded structure. Shd as a whole. Some cracks brn or coated by seam.	50 (Q/min)	4.12 (m)	260.8
2										Lu=4.5	Supply Leakage		
3													
4													
5													
6													
7													
8													
9													
13.0					reddish brn ~ gry.		3	4		10-70cm breccia and crackly zone alternation. Some cracks brn. but not so remarkable.	Lu=2.6		
1													
2													
3													
4													
5													
6													
7													
8													
9													
14.0													



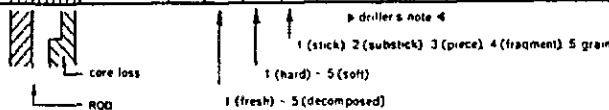
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-2 (SHEET 8 OF 9)

LOCATION Penstock, left bank DEPTH OF HOLE 180.0 m COMMENCED May - 1 - 1979
 ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May - 15 - 1979
 COORDINATE 1682 274 2N 490 653 3E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
14.0m			0 → 100									14.0m	240.8	
1	Calcareous SANDSTONE.				reddish brn ~ gry.	3	3	4	Shd. as a whole. 10~70cm breccia and cracky zone alternation. Some cracks brn., but not so remarkable.	145.0	LU=2.4	Supply	Leakage	1
2														
3														
4														
5														
6	Calcareous SANDSTONE.				gry ~ reddish brn.	3	3	3	Banded structure. Good core. Core length 5~40cm. Cracky zone or shd. zone at 156~156.5, 157.8~158.2.	150	LU=2.4		6	
7														
8														
9														
10														
11	Calcareous SANDSTONE.				gry ~ reddish brn.	2	2	2		150	LU=2.1		11	
12														
13														
14														
15														
16.0												16.0	220.8	



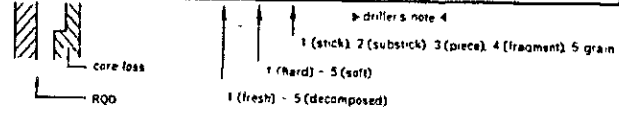
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No P-2 SHEET 9 OF 9

LOCATION Penstock, left bank DEPTH OF HOLE 180.0 m COMMENCED May - 1 - 1979
 ELEVATION 380.8 m DEPTH OF OVERBURDEN 2.0 m COMPLETED May - 15 - 1979
 COORDINATE 1682 274 2N 490 653.3 E LENGTH OF ROCK DRILLING 178.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 180.0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 100.0%

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
160m			0-100								160m	220.8	
1	SANDSTONE.				reddish brn	3 5 2	3 1 2	3 1 2		Lu = 4.8	Supply Leakage	1	
2													
3													
4													
5													
6													
7													
8													
9													
10													
170	Calcareous SANDSTONE.				gry ~ reddish brn	3 5 2	3 1 2	3 1 2		Lu = 2.9		1	
2													
3													
4													
5													
6													
7													
8													
9													
10													
180											180	200.8	

Banded structure.
 Good core.
 Core length 5~40cm.
 Cracky zone or shd.
 zone at 164.8~165.2,
 166.2~166.4, 166.8~167.0,
 173.3~176.0, 177.~177.5,
 179~180.0.



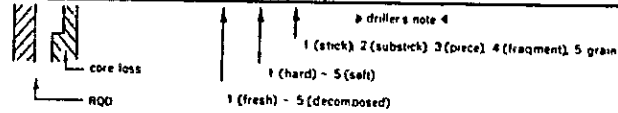
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-3 (SHEET 1 of 4)

LOCATION Penstock, left bank DEPTH OF HOLE 80.0 m COMMENCED May 30 1979
 ELEVATION 292.6 m DEPTH OF OVERBURDEN 1.6 m COMPLETED Jun 4 1979
 COORDINATE 1682 224 5N, 490 5638 E LENGTH OF ROCK DRILLING 78.4 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 60° TOTAL LENGTH OF CORE 80.0 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE N57°E CORE RECOVERY 100.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0			0 = 100									0	292.6
0.5	O.B.	△			dark brit.				Organic soil at 0.0-0.5. Silty clay at 0.5-1.6.				
1.6		△							Very good core				
1.7									Open cracks are coated with brown seam at 1.7 ~ 2.0, 2.23, 2.64, 3.0, 3.9, 5.2, 6.65, 6.9, 7.26, 7.55, 7.85, 8.6, 8.8, 9.63, 9.93.				
4.5									Dissolved cracks at 4.5.				
10.0	Calcareous SANDSTONE.				brownish gry ~ gry.	2	2		10.0				
11.0									all cracks are open cracks, coated with brown seam, except for a few dissolved cracks at 11.0, 14.25.				
16.1									cracky zone at 10.5 ~ 10.65, 16.0 ~ 16.1.				
19.85									sheared zones with gouge and breccia at 11.3 ~ 11.7, 19.75 ~ 19.85.				
16.5									Soluable caves at 16.2 ~ 16.5.				
20.0												20	275.3



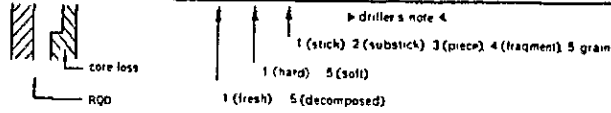
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No P-3 (SHEET 2 of 4)

LOCATION <u>Penstock, left bank</u>	DEPTH OF HOLE <u>80.0</u> m	COMMENCED <u>May 30</u> 1979
ELEVATION <u>292.6</u> m	DEPTH OF OVERBURDEN <u>1.6</u> m	COMPLETED <u>Jun 4</u> 1979
COORDINATE <u>1682 224 5N 490 563 8E</u>	LENGTH OF ROCK DRILLING <u>78.4</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>60°</u>	TOTAL LENGTH OF CORE <u>80.0</u> m	LOGGED BY <u>Y. Fukutake</u>
BEARING OF ANGLE HOLE <u>N57°E</u>	CORE RECOVERY <u>100.0</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					DESCRIPTION
2.9			0-100%								2.9	275.3	
1	Calcareous SANDSTONE.	Rg			3	3	3		Lu = 16.1	Supply	No Leakage	L = 7	
2													Open cracks are coated by brown seam at 21.55, 21.78, 23.05, 23.93, 24.05, 24.34, 24.4, 24.66, 24.9~25.0, 26.29, 27.25, 29.13, 29.23, 29.55, 30.08.
3													Dissolved cracks are coated with brown seam at 22.72.
4													Sheared zones with gouge and breccia at 37.3-37.6, 38.0-39.7.
5													Sheared zones with recemented breccia at 28.6-28.85, 32.2-32.3, 37.0-37.3.
6													Crystalline Caves at 36.5, 36.7, 36.8.
7													
8													
9													
30													
1													
2													
3													
4													
5													
6													
7													
8													
9													
40											40	258.0	



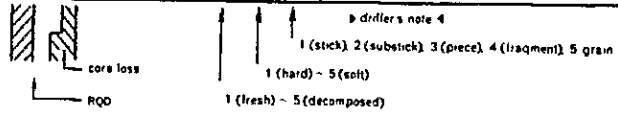
GEOLOGIC LOG OF DRILL HOLE

Upper Que Yai PROJECT

HOLE No P-3 (SHEET 3 OF 4)

LOCATION Penstock DEPTH OF HOLE 80.0 m COMMENCED May - 30 - 1979
 ELEVATION 292.6 m DEPTH OF OVERBURDEN 1.6 m COMPLETED Jun - 4 - 1979
 COORDINATE 1682 2245N 490 5638E LENGTH OF ROCK DRILLING 78.4 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 60° TOTAL LENGTH OF CORE 80.0 m LOGGED BY Y. Fukutake
 BEARING OF ANGLE HOLE N57°E CORE RECOVERY 100.0%

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION																												
					COLOR	WEATHERING	HARDNESS	CORE CUTTING																																	
4.0m			0 → 100%										218.0 m																												
1	Calcareous SANDSTONE.																																								
2														3	3	3	all cracks are ordinary cracks no brown seam. Sheared zones with gouge and breccia at 40.05, 40.34, 41.46, 42.22.	LUGEON 50 (l/min)	40	4.0m																					
3																					Lu = 4.6																				
4																	44.0							Lu = 5.7																	
5																	very good core. all cracks are ordinary cracks. no brown seam, except for one dissolved cracks at 58.45~58.8.										Supply	NO leakage													
6																	Cracky zones at 54.8~55.0, 59.0~59.8.													Lu = 7.7											
7																	Sheared zones with gouge and breccia at 44.0~44.2, 45.6~45.8, 55.4.																Lu = 7.2								
8																																									
9																																									
50																																									
1																																									
2																																									
3																																									
4																																									
5																																									
6																																									
7																																									
8																																									
9																																									
60																																									



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No P-3 SHEET 4 OF 4

LOCATION <u>Penstock</u>	DEPTH OF HOLE <u>80.0</u> m	COMMENCED <u>May - 30 - 1979</u>
ELEVATION <u>292.6</u> m	DEPTH OF OVERBURDEN <u>1.6</u> m	COMPLETED <u>Jun - 4 - 1979</u>
COORDINATE <u>1682 224 5N 490 563 8E</u>	LENGTH OF ROCK DRILLING <u>78.4</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>60°</u>	TOTAL LENGTH OF CORE <u>80.0</u> m	LOGGED BY <u>Y. Fukutake</u>
BEARING OF ANGLE HOLE <u>N57°E</u>	CORE RECOVERY <u>100.0</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	DEPTH	ELEVATION		
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					LEAKAGE OF DRILLING WATER	
6.0m			0 - 100									6.0m	240.6		
1	Calcareous SANDSTONE.	[Log pattern]			gry.				all cracks are ordinary cracks, no brown seam, except for a few dissolved cracks at 63.5, 63.8.	Lu = 5.5	Supply				
2														Cracky zones at 62.9-63.0, 63.15-63.25, 64.7-64.85, 71.6-71.9.	
3															
4															
5															
6															
7															Sheared zones with gouge and breccia at 65.5-65.75, 67.3-67.57, 68.15-68.25, 72.62-72.67, 74.85-75.0.
8															
9															
10															
11															
12															
13	Cavernous zone at 69.0-69.65.														
14															
15															
16															
17															
18															
19															
20															
21															
22															
23	Lu = 8.5														
24															
25															
26															
27															
28															
29															
30															
31															
32															
33	Lu = 10.5														
34															
35															
36															
37															
38															
39															
40															
41															
42															
43	Lu = 12.3														
44															
45															
46															
47															
48															
49															
50															
51															
52															
53	Lu = 12.3														
54															
55															
56															
57															
58															
59															
60															
61															
62															
63	Lu = 12.3														
64															
65															
66															
67															
68															
69															
70															
71															
72															
73	Lu = 12.3														
74															
75															
76															
77															
78															
79															
80															
81															
82															
83	Lu = 12.3														
84															
85															
86															
87															
88															
89															
90															
91															
92															
93	Lu = 12.3														
94															
95															
96															
97															
98															
99															
100															
101															
102															
103	Lu = 12.3														
104															
105															
106															
107															
108															
109															
110															
111															
112															
113	Lu = 12.3														
114															
115															
116															
117															
118															
119															
120															
121															
122															
123	Lu = 12.3														
124															
125															
126															
127															
128															
129															
130															
131															
132															
133	Lu = 12.3														
134															
135															
136															
137															
138															
139															
140															
141															
142															
143	Lu = 12.3														
144															
145															
146															
147															
148															
149															
150															
151															
152															
153	Lu = 12.3														
154															
155															
156															
157															
158															
159															
160															
161															
162															
163	Lu = 12.3														
164															
165															
166															
167															
168															
169															
170															
171															
172															
173	Lu = 12.3														
174															
175															
176															
177															
178															
179															
180															
181															
182															
183	Lu = 12.3														
184															
185															
186															
187															
188															
189															
190															
191															
192															
193	Lu = 12.3														
194															
195															
196															
197															
198															
199															
200															
201															
202															
203	Lu = 12.3														
204															
205															
206															
207															
208															
209															
210															
211															
212															
213	Lu = 12.3														
214															
215															
216															
217															
218															
219															
220															
221															
222															
223	Lu = 12.3														
224															
225															
226															
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230															
231															
232															
233	Lu = 12.3														
234															
235															
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238															
239															
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241															
242															
243	Lu = 12.3														
244															
245															
246															
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248															
249															
250															
251															
252															
253	Lu = 12.3														
254															
255															
256															
257															
258															
259															
260															
261															
262															
263	Lu = 12.3														
264															
265															
266															
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269															
270															
271															
272															
273	Lu = 12.3														
274															
275															
276															
277															
278															
279															
280															
281															
282															
283	Lu = 12.3														
284															
285															
286															
287															
288															
289															
290															
291															
292															
293	Lu = 12.3														
294															
295															
296															
297															
298															
299															
300															
301															
302															
303	Lu = 12.3														
304															
305															
306															
307															
308															
309															
310															
311															
312															
313	Lu = 12.3														
314															
315															
316															
317															
318															
319															
320															
321															
322															
323	Lu = 12.3														
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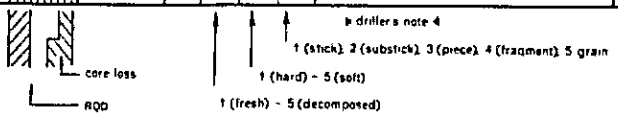
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No S-1 (SHEET 1 OF 2)

LOCATION Spillway DEPTH OF HOLE 40.0 m COMMENCED Jan - 15 - 1979
 ELEVATION 376.1 m DEPTH OF OVERBURDEN 0.9 m COMPLETED Jan - 24 - 1979
 COORDINATE 182 4175N 490 2163E LENGTH OF ROCK DRILLING 39.1 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 35.09 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 87.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0m			0 = 100										376.1	
0.9	O.B.				blk.				Overburden. (blk. Soil)					
1.15					brn.	3	4		Calc SS (massive).					
2.04	Calcareous SANDSTONE.				brn.	3	4		Core loss. 2.4	204 Calcite veins remarkable.				
3.09					brn.	3	4		Core loss. 3.52	all cracks brn				
3.79					brn.	3	4		Core loss					
4.1					reddish ~ yellowish brn	3	3		Cracks brn and someone filled by soil.					
5.61	Calcareous SANDSTONE.				reddish ~ yellowish brn	3	3		Shd. at 4.95-5.0, 5.7-5.75					
6.1					reddish ~ yellowish brn	3	3		~6.5 6.95-7.0					
7.0					brn	3	3		Core loss. 6.1					
8.0					gry ~ brn	2	1		Good core.					
8.1									Core loss. 8.6					
8.6	SH & Calc. SS.				brn.	4	4		SH and Calc. SS. Mainly SH.					
10.0					brn.	4	4		Shd. as a whole and soft. Cracks every 5-10 cm and horizontal.					
12.0					brn ~ gry.	3	2		Brecciated at 8~8.1 8.6-8.75 9.4~9.8.					
13.0					brn ~ gry.	3	2		Cracks at 12~12.5 dissolved and coated by lime.					
13.35	Calcareous SANDSTONE.				brn				Core loss. 13.35	Core length 5~25cm.				
16.15					brn				Breccia.					
16.45									Core loss.					
17.0					brn ~ white gry.	3	2							
20.0													356.1	



ELECTRIC POWER DEVELOPMENT CO. LTD.
TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT HOLE No S-1 (SHEET 2 OF 2)

LOCATION Spilway DEPTH OF HOLE 40.0 m COMMENCED Jan -15 -1979

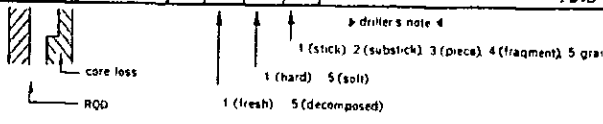
ELEVATION 376.1 m DEPTH OF OVERBURDEN 0.9 m COMPLETED Jan -24 -1979

COORDINATE 1682 417 5N 490 216 3 E LENGTH OF ROCK DRILLING 39.1 m DRILLED BY FONDISA

ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 35.09 m LOGGED BY Y Fukutake

BEARING OF ANGLE HOLE _____ CORE RECOVERY 87.7 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE 1FST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
2.0m			0 → 100 %										2.0m	356.1m	
1	SANDSTONE.				brn ~ white gry.	2	2	4	<p>Rock hard, but cracky generally.</p> <p>Core length 3~5cm.</p> <p>all cracks wethd. and coated by seam.</p> <p>Solution cracks at 18.5~18.85, 19.55~19.6, 21.7~21.9, 29.85.</p> <p>Crackly zone at 23.55~23.8, 24 ~ 24.45, 26 ~ 26.2.</p>				1		
2															
3															
4															
5															
6															
7															
8															28.0
8															28.3
9															
30															
1	Calcareous SANDSTONE.				brn~white gry.	2	2	4	<p>Very hard, remarkable calcite veins.</p> <p>Cracks brn. and filled by seam.</p> <p>Solution Cracks at 31.95, 33, 33.5, 37.75, 38.</p> <p>Shd. at 38.1, 38.75.</p> <p>No core at 37.25~37.3.</p>				1		
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40															
2-3															
39.4															
40.0														336.1	



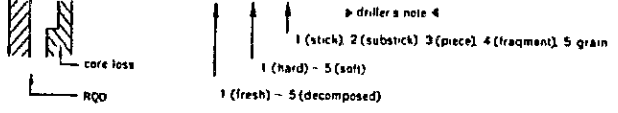
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No S-2 (SHEET 1 OF 3)

LOCATION Spillway DEPTH OF HOLE 45.9 m COMMENCED Dec-18-1978
 ELEVATION 316.3 m DEPTH OF OVERBURDEN 0.65m COMPLETED Dec-26-1978
 COORDINATE 1682 151 IN 490 2305E LENGTH OF ROCK DRILLING 45.25 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 41.78 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTA FOR KIND OF BIT OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0.5			0-100											
0.65					blk.				Overburden. (blk soil) 0.65				316.3	
1.0	Calcareous SANDSTONE.	D.B			gry.	2	1	3	Core length 10-35cm. Cracks brn. 1.7	Supply	Leakage			
2.0					brn.	4	3	3	Shd. generally. all cracks filled by seam. Shd. at 1.85, 2.5-2.8 3-3.1, 3.5. 3.5					
3.0					brn.	3	4	4	all cracks slightly wethd. Most of them horizontal. 5.0					
4.0					reddish brn.	3	3	3	Brn. cracks at 5.35 6.05, 6.8-7.0. Other cracks not brn. 7.0					
5.0					gry.	2	1	1	all cracks brn, but no seam. NO solution cracks. Core length 7cm, horizontal crack remark. 9.55 9.75					
6.0					brn.	3	3	3						
7.0					brn.	3	1	1						
8.0					brn.	3	2	4						
9.0					brn.	3	1	1						
10.0					brn.	3	2	4						
11.0	Calcareous SANDSTONE.				brn.	3	1	1						
12.0					brn.	3	1	1						
13.0					brn.	3	1	1						
14.0					brn.	3	1	1						
15.0					brn.	3	1	1						
16.0	CONGLOMERATE.				brn.	3	3	3	Pebbles Calc. ss. and they are round to sub-angular. all cracks brn. and filled by seams. cracky at 19.45-19.55. 14.45 14.6					
17.0					brn.	3	3	3						
18.0					brn.	3	3	3						
19.0					brn.	3	3	3						
20.0					brn.	3	3	3						



ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No S-2 (SHEET 2 OF 3)

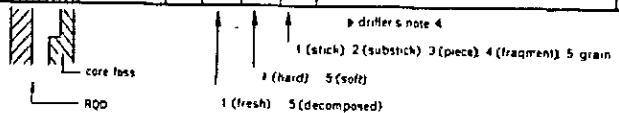
LOCATION <u>Spillway</u>	DEPTH OF HOLE <u>45.9</u> m	COMMENCED <u>Dec -18 -1978</u>
ELEVATION <u>316.3</u> m	DEPTH OF OVERBURDEN <u>0.65</u> m	COMPLETED <u>Dec -26 -1978</u>
COORDINATE <u>1882 151 IN 490 230 5E</u>	LENGTH OF ROCK DRILLING <u>45.25</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE <u>41.78</u> m	LOGGED BY <u>Y. Fukutake</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>91.0</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
2.0			0-100										2.0m	296.3 m
1						3	3	3	20.15					
2									21.0					
3					reddish brn.				Core loss. 21.35					
4						3	3	3						
5														
6														
7									26.8					
8									Core loss. 27.15					
9					greenish gry.	2	2	3	27.5					
10														
11														
12														
13														
14														
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16														
17														
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40														276.3

CONGLOMERATE.

Supply

Leakage



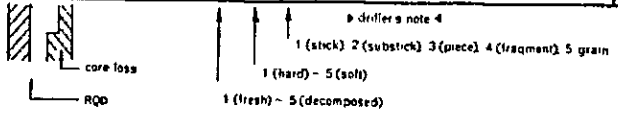
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yoi PROJECT

HOLE No. S-2 (SHEET 3 OF 3)

LOCATION Spillway DEPTH OF HOLE 45.9 m COMMENCED Dec-18 -1978
 ELEVATION 316.3 m DEPTH OF OVERBURDEN 0.65 m COMPLETED Dec-26 -1978
 COORDINATE 1682 151 N 490 230.5 E LENGTH OF ROCK DRILLING 45.25 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 41.78 m LOGGED BY Y Fukutake
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 91.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
49m			0 ~ 100%								4.0m	276.3
1	CONGLOMERATE.				greenish gry.	2	2	3	Most of cracks not brn. Pebbles reddish calc. ss. and round to subangular. Shd. at 44~44.2, 44.8 ~45.0.	Supply Leakage		
2												
3												
4												
5												
48											45.9	270.4
7												
8												
9												
0												
1												
2												
3												
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5												
6												
7												
8												
9												
0												



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No PH-1 (SHEET 1 OF 2)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 30.0 m COMMENCED Nov -20 -1978
 ELEVATION 200.7 m DEPTH OF OVERBURDEN 0.0 m COMPLETED Nov -28 -1978
 COORDINATE 1682206.4 N, 490459.8 E LENGTH OF ROCK DRILLING 30.0 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 27.68 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 92.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0m			0-100%									0	200.7	
0.6					2	2-3	3-4		0.6					
0.9					2	2-3	3-4		Cave					
1.5									Cave					
1.65									Cave					
2-4					White gry.				Cracks dissolved and stained brn					
2-3						2	3		Generally banded structure developed					
4.47														
5.18						2	3							
5.5						3	4		Core loss					
6.0						2	2-3	3-4	Core loss					
6.28									Core loss					
6.75						2	2-3	3-4	Core loss					
7.0									Core loss					
7.2						2	2-1	3-4	Core loss					
7.68									Core loss					
8-10					White gry.				Some parts of none core seem to be clayey zone and not cave.					
8						2	3		Lustrous cracks remarkable					
8.4														
10.4														
12.8									Fresh and hard					
12.8									Cracks no brn.					
14.3-14.55						2	2		Fragmentary core at					
14.48-15.51						1	2		Clay seams at					
15.51						1	1							
17.4														
17.4-17.53						2	3		Clay Seam at					
17.45						1	1		Lustrous cracks remarkable					
17.45						3	4		Somewhat brittle					
19.45														
19.45-19.60						2	2-3		Core lost at					

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) - 5 (soft)
 1 (fresh) 5 (decomposed)

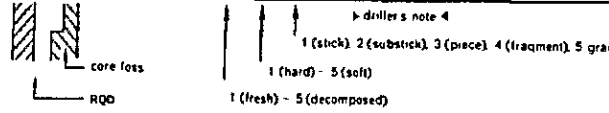
GEOLOGIC LOG OF DRILL HOLE

Upper Que Yai PROJECT

HOLE No PH-1 (SHEET 2 OF 2)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 30.0 m COMMENCED Nov -20 -1978
 ELEVATION 200.7 m DEPTH OF OVERBURDEN 0.0 m COMPLETED Nov -28 -1978
 COORDINATE 1682206.4N, 490459.8E LENGTH OF ROCK DRILLING 30.0 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 27.68 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 92.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION				
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION									
20m			0-100%										20m	180.7 m				
1	Calcareous SANDSTONE				White gray.	2	2	4	20.35	Banded structure. Fresh and hard. Cracks no brn. Fragmentary cores at 22.8-23.0, 23.25-23.45.	LUGEON 50(9m)		Supply		20m	180.7 m		
2								3	21.2								Lu = 7.5	
3								2										
4								1										
5								3										
6								26.0	Lu = 1.6									
7								1										26.7
8								2										
9								1										
10								3										28.6
11	1		Lu = 1.9															
12	4	Cracky zone at 28.7-30.0 m																
13		30.0																
14																		
15																		
16																		
17																		
18																		
19																		
20				30m	170.7 m													



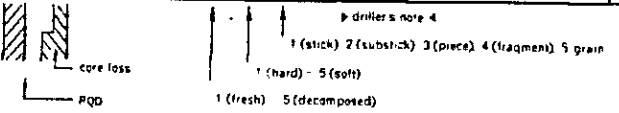
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No PH-2 (SHEET 1 OF 2)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 36.0 m COMMENCED Dec. 4 1978
 ELEVATION 223.9 m DEPTH OF OVERBURDEN 2.2 m COMPLETED Dec. 24 1978
 COORDINATE 1682135.7N, 490500.9E LENGTH OF ROCK DRILLING 33.8 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 30.30 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 84.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0.5			0-100%										223.9 m
1		△			brn.								
2		△											
3		X			dark gry	3-4	3-4	4-5					
4		X			dark gry.	3	3-2	2-3					
5		X			dark gry.	3	1	1					
6		X			dark gry.	2	3						
7		X			dark gry.	3	3	4-3					
8		X			dark gry.	3	3-2	2-3					
9		X											
10		X											
11		X											
12		X											
13		X											
14		X											
15		X											
16		X											
17		X											
18		X											
19		X											
20		X											



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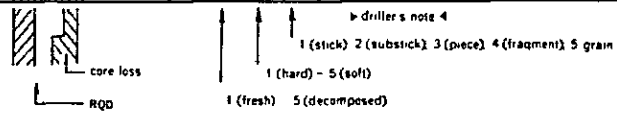
GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT

HOLE No PH-2 (SHEET 2 OF 2)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 36.0 m COMMENCED Dec - 4 1978
 ELEVATION 223.9 m DEPTH OF OVERBURDEN 2.2 m COMPLETED Dec - 24 1978
 COORDINATE 1682135.7N, 490500.9E LENGTH OF ROCK DRILLING 338 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 3030 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 84.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION						
20m			0 → 100 %										20m	203.9	
1	(Calc. ls)		100		brn.	4	5	1	4	21.0	Slime	NO Test	Supply	Leakage	Lu=2.8
2										22.7	sheared zone.				
3										24.0	clayey.				
4										25.35	Slime.				
5	SANDSTONE		100		white gry.	2	2	3	2	25.35	Cracks no brn.	Lu=1.4	Lu=2.1	Lu=1.2	
6										25.73	Core loss				
7										26.1	Clayey				
8										27.7	a few hair cracks.				
9										27.9	Core loss				
10										30.0	Rarely cracks brn				
11										30.3	Somewhat brittle.				
12										30.4-30.65	Clay fins along cracks				
13										30.65	Core loss at 30.4-30.65				
14										31.4	Fragmentary cores at				
15	Calcareous SANDSTONE		100		white gry.	2	2	3	1	32.45-32.5	Fragmentary cores at	Lu=2.1	Lu=1.2		
16										32.65-32.85	Fragmentary cores at				
17										34.6	Fragmentary cores at				
18										35.2	Fragmentary cores at				
19										35.8	Core loss				
20	36.0	Core loss	36.0	187.9											



ELECTRIC POWER DEVELOPMENT (C), LTD
 TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No PH-3 (SHEET 1 OF 2)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 280 m COMMENCED Jan - 8 - 1979

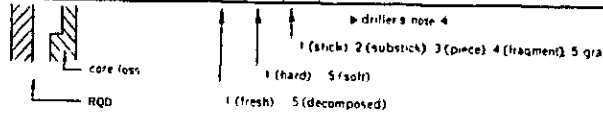
ELEVATION 211.4 m DEPTH OF OVERBURDEN 1.9 m COMPLETED Jan - 17 - 1979

COORDINATE 1682149.0N, 490485.3E LENGTH OF ROCK DRILLING 261 m DRILLED BY EGAT

ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 231.9 m LOGGED BY M. Yamada

BEARING OF ANGLE HOLE _____ CORE RECOVERY 82.8 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0			0-100											211.4
0.8	O.B.				brn.				Topsoil					
1					dark gry	3	1	3	Weathered along cracks and colored yellowish gry Brittle. Cracks dissolved at 4.5-4.6 5.65. Some Caves of 1cm width are found. Core loss at 19-20, 27-3.0 3.25-3.75 4.6					
2														
3														
4														
5									Core loss	5.45				
6									Core Loss	5.85				
7									Core Loss at 6.5-6.65.	6.2				
8										7.5				
9									Core Loss	9.15				
10									Clay films are found.	9.6				
11									Core Loss at 9.75-9.95	10.3				
12									Sheared zone.					
13									clayey fault breccia	11.15				
14									LS breccia	11.7				
15									Coarse grained sandy slime.	13.0				
16									Medium~ Coarse grained Sandy slime					
17									Probably breccia contain fault clay.					
18									Fault breccia (LS)	15.9				
19									Medium~coarse grained Sandy core.	16.7				
20									Fine grained Sandy slime at 18.5-18.65, 19.55-19.7.	18.5				



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No PH-3 (SHEET 2 OF 2)

LOCATION <u>Power house Left Bank</u>	DEPTH OF HOLE <u>28.0</u> m	COMMENCED <u>Jan - 8 - 1979</u>
ELEVATION <u>211.4</u> m	DEPTH OF OVERBURDEN <u>1.9</u> m	COMPLETED <u>Jan - 17 - 1979</u>
COORDINATE <u>I682149 ON 490485.3E</u>	LENGTH OF ROCK DRILLING <u>26.1</u> m	DRILLED BY <u>EGAT</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE <u>23.19</u> m	LOGGED BY <u>M. Yamada</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>82.8</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE (FST) LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
20m			0 - 100 %							LUGEON 50 (l/min)	20m	191.4	
1	Calc. S-S				White gry	2-3	3-2	4-3	20.55	Somewhat cracky	Supply	1	
2					2	2	3-1	21.0					
3	Calc. S-S				White gry	5	5	5	22.3	clayey fine sandy Slime.	Leakage	2	
4					2-1-3	2-1-3	3-1-4	23.0					
5	Calc. S-S				White gry	5	5	5	23.8	Reddish	Test	3	
6					2	2	3-1-4	25.0					
7	Calc. S-S				White gry	5	5	5	26.5	clayey fine sandy Slime.	NO	4	
8					2	2	3-1-4	27.0					
9	Calc. S-S				White gry	5	5	5	28.0	Reddish and banded. Cracks fresh.	NO	5	
10					2	2	3-1-4	28.0					
11	Calc. S-S				White gry	2	2	4	26.5	clayey fine sandy Slime	NO	6	
12					5	5	5	27.0					
13	Calc. S-S				White gry	2	2	4	28.0	NO	7		
14					5	5	5	27.0					
15	Calc. S-S				White gry	2	2	4	28.0	NO	8		
16					5	5	5	27.0					
17	Calc. S-S				White gry	2	2	4	28.0	NO	9		
18					5	5	5	27.0					
19	Calc. S-S				White gry	2	2	4	28.0	NO	10		
20					5	5	5	27.0					
21	Calc. S-S				White gry	2	2	4	28.0	NO	11		
22					5	5	5	27.0					
23	Calc. S-S				White gry	2	2	4	28.0	NO	12		
24					5	5	5	27.0					
25	Calc. S-S				White gry	2	2	4	28.0	NO	13		
26					5	5	5	27.0					
27	Calc. S-S				White gry	2	2	4	28.0	NO	14		
28					5	5	5	27.0					
29	Calc. S-S				White gry	2	2	4	28.0	NO	15		
30					5	5	5	27.0					
31	Calc. S-S				White gry	2	2	4	28.0	NO	16		
32					5	5	5	27.0					
33	Calc. S-S				White gry	2	2	4	28.0	NO	17		
34					5	5	5	27.0					
35	Calc. S-S				White gry	2	2	4	28.0	NO	18		
36					5	5	5	27.0					
37	Calc. S-S				White gry	2	2	4	28.0	NO	19		
38					5	5	5	27.0					
39	Calc. S-S				White gry	2	2	4	28.0	NO	20		
40					5	5	5	27.0					

> driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 gram
 1 (hard) - 5 (soft)
 1 (fresh) - 5 (decomposed)

ELECTRIC POWER DEVELOPMENT CO., LTD.
TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Que Yoi PROJECT

HOLE No PH-4 (SHEET 1 OF 3)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 50.0 m COMMENCED Feb-17-1979
 ELEVATION 242.8 m DEPTH OF OVERBURDEN 2.1 m COMPLETED Feb-22-1979
 COORDINATE 1582023.5N, 490686.6E LENGTH OF ROCK DRILLING 47.9 m DRILLED BY E.GAT
 ANGLE FROM HORIZONTAL 70° TOTAL LENGTH OF CORE 49.15 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE S50°W CORE RECOVERY 98.3 %

DEPTH	ROCK NAME	LUG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
0m			0 → 100 %									0	242.8 m	
0-2.1	O.B.	△			brn.				Topsoil clay ~ silt.					
2.1-4.9		△			blu white				φ10cm cave at 2.2-2.3 φ7cm cave at 2.8-2.87 φ5cm cave at 3.25-3.3. Banded structure.		Supply			
4.9-7.5									φ3cm cave at 6.6.		Leakage			
7.5-9.5					reddish ~ bluish white.				Below 7.5 calcite vein remarkable. φ2cm cave at 9.5.					
9.5-15.0	Calcareous LIMESTONE								Fresh and hard. Cracks brn.					
15.0-19.2									14.2 19.2 Some parts cracks brn					
19.2-22.0									Several small druse					

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 core loss
 RQD
 1 (hard) 5 (soft)
 1 (fresh) 5 (decomposed)

ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO JAPAN

GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No PH-4 (SHEET 2 OF 3)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 50.0 m COMMENCED Feb - 17 - 1979

ELEVATION 242.8 m DEPTH OF OVERBURDEN 2.1 m COMPLETED Feb - 22 - 1979

COORDINATE 682023.5N, 490686.6E LENGTH OF ROCK DRILLING 47.9 m DRILLED BY EGAT

ANGLE FROM HORIZONTAL 70 ° TOTAL LENGTH OF CORE 49.15 m LOGGED BY M. Yamada

BEARING OF ANGLE HOLE S50°W CORE RECOVERY 98.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION																																																	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING																																																						
20m			0-100%									20m	224.0 m																																																	
1	Calcareous SANDSTONE				reddish-bluish white					Fresh and hard Brecciated structure. Calcite vein remarkable Some parts cracks brn.	LUGEON 30 (4min) Supply Leakage	1																																																		
2														2	2	2	1	25.4 25.6	30	2																																										
3																					1	1	1	290	30	3																																				
4																											1	1	1	Some parts brecciated structure. Cracks almost fresh	30	4																														
5																																	1	1	1	25.8	30	5																								
6																																							1	1	1	Massive. Calcite vein found in some parts. Bluish white at 360-370.	30	6																		
7																																													1	1	1		30	7												
8																																																			1	1	1		30	8						
9																																																									1	1	1		30	9
40																																																														

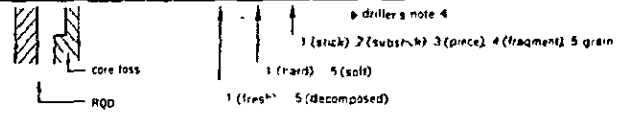
driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 1 (hard) 5 (soft)
 1 (fresh) 5 (decomposed)

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Ya PROJECT HOLE No PH-4 (SHEET 3 OF 3)

LOCATION Powerhouse, Left Bank DEPTH OF HOLE 50.0 m COMMENCED Feb. 17 1979
 ELEVATION 242.8 m DEPTH OF OVERBURDEN 2.1 m COMPLETED Feb. 22 1979
 COORDINATE 1682023.5N, 490686.6E LENGTH OF ROCK DRILLING 47.9 m DRILLED BY E GAT
 ANGLE FROM HORIZONTAL 70 ° TOTAL LENGTH OF CORE 49.15 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE S50°W CORE RECOVERY 98.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
4.0m			0-100%								4.0m	205.2
1	Calcareous SANDSTONE	bluish white. (Some parts reddish)							Fresh and hard Massive.	Supply Leakage	1	
2												
3												
4											44.0	
5											Banded structure. Massive.	
6												
7												
8												
9												
50.0												
1										1		
2										2		
3										3		
4										4		
5										5		
6										6		
7										7		
8										8		
9										9		
0										0		



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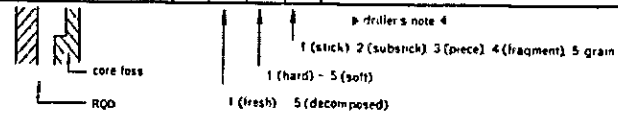
GEOLOGIC LOG OF DRILL HOLE

Upper Qued Yai PROJECT

HOLE No PH-5 (SHEET 1 OF 2)

LOCATION Powerhouse Left Bank DEPTH OF HOLE 40.0 m COMMENCED Mar - 2 - 1979
 ELEVATION 222.0 m DEPTH OF OVERBURDEN 1.8 m COMPLETED Mar - 7 - 1979
 COORDINATE 1682033.6N, 490576.2E LENGTH OF ROCK DRILLING 38.2 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 60 ° TOTAL LENGTH OF CORE 37.60 m LOGGED BY M. Yamada
 BEARING OF ANGLE HOLE N20°E CORE RECOVERY 94.0 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING				
0m			0 → 100								0m	222.0
0.8		△			brn				Topsail clayey.		1	
1.8		△							sheared zone.		2	
2.0									clay with brecciated LS		3	
3.0					reddish purple ~ yellowish brn.				Remarkably Wethered.	Supply	4	
4.0										Leakage	5	
5.0						4	5	5			6	
6.0											7	
7.0											8	
8.0											9	
9.0											10	
9.9												
10.0					gry.	2-3	2	2	LIMESTONE			
10.95												
11.0					brn. gry.	3	4	4	Cracks brn.			
12.0						1	1	1	Clay film remarkable.			
12.5						4	3	3				
13.0									Clay with abundant brecciated LS.			
13.3												
13.5									LIMESTONE (HW=3-2, C=2-3) at 13.0~13.3			
14.5									13.5~13.7, 14.5~14.7			
15.6									15.0~15.6.			
20.0					gry.	4	5	5			20	204.7



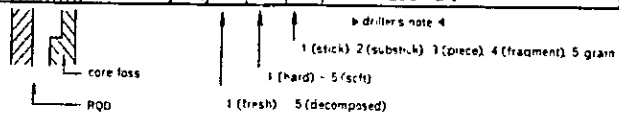
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No PH-5 SHEET 2 OF 2

LOCATION <u>Powerhouse Left Bank</u>	DEPTH OF HOLE <u>40.0</u> m	COMMENCED <u>Mar - 2 - 1979</u>
ELEVATION <u>222.0</u> m	DEPTH OF OVERBURDEN <u>1.8</u> m	COMPLETED <u>Mar - 7 - 1979</u>
COORDINATE <u>1682033 6N, 490576.2E</u>	LENGTH OF ROCK DRILLING <u>38.2</u> m	DRILLED BY <u>EGAT</u>
ANGLE FROM HORIZONTAL <u>60°</u>	TOTAL LENGTH OF CORE <u>37.60</u> m	LOGGED BY <u>M. Yamada</u>
BEARING OF ANGLE HOLE <u>N20°E</u>	CORE RECOVERY <u>94.0</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	DEPTH	ELEVATION		
					COLOR	WEATHERING	HARD	NI	CORE CUTTING				DESCRIPTION	WATER PRESSURE TEST
2.0m			0 = 100											
1	(LIMESTONE)	[Cross-hatched pattern]	[Vertical lines pattern]	[Vertical lines pattern]	gry.	4	4	5	25.7	Sheared zone. clay with brecciated LS	[Water table line]	[Leakage line]	20m	204.7
2														
3														
4														
5														
6														
7	(LIMESTONE)	[Cross-hatched pattern]	[Vertical lines pattern]	[Vertical lines pattern]	yellowish gry.	4	4	5	37.0	clay with brecciated LS and fragmentary ~grainy cores.	[Water table line]	[Leakage line]	30m	187.4
1														
2														
3														
4														
5														
6														
7														
8	(LIMESTONE)	[Cross-hatched pattern]	[Vertical lines pattern]	[Vertical lines pattern]	reddish yellowish bluish white	3	3	3	37.8	Conglomerate	[Water table line]	[Leakage line]	40m	187.4
1														
2	(LIMESTONE)	[Cross-hatched pattern]	[Vertical lines pattern]	[Vertical lines pattern]	reddish yellowish bluish white	4	4	5	38.45	Sheared zone of Cgl.	[Water table line]	[Leakage line]	40m	187.4
1														
2	(LIMESTONE)	[Cross-hatched pattern]	[Vertical lines pattern]	[Vertical lines pattern]	reddish yellowish bluish white	2	1	2	38.45	Many hair cracks and lustrous cracks. Some parts brecciated structure.	[Water table line]	[Leakage line]	40m	187.4
1														



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No Q - 1 SHEET 1 OF 3

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED Apr -20 1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 0.0 m COMPLETED Apr -28 1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 50.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 42.13 m LOGGED BY Ch. Peal
 BEARING OF ANGLE HOLE --- CORE RECOVERY 84.3

DEPTH	ROCK NAME	LOG	CORE RECOVERY	FEMENZA TION KIND OF BIT CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE (FST)	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE LUTTING					
0m			0-100									0m	
0.8		△											
0.50													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Cataclastic DOLOMITE

white gry.

white gry.

white gry.

Top Soil 0.50

Core length generally 10-30 cm, sometimes 70 cm.

Easy break to small pieces.

No brn. weathering.

Core length 5-15 cm

Very easy break to small pieces.

NO CORE (cave?) Cave fill Soil.

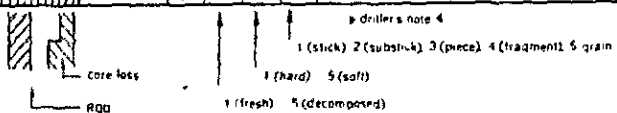
Core length 10-30 cm.

Some Cavities.

Easy to break

Supply

Leakage

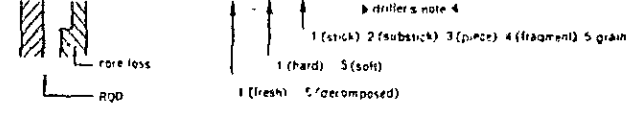


GEOLOGIC LOG OF DRILL HOLE

Upper Qude Yai PROJECT HOLE No Q-1* (SHEET 2 OF 3)

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED Apr. 20 -1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 0.0 m COMPLETED Apr. 28 -1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 50.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 42.13 m LOGGED BY C.H. Peel
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 84.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BLASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING							
20.0			0-100										LUCEON 50 (mm)	40	20m
1	Cataclastic DOLOMITE	Cataclastic DOLOMITE			Whity gry.	2	3-4	2		20.25	Core length 5-30cm clear cataclastic structure.	Supply Leakage	Supply Leakage	1	
2						2	3	2							
3						4	4	2							
4									24.0						
5									NO core and 10cm cave fill soil	25.30					
6															
7															
8															
9															
30															
1													1		
2													2		
3													3		
4													4		
5													5		
6													6		
7													7		
8													8		
9													9		
40													40		

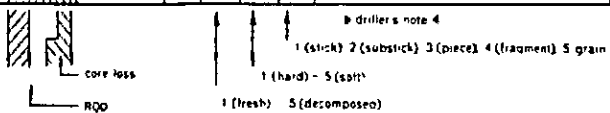


GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT HOLE No Q-1 (SHEET 3 OF 3)

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED Apr -20 -1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 0.0 m COMPLETED Apr -28 -1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 50.0 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 42.13 m LOGGED BY CH. Paol
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 84.3 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING							
40m			0 → 100 %									0	40m		
1	<i>Cataclastic DOLOMITE</i>				<i>Whity gry.</i>	3	3	4					1		
2															
3															
4															
5															
6															
7															
8															48.00
9															<i>Remarkable cataclastic structure.</i>
50															50.00
1												1			
2												2			
3												3			
4												4			
5												5			
6												6			
7												7			
8												8			
9												9			
60												60			



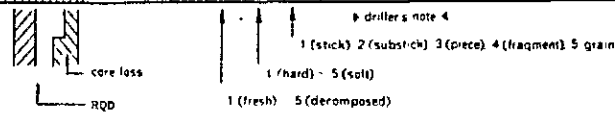
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No 0-2 (SHEET 1 OF 3)

LOCATION	<u>Right Bank</u>	DEPTH OF HOLE	<u>50.0</u> m	COMMENCED	<u>May - 2 - 1979</u>
ELEVATION	<u>No Data</u> m	DEPTH OF OVERBURDEN	<u>1.3</u> m	COMPLETED	<u>May - 9 - 1979</u>
COORDINATE	<u>No Data</u>	LENGTH OF ROCK DRILLING	<u>48.7</u> m	DRILLED BY	<u>FONDISA</u>
ANGLE FROM HORIZONTAL	<u>90 °</u>	TOTAL LENGTH OF CORE	<u>48.3</u> m	LOGGED BY	<u>CH. Peel</u>
BEARING OF ANGLE HOLE		CORE RECOVERY	<u>96.6</u> %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BITTING CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0m			0-100%								0	40 Om
0.5	O.B.	△							Top Soil			
1		△			brn.	4	4	4	Gravelly core Strong weathering			1
1.50									NO core			1.50
2					gry.	3	4	4	Many Weathered cracks			2
3						4			Easy to break.			3.15
4									Remarkable cataclastic structure.			
5												
6									Gravelly core, no brn cracks but very easy break to small pieces.			
7					whity gry	3	1	5				
8												
9												
10												
11.00									Core loss			
11.45					whity gry	3	3	5				
12.40									Core loss			
12.90												
15.60					whity gry.	3	3	5				
16									Remarkable cataclastic structure.			
17												
18					gry.	2	3	3	Silicious and very easy break to small pieces.			
19												
20												



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No 0-2 (SHEET 2 OF 3)

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED May - 2 - 1979

ELEVATION No Data m DEPTH OF OVERBURDEN 1.3 m COMPLETED May - 9 - 1979

COORDINATE No Data LENGTH OF ROCK DRILLING 48.7 m DRILLED BY FONDIS

ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 48.3 m LOGGED BY CH. Peel

BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.6 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
20m			0-100									LUGEON 50(0mm)	40	20m
1	Cataclastic DOLOMITE	[Pattern]			gry.	2	3-4	3	23.70			Supply	1	
2														
3														
4	Sheared ZONE	[Pattern]			white	3-4	4-5	Gravelly core and fault breccia.	25.70			Leakage	4	
5														
6	Cataclastic DOLOMITE	[Pattern]			gry.	2	3	3-2	silicious, remarkable cataclastic structure. Easy break to small pieces.				6	
7														
8														
9														
30														
1														
2														
3														
4														
5														
6														
7														
8														
9														
40														

driller's note 4
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 core loss
 1 (hard) - 5 (soft)
 RQD
 1 (fresh) - 5 (decomposed)

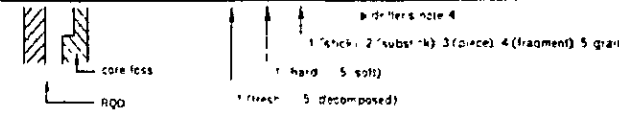
GEOLOGIC LOG OF DRILL HOLE

Upper Que Yai PROJECT

HOLE No 0-2 (SHEET 3 OF 3)

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED May - 2 - 1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 1.3 m COMPLETED May - 9 - 1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 48.7 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 48.3 m LOGGED BY CH. Peol
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.6 %

DEPTH	ROCK NAME	CORRECTION	RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
4.6			0-100								0	40	4.1
1	<i>Cataclastic DOLOMITE</i>												
2													
3													
4													
5													
6													
7													
8													
9													
50													
1													
2													
3													
4													
5													
6													
7													
8													
9													
60													



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GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT HOLE No Q-3 (SHEET 1 OF 3)

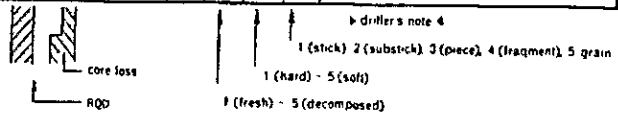
LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED May-16-1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 1.5 m COMPLETED May-20-1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 48.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE 49.1 m LOGGED BY C.H. Peel
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
0m			0-100								0	40	0m
0.5	D.B.	△											
1		△											
1.5													
2						4	4	3		Hum is Soil With Some roots of plant			
2.5						4	4	3		core lost			
3						5	5			2.85 3.00			
3.5													
4										Rock is rather deep.			
5										Weathered cavernous zone gravelly size all cracks are weathered brown.			
6													
7						4	4	3					
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Dolomitic LIMESTONE

light gry.

light gry.



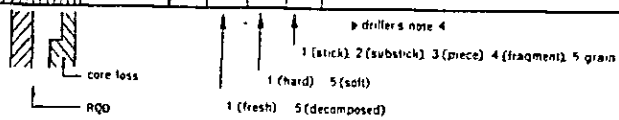
GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT

HOLE No Q-3 (SHEET 2 OF 3)

LOCATION <u>Right Bank</u>	DEPTH OF HOLE <u>50.0</u> m	COMMENCED <u>May-16-1979</u>
ELEVATION <u>No Data</u> m	DEPTH OF OVERBURDEN <u>1.5</u> m	COMPLETED <u>May-20-1979</u>
COORDINATE <u>No Data</u>	LENGTH OF ROCK DRILLING <u>48.5</u> m	DRILLED BY <u>FONDISA</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE <u>49.1</u> m	LOGGED BY <u>CH. Peei</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>98.2</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION					
					COLOR	WEATHERING	HARDNESS	CORE CUTTING									
20m			0-100%							0	40	20m					
1	Dolomitic LIMESTONE	Light gry.								Supply	Leakage	40					
2													3	3	3		20m
3													3	3	3		
4													3	3	3		
5													3	3	3	25.00	
6													4	4	3	Rock is weathered all cracks are weathered brown.	
7													4	4	3	28.00	
8													3	3	3	All cracks are weathered brown. Cataclastic texture.	
9													3	3	3	29.30	
30													4	4	5	Gravelly size, brown cracks.	
1	4	4	5	32.00													
2	3	3	3	No brown cracks, average core length = 5cm.													
3	3	3	3	3													
4	3	3	3	4													
5	3	3	3	36.00													
6	3	3	3	All cracks are weathered brown, partially cataclastic													
7	3	3	3	3													
8	3	3	3	3													
9	3	3	3	3													
40												40					



GEOLOGIC LOG OF DRILL HOLE

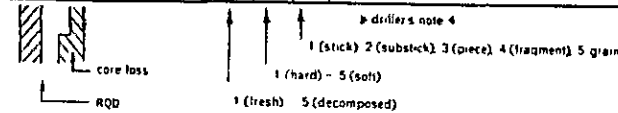
Upper Quae Yai PROJECT

HOLE No 0-3 (SHEET 3 OF 3)

LOCATION Right Bank DEPTH OF HOLE 50.0 m COMMENCED May-16 -1979
 ELEVATION No Data m DEPTH OF OVERBURDEN 1.5 m COMPLETED May-20 -1979
 COORDINATE No Data LENGTH OF ROCK DRILLING 48.5 m DRILLED BY FONDISA
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE 49.1 m LOGGED BY CH. Peel
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.2 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BOND OF CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE (PSI)	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
4.0m			0 - 100 %									0	4.0m	
1	<i>Dolomitic LIMESTONE</i>				<i>light gry.</i>	3	3	3				0	1	
2														
3														
4														
5														
6														
7														
8														
9														
50														
1													1	
2													2	
3													3	
4													4	
5													5	
6													6	
7													7	
8													8	
9													9	
0													0	

Supply Leakage



GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yoi PROJECT (Thi Khong Site) HOLE No LL-1 (SHEET 1 OF 2)

LOCATION Left Bank DEPTH OF HOLE 35.00 m COMMENCED June-25-1979
 ELEVATION 189 m DEPTH OF OVERBURDEN 8.60 m COMPLETED June-30-1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 26.40 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Pael
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 48.29 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE					WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION					
0m			0 → 100										0m	
1		△											1	
2		△											2	
3		△											3	
4		△											4	
5		△											5	
6		△											6	
7		△											7	
8		△											8	
9													9	
10													10	
1													1	
2													2	
3													3	
4													4	
5													5	
6													6	
7													7	
8													8	
9													9	
20													20	

O. B

Calcareous SILTSTONE

φ 55mm - Diamond Bit

dark grn.

red brick.

greenish gry.

Humus soil and yellowish clay

All cracks are weathered, brown.
 Sheared at 9.60
 Core loss 10.00
 10.40-10.60
 10.75

All cracks are weathered, brown.
 Small voids distributed over at 11.75-12.75.
 12.75
 Core lost 13.00

All cracks are weathered, brown
 Small fragment about 8-15cm.
 17.40

All cracks are weathered brown
 19.20
 19.50 core lost.

8.60

13.00

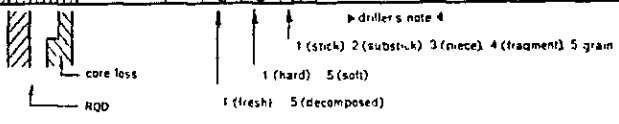
17.40

19.20

19.50

Lu = 28

Lu = 24

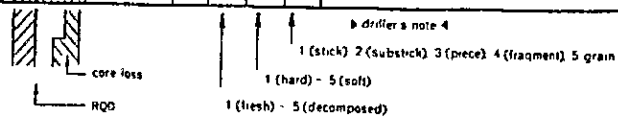


GEOLOGIC LOG OF DRILL HOLE

Upper Quoc Yai PROJECT (Thi Khong Site) HOLE No LL-1 (SHEET 2 OF 2)

LOCATION Left Bank DEPTH OF HOLE 35.00 m COMMENCED June-25-1979
 ELEVATION 189 m DEPTH OF OVERBURDEN 8.60 m COMPLETED June-30-1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 26.40 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Pee!
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 96.28 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						DESCRIPTION
0m			0 ~ 100 %								0m	189m		
1	Calcareous SILTSTONE	LOG	0 ~ 100 %	Diamond Bit	greenish grey	3	3	3	Cracky zone at 19.50 ~ 19.75.	LUGEON	18m	40m	Elev	
2								22.00						
3					red brick.	4	4	4	Small void distributed All over and deposited with green material.					Lu = 4
4								25.00						
5					greenish red	3	3	3	Some of cracks are brown.					Lu = 18
6														
7														
8														
9														
30									3					3
31					red brick.					Lu = 10				
32								Most of them contained green material.						
35.00														



GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT (Thi Khang Site) HOLE No LL-2 (SHEET 1 OF 2)

LOCATION Left Bank DEPTH OF HOLE 30.00 m COMMENCED July - 3 - 1979
 ELEVATION 216 m DEPTH OF OVERBURDEN 7.50 m COMPLETED July - 7 - 1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 22.50 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Pael
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 95.33 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE					WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING	DESCRIPTION			
0			0 - 100 %								0	40.0m
1		△										1
2		△										2
3		△										3
4		△										4
5		△										5
6		△										6
7		△										7
8												8
9												9
10												10
11												11
12												12
13												13
14												14
15												15
16												16
17												17
18												18
19												19
20												20

0 B

Calcareous SILTSTONE

Ø 55mm - Diamond Bit

dark brn.

greenish gry.

greenish gry.

green.

reddish green.

silty clay

*All cracks are brown
Cracky zone at
8.15 ~ 8.25
9.00 ~ 9.25
9.40 ~ 9.60
10.00 ~ 10.15
11.40 ~ 12.00.*

*Some cracks are brown.
Dissolved cracks at
13.60*

*Some cracks are brown.
Cracky zone at
15.00 ~ 16.50.*

7.50

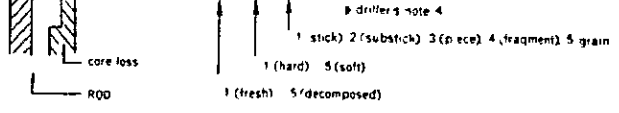
12.00

14.30

18.50

LU = 31

LU = 20

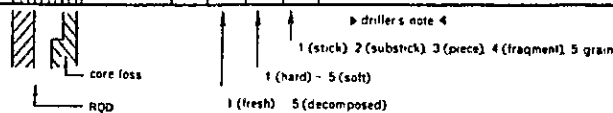


GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT (Thi Khong Site) HOLE No LL-2 (SHEET 2 OF 2)

LOCATION	Left Bank	DEPTH OF HOLE	30.00 m	COMMENCED	July - 3 - 1979
ELEVATION	216 m	DEPTH OF OVERBURDEN	7.50 m	COMPLETED	July - 7 - 1979
COORDINATE		LENGTH OF ROCK DRILLING	2250 m	DRILLED BY	E.GAT.
ANGLE FROM HORIZONTAL	90 °	TOTAL LENGTH OF CORE		LOGGED BY	CH. Peel
BEARING OF ANGLE HOLE		CORE RECOVERY	95.33 %		

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE		DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING		WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER		
20m			0 → 100 %									20m	
1	<i>Calcareous SILTSTONE</i>	<i>φ 55 mm - Diamond Bit</i>	<i>reddish green.</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>26.00</i>	<i>Weathered cracks, brown</i>	<i>LU = 24</i>	<i>NO Test</i>	1		
2													
3													
4													
5													
6													
7													
8													
9													
30													
1											1		
2											2		
3											3		
4											4		
5											5		
6											6		
7											7		
8											8		
9											9		
40											40		



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GEOLOGIC LOG OF DRILL HOLE

Upper Quae Yai PROJECT (Thi Khong Site) HOLE No RR-1 (SHEET 1 OF 2)

LOCATION <u>Right Bank</u>	DEPTH OF HOLE <u>30.20</u> m	COMMENCED <u>July - 13 - 1979</u>
ELEVATION <u>1.87</u> m	DEPTH OF OVERBURDEN <u>3.40</u> m	COMPLETED <u>July - 16 - 1979</u>
COORDINATE _____	LENGTH OF ROCK DRILLING <u>26.80</u> m	DRILLED BY <u>E. GAT</u>
ANGLE FROM HORIZONTAL <u>90</u> °	TOTAL LENGTH OF CORE _____ m	LOGGED BY <u>C.H. Peel</u>
BEARING OF ANGLE HOLE _____	CORE RECOVERY <u>98.17</u> %	

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE		DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORF CUTTING		WATER TABLE	WATER PRESSURE TEST		
0.9			0-100									0	0m
1		△							Silty clay with some roots of plant.				
2		△											
3		△											
4		△							3.40				
5									Rock is deep weathered. Some decomposed to be clay				
6									4.65 Core loss 4.95				
7									Cracks are brown and filled by soil.				
8									6.65				
9									7.20				
10									Core lost				
11									8.55				
12									8.70				
13									9.30				
14									Rock is contained much more clay particle				
15									All cracks are weathered brown.				
16									Cracky zone at				
17									9.70 - 9.90				
18									11.50 - 11.60				
19									13.70 - 14.00				
20									14.00				
21									Good core				
22									15.00				
23									All cracks are weathered brown, many voids of dissolved green material.				
24									17.00				
25									Good core				
26									All cracks are weathered brown, some green colour material are irregular folding				
27									20.00				

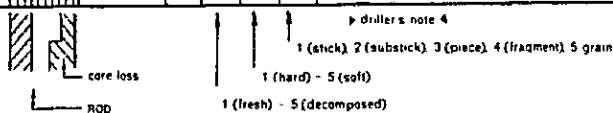
core loss
 RQD
 1 (fresh) 5 (decomposed)
 1 (hard) 5 (soft)
 1 (stick) 2 (substick) 3 (piece) 4 (fragment) 5 grain
 Driller's note 4

GEOLOGIC LOG OF DRILL HOLE

Upper Quee Yai PROJECT (Thi Khong Site) HOLE No RR-1 (SHEET 2 OF 2)

LOCATION Right Bank DEPTH OF HOLE 30.20 m COMMENCED July - 13 - 1979
 ELEVATION 187 m DEPTH OF OVERBURDEN 3.40 m COMPLETED July - 16 - 1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 26.80 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Peel
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.17 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE WATER PRESSURE TEST LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION	
					COLOR	WEATHERING	HARDNESS	CORE CUTTING					
20m			0 → 100 %								20m		
1	Calcareous SILTSTONE	[Hatched pattern]	[Vertical lines]	φ 55 mm - Diamond Bit	breenish red	3	3	2	All cracks are weathered brown.	19.72	[Scale]		
2													
3													
4													23.50
5													23.80
6													24.10
7													27.00
8													29.80
9													29.80
30													
1	CONGLOMERATE	[Dotted pattern]	[Vertical lines]					All cracks are weathered brown, dissolved cracks at 29.80~30.00.	Lu = 14	[Scale]			
2													
3													
4													
5													
6													
7													
8													
9													
40													

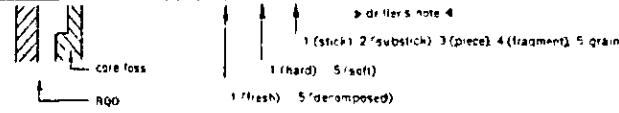


GEOLOGIC LOG OF DRILL HOLE

Upper Quee Ya! PROJECT (Thi Khong Site) HOLE No RR-2 SHEET 1 OF 2

LOCATION Right Bank DEPTH OF HOLE 30.60 m COMMENCED July -10 -1979
 ELEVATION 198 m DEPTH OF OVERBURDEN 3.80 m COMPLETED July -12 -1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 26.80 m DRILLED BY E GAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Peal
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.92 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE (PST)	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
0.5			0-100									0	40	0m
1	O. B.	Δ												
2														
3														
4														
4.8	Calcareous SILTSTONE	W												
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														



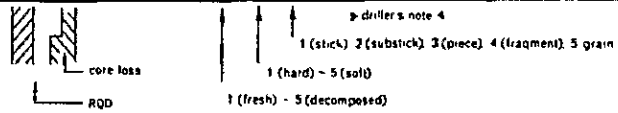
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GEOLOGIC LOG OF DRILL HOLE

Upper Que Yal PROJECT (Thi Khong Site) HOLE No RR-2 (SHEET 2 OF 2)

LOCATION Right Bank DEPTH OF HOLE 30.60 m COMMENCED July 10 1979
 ELEVATION 198 m DEPTH OF OVERBURDEN 3.80 m COMPLETED July 12 1979
 COORDINATE _____ LENGTH OF ROCK DRILLING 26.80 m DRILLED BY EGAT
 ANGLE FROM HORIZONTAL 90 ° TOTAL LENGTH OF CORE _____ m LOGGED BY CH. Peel
 BEARING OF ANGLE HOLE _____ CORE RECOVERY 98.92 %

DEPTH	ROCK NAME	LOG	CORE RECOVERY	CEMENTATION KIND OF BIT CASING	OBSERVATION OF CORE				DESCRIPTION	WATER TABLE	WATER PRESSURE TEST	LEAKAGE OF DRILLING WATER	DEPTH	ELEVATION
					COLOR	WEATHERING	HARDNESS	CORE CUTTING						
2.0m			0-100%										2.0m	193
1	<i>Calcareous SILTSTONE</i>				<i>greenish grg.</i>	3	3	3	Core length about 10cm. Good core recovery, cracks are not so weathered.				1	193
2														
3														
4														
5														
6														
7														
8														
9														
30														
1													1	
2														
3														
4														
5														
6														
7														
8														
9														
40														



CHAPTER 2 MATERIALS

Chapter 2

Material

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2-1-1 (1) Results of Soil Tests

Area No.	Sample No.	Depth (m)	Soil Classification		Water Content as received (%)	Specific Gravity	Atterberg Limits			Gradation						Compaction**	
			Unified System	Revised P.R. System			LL (%)	PL (%)	PI	-38.1 ^{mm} (1 1/2") (%)	-19.0 ^{mm} (3/4") (%)	-4.75 ^{mm} (No. 4) (%)	-2.0 ^{mm} (No. 10) (%)	-0.425 ^{mm} (No. 40) (%)	-0.075 ^{mm} (No.200) (%)	Optimum Water Content (%)	Maximum Dry Density (t/m ³)
P - 1		0.1-1.0	GC	A-6-a(2)	7.4	2.61	37.6	19.9	17.7		100	73	58	47	38	13.2	* 1.83
		1.0-2.0	GP-GM	A-1- (0)	10.1		-NP-	-NP-	-NP-		66	30	19	14	11		
		2.0-2.5	GC	A-2-6(1)	10.9		33.9	19.6	14.3		89	56	45	36	32		
P - 2		0.2-1.0	GC	A-2-6(1)	9.5		36.8	21.5	15.3		99	65	50	42	34	16.4	* 1.75
		1.0-2.0		A-1-a(0)	9.2						82	38	27	19	14		
		2.0-2.5	GW-GC	A-2-6(0)	6.5		31.8	19.0	12.8		82	27	12	11	6		
P - 3		0.2-1.0	GM-GC	A-2-6(0)	7.2		20.1	16.0	4.1		93	55	35	26	13	13.0	1.81
		1.0-2.0	SM	A-2-7(0)	12.2		50.9	38.3	12.6		100	77	53	33	25		
		2.0-3.0	GM-GC	A-2-6(0)	8.4		21.6	16.7	4.9		65	48	42	36	27		
		3.0-4.0	SC	A-2-6(0)	13.8		24.5	14.8	9.7		85	67	54	44	27		
		4.0-5.0	CL	A-6 (6)	15.1		30.6	18.2	12.4		100	88	83	78	61		
P - 4		0.2-1.0	SC	A-2-6(1)	8.0		32.4	18.9	13.5		100	78	63	53	35	18.4	1.73
		1.0-2.0	SC	A-6 (2)	8.8		34.2	21.9	12.3		100	85	69	62	42		
		2.0-3.0	CL	A-6 (12)	15.6		35.8	16.0	19.8		100	97	91	86	69		
		3.0-4.0	SC	A-6 (2)	14.6		35.6	23.6	12.0		100	86	74	66	43		
		4.0-5.0	CL	A-6 (7)	15.4		30.2	19.2	11.0		100	92	86	83	66		
P - 5A		0.3-1.0	SP-SC	A-2-6(0)	9.0		35.3	22.1	13.2		96	59	41	29	12	15.0	* 1.78
P - 5B		0.3-1.0	GC	A-2-6(0)	5.7		36.4	23.3	13.1		100	59	35	27	22	12.5	* 1.86
P - 6		0.3-1.0	SC	A-6 (4)	10.7	2.68	37.0	21.1	15.9		100	78	65	56	46	16.9	* 1.72
		1.0-2.0	SM	A-2-6(0)	10.5		34.0	27.2	6.8		100	76	53	40	34		
		2.0-3.0															
		3.0-4.0	GW-GC	A-2-6(0)	12.7		39.8	21.0	18.8		69	36	24	15	10		
		4.0-5.0	GP-GC	A-2-6(0)	15.5		38.9	21.3	17.6		82	43	28	18	12		
P - 7		0.2-1.0	GW-GC	A-2-6(0)	13.9		40.2	22.1	18.1		100	41	24	11	7	17.1	* 1.78
		1.0-2.0	SC	A-2-6(0)	11.6		37.7	24.0	13.7		92	53	35	20	13		
		2.0-3.0															
		3.0-4.0	GM	A-2-7(0)	11.6		41.4	29.4	12.0		92	50	34	21	16		

* Soil sample passing sieve 3/4" otherwise passing sieve No. 4

** ASTM D698-70 Method C

2-1-1 (2) Results of Soil Tests

Area No.	Sample No.	Depth (m)	Soil Classification		Water Content as received (%)	Specific Gravity	Atterberg Limits			Gradation						Compaction**	
			Unified System	Revised P.R. System			LL (%)	PL (%)	PI	-38.1 ^{mm} (1 1/2") (%)	-19.0 ^{mm} (3/4") (%)	-4.75 ^{mm} (No. 4) (%)	-2.0 ^{mm} (No. 10) (%)	-0.425 ^{mm} (No. 40) (%)	-0.075 ^{mm} (No.200) (%)	Optimum Water Content (%)	Maximum Dry Density (t/m ³)
P - 8	0.2-1.0	SC	A-2-7(1)	12.7	2.68	49.4	28.0	21.4	100	68	50	31	22	14.3	* 1.82		
	1.0-2.0	GP-GC	A-2-6(0)	11.4		35.7	20.1	15.6		77	39	26	15			11	
	2.0-3.0	SC	A-2-6(0)	21.8		26.8	17.7	9.1		100	99	89	56			31	
P - 9	0.2-1.0	SC	A-6 (1)	8.0	2.67	31.3	22.3	9.0	98	80	67	55	38	14.1	1.88		
	1.0-2.0			4.2		23.8	14.9	8.9									
P - 10	0.3-1.0	SM	A-7-6(1)	17.6	2.68	49.3	43.2	6.1	100	97	89	64	38	22.0	1.65		
	1.0-2.0	CL	A-7-6(7)	8.5		41.0	24.7	16.3		100	76	66	59			56	
	2.0-3.0	SC	A-6 (2)	14.5		39.1	23.1	16.0		100	90	76	52			37	
	3.0-4.0	CL	A-6 (7)	10.0		37.1	22.7	14.4		100	88	77	68			59	
	4.0-5.0	SC	A-6 (3)	14.3		37.0	20.2	16.8		100	88	73	50			40	
P - 11	0.2-1.0	SM	A-7-6(3)	15.5	2.67	51.6	38.3	13.3	98	85	69	49	42	14.5	* 1.83		
	1.0-2.0	SC	A-7-6(1)	12.1		42.2	25.0	17.2		92	70	52	41			36	
	2.0-3.0	GC	A-7-6(4)	12.4		45.1	24.1	21.0		100	65	52	44			39	
	3.0-4.0			9.7		34.9	22.3	12.6									
	4.0-5.0	GW-GC	A-2-6(0)	10.2		34.4	15.6	18.8		87	32	12	10			5	
P - 12	0.3-1.0	ML	A-7-6(7)	12.8	2.67	41.8	26.8	15.0	100	99	93	72	59	11.1	* 1.93		
	1.0-2.0	GC	A-2-6(0)	8.4		32.8	18.3	14.5		92	50	31	21			14	
	2.0-3.0	GW-GC	A-1-a(0)	8.1						90	39	22	11			6	
P - 13	0.3-1.4	GW	A-2-6(0)	9.6	2.71	37.0	21.7	15.3	54	9	4	2	2	13.6	* 1.83		
P - 14	0.0-1.0	GW-GM	A-2-7(0)			48.0	28.3	19.7		78	29	16	9			7	
	1.0-2.0					30.4	22.6	7.8									16.2
	2.0-3.0			9.3	31.7	21.6	10.1										
P - 15	0.2-1.0	SC	A-2-7(1)	19.7	2.71	58.7	33.1	25.6	100	87	65	35	20	30.2	1.42		
P - 16	0.2-1.0	GM	A-2-7(0)	12.3	2.75	52.4	32.0	20.4	96	52	30	23	12	15.2	* 1.83		
	1.0-2.0			9.6		51.9	29.3	22.6									
	2.0-3.0	GP-GC	A-2-6(0)	11.3		40.4	23.3	17.1		100	49	28	14			9	
	3.0-4.0	SC	A-2-6(0)	9.6		39.3	22.0	17.3		100	63	42	25			18	

* Soil sample passing sieve 3/4" otherwise passing sieve No. 4
 ** ASTM D698-70 Method C

2-1-1 (3) Results of Soil Tests

Area No.	Sample No.	Depth (m)	Soil Classification		Water Content as received (%)	Specific Gravity	Atterberg Limits			Gradation						Compaction**	
			Unified System	Revised P.R. System			L L (%)	P L (%)	P I	-38.1 ^{mm} (1 1/2") (%)	-19.0 ^{mm} (3/4") (%)	-4.75 ^{mm} (No. 4) (%)	-2.0 ^{mm} (No. 10) (%)	-4.25 ^{mm} (No. 40) (%)	-0.075 ^{mm} (No. 200) (%)	Optimum Water Content (%)	Maximum Dry Density (t/m ³)
P - 17	0.0-1.0	GW-GC	A-2-6(0)	8.9	2.66	36.5	23.7	12.8		100	52	30	15	11	13.6	* 1.81	
	1.0-2.0	GW-GM	A-2-6(0)	12.5		34.6	24.6	10.0		78	46	30	18	12			
	2.0-3.0					32.1	19.2	12.9									
P - 18	0.4-1.0	SC	A-2-7(0)	11.6		44.8	25.5	19.3		91	66	45	26	19	19.0	* 1.72	
	1.0-2.0	SM	A-7-6(10)	10.3	59.8	33.4	26.4		100	86	71	58	49				
	2.0-3.0																
	3.0-4.0	SP-SC	A-2-6(0)	10.0	36.0	23.5	12.5		92	66	40	19	11				
	4.0-5.0	SP-SC	A-2-6(0)	8.5	34.6	22.8	11.8		100	68	36	16	9				
P - 19	0.3-1.0	SW	A-2-6(0)	11.1		33.8	25.1	8.7		94	61	33	7	2	14.5	* 1.83	
	1.0-2.0	SC	A-2-7(1)	9.9	41.6	23.2	18.4		100	83	60	37	29				
	2.0-3.0	SW	A-2-6(0)	18.6	31.5	19.3	12.2		100	78	46	13	2				
	3.0-4.0	SP-SC	A-2-6(0)	10.8	33.9	20.3	13.6		92	67	41	18	11				
	4.0-5.0	GW-GC	A-2-6(0)	10.5	33.2	19.6	13.6		100	50	28	10	6				
P - 20	0.2-1.0	SM	A-2-7(0)	12.6	2.66	51.6	42.2	9.4		100	76	61	42	19	15.6	* 1.80	
	1.0-2.0	SM	A-2-7(2)	9.9	58.2	36.0	22.2		100	69	48	37	31				
	2.0-3.0	GW-GC	A-2-7(0)	13.0	46.5	24.5	22.0		90	46	28	16	12				
	3.0-4.0	GW-GC	A-2-7(0)	11.3	42.3	23.4	18.9		100	31	19	11	6				
	4.0-5.0	GW-GC	A-2-6(0)	10.4	37.8	22.0	15.8		56	29	19	13	10				
P - 21	0.2-1.0	MH	A-7-6(11)	31.4		59.4	39.2	20.2		100	98	88	69	53	36.0	1.36	
	1.0-2.0	GC	A-2-6(0)	17.8	34.5	22.3	12.2		89	46	31	20	16				
	2.0-3.0	MH	A-7-6(10)	25.9	57.8	36.4	21.4		100	98	86	63	34				
	3.0-4.0	SM	A-2-7(1)	27.8	57.3	39.0	18.3		100	98	87	64	31				
P - 22	0.2-1.0	MH	A-7-6(8)	25.0		61.0	47.3	13.7		100	98	93	78	56	13.3	* 1.91	
	1.0-2.0	GM	A-2-6(0)	6.5	27.1	22.1	5.0		70	51	46	40	19				
P - 23A	0.2-1.0					74.2	47.6	26.6							34.8	1.35	
P - 23B	0.2-1.0	SM	A-7-6(4)	25.8	2.65	60.5	34.0	26.5		100	99	89	58	36	34.0	1.39	

* Soil sample passing sieve 3/4" otherwise passing sieve No. 4
 ** ASTM D698-70 Method C

2-1-1 (4) Results of Soil Tests

Area No.	Sample No.	Depth (m)	Soil Classification		Water Content as received (%)	Specific Gravity	Atterberg Limits			Gradation						Compaction**	
			Unified System	Revised P.R. System			L L (%)	P L (%)	P I	-38.1 ^{mm} (1 1/2") (%)	-19.0 ^{mm} (3/4") (%)	-4.75 ^{mm} (No.4) (%)	-2.0 ^{mm} (No.10) (%)	-0.425 ^{mm} (No.40) (%)	-0.075 ^{mm} (No.200) (%)	Optimum Water Content (%)	Maximum Dry Density (t/m ³)
P - 24	0.2-1.0	SM	A-7-6(8)	35.7		63.2	43.5	19.7		100	99	94	76	49	29.1	1.47	
	1.0-2.0	SM	A-7-6(7)	28.7		71.0	36.4	34.6		100	99	87	57	39			
	2.0-3.0	SM	A-2-7(1)	26.5		53.2	33.9	19.3		100	96	75	41	22			
	3.0-4.0	SM	A-2-7(2)	25.0		61.1	38.3	22.8		100	96	83	54	34			
	4.0-5.0	GW-GM	A-2-7(0)	8.0		48.6	31.8	16.8		72	33	19	9	5			
P - 25	0.2-1.0	CL	A-7-6(14)	16.8		44.8	25.5	19.3			100	97	87	74	17.0	1.78	
	1.0-2.0	CL	A-6 (5)	10.9		29.2	19.0	10.2		98	93	86	79	61			
	2.0-3.0	CL	A-6 (4)	12.2		30.1	19.5	10.6		98	92	84	74	54			
	3.0-4.0	CL	A-6 (5)	11.0		28.1	15.8	12.3		100	89	80	70	54			
	4.0-5.0	GC	A-2-6(0)	12.0		38.2	22.7	15.5		89	49	32	21	16			
P - 26	0.0-1.0														12.1	* 1.91	
	1.0-2.0	GC	A-2-6(0)	9.3		30.3	16.8	13.5		76	41	27	20	14			
	2.0-3.0	GC	A-2-6(0)	7.2		34.2	20.8	13.4		89	49	31	24	21			
	3.0-4.0	GC	A-2-6(0)	8.6		30.7	17.8	12.9		78	52	35	22	14			
	4.0-5.0	GW-GC	A-2-6(0)	4.2		30.8	19.5	11.3		71	25	15	8	6			
P - 27	0.0-1.0				2.74										18.0	* 1.75	
	1.0-2.0	SC	A-7-6(3)	14.8		40.6	22.8	17.8		100	86	70	52	41			
	2.0-3.0	SC	A-2-6(0)	13.1		38.6	23.1	15.5		86	60	35	18	11			
	3.0-4.0	GP-GM	A-2-6(0)	15.6		33.3	24.0	9.3		100	42	27	15	9			
	4.0-5.0			14.5						100	75	61	45	37			
P - 28	0.3-1.0	SC	A-2-6(0)	12.6		37.1	23.3	13.8		100	70	48	35	19	13.5	* 1.83	
	1.0-2.5	SC	A-2-6(0)	10.8		27.6	15.4	12.2		94	74	59	52	34			
P - 29	0.3-1.0	SC	A-6 (6)	9.8	2.66	34.3	18.3	16.0		94	81	71	68	54	15.0	* 1.79	
	1.0-2.0			8.6						100	76	67	61	40			
	2.0-3.0	GC	A-2-6(1)	11.8		36.4	20.6	15.8		79	50	39	32	26			
	3.0-4.0	GC	A-2-6(0)	8.6		33.3	18.4	14.9		86	53	39	27	16			
	4.0-5.0	SC	A-2-6(0)	14.8		39.3	22.7	16.6		93	66	52	36	22			
P - 30	0.3-1.0	SM	A-7-6(4)	18.1		65.7	44.2	21.5		100	86	59	46	38	21.4	* 1.62	
	1.0-2.0																
	2.0-3.0	GW-GM	A-2-6(0)	13.8		39.2	27.1	12.1		57	24	13	9	7			

* Soil sample passing sieve 3/4" otherwise passing sieve No. 4

** ASTM D698-70 Method C

