

THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA  
CEYLON ELECTRICITY BOARD

**FEASIBILITY STUDY  
ON  
UPPER KOTMALE  
HYDROELECTRIC POWER DEVELOPMENT PROJECT**

**FINAL REPORT**

**VOLUME 4**

**DATA BOOK DRILLING CORE LOG**

AUGUST 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

MPN
CR 7
87-122-4/4



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**FINAL REPORT**

16886

**VOLUME 4**

**DATA BOOK DRILLING CORE LOG**

AUGUST 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団	
受入 月日 '87.10.15	120
登録 No. 16886	64.3
	MPN

# DRILLING CORE LOG

## DRILLING DATA

Location	Drilling Hole No.	Coordinates North East	Ground Height(m)	Drilled Depth (m)	No. of Sheet	Page
Caledonia Dam Site	CD - 1	189,140.49 192,705.11	1,301.592	20.59	1	1
	CD - 2	189,337.00 192,830.59	1,377.271	30.08	1	2
	CD - 3	189,318.93 192,783.98	1,366.901	40.09	2	3
	CD - 4	189,284.19 192,713.54	1,347.146	40.11	2	5
	CD - 5	189,238.44 192,606.67	1,310.582	50.28	2	7
	CD - 6	189,245.74 192,560.49	1,335.274	40.00	2	9
	CD - 7	189,210.47 192,526.75	1,371.780	40.05	2	11
	CD - 8	189,233.00 192,476.61	1,385.291	40.39	2	13
	CD - 9	189,360.80 192,653.76	1,325.843	29.50	1	15
	CD - 10	189,309.33 192,583.25	1,300.202	40.10	2	16
	CD - 11	189,485.33 192,591.31	1,353.816	50.47	2	18
	CD - 12	189,359.26 192,527.94	1,331.115	40.17	2	20
	CD - 4 - A	189,261.32 192,695.75	1,328.496	50.55	2	22
	Sub-total			512.38		
Caledonia Intake	CI - 1	189,180.85 192,854.03	1,337.317	24.85	1	24
	Sub-total			24.85		

**DRILLING DATA**

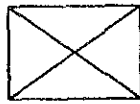
Location	Drilling Hole No.	Coordinates North East	Ground Height(m)	Drilled Depth(m)	No. of Sheet	Page
Caledonia Saddle	CS - 1	188,875.68 192,542.13	1,369.136	32.35	2	25
	CS - 2	188,829.74 192,511.49	1,349.065	30.45	2	27
	CS - 3	188,742.78 192,496.88	1,366.855	30.00	1	29
	CS - 4	188,961.09 192,487.22	1,364.810	30.55	2	30
	CS - 5	188,845.01 192,448.33	1,338.195	20.20	1	32
	CS - 6	188,934.95 192,145.61	1,271.778	17.15	1	33
	Sub-total			160.70		
Caledonia Quarry	CQ - 1	189,321.70 193,246.09	1,425.899	40.14	2	34
	CQ - 2	188,430.86 193,424.44	1,355.958	40.08	2	36
	Sub-total			80.22		
Caledonia Power Station	CP - 1	190,754.96 190,614.24	1,299.214	150.50	6	38
	CP - 2	CANCELLED				
	Sub-total			150.50		
Caledonia Surge Chamber	CC - 1	190,717.03 190,746.34	1,340.131	70.40	3	44
	CC - 2	CANCELLED				
	Sub-total			70.40		
<b>Caledonia Total</b>				<b>999.05</b>		

**WATER PRESSURE TEST**

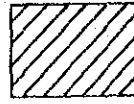
Location	Drilling Hole No.	Coordinates North East	Ground Height(m)	Drilled Depth(m)	No. of Test	Page
Talawakelle Dam	TD - 1	190,063.49 187,937.73	1,239.079	30.81	2	47
	TD - 2	193,076.72 187,847.49	1,199.448	19.63	1	49
	TD - 3	193,063.49 187,937.73	1,195.380	19.99	1	50
	TD - 4	193,076.72 187,847.49	1,206.143	28.96	1	51
	TD - 5	192,748.73 187,893.87	1,200.600	30.58	2	52
	TD - 6	192,623.64 187,867.66	1,197.542	25.90	1	54
	Sub-total			155.87		
Talawakelle Power Station	TP - 1	CANCELLED				
	TP - 2	204,320.21 187,505.46	941.695	351.57	12	55
	TP - 2'	204,467.32 187,303.85	800.722	50.87	2	67
	Sub-total			402.44		
Talawakelle Surge Chamber	TC - 1	CANCELLED				
	TC - 2,2'	203,996.94 187,991.91	1,243.015	100.51	4	69
	Sub-total			100.51		
Talawakelle Penstock	TS - 1	204,149.03 187,733.94	1,024.046	121.11	5	73
	Sub-total			121.11		
<b>Talawakelle Total</b>				779.92		
<b>GRAND TOTAL</b>				1,778.98		

**SYMBOLS IN DRILLING CORE LOG**

GEOLOGICAL SYMBOLS



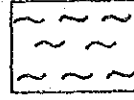
Top Soil & Talus  
Deposit



Mafic Band or  
Biotite Schist



Quartzite



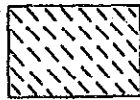
Granitic Gneiss



Felsic Band



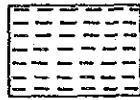
Calc Gneiss



Felsic Gneiss



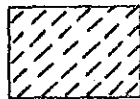
Pegmatite



Intermediate  
Charnockite



Crystalline  
Limestone



Basic  
Charnockite or  
Biotite Gneiss

WEATHERING CONDITION



Highly Weathered  
Rock



Fresh Rock



Weathered Rock



Core Loss



Slightly Weathered  
Rock



# DRILLING CORE LOG

Hole No. **CD - 1**

Name of Project **Feasibility Study for Upper Kotmale Hydroelectric Power Development Project**  
 Caledonia Dam  
 189,140.49N  
 Location **192,705.11E**

Sheet No. **1** of **1**

Depth of Bedrock  m      Bore Hole Dia  mm  
 Core Recovery  %      Type of Drill Machine   
 Undergound Water Table  m      Capacity of Pump  l/min

Operator

Depth of Hole **20.59** m

Elevation **1301.592** m

Direction       Supervisor   
 Inclination       Core Recovery  %  
 Undergound Water Table  m

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Rock Quality Designation	Permeability Test		Drilling Status		Description	Date Drilled
									p - q curve	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1	1300.39	X	Talus		red- brn to yel- brn									
2	1300.28	X				slightly- kd							Clayey silt with quartz grains.	
3	1300.06	X											Highly weathered rock; fragments are slightly hard, but oxidized and discolored. Biotite schist; moderately soft and lamellate.	
4		X	inter chkn										Undulated; with thin interbeds of mafic band and felsic band at various depths	
5		X											Open crack 80° at 5.15~5.43m; plane has clay film. Dip: 60°.	
6	1295.99	X	fels gn										Consists of mainly quartz and plagioclase; with thin interbeds of biotite. Granitic texture at 6.42~6.52.	
7	1294.74	X											Undulated with felsic mineral lense at 7.73~7.78m and 10.31~10.34m. Open crack 80° at 8.26~8.54m; plane has clay film. Hair crack 90° at 10.20~10.29m	
8		X	inter chkn											
9		X												
10	1291.19	X												
11	1290.55	X	gra- gn										Generally indicates granitic texture. Pegmatitic at 10.60~10.68m	
12		X	inter chkn										Undulated with felsic mineral lense; appears to be charnockite at 12.20~12.42m. Core shows much cracking at 11.78~11.98m	
13	1289.17	X											Consists of mafic minerals and some felsic minerals (quartz and feldspar).	
14	1288.28	X	bio- gn										Cores are undulated; with thin interbeds of mafic band and basic charnockite, and with felsic mineral lenses. There are some open cracks and closed cracks in the cores. Open crack 56° at 13.85~13.94m with clay film. Color is black and dark green. Open crack 70° at 15.82~15.98m; plane has slight clay film. Some hair cracks 80~90° in some portions. Dip: 50°.	
15		X	inter chkn											
16		X												
17		X	inter chkn											
18		X												
19		X												
20	1281.79	X												
21	1281.18	X	bio- gn										Mainly consists of biotite lamellas with thin interbed of felsic band at 19.82~19.98m. Dip: 50°. Planeless fault 70° at 20.30~20.53m. Vertical displacement is about 35mm.	
22	1281.00	X	inter chkn											
23		X												
24		X												
25		X												
26		X												
27		X												
28		X												
29		X												
30		X												

# DRILLING CORE LOG

Hole No. CD - 2

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 1

Location Caledonia Dam  
189° 33' 00N  
192° 830' 59E

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 30.08 m

Elevation 1377.271 m

Operator         

Direction         

Supervisor         

Inclination          %

Type of Drill Machine         

Capacity of Pump          l/min

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled	
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.			Loss Water Vol. (l/min)
1	1375.75	X	Talus		red-brn									
2		~			red-brn to pink-wht	hilly-wd						Red soil with many quartz grains.		
3		~										Appears to be silty clay; sometimes rock texture remains; very easy to break with fingers. All of the minerals have been weathered (for example mafic minerals and feldspar) except quartz.		
4		~												
5		~												
6		~	chnk D											
7		~												
8		~												
9		~												
10	1366.99	~												
11		~												
12		~												
13		~												
14	1362.96	~												
15	1361.84	~	chnk											
16	1360.69	~	inter chnk											
17	1359.83	~	bio-gn											
18		~	inter chnk											
19	1358.37	~												
20	1357.17	~	bio-gn											
21	1356.95	~	inter chnk											
22	1355.73	~	bio-gn											
23		~												
24		~												
25		~												
26		~	inter chnk											
27		~												
28		~												
29	1347.86	~												
30	1347.27	~	fels gn											

# DRILLING CORE LOG

Hole No. CD - 3 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location 192,783.98E  
189,788.83N  
Caledonia Dam

Depth of Bedrock          m      Bore Hole Dia          mm

Depth of Hole 40.09 m

Elevation 1366.90 m

Operator         

Direction               Core Recovery          %

Underground Water Table

Supervisor         

Inclination          m      Capacity of Pump          l/min

Type of Drill Machine         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	p - q curve	Lugeon Value	Infiltrate Water Vol.		
1	1366.20	X	Talus										
2		~											
3		~											
4		~											
5		~	chnk										
6		~											
7	1359.60	~											
8		~											
9		~											
10		~											
11		~											
12		~											
13		~											
14		~											
15		~											
16		~											
17		~											
18		~											
19		~											
20		~											
21		~											
22		~											
23		~											
24	1342.02	~	inter chnk										
25	1342.42	~											
26		~	bio-sch										
27		~											
28		~											
29	1338.20	~	+ + Peg										
30	1337.80	~	+ + Peg										
31	1337.14	~	~ gra-grn										
32	1336.90	~	+ + Peg										

# DRILLING CORE LOG

Hole No. CD - 3 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192.783.98E  
189.318.93N  
 Caledonia Dam

Depth of Bedrock      m      Bore Hole Dia      mm  
 Type of Drill Machine     

Depth of Hole 40.09 m

Elevation 1366.901 m      Core Recovery      %  
 Direction           Undergound Water Table  
 Inclination      m      Capacity of Pump      l/min

Operator     

Supervisor     

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Core Characteristics		Permeability Test		Drilling Status			Description	Date Drilled
							Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)	Bit Type		
31			gra-gn				20 40 60 80%								
32	1335.00		fels-gn											Core has pegmatitic texture at 30.86m. Open crack 80° at 30.0~30.48m; plane is coated with iron stain; mafic minerals and feldspar are weathered. Iron stains noted along gneissosity.	
33	1333.77		peg											Core loss at 31.9~32.6m. Iron stain of 5cm thickness at 31.9m. Iron stain along the crack 30~70°.	
34	1333.56		fels-gn											There are some hair cracks on the core. With thin biotite lamellas. There are some cracks and hair cracks on the core. Slightly cracked planes are coated with iron stains.	
35	1331.60		bio-gn											Granitic texture at 33.38~36.08m; plane has slickenside and clay film.	
36			peg											Gneissosity 80°. Felsic minerals are slightly rich under 37.3m. Pegmatitic texture under 37.4m. Open cracks 85° at 35.38~36.08m, plane has slickenside and clay film.	
37	1329.45		gra-gn											There are many hair cracks of various dip on the core. Generally rock core is coated with iron stains. Open cracks with iron stains are in some sections.	
38														Granitic texture; gneissosity 50~60°. No open cracks and only a few hair cracks. Rock core is hard and fresh.	
39	1327.95														
40	1326.81														
41															
42															
43															
44															
45															
46															
47															
48															
49															
50															
51															
52															
53															
54															
55															
56															
57															
58															
59															
60															

# DRILLING CORE LOG

Hole No. **CD - 4** ①

Name of Project **Feasibility Study for Upper Kotmale Hydroelectric Power Development Project**

**Caledonia Dam**  
189,284.19N  
192,713.54E

Sheet No. **1** of **2**

Location **192,713.54E** m

Depth of Bedrock  m

Depth of Hole **40.11** m

Elevation **1347.146** m

Bore Hole Dia  mm

Operator

Direction

Type of Drill Machine

Inclination

Core Recovery  %

Supervisor

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.		
1-5	1341.65	X	Talus										
6-11	1336.20	/ \	chkn	D	red-brn to yel-brn	hily-wd	Soft						
12-13	1335.85	/ \			wd	wd							
14-15	1334.39	/ \	bio-gn		red-brn to yel-brn	hily-wd							
16-20	1327.15	/ \			red-brn to yel-brn	hily-wd	Hard						
21-22	1325.83	/ \	inter chkn		red-brn to yel-wht	hily-wd	Hard						
23-25	1322.23	/ \	inter chkn		red-brn to yel-wht	hily-wd	Hard						
26-27	1319.55	/ \	fels gn		red-brn to yel-wht	hily-wd	Hard						
28-29	1318.47	/ \	inter chkn		red-brn to yel-wht	hily-wd	Hard						
30	1317.91	/ \	fels gn		red-brn to yel-wht	hily-wd	Hard						

# DRILLING CORE LOG

Hole No. CD - 4 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192,713.54E  
189,284.19N  
Caledonia Dam

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 40.11 m

Elevation 1347.146 m

Type of Drill Machine         

Operator         

Direction         

%

Supervisor         

Inclination         

Capacity of Pump          l/min

Depth (m)	Elevation (Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Core Characteristics		Permeability Test		Drilling Status		Description	Date Drilled	
								Rock Quality Designation	Hardness	p - q curve	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)			Bit Type
31	1316.70							20 40 60 80%						Generally rock core is slightly basic; with interbeds of mafic band in some portions (32.26~32.36m, 32.42~32.48m, 33.64~33.70m); includes megacrysts of quartz plagioclase and biotite at 34.24~34.55m Core is slightly acidic at 37.92~38.1m due to quartz grains. There are many open cracks 30~40° at intervals of 4~10cm at 29.51~30.1m; planes are coated with clay film. Many open cracks 10°, 30°, 45° with iron stains at 33.91~34.27m. Hair cracks 80~90° at 34.24~34.55m. Open crack 30° with clay film at 35.26m. Hair cracks 65~80° at 35.65~35.85m. Open crack 30° with clay film at 36.4m. Hair crack 60° at 36.93~36.97m. Closed cracks 45°, 70° at 38.82~39.91m.		
32																
33																
34																
35			inter chnk			Fresh	Hard									
36																
37																
38																
39	1308.95															
40	1308.06		bio-sch													
41	1307.04		inter chnk													
42																
43																
44																
45																
46																
47																
48																
49																
50																
51																
52																
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54																
55																
56																
57																
58																
59																
60																

# DRILLING CORE LOG

Hole No. CD - 5 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location Caledonia Dam  
189,238.44N  
192,606.67E

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 50.28 m

Elevation 1310.582 m

Core Recovery          %

Operator         

Direction         

Underground  
Water Table

Type of  
Drill Machine         

Supervisor         

Capacity of Pump          l/min

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.		
1			Talus										
2	1306.36												
3													
4			chkn	D	red-brn to dark-brn	slly-nd							
5													
6	1305.03												
7	1303.42												
8													
9													
10	1301.00												
11	1300.89												
12													
13	1298.13												
14	1297.02												
15	1296.85												
16	1296.05												
17	1295.64												
18	1294.82												
19	1294.56												
20													
21	1292.78												
22	1291.86												
23	1290.69												
24	1286.62												
25	1285.66												
26													
27													
28													
29													
30	1280.71												

# DRILLING CORE LOG

Hole No. CD - 5 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192.606.67E  
Caledonia Dam  
189,238.44N

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 50.28 m

Elevation 1310.582 m

Operator         

Direction         

Supervisor         

Inclination          %

Type of Drill Machine         

Capacity of Pump          l/min

Depth (m)	(Thickness) (Elevation)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	p - q curve	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31	1290.03		fels gn									Open cracks 45~50° with clay film at 29.8~30m.	
32			inter chnk									With thin interbeds of mafic band in some sections. Cores are fragmented and short columnar shape at 31.45~33.53m because of many cracks at intervals of 1~10cm; planes have slickenside and striations and are coated with clay film. Crack dip is mainly 45°, 60°, 70°, 80°.	
33	1277.16		bio-gn									Core has few cracks and no open cracks. Closed crack 70° at 34.66~34.83m. Felsic mineral rich at 34.2~34.26m.	
34			bio-gn									With thin interbeds and lenses of mafic band in some sections of some portions. Felsic minerals are rich and include megacrysts of quartz and feldspar. There are many open cracks on the cores at 34.79~37.0m. Cores are fragmental at 35.55~35.90m due to open cracks 60°, 70°; planes have slickenside and striations. Under 36m, open cracks 45°, 50~60° with slickenside and clay film. Closed crack 30° at 37.15m. Closed crack 70~75° at intervals of 5~20mm. Open crack 20° with clay film at 42.32. Open cracks 25~30° at 45.92m, 46.11m; planes are coated with clay film colored black to gray; there are many hair cracks 20°, 30°, 45° along these open cracks. Dip: 70°.	
35	1275.79		bio-gn										
36			bio-gn										
37			bio-gn										
38			bio-gn										
39			bio-gn										
40			bio-gn										
41			bio-gn										
42			bio-gn										
43			bio-gn										
44			bio-gn										
45			bio-gn										
46	1264.33		bio-gn										
47	1263.91		bio-gn									There are no prominent cracks. Slightly mafic mineral rich at 46.8~47.2m. Quartz rich in some portions at 48.32~50.28m. Closed cracks 70~90° at intervals of 10~30cm are very prominent at 47.11~47.77m. Open crack 10° with slickenside and clay film at 48.32m. There are no prominent cracks under 48.32m.	
48			bio-gn										
49			bio-gn										
50	1260.30		bio-gn										
51			bio-gn										
52			bio-gn										
53			bio-gn										
54			bio-gn										
55			bio-gn										
56			bio-gn										
57			bio-gn										
58			bio-gn										
59			bio-gn										
60			bio-gn										



# DRILLING CORE LOG

Hole No. **CD - 6 ①**

Name of Project **Feasibility Study for Upper Kotmale Hydroelectric Power Development Project**

Sheet No. **1** of **2**

Location **Caledonia Dam  
189, 245.74N  
192, 560.49E**

Depth of Bedrock **m**

Bore Hole Dia **mm**

Depth of Hole **40.00** m

Elevation **1335.274** m

Type of

Operator

Direction **Inclination**

Drill Machine

Supervisor

Depth (m)	(Thickness) Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled	
				Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.			Loss Water Vol. (l/min)
1	1334.81	Talus		yel-brn			20 40 60 80%						
2		chkn	D	yel-brn	hly-g	soft							
3	1332.48			yel-wht									
4		inter chkn											
5													
6		inter chkn											
7													
8													
9	1325.90												
10	1325.51	bio-gn											
11	1324.93	inter chkn											
12	1324.41	bio-gn											
13		inter chkn											
14	1321.46												
15	1320.61	bio-gn											
16													
17		inter chkn											
18													
19													
20	1315.78												
21	1314.80	mafo-bd											
22	1314.40	fels											
23	1314.07	mafo-bd											
24		inter chkn											
25	1310.81												
26	1309.62	bio-gn											
27	1308.37	inter chkn											
28	1307.63	fels											
29		inter chkn											
30													

# DRILLING CORE LOG

Hole No. CD - 6 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192,560.49E  
189,245.74N  
 Caledonia Dam

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 40.00 m

Elevation 1335.274 m

Type of Drill Machine         

Operator         

Direction           
 Inclinaton         

Core Recovery          %  
 Underground Water Table          m

Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31														
32	1303.47													
33														
34	1301.13													
35														
36														
37														
38														
39														
40	1295.27													
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CD - 7 (1)

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location Caledonia Dam  
189,210.47N  
192,526.75E

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 40.05 m

Elevation 1371.780 m

Type of Drill Machine         

Operator         

Direction         

Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) Elevation	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> -min)	Infiltrate Water Vol.		
1	1370.78	X	Talus									Silty clay with quartz grains.	
2		~	chkn	D	wh	hilly						Cores are generally soft and fragmented. Very easy to break with fingers at 1.0~1.45m; but rock texture remains. Fragments are slightly hard at 1.45~3.0m, but coated with iron stain and discolored; easy to break with light hammering.	
3	1368.78	~	inter chkn		wh							Core samples are short to long columnar shapes. Weathering and discoloration are proceeding from cracks. Highly weathered rock at 3.55~3.95m; easy to break with fingers.	
4	1367.28	~	inter chkn		wh							Minerals are slightly discolored. Mafic minerals are altered to clay minerals. With interbeds of intermediate chnockite 1~5cm wide.	
5	1366.73	~	inter chkn		wh							Closed crack 45° at 5.20~5.25m. Hair crack 45° at 5.30~5.35m. Closed crack 70°, 50° at an interval of 4cm at 5.58~5.85m.	
6	1365.37	~	mela chkn		wh							Interbed of biotite gneiss 4cm wide at 7.32~7.38m. Quartz vein 2.5mm wide at 7.46~7.53m. Quartz grains rich at 7.89~8.07m. Cores have hair cracks 80~90° in some sections.	
7		~	inter chkn		wh							Quartz megacrysts mixed at 8.07~8.12m. There are no open cracks in this section.	
8	1363.71	~	inter chkn		wh							With interbeds and lenses of biotite gneiss in some portions at 8.62~12.03m. Mafic minerals rich at 9.68~11.0m. Felsic minerals rich at 11.03~11.83m; mixed with big grains of quartz and plagioclase.	
9	1363.16	~	inter chkn		wh							Open cracks 45°, 50° at an interval of 6cm at 9.63~9.80m; planes are coated with clay film colored black to dark green.	
10		~	inter chkn		wh							Open crack 30°, 40° with closed crack and hair cracks at 11.51~11.67m.	
11		~	inter chkn		wh							There are no prominent cracks.	
12	1359.73	~	inter chkn		wh							With interbeds and lenses of felsic band and mafic band at various depths. Mafic band 2~7mm wide and basic chnockite 10~30mm wide at 13.84~14.45m.	
13	1359.33	~	inter chkn		wh							Closed crack 90° at core center at 12.54~12.86m; disappearing on both sides.	
14		~	inter chkn		wh							Open crack 30° with clay film at 12.59m.	
15		~	inter chkn		wh							Open crack 30° with slickenside at 13.10m.	
16		~	inter chkn		wh							Closed crack 60° and hair cracks 90° at 13.61m.	
17	1355.23	~	inter chkn		wh							Open crack 30°~40° with clay film at 14.40~14.47m.	
18	1354.35	~	inter chkn		wh							Closed crack 10°~30° at 14.47~14.82m, 15.60m. Closed crack and open cracks 30°, 45°, 60° at an interval of 40~60mm at 15.89~16.07m.	
19		~	inter chkn		wh							Quartz grains rich at 16.94~17.04. There are no open cracks on the cores. Closed cracks 75° at 16.56~16.73. Closed crack 20° at 17.2m.	
20		~	inter chkn		wh							With interbeds of biotite gneiss in some portions. Hair crack 80~90° at 18.10~18.20m.	
21		~	inter chkn		wh							Open crack 40° with thin clay film at 19.17m.	
22		~	inter chkn		wh							Closed cracks 40°, 35° at 19.63m, 19.87m.	
23	1349.21	~	inter chkn		wh							Open crack 30° with thin clay film at 19.90m. Cores are fragmented at 20.45~21.50 due to high pressure in core tube.	
24	1348.30	~	inter chkn		wh							Interbed of basic chnockite at 21.5~21.65m. No open cracks at 21.65~22.12m.	
25		~	inter chkn		wh							With interbeds of felsic band and intermediate chnockite. Open crack 30° at 23.48m; plane is coated with thin clay film colored black.	
26	1346.02	~	inter chkn		wh							With interbeds and lenses of biotite gneiss and felsic band 2~7cm wide in some portions. Open crack 25° at 24.8m; plane is fresh.	
27	1345.76	~	inter chkn		wh							Open crack 25° with slickenside and clay film at 25.0m.	
28		~	inter chkn		wh							Open crack 25° with clay film at 25.4m.	
29		~	inter chkn		wh							Open crack 45~50° at 25.7~25.75m; plane is coated with clay film colored dark green.	
30		~	inter chkn		wh							Includes biotite lamellas; no open cracks. Generally with lenses of felsic minerals. Pegmatitic texture of megacrysts of quartz, plagioclase, k-feldspar and biotite at 26.96~27.06m. Mafic band 5~10mm wide at 27.94, 28.02m. Interbed of biotite gneiss at 30.25~30.40m. Open cracks 30° at 28.42m, 28.56m; planes have some striations and are coated with clay film colored black to dark green. Discontinuous hair crack 80° at the core center at 28.83~28.89m.	

# DRILLING CORE LOG

Hole No. CD - 7 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192,526.75E  
189,210.47N  
Caledonia Dam

Depth of Bedrock          m     Bore Hole Dia          mm

Depth of Hole 40.05 m

Elevation 1371.780 m

Core Recovery          %

Operator         

Direction              Incline              Type of Drill Machine         

Supervisor         

Underground Water Table          m     Capacity of Pump          l/min

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Core Characteristics		Permeability Test		Drilling Status		Date Drilled
								Rock Quality Designation	Underground Water Table	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	p - q curve	Infiltrate Water Vol.	
31														
32														
33			inter chnk											
34														
35														
36	1336.12		bio-gn											
37	1335.29													
38			inter chnk											
39														
40	1331.73													
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CD - 8 ①

Name of Project Feasibility Study for Upper Kotmale HydroElectric Power Development Project  
 Caledonia Dam  
 189,233.00N  
 192,476.61E

Sheet No. 1 of 2

Location 192,476.61E 189,233.00N 192,476.61E 189,233.00N  
 Depth of Bedrock          m          mm          mm          mm  
 Core Recovery          %          %          %          %

Depth of Hole 40.39 m

Elevation 1365.291 m          m          m          m  
 Direction                                      
 Inclinaton                                    

Operator         

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> -min)	Infiltrate Water Vol.		
1	1384.85	X	Talus		yel-brn	slly wd							
2	1382.94	~	chkn		brn to wht	wd							
3		~			drk-gry to yel-wht								
4		~	inter chkn										
5	1380.12	~											
6	1378.59	~	fels gn										
7		~											
8	1377.09	~	inter chkn										
9		~											
10		~	fels gn										
11	1374.28	~											
12		~											
13		~											
14		~	inter chkn										
15		~											
16		~											
17		~											
18	1367.96	~	fels gn / bio-gn										
19	1366.11	~	Alter										
20		~											
21		~											
22		~											
23		~											
24		~											
25		~	inter chkn										
26		~											
27		~											
28		~											
29		~											
30		~											

# DRILLING CORE LOG

Hole No. CD - 8 (2)

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192°47'6.61E  
Caledonia Dam  
189,233.00N

Depth of Bedrock          m

Bore Hole Dia          mm  
Type of Drill Machine         

Depth of Hole 40.39 m

Elevation 1385.291 m

Core Recovery          %

Capacity of Pump          l/min

Operator         

Direction           
Underground Water Table

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31	1353.86													
32	1352.96		fels gn		20 40 60 80%								Cracks on the cores.	
33			inter chnk										Many cracks 45°-60°-70°-80°-90°, some of them are open with clay film; hair cracks at an interval of 1cm.	
34													Core samples are massive and hard. Cores are of long columnar shape, fragmented and short columnar shape. There are a few cracks on the core. Open crack 30° at 34.8m. Dip: 45°-50°	
35	1350.33		Alter										Felsic gneiss and biotite gneiss alternation at an interval of 3~5cm.	
36	1349.75		bio-gn										Consists of mafic minerals.	
37	1349.21												Core samples are generally massive and hard. Interbeds of biotite lamella 3~10mm wide at 35.88~37.82m. Granitic texture at 36.38~36.54m. There are a few cracks 45°-50° at an interval of 2~3m at 38.02m, 40.39m. The portion of granitic texture has many irregular hair cracks.	
38			inter chnk											
39														
40	1344.90													
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CD - 9

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 1

Location Caledonia Dam  
189, 360.80N  
192, 653.76E

Depth of Bedrock      m    Bore Hole Dia      mm  
Type of      Drill Machine

Depth of Hole 29.50 m

Elevation 1325.843 m    Core Recovery      %  
Direction      Underground  
Inclination      m    Water Table      m    Capacity of Pump      l/min

Operator     

Supervisor     

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> -min)	Infiltrate Water Vol.		
1		X	Talus	red-brn to yellow-brn									
2	1324.04	~	chnk	D									
3		~											
4		~											
5		~											
6		~											
7		~											
8		~											
9		~											
10		~											
11		~											
12		~											
13		~											
14		~											
15		~											
16		~											
17		~											
18		~											
19		~											
20		~											
21	1305.09	~											
22	1303.89	~											
23	1303.10	~											
24	1302.53	~											
25	1300.99	~											
26		~	inter chnk										
27		~											
28		~											
29	1296.34	~											
30		~											

# DRILLING CORE LOG

Hole No. **CD - 10 ①**

Name of Project **Feasibility Study for Upper Kotmale Hydroelectric Power Development Project**

Sheet No. **1 of 2**

Location **Caledonia Dam  
189° 30' 33" N  
192° 58' 25" E**

Depth of Bedrock **mm**  
Bore Hole Dia **mm**  
Type of Drill Machine

Operator **\_\_\_\_\_**  
Supervisor **\_\_\_\_\_**

Elevation **1300.202 m**  
Direction **\_\_\_\_\_**  
Inclination **\_\_\_\_\_**  
Core Recovery **%**  
Underground Water Table **m**  
Capacity of Pump **l/min**

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Core Characteristics		Permeability Test		Drilling Status			Description	Date Drilled
								Rock Quality Designation	Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> min)	p - q curve	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1	1298.20	X	Talus		dark-brn											
2	1298.65		inter chnk	D	brn	hly-		20								
3			inter chnk					40								
4			inter chnk					60								
5	1295.03		bio-gn			wkly-		80								
6	1294.01		bio-gn													
7																
8	1292.16		bio-gn													
9	1291.36		inter chnk													
10																
11																
12																
13			inter chnk													
14																
15																
16	1284.50		fels bd													
17	1284.12															
18																
19																
20																
21																
22																
23			inter chnk													
24																
25																
26																
27																
28																
29																
30																



# DRILLING CORE LOG

Hole No. CD-10 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192,583.25E  
Caledonia Dam  
189,309.33N

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 40.10 m

Elevation 1300.202 m

Operator         

Direction           
 Inclinaton         

Core Recovery          %

Type of Drill Machine         

Underground Water Table          m

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31														
32														
33	1266.81													
34														
35	1264.77		bio-sch											
36														
37														
38			inter chnk											
39														
40	1260.10													
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
51														
52														
53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CD - 11 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location Caledonia Dam  
180° 28' 33" N  
192° 59' 31" E

Depth of Bedrock      m

Bore Hole Dia      mm  
Type of Drill Machine     

Depth of Hole 50.47 m

Elevation 1353.816 m

Core Recovery      %  
Underground Water Table      m

Operator     

Direction     

Inclination      m  
Capacity of Pump      l/min

Supervisor     

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
						Weathering	Hardness	Rock Quality Designation	p - q curve P (kg/cm) q (l/m·min)	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1	1352.32	X	Talus		red- brn to yel- brn	hily- kd	Soft						Clayey silt with quartz grains and highly weathered gravels.	
2	1351.32		chnk	D	brn	hily- kd	Soft						Fragmented ~ short columnar shape. Very easy to break with fingers because of weathering.	
3													Generally core samples are undulated; there are some lenses of felsic minerals and mafic minerals in some portions. Open crack at 2.50m with iron stains. Weathered portion along some cracks at 6.67~6.88m; core has iron stains and discoloration. Partial core loss. Highly weathered portion along some cracks of 4.5°, 60°, 70° at 8.05~8.58m; core samples are fragmented and short columnar shape. Very easy to break with light hammering.	
4														
5														
6														
7					red- brn									
8				D	red- brn	hily- kd	Soft							
9														
10														
11														
12														
13			inter chnk											
14														
15														
16														
17	1336.96													
18	1336.15		mafc- bd											
19														
20														
21														
22														
23														
24			inter chnk											
25														
26														
27														
28														
29														
30														

# DRILLING CORE LOG

Hole No. CD - 11 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192,591.31E  
189,485.33N  
 Caledonia Dam

Depth of Hole 50.47 m

Depth of Bedrock \_\_\_\_\_ m      Bore Hole Dia \_\_\_\_\_ mm

Elevation 1353.816 m

Operator \_\_\_\_\_

Direction \_\_\_\_\_

Core Recovery \_\_\_\_\_ %

Type of Drill Machine \_\_\_\_\_

Supervisor \_\_\_\_\_

Underground Water Table \_\_\_\_\_ m

Capacity of Pump \_\_\_\_\_ l/min

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31	1322.72													
32	1322.17		bio-gn											
33	1321.83		gn											
33	1321.42		Peg											
33	1321.34		gn											
34														
35			inter chnk											
36														
37														
38	1315.88													
39	1315.05		Peg											
40														
41														
42			mafc-bd											
43														
44														
45														
46														
47			inter chnk											
48														
49														
50	1303.35													
51														
52														
53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CD - 12 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location 192.527.94E  
189.359.26N  
 Caledonia Dam

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 40.17 m

Elevation 1331.115 m

Core Recovery          %

Type of Drill Machine         

Operator         

Direction           
 Inclinaton          m

Underground Water Table          m  
 Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Rock Quality Designation	Permeability Test		Drilling Status		Description	Date Drilled
									p - q curve	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1	1330.27	X	Talus		yel-brn			20 40 60 80%					Clayey silt with quartz grains, soft.	
2	1329.22	~	chnk		hly-wd	soft							Very easy to break with fingers. Core samples are fragmented.	
3		~											Core samples are columnar shape. Weathering and discoloration at cracks are prominent.	
4		~	inter chnk			wd							Core loss, highly weathered portion at 2.05~2.55m. Slightly weathered portion at 2.35~2.96m. Open cracks 20° 60° at 2.96m, plane is smooth and coated with iron stains.	
5	1325.84	~											Variation of rock facies is not prominent at 5.21~9.99m. There are some lenses of felsic minerals in some sections.	
6		~											Interbed of mafic band at 13.30~13.46m. Oxidized and pyrite specks are present at 13.43~13.46m.	
7		~											Interbed of mafic band at 14.65~14.75m. Open crack of 25° at 13.30m.	
8		~											Open crack of 15° at 13.46m.	
9		~											Closed crack of 75° at 14.49~14.61m.	
10		~											Open crack 20° at 14.68m, plane has slickenside and striations.	
11		~											Open crack 60° at 14.75m.	
12		~											Interbed of some lenses of felsic minerals in some portions at 15.94~21.81m.	
13		~											No prominent cracks on the core at 15.94~17.99m.	
14		~											Open crack 60° at 17.92~17.99m, with smooth plane colored black to dark green.	
15		~	inter chnk										Open cracks 70° at 18.13~18.28m, plane has oxidation and discoloration along cracks.	
16		~											Closed crack 70~80° at 18.93~19.10m.	
17		~											Open crack 80° with iron stains and discoloration at 20.13~20.26m.	
18		~											Open crack 30° at 20.26~20.36m, with plane colored black to green.	
19		~											Open crack 45° at 20.39~20.42m, plane has slickenside and thin clay film colored bluish green.	
20		~											Open crack 70° at 20.84~20.94m, with plane colored black to dark bluish green.	
21		~											Closed cracks 80° at intervals of 1~3mm at 21.50~21.81m.	
22		~											Variation of rock facies is not prominent, but there are some lenses of felsic minerals in some portions.	
23		~											Open crack 40° at 23.03m, with smooth plane with slickenside and striations.	
24		~											Open crack 40° at 23.22m with thin clay film. Closed crack 40°~45°, 60° at 23.03~23.22m at intervals of 7~40mm.	
25		~											Closed crack 30° at 23.32m, 23.42m.	
26		~											Open crack 70° at 24.45~24.58m, plane has slickenside and striations.	
27		~											Hair cracks 80~90° at 25.10~25.35m.	
28		~											Hair cracks 15° at 26.15m, plane is smooth and has slickenside and striations.	
29		~	fels gn										Hair cracks 90° at 27.49~27.60m.	
30		~											Closed crack 80° at 28.31~28.43m. Includes felsic minerals and megacrysts of quartz and plagioclase at 28.94~29.05m.	

# DRILLING CORE LOG

Hole No. CD - 12 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location Caledonia Dam  
186° 35' 26" N  
192° 52' 94" E

Depth of Bedrock          m      Bore Hole Dia          mm

Depth of Hole 40.17 m

Elevation 1331.115 m

Operator         

Direction         

Supervisor         

Core Recovery          %

Type of Drill Machine         

Underground Water Table          m

Capacity of Pump          l/min

Depth (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
				Color	Weathering	Hardness	Rock Quality Designation	p - q curve	Infiltrate Water Vol.	Loss Water Vol. (l/min)	Bit Type		
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

# DRILLING CORE LOG

Hole No. CD-4-A (1)

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location Caledonia Dam  
189° 26' 1.32" N  
192° 6' 95.75" E

Depth of Bedrock          m      Bore Hole Dia          mm      Depth of Hole 50.55 m

Elevation 1328.496 m      Core Recovery          %      Type of Drill Machine         

Operator         

Direction               Underground Water Table          m      Capacity of Pump          l/min      Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Core Characteristics		Permeability Test		Drilling Status			Description	Date Drilled	
								Rock Quality Designation	Recovery (%)	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)	Bit Type			
1		X	Talus		red-brn												
3	1325.50				yel-brn to yel-wht	hilly-wd											Clayey silt with angular quartz grains φ under 1~2mm. Includes some gravels of highly weathered rock φ 2~100mm.
4																	Core samples look like sand with gravels at 3.00~5.80m. Very easy to break with fingers. Below 5.80m, fragmental cores, very easy to break with light hammering. Fragments are oxidized and discolored. Fragments are undulated but discolored.
6	1321.78		inter chnk			wkly-wd											Core samples are long columnar shape, but oxidized and discolored along some cracks. There are some open cracks on the cores.
8	1320.65																Includes lenses of felsic minerals at 9.96~10.15m, very prominent at 10.40~10.55m. No prominent cracks at 8.38~10.58m. Open crack 60° at 10.58~10.72m, plane has slickenside and clay film 1mm wide colored black~dark green; dip: 65°.
11	1317.78					wkly-fresh											Open cracks 60°-70° with oxidized plane. Fragmented, weathering along cracks.
12	1317.23					wkly-wd											Core samples are almost all long columnar shape and undulated. Includes lenses of felsic minerals below 12.26m. Open crack 80° at 11.27~11.32m, plane has slickenside and striations, coated with clay film. Open crack 90° at 11.44m with iron stains. Open crack 45° at 12.47m with iron stains. Closed crack 80° at 13.84~14.15m. Open crack 10° at 14.57m with iron stains.
15	1313.82																Undulated and no open cracks on the core samples at 14.86~19.13m. Felsic minerals are slightly rich at 15.95~16.64m. Felsic minerals are rich at 17.50~17.78m. Lense of felsic minerals at 18.50~18.65m. Open crack 10° at 16.65m, plane has slickenside. Closed crack of 75° at 16.78~16.94m. Hair cracks of 75° at 18.60~18.70m. Rock facies are homogeneous at 19.13~20.95m. Felsic mineral rich below 20.95m. Includes garnet grains at 22.22~22.51m. Interbed of felsic band at 27.26~27.40m. Felsic minerals poor at 27.40~27.86m. Includes many megacrysts of felsic minerals at 27.95~28.26m, pegmatitic texture. Felsic mineral rich with garnet grains at 31.30~31.50m. Interbed of felsic band at 31.90~31.94m. Closed crack 80° at 20.07~20.36m, 21.75~22.09m. Open crack 80° at 22.90~23.25m, plane has thin clay film colored black to dark green. Closed crack 70° at 26.04~26.14m. Open crack 45° with thin clay film at 26.86m. Open crack 60° at 28.14~28.24m, with plane colored black to dark green.
28	1300.54																
28	1300.24		Peg														

# DRILLING CORE LOG

Hole No. CD-4-A ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location Caledonia Dam  
198°261.32N  
192°695.75E

Depth of Bedrock \_\_\_\_\_ m

Bore Hole Dia \_\_\_\_\_ mm

Depth of Hole \_\_\_\_\_ 50.55 m

Core Recovery \_\_\_\_\_ %

Type of Drill Machine \_\_\_\_\_

Operator \_\_\_\_\_

Supervisor \_\_\_\_\_

Elevation 1328.496 m

Direction \_\_\_\_\_  
Inclination \_\_\_\_\_

Capacity of Pump \_\_\_\_\_ l/min

Depth (m)	(Thickness) (Elevation)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Core Characteristics		Permeability Test		Drilling Status		Description	Date Drilled
								Rock Quality Designation	Recovery (%)	p - q curve	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31								20 40 60 80%							
32															
33															
34															
35															
36			inter chnk			Fresh									
37															
38															
39															
40															
41															
42	1286.99		gra-gn												
43	1286.28		inter chnk												
44	1285.93		bio-gn												
45	1285.59		inter chnk												
46	1284.77		fels gn												
47	1282.96		peg												
48	1282.60														
49	1282.36														
50	1282.23														
51	1277.96														

# DRILLING CORE LOG

Hole No. CI - 1

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 1

Location Caledonia Intake  
189° 180.85N  
192° 854.03E

Depth of Bedrock          m      Bore Hole Dia          mm

Depth of Hole 24.85 m

Elevation 1337.317 m

Core Recovery          %

Operator         

Direction           
Inclination         

Type of Drill Machine         

Supervisor         

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Color	Weathering	Hardness	Rock Quality Designation	Permeability Test		Drilling Status		Description	Date Drilled
									p (kg/cm <sup>2</sup> )	q (l/m <sup>3</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
0														
1														
2														
3														
4			Talus		red-brn									
5														
6														
7														
8	1329.82													
9														
10														
11														
12					yel-brn									
13														
14														
15														
16														
17														
18														
19	1318.79													
20	1317.29													
21	1316.92													
22	1316.67													
23	1314.77													
24														
25	1312.47													
26														
27														
28														
29														
30														



# DRILLING CORE LOG

Hole No. CS - 1 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location 192.542.13E  
186,875.68N  
Caledonia Saddle

Depth of Bedrock          m      Bore Hole Dia          mm

Depth of Hole 32.35 m

Elevation 1369.136 m

Core Recovery          %

Type of Drill Machine         

Operator         

Direction         

Underground Water Table          m

Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1	1369.54	⊗	Talus											
2		▨	inter chnk											
3		▨	bio-gn											
4		▨	inter chnk											
5		▨	inter chnk											
6		▨	inter chnk											
7		▨	inter chnk											
8		▨	bio-gn											
9		▨	inter chnk											
10		▨	inter chnk											
11		▨	inter chnk											
12		▨	inter chnk											
13		▨	inter chnk											
14	1365.14	▨	inter chnk											
15	1354.04	▨	inter chnk											
16		▨	inter chnk											
17		▨	inter chnk											
18		▨	inter chnk											
19		▨	inter chnk											
20		▨	inter chnk											
21		▨	inter chnk											
22		▨	inter chnk											
23		▨	inter chnk											
24		▨	inter chnk											
25		▨	inter chnk											
26		▨	inter chnk											
27	1342.14	▨	inter chnk											
28	1341.80	▨	inter chnk											
29	1340.41	▨	inter chnk											
30		▨	inter chnk											

# DRILLING CORE LOG

Hole No. CS - 1 ②

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project  
 Caledonia Saddle  
 188,875.68N  
 Location 192,542.31E

Sheet No. 2 of 2

Depth of Hole 32.35 m

Depth of Bedrock          m      Bore Hole Dia          mm  
 Type of Drill Machine         

Operator         

Elevation 1369.136 m      Core Recovery          %  
 Direction               Undergound Water Table  
 Inclinaton          m      Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	p - q curve	Lugeon Value	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
31														
32	1336.79	inter chuk			20 40 60 80%	p (kg/cm <sup>2</sup> )	q (l/m·min)						Open cracks 30°, 45°, 80° with clay film at 29.13~29.35m. Open crack 80° with clay film at 29.61~29.96m. Open cracks 45° with clay film at 30.5m. many cracks 70~90°, 10~20° on cores at 30.78~32.35m; samples are fragmented in some sections. Crack planes have slickenside, striations and clay films colored black.	
33														
34														
35														
36														
37														
38														
39														
40														
41														
42														
43														
44														
45														
46														
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50														
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53														
54														
55														
56														
57														
58														
59														
60														

# DRILLING CORE LOG

Hole No. CS - 2 ①

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 1 of 2

Location Caledonia Saddle  
188,829.74N  
192,511.49E

Depth of Bedrock          m      Bore Hole Dia          mm

Depth of Hole 30.45 m

Elevation 1349.065 m

Type of Drill Machine         

Operator         

Direction         

Core Recovery          %

Capacity of Pump          l/min

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> .min)	Infiltrate Water Vol.	Loss Water Vol. (l/min)		
1-4		X												
5	1344.57		Talus		yel-brn to pink-wht									
6-10		~	chnk		yel-brn to yel-wht									
11	1339.02													
12	1337.43		fels gn											
13-30		/												

Silty clay with quartz grains  $\phi$  1~2mm and highly weathered gravels of  $\phi$  2~10mm.

Very easy to break with fingers due to heavy weathering, but rock texture is retained.

Washed cores; consists of medium to coarse sand with quartz grains.

Generally, core samples are columnar~long columnar shape, in some portions fragmented~short columnar shape. There are many cracks on the cores and some of them are open.  
 Closed cracks 80° with clay film at intervals of 10~30mm at 11.75~12.28m.  
 Cracks of 80° at 12.62~13.00m, partially open at 12.8~13.0m, with slickenside and clay film.  
 Closed cracks and open cracks of 30°, 45°, 60°, 70° at 13.0~13.5, open crack planes have slickenside, very easy to split along cracks with light hammering.  
 Cracks of 30~45° at intervals of 3~10cm at 13.5~14.27m, some of them open with clay film.  
 Open cracks 80° at 14.27~14.48m with slickenside, thin clay film and pyrite specks.  
 Cracks of 70~75° at intervals of 4~10cm at 14.48~15.24m.  
 Open crack with clay film and pyrite specks at 14.86~15.11m.  
 Cracks of 70~80° are very prominent at 15.76~17.38m, some of them open with clay film 1~3mm wide; pyrite specks and quartz vein.  
 Open crack 20° with clay film and pyrite specks.  
 Cracks 60° at intervals of 5~10cm at 18.25~19.26m.  
 Open crack 60° at 19.15m, plane has slickenside, striation and thin clay film.  
 Many cracks of 30~45° at intervals of 5~10cm at 19.37~20.15m.  
 Open cracks with slickenside and clay film at 19.45~19.57m.  
 Open crack 80° is very prominent at 19.72~20.00mm with clay film.  
 Irregular crack at 20.0~20.05 with clay film colored green.

# DRILLING CORE LOG

Hole No. CS - 2 (2)

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project

Sheet No. 2 of 2

Location 192, 511.49E  
188, 829.74N  
 Caledonia Saddle

Depth of Bedrock          m

Bore Hole Dia          mm

Depth of Hole 30.45 m

Elevation 1349.065 m

Core Recovery          %

Operator         

Direction           
 Inclinatio         

Underground Water Table          m

Supervisor         

Depth (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status			Description	Date Drilled
				Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm)	p - q curve	Lugeon Value	Infiltrate Water Vol.		
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

# DRILLING CORE LOG

Hole No. CS-3

Name of Project Feasibility Study for Upper Kotmale Hydroelectric Power Development Project  
Caledonia Saddle  
188,742.78N  
Location 192,496.88E

Sheet No. 1 of 1

Depth of Bedrock          m      Bore Hole Dia          mm  
 Core Recovery          %      Type of Drill Machine           
 Underground Water Table          m      Capacity of Pump          l/min

Depth of Hole 30.00 m

Operator         

Elevation 1366.855 m

Direction         

Inclination         

Supervisor         

Depth (m)	(Thickness) Elevation (m)	Geological Symbol	Geology	Rock Quality Classifications	Core Characteristics			Permeability Test		Drilling Status		Description	Date Drilled
					Color	Weathering	Hardness	Rock Quality Designation	P (kg/cm <sup>2</sup> )	q (l/m <sup>2</sup> ·min)	Infiltrate Water Vol. (l/min)		
1	1366.16	X	Talus		red- brn							Clayey silt with quartz grains and weathered gravels.	
2		/			pink- wht							Core samples look like silty sand, but retain rock texture; very easy to break with fingers; it is very difficult to determine the original rock due to heavy weathering; there are some portions that are quartz rich and weathered mica rich at various depths. Quartz rich at 2.30m, φ under 1mm. Quartz grains rich at 4.80m, 5.60m; φ 1~3mm. Consists of weathered mica at 6.70~7.63m. Consists of quartz grains and weathered mica at 8.73~8.80m. Quartz grains and weathered mica rich at 8.80~9.00m. Consists of weathered mica at 9.00~14.00m; very easy to break with fingers. Consists of quartz grains and weathered mica at 14.00~15.50m; interbeds of mafic band in some portions. Quartz rich at 15.50~17.00m. Consists of quartz and weathered mica at 17.00~17.10m. Weathered mica rich at 17.10~17.82m; very easy to break with fingers. Core loss is very prominent at 17.82~20.76m; samples are fragmented, fragments are a little undulated, difficult to break with fingers. Fragments are highly oxidized and discolored; there are some crack planes with iron stains.	
3					to								
4			chkn		pink- brn								
5					to								
6					red- brn	hly- wd							
7			bio- gn		to								
8			inter chkn		red- brn								
9					to								
10					red- brn								
11					yel- brn								
12			bio- gn		to								
13					to								
14					yel- wht								
15			inter chkn										
16			fels gn										
17			bio- gn										
18			inter chkn										
19			fels gn										
20			inter chkn										
21	1346.10												
22			fels gn										
23	1343.86												
24			fels gn										
25													
26													
27	1340.13												
28			gra- gn										
29	1339.88												
29			fels gn										
30	1337.08 1336.88		inter chkn										