

PART - I

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GEOLOGY AND CONSTRUCTION MATERIALS

(地質および建設材料)

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GEOLOGY AND CONSTRUCTION MATERIALS

(地質および建設材料)

A - 1 ~ A - 10

APPENDIX

- A-1 Geologic Log of Drillholes
- A-2 Core Photograph
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A-1 Geologic Log of Drillholes

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GEOLOGIC LOG OF DRILL HOLE

LOS LLANOS PROJECT

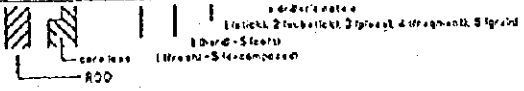
HOLE No. **PHLL 1SP**

(SHEET 1 of 4)

LOCATION	DAM SITE	DEPTH OF HOLE	70.70 m	COMMENCED	
ELEVATION	503.001 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION		LOGEON	P _{max}	P _c							DEPTH RESULT
	0.3			0-100%						0.3 Non Core									0m	
	1	Residual Soil	△		brown	5	5	5	>e	Brown, yellowish brown slime (silty - sandy) with a few brittle rock fragments. Core recovery very poor.									1	
	2		△							4.2									2	
	3		△							Strongly Weathered									3	
	4		△							Brown - greyly brown slime (silty - sandy) with a few gravelish									4	
	5	Conglomerate	○		brown	5	5	5	>e	7.05 cores.									5	
	6		○							Strongly Weathered									6	
	7		○			brownish gray	5	4	3	e	8.05								7	
	8		○							Strongly Weathered									8	
	9		○			brownish gray	5	5	5	>e	9.3								9	
	10		○							9.7 Weathered rocks.									10	
	11		○			brownish gray	4	3	2	d	Probably brittle cracky, and loosened rocks by weathering.								11.00	11
	12		○							Core loss in part, but almost sticky core.									No Return	12
	13		○			yellowish gray	(5)	(4)	(3)		Partially discolored by weathering.								12.50	13
	14	○							14.8									14		
	15	○			yellowish gray	5	4	4	e	Generally very cracky (Apparently loosened rocks)									15	
	16	○							17.2									16		
	17	○							Generally cracky										17	
	18	○							(2)	18.5								18		
	19	○			brownish gray	4	4	3	e	Possibly very cracky and somewhat loosened rocks.									19	
	20	○							(5)(3)(4)										20	

Core Lobo Test
9.75



A-1 Geologic Log of Drillholes

- Fig A-1-1 Geologic Log PHLL1SP
- Fig A-1-2 Geologic Log PHLL2SP
- Fig A-1-3 Geologic Log PHLL3SP
- Fig A-1-4 Geologic Log PHLL4SP
- Fig A-1-5 Geologic Log PHLL5CM
- Fig A-1-6 Geologic Log PHLL6CM
- Fig A-1-7 Geologic Log PHLL7CM
- Fig A-1-8 Geologic Log PHLL8CM
- Fig A-1-9 Geologic Log PHLL9CM
- Fig A-1-10 Geologic Log PHLL10TO
- Fig A-1-11 Geologic Log PHLL11TP
- Fig A-1-12 Geologic Log PHLL12CM
- Fig A-1-13 Geologic Log PHLL13CM
- Fig A-1-14 Geologic Log PHLL14CM
- Fig A-1-15 Geologic Log PHLL15CM
- Fig A-1-16 Geologic Log PHLL16CM
- Fig A-1-17 Geologic Log PHLL17TP
- Fig A-1-18 Geologic Log PHLL18TP
- Fig A-1-19 Geologic Log PHLL19CM

GEOLOGIC LOG OF DRILL HOLE

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HOLE No. **PHLL 1SP**

(SHEET 1 of 4)

LOCATION	DAHSITE	DEPTH OF HOLE	70.70 m	CORRENCED	
ELEVATION	503.001 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION		LOGEON	Pmax	Pc						
	0.3			0.3						0.3							X		0m
	1	Residual Soil	△		brown	5	5	5	>e	0.3 Non Core									
	2			Brown, yellowish brown slime (silty - sandy) with a few brittle rock fragments.															
	3			Core recovery very poor.															
	4			4.2															
	5	Conglomerate	○		brown	5	5	5	>e	Strongly Weathered									
	6			Brown - greyly brown slime (silty - sandy) with a few gravelish cores.															
	7			7.05															
	8	Conglomerate	○		brownish gray	5	4	3	e	Strongly Weathered									
	9			8.05															
	10	Conglomerate	○		brownish gray	5	5	5	>e	Strongly Weathered									
	11			9.3															
	12	Conglomerate	○		brownish gray	4	3	2	d	9.7 Weathered rocks.									
	13			Probably brittle cracky, and loosened rocks by weathering.															
	14	Conglomerate	○		yellowish gray	(5)	(4)	(3)		Core loss in part, but almost sticky core.									
	15			11.00															
	16	Conglomerate	○		yellowish gray	5	4	4	e	Partially discolored by weathering.									
	17			12.50															
	18	Conglomerate	○		brownish gray	4	3	3	d	Generally very cracky (Apparently loosened rocks)									
	19			14.8															
	20	Conglomerate	○		brownish gray	4	4	3	e	Generally cracky									
	21			17.2															
	22	Conglomerate	○		brownish gray	4	3	(2)	d	Possibly very cracky and somewhat loosened rocks.									
	23			18.5															
	24	Conglomerate	○		brownish gray	4	4	3	e	Generally cracky									
	25			19.7															
	26	Conglomerate	○		brownish gray	5	(3)	(4)	e	Probably brittle cracky, and loosened rocks by weathering.									
	27			20.5															

GEOLOGIC LOG OF DRILL HOLE

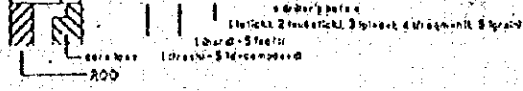
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LOS LLANDS PROJECT

HOLE No. **PBLL 1SP** (SHEET 2 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	10.70 m	COMMENCED	
ELEVATION	503.001 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	LOGEON		P _{max}	T _c	DEPTH RESULT						
20.0				0-100%	Brownish gray	4	4	3	b	20.1	Kg/cm ²	20.00					X		0m
21.0					light gray	(5)	(3)	(4)		Generally cracky and somewhat weathered rocks	No Return	21.50							1
22.0										Some cracks and/or joints are discolored along their planes. Sticky core somewhat weathered, but not so brittle.								2	
23.0						3	3											3	
24.0						(4)	(2)		c	Some cracks and/or joints are discolored along their planes. Sticky core somewhat weathered, but not so brittle.								4	
25.0																		5	
26.0																		6	
27.0																		7	
28.0																		8	
28.4						3	4			28.4								8	
29.0						4	(4)	(3)	e	29.0 Cores broken into small pieces in part.								9	
30.0										Some cracks and/or joints are rather discolored along their planes.		30.00						0	
31.0						3	3	3	d	Some cracks and/or joints are rather discolored along their planes.	No Return	31.50						1	
32.0																		2	
32.6						3	3	4		32.6								2	
32.8						(4)	(4)			32.8 Cracky part.								3	
33.0										Lithologically hard but cracky in general.								3	
34.0						(2)	2		c									4	
35.0																		5	
35.6						3	3	4		35.6								5	
36.0						3	(4)	4		Some cracks with clayish materials, somewhat cracky.								6	
37.0						3	2		d									7	
38.0						(3)				38.2								8	
38.2-38.8m						3			c	38.2-38.8m sandstone								9	
39.0						(2)				Generally hard compact								9	
40.0																		0	



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

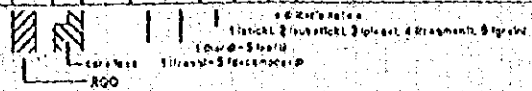
HOLE No. **PHLL 1SP**

(SHEET 3 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	70.70 m	COMMENCED	
ELEVATION	503.001 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCKY EVALUATION		LUCEON	Pmax	Pc						
	40.0			0-100%	light gray	3	2	(2)	c	Somewhat cracky			40.00						0m
	40.9				light gray	3	(2)	(3)	c	40.9		No Return							
	41.4				light gray	3	(4)	(4)	d	41.4 Slightly cracky			41.50						1
	42.7								2	Somewhat cracky.									2
	43.0									Compact rather fresh									3
	44.0					3	3	2		Partially somewhat weathered along cracks and/or joints.									4
	45.0					(2)	(2)	(3)											5
	47.9								c	Slightly brittle as a whole.									7
	49.0					2		2		Slightly brittle at cracky parts.									8
	50.0					(3)				50.0			50.00				Core Lab. Test	49.45	9
	51.5				light gray	3	2		d	Somewhat cracky as a whole.		No Return							0
	51.5					(2)							51.50						1
	52.0						(3)			Generally massive and fresh.							Core Lab. Test	51.50	2
	53.0					2		2	b	with a few joints or cracks.									3
	54.0						(1)												4
	55.1									55.1									5
	56.8-57.4					3	3	(4)	(3)	d	Somewhat cracky. Partially gravelish core at 56.8-57.4m.								6
	58.0					2	2		b	Hard compact rather fresh							Core Lab. Test	58.00	8
	59.0					2	2	(1)		Massive sticky core.									9

Conglomerate



GEOLOGIC LOG OF DRILL HOLE

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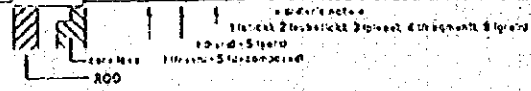
LOS LLANOS PROJECT

HOLE No. **PHLL 1SP**

(SHEET 4 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	70.70	COMMENCED	
ELEVATION	503.001	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	O.W.L (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LOGEON	P _{max}	P ₀						
60.00	0			0-100%															0m
61.00	1							2		Hard compact rather fresh			No Return						1
62.00	2					2	2		b	Massive sticky core somewhat cracky in part.									2
63.00	3							(1)											3
64.00	4								d	64.0									4
64.3						3	3	4	d	64.3 Cracky part									
65.00	5								b	Hard, compact rather fresh.									5
66.00	6					2	2		(1)										6
67.00	7								c	Somewhat cracky.									7
67.75						(2)	(2)		3	67.75									
68.00	8									Generally massive. Hard, compact rather									8
68.90																			8
69.00	9					2	2	2	b	fresh sticky core somewhat cracky in part.			No Return						9
70.00	0																		0
70.40																			0
	1									Bottom of Hole at 70.70m									1



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL 2SP**

(SHEET 1 of 5)

LOCATION	DAMSITE	DEPTH OF HOLE	83.30 m	COMMENCED	
ELEVATION	510.332 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			DEPTH						
					COLOR	WEATHERING	HARDNESS	CRACK SPACING		ROCK EVALUATION	LUCEON	P _{max}		P _c	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRIILL WATER RETURN
				0-100%						Kgf/cm ²			%					0m	
	0.5								0.5									0.5	Non Core
	1.0				yellow	5	5	5										1.0	Strongly Weathered
	2.0				light gray	3	3	2	c									2.0	Fresh core but oxide in crack in part Generally hard, compact sticky core.
	4.0				light gray	3	3	2	c									4.0	Core Labo. Test 2.50
	4.5																	4.5	Non Core
	5.0				light gray	3	3	3	d									5.0	Cores easily broken Somewhat cracky
	6.1				light gray	3	3	2	c									6.1	as a whole Generally somewhat cracky.
	9.4				yellow	3	3	3	d									9.4	Recovered some stick cores.
	10.1				yellow	(4)	3	3	d									10.1	Cracky.
	11.7				light gray	(2)	3	2	c									11.7	Cracky parts are discolored and slightly brittle
	14.7				light gray	2	2	1	b									14.7	Generally fresh. Hard, compact, massive sticky core.
	15.0				light gray	2	2	1	b									15.0	The longest length of core is nearly 1m.
	15.5				light gray	2	2	1	b									15.5	Conglomerate with well rounded gravel.
	19.4				light gray	2	2	1	b									19.4	Coarse sandstone in part, but bedding planes are not clear.
	20.0																	20.0	



1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00
 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00
 21.00 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.00
 31.00 32.00 33.00 34.00 35.00 36.00 37.00 38.00 39.00 40.00
 41.00 42.00 43.00 44.00 45.00 46.00 47.00 48.00 49.00 50.00
 51.00 52.00 53.00 54.00 55.00 56.00 57.00 58.00 59.00 60.00
 61.00 62.00 63.00 64.00 65.00 66.00 67.00 68.00 69.00 70.00
 71.00 72.00 73.00 74.00 75.00 76.00 77.00 78.00 79.00 80.00
 81.00 82.00 83.00 84.00 85.00 86.00 87.00 88.00 89.00 90.00
 91.00 92.00 93.00 94.00 95.00 96.00 97.00 98.00 99.00 100.00

GEOLOGIC LOG OF DRILL HOLE

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HOLE No. **PBLL 2SP** (SHEET **2 of 5**)

LOCATION	DAMSITE	DEPTH OF HOLE	83.30	COMPLETED	
ELEVATION	510.332	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER-INC	HARDNESS	CRACK SPACING		ROCK EVALUATION	LUCEON	P _{max}						
20.0				0.1														0m
21.0									Somewhat hard and compact as a whole. Generally fresh and massive sticky core.	No Return								1
22.0									The longest length of core is nearly 1m. Conglomerate with well rounded gravel.									2
23.0									Coarse sandstone in part, but bedding planes are									3
24.0									28.4 not clear.									4
25.0									29.1 somewhat massive									5
26.0									Partially slightly brittle.									6
27.0									Partially a few oblique joints with very slightly discolored planes.	No Return								7
28.0									Generally fresh, hard compact and massive sticky core.									8
29.0									36.9									9
30.0									37.55 part alternate									0
31.0									Generally hard. Fresh hard compact and massive. Somewhat cracky in part.									1
32.0																		2
33.0																		3
34.0																		4
35.0																		5
36.0																		6
37.0																		7
38.0																		8
39.0																		9
40.0																		0

Conglomerate



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GEOLOGIC LOG OF DRILL HOLE

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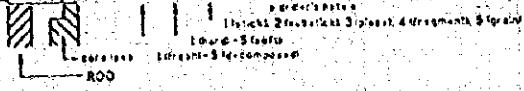
LOS LLANOS PROJECT

HOLE No. **PHLL 2SP**

(SHEET 3 of 5)

LOCATION	DAMSITE	DEPTH OF HOLE	83.30 m	COMMENCED	
ELEVATION	510.332 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH					
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	P _{max}	P _c	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)
40.0	0.0			0-100%															0m	
41.0	1.0				light gray	2	2	1	b	Compact, and fresh and somewhat cracky in part.				No Return						1
42.0	2.0				light gray			(2)						41.50						2
43.0	3.0				yellow	3				43.3										3
44.0	4.0				gray yellow	(4)	3	3	d	43.8 Somewhat weathered rocks										4
45.0	5.0				gray	2	2	2	c	Partially somewhat cracky.										5
46.0	6.0					(3)	(3)	(3)		45.2										6
47.0	7.0									Generally hard and compact										7
48.0	8.0									Fresh and massive sticky core.										8
49.0	9.0									Somewhat cracky in part with horizontal or gentle dip cracks.				50.00						9
50.0	10.0	Conglomerate												No Return						10
51.0	11.0				light gray	2	2	1	b	Conglomerate with well rounded gravel.				51.50						11
52.0	12.0									Gravel size is cobble to granule. Coarse sandstone in part, but bedding planes are not clear. Rock species of gravel are sedimentary rocks (ex: conglomerate or sandstone) and some volcanic rocks.										12
53.0	13.0																			13
54.0	14.0																			14
55.0	15.0																			15
56.0	16.0																			16
57.0	17.0																			17
58.0	18.0																			18
59.0	19.0																			19
60.0	20.0																			20



GEOLOGIC LOG OF DRILL HOLE

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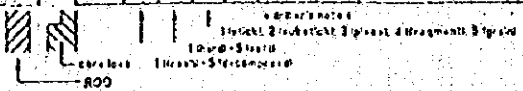
HOLE No. **PHLL 2SP**

(SHEET 4 of 5)

LOCATION	DAMSITE	DEPTH OF HOLE	83.30 m	COMPLETED	
ELEVATION	510.332 m	DIRECTION OF HOLE	V.	COMPLETED	017
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (DEPTH)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING		ROCK EVALUATION	LOGGED	Penax						
60.0				0.4 100%					Hard and compact.									0m
61.0					light gray	2	1	b	60.9									1
62.0					light gray	2	3	c	slightly cracky. Somewhat hard and compact.									2
63.0					yellow	(3)	(2)		63.1									3
64.0					yellow	(4)	(3)	d	63.3									4
65.0									Lithologically hard and compact									5
66.0					light gray	2	1	b	Fresh and massive sticky core with horizontal or gentle dip cracks in part.									6
67.0					light gray	2												7
68.0									68.8									8
69.0						(3)	3	c	Cracky and somewhat brittle as a whole.									9
70.0						2		b	slightly cracky. Generally compact and massive.									0
71.0						2	(1)		71.1									1
72.0					yellowish gray	3	2		Generally cracky. Most of crack/joint planes are discolored by weathering.									2
73.0					yellowish	(4)	(3)	d										3
74.0									75.1									4
75.0					yellow	4	4	e	Somewhat cracky as a whole.									5
76.0					gray	(3)	(5)		76.2	12.59								6
77.0					light gray	3	2	c	slightly cracky. Generally gravelish core.									7
78.0					gray	(2)	(3)		78.3									8
79.0					yellowish	4	4	e	Generally cracky, moderately weathered along cracks									9
80.0					gray	(3)	(3)		80.0	19.85								0

Conglomerate



GEOLOGIC LOG OF DRILL HOLE

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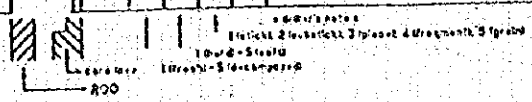
LOS LLANOS PROJECT

HOLE No. **PHLL 2SP**

(SHEET **5 of 5**)

LOCATION	DAMSITE	DEPTH OF HOLE	83.30	COMPLETED	
ELEVATION	510.332	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH				
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}							P _c	DEPTH RESULT		
	80.0	Conglomerate	○	100%	light gray	2	2	1	b	Generally hard and compact but slightly crack as a whole. Fresh sticky core.								81.50	0m			
	81.0																	(3)		(3)	(2)	No Return
	82.0																	83.00				
	83.0	Bottom of Hole at 83.30m																				
	84.0																					
	85.0																					
	86.0																					
	87.0																					
	88.0																					
	89.0																					
	90.0																					
	91.0																					
	92.0																					
	93.0																					
	94.0																					
	95.0																					
	96.0																					
	97.0																					
	98.0																					
	99.0																					
	100.0																					



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHL 3SP

(SHEET 1 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	80.0	m	COMMENCED	
ELEVATION	493.922	DIRECTION OF HOLE	V.		COMPLETED	
COORDINATE		CORE RECOVERY	%		DRILLED BY	
		DRILLING MACHINE			LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.W)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax						
	0			0-100%						Non Core								0m
	1.0									Cracks and/or joints with discolored planes due to weathering.								
	2.0				brownish gray	4	4	4										
	3.0					(5)		(5)										
	4.0					4	3	3	e									
	5.0					(3)	(4)											
	6.0				light gray	3	3	3	c	slightly, brittle Discolored along crack and/or joint planes.				Core Labo. Test				
	7.0					(2)	(2)	(2)							4.70			
	8.0					2	3	3	d	Generally rather cracky.				Core Labo. Test				
	9.0					(3)				7.8				7.00				
	10.0									Generally hard and compact but cracky and weathered along most of cracks and/or joints.				Deformation Test				
	11.0													7.0				
	12.0													8.0				
	13.0													8.50				
	14.0													No Return				
	15.0													10.00				
	16.0																	
	17.0																	
	18.0																	
	19.0																	
	20.0																	

GEOLOGIC LOG OF DRILL HOLE

LOS LLANOS PROJECT

HOLE No. PHLL 3SP

(SHEET 2 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	80.0	COMPLETED	
ELEVATION	493.922	DIRECTION OF HOLE	Y.	DRILLED BY	
COORDINATE		CORE RECOVERY	X	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE				TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	UNIFORM						
	20.0			100%						Somewhat brittle at cracky part.							0m
	21.0				gray	2	2	b		Most of cracks and/or joints are discolored due to weathering.	14.25		21.50				1
	22.0					(3)							3				2
	23.0				low	4	5	5		23.8			23.00				2
	24.0					(5)	(4)	(4)		23.9							3
	25.0									Hard, compact and fresh in lithologic.							4
	26.0																5
	27.0									Cracky parts somewhat weathered and brittle.							6
	28.0																7
	29.0				gray	(3)				Some parallel cracks with oblique dip at 34.2-34.5, 35.1-35.5, 36.7-36.9m, with gentle to horizontal dip at 31.0-31.6m, 38.2-38.5m.							8
	30.0												30.35				9
	31.0												15.14				0
	32.0									with gentle to horizontal dip at 31.0-31.6m, 38.2-38.5m.			9				1
	33.0												31.85				2
	34.0									Conglomerate with well rounded gravel.							3
	35.0												15.53				4
	36.0									Gravel size is cobble to granule.			34.30				5
	37.0				light gray			1					35.80				6
	38.0							(2)					36.30				7
	39.0												15.73				8
	40.0												7				9
													37.80				0
																	1
																	2
																	3
																	4
																	5
																	6
																	7
																	8
																	9
																	0

Conglomerate

GEOLOGIC LOG OF DRILL HOLE

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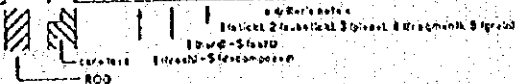
LOS LLANOS PROJECT

HOLE No. PHL 3SP

(SHEET 3 of 4)

LOCATION	DAMSITE	DEPTH OF HOLE	80.0	COMPLETED	
ELEVATION	493.922	DIRECTION OF HOLE	V.	DRILLED BY	
COORDINATE		CORE RECOVERY	%	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	DRILL WATER RETURN %	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc					
40				0.3 100%													Core Labo. Test	0m
41					light gray	2	2	1	b	Generally massive. Hard, compact and fresh sticky core, with a few horizontal to gentle dip cracks.							40.00	1
42																		2
43								(2)		Coarse sandstone in part.								3
44																		4
45										45.6							Core Labo. Test	5
46					gray	3	4	5	e	46.0 Weathered and cracky zone.							45.80	6
47					low gray	2	2	2	b	Somewhat massive and compact.			46.50					7
48					low gray	3	4	4	d	47.5 Slightly discolored	16.75		3					8
49										48.00								9
50										Compact and fresh. Generally massive and hard sticky core with a few horizontal to gentle dip cracks.								0
51						2	3	2	b								Core Labo. Test	1
52					gray			(1)		Conglomerate with well rounded gravel.							51.25	2
53																		3
54										Coarse sandstone in part.							53.60	4
55										54.6 Sheared part.								5
56										54.7								6
57					yellow	2	3	2	b	Partially cracky but rather massive as a whole.								7
58								(1)		57.1								8
59					gray	3	3	2	c	57.7 Rather cracky as a whole.								9
60								(2)										0
										Rather massive part and slightly cracky part are alternated.								



GEOLOGIC LOG OF DRILL HOLE

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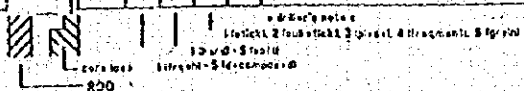
LOS LLANOS PROJECT

HOLE No. PHL 3SP

(SHEET 4 of 4)

LOCATION	DAM SITE	DEPTH OF HOLE	80.0 m	COMPLETED	
ELEVATION	493.922 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH								
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	γ _{LOG}	P _{max}	PC		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)		
	60m			9-100%																0m		
	61	Conglomerate								Generally hard, compact and fresh. Massive sticky core with few horizontal to gentle dip cracks. Some parallel and oblique cracks at 70.4-70.6m, 74.5-74.8m and 77.5-77.8m. Almost planes of cracks are not oxidized nor weathered.											1	
	62																					2
	63																					3
	64																					4
	65																					5
	66																					6
	67																					7
	68																					8
	69																					9
	70						gray	2	2	1			18.99	3								0
	71																				1	
	72																				2	
	73																				3	
	74																				4	
	75																				5	
	76																				6	
	77																				7	
	78																				8	
	79																				9	
	80																				0	



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

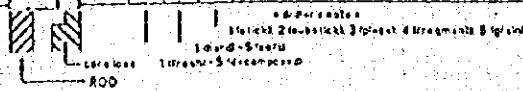
HOLE No. **PHLL 4SP**

(SHEET 1 of 3)

LOCATION	DAMSITE	DEPTH OF HOLE	60.0 m	COMPLETED	
ELEVATION	453.755 m	DIRECTION OF HOLE	70/300	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	PC						
	0			0-100						U.3 Concrete		Kgf/Cd				%		0m	
	1									Core recovery poor in general.								1	
	2					brownish gray	4	4	4	(Probably strongly weathered rocks with rather hard blocks in part)								2	
	3					(5)	(5)	(5)										3	
	4																	4	
	5								e	Almost gravelish core.								5	
	6					gray	4		3	Some fresh and compact part are probably residual from weathering.								6	
	7					(3)												7	
	8					brownish gray	4	4	5									8	
	9					(5)	(4)			9.1								9	
	10							2		Most of crack/joint planes are more or less, discolored due to weathering.			10.40					10	
	11						3		(3)				No Return					11	
	12						(2)	3	d	Generally cracky with horizontal to gentle dip cracks.		13.29		11.90				12	
	13							3					37	Core Lab. Test		12.75		13	
	14												13.40					14	
	15					gray				14.6			14.70					15	
	16									Cracky and somewhat brittle.		13.57		23				16	
	17						2	1	b	Generally fresh, compact and hard sticky core.			16.20					17	
	18						(3)	(2)		The longest length of core is nearly 1m.								18	
	19																	19	
	20																	20	

Conglomerate



GEOLOGIC LOG OF DRILL HOLE

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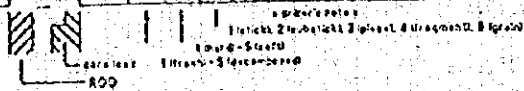
LOS LLANOS PROJECT

HOLE No. PHL 4SP

(SHEET 2 of 3)

LOCATION	DAMSITE	DEPTH OF HOLE	60.0 m	COMPLETED	
ELEVATION	453.755 m	DIRECTION OF HOLE	70/300	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHER-INC	HARDNESS	CRACK SPACING		ROCK EVALUATION	LUREON	Pmax						
	0m																	
	2.1				2		1	b	Cracky and somewhat brittle.									
	2.2					(3)	(2)		Generally fresh, compact sticky									
	2.3				3		4	d	22.8 core. Somewhat cracky.									
	2.4								Rather hard and compact but cracked moderately as whole.									
	2.5																	
	2.6				2		1	b	Generally fresh and massive sticky									
	2.7					(3)	(2)		core with few horizontal to gentle dip cracks.									
	2.8																	
	2.9																	
	3.0				2		3		29.8									
	3.1				(3)	(2)	3		Partially hard and compact, but generally rather cracky.									
	3.2						2	c	Planes of cracks are not oxidized nor weathered.									
	3.3				(3)	(3)			34.0									
	3.4																	
	3.5				2				Hard and compact but somewhat									
	3.6						1		cracky in part. Fresh and massive									
	3.7				2	(2)	b		sticky core with few cracks gentle to horizontal dip.									
	3.8								Replacement of matrix to silicate minerals in part.									
	3.9																	
	4.0																	



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHL 4 SP

(SHEET 3 of 3)

LOCATION	DAM SITE	DEPTH OF HOLE	60.0 m	COMPLETED	
ELEVATION	453.755 m	DIRECTION OF HOLE	70/300	DRILLED BY	
COORDINATE		CORE RECOVERY	5	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	OIL/WATER RETURN	G.W.L. (opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LOGEON	P _{max}	P _c						
40				0-100%															0m
41	41	Conglomerate			gray	2	2	1	b	Hard, compact, fresh and rather massive	12.13		40.30						1
42	42	Conglomerate			gray	2	2	(2)	b				55						2
43	43	Sandstone			dark gray	2	2	2	b	42.9			41.80						3
44	44	Conglomerate			gray	2	2	2	b	Cracky part are somewhat discolored									4
45	45	Sandstone			gray	2	2	2	b	45.4			45.20						5
46	46	Conglomerate			dark gray	2	3	4	d	Somewhat separatable along bedding plane	16.62		0						6
47	47	Sandstone			gray	2	2	2	b	Somewhat hard and fresh.	16.76		46.70						7
48	48	Conglomerate			gray	3	3	4	d	Somewhat cracky as a whole.			48.10						8
49	49	Sandstone			gray	2	2	2	b	Generally fresh, compact, hard and massive sticky core.									9
50	50	Conglomerate			gray	2	3	1	b	50.4									0
51	51	Sandstone			dark gray	2	2	2	b	50.8 Cracky along bedding plane									1
52	52	Conglomerate			gray	2	2	1	a	Generally hard, compact and fresh									2
53	53	Conglomerate			gray	2	2	2	a	sticky core with few oblique cracks in part.									3
54	54	Conglomerate			gray	(1)	(2)		a	Planes of cracks are not oxidized nor weathered.									4
55	55	Conglomerate			gray				a	Conglomerate with well rounded gravel.									5
56	56	Conglomerate			gray				a	Coarse sandstone in part.									6
57	57	Conglomerate			gray				a										7
58	58	Conglomerate			gray				a										8
59	59	Conglomerate			gray				a										9
60	60								a	Bottom of Hole at 60.00m									0

GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PBL 5CM

(SHEET 1 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	30.00 m	COMPLETED	
ELEVATION	97.503 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCCON	Pmax	PC							DEPTH RESULT
	0 → 100																			
	0.35		△							0.35 Non Core										
	1	Talus Deposits	△			brown	5	5	5	e	Mostly silt and/or sand) with a few gravels.									
	2		△								Core recovery is very poor.									
	3																			
	4			△							4.35									
	5	Mudstone (Marl)				brown	5	4	4	e	Strongly Weathered Cores broken into small pieces in part.								4.65	
	6								(5)											
	7										7.35									
	8									Detail Condition of Core are unknown because of crumbling										
	9																			
	10																			
	11																			
	12						2	5	5	d										
	13						(?)	(?)	(?)	(?)										
	14																			
	15																			
	16																			
	17																			
	18																			
	19																			
	20																			

GEOLOGIC LOG OF DRILL HOLE

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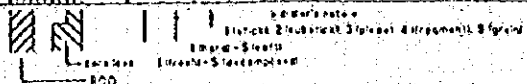
LOS LLANOS PROJECT

HOLE No. PHL 5CM

(SHEET 2 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	30.00 m	COMPLETED
ELEVATION	97.503 m	DIRECTION OF HOLE	V.	LOGGED BY
COORDINATE		CORE RECOVERY	X	DRILLED BY
		DRILLING MACHINE		LOGGED BY

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH							
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}	P _c	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)		
20.0	0	Mudstone (Marl)		0-100%	bluish gray	2	5	5	d	Detail Condition of Core are unknown because of crumbling.									0m			
21.0	1																				1	
22.0	2																					2
23.0	3																					3
24.0	4																					4
25.0	5																					5
26.0	6																					6
27.0	7																					7
28.0	8																					8
29.0	9																					9
30.0	0									Bottom of Hole at 30.00m										0		
1	1																			1		
2	2																			2		
3	3																			3		
4	4																			4		
5	5																			5		
6	6																			6		
7	7																			7		
8	8																			8		
9	9																			9		
	0																			0		



GEOLOGIC LOG OF DRILL HOLE

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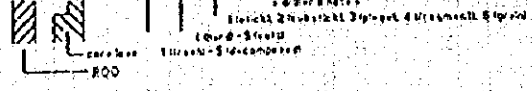
LOS LLANOS PROJECT

HOLE No. **PELL 6CM**

(SHEET 1 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	24.30 m	COMMENCED	
ELEVATION	95.540 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGION	Pmax	Po							DEPTH RESULT
	0			0 - 100%													X		0m	
	1	Tplus Deposits	△			brown	5	5	5	>e	0.2 Non Core Gravelish cores only. with some slime. 2.2							▽ 1.3	1	
	2																			2
	3										Detail Condition of Core are unknown because of crumbling								3	
	4																		4	
	5																		5	
	6																		6	
	7																		7	
	8																		8	
	9																		9	
	10																		10	
	11	Mudstone (Marl)					2	5	5	d									11	
	12						bluish gray	(?)	(?)	(?)	(?)									12
	13																			13
	14																			14
	15																			15
	16																			16
	17																			17
	18																			18
	19																			19
	20																			20



GEOLOGIC LOG OF DRILL HOLE

Page

LOS LLANOS PROJECT

HOLE No. **PHLL 6CM**

(SHEET **2 of 2**)

LOCATION	POWERHOUSE	DEPTH OF HOLE	24.30 m	COMENCED	
ELEVATION	95.540 m	DIRECTION OF HOLE	Y	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH									
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Po		DEPTH RESULT	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)				
	20 m	Mudstone (Marl)		100%	bluish gray	2 (?)	5 (?)	5 (?)	d (?)	Detail Condition of Core are unknown because of crumbling										20 m			
	21																						
	22																						
	23																						
	24											Bottom of Hole at 24.30m											
	5																						
	6																						
	7																						
	8																						
	9																						
	0																						
	1																						
	2																						
	3																						
	4																						
	5																						
	6																						
	7																						
	8																						
	9																						
	0																						



1. Drill's name
 2. Location
 3. Date
 4. Drilling
 5. Core
 6. Diameter
 7. Length
 8. Weight
 9. Recovery
 10. Direction
 11. Remarks

EPDC
 ELECTRIC POWER DEVELOPMENT CO. LTD.

GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHL-7CM**

(SHEET 1 of 2)

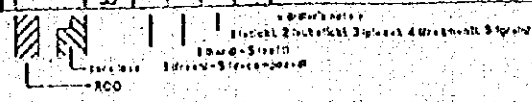
LOCATION	POWERHOUSE	DEPTH OF HOLE	28.00 m	COMPLETED	
ELEVATION	95.086 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	X	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (CO.FT.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	P _{max}	P _c	DEPTH RESULT						
	0			0 = 100%																0m
	0.4									0.4 Non Core										
	1									Strongly Weathered										
	2									Weathered rocks.										
	3									Cores easily broken										
	4									into pieces.										
	5									Green colored										
	6									Montmorillonite										
	7									at 4.1m										
	8									Mostly gravelish and										
	9									discolored cores.										
	10									Core recovery is										
	11									very poor.										
	12									9.6										
	13									Somewhat weathered but										
	14									not so sheared										
	15									Core recovery poor										
	16									in general.										
	17									Almost core										
	18									length is less										
	19									than 5cm.										
	20									Original rock										
	21									structure are										
	22									hard to										
	23									identify.										
	24									17.35 Sheared										
	25									Detail Condition										
	26									of Core are unknown										
	27									because of crumbling										

Conglomerate

Mudstone (Marl)

▽
3.90



GEOLOGIC LOG OF DRILL HOLE

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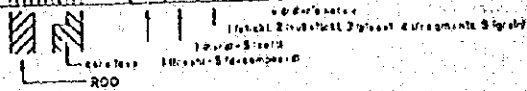
LOS LLANOS PROJECT

HOLE NO. **PHL 7CM**

(SHEET **2 of 2**)

LOCATION	POWERHOUSE	DEPTH OF HOLE	28.00 m	COMPLETED	
ELEVATION	95.086 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CEMENTATION	DRILL WATER RETURN	G.W.L. (O.P.H.)	DEPTH	
					COLOR	WEATHER-ING	HARD-NESS	CRACK-SPACING	ROCK-EVALUATION	DESCRIPTION	LUCEON	P _{max}						P _c
	20 m			0-100%											X		0m	
	21	Mudstone (Marl)			bluish gray	2	5	5	d	Detail Condition of Core are unknown because of crumbling								
	22																	
	23																	
	24																	
	25																	
	26																	
	27																	
	28																	
	29																	
	30																	
	31																	
	32																	
	33																	
	34																	
	35																	
	36																	
	37																	
	38																	
	39																	
	40																	



GEOLOGIC LOG OF DRILL HOLE

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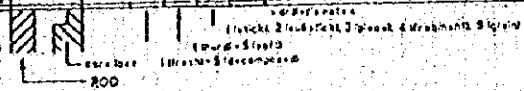
LOS LLANOS PROJECT

HOLE No. PHLL-8CM

(SHEET 1 of 1)

LOCATION	POWERHOUSE	DEPTH OF HOLE	20.10 m	COMPLETED	
ELEVATION	86.146 m	DIRECTION OF HOLE	V.	DRILLED BY	
COORDINATE		CORE RECOVERY	X	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH				
					COLOR	WEATHERING	HARDNESS	CRACKING	SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	P _{max}	P _c		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION
	0			0-100%															0m
	0.25										U. 25 Non Core								
	1		<input type="checkbox"/>								Core recovery is very poor. Slime with some gravelish core. Slime are sand and silt. Some sticky core are probably derived from gravel.								
	2		<input type="checkbox"/>																
	3	Terrace Deposits	<input type="checkbox"/>																
	4		<input type="checkbox"/>																
	5		<input type="checkbox"/>																
	6		<input type="checkbox"/>																
	7		<input type="checkbox"/>																
	8		<input type="checkbox"/>																
	8.1										8.1								
	9										Detail Condition of Core are unknown because of crumbling								
	10																		
	11																		
	12																		
	13																		
	14	Mudstone (Marl)																	
	15																		
	16																		
	17																		
	18																		
	19																		
	20										Bottom of Hole at 20.0m								



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHL 9CM

(SHEET 1 of 2.)

LOCATION	POWERHOUSE	DEPTH OF HOLE	31.50 m	COMMENCED	
ELEVATION	88.296 m	DIRECTION OF HOLE	N.	COMPLETED	
COORDINATE		CORE RECOVERY	3	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	P _{max}	P _c	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION
	0																	0m
	0.4									0.4 Non Core								
	1									Core recovery is very poor.								
	2									Only gravelish core with some slimes (sand and sandy silt).								
	3																	
	4																	
	5									Some sticky core are probably derived from gravels.								
	6																	
	7																	
	7.45																	
	8									Detail Condition of Core are unknown because of crumbling								
	9																	
	10																	
	11																	
	12																	
	13																	
	14																	
	15																	
	16																	
	17																	
	18																	
	19																	
	20																	

Terrace Deposits

Mudstone (Marl)

▽
4.40

	15.75
6.68	5
16.50	17.25
9.75	0
18.00	

1. Scale of Penetration
 2. Scale of Penetration
 3. Scale of Penetration
 4. Scale of Penetration
 5. Scale of Penetration
 6. Scale of Penetration
 7. Scale of Penetration
 8. Scale of Penetration
 9. Scale of Penetration
 10. Scale of Penetration
 11. Scale of Penetration
 12. Scale of Penetration
 13. Scale of Penetration
 14. Scale of Penetration
 15. Scale of Penetration
 16. Scale of Penetration
 17. Scale of Penetration
 18. Scale of Penetration
 19. Scale of Penetration
 20. Scale of Penetration

GEOLOGIC LOG OF DRILL HOLE

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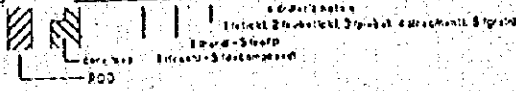
LOS LLANOS PROJECT

HOLE No. PBL 9CM

(SHEET 2 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	31.50 m	COMMENCED	
ELEVATION	88.296 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	Pmax	Pc	DEPTH RESULT									
	20 m			0-100%																0m			
	21	Mudstone (Marl)								Detail Condition of Core are unknown because of crumbling										1			
	22																					2	
	23																						3
	24																						4
	25																						5
	26																						6
	27																						7
	28																						8
	29																						9
	30																						0
	31																				1		
	32									Bottom of Hole at 31.50 m											2		
	33																					3	
	34																					4	
	35																					5	
	36																					6	
	37																						7
	38																						8
	39																						9
	40																						0



GEOLOGIC LOG OF DRILL HOLE

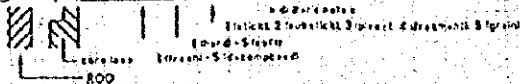
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LOS LLANOS PROJECT

HOLE No. **PBLL 10T0** (SHEET 1 of 2)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	36.40 m	COMMENCED	
ELEVATION	148.463 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.G.	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	C.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATOR		LOGEON	PARA	PE						
	0.3			0.4						0.3 Non Core									0m
	1.8	Residual Soil	▽							1.8									
	3.6	Conglomerate	○		5	5	5	e		Strongly Weathered Core recovery is very poor.									
	4.5				5	5	5	e		4.5 Non Core									
	6.9	Conglomerate	○		5	5	5	e		Strongly Weathered Core recovery is very poor.									
	7.4									7.4 Non Core									
	6.9m				5	4		e		Strongly Weathered Core recovery is poor, but rather better compared with shallower than 6.9m.									7.80
	14.1	Conglomerate	○		(4)	(5)		e		Weathered and loosened rock. Partially discolored									Core Labo. Tes
	17.8				3			d		Recovered some stick cores. Generally cracky and weathered core.									Core Labo. Tes
	18.8				4	5	4	e		Strongly weathered.									Core Labo. Tes
					2	2	2	b		Rather massive part and slightly cracky									



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL 10T0** (SHEET 2 of 2)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	36.40 m	COMMENCED	
ELEVATION	148.463 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH			
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	P _{max}	P _c							DEPTH RESULT		
	20			0-100%																	0 m	
	21	Conglomerate								Rather hard and compact but cracked moderately as whole. Core recovery is rather well with some sticky core.											1	
	22					2	2	2	b		Gravels in conglomerate are derived from volcanic rocks.											2
	23																					3
	24																					4
	25																					5
	26																					6
	27																					7
	28						2	3	4	d	Generally cracky											8
	29										Partially hard and compact, but generally rather cracky. Core recovery is not so poor, with some sticky core.											9
	30						2	2	2	c												10
	31																				1	
	32																				2	
	33					3	3	4	e	33.4 Carbonate(?) Veinlet: Somewhat cracky as a whole.											3	
	34																				4	
	35																				5	
	36					4	2	2	e	35.5 loosened core											6	
						2	2	3	c	Somewhat cracky												7
										Bottom of Hole at 36.40m												7

Core Labo. Test
20.25

Core Labo. Test
26.75

Core Labo. Test
30.25

Core Labo. Test
33.50

GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PBL 11TP

(SHEET 1 of 2)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	30.80	m	COMPLETED
ELEVATION	278.718	DIRECTION OF HOLE	Y.		COMPLETED
COORDINATE		CORE RECOVERY		%	DRILLED BY
		DRILLING MACHINE			LOGGED BY

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt.H.)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUCEON	P _{max}	P _c						
	0			94-100%						0.3 Non Core									0m
	0.7	Residual Sp. Silt	▽		brown	5	5	5	>e	Strongly Weathered									1
	2.2				brown (4)	5	5		>e										2
	3									In shallow part are breccia without sharp boundary of lithology									3
	5					2	1			Hard, compact, fresh and rather massive									5
	6					2			a	with some sticky core.									6
	9.3					(3)	(2)			Cracks dip gentle to horizontal.									7
	9.52																		9
	9.52				dark gray					Hard and compact, but somewhat cracky in part.									10
	11.9									ex.) 104-11.9m in depth.									11
	13					2	2			Generally									13
	13.42					3			b	somewhat fresh and massive									14
	15					(3)	(3)			with some sticky core.									15
	16									Gravels in conglomerate									16
	17									are derived from volcanic rocks.									17
	17.10																		18
	20																		20

1. 100% Recovery
 2. 75% Recovery
 3. 50% Recovery
 4. 25% Recovery
 5. No Core

GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHL 12CM (SHEET 1 of 2)

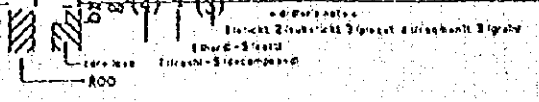
LOCATION	POWERHOUSE	DEPTH OF HOLE	30.85 m	COMPLETED	
ELEVATION	101.276 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	5	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH			
					COLOR	WEATHER-ING	HARD-NESS	CRACK-SPACING	ROCK-EVALUATION	DESCRIPTION	LOGEON	Pmax	Pc	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION
	0.3			0-100%						0.3 Non Core								0m
	0.75	Residual Soil	▽							0.75								1
	1.0	Talus Deposits	△		brown	5	5	5	>e	Gravelish cores only.								2
	3.95		△		brown	5	5	5	>e	Core recovery is very poor.								3
	5.55				brown	4	4	4	e	Possibly very cracky and somewhat loosened rocks.								4
	10.7				dark gray	(5)	(3)	(5)	e	Somewhat cracky as a whole. Core recovery is not so well. Somewhat weathered rock with some gravelish core.								5
	12.2	Conglomerate			dark gray	3	3	2	c	Slightly brittle at cracky parts.								6
	15.35				dark gray	(2)	(4)	(3)	c	Probably sheared Weak and loosened core. Easily broken.								7
	19.9				gray	3	3	3	d	Generally somewhat cracky. Cracky parts are discolored and slightly brittle Somewhat weathered.								8
					brownish gray	3	4	4	e									9

Core Labo. Test 6.40

Core Labo. Test 12.20

Core Labo. Test 19.28



GEOLOGIC LOG OF DRILL HOLE

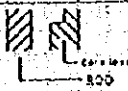
LOS LLANOS PROJECT

HOLE No. **PHLL 12CM**

(SHEET 2 of 2)

LOCATION POWERHOUSE	DEPTH OF HOLE 30.85 m	COMPLETED	
ELEVATION 101.276 m	DIRECTION OF HOLE V.	DRILLED BY	
COORDINATE	CORE RECOVERY %	LOGGED BY	
	DRILLING MACHINE		

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH	
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	Pc							DEPTH RESULT
	20.0	Conglomerate	○	0-100%	brownish gray	3	4	4	e	Weak and loosened core.						X		0m		
	21.25						(4)	4	(3)		21.25									1
	22										Generally rather cracky.									2
	23						gray			3	d	Core recovery is not so poor, but with almost gravelish core.								3
	24							3		(2)										4
	25							3				Core Lab. Test								5
	26.5											26.5								6
	27									4		Sheared Slickenside in part								7
	28						dark gray			4	(3)	Weak and loosened core.								8
	29							3	4	5	e	Easily broken. Somewhat weathered.								9
	30					(4)	(5)	(4)										0		
	1									Bottom of Hole at 30.85m								1		
	2																	2		
	3																	3		
	4																	4		
	5																	5		
	6																	6		
	7																	7		
	8																	8		
	9																	9		
	0																	0		



1/2" = 1' Scale
 Electric Power Development Co. Ltd.
 Board - Street
 Caracas - Venezuela

GEOLOGIC LOG OF DRILL HOLE

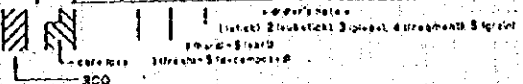
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LOS LLANOS PROJECT

HOLE No. **PHLL. 13CM** (SHEET 1 of 3)

LOCATION	POWERHOUSE	DEPTH OF HOLE	50.0	COMPLETED	
ELEVATION	102.035	DIRECTION OF HOLE	Y.	DRILLED BY	
COORDINATE		CORE RECOVERY	%	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LOGEON	Pmax	Pc						
	0			0-100%													X		0m
	1	Residual Soil	▽		5	5	5	e		Gravelish core only without any slime.									1
	2									2.25									2
	3	Talus Deposits	△		5	4	4	e		Core recovery is very poor, with some gravelish core and slime (sand and sandy silt).									3
	4				(4)	(5)	(5)												4
	5		△							7.05									5
	6																		6
	7																		7
	8		▽							Cracky and somewhat brittle.									8
	9									Partially somewhat weathered along cracks and/or joints.								Core Labo. Tes	9
	10		△															9.25	10
	11									Generally weathered rock with some gravelish core.									11
	12	Breccia	▽		4	4	3	d		Almost cracks dip oblique.								Core Labo. Tes	12
	13		△		(3)	(3)	(4)											12.95	13
	14									Gravels in breccia are obviously angular.									14
	15		▽							But it is thought that it is a part of conglomerate.								Core Labo. Tes	15
	16																	17.41	16
	17		△																17
	18																		18
	19		▽																19
	20																		20



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT HOLE No. **PHL 13CM** (SHEET 2 of 3)

LOCATION	POWERHOUSE	DEPTH OF HOLE	50.0 m	COMMENCED	
ELEVATION	102.035 m	DIRECTION OF HOLE	Y.	COMPLETED	
COORDINATE		CORE RECOVERY	3	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING				DEPTH											
					COLOR	WEATHERING	HARDNESS	GRAVITY SPACING		ROCK EVALUATION	LOGEON	P _{max}	P _c		DEPTH RESULT	OIL TYPE	CASING CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)						
																	0m								
	20 ^m	Breccia	△	100%	greenish brown	4		3	d	Generally weathered and cracky core with some 22.5 gravelish core.							1								
	21				(3)	(4)										Core Lab. Test				2					
	22				greenish gray	3	(3)	4	e	Recovered cores easily broken Weakly and loosened core.							3								
	23				greenish gray	(4)	(5)			25.5							4								
	24				gray	3		4	d	Generally cracky but slightly weathered rock.							5								
	25				gray	(2)	(3)			28.2							6								
	26				brown	5	4	5	e	Sheared and re-consolidated							7								
	27				brown	(5)	(4)			29.0							8								
	28	Conglomerate	○		dark gray	3	3	3	d	Generally cracky, crack planes are discolored by weathering. Core recovery is not so well with some gravelish core.							9								
	29										(2)	(4)						35.05							0
	30										4	4	(5)	e	Weak and loosened			36.0							1
	31										4	3	3	c	Somewhat cracky. Generally										2
	32				light gray	4	3	3	c	weathered and loosened core with some oblique dip cracks.							3								
	33				(3)	(4)	(4)										4								
	34																5								
	35																6								
	36																7								
	37																8								
	38																9								
	39																0								

GEOLOGIC LOG OF DRILL HOLE

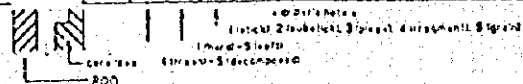
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LOS LLANOS PROJECT

HOLE No. **PHELL-13CM** (SHEET 3 of 3)

LOCATION	POWERHOUSE	DEPTH OF HOLE	50.0 m	COMPLETED	
ELEVATION	102.035 m	DIRECTION OF HOLE	V.	DRILLED BY	
COORDINATE		CORE RECOVERY	%	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING				DEPTH				
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LUGEON	P _{max}	P _c	DEPTH RESULT		BIT TYPE	CASING CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. M)
40.3				0 - 100%													0m		
41		Conglomerate	○	□	light gray	(3)	3	(4)	c	Generally									
42					4	(4)	4	e	Weak and										
43					dark brown	2		3	3	d	Slightly								
44			○		dark brown	(3)				weathered . and									
45			○		willy gray	5	5	5	e	cracky core.									
46		Mudstone (Marl)		□						44.9									
47					greenish gray	3	4	5	e	Cracky and loosened									
48								(4)				along bedding plane							
49								5				Core recovery is							
50					(4)				not so well with										
									Cracks dip										
									oblique										
										Bottom of Hole at 50.00m									



GEOLOGIC LOG OF DRILL HOLE

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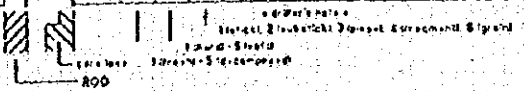
LOS LLANOS PROJECT

HOLE No. PBL-14CM

(SHEET 1 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	34.15 m	COMMENCED	
ELEVATION	103.851 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOC	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING		ROCK EVALUATION	LOGEON	P _{max}						
	0.2								0.2 Non Core									0.2
	0.9	plus Deposits	△		gray brown	5	5	5	>e	0.9								0.9
	1.5				gray	3	3	4	e	1.5								1.5
	1.5 - 2.0									Fresh and hard core								1.20
	2.0 - 4.0									Partially somewhat cracky. Core recovery is not so poor.								
	4.0 - 5.5									Generally massive and compact core.								5.15
	5.5 - 7.0				black-dark gray	2	3	2	b	Some crack planes are slightly weathered.								
	7.0 - 8.5									Gravels in conglomerate are derived from volcanic rocks.								8.80
	8.5 - 9.5																	9.40
	9.5 - 12.0																	12.15
	12.0 - 13.0				dark gray	3	3	4	d	12.6								11.32
	13.0 - 13.4									13.4 Somewhat cracky.								2
	13.4 - 14.0																	13.65
	14.0 - 15.5									Fresh and hard core but slightly cracky in part.								
	15.5 - 17.0				black-dark gray	2	3	3	b	Generally massive and compact.								
	17.0 - 18.5																	18.5
	18.5 - 19.5									Generally cracky core.								18.68
	19.5 - 20.0																	19.85



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHL 14CM (SHEET 2 of 2)

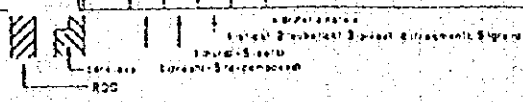
LOCATION	POWERHOUSE	DEPTH OF HOLE	34.15 m	COMMENCED	
ELEVATION	103.851 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE				DESCRIPTION	TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING		ROCK EVALUATION	LOGEON	Pmax						
	20.3			0-100%					Generally cracky									0m
	21.15					3	4	c	21.15	12.09		1						1
	22					2			Hard, compact rather fresh.									2
	23					3												4
	24					(2)	3	b	Slightly cracky in part.									4
	25																	5
	26								26.1									6
	27					3	4	c	Carbonate(?) Veinlet									7
	28					2			27.25									8
	29					(3)	3	b	Hard, compact and rather fresh.									8
	29.7					(2)	3		29.7									9
	30								Sheared and re-consolidated									0
	31					3	3	5	Slickenside in part									1
	32					(4)	(4)	(4)	Weak and loosened core.									2
	33								Easily broken.									3
	34								Core recovery is poor.									4
	34.15								Bottom of Hole at 34.15m									5

Conglomerate

Core Labo. Test
23.57
Core Labo. Test
24.28

Core Labo. Test
27.87
Core Labo. Test
28.60



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL 15CM** (SHEET 1 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	26.40 m	COMPLETED	
ELEVATION	103.173 m	DIRECTION OF HOLE	V.	DRILLED BY	
COORDINATE		CORE RECOVERY	%	LOGGED BY	
		DRILLING MACHINE			

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					DESCRIPTION	TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION		LOGEON	Pmax	Pc	DEPIN RESULT						
		Residual Soil	▽	0-100%						0.7 Slime.							X		0m	
	1				brownish gray	5	4	5	e	Partially weakened and crumbled									1	
	2									Core recovery is very poor.									2	
	3									3.5									3	
	4									Somewhat fresh core but somewhat cracky along surface of gravel									4	
	5									Core recovery is not so poor with some sticky core.									5	
	6									Somewhat weathered along crack planes.									6	
	7				dark gray	3	3		c	10.5									7	
	8									Generally cracky and slightly weathered with some gravelish core.									8	
	9									13.4									9	
	10									14.05 Sheared and crumbled									10	
	11									Somewhat cracky and weathered.									11	
	12									15.9-16.0m									12	
	13									Weaken									13	
	14									Core recovery is not so well with some gravelish core.									14	
	15																		15	
	16																		16	
	17																		17	
	18																		18	
	19																		19	
	20																		20	

EPDC Logo
 Electric Power Development Co. Ltd.
 1100-1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200

GEOLOGIC LOG OF DRILL HOLE

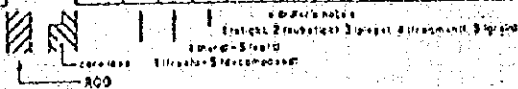
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LOS LLANOS PROJECT

HOLE No. **PBLL 15CM** (SHEET 2 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	26.40 m	COMPLETED	
ELEVATION	103.173 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L O C	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH								
					COLOR	WEATHER-ING	HARD-NESS	CRACKY SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax	Pc		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)		
	20 m			0-100%															0m			
	21	Conglomerate	○		gray-dark gray	3	3	3		Somewhat cracky and weathered.									1			
	22				(4)	(4)	(4)															2
	23											22.9										3
	24							gray-brownish dark gray	5	5	5		Probably sheared Slickenside in part Sheared and re-consolidated Carbonate(?) Veinlet disturbed									4
	25				gray-brownish dark gray	5	5	5												5		
	26				dark gray	4	4	4												6		
	27									Bottom of Hole at 26.40m										7		
	28																			8		
	29																			9		
	30																			10		



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL 16CM**

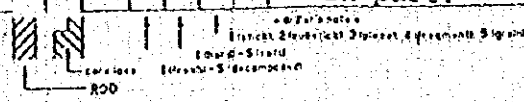
(SHEET 1 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	26.0 m	COMPLETED	
ELEVATION	104.197 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	1	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH				
					COLOR	WEATHER-ING	HARD-NESS	CRACKY SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}	P ₀	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN
	0			0-100%															0m
	0.3									0.3 Non Core									
	1.0				brownish gray	4	4	5	e	Strongly Weathered									1
	2									Many andesite gravels									2
	3									Generally cracky and slightly weathered.									3
	4									Somewhat weathered along crack planes.									4
	5									Core recovery is not so poor, with some gravelish core.									5
	6									Slightly massive, compact and hard in part (ex. 15.4-16.1m).									6
	7																		7
	8																		8
	9																		9
	10																		10
	11																		11
	12																		12
	13																		13
	14																		14
	15																		15
	16																		16
	17									16.1									16
	17.55									Generally cracky and slightly weathered.									17
	18									Somewhat fresh and slightly compact but somewhat cracky in part.									18
	19																		19
	20																		20

Conglomerate

black-dark gray



GEOLOGIC LOG OF DRILL HOLE

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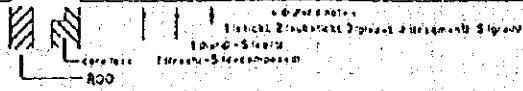
LOS LLANOS PROJECT

HOLE No. PHL 16CM

(SHEET 2 of 2)

LOCATION	POWERHOUSE	DEPTH OF HOLE	26.0 m	CORROSION	
ELEVATION	104.197 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Dpt. H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax						
20.3				0-100%	black gray	2	2	(4)	b	20.4 Somewhat fresh.								0m
20.85					black gray	4	(4)	c	e	20.85 Silicias veinlet								1
20.85					black-dark gray	2	2	4	c	Fresh core Slightly massive and compact but cracky in general. Slightly weathered along crack planes.								2
20.85							(3)	(3)										3
20.85																		4
20.85																		5
20.85																		6
20.85										Bottom of Hole at 26.00m								7
																		8
																		9
																		0



GEOLOGIC LOG OF DRILL HOLE

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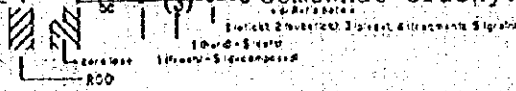
LOS LLANOS PROJECT

HOLE No. PBL 17TP

(SHEET 1 of 2)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	21.60 m	COMMENCED	
ELEVATION	391.319 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE						TESTING				DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	P _{max}	P _c	DEPTH RESULT		BIT TYPE	CASING	CEMENTATION
	0			0-100%														0m
	1	talus Deposits	△		brown	5	5	5	>e	0.3 Non Core Gravelish core with some 1.7 slime.								1
	2	Conglomerate	○		light brown	5	5	5	>e	Strongly Weathered Weak and loosened core. Easily broken.								2
	3									5.45								3
	4									5.85 Non Core								4
	5																	5
	6	Conglomerate	○		black-brown dark gray	2	3		3	Somewhat cracky but slightly weathered with some gravelish core.								6
	7									(3)(4)								3
	8									8.35								3
	9	Conglomerate	○		brown	4	4	4	e	Generally weathered.								9
	10									9.65 Non core.								4
	11	Conglomerate	○		brown	4	4		d	Generally weathered and cracky with some gravelish core.								11
	12									(3)(3)								4
	13																	4
	14																	4
	15																	(5)
	16	Conglomerate	○		brown	4	4		e	Core recovery is very poor without any sticky core.								16
	17									(3)								4
	18																	4
	19	Conglomerate	○		gray	4	4		c	Slightly hare in part (ex. 16.3-17.5m).								19
	20									(3)								4
	20									Somewhat cracky.								20



GEOLOGIC LOG OF DRILL HOLE

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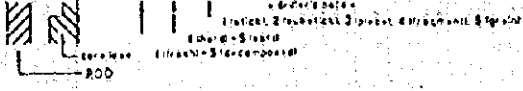
LOS LLANOS PROJECT

HOLE No. **PBLL 17TP**

(SHEET 2 of 2)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	21.60 m	COMPLETED	
ELEVATION	391.319 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE		CORE RECOVERY	%	DRILLED BY	
		DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE						TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	O.W.L. (Opt.H)	DEPTH			
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax	P6							DEPTH RESULT		
	20 m	Conglomerate	O	0-100%															0 m			
	21				BROWN STAY	3	4 (3)	4	c	Somewhat cracky.												1
	2					4	4 (5)	4	d	Generally cracky and weathered.												2
	2							Bottom of Hole at 21.60m												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		



EPDC
 ELECTRIC POWER DEVELOPMENT CO. LTD.

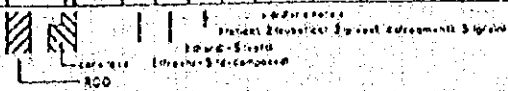
GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT		HOLE No. PHLL18TP	(SHEET of)
LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	30.20 m COMMENCED
ELEVATION	297.205 m	DIRECTION OF HOLE	V. COMPLETED
COORDINATE	455,532.940	CORE RECOVERY	% DRILLED BY
	385,288.135	DRILLING MACHINE	 LOGGED BY

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH					
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUCEON	Pmax	PC		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN
	0			0 + 100															0m
	1	Residual Soil	▽		yellowish brown	5	5	5		A few rounded gravels are recovered.									1
	2									2.5									2
	3									Core loss									3
	4									4.0									4
	5	Residual Soil	▽		yellowish brown	5	5	5		Strongly weathered conglomerate with some rounded gravels derived from residual core of weathering.									5
	6		▽							6.0-6.45m									6
	7									REC are very low.									7
	8									8.0-9.13m									8
	9		▽							REC are very low.									9
	10				gray	3	3	4		Hard but somewhat cracky.									10
	11				brownish gray	5	5	5		10.1-10.2m									11
	12				gray	3	2	3		Somewhat clayish.									12
	13									10.2-13.7m									13
	14				gray	4	3	3		Gravels are almost all volcanic rocks with phenocrysts obviously and rare groundmass.									14
	15				dark gray	3	2	2		13.7									15
	16									14.05									16
	17									14.55									17
	18									Oxidized plane are obviously.									18
	19									White vein with oxidized plane vertical-15° are obviously.									19
	20									Hard and fresh rock not so cracky.									20

20



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. PHLL18TP

(SHEET of)

LOCATION	PENSTOCK ROUTE	DEPTH OF HOLE	30.20 m	COMPLETED	
ELEVATION	297.205 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE	455,532.940	CORE RECOVERY	%	DRILLED BY	
	385,288.135	DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING			BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGGON	Pmax						
	20m			0 = 100%						Hard and fresh rock not so cracky. 20.5-20.6m								0m
	21		○		dark gray	3	2	1		White vein vertical -20° separated along vein are obviously.								1
	22				dark gray					Oxidized brown plane are obviously.								2
	23		○		brownish gray			3		23.1								3
	24				gray	4	4	4		23.5								4
	25		○		dark gray	2	2	1		23.8								5
	26				dark gray					Fresh and hard rock but almost all mafic minrals are somewhat altered. Felsic minerals are not altered.								6
	27		○		dark gray					27.5								7
	28					3	4	4		27.9								8
	29		○			2	2	2		Somewhat cracky compared with upper than 27.5m.								9
	30									Bottom of Hole at 30.20m								0

GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL19CM**

(SHEET of

LOCATION	POWERHOUSE	DEPTH OF HOLE	25.25 m	COMMENCED	
ELEVATION	88.684 m	DIRECTION OF HOLE	V.	COMPLETED	
COORDINATE	454, 953.190	CORE RECOVERY	%	DRILLED BY	
	385, 386.504	DRILLING MACHINE		LOGGED BY	

ELEVATION	DEPTH	ROCK NAME	L.O.C.	CORE RECOVERY	OBSERVATION OF CORE					TESTING				BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	DEPTH
					COLOR	WEATHERING	HARDNESS	CRACK SPACING	ROCK ELEVATION	DESCRIPTION	LUCEON	P _{max}	P ₀						
	0			0-100%															0m
	1									Core loss									1
	2																		2
	3									3.45									3
	4	Top Soil	▽		dark brown					4.0									4
	5	Terrace Deposits	□		dark green					A few sub-rounded gravels are recovered.									5
	6				dark green					5.4									6
	7		□		dark brown					1.5-5.0m core loss									7
	8				dark brown					6.43									8
	9				dark brown					5.4-6.43m coarse grained sandstone with some pebbles									9
	10				dark brown					7.6									10
	11				dark brown					8.10-8.20m core loss									11
	12				dark brown					8.2									12
	13				dark brown					8.45									13
	14				dark brown					Micro slip planes are observable. Calcite vein are not obvious comparing other parts.									14
	15				dark brown					10.45-10.85m									15
	16				dark brown					Disturbed and reconsolidated. (very brittle, easily clackly)									16
	17				dark brown					12.70-13.15m									17
	18				dark brown					Disturbed and very brittle partially clayey.									18
	19				dark brown					13.15-14.00m									19
	20				dark brown					Somewhat sandy. (sandy part is rather well-cemented)									20
	21				dark brown					14.0-14.1m									21
	22				dark brown					Sheared and brittle.									22
	23				dark brown					16.0									23
	24				dark brown					15.7-16.0m									24
	25				dark brown					Sheared and clayey part.									25
	26				dark brown					16.0-18.4m									26
	27				dark brown					Somewhat massive not so flaky.									27
	28				dark brown					18.4-19.0m									28
	29				dark brown					Somewhat flaky. Microslip planes are observable every places.									29
	30				dark brown														30



GEOLOGIC LOG OF DRILL HOLE

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LOS LLANOS PROJECT

HOLE No. **PHLL19CM**

(SHEET of)

LOCATION	POWERHOUSE	DEPTH OF HOLE	25.25 m	COMPLETED
ELEVATION	88.684 m	DIRECTION OF HOLE	V.	COMPLETED
COORDINATE	454,953.190	CORE RECOVERY	%	DRILLED BY
	385,386.504	DRILLING MACHINE		LOGGED BY

ELEVATION	DEPTH	ROCK NAME	LOG	CORE RECOVERY	OBSERVATION OF CORE					TESTING				DEPTH						
					COLOR	WEATHER-ING	HARD-NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LOGEON	Pmax	Pc		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)
	20	Mudstone (Marl)		0.100%															0m	
	21		grayish black - black			3	3	4		Microslip planes are observable every places.										1
	22					(2)	(4)	(3)		22.0-24.5m Somewhat massive. (but partially flaky)										2
	23																			3
	24																			4
	25					2	4	4		24.5 Very brittle. Very flaky.									5	
	26					(3)	(5)	(5)		Bottom of Hole at 25.25m									6	
	27																		7	
	28																		8	
	29																		9	
	30																		0	

