HOLE NO. : D05
AREA : LUSHUKU
DATE DRILLED : FEB.12 - FEB.21
TOTAL DEPTH : 215.05m
ELEVATION : -290.90m
COORDINATE : X=+2,931,000 Y=-76,000

JAPAN INTERNATIONAL COOPERATION AGENCY

Borehole Log D05

Dwg.	4 e	Scale	1 : 200
Date	May. 1981	Prepared by	N.Ishihara, H.Hatakeyama

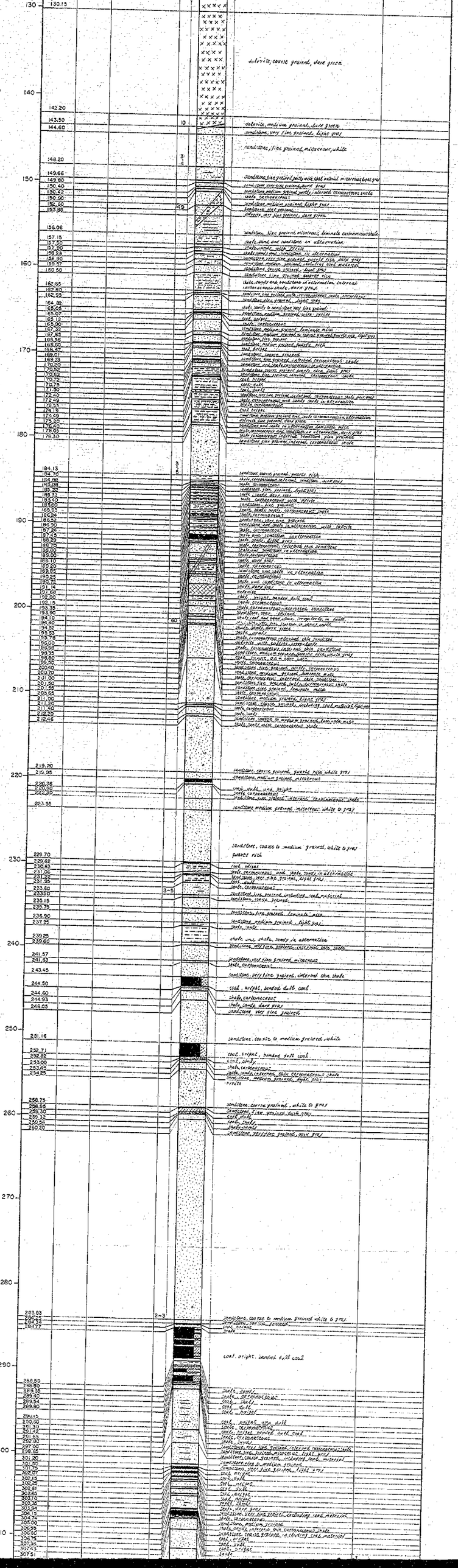
Depth of Borehole (M)	Apparent Thickness of Strata (M)	Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description
1.20					weathered Soil
12.70					sandstone, medium grained, quartz and feldspar rich, white
14.85					sandstone, coarse grained, white
16.50					sandstone, coarse to medium grained with thin shale, white to gray
18.70					sandstone, medium, in parts, quartz and feldspar rich, white
21.18			8°		sandstone, fine grained, intercalate shale, irregularly, in parts micaceous
21.42					shale, dark gray
23.30					sandstone, medium to fine grained, intercalate thin shale, micaceous
25.94					sandstone, coarse to medium grained, quartz rich, white gray
26.07					shale, dark gray
26.21					sandstone, coarse grained, light gray
28.00					sandstone, very fine grained, intercalate thin shale
36.80					diorite, coarse grained, dark green.
37.20					'union point' (TOP)
38.15					shale sand
40.10					diorite, silty, dark green
41.95			8°		sandstone, fine grained, light gray
42.80					sandstone, fine grained, light gray
45.10					sandstone, fine grained, carbonaceous
49.45					sandstone, fine to medium grained, intercalate carbonaceous shale, irregularly, light gray.
51.10					shale, carbonaceous with very thin sandstone
53.50					shale, sandy with carbonaceous shale, irregularly
54.65					sandstone, very fine grained and shale in alternation
54.89					sandstone, very fine grained with sandy in alternation, light gray
55.26					sandstone, medium grained with carbonaceous matter
56.00					sandstone, fine grained, light gray
57.84					shale & sandstone, very fine grained in alternation, sandstone rich
58.71					sandstone, very fine grained, micaceous
59.88					sandstone, very fine grained & shale in alternation, sandstone rich
62.11					sandstone, very fine grained, in parts, intercalate thin shale, at the bottom, shale, carbonaceous
62.39					sandstone, medium to coarse grained
63.99					shale
64.51					siltstone, very fine grained
64.72					shale
65.21					sandstone, coarse grained
65.60					shale & sandstone, fine grained in alternation
66.53					sandstone, very fine grained with thin carbonaceous matter
67.44					sandstone, medium to fine grained with lots of carbonaceous pieces, light gray
67.76					sandstone, very fine grained, light gray
69.03					sandstone, coarse grained, white
69.75					shale
70.61					sandstone, coarse grained
71.02					sandstone, medium grained, intercalate thin shale, irregularly
71.58					sandstone, coarse grained, white
71.94					sandstone, medium grained, and thin shale in alternation, light gray
72.26					sandstone, medium grained, white
72.90					sandstone, medium to fine grained, intercalate thin shale
73.58					shale, sandy
74.26					shale, intercalate thin sandstone, medium grained
74.66					shale, sandy to very fine, grained
77.80			2°		sandstone, fine grained with sheet of carbonaceous pieces
77.92					shale, carbonaceous
78.10					coal, bright, partly dull coal.
78.32					shale, carbonaceous
78.33					coal, bright
78.45					shale, sandy
78.94					sandstone, fine grained
79.86					shale, intercalate sandstone, fine grained
83.22					sandstone, very fine grained, white
85.18					sandstone, fine grained, light grey
85.89					sandstone, coarse grained with carbonaceous stripes
86.91					shale, intercalate sandstone, fine grained
87.25					shale, sandy
87.92					sandstone, very fine grained, intercalate very thin shale
88.78					shale and sandstone, fine to medium grained in alternation
91.48					sandstone, medium grained, white
93.06					sandstone, coarse to medium grained, quartz and feldspar rich
93.70					sandstone, medium grained, with plenty of carbonaceous pieces
94.32					sandstone, fine grained & shale in alternation
94.73					sandstone, coarse grained, conglomeratic
95.38					sandstone, medium grained, quartz and feldspar rich
95.69					coal, dull
97.39					sandstone, fine grained
98.54					shale, sandy, light green
99.42					sandstone, fine grained, intercalate very thin shale
100.00					sandstone, medium to coarse grained
101.95					sandstone, very fine grained, intercalate outer & lower part, shale rich
102.52					sandstone, very fine grained & shale shell
102.82					sandstone, fine grained
103.04					shale, sandy
103.05					coal, bright
107.69					sandstone, fine grained, silty, light gray
113.77					sandstone, fine to very fine grained, in parts intercalate very thin shale.
116.80					sandstone, medium grained
116.85					sandstone, coarse grained, quartz and feldspar rich, white gray.
117.10					sandstone, medium grained, intercalate shale, white
117.46					sandstone, fine grained, dark gray.
117.70			30°		shale, carbonaceous with calcite
118.30			45°		siltstone, very fine grained
118.85					sandstone, medium grained, light gray
119.60					siltstone, very fine grained, greenish gray
119.90					shale, carbonaceous
121.75					sandstone, fine grained, white
124.20					sandstone, medium to coarse grained, interbed thin shale
126.75					sandstone, fine grained, feldspar rich.
126.20					shale, sandy to sandstone, very fine grained, light gray
127.20					siltstone, silty, greenish gray
127.55					shale, sandy, interbed thin sandstone
128.35					sandstone, very fine grained light gray
131.15					sandstone, very fine grained to shale, sandy, micaceous.
131.30					coal, dull & bright, coal, shaly
132.25					shale, carbonaceous
132.70					coal, dull, banded, bright coal
132.90					shale
139.29					sandstone, coarse grained, feldspar and quartz rich, white
141.12					coal, dull, banded, empty coal
141.35					coal, shaly
141.62					shale, carbonaceous
147.15					sandstone, coarse grained, conglomeratic, at the depth of 145.5m thin coal firm.
147.85					coal, dull, banded, bright empty coal
148.10					shale, carbonaceous
148.42					sandstone, medium grained and shale in alternation

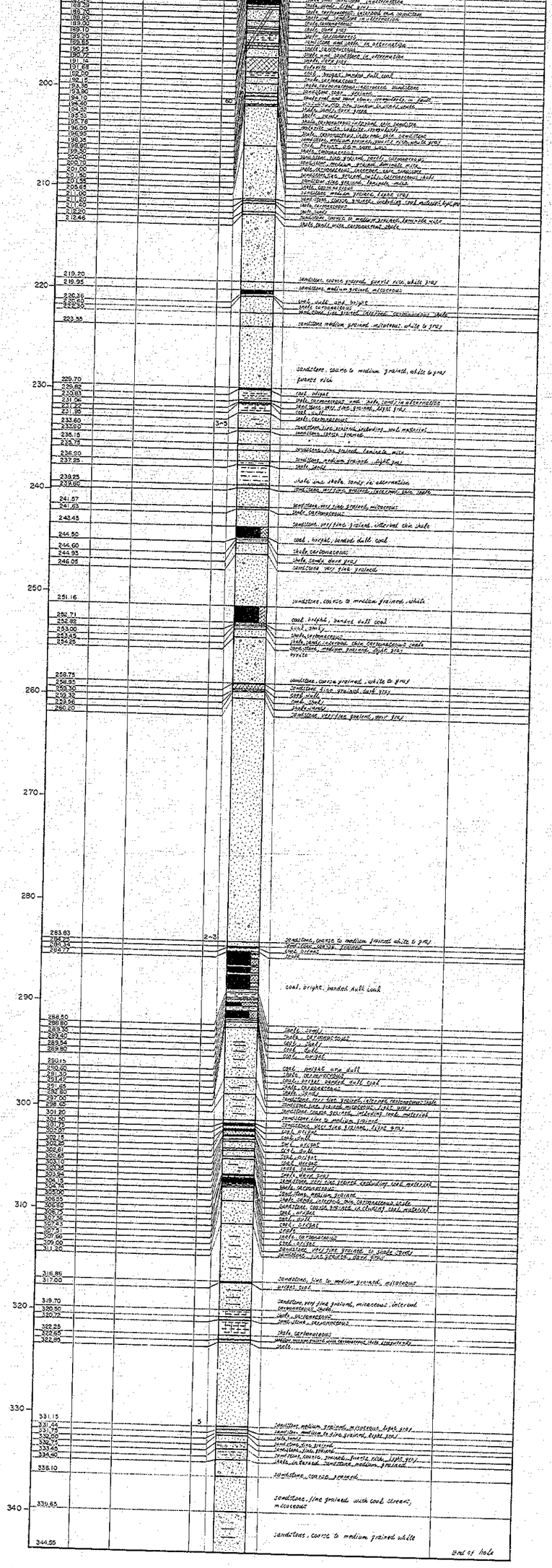
51.10		shale, carbonaceous with very thin sandstone
53.50		shale, sandy with carbonaceous shale, irregularly
54.65		sandstone, very fine-grained and shale in alternation
54.89		sandstone, very fine grained & shale, sandy to alternation, light grey
55.20		sandstone, medium grained with carbonaceous matter
56.00		sandstone, fine grained, light grey
57.84		shale & sandstone, very fine grained in alternation, sandstone rich
58.71		sandstone, very fine grained, micaceous
59.88		sandstone, very fine grained & shale in alternation, sandstone rich
62.11		sandstone, very fine grained, in parts, intercalate thin shale, at the bottom, shale, carbonaceous
62.39		sandstone, medium to coarse grained
63.90		shale
64.31		dolerite, very fine grained
64.72		shale
65.21		sandstone, coarse grained
65.60		shale & sandstone, fine grained in alternation
66.63		sandstone, very fine grained with rich carbonaceous matter
67.44		sandstone, medium to fine grained with lots of carbonaceous pieces/fragments
67.76		sandstone, very fine grained, light grey
68.03		sandstone, coarse grained, white
69.75		shale
70.21		sandstone, coarse grained
71.02		sandstone, medium grained, intercalate thin sandy, carbonaceous
71.59		sandstone, coarse grained, white
71.94		sandstone, medium grained and thin shale in alternation, light grey
72.24		sandstone medium grained, white
72.50		sandstone, medium to fine grained, intercalate thin shale
73.58		shale, sandy
74.26		shale, intercalate thin sandstone, medium grained
74.66		shale, sandy to very fine grained
77.80	5	sandstone, fine grained with shale of carbonaceous pieces
77.92		shale, carbonaceous
78.10		coal, bright, banded dull coal
78.32		shale, carbonaceous
78.33		coal, bright
78.45		shale, sandy
78.94		sandstone, fine grained
79.85		shale, intercalate sandstone, fine grained
83.22		sandstone, very fine grained, white
85.18		sandstone, fine grained, light grey
85.89		sandstone, coarse grained with carbonaceous streaks
86.91		shale, intercalate sandstone, fine grained
87.25		shale, sandy
87.82		sandstone, very fine grained, intercalate very thin shale
88.78		shale and sandstone, fine to medium grained in alternation
91.48		sandstone, medium grained, white
93.08		sandstone, coarse to medium grained, quartz and feldspar rich
93.70		sandstone, medium grained with lots of carbonaceous pieces
94.32		sandstone, fine grained & shale in alternation
94.73		sandstone, coarse grained, conglomeratic
95.58		sandstone, medium grained, quartz and feldspar rich
95.69		coal, dull
97.59		sandstone, fine grained
98.54		shale, sandy, light green
99.42		sandstone, fine grained, intercalate very thin shale
100.00		sandstone, medium to coarse grained
101.05		sandstone, very fine grained, intercalate shale in lower part, shale rich
102.52		sandstone, very fine grained & sandy shale
102.82		sandstone fine grained
103.04		shale, sandy
103.05		coal, bright
107.60		sandstone fine grained, silty, light grey
113.77		sandstone, fine to very fine grained, in parts intercalate very thin shale
116.60		sandstone, medium grained
116.85		sandstone, coarse grained, quartz and feldspar rich, white grey
117.10		sandstone, medium grained, intercalate shale, white
117.46		sandstone, fine grained, dark grey
117.70	50	shale, carbonaceous with calcite
118.50	48	dolerite, very fine grained
118.85		sandstone, medium-coarse, light grey
119.60		dolerite, very fine grained, greenish grey
119.90		shale, carbonaceous
121.75		sandstone, fine grained, white
124.20		sandstone, medium to coarse grained, interbed thin shale
124.75		sandstone, fine grained, feldspar rich
126.20		shale, sandy to sandstone, very fine grained, light grey
127.20		dolerite, very fine grained, green
127.55		shale, sandy, interbed thin sandstone
128.35		sandstone, very fine grained, light grey
131.15		sandstone, very fine grained to shale, sandy, micaceous
131.20		coal, dull & bright, coal, shaly
132.25		shale, carbonaceous
132.70		coal, dull, banded bright coal
132.90		shale
138.29		sandstone, coarse grained, feldspar and quartz rich, white
141.12		coal, dull, banded bright coal
141.35		coal, shaly
141.62		shale, carbonaceous
147.15		sandstone, coarse grained conglomeratic, at the depth of 148.10m thin coal (10cm)
147.95		coal, dull, banded bright, bright coal
148.16		shale, carbonaceous
148.42		sandstone, medium grained and shale in alternation
161.42		sandstone, coarse grained, partly, quartz and feldspar rich, micaceous, white
161.89	4.08	sandstone, medium to fine grained, white
162.24		coal, bright, intercalate sandstone fine grained (10cm)
162.62		sandstone, fine grained with shale, carbonaceous, micaceous, dark grey
162.97		shale, carbonaceous with sandstone bands
163.45		coal, dull and bright
163.95		shale, carbonaceous, shale sandy and coal shaly
164.92		coal, dull, banded bright coal
166.70		coal, bright, banded dull coal
166.91		coal, dull, banded bright coal
167.95		coal, bright, banded dull coal
168.26		shale, sandy with carbonaceous streaks, blackish grey
169.27		sandstone, fine grained, carbonaceous, blackish grey
169.70		shale, carbonaceous and coal, shaly (can be less 10cm)
170.00		shale, carbonaceous, intercalate sandstone
170.35		shale, sandy, carbonaceous and sandstone medium grained
172.52		shale, carbonaceous, blackish grey
172.03		sandstone, coarse, arkosic, mica rich
172.60		sandstone, fine to very fine grained with shale, carbonaceous
175.20		sandstone, coarse to medium grained, light grey
175.55		coal, bright, banded dull coal
176.70		shale, carbonaceous
177.00		sandstone, coarse, quartz
177.40		sandstone medium grained intercalate thin shale, grey
178.89		sandstone, coarse grained, quartz and feldspar rich, white
179.34		sandstone medium grained, light grey
183.11		sandstone, coarse grained, quartz and feldspar rich, partly conglomeratic
183.51		sandstone, medium grained, mica rich, light grey
183.96		sandstone, coarse grained, quartz and feldspar rich with coal streaks
184.39		sandstone, medium grained, light grey
187.29		sandstone, coarse grained, quartz and feldspar rich, white
188.05		coal, dull intercalate sandstone coarse grained (12cm)
188.25		shale, carbonaceous
189.03		shale, sandy to sandstone very fine grained, grey
196.27	4	sandstone, coarse to medium grained, partly quartz and feldspar rich, white
196.58		coal, dull, banded bright coal
196.95		coal, bright, banded dull coal
195.75		coal, shale and shale, carbonaceous
198.80		coal, bright banded dull coal
197.70		shale, carbonaceous
198.22		sandstone, fine grained, micaceous, light grey
199.00		sandstone, medium grained, micaceous
199.09		shale, sandy to sandstone, very fine grained
		coal, bright
205.72		sandstone, coarse grained, quartz and feldspar rich, mica rich, white to light grey
206.40		shale, sandy, intercalate sandstone, very fine grained, grey
206.79		sandstone, coarse to medium grained
207.78		shale, intercalate, very thin sandstone, fine grained
208.02		sandstone, fine grained, grey
208.28		shale, carbonaceous
208.30		coal, dull and bright
209.00		shale, carbonaceous with thin sandstone bands
210.03		sandstone, very fine grained, with carbonaceous material, micaceous
210.05		coal, bright
210.25		shale, sandy, carbonaceous
211.40		sandstone, fine to very fine grained with carbonaceous material, dark grey
214.35		sandstone, coarse grained, micaceous, light grey
215.05		sandstone, fine grained intercalate thin shale, dark grey
		END OF HOLE

HOLE NO. : DD6
AREA : LUBHUKU
DATE DRILLED : DEC.31 - JAN.22
TOTAL DEPTH : 344.55m
FLEVATION : + 282.50m
COORDINATE : X=+2,933,000, Y=-76,400

JAPAN INTERNATIONAL COOPERATION AGENCY			
Borehole Log DD6			
Dwg.	41	Scale	1 : 200
Date	May, 1981	Prepared by	N.Ishihara, H.Hatakeyama

Depth of Bore Hole (H)	Apparent Thickness of Strata (M)	Thickness of Strata (M)	Dip of strata	Columnar Section	Rock Description	Remarks
3.80					soil	
7.23					shale, dark gray	
11.35					sandstone, coarse grained including coal material	
17.00			3		sandstone, fine grained, light gray	12.3m calcite 17.0m calcite
19.65					sandstone, fine grained, interbed thin shale	
21.40			2~3		sandstone, fine to very fine grained, partly interbed carbonaceous shale	
23.40					sandstone, coarse grained, partly interbed carbonaceous shale, quartz rich	
24.00					sandstone, medium grained, interbed carbonaceous shale, light gray	
24.30			45		dolerite, dark green	
24.40					sandstone, coarse grained, carbonaceous	
26.80					sandstone, coarse grained, partly quartz rich, white gray	
27.20			5		sandstone, fine grained	
36.20					sandstone, medium to fine grained, partly interbed carbonaceous shale pyrite.	
39.25					sandstone, fine grained, interbed shale, carbonaceous	
39.80					sandstone, coarse grained	
40.20					shale, carbonaceous, with thin silty shale	
42.00			5~6		sandstone, coarse grained, partly interbed carbonaceous shale	
42.25					shale, carbonaceous	
43.80					sandstone, medium grained, partly interbed carbonaceous shale	
44.50					sandstone, very fine grained, with shale, carbonaceous	
46.10			5		sandstone, fine grained with shale carbonaceous irregularly	
47.50					shale, carbonaceous	
51.10					sandstone, very fine grained, interbed, carbonaceous shale, irregularly	
52.30			5~6		sandstone, coarse grained, partly with coal material	
52.60					shale, carbonaceous	
54.15					sandstone, medium grained, partly with coal material	
56.60					sandstone and shale, carbonaceous in alternation	
56.90			45		dolerite with calcite	
58.20					sandstone, fine grained and shale, carbonaceous in alternation	
58.35					dolerite	
59.10					shale, carbonaceous	
59.20					sandstone, fine grained	
60.00			30		dolerite	
60.60					shale carbonaceous	
61.15					sandstone, very fine grained, light gray	
61.30					shale, silty	
61.50					sandstone, very fine grained	
76.30					dolerite, silty, dark green	
76.39					shale, carbonaceous	
78.15			3~5		sandstone, fine grained, partly with coal material, light gray	
82.45					sandstone, medium grained, partly interbed carbonaceous shale, dark gray.	
82.85					dolerite	
83.60					shale with calcite	
83.70					dolerite	
83.85					shale, sandy	
85.50					shale, interbed sandstone, fine grained, partly carbonaceous shale	
86.00					sandstone, fine grained, light gray	
87.50					sandstone, fine grained, intercalate carbonaceous shale irregularly	
88.10					shale, sandy, dark gray	88.[illegible]m coal
88.29					shale, carbonaceous	88.[illegible]m coal
88.43					"	
88.80					sandstone, fine grained, quartz rich	
89.16					dolerite	
89.42					sandstone, fine grained	
89.44					dolerite	
90.50					sandstone, fine grained, light gray	
91.60					dolerite, medium grained	
92.43			3		sandstone, fine grained, interbed fine shale	
93.62					dolerite, dark green	
93.69					shale	
93.71					sandstone, fine grained	
93.73					dolerite	
98.83					sandstone, medium grained	
99.37					shale, dark gray	
99.80					sandstone, fine grained, interbed shale	
99.90					shale, dark gray	
100.15					sandstone, fine grained	
100.81					dolerite	
100.85					sandstone, fine grained	
101.00					dolerite	
103.70					sandstone, very fine to shaly sandstone, light gray.	light gray
104.20			2		sandstone, fine grained	
105.65					sandstone, medium grained, light gray	
106.90					sandstone, medium grained	
106.94					dolerite	
107.00					sandstone, medium grained	
107.04					dolerite	
108.15					sandstone, medium grained, light gray	
108.35					shale, dark gray.	
108.70					sandstone, fine grained, partly with coal material	
109.60			25~30		dolerite, very fine grained	
116.20					dolerite, medium grained, dark gray.	
120.60					dolerite with large grain sizes, light grayish green	
130.15					dolerite, medium grained, dark green	
142.20					dolerite, coarse grained, dark green	
143.50			10		dolerite, medium grained, dark green	
144.60					sandstone, very fine grained, light gray	
148.20			3~4		sandstone, fine grained, micaceous, white	
149.66					sandstone, fine grained, partly with coal material, micaceous, light gray	
149.80					sandstone, very fine grained, dark gray	
150.40					sandstone, medium grained, partly interbed carbonaceous shale	
150.42					shale, carbonaceous	
150.90					sandstone, medium grained, light gray	
[illegible]			[illegible]		sandstone, fine grained	


130
130.15
diorite, coarse grained, dark green
140
142.20
143.50
144.60
diorite, medium grained, dark green
sandstone, very fine grained, light gray
sandstone, fine grained, microcrossed, white
148.20
149.65
150
149.80
150.40
150.42
150.90
151.00
153.90
sandstone, medium grained, light gray
sandstone, very fine grained
shale, very fine grained, dark green
156.06
sandstone, fine grained, micaceous, laminate carbonaceous shale
157.15
157.50
157.90
158.35
158.90
159.17
160
160.50
shale, dark gray
sandstone, fine grained, massive, light gray
sandstone, fine grained, massive, light gray, weathered
162.85
162.90
162.95
shale, sandy and sandstone in alternation, interbed carbonaceous shale, dark gray
sandstone, fine grained with carbonaceous shale, interbed
sandstone, fine grained, light gray
164.85
165.05
165.07
165.12
165.90
167.32
167.65
168.58
168.90
169.07
169.01
169.23
169.40
170.05
170.62
170.75
171.50
172.50
172.59
173.15
174.13
174.49
174.90
176.20
177.00
178.30
170
shale, sandy to sandstone very fine grained
sandstone, medium, massive, white, carbonaceous
shale, carbonaceous
sandstone, medium grained, massive, light gray
shale, carbonaceous
sandstone, medium grained, massive, light gray
sandstone, medium grained, massive, light gray
sandstone, medium grained, massive, light gray
sandstone, very fine grained, massive, light gray
shale, sandy
sandstone, coarse, massive
sandstone, very fine grained, massive, carbonaceous shale
sandstone, very fine grained, massive, carbonaceous shale
shale, sandy
shale, carbonaceous
sandstone, medium grained, massive, white
shale, carbonaceous
sandstone, fine grained, massive, light gray
shale, carbonaceous
shale, carbonaceous
shale, carbonaceous


200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
End of hole

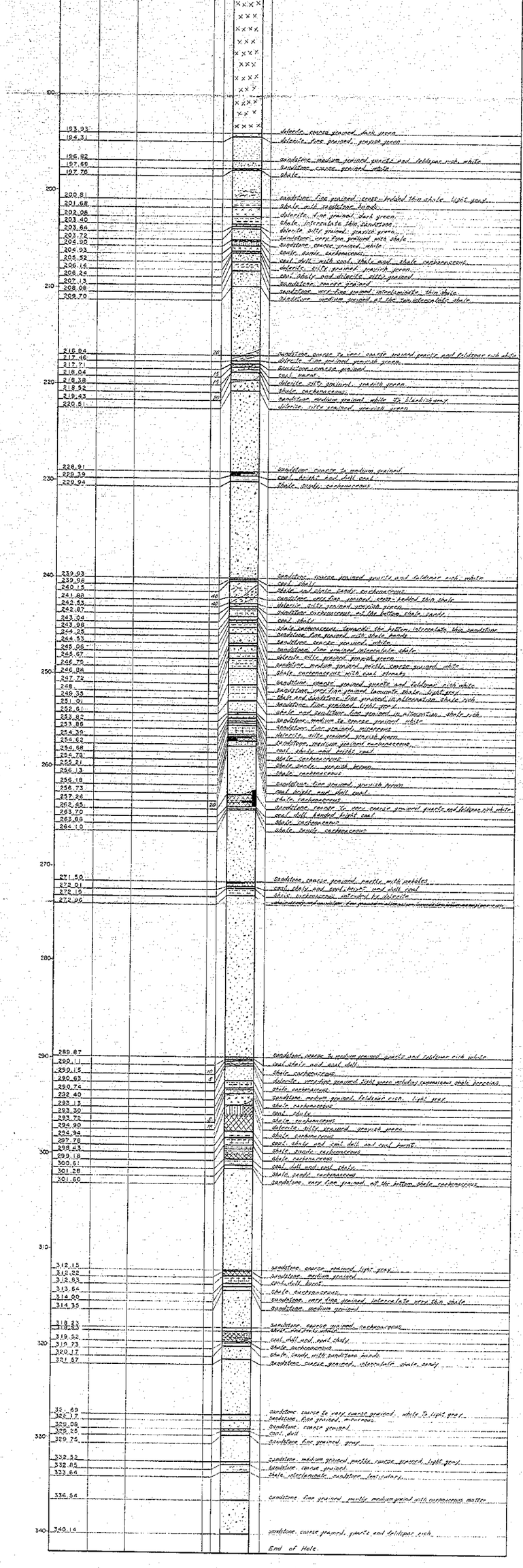
HOLE NO. : DD7
AREA : LUSHUKU
DATE DRILLED : JAN. 25, 1982 – FEB. 10, 1982
TOTAL DEPTH : 340.14 m
ELEVATION : +270.0 m
COORDINATE : X = 2,933,000, Y = – 77,000

JAPAN INTERNATIONAL COOPERATION AGENCY			
Borehole Log DD7			
Dwg.	49	Scale	1:200
Date	Sep. 1982	Prepared by: Ishihara, H. Hoshiyama	

Depth of Bore hole	Apparent Thickness of Strata (M)	True Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description
1.00					soil
3.00					sandstone medium to coarse grained weathered
7.00					sandstone fine grained and fragments of diorite
9.00					diorite
17.00					sandstone fine to medium grained weathered, green
19.00					sandstone fine grained and fragments of shale
20.00					sandstone medium grained, white
21.00					sandstone medium grained and shale, sandstone rich
25.00					sandstone fine grained, white
27.00					sandstone fine to medium grained and shale white
28.00					sandstone fine grained and shale, gray
28.34					sandstone fine grained
29.59					sandstone fine grained with plenty of carbonaceous streaks
30.72					sandstone coarse grained, white
31.43					shale carbonaceous, at the bottom intercalate sandstone bands
31.60					sandstone very coarse grained, conglomeratic quartz rich
34.44					sandstone fine grained, laminate thin shale, light gray
36.46					sandstone, coarse grained, in the middle part intercalate shale and very fine grained sandstone
37.00					sandstone medium grained, intercalate shale bands
37.39					sandstone, coarse grained, white
41.04					sandstone, fine grained, massy, intercalate coarse grained sandstone with carbonaceous streaks
42.01					sandstone, coarse grained, white
42.60					shale, sandy with sandstone intercalate
43.61					sandstone fine grained, laminated thin shale, at the bottom with carbonaceous streaks
44.23					diorite, silty grained, greyish green
44.60					sandstone fine grained with carbonaceous streaks
45.16					shale, sandy
46.74					shale, intercalate sandstone bands
47.92					sandstone, very fine grained, silty with plenty of carbonaceous streaks, gray
48.63					sandstone, very fine grained, silty, bluish gray
50.10					sandstone fine grained, laminate shale
50.92					sandstone medium grained laminate shale
51.20					shale with sandstone bands
53.55					sandstone fine grained, interlaminate thin shale, in parts cross bedded
53.41					sandstone fine grained and shale in alternation, in sandstone layers, cross bedded shale
59.77					shale carbonaceous
60.55					sandstone medium grained and shale in alternation, sandstone rich
61.65					sandstone fine grained and shale in alternation, sandstone rich
64.39					sandstone fine grained and coarse grained to medium grained in alternation
66.23					shale, sandy, interlaminate thin sandstone
67.55					sandstone coarse grained carbonaceous, quartz and feldspar rich
68.69					sandstone, coarse grained, intercalate shale
69.35					shale, sandy
69.82					sandstone, coarse grained, white
71.11					sandstone very fine grained with carbonaceous streaks, light gray
71.55					sandstone medium grained, light gray to white
71.93					sandstone fine grained, light gray
72.52					shale, intercalate sandstone, fine grained
72.57					coal, dirt
72.63					shale carbonaceous with coal streaks
72.82					sandstone fine grained, carbonaceous
74.73					sandstone medium grained, light gray
76.05					sandstone fine grained, light gray
79.33					sandstone medium grained, white to light gray
85.41					sandstone fine grained and shale in alternation sandstone rich
85.79					sandstone fine grained with thin carbonaceous streaks
87.75					sandstone medium grained with carbonaceous streaks, light gray
87.85					sandstone fine grained, dark green
88.35					diorite greyish gray
88.73					sandstone fine grained, gray
89.09					coal dirt, bentil, light coal, at the bottom shale carbonaceous
95.08					sandstone medium grained, partly intercalate very thin shale
96					sandstone very fine grained, to shale sandy, gray
98.56					sandstone fine grained, cross-bedded shale
100.71					sandstone fine grained, cross-bedded
101.06					sandstone medium grained with thin coal matter
102.88					sandstone fine grained, laminate shale, gray
103.07					diorite silty grained, dark green
103.80					shale and sandstone in alternation, laminated
105.08					sandstone medium to fine grained with carbonaceous streaks
113.09					sandstone fine grained, intercalate shale
119.04					sandstone, coarse grained, quartz and feldspar rich at the bottom conglomeratic, white
119.32					coal (height, bituminous, thin dirt coal), at the bottom shale carbonaceous
120.52					sandstone fine grained, laminate thin shale
121.32					shale carbonaceous inter laminate thin shale
122.07					sandstone medium grained
124.05					sandstone fine grained, towards the bottom cross-bedded
124.28					diorite silty grained greyish green
125.92					sandstone very fine grained, intercalate shale, gray
125.43					shale sandy laminate sandstone
127.28					shale carbonaceous inter-laminate sandstone
127.64					shale sandy to sandstone very fine grained
128.27					sandstone medium to fine grained with carbonaceous streaks
128.47					shale carbonaceous intercalated by diorite
134.70			77		sandstone coarse grained quartz and feldspar rich
136.60					shale and sandstone very fine grained in alternation dark gray
137.05					shale silty, dark gray
138.52					sandstone very fine grained partly very thin shale light gray
140.00					shale silty gray
140.90					sandstone very fine grained
141.22					diorite silty grained light green
141.40					sandstone very fine grained
144.00			40		sandstone medium grained white
144.40			40		diorite silty grained greenish gray
145.95			30		sandstone medium grained hard white
147.00					diorite very fine grained, dark green

NON – CORE DRILLING

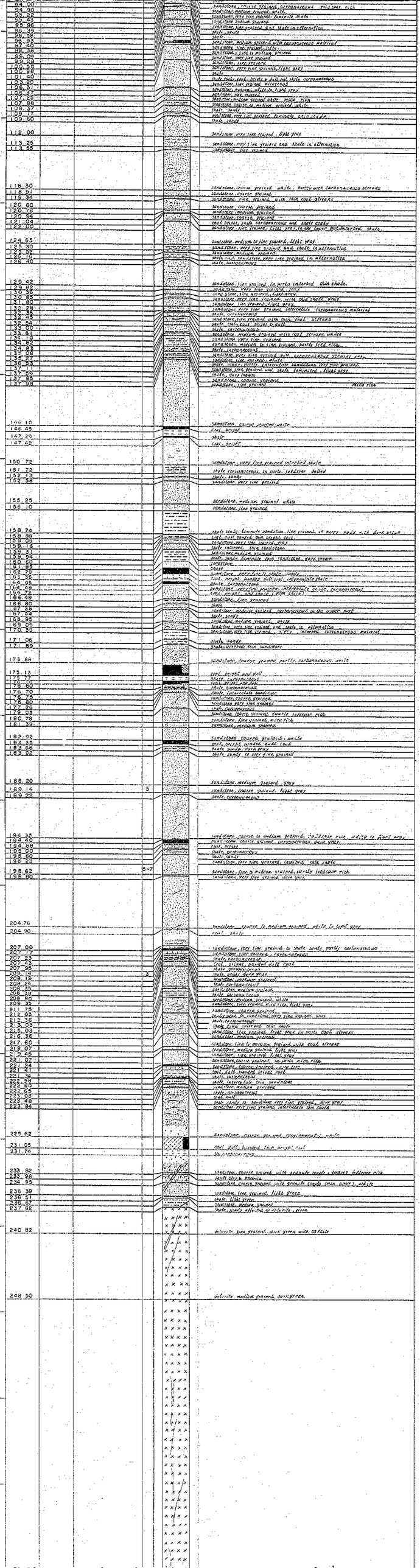
Depth	Recovery	Description
118.06		sandstone, coarse grained, quartz and feldspar rich, at the bottom, complemented white
119.32		coal bright, banded thin dull seat, at the bottom shale carbonaceous
120.52		sandstone fine grained laminate pro shale
121.32		shale carbonaceous inter laminate thin shale
122.97		sandstone medium grained
124.05		sandstone fine grained laminated the bottom cross-bedded
124.29		dolerite silty grained greyish green
124.62		sandstone very fine grained intercalate shale grey
125.43		shale dark laminate sandstone
127.28		shale carbonaceous interlaminate sandstone
127.64		shale sandy to sandstone very fine grained
128.27		sandstone medium to fine grained with carbonaceous streaks
128.47		shale carbonaceous intruded by dolerite
134.70	90	sandstone coarse grained quartz and feldspar rich
136.60		shale coal sandstone very fine grained in alternation dark grey
137.05		shale silty dark grey
138.52		sandstone very fine grained partly very thin shale light grey
140.00		shale silty grey
140.92		sandstone very fine grained
141.22		dolerite silty grained light green
141.40		sandstone very fine grained
144.00	40	sandstone medium grained white
144.40	80	dolerite silty grained greenish grey
145.98	30	sandstone medium grained hard white
147.90		dolerite very fine grained dark green
193.93		dolerite coarse grained dark green
194.31		dolerite fine grained greyish green
196.82		
197.68		sandstone medium grained quartz and feldspar rich white
197.78		sandstone coarse grained white
		shale
200.81		sandstone fine grained cross-bedded thin shale light grey
201.68		shale with sandstone bands
202.08		dolerite fine grained dark green
203.40		shale intercalate thin sandstone
203.86		dolerite silty grained greyish green
203.72		sandstone very fine grained with shale
205.90		sandstone coarse grained white
206.09		shale sandy carbonaceous
206.52		coal dull with coal shale and shale carbonaceous
208.14		dolerite silty grained greyish green
208.24		coal shaly and dolerite silty grained
207.13		sandstone coarse grained
208.08		sandstone very fine grained interlaminate thin shale
209.70		sandstone medium grained at the top intercalate shale
216.93	70	sandstone gravel to very coarse grained quartz and feldspar rich white
217.46		dolerite fine grained greyish green
217.71		sandstone coarse grained
218.04	15	coal bright
218.38	15	dolerite silty grained greyish green
218.52		shale carbonaceous
219.43	70	sandstone medium grained white to blue-bluish grey
220.51		dolerite silty grained greyish green
228.91		sandstone coarse to medium grained
228.35		coal bright and dull coal
229.96		shale sandy carbonaceous
239.93		sandstone coarse grained quartz and feldspar rich white
239.58		coal shale
240.16		shale coal shale sandy carbonaceous
241.88	45	sandstone very fine grained cross bedded thin shale
242.53	60	dolerite silty grained greyish green
242.87		sandstone carbonaceous at the bottom shale sandy
243.06		coal shale
243.98		shale carbonaceous towards the bottom intercalate thin sandstone
244.25		sandstone fine grained with shale mass
244.53		sandstone coarse grained white
245.08		sandstone fine grained intercalate shale
245.67		dolerite silty grained greyish green
246.79		sandstone medium grained with coarse grained white
246.98		shale carbonaceous with coal streaks
247.72		sandstone coarse grained quartz and feldspar rich white
248		sandstone very fine grained laminate shale light grey
249.35		siltstone sandstone fine grained in alternation shale rich
251.01		sandstone fine grained light grey
252.61		shale coal sandstone fine grained in alternation shale rich
253.82		sandstone medium to coarse grained white
253.88		sandstone fine grained micaceous
254.35		dolerite silty grained greyish green
254.52		sandstone medium grained carbonaceous
254.68		coal shale and bright coal
255.78		shale carbonaceous
255.21		shale sandy greyish green
256.13		shale carbonaceous
256.18		sandstone fine grained greyish brown
256.73		coal bright coal dull coal
257.26		shale carbonaceous
262.85	70	sandstone gravel to very coarse grained quartz and feldspar rich white
263.70		coal dull banded bright coal
263.88		shale carbonaceous
264.10		shale sandy carbonaceous
271.90		sandstone coarse grained gravelly with pebbles
272.01		coal shaly and coal bright and dull coal
272.19		shale carbonaceous altered by dolerite
272.26		shale sandy and carbonaceous fine grained micaceous or coarse grained medium grained
289.87		sandstone coarse to medium grained quartz and feldspar rich white
290.11		coal shaly and dull dull
290.15	10	shale carbonaceous
290.63	5	dolerite very fine grained light green altering ammonitic shale fragments
290.74		shale carbonaceous
292.40		sandstone medium grained feldspar rich light grey
293.13		shale carbonaceous
293.30		coal shaly
293.72	5	shale carbonaceous


193.93 dolerite coarse grained dark green
194.31 dolerite fine grained greyish green
196.82 sandstone medium grained quartz and feldspar rich white
197.65 sandstone coarse grained white
197.78 shale
200
200.81 sandstone fine grained coarse bedded thin shale light grey
201.68 shale with sandstone bands
202.08 dolerite fine grained dark green
203.40 shale interclate thin sandstone
203.64 dolerite silty grained greyish green
203.72 sandstone very fine grained with shale
204.90 sandstone coarse grained white
205.93 shale sandy carbonaceous
206.52 coal dull with coal shale and shale carbonaceous
206.16 dolerite silty grained greyish green
206.24 coal shaly and dolerite silty grained
207.13 sandstone coarse grained
208.08 sandstone very fine grained interclaminate thin shale
208.70 sandstone medium grained at the top interclaite shale
210
215.94 70 sandstone coarse to very coarse grained quartz and feldspar rich white
217.46 dolerite fine grained greyish green
217.71 sandstone coarse grained
218.04 15 coal seam
220 218.38 15 dolerite silty grained greyish green
218.52 shale carbonaceous
219.43 20 sandstone medium grained white to blackish grey
220.51 dolerite silty grained greyish green
226.91 sandstone coarse to medium grained
230 228.39 coal dull and dull coal
229.94 shale sandy carbonaceous
240 239.93 sandstone coarse grained quartz and feldspar rich white
239.98 coal shaly
240.15 shale interclate sandy carbonaceous
241.88 40 sandstone very fine grained very bedded thin shale
242.53 40 dolerite silty grained greyish green
242.87 sandstone carbonaceous at the bottom shale sandy
243.04 coal shaly
243.98 shale carbonaceous towards the bottom interclate thin sandstone
244.25 sandstone fine grained with shale bands
244.53 sandstone coarse grained white
245.06 sandstone fine grained interclate shale
245.67 dolerite silty grained greyish green
246.70 sandstone medium grained pebbly coarse grained white
250 246.98 shale carbonaceous with coal streaks
247.72 sandstone coarse grained quartz and feldspar rich white
248
249.33 sandstone very fine grained laminate shale light grey
251.01 shale and sandstone fine grained interclaminate shale rich
252.61 sandstone fine grained light grey
253.82 shale and sandstone fine grained interclaminate shale rich
253.86 sandstone medium to coarse grained white
254.30 sandstone fine grained micaceous
254.62 dolerite silty grained greyish green
254.68 sandstone medium grained carbonaceous
254.78 coal shaly and dull coal
260 255.21 shale carbonaceous
256.13 shale sandy greyish brown
256.18 shale carbonaceous
256.73 sandstone fine grained greyish brown
257.26 coal shaly and dull coal
262.65 20 shale carbonaceous
263.70 sandstone coarse to very coarse grained quartz and feldspar rich white
263.88 coal dull banded light coal
264.10 shale carbonaceous
shale sandy carbonaceous
270
271.50 sandstone coarse grained pebbly with pebbles
272.01 coal shaly and coal bright and dull coal
272.19 shale carbonaceous intruded by dolerite
272.96 sandstone medium fine grained clinoclase [illegible]
280
289.87 sandstone coarse to medium grained quartz and feldspar rich white
290 290.11 coal shaly and coal dull
290.15 10 shale carbonaceous
290.63 5 dolerite very fine grained light green including carbonaceous shale bearing
290.76 shale carbonaceous
292.40 sandstone medium grained feldspar rich light grey
293.13 shale carbonaceous
293.30 coal shale
293.75 5 shale carbonaceous
294.90 10 dolerite silty grained greyish green
295.94 shale carbonaceous
297.76 coal shale and coal dull and coal bright
298.23 shale sandy carbonaceous
300 299.18 shale carbonaceous
300.61 coal dull and coal shale
301.28 shale sandy carbonaceous
301.60 sandstone very fine grained at the bottom shale carbonaceous
310
312.13 sandstone coarse grained light grey
312.22 sandstone medium grained
312.83 coal dull bright
313.64 shale carbonaceous
314.00 sandstone very fine grained interclate very thin shale
314.35 sandstone medium grained
318.23 sandstone coarse grained carbonaceous
319.52 shale and coal shale
320 319.73 coal dull and coal shaly
319.77 shale carbonaceous
320.17 shale sandy with sandstone bands
321.57 sandstone coarse grained interclate shale sandy
328.69 sandstone coarse to very coarse grained white to light grey
328.17 sandstone fine grained micaceous
329.08 sandstone coarse grained
330 328.29 coal dull
329.74 sandstone fine grained grey
332.52 sandstone medium grained pebbly coarse grained light grey
332.85 sandstone coarse grained
333.64 shale interclaminate sandstone lenticular
336.54 sandstone fine grained mostly medium grained with carbonaceous matter
340 340.14 sandstone coarse grained quartz and feldspar rich
End of Hole.

HOLE NO. : DD8
AREA : LUBHUKU
DATE DRILLED : JAN. 21 - FEB. 10, 1981, JAN. 21 - FEB. 3, 1982
TOTAL DEPTH : 347.60m
ELEVATION : + 252.80m
COORDINATE : X = + 2,932,800 Y = 78,000

JAPAN INTERNATIONAL COOPERATION AGENCY			
Borehole Log DD8			
Dwg.	4 h	Scale	1:200
Date	Sep. 1981	Prepared by	H. Shinoraji, H. Hotokeyama

Depth of Borehole (M)	Apparent Thickness of Strata (M)	True Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description
0					
3.85					weathered soil
10					
20					
30					
32.40					shale, intercalated with sandstone
38.00					sandstone, medium grained, in parts, intercalate carbonaceous material, white
38.10			4		sandstone, medium grained
					sandstone, coarse grained
40					
49.35			5		sandstone, very fine grained, in the lower much shale sandy, mica rich, light gray
50					
52.55					sandstone medium grained with shale, carbonaceous irregularly
55.60					sandstone, medium to coarse grained, feld spar rich
57.60					sandstone: fine grained carbonaceous, gray
58.37					sandstone: medium grained, white
59.73					
60.27					sandstone, fine grained with many carbonaceous streaks
					sandstone, medium grained, light gray
60					
61.42					sandstone, fine grained, light gray — 10cm pyrite
61.54			5		shale: carbonaceous
62.98					sandstone: fine grained, in parts, intercalate shale
63.15					shale: carbonaceous, in lower parts, sandstone rich
63.65					sandstone: coarse, to medium grained
63.97					sandstone: fine grained with shale, soft, stratifiedly
64.4					shale: continuous count
64.55					sandstone: coarse grained
69.95					sandstone: medium grained, light gray
70.12					shale: carbonaceous, stratifiedly sandstone irregularly
70					
71.90					sandstone, coarse grained, feldspar rich, light
72.20					sandstone, medium grained with carbonaceous streaks
74.40					
74.58					sandstone, fine grained, at the bottom, carbonaceous, gray to light gray
75.10					fine sand, medium grained, white
76.50					shale, sandy, carbonaceous, shale and sandstone
					shale, dark gray to black
80.30					sandstone very fine grained with shale irregularly
80.58					sandstone, medium grained, white
80.63					shale, carbonaceous
81.53					fine sand, medium grained, in part shale, carbonaceous
83.24					sandstone: fine grained towards the bottom, very fine grained
83.80					shale and sandstone in alternating, dark gray
84.06					sandstone very fine grained, light green
84.47					shale and sandstone very fine grained, in alternation
85.50					shale
85.85					shale, sandy, gray
87.20					shale, carbonaceous
87.61					sandstone medium to fine grained with carbonaceous shale
87.94					shale, carbonaceous
88.04					sandstone medium grained
88.43					shale, carbonaceous
88.96					shale
89.20					sandstone, light green
89.30					shale, carbonaceous
89.50					fine sand, medium grained, white
89.56					shale, carbonaceous
89.80					sandstone, fine grained, light gray
89.88					fine sand, medium, medium
90.00					sandstone, fine grained, in parts, intercalate shale
90.57					sandstone, coarse grained
91.04					sandstone, very fine grained, light gray
91.17					shale, sandy, carbonaceous, fine grained
92.83					shale
93.00					sandstone, coarse grained, carbonaceous, feldspar rich
93.90					sandstone, medium grained, white
94.22					sandstone very fine grained, feldspar shale
95.23					sandstone medium grained
95.46					sandstone, fine grained, and shale in alternation
96.19					shale, sandy
96.39					shale
96.50					sandstone medium grained with carbonaceous material
96.60					shale, sandy, carbonaceous
96.85					sandstone, fine to medium grained
97.05					sandstone, very fine grained
98.28					sandstone, fine grained
99.60					sandstone, very fine grained, light gray
100.06					shale
100.20					shale, sandy, coal, medium to medium shale, carbonaceous
100.30					sandstone, fine grained, micaceous
100.37					sandstone, medium, white to light gray
100.55					sandstone, fine grained
100.86					sandstone medium grained white, mica rich
100.97					sandstone, coarse to medium grained, white
109.17					shale, sandy
109.60					sandstone very fine grained, feldspar rich shale
					shale, sandy
112.00					sandstone, very fine grained, light gray
113.25					sandstone, very fine grained and shale in alternation
113.55					sandstone, fine grained
118.30					sandstone, coarse grained, white, rusty with carbonaceous streaks
118.91					sandstone, coarse grained
119.90					sandstone, fine grained, with thin coal streaks
120.60					sandstone, coarse grained
120.78					sandstone, medium grained
120.94					sandstone, coarse grained
121.06					sandstone, coarse grained
122.00					fine grain, shale carbonaceous and shale coals
					sandstone, fine grained, light gray, in the lower part interbedded shale
124.65					sandstone medium to fine grained, light gray
124.90					sandstone, very fine grained and shale in alternation
125.40					sandstone medium grained
125.65					shale and sandstone very fine grained in alternation
					shale, carbonaceous
128.42					sandstone fine grained in parts intercalated thin shale.
129.62					sandstone, very fine grained, gray
130.36					fine sand, fine grained, gray
130.46					sandstone, very fine grained, white with thin shale gray
131.80					sandstone, fine grained, light gray
132.39					sandstone very fine grained intercalate carbonaceous material
132.46					shale, carbonaceous
132.45					sandstone, fine grained with thin coal streaks
132.50					shale, coal, coal seam & shale
132.80					shale, carbonaceous
133.41					sandstone, medium grained with coal streaks, white
134.10					fine sand, very fine grained
134.90					siltstone, medium to fine grained, partly fere rich
135.47					shale, carbonaceous
135.97					sandstone very fine grained with carbonaceous streaks, gray
136.53					sandstone, fine to very fine, white
137.11					shale, sandy, partly intercalate sandstone, very fine grained
137.60					sandstone, fine grained and shale, laminated, light gray
137.86					shale, fine grained
137.95					sandstone, coarse grained
					sandstone, fine grained — mica rich
146.10					sandstone, coarse grained white
146.45					coal, green
147.29					shale
147.42					coal, bright
150.72					sandstone, very fine grained interbed shale
151.72					shale, carbonaceous, in part, yellow ocher
152.13					shale, sandy
152.98					sandstone, very fine grained
155.25					sandstone, medium grained, white
156.10					sandstone, fine grained
158.74					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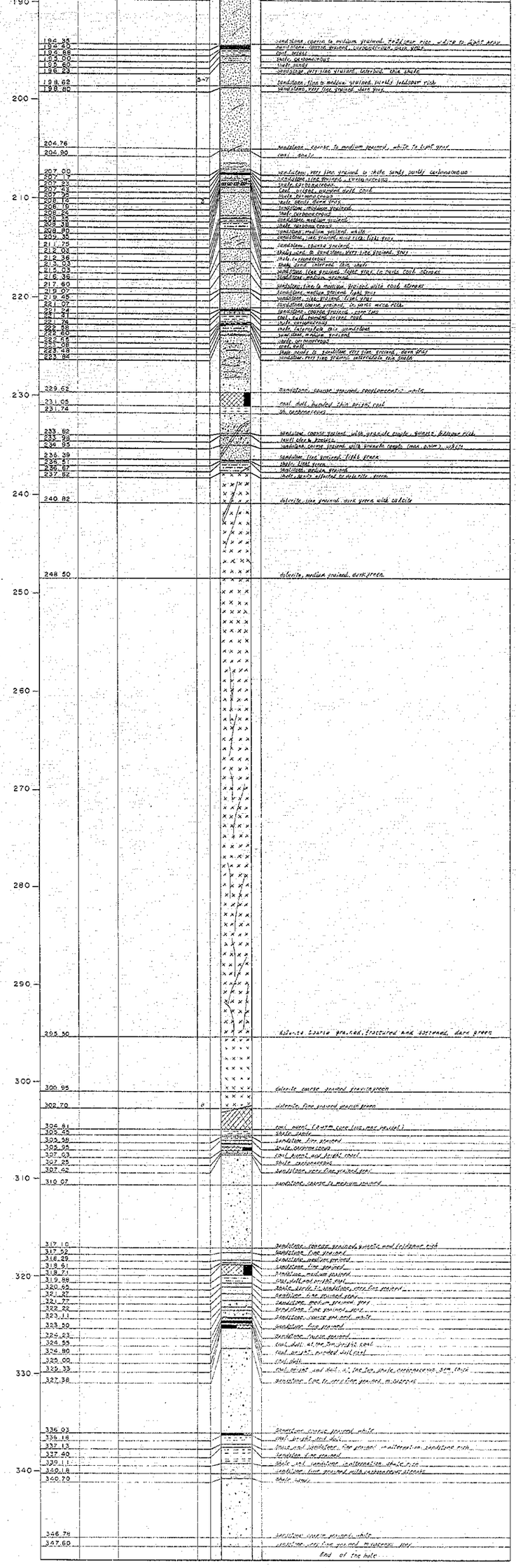

190
194.33 sandstone, coarse to medium grained, red/gray, pink, white to light gray
194.40
194.68
194.90
195.00
195.60
196.23
198.62 sandstone, fine to medium grained, pyrite, feldspar rich
198.80 sandstone, very fine grained, dark gray
200
204.76 mudstone, coarse to medium grained, white to light gray
204.90 coal, dull
207.00 sandstone, very fine grained to shale sandy, pyrite carbonaceous
207.22
207.23
207.45
207.75
208.10
208.70
209.65
209.35
209.80
209.35
211.75 sandstone, coarse grained
212.03
212.38
213.03
217.03
216.38
217.60
210
219.07
219.45
221.07
221.24
221.81
221.76
222.88
223.60
223.65
223.08
223.48
223.80
220
229.62 mudstone, coarse grained, carbonaceous, white
230
231.05 coal dull, banded thin pristine coal
231.74 sh carbonaceous
233.82 sandstone, coarse grained, with granule, simple, quartz, feldspar rich
233.93 shale slty & banded
234.93 sandstone, coarse grained, with granule rounded, (mas, brown), white
236.39 sandstone, fine grained, light green
236.51 shale light green
236.67 sandstone, medium grained
237.82 shale, earth, altered to pale green
240
240.82 diorite, fine grained, dark green with calcite
248.50 diorite, medium grained, dark green
250
260
270
280
290
293.30 diorite, coarse grained, fractured and weathered, dark green
300
300.95 diorite, coarse grained, greenish green
302.70 diorite, fine grained, dark green
304.81 coal, band, (ash, pure low, mat, pristine)
305.42 shale, black
305.58 sandstone, fine grained
305.95 shale, carbonaceous
307.03 coal band, mat bright coal
307.25 shale, carbonaceous
307.62 sandstone, very fine grained
310
310.07 sandstone, coarse to medium grained
317.10 sandstone, coarse grained, quartz and feldspar rich
317.52 sandstone, fine grained
318.29 sandstone, medium grained
319.51 sandstone, fine grained
318.71 sandstone, medium grained
319.88 coal, dull and bright coal
320.62 shale, black to sandstone, very fine grained
321.27 sandstone, fine grained, gray
321.77 sandstone, medium grained, gray
322.22 sandstone, fine grained, gray
323.11 sandstone, coarse grained, white
323.30 sandstone, fine grained
324.23 sandstone, fine grained
324.55 coal, dull, at the top, shale, carbonaceous, some trace
326.80 coal, bright, banded dull coal
325.00 coal, dull
325.33 coal, bright and dull, at the top, shale, carbonaceous, some trace
327.38 sandstone, fine to very fine grained, micaceous
320
336.03 sandstone, coarse grained, white
336.18 coal, bright and dull
337.13 shale and sandstone, fine grained, interbedded, sandstone rich
337.40 sandstone, fine grained
339.11 shale and sandstone, interbedded, shale rich
339.18 sandstone, fine grained, with carbonaceous streaks
340
340.70 shale, gray
346.78 sandstone, coarse grained, white
347.60 sandstone, very fine grained, micaceous, gray
End of the hole

HOLE NO. : D09
AREA : LUBHUKU
DATE DRILLED : JAN.18, 1982 – FEB.16, 1982
TOTAL DEPTH : 395.40 m
ELEVATION : +248.9 m
COORDINATE : X = +2,932,900, Y = −79,000

JAPAN INTERNATIONAL COOPERATION AGENCY

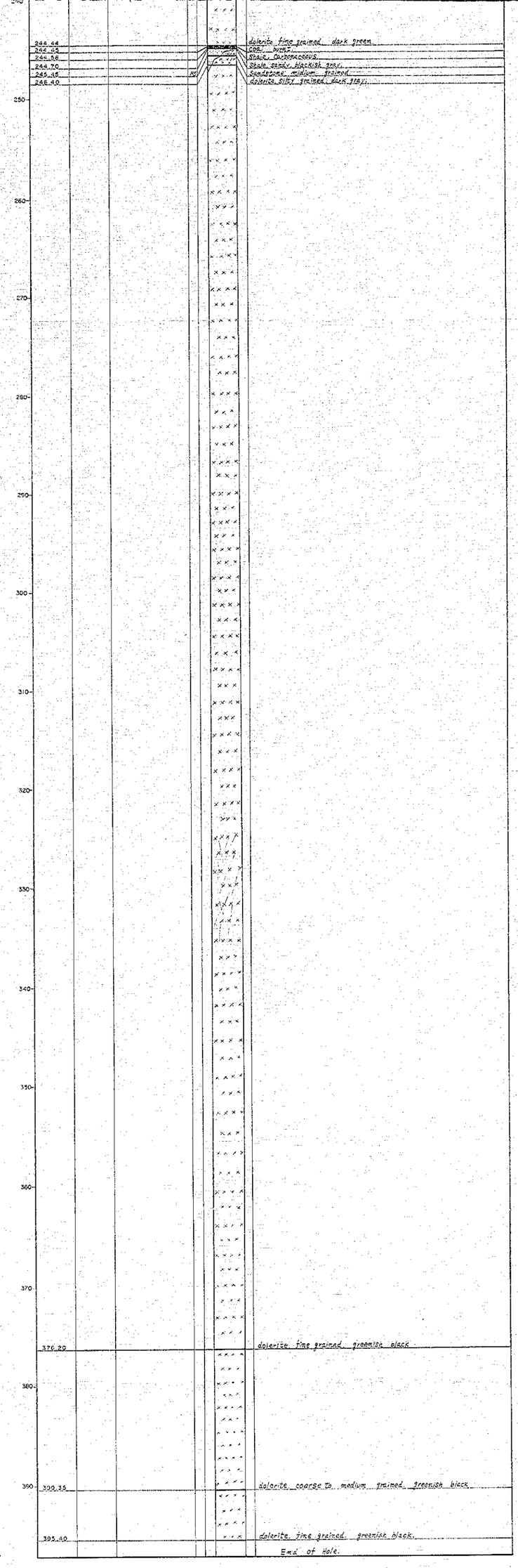
Borehole Log D09

Dwg. 41 Scale 1:200
Date Sep. 1982 Prepared by: Takahara, H. Hatakeyama

Depth of Bore hole	Apparent Thickness of Strata (M)	True Thikness of Strata (M)	Dip of Strata	Column Section	Rock Description
6.00					Sandstone very coarse grained. quartz and feldspar rich
9.00					Sandstone, medium grained, weathered.
11.00					Shale and sandstone, medium grained shale rich
13.00					Sandstone, coarse grained and shale, sandstone rich, gray
15.00					Shale, gray.
23.23					Shale.
26.85					Shale, interbed thin sandstone. dark gray
41.21					Shale, intercalate thin sandstone bands, dark gray.
43.22					dolerite, medium grained dark green
43.40					dolerite, silty grained, dark gray
46.75					Shale, partly with thin sandstone bands, dark gray.
50.12					Sandstone fine grained with thin carbonaceous matter irregularly, light gray.
52.57					Sandstone, fine grained, micaceous, light gray.
63.60					Sandstone, fine to very fine grained, partly intercalate very thin shale streaks light gray.
65.20					Sandstone medium grained, in parts quartz and feldspar rich, white
66.75			10		Sandstone very fine to fine grained, intercalate shale, light gray.
67.20					Dolerite, silty grained, dark green
98.57			20		dolerite, fine to silty grained, gray
98.91			30		Sandstone fine grained, intercalate shale.
103.14					dolerite, fine grained, gray.
104.17					Sandstone medium grained, quartz rich
105.67					Sandstone fine grained, laminated, bluish gray.
106.56					Sandstone coarse grained, quartz rich, white.
108.12					Sandstone, fine grained, bluish gray, core broken
119.03					sandstone medium to coarse grained, quartz rich, white
111.90			55		Sandstone fine grained with calcite vein, bluish gray.
114.72			20		dolerite fine to silty grained, dark greyish green.
116.40			70		dolerite, fine to medium, grained, greyish green
117.48			70		dolerite, silty grained, dark gray
117.68			70		dolerite, medium grained, greyish green
121.75			20		dolerite, fine to silty grained, dark gray, core broken
123.19			20		dolerite medium grained, greyish green
146.02					dolerite, medium to coarse grained, dark green
147.29					dolerite, silty grained, gray

Non-Core Drilling

Depth	Recovery	Description
104.17		Sandstone medium grained quartz rich
105.07		Sandstone fine grained laminated, bluish gray
106.06		Sandstone coarse grained quartz rich, white
108.10		Sandstone: fine grained, bluish gray, core broken
110.03		Sandstone medium to coarse grained quartz rich, white
111.80	55	Sandstone fine grained with calcite rein, bluish gray.
114.72	60	dolerite fine to silty grained, dark greyish green.
116.40	70	dolerite fine to medium grained greyish green
117.48	70	dolerite silty grained, dark grey.
117.88	70	dolerite, medium grained, greyish green.
121.75	50	dolerite fine to silty grained darkgray core broken
123.19	40	dolerite medium grained greyish green.
146.82		dolerite, medium to coarse grained, dark green.
147.20		dolerite, silty grained, grey
157.30		Sandstone, fine grained laminated light gray.
159.10		Sandstone fine grained and shale in alternation, sandstone rich
168.68		Sandstone, medium to fine grained, light gray.
168.73		dolerite fine grained dark gray.
168.91		Sandstone fine grained
204.48		dolerite medium grained greyish green.
207.68		dolerite fine grained greyish green.
209.03	75	dolerite silty grained, greyish green.
209.73	75	Sandstone very fine grained light gray.
211.48	80	dolerite silty grained light green.
212.40	40	dolerite silty grained fractured dark green.
212.47	40	Shale carbonaceous fractured
213.38	40	Sandstone medium grained quartz and feldspar rich white.
213.94		Sandstone coarse grained with conglomerate
215.14		Shale carbonaceous interclate sandstone fine grained at top 3cm thin coal
215.65	100	Sandstone fine grained laminate shale at the crown shale rich
215.76		coal, brittle, pasted dull coal
216.16		Shale sandy interclate sandstone
217.75		Sandstone very fine grained light gray.
219.25		Sandstone fine grained white
219.40		Shale interclaminate sandstone
220.26		Sandstone coarse grained white
220.56		Shale with coal streaks.
225.22		Sandstone fine to very fine grained partly laminate thin shale light gray
228.12		Sandstone coarse grained quartz and feldspar rich white.
228.63		Shale with sandstone bands darkgray (0.40m core loss)
231.25	70	Sandstone coarse grained quartz and feldspar rich white.
244.44		dolerite fine grained dark green.
244.45		coal burnt
244.58		Shale carbonaceous
244.70		Shale sandy blackish gray
245.45	100	Sandstone medium grained
248.60		dolerite silty grained dark gray.


244.44
244.63
244.68
244.70
245.15
245.40
dolerite fine grained dark green
coal, black
Shale, carbonaceous
Shale, sandy, blackish grey
Sandstone medium greyish
dolerite silky grained dark grey
250
260
270
280
290
300
310
320
330
340
350
360
370
376.20
dolerite fine grained greenish black
380
390
393.35
dolerite coarse to medium grained greenish black
395.40
dolerite fine grained greenish black.
End of Hole.

HOLE NO. : DD 10
AREA : LUBHUKU
DATE DRILLED : FEB.17 - MAR 8 :1981, OCT.14 - OCT.30, 1982
TOTAL DEPTH : 401.46 m
ELEVATION : 266.20 m
COORDINATE : X=+2,934,650, Y=-76,720

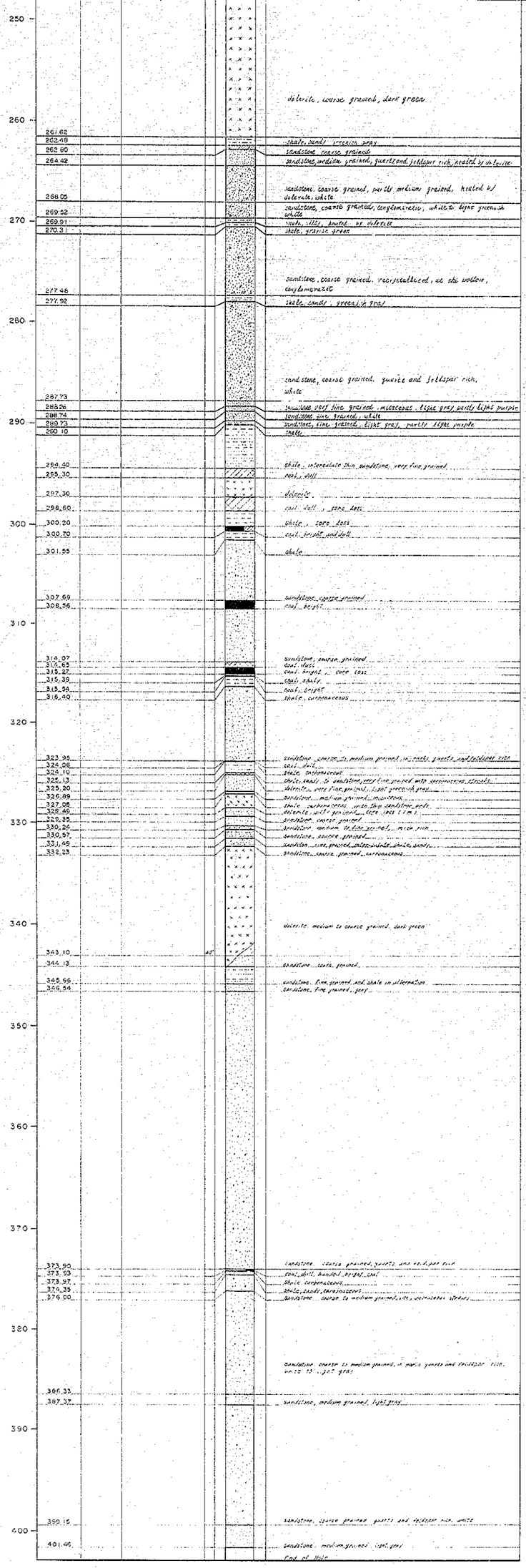
JAPAN INTERNATIONAL COOPERATION AGENCY

Borehole Log DD 10

Dwg.	41	Scale	1 : 200
Date	Sep. 1982	Prepared by	N. Iwahara, H. Hatoneyama

Depth of Borehole (M)	Apparent Thickness of Strata (M)	True Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description
5.10					coal, weathered
7.40					sandstone, fine grained, silty, micaceous, weathered
10.05					sandstone, coarse grained, weathered
12.65					sandstone, very fine grained, silty, weathered
14.25					shale, weathered
19.48					sandstone, coarse grained.
20.61					sandstone, fine grained, intercalate shale, irregularly
22.35					shale, intercalate thin sandstone, fine grained
25.55					shale, sandy, in the lower part, intercalate sandstone
27.12					sandstone, very fine grained, carbonaceous, grey to dark grey
27.76					sandstone, medium grained and shale carbonaceous in alternation
28.90					sandstone, medium to coarse grained, white
29.02					shale, in the lower part, sandstone, coarse grained
31.15					sandstone, very fine grained, grey
33.96					shale, black
35.10					sandstone and shale, in alternation
36.00			15		sandstone fine grained, light grey
51.30					dolerite, fine grained, hard
51.90					sandstone, fine grained, hard
52.54					dolerite, fine grained, hard
53.67					sandstone, fine grained, in parts, intercalate medium grained sandstone
54.34					sandstone fine grained & shale in alternation
54.66					dolerite fine grained, hard
55.17					shale, sandy to sandstone, very fine grained
55.28					dolerite fine grained
55.95					shale
58.84					sandstone medium grained with carbonaceous streaks, white
59.34					sandstone, coarse grained, white
59.57					sandstone, fine grained, light grey
61.39					sandstone, coarse grained, white
61.65			82		shale, sandy
61.82					dolerite fine grained, hard
63.88					sandstone, coarse grained, quartz and feldspar rich, white
65.78					shale, sandy, intercalate sandstone, fine grained
65.95					dolerite fine grained, hard
66.88					sandstone fine grained, intercalate thin shale
67.56					shale and sandstone, fine grained, in alternation
68.27					shale, sandy, grey
69.52					shale & sandstone, fine grained, in alternation
71.85					sandstone, medium to coarse grained, white
73.25					sandstone, coarse grained, with granule conglomerate in the lower parts
74.22					sandstone medium grained & shale in alternation
75.07					sandstone, coarse grained, with granule conglomerate
76.74					sandstone, medium grained, white
77.57					sandstone medium grained, in parts, intercalate very thin shale
77.74					shale, sandy
78.14					sandstone fine grained, intercalate thin shale
78.72					sandstone, fine grained
79.69					sandstone, medium grained
80.07					dolerite very fine grained, reddish green
80.48					sandstone fine grained, with very thin shale bands
83.20					sandstone, coarse grained, white
84.11					sandstone, medium grained
85.55					sandstone, very fine grained, intercalate very dark shale and carbonaceous streaks, micaceous, dark grey
86.07					dolerite, very fine grained, dark green
89.20					sandstone fine grained with carbonaceous streaks in the upper parts, light grey
90.45					sandstone medium grained, quartz and feldspar rich, white
90.65					shale, sandy, light grey
91.00					sandstone medium grained with calcite white
97.82					sandstone, coarse grained, in parts, quartz and feldspar rich, in the lower part, coarse to medium grained
97.98					coal, weathered, bituminous dull coal
98.50					shale, sandy to sandstone, very fine grained
99.00					sandstone, fine grained, partly micaceous, light grey
99.30					shale, carbonaceous and sandstone in alternation
99.70					shale, carbonaceous, thick, thin sandstone bands, bluish grey
101.00					sandstone, very fine grained, mica rich
102.00					sandstone, very fine grained, intercalate thin shale, light grey
104.55					shale, carbonaceous and shale, sandy, in alternation, dark grey
104.87					shale, sandy and shale, carbonaceous
106.72					sandstone, coarse medium grained, partly mica rich, white
112.68			70		sandstone, coarse grained, quartz and feldspar rich, white
113.17			55		dolerite fine grained
113.66					sandstone, coarse grained, in the lower part, shale
114.57					sandstone, medium to very fine grained & shale, carbonaceous in alternation
115.09					sandstone, medium grained
115.45					shale, intercalate very thin sandstone
115.72					shale, carbonaceous
116.30					sandstone, very fine grained
117.05					shale, with thin sandstone bands, in the lower part, shale, sandy
117.35					sandstone, coarse grained
117.65					sandstone, very fine and medium grained
118.94					shale, carbonaceous
120.25					dolerite fine grained
122.02					dolerite, medium grained
123.36					dolerite, fine grained
125.44					dolerite, coarse grained
126.30			20		shale, sandy, grey
136.65			50		dolerite, fine grained
136.85					sandstone, coarse grained, quartz rich
137.49					dolerite fine grained, white
137.68					sandstone, very fine grained, light grey
138.40			55		dolerite fine grained
139.96					sandstone very fine grained, intercalate very thin shale, micaceous
141.89					dolerite fine grained
142.97					sandstone, very fine grained and shale, sandy, in alternation, grey to light grey
143.21					shale
143.52					sandstone, very fine grained, light grey
144.85					shale, sandy, black
146.65					sandstone, coarse grained
146.72					coal, dull, coarse
146.96					shale, carbonaceous with coal matter
147.26					coal, shale
147.54					coal, bright, powdery dull coal
148.00					shale, carbonaceous
148.70					shale, sandy, grey
149.51			5		dolerite, fine grained
150.37					shale, sandy
151.09					sandstone, fine grained, carbonaceous
155.65			75		sandstone, coarse grained to medium grained, coarse grained rich, white

Depth (m)	Dip	Description
116.30		sandstone, very fine grained
117.05		core with thin sandstone bands, in the lower part shale, sandy
117.35		sandstone coarse grained.
117.85		sandstone, very fine and medium grained
118.04		shale, carbonaceous
120.25		diorite fine grained
122.02		dolerite, medium grained
123.36		dolerite, fine grained
125.44		dolerite, coarse grained
126.36	40	shale, sandy, gray
136.45	50	dolerite fine grained
136.85		sandstone coarse grained, purple veins
137.48		dolerite fine grained, blocs
137.68		sandstone very fine grained, light gray
138.40	55	dolerite fine grained
139.96		sandstone, very fine grained, intercalate very thin shale, micaceous
141.89		dolerite fine grained.
142.97		sandstone, very fine grained with shale, sandy in alternation, gray to dark gray
143.21		shale
143.52		sandstone, very fine grained, light gray
144.82		shale, sandy, black
144.65		sandstone coarse grained
145.74		coal, dull coal
146.53		shale, carbonaceous with coal matter
147.22		coal, dull
147.34		coal, white, banded dull coal
148.00		shale, carbonaceous
148.70		shale, sandy, gray
149.51	5	siltstone fine grained
150.37		shale sandy
151.07		sandstone, fine grained, carbonaceous
155.65	75	sandstone, coarse grained to medium grained, coarse grained rich, white
168.67	60	dolerite, coarse grained, at the depth of 161.70m slicken side of 45°
170.67		sandstone, coarse grained, white
171.10		dolerite fine grained with calcite
171.65		shale
172.32		sandstone medium grained
173.85		sandstone coarse grained
173.96		shale, sandy
176.12		sandstone, coarse grained, carbonaceous
176.15		calcite veins
180.95		dolerite, coarse grained, dark green
181.10		dolerite, fractured
187.10		sandstone coarse grained with granule conglomerate, quartz and feldspar rich, as parts, carbonaceous
		189.15 fault?
		191.00 – 195.00m core fractured
		201.00 – 204.00 calcite veins, vertical
		dolerite, coarse grained, dark green
261.82		
262.48		shale, sandy, greenish gray
262.60		sandstone coarse grained
264.42		sandstone, medium grained, quartz and feldspar rich, healed w/ dolerite
268.05		sandstone, coarse grained, partly medium grained, healed w/ dolerite, white
269.52		sandstone, coarse grained, conglomeratic, white to light greenish white
269.91		shale, silty, healed w/ dolerite
270.31		shale, greenish green
277.48		sandstone, coarse grained recrystallized, at the bottom, conglomeratic
277.92		shale, sandy, greenish gray
286.73		sandstone, coarse grained, quartz and feldspar rich, white
288.20		sandstone very fine grained, micaceous, light gray partly light purple
289.74		sandstone, fine grained, white
290.73		sandstone, fine grained, light gray, partly light purple
290.10		shale
294.43		shale intercalate thin sandstone very fine grained
295.30		coal, dull
297.30		siltstone
298.60		coal, dull, core loss


250
260
270
280
290
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310
320
330
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350
360
370
380
390
400
261.62
262.49
262.90
264.42
268.05
269.52
269.91
270.31
277.48
277.92
287.73
288.26
288.74
289.73
290.10
294.50
295.30
297.30
298.60
300.20
300.70
301.55
307.69
308.56
314.07
315.65
315.27
315.39
315.56
316.40
323.95
326.08
326.10
325.13
325.20
326.89
327.05
328.49
329.35
330.25
330.57
331.69
332.23
343.10
344.13
345.96
346.54
373.90
373.93
373.97
374.35
376.00
386.33
387.37
389.15
401.46
End of Hole
dolerite, coarse grained, dark green
shale, sandy, greenish grey
sandstone, coarse grained
sandstone, medium grained, quartz and feldspar rich, weathered to dolerite
sandstone, coarse grained, partly medium grained, heated w/ dolerite, white
sandstone, coarse grained, conglomeratic, white to light greenish white
shale, silty, banded w/ dolerite
shale, greenish grey
sandstone, coarse grained, recrystallized, at the bottom, conglomeratic
shale, sandy, greenish grey
sandstone, coarse grained, quartz and feldspar rich, white
sandstone very fine grained, micaceous, light grey, partly light purple
sandstone, fine grained, white
sandstone, fine grained, light grey, partly light purple
shale
shale, interbedded thin sandstone, very fine grained
coal, dull
dolerite
coal, dull, some dots
shale, some dots
coal, bright and dull
shale
sandstone, coarse grained
coal, bright
sandstone, coarse grained
coal, dull
coal, bright, some dots
coal, shaly
coal, bright
shale, carbonaceous
sandstone, coarse to medium grained, w. mafic grains and feldspar rich, white to light grey
shale, sandy to sandstone, very fine grained with carbonaceous streaks
dolerite, very fine grained, light greenish grey
sandstone, medium grained, micaceous
shale, carbonaceous, with thin sandstone beds
dolerite, well grained, some dots (max 1 cm)
sandstone, coarse grained
sandstone, medium to fine grained, mica rich
sandstone, coarse grained
sandstone, fine grained, interbedded shale, sandy
sandstone, coarse grained, carbonaceous
dolerite, medium to coarse grained, dark green
sandstone, coarse grained
sandstone, fine grained and shale in alternation
sandstone, fine grained, grey
sandstone, coarse grained, quartz and feldspar rich
coal, dull, banded, bright coal
shale, carbonaceous
shale, sandy, carbonaceous
sandstone, coarse to medium grained, w. carbonaceous streaks
sandstone, coarse to medium grained, w. mafic grains and feldspar rich, white to light grey
sandstone, medium grained, light grey
sandstone, coarse grained, quartz and feldspar rich, white
sandstone, medium grained, light grey

HOLE NO. : DD11
AREA : LUBUKU
DATE DRILLED : FEB.23 - MAR.14
TOTAL DEPTH : 322.85m
ELEVATION : + 274.20m
COORDINATE : X=+2,937,220 , Y=-76,040

JAPAN INTERNATIONAL COOPERATION AGENCY

Borehole Log DD11

Dwg. 4 x 4 | Scale 1 : 200
Date May. 1981 | Prepared by Y.Ishihara, H.Hatakeyama

Depth of Borehole (M)	Apparent Thickness of Strata (M)	True Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description
7.30					shale
29.50					diorite, coarse grained, weathered, yellowish gray
36.30					diorite, fine grained, dark gray
37.00					sandstone, medium grained, hard, quartz rich, light gray
44.95			2 3		shale, intercalate sandstone, dark gray
45.10					sandstone, fine grained, light gray
46.00					shale, sandy to sandstone, very fine grained, light gray
50.05					sandstone, very fine, grained with carbonaceous streaks
50.56					shale, sandy to sandstone, very fine, grained
51.60					sandstone, very fine, grained, light gray
52.50			34		shale, sandy to sandstone, very fine grained
54.20					shale and sandstone, very fine grained, in alternation, dark gray
54.85					sandstone, fine, grained, in the upper part, carbonaceous, dark gray
55.10					sandstone, medium grained, white
56.00					shale, intercalate thin sandstone, in the upper part, dark gray
59.30					sandstone, coarse grained, partly quartz and feldspar rich, white
63.20					sandstone, fine grained with carbonaceous shale, irregularly, dark gray
64.10			7°		sandstone, fine grained with carbonaceous streaks, light gray
66.15					sandstone, fine grained, intercalate carbonaceous shale
66.50					sandstone, fine, grained, intercalate, carbonaceous matter
68.60					sandstone, medium to fine grained, quartz and feldspar rich
69.02					sandstone, fine grained, with carbonaceous streaks
69.77					sandstone very fine grained, intercalate dark shale
69.90					shale, carbonaceous
70.85					sandstone, very fine grained, intercalate thin shale, light gray
71.90					sandstone, medium grained with coal matter
72.90					sandstone, medium grained, quartz and feldspar rich
73.25					sandstone, fine grained, white
73.67					shale, carbonaceous with sandstone bands
74.05					sandstone, medium grained, white
74.70					shale, carbonaceous, intercalate thin sandstone bands
76.70					sandstone, medium grained
77.60					sandstone, medium grained, carbonaceous, light gray
79.85					sandstone, very fine grained, and shale, carbonaceous, in alternation
81.20					sandstone, very fine grained, with thin carbonaceous shale, dark gray
83.80			5°		shale, sandy to sandstone, very fine, grained with carbonaceous streaks, dark gray
84.70					sandstone, fine grained, dark gray
85.35					sandstone, fine grained, and shale, carbonaceous in alternation
86.25					sandstone, very fine grained, intercalate carbonaceous shale, light gray
89.20					shale, carbonaceous
89.50					sandstone, very fine grained, with thick carbonaceous streak
90.50					sandstone, fine to very fine grained, intercalate thin shale
92.50					sandstone, fine to medium grained with shale bands
93.80			5°		sandstone, fine to very fine grained, with carbonaceous shale bands, irregularly, dark gray
95.00					sandstone, fine to very fine grained, intercalate, thin shale, dark gray
96.70					shale, carbonaceous and sandstone, very fine grained, in alternation, dark gray
97.75					sandstone, fine grained
98.00					shale, sandy
99.10					sandstone, medium grained and shale, carbonaceous, in alternation
99.65					sandstone, fine grained, with shale bands, dark gray
100.20					sandstone, very fine grained
100.95					shale, carbonaceous
101.37					shale, carbonaceous and coal, weight, sandwich dull coal
101.55					shale, carbonaceous
103.80					sandstone, fine grained, carbonaceous
105.50					sandstone, medium grained with diorite, white
115.45					sandstone, coarse to medium grained
115.46					coal, bright
116.80					sandstone very fine grained, with shale bands
117.95					sandstone, fine grained, carbonaceous
119.65					sandstone, fine grained, intercalate thin shale, partly, quartz rich, light gray
121.05					sandstone, very fine grained, intercalate shale, micaceous
122.90					shale, carbonaceous with sandstone bands
124.05					sandstone, medium grained with shale bands
127.55			40°		sandstone, coarse grained, quartz and feldspar rich, white
129.10			50°		diorite, very fine grained with calcite, gray
130.20					sandstone, coarse to medium grained
131.30					sandstone, medium grained, with shale bands, white
132.00			35		sandstone, coarse grained, white
133.30			40		diorite, very fine grained with calcite, green
133.95					sandstone, coarse grained, quartz and feldspar rich, white
134.75					sandstone, fine grained, partly micaceous
136.35					sandstone, coarse grained, in part, quartz and feldspar rich
137.20					shale, carbonaceous, in the lower part, sandstone, fine grained
137.80					sandstone, fine grained, intercalate thin shale, light gray
139.70					sandstone, coarse grained, white
140.42					sandstone, fine grained, intercalate shale
141.65					shale, carbonaceous, intercal. sandstone, in the middle part
142.30					sandstone, very fine grained and shale, carbonaceous in alternation
143.30					shale, carbonaceous
143.85					coal, thick, dull, center
144.05					coal, weight and dull
144.10					shale, carbonaceous
144.90			10		sandy shale
145.25			12		diorite, silty grain
146.05					coal, dull
149.00					sandstone, carbonaceous
148.00					sandy shale, intercalate thin sandstone, dark gray to brownish gray
150.15					sandstone, very fine grained, green
152.05					sandstone, very fine, grained to shale, sandy, partly micaceous
152.50					sandstone, coarse, grained
152.75			10°		shale, carbonaceous
156.50					sandstone, coarse grained with carbonaceous shale bands

Depth	Thickness	Description
142.90		coal, shale and shale
144.06		coal, brines and dull
144.10		shale carbonaceous
144.80	110	shales, sands
145.25	12	dolerite, silty, green
145.30		coal, dull
146.50		sandstone, carbonaceous
146.62		shale, sands interbedded thin sandstone, dark gray to black gray
150.15		dolerite, very fine grained, green
152.05		sandstone, very fine grained to shale, sandy, partly micaceous
152.30		sandstone, coarse grained
152.75	10	shale, carbonaceous
153.50		sandstone, coarse grained with carbonaceous shale bands
157.45		coal, compact, banded, bulk coal, and shale
158.40		shale, sandy to sandstone, very fine grained, dark gray
159.30		sandstone, coarse grained
159.80		coal, dull and coal, shale
161.00		shale, probably dolerite, greenish gray
163.93	25	dolerite, fine grained
163.88		sandstone, medium grained, heated by dolerite
164.40		sandstone, medium to fine grained
171.90		sandstone, coarse to medium grained, in parts, feldspar rich
172.25		mudstone, fine grained, with carbonaceous streaks, dark gray
172.50		shale, dark
173.30		sandstone, coarse grained, light gray
173.65		sandstone, fine grained, light gray
174.07		shale
175.85	20	sandstone, coarse grained with carbonaceous streaks and pyrite
176.15	60	dolerite, silty, greenish gray
176.55	20	sandstone, coarse grained, light gray
182.32	10	dolerite, medium grained, dark gray
183.10		sandstone, medium grained, light gray
188.32		sandstone, coarse grained, partly quartz and feldspar rich, white
191.84		dolerite, fine grained with calcite, irregularly, greenish gray
192.30		coal, dull coal, shale and coal, bright
193.15		sandstone, carbonaceous, at the bottom shale, sands
196.40		sandstone, coarse to medium grained, quartz rich, white
199.17		sandstone, very coarse grained, light gray
200.60		coal, dull, banded bright coal
201.50		sandstone, carbonaceous and sandstone, very fine grained
207.40		sandstone, coarse to very coarse grained, brownish gray
208.20		coal, bright, banded dull coal
208.68		shale, carbonaceous and shale, sandy
214.50		sandstone, coarse to medium grained, partly mica rich, brownish gray
214.62		coal, bright
214.95		mixed coal and shale, carbonaceous
215.80		dolerite, very fine grained, greenish gray
216.80	5	shale, carbonaceous, intercalate thin sandstone, very fine grained
217.65	5	sandstone fine grained, with carbonaceous streaks, brownish gray
218.35		sandstone, medium grained
219.30		shale, carbonaceous, intercalate thin sandstone
221.10		coal, dull and bright, coal, shale, carbo
222.30		dolerite, very fine grained, dark green
223.35		coal, bright and dull, and coal, shale
224.25		dolerite, very fine grained, dark green
224.90		coal, bright and dull
224.95		dolerite, medium grained, dark green
225.85		shale, carbonaceous
232.60		sandstone, coarse to very coarse grained, quartz rich, white
233.22		dolerite, fine grained, dark green
236.90	40	sandstone, coarse grained, quartz rich, white
239.20	40	dolerite, coarse grained, dark green
240.40		sandstone, coarse grained, quartz rich, white
244.40	100	sandstone, medium grained, mica rich, white to light gray
245.75		sandstone, fine grained, micaceous, light gray
246.20		sandstone, medium grained, white
246.70		sandstone, fine grained with shale bands
247.60		sandstone, medium grained, white
250.90		dolerite, coarse grained with calcite, irregularly
253.00		sandstone, medium grained, light gray
253.70	7	shale, carbonaceous
255.00		sandstone, medium to fine grained
268.62	10	dolerite, coarse grained with calcite veins, dark green
280.32		sandstone, medium grained, micaceous
289.90	5	sandstone, fine grained, intercalate thin shale, dark gray
290.77		sandstone, medium grained, light gray
291.60		coal, dull, banded bright coal
293.25		sandstone, medium to fine grained, light gray to dark gray
296.70		sandstone, coarse grained, light gray
297.00		sandstone, medium grained with carbonaceous streaks
298.00		sandstone, mostly fine grained, partly granulo
298.40		coal, dull banded bright coal
298.65		shale, carbonaceous
300.15		sandstone, fine to medium grained
306.60		sandstone, coarse grained, in parts, mostly reddish-gray gray
306.80		shale, sandy with pyrite, dark gray
309.00		sandstone, fine grained, micaceous, light gray
310.35		sandstone, medium grained
311.20		shale carbonaceous, intercalate thin sandstone
312.30		sandstone, coarse grained
312.60		shale, dark gray
313.30		shale, carbonaceous
322.85		sandstone, coarse to medium grained, white to light gray in parts with shale

End of hole

HOLE NO. : DD13
AREA : LUBHUKU
DATE DRILLED : OCT. 7. 1981 - NOV.19.1981
TOTAL DEPTH : 421.15m
ELEVATION : +248.7m
COORDINATE : X = +2,937,000 Y = -78,200

JAPAN INTERNATIONAL COOPERATION AGENCY			
Borehole Log DD13			
Dwg	41	Scale	1:200
Date	Sep. 1982	Prepared by	K.Ishihara, H.Hasokiyama

Depth of Borehole	Apparent Thickness of Strata	True Thickness of Strata (M)	Dip of Strata	Columnar Section	Rock Description	
2.00					sandstone, medium to coarse grained, white	Non-Core Drilling
5.00					shale, weathered	
6.00					sandstone, medium grained and shale	
7.00					shale	
9.00					shale and sandstone	
10.00					shale	
11.00					sandstone, coarse grained	
13.00					shale and sandstone, sandstone rich	
17.00					shale	
18.00					shale and sandstone	
19.00					sandstone, fine grained and shale, sandstone rich	
21.00					shale with sandstone	
22.00					sandstone, medium grained	
23.00					sandstone, coarse grained, greyish yellow	
25.00					sandstone, coarse grained	
26.00					shale, black	
29.00					sandstone, coarse grained	
31.64					sandstone, coarse grained with shale	
33.67					sandstone coarse grained to medium grained and shale in alternation	
36.96					shale towards the bottom intercalate sandstone, coarse grained	
38.00					sandstone, coarse grained, quartz rich	
38.79					sandstone, coarse grained and shale in alternation	
38.18					core loss	
40.12					sandstone, medium to fine grained, white	
66.65					shale with very thin sandstone bands, dark gray	
67.58					shale sandy, greyish white	
68.18					dolerite, fine grained, dark green	
79.25					dolerite, coarse grained, dark green	
80.44					shale, heated by dolerite, greenish gray	
89.64					shale with very thin sandstone beds	
95.23					sandstone, fine to medium grained, intercalate thin shale	
96.73					shale and sandstone, fine grained in alternation, shale rich	
97.26					sandstone, coarse grained, white	
97.45					sandstone, fine grained, intercalate shale, irregularly	
98.92					dolerite, fine grained, dark gray	
100.00					shale, intercalate sandstone, towards the bottom, shale, sandy	
100.33					sandstone, very fine grained, dark gray	
101.38					shale, sandy	
103.65					shale with sandstone bands	
105.31					sandstone, fine grained and shale in alternation, sandstone rich	
108.14					sandstone, coarse grained, at the bottom, medium grained	
109.28					sandstone, medium grained with carbonaceous streaks, irregularly	
110.75					shale, sandy, carbonaceous	
110.94					sandstone, coarse grained, quartz rich	
111.37					shale, carbonaceous	
111.87					sandstone, coarse grained	
113.26					sandstone, medium grained with carbonaceous streaks	
114.74					sandstone, coarse grained, quartz rich	
116.15					sandstone, medium grained, towards the bottom, coarse grained	
117.00					shale and sandstone, fine grained in alternation	
117.20					shale, carbonaceous	
117.97					sandstone, medium grained	
118.10					sandstone, coarse grained	
120.75					sandstone, fine grained, partly, intercalate shale	
124.57					sandstone, coarse grained	
125.18					shale, sandy, intercalate sandstone	
126.18					sandstone, fine grained, at the bottom, with carbonaceous shale	
126.72					shale, sandy	
128.49					shale, carbonaceous	
131.07					shale, sandy, towards the bottom, intercalate sandstone	
132.22					sandstone, fine to medium grained and shale in alternation	
133.33			60		sandstone, fine grained with carbonaceous matter	
134.27					dolerite, silty, greyish green	
135.08					sandstone, coarse grained	
135.87					sandstone, medium grained	
135.77					shale, carbonaceous	
136.98					sandstone, coarse grained	
137.59					shale, carbonaceous	
138.31					sandstone, fine grained with shale bands, gray	
138.85					shale, sandy	
138.71					sandstone, very fine grained, greenish green	
143.71					dolerite, medium to coarse grained, greyish green	
145.36					sandstone, very fine grained and shale in alternation	
145.60					shale, carbonaceous	
146.18					sandstone, medium grained, carbonaceous, intercalate shale	
147.07					shale, carbonaceous	
147.40					sandstone, fine grained, laminated shale	
147.92					dolerite, fine grained, greenish gray	
148.17					sandstone, very fine grained, carbonaceous	
149.90					dolerite, silty texture, greyish green	
150.68					shale, sandy, intercalate thin shale	
152.78					shale, intercalate thin sandstone beds	
153.40					sandstone coarse grained, at the middle part, intercalate shale	
154.00					shale, intercalate very thin sandstone	
154.48					sandstone coarse grained	

Depth	Description
118.10	sandstone, coarse grained
120	
129.75	sandstone, fine grained, partly, intercalate shale
124.57	sandstone, coarse grained
125.18	shale sandy, intercalate, sandstone
126.18	sandstone, fine grained, at the bottom, with carbonaceous shale
126.75	shale, sandy
128.49	shale, carbonaceous
130	
131.07	shale, sandy, towards the bottom, intercalate sandstone
132.22	sandstone, fine to medium grained and shale in alternation
133.33	sandstone, fine grained with carbonaceous matter
134.27	dolerite, silty, greyish green
135.06	sandstone, coarse grained
135.07	sandstone, medium grained
135.79	shale, carbonaceous
135.98	sandstone, coarse grained
137.58	shale, carbonaceous
138.31	sandstone, fine grained with shale bands, gray
138.65	shale, sandy
140	
139.71	sandstone, very fine grained, greenish green
143.71	dolerite, medium to coarse grained, greyish green
145.30	sandstone, very fine grained and shale in alternation
145.60	shale, carbonaceous
146.18	sandstone, medium grained, carbonaceous, intercalate shale
147.07	shale, carbonaceous
147.40	sandstone, fine grained, laminated shale
147.90	dolerite, fine grained, greenish gray
148.17	sandstone, fine grained, carbonaceous
149.62	dolerite, silty grained, greyish green
150	
150.68	shale, sandy intercalate thin shale
152.78	shale, intercalate thin sandstone bands
153.44	sandstone coarse grained, at the middle part, intercalate shale
154.00	shale, intercalate very thin sandstone
154.46	sandstone coarse grained
159.00	dolerite, silty, greyish green, core broken
159.03	coal, dull/drums, and shale coal
160	
160.53	shale, carbonaceous
161.12	sandstone, fine grained, light gray
162.50	sandstone, medium grained, at the depth of 163.3m to 163.8m, dolerite
162.88	shale
163.20	shale, and sandstone very fine grained, in alternation, shale rich
163.72	dolerite, silty grained, greyish green
165.53	sandstone, very fine grained to shale, sandy, micaceous, gray
168.60	shale, intercalate thin sandstone
170.00	sandstone, coarse grained, quartz rich
170	
170.18	shale
172.80	sandstone, coarse grained, white
173.66	sandstone, medium grained
173.78	coal, bright, banded, dull coal
173.90	shale, carbonaceous
174.13	sandstone, coarse, laminated
174.32	shale, sandy
177.50	sandstone, coarse grained, quartz rich
180	
182.67	shale, sandy, intercalate thin sandstone, brownish gray
190	
200	
201.16	sandstone, coarse grained, quartz rich, massive
201.29	coal, bright, banded dull coal
201.73	shale, sandy, carbonaceous
203.30	sandstone, medium grained, white
204.14	shale, sandy to shale
204.16	coal, bright
204.65	sandstone, fine grained, light gray
206.17	sandstone, coarse grained, intercalate shale
207.27	sandstone, very fine grained
208.35	shale and sandstone, very fine grained in alternation
210	
210.05	shale, carbonaceous
210.34	sandstone, medium grained
210.40	shale, carbonaceous
210.45	coal dull and hard shale
212.42	sandstone, fine grained with shale bands
213.46	shale, sandy
214.09	shale, intercalate thin sandstone
214.60	shale, sandy
216.30	sandstone, coarse to medium grained, white
216.65	sandstone, very fine grained to shale, sandy
217.18	shale, at the bottom, carbonaceous
217.31	coal, bright, banded, dull coal
219.05	sandstone, fine grained, intercalate shale
219.50	shale, sandy
219.00	shale, carbonaceous, at the bottom, shale, sandy
220.55	sandstone, fine grained, partly, intercalate thin shale
221.03	shale, sandy, hard, greyish green
221.95	shale, carbonaceous, at the depth of 221.85m, very thin coal
222.34	sandstone, medium grained
222.80	shale, intercalate thin sandstone
226.55	shale, sandy, silty, light gray
230	
240	
250	
258.16	dolerite, coarse grained, dark green
258.42	sandstone, fine grained, baked by dolerite
258.65	shale, light green
260	
262.26	sandstone, very fine grained, silty with thin shale bands
265.22	sandstone, coarse grained, white
265.10	coal, dull and bright, core broken
266.28	coal, bright and dull, core broken
266.72	shale, sandy
267.03	shale, carbonaceous
267.17	coal, bright, banded dull coal
269.47	sandstone, fine to very fine grained
269.32	shale, intercalate very thin sandstone
269.64	sandstone, fine grained
269.86	shale and sandstone, very fine grained, in alternation
269.91	coal, bright
274.80	sandstone, coarse grained
275.05	coal, bright
275.00	shale, carbonaceous with thin sandstone
275.75	coal, bright and dull
276.53	sandstone, very fine grained to shale, sandy at the top shale carbonaceous (thin band)
279.90	sandstone, very coarse grained, quartz rich
280	
280.80	sandstone, coarse or medium grained
290	
290.10	sandstone, coarse grained, quartz and feldspar rich, partly, intercalate carbonaceous shale
291.73	sandstone, very fine grained, intercalate carbonaceous shale
291.94	shale, carbonaceous
292.07	coal, dull, banded bright coal
292.27	shale, carbonaceous, partly with thin coal
293.10	sandstone very fine grained, intercalate thin shale
293.60	shale to shale, sandy, dark gray
294.70	sandstone fine to very fine grained at the bottom, carbonaceous, brown
296.77	coal, bright and dull
297.50	sandstone, fine to very fine grained, intercalate carbonaceous shale
298.10	sandstone, coarse grained
299.70	sandstone, fine grained
300	
300.91	sandstone, coarse to medium grained, in parts, mica rich, white to light gray

258.16	dolerite, coarse grained, dark green
258.82	sandstone, fine grained, altered by dolerite
258.68	shale, light green
260	
262.26	sandstone, very fine grained, silty with thin shale bands
263.72	sandstone, coarse grained, white
264.10	coal, dull and bright, core burnt
265.28	coal, bright and dull, core burnt
266.72	shale, sandy
267.05	shale, carbonaceous
267.17	coal, bright, banded dull coal
270	
268.47	sandstone, fine to very fine grained
269.32	shale, intercalate very thin sandstone
269.64	sandstone fine grained
269.89	shale and sandstone, very fine grained, in alternation
269.91	coal, bright
274.80	sandstone, coarse grained
274.88	coal, bright
275.00	shale, carbonaceous with thin sandstone
275.75	coal, bright and dull
276.53	sandstone (tuff) fine grained to shale, sandy at the top, shale carbonaceous (thin band)
279.82	sandstone, very coarse grained, quartz rich
280	
280.80	sandstone, coarse to medium grained
290.10	sandstone, coarse grained, quartz and feldspar rich, partly, intercalate carbonaceous shale.
291.73	sandstone, very fine grained, intercalate carbonaceous shale.
291.94	shale, carbonaceous
292.07	coal, dull, banded, bright coal
292.27	shale, carbonaceous, partly with thin coal
293.10	sandstone very fine grained, intercalate thin shale
293.60	shale to shale, sandy, dark gray
294.70	sandstone, fine to very fine grained, at the bottom, carbonaceous streaks
296.74	coal, bright and dull
297.50	sandstone, fine to very fine grained, intercalate carbonaceous shale
298.10	sandstone, coarse grained
298.70	sandstone, fine grained
300	
300.61	sandstone, coarse to medium grained, in parts, mica rich, white to light gray
300.74	coal, bright banded, dull coal
304.80	sandstone, coarse grained
305.20	shale, intercalate sandstone, dark gray
305.23	coal, dull
305.33	shale, carbonaceous
305.85	coal, bright and dull
306.10	shale, sandy, carbonaceous
310	
310.95	sandstone, coarse to medium grained, in parts, quartz and feldspar rich, white to light gray.
315.76	dolerite, silty grained, greenish gray
319.38	sandstone, coarse grained, white
320	
319.76	sandstone, very coarse grained, white
319.87	shale, carbonaceous
320.36	coal, dull, banded, bright coal
320.70	shale sandy
321.77	sandstone, fine grained, micaceous, dark gray
324.96	sandstone, coarse grained, in the lower part, conglomeratic
325.06	coal, bright, banded, dull coal
325.75	thin sandy, carbonaceous
329.45	sandstone, fine grained, at the top, intercalate thin shale, light gray.
330	
332.80	sandstone, coarse grained, quartz and feldspar rich
333.20	sandstone, fine grained with thin shale bands
334.10	shale carbonaceous, at the top, shale sandy, carbonaceous
334.21	coal, carbonaceous, (dull, dirty, P.) very soft
334.39	coal, dull and coal, shaly
335.26	coal, burnt
335.35	shale carbonaceous
336.30	coal, burnt
340	
350.02	dolerite, coarse grained, dark green
353.30	dolerite, medium grained
353.83	dolerite, silty grained, light gray
354.32	shale, sandy, altered by dolerite
354.82	shale less (coal)
355.37	sandstone, medium grained
356.32	sandstone, fine grained, micaceous, dark gray
360	
364.10	sandstone, coarse grained, in parts, conglomeratic
364.98	sandstone, fine grained
366.37	sandstone, coarse grained
366.44	sandstone, medium grained, carbonaceous
367.24	coal, bright and dull
367.57	shale, carbonaceous
368.04	coal, bright and dull
370	
368.18	shale
377.35	sandstone, coarse grained, quartz rich, white.
378.42	coal, bright, banded thin dull coal
379.13	shale sandy
380	
380.70	sandstone, medium grained, micaceous, at the top, coarse grained
381.72	sandstone coarse grained, conglomeratic
382.64	sandstone, medium grained, micaceous, at the top, intercalate sandy/carbonaceous streaks
384.69	sandstone, coarse grained, at the bottom, micaceous
385.73	coal, bright
386.35	shale, sandy, carbonaceous
390	
391.07	sandstone, medium grained, micaceous, lightly gray
391.86	sandstone coarse grained, white
392.34	shale, sandy
395.24	sandstone, coarse grained, partly, conglomeratic with carbonaceous streaks
395.71	sandstone fine grained, micaceous
395.76	coal, bright and dull
396.50	shale, sandy, grayish black
397.43	sandstone, coarse grained
398.12	sandstone, fine grained, light gray
399.43	shale sandy, intercalate thin sandstone beds
399.98	sandstone, medium grained
400	
400.37	sandstone very fine grained, silty, gray
400.50	shale, sandy
400.76	sandstone fine grained
400.85	coal, bright and shale, carbonaceous
401.08	shale carbonaceous
401.92	sandstone, fine grained, intercalate sandstone, medium grained
402.85	sandstone, coarse to medium grained
406.26	sandstone, coarse grained, white
406.52	shale, carbonaceous
407.02	shale sandy to sandstone, very fine grained
407.57	sandstone, very fine grained, intercalate shale, irregularly
410	
408.15	shale, sandy
420	
421.15	sandstone, very coarse grained, quartz and feldspar rich, in parts, with coal matter
	End of Hole