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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS

1951/49

RESULTS OF DRILLING AT COCKED HAT CREEK, N.S.W.

by

H. B. Owen

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SUMMARY

Diamond drilling at Cocked Hat Creek near Young Wallsend, Newcastle district, to test the Australasian seam indicated potential reserves of coal suitable for open-cut exploitation amounting to 665,000 long tons. The seam containing these reserves has an average thickness of 8 feet and is overlain by sandstone and shale with an average depth of 40 feet.

The coal is of low grade. With shale bands of half an inch or greater thickness excluded the average composition is

Moisture	2.8.	per	cent.
Volatile matter	29.2	"	"
Fixed Carbon	47.1	"	"
Ash	20.9	"	"
	100.0	"	"

Calorific value, 11,040 BThUs per lb.

INTRODUCTION.

This statement supplemented by graphic bore logs, sets out the results of a drilling campaign conducted at Cocked Hat Creek immediately west of the village of Young Wallsend, Newcastle district, by the Bureau in accordance with an agreement between the Mines Department of New South Wales, the Joint Coal Board and the Bureau.

The area covered by the drilling grid totals about 200 acres, and includes parts of Portions 55, 60, 73 and 79, Parish of Teralba, County of Northumberland, and is shown on the accompanying plan (N14-30).

It is known that this area, and a large extension to the north amounting to at least 4 square miles, is underlain by the Australasian seam which had been intersected at 50 feet from the surface in Portion 60 where it is approximately coincident with sea-level. Also the seam is exposed at various points along the northern margin of the larger area at elevations ranging from 170 to 220 feet.

The purpose of the drilling was to test the thickness and quality of this seam, hitherto almost unknown factors, and to determine whether a potential open-cut site worthy of more exhaustive investigation exists.

The first four holes were sunk at or near sites chosen by the Geological Survey of New South Wales, and the remaining six bores were put down to conform to a rectangular grid spaced at intervals of 1200 feet by 900 feet. Proximate analyses and calorific value determinations of the coal cores were carried out by the New South Wales Mines Department laboratory in Sydney. All coal cores were forwarded from the field to the laboratory and the analysts selected samples for examination by rejecting shale and sandstone bands which had a thickness of half an inch or more. Stony coal or carbonaceous shale with specific gravity exceeding 1.6 was also excluded from the samples submitted to analysis. Consequently the analyses quoted indicate a composition roughly

equivalent to that which might be expected for cleaned or hand picked coal from this area.

DEFINITION OF SUITABLE COAL.

Coal intersected has been included in the computation of reserves when it conforms to the following conditions which are regarded as suitable for open-cut mining.

1. Depth of Floor of Seam Feet	Thickness of Coal not less than Feet	Inches
80 or less	5	-
90	5	7
100	6	3
110	6	10
120	7	6
130	8	2
140	8	9
150	9	5
160	10	-
170	10	7

2. Calorific value: not less than 10,000 BThU's per pound.

DRILLING RESULTS

Only three bores intersected coal which conforms to these specifications viz. S1, S6 and S14. These bores are adjacent and indicate potentially useful coal underlying a triangular area of 52 acres. The seam dips gently to the south-west under rising ground which limits the area suitable for open-cut mining in this direction. (Refer to Sections, Plan No. N14-35 and 36 herewith).

The area as a whole is not favourably situated for the development of an open cut. It is traversed by Cocked Hat Creek and lateral streams which would have to be diverted before open-cut mining could proceed.

Salient details of the three bores mentioned above are set out briefly below.

Bore No.	Approx. Elevation of Surface above sea-level Feet	Depth and Thickness of Coal Seam INcluding bands From Ft.	Ins.	To Ft.	Ins.	Thickness Ft.	Ins.	Core Recovery INcluding bands Ft.	Ins.	Per Cent.
S1	50.0	45	5	52	7	7	2	6	2½	86.7
S6	74.5	77	5	83	11	6	6	5	9	88.5
S14	47	19	11	31	8	11	9(a)	7	5	63.0

(a) INcluding 1ft. 7 ins. of clay not recoverable as core.

INDICATED COAL RESERVES

The tonnage of coal and its average composition with bands EXcluded from both figures, are shown in summarized form:

Long Tons	Average Thickness	Composition Moisture	Volatile Matter	Fixed Carbon	Ash	BThUs per lb
665,000	8 feet	2.8%	29.2%	47.1%	20.9%	11,040

Greater detail is contained in Tables 1 and 2 which include results of all bores in the area.

Overburden consists of sandstone, intersected in Bore S5 to a depth of 33 feet, overlying carbonaceous and clay shale with thin seams of coal. Bores S1 and S14 started below the sandstone and revealed only alluvium and shale above the coal.

It is improbable that coal produced from this area by open-cutting could be marketed without prior washing.

RECOMMENDATION.

The decision whether an open cut will be established at Cocked Hat Creek will depend on engineering, cleaning, handling and marketing conditions discussion of which is beyond the scope of this report. If it is decided that open-cut mining is practicable further boring or shaft-sinking will be necessary to define more accurately the reserves and overburden ratio indicated by the scout boring.

Closely spaced test-holes are not likely to disclose large additional reserves of suitable coal to the immediate north or west of the area containing Bores S1, S6 and S14, but a south-easterly extension of the coal along the course of the creek might be found. This possibility accentuates the engineering difficulty imposed by the drainage system of Cocked Hat Creek.

SUMMARY OF DRILLING RESULTS

COCKED HAT CREEK

Ph. of Teralba, Co. Northumberland

TABLE I. DETAILS OF INDICATED COAL RESERVES

Bore	Thickness of Coal bands more than ½ in. thick Assumed from Log. Feet Ins. (a)	EXcluding Recov. & Analysed. Feet Ins.	Coal Recovered %	Overburden Thickness Feet	Composition of Coal Moist. %	V.M. %	F.C. %	Ash. %	BThUs per lb. (bands EXcluded)	Approx. BThUs per lb. (Bands INcluded) (b)
S1	7 2	6 2½	86.7	45.5	2.3	29.8	47.4	20.5	11,240	11,240
S6	6 0½	5 3	86.7	77.5	3.2	28.2	46.0	22.6	10,800	9,700
S14	9 11	7 1	71.3	19.9	2.9	29.5	47.9	19.7	11,080	8,600
Average	8 0	- -	-	40	2.8	29.2	47.1	20.9	11,040	9,850

Tonnage Average thickness 8.0 feet over 52 acres
= 8.0 x 52 x 1600 tons = 665,000 tons

Overburden thickness: Range; 20 to 78 feet. Average approximately; 40 feet.

Ratio. Overburden to Coal: Range, 2/1 to 12/1. Average approximately; 5/1.

(a) Lost core for which there is no information is regarded as coal of same composition as coal recovered and analysed.

(b) Calculated on assumption that bands have no calorific value.

TABLE 2. DETAILS OF COAL NOT INCLUDED IN RESERVES.

Bore No.	Thickness of Coal Excluding bands more than 2" thick. Assumed from Log	Recovered & Analysed	Coal Recovered %	Overburden Thickness Feet	Composition of Coal Moist. %	V.M. %	F.C. %	Ash. %	BThUs per lb.	Remarks (See also accompanying graphic logs)
S2	4'5"	4'5"	100	86.5	3.5	28.9	45.5	22.1	10,820	Thin seams of inferior coal occur between 33 ft. and 61 feet. Banded coal between 179'10" and 189'6" totals 8'2" thick excluding bands.
S3	6'4"	5'4"	84	125.0	2.5	30.2	47.0	20.3	11,290	Thinseams of coal occur between 91'2" and 92'7", 137'5" and 139'11" and heavily banded coal between 165'6" and 170'6".
S4	5'3"	4'11"	93	66.1	3.0	28.0	44.4	26.6	10,600	Excluded from reserves because of 5 inch band of grey shale at 69'10" to 70'3" and low quality of coal. Thin seams of coal occur at 35'8" to 40'0" and 139'1" to 145'0".
S5	4'5"	3'7"	81	50.0	2.5	28.6	47.5	21.4	11,110	Thin coal seams with bands occur at 109'2" to 112'8" and 156'0" to 159'5".
S8	3'9"	3'2"	84	45.0	3.9	28.4	45.2	22.5	10,770	Thin seams of coal occur at 128'0" - 128'10" and 131'0" - 132'3"
S10	3'10"	3'1"	80	66.0	2.6	22.2	40.7	34.5	-	
S13	-	2'8"	-	55.6	3.2	27.8	47.2	21.8	10,890	Between 55'7" and 63'10" core recovery was approximately 50 per cent. and coal contains numerous shale bands 1" to 2" in thickness. Very banded coal occurs between 106'4" and 118'; bands range in thickness from 1" to 7" and total core recovered amounted to 2'7".

DRILLING LAYOUT
COCKED HAT CREEK AREA

SCALE

400 0 400 800 1200 FEET

REFERENCE

S8 ● 72·0 / 45·0 / 4·9 — *Bores, showing number of bore, reduced level and thickness in feet of overburden over thickness of coal.*

Area of economic coal. J ⊙ 74·2 *Grid points not drilled.*

J ⊙ 74·2

N ⊙ 124·8

S 8 ● 72·0 / 45·0 / 3·7

M ⊙ 71·5

101 79 55

S4 ● 121·0 / 66·0 / 5·2

B SECTION

S 2 ● 88·0 / 86·5 / 4·5

Cocked Hat Creek

L ⊙ 66·2

F ⊙ 116·1

T ⊙ 93·5

114 73 82

A SECTION

S 6 74·5 / 77·5 / 6·5

S11 ● 46·5 Abandoned

S14 Approx. ● 46·5 / 19·9 / 9·9

S5 ● 88·2 / 50·0 / 4·4

S10 ● 91·0 / 66·0 / 4·0 A₁ SECTION

S13 ● 62·6 / 55·5 / 2·7

0 ○ 53·2

S3 ● 73·8 / 125·0 / 6·5

S1 ● 50·0 / 45·5 / 7·5

60 GROUND LEVEL AT „S1" FROM MILITARY 1 MILE MAP

72

B SECTION

YOUNG WALLSEND SHAFTS

FROM WEST WALLSEND

N

LOCALITY MAP

NEWCASTLE 4 MILE MAP

N.S.W.

NEWCASTLE

SYDNEY

60 0 60 MILES

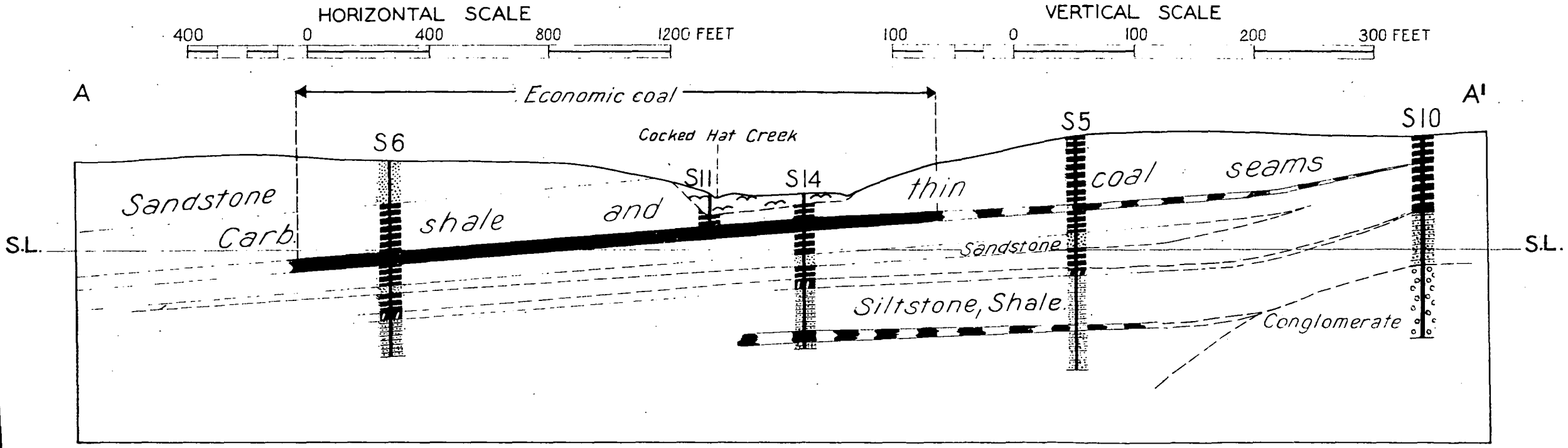
N14-30

A.St.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS, SEPT. 1951

SECTION AA', COCKED HAT CREEK

PARISH OF TERALBA, COUNTY OF NORTHUMBERLAND, NEW SOUTH WALES



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS, SEPT. 1951

N14-35

1951/49

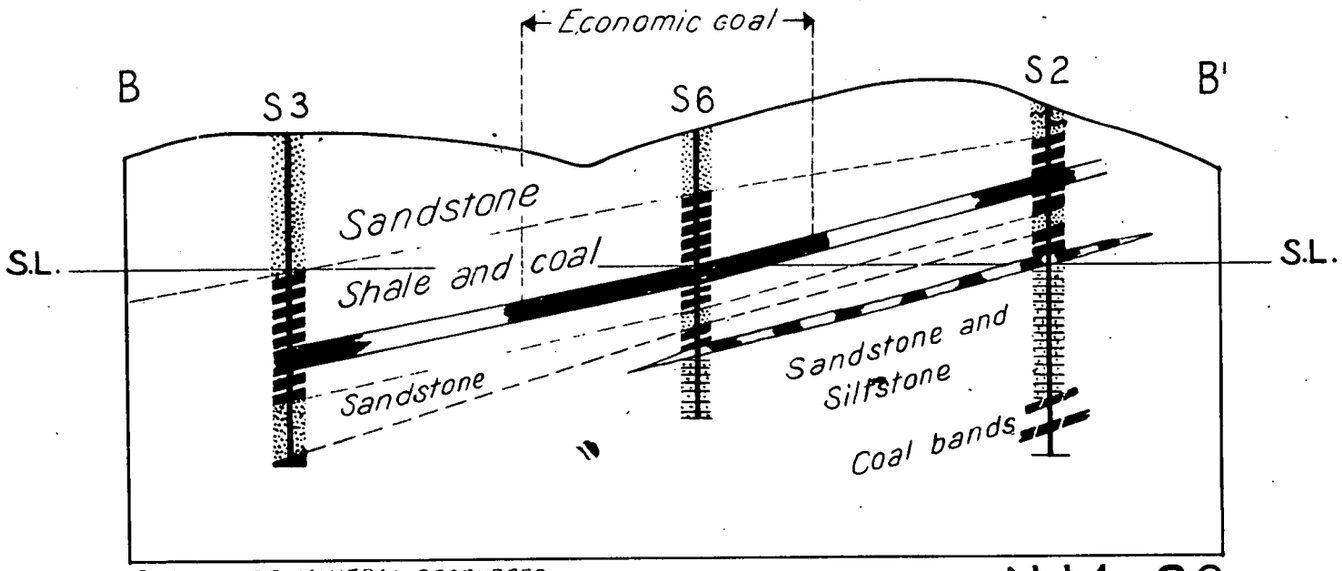
SECTION BB'
COCKED HAT CREEK
PARISH OF TERALBA, COUNTY OF NORTHUMBERLAND, NEW SOUTH WALES.

HORIZONTAL SCALE

400 0 400 800 1200 FEET

VERTICAL SCALE

100 0 100 200 300 FEET



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS, OCT. 1951.

N 14-36

Missing N14/37A – D, F, G.

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S1., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 28.31 DATUM WATER BOARD STANDARD DEPTH 163'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
27'9"				
29'9"		33·4		
30'3"				
31'9"		41·1		
40'6"				
43'7"		30·7		
45'5"				
48'6"		22·6	10,970	
		19·1	11,430	
52'11"				
55'2"				
		25·4	10,490	
60'3"				
61'11"		30·7		
63'1"				
65'6"		33·2		
70'				
80'				
87'10"				
		22·8		
91'5"				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
110'				
120'				
130'				
140'				
150'				
163'				

N14-37 A

BORE LOG: COCKED HAT CREEK AREA.
BORE NO. S 2., PARISH OF TERALBA
COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 66.3 DATUM WATER BOARD STANDARD DEPTH 198'9"

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
30'				
32'10"				
		50·6		1"
36'4"				
37'3"				
		29·0	9,840	
42'3"				
43'3"				
		22·3	10,970	10"
49'7"				
50'10"				
		32·3	9,370	3"
54'4"				
60'1"				
60'10"		31·0	9,570	
70'				
80'				
86'5"				
		22·1	10820	4"
90'11"				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
110'				
120'				
130'				
140'				
150'				
160'				
170'				
180'6"				
		17·7	11,530	1"
181' 9"				
184'4"				
		27·0	10,160	1"
189'6				
198'9"				

N14-37 B

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S 3., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 52.1 DATUM WATER BOARD STANDARD DEPTH 185'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
91'2"		21·4	10,890	
93'8"				
95'8"		28·5	9960	

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
101'2"		28·5	9,960	
104'11"		38·4	–	1"
109'4"				
120'8"		34·3	9,160	
122'9"				
125'0"		20·3	11,290	1"
131'6"				
135'6"		24·8	10,630	12"
140'				
143'5"				
145'9"		36·2	–	
147'8"				
165'6"		21·8"	10,810	
170'5"				
185'				

N14-37C

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S 4., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 99.3 DATUM WATER BOARD STANDARD DEPTH 171'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
30'				
35'0"		21·9	10,970	2"
39'0"				
47'0"		37·1	—	
49'6"				
50'				
65'0"		25·6	10,510	½"
70'0"				
70'6"		22·3	11,020	7"
76'6"				
78'0"		33·0	9,270	
79'0"				
90'				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
110'				
120'				
130'				
139'1"		22·7	10,850	
145'0"				
150'				
160'				
171'				

N14-37 D

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S 5., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 66·5 DATUM WATER BOARD STANDARD DEPTH 191'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
16'1"		16·7	9,630	
20'6"				
29'8"		30·7	9,760	
30'8"				
40'				
49'2				
55'7"		21'4"	11,110	
57'0"				
60'				
71'4"		32·6'	9,430	24"
80'				
90'				

Depth	Section	Ash %	B.Th.U. per lb	Bands excl. from Analysis
107'4"				
113'0"		24·9	10,450	6"
120'				
130'				
140'				
151'7"		28·9	9,890	7"
153'10				
155'6		19·9	11,230	2"
159'5				
170'				
180'				
191'				

N14-37 E

BORE LCG: COCKED HAT CREEK AREA, BORE NO. S 6., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 52.8 DATUM WATER BOARD STANDARD 28·31 DEPTH 161'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
30'				
40'				
43'9"		15·7	11,930	1"
46'6"				
47'9"		21·9	11,040	13"
50'0"				
58'8"		27·9	10,230	
60'9"				
70'				
72'7"				
74'0"		34·6	9,190	1"
75'0"		20·9	11,150	
75'10"				
77'5"		26·5	10,250	½"
80'5"		18·6	11,360	
83'11"				
88'9"				
95'0"		25·0	10,420	11"
99'2"		34·1	9,160	

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
101'1"				
110'				
120'				
123'2"		25·1	10,260	5"
126'8"				
130'				
140'				
150'				
161'				

N14-37 F

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S 8., PARISH OF TERALBA COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 50.3 DATUM WATER BOARD STANDARD DEPTH 170'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
43'8" – 50'0"		22·5	10,770	10"
126'4" – 127'2"		27·6	10,190	
132'0" – 133'3"		20·0	11,290	

10' 20' 30' 40' 60' 70' 80' 90' 110' 120' 140' 150' 160' 170'

N14-37 G

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S10., PARISH OF TERALBA, COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 69.3 DATUM WATER BOARD STANDARD DEPTH 166'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
30'				
40'				
50'				
60'				
66'0"		34·5		
69'10				
80'				
90'				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
110'				
120'				
130'				
140'				
150'				
160'				
166'				

N14-37 H

BORE LOG: COCKED HAT CREEK AREA, BORE NO. S13., PARISH OF TERALBA, COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 40.9 DATUM WATER BOARD STANDARD DEPTH 170'

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
20'				
30'				
40'				
50'				
55'4"		21·8	10,890	7"
60'				
62'8"				
70'				
80'				
90'				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
107'2"		25·9	10,140	15"
113'4"				
114'4"		24·3	10,340	
117'0				
120'				
130'				
140'				
150'				
160'				
170'				

N14-37 J

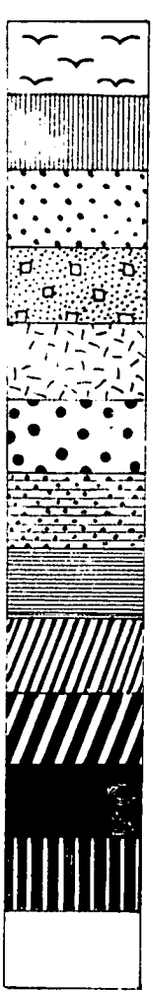
BORE LOG: COCKED HAT CREEK AREA, BORE NO. S14., PARISH OF TERALBA, COUNTY OF NORTHUMBERLAND, N. S. W.

R. L. 24.8 DATUM WATER BOARD STANDARD DEPTH 128'4"

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
10'				
13'11¼"		29·2	9,750	5"
17'0"				
19'11"		21·9	10,780	10"
26'11"				
27'2"		17·5	11,390	—
31'7"				
35'3"		26·8	10,110	—
38'7"				
39'7"		24·5	10,730	—
42'2"				
50'				
60'				
70'				
72'7"		24·6	10.640	1"
75'3¼"				
78'8½"		28·7	10,040	1"
80'				
90'				

Depth	Section	Ash %	B.Th.U. per lb.	Bands excl. from Analysis
110'				
114'0"		26·9	10,360	—
115'0"				
119'10		27·1	10,390	—
121'11"				
128'4"				

LEGEND



- Alluvium
- Clay
- Sandstone
- Greywacke
- Tuff
- Conglomerate
- Siltstone
- Shale
- Carb. shale (Over 30% ash)
- Shaly coal (20–30% ash)
- Coal (Under 20% ash)
- Carb. shale or coal compos. unknown.
- No core recovered

N14-37 K