

1952/7

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MINMI AREA, NEWCASTLE DISTRICT.

Results of Drilling in Western and Central Blocks.

by

H.B. Owen & W.J. Perry.

Records 1952/7.

C O N T E N T S.

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SUMMARY.

A programme of 'test and define' core drilling by the Bureau in the Minmi area has indicated the presence of more than 489,000 long tons of coal within the physical limits required for open-cut mining. The locality comprises three areas underlain by economic coal, two of which, the western and central blocks, are described in this report. Lack of analyses precludes detailed treatment of the eastern block, and only a rough estimate of tonnage, not included in the above figure, has been attempted.

The coal contains thin bands which would render selective mining difficult, and it is unlikely that it could be marketed without prior washing.

INTRODUCTION.

This statement sets out the results of drilling in part of the Minmi Area, Newcastle District. Complete information has not yet been received but sufficient is to hand to permit the compilation of piece-meal reports.

The area covered by the drilling grid totals about 390 acres and includes parts of Portion 130 Ph. of Teralba and Portions 15 and 26, Ph. of Hexham, and is shown on the attached plan (N.14-67).

This statement refers to the western and central blocks of the area which are immediately south of the village of Minmi and are separated from each other by the ridge carrying the Minmi to West Wallsend road.

The Young Wallsend Seam was the drilling target but three bores, S.7 Teralba, S.2 and S.18 Hexham, were carried down into old workings below. In S.2 and S.18 old workings probably on the Borehole Seam, were encountered at approximately 55' below the floor of the Young Wallsend, but in S.7 old workings are 150' below the only seam intersected in this bore.

The grid interval and a minimum number of bore sites were suggested by officers of the Joint Coal Board, and in general their proposal was adopted and extended to include additional bores.

Proximate analyses and calorific value determinations of the coal cores were made by the New South Wales Mines Department laboratory in Sydney. All coal cores as recovered were forwarded from the field to the laboratory and the analysts selected samples for examination by rejecting shale etc. bands which had a thickness of half an inch or more. Stony coal with S.G. of more than 1.6 was also excluded from the samples analysed. Consequently the analyses here quoted indicate a composition roughly equivalent to that which might be expected for cleaned or hand-picked coal from this area.

The potential open-cut area is bounded on the south by a ridge which trends westerly from the outskirts of Plattsburg to the Great Sugarloaf. The crest of this ridge has an elevation of 300 feet a.s.l. at $\frac{3}{4}$ mile south-south-west of Minmi school. The area drilled is divided by spurs which extend in a northerly direction from the main ridge, and have the effect of increasing the overburden to a thickness greater than permissible for open-cut exploitation. The northern edge of the area is defined by the zone of perished coal near the out crop.

Within the area the gentle regional dip has a southerly component into the rising ground which further limits potential open-cut mining.

The three blocks which contain economic coal are each traversed by creeks which flow northerly to join Back Creek, and both the Central and Western blocks are crossed by an electric power line.

Definition of Suitable Coal.

Coal has been included in computation of reserves only when it conforms to the following conditions:

1.	Depth to Floor of Seam Feet.	<u>Thickness of Coal Not</u> <u>Less than</u>	
		<u>Feet.</u>	<u>Inches.</u>
	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 B.Th.U's per pound.		

Drilling Results.

Core recovery was not very satisfactory. The thickness used for computing tonnages which are shown in the Tables has been assumed from a study of core and cuttings records.

In the Western and Central blocks six and seven bores were drilled respectively. Only one of the western bores (S.4 Hexham) revealed coal which conformed to the definition of open-cut coal, but three bores were successful in the central area and it has been assumed that one (S.18) for which analyses are not available is also successful.

Western Block.

Drilling Results.

The western block is that part of the area west of the Minmi-West Wallsend road. Principal figures for the one successful bore are:-

Bore No.	Approx. elevation at Ground Surface. Feet.	Depth & Thickness of Coal Seam Including bands.						Core recovery Including bands.	
		From Ft. Ins.	To Ft. Ins.	Thickness. Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Per Cent.	
S.4 (Hexham) 105		53 2	59 4	6 2	4	7		74	

Details of coal excluding bands are shown in Table 1.

Figures for coal not included in reserves are given in Table 2.

Indicated Coal Reserves.

The combination of a $4\frac{1}{2}$ degree southerly dip component with rising ground to the south restricts the area of economic coal to $3\frac{3}{4}$ acres. The average thickness of coal throughout this area has been assumed to be 5 ft. 8 ins., the thickness intersection in bore S.4; the indicated tonnage is therefore 34,000 tons. The ash content of the coal with bands included is estimated to be 19%.

Overburden.

The overburden is mostly shale with two beds of sandstone each approximately 6 ft. thick, and minor beds of sandstone and chert. Details are shown in the accompanying graphic logs. The average thickness of overburden is 54.8 ft. and the average overburden ratio is 9.7/1.

Central Block.

Drilling Results.

Principal details of the four successful bores mentioned above are:-

Bore No.	Elevation(A) at Ground Surface Feet.	Depth & Thickness of Coal Seam Including bands.						Core recovery Including bands.	
		From Ft. Ins.	To Ft. Ins.	Thickness Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Per Cent.	
S.5	86.8	76 9	85 5	9 8	6	4		65.5	
S.6	71.3	87 9	95 1	7 4	5	3		71.5	
S.9	104.8	94 3	103 0	8 9	6	6		74.5	
S.18	88	39 6	45 7	6 1	3	10		63	

(A) Referred to Hunter District Water Board datum.

The figures given above should be compared with those given in Table 3 in which are given coal thicknesses and analyses with bands excluded.

Indicated Coal Reserves.

The tonnage of coal and its average composition with bands excluded from both figures are shown in summarized form below. It has been assumed that coal intersected in Bore S.18 is of the same composition as the average shown by the other three bores. If subsequent information shows that this assumption has introduced serious error an amendment will be issued.

Long Tons	Average Thickness.	Composition.				
		Moist.	Volatile Matter	Fixed Carbon	Ash	B.Th.U's per lb.
455,000	7 ft. 2 ins.	2.5	32.5	48.4	17.6	11,750

Ash content of the coal as mined, that is including bands, would be approximately 27 per cent.

Overburden.

The overburden consists largely of shale with bands of sandstone and siltstone and minor bands of a few inches thickness of chert (silicified mudstone). The attached graphic logs show details of the overburden derived from cuttings reports or from the descriptions of cores for those holes which were cored above the coal. The average thickness of overburden is 62 ft. and the average overburden ratio is 8.7/1.

Eastern Block.

Of three bores drilled near the eastern margin of the area it appears that only one encountered coal conforming to the definition, but until complete results from Bore S.17 Hexham are received only the following approximate estimate of coal reserves in the Eastern block can be made.

Area Acres.	Coal	Long Tons.	Overburden.	
	Thickness Feet.		Thickness	Av. ratio
28½	6	270,000	25 to 100	8/1.

CONCLUSION and RECOMMENDATION.

Shale bands are too narrow to permit of exclusion by selective mining and therefore it is improbable that coal recovered by open-cut methods from this area could be marketed without washing.

Logs of bores S.17 and S.18 show thinning of the Young Wallsend seam towards the outcrop where deterioration may also be expected, therefore only little useful coal may be found by close drilling north of a line through these bores. Nevertheless some investigation north of the gap between the Central and Eastern blocks is recommended as part of any proving campaign which may be undertaken.

TABLE I. MINNI AREA.
Western Block. Coal Reserves.

Bore No.	Thickness of Coal <u>EX</u> cluding bands more than $\frac{1}{2}$ " thick.			Overburden Thickness. Ft.	Composition of Coal bands <u>EX</u> cluded.					Approx. B.Th.U's per lb. bands <u>IN</u> cluded (b)
	Assumed from log (a)	Recovered and analysed.	% Coal recovered		Moist %	V.L. %	F.C. %	Ash %	B.Th.U's per lb.	
S.4(Hexham)	5 ft. 8 ins.	4 ft. 1 ins.	70	53.2	2.8	30.1	50.0	17.1	11,630	11,400
<u>Tonnage:</u> Average thickness 5'8" over $3\frac{3}{4}$ acres. 5.66 x 3.75 x 1600 - 34,000 tons. <u>Overburden thickness:</u> Range 20 to 85 feet average 54.8 feet. <u>Overburden ratio:</u> Range 4/1 to 15/1. Average 9.7/1. <u>Overburden volume:</u> 974,100 cubic yards.										

TABLE 2.
Western Block. Coal not included in reserves.

Bore No.	Thickness of Coal <u>EX</u> cluding bands more than $\frac{1}{2}$ " thick.			Overburden Thickness. Ft.	Composition of Coal bands <u>EX</u> cluded.					Approx. B.Th.U's. per lb. bands <u>IN</u> cluded (b)
	Assumed from log (a)	Recovered and analysed.	%Coal recovered		Moist %	V.L. %	F.C. %	Ash %	B.Th.U's per lb.	
S.10(Hexham)	7 ft. 9 ins.	5 ft. 2 ins.	67	209	2.9	24.2	39.0	33.9	9,120	8,320
S.7(Teralba)	7 ft. 6 ins.	-	44	46.3	No samples taken by analyst.					
S.9(Teralba)	11 ins.	11 ins.	100	129.4	3.3	30.2	48.8	17.7	11,540	11,540
S.15	6 ft.10 ins.	5 ft. 8 ins.	83	198.7	3.3	28.2	45.8	22.7	10,820	10,090
(Teralba)	4 ft. 8 ins.	11 ins.	20	46.6	3.0	27.3	44.7	25.0	10,500	10,500
S.12	3 ft. 4 ins.	2 ft. 2 ins.	70	110	3.3	32.2	45.2	19.3	11,130	10,000
Teralba)	2 ft. 0 ins.	1 ft. 3 ins.	63	260.3	3.0	35.5	50.8	10.7	12,450	12,450

Notes: (a) Lost core from within the coal seam and for which there is no information is regarded as coal of the same composition as that recovered and analysed.

(b) It is assumed that bands have no calorific value.

TABLE 3. MIMI AREA.
Central Block. Coal Reserves.

Bore Ph. Hexham.	Thickness of Coal EXcluding bands more than $\frac{1}{2}$ " thick.			Overburden thickness. Ft.	Composition of Coal bands EXcluded.					Approx. B.Th.U's. per lb. Bands Included. (b)
	Assumed from log (a)	Recovered and analyzed	Recovered and analysed %		Moist %	V.M. %	F.C. %	Ash %	B.Th.U's per lb.	
S.1	5 ft.7ins.(c)	2 ft. 7 ins.	46	128.5	2.6	32.5	50.4	14.5	12,190	12,190
	7 ft.7ins.(d)	7 ft. 0 ins.	92	205.7	2.4	33.5	51.5	12.6	12,565	12,565
S.5	7 ft.7 ins.	5 ft. 1 ins.	67	76.8	2.8	32.4	48.7	16.1	11,980	10,000
S.6	6 ft.8 ins.	4 ft. 7 ins.	69	87.8	2.5	34.5	45.8	22.2	11,125	8,730
S.9	8 ft.3ins.	6 ft. 0 ins.	73	94.3	2.4	30.8	48.7	18.1	11,690	10,790
S.18	6 ft. 1ins.	-	-	39.5	No analyses					
Average	7 ft.2 ins.	-	-	-	2.5	32.5	48.4	17.6	11,750	10,430

Tonnage: Average thickness 7'2" feet over 39.5 acres. $7.17 \times 39.5 \times 1600 = 455,000$ tons.

Overburden thickness: Range 30 to 190 feet. Average 62 feet.

Overburden ratio: Range 5/1 to 15/1. Average 8.7/1.

Overburden volume: 3,983,000 cubic yards.

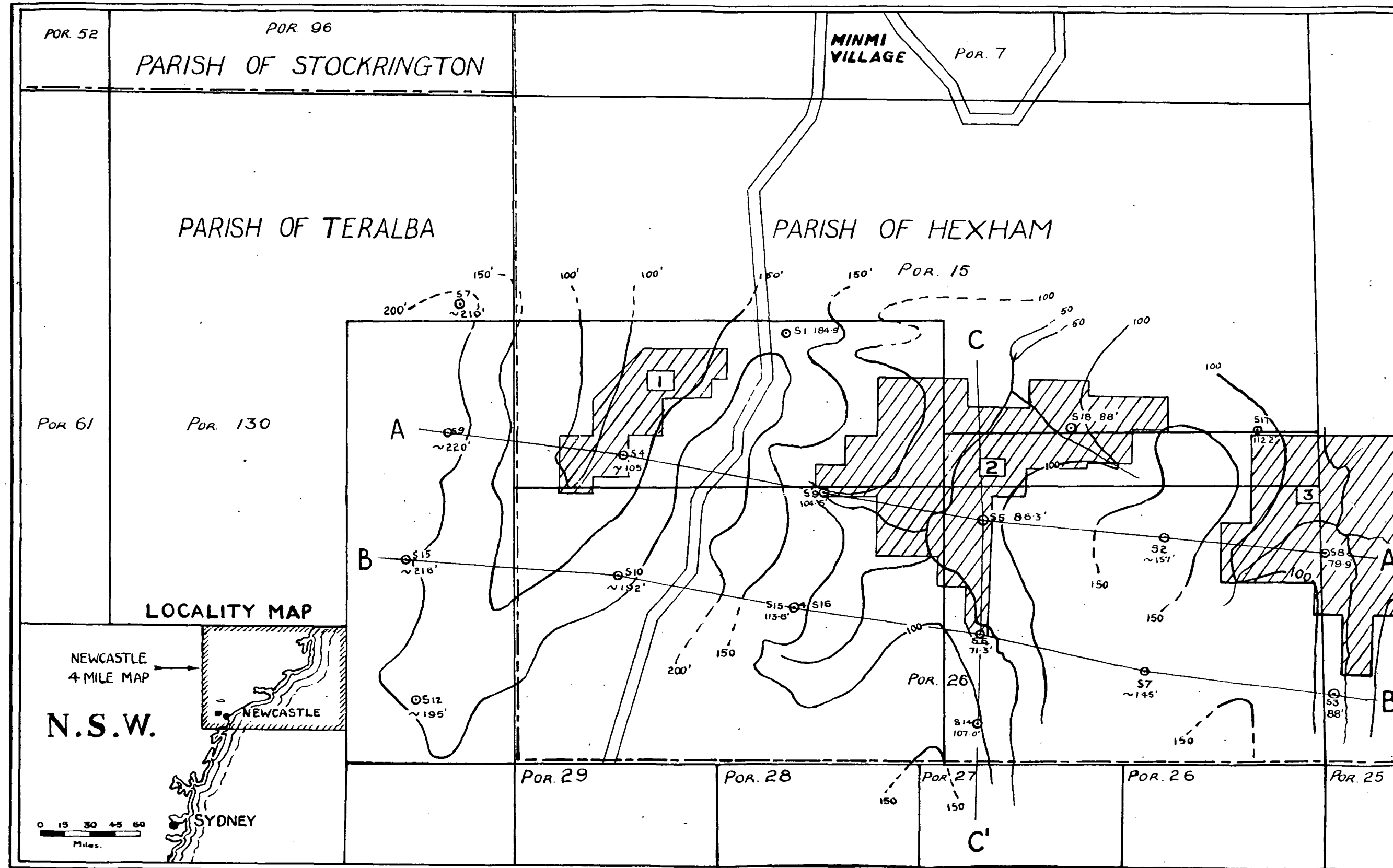
- Notes:
- (a) Lost core from within the coal seam and for which there is no information is regarded as coal of the same composition as that recovered and analysed.
 - (b) Assumed that bands have no calorific value.
 - (c) Too deep. Not included in tonnage, but composition has been incorporated in average for seam.
 - (d) Borehole Seam. Not included in tonnage or average composition.

TABLE 4. CENTRAL BLOCK - MINEL AREA.
Details of Bores in Coal not included in reserves.

BoreNo. Ph. of Hexham.	Thickness of Coal EX cluding bands more than $\frac{1}{2}$ " thick.			Overburden Thickness Ft.	Composition of Coal bands EX cluded					Remarks.
	Assumed from log	Recovered and analysed.	% Coal recovered		Moist. %	V.M. %	F.C. %	Ash %	B.Th:U's per lb	
S.1	3 ft. 7 ins. 5 ft. 7 ins. 7 ft. 7 ins.	2 ft. 1 ins. 2 ft. 7 ins. 5 ft. 1 ins.	58 46 67	21.8 128.5 205.7	2.4 2.6 2.4	29.8 32.5 33.5	48.8 50.4 51.5	19.0 14.5 12.6	11,570 12,190 12,565	Too thin. (Too deep Borehole Seam) Sec Table 3.)
S.14	5 ft. 4 ins.	-	-	131.5	No analyses received.					Too deep.
S. {15 16	8 ft. 7 ins.	-	-	135.7	No analyses received.					Too deep.

Notes: (a) Lost core from within the coal seam and for which there is no information is regarded as coal of the same composition as that recovered and analysed.

(b) It is assumed that bands have no calorific value.

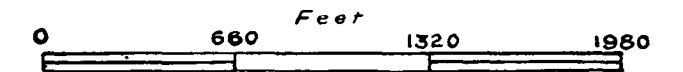


DRILLING LAYOUT

MINMI AREA

(SKETCH PLAN)

SCALE



N

REFERENCE

- ⊙ S11 Bore, showing number of bore and reduced level 94.2'
- ⊙ S12 Bore, showing number of bore and approximate reduced level ~113'
- Economic Coal

- 1 WESTERN AREA.
- 2 CENTRAL AREA.
- 3 EASTERN AREA.

— 100 — Contours, approximate

--- Parish Boundary.

DATUM Hunter District Water Board Standard.

MINMI OPENCUT DRILLING

Ph HEXHAM

Co NORTHUMBERLAND

YOUNG WALLSEND SEAM

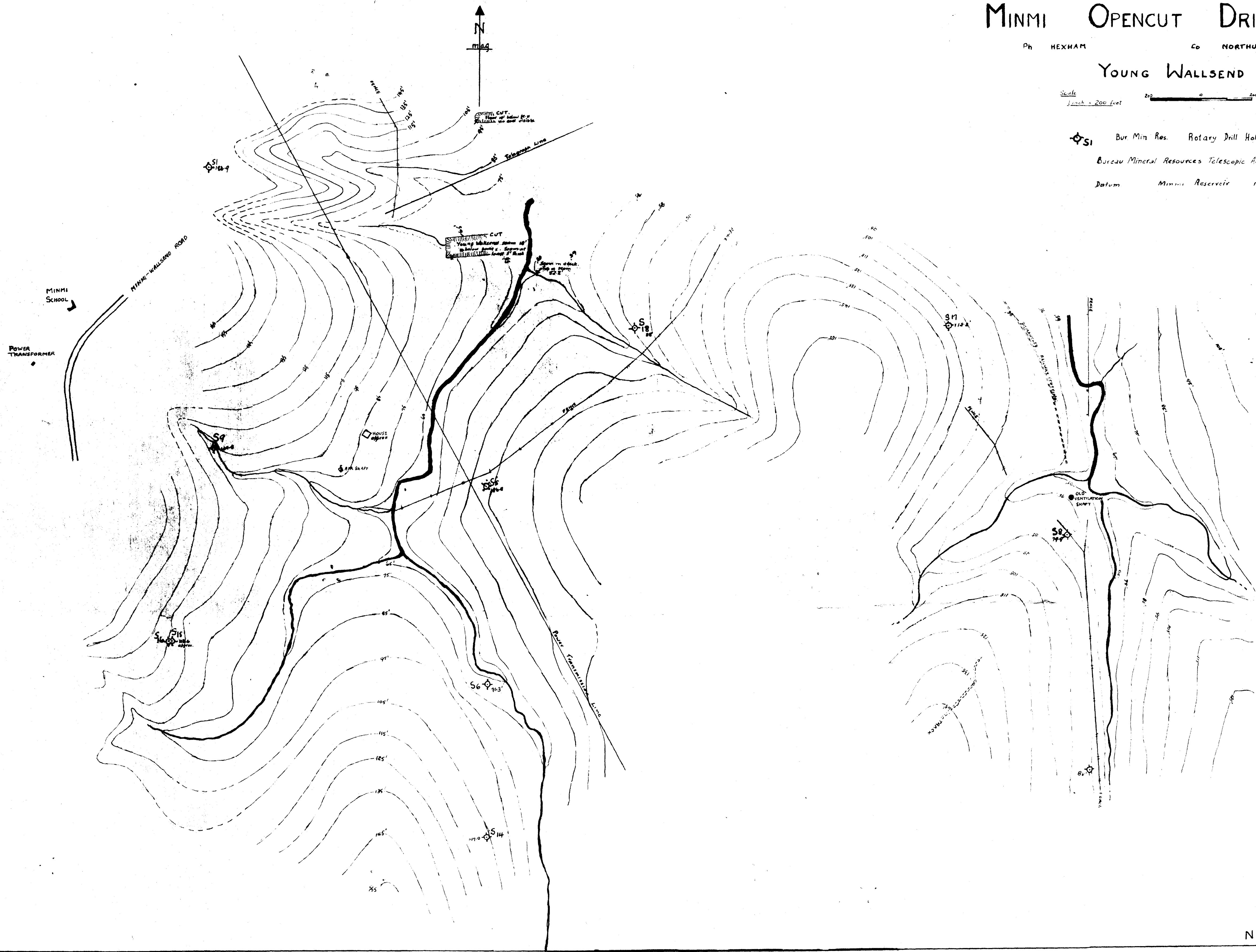
Scale
1 inch = 200 feet




 Bur. Min. Res. Rotary Drill Hole No. S1

Bureau Mineral Resources Telescopic Alidade Survey Nov. 1951

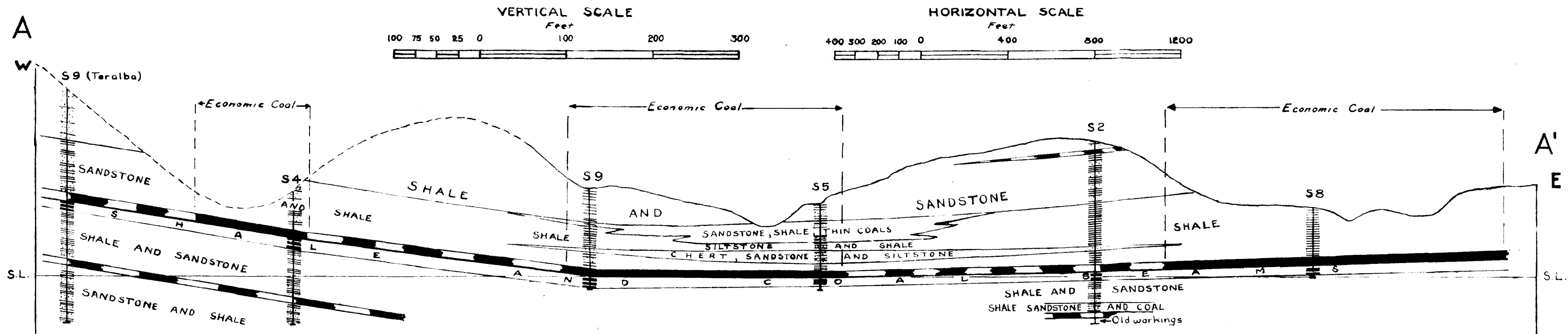
Datum	Minim. Reservoir	192.5 ft.	H.D.W.B.
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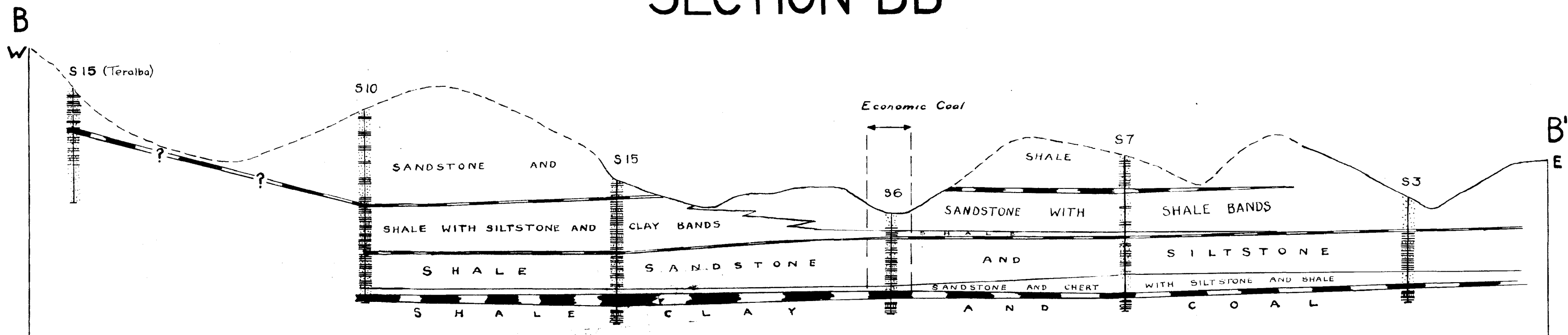
N 14/40

SECTION AA' MINMI AREA

PARISHES OF TERALBA AND HEXHAM, COUNTY OF NORTHUMBERLAND, NEW SOUTH WALES



SECTION BB'

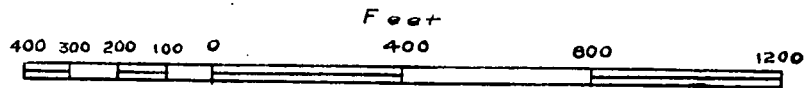


N 14-68

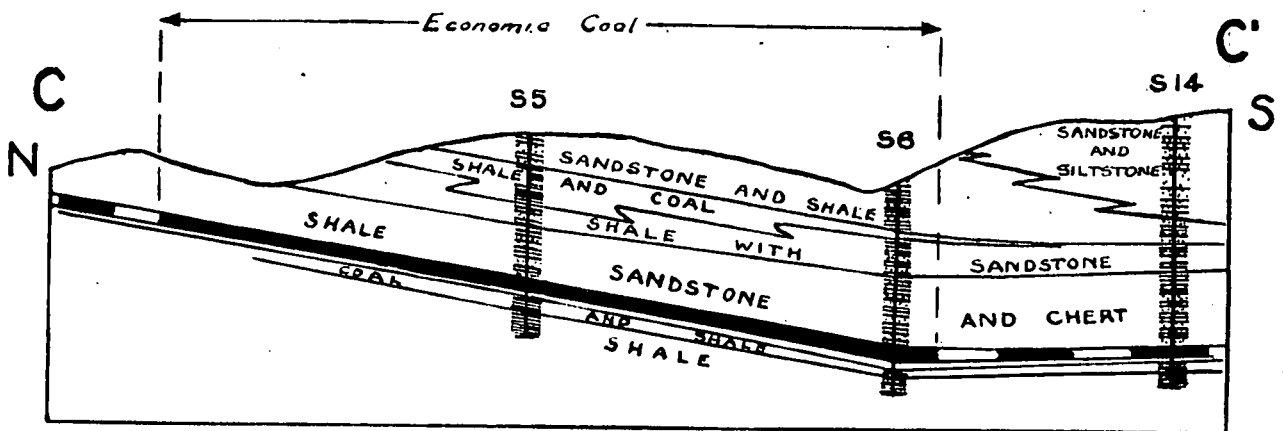
SECTION CC'

MINMI AREA

HORIZONTAL SCALE

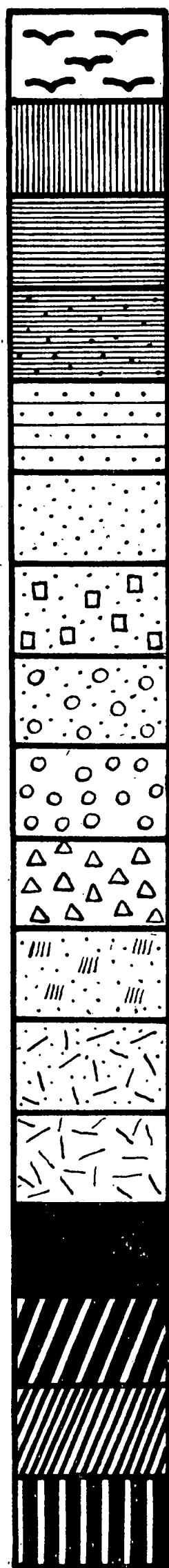


VERTICAL SCALE



N 14-69

REFERENCE



Alluvium

Clay

Shale

Sandy Shale

Siltstone

Sandstone

Greywacke

Sandy Conglomerate

Conglomerate

Breccia

Chert

Tuff

Igneous Rock

Coal (Under 20% Ash)

Shaly Coal (20-30% Ash)

Carb. Shale (Over 30% Ash)

Carb. Shale or Coal
composition unknown

Commonwealth of Australia
Bureau of Mineral Resources
Geology & Geophysics

Area: MINMI
Hole No: S7 TERALBA
Map Ref: N14 - 67

R.L. approx. 210' Hunter District
Datum: Water Board
Driller: B.M.R. Logger: N. HOYLING
Started: 9/5/51 Completed: 14/5/51
Drill type: Failing "2500" Total Depth of hole: 2099'
Indication of hole: Vertical.

Depth	Section	Description	% Core Recovered		
				Shale	
				Shale (Coal)	
				Sandstone	
					51
					52
				Siltstone	
				Sandstone	
					110
				Sandstone	
				Siltstone	
					120
				Sandstone	
				No Sample	
				Sandstone	
					130
				Sandstone	
				Clay (Coal)	
					140
					56
					77
				Shales	
				Sandstone (Coal)	
				Shale	
					150
				Sandstone	
				Shale	
				Sandstone	
					160
				No Sample	
					97
				Shale	
			58	Sandstone	
			43		170
			67	Shale (Coal)	
			100	Shale	
					180
				Sandstone	
				Shale, Coal	
				Shale, Coal	
					190
				Shale	
				Sandstone	
				Shale	
					200
				Sandstone	
				Shale	
				OLD WORKINGS	
				No Sample	
					210

N 14-71 A

Commonwealth of Australia
Bureau of Mineral Resources
Geology & Geophysics

Area: **MINMI.**

Hole No. **S 9. TERA LBA**

Map Ref: **N 14 - 67**

Hunter District

R.L. approx. **220'** Datum: **Water Board**

Driller: **B. P. R.** Logger: **N. HOYLING**

Started: **18/5/51** Completed: **25/5/51**

Drill Type: **Farling 2500** Total Depth of hole: **275'**

Inclination of hole: **Vertical**

Depth	Section	Description	Cone Recovered			
				Sandstone		
				Shale		
				Sandstone		
				Shale		
			100	Coal		
				Sandstone		
				Shale		
				Sandstone		
				Shale		
			110	Sandstone		
				Shale		
				Shale		
				Sandstone		
				Shale		
			120	Sandstone		
				Coal, Shale		
	Shale					85
	Siltstone					
10	Sandstone		125' 5"		17.7% Ash 11,540 B.T.U./lb.	78
	Clay		130' 4"			
	Shale					88
	Sandstone					42
	Shale					
20	Sandstone		140			
	Shale					
	Sandstone					
				Shale		
				Sandstone		
30			150			
	Sandstone			Shale		
	Shale					
				Shale		
				Shale		
40			160	Shale		
	Sandstone			Sandstone		
	Shale			Shale		
				Shale		
50	Sandstone and		170	Shale		
	Shale			Coal		
	Sandstone and					41
60	Shale		180			
			100			81
						97
70	Sandstone		190	Shale		
	Shale			Chert		
				Shale		
				Sandstone		
			192' 6"	Sh. Silt		79
80	Sandstone Shale				22.7% Ash 10,820 B.T.U./lb.	
			205' 8"			86
90	Sandstone		210			91

N 14-71 B

Commonwealth of Australia
Bureau of Mineral Resources
Geology & Geophysics

Area: MINMI

Hole No. S9 TERALBA

Map Ref: N14-67

R.L. approx. 220' Datum: Hunter District Water Board
Driller: B. M. R. Logger: N. HOVLING
Started: 19/5/51 Completed: 25/5/51
Drill Type: Falling "2.500" Total Depth of hole: 275'
Inclination of hole: Vertical

Depth	Section	Description	Core Recovered
210	(Coal)		
	Sandstone		
	Shale		
	Sandstone		
	Siltstone		
220	Shale		
	Sandstone		
	Shale		
	Siltstone		
	Sandstone		
230	Shale		
	Sandstone		
	and		
	Shale		
240	Sandstone		
	and		
	Shale		
250	Sandstone		
	Shale		
	Sandstone		
260	Sandstone		
	Shale		
	Sandstone		
	Shale		
270	Coal		
	Sandstone		
	Coal		
	Shale		

N14-71B

Commonwealth of Australia
Bureau of Mineral Resources
Geology & Geophysics

Area: **MINMI**
Hole No. **S 15** Ph. **Teralba**
Map Ref: **N14-67**

R.L. approx. **216'** Datum: **Hunter District Water Board**
Driller: **A. Pye** Logger: **N. Hayling**
Started: **28/6/51** Completed: **1/7/51**
Drill type: **Sullivan D.D.** Total Depth of hole: **129'6"**
Inclination of hole: **vertical**

Depth	Section	Description	% Core Recovered		
			53		89
			49		53
10			88		98
			88		
20			57		
			68		
30			67		
			71		
			30		
			53		
			67		
41' 2"		42.8% Ash	76		
42' 3"			31		
			170		
46' 7"		25.0% Ash 10,500 B.Th.U./lb.	27		
51' 3"			83		
			42		
			178		
			24		
			25		
60			27		
			60		
			100		
			85		
70			100		
			94		
80			89		
			99		
90					

N 14-71 C

Commonwealth of Australia
Bureau of Mineral Resources
Geology & Geophysics

Area: **MINMI**

Hole No. **S12. TERALBA**

Map Ref: **N14-67**

R.L. approx. **195'** Datum: **Hunter District Water Board**
Driller: **B.M.R.** Logger: **N. HOYLING**
Started: **29/5/51** Completed: **12/6/51**
Drill type: **Fairing 2.500"** Total Depth of hole: **280'**
Inclination of hole: **Vertical**

Depth	Section	Description	% Core Recovered			
						38
						93
						76
				100	Shale	
					abt. 20% Coal	
						53
				106'3"		
				109'3"		
				110		
					19.3% Ash	11,130 B.T.U./lb.
						86
						88
						100
				120		100
						100
						94
10	Sandstone			130		
	Cgt.					109
						82
20	Sandstone			140		
	Cgt.					
	Sandstone					
	Conglomerate and					
30	Sandstone			150		
	Shale					
40	Cgt.					
			92	180	Shale	
			60			
			62			
			100		Sandstone and	
			100			
			57		Shale	
			83			
50	Silt. Sh.		96	170		
	Siltstone					
	Shale		31		Sandstone and	
			115		Shale	
60	Siltstone		86	180		
	Shale		31		Ss.	
			30		Shale	
			64			
			100		Ss. shale	
70				190	Siltstone	
			78		Sandstone	
			73		Shale (Coal)	
					Shale	
80			125	200	Sandstone (Coal)	
			78		Shale	
			37		Coal	
			77		Sandstone	
			37		Coal, Shale	
90				210		

N 14-71 D

Commonwealth of Australia
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Geology & Geophysics

Area: **MINMI**

Hole No: **S.12. TERALBA**

Map Ref: **N14-67**

R.L. approx. 195' Datum: Hunter District Water Board
Driller: B.M.R. Logger: N. Hovine
Started: 29/5/51 Completed: 12/6/51
Drill Type: Falling 2500" Total Depth of hole: 280'
Inclination of hole: Vertical

Depth	Section	Description	% Core Recovered
210	Coal, Shale		
220			100
	Sandstone Shale		
230	(Coal.) Shale Sandstone Shale		
240	Sandstone Shale Siltstone Sandstone Shale and		
250	Sandstone Shale Coal		
258' 7"		10.7% Ash. 12,450 Bk. U/L	
260'			86
	Shale Siltstone Coal.		
270	Sh. Silt.		
			93
280			

N14-71D

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Area: **MINMI.**
Hole No **S4** **HEXHAM**
Map Ref: **N14-67**

R.L. approx. 105' Datum: Hunter Dist. Water Board
Driller: **R. PVE** Logger: **N. HOYLING**
Started: **9/12/51** Completed: **18/12/51**
Drill Type: **Sullivan D.D.** Total Depth of hole: **160'5"**
Inclination of hole: **Vertical**

Depth	Section	Description	% Core Recovered			
				99		
				100		
				100		
				110		
				92		
				120		
			12			
			33	127'1"		
10			83		12.3% Ash	12,410 B.T. U ₅ /lb.
			21	130'6"		
			71	130'9"	10.7% Ash	12,650 B.T. U ₅ /lb.
			80	135'10"		
20			95	140		
			98			
30			100	150		
			82			
			94			
40			63	160		
			85			
			68			
49'8"		32.5% Ash	85		9,470 B.T. U ₅ /lb.	
53'2"		21.3% Ash	85		11,060 B.T. U ₅ /lb.	
57'2"		12.8% Ash	85		12,300 B.T. U ₅ /lb.	
57'53"						
58'02"						
			75			
66'5"		11.1% Ash	71		12,610 B.T. U ₅ /lb.	
69'0"						
			97			
82'0"		3.75% Ash	87		13,130 B.T. U ₅ /lb.	
82'4"						
90						

N14-71E

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Area: MINMI
Hole No: S.10 PH: HEXHAM
Map Ref: N14-67

R.L. approx. 192' Datum: Hunter District Water Board
Driller: B.M.R. Logger: N. Heyling
Started: 30/7/51 Completed: 3/8/51
Drill type: Failling. 2500" Total Depth of hole 220'
Inclination of hole: vertical

Depth	Section	Description	% Core Recovered			
				100	sandstone siltstone and shale	
				105'1"		60
				107'7"	36.7% Ash	91
				110'1"		
				112'4"	38.4% Ash	74
				116'11"	31.7% Ash 9,370. B.Th.U./lb.	57
10	clay and shale			120	cherty shale and 5% coal	
					shale siltstone and 5% coal	
				130	shale sandstone and 5% coal	
20					shale and sandstone	
				140		
	shale and sandstone				shale	
30				150	sandstone and	
	shale and sandstone				coal	
40					shale and	
	shale and sandstone			160	sandstone	
50					shale sandstone and 10% coal	53
				170	sandstone siltstone shale and 5% coal	
60	sandstone and shale			180	sandstone siltstone and shale	
					siltstone and	
70				190	shale	
	sandstone and shale					
80				200	shale clay and chert	
					sandstone clay chert 5% coal	
90	sandstone siltstone and shale			209'0"		76
					33.9% Ash 9,120 B.Th.U./lb. 6" band excluded from analysis	65
				217'3"		101

N14-71 F

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Area: MINMI.
Hole No. S1. PH: HEXHAM
Map Ref: N14-40

R.L. 184.9' Hunter Dist.
Datum: Water Board.
Driller: B.M.R. Logger: N. HOYLING
Started: 19/6/51 Completed: 29/6/51
Drill Type: Falling "2.500" Total Depth of hole: 218'6"
Inclination of hole: Vertical.

							58
							71
				100			15
						100	81
				110			83
							59
				120	Shale		
					Coal.		
					Shale		
					Coal.		
10				128'6"		14.5% Ash 12,190 B.T.U. U.S./lb.	50
				134'7"			82
	Sandstone Coal Shale						
20				140	Shale		
21'1"			56		Coal		
		13.0% Ash 11,570 B.T.U. U.S./lb. 1" shale excluded from analysis. 1" carbonaceous shale excluded.	68		Sandstone		
24'8"					Shale		
			33		Sandstone		
30				150	Chert.		
			67		Shale		
					Sandstone		
					Chert.		
					Coal.		
	Missing				Shale ss. chert coal.		
40				160			88
			67		Shale		
					Coal.		
			78		Shale		
50				170	Coal.		
			99		Shale		
					Coal		
					Sandstone		
			75		Sandstone		
60				180	Shale		
					Sandstone		
			104		Shale		
					Coal		
					ss. Shale		
70				190	Coal.		
			100		Sandstone		
					Coal		
					Shale		
			88		Sandstone		
80				200	Shale		
					Coal.		
					Sandstone		
			0	205'9"	Coal.		
						13.6% Ash 12,430 B.T.U. U.S./lb.	
90			50	208'6"			104
				21'20"			

N 14-71 G

Area: MINMI
Hole No: SI. HEXHAM
Map Ref: N 14-40

Map Ref. _____ Hunter Dist. _____
 R.L. 184.9' Datum: Water Board
 Driller: B. M. R. Logger: N. Hoyling
 Started: 1916/51 Completed: 2916/51
 Drill type: Failing "2500" Total Depth of hole: 218.6'
 Inclination of hole: Vertical.

N14-71 G

R.L.	104.8'	Datum.	Hunter Dist. Water Board.
Driller:	A. Pye	Logger:	N. Hoxley.
Started:	27.12.51	Completed:	9.1.51
Drill type:	Sullivan D.D.	Total Depth of hole:	165.10
	Inclination of hole		Vertical.

N 14-71 H

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Area: MINMI.
Hole No. S 6. PH. HEXHAM.
Map Ref: N 14-40

R.L. 71.3' Datum, Hunter Dist.
Driller: J. MacD ROYLE Logger: N. HOVLING
Started: 19/7/51 Completed: 25/7/51
Drill type: Sullivan NX D.D. Total Depth of hole: 110'
Inclination of hole: vertical

Depth	Section	Description	Cone Recovery
	alluvium with sandstone fragments		6
0			21
			20
			52
20			93
			101
			53
30			31
			80
			99
40			96
			95
50			90
			99
60			93
70			99
80			121
87.9'			78
90			

91.6'			66
92.2'			76
96.7'			96
			67
100			55
			90
			95

15.8% Ash 12,110 B.Tk. U.S./lb.

28.6% Ash 10,140 B.Tk. U.S./lb.

N14-711

Area: MINMI
Hole No. SS HEXHAM.
Map Ref: N 14-40

Depth	Section	Description	% Core Recovered
			
	Sandstone		
	Shale		
10	Clay.		
	Sandstone		
	Shale		
	Clay		
	Shale		
20	Sandstone		
	Ss. shale		
	Aht. 15% Coal		
	Coal and Shale		
	Shale and Coal		
30	Sandstone and Coal		
	Sandstone		
	Shale		
	Coal		
	Shale		
	Sandstone		
	Clay		
40	Coal.		
	Sandstone		
	Clay		
	Shale		
	Coal.		
	Shale		
	siltst.		
	chert.		
50	Shale, siltst.		
	cherts.		
	Shale		
	Siltst.		
	Sandstone		
	Siltstone		
60	Chert.		
	Sandstone		
	Chert		
	Siltstone.		
	Siltstone		
	Chert		
70	Shale		
	Siltstone		
	Sandstone		
	Ss. with		
78'5"	some Coal.		
80'9"		15.1% Ash 12,200 B.T.U./lb.	77
84'9"		20.4% Ash 11,370 B.T.U./lb.	93
85'5"		12.8% Ash 12,370 B.T.U./lb.	88

945'		11.5% Ash	12560 B.Th. U ₃ /lb.	97
		(18" Carb. Shale excluded from analysis)		
949'		12.0% Ash	12,110 B.Th. U ₃ /lb.	75
976'				
110				102

N14-71 J

Inclination of hole: Vertical.

N 14-71 K

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Area: MIN MI
Hole No: S.7 Ph: HEXHAM
Map Ref: N14-67

R.L. Approx 137' Hunter Dist. Datum: Water Board
Driller: B.M.R. Logger: N. Hoyling
Started: 24/7/51 Completed: 20/7/51
Drill Type: Falling "2500" Total Depth of hole: 1766'
Inclination of hole: vertical

Depth	Section	Description	% Core Recovered			
					sandstone shale & coal	
						0 67
				100	shale clay & sandstone	
					sandstone siltstone clay & coal	
				110	sandstone siltstone & clay	
					sandstone shale & chert	
				120	sandstone clay & shale	
	clay & sandstone				sandstone clay siltstone & shale	
10				130	sandstone clay siltstone shale coal	
	sandstone & shale					
	sandstone shale & clay			140		
20					sandstone shale chert & coal	
	sandstone & clay			150		
	clay, shale & sandstone					
30				156'		
	sandstone shale clay & coal		70			15
36'3"		37.1% Ash		156'		
			96			79
40'1"						83
41'0"				163'9"		77
43'6"		38.8% Ash	67			86
			129			58
50				170		100
	no					
60				180		
	samples					
70						
	sandstone					
	siltstone & claystone					
80						
	siltstone claystone & sandstone					
90						

N14-71L

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CO: NORTHUMBERLAND
Area: MIN.MI
Hole No: S.3 HEXHAM
Map Ref: N14-40

R.L. 88' Hunter Dist.
Datum: Water Board
Driller: J. MacD. Royle Logger: N. Hoyling
Started: 1/7/51 Completed: 19/7/51
Drill Type: Mindrill D.D. Total Depth of hole: 120
Inclination of hole: Vertical

Depth	Section	Description	%Core Recovered		
			14		91
					100
			18		100
10			89		93
			88		93
			62		10
20			94		79
			100		78
30			97		
			89		
36.5			105		
38.5		7.0% Ash 13,330 B.Th.U's per lb. i band excluded from analysis	97		
			62		
			62		
50			89		
			117		
			93		
			105		
			44		
60			94		
			61		
			104		
			100		
70			83		
			106		
80			60		
			104		
			100		
90			92		

N14-71 M

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Bureau of Mineral Resources

Geology & Geophysics

Co: NORTHUMBERLAND

Area: MINNI

Hole No: S.S. PH. HEXHAM

Map Ref: N 14-40

R.L. 79.9' Hunter Dist. Datum: Water Board

Driller: J. MacD. Royle Logger: N. Heyling

Started: 28/7/51 Completed: 9/8/51

Drill type: Mindrill D.D. Total Depth of hole: 81'

Indication of hole: Vertical

Depth	Section	Description	% Core Recovers
			0
10			
			50
20			93
			85
30			
			49
40			97
			93
50			72
			74
59.7		Ash % B.Th. Up per lb. Bands excluded from analysis	76
61.1		20.7 11,300 1 ex	100
62.0		20.4 10,310	86
63.0		13.2 12,400 1 ex	132
64			55
70			54
			75
			71
			73
			77
80			75
			100
80			

N 14-71 N