

941001

OPEN FILE

AVOCA TRANSPORT COMPANY PTY LTD

E.L. 21/82

MERRYWOOD AREA

EXPLORATION LICENCE REPORT

PERIOD OCTOBER 1985- OCTOBER 1986

*87-2645
copy 1*

941B

1.0 INTRODUCTION

This report documents the exploration activities within the Exploration Licence for the 12 month period from October 1985 to October 1986.

A consulting geologist, Mr D.N.Nelson of D. Nelson and Associates (Sydney) was engaged to supervise the drilling program and mapping. This included the review of all published information and all work carried out on the E.L. and within the mining lease area to date.

In the period from May 26 to June 6 a small drilling and mapping program was carried out within the E.L. This programme included the deepening of an existing drill hole to confirm correlation, the drilling of a further two diamond drill holes and one open hole within the immediate vicinity of the Merrywood Coal Mine and the drilling of two scout holes in the western portion of the E.L. Drill holes planned in the eastern side of the E.L. were not attempted due to access problems associated with the heavy rain in early may. Geological mapping was also carried out in an attempt to locate the coal seam sequence or associated sediments in areas remote from the existing mine workings.

The aim of this work being to delineate additional reserves due to an extension of the coal seams outside the mine lease area.

The locations of the holes drilled within the Merrywood Coal Mine lease area are presented on FIGURE 1 while the locations of the scout holes are presented on FIGURE 2. A drill hole summary is presented in TABLE 1. Total metreage drilled was 165.22m.

The geology of the Merrywood area has been discussed in detail in previous reports. The purpose of this report is to incorporate the results of the recently completed drilling programme with existing data and present a brief interpretation of the results.

2.0 MERRYWOOD MINE AREA

2.1 LOCAL STRATIGRAPHY

The stratigraphic sequence intersected in the mine lease area is presented in FIGURE 3. Almost the entire area is covered by a variable thickness of dolerite scree, varying from 24m beneath Cowies Bluff to around 4m in the eastern drill holes. The sediments immediately below the scree are generally extremely weathered and probably represent an old soil profile indicating the scree is a much later depositional unit.

There are up to three coal seams represented in the area, the top two being generally poorly developed. The uppermost seam was only intersected in two

TABLE 1

E.L. 21/82 DRILL HOLE SUMMARY

HOLE No.	EASTING	NORTHING	ELEVATION (m ASL)	TOTAL DEPTH (m)	PRE-COLLAR DEPTH (m)
AT 1	579870	5374930	479.80	29.55	10.20
AT 5 *	579900	5374950	500	27.73	4.20
AT 6 *	579600	5375350	530	42.00	24.50
AT 7 *	579600	5374750	480	22.00	22.00
AT 8 *	577000	5375640	570	37.00	37.00
AT 9 *	577400	5374950	480	17.50	1.20

* TO BE SURVEYED

holes, ICE 78RG-4 (0.35m of weathered coal) in the north and AT 2 (0.9m) in the east. In other areas this seam has probably been eroded prior to the deposition of the dolerite scree.

The second seam occurs as a weathered coal horizon in the north-eastern highwall of the open cut and was intersected in the previously drilled Investigator Coal hole 78RG-4 and in the recently completed hole AT 6. The seam in ICE 78RG-4 occurred as 0.27m of carbonaceous mudstone and coal at 29m and as 0.42m of coal in AT 6 at 29m. The top portion of the seam in this bore contained numerous clay pellets and would have a high ash content. A dolerite horizon intersected in AT 2 at approximately 21m could represent an intruded section of this seam.

It is doubtful if either of these two upper seams would have any future reserve potential.

The principal seam in the area, the Merrywood seam, occurs throughout the area and is well developed although it appears some erosion of the seam has occurred in places.

The dominant overburden material in the area, apart from the dolerite scree, is a generally massive mudstone, similar to that being excavated in the northern areas of the open pit. However, the immediate roof of the seam in the central portion of the mine area, which includes holes 78RG-4, AT 6, AT 3 and AT 7 is a fine grained sandstone. Where intersected in drill core the sandstone was reasonably soft with frequent bedding planes, carbonaceous threads and fossil horizons which will probably allow the material to be readily broken. This unit is currently being successfully removed in the southern open pit workings.

The immediate floor of the seam is a thinly bedded mudstone/siltstone sequence which is frequently carbonaceous. This is underlain by a thick massive sandstone.

2.2 MERRYWOOD SEAM

The Merrywood seam contains a number of non-coal partings which can be correlated over the entire licence area. Figure 4 presents the ply and parting correlation for the holes drilled within the Mine lease.

A major stone band which has developed in holes ICE 78RG-4, AT 6 and to a lesser extent AT 2 can be correlated across the area. This band effectively splits the Merrywood seam into two coal plies and appears to be thickening in a north easterly direction to more than 1m.

The ply correlation indicates that the top section of the uppermost coal ply has been partially eroded in AT 3 by the overlying channel sandstone unit and completely eroded in hole AT 1 in the east. The extent of this erosion is

004

unknown however, in the vicinity of AT 1 it is thought to be a local feature which is topographically related.

Isopachs of the Merrywood seam are presented in Figure 5. These isopachs represent the cumulative coal thickness excluding the major stone band. The isopachs highlight the eroded areas associated with AT 3 (2.66m) and AT 1 (2.79m). The 3.40m recorded in AT 7 is approximate only as this hole was not cored and thicknesses and depths estimated by observing drill progress and the change in the colour of the water return. The thicknesses recorded in the open pit were taken from the report by Bacon and the location estimated from description and personal communication.

Structure contours drawn to the base of the seam are presented in Figure 6. These indicate a synclinal structure, roughly associated with the Merrywood Creek. West of the Creek the seam dip is approximately 1 in 7 to the south-east, swinging to the south-west east of the creek. The structure is indicative only as the true seam RL's need to be confirmed by the surveying of the bore collar heights.

A fault located in the northern end of the open pit caused the collapse of the highwall in that area, covering exposed coal. The approximate orientation of this fault is N 65 deg. E. Cleat measurements taken in the coal indicate two strongly developed directions which are carbonate coated. These two directions are bisected by the fault direction as indicated on Figure 7 and indicate the area to be in tension with the direction of maximum principle stress being roughly SE - NW. On a more regional basis strong lineations in geomorphological features confirm the fault direction and suggest a second major structural orientation approximately perpendicular to the fault.

3.0 WESTERN AREA

Two holes, AT 8 and AT 9, were drilled in the western area of 21/82. These two holes were located in areas which showed potential for a reasonable area of shallow open cut coal based on extrapolation of seam data from the ICE 78RG-3 further to the west.

Hole AT 8, located on the western boundary of the licence area, was terminated at 37m in Dolerite Scree while AT 9, located approximately 80m lower than the initial hole was terminated at 17.5m in sandstone.

Mapping in the area did not locate the coal sequence. However, a thin coal seam was located in the upper portion of Hockey's Creek north of the license area at approximately the 650m elevation. The sandstone floor to this seam could be traced to the 550m contour. This sandstone appeared similar to that intersected in AT 9 a further 70m lower. It is unknown where the coal sequence occurs in this area however, it is felt that the area offers little potential for open cut coal and further investigation is not recommended.

4.0 EASTERN AREA

Although access did not allow the planned drilling to take place in the eastern portion of E.L. 21/82 some preliminary geological mapping was undertaken in an attempt to locate the coal sequence in that area. This mapping, east of Pratts Hill and within the north-western portion of the Lochaber property, located a thin mudstone horizon which may be associated with the coal sequence.

5.0 ANALYTICAL PROGRAMME

Six samples were taken for analysis from the Merrywood Mine drilling programme - three samples in AT 5 and three in AT 6. TABLE 2 presents the results.

TABLE 2: COAL QUALITY

Sample No.	Mass	Moisture	Ash	Volatile Matter	Fixed Carbon	Total S (%ad)	SE MJ/kg
ME 10	1.994	5.0	39.5	19.8	35.7	0.40	17.62
ME 11	4.276	3.5	27.7	22.2	46.6	0.34	22.38
ME 12	2.324	3.3	22.6	23.1	51.0	0.40	24.74
ME 13	1.802	4.0	32.3	24.5	39.2	0.37	20.32
ME 14	3.022	3.4	29.2	22.6	44.8	0.33	21.66
ME 15	2.200	3.1	26.3	25.6	45.0	0.43	22.84
ME 16	1.008	3.5	36.7	26.0	33.8	0.77	19.42
(Composite of ME 10, 11,12.)							

6.0 EXPENDITURE

Drillings (H.J.Stacpoole)	\$12825
Coal analyses	\$1110
Consultants (geological, engineering)	\$8083
Working Proprietor 10 days @ \$240	\$2400
Labour 5 days at \$120	\$600
Dozer 1 day @ \$ 600	\$600
TOTAL	\$25618

7.0 PROPOSED EXPLORATION PROGRAMME 1986-87

The area to the east of Pratts Hill appears to have some potential for shallow open cut reserves. At least two drill holes are planned in this area in March-April 1987 when access permits to test the mining potential.

Should this drilling be successful, consideration will be given to drilling at Pratts Hill itself to test for the continuation of the Merrywood Mine coal seams under the hill. This area has potential for underground mining.

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5375500

5375000

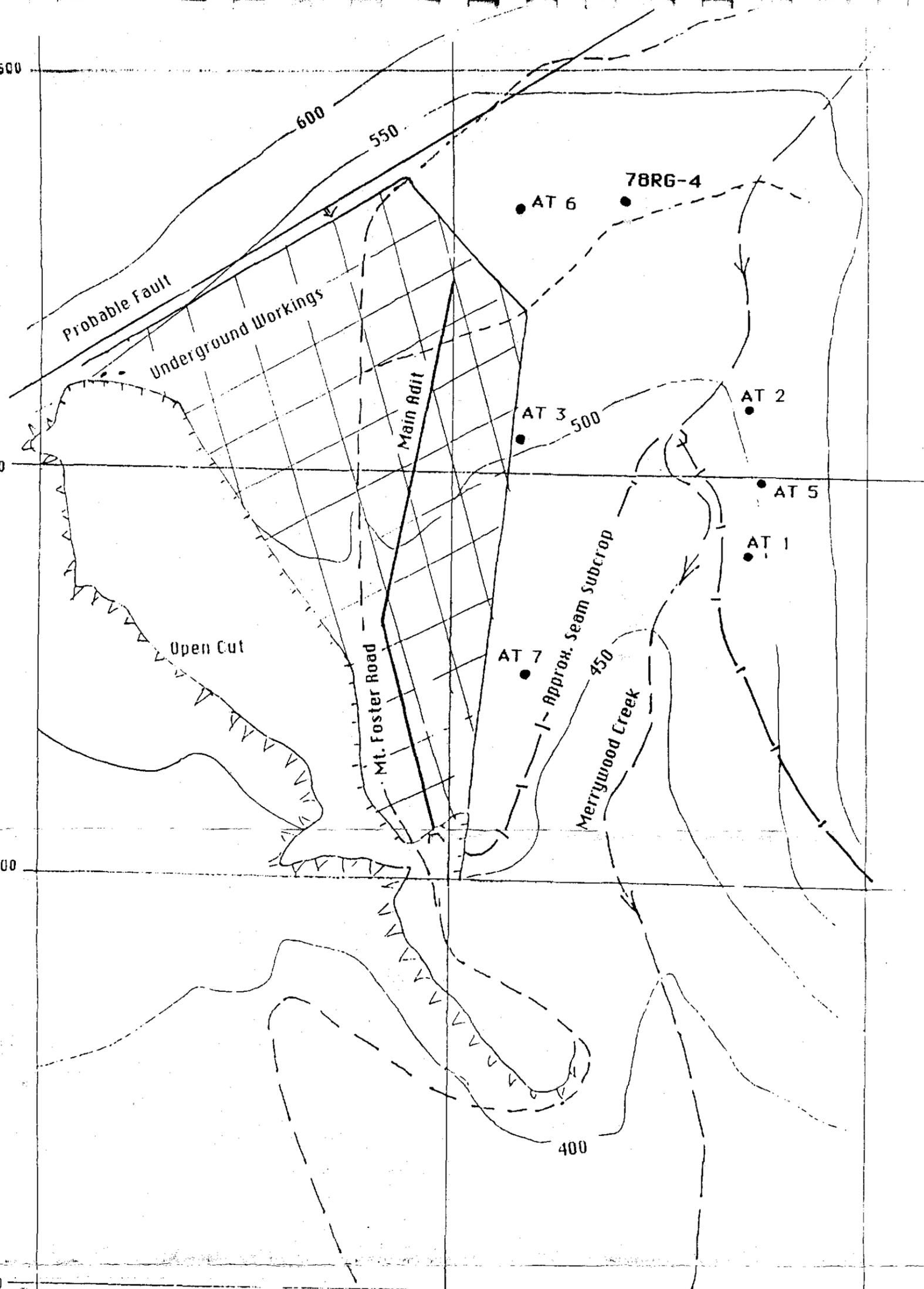
5374500

5374000

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579500

580000



● AT 1 DRILL HOLE

AVOCA TRANSPORT
MERRYWOOD COLLIERY
BOREHOLE LOCATION

Scale 1:5,000

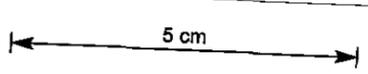


FIG 1

941009

008

941010

197

Bully

9.14

Hockeys Marsh

ROAD

126

834 MOUNT SLAUGHTER

738

E.L. BOUNDARY

100

AT 8

550

826

four wheel drive only

forestry operations

1664

COWIES

BLUFF

600

AT 9

1667

500

mine (inactive)

900

RUBENACK

1660

400

1704

1666

HOCKEYS

1005

1659

1658

ROAD

1661

Merrywood

1664

337

1657

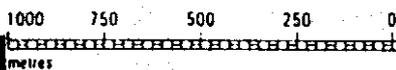
Creek

335

1662

Toms Creek

Merrywood



SCALE 1:20000

E.L. 21/82
DRILL HOLE LOCATION PLAN

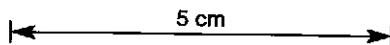


FIG 2

FIG 3

MERRYWOOD COLLIERY
BOREHOLE CORRELATION

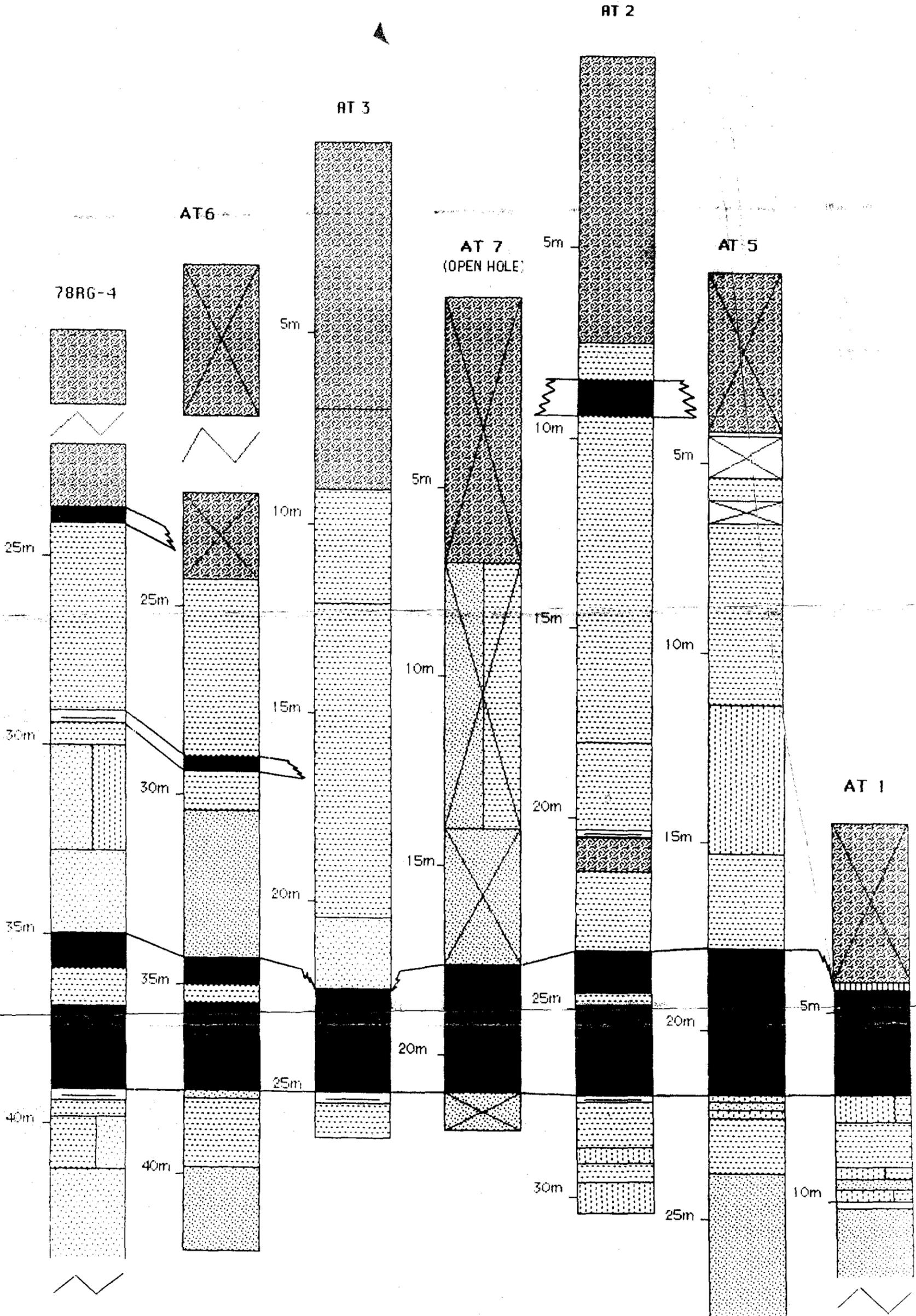
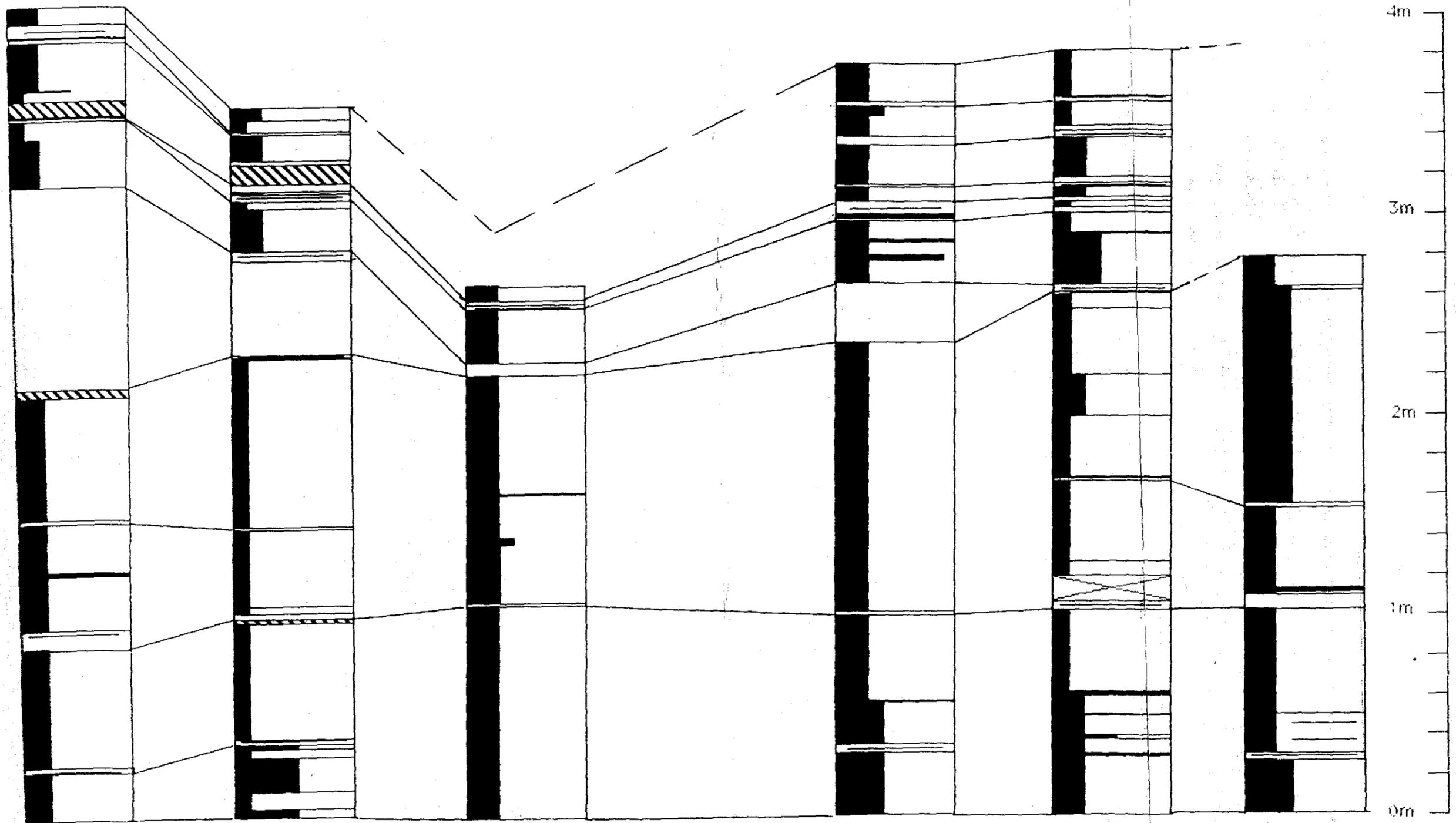


FIG 4

MERRYWOOD COLLIERY
MERRYWOOD SEAM PLY CORRELATION



78RG-4

AT 6

AT 3

AT 2

AT 5

AT 1

010

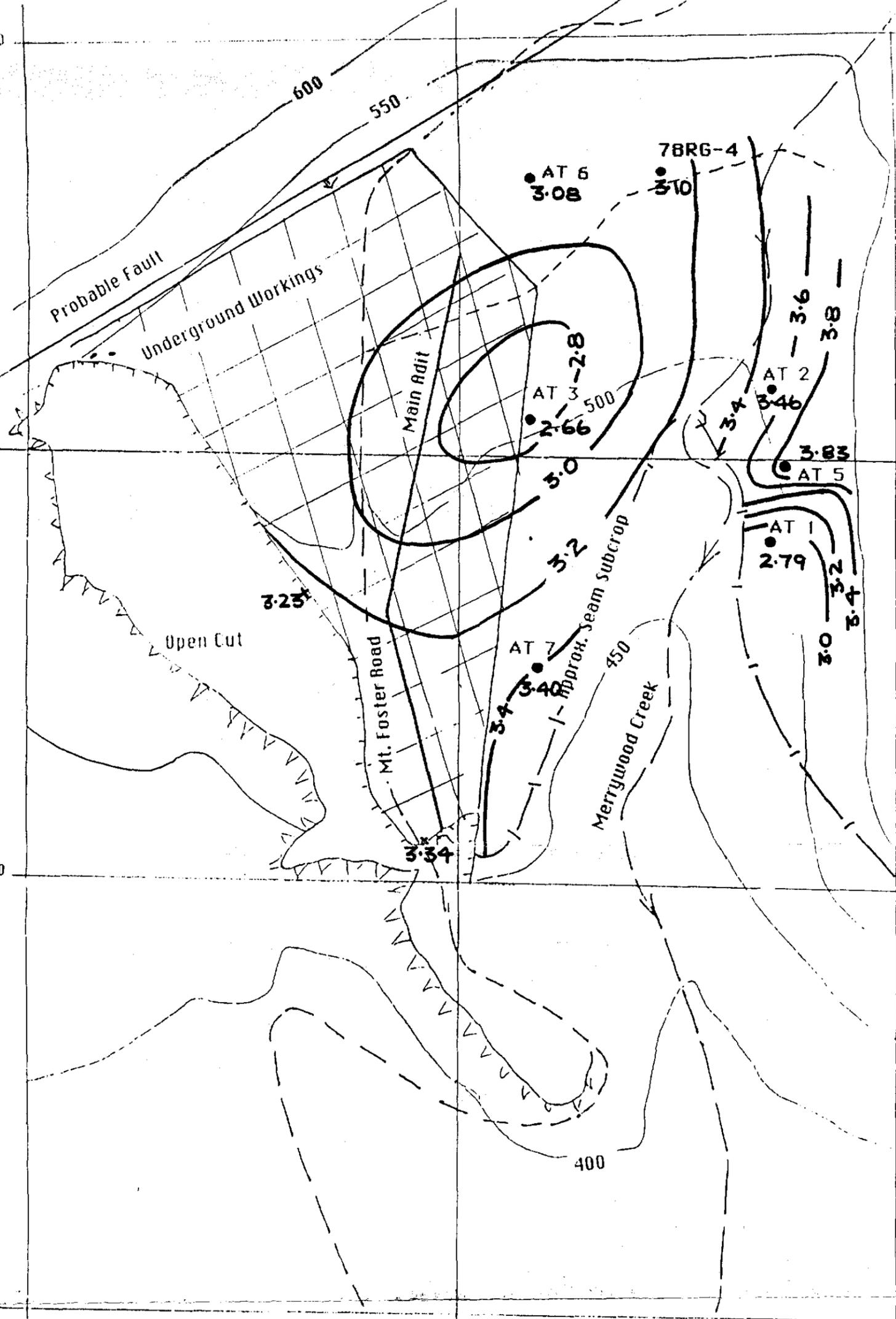
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● AT 1 DRILL HOLE

AYOCA TRANSPORT
MERRYWOOD COLLIERY
MERRYWOOD SEAM ISOPACH

Scale 1:5,000

FIG 5

5 cm

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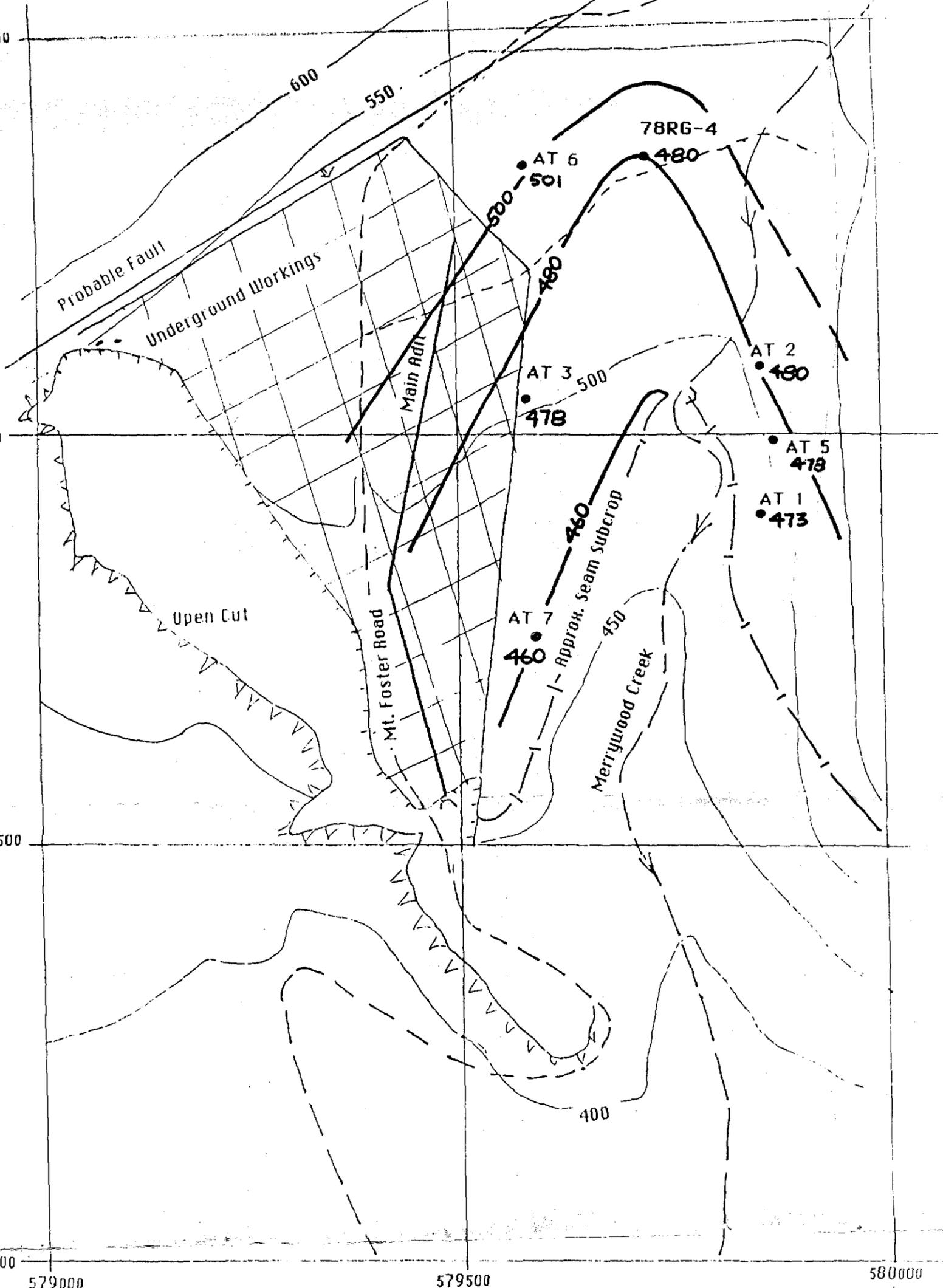
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● AT 1 DRILL HOLE

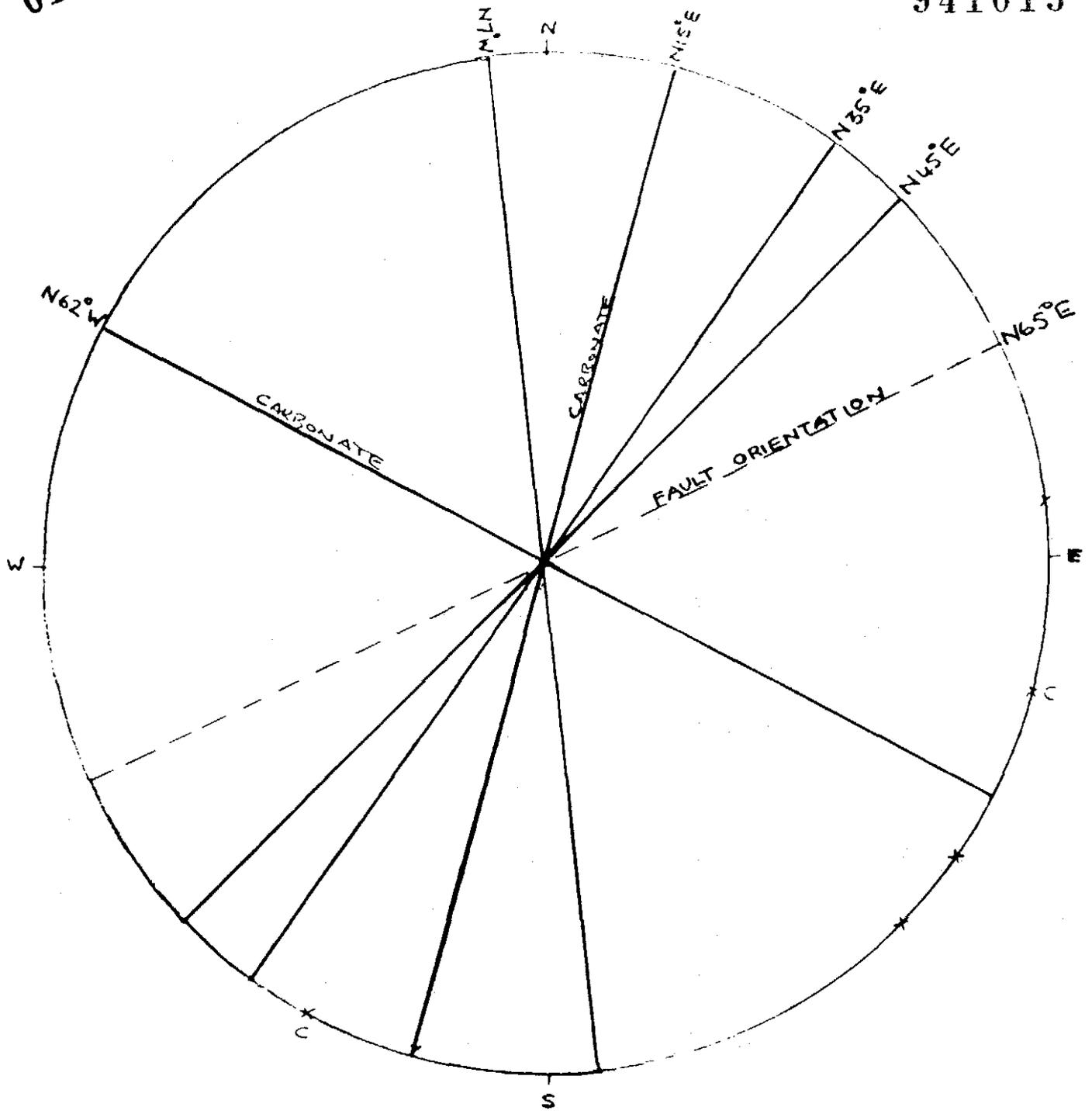
AVOCA TRANSPORT
MERRYWOOD COLLIERY
MERRYWOOD SEAM STRUCTURE

Scale 1:5,000

FIG 6



941014



CLEAT ORIENTATION IN COAL

FIG 7

014 375500

5375000

537-1500

537-1000

579000

579500

580000

● AT 1 DRILL HOLE

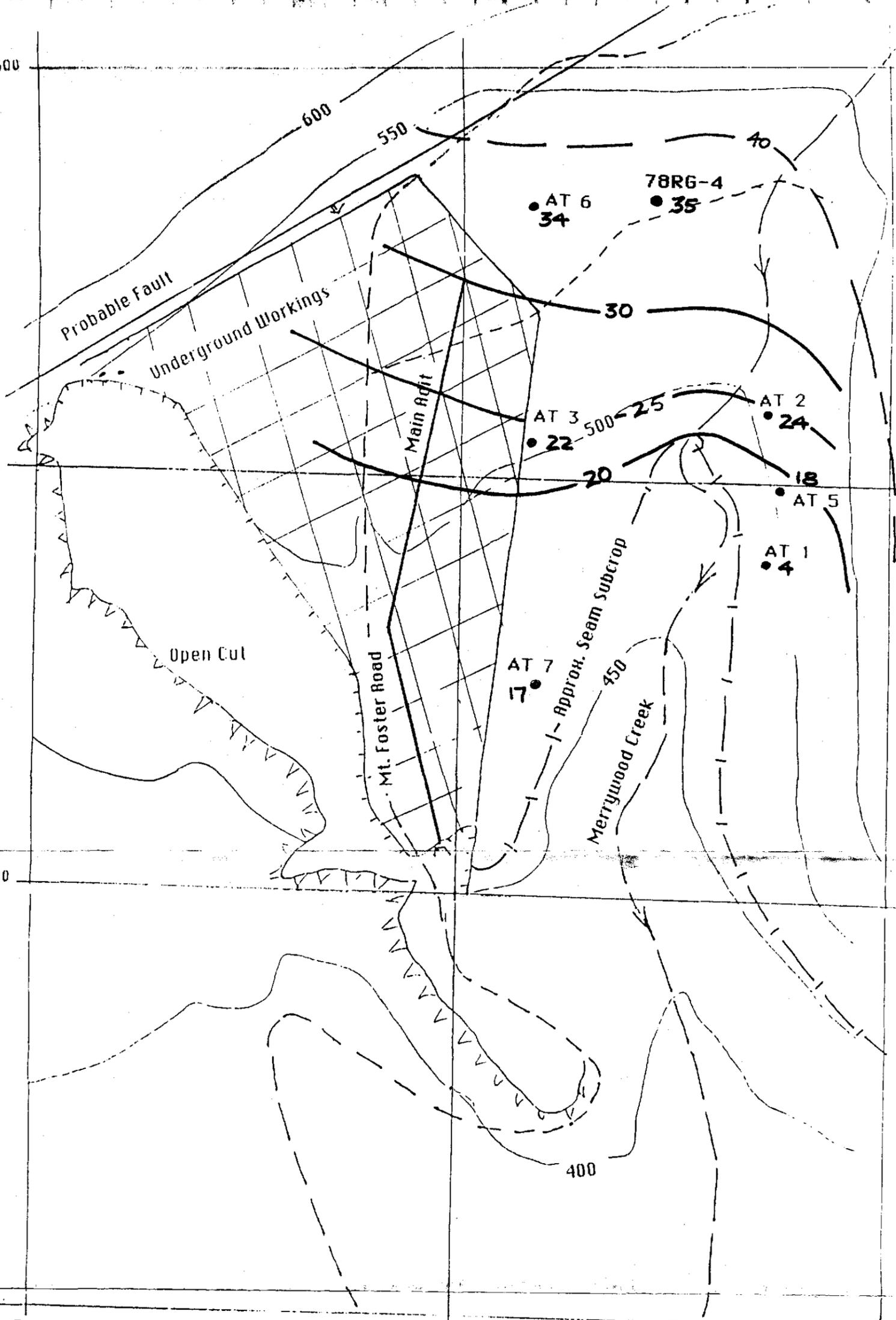
AVOCA TRANSPORT
MERRYWOOD COLLIERY
MERRYWOOD SEAM DEPTH OF COVER

Scale 1:5,000

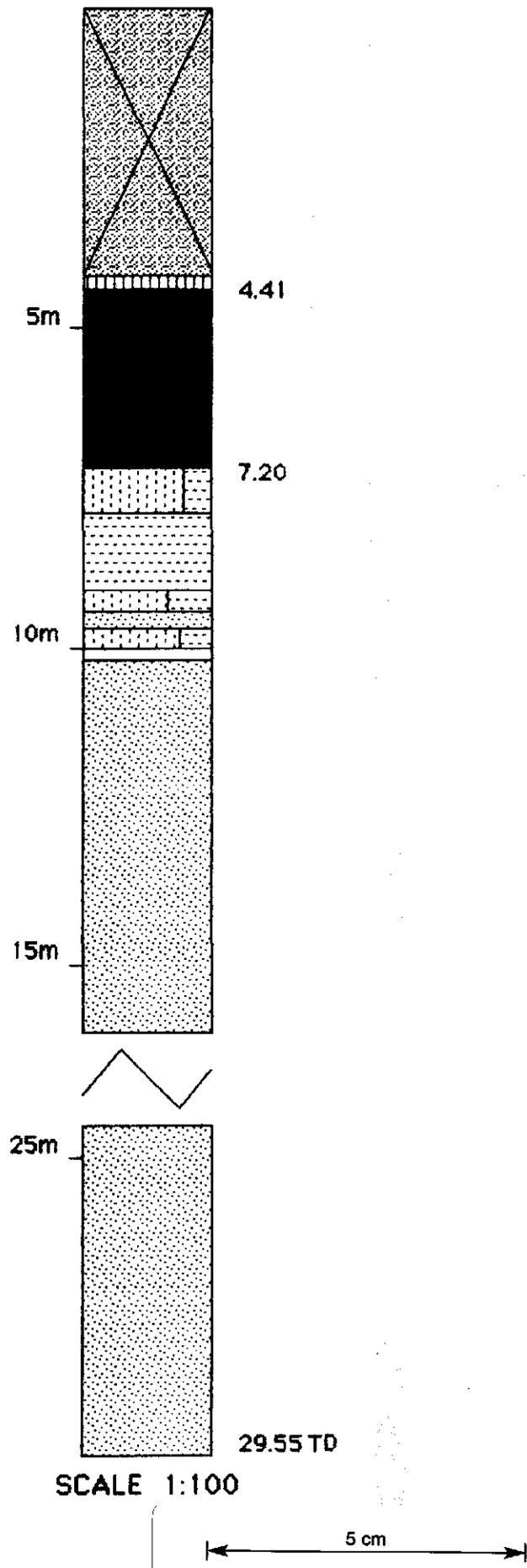
FIG 8

5 cm

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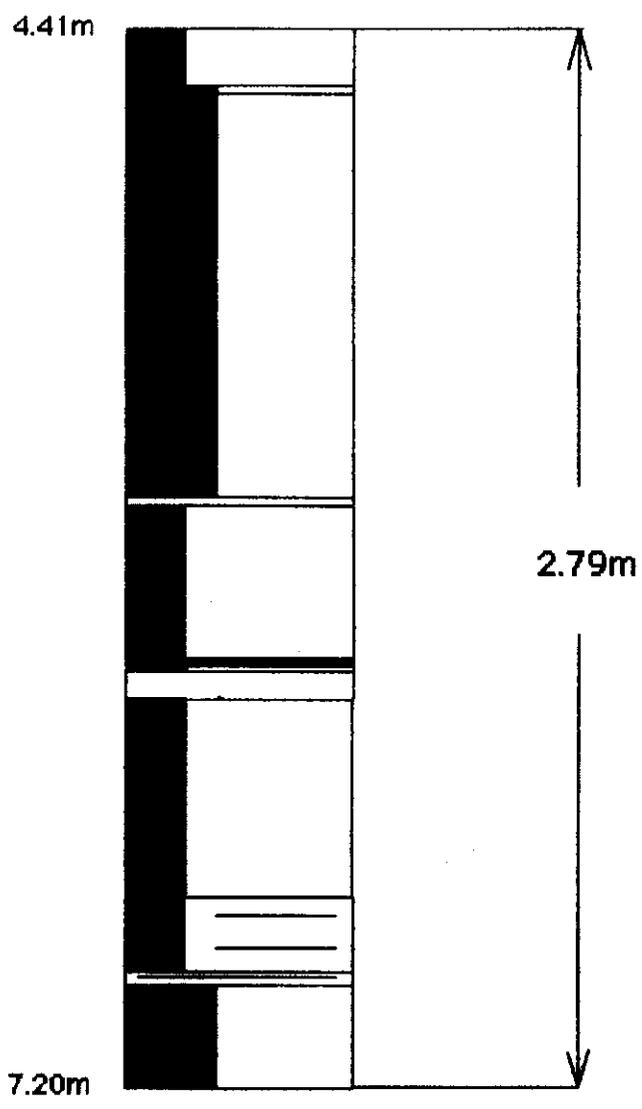
MERRYWOOD DRILL HOLE AT 1



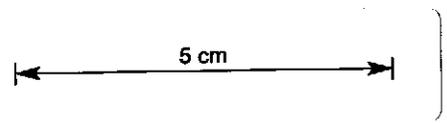
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MERRYWOOD AT 1 DETAILED COAL LOG

941019



SCALE 1:20



018

941020

D. NELSON & ASSOCIATES PTY LTD
Mining & Geological ConsultantsLITHOLOGICAL LOG

PROJECT: MERRYWOOD

CLIENT: AVOCA TRANSPORT

PAGE: 1

HOLE No. AT 5

CORE: NQ

E 579900

N 5374950

RL: 500

DRILLER: STADPOOLE

DATE DRILLED: 27/5/86 - 28/5/86

FORM/ SEAM	SAMPLE No.	TD (m)	THICK (m)	GEOLOGICAL DESCRIPTION
		4.20	4.20	Open Hole - Dolerite Scree
		4.30	0.10	Mudstone - green/brown, soft, weathered
		5.45	1.15	Lost Core
		6.00	0.55	Mudstone - green/brown, broken, iron stained joints, fossiliferous weathered, firm.
		6.60	0.60	Lost Core
		7.05	0.45	Mudstone - green/brown, firm, irregular carbonaceous threads throughout, 30 degree slickensides, weathered
		7.43	0.38	Mudstone - grey/brown, firm, ironstained 50 degree joints and near horizontal bedding planes
		7.80	0.37	Mudstone - green/brown, firm, ironstained 50 degree joints, irregular carbonaceous threads and inclusions throughout
		8.78	0.98	Mudstone - grey/brown, firm, sub-horizontally bedded, carbonaceous threads throughout, 50 degree shear zone at base (fault?)
		11.40	2.62	Mudstone - light to mid grey, firm, silty phases throughout, irregular turbid bedding, carbonaceous threads, 50 degree ironstained joints
		12.00	0.60	Siltstone - grey, firm, irregularly bedded
		12.44	0.44	Siltstone - grey, badly sheared.
		14.40	1.96	Siltstone - grey, irregularly bedded, irregular carbonaceous threads throughout
		14.44	0.04	Siltstone - badly sheared
		15.34	0.90	Siltstone - grey, sub-horizontally bedded, carbonaceous threads throughout, 50 degree joints and slickensides
		15.44	0.10	Mudstone - carbonaceous
		17.84	2.40	Mudstone - grey, irregular bedding, fossiliferous
				SEAM ROOF
10	1	ME10	18.07	0.23 Coal - dull

Signed

Geologist

LITHOLOGICAL BORELOG

PROJECT: MERRYWOOD CLIENT: AVOCA TRANSPORT PAGE: 2

HOLE No. AT 5 CORE: E N RL:

DRILLER: DATE DRILLED:

FORM/ TEAM	SAMPLE No.	TD (m)	THICK (m)	GEOLOGICAL DESCRIPTION	
M0	1	ME10	18.10	0.03	Shaly Coal
M0	1	ME10	18.22	0.12	Coal - dull
M0	1	ME10	18.25	0.03	Claystone - brown, soft.
M0	1	ME10	18.28	0.03	Shaly Coal
M0	1	ME10	18.48	0.20	Coal - dull, minor bright bands, shaly at base
M0	1	ME10	18.51	0.03	Claystone - brown, soft
M0	1	ME10	18.53	0.02	Shaly Coal
M0	1	ME10	18.59	0.06	Coal - dull, minor bright bands
M0	1	ME10	18.61	0.02	Shaly Coal
M0	1	ME10	18.63	0.02	Coal - dull
M0	1	ME10	18.66	0.03	Mudstone - carbonaceous, slickensided
M0	1	ME11	18.76	0.10	Coal - dull
M0	1	ME11	19.02	0.26	Coal - banded dull
M0	1	ME11	19.05	0.03	Carbonaceous Mudstone
M0	1	ME11	19.07	0.02	Shaly Coal
M0	1	ME11	19.14	0.07	Coal - dull, claystone pellets throughout
M0	1	ME11	19.47	0.33	Coal - dull
M0	1	ME11	19.70	0.23	Coal - dull with minor bright bands
M0	1	ME11	19.70	0.00	Penny Band - Claystone
M0	1	ME11	19.99	0.29	Coal - dull
M0	1	ME11	20.00	0.01	Shaly Coal
M0	1	ME11	20.40	0.40	Coal - dull, near vertical carbonate filled cleat through length
M0	1	ME11	20.47	0.07	Coal - dull
M0	1	ME11	20.60	0.13	Lost Core - probably coal
M0	1	ME12	20.61	0.01	Shaly Coal
M0	1	ME12	20.64	0.03	Mudstone - carbonaceous
M0	1	ME12	20.77	0.13	Coal - dull
M0	1	ME12	20.77	0.00	Penny Band - Mudstone
M0	1	ME12	21.05	0.28	Coal - dull

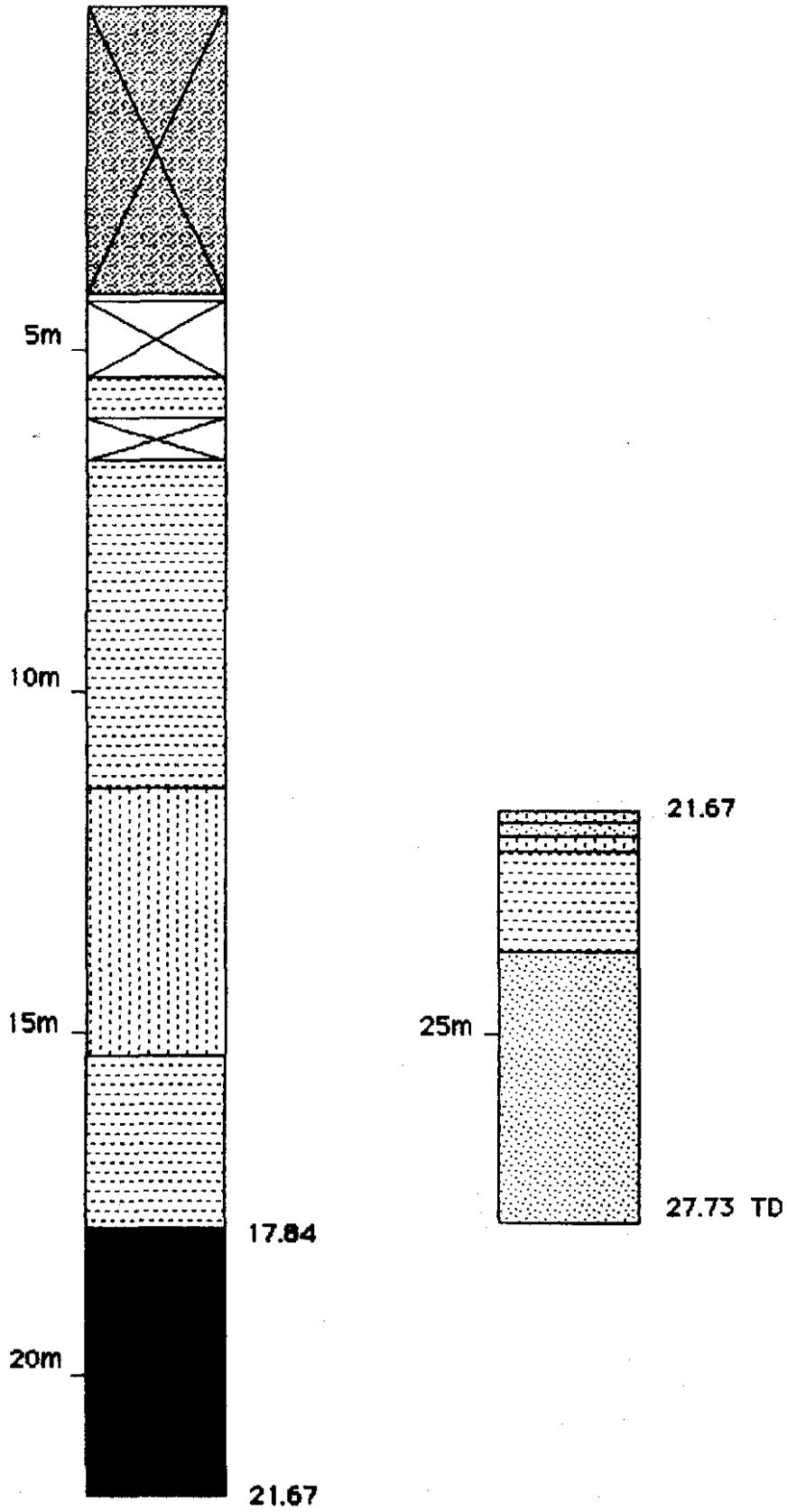
Signed

Geologist.

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941023

MERRYWOOD DRILL HOLE AT 5



023

941025

D. NELSON & ASSOCIATES PTY LTD
Mining & Geological ConsultantsLITHOLOGICAL LOG

PROJECT: MERRYWOOD CLIENT: AVOCA TRANSPORT PAGE: 1

HOLE No. AT 6 CORE: NQ E ~ 579600 N ~ 5375350 RL: ~ 530

DRILLER: STACPOOLE DATE DRILLED: 29/5/86 - 2/6/86

FORM/ TEAM	SAMPLE No.	TD (m)	THICK (m)	GEOLOGICAL DESCRIPTION	
		24.30	24.30	Dolerite Scree - Dolerite & Clay, open holed	
		24.50	0.20	Weathered Carbonaceous Material - Coal? open holed	
		24.85	0.35	Mudstone - open holed	
		25.10	0.25	Mudstone - grey, massive, 60 degree joint	
		25.11	0.01	Coal - dull	
		25.16	0.05	Carbonaceous Mudstone	
		28.10	2.94	Mudstone - grey, carbonaceous threads throughout, fossiliferous, high angle slickensides	
		28.20	0.10	Mudstone & Carbonaceous Mudstone interbedded	
		28.27	0.07	Mudstone - grey, massive	
		28.53	0.26	Mudstone & Carbonaceous Mudstone interbedded (70/30) - Sub- horizontally bedded, becoming more carbonaceous to base	
		28.63	0.10	Mudstone & Coal interbedded (50/50) - irregularly bedded	
		28.99	0.36	Mudstone - grey, carbonaceous threads throughout, irregular	
MN	1	ME16	29.25	0.26	Coal - dull, clay pellets at top
MN	1	ME16	29.26	0.01	Coal - bright
MN	1	ME16	29.40	0.14	Coal - banded dull
MN	1	ME16	29.41	0.01	Coal - bright
		29.71	0.30	Mudstone - grey, numerous carbonaceous threads throughout, irregularly bedded	
		30.41	0.70	Mudstone - grey, occasional carbonaceous thread, silty to base	
		31.55	1.14	Sandstone - light grey, fine grained, lithic, silty in places, irregularly bedded, minor 1cm fault	
		31.90	0.35	Sandstone - light grey, medium to coarse grained, lithic, erosional lower contact	
		32.22	0.32	Sandstone - light grey, fine grained, silty in places, irregular bedding	
		32.23	0.01	Coal - dull	
		32.25	0.02	Sandstone & Coal	

Signed

Geologist.

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LITHOLOGICAL BORELOG

PROJECT: MERRYWOOD CLIENT: AVOCA TRANSPORT PAGE: 2

HOLE No. AT 6 CORE: E N RL:

DRILLER: DATE DRILLED:

FORM/ TEAM	SAMPLE No.	TO (m)	THICK (m)	GEOLOGICAL DESCRIPTION	
		32.46	0.21	Sandstone - light grey, fine grained, lithic, carbonaceous threads throughout	
		32.57	0.11	Siltstone - mid grey, fine sandy phases throughout	
		34.27	1.70	Sandstone - light grey, fine grained, lithic, occasional thin silty phase, cross bedded in places, erosional lower contact	
MO	2	ME13	34.34	0.07	Coal - banded dull
MO	2	ME13	34.40	0.06	Coal - dull, clay pellets throughout
MO	2	ME13	34.41	0.01	Shaly coal
MO	2	ME13	34.54	0.13	Coal - dull with minor bright bands, clay pellets throughout, carbonate coated near vertical cleat
MO	2	ME13	34.56	0.02	Claystone - brown
MO	2	ME13	34.66	0.10	Shaly coal
MO	2	ME13	34.68	0.02	Mudstone - carbonaceous
MO	2	ME13	34.69	0.01	Sandstone - brown, coarse grained, erosional lower contact
MO	2	ME13	34.71	0.02	Coal - dull with minor bright bands Penny band - claystone
MO	2	ME13	34.72	0.01	Coal - dull
MO	2	ME13	34.74	0.02	Carbonaceous Mudstone
MO	2	ME13	34.78	0.04	Coal - dull, carbonate coated fractures
MO	2	ME13	34.99	0.21	Coal - dull with minor bright bands, carbonate coated fractures
MO	2	ME13	35.04	0.05	Carbonaceous Mudstone
		35.51	0.47	Mudstone - mid grey, fossiliferous	
MO	3	ME14	35.53	0.02	Carbonaceous Mudstone
MO	3	ME14	35.83	0.30	Coal - dull, clay pellets throughout,
MO	3	ME14	36.37	0.54	Coal - dull
MO	3	ME14	36.39	0.02	Claystone - brown, carbonaceous
MO	3	ME14	36.41	0.02	Coal - dull Penny Band - Mudstone

Signed

Geologist.

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D.NELSON & ASSOCIATES PTY LTD
Mining & Geological ConsultantsLITHOLOGICAL BORELOG

PROJECT: MERRYWOOD CLIENT: AVOCA TRANSPORT PAGE: 3

HOLE No. AT 6 CORE: NQ E N RL:

DRILLER: DATE DRILLED:

FORM/ TEAM	SAMPLE No.	TO (m)	THICK (m)	GEOLOGICAL DESCRIPTION	
MO	3	ME14	36.77	0.36	Coal - dull
MO	3	ME14	36.78	0.01	Mudstone & Coal
MO	3	ME14	36.80	0.02	Coal - dull
MO	3	ME15	36.83	0.03	Mudstone - grey, numerous coaly threads
MO	3	ME15	36.85	0.02	Shaly coal - pyritic
MO	3	ME15	37.43	0.58	Coal - dull, carbonate infilled fractures throughout
MO	3	ME15	37.46	0.03	Mudstone - carbonaceous
MO	3	ME15	37.48	0.02	Coal - banded
MO	3	ME15	37.53	0.05	Coal - dull
MO	3	ME15	37.69	0.16	Coal - banded
MO	3	ME15	37.78	0.09	Coal - dull
MO	3	ME15	37.82	0.04	Coal - banded
			37.85	0.03	Carbonaceous Mudstone.
			37.93	0.08	Sandstone - light brown; fine grained, silty at top.
			37.95	0.02	Siltstone - mid grey
			38.01	0.06	Sandstone - light brown; fine grained
			39.78	1.77	Mudstone - dark grey; generally massive; carbonaceous in parts; silty at base
			39.93	0.15	Sandstone - light grey; fine grained, cross bedded
			40.60	0.67	Sandstone - light grey, medium grained, lithic, massive, erosional lower contact
			40.62	0.02	Sandstone - mid grey, fine grained, cross bedded, abrupt lower contact
			42.00	1.38	Sandstone - light grey, medium grained, lithic, massive
					T.D.

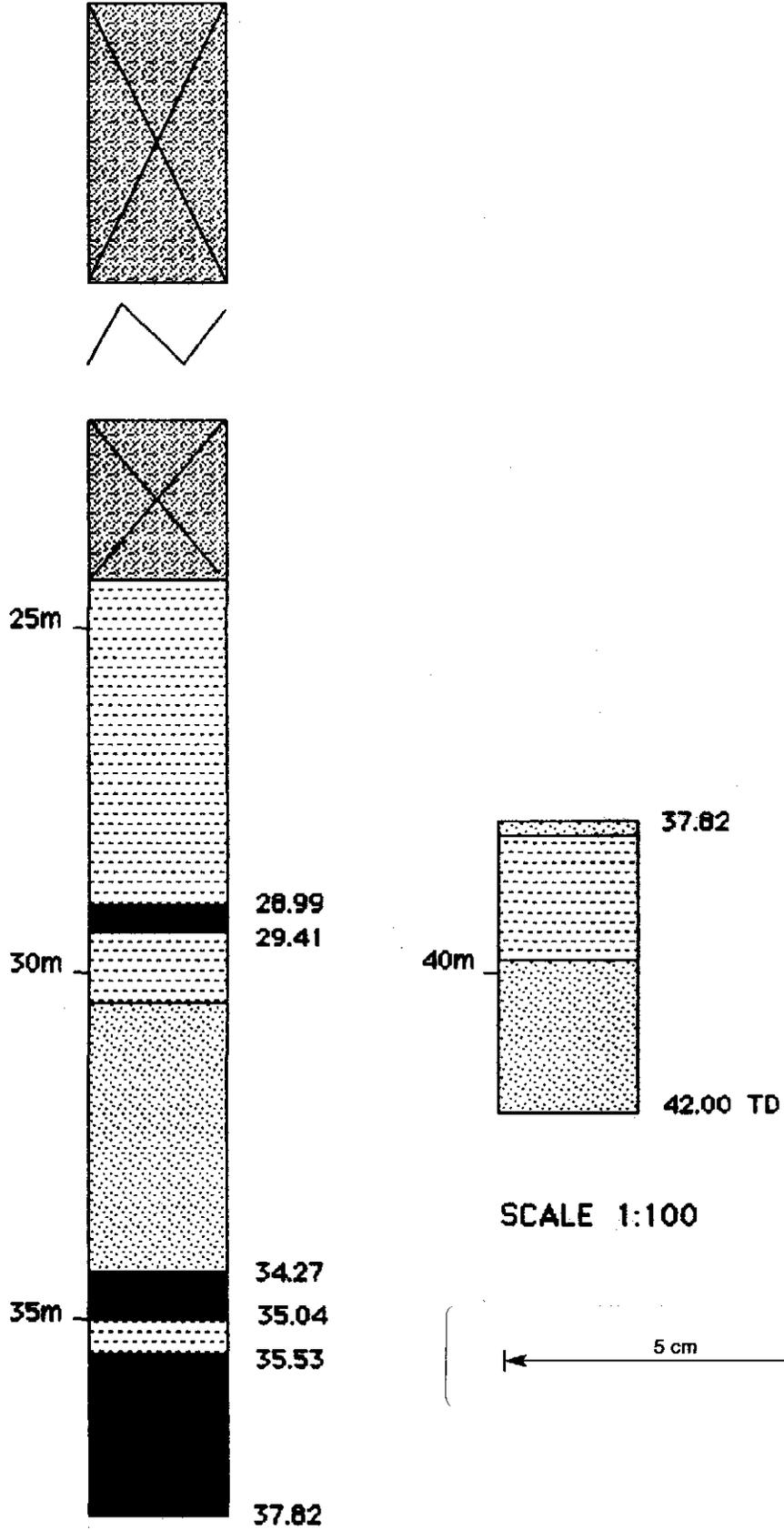
Signed

Geologist.

026

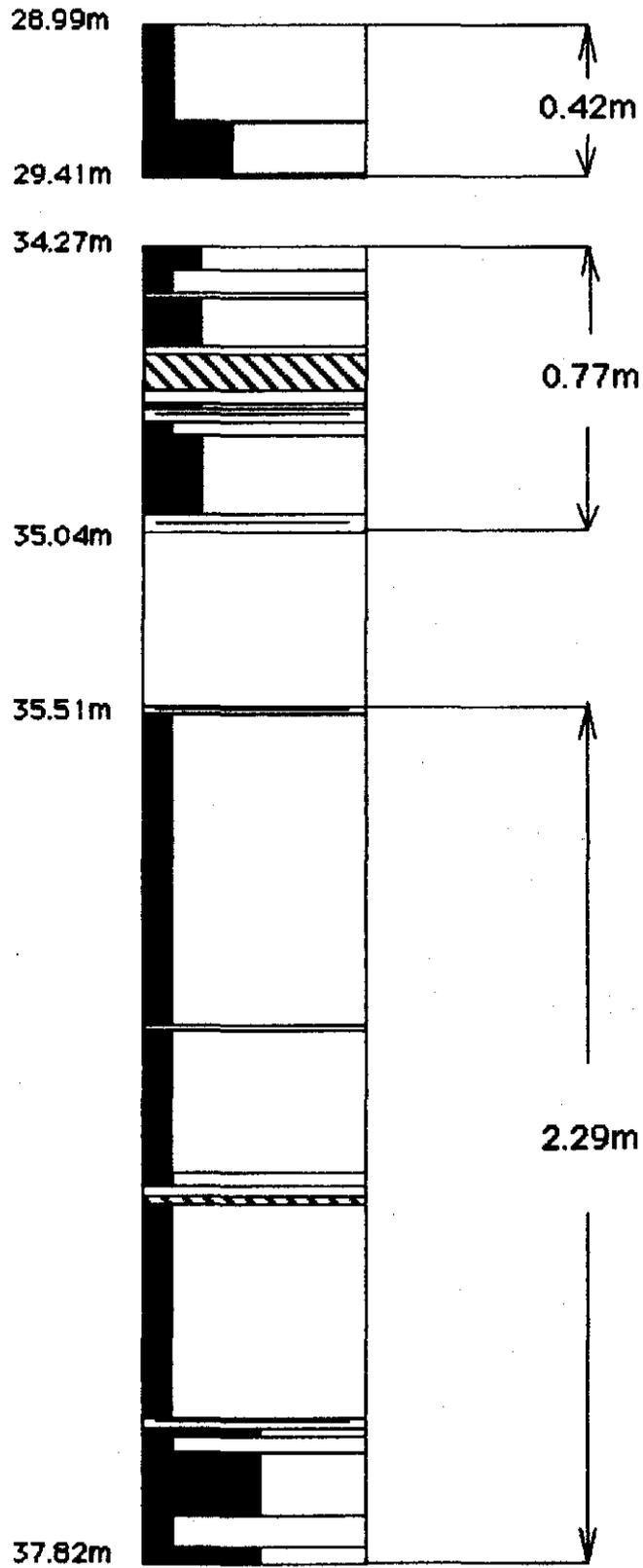
941028

MERRYWOOD DRILL HOLE AT6

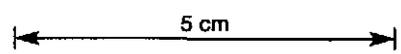


027

MERRYWOOD AT 6
DETAILED COAL LOG



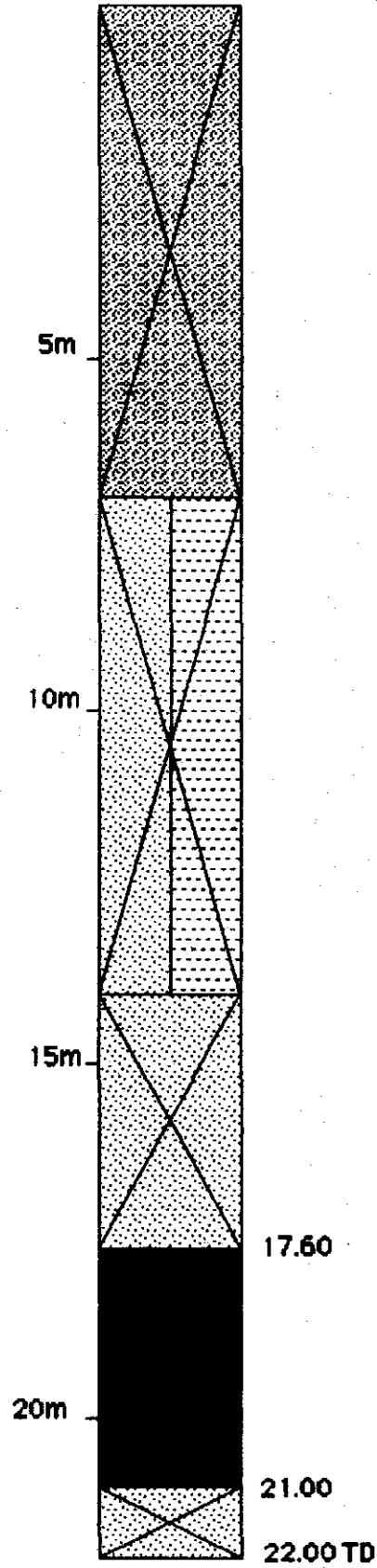
SCALE 1:20



029

941031

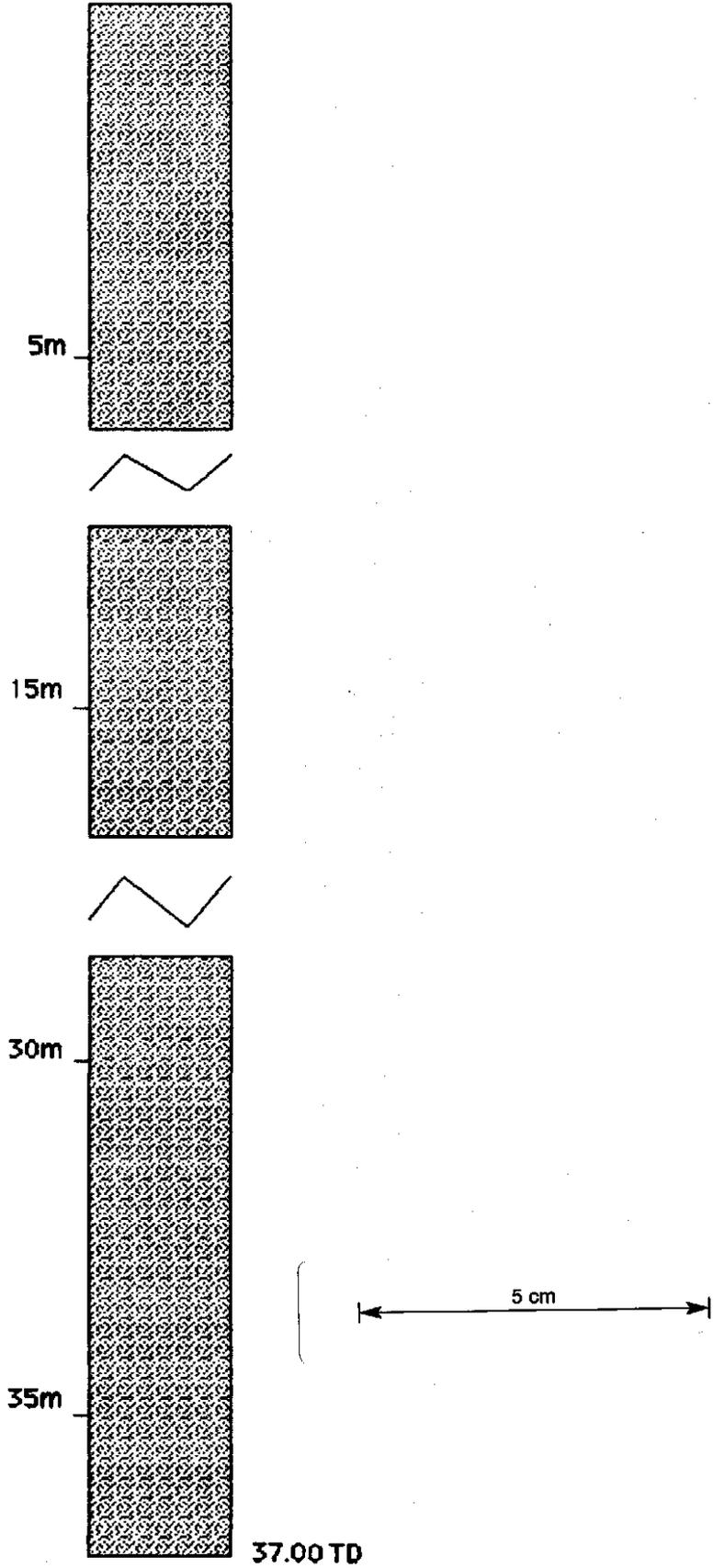
MERRYWOOD DRILL HOLE AT 7 (OPEN HOLE)



031

941033

MERRYWOOD DRILL HOLE AT 8



SCALE 1:100