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MEMORANDUM

FROM Area Planning Branch, Glebe House, Fenton.

Our Ref. AL/BB.

TO P.Smallman, Esq., Agent/Manager, Chatterley Whitfield.

Your Ref. _____

Subject Chatterley Whitfield Colliery
Encounter with water in the Middle Pit - Proving borehole to Moss Seam.

Date 24th May, 1961.

Please find enclosed a copy of the report as forwarded to Mr. Hewitt on 9th May, 1961.

Additional copies have been forwarded to Messrs. Scurfield, Archer and Barnsley.

A Lemming.

No.1 Group Planning Engineer.

CW/5/24

Encl.

G.E.Hewitt, Esq., Area Planning Engineer (North)

9th May, 1961.

Chatterley-Whitfield Colliery.
Encounter ~~Inrush of~~ Water from the Moss Seam proving borehole on No.1 North Yard Main Level in the Middle Pit.

Following the ~~inrush of~~ encounter with water from the Moss proving borehole on 19th May, 1961, I have attempted to correlate the known facts regarding the presence of water associated with the Yard Seam in the Middle Pit area.

The relevent facts of which I am aware are as follows :-

Reference Plan Nos.1 and 2.

1. The Yard seam was extensively worked from the outcrop in the Chatterley-Whitfield Colliery 'take' pre-1870.

2. The first development of the Yard Seam occurred at Chatterley 1870/80 from and above the 10,260' crut from the Engine Pit. These workings made definite contact with the pre-1870 workings from the outcrop over a considerable area, and linked up with Outclough and New Shaft Collieries.

3. The 10,260 crut from the Engine Pit is at present draining water from the old Yard workings, and in all probability has been draining water from this area ever since the working of the seam was undertaken in 1870/80.

4. The second development of the Yard Seam from the Colliery took place in 1915-1930 from and above a rising 1 in 14/16 crut from the Middle Pit Bottom contacting the Yard Seam at 9972'. This crut is known at the colliery as the 'Bellringer Old Crut', no travel inbye of the Bellringer Seam being possible. The return crut for this development, contacting the Yard seam approximately 130 feet higher in the seam than the intake crut, is also impassable inbye of the Bellringer Seam. The return crut at the Bellringer contact is wet, and an appreciable make of water is continuously being drained on the Bellringer Old Crut from the old Yard Goaf (9972') worked in 1915-1930.

   From the old working plans it is apparent that this second development of the Yard Seam took place to the rise and approached to approximately 140 yards from the deepside of the 1870/80 goaf worked from the 10,260' Crut.

5. In the early life of the second development a crut was driven from the old Yard Main Level at 9982' to prove the Moss Seam. History related that this crut met with a considerable amount of water during the drivage. Some confirmation of this appears in the plotting, from old spot levels of a section along the line of this crut. It appears that the crut was driven approximately level for 75 yards, followed by a rise of 1 in 7 for 55 yards, flattening to a rise of 1 in [illegible] for 90 yards.

6. The third, and present development of the Yard Seam at the Colliery began in 1954. A rising 1 in 47.6 crut from the Bellringer forms the return, contacting the Yard seam at 9890'. This crut is very wet, water continuously dripping from the roof. A rising 1 in 70 Crut from the Bellringer forms the intake, contacting the Yard Seam at 9519'. No evidence of water is apparent on this intake crut. The extension of the intake crut was undertaken, rising 1 in 1.5 to prove the Moss Seam. No water was encountered.

   The first South-going face in the Yard Seam (No.2 South) was, for all practical purposes, dry.

The first North-going face (No.1 North) finished in 1956, having only advanced approximately 40 yards, before encountering extensive washout conditions. The face conditions were damp, but not wet.

The second North-going face (No.1 North) commenced in 1957 and finished in April 1961 due, once again, to extensive washout conditions.

7. From the above mentioned No.1 North Yard, an exploratory borehole (Borehole X) was started in April 1961, to prove the Moss Seam. At a height of approximately 108 feet above the floor of the Yard Main Level, water was encountered on 19th April, 1961 in considerable quantity (approximately 100 gallons per minute) and pressure (200 lbs. per sq. inch rising to 225 lbs. per sq. inch). This pressure gives an apparent 'head' of approximately 500 feet, the level of the head being at or about 10260'. (refer item 2).

8. The cores recovered from the borehole were inspected by the Area Geologist. His report states that the borehole encountered the water at or about the base of a fine grained sandstone, following drilling through a coarser grained siltstone. "Neither the sandstone nor the siltstone could hold any large quantity of water within the rock itself, but the cores give evidence of natural fissures. If these fissures are of any size they could permit the rapid passage of large quantities of water. The cores show that the boring had not entered old goaf and that it is highly unlikely that it has struck some old crut. The fissures are probably in the nature of joints in the sandstone and siltstone, there is no evidence that the boring had struck any faulting greater than a foot or two in throw. A sample of the water was passed to the Area Chief Scientist for analysis, and he reports that it is typical Middle Pit water of the type believed to percolate from the surface, it is unlike water encountered in old workings. I consider that this boring has struck a fissured sandstone, which fissures provide an easy passage for waters moving down the dip from the outcrop. If these fissures are of wide extent they may form a danger to Chatterley 'Yard' coal working, especially in the vicinity of faults, ..."

9. The borehole was started approximately 13 months after the No.1 North Yard face had worked past that point.

10. Associated workings in the Hams Seam were undertaken in conjunction with the first and second developments of the Yard Seam (from 10260' and 9972'). It is extremely likely that the old workings in the Hams as well as those in the Yard Seam contain an appreciable quantity of water.

11. Cruts in the Hesketh Pit passing through identical strata to the above at a level of approximately 8700' show no indication of water.

12. The outcrop of the fissured sandstone passes to the North of the Colliery through a stream and associated sandy wet ground in a faulted zone; and to the South of the Colliery through another stream and marshy ground in the area of the outcrop of the Chell Heath Fault.

<u>Observations on the above mentioned facts</u>:

13. That the water is coming from the surface, an abundant and continuous supply being encountered at the junction of the sandstone outcrop with streams in wet ground and faulted zones. Culverting of these streams may prove highly beneficial.

14. That water is draining through the strata in the region of the top of a coarse-grained siltstone and the base of a fine grained sandstone, situated approximately 108 feet vertically above the Yard Seam, as encountered in the proving borehole to the Moss.

15. That, from the Area Geologist's Report, the Sandstone itself does not hold any large quantity of water, but that the presence of fissures in the sandstone, if of any size, could permit the rapid passage of large quantities of water.

16. That the fissures in the sandstone are not 'natural' fissures, but fissures induced by strata movement and subsidence caused directly by the working of the Yard Seam. Another likely idea is that bed-separation has occurred at the base of the sandstone forming water containing cavities. Mr.Barnsley considers that the former is unlikely due to the absence of fissures in the strata between the sandstone and the Yard seam, but that the latter is the more likely solution. Whichever, if either, of these ideas is proved to be correct, the suggestion remains that <u>water does not travel through the base of the sandstone unless the Yard seam has been worked beneath</u>. This could explain why water is encountered in this strata in one vicinity, but not in another (refer items 6 and 11).

17. Following the above mentioned idea to its conclusion, I would suggest that no water of appreciable quantity will be found in this strata providing that the Yard Seam has not been worked beneath; and that under normal conditions no water would be found above a working face in the Yard Seam. Allowing for a period of time, however, the water would begin to move along the panel, in the sandstone above and behind the working face. This time-delay, if correct, could be proved by a simple borehole pattern.

18. <u>No.1 South Yard Panel</u>. This panel may well be the first panel in the Yard seam at Chatterley to be worked between two panels of goaf. I suggest that the top rise side goaf may have affected the sandstone above, and that a considerable water pressure may be in existance. The goaf lying to the deppside may have caused the overlying sandstone to become receptive for the holding of water in large quantities, but until the No.1 South panel has bridged the apparent gap between the two goaf areas and allowed the water to drain through, no water may be encountered.

A further complication to the working of this panel may be experienced in the close proximity of the old proving crut to the Moss, which passes approximately 75 feet above the top level and overlies the panel. Considerable water pressures may be in evidence.

A.Lemming.

<u>No.1 Group Planning Engineer</u>.

PLAN No. 2

CHATTERLEY WHITFIELD COLLIERY.

MIDDLE SHAFT

ENGINE SHAFT

WINSTANLEY SHAFT

No. 1 North Yard

1957

1930

1877

10,260' Crut

1 in 120

1 in 16

Proving Borehole from Yard to Moss encountering water – approx. 870 Yards inbye from Yard Main Dip.

Bellringer

Bellringer

OLD GOAF 1876

Washout

1956

No. 2 North Yard

Bellringer Main Dip.

9890' Yard Return Crut

1 in 47·6

Yard Main Crut

1 in 70

1 in 3·4

1 in 1·5

Yard Main Dip

April 1961

1 in 14

9972

A

9982'

NEW SHAFT

No. 1 South Yard

1917

10,037

C. 1'-9"

C. 2'-0"

10,003

C. 6"

9980

C. 7"

Old Crut to Moss

1880

9987'

9992'

9700

9600

Full Dip 1 in 3·4

A

1959

CHELL HEATH FAULT

9996'

1919

9993'

3/7

3/-

4/6

2/-

3/-

11/-

4/-

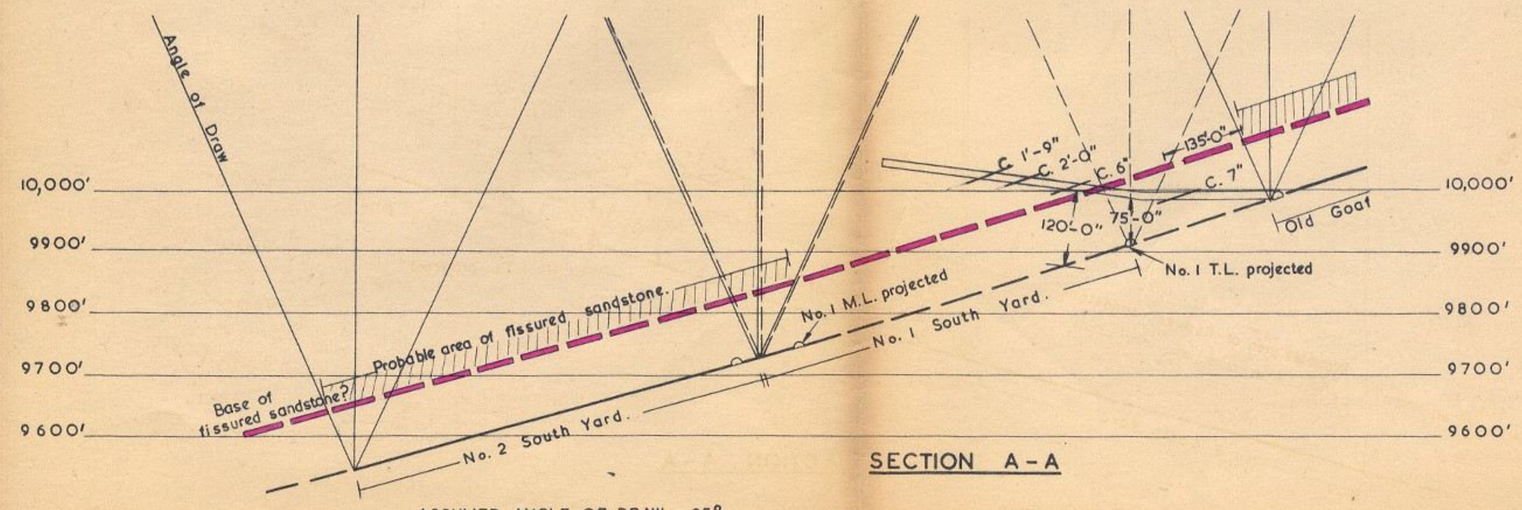
1/6

5/-

2/-

No. 2 South Yard

April 1961



SECTION A – A

ASSUMED ANGLE OF DRAW = 25°

NATIONAL COAL BOARD

WEST MIDLANDS DIVISION No. 1 NORTH STAFFS: AREA

CHATTERLEY WHITFIELD COLLIERY

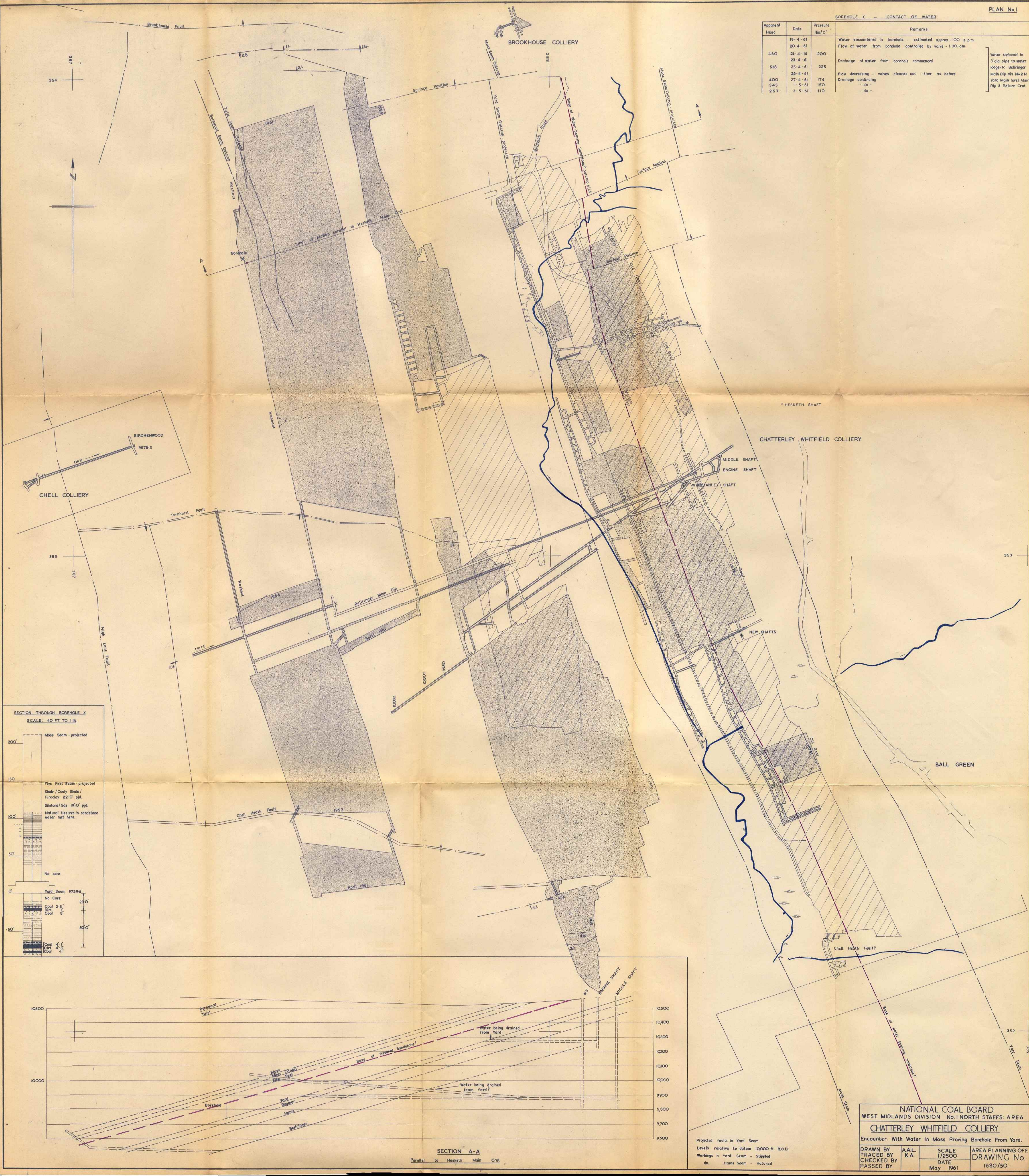
Encounter with Water in Moss Proving Borehole from Yard.

DRAWN BY TRACED BY CHECKED BY PASSED BY	A.A.L. W.E.	SCALE 1/2500 DATE May 1961	AREA PLANNING OFF DRAWING No. 1681/50

PLAN No.1

BOREHOLE X — CONTACT OF WATER

Apparent Head	Date	Pressure lbs/□"	Remarks	
	19·4·61		Water encountered in borehole - . estimated approx - 100 g.p.m.	
	20·4·61		Flow of water from borehole controlled by valve - 1·30 am.	
460	21·4·61	200		Water siphoned in 3" dia. pipe to water lodge-to Bellringer Main Dip via No.2 N. Yard Main level, Main Dip & Return Crut.
	23·4·61		Drainage of water from borehole commenced	
518	25·4·61	225		
	26·4·61		Flow decreasing - valves cleaned out - flow as before	
400	27·4·61	174	Drainage continuing	
345	1·5·61	150	- do -	
253	3·5·61	110	- do -	



Projected faults in Yard Seam
Levels relative to datum 10,000 ft. B.O.D.
Workings in Yard Seam - Stippled
do. Hams Seam - Hatched

NATIONAL COAL BOARD
WEST MIDLANDS DIVISION No.1 NORTH STAFFS: AREA

CHATTERLEY WHITFIELD COLLIERY

Encounter With Water In Moss Proving Borehole From Yard.

DRAWN BY TRACED BY CHECKED BY PASSED BY	A.A.L. K.A.	SCALE 1/2500 DATE May 1961	AREA PLANNING OFF. DRAWING No. 1680/50