REPORT ON THE POSSIBLE METHODS OF DEALING WITH CHATTERLEY WHITFIELD WATER AFTER CLOSURE OF THE COLLIERY.

Synopsis:

This report has been prepared at the request of a meeting on 26th. April 1977., held to discuss the Wolstanton Pumping Scheme. The existing pumping system is outlined. The alternative methods of dealing with Whitfield water are examined together with the advantages and disadvantages of each alternative and the possible consequences to Wolstanton and Victoria Collieries.

1. Introduction:

Water is pumped from Chatterley Whitfield at a current rate (Dec. 1976) of some 160 million gallons per year. Due to the connection drivage between Chatterley Whitfield and Wolstanton in the Hardmine Seam, this water will have to be adequately dealt with, in order that Wolstanton can continue to work the Northern area in complete safety. The problem is complex and care must be exercised in dealing with the water to ensure maximum safety.

2. Present Pumping (Plan No.1.)

- 2. 1. Pumping is carried out at the present time from three shafts at three different levels. These are:
 - (a) Winstanley Shaft which pumps 53 million galls/year, 250 yards to the surface from the Middle Pit Region called Middle Pit Water.
 - (b) Institute horizon which pumps 22 million gallons/year 225 yards down the Hesketh Shaft via an inset, to Hesketh Lodge.
 - (c) Hesketh horizon which pumps an additional 85 million gallons/year collected from the Hesketh Crut region at 8700 level and the Bullhurst Crut at 7700 level.
- The 52 million gallons of Middle Pit water is made principally from workings near the various seam outcrops to the rise side of the shafts. Water also descends the disused Engine Shaft, which had been capped and has subsequently part collapsed. This water reaches the Winstanley lodge via a disused staple shaft. Nater is also pumped from the Holly Lane Back Dip but a proportion of this together with any overflow from winstanley lodge, flows past this pump into the Middle Pit Holly Lane workings. The water here presents a special problem and is discussed more fully in Para. 3.1.

Some water is also pumped from the Bellringer dip to winstanley lodge. This dip is open and travellable via Ten Feet Crut to the Hesketh Main Crut. A large proportion of this water, flows past the pumps and is dealt with at Hesketh Crut Level.

- Institute Pit Water is made principally from Banbury Seam from the rise side of the shafts and also from the Platt and Institute shafts. The whole of the make of this water is now pumped through an inset in the Hesketh Shaft and down the shaft to the Hesketh pit bottom lodge. From here it is pumped back to the surface.
- 2. 4. The Hesketh Lodge collects the Insitute Pit water plus water which is made at 8700 level from Hesketh Main and Banbury/Moss Cruts. This water originates from various seams and, at the present time, 10 pumps are utilised to dispose of the water.

Water from the deepest workings in the Banbury, Bullhurst and the recent Hardmine seams, is collected at the Bullhurst Crut lodge at 7700' level from whence it is pumped to the Hesketh lodge.

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3. Factors influencing future Action:

3. 1. The Middle Pit Holly Lane Workings are known to contain a large accumulation of water which has reached a point some 675 feet vertical, Plan No. L., above the Hesketh and Banbury/Moss Crut level. This water has given rise to some concern in the past and has been the subject of a number of reports and meetings. The problem arises because the Middle Pit Holly Lane Goaf has been connected to the Ban/Moss Crut at 8700 level by means of a lodge. This was driven in Holly Lane Seam to enable the Middle Pit Holly Lane water to be drained off. The water has never arrived here and yet is known to lie at least 675 feet above the lodge. Recovery operations were carried out in the Holly Lane Back Dip from Middle Pit region to find the water in 1974. Observation was made and it was discovered that the water level fluctuates. Currently no check on the level can be made because the roadway condition has deteriorated and it has also become gassed off above the last known highest water mark.

It is possible that if the water in these workings were to build up any higher it could appear suddenly at the Ban/Moss Crut lodge thus creating a danger at and below this level. To prevent any danger from this water it would be necessary to build a number of dams. The number required would depend upon the final course of action.

- 3. 2. The three pumping shafts are interconnected by open roadways such that the whole of the whitfield water make could eventually find its way to the Wolstanton Northern Area workings via the connection in Hardmine Seam.
- Some roadways namely the Holly Lane Back Dip, Bellringer Dip and Ten Feet Crut, the Ban/Moss Crut and No.1. South Hardmine level (which provides access to the Wolstanton connection) are rapidly deteriorating in condition. No.1.S. Hardmine is being repaired but the other roadways are impossible to repair and will continue to deteriorate rapidly until they eventually become impassable.
- 3. 4. A number of thin barriers exist in various seams at different levels, between Chatterley-whitfield workings and the neighbouring Victoria, Norton and Sneyd workings. These thin barriers are listed below:
 - (a) 40 yd. barrier with Victoria in Hams seam at 8500' Plan No.4.
 - (b) 13 yd. barrier with Victoria in Ten Feet seam at 9950' Plan No.6.
 - (c) Nil barrier with Norton in Ten Feet Seam at 9750' Plan No.6.
 (d) 18 yd. barrier with Norton in Holly Lane Seam at 9950' Plan No.8.
 - (e) 5 yd. barrier with Norton in Bullhurst Seam at 8850' Plan No.12.
 (f) 16 yd. barrier with Sneyd in Bullhurst Seam at 7800' Plan No.12.

These barriers could allow water to flow from Whitfield goaf, if it is allowed to fill, to the other collieries or from the other collieries to Whitfield goaf when they close in their turn.

collieries to Whitfield goaf when they close 4. Possible Methods of Dealing with Whitfield Water:

- 4. 1. The factors referred to in Par.3. influence the possible courses of action that can be taken to ensure that whitrield water is dealt with safely and effectively.
- 4. 2. The simplest method of dealing with the problem would be to continue pumping at whitfield with the existing pumping system exactly as it stands. This would involve keeping the three shafts open together with the necessary surface plant. The ventilation roadways including the wolstanton connection would have to remain open for a period of approx. 22 years.

The problems that would arise from adopting this method would be:

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- (a) Middle Pit Holly Lane Back Dip cannot now be travelled because of gas and poor roadway conditions. Therefore the level of the water in the goaf cannot be monitored and water could build up in Holly Lane seam to Middle Pit Bottom level. If this were to happen a serious situation might arise at the Ban/Moss Crut Level, whereby the water could break through at Holly Lane Lodge. It could also break through at the cruts and staple pit which were driven across the High Lane fault to give access to the deepside Holly Lane workings. From here it would find its way to Wolstanton via connections driven between Holly Lane and Hardmine. Protection against this possible danger would require seven dams to be built in roadways that are difficult of access and in poor condition.
- (b) The roadways referred to in para. 3.3. will continue to deteriorate and eventually render some pumping stations inaccessible.
- (c) It would be very costly in terms of manpower and facilities to retain the existing set up for 22 years.

An alternative to para.4.1. would be to rationalise the present pumping arrangements, see plan No.1. and reduce the number of open roadways by withdrawing the 4 pumps from the Bellringer dips. The water made at these pumps could flow down the dip and Ten Feet Crut to Hesketh Main Crut where it would flow outbye. 9 of the pumps on the Hesketh Main and Banbury/Moss Cruts would also be withdrawn and 3 dams constructed outbye of the Holly Lane Lodge referred to in para. 3.1. to provide protection from the Middle Pit Holly Lane water. Two pumps would be needed to remove the Bellringer Dip water and the Hesketh and Ban/Moss Crut water from behind the dams to prevent any build up of water in whitfield goaf. The pumping arrangements at Middle Pit level and Institute level would remain as they are.

It would be necessary to build a dam on the Wolstanton Connection to protect Wolstanton from the MIddle Pit Holly Lane water. Pipes through the dam would allow nuisance water from No.1 South Hardmine main level to flow to wolstanton thus keeping to a minimum the water level in Hardmine goaf, adjacent to Wolstanton.

Walls would have to be built across the access roads to No.1 South Hardmine to divert any water that may flow from the North Hardmine workings, outbye along the Holly Lane Crut. The existing pump in the South Banbury would be withdrawn and the goaf allowed to fill to Holly Lane Crut Level. This goaf would also act as a catchment for any water flowing outbye along Holly Lane Crut. The water would be kept at this level by pumping from the Banbury into the existing Bullhurst Crut Lodge and thence to Hesketh Pit Bottom as at present.

4. 3. 1. Advantages:

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(a) Hesketh Crut and Wolstanton would be protected from Middle Pit Holly Lane water.

(b) A number of roadways which are deteriorating would be eliminated.
(c) whitfield workings would remain largely in their present

condition although some extra waterlogged areas would be created. The thin barriers would therefore present no problems.

(d) The number of pumps in use would be reduced by 11 and would require less manpower.

4. 3. 2. Disadvantages:

(a) Three open shafts, three capped shafts and surface plant would have to be retained.

(b) It would be difficult to site one of the dams at Hesketh Back Crut as it involves a short drivage to gain access to the site. This dam would be needed to ensure maximum protection from Middle Pit Holly Lane.

The course of action outlined in para. 3 is currently being costed by Method Study.

4. 4. The final course of action to be considered is that of abandoning whitfield completely and withdrawing all the pumping facilities. To achieve this it would be necessary to construct a dam on the wolstanton connection, of sufficient dimension to contain the whole head of water to whitfield surface (1,000 yds.) In order to protect the thin barriers referred to in para.3.4. it would still be necessary to keep whitfield goaf free of water so far as is possible. This can be done by installing pipes through the dam and allowing the whole of the Whitfield make of water to flow through to wolstanton. These pipes would carry pressure guages to monitor the head of water behind the dam. A new pumping system would have to be set up at wolstanton to deal with this extra water.

4. 4. 1. Advantages:

(a) All the shafts at Whitfield could be filled in and the colliery abandoned.

(b) The dam on the Wolstanton Connection would protect Wolstanton Northern Area even if whitfield became completely waterlogged.

(c) The Middle Pit Holly Lane problem would be eliminated.

4. 4. 2. Diadvantages:

- (a) Whitfield goaf would have to be treated as though it were waterlogged in any approach by workings from Victoria and Wolstanton. Despite the monitoring of the head of water at the dam site, it is conceivable that circumstances could arise at some time in the future when water might be prevented from reaching the dam thus allowing Whitfield to fill with water, and the pressure remain apparently normal.
- (b) In the event of Whitfield goaf becoming waterlogged the thin barriers could allow water to pass through to Victoria, Norton and Sneyd. In the case of these latter two, the water would reach Wolstanton by other routes, and create further waterlogged goaves which are at present dry.

5. Conclusions:

It is apparent that difficulties will arise whichever course of action is adopted. The problem is complex and a great deal of care must be exercised in reaching any decision.

Because there is a possibility that whitfield workings could become completely waterlogged para. 4.4. no further connections should be made with whitfield goaf by drivage or borehole or any approach made other than at an agreed safe distance as this could add to the difficulties that already exist.

Some areas of goaf which are dry at present, will become waterlogged if the action referred to in paras.3.& 4. are adopted. These new waterlogged areas are shown on Flan No.s. 2 - 13.

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