Introduction

The Yorkshire Coalfield covers a large area (approx. 3000 km²) extending from the North Nottinghamshire Coalfield south of Sheffield in the south, to north of Leeds. Parts of the eastern extent of the coalfield are overlain by Permo-Triassic strata, which form part of the major drinking water aquifer. The western extent comprises areas where differing sections of the coalfield are exposed to the surface; it should also be noted that several of the Coal Measures sandstones in the area form minor aquifers (used for drinking water and commercial water supply).

The last report undertaken for the Coal Authority for the Yorkshire Coalfield was by IMC in 2000, for the mine water rebound and gas risk areas. However, this report was written with active working collieries in the area and with little or no data on some of the deeper sections of the mine water regime. Since this report there has been a good deal of information gained on the area, and various mining / pumping operations have ceased or are likely to stop in the near future.

Reasons for Study

A lot of the coalfield is undergoing mine water rebound and thus, is likely to cause future needs for preventative schemes. These will be required to both prevent contamination of aquifers used for potable supply and stop new outbreaks of mine water causing surface water pollution. The dates, timing and likely sites to control these scenarios is uncertain and complex, hence a study is required to assess these needs.
Brief description of requirements for the study

For this study, the Coal Authority requires the Consultant to prepare A single technical report to include all the main section of the Yorkshire Coalfield (areas 1 to 8 on Figure 1). As a minimum the report should address the following points:

- Assess the likelihood of risks to surface waters due to rising mine water, including potential timing and risk areas.
- Assess the likelihood of risks to aquifers from rising mine water, including potential timescale and areas at risk.
- The likelihood and potential for other significant risks (i.e. mine gas) due to rising mine water and any areas where these are likely to occur.
- Highlight any unknowns in the rising mine water areas, and other unknowns against mine water regimes and risks of rising mine water.
- Recommendations to address any of the unknowns highlighted above.
- Recommended strategy (or strategies) (with some approximation of lifetime (20 year) costs) for additional requirements for the Coal Authority to successfully manage the Coalfield and any associated risks. This should include possibility of borehole (water monitoring) requirements and any potential sites for mine water control (i.e. pumping; gravity discharge and/or treatment).
- Where possible any recommendations / actions required should be prioritised based on risk.
- Identify and give a brief assessment of potential benefits for any areas/sites where there is potential for opportunities to re-use the water, or use the mine water as a resource (i.e. co-treatment, ground source heat).

Specific Area Requirements

The study should include all of the mining blocks (including those not within the remit of the Coal Authority (i.e. those being mined)); however more detailed assessments should be focussed on to the following areas, and where possibly other significant risks due to rising mine water should be highlighted in the report:

- **Yorkshire Area 4&5 (Rotherham/Barnsley):** Although the northern/western extent (i.e. Strafford) appears to be largely recovered, the southern/eastern part of the block is not fully recovered and may interact with the adjacent (Maltby) area. This area also includes a number of UK Coal sites, some of which are in the process of being transferred to the Authority. Details of future mine water scenario will be required for this section of the coalfield; along with any recommendations / priorities for the UK Coal sites.
- **Yorkshire Area 3 (Maltby):** Since the previous reports the Authority has gathered additional data for the rising mine water in the area around Maltby (i.e. Kilnhurst/Thurcroft areas). In addition to this Maltby has been closed and abandoned, and no pumping will take place, although one shaft may be utilised in the future to extract mine gas. This part of the coalfield is part overlain by the Permian strata and drinking water aquifer, hence we require any
details of the rising mine water situation, likely timings and locations of potential risk areas and any future control measures.

- **Yorkshire Area 2 (Dearne Valley):** The Authority has received recent data and information, primarily via former gas extraction boreholes. These show the deep parts of this mining block are recovering, thus details of the mine water situation, future scenarios, timings and locations of risk areas and any future control measures will be required.

- **Yorkshire Areas 7 & 8 (Manor / Calder Valley / Allerton):** The Authority has very little mine water data within this mining block. However, it is believed to be recovering; hence we require details of future scenarios, timings and locations of risk areas, future control measures, and any other recommendations (i.e. rough areas for boreholes)

- **Yorkshire Area 6 (Caphouse / Woolley):** Recently there have been some minor changes to trends in the mine water levels between Woolley and Denby Grange. In addition to this the Hay Royds Colliery closed in 2012. The Authority require details on any current and future risks of additional water affecting the pumping at Caphouse & Woolley from either Hay Royds or any other connected mining areas (i.e. Park Mill / Coxley). We would also require any details on any current / possible future risks for the mining museum at Caphouse.

- **Yorkshire Area 1 (Kiveton Park / Steetley):** The Authority has very limited water data for the southernmost section of the Coalfield. We require details of any interactions this block has, or may have, with the adjoining mining blocks both in to Yorkshire and North Nottinghamshire. We would also like details of any timing for risks to occur, locations of risk areas and any recommendations or required measures.

To achieve the above points, the Authority expects the following activities to be undertaken, with the initial draft being completed before end of March 2015, although this date can be altered (i.e. time-scale extended), subject to prior approval by the Coal Authority.

- Review of historical reports (see bibliography) and published papers and documents.
- Review the monitoring data (electronic in Microsoft Excel format) currently held by the Authority; these data provide an update to the previous studies undertaken in the Yorkshire Coalfield. Currently the Authority has approx. 85 water level monitoring sites in the coalfield; there are also approx. 95 mine gas monitoring sites and approx. 20 monitored mine water discharges.
- The Authority holds mining plans and information for the coalfield; if the details in the available reports (see bibliography) is not adequate, then a brief overview may be undertaken of this information held at the Authority may be required to aid this study.
- Update any conceptual models based on the reviews of mining information and monitoring data.
- Although at this stage the Authority are not requiring a numerical model to be undertaken, we would like the current models (i.e. Burke & Younger, 2000) to be assessed, and also highlight any changes, alternative or recommendations for any further modelling requirements.
- Assess any risks and develop any mitigation strategies; these should be discussed with the Authority.
- Attend meetings including a start-up meeting, interim meeting, and a final meeting to present the work, meetings to be held at the Authority’s Mansfield office.
- Where and if required, there may be a need for limited sites visits to clarify key points; these visits would be a provisional item; hence must be agreed in advance with the Authority e.g. possibly at an interim telecom/meeting or start-up meeting. In addition to this the Authority will require a monthly update on the budget spend to date and the predicted future budget forecasts to the end of the study.
- Draft report to be submitted for review by the Authority, then a final copy (copyright to the Coal Authority) to be submitted. Note that both these reports are to be written in accordance with the Coal Authority’s terms and conditions set out in the framework contract.

Bibliography


Figure 1 - Map of Yorkshire Coalfield and Mining Block Area