

MINING BENEATH THE MAIN SOUTHERN RAIL LINE SUCCESSFULLY COMPLETED AT TAHMOOR

Background

The Main Southern Railway line passes directly over Tahmoor Colliery's coal mining lease areas between Tahmoor and Picton. Longwall mining of these leases results in mine subsidence, which presents a unique set of issues that must be competently managed as mining progresses under the railway. Researching and developing a method to maintain the safety and serviceability of rail operations, while mining beneath the railway, has been an important consideration for the mine over many years.

Tahmoor Colliery commenced developing options for mining beneath the Main Southern Railway in 2002. Longwall mining beneath rail lines has been successfully carried out for many years in Britain. In recent years in NSW, longwall mining has also been carried out by Teralba Colliery under the main northern rail line at Booragul, near Newcastle. However, the subsidence management methods utilised were labour intensive, and required intermittent disruption to rail services.

Tahmoor Colliery assembled an experienced team of railway, geotechnical, structural, mining, civil, electrical and subsidence engineers to develop and implement a modern subsidence management system. This system was to safely and efficiently allow mining to pass under the railway, while rail services were safely maintained without disruption.

Initially, longwall mining was carried out near to, but not directly beneath, the railway lines in the vicinity of Tahmoor Colliery, and the small subsidence effects were monitored and measured. Progressively over time, the final system utilising specialised expansion switches or joints in the track was developed, along with a comprehensive continuous rail monitoring and management system. Particular attention was also paid to civil structures, with the Thirlmere Way overbridge being replaced with a steel bridge deck, and the Myrtle Creek culvert substantially reinforced.

Planning

This initial work culminated in Tahmoor Colliery, in close cooperation with the Australian Rail Track Corporation, completing and installing a series of engineering designs and developing a comprehensive plan in October 2008 to manage mine subsidence from longwall mining passing directly under the Main Southern Rail line. The final plan was approved by both the government rail and mining regulators in March 2009 prior to the start of longwall mining beneath the railway. The plan essentially combined the use of expansion switches, automated electronic rail and structure monitoring, along with detailed daily checks and inspections. Although designed for all trains to operate at normal speeds, a 40 km/h speed restriction was agreed in this first instance as an additional precaution.

Result

Tahmoor Colliery's longwall 25 has now completed mining beneath the Main Southern Railway and the longwall is now over 350m north west of the railway line and moving further away. Mine subsidence has virtually finished within the rail corridor, with only very small residual movements now occurring. The overall outcome of both the mining and railway management has been very positive. The mining operation has progressed as planned, with subsidence movements occurring as predicted, and all management and monitoring systems performing as designed. In particular, there were no unexpected impacts of any significance on rail operations and the expansion switches easily managed the ground movement. The expansion switches, having completed their task, are now being progressively removed and will be relocated and re-installed at a later date as mining operations progress northward.

The outcome has been a great success for all stakeholders and Tahmoor Colliery would particularly like to acknowledge and thank everyone involved in this remarkable project.

