

# **Continuous Monitoring of Longwall Undermining - Blakefield South LW1**

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**KEY WORDS:** Interdisciplinary Approaches for the Design and Analysis of Deformation Measurements, Warning and Alert Systems, Monitoring Concepts for Static and Dynamic Deformations of Engineering and Geotechnical Structures, Applications in Geotechnical and Structural Engineering, Multi-Sensor Systems and Sensor-Networks, Innovative Concepts for Sensors and Methods, Automation of Monitoring Measurements and Interpretation

## **ABSTRACT:**

Lynton Surveys was appointed by Beltana Highwall Mining to install, commission and manage a suitable continuous subsidence monitoring system during the mining of Longwall 1 at Blakefield South, near Singleton, NSW, Australia. The longwall was extracted from the Blakefield Seam which is situated beneath the existing longwall workings in the Whybrow seam.

The objective of this work was to understand the rate and nature of the subsidence movements above different pillar and goaf interactions formed by the two longwall blocks, with particular application to the future undermining of Broke Road. The system incorporates multiple sensor types (TS30 precision total station and two GPS receivers), CORSnet-NSW GPS reference data, web-based technologies and custom hardware to form a complete system for collection of monitoring data from approximately 80 monitoring prisms above the goaf.

This project provided a number of lessons including: survey mark selection, maintaining total station verticality, correction for vertical and horizontal movement of the total station, refraction correction and integrating efficient GPS processing into monitoring line analysis.