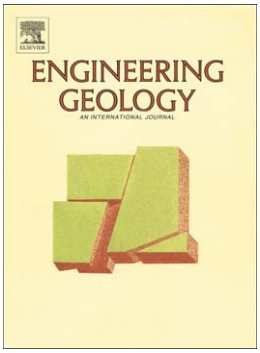

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Numerical Analysis of a Large Landslide Induced by Coal Mining Subsidence

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ABSTRACT

Mining induced subsidence is one of the challenging problems in geotechnical engineering. The surface topography of the ground over mining excavations plays a key role in the mechanism of subsidence. When a mining operation is performed beneath mountainous or hilly terrain, it may trigger landslides. This study, therefore, aims to analyse the impacts of underground mining on the stability of slopes by using numerical modelling. A coal mining induced landslide at Nattai North, Australia, is investigated as a typical case study. In this area, mining operations beneath the Sydney Basin escarpments initiated the largest contemporary landslide and mass movement known in Australia (Cunningham 1988). Discontinuous numerical modelling is employed to analyse the mechanisms of the ground movements leading to this landslide. The role of geological and geotechnical factors, such as rock mass characteristics, bedding, and joints, are discussed through the numerical modelling. The outcomes of the analyses reveal that mining induced stresses lead to the shear and compressive failure of weak strata at the escarpment base, particularly around its toe. The failure of the base materials as well