

## Principal Geotechnical Engineer

**Expertise** Harley gained his experience working at a variety of underground and open pit mining operations in Australia, Africa and Asia. He has provided onsite geotechnical support to a range of metalliferous and coal operations, from high stress and seismically active caving and stoping operations, through to large open pits. As well as his onsite experience, he has managed and delivered several major geotechnical design projects at scoping, feasibility and implementation levels.

**Education** Master of Engineering Science (Geotechnical Engineering), 2013  
University of New South Wales, Sydney, NSW, Australia  
Bachelor of Engineering (Civil), 2011  
Griffith University, Southport, QLD, Australia

**Professional Affiliations** Chartered Professional: Australasian Institute of Mining and Metallurgy

**Honors** BE 1<sup>st</sup> Class Honors (2011)  
Griffith University Award for Academic Excellence (2010)

## Professional Experience

2024 – Present	ITASCA Australia Pty Ltd, Perth, WA Principal Geotechnical Engineer
2018 – Present	Australian Centre for Geomechanics, Perth, WA PhD Candidate
2023 – 2024	BHP, Nickel West, Leinster, WA Lead Geotechnical Engineer (Analysis)
2021 – 2023	Mining One Consultants, Jakarta, Indonesia General Manager (Indonesia)
2017 – 2021	Mining One Consultants, Melbourne, VIC Senior Geotechnical Engineer
2012 – 2017	Mining One Consultants, Melbourne, VIC Geotechnical Engineer
2011 – 2012	Parsons Brinckerhoff, Perth, WA Graduate Geotechnical Engineer

## Project Experience

### Mining

Propagation analysis for the B11 block cave mine: Completed three-dimensional simulations for the initiation of a block cave mine using a coupled finite volume – gravity flow numerical model. The results were used to provide routine geotechnical recommendations for draw control, as well as helped to develop an optimised strategy for undercut and drawbell remediation.

Seismic analysis and hazard management for the Leinster Underground Mine: Completed seismic analyses at a block and sublevel cave. The analyses included reviewing source mechanisms to highlight trends in the evolution of seismicity, major event investigations, re-entry analysis, hazard assessment, review of critical structures, and data quality review.

Block and sublevel cave interpretation and tracking for the Leinster Underground Mine: Conducted cave interpretation and mass-balance assessments as part of airblast hazard management. This includes the design and management of cave monitoring systems, and data utilization for numerical model calibration.

Carmen Copper failure back analysis and remediation studies in Cebu, Philippines. This project involved the back analysis of a major failure that unfortunately resulted in multiple fatalities. The project involved the creation of geotechnical domains and stability analysis using FLAC3D, followed by a detailed remediation strategy and updated mine plan.

Underground and open pit mine feasibility studies for the Toka Tindung (Sulawesi, ID), Talawaan (Sulawesi, ID) and Four Eagle mines (VIC). These projects involved geotechnical investigations, data interpretation and analysis of several mine designs. The projects involved providing recommendations for the underground and open pit interactions. The Indonesian projects included the additional challenge of how extreme geothermal water inflows could be managed.

Phu Kham copper mine pre-feasibility, feasibility and life of mine studies in Laos. This project involved the rock mass characterisation and slope stability analysis of several cutbacks to a large open pit mine with slope heights greater than 600m. It included the detailed structural analysis, rock mass characterisation and block modelling of a complex deposit, followed by numerical analysis of design options.

Feasibility studies for the Tujuh Bukit mine (Java, ID), Polowijo mine (Java, ID), Way Linggo mine (Sumatra, ID), Cobalt Blue mine (VIC), Northparkes E31N mine (NSW), Hope Downs 1 North mine (WA), Baby Hope mine (WA), Marillana mine (WA), Brockman 2 Pit 8 mine (WA). These project were each unique and provided different geotechnical challenges due to the range of rock mass conditions. This range of conditions included topographically and hydrogeological issues typical for Indonesia, through to Pilbara iron ore projects and blocky hard rock mines in Australia.

Numerous feasibility and life of mine design studies and reviews for Indonesia greenfield and brownfield coal mines, including the HAI, BSEE, SBP, KJB, PBM, AGM, BRE and BMP coal mines in the Kalimantan and Sumatran coal basins.

Numerous analysis projects including shaft assessments for Costerfeild (VIC), waste dump failure investigation and remediation studies for the Bakan (Sulawesi, ID) and KJB (Kalimantan, ID) mines, infrastructure inspections for McArthur River mine (NT), mine closure studies for the Anglesea mine (VIC) and Rum Jungle mine (NT).

### Research

Currently undertaking a project with the Australian Centre for Geomechanics and the University of Western Australia, researching the reliability of numerical modelling in forecasting mining induced seismicity. The project involves quantifying the impact of aleatoric and epistemic uncertainty on model calibration, and establishing a methodology to calculate the spatio-temporal model performance.