

Improving mine development through engineering research

Innovative methods developed at the Australian Centre for Geomechanics for understanding the effects of explosive charges on underground rock will help make Western Australia's modern safety-conscious mining industry more productive and cost effective

This project, part of a major collaboration between the Minerals Research Institute of Western Australia (MRIWA), the Australian Centre for Geomechanics (ACG) and sponsor Agnico Eagle Mines sought to develop a new approach for predicting and measuring the effects of explosive charges used to develop underground mines.

Led by Professor Yves Potvin at the ACG, the project team used high-resolution measurements to evaluate how the performance of planned explosions varies in relation to geological features and nearby mining activity.

“Modern mining is driven by complex engineering and fine profit margins, where the performance of the explosive charges used to develop underground ore bodies can be a critical control on safe and profitable mine operations.” explained Professor Potvin.

“An explosion that excavates too much rock may dilute the valuable ore, or destabilise surrounding areas, while an explosion that excavates too little may need to be repeated, wasting time and resources.”

“By delivering a practical way of predicting and measuring this performance, we aim to allow engineers to plan underground mine development with greater accuracy and confidence.”

Tackling this problem from the ground up and incorporating cutting-edge computational practices, the ACG has developed a new approach specifically tailored to the underground mining environment.

Documented in MRIWA report 489 and supported by widely available software tools, this new methodology provides industry with a planning toolkit to make underground mining more efficient and cost effective.

In releasing the research report, MRIWA CEO Nicole Roocke said “MRIWA's support of this work by Professor Potvin and his team at the ACG is an example of Western Australia's leadership in practical applied research in mining innovation.”

“The real-world applications of this study will help make underground mining more productive and predictable.”

“By supporting this sort of applied research, the State Government of Western Australia is helping to address the everyday challenges of the mining sector and keep our industry safe and internationally competitive.”

Further information and a technical report describing this research can be located at <https://www.mriwa.wa.gov.au/research-projects/project-portfolio/probabilistic-stope-design/>

For more information on MRIWA's research program, contact Nicole Roocke, MRIWA on 08 6180 4343.

For more information of the specific research findings, contact Josephine Ruddle, Australian Centre for Geomechanics, Tel.: +61 8 6488 3300, email: josephine.ruddle@uwa.edu.au