International
Slope Stability in Mining
Conference

ACG AUSTRALIAN CENTRE FOR GEOMECHANICS

CSIRO | The University of Western Australia | Joint Venture

SSIM 2021

Proceedings of the Second International Slope Stability in Mining Conference

26–28 October 2021 | Perth, Australia

EDITOR Phil Dight

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Australian Centre for Geomechanics

The Australian Centre for Geomechanics (ACG) was formally established in 1992 as a University of Western Australia not-for-profit research centre in order to promote research excellence and continuing education in geomechanics, with particular emphasis on its application to the mineral and energy extraction sections of Australia's resources industry.

The Australian Centre for Geomechanics is an unincorporated Joint Venture involving:

- CSIRO Mineral Resources
- The University of Western Australia — Civil, Environmental and Mining Engineering

The ACG draws together staff knowledge, experiences and expertise from within the two groups forming the Centre and facilitates a multi-disciplinary approach to research and education in geomechanics. Research undertaken by the ACG attracts both national and global support and the outcomes of the projects are utilised to promote safer mining and environmental geomechanics practices, operating efficiencies and to meeting community expectations for sustainable mining practices.

With the guidance of strong industry representation on the Board of Management, and close collaboration with senior representatives of the mining industry, research, training and further education activities are tailored directly to the needs of industry. The ACG Board expects the Australian Centre for Geomechanics to be the focal point for industry on geomechanics issues and to address the needs of industry through a collaborative interdisciplinary approach.

Online Repository of Conference Proceedings

Launched in 2017, the ACG Online Repository of Conference Proceedings provides the global mining community with open access, peer-reviewed conference papers that may assist industry practitioners to maintain and develop their skills, knowledge and capabilities. This highly interactive and searchable repository provides importable citation information in various forms, links to the paper authors' profiles on ResearchGate and LinkedIn, as well as the ability to share papers on social media.

With the recent addition of the SSIM 2021 papers, more than 350 open pit conference papers are now freely available.

Setting a high standard for technology transfer and accessibility, this valuable online resource will continue to develop and grow with future conferences. In October 2021, the Repository achieved a significant milestone with over 585,000 paper downloads; including a remarkable 115,000 downloads of Open Pit conference papers.

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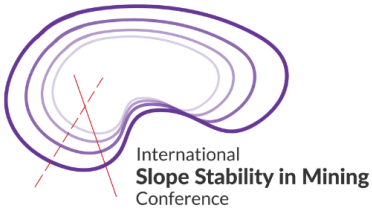

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Preface

This conference is being held during the COVID-19 pandemic which has resulted in lockdowns, loss of life and a significant impact on many people's lives. Interestingly, the mining industry has largely been without incident, which is a credit to our workforce.

This conference originated from the ACG First Asia Pacific Slope Stability in Mining Conference (APSSIM) held in 2016. With demand it has now evolved into a series of International Slope Stability in Mining Conferences (SSIM), with emphasis on specific issues associated with our industry with respect to safety, risk management, detailed monitoring, groundwater issues, and remediation.

Foremost is the safety of personnel. Our industry upholds the highest standards to minimise injury from instability in pit walls and access to the mines. However, we are also fully cognisant of the fact we are dealing with natural materials often affected by alteration resulting from the mineralising process, local tectonics, and weathering. We cannot relocate the mine if these aspects are unfavourable, so we need to recognise the challenges and deal with the risks involved.

Why monitoring? It is an essential key along with observational techniques to manage project performance – if you cannot measure it you cannot manage it. Indeed, a significant issue in our design process is that deformation is seldom used to evaluate a design, yet this is the only measure we have during development and closure that we can use to infer stability. This is a major challenge for our engineers and geologists.

Groundwater and surface water affect stability and impose constraints on blasting. The difficulty experienced when removing water has significant implications on successful mining.

Mine closure is something that is left to last. It raises issues of what is behind the wall, in terms of geology/structure, which is often not explored in detail before or during mining, where our focus is on what we can see. More attention is needed in this area. We will be faced with legacy issues (blast damage, weathering, continuing deformation, etc.) long after the mine has ceased operation, but long-term monitoring will be necessary after closure.

This conference addresses many of these issues. The majority of keynote lectures were selected from papers submitted and deemed noteworthy by the committee and reviewers.

A conference such as this could not have taken place without the support of the Principal Sponsor Reutech Mining, and our sponsors and exhibitors. Thank you to all sponsors for your involvement in and your support of the conference series.

The proceedings are freely available from the ACG Online Repository of Conference Proceedings, courtesy of Open Access Sponsor SRK Consulting. The papers can be accessed from papers.acg.uwa.edu.au/ssim2021

All the people supporting this conference are gratefully acknowledged for their time and efforts.

Professor Phil Dight, Australian Centre for Geomechanics, Australia
Editor and Conference Chair

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