

A methodology for assessing stope design modifying factors for the Olympic Dam Mine

D Cumming-Potvin¹, S Tierney², Y Potvin³, I Thin⁴ and D Grant⁵

1. Research Associate, Australian Centre for Geomechanics - University of Western Australia, Perth WA 6009. MAusIMM Email: daniel.cumming-potvin@uwa.edu.au
2. PhD Candidate, Australian Centre for Geomechanics - University of Western Australia, Perth WA 6009. Email: stuart.tierney@uwa.edu.au
3. Professor, Australian Centre for Geomechanics - University of Western Australia, Perth WA 6009. MAusIMM Email: yves.potvin@uwa.edu.au
4. Principal Geotechnical Engineer, KSCA Geomechanics, Perth WA 6009. MAusIMM Email: iain.thin@kscageomechanics.com.au
5. Principal Strategic Planning, BHP, Adelaide SA 5000. FAusIMM Email: Don.Grant@bhp.com

ABSTRACT

The preliminary modifying factors for future stope design in the Southern Mine Area of Olympic Dam consisted of only a single, arbitrary value of Equivalent Linear Overbreak/Sloughing (ELOS). In order to improve this, a study was conducted which developed a more comprehensive methodology for assigning ELOS, Equivalent Linear Lost Ore (ELLO) and Equivalent Linear Fill Overbreak (ELFO) to individual stope faces based on geotechnical and mining parameters.

The approach used was to look at the simple cases, which were classed as vertical stope walls in good ground (RQD 80-100%), divided into wall orientations (North, South, East, West). The stope walls were also split based on the blasting practice used (toeing, parallel or a combination of the two). The expected ELOS and ELLO from these 'base cases' are then modified by parameters which have historically been found to affect stope performance (Hydraulic Radius and Q'). The size of the effect found in the historical data determines the ELOS / ELLO applied.

The methodology was summarised in an easy to use flow chart and was applied to all of the proposed stope shapes for the Southern Mine Area and summarised per mining block. This allowed each iteration of the mine plan to be assessed in terms of overbreak (both rock and vertical fill exposures) and underbreak.