

“How green was my biomining?”; a personal critique of the of the limitations and untapped potential of applying bioprocessing techniques for metal extraction and recovery

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The modern era of biomining began in the 1960s, with low-tech “dump leaching” used to recover copper from what had been considered to be waste (run-of-mine) rock. “Biomining” has since evolved into a variety of more complex engineered practices, including bioheap leaching and stirred tank operations. Protagonists, and particularly researchers justifying support from industry and research councils, have often promulgated the notion that bio-processing is a much “greener” method of winning metals than conventional (e.g. pyrometallurgy and pressure leaching) approaches. Such claims, however, do not always stand up to close scrutiny. This presentation will give a critical overview of the environmental impact of biotechnologies in mineral processing and metal recovery, identifying areas where existing approaches have (and do not have) significant green credentials, and will also highlight where new developments, currently at the laboratory or pilot-scale stage of development, could have major environmental impact in future years.