

Natural Leachability of Critical Metals - Investigating AMD and Metal Recovery at Normanby Mine

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Mining is the largest export industry in Australia, and concurrently the most polluting. There are over 50,000 mine waste sites around the country, many of which are poorly managed or discarded, and present the risk of generating acid and metalliferous drainage (AMD). The environmental hazards of these waste piles further include leaching of heavy metals, acidifying surface and groundwater, pollution of soil and sediment and potential toxicity to plant or aquatic life dependent on the area. Reprocessing this waste can reduce AMD production and provide a source of critical minerals. This study aims to determine the AMD potential of the abandoned Normanby mine in southeast Queensland and evaluate the recovery potential of critical metals from the site. A geochemical analysis of the site found multiple enriched metalloids including Ag, As, Bi, Cu and Sb at concentrations 10 times the average crustal abundance, all of which are listed as critical minerals for Australia. This investigation will utilise novel methods such as a 100-day accelerated kinetic leach column test for six waste rock samples to determine acid generating potential and metal enrichment and contribute to a protocol for the characterisation and management of legacy mine waste across Australia.