

PhD scholarships

Improved Prediction, Remediation and Closure of Acid and Neutral Metalliferous Drainage (AMD/NMD) Sites by Examination of Mine Waste Behaviour at the Meso-scale

Acid and neutral metalliferous drainage (AMD/NMD) remains a vexed and costly environmental management challenge for the mining industry. Estimates of AMD and NMD in Australia are estimated for operating and abandoned mine sites to be in the order of A\$40k to \$100k per ha respectively, or \$120 million and \$650 million p.a. nationwide. Equivalent estimates internationally are greater, with combined total liability costs for remediating AMD/NMD-impacted sites in the US and Canada running into the tens of billions of dollars. It is essential that long-term stability of these wastes is maintained, via sustainable low-cost methods, to prevent the release of metals, metalloids and acid into the environment; as well as allowing for site repurposing and economic transitions.

The overall objective of this project is to develop improved prediction and remediation of AMD and NMD from mine wastes. The Cooperative Research Centre for Transformations in Mining Economies (<https://crctime.com.au/>) provides the framework by which to do this by enabling the investigation of mine wastes from across a range of climatic zones and evolutionary stages of weathering and closure planning.

Previously, widespread failings in standard international AMD/NMD assessment methods on scale-up have been identified and recognised in Australia and internationally. There are potential improvements, utilising both mineralogy and microbiology, for assessment and remediation of the undersaturated mine waste zone through examination of the behaviour of mine wastes at a range of scales, with emphasis on the mesoscale at greater than one tonne.

The successful applicant will be part of a large international multidisciplinary team and will have the opportunity to interact extensively with our industry partners. Industry partner sites of interest are international in scope across Australia, Mongolia, Peru, Guinea, USA. This project will provide the necessary experiences, on completion of PhD studies, for graduating students to choose career pathways as diversified as research scientist or industry practitioners. A range of state-of-the-art facilities and equipment are available (eg. <https://www.flinders.edu.au/microscopy>).

Applicants should have an Honours degree or Bachelors degree with relevant experience in chemistry, chemical engineering, microbiology or mineralogy or a related field.

Stipend: Both full scholarships (\$29,000 p.a. tax free) and top up scholarships (\$10,000 p.a.) are available. Allowances are also available for relocation and thesis preparation. There will be opportunities to attend national and international conferences relevant to the research and also to visit sponsor industries mine sites.

Application Deadline: September 8th, 2022

Application Submission and Contact: Please send your CV, academic transcript and research experience statement to Professor Sarah Harmer (+61 8 8201 5338, Sarah.Harmer@flinders.edu.au)