The development of a Queensland approach for field-scale trials of mine waste cover system designs

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# ABSTRACT

Impacts of AMD seepage from mine wastes are commonly observed. The properties of mine waste, availability of suitable cover system materials and climatic factors are unique on every site. Field-scale trials are often used to identify an appropriate cover system design.

To facilitate a consistent approach, we developed advice for the design and delivery of cover system trials. We sought to understand how companies have historically approached trials in Queensland and other jurisdictions, developed a series of case studies, and interrogated international guidance. We then applied these learnings to describe an approach to undertake mine waste cover trials that is applicable in Queensland and similar geographic settings elsewhere.

Our review of the literature and international guidance identified factors that should be considered when planning a field-scale trial and the activities that should be completed prior to undertaking such a trial.

A comparative review of the case studies on cover system trials and cover system performance was also undertaken. We found there is wide variation between the methods used to plan, implement and report results. The case study trials were challenged by remote operating environments, equipment failure, construction deviating from design, changes in leadership and other barriers to successful demonstration of performance.

Considering that most mines in Queensland are located where evaporation exceeds rainfall, the work focussed on store-and-release cover design with net percolation used as the key performance measure. A field-scale trial was defined as being at a scale sufficient to test the constructability of the design, using full size machinery and built using materials that meet design specifications.

We developed a 5-stepped approach for undertaking a field-scale trial. We present a strategy to compare cover system design options, identify the most appropriate study design for a field-scale trial to test its constructability and importantly, performance in reducing net percolation.