

A REVIEW OF MINE LAND REHABILITATION OUTCOMES: CULTURE, PROCUREMENT AND PRACTICE

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Land rehabilitation transcends the mere establishment of vegetation across disturbed landscapes; it should be conceptualized as a specialized ecological reconstruction process. This process necessitates a long-term perspective on the success of land repurposing and requires a continuum of inputs managed by a custodian to ensure sustained economic viability and ecological sustainability.

Based on the combined experience and field observations of the authors over more than five decades, we advocate for an urgent shift away from traditional land rehabilitation practices toward a paradigm centered on land capability reconstruction and custodianship. The prevailing rehabilitation culture has overly simplified the process to a mere revegetation exercise, which is fundamentally incompatible with the comprehensive requirements for sustainable land capability. While the regulatory framework provides valuable guidance for obtaining a mine's social license to operate, a paradigm reset is essential. Mines must prioritize rehabilitation quality, setting achievable sustainability goals and establishing clear pathways for meeting relinquishment criteria. Currently, the status quo—a model reliant on outsourced agricultural approaches—views mine rehabilitation as a one-time intervention rather than a complex, systemic process. This perspective presents significant challenges, as the success of ecological interventions can only be accurately assessed over extended timeframes, often spanning decades.

Shortsighted rehabilitation specifications, coupled with practitioners operating within agricultural decision frameworks, frequently overlook the necessity for integrated rehabilitation expertise and the scientific foundation essential for designing and implementing effective ecological outcomes. Understanding the importance of long-term monitoring and adaptive management of substrates supporting revegetated systems is crucial before transitioning land use, particularly given the complexities of altered soils and associated surface and groundwater liabilities.

This issue is largely attributable to a prevailing culture of "planting grass," which arises from a lack of rehabilitative vision within mining companies. Additionally, the standard procurement practices that prioritize immediate cost savings over the reinstatement of sustainable quality processes further exacerbate the problem. This culture is costing the mining industry millions annually, often without

recognition of the inadequacies in long-term liability mitigation and the substandard ecological success achieved.

The disconnect between procurement processes, the qualifications of service providers, and the unclear pathways to relinquishment can impede successful rehabilitation outcomes, frequently undermining progress toward sustainability milestones. Unless there is a fundamental reset of the land rehabilitation culture, the pursuit of sustainability will remain an elusive objective.

Consequently, mining companies may continue to hesitate in fully committing to sustainable land rehabilitation practices, as the prospects for relinquishment and final closure remain, at best, uncertain.