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Mine Closure  
Innovating for Sustainability

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# Introduction

A mine, once opened, has to ultimately be closed once the resource or mineral asset has been depleted or if mining activity has stopped. South Africa, like other mining jurisdictions, is home to thousands of defunct mines that retain wide ranging environmental, social, health and safety risks. Most of these mines are ownerless and derelict, which has meant that the responsibility to manage the ongoing environmental risks and social issues has fallen on the government to manage.

To prevent the continued abandonment of mine sites, several tools are used by regulators to ensure that there is sufficient funding to manage the risks associated with achieving mine closure. Integrated closure planning ensures that mine closure activities are carried out concurrently with mining activities and that they are monitored and reported on by the operators. Typically, the development and implementation of a closure plan occurs as the mine approaches end of life.

*This approach to focussing on legal closure has meant the many opportunities that a mine closure process presents are overlooked. Mine closure presents one of the greatest opportunities to innovate for the future landscape of the mine and to make a measurable and sustainable difference in mining communities while contributing to optimising and reducing financial provisions for closure activities.*

Make a measurable and sustainable difference in mining communities while contributing to optimising and reducing financial provisions for closure activities.



# Mine closure in practice

For a typical closed mine or one approaching closure, there are context-specific and complex risks that need to be managed. Most of the effects caused by these risks cannot be reversed, but the degree of impact can be reduced. The most significant risks relate to the management of mine affected water, waste rock dumps, tailings storage facilities, ground subsidence and sinkholes, unrehabilitated mine voids, dust pollution and the health, safety, and security of neighbouring communities.

In South Africa, the granting of a closure certificate means that the mining company has adequately rehabilitated the mine site, in line with a closure plan and to the satisfaction of the mining, water, and environmental authorities. Once a closure certificate has been issued, the mining company can claim its financial provision and move on to other projects. Many intangible hurdles need to be cleared before a closure certificate can be issued. The multitude of mining regulations that apply to mine closure requires specialised expertise to help the mine achieve its intended closure outcomes.

## The Mineral and Petroleum Resources Development Act's closure principles require:

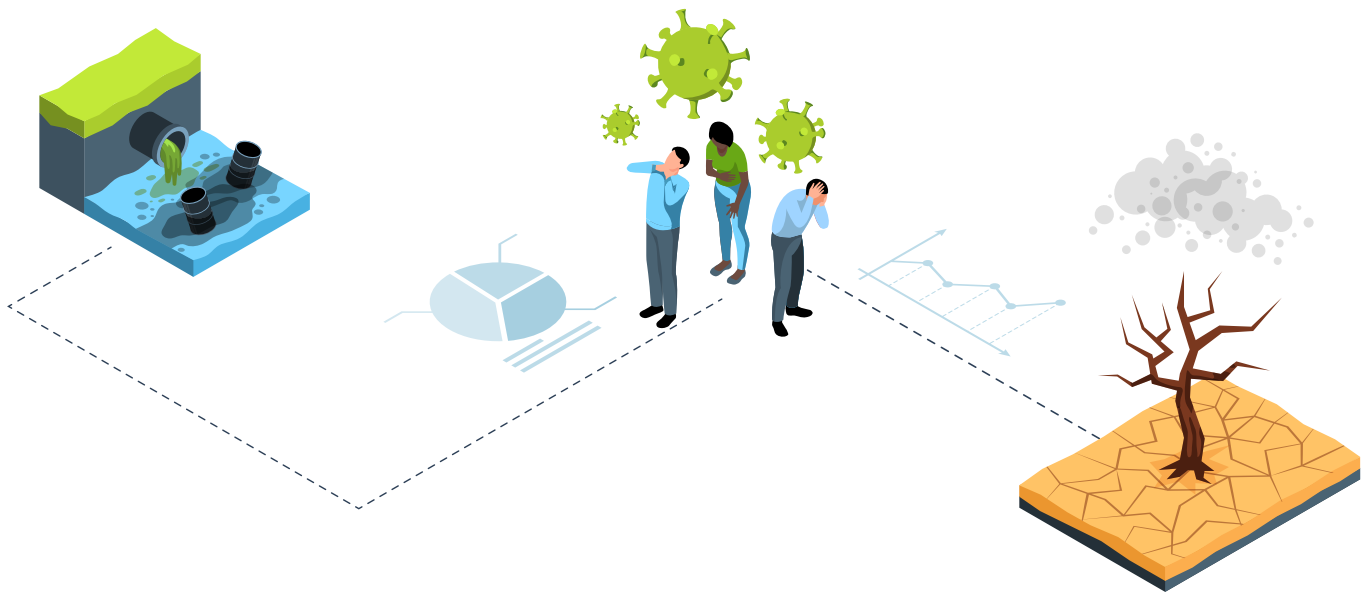


Despite some interventions, there is general acceptance within the South African mining industry that undertaking closure-related work for the sole purpose of achieving legal closure has had a low success rate.

From across the fence of a mining property, stockpiles, waste rock dumps and tailings storage facilities appear the most attractive 'assets'. However, in most instances, the economic potential from such facilities is very low. For the mining company, they usually represent a financial liability and ongoing environmental risk that contributes to the generation of dust, the pollution of the regional water system, and the ever-imminent safety risk of dam failure.

Recent incidents of dam failure across the world have served to highlight that care, maintenance and monitoring of such facilities is critical. The first prize is the elimination of this risk to communities by removing the facilities from site. In a few cases, this can be achieved through reclamation. In most cases, the risk can only be mitigated by putting measures in place to protect the community and the environment.

The difficulty in obtaining legal closure has meant that mining companies have had to come up with workable solutions to manage their considerable liabilities and grasp available exit points. Some practices employed by mining companies include ongoing care and maintenance, the on-selling of mines, and relinquishment of control of the operations, sometimes to unauthorised miners.



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# Achieving sustainability through stakeholder collaboration

**Traditional mine closure has little to offer to other stakeholders, yet mine closure practices with the creation of shared value at its centre, present a different and more attractive proposition.**

When stakeholders are aligned on what needs to be achieved through good environmental, social and governance practices, the outcome can bring about win-win solutions and shared value. Obvious as it may seem, stakeholder consultation and collaboration are key to realising the solutions needed to facilitate human-centred integrated mine closure. There has been a nuanced but real change from treating community projects as philanthropy or corporate social responsibility to one of creating shared value. The pursuit of shared value is the solution to most of the environmental and social ills faced by the mining industry.

Mine closure is the ideal space where mining companies, regulators, community members, local government, former employees, and other stakeholders have an opportunity to create real tangible shared value. In many ways, shared value is about human-centred design of local economies that work for the benefit of all stakeholders. The economic value for the mining company concerned is a direct reduction in its financial provisions. Realising this value requires that there are well defined objectives, set time frames, priorities and assigned responsibilities.

In achieving sustainable closure, the mining company plays the implementation role, practically rehabilitating mine areas and integrating environmental and social governance practices, pioneering and steering stakeholder engagement.

Putting stakeholder capitalism ([Enhancing Shared Value Through Collective Action](#)) in place of shareholder primacy and the rise of environmental, social and governance considerations presents opportunities for the mining sector to generate value beyond



**Optimised financial provisions**



**Improved mine closure risk management practices**



**Improved stakeholder relations**



**Water & biodiversity improvements**



**Better land management outcomes**

**To capture these opportunities, the Government should play a catalyst role, enabling innovation within the mining sector ecosystem, improving the ability to innovate and generate new business ideas in collaboration with stakeholders.**

Where rehabilitation has been carried out to the point where most of the original landscape, fauna and flora have been restored, the land is a valuable asset that can have other uses. These include grazing, agriculture, and other innovative projects such as the establishment of solar energy farms. Repurpose for innovation is a cross-sector solution, and a critical frame that requires buy-in from all stakeholders and guidance from sector governance.

**Global geopolitical uncertainty and the recovery from the COVID pandemic, has demonstrated the core role of government in addressing change, responding with the necessary speed, agility and scale.**

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**Successful multi-stakeholder efforts have been catalysed, assembled and enabled by governments. Government's role as a solution catalyser has been growing in breadth and complexity, with an emphasis on how to harness innovation across sectors for public good." -Deloitte Insights**

The mining sector needs to look beyond fixing historical and systemic failures in mine closure, to embrace cross-sector solutions. With a strong understanding of key societal issues, Government can build a shared-value ecosystem, leverage partnerships to cultivate innovation and drive delivery of mine closure solutions. In South Africa, this includes the use of global standards for regulatory change, the use of technology to improve monitoring and reporting to predict structural failure of closed or defunct mines, the development of waste solutions and enabling commercial land-use.



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