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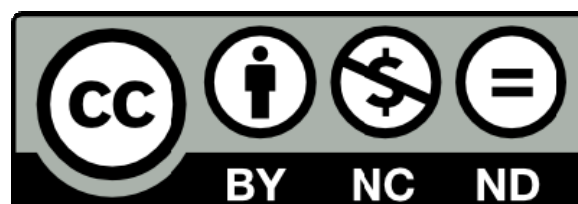
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Complexity in extractives regulation on the African continent: Has ‘best practice’ legislation been followed by implementation in practice in South Africa?

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Abstract

The legal framework for mine closure and rehabilitation of new and former mine sites in South Africa, including legacy abandoned sites, is comprehensive. This paper discusses legislative provisions for mine site rehabilitation and closure in South Africa with reference to established international expectations. Overall, while the South African legislative framework for mine closure and rehabilitation generally conforms with international expectations for best practice, the system is extremely complex and unwieldy. Many individual laws, regulations, and guidelines and their corresponding ministries applicable to mine closure planning and management in South Africa has created a complicated inter-connected raft of provisions and expectations. It is an open question whether the most recent amendments (December 2014), have untangled or rather added to the complexities. This historical complexity along with identified governance capacity constraints (financial, technical and experience based) likely explains why implementation of the legislative framework has fallen short of mine closure expectations and mandates. As South Africa is a jurisdiction on the African continent with much experience in mining, there are many lessons that are applicable to emerging countries in the region who wish to attract the benefits of the extractives industries and minimize their potential negative consequences.

Keywords: mine closure policy, mining regulation; ‘best practice’; extractives; South Africa

1. Introduction

While a comprehensive environmental governance regime has been established in many African nations over the last two decades in conjunction with provisions for mine closure within mining legislation (Morrison-Saunders et al., 2016), it has apparently not permeated effectively into avoiding or managing ineffective or abandoned mine closures. The primary foci of country and legislative reform is on improving governance, attracting investment, and associated opportunities for harnessing resource development (African Union, 2009; United Nations Economic Commission for Africa and African Union, 2011; African Union Commission et al., 2012a; African Union Commission et al., 2012b; African Mineral Skills Initiative, 2013; African Union, 2013). For example, the action plan for implementing African Mining Vision (African Union Commission et al., 2012a) presents discussion in relation to the following selected goals: 1) “To create a mining sector that is knowledge driven and is the engine of an internationally competitive African industrial economy” (p18); 2) “To create a sustainable and well governed mining sector that is inclusive and appreciated by all stakeholders and surrounding communities” (p24); and 3) “To increase the level of investment flows into mining and infrastructure projects to support broad socio-economic development” (p37). The apparent lack of discussion of mine site rehabilitation and closure planning within these vision building initiatives is a notable omission. However, there is a growing awareness of managing environmental resources to promote sustainable mining. Clear international expectations, principles and policies for mine closure planning and management have emerged in the last decade or so. These are discussed in Section 3. They set the context for evaluating mine closure policy and legislation. As mineral commodity prices can be volatile, mining companies,

governments, and local communities are vulnerable to unexpected/unplanned mine closure. Therefore, legislation should ideally incorporate mine closure measures into business feasibility studies at the design stage that demonstrate adequacy of financial resources to meet closure requirements (International Council on Mining & Metals (ICMM), 2005; Sassoon, 2009; McHenry et al., 2015; Morrison-Saunders et al., 2015; 2016). Within this context, the principal aim of this paper is to understand the complexity of legislative provisions for mine site rehabilitation and closure in a single jurisdiction using South Africa as the case study example. This is done with reference to international expectations for mine closure.

Due to the long history of mining in South Africa there are many current operational mines for which closure needs to be carefully planned, as well as a legacy of already closed and abandoned mines (MMSD, 2002a). Reports of the number of abandoned mine sites, their extent and issues arising vary. Van Wyngaardt (2012) and Sustainable Development Through Mining (2013) reported that there are about 5,858 Derelict and Ownerless (D&O) mines in South Africa and similarly the (Auditor General, 2009) estimated the total number of abandoned mines to be roughly 6,000. According to the World Wildlife Fund – South Africa the incidence of acid mine drainage, soil contamination, and the high number of D&O mines, as well as dangerous sinkholes and collapsing entry points (particularly in the Witwatersrand gold fields), have effectively brought the consequences of inadequate environmental rehabilitation and closure in the mining sector into sharp focus. It is expected that the estimated cost of rehabilitation of the 6,000 abandoned mines is approximately R30 billion, and that roughly 54% of Mpumalanga province is under some form of planned mining action Van Zyl et al., 2012. It is clear from the above that the historical failure of mining companies as well as governments to plan, budget, and implement measures for mine rehabilitation and closure is of enduring concern in South Africa.

2. Methodology

A core part of our method involved literature reviews focussed on South African mining legislation and associated policy documents past to present. We also draw upon our own collective experience in the sector, and we summarised feedback on the topic from invited professional environmental practitioners from South Africa during a workshop at North-West University in September 2013. The practitioners were asked to reflect upon a single open ended question as follows: 'What (in your opinion and experience) are the key issues or challenges associated with mine closure planning and rehabilitation under the South African arrangements and what are possible solutions?' We present the responses from 15 (of the 29 overall) workshop participants who had direct working experience in the South African mining sector, representing consulting organisations, regulators, and mining company employees. It is from these responses, that we initially identified the challenges facing the legal framework for mine closure at that time. Recognising the slew of legislative amendments that have occurred since the interviews were conducted, in the second part of the note we seek to determine whether these amendments have served to address the legislative challenges as highlighted in relation to mine closure. Throughout the note we weave workshop respondent discussions around key issues and proposed solutions regarding mine closure planning and rehabilitation in South Africa into the discussion of the literature. As stated above, the discussion integrates the current legislative provisions related to mine closure in South Africa, pegged to international practice or expectations. From this basis, we consider the governance and implementation challenges surrounding the legislative framework and the historic legacy around mine closure and abandonment, and whether the current legislative amendments in anyway address these.

3. International mine closure principles

To place our account of the legislative provisions related to mine closure in South Africa in context, we note that international expectations around this issue have been clearly established and codified over the past decade or so. We briefly summarise key mine closure principles in relation to timing, responsibility, aims and intended outcomes, and financial provisioning. Our choice of

sources focuses on international policy and guidance documents and/or papers that include reviews of international practice rather than specific jurisdictional documentation. For example, in developing guidance for mine closure planning in Brazil, Sánchez et al. (2014) drew upon a review of international materials. We have included the Western Australian *Guidelines for preparing mine closure plans* (DMP and EPA, 2015) in our selection, which are now in their second iteration following update of the original 2011 document of the same name, since Hall and Hall (2015) consider them to be regarded as best practice nationally within Australia and they provide evidence of their application internationally. They were also included in the international review of Sánchez et al. (2014).

With respect to *timing*, mine closure planning should commence early in the development planning phase and be continuous throughout the mining life cycle and closure phase (e.g. Sweeting and Clark, 2000; MMSD, 2002b; International Finance Corporation, 2007; ICMM, 2008; Sánchez et al., 2014; DMP and EPA, 2015). Early commencement of mine closure planning in the context of mining regulation coincides with other regulatory controls for development planning in, for example, environmental protection legislation. Consequently mine closure planning should be integrated with other assessment and approval processes; such as social or environmental impact assessments where appropriate (e.g. Morrison-Saunders, 2016) which have a similar timing profile of pre-development planning through operations to decommissioning. Regular reporting and updating of the mine closure plan should also take place; in Western Australia, for example, mine closure plans are expected to be reviewed and updated at least every three years (DMP and EPA, 2015), with increasing intensity and level of information occurring as end-of-life-of-mine draws nearer and site closure takes place (ICMM, 2008). Reporting and updating of mine-closure plans, including performance monitoring, should continue into the post-mining phases until formal closure is certified and the land is returned into government or community ownership (e.g. Environmental Law Alliance Worldwide, 2010).

The nature of mine closure planning means that many stakeholders are involved and have *responsibility* in the overall process. However, in keeping with the 'polluter pays principle' it is the mining company that bears greatest responsibility for mine closure planning and for most of the management actions that ensue (Sánchez et al., 2014). One such responsibility is ongoing engagement and communication with other stakeholders, especially mining but also other government regulators (e.g. environment, social, health etc) and the affected community (ICMM, 2002c; DMP and EPA, 2015; Hall and Hall, 2015). The government regulators will mainly be responsible for enforcing company compliance with mine closure requirements but will also be responsible for particular actions arising (e.g. provision of infrastructure or services to support the overall community affected by mining activity), thus they play the roles of regulator and guardian alike (Hall and Hall, 2015). A key principle of mine closure planning is that the final land use should be determined in consultation with the local community and other affected stakeholders (ICMM, 2008; Sassoon, 2009; Stacey et al., 2010; Sánchez et al., 2014; Hall and Hall, 2015; EPA and DMP, 2015) and thus their active participation in mine closure processes is an important responsibility.

Some *aims and outcomes* of mine closure planning have already been revealed in previous discussion. In a nutshell the ultimate outcome is for mine-closure and rehabilitation of site to a standard fit for a sustainable landuse whether that is a new or return to the original pre-mining landuse. Hall and Hall (2015) urge a paradigm shift whereby a closed mine be looked at as an asset rather than a financial and environmental liability given the millions or possibly billions of dollars that been invested in the mine. Benefits or net positive outcomes should be realised for all stakeholders from effective mine closure planning especially affected community members whereby the ideal is to deliver enhanced quality of life or well-being beyond the mine life (Otto, 1997; MMSD, 2002c; Stacey et al., 2010; Davies et al., 2012; Morrison-Saunders et al., 2016). Many specific considerations will need to be addressed to accomplish this overall aim, and these will be particular or unique for a given site. In summary terms it will be necessary to address: physical and chemical stability; public health and safety risks; ecological risks for all areas

disturbed or altered by mining activities (e.g. mined areas, waste rock dumps and tailings storage facilities, infrastructure - buildings, roads, processing equipment etc.) including the more intangible socio-economic impacts arising (Petrova and Marinova, 2015). To determine the performance of mine closure activity, it is imperative for mining companies to monitor all aspects accordingly (Sánchez et al., 2014; DMP and EPA, 2015) and this comes with an expectation for continual improvement of performance, such as rehabilitation standards, to be realised and demonstrated (MMSD, 2002b; ICMM, 2005; DMP and EPA, 2015).

Financial provisioning for all mine closure planning and management activity is important and as indicated before the mining company is expected implement and hence to fund the bulk of actions directly (ICMM, 2005; Sassoon, 2009; Sánchez et al., 2014; McHenry et al., 2015; Morrison-Saunders et al., 2015). A key principle is to provide for contingency funding for management and rehabilitation in the event of premature closure or unplanned abandonment of the mine (Sassoon, 2009). Unconditional performance bonds are a common and well-known approach for this financial provisioning carried out on a single-site (e.g. Miller, 2005; Sassoon, 2009; Hall and Hall, 2015), but use of centralised funds (such as the Mining Rehabilitation Fund in Western Australia - Gorey et al., 2014; 2016) that receive contributions from all active mining operations within a given jurisdiction have emerged in recent years as an innovative approach (Hall and Hall, 2015). One advantage of the latter approach is the ability put in place a financial mechanism that can generate funds to pay for the rehabilitation of legacy abandoned mine-sites (Gorey et al., 2016), something we consider to represent a best practice principle for mine closure planning (Morrison-Saunders et al., 2015).

Taken collectively the principles of mine closure planning are inter-twined. This underscores a key characteristic of state-of-the-art mine closure planning being that it is an integrated concept. This is perhaps not surprising in light of it seeking to deliver sustainable outcomes from mining. We now turn our attention to the legislative representation of mine closure planning and management in South Africa.

4. Developments of legislative provisions related to mine closure in South Africa

In seeking to examine the South African legislative provisions in light of these international expectations around mine closure planning and rehabilitation, the first feature to realise is that the historic and existing provisions were and are many, and complex. For example, we have identified more than fifteen Acts of parliament alone that have relevance to mining activity and outcomes (Table 1). These commence with the Constitution (which, through s24, establishes that *inter alia* mining and petroleum resources should be developed in an ecologically sustainable manner and provides for every South African with the right to an environment that is not harmful to their health or well-being).¹ There are also legal instruments applied at the provincial and municipal level that impact on mining activity, as well as an extensive and ever growing number of court cases and common law rulings related to mining. (We denote some of these in Table 1. There are also accompanying regulations for some Acts, and some national strategies and policies on similar topics also in Table 1). Finally, South Africa has an extensive array of guiding documents that relate directly or indirectly to mine closure and abandonment mine sites management, environmental risk mitigation and rehabilitation of abandoned mine sites, including those grouped under broad topic headings in Table 2. We realise that the names of the legislative provisions listed in Tables 1 and 2 may not obviously denote their relationship with mine closure matters. For example, the Income Tax Act provides for tax exemptions for: 'companies and persons who receive, hold, and apply money to be used to rehabilitate land, protect it or make it safe; prevent or combat pollution; or protect water resources, following mining, prospecting, quarrying or similar operations.'² However, it is beyond the scope of this note to attempt to explain the details of and interactions between these collective legislative provisions. If nothing else, the simple lists within Box 1 and 2 already

¹ Section 24 of the Constitution of the Republic of South Africa , 1996.

² Section 10(1) of The Income Tax Act 58 of 1962.

communicate the complexity of the legal framework relevant to mine closure in South Africa. For the remainder of this section we focus on salient sections of the principal legislation only; the Minerals and Petroleum Resources Development Act (MPRDA)³ as well as the National Environmental Management Act (NEMA)⁴, which regulates mine closure as of December 8 2014.

Table 1: Legislative provisions relevant to mine closure and rehabilitation in South Africa

| Legislation | Objective and relevance to closure |
|--|--|
| Acts of parliament: Constitution of the Republic of South Africa of 1996 | Provides inter alia the right to an environment that is not harmful to human health or wellbeing, and to secure ecologically sustainable development. |
| Companies Act 71 of 2008 | Deals inter alia with registration and liquidation of companies and thus the regulation of mining company rights and liabilities with regards to mine closure |
| National Environmental Management Act 107 of 1998 | Framework law giving effect to the constitutional environmental right. Provides the framework for regulatory tools in respect of environmental impacts, including mining and mine closure. |
| Minerals Act 50 of 1991 | Repealed by the MPRDA below, however still relevant as holders of old order rights issued in terms of this act are still held liable for ensuring sustainable mine closure and rehabilitation. |
| Minerals and Petroleum Resources Development Act 28 of 2002, as amended by the | Main legislative provision for the granting of mineral rights. Also the relinquishment of such rights and associated closure liabilities after successful closure and rehabilitation. Introduces the various financial vehicles which may be used to provide for closure and rehabilitation funding. |
| Mineral and Petroleum Resources Development Act 49 of 2008 | Amendment of the above act, which started to align environmental and mining law provisions so as to avoid duplication and to allow for one system of regulation and authorisation. |
| Income Tax Act 58 of 1962 | Regulates the payment of taxes by inter alia mining companies. Relevant in respect of the financial provisions required by the MPRDA above so as to ensure that sufficient monies are available to rehabilitate and close mining operations as well as providing for certain tax exemptions in respect of funds related to rehabilitation. |
| National Water Act 36 of 1998 | Regulates the protection of the water resource and the use of water on inter alia mining areas. Furthermore contains provisions relevant to mine closure with regard to water resource protection from pollution and environmental degradation. |
| Water Services Act 108 of 1997 | Deals with the provision of inter alia drinking water services and quality to people, and furthermore regulates the situations where mines have undertaken to provide such services. Relevant in terms of mine closure as such services are often required despite closure of a specific site. |
| Mine Health and Safety Act 29 of 1996 | Deals with the Health and Safety of employees throughout the entire mining life cycle including closure and rehabilitation operations. |
| Nuclear Energy Act 46 of 1999 | Regulates the management and safety of nuclear or radioactive sources including naturally occurring radioactive matter such as tailings facilities as well as contaminated mining plant and equipment. |
| Hazardous Substances Act of 1973 (Group IV Hazardous Substances) | Regulates the management and safety of sealed nuclear sources throughout the entire mining life cycle, including decommissioning and disposal at the time of closure. |
| National Environmental Management: Waste Act 59 of 2008 as amended by the | Regulates inter alia the management, transport and disposal of waste including mining waste such as residue deposits and residue stockpiles. Furthermore regulates the rehabilitation of contaminated land and waste disposal facilities including mining waste facilities. |
| National Environmental Management Laws Amendment Act 26 of 2014 | Introduces amendments in line with the MPRDA amendment act above so as to align the regulation and authorisation of mining |

³ Minerals and Petroleum Resources Development Act 28 of 2002

⁴ National Environmental Management Act No 107 of 1998

| | |
|---|---|
| | activities between different acts and government departments such as the Department of Environmental Affairs and Department Mineral Resources. |
| National Environmental Management: Biodiversity Act 10 of 2004 | Regulates the protection of biodiversity and the use of alien and invasive species on mining sites |
| National Environmental Management: Protected Areas Act 57 of 2003 | Prohibits mining in certain protected areas. |
| National Environmental Management: Air Quality Act 39 of 2004 | Regulates activities which may have a detrimental effect on ambient air quality including certain processes and dust generating activities such as tailings deposition. |
| Conservation of Agricultural Resources Act 43 of 1983 | Regulates the eradication of weeds and invader plants on mining sites |
| Other legal measures Land Use Planning Ordinances (provincial government level). | Regulates the zoning of land for mining purposes, as well as the re-zoning of mining land post closure |
| Local by-laws (local municipality level). | Regulates a variety of issues on mine sites in terms of local regulations |
| Common law/case law. | Regulates issues such as nuisance, neighbour law, delictual liability all possible issues which may emanate form mine closure processes. |
| Regulations GNR 1147 in GG 39425, 20 November 2015. Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations. | The main set of regulations pertaining to the provisions of finances for the closure and rehabilitation of mine sites, throughout the lifecycle of the mine. |
| GNR 982, 983, 984 in GG 38282 of 4 December 2014. Environmental Impact Regulations and Listed Activities. | Lists certain activities which require and environmental assessment and authorisation before they may e undertaken. Mine closure is specifically listed and is thus subject to an environmental assessment and the issuance of an Environmental authorisation with approved closure plan. |
| GNR632 in GG 39020 of 24 July 2015. Regulations for the management of residue deposits and residue stockpiles. | Sets out the regulatory framework for the management of residue deposits and stockpiles as well as the closure and rehabilitation of such facilities. |
| MPRDA: GNR 527 in GG 26275, 23 April 2004. Chapter 2: ‘Mineral and Petroleum, Social and Environmental Regulations’. | Provides for the substantive regulations to give effect to the provisions of the Mineral and Petroleum Resources Act . Includes several provisions relating to mine closure and rehabilitation |
| GNR704 in GG 20119 of 4 June 1999, “Regulations of Use of Water for Mining and Related Activities aimed at the Protection of Water Resources”. | Regulates the use of water on mining areas and introduces controls to prevent and mitigate the pollution of water resources within mining areas. Also regulates the management of residue deposits and residue stockpiles so as to prevent water resource pollution. |
| GNR 331 in GG 37603, 2 May 2014 “National Norms and Standards for the Remediation of Contaminated Land and Soil Quality”. | Regulates the remediation of contaminated land including land contaminated by mining activities. |
| Regulations 847, 848 of 1994 of the Nuclear Energy Act 46 of 1999. | To be read with the Nuclear Energy Act above. |
| Other measures: accords, policies and strategies: The 1970 Fanie Botha Accord stated that mines that closed before 1956 are the responsibility of government, with those that closed afterwards to be remediated by the responsible company (Johannesburg Inner City Business Coalition (JCBC), undated). | The accord has for all intents and purposes been negated by the promulgation of the 2008 amendments to the Mineral and Petroleum resources act, which infers liability for closure to historic sites despite the 1956 cut off. |

| | |
|--|---|
| A Strategic Framework for Implementing Sustainable Development in the South African Minerals Sector: Towards Developing Sustainable Development Policy and Meeting Reporting Commitments (DME, 2009). | [Self explanatory] |
| White Paper: A Minerals and Mining Policy for South Africa (the Minerals White Paper) N 2359/1998 in Government Gazette No 19344, 20 October 1998). | Sets out government policy for the exploitation of minerals in the country with specific focus on sustainability and equity. |
| White Paper on Environmental Policy for South Africa (The CONNEP White Paper) (Department of Environment Affairs and Tourism, 1997). | Government policy regarding the achievement of South Africa's environmental right and the regulation of activities which may have a detrimental impact on the environment, which by implication includes mining and mine closure. |
| White Paper on Integrated Pollution and Waste Management for South Africa: A Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation March 2000. GN R227 GG 20978 of 17 March 2000 (DEAT, 2000). | Commits South Africa to a regulatory approach which implements inter alia the waste management hierarchy, and by implication applies to mining waste which includes residue deposits and residue stockpiles. |
| Water Conservation and Water Demand Management Strategy for the Industry, Mining and Power Generation Sector, August 2004. | [Self explanatory] |
| National Water Resource Strategy II of 2013. | South Africa's strategy for the integrated management of the country's water resources, including the protection of water resources from pollution sources such as mine sites. |

Historically, the MPRDAs obligated the holder of rights or permits (here after the holder) to rehabilitate the environment to: its natural state; or a predetermined state; or a land use which conforms to the generally accepted principle of sustainable development. It also states that 'the holder is responsible for any environmental damage, pollution or ecological degradation inside and outside of its boundaries.'⁶ It is also required that holders of rights must: 'give effect to the general objectives of integrated environmental management laid down in Chapter 5 of National Environmental Management Act'; and 'must consider, investigate, assess and communicate the impact of the mining activity on the environment in terms of s. 24(7) of NEMA'⁷. Notwithstanding the relevant provisions of NEMA, mining companies were at the time required by the MPRDA to conduct an Environmental Impact Assessment (EIA), and to submit an Environmental Management Plan (EMP) for approval by the DMR.⁸ The EMP must , have included the environment, socio-economic conditions and cultural heritage affected by the prospecting or mining operations, as well as baseline information to determine protection and mitigation measures.⁹ Additionally, the EMP had to describe "...the manner in which the holder intends to: (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) contain or remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed waste standard or management standards or practices."¹⁰ The EMP furthermore had to include the environmental objectives and goals for mine closure rehabilitation as well as a closure

⁵ Section 38(d) of the Minerals and Petroleum Resources Development Act 28 of 2002

⁶ Section 38(e) of the Minerals and Petroleum Resources Development Act 28 of 2002

⁷ Section 38(a)-(b) of the Minerals and Petroleum Resources Development Act 28 of 2002

⁸ Section 39(1) of the Minerals and Petroleum Resources Development Act 28 of 2002

⁹ Section 39(a)-(b) of the Minerals and Petroleum Resources Development Act 28 of 2002

¹⁰ Section 39(3d) of the Minerals and Petroleum Resources Development Act 28 of 2002

plan as outlined in Government Notice Regulation 527 regulation 62;¹¹ management of identified environmental risks and liabilities and financial provision, i.e. both the methods of determining the provision and the quantum thereof .¹²

Table 2: Mine closure and rehabilitation related guidelines in South Africa.

| Document | Objective and relevance to closure |
|--|--|
| <p><i>Environmental protection and rehabilitation</i></p> <ul style="list-style-type: none"> • Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine, • DME Guideline document 2004 available at http://www.dmr.gov.za/publications/summary/21-mineral-policy/588-guideline-document-for-the-evaluation-of-the-quantum-of-closure.html. • Handbook of Guidelines for Environmental Protection, Chamber of Mines (CEM (SA)) (Chamber of Mines of South Africa, 1979) Volume 1/1983: The design, operation and closure of metalliferous and coal residue deposits. • Volume 2/1979: The vegetation of residue deposits against water and wind erosion • Volume 3/1981: The rehabilitation of land disturbed by surface coal mining in South Africa. • Volume 5/1982: The Chamber of Mines erosion tester (comet) instrument (for determining the erodibility of slime). • Volume 7: Statutory requirements for environmental management. • Guidelines for the Rehabilitation of Mined Land (DMR: Chamber of Mines and Coaltech Research Association, 2007). • Template guide for: “Environmental Management Plan for Small-Scale Mining”. (DMR, 1998). • Mine Residue – Code of Practice (SABS 0286:1998). • Anglo American Mine Closure Toolbox Version 1 (AAplc) (Botha & Coombes, 2007). • Anglo American Mine Closure Toolbox Version 2 (AAplc) (Anglo American Plc, 2013). | <p>Several guidelines have been published in South Africa relating to the protection of the environment as well as mine site rehabilitation. Although not being law these guidelines provide for substantive considerations which may be used by either regulators or mines in pursuing sustainable mine closure and rehabilitation.</p> |
| <p><i>Soil, waste and biodiversity</i></p> <ul style="list-style-type: none"> • Framework for the Management of Contaminated Land DEA 2010. • Minimum Requirements for Waste Disposal by Landfill; Handling, Classification and Disposal of Hazardous Waste; Water Monitoring at Waste Management Facilities (DWAF, 1998). • Mining and Biodiversity Guideline – Mainstreaming biodiversity into the mining sector of 2013 (DEA, DMR, CM, South African Mining and Biodiversity Forum and South African National Biodiversity Institute, 2013). | <p>As above, these guidelines pertain to particular aspects of protection of the environment relevant to mine site rehabilitation.</p> |

¹¹ Reg 62 in GN R527 in GG 26275 of 1 May 2004

¹² Reg 52 in GN R527 in GG 26275 of 1 May 2004

Water

- Water Conservation and Water Demand Management (WC/WDM) Guideline for the Mining Sector in South Africa, June 2011 (DWA, 2011).
- Guideline Document for the implementation of Regulations on use of water for Mining and related activities aimed at the protection of Water Resources, Second Edition, May 2000.
- Best Practice Guidelines for Water Resource Protection in the South African Mining Industry (Department of Water Affairs, 2006):
 - Series A: Best Practice (BP) Guideline A1.1: Small Scale Mining Practices, Aug. 2006.
 - Series A: BP Guideline A1: Small Scale Mining, Aug. 2006.
 - Series A: BP Guideline A2: Water Management for Mine Residue Deposits, Jul. 2008
 - Series A: BP Guideline A3: Hydrometallurgical Plants, Jul. 2007
 - Series A: BP Guideline A4: Pollution Control Dams, Aug. 2007
 - Series A: BP Guideline A5: Water Management for Surface Mines, Jul. 2008
 - Series A: BP Guideline A6: Water Management for Underground Mines, Jul. 2008.
 - Series G: BP Guideline G1: Storm Water Management, Aug. 2006.
 - Series G: BP Guideline G2: Water and Salt Balances, Aug. 2006.
 - Series G: BP Guideline G3: Water Monitoring Systems, Jul. 2007.
 - Series G: BP Guideline G4: Impact Prediction, Dec. 2008.
 - Series G: BP Guideline G5: Water Management Aspects for Mine Closure, Dec. 2008
 - Series H: BP Guideline H1: Integrated Mine Water Management, Dec. 2008.
 - Series H: BP Guideline H2: Pollution Prevention & Minimization of Impacts, Jul. 2008.
 - Series H: BP Guideline H3: Water Reuse & Reclamation, Jun. 2006.
 - Series H: BP Guideline H4: Water Treatment, Sep. 2007.

A series of guidelines drafted by the Department of Water Affairs with several relating specifically to mining and mine closure activities. The aim behind the guidelines being to ensure practices consistent with the National Water Act and the National Water Resource Strategy discussed above and in so doing ensuring protection of the water resource.

Socio-economic

- Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DME/DMR, 2005).
- The Socio Economic Aspects of Mine Closure and Sustainable Development: Guideline for the Socio-Economic Aspects of Closure of 2010 (see Stacey *et al.*, 2010).

Socio economic guidelines for the closure mines, providing substantive guidance on mine closure costing and socio economic impact mitigation for closure.

In theory, the estimation of financial provisions, as provided for in the MPRDA,¹³ should have been in sync with the EMP and may have been based either on rehabilitation and closure cost estimation models developed by the mining concern or the DMR guidelines (DMR, 2005). Methods of financial provision for the rehabilitation, management, and remediation of negative environmental impacts included: an approved contribution to a trust fund; a financial guarantee from a South African registered bank, or any other bank, or financial institution approved by the Director-General; a deposit into the account specified by the Director-General; and any other methods as the Director-General may determine.¹⁴ Mining companies were required to annually assess their environmental liability and increase their financial provision in line with such an assessment.¹⁵ Ministerial powers to recover costs in event of urgent remedial measures, and to remedy environmental damage were and are still provided for.¹⁶ Finally, if a permit renewal was needed, the MPRDA¹⁷ obligates the holder to report his or her environmental performance,

¹³ Section 41 of the Minerals and Petroleum Resources Development Act 28 of 2002

¹⁴ Reg 53(1) in GN R527 in GG 26275 of 1 May 2004

¹⁵ Section 41(3) of the Minerals and Petroleum Resources Development Act 28 of 2002

¹⁶ Section 45-46 of the Minerals and Petroleum Resources Development Act 28 of 2002

¹⁷ Section 24(2) of the Minerals and Petroleum Resources Development Act 28 of 2002

rehabilitation to be completed and estimated cost thereof. In July 2013 s38-42 were repealed pending the much anticipated move of the regulation of environmental considerations across to the NEMA dispensation. This created a temporary *lacunae* in the law, yet these sections were at the time still implemented as if still in force by the regulator.¹⁸ Some months later in 2013 it was revealed that NEMA s24 (discussed below) would cater for these provisions.

At the time of writing, the application for closure of a mine is regulated predominantly by the provisions contained within the MPRDA s43¹⁹ along with those contained in NEMA²⁰ as discussed below. Mindful of the proposed amendments to s43 as contained within the MPRDA amendment Bill 2013, we reflect on the future regulation of mine closure accordingly.²¹ In terms of the MPRDA mine closure is largely regulated by section 43 as stated above. Section 43 provides an outline of the process which should be followed by regulatory bodies to grant closure certificates. Section 43(1) states that the holder of a mining right remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate. Section 43(4) of the MPRDA outlines the requirements which should be adhered to when applying for mine closure, as well as the submission process. Fundamentally, section 43(5) of the MPRDA stipulates that no closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and management of potential pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed. In assisting the Department of Water Affairs (DWA) in reaching such confirmation, the Best Practice (BP) Guidelines as listed above have been published (DWA, 2006). The above provisions of the MPRDA as amended, have extended the scope of the original section 43(1). These extended liabilities included in s43(1) now state that the holder of *inter alia* a mining right, remains responsible, apart from the original provisions relating to health, safety and water pollution for any: environmental liability; pollution; ecological degradation; the pumping and treatment of extraneous water; compliance to the conditions of the environmental authorisation, and; the management and sustainable closure thereof, until the Minister has issued a closure certificate in terms of the MPRDA. *Inter alia* the Department of Environmental Affairs has to be approached for comment as per the dictum of section 43(1).²² This is a departure from the original prescription that only the DMR and The DWA be consulted with regard to mine closure. The MPRDAA also requires that the Council of Geoscience confirms in writing that all requisite reports in terms of section 21(1) have been compiled and submitted before a closure certificate is issued.²³

A noteworthy addition made by the recent amendments to the MPRDA relates to the closure of interconnected mines. Section 45(9)-45(12) deals therewith, and prescribes that the Minister of DMR, along with the Minister of Environmental Affairs may take certain measures in relation to the closure of interconnected mines. Such measures relate to *inter alia* identification of such areas, cumulative impact determinations as well as apportionment of liability. Further proposed amendments to the MPRDA, in the form of the Mineral and Petroleum Resources Development Amendment Bill of 2013 (Amendment Bill)²⁴ will extend the abovementioned liabilities even further. In terms of section 43(1A) of the bill, the holder of *inter alia* a mining right will remain liable for any latent or residual environmental liability, pollution, ecological degradation and/or the

¹⁸ National Environmental Management Act No 107 of 1998

¹⁹ Section 43 of the Minerals and Petroleum Resources Development Act 28 of 2002

²⁰ National Environmental Management Act No 107 of 1998

²¹ Minerals and Petroleum Resources Development Amendment Bill in GG 36523 of 31 May 2013

²² Section 43(1) of the Minerals and Petroleum Resources Development Act 28 of 2002

²³ Section 21(1) of the Minerals and Petroleum Resources Development Amendment Act no 49 of 2008. The MPRDAA deals with data in respect of reconnaissance and prospecting, as well as the keeping of records, and submission of information relating thereto to the Council of Geoscience.

²⁴ Minerals and Petroleum Resources Development Amendment Bill in GG 36523 of 31 May 2013

pumping and treatment of extraneous water as these liabilities may arise in the future, even though a closure certificate might have been issued in the past.²⁵ These proposed amendments, creating in effect, a situation of perpetual liability, which is discussed further below. An important point here is that the notion of perpetual liability for mine closure and rehabilitation stands over and above the international expectations outlined previously, in which it is implied that once closure status is attained, new land uses and users take over.²⁶

5. Changes to legislative provisions related to mine closure in South Africa

As noted above, the 8th of December 2014 saw a shift in terms the regulation of environmental impacts emanating from mining activities. Accordingly, provisions relating to the closure of mines are now contained within NEMA, specifically section 24 and accompanying regulations. At present all environmental considerations and impacts on mines are regulated in terms of the NEMA. The regulating authority, however, still remains DMR, albeit that they now have to apply the NEMA rules. In accordance with section 24 N of NEMA, an Environmental Management Programme (EMPr) is required for any EIA submitted in relation to mining activities 24N(1A): Such an EMPr must contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the operations in question. In effect giving credence to the requirements of the MPRDA as discussed above.

Similar to the provisions contained within the repealed MPRDA sections, these requirements serve to hold mines liable for environmental pollution and degradation emanating from their mining activities. In order to ensure that such liabilities can be covered by the mine in question, section 24O of NEMA prescribes that when considering an application, the competent authority must consider the applicants ability to comply with the prescribed financial provisions.²⁷ The financial provision referenced in section 24O is detailed in section 24P of NEMA, which requires that an applicant for an authorisation pertaining to mining or related activities must comply with the prescribed financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts.²⁸ This financial provision must be annually assessed on the basis of the mines environmental liability to the satisfaction of the minister of mineral resources. An annual independent audit is furthermore required in order to illustrate the adequacy of the financial provision.²⁹ Such a financial provision has to be maintained until such time as the minister issues a mine with a closure certificate.³⁰ The minister does, however, maintain the prerogative to retain any part of the financial provisions as is deemed fit so as to rehabilitate the closed mining or prospecting operation in respect of latent or residual environmental impacts. Further provisions with regard to the financial provisions for mine closure in terms of NEMA are contained within the regulations pertaining to the financial provision for the rehabilitation, closure and post closure of prospecting, exploration, mining or production operations.³¹

Section 24R of NEMA deals with environmental liabilities and states that the holder of a right, holder of an old order right, or holder of works (the listing of the different types of rights spanning the history of mining rights in South Africa, thus implying retrospectively of this section)

²⁵ See section 31(b) of the Amendment Bill.

²⁶ For further reading on the topic of perpetual liability in regard to mine closure, see: Humby T. 2013. The Specter of Perpetuity: Liability for Treating Acid Water on South Africa's Gold Fields, *Journal Of Energy and Natural Resources Law* 31(4), 453-466.

²⁷ Section 24O1(b)(iiiA) of the National Environmental Management Act No 107 of 1998

²⁸ Section 24P(1) of the National Environmental Management Act No 107 of 1998

²⁹ Section 24P(3) of the National Environmental Management Act No 107 of 1998

³⁰ Section 24P(5) of the National Environmental Management Act No 107 of 1998

³¹ GNR 1147 in GG 39425 of 20 November 2015.

remains responsible for any environmental liability, pollution, or ecological degradation, the pumping and treatment of extraneous water, the management and sustainable closure thereof, until the minister of mineral resources has issued a closure certificate in terms of the MPRDA. In effect, 24R applies a retrospective liability on mines, even those which were closed before the enactment of the MPRDA. This liability is also contained within section 28 of NEMA, albeit indirectly. In gearing up for the implementation of the NEMA provisions in so far as they relate to mining, and particularly mine closure, the DEA have drafted a number of regulations to flesh out the regulatory provisions as discussed above. These regulations deal with *inter alia* the financial provision for mine closure, as discussed above, and the management of residue deposits and residue stockpiles.³² This provision, namely 24R, read in accordance with the proposed perpetual liability amendment provision as contained in section 43 of the MPRDA bill 2013,³³ underscores the stance taken on historic mining pollution, and the efforts taken by the regulator to minimise the possibility of mines walking away from pollution or degradation caused by their activities. Criticism is however levelled at the notion of perpetual liability as it is argued by industry that the incentive to obtain a closure certificate is thus negated. Nonetheless, with respect to their substantive content, it is clear that the legislative provisions for mine closure in South Africa are generally consistent, if not more onerous on paper, with the international expectations internationally outlined previously. The question that arises for South Africa and the continent more generally is in regards to implementation of these provisions, especially in regards the governance challenges.

One of the most significant changes to the regulatory regime is the requirement as of December 2014 for mines to conduct an EIA for closure. A closure certificate is thus required in terms of s43 of the MPRDA, along with an Environmental Authorisation in terms of s24 of NEMA, before a mine is deemed to have closed. The result being two authorisations, issued by the same ministry, along with approval from all other ministries related to the environment as discussed above. It is not clear how the EIA for closure will work in practice. Pragmatically speaking, the resultant environmental authorisation and approved EMPr will contain conditions that must be met before the mine may be deemed to have successfully ticked all the requirements for a closure certificate. The resultant conditions will thus have to be pegged to some sort of sunset clause, and for all intents and purposes will not be able to contain any provisions related to monitoring or management *ad infinitum*. This is especially true if a closure certificate is to be sought. As stated the interplay between the two processes and applications remain to be clarified, as they are both administered and issued by the DMR.

6. Governance/legislative challenges associated with mine closure in South Africa

Some of the key governance and legislative challenges for mine closure in South Africa are addressed in this section, and summarised in Table 3. Apart from the simple evidence expressed in Tables 1 and 2, it has long been well known that South Africa has a complex legislative regime for implementing mine closure and rehabilitation measures. The principles of co-operative governance and intergovernmental relations in accordance with the 1996 Constitution creates parallel (or 'side-by-side') decision-making and management (Kotz et al., 2007), as opposed to tiered (or 'top down') structures employed in other countries (such as Australia) where national laws typically take precedence over state or local laws. In South Africa, it is not simply a matter of addressing the principal legislation that should apply to mining closure and rehabilitation activities, but also procedural aspects for particular stages in the management process. For example, a mine closure proponent will have to approach a host of regulatory bodies, often with overlapping requirements, and disparate interpretations in order to secure a closure certificate. One workshop

³²The Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation were published in GNR 632 of 24 July 2015 in GG 39020.

³³ Section 43 of the Minerals and Petroleum Resources Development Amendment Bill in GG 36523 of 31 May 2013

respondent, for example, noted that there has been a historical fragmentation of laws associated with managing mineral waste and stockpile residues as well as the principal mining and environmental protection legislation. Similarly van Zyl et al. (2012) pointed out that integrated authorisation/sign-off of EMPs from multiple authorities is needed. A further example of fragmentation and unaligned regulatory approaches is the case observed with the latest financial provision regulations. The historic DMR approach for determining financial provisions is still used in select instances, despite the finalisation of new financial regulations by the Department of Environmental Affairs³⁴. The de facto use of the historic approach being justified by certain DMR officers whom contend that the new regulations are drafted by a sister department, historically not involved in mine regulation. It is also being offered as a temporary regulatory fix until such time as the contention and confusion surrounding the implementation of the new regulations has been addressed. The workshop respondents further noted that the Department of Water Affairs (DWA) guidelines have a principles-based approach which they advocate should underpin the water management financial provisions. These examples illustrate the complexity of the historic legislative framework where dual provisions for management of particular issue overlap or intersect, and likewise make it clear that any solution involving legislative reform will necessarily also be complex and affect multiple stakeholders and the potential conflicts of interests within single and between government agencies.

Many mines were abandoned or closed before NEMA was passed, and there were no mine closure or rehabilitation plans for these mines (MMSD, 2002; Stacey et al., 2010). Although the MPRDA follows the *polluter pays principle*, and NEMA (s28: 1, 4, and 7) along with the National Water Act (s19) makes provisions for a retrospective liability, five of our workshop respondents were strongly of the view that the organisations with [or who had] abandoned mines are not being held liable for environmental risks, as the legal liability for existing and historical mines are in practice 'too soft'. This is despite the 2008 MPRDA provisions, along with s28 of NEMA essentially creating a retrospective liability, and the 2013 MPRDA read with s 24R of NEMA, creating a perpetual liability. By way of solutions on this matter, several workshop respondents advocated that government should make use of the law and trace and hold previous owners liable, and have the funds for abandoned mines independently audited; clearly the funds must represent a real financial security for abandoned mines in the first instance. The provisions of the draft regulations on financial provisions as listed above reflect the exact requirements as those stipulated by the MPRDA regulations, specifically reg 53 with regard to methods of financial provision, thus not addressing the concern of real financial security as highlighted above. GNR 1147³⁵ does however provide for the confirmation of the adequacy of the financial provision through annual assessments by a specified team of specialists, potentially addressing the workshops respondents concerns around independent auditing. One workshop respondent also suggested that it would be beneficial if the regulatory efforts of government are also supported by internal (EMP and ISO) and external (ISO certification) audits. The changes brought about by the 2014 amendments to NEMA have introduced a new epoch in terms of auditing, which is now seen as a regulatory tool to support governments enforcement efforts. Audits are now more stringently regulated, along with specific outcomes for the audits being required. These changes are reflected in GNR 982.³⁶ With regards to the challenge of managing small scale and artisanal mining, which might eventuate at a mine site following formal closure by the original large-scale miner, it has recently been suggested that EIA may be an appropriate mechanism for anticipating the effects of this activity and for putting in place initial management frameworks (Morrison-Saunders et al., 2015). As discussed above, the recent shift to the NEMA regime has heralded the need for EIAs to be conducted for mine closure. It would be expected that the issue of small scale and artisanal miners are addressed when these EIAs are conducted. Furthermore smaller mines need to undergo EIA's, in the form a basic assessments

³⁴ GNR 1147 in GG 39425 of 20 November 2015.

³⁵ GNR 1147 in GG 39425 of 20 November 2015.

³⁶ GN R982 in GG 38282 of 4 December 2014.

as regulated by section 24 of NEMA.³⁷ If implemented and enforced, which is a tough ask in terms of artisanal miners, this process may serve to regulate these practices in a more controlled manner in South Africa and the continent more generally.

³⁷ See, for example, GNR 983 of 8 December 2014 in GG 38282, activities 20-22.

Table 3: Selected workshop respondent (WR) and referenced mine closure planning and management challenges and solutions.

| Identified challenges | Potential solutions |
|--|---|
| The ‘Walk-away’ solution is not always feasible or realistic in practice, and the MPRDAA perpetual liability renders it non-existent in law. (Marais, 2009; WR # 12). | Organisations must adequately cost and provide funds for adequate closure planning (end of mine and premature closure). This is arguably the biggest challenge in South African mine closure. |
| The scope and objective of the rehabilitation and closure of a mine are not always properly/well defined in the initial EMP, and commitments tend to evolve over time due to cost implications. (Marais, 2009; WR # 1 & 6). | In relation to the scope, the operation should identify challenges (obstacles & constraints); achievability of the objective; cost implications; alternatives; measurables; relevant regulatory requirements (MPRDA; EMP commitments; and all other applicable legislation); and ensure performance monitoring and assessment. (Marais, 2009) |
| High levels of variation with regard to the quality of modern EMPs and inadequate consideration of longer term water quality issues in particular. This points to outdated EMPs, enforcement and variability of qualifications and experience of Environmental Assessment Practitioners. (van Zyl et al., 2012; Botham, 2011; WR# 6; 8). | Change attitudes from “mine now, rehabilitate and close later” to careful rehabilitation and mine closure planning. (Marais, 2009; Van Deventer, 2009) |
| EMS and EMS certification are viewed as being “Just another label” and not aligned with planning arrangements (EIA: EMP and EMPs) and mining activities such as: mining programmes and/or closure plans. EMS does not address the significant aspects of rehabilitation, closure and water rehabilitation. (Van Deventer, 2009) | To move away from EMS and EMS certification as being just a label, in order to focus environmental management activities [and related systems] as a holistic remediation approach for effective long term closure [and the minimisation of long term water pollution]. (Van Deventer, 2009b; Linde, 2013) |
| Lack of in-house competency (technical experience) in closure planning for mining companies (as opposed to closure specialists that are available. (Laurence, 2006; WR# 6; 10; 12) | Ensure that Environmental Officers, Environmental Managers as well as Mine Managers responsible are planning for rehabilitation and mine closure (refer to ISO element 4.4.2). |
| Insufficient data is often available to evaluate the regional and long-term impact of mines, particularly for the period after closure. The details in the EMP documents are mostly of a descriptive nature and insufficient for a scientific regional impact assessment. (DMR, 2005; SDTM, 2007) | Mining organisations should compile scientifically based and adequate EMPs and EMPs that supports regional assessment and decision making by Government and other role players. There is a need to move away from simply one mine site at a time and consider wider local and regional impacts. |

Reform of the legislative framework for mine closure in South Africa is only a starting point for changing actual practice and the ability of the responsible governing agencies to uphold the legislation is a key consideration. For example, Botham (2011) pointed to a lack of capacity and resources (human and financial) in the DMR and suggested that this is aggravated by not rewarding employee’s in-line with market based salaries, poor working conditions, and broad based economic empowerment obligations and targets. These structural and institutional challenges may also weaken the enforcement of existing environmental provisions (DME, 1998). NEMA as amended, now makes provision for the designation by the Minister of Mineral Resources, the so-called Mineral Resource Inspectors. It is our understanding that these inspectors will have the duty of ensuring compliance with NEMA and other environmental provisions on mines. Less clear however is how these will interface with the existing Environmental Management Inspectors, who, in terms of section 31D of NEMA, may be designated to perform the compliance functions as designated to the Minister of Mineral resources if the Mineral Resource Inspectors are over stretched or unable to ensure compliance. The argument can thus be made that Mineral Resource Inspectors are the enforcers on mines in terms of environmental provisions. The Green Scorpions or

EMI's are seen as operating outside of the mining sector unless specifically called in to assist. This creates several issues in that EMI's, if designated can enforce NEMA and the sector environmental acts, so why exclude them from mines? Placing mines on a pedestal in terms of enforcement and who can enforce creates a smorgasbord of issues. For instance, the act recognises also the potential for the DMR to not fully give effect to their enforcement duties in terms of NEMA and through section 31D(4) creates a mechanism whereby parties contending that enforcement duties are not fully being dispensed with can lodge a grievance to the Minister of Environmental Affairs, who must then consult with and assist the Minister of Mineral Resources. More generally, participants in our workshop repeatedly raised concerns about lack of enforcement within the sector, with a critical attention to the closing planning practices of organisations, the issue of closure certificates, small-scale mining activity, and land use planning around the sites (Botham, 2011). These concerns for the South African context are also reflective of many other jurisdictions in the region (e.g. Morrison-Saunders et al., 2016) and seemingly also many others globally.

Conclusions

In this paper we set out to analyse mine closure and rehabilitation in South Africa; the key question being whether the recent amendments to the legal regime have reduced or added to the complexity. In order to answer the question posed, one would need to ask; what has changed? Throughout the paper we have shown that the South African legislative framework was and still is complex and at times confusing due to the different ministries having different powers and functions related to mine closure and the sheer volume of legislative and guidance material produced by each. These ministries include but are not limited to DMR, DWA, and DEA. So what has changed in terms of the legal framework? The answer would be, on the face of it, quite a bit. Mine closure is predominantly now regulated by the NEMA and the relevant regulations thereunder. These regulations although modelled along the lines of the MPRDA regulations relating to closure, have introduced new nuances in terms of aspects such as auditing of financial provision, closure designs and closure EIAs. The authority responsible, however, still remains DMR. Which raises yet another question, have we achieved anything despite the current regulatory shake up? The maxim that resonates is that law is only as good as its implementation and enforcement.

Dual authorisation, in the form of closure certificates and Environmental Authorisations, sign off from several ministries along with added financial, closure design and risk assessment requirements are but some of the contributing factors to added complexity of the regime. However, complexity should not be understood as a negative attribute in all instances. Respondents in the study clearly indicated the need to address the issues relating to financial provisions, and it would appear that for all intents and purposes the financial provision regulations³⁸ attempt to address some of the shortfalls that were prevalent in the MPRDA regime. The question still remains whether the DMR will enforce these provisions. From the outside the situation in terms of mine closure seems to be little different, albeit with slightly differing rules under a different legal regime. It will ultimately be implementation of the rules by DMR that will result in sustainable closure or not for South Africa and a shift from the status quo of abandoned, derelict and unclosed mines.

These complexities are not isolated to the South African experience, and are common in many mining jurisdictions. With varying levels of complexity the vast majority of nations of Africa already have specific legislation or regulations for mining and EIA that relate to mine closure, with broad intentions that it occur early, regularly reviewed and updated, and that the community will be engaged in defining post mining land-use. Across the continent issues with capacity of government agencies to implement legislation are well known, with the Economic Commission for Africa and African Union stating in 2011 (p52): "Developing discharge and emission standards, mine closure obligations to be applied to mining and mineral processing in Africa and a cadre of professionals with the needed skills to conduct impact assessments still presents challenges. Financial and human resource constraints in most African countries limit the capacity of institutions tasked with

³⁸ GNR 1147 as discussed above.

enforcing these requirements”. What is not commonly considered in legal frameworks are the very human elements of mine closure planning, and how different government agencies act as the intermediary between the mining companies and communities, and implement the framework to achieve the best outcomes post-mining. The principles of mine closure planning are an integrated concept seeking to deliver sustainable outcomes from mining. It is possible that realising effective mine site rehabilitation and closure planning firstly requires it to be elevated to feature in ‘vision building initiatives’. For each jurisdiction it will also require exploration of international examples where mine closure planning legislation is working in practice, and in particular how ministries and other governmental entities collaborate, align, and share resources and capacity.

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