Enhancements in mine closure planning in Western Australia and possible applications for Africa

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Abstract

It is now well established, for example by the International Council of Mining and Metals, that mine closure planning should be considered from the outset of mining planning and approval, and that this should involve relevant stakeholders to agree upon post-mining land-uses. This has been precipitated by situations where governments have been left with clean up obligations following mine closure. Recent innovations in legislation and regulations for mine closure planning in Western Australia are being evaluated for potential adaptation and application to five African countries. Western Australia has a sophisticated mining sector with respect to regulation and regulator capacity, and the purpose of this research is to showcase the Western Australian approach, and invite discussion on possible applications elsewhere. Whilst our Australian Government funded research specifically targets South Africa, Nigeria, Ghana, Mozambique, Kenya, Tanzania, and Zambia, we are keen to explore implications for other countries where mine closure remains an abiding issue. A key observation from the cooperative governance approach employed in Western Australia between various agencies responsible for mining and environmental regulation and operators is central to the effectiveness of mine closure planning. Early consideration forces both the regulators and operators alike to justify their respective closure requirements; the details of which are reflected in approval conditions for the mining operation. This brings the mine planning phase to a head regarding the likely feasibility of planned closure and post-mining land-use activities. In this manner, the likelihood of legacy problems associated with unexpected abandonment or premature mine closure is minimised, relative to former practices where the mine planning process was essentially left unresolved. In short, the closure requirements become more realistic with this early, consultative and progressing comprehensive mine-closure planning framework in place, with potential scope for adaptive management and numerous creative options for positive post-mining legacies woven into the local socio-economic fabric.

Résumé

Il est bien établi maintenant, par exemple par le Conseil international des mines et métaux, que la planification de fermeture de mine devrait être envisagée dès le début de la planification et de l’approbation de l’exploitation minière, et qu’elle devrait impliquer les parties prenantes concernées afin de convenir de l’utilisation du terrain après l’exploitation. Cette décision a été précipitée par des situations où les gouvernements avaient des obligations de nettoyage après la fermeture des mines. Des innovations récentes dans les lois et règlements relatifs à la planification de la fermeture des mines de l’ouest de l’Australie sont évaluées pour leur potentiel d’adaptation et d’application dans cinq pays d’Afrique. L’Australie occidentale a un secteur minier sophistiqué concernant la capacité de réglementation et l’organisme de contrôle, et le but de cette recherche est de mettre en valeur l’approche de l’ouest australien et d’inviter à débattre sur les applications qui seraient possibles ailleurs. Alors que nos recherches financées par le gouvernement australien visent particulièrement l’Afrique du Sud, le Nigeria, le Ghana, le
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Mozambique, le Kenya, la Tanzanie et la Zambie, nous sommes désireux d’explorer les implications pour d’autres pays où la fermeture des mines reste un problème constant. Une observation clef de l’approche de gouvernance coopérative utilisée en Australie de l’ouest entre les directeurs et les divers organismes responsables de la réglementation minière et environnementale est essentielle pour une planification efficace d’une fermeture de mine. Un examen précoce oblige les régulateurs et les directeurs à justifier leurs exigences respectives de fermeture ; les détails de ces exigences figurent dans les conditions d’approbation de l’exploitation minière. Ceci conduit la phase de planification de la mine à son paroxysme en ce qui concerne la faisabilité de la fermeture prévue et des activités d’aménagement après exploitation. De cette manière, la probabilité des problèmes hérités associés à un abandon inattendu ou une fermeture prématurée de mine est réduite au minimum par rapport aux anciennes pratiques où le processus de planification restait essentiellement irrésolu. En bref, les conditions de fermeture deviennent plus réalistes avec ce cadre de planification de fermeture de mine précoce, consultatif, progressif et complet mis en place, avec une possibilité de gestion adaptative et de nombreuses possibilités créatives de legs positifs après l’exploitation, imbriqués dans le tissu socioéconomique local.

1 Introduction

While emerging African extractive industry-intensive countries are focussed on governance mechanisms related to maximising development opportunities and pro-poor strategies, the cyclical nature and limited life cycle of mining operations can create vulnerabilities to ‘downturns’ and consequences of mines being in ‘care and maintenance’, or abandoned altogether. In practice, government budgetary constraints result in little expenditure on abandoned mine remediation, and mine sites remain a source of harm for communities and the wider environment. Today, there is a well-established international expectation that mine closure planning should be factored into the entire life cycle of mining from initial project design to assessment, implementation, decommissioning, and final rehabilitation (e.g. Sweeting and Clark 2000; Mining, Minerals and Sustainable Development [MSSD] 2002; International Finance Corporation [IFC] 2007; International Council on Mining & Metals [ICMM] 2008). One definition of a mine closure plan includes the notion that it “must include a guide to deactivate, stabilize, and perform long-term surveillance of waste management units or facilities” (Environmental Law Alliance Worldwide 2010, p. 96). By commencing early and proactively, and progressively becoming more detailed as the end of the life cycle of a mining operation approaches (ICMM 2008), mine closure plans are intended to benefit all stakeholders working in or directly affected by the extractives industry sector. For example, mining companies will benefit from reduced future clean-up costs and decreased potential legal liability (Sweeting and Clark 2000); if they produce effective mine closure plans, with community members able to realise an enhanced level of wellbeing and quality of life beyond the conventional life of a mine (Otto 1997; Stacey et al. 2010; Davies et al. 2012). In this regard government regulators will be able to confidently and appropriately assess mining operations for approval decision-making, and benefit from risk reduction and acceptable liability associated with long term legacy of mining (Warhurst 1994; Mackenzie et al. 2006; Mackenzie et al. 2007).

Other core principles for mine closure plans include:

○ incorporating mine closure measures into business feasibility at the design stage, and demonstrating that there are adequate financial resources to meet mine closure requirements (e.g. ICMM 2005; Sassoon 2009);

○ engaging the community in defining post mining land-use and other social objectives of mine-closure (e.g. Minerals Council of Australia [MCA] 2005; ICMM 2008);

○ being subjected to periodic review processes to ensure they reflect current developmental, environmental and socio-political needs (e.g. Sassoon 2009; Stacey et al. 2010), and seek continual improvement of performance (MMSD 2002; ICMM 2005);

○ identifying and assessing environmental and social impacts of mining, along with putting in place appropriate mitigation, management and monitoring measures for developing the environmental impact assessment (EIA) for a proposed mining project (e.g. Otto 1997; Sanchez et al. 2014), and;
providing enough specific information in a mine closure plan to enable an independent appraisal of whether the plan in the specific context of the proposed mining activity is workable with respect to delivering acceptable outcomes (Environmental Law Alliance Worldwide 2010).

While the principles for good mine closure planning may be well established internationally, Buxton (2012) suggests that many ongoing challenges with mine closures in practice persevere which can and do lead to “significant adverse environmental and health and safety impacts” (Buxton 2012, p. 20). This research discusses the recent enhancements in mine closure planning provisions in Western Australia, along with some emerging reflections on ensuing practice. The greater research program from which this paper springs is funded by the Australian Government to investigate policy innovation in mine closure management, environmental risk mitigation and rehabilitation of abandoned mine sites in Western Australia, and seven case study countries in sub-Saharan Africa (Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania, and Zambia). In view of the well-developed mining sector in Western Australia, it is envisaged that recent policy and regulatory developments for mine closure planning in Western Australia may be of value for adaptation and application within the case study countries, and other countries currently experiencing a rapid growth in mining-related development activity. Thus, a secondary aim of this research is to reflect on possible applications of the lessons learned around mine closure planning in Western Australia to date, and the potential applicability to other countries where mine closure planning remains an abiding issue.

This research focuses upon three aspects of mine closure planning in Western Australia that we believe are key strengths of the particular regulatory arrangements and practice: cooperative governance approach, adaptive management and centrality of agreed final land use. We address each in turn, and in doing so we outline the regulatory requirements followed by examples and observations about actual practice. In our concluding section, we draw the three threads together and reflect upon possible applications in an African context and for international practitioners more generally. Our research methodology is based in large part upon document analysis and literature review in order to discuss the policy and regulatory provisions for mine closure planning in Western Australia in relation to international expectations or principles. We also provide some reflections on experience from practice so far with these new provisions, based in part on our own experience in the extractive industries sector and arising from discussions with miners and regulators alike during site visits and networking and information sharing events where we have discussed and presented our research to industry representatives. The latter includes conferences, seminars and other events attended by both Western Australian mining companies operating in Africa as well as researchers and practitioners active within the African extractives industry sector. While we try to draw on published and reputable sources wherever possible, we acknowledge that our approach is anecdotal and drawn from limited examples. Nevertheless we believe we have some positive lessons learned to share with the international community interested in effective mine closure planning measures.

2 Cooperation between mining and environmental agencies in Western Australian mine closure planning

There is a long history and awareness of the benefits of effective mine closure planning in Western Australia. For example, during the EIA of a quarrying project a short distance from the capital city of Perth, the Western Australian Environmental Protection Authority [EPA] (1985) made recommendations that iterative rehabilitation and environmental management practices be implemented by the proponent, with ongoing involvement of the EPA to ensure that planned programmes eventuate as agreed at the time of project approval, and that a suitable rehabilitation fund be established for the project. However, notwithstanding that the Mining Act 1978 of Western Australia has long contained provisions for mining operators to: “make good injury to the surface of the land or injury to anything on the surface thereof” (s26a); it was not until 2010 that requirements for mine closure plans were incorporated into the Mining Act. To avoid duplication with the EIA related provisions of the Environmental Protection Act 1986 (hereafter EPAct) the EPA and the Department of Mines and Petroleum (DMP) have employed a
cooperative governance approach for all environmental management aspects of mining activities including mine closure planning matters.

In 2010-2011 the Mining Act 1978, supporting regulations and guidance material were amended to require mine closure planning provisions to be addressed by mining companies as part of the issue of new mining approvals. These provisions are a partnership approach between the DMP and the EPA, with jointly agreed processes that avoid administrative duplication when assessing and approving mine closure plans. Following approval, during the entire life cycle of mining operations, revisions of mine closure plans are required with increasing detail provided as the mining operation approaches its end. A minimum 10 year monitoring period for closure and rehabilitation works is expected; the government regulators will only allow a miner to relinquish their tenement, and the environmental and social protection obligations associated with mine-closure once monitoring demonstrates that safe, stable, and suitable quality post-mining land-uses have been delivered.

The inter-agency cooperation for mining and environmental regulation in Western Australia is central to the effectiveness of the mine closure planning provisions in practice. The extractives sector is a significant part of the State of Western Australia’s economy accounting for more than a third of gross state product (DMP 2013a, p. 9), and it continues to attract the largest portion of national exploration expenditure (DMP 2013a, p. 11). The DMP is the lead agency in attracting private investment in resource exploration and development in Western Australia (DMP 2013a, p. 4); and it also carries prime responsibility for all aspects of regulating mining and petroleum industry activities from coordinating project approval processes through to enforcing regulations and conditions of approvals (DMP 2013a, p. 6). The DMP is responsible for upholding the Mining Act 1978, which includes the provisions for mine closure planning, and also the Mining Rehabilitation Fund Act 2012. The EPA is an independent five member Board appointed by the Minister for the Environment, charged with responsibility for administering the Environmental Protection Act 1986. To carry out its duties, the EPA is supported by a public service department known as the Office of the EPA (OEPA). The EPAct identifies EIA as one of the key functions of the EPA, and mining activities likely to have a significantly adverse impact on the environment will normally be subjected to EIA. However, in the interests of avoiding duplication of assessment and approval processes, the EPA utilise alternate regulatory processes (i.e. such as those of the DMP) wherever satisfied that they will deliver appropriate environmental protection (EPA 2013). The EPA has entered into a “Memorandum of Understanding between the Department of Mines and Petroleum and the Environmental Protection Authority in relation to the referral of Mineral and Petroleum (Onshore and Offshore) and Geothermal Proposals” [hereafter MOU] (available at http://edit.epa.wa.gov.au/EPADocLib/EPA-DMP-MOU.pdf – viewed 23 June 2014), which generally sets out which mining activities can normally be handled by the DMP processes alone because they will adequately meet the objectives of the EPAct. The EPA can still assess mining proposals but will only do so where it considers that it is appropriate or necessary to impose environmental conditions of approval issued by the Minister for the Environment under s45(5) of the EPAct. Like any approval conditions established by the DMP under the Mining Act, these are legally binding upon the mining proponent.

The MOU outlines the agreement reached between the EPA and DMP to share and exchange information relevant to their overlapping assessment and decision-making responsibilities. As indicated previously, the MOU in essence empowers the DMP to regulate environmental controls on mining proponents, that otherwise the EPA would subject to their own EIA processes. Schedules to the MOU outline the environmental considerations that would trigger DMP specifically referring new mining proposals to the EPA’s EIA process or to liaise with staff in the OEP to discuss the matter. These considerations revolve around parts of the environment for which the EPA has established a policy or position upon with respect to environmental protection; examples being national parks, protected wetlands (i.e. identified in specific policy documents) and where mining within 2 km of an occupied town-site is proposed.

Further to the MOU, mine closure plan guidelines have been jointly prepared and published by DMP and EPA (2011). Importantly the Mining Act bestows legal status on the guidelines when it states that:
“mine closure plan means a document that – (a) is in the form required by the guidelines; and (b) contains information of the kind required by the guidelines about the decommissioning of each proposed mine, and the rehabilitation of the land, in respect of which a mining lease is sought or granted, as the case requires” (Mining Act 1978, s70O).

The same section defines guidelines as those “approved by the Director General of Mines” and in practice this is the DMP and EPA (2011) mine closure guidelines document. The objectives for mine closure encompass the governance interests of both agencies. Specifically it is stated that:

“the Government’s broad closure objectives are (physically) safe to humans and animals, (geo-technically) stable, (geo-chemically) non-polluting, and capable of sustaining an agreed post-mining land use” (DMP & EPA 2011, p. 23)

They identify that the: “EPA’s primary objective is to ensure that the mine is capable of being closed in an ecological sustainable manner” (DMP & EPA 2011, p. 6), and further explain that where mining proposals are subject to EIA: “proponents will need to provide, as part of their EIA documentation, a Mine Closure Plan with sufficient information to meet that objective” (DMP & EPA 2011, p. 6). The mine closure guidelines provide some clarification of the cooperative governance arrangement. Major development projects in Western Australia are administered by the Department of State Development through what are known as State Agreement Acts. Such acts are subject to the EPAct, but not to the Mining Act, so this one case where the EPA will undertake EIA and associated mine closure planning oversight. Otherwise the mine closure guidelines state that the EPA will generally not assess mine closure as part of its EIA of mining proposals under the EPAct when they are subject to the Mining Act and that:

“The EPA will only assess mine closure in these circumstances if it considers there are particular issues which pose a high environmental risk. The EPA would consult with DMP before making any such decision” (DMP & EPA 2011, pp. 6-7).

The cooperative governance arrangements are not solely between the EPA and DMP. The mine closure guidelines record a range of other legislation and state government agencies that will apply to approval processes for mine closure plans. In some cases the EPA has entered into memoranda of understanding with these other agencies. As with the arrangement between the EPA and DMP, communication and information-sharing during assessment and decision-making processes, so as to avoid duplication or delays, lies at the heart of the approach adopted. In practice we have observed that staff cooperation between the two agencies is highly functional and has enhanced the efficiency of mine assessment processes (including the mine closure planning element). Information sharing and being prepared to adapt assessment processes, rather than viewing them as static, is key to success.

3 The role of adaptive management in mine closure planning

The concept of adaptive environmental management was originally advanced by Holling (1978) as an approach for dealing with renewable resource management problems through an ongoing investigation into impacts accompanied by appropriate modified and ongoing management responses. Adaptive management has since become a hallmark of best practice EIA (e.g. International Association for Impact Assessment and Institute for Environmental Assessment, 1999; Morrison-Saunders, 2011), and has long been a strength of EIA practice in Western Australia (Morrison-Saunders et al., 2004). Adaptive management is a central tenet of the mine closure planning approach in Western Australia as well as in Australia more broadly (e.g. Department of Industry Tourism and Resources [DITR], 2006). For example, when discussing principles and approaches for mine closure planning in Western Australia, the DMP and EPA (2011) state that:

“mine closure planning needs to be appropriately integrated into the different stages of the life of a mine, and flexible enough to allow for adaptive management” (DMP and EPA 2011, p. 11).

The opportunity for adaptive management is created by the mine closure plan review requirements in the Mining Act itself. Section 70O of the Mining Act requires a Mine Closure Plan to be submitted by mining
proponents to the DMP for approval as part of mining proposal applications (s70O) and section 84AA requires that the plan be reviewed at least every three years after a mining lease is granted (s84AA). The review process enables new or emerging issues to be taken into consideration and incorporated into the mine planning process. For example, the actual physical and chemical properties of waste rock dumps will not be fully understood until mining and processing takes place on site, notwithstanding the best efforts to predict outcomes based upon initial drilling surveys and sampling. The guidelines recognise the expected changes in knowledge and understanding of a given operation, with changes in the level of closure detail reported in successive mine closure plans for a given operation being linked to the life of mine. For example, for long term mining activities (25+ years) ‘indicative’ and ‘preliminary’ closure plans are sufficient while for short-term (up to 10 years) and small mining operations details must be ‘accurate’ and plans fully ‘completed’ (DMP & EPA 2011, p. 13). The guidelines also address ‘unexpected closure and temporary closure’ specifying that in the event of unexpected closure, the formal mine closure process should be accelerated while in the case of temporary closure a detailed Care and Maintenance Plan is required to be prepared and submitted that demonstrates that ‘on-going environmental obligations will be met’ during the closure period (DMP & EPA 2011, p. 9).

The management approach adopted by the DMP and EPA alike when establishing approval conditions to apply to new mining development proposals is to identify the outcomes to be achieved but leave the design and mitigation strategies for doing so up to the proponent to determine. In the EIA administrative procedures for Western Australia, the EPA clarify:

“The EPA’s preference is to recommend outcome-based conditions. That is, conditions which focus on the ultimate objective that is to be achieved (in contrast to prescriptive conditions, with detailed requirements about ‘how’ to achieve the objective). The aim of the outcome based approach to condition-setting is to regulate ‘what’ to achieve, not ‘how’ to achieve it” (Environmental Protection Act 1986 Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012 Government Gazette, WA 7 December 2012, No. 223: 5939-5959, s16).

This approach allows proponents to apply adaptive management to operations to achieve environmental outcomes. So, for example, an outcome for mine closure might be established around rehabilitation of waste rock dumps with planting of native vegetation, where a minimum percentage cover might be specified, rather than the technique or approach to follow. Some of the authors visited a case of this first-hand at a gold mining operation near Kalgoorlie, Western Australian in December 2013. The environmental officer of this particular operation showed us several rehabilitation areas on the site. She explained that the earlier attempts at rock dump rehabilitation had proved unsatisfactory owing to the use of gradients that resulted in high levels of erosion during rainfall events (which tend to be brief but heavy in that region). The company was subsequently reworking the contours of old and ongoing waste rock dumps accordingly. They had also refined their revegetation planting, using hand sowing methods that would ensure that trees were only positioned in specially ripped trenches on the rock dumps, as they needed the benefit of the extra water this physical contouring could deliver. Meanwhile grass and shrub species were spread across all of the rock dump areas less discriminately. It is this kind of attention to detail that specific regulation cannot hope to capture.

The flexible mine closure planning approach in Western Australia promotes an adaptive management approach, as being adaptable in the application of mine closure requirements between different projects is important for successful management by regulators and mining proponents alike. The mine closure plan guidelines take into account the scale of a mining operation whereby “the level of detail required to assess the environmental impacts and closure requirements is much less than that required for typically larger mining operations” (DMP & EPA 2011, p. 8). The advantage of using the regulatory approach previously described in which the guidelines are given legal effect by the Mining Act, as opposed to attempting to specify all requirements in the legislation itself enables a degree of flexibility and adaptability by the two departments involved. This is consistent with a perspective of Stacey (et al. 2010, p. 384) that “closure cannot be formulaic...due to the complexity of contexts which it takes place”. Part of the process for
tailoring mine closure solutions to particular circumstances involves consultation with stakeholders prior to the commencement of mining to agree upon final land uses post-closure.

4 The importance of agreeing on final land use in mine closure planning

While a principle in mine closure planning is that final post-mining land uses should be agreed in consultation with relevant stakeholders, different starting positions on final land use are evident in the literature. From an EIA perspective, there would normally be an expectation that the final land use is identical or equivalent to that which preceded development so that environmental values are maintained. This is the perspective taken by the Environmental Law Alliance Worldwide who have stated that:

“A mining project should not be approved unless the mining company has put forward a detailed, workable, and adequately funded plan to prevent environmental impacts for decades after mining ceases, and restore the ecology of the mine site as closely as possible to pre-mining conditions”


In contrast, the MSSD (2002) indicate that planning for post closure is even more important than mine closure, and that this process should “ensure that the land and structures can be restored for alternative uses after the mine closes” (MSSD 2002, p. 27). Mining requires a physical transformation of the land. Where this only affects the top layers associated with shallow ore deposits (e.g. gravel, bauxite and mineral sands are examples common in Western Australia), it may be feasible to return overburden and topsoil material removed during the mining process and to return the area to its former land-use. For example, in their bauxite mining operations in the jarrah forests of Western Australia, Alcoa Australia (Alcoa 2012, p. 27) seek to re-establish the same level of plant species richness in rehabilitated areas as exists in the un-mined jarrah forest return, and they report that at some sites they have managed to exceed the plant species richness of un-mined forest reference sites in their rehabilitation areas. Similarly, land subjected to underground mining, despite the land profile subsiding over mined areas, existing land uses may be maintained. However, for major open-cut mining operations, the physical scale of operations with respect to the pits and spoil dumps created may necessitate new land uses. From a sustainable development perspective, there would be an expectation that mined areas would provide a stable and productive final land use beneficial for existing and future communities (e.g. Stacey et al. 2010; Davies et al. 2012). One example from coal mining in Western Australia has been the creation of recreational lakes, especially for camping in former mine voids, notwithstanding the ongoing issues with acidity of the water; remaining as a health implication for direct contact recreation activities (e.g. Zhao et al. 2009; Hinwood et al. 2010).

The social dimension of mine closure includes both outcomes for the affected community in terms of what legacy they ultimately inherit when a mining operation ceases, and the processes of engagement during the life cycle of mining; the two come together in the mine closure planning process. In the Western Australian mine closure plan guidelines, key stakeholders, who are defined as ‘post-mining land owners/managers and relevant regulators’ (DMP and EPA 2011, p. 21), are to be consulted by proponents during the mine closure plan process. This should include ‘acknowledging and responding to stakeholder’s concerns’ (DMP and EPA 2011, p. 14), and perhaps most importantly of all, that ‘Post-mining land uses should be identified and agreed upon through consultation before approval of new projects’ (DMP and EPA 2011, p. 14).

A mine closure plan was recently submitted as part of an EIA for an expansion to a gold mining operation in the south west of Western Australia that originally commenced in 1987 by widening and deepening the existing mining pits (EPA 2014). In the mine closure plan, the proponents outlined their stakeholder engagement register comprising a series of tables; itemising the type of engagement approach (e.g. meetings, working groups, public reporting etc), the target audience, frequency of engagement, and the information either provided or sought for each occasion (Newmont Asia Pacific 2012, p. 5.3); recording actual dates, stakeholders, consultation type and the discussion and responses (pp. 5.4-5.7); and ‘community visioning’ for the town near to the minesite and surrounds (pp. 5.9-5.10); with the report (pp. 6.1-6.10) also detailing the post-mining land use and closure objectives. The report notes that the post-mining land use for the mine has not yet been finalised, and will continue to be refined as part of the
ongoing closure planning process. Thus this is a further example of adaptive management in mine closure planning, with ongoing community involvement around agreed post-mining land uses being key to success.

5 Where to start: connecting existing African mining initiatives for enhanced social and environmental responsibilities

Our research scope has purposefully aligned with and extends principles of the numerous mining initiatives, including the Extractive Industry Transparency Initiative [EITI] (available at http://eiti.org/ – viewed 26 June 2014), and the African Mining Vision (AMV) Action Plan (available at http://www.africaminingvision.org/ – viewed 26 June 2014), into areas of improving institutional capacity for a socially and environmentally responsible mining sector. Specifically, our exploration into enhancements to mine closure planning is guided by the AMV’s action plan programme goals (clusters 3, 5, 6, 7 and 9, respectively):

“To create a mining sector that is knowledge driven and is the engine of an internationally competitive African industrial economy”; “To create a sustainable and well governed mining sector that is inclusive and appreciated by all stakeholders including surrounding communities”; “To create a knowledge driven mining sector that is a key component of a diversified, vibrant and globally competitive industrialising African economy”;

“To create a mining sector that is environmentally friendly, socially responsible and appreciated by all stakeholders and surrounding communities”, and; “To increase the level of investment flows into mining and infrastructure projects to support broad socio-economic development” AMV Action Plan (2011, p. 18-37).

Whilst there is a unified AMV, and several similar pan-African initiatives, there are numerous differentiated responsibilities in each African country in relation to mine site rehabilitation and closure regulations, policies, and securities systems requiring detailed country-specific understanding. At the present time, many emerging African extractive industry intensive countries are focussed on improving governance mechanisms related to attracting investment and associated opportunities for harnessing resource development (e.g. African Mineral Skills Initiative, undated; African Union, et al. 2013), with relatively less impetus on mine closure planning. As government budgetary constraints and political considerations can often result in little or no expenditure on environmental standards and remediation, operating and abandoned mine sites remain a commonplace source of harm for communities and the wider environment in the countries of Africa. However, implementation of country-specific appropriate reforms in mine closure planning and associated standards (when incorporating adaptive management with mining proponent flexibility, effective cooperative governance, and agreed final use between stakeholders) will be unlikely to repel good international mining investments. Ironically, the processes involved in developing mine closure standards and the planning process itself may have the ability to attract and retain new mining investments, as the clarity and transparency between mining companies, governments, and communities may improve the interdependent security of all stakeholders. The resulting approach thus utilises a practical outcome-based rationale that meets the expectations of mining companies, governments, and the local communities.

A key feature of the processes for the reform of mine closure planning and rehabilitation legislation in Western Australia is the close cooperation between government and the mining industry in finding solutions. For example, the new rehabilitation funding model established in the Mining Rehabilitation Fund Act 2012: “was chosen following extensive consultation with industry, Government and conservation/community stakeholders” (DMP 2013b). This included a preliminary discussion paper of policy options (DMP 2010), followed by a preferred option paper (DMP 2011) prior to proceeding with drafting the new legislation and regulations. A major result of the mining reforms in Western Australia was to simultaneously reduce the significant exposure for governments in terms of environmental obligations, and also reduce the significant capital cost challenges of conventional bond mechanisms for mining companies (particularly smaller companies) that acted as a disincentive to mining activity investments. The resulting legislation lead to a solution that anticipates and underwrites the full closure costs for mine rehabilitation with additional funds to remediate the existing historical legacy of abandoned mines (on a cost-neutral
basis for governments), and importantly; with industry benefitting through the ‘freeing up’ of significant capital at the commencement of project activities to commence production and generate a positive cash-flow sooner than was possible prior to the introduction of the reforms. The analysis of extracting such multifarious benefits as improving the environmental, social, and fiscal credentials from mining activity in South Africa, Nigeria, Ghana, Mozambique, Kenya, Tanzania and Zambia is a major element of the research programme underway.

6 Conclusions

The research considers the applicability and adaptability of the Western Australian mine-closure planning approach to the African continent. It is hoped that clarifying and discussing the lessons learned in Western Australia might assist potential mine-closure planning development elsewhere. Cooperative governance between agencies has proved to deliver efficient and effective mine closure planning in Western Australia. The approach taken has encouraged adaptive management by mining proponents which emphasises good outcomes and is intended to also reduce regulatory burden. Stakeholder consultation is central to the mine closure planning process, and mine closure plans must be prepared in consultation with affected stakeholders to match agreed end land-uses for mine site operations. The wider research program of which this research forms a part investigates policy innovation in mine closure management, environmental risk mitigation and rehabilitation of abandoned mine sites in Western Australia, and seven case study countries; South Africa, Nigeria, Ghana, Mozambique, Kenya, Tanzania, and Zambia. The objectives include determining what regulation, policy, and securities exist for managing mine closure, and minimising risks of enduring harm, and in parallel ascertain how reforms and environmental closure standards can attract and retain mining investment. As part of the wider consultation and communication process we hope our research stimulates additional cross-jurisdictional exploration into enhancements in mine closure planning, enabling others to achieve such objectives at the national level.

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A. Morrison-Saunders, P. Gorey, D. Doepel, H. Mtegha and M.P. McHenry


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