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# Remediation, Rehabilitation and Mine Closure

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### About This Series and MLRI

This *Working Papers Series on International Best Practices* is prepared within the scope of the **Mining Legislation Reform Initiative (MLRI)**, a project of the **AUA Center for Responsible Mining**. MLRI is a multi-year effort, funded by the **Tufenkian Foundation**, to improve Armenia's legislation ensuring that mining in Armenia provides sufficient benefits to the country and local communities. The initiative involves drafting and passing legislation that elevates the socio-economic benefits of mining, while reducing the negative environmental and public health impacts. A key component of the MLRI is collaborating and partnering with civil society, advocacy groups, academic institutions, and relevant national and international organizations. MLRI works with the key governmental and legislative bodies in getting the draft legislation passed into law. For more information visit <http://mlri.crm.aua.am>.

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## Introduction

Mine closure occurs once the mineral resource at a working mine is exhausted or operations are no longer profitable. Prior to the introduction of mine closure requirements, beginning in the 1970s, mines were often abandoned without being adequately decommissioned or reclaimed. The manner in which mining companies rehabilitate the land used for mining, both surface and underground, requires careful regulation. For the system to be effective, accountable and user-friendly, the obligations and processes should be clearly defined in the legislation. In addition, the rehabilitation process should be as transparent as possible, providing for meaningful consultation in order to ensure accountability to stakeholders and especially to communities whose livelihoods are dependent on the success of mine rehabilitation and closure.

## Current situation in Armenia

The application for the mining right needs to include a mine closure plan, which should be part of the mining contract, and cover the following: dismantling of infrastructure, machinery, equipment and buildings, land reclamation plan, workforce social mitigation plan, a monitoring plan and final mine closure plan to be approved two years prior to the planned end of operations.<sup>1</sup>

The Mining Code makes specific provision for the inclusion of a financial guarantee for the implementation of the mine closure plan. This is related to provisions of the EIA Law for the assessment of costs for reclamation and mine closure and the levels of payments to the Nature Protection and Reclamation Fund, the balance of which in late 2015 stood at US\$2 million. Payments are regulated through Government Decision N 1079 on Calculation of Reclamation Funds. The preliminary payment is required after the contract is signed with the amount not less than 15% of the total estimated amount. Subsequent annual payments are calculated from the outstanding part of the total estimated cost and the time period for planned reclamation activities.<sup>2</sup>

## International best practice

International best practice for mine closure requires early planning, integration of closure plans throughout all phases of mining and post-closure, financial assurances and progressive reclamation provisions.

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<sup>1</sup> The World Bank (2016), [Armenia: Strategic Mineral Sector Sustainability Assessment](#), April, p. 35.

<sup>2</sup> Ibid, p. 37.

## Mine closure plans

In best practice jurisdictions, mine land reclamation and closure plans are required before a mining permit is granted, often as a component of the environmental impact assessment process. Plans are typically mine site-specific and include details on how the mining company will close the mine site, how environmental protection will be achieved and how the site will be returned to an acceptable state for a pre-arranged use. Depending on the site, the mine may be repurposed for other human uses or restored to its pre-mining use. Four distinct but closely linked mine closure steps are used in the preparation of the site for another use:

- *Remediation*: The clean-up of the contaminated area to safe levels by removing or isolating contaminants.
- *Reclamation*: The physical stabilisation of the terrain, landscaping, restoring topsoil and the return of the land to a useful purpose.
- *Restoration*: The process of rebuilding the ecosystem that existed at the mine site before it was disturbed.
- *Rehabilitation*: The establishment of a stable and self-sustaining ecosystem, but not necessarily the one that existed before mining began.

In most cases, complete restoration may be impossible, but successful remediation, reclamation and rehabilitation can result in the timely establishment of a functional ecosystem. Many of the unrecovered environmental obligations are a result of the failure of past rather than current regulations.

## Financial assurance

In best practice jurisdictions, financial assurance is required by regulators as a guarantee that the funds required for mine closure will be available in the event that the proponent or the operator is unable to complete the closure as planned. The main costs and liabilities occur when an operation has declining revenue and least able to fund them. Unless a cash fund has been accrued, or the operator has sufficient corporate resources, there will be no finance for closure. Similarly, a sudden fall in commodity prices can lead to a rapid decline in the solvency of the company and unplanned abandonment. Cost recovery and enforcement of environmental clean-up have been directly improved by financial assurance requirements. Best practice jurisdictions determine the financial assurance on a case-by case basis, covering the complete cost of mine clean-up.

The decision on the type of financial assurance mechanism to be used can cause tension between governments and companies. There are several types, ranging from the hard, secure and costly types, including cash deposits or certificates of deposits and trust or reclamation funds; to the soft, inexpensive and risky 'self-assurance'. In the middle are other mechanisms, such as (1) surety or rehabilitation bond (the most commonly used mechanism in best

practice jurisdictions); (2) letter of credit; (3) insurance policy (quite rare and untested);<sup>3</sup> and (4) third party guarantee, including parent company.<sup>4</sup>

Rehabilitation bonds provide financial security prior to the commencement of mining activities in order to ensure that rehabilitation can be undertaken by the authorities should the operator be unable to meet their rehabilitation obligations. Bond systems can be categorised as the (a) up-front or gradual set-aside or (b) guaranteeing of expected clean-up cost. There is a diversity of bonds arrangements and exemptions with a growing trend towards increasing bonds to 100% of estimated closure costs. While some jurisdictions do not require bonds, they retain ministerial power to do so.

Maintaining a strict bond system to represent the true cost of rehabilitation has been discounted by some jurisdictions.<sup>5</sup> Influenced by industry opposition, decisions against bond systems are often based on the perception that bonds discourage investment by tying up funds that could be invested in developing new projects, thus contributing to the growth of the sector (and the economy). Bonds systems are also criticised for falling short of meeting the actual mine closure costs.

In order to ensure that a bond does not fall short of actual costs, it is necessary to (a) develop a system that can accurately calculate the cost of mine closure; (b) annually review and adjust the calculation based on performance milestones or non-compliance with any incremental requirements; and (c) legislate that all mines need a bond equivalent to 100% of actual closure costs, rather than an optimistic or best case scenario.

Financial or other security is used in some jurisdictions if an environmental incident is imminent or has occurred, either as an alternative to up-front financial assurances or bonds or in addition to them (such as Hungary and Estonia). Many European member states, however, do not allow charges or other security over land affected by environmental damage. Instead, they require payments or financial (as opposed to documented) security (such as France).

## Canada

Canada's mine closure and reclamation obligations require the preparation and filing of a mine closure plan before mine production can proceed. All of the provincial, territorial and federal governments have legislation in place to provide financial assurance for rehabilitation

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<sup>3</sup> The insurance policies are disguised rehabilitation bonds. Insurance products are being developed in the US and South Africa, but remain of little application.

<sup>4</sup> For more detail on these mechanisms, see James M Otto, 'Global Trends in Mine Reclamation and Closure Regulation' in Jeremy P. Richards (ed.), *Mining, Society and a Sustainable World* (Springer-Verlag Berlin Heidelberg, 2009), pages 251-288, available for purchase: <http://www.springer.com/us/book/9783642011023>.

<sup>5</sup> For example, by Queensland, Australia. See [https://www.csrn.uq.edu.au/publications?task=download&file=pub\\_link&id=753](https://www.csrn.uq.edu.au/publications?task=download&file=pub_link&id=753).

in the event the mine operation is unable to do so.<sup>6</sup> All jurisdictions require that closure plans are put on file and, as part of the plan, mine closure costs are estimated and financial assurance provided to the government to cover the closure costs before mining operations can begin.<sup>7</sup>

Increasingly, progressive reclamation obligations are being considered. The method of calculating the amount and the acceptable forms of financial assurance (for example, letters of credit, government bonds, cash, mine-reclamation trusts) varies depending on the jurisdiction. If a mining company declares bankruptcy before the mine is closed, the regulating agency can use the security deposit to cover the costs of repair, maintenance, clean-up and closure of the mine site. If the mining company conducts the proper clean-up and site reclamation, the financial security deposit is returned to the company.

### South Africa

The South African legislature has developed mechanisms to promote sound management of mine closure and rehabilitation by mining companies. The *Mineral and Petroleum Resources Development Act 2002* (MPRDA) requires all mining rights holders to set aside a financial guarantee for rehabilitation, which can be returned to them on the issuing of a closure certificate by the regulator. The MPRDA aims to ensure the availability of funds for the environmental rehabilitation of the site regardless of the financial state of the mining company, through requiring the company to set aside a 'financial provision' as a condition for the issuing of a mineral right. The MPRDA allows for four methods for securing the financial provision: cash deposit, guarantee, insurance or approved trust fund. In the event that the holder of the right or permit fails to manage and/or rehabilitate the environment, the government may use this sum to do so itself.<sup>8</sup>

The government requires an application for a closure certificate on the closure or abandonment of the mining operation. The closure certificate can only be granted if the closure plan and an environmental risk report are provided and the environment has been satisfactorily rehabilitated. A closure certificate is made on application to the minister. The mineral rights holder remains responsible for any environmental liability, pollution or ecological degradation until the minister has issued a closure certificate. The issuing of the certificate makes the right holder eligible for a return of a portion of the financial provision once an acceptable environmental state has been reached. Upon the issuing of a closure certificate, the obligation to maintain a financial provision ends, although the government

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<sup>6</sup> For details on mandatory requirements for reclamation bond financial assurance for mine closure and reclamation in Canadian jurisdictions, see <http://www.eisourcebook.org/cms/Canada%20Provinces%20Environmental%20Protection%20re.%20Mine%20Closure%20&%20Reclamation.pdf>.

<sup>7</sup> See <http://www.fasken.com/en/getting-the-deal-through---mining-2015--canada/>.

<sup>8</sup> See [http://awsassets.wwf.org.za/downloads/wwf\\_mining\\_8\\_august\\_low\\_res.pdf](http://awsassets.wwf.org.za/downloads/wwf_mining_8_august_low_res.pdf).

may retain a portion for the purpose of rehabilitating the closed site in respect of latent or residual environmental impacts.

The holder of a prospecting right, mining right, retention permit or mining permit must apply for a closure certificate upon:

- the lapsing, abandonment or cancellation of the right or permit in question;
- cessation of the prospecting or mining operation;
- the relinquishment of any portion of the prospecting of the land to which a right, permit or permission relates; or
- completion of the prescribed closing plan to which a right, permit or permission relates.<sup>9</sup>

### Western Australia

Beginning in 2010, the Department of Mines and Petroleum (DMP) started reforming regulatory and policy frameworks relating to mine closure in Western Australia (WA). In 2012, in response to an increasing potential unfunded liability, the WA Government passed the *Mining Rehabilitation Fund Act 2012*.<sup>10</sup> The intent of this Act was to introduce an annual levy on tenements covered under the *Mining Act 1978* based on the area of disturbed land.

The system imposes an annual levy to be paid into the Mining Rehabilitation Fund (MRF). The levy does not absolve tenement holders of the requirement to properly rehabilitate their sites. The funds generated from these levies can be used to rehabilitate mining sites where all other options to ensure rehabilitation had been exhausted. The MRF was implemented on 1 July 2013 for an initial voluntary year. It became compulsory on 1 July 2014. The MRF replaced a system of unconditional performance bonds (UPBs) that were not considered to be providing an adequate level of surety to government in the event of mine abandonment prior to rehabilitation.

Implementation of the MRF has been a major success story for WA.<sup>11</sup> The incentive for tenement holders to voluntarily enter the fund provided the opportunity to have unconditional performance bonds held against their tenements retired. During the voluntary year, A\$7 million was collected in voluntary levy payments and A\$280 million in bonds was retired. A further A\$26 million has been collected in the first compulsory year and over A\$1

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<sup>9</sup> See <http://www.bowman.co.za/FileBrowser/ArticleDocuments/Getting-the-Deal-Through-Mining-2013.pdf>.

<sup>10</sup> See <http://www.dmp.wa.gov.au/Environment/Mining-Rehabilitation-Fund-MRF-4906.aspx>. For MRF Act 2012, see

[https://www.slp.wa.gov.au/pco/prod/FileStore.nsf/Documents/MRDocument:25925P/\\$FILE/Mining%20Rehabilitation%20Fund%20Act%202012%20-%20\[00-d0-03\].pdf](https://www.slp.wa.gov.au/pco/prod/FileStore.nsf/Documents/MRDocument:25925P/$FILE/Mining%20Rehabilitation%20Fund%20Act%202012%20-%20[00-d0-03].pdf); for MRF Regulations 2013, see

[https://www.slp.wa.gov.au/pco/prod/FileStore.nsf/Documents/MRDocument:25780P/\\$FILE/Mining%20Rehabilitation%20Fund%20Regulations%202013%20-%20\[00-c0-03\].pdf](https://www.slp.wa.gov.au/pco/prod/FileStore.nsf/Documents/MRDocument:25780P/$FILE/Mining%20Rehabilitation%20Fund%20Regulations%202013%20-%20[00-c0-03].pdf).

<sup>11</sup> For MRF guidance, see <http://www.dmp.wa.gov.au/documents/ENV-MEB-382.pdf>.

billion in bonds has been retired over the first two years, providing a significant injection of funds into the economy.

The report published in 2015 provides a background to the MRF and its development and explains some of the reasons for its success.<sup>12</sup> A major driver has been the strong support from industry, in particular groups such as the Chamber of Minerals and Energy and the Association of Mining and Exploration Companies.

The Rehabilitation Liability Estimate Calculator assists tenement holders in estimating their rehabilitation liability and the associated MRF levy.<sup>13</sup> The calculator also assists in understanding how to reduce the levy through progressive rehabilitation of disturbances on the tenement. The calculator provides a liability estimate based on the level and type of disturbance and the amount of rehabilitation that has been conducted on a tenement. It allows tenement holders to enter individual activity types, for example roads or TSFs, or combine multiple activities into a single 'Mine Activity Type'. The calculator can assist tenement holders to gauge the potential impact that future rehabilitation work, or expanded operations, may have on the levy calculation.

The fund can also be used to rehabilitate abandoned sites, which, in WA, number over 10,000. Interest generated from the MRF can be used to rehabilitate WA's legacy abandoned mine sites. The reforms have been aimed at managing and rehabilitating mine sites that are abandoned.<sup>14</sup> In January 2016, the WA Government released the *Abandoned Mines Policy*, which provides a robust framework to support decisions regarding the prioritisation, management and/or rehabilitation of abandoned sites.<sup>15</sup>

The WA Government defines abandoned mine sites as "areas of land impacted by former mining activities for which no individual, company or organisation can be held responsible for rehabilitation." Such sites may comprise of multiple areas of land or site features (e.g. mine shafts, waste dumps, abandoned equipment) that may or may not be adjacent to each other.<sup>16</sup>

Negative mining legacies are impacts of closed mines that continue to negatively affect the environment or associated communities. They include both abandoned sites (e.g. where the owner is known, but for some reason, is unable or unwilling to take the necessary remedial

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<sup>12</sup> See [http://www.dmp.wa.gov.au/Documents/Environment/MRF\\_The\\_First\\_Two\\_Years.pdf](http://www.dmp.wa.gov.au/Documents/Environment/MRF_The_First_Two_Years.pdf).

<sup>13</sup> See <https://ace.dmp.wa.gov.au/ACE/Public/MrfRleCalculator/RleCalculator>.

<sup>14</sup> For more detail on Abandoned Mines Program, see <http://www.dmp.wa.gov.au/Environment/Abandoned-Mines-15518.aspx> and [http://www.dmp.wa.gov.au/Documents/GEMG\\_presentation\\_on\\_the\\_Abandoned\\_Mines\\_Program\\_-\\_18\\_May\\_2016.pdf](http://www.dmp.wa.gov.au/Documents/GEMG_presentation_on_the_Abandoned_Mines_Program_-_18_May_2016.pdf).

<sup>15</sup> For Abandoned Mines Policy, see [http://www.dmp.wa.gov.au/Documents/Environment/Abandoned\\_mines\\_policy.pdf](http://www.dmp.wa.gov.au/Documents/Environment/Abandoned_mines_policy.pdf).

<sup>16</sup> [http://www.dmp.wa.gov.au/Documents/Environment/Abandoned\\_mines\\_policy.pdf](http://www.dmp.wa.gov.au/Documents/Environment/Abandoned_mines_policy.pdf), page 5.



action) and orphaned sites (e.g. where the legal owner cannot be traced).<sup>17</sup> As the WA example demonstrates, considering abandoned mines in the broader context of negative mining legacy provides an effective conceptual framework from which to consider policy solutions.

### Victoria (Australia)

The Earth Resources Regulation (ERR) branch of the Department of Economic Development, Jobs, Transport and Resources is responsible for setting and reviewing rehabilitation bonds for mining in Victoria, as required by the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act). The MRSD Act requires the holder of an exploration / mining licence to rehabilitate the land in accordance with the rehabilitation requirements of the approved work plan, licence conditions or code of practice.<sup>18</sup> The MRSD Act requires rehabilitation to be carried out progressively during the life of the operation. Mining and exploration licences and work authorities are also granted subject to a number of conditions which may contain further rehabilitation requirements.

The MRSD Act requires a licensee or an applicant for an extractive industry work authority to enter into a rehabilitation bond for an amount determined by the Minister. The condition of a rehabilitation bond is that the authority holder rehabilitates the land as required the MRSD Act. The ERR is non-discriminatory with respect to land tenure and requires bonds to be lodged for operations on both private and Crown land. While standards of rehabilitation on private land are principally a matter for landowners, the department has an interest in ensuring that all land is rehabilitated to an appropriate standard (i.e. in relation to public safety, amenity and potential impacts on the wider environment).

The guidelines provided by the ERR in 2014 enable operators to assess the rehabilitation liability of their operation by the application of standard rehabilitation rates for simple operations and a rehabilitation bond calculator for all other operations.<sup>19</sup> Rehabilitation bonds are periodically reviewed by the ERR to ensure that they remain at appropriate levels during the life of the operation. The bond is also reviewed when a work plan variation is submitted, a tenement is transferred or when requested by the tenement holder.

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<sup>17</sup> There are approximately 50,000 known mining legacy sites in Australia. See <http://www.mpi.org.au/2015/11/a-sense-of-place-a-sense-of-loss-australias-mining-legacies/>.

<sup>18</sup> See [http://www.energyandresources.vic.gov.au/\\_data/assets/word\\_doc/0013/1213600/9252\\_DEDJTR\\_EERR\\_Code\\_of\\_Practice\\_for\\_Mineral\\_Exploration\\_accessible.doc](http://www.energyandresources.vic.gov.au/_data/assets/word_doc/0013/1213600/9252_DEDJTR_EERR_Code_of_Practice_for_Mineral_Exploration_accessible.doc). For Western Australian code of practice, see [http://www.dmp.wa.gov.au/Documents/Safety/MSH\\_COP\\_MineralExplorationDrilling.pdf](http://www.dmp.wa.gov.au/Documents/Safety/MSH_COP_MineralExplorationDrilling.pdf). For Queensland (Australia) code of practice, see [https://www.dnrm.qld.gov.au/\\_data/assets/pdf\\_file/0005/240566/qld-guidance-note-exploration-safety.pdf](https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0005/240566/qld-guidance-note-exploration-safety.pdf).

<sup>19</sup> For detailed guidelines, see <http://www.energyandresources.vic.gov.au/earth-resources-regulation/licensing-and-approvals/minerals/guidelines-and-codes-of-practice/establishment-and-management-of-rehabilitation-bonds-for-the-mining-and-extractives-industries>.

The amount of bond is calculated to address in full the rehabilitation liability based on the works specified in the approved work plan or for simple operations or operations working under a code of practice, on a per hectare basis. For an initial bond, this is based on the point of maximum disturbance for the first stage of the development as specified in the approved work plan. For periodic bond reviews, the bond is calculated on the existing rehabilitation liability at the time of the review. For both the initial bond and periodic bond reviews, the rehabilitation liability is calculated on achieving the final rehabilitated landform as specified in the rehabilitation plan.

The *Mineral Resources (Sustainable Development) Act 1990* requires an applicant for a licence or work authority (or a proposed transferee) to lodge a bond with the department as a surety for compliance with the conditions of the tenement relating to rehabilitation. The ERR only accepts rehabilitation bonds in the form of an unconditional bank guarantee. Other forms of financial security such as insurance bonds and cash bonds are not accepted.<sup>20</sup>

### New South Wales (Australia)

It is the responsibility of Resources & Energy branch of the Department of Industry to ensure that land disturbed by mining activities is returned to a sustainable post-mining land use. A security deposit that covers the full rehabilitation costs is required on all authorisations. This requirement ensures that the State does not incur financial liabilities in the event of an authorisation holder defaulting on their rehabilitation obligations.<sup>21</sup>

The authorisation holder under the *Mining Act 1992* is required to provide a Rehabilitation Cost Estimate (RCE) for consideration when determining the security deposit amount. The RCE is used by the Government to assist in determining the amount of the security deposit.<sup>22</sup> A Rehabilitation Cost Calculation Tool is available to assist in calculating the security deposit for a site.<sup>23</sup> Holders of authorisations are required to submit an RCE whenever a potential change in rehabilitation liabilities occurs. Resources & Energy determines when rehabilitation obligations have been met and the security deposit is released. Partial release of the security deposits may occur when successful rehabilitation has been demonstrated for part of the site.

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<sup>20</sup> See <http://www.energyandresources.vic.gov.au/earth-resources-regulation/licensing-and-approvals/minerals/guidelines-and-codes-of-practice/establishment-and-management-of-rehabilitation-bonds-for-the-mining-and-extractives-industries>.

<sup>21</sup> See [http://www.resourcesandenergy.nsw.gov.au/\\_data/assets/pdf\\_file/0020/96104/EDP11-Policy-Rehabilitation-Security-Deposits.pdf](http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0020/96104/EDP11-Policy-Rehabilitation-Security-Deposits.pdf).

<sup>22</sup> For guidelines, see [http://www.resourcesandenergy.nsw.gov.au/\\_data/assets/pdf\\_file/0006/363516/ESG1-Rehabilitation-Cost-Estimate-Guidelines.PDF](http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0006/363516/ESG1-Rehabilitation-Cost-Estimate-Guidelines.PDF).

<sup>23</sup> To download the Excel spreadsheet, click on the following link: [http://www.resourcesandenergy.nsw.gov.au/\\_data/assets/excel\\_doc/0008/427247/Rehabilitation-Cost-Calculation-Tool.xls](http://www.resourcesandenergy.nsw.gov.au/_data/assets/excel_doc/0008/427247/Rehabilitation-Cost-Calculation-Tool.xls).

The Mining Operations Plan (MOP) is a tool used by the NSW Government to monitor the progress of mining and rehabilitation activities across the life of a mine. In September 2013, the NSW Government released *MOP Guideline*, which details the process for monitoring and managing progression towards successful rehabilitation outcomes. The Guideline requires industry to identify and provide measurable data and demonstrate that proposed rehabilitation outcomes are achievable and realistic within a given timeframe.<sup>24</sup>

Increasingly jurisdictions are considering breaching the corporate veil to chase shareholders who hide behind a company's limited liability. In Queensland the Chain of Responsibility legislation draws the net even wider to anyone who benefits from the carrying out of the mining activities. In his 1988 monograph, *The Age of Atonement*,<sup>25</sup> the economic historian Boyd Hilton explains how evangelical religious thought in the first half of the 19<sup>th</sup> century bolstered laissez-faire market attitudes and unbridled Victorian capitalist competition. The evangelicals with political clout believed that such policies were the establishment in the market of God's will. If you failed in such an unforgiving market you had to atone for your sins by full repayment of all your debts.<sup>26</sup> Sir Walter Scott famously spent years repaying creditors for losses associated with a failed business venture.

It was not until the advent of the limited liability company in the 1850s that the market and its accompanying economic policy became more forgiving. A shift from atonement to incarnation in religious thought provided momentum for a new accent on God's love rather than her more punitive requirements for atonement. The shift in policy towards limited liability can thus be traced not only in the intervention of Government to ameliorate the worst excesses of industrialisation, but in the religious thinking of those who gradually began to see the need for that interference. Atonement made way for incarnation, laissez-faire for intervention, limited liability for full personal responsibility.

That direct personal responsibility for the actions of your joint stock enterprise may be making a comeback. In Queensland, Australia, *the Environmental Protection (Chain of Responsibility) Amendment Act 2016 (Qld)* has made groups of companies and significant investors liable for a company unable to comply with environmental legislation. If the company goes into administration or liquidation for whatever reason, the other companies in its group, very broadly defined, as well as significant investors originally benefiting from the company's mining operations, can be chased by the State Government in order to meet

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<sup>24</sup> See [http://www.resourcesandenergy.nsw.gov.au/\\_data/assets/pdf\\_file/0007/527911/ESG3-Mining-Operations-Plan-MOP-Guidelines-September-2013.pdf](http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0007/527911/ESG3-Mining-Operations-Plan-MOP-Guidelines-September-2013.pdf).

<sup>25</sup> AJB Hilton, *The Age of Atonement: The Influence of Evangelicalism on Social and Economic Thought, 1795 – 1865*, Oxford: Clarendon Press 1988, pages 3-5

<sup>26</sup> *Ibid*, at 257: Lord Eldon, a Tory, said "that each man who invested in a scheme from which massive dividends were expected must also expect to have to pay the debts of the company in the event of its failure 'to his last shilling and acre'." His Liberal and High Tory colleagues "fully subscribed to the vulgar view, enshrined in the famous judgment of 1793 in *Waugh v Carver*, that 'he who feels the benefit should also feel the burden'."

the outstanding environmental liability. The point, of course, is to protect the taxpayer from companies avoiding their environmental clean-up responsibilities.

This legislation may well attract interest from other jurisdictions. This is for at least three reasons. First, green votes are gaining political significance not only for the distribution of preferences to major parties (in those polities where preferential voting is used) but also in their own right as climate change and other significant global environmental issues take on ever more prominence. Larger parties may seek out those votes in order to shore up their electoral position, or because their policy on these major environmental issues shifts to take account of public concerns. To this end, it is significant to note that the legislation in Queensland had the support of both the major parties in the State of Queensland's Legislative Assembly (Queensland has a unicameral legislature).

Second, State budgets in Australia are under pressure, particularly in the resources and energy States (in particular, Western Australia and Queensland) due to the downturn in commodity prices and thus royalty returns. Any means of funding abandoned mines so that they are not a burden on the taxpayer is likely to be very welcome.

Third, such legislation is in Australia very difficult to challenge on constitutional grounds.<sup>27</sup> States are sovereign Governments in a federal system. They each have written constitutions which allow legislation to be passed for the "peace, order and good government" of each State. Unless that legislation is inconsistent with Commonwealth legislation under section 109 of the Commonwealth, laws passed by the State will be valid and of full force and effect within the State. This great difficulty in challenging such legislation means that persons aggrieved by its operation have very limited remedies apart from appeal to test the limits of the legislation's very broad categories and its considerable ambit. In Armenia, the ambit of constitutional provisions in relation to the environment is broad enough to encompass such corporate-veil-breaching concepts.<sup>28</sup> In addition in Queensland, seeking judicial review does not allow a merits review, only a review of the process which led to the decision. Thus, if the decision is not properly made, the department that made the decision simply follows the court's reasoning and makes the decision again.

Environmental legislation in many jurisdictions has long provided for executive officer liability.<sup>29</sup> The definition of executive officers is usually not restricted to directors and also

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<sup>27</sup> *Union Steamship Co of Australia Pty Ltd v King* (1988) 166 CLR at [16] per the majority: "That is, the words "for the peace, order and good government" are not words of limitation. They did not confer on the courts of a colony, just as they do not confer on the courts of a State, jurisdiction to strike down legislation on the ground that, in the opinion of a court, the legislation does not promote or secure the peace, order and good government of the colony."

<sup>28</sup> Article 11, *Armenian Constitution*.

<sup>29</sup> For instance, Part 5.9 of the *Protection of the Environment Operations Act 1997 (NSW)*; Division 18 of Part 17 of the *Environmental Protection and Biodiversity Conservation Act 1999 (Cth)*; Part 2 of Chapter 10 of the *Environmental Protection Act 1994 (Qld)*; section 118 of the *Environmental Protection Act 1986 (WA)*.

includes senior managers with line responsibility. If the company holding the environmental approvals or permits is unable to comply with the terms and conditions of the approvals, for insolvency or other reasons, the executive officers can be prosecuted for failing to ensure the company of which they are officeholders complies with its environmental obligations. The executive officers are usually provided with a defence. Typically these defences involve the officers having taken reasonable steps to prevent the company's non-compliance or variations on a due diligence defence.

But in Queensland, Australia, as of 15 March 2016, the chain of responsibility for environmental non-compliance has lengthened considerably.<sup>30</sup> This legislation introduces a significantly extended scope of liability, which goes well beyond executive officers. It extends to persons capable of significantly benefitting financially from the company that has not complied with its environmental obligations, and legal persons and individuals who in the previous two years has been in a position to influence the company's compliance with those environmental obligations. This includes ostensible directors, shadow directors and anyone making funding available to or investing in the company except 'Mum and Dad' shareholders. There is also a great degree of discretion in the department administering the legislation to decide if someone is a related person for these purposes. The department may also decide to move on related persons of previous owners of the projects held by the impugned company. The Act therefore has some retrospective operation.

If such legislation spreads around the globe, it could have fundamental adverse consequences for mining and petroleum investment. Royalty funding of projects is often sold by its proponents as one step removed from the direct environmental liabilities of the company undertaking the mining. Royalty funders will no longer so easily be able to make that claim if legislation like this becomes ubiquitous. Significant white knight investors saving a project from default will need to extend their due diligence to a technical assessment of the company's compliance with environmental laws before risking an investment. All legal advisers will need to monitor the pronouncements of environmental policy makers in their respective jurisdictions, as the chill wind of a new age of atonement may be about to blow around the world. For instance, already in Hungary, shareholders can be targeted to pay in the absence of funds or insolvency of a corporation. In Spain and Portugal parent companies can be targeted. These sorts of provisions may take hold in Europe and Armenia may follow suit.

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<sup>30</sup> *Environmental Protection (Chain of Responsibility) Amendment Act 2016 (Qld)*.

## Conclusions and recommendations

While Armenia's approach to mine closure regulations is in line with international standards, several issues could arise during implementation, mainly related to financial assurances and liabilities associated with post-closure monitoring. There are no provisions in the current system that ensure that there will be sufficient funds for complete reclamation and closure at any point in time. This is, as demonstrated above, one of the main elements of international best practice on mine reclamation and closure. There are also no provisions which allow changes in monetary value through exchange rate fluctuations or inflation.

At the end of 2015, Armenia's Nature Protection and Reclamation Fund had a balance of US\$2 million, earmarked for rehabilitation after closure of current metal mining operations. While the establishment of the fund is the right approach to prevent future environmental legacies, the amount deposited is inadequate for the rehabilitation of even one of the more substantial operating mines. In comparison, the corresponding fund in Sweden (with a metal mining sector about 4-5 times that of Armenia) had a late 2015 current value of US\$400 million, 200 times larger than the corresponding Armenian fund. In Sweden, the funds deposited are directly tied to the estimated cost of closing an operation at the present time. In Armenia, the money in the fund is only part of the cost to close the mine at some time in the future, set by the estimated life of mine. This provides inadequate protection for the event of early closure.<sup>31</sup>

Regulating in relation to financial assurance for mine closure entails numerous and complex issues. It is about assessing, through financial technicalities, a difficult balance between comfortable levels of environmental protection, while not preventing mineral resources development. Governments can be flexible regarding acceptable financial assurance mechanisms, thus allowing companies to accommodate specific circumstances and use the most cost-effective tools. At the same time, as demonstrated by various examples throughout this paper, they should develop guidelines or templates to ensure each mechanism complies with minimum conditions. Most importantly, regardless of the selected mechanism, the regulator should ensure that the assurance will be enforceable and effective in the scenario of insolvency or bankruptcy.

Best practice jurisdictions require regular reviews of mine closure plans so they are kept up to date as the project progresses through the various stages of development. Plans should be regularly updated to reflect changes in mine development, operational planning and environmental and social conditions. In best practice jurisdictions, final mine closure plans are required five years prior to the estimated date for cessation of production. In this context, two years in the case of Armenia is too short. By comparison, Turkey's closure rules require

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<sup>31</sup> The World Bank (2016), [Armenia: Strategic Mineral Sector Sustainability Assessment](#), April, p. 80.

closure plans to be developed as part of the EIA and but reclamation plans do not have to be kept up to date throughout the mine's working life. Closure in Turkey is less about post-mining land uses and mostly about reaching a stable post-mining land form only. Final mine closure plans must also contain specific details of how closure will be achieved and how monitoring will be carried out to demonstrate the success of closure and to allow relinquishment. Implementation of mine closure plans is monitored until the site achieves a sustainable long-term outcome.<sup>32</sup>

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<sup>32</sup> International Council on Mining and Metals: Planning for Integrated Mine Closure: Toolkit [hub.icmm.com/document/310](http://hub.icmm.com/document/310)

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