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**Government of Victoria
Department of Primary Industries**

**Options for Financial Assurance
for Rehabilitation of Mine and
Quarry Sites in Victoria**

June 2011

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Stakeholder Discussion Paper only**



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1 Introduction

1.1 Background

As part of their exploration or mining licence, mine and quarry operators are required to rehabilitate the site in accordance with an approved rehabilitation plan. This is to provide a sustainable end land use after site closure. Rehabilitation securities are used to ensure there are sufficient funds available to rehabilitate a site if the operator fails to meet their site closure obligations.

The Victorian Department of Primary Industries (DPI) is responsible for managing the risk that an operator fails to rehabilitate their site in Victoria. This risk is currently managed through a performance bond system.

1.2 Current system

The bond system is in place to protect the government against having to fund rehabilitation in the case of non-compliance, insolvency, financial difficulty or early closure.

The amount of the bond to be provided is estimated by a bond calculator. The amount is periodically reviewed and may be amended to match the liability. Operators may request a reduction in the bond if the rehabilitation liability of the site has been significantly reduced. The liability is estimated based on the assumption that rehabilitation would be undertaken by a third party. In Victoria, bonds are only accepted in the form of an unconditional bank guarantee (sometimes referred to as a Letter of Credit). Bonds are returned to the operator when the DPI is satisfied that the land has been rehabilitated.

Up until now, few operators have been unable to meet their rehabilitation obligations. However, the current system provides for a 100% failure rate. That is, an operator's rehabilitation bond must cover 100% of their assessed liability. This is not financially efficient as bank guarantees are costly to the operator and limit their borrowing capacity.

Operators have claimed a further financial burden caused by bond reviews which in the past have, in some cases, resulted in large increases to the liability estimate. However, operators are able to access the DPI's bond calculator independent of DPI bond reviews, and can progressively make provision for increases in liability.

While bond amounts may be increased, there are currently no discounts offered for previous good performance or compliance, nor does the system offer any other options for the provision of alternative financial assurance to the DPI.

1.3 Aim

The DPI is aware of operators' concerns regarding the current system and the burdens that it can create. Further, the DPI recognises the economic benefit that mining and extractive activities provide to the community, and that financial assurance must not be such a burden on operators that it threatens the viability of their operations. As a result, the DPI is investigating alternative forms of financial assurance for site rehabilitation to address these issues.

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As part of this investigation, KPMG facilitated working group meetings to explore the options available. The working group was comprised of representatives from the DPI, industry bodies and government agencies. These meetings provided KPMG and the DPI with the opportunity to obtain input from stakeholders and understand the implications that alternative forms of financial assurance would have on their operations.

KPMG has performed a literature review of the different mechanisms for the management of mine and quarry site rehabilitation risk being used in other jurisdictions. Each model has advantages and disadvantages which need to be weighed up to take into account the nature of operating processes in Victoria. As part of the investigation, KPMG visited a quarry site and consulted two industry bodies and officers of the DPI and EPA to gain a better understanding of site rehabilitation and the associated risks.

This report presents the results of the investigation of published materials and consultations with the working group collectively and individually. It looks at the principles of a rehabilitation security model and uses those principles as a benchmark to draw comparisons between different mechanisms for financial assurance. The aim of this report is to provide the DPI with a comprehensive overview of different mechanisms for the management of rehabilitation risk.

It is understood that DPI will use the results of this investigation as part of a consultative process and obtain further stakeholder input into the advantages and disadvantages of the alternative models.



2 Principles of a good security model

2.1 Calculating the level of assurance

Closure and rehabilitation plans for mines and quarries must give due consideration to physical and socioeconomic risks. The area must be made safe for the public and the land must be usable in the long term so as not to adversely affect the surrounding communities. Since the style of mining or extractive activities affects the rehabilitation process, rehabilitation must be considered during the planning process of the mine so that future costs can be estimated. The cost of rehabilitation is also affected by the type of product being mined, the increased standards of rehabilitation and the desired future land use.

The estimated cost can either be calculated by the operator or the regulator. It is based on the cost of contracting a third party to perform the rehabilitation. A spreadsheet-based calculator was developed by two Australian consulting companies as a guide in estimating the cost of rehabilitation. It takes into account all aspects of the site closure (including demolition, removal of infrastructure, maintenance of the site, monitoring of rehabilitation and soil testing).

To protect the government financially, securities must provide sufficient funds to cover the cost of closure of a mine or quarry site if the operator does not adequately rehabilitate the site. The range of closure costs for a site is wide, ranging from thousands to tens of millions. Typically, rehabilitation cost is in the tens of thousands of dollars, but it can be difficult to estimate due to unanticipated costs and the fact that rehabilitation does not always go exactly as planned.

Based on periodic reviews of the site, the amount of financial assurance may be revised and amended during the life of the site. This uncertainty around the amount potentially creates a financial burden to mine and quarry operators who may have to put forward a large sum of money at short notice to account for an increased cost estimate. Another consideration is that it can be costly to the government to perform frequent site reviews. One suggestion to compensate for this was for the DPI to perform random site checks.

2.2 Important considerations

2.2.1 Economic efficiency

It was agreed by the working group that financial assurance should be economically efficient and readily convertible to cash. For this reason, it was considered that personal property or operating equipment are not ideal as security, noting also that these items may already be relied on to fund business operators.

From the operator's point of view, an economic consideration is their access to capital: financial assurance should not tie up too much capital for the entire life of the mine. Another consideration raised was that international companies (for example, those listed on the NYSE) are suffering the accounting impost twice with the requirement to disclose both the contingent liability for the bond and the contingent liability for the rehabilitation. If possible, the model should be flexible enough to take this into account.



2.2.2 Moral hazard

The form of financial assurance should not create moral hazard. This can happen if the security could provide an alternative to a company meeting its legal obligation to rehabilitate a site. For example, consider an operator who takes out insurance to cover their rehabilitation costs in the case of financial difficulty. The premium payments are much lower than the rehabilitation costs which may tempt an operator to abrogate its rehabilitation responsibilities and instead leave the liability with the insurers.

2.2.3 Incentives for good practice and progressive rehabilitation

The model should encourage good environmental practice by the operator. One way to encourage good behaviour is through incentives, such as discounts on future financial assurance based on past good performance. The current system allows this informally through negotiation of increases to bond amounts. To achieve the discount, operators should look to minimise disturbance to the site to reduce rehabilitation risks and costs and complete rehabilitation in a timely manner.

To facilitate rehabilitation, operators may organise for the site rehabilitation to be an ongoing process during the life of the site. However, this can be financially impeded if capital is tied up in a mining security. Most jurisdictions currently do not release funds for ongoing rehabilitation though funds are partially released as steps towards rehabilitation are completed.

2.2.4 Administration

It was agreed that models should not create an administrative burden for the government. This is a point which must be carefully considered as certain features of the models may complicate administrative tasks for the government. For example, there are some jurisdictions which allow mining and extractive companies to select a form of assurance which would be best for them financially. Others let companies use a combination of securities. Combinations can be considered but the DPI must keep in mind the implications on administration and management. Another example is the periodic release of funds, which would lift some of the financial burden for the operator but may be difficult for the government to manage.

2.2.5 Rehabilitation failure rate

When selecting a model, the failure rate of operators in terms of rehabilitation obligations also needs to be considered. It is not likely that 100% of operators will fail to meet their rehabilitation obligations. Therefore if some type of fund pool is used, the level of assurance does not need to total the full rehabilitation costs of all operators across Victoria. This would mean that operators do not have to contribute 100% of their estimated rehabilitation costs to the pool. If this model is used, clear policies must be put in place regarding what the funds may be used for, and it must be ensured that the money is used for those purposes only.

2.2.6 Cross-subsidy

A common fund pool would create a risk to operators that they may not receive the full amount of their bond back, even if they have met their rehabilitation obligations successfully. A combination of financial assurance models might have to be considered to minimise this risk, if it is not too administratively complex. For example, operators could put forward their own bond,



and contribute a smaller amount to the pool, so that they are not completely exposed to the risk of rehabilitation failure of other operators.

2.2.7 Timeline Approach

To the extent possible, large and uncertain increases in the level of financial assurance should be avoided to facilitate operators' ability to meet these increases and have maximum economic efficiency.

As with the insurance model, caution must be taken to ensure a fund pool with small contributions from each operator does not create moral hazard, which could happen if the contributions are much less than the cost of rehabilitation. This risk may be mitigated to some degree if civil and criminal penalties are put in place.

2.3 Ten guiding principles

Based on the above considerations and discussions with the working group, various stakeholders, and the DPI, a set of guiding principles for a good security model has been developed. The DPI and interested stakeholders can utilise these principles to decide which model would be best suited to their requirements. The principles are as follows:

1. The system should reflect the fact that a rehabilitation failure rate of 100% is unlikely;
2. The system cannot be a "no assurance" system – this creates moral hazard;
3. The system should reward past good behaviour;
4. The system should also encourage future good behaviour and discourage future bad behaviour;
5. The system should be based on risk management principles;
6. The system should avoid cross subsidies;
7. The system should attempt to avoid large and uncertain increases in the amount of financial assurance;
8. The Government will seek to manage its financial risks to minimise any budgetary impact;
9. Any new model should, where possible, not materially increase the administrative burden; and
10. Financial assurance should be readily converted into cash.

Models for financial assurance can be compared by benchmarking them against these principles. Not all attributes will be met in any one model. By changing the models slightly or using a combination, the DPI and stakeholders can determine which system is appropriate for their purposes.



3 Alternative models in use globally

As part of the literature review performed, a number of alternative forms of financial assurance and models in use globally were identified. These are outlined below.

3.1 Forms of financial assurance

There are many models for financial assurance in place across the world. Many jurisdictions accept more than one form of financial assurance.

3.1.1 Bank guarantee

A bank guarantee, or letter of credit, is an agreement between the operator and the bank that funds will be provided to the government (or addressee) for rehabilitation purposes if needed. The government must decide from which banks they will accept a guarantee. The guarantee is administratively simple for the government. For the operator however it can limit their access to capital, as it is considered to be the provision of credit by the financial institution.

3.1.2 Trust fund

A trust fund can be set up by the operator, with the agreement being that the money is to be used for rehabilitation only. Contributions would be made to the fund according to a payment schedule which makes them predictable, meaning the operator can budget for the assurance and there are no unanticipated increases in the amount of assurance which must be provided. The operator and government should agree on how the money will be invested. The advantage is that the fund can appreciate. However, poor investment choices can cause a loss in value, and if a company becomes insolvent, the bank may take priority over environmental stakeholders when it comes to the distribution of funds from the trust. The trust would have to be set up to avoid this risk. The DPI would also need to be able to monitor the trust and ensure that it holds the agreed upon level of funds.

3.1.3 Insurance

Taking out insurance is another way to mitigate rehabilitation risk. However, it creates a moral hazard and the market for appropriate insurance schemes is limited. Because insurance must be periodically renewed, there is always the chance that the insurer will decide not to renew it. The risk may increase towards the end of the life of a mine, when rehabilitation costs increase and there is not much value left in the mine. Insurance may be better used in conjunction with another assurance option. It has been suggested that insurance could be used in conjunction with a sinking fund. The insurance would cover any shortfall if the cost of rehabilitation exceeded the level of available funds.

3.1.4 Sinking Fund

Sinking funds are built up incrementally, with the operators making scheduled contributions until the full amount of required financial assurance has been reached. Contributions towards the fund then become minimal (unless the fund has had to pay out or has suffered an investment loss). Alternatively, to take advantage of the fact that not all operators will fail to rehabilitate their site, Victorian operators could contribute to a common sinking fund. This creates a cross-subsidy risk, with responsible operators footing the bill for those who have not met their rehabilitation



obligations. However it takes advantage of the fact that the failure rate is less than 100%, meaning operators do not have to put forward the full amount of their rehabilitation costs.

These models for mining securities are some of the more popular mechanisms used in different jurisdictions. The common themes are that the rehabilitation cost is estimated by the operator, and reviewed by the regulating body or government. Funds are not usually released prior to successful rehabilitation though they can be partially released in some jurisdictions.

3.2 Implementation

There are many differences between jurisdictions in the way financial assurance models are implemented, with some notable features discussed below.

3.2.1 Queensland

Queensland accepts cash, a bank guarantee or an insurance bond. A discount is granted based on past environmental good practice. Discounts of up to 75 percent were allowed up until 2009 when this was reduced to 30 percent (World Bank paper, see references).

3.2.2 Nevada

Nevada in the United States accepts several forms of financial assurance. An operator may use one or even several of these forms to provide assurance. There are also arrangements in place to assist small operators. For example, cash deposits are accepted from smaller operators who may not be able to obtain a bank guarantee.

3.2.3 Ontario

In Ontario, Canada, several forms of assurance are acceptable. Company guarantees account for two thirds of the funds held as security. A company guarantee is only accepted from companies with a stable financial history and a good credit rating.

3.2.4 Manitoba

In Manitoba, Canada, operators make scheduled contributions towards financial assurance. Contributions start off as a small proportion of the total amount required, and increase with the lifetime of the mine. The majority of the financial assurance is put forward towards the end of the life of the mine. This way, capital is not tied up during the entire operation.

3.2.5 South Australia

South Australia acknowledges the differences between mines and quarries by having two separate arrangements for the financial assurance of rehabilitation (bonds for mining and a levy for quarrying). This is the only state where this happens and is possibly motivated by the idea that quarries have more predictable extractions than mines in general. The Primary Industries and Resources S.A. (PIRSA) acknowledges in its discussion paper (see references) that it is arguable whether there is a significant difference which justifies this.



4 Proposed alternatives to the current system

Current System

In the following sections we present five alternatives to the current system developed through consultation with the working group. The current system, as described above, serves as an alternative itself (that is, leave the system unchanged). It also may be used as the alternative for those not wanting to enter into any "risk sharing" scheme, or as the default option for those not permitted entry into another system or removed from another system by the Government. The main characteristics of the system are summarised below:

- The amount of the bond to be provided is estimated by a bond calculator.
- The amount is periodically reviewed and may be amended to match the liability. Operators may request a reduction in the bond if the rehabilitation liability of the site has been significantly reduced.
- The liability is estimated based on the assumption that rehabilitation would be undertaken by a third party.
- Bonds are only accepted in the form of an unconditional bank guarantee (sometimes referred to as a Letter of Credit).
- This is demonstrated graphically in figure 1.

Current Unconditional Performance Bond System

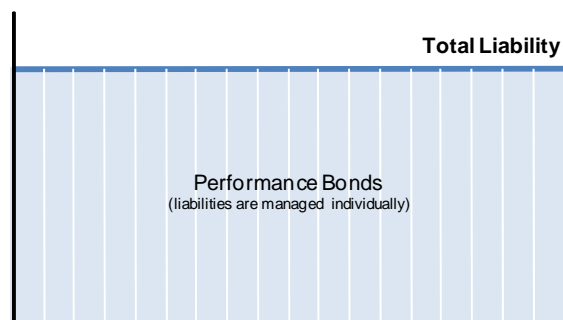


Figure 1: The current unconditional performance bond system

4.1 Alternative 1 – Discounted performance bond system

4.1.1 The Model

- Like the current model, operators would still be required to provide performance bonds at a level of surety considered to cover the expected liability for the current review period.
- To address some of the issues noted in the foregoing discussion, a number of possible features for Alternative 1 include:



- Allowing additional forms of financial assurance to provide additional flexibility to operators;
 - A fixed / agreed schedule for increases in the bond amount;
 - Allowing the release of a portion the bond for ongoing rehabilitation; and
 - Offering a discount based on past performance.
- Figure 2 demonstrates these features:

Discounted Performance Bond System

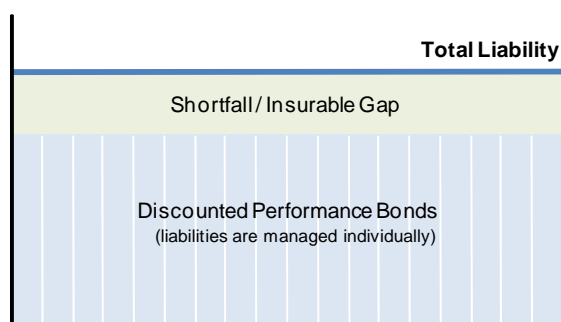


Figure 2: A possible discounted performance bond system

4.1.2 Evaluation against specified criteria

The model offers the following potential advantages in that it:

- Is easy to implement as minimal changes would be required;
- May provide more predictable calculations of bond liabilities due to simplification in the calculation methodology;
- Has increased predictability in cash flows due to a fixed schedule of increases;
- Increases access to capital to facilitate rehabilitation due to the releasing of portions of the bond; and
- Rewards those members of the industry who have demonstrated past good behaviour.

The following disadvantages are associated with the model:

- It does not reflect the historically low failure rate at an industry level;
- The Government has the extra liability in the event that an operator with a discounted bond defaults on their rehabilitation obligation;



- The system may become administratively complex if projects change significantly over time; and
- It may not offer sufficient change to the current system to address operator concerns.

4.1.3 Discussion

While the suggested reforms address some of the industry's current concerns, an issue remains around the locking up of capital in an unconditional performance bond system. Any discounts on the bond would reduce this somewhat, but at the same time may transfer an unacceptable level of risk to the Government.

The suggestion of allowing the progressive release of the bonds to facilitate rehabilitation was well received during the working group meetings. However, based on the paper released by the World Bank, it seems that no jurisdiction around the world currently does this on a scheduled basis. One potential issue is that the rehabilitation may not be carried out at an acceptable level by the operator after the bond is released.

4.2 Alternative 2 – Government-owned site rehabilitation sinking fund system

4.2.1 The Model

- This system would work in two parts. Each operator (for those that opt into the system) establishes an individual performance bond in the same manner as the current system (an initial bond), but with a significant discount on the amount required. Each operator would contribute to an industry rehabilitation 'sinking fund' controlled and owned by the Victorian Government (DPI).
- Contribution to the sinking fund would be proportional to the operator's liability. However, consideration would need to be given to the concentration effect created by a number of large operators which may destabilise the fund.
- It is proposed that the contribution to the sinking fund be made in annual cash payments. The fund would be owned by the Government and drawn on at the Government's discretion.
- In the event that there is a default, the operator who defaults will have their individual performance bond called. The remaining liability will be called from the sinking fund, with the fund then pursuing the defaulting operator for reimbursement where feasible.
- On closure of a site, the operator will have their individual bond returned (provided the operator has met its obligations). Contributions to the sinking fund are non-refundable, but will be transferable where ownership of a site is transferred.
- Entry into the scheme will be optional (for operators and for the DPI) on the basis of meeting pre-defined scorecard criteria, with the alternative being an the current unconditional performance bond system. Possible factors for a scorecard include: financial stability; credit rating; past performance; years in industry; management experience; community benefit; the use of a third party accredited environmental management system; and reference checking.



- In the event that an operator does not opt in or is not granted access by the DPI, then that operator would default to the current scheme.
- For the scheme to operate it would need to have a 'critical mass' of operators.
- Moral hazard would be mitigated by civil and/or criminal penalties which may include the exclusion of directors and/or senior management from the industry.
- The DPI would need to monitor financial KPIs and where appropriate, exercise its right to move operators back into the default scheme.
- The DPI could also consider taking out an insurance policy to cover any shortfall which may arise due to the use of the sinking fund. This is discussed below.
- There would need to be a transition period for the sinking fund to accumulate sufficient funds. At a contribution of 1% of total liability, this would take approximately 10 years; at a contribution rate of 2%, this would take approximately 5 years.
- Appendix B provides an analysis of the potential level of assurance required. However, if this model were to be used the Government would need to determine what level of risk that it is willing to bear and what the appropriate amounts are for that level of risk.
- Figure 3 demonstrates these features:

Government-Owned Sinking Fund System

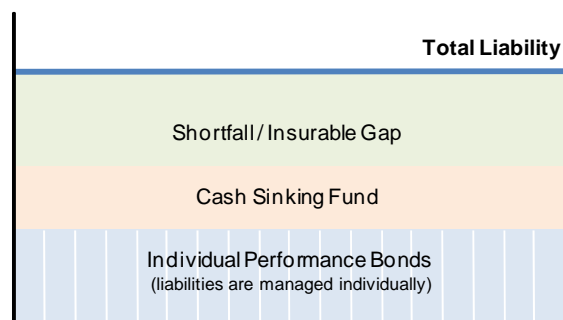


Figure 3: A cash sinking fund on top of discounted performance bonds

4.2.2 Evaluation against specified criteria

The model offers the following potential advantages in that:

- Risks are managed by the Government using a portfolio approach;
- The amount of capital tied up in performance bonds is significantly reduced;
- Past good behaviour is rewarded and future good behaviour is encouraged in terms of ongoing rehabilitation; and



- The contributions to the sinking fund and the premium for Government insurance could be funded by the savings due to the reduction in fees from performance bonds. A typical performance bond attracts a fee of approximately 2 to 3 per cent (depending on the financial strength of the operator), and hence a 2% contribution to the sinking would approximate the saving on the bank fees for the performance bond.

The following disadvantages are associated with the model:

- In the event of any default, the sinking fund will create a cross subsidy for the operator that defaults (and non-defaulting operators will have to “restore” the sinking fund by paying the amount that has been paid out of the sinking fund to bring it back to its original level, either immediately or over time);
- Complexity is added by the necessity to determine how later entrants in the scheme will compensate earlier entrants (e.g. a once-off admission fee may be needed to mitigate this); and
- There is an added layer of complexity relative to the current system.

4.2.3 Discussion

The design of this system attempts to reflect the historically low failure rate of operators to rehabilitate their sites. However, it is essential that the Government is protected from liability in the event of a default. To facilitate this, operators are required to accept some level of risk borne by other operators (through the industry sinking fund). In addition, the Government could take out an insurance policy to cover any ‘shortfall’. Any costs involved in such an insurance policy would be recovered through a fee to operators involved in the fund. It is noted that risk tolerances will vary between operators, and hence entry into the fund must be voluntary. This system would also need to be ‘backstopped’ by civil or criminal sanctions for wilful failure to honour obligations.

From an administrative point of view, implementation of the system may be costly due to the need for legislative changes and other changes within DPI. However, the savings to the industry on the whole could compensate for these costs. Given the ownership of the fund will be by the government, this will simplify fund administration.

In the case of a large drawdown, the fund would need to be built up which may require operators to make extra contributions. There would need to be a set of guidelines around this process to ensure that the fund is topped up to an appropriate level in a timely manner. The operators must be made aware of their options and obligations in the case of a default.

4.3 Alternative 3 – Industry-owned site rehabilitation bond pool system

4.3.1 The Model

- This system would work in two parts in a similar manner as the alternative outlined above. Each operator would establish a performance bond for a fixed percentage of its obligation (as outlined above). However, in lieu of a sinking fund, operators would establish a bond “pool”



(or pools) which would be owned by the members and be refundable (i.e. both bonds returned) on site closure and rehabilitation.

- It is proposed that the contributions to the bond pools be in the form of a performance bond as opposed to cash due to administrative ease on behalf of both parties.
- Third parties would manage these pools of funds built up by a group of operators which have come together to enter this scheme and would then provide financial assurance to the Government for all of these operators.
- In this case, the scheme would be self-regulated in the sense that the industry bodies set the entry criteria, with the DPI providing guidance.
- In the event that there is a default, the operator who defaults will have both of their bonds called. The remaining liability will be called from the performance bonds in the bond pool. The amount called from each operator's bond will be based on the size of their contribution to the pool relative to the total size of the pool.
- In practice, non-defaulting operators would be required to provide a pro-rata contribution in line with the loss and the size of their own liability. Only in the event of a failure to make this contribution would the bond be called.
- On closure of a site, the operator will have their initial bond returned, plus any remaining share in their bond contributed to the pool.
- Participation in the scheme will be optional for operators at the approval of DPI on the basis of meeting pre-defined scorecard criteria, with the alternative being an the current unconditional performance bond system. As discussed above, possible factors for a scorecard include: financial stability; credit rating; past performance; years in industry; management experience; community benefit; the use of a third party accredited environmental management system; and reference checking.
- Moral hazard would be mitigated by civil and/or criminal penalties which may include the exclusion of directors and/or senior management from the industry.
- The DPI could also consider taking out an insurance policy to cover any shortfall which may arise due to the exhaustion of the bond pool. This is discussed below.
- Appendix B provides an analysis of the potential level of assurance required. However, if this model were to be used the Government would need to determine what level of risk they are willing to bear and what the appropriate amounts are for that level of risk. Figure 4 demonstrates these features:



Industry-Owned Sinking Fund System

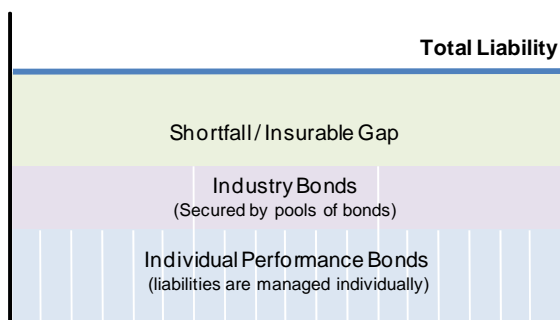


Figure 4: An industry-owned bond sinking fund system on top of discounted performance bonds

4.3.2 Evaluation against specified criteria

The model offers the following potential advantages in that:

- Risks are managed by the Government using a portfolio approach;
- The amount of capital tied up in performance bonds is significantly reduced; and
- Past good behaviour is rewarded and future good behaviour is encouraged.

The following disadvantages are associated with the model:

- In the event of any default, the bond pool will create a cross subsidy for the operator that defaults; and
- There is an added layer of complexity relative to the current system.

4.3.3 Discussion

This alternative has similar advantages and disadvantages as the Government-owned sinking fund version. The one difference comes in the ownership of the bond pool and the way in which contributions are made. An industry-owned pool signals that the industry is taking responsibility for ensuring its obligations are met on the whole, and relies on the good reputation that the industry has developed in the community through meeting these obligations in the past.

4.4 Alternative 4 – Predefined liability proportion performance bond system

4.4.1 The Model

- The system is a hybrid of the current system and the system used in the province of Manitoba, Canada.



- Under the 'Manitoban system', the amount of financial assurance to be provided in any particular year is determined using a table based on the expected life of the site, the current year of operation and the estimated cost of rehabilitation.
- As per the current system, financial assurance will still be provided in the form of a performance bond. However the timing of contributions towards the bond differs to that of the current system.
- Under the predefined liability proportion performance bond system, operators would make contributions towards their financial assurance with the amount and frequency determined by the Manitoban "track" (track 1) which represents a predefined proportion of the assessed liability.
- Contributions during the early life of the site will be smaller. Larger contributions are made toward the end of the site's life.
- The right to schedule contributions as per track 1 would be subject to certain on-going performance requirements, for example maintaining debt to equity and times interest earned ratios.
- Failure to meet those performance requirements would result in an operator being moved back to the current system (track 2), leading to an immediate increase in the amount of the bond.
- Figure 5 demonstrates this concept:

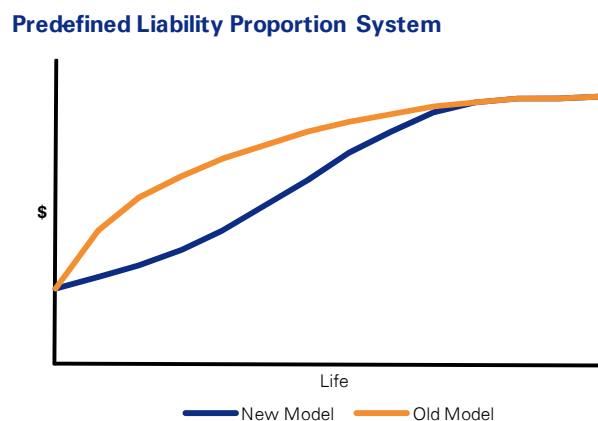


Figure 5: Possible tracks under the predefined liability proportion system

- The DPI could also consider taking out an insurance policy to cover any shortfall. This is discussed in Section 5.



- A simpler variant of the model could provide for a reduced bond in the start-up phase of operations. This would reflect not only the reduced risk of failure in the early stages, but also lesser liability in the early stages before the operation is fully constructed and operational.

4.4.2 Evaluation against specified criteria

The model offers the following potential advantages:

- Creates an incentive to perform to a defined standard through the threat of an immediate and large increase in the bond amount;
- Allows for greater access to capital during the earlier stages of the life of the site; and
- Gives a greater level of certainty due to the fixed schedule of bond increases.

The following disadvantages are associated with the model:

- Movement from track 1 to track 2 may cause financial distress to the operator;
- There could potentially be an increase in the required administration for the Government; and
- The scheme may become complicated to administer where projects change over time or the project “life” is not well known, particularly where limited mineral / stone reserves are identified at the project outset.

4.4.3 Discussion

The model offers significant benefits in terms of increased access to capital during the early life of the site, but ultimately will still require 100% of the liability to be covered by the operator later in the site’s life.

Due to the nature of mining and extractive activities, the lifetime of a mine or quarry may not be as simple as the two track system assumes. Some sites effectively have several lives, meaning frequent reassessments would be required to keep the bond contribution schedule current.

Other potential issues include the level of administration required by the Government to run such a model, in particular to keep track of the prescribed performance requirements, and the potential liability to the Government if an operator’s bond does not cover their liability in the event of default.

The model would offer the most benefit to new entrants and “younger” operations. It is less applicable to older operations, which are further through the life cycle. Such older operations may suffer a competitive disadvantage by comparison with now entrants and “younger” operations.



4.5 Alternative 5 – Insurance based system

4.5.1 The Model

- All operators would be required to hold an insurance policy to cover the risk that they will not be able to meet their rehabilitation obligations.
- The cost of closure and rehabilitation would be estimated when the insurance is taken out.
- This estimate would be reviewed every few years and the insurance policy would be updated accordingly.
- The insurance would cover the full cost for the government to complete the site rehabilitation.
- Significant penalties would apply in the case that an operator is under-insured.
- Figure 6 demonstrates these features:

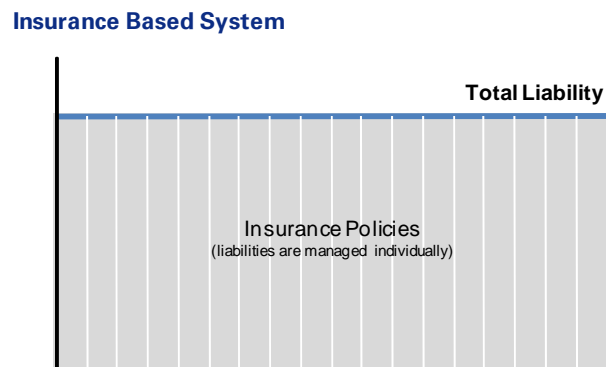


Figure 6: Individual insurance policies by operators

4.5.2 Evaluation against specified criteria

The model offers the following potential advantages:

- The cost of rehabilitating the site would be fully covered;
- Penalties provide an incentive for operators to ensure that they are adequately insured;
- Premiums paid for an insurance policy may be tax deductible; and
- Insurance is an affordable option for small operators who cannot afford the costs associated with the current performance bond system.

The following disadvantages are associated with the model:



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- There is an element of moral hazard as defaulting on the rehabilitation obligation may be the lower cost option for the operator;
- The model does not recognise past good performance or encourage future performance going forward; and
- Insurance policies may not be suitable for long-term projects as they are often short term and may not be renewed by the insurer.

4.5.3 Discussion

The primary concern with an insurance-based system is the element of moral hazard that occurs. It is acknowledged that any insurance company offering such a policy would have a vested interest in the operator not making a call on the policy, and as such would have systems in place to protect their own interests. Such systems may mitigate the moral hazard but would not eliminate it entirely.

Responses to a discussion paper from DPI in 2002 indicate that at the time there was little support for an insurance-based system. Further, the recently released Western Australian Mining Security System Preferred Option Paper has found that an insurance-based system would not be an appropriate replacement for their current system. It also appears that there is currently no insurance scheme available which is designed to cover long-term rehabilitation costs, and if there were such a scheme, it may potentially not be a cost effective alternative.

Based on the above, it appears that an insurance-based system is not a viable option as a replacement for the current system.



5 Other considerations

5.1 Insurance for the DPI

For each alternative model there is still some risk that the amount of financial assurance does not cover the full cost of rehabilitation. This could be due to unexpected costs during the rehabilitation process.

The DPI can consider taking out an insurance policy as protection against this risk. The insurance would be used to cover the gap between the amount of financial assurance provided by operators and the cost of rehabilitation, if the latter is greater.

Some investigation through an insurance authority has found that such an insurance policy may be possible. Currently there is a somewhat similar product offered by Environmental Liability insurers where, in the event that the remediation of land becomes bigger than anticipated as a result of the finding of greater quantities of pollutants than expected, the costs above a pre-agreed cap are covered by the insurance. It seems likely however, that any such new insurance product would be an expensive option.

5.2 Exclusions from a pooled fund

When a pooled fund is used, there must be transparency around the list of participants, the scorecard criteria and the level of liability of each operator. The DPI must be able to use its discretion to exclude any operator who would threaten the stability of the fund. There must be clear guidelines around the approval and exclusion process so that operators can make an informed decision about whether to opt in to the pool and accept the associated risks.

5.3 Risk currently beared by the government

The working group was informed that the rehabilitation liabilities of certain operators, due to their size, importance to the economy, and legacy issues, are greater than the financial assurance provided by those operators. Accordingly, the DPI is currently bearing this "shortfall" risk and it could be unfair to transfer this shortfall onto a revised scheme. Until this is resolved, the government should probably continue to bear this risk which may mean certain operators (where there is a shortfall between their obligations and the financial assurance they are providing) could be excluded from the pooled fund for the time being. This would appear equitable in that these operators are already receiving special consideration / discounts to financial assurance obligations and therefore should probably not receive additional benefits.



6 Summary

Through the meetings of the working group and the analysis of alternatives, a number of key themes have emerged. The most significant of these is the need to recognise the historically low failure rate of operators and through this grant some relief on the current capital requirements. The alternatives presented attempt to reflect this while striking a balance with the other factors, the most important of which is the residual risk that the Government may have to bear.

The table below benchmarks the alternatives considered above against the ten guiding principles for development outlined in the Introduction, as agreed "on balance" by the Working Group.

	Current model	Discounted bond model	Sinking fund model	Bond pool model	Predefined liability proportion model	Insurance model
1 Considers failure rate of less than 100%	Does not meet	Meets	Meets	Meets	Meets	Meets
2 Avoids moral hazard	Meets	Does not meet	Partially meets	Partially meets	Meets	Does not meet
3 Rewards past good behaviour	Partially meets	Partially Meets	Meets	Meets	Meets	Does not meet
4 Encourages (discourages) good (bad) behaviour	Meets	Does not meet	Meets	Meets	Meets	Does not meet
5 Based on risk management principles	Does not meet	Does not meet	Meets	Meets	Meets	Does not meet
6 Avoids cross subsidies	Meets	Meets	Does not meet	Partially meets	Meets	Meets
7 Avoids large uncertain increases	Partially meets	Partially meets	Partially meets	Partially meets	Meets	Meets
8 The Government minimises financial risk	Meets	Does not meet	Meets	Partially meets	Meets	Does not meet
9 Administrative burden not materially increased	Meets	Partially meets	Does not meet	Meets	Partially meets	Meets
10 Funds readily available	Meets	Meets	Meets	Meets	Meets	Does not meet

Based on this analysis and the working group discussions, it appears that the two potential candidates for a replacement model are the sinking fund / bond pool models and the two-track model. Of these, only the sinking fund / bond pool models offer a significant reduction in the capital requirements of the operators over the entire life of the site. However, as discussed this comes at the expense of creating cross subsidies.



7 References

In accordance with the terms of the engagement between KPMG and DPI, KPMG have performed a review of the relevant literature as supplied by DPI and sourced by KPMG. This literature, in addition to the outcomes of the working group meetings, has been used as a basis for forming this report. The following is a list of the documents reviewed:

- Western Australia's Mining Security System – Preferred Option Paper, Government of *Western Australia Department of Mines and Petroleum*, March 2011
- Policy Options for Mining Securities in Western Australia – Preliminary Discussion Paper, *Government of Western Australia Department of Mines and Petroleum*, December 2010
- Financial Assurance for Rehabilitation of Mine Sites and Lease Relinquishment in the Australian Minerals Industry – Minerals Council of Australia, *Ernst & Young*, July 2008
- Financial Surety – Guidelines for the Implementation of Financial Surety for Mine Closure, *Meredith Sassoon, The Work Bank*, June 2009
- Manitoba, Mine Closure Regulation 67/99 – Mine Closure Guidelines, Financial Assurance, *Manitoba Industry, Trade and Mines, Mines Branch*, March 2001
- Mine Rehabilitation in Ontario, Canada: Ten Years of Progress, *W.R. Cowan & J.G.A. Robertson*, September 1999
- Mine site rehabilitation – An economic review of current policy issues, ABARE report prepared for the Department of Industry, Science and Resources, *Chris Allen, Andrew Maurer and Marat Fainstein, ABARE*, August 2001
- Rehabilitation Bonds for the Mining and Extractive Industries – Position Paper, *State Government of Victoria, Department of Primary Industries, Minerals & Petroleum Division*, March 2004
- Review of NRE's Policy on the Determination and Application of Rehabilitation Bonds for Mining and Extractive Industries – Discussion Paper, *State Government of Victoria, Department of Natural Resources and Environment*, April 2002
- Discussion and Options Paper – Rehabilitation Bonds, *Cement, Concrete & Aggregates Australia*, March 2011
- CMPA Submission: Extractive Sector Rehabilitation Bonds, *CMPA*, March 2011
- An alternative bond model for mining and extractive industry, Author & Date unknown
- Targeted Discussion Paper No. 5 – Rehabilitation and Bonds, Author & Date unknown
- Victorian Mining / Oil & Gas Statistics, *Department of Primary Industries*, April 2011
- 2009/10 Statistical Review – Victoria's Minerals, Petroleum and Extractive Industries, *State Government of Victoria, Department of Primary Industries*, Date Unknown
- Funding of rehabilitation in the extractive industries in South Australia – Discussion Paper, *Primary Industries and Resources S.A, Minerals, Petroleum & Energy*, April 2003



A Working group meetings

Working group meetings, held at the office of the DPI, were scheduled for the following dates:

- Meeting 1: Friday 25 March 2011
- Meeting 2: Thursday 31 March 2011
- Meeting 3: Friday 29 April 2011
- Meeting 4: Thursday 26 May 2011

The meetings were attended by KPMG and the following stakeholders from the DPI, the Department of Sustainability and Environment (DSE), the Environmental Protection Authority (EPA), the Minerals Council of Australia (MCA), Cement, Concrete and Aggregates Australia (CCAA) and the Construction Materials Processors Association (CMPA):

- Mike Hollitt DPI
- Phil Roberts DPI
- John Mitas DPI
- Andrew Radojkovic DP
- Colin Thornton DPI
- Anouk Fawns DPI
- Tony Nolan DPI
- Danny Suster DPI
- Grant Smith DSE
- Gary Niewand DSE
- Stewart Dekker DSE
- David Grace DSE
- Wil Blackburn DSE
- Brad Lowe EPA
- Briony Ruse EPA
- Megan Davison MCA
- Brian Hauser CCAA
- Roger Buckley CCAA
- Bruce McClure CMPA
- Stephen Cheesewright KPMG
- Damien Barnett KPMG
- Sarah Foda KPMG



B Analysis of current and past liabilities

B.1 Current liabilities

For the purposes of this discussion paper, the value of performance bonds are used as a proxy for rehabilitation liabilities, although as discussed above this is not necessarily the case.

KPMG were provided data on the current performance bonds held by DPI. The following table provides summary statistics:

Sum	\$195,649,661
Average	\$186,156
Standard Deviation	\$1,378,436
Count	1,051

The following table lists the 10 largest current bonds:

1	\$25,050,000
2	\$24,580,000
3	\$15,000,000
4	\$15,000,000
5	\$11,460,500
6	\$6,940,500
7	\$6,200,000
8	\$5,282,000
9	\$4,547,738
10	\$4,097,500

The figure below gives a graphic representation of the distribution of bonds up to \$200,000.

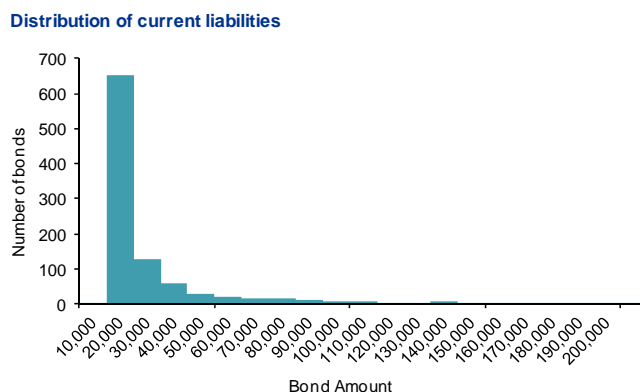


Figure 7: Distribution of current liabilities



Figure 7 shows that the majority of bonds are at the lower end of the scale. This is demonstrated by the fact that 1,037 of the 1,051 bonds held (98.67%) have a value of less than \$1 million, 1,002 of the 1,051 bonds held (95.34%) have a value less than \$300,000, and 783 of the 1,051 bonds held (75.50%) have a value less than \$20,000.

B.2 Past liabilities

KPMG was also provided with history of default data. This data revealed that since November 2005 the DPI has had to call on 24 performance bonds. Of these, only three exceeded \$20,000 (\$5.01m, \$1.72m, and \$75k).

B.3 Possible values for Government-owned sinking fund contribution

Based on the data provided for the current bonds held by the DPI, an initial bond with a face value equal to 25% of the operator's liability, plus an annual cash contribution into a common fund equal to 1% of the operator's liability may result in a pool increasing in value annually by approximately \$2m.

Of course, until the pool builds up to a level which the Government considers to cover their risks at an adequate level, some other measure would need to be relied on. For example, the initial bond may remain at 100% of the operator's liability for the first year, and gradually reduce down to 25% over the years required to build the fund up.

These values are based on a preliminary analysis of the data and will be subject to further discussion should the model be adopted.

B.4 Possible values for Industry-owned sinking fund contribution

Based on the data provided for the current bonds held by the DPI, an initial bond with a face value equal to 25% of the operator's liability, plus a secondary bond into a common fund with a face value equal to 10% of the operator's liability, would cover a substantial proportion of the Government's risk.

More specifically, the pool of bonds in the common fund would exceed \$19m, and this would cover the largest remaining liability (that is, the largest liability less the 25% covered by the operator's initial bond) of \$18.79m. At the other end of the spectrum, the pool would cover the total cost of defaults by the operators with the 966 smallest liabilities.

The above analysis is simplified in that it assumes a single bond pool with all current operators contributing to this pool. Should multiple pools be established by separate industry bodies, the contributions would be dependent on the number of participants in the pool and the combined size of their liabilities.

These values are based on a preliminary analysis of the data and will be subject to further discussion should the model be adopted.