
New South Wales Auditor-General's Report

Performance Audit

Mining Rehabilitation Security Deposits

Department of Planning and Environment



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In accordance with section 38E of the *Public Finance and Audit Act 1983*, I present a report titled **Mining Rehabilitation Security Deposits: Department of Planning and Environment**.

A handwritten signature in black ink, appearing to read 'IG'.

Ian Goodwin
Acting Auditor-General
11 May 2017

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Executive summary

This audit was undertaken when the Department of Industry, Skills and Regional Development was responsible for ensuring land disturbed by mining activities is rehabilitated in accordance with the relevant development approval, including the administration of mining rehabilitation security deposits. On 1 April 2017, this responsibility was transferred to the Department of Planning and Environment (the Department).

This audit assessed whether the Department maintains adequate security deposits to cover the liabilities associated with mine closures, including rehabilitation. Companies authorised by the Department to undertake mining activities must provide a security deposit to cover the full costs of rehabilitation in the event of default by the company. Rehabilitation is the treatment of disturbed land or water to establish a safe, stable, non-polluting and sustainable environment.

Mining companies must provide an estimate of rehabilitation costs for each site. The Department provides a Rehabilitation Cost Calculation tool to assist companies calculate the deposit amount. Companies are also required to ensure that the cost estimate is in accordance with the approved Mining Operations Plan (MOP). The MOP is intended to be a mine rehabilitation and closure plan, and forms the basis for the estimation of the security deposit. The Department reviews the estimates and determines the deposit for each site.

Security deposits are an option of last resort. The Department has other legislative and regulatory tools which it normally uses to promote compliance with rehabilitation requirements before accessing a security deposit. It can direct action by the mining company, issue fines and even have the Minister revoke a mining lease. To date, the Department has never had to access a security deposit for a state significant development mine site.

Conclusion

The Department holds security deposits for mining rehabilitation consistent with the amounts it has requested from mining companies, and it should be able to claim on a deposit if a mining company defaults on its rehabilitation obligations. The total value of deposits has increased from \$500 million in 2005 to around \$2.2 billion in 2016, covering around 450 mine sites. The Department's management of the security deposit process has improved in recent years, and it has well advanced plans for further improvement, including a revised cost calculation tool.

The Department's policy is that each mine's security deposit should cover the full costs of rehabilitation for that mine. The security deposits the Department holds are not likely to be sufficient to cover the full costs of each mine's rehabilitation in the event of a default. The rates and allowances in the current cost calculation tool have not been updated since 2013 and some activities required for effective rehabilitation are not covered, or not covered adequately.

Security deposits also do not include sufficient contingency given the substantial risks and uncertainties associated with mine rehabilitation and closure, particularly in the absence of a detailed closure plan. This risk is exacerbated by the limited independent verification of mining company claims about the size of the outstanding rehabilitation task, which remains the case despite recent improvements to monitoring and review procedures and practices.

There is also no financial assurance held over the risk of significant unexpected environmental degradation in the long-term after a mine is deemed to be rehabilitated and the security deposit is returned. A security deposit is not an appropriate vehicle for covering this risk.

Security deposits are close to calculated value and should be accessible if needed

The value of securities held by the Department aligns with the latest approved rehabilitation cost estimates. This contrasts with the situation found by investigations in Victoria and Queensland, where deposit amounts held fell below the calculated costs.

The security deposits are usually in the form of a bank guarantee or cash. The Department has obtained legal advice indicating that it should be able to claim on these bank guarantees if the need arises. As the guarantee is between the financial institution and the Department, if a mining company goes into liquidation the Department should still be able to access the funds.

When the latest estimate of rehabilitation costs is higher than the existing deposit, the Department will request additional security. It has experienced extensive delays in obtaining additional security for some sites, increasing the risk that available funds will be insufficient if needed.

Rehabilitation cost estimates are not yet adequate, but improvements are planned

The Department's policy is for security deposits to cover the full cost of rehabilitation. No discounts are provided to mining companies for past good behaviour or low likelihood of default, unlike in some other states. Discounting could undermine the policy position.

Current security deposits are unlikely to cover the full cost of rehabilitation on each mine site. The Department provides a rehabilitation cost calculation tool to help mining companies calculate the cost of rehabilitation and the required deposit amount, but:

- several activities required to effect closure are not included and others underestimated
- it does not make provision for industry cost changes over time
- the rates used in the tool have not been updated since 2013
- it was not able to provide the basis for the rates and allowances in the tool.

The Department reviews cost estimates provided by mining companies, but its verification of the extent of rehabilitation work on which these estimates are based is limited. It relies instead on section 387C of the *Mining Act 1992* which makes it an offence for mining companies to provide false or misleading information. It is not evident how the Department would establish that information provided was false or misleading without more verification work, and six of the 14 cost estimates we reviewed were not signed by the mine manager, making enforcement more difficult.

The Department has developed a new calculation tool, and recently released it for industry consultation. The new tool should improve rehabilitation estimates. It updates rates and allowances, and includes additional items to better cover required rehabilitation tasks. While a substantial improvement, the new tool could be further improved by providing additional coverage for stakeholder engagement, additional planning approvals, insurance costs, and any additional design, research and verification work required for successful closure.

There is no financial assurance over long-term environmental risks

The Department does not hold any financial assurance to cover the costs associated with mitigating any future environmental degradation once a mine closes and the security deposit is relinquished to the mining company. Security deposits are probably not the appropriate mechanism to cover these long-term risks but the risk of potential post-closure environmental degradation still needs to be costed and covered. A fund to cover the state-wide risk, to which all mines would contribute, is a possible mechanism.

Rehabilitation and closure outcomes are vague, particularly for unplanned closure

Rehabilitation outcomes in the MOPs we reviewed were generally not specific. Any lack of specificity in MOPs translates into uncertainty about rehabilitation work required if a mining company defaults. Part of the problem is that rehabilitation outcomes established in planning approvals are usually not specific and may not address all closure requirements. The Department has recognised there is scope to improve the clarity and specificity of rehabilitation requirements in planning approvals, and has started a review focusing on open-cut mines.

Rehabilitation outcomes are even less specific in the event of an unexpected early closure because they will probably be different from that achievable from a planned closure.

MOP guidelines do not cover management of some key closure matters, such as the requirements of environment protection licences issued by the Environment Protection Authority and the management of heritage sites during closure.

There were significant variations in quality of MOPs we reviewed and the way closure risks and uncertainties were identified and addressed. The Department plans to improve the quality of rehabilitation programs through enhanced guidance and oversight.

Monitoring is not adequate to effectively gauge rehabilitation progress

The Department was not able to show it has been monitoring operational mine sites effectively to gauge the progress of ongoing site rehabilitation and the management of closure risks. There was no protocol for site inspections and limited evidence of inspections for the sites we reviewed.

The Department receives annual environmental management reports from mining companies, with most describing the areas of disturbance and rehabilitation occurring at each mine site. The Department recently established procedures for reviewing these annual reports, and has developed a risk-based process for prioritising reviews.

Most annual reports we reviewed did not explain environmental changes over time, nor the risks to mine closure and the measures required to mitigate them. For example, analysis of changes to surface water and groundwater quality was limited despite its relevance for assessing future contamination risks.

The Department does not currently have adequate processes in place to effectively verify the reported areas of disturbance and rehabilitation. It is developing geographic information system-based tools to better measure areas of disturbance and rehabilitation, new rehabilitation guidelines, and a procedure for determining whether rehabilitation has been successful. These initiatives should improve the monitoring and reporting of rehabilitation progress at mine sites.

There is no mechanism to prevent a mine being in 'care and maintenance' indefinitely

The Department does not have a clear policy on the length of time and circumstances under which a mine can remain in 'care and maintenance'. Indefinite postponement of rehabilitation and closure is therefore possible. 'Care and maintenance' is the period following temporary cessation of operations when infrastructure remains largely intact and the site continues to be managed. There are a range of valid reasons for a mining company to put a mine in 'care and maintenance', but it is also reasonable for the community to expect a limit to how long it has to wait for proper rehabilitation.

Recommendations

We recommend that the Department should, by January 2018:

1. Improve the quality of rehabilitation and closure plans by:
 - ensuring plans submitted by mining companies include robust mine rehabilitation and closure risk assessments
 - clarifying the level of detail required in plans at each stage of a mine's operation
 - specifying how requirements set under other legislative instruments (e.g. environment protection licences, heritage assets) should be addressed.
2. Improve assurance that security deposits are sufficient by:
 - ensuring its new cost calculation tool adequately covers all works needed for rehabilitation and closure
 - increasing the contingency for uncertainties associated with mine rehabilitation and closure, at least until the mining company provides a detailed closure plan
 - verifying the cost estimates for a sample of high risk sites annually
 - ensuring that when mining companies are required to provide increased security deposits, they do so with minimal delay.

3. Enhance oversight of mine rehabilitation by:
 - developing a protocol to ensure sufficient and adequate site inspections
 - ensuring mining companies report performance against rehabilitation targets and environmental changes clearly, including an analysis of long-term surface water and groundwater trends in terms of levels, flow and quality
 - improving how it determines the progress and success of mine rehabilitation
 - developing clear policy and procedures for ensuring a mine cannot be put into 'care and maintenance' indefinitely.
4. Collaborate with relevant agencies to establish a financial assurance mechanism, such as a sinking fund, to cover the risk of long-term environmental degradation after mines are closed and security deposits returned.

Introduction

Mining operations make a significant contribution to the NSW economy, including over \$1.3 billion in royalties each year. Around 400 mine sites throughout NSW provide over 40,000 jobs and are a major source of economic activity for many communities. Despite these benefits, it is important to ensure that mining companies fulfil their obligations to rehabilitate land disturbed as a result of mining activity.

Exhibit 1: Distribution of mines and minerals across NSW



Source: NSW Minerals Council, 2013.

There are few examples of large mines in NSW which have been successfully rehabilitated and closed to modern environmental standards. There are a range of reasons for this including weaker rehabilitation obligations in the past, and mine sites expanding or being placed into 'care and maintenance' rather than being closed and fully rehabilitated.

Rehabilitation means establishing a safe, stable environment

Rehabilitation, as defined by the *Mining Act 1992* (the Act), is 'the treatment or management of disturbed land or water for the purpose of establishing a safe and stable environment', not necessarily returning it to its original condition. One of the objects of the Act is to ensure effective rehabilitation of disturbed land and water. The Department's Mine Operations Plan (MOP) guidelines state that, as a minimum, all rehabilitation should result in an agreed post mining land use goal that is safe, stable, non-polluting and sustainable.

Rehabilitation is supposed to be undertaken progressively over the life of the mine and is subject to monitoring by the Department. Mining companies must submit an annual environmental management report, which is meant to detail the progress of rehabilitation against the forecasts presented in their MOPs.

Mine closure planning is a process that extends over the mine life cycle and includes decommissioning and rehabilitation. It typically culminates in relinquishment of the mining lease. It includes decommissioning and rehabilitation. The term 'closure' alone is sometimes used to indicate the point at which operations cease, infrastructure is removed and management of the site is largely limited to monitoring.

Rehabilitation requirements are established in mining approval process

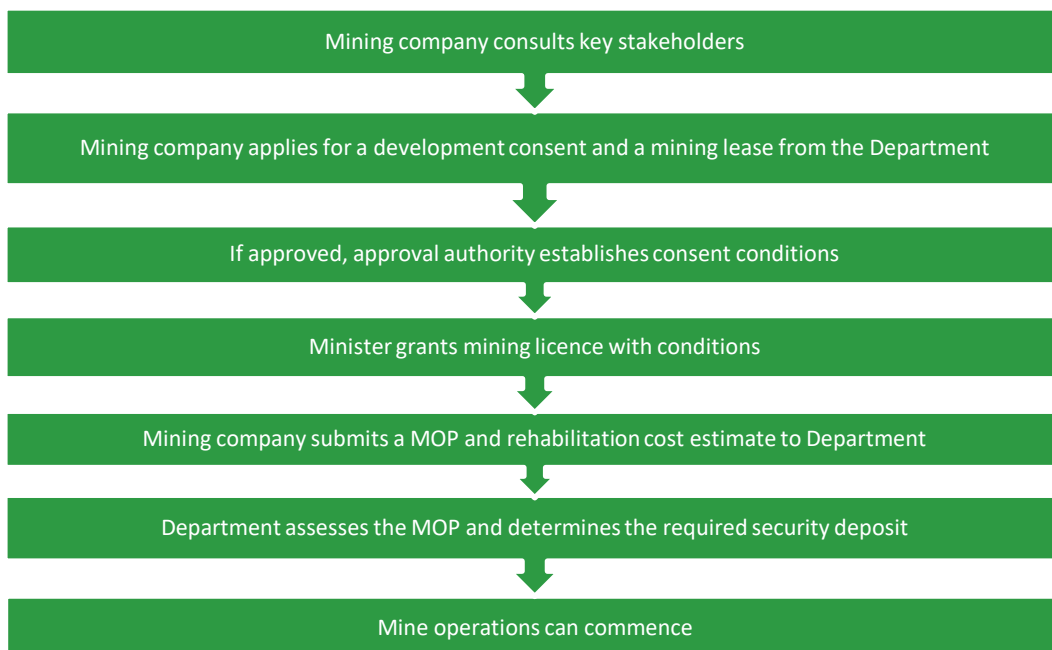
Mining companies are required to rehabilitate sites in accordance with consent conditions set in the development approval. Companies must apply to the Department for all state significant mining operations. The application includes an Environmental Impact Statement, which considers the potential impacts of mining operations on biodiversity, water management and the ecological stability of the area to be mined. Mining companies must also apply for a mining lease through the Department.

Under a Ministerial delegation, the Planning Assessment Commission may determine all state significant development. The State and Regional Development State Environmental Planning Policy sets out categories of development that qualify as state significant development. This includes development for the purpose of mining that is coal or mineral sands mining, or is in an environmentally sensitive area of state significance, or has a capital investment value of more than \$30 million.

When granting development consent, the approval authority will impose site-specific consent conditions to minimise potential environmental impacts as well as set final land use objectives that must be met following rehabilitation. Mining companies use these objectives to develop rehabilitation completion criteria for inclusion in a MOP to be provided to the Department. The MOP includes details of proposed mining activities, including management of relevant environmental issues and rehabilitation activities.

As part of their mining approval, mining companies must submit a rehabilitation cost estimate to the Department. The cost estimate, which is usually calculated using the rehabilitation cost calculation tool, is based on the total costs of rehabilitating the site at the point of maximum land disturbance during the period of the MOP or the current level of disturbance. A mining company may choose to use another calculation method but this must be approved by the Department. The Department reviews the rehabilitation cost estimate and determines the amount of the security deposit the mining company must provide prior to commencing operations. A security deposit is in the form of a bank guarantee or cash.

Exhibit 2: Mining approval process



Source: Audit Office research, 2017.

The Department will approve a MOP and rehabilitation cost estimate for a period of up to seven years. Mining companies are required to submit a new MOP and cost estimate prior to the expiry of their current MOP. A new MOP and cost estimate are also required if there are changes to the development consent or closure criteria, major variations from the planned

surface footprint of the mine, if the mine is placed into care and maintenance, or premature or unplanned closure. Where security is calculated on the current level of disturbance, a new rehabilitation cost estimate is to be submitted on an annual basis.

Security deposits are an option of last resort

The Department has a number of other tools to promote compliance with progressive and final rehabilitation requirements. It can direct a mining company, under section 240 of the Act, to conduct rehabilitation activities should the company fail to fulfil its rehabilitation obligations under consent conditions or the mining lease. The Department can use this provision to force a mining company to cease operations if there is the potential for significant environmental harm, regardless of the original consent conditions. Failure to comply with a section 240 direction can result in fines of up to \$1.1 million and additional penalties for each day the offence continues. In addition, failure to comply with a direction may be sufficient grounds for the Minister to access the relevant security deposit.

If the Department has concerns about rehabilitation planning or progress at a site it can also request an audit to provide information on compliance or otherwise with obligations under the mining lease, MOP or consent conditions, and proposed mitigation strategies.

If the Minister is still unsatisfied by the rehabilitation activities of a mining company, the Minister can revoke the mining lease. Without a mining lease, the company cannot legally continue operations and could be forced to begin closing and rehabilitating the site.

Security deposits can only be accessed if the mining company fails to comply with a section 240 direction, or does not hold a current mining lease. To date, the Department has never had to access a security deposit for a state significant development mine, although it has accessed deposits for some smaller derelict sites.

Security deposit policy says full cost to be covered

The Department's policy on rehabilitation security deposits states the security deposit must cover the government's full costs in undertaking rehabilitation in the event of default by the titleholder. This is consistent with the Act, which enables the Department to require the holder of the mining lease to provide and maintain a security deposit to secure funding for the fulfilment of obligations under the lease. These obligations include the requirement to rehabilitate land or water that is or may be affected by its activities.

About this audit

This audit assessed whether the Department maintains adequate security deposits to cover the liabilities associated with mine closures including rehabilitation.

In making this assessment, the audit examined whether the Department:

1. has a clear understanding of closure and rehabilitation outcomes for each mine site
2. maintains reasonable estimates of closure and rehabilitation costs including contingencies
3. undertakes ongoing reviews of the extent of disturbance and rehabilitation at each major mine site
4. can access adequate security deposits to cover the costs of closure and rehabilitation when needed.

The audit focused on large coal and metalliferous mining operations, as they account for the majority of the mining-related disturbance across NSW. We reviewed 13 mines comprising a mix of underground and open-cut sites, spread across three regions. Eight sites were operational, three sites had ceased operations and two sites were in 'care and maintenance'.

The Department's response to the audit report is at Appendix 1. Further information on the audit scope and criteria is at Appendix 2.

Key findings

1. Clarity of outcomes and rehabilitation requirements

To ensure that security deposits are sufficient, the Department needs a clear understanding of the closure outcomes to be achieved for each mine site, as well as the activities and the time required to achieve these outcomes.

Closure outcomes in MOPs are usually not specific, especially in relation to key challenges such as the management of open-cut pit voids, waste rock landforms, tailings dams and surface and groundwater, and how post-mining land use is agreed with stakeholders. The lack of specificity translates into uncertainty about the rehabilitation work required to be undertaken should a mining company default on its rehabilitation obligations. Mining companies need to prepare detailed closure plans prior to a planned closure but there is no clear policy on when this should occur and, historically, most mine closures have not been planned.

There is also significant variation in the quality of MOPs and the way risks and uncertainties are identified and addressed. The MOP guidelines provide limited information on the steps required to meet closure criteria and the level of detail required in closure plans at each stage of a mine's operation. The guidelines also lack information on managing some key closure concerns such as how the requirements of environment protection licences issued by the Environment Protection Authority are to be addressed at closure. Management of heritage sites is also not addressed in the guidelines.

The Department is yet to develop a clear policy on the length of time a mine can be in 'care and maintenance' and the circumstances in which a mine can continue in that condition. This creates the potential for mine closure to be postponed indefinitely.

The Department is reviewing the mine regulatory process for current and future open-cut coal mines. It advised the review is likely to examine the planning approval process, including specificity about the outcomes to be achieved and the standard of rehabilitation required. The Department is also planning improved guidance and enhanced oversight, which should improve the quality and consistency of rehabilitation of mine sites.

Recommendations

The Department should:

- improve the quality of rehabilitation and closure plans by:
 - ensuring plans submitted by mining companies include robust mine rehabilitation and closure risk assessments
 - clarifying the level of detail required in plans at each stage of a mine's operation
 - specifying how requirements set under other legislative instruments (e.g. environment protection licences, heritage assets) should be addressed
- enhance oversight of mine rehabilitation by developing a clear policy and procedures for ensuring a mine cannot be put into 'care and maintenance' indefinitely.

1.1 Department's requirements for MOPs

Guidelines developed for MOPS

The Department has processes to obtain an understanding of rehabilitation requirements for each site. It has issued guidelines which require mining companies to include planning consent conditions, mining lease conditions and other rehabilitation obligations in MOPs.

The guidelines require mining companies to document activities that will occur over the MOP term (up to seven years) including progressive rehabilitation, investigations and research, monitoring and any decommissioning work. The guidelines also require an environmental risk

assessment to be undertaken, in accordance with the requirements of AS/NZS ISO 31000:2009, 'Risk Management - Principles and Guidelines', although there is no specific requirement to focus on rehabilitation and closure risks. The guidelines also identify a range of risks to rehabilitation that may need to be addressed including the potential for acid and metalliferous mine drainage, erosion, slope stability, subsidence, and flora and fauna management.

Mining companies must submit a MOP

The MOP guidelines and mining lease require an approved MOP to be in place prior to commencing any significant surface-disturbing activities. MOPs are required to:

- be consistent with any development consent requirements
- be based on objectives and outcomes developed with stakeholder involvement
- provide sufficient detail, supported by scientific and engineering assessment and/or peer review where appropriate, to clearly demonstrate that the objectives and outcomes defined in the MOP will be met.

The Department had a current MOP in place for each operational mine site we examined. It has recently prepared a checklist for reviewing MOPs. It also has processes to approve MOPs or 'refuse' them and seek further information from mining companies.

MOPs aim to cover rehabilitation and closure

The MOP guidelines state that the MOP is intended to fulfil the function of both a rehabilitation plan and a mine closure plan, and it also forms the basis for the estimation of the security deposit. The guidelines also require MOPs to document the long-term mine closure principles and outcomes while outlining the proposed rehabilitation activities during the MOP term.

The guidelines provide limited information on detailed closure planning including the steps required to meet closure criteria and the level of detail required in closure plans at each stage of a mine's operation. Some other jurisdictions, such as Western Australia, have guidelines encouraging detailed closure planning early in the life of a mine to ensure adequate forward planning to minimise the risk of long term legacy issues.

Further, the International Council on Mining and Metals toolkit on Planning for Integrated Mine Closure states that an active and detailed closure plan that is in effect during the early stages of operations represents good practice. In addition to allowing the mine plenty of time to fine tune and optimise closure outcomes, a fully detailed closure plan increases the ability of an operating mine to deal with issues such as unplanned closure.

The MOP guidelines provide limited information on how any offsite impacts from a mine will be managed under an environment protection licence issued by the Environment Protection Authority and the steps required to relinquish the licence post-closure. The guidelines also lack information on how heritage sites will be managed during and after closure. This presents a risk that these requirements will not be adequately managed and costed in rehabilitation calculations.

1.2 Clarity of outcomes in MOPs

High level of uncertainty in closure planning

As previously indicated, MOPs are intended to fulfil the function of a mine closure plan. MOPs we reviewed included broad, high-level information on mine closure including final landforms and land use as well as closure criteria. Mining companies will need to prepare detailed closure plans prior to a planned closure but there is no clear policy on when this should occur and, historically, most mine closures have not been planned.

Typical uncertainties around mine closure include final void management, containment of tailings, repairs required to address subsidence, stability of slopes and erosion control. There may also be the potential for saline or acid and metalliferous mine drainage, surface and groundwater interaction following cessation of dewatering and the need for ongoing management or treatment, as well as uncertainties associated with vegetation establishment.

Uncertainty can also exist around whether materials required to rehabilitate a mine are readily available on site or will need to be imported at additional cost.

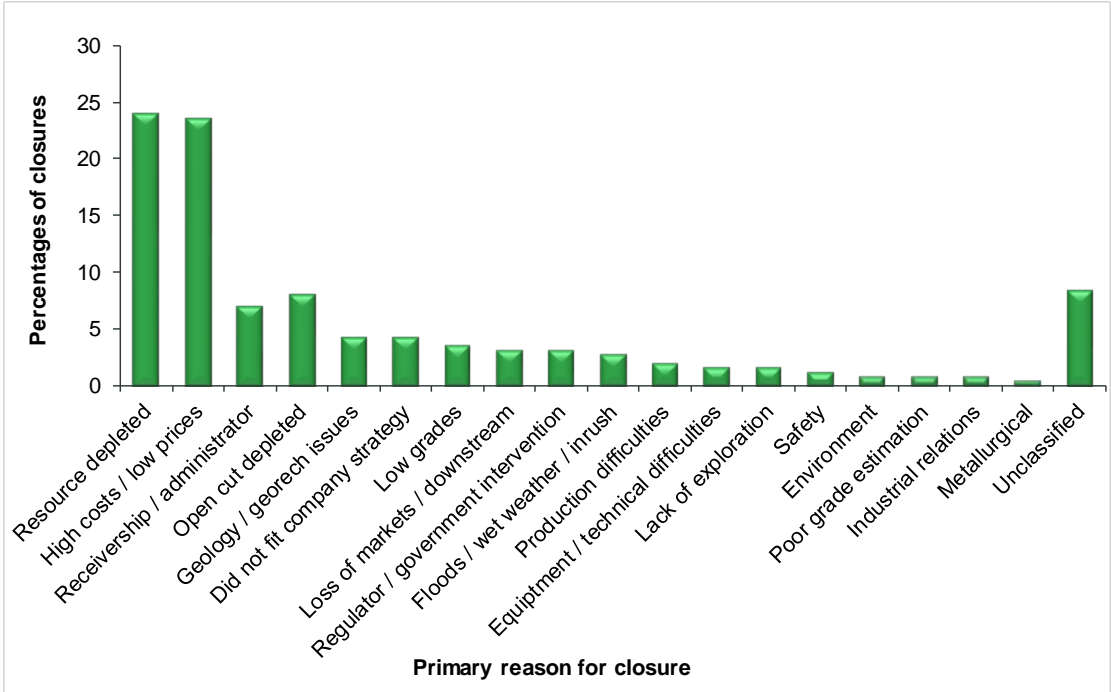
The estimated time between cessation of mining and successful rehabilitation and closure is another uncertainty, being difficult to estimate as it depends on many variables. However, it is a cost-critical aspect of closure planning and expert advice indicates it has been underestimated in most mine closures. A review of 73 mine closure plans dating from 2007 to 2013 showed that, on average, relinquishment of the mining lease is proposed to be achieved in 11 years. A separate review of 57 mines in actual closure shows that only five have so far achieved relinquishment with an average closure period of 14 years after production ceased. The remaining 91 per cent of sites in closure had an average closure duration of over 21 years and counting.

There can be no detailed plan for unexpected early mine closure

The Department will not have a clear picture of what each site will look like if it closes prematurely, and the specific tasks required for successful rehabilitation and closure. Practical planning for sudden closure cannot be done in detail, as the circumstances surrounding the closure may dictate possible closure scenarios. Being prepared for sudden closure relies instead on regular updates of the detailed closure plan, which gives the closure planner the ability to rapidly evaluate the remaining unknowns and risks associated with closure and to develop a plan.

If an open-cut mine site closes prematurely, the agreed final land use may not be achievable and the approved final landform will probably not be achieved. A 2006 review of 800 mines in Australia over 25 years from 1981–2005 found that unexpected early closures accounted for around 75 per cent of mine closures. That is, only around 25 per cent of mines closed due to the anticipated resources being depleted.

Exhibit 3: Mine Closures 1981–2005 - Primary reason for closure



Source: Laurence, 2006.

MOPs discuss key aspects of rehabilitation but quality varies

Most MOPs we reviewed contained information on key aspects of site rehabilitation and environmental management for the period of the MOP. This information included anticipated progress with revegetation, stabilisation and erosion control, managing potential sources of contamination, surface and groundwater management, rehabilitation risks and short-term rehabilitation targets.

MOPs are meant to form the basis for the estimation of security deposits. We found the quality of MOPs and their suitability for this purpose varied. Some MOPs provided clear and meaningful information on areas of disturbance across the mine site and key closure risks and uncertainties, whereas this information was not readily available in other MOPs.

Some MOPs we examined provided commentary on the research and trials that will be required to address closure risks and uncertainties such as slope stability and erosion control, and surface water and groundwater quality, management of voids and capping of tailings dams. However, some other MOPs did not identify these risks and how they will be managed.

Only a few of the MOPs included a robust risk assessment of rehabilitation and closure risks and their treatment. One MOP, in particular, contained a much greater level of detail although it was mainly focused on revegetation and landform stability aspects and did not adequately cover other closure risks such as management of final voids, tailings dams and surface water and groundwater. Further, although 10 out of 13 case-study sites reported cultural or natural heritage items, only three of the MOPs reviewed provided a discussion of the management of these heritage items.

Most of the MOPs we examined discussed closure criteria but most were vague and provided limited information on how the criteria are to be achieved. Part of the problem is that rehabilitation outcomes established in planning approvals are also usually not specific.

For example, planning approvals generally contain limited information on landforms for final voids and little or no information on their final land use and how any water that forms in the void is to be managed post-closure. One site we visited had completed operations in one of its open-cut pit voids but the current planning approval, while allowing the void, does not specify how it is to be managed and used following mine closure. Rather, the requirement is for the company to produce a strategy to investigate options for the future use of the void.

Exhibit 4: Project approval allows for open-cut pit void



Source: Audit Office site visit 2016.

Over time, many open-cut pit voids will begin to fill with water. The water may be acidic and contain metals and/or may be highly saline. At some point the void water may start to interact with groundwater and surface water causing degradation of water resources. Water quality will therefore need to be monitored and managed for many years to ensure any potential impact on the surrounding environment is adequately mitigated.

We note that the Department is reviewing the mine regulatory process for current and future open-cut coal mines. We are advised that this review is likely to examine the planning approval process, including specificity around the outcomes to be achieved and the standard of rehabilitation required.

The Department has plans to strengthen focus on rehabilitation in MOPs

The Department plans to increase its focus on rehabilitation management by implementing its rehabilitation reform package. This includes new rehabilitation management plan guidelines, intended to replace the MOP guidelines, which should help to address concerns regarding closure planning and the variable quality of MOPs.

As previously noted, the Department is also reviewing the mine regulatory process for current and future open-cut coal mines. The draft terms of reference state that a key deliverable will be criteria for acceptability of post-mining landform and land use, and options to improve progressive rehabilitation outcomes. The project is currently scheduled for completion in December 2017. These initiatives should help to improve rehabilitation and closure outcomes and reduce uncertainty, particularly for planned closures of open-cut coal mines.

No clear timeframes around care and maintenance

Mine site 'care and maintenance' is defined as the period following temporary cessation of operations when infrastructure remains largely intact and the site continues to be managed. If a mine is placed into care and maintenance the MOP guidelines require a new MOP to be prepared.

Placing a mine into care and maintenance allows a mining company time to reassess the availability of economically viable mineral resources, examine options for the site and apply for further planning consents if it wishes to continue mining. A number of stakeholders we consulted believe it is a convenient way for mining companies to postpone site rehabilitation and closure.

One site we examined had been under care and maintenance for around a decade, with the MOP providing limited detail on how closure risks will be addressed. The Department advised that of the 105 mines classed as state significant sites 12 are in care and maintenance. It also advised that the total number of mines currently in care and maintenance is 86 out of a total of around 450 sites.

The Department is yet to develop a clear policy on the length of time a mine can be in care and maintenance and the circumstances in which a mine can continue in that condition. It has to deal with the competing objectives of mine rehabilitation and ensuring the continued availability of mineral resources. This creates the potential for mine closure to be postponed indefinitely.

Off-title impacts now included in the *Mining Act 1992*

Off-title impacts from mining activities, such as damage to creeks and roads due to underground mining subsidence, have been recently included in the *Mining Act 1992*. The Department has taken steps to ensure off-title impacts from mine sites are captured in MOPs and rehabilitation cost estimates. This should improve outcomes for these sites.

Costs associated with off-title impacts were included in one of the cost estimates we reviewed. These costs related to the repair of the base of the stream and the rock bars (i.e. natural weirs) in a creek following subsidence and cracking due to underground mining. The project approval for the mine required that there be no change in the natural drainage behaviour of pools and minimal iron staining. The rehabilitation objective was to restore surface flow and pool holding capacity as soon as reasonably practicable.

The cracking, following underground mining, allowed the stream flow to disappear underground and at least partially re-emerge downstream. Its interaction with the rock strata caused it to collect iron compounds on the way. This caused significant iron staining and adversely impacted water quality.

Exhibit 5: Repairs to cracking in creek following underground mining



Source: Water NSW 2017.

The mining company is currently conducting trials in an effort to repair the rock bars. The repair process involves vertical drilling into each damaged rock bar and injecting polyurethane to form an impermeable curtain underground. This is designed to force the water back to the surface and across the rock bar. Advice we received indicates that some flow has returned in the creek but more monitoring is required during dry periods to determine the long-term success of the repair works and any residual impacts on stream flow and water quality.

2. Calculating the cost of rehabilitation

The Department's policy is for security deposits to cover the full cost of rehabilitation. No discounts are provided to mining companies for past good behaviour or low likelihood of default, unlike in some other States.

The security deposits the Department holds are not likely to be sufficient to cover the full costs of each mine's rehabilitation in the event of a default. The Department provides a Rehabilitation Cost Calculation tool to help mining companies calculate the cost of rehabilitation and the required deposit amount, but:

- several activities required to effect closure are not included and others are under-costed
- it does not make provision for industry cost changes over time, even though the period between one cost calculation for a mine site and the next can be up to seven years
- the rates used in the tool have not been updated since 2013
- the basis for the rates and allowances set in the tool is not documented.

The Department recently released a new calculation tool for industry consultation. If implemented, the new tool should improve the rehabilitation estimates. It updates rates and allowances, and includes additional items to better cover required rehabilitation tasks. The Department was also able to provide a basis for how the rates and allowances in the new tool were derived. While a substantial improvement, the new tool could be further improved by providing additional coverage for stakeholder engagement, additional planning approvals, insurance costs, and any additional design, research and verification work required for successful closure.

Security deposits may not be adequate to cover uncertainties associated with planned and unplanned mine closure as discussed in the previous chapter. The deposits are also not designed to cover the risk of environmental degradation after a mine is closed and the deposit returned to the mining company. This needs to be costed and covered as part of a separate mechanism such as a sinking fund.

The Department reviews cost estimates provided by mining companies, but verification of the required rehabilitation work on which these estimates are based is limited.

Recommendations

The Department should:

- increase certainty that security deposits are sufficient by:
 - ensuring its new cost calculation tool adequately covers all works needed for rehabilitation and closure
 - increasing the contingency for uncertainties associated with mine rehabilitation and closure, at least until the mining company provides a detailed closure plan
 - verifying the cost estimates for a sample of high risk sites annually
- collaborate with relevant agencies to establish a financial assurance mechanism, such as a sinking fund, to cover the risk of long-term environmental degradation after mines are closed and security deposits returned.

2.1 Calculating rehabilitation costs

Deposits should cover 100 per cent of rehabilitation costs

The Department has issued a clear policy statement which says that deposits must cover the government's full costs in undertaking rehabilitation in the event of a default. The Department has increased the total amount of security deposits held from nearly \$500 million in 2005 to

around \$2.2 billion in 2016. The Department advises that this increase coincides with gradual improvements in the way deposits are calculated and collected.

Mining companies must calculate rehabilitation costs

Mining companies must submit a new rehabilitation cost estimate whenever a security deposit review is required. A review can be triggered by a mining lease renewal or transfer, a new or amended MOP, as part of an annual environmental management report, a request from the Department or a request from the mining company.

The Department has produced procedures and a form for mining companies to submit these cost estimates. Companies can choose to use the Department's calculation tool to estimate the costs or they can use another approved method.

All operational mine sites we examined, apart from one, had provided rehabilitation cost estimates calculated using the tool. The remaining site employs its own tool that was approved by the Department.

Companies must ensure that the cost estimate is based on the rehabilitation and closure details in the MOP. The MOP is required to provide information such as areas of disturbance and infrastructure assets requiring eventual removal. It also needs to identify aspects of the site that need to be managed to achieve closure, including final landforms and land use.

Department developed tool for calculating rehabilitation costs

The Department's rehabilitation cost calculation tool is in the form of a series of spreadsheets by domains, or mine site areas, with a schedule of rates and unit costs for each activity. The Department has produced guidelines to support the tool and the security deposit review process.

We identified anomalies with the way the calculation tool was being used by some mining companies. There were errors in some calculations, although these were not material, and some rates were changed without explanation. Rates are not locked in the spreadsheet and can be altered without explanation.

2.2 Reviewing rehabilitation costs

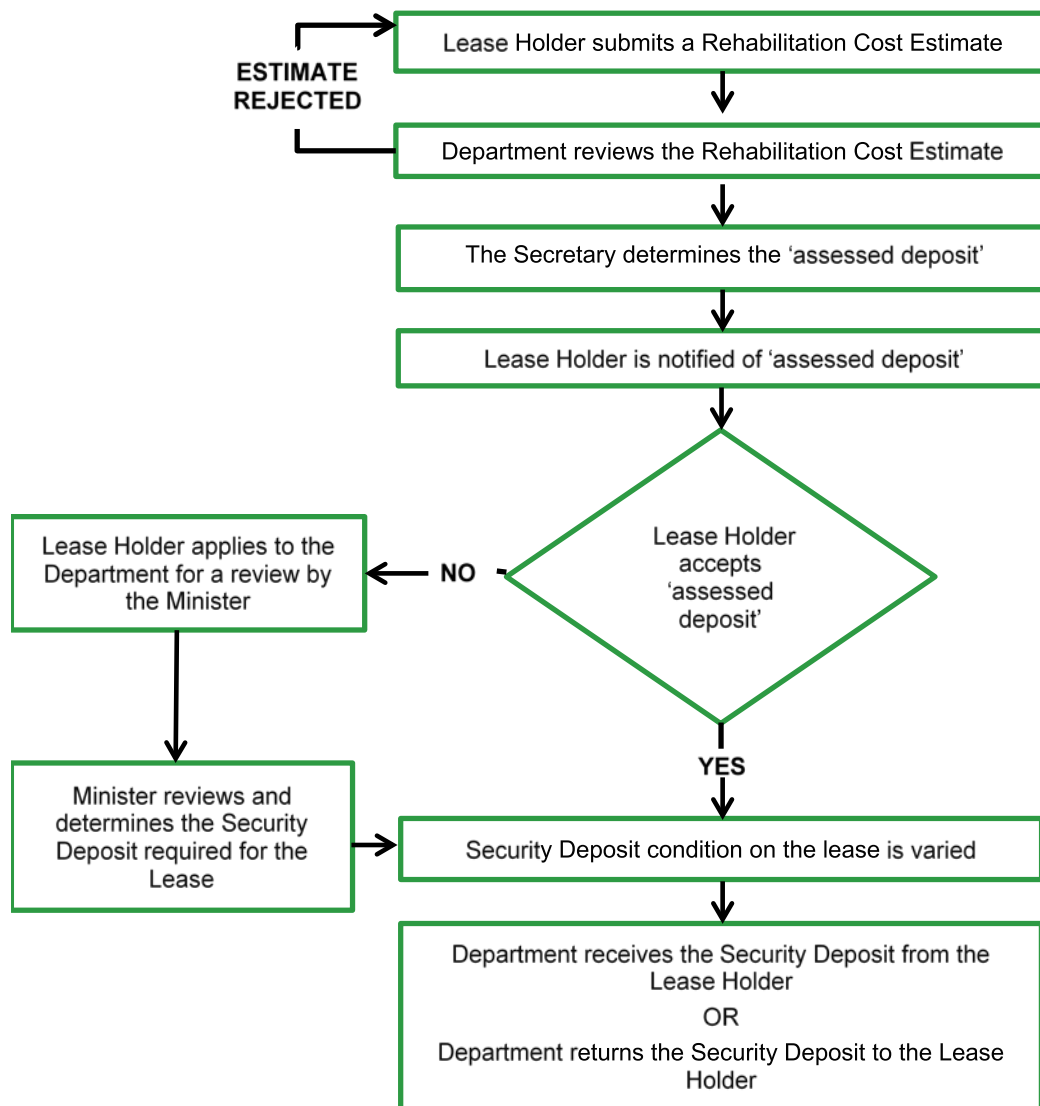
The Department reviews rehabilitation cost estimates

The Department reviews the cost estimates submitted by mining companies, determines the required deposit amount and then requests the deposit. It has established a checklist for high level reviews of cost estimates. The completed checklists contained limited information on the level of detail and rigour applied to the assessment. Independent verification of mining company claims about the size of the outstanding rehabilitation task is also limited.

Our site visits highlighted some opportunities for improvement in the way the Department reviews cost calculations. For example, some Department inspectors request site maps containing the areas relevant to the cost estimates to better understand the cost calculations, and these were evident in one of the completed cost calculations we examined. We also note that the Department does not ask mining companies for the actual cost of rehabilitation conducted to date, or for their internal estimates of the cost of rehabilitation and closure, to further inform cost estimates and the rates used in the tool.

If a mining company disagrees with a rehabilitation cost estimate determination it can request a Ministerial Review. These reviews are undertaken by another Departmental team from a different region to the team that made the original determination. The Department recently evaluated the Ministerial Review process and recommended that such reviews be conducted by parties independent of the Department's resources division.

Exhibit 6: This can be used for captions, case studies or methodologies



Source: NSW Department of Industry, 2017.

Areas and volumes critical but not adequately verified

The Department does not routinely verify the areas of the site and volumes of material used in cost estimates. It advises that it relies instead on section 387C of the *Mining Act 1992*, making it an offence for mining companies to provide false or misleading information, to ensure mining companies provide reasonably accurate information in their rehabilitation cost estimates. However, it is not evident how the Department would establish whether information was false or misleading without more verification work. Further, of the 14 cost estimates we reviewed, eight were signed by the mine general manager, five were signed by other managers and one did not have a signature. It should also be noted the cost estimates are sensitive to any error in the estimation of these areas or volumes, and there is no requirement for estimates to be audited by qualified auditors.

The Department does not have a system that would enable it to readily consolidate the information it gathers to monitor changes in the level of disturbance, and associated rehabilitation, of major mine sites. It plans to implement a new Geographic Information System (GIS) based mapping tool to assist mining companies and mine inspectors to more easily and accurately record areas of disturbance and rehabilitation at each site. This is in the pilot stage and expected to be implemented soon.

The mapping tool should allow mining companies to submit data that maps areas of mine disturbance and rehabilitation as part of MOPs and annual environmental management reports. The data will then be available to staff to download and view during inspections to

enable the verification of the location and size of mine operational areas and areas rehabilitated. Once implemented this should improve the accuracy and verification of cost estimates.

2.3 Weaknesses in current rehabilitation cost calculation tool

No allowance for cost increases over time

The unit rates and allowance used in the calculation tool have not been updated since August 2013, with no allowance for inflation or other changes in industry rates. MOPs may be valid for up to seven years, meaning a review of the cost estimates may not occur during that period and the rates will not be adjusted. Because of the scale of mining operations and the large quantities of material that need to be moved around a site, even small changes in unit rates can result in major changes to cost estimates.

No justification for the rates in the rehabilitation cost calculation tool

The Department was unable to provide information on how the rates and allowances used in the current tool were derived and provided limited information on what costs they are designed to cover. For example, it is unclear how the rates for sourcing, carting and spreading topsoil or for removing railway lines or the maintenance of rehabilitated areas were derived.

Because the Department is not able to provide a basis for the rates and allowances, we do not know what is included in them and why they think they are appropriate. Without a basis for the rates, we cannot provide assurance as to the sufficiency of rehabilitation cost estimates.

Rehabilitation cost calculation tool may not cover all management costs

The calculation tool allocates ten per cent of the total rehabilitation estimate to project management and surveying costs. For state significant development sites this means anywhere from \$500,000 to more than \$10 million can be allocated to these tasks. Departmental staff advised that, in their experience of mine closures, the allowance of ten per cent for project management is appropriate to cover costs for most mine sites. However, the Department was not able to provide a basis for this allowance or say exactly what activities it is meant to cover.

There is a risk that the ten per cent allowance may not be sufficient to cover standard project management and surveying costs, as well as management activities specific to unplanned closure and rehabilitation including:

- stakeholder engagement associated with rehabilitation and closure, including seeking agreement on final landforms and land use from a range of government agencies and community groups throughout the closure planning and implementation process
- insurance costs, especially as they relate to liability for any downstream harm caused during rehabilitation works
- developing and verifying detailed design plans for site rehabilitation and final closure, including associated investigations to gather new knowledge before implementing the works
- a range of third-party contractor costs such as office space and equipment, workshops and tools, demolition and rehabilitation equipment, maintenance and overheads.

Insufficient allowance for long-term site management

The calculation tool allocates five per cent of the total rehabilitation estimate for post-closure environmental monitoring. For state significant development sites this means anywhere from \$250,000 to more than \$5 million can be allocated to this task. There are also allowances in the tool for maintenance of established rehabilitation areas for up to five years. The Department advises that issues around slope stability and erosion, and management of vegetation and fauna would be adequately covered by the allowances in the tool.

It also advises that the five per cent allowance would be sufficient to cover ongoing environmental monitoring programs for most sites. For example, in relation to an \$80 million cost estimate associated with rehabilitating a large scale open cut mine, this contingency

would allow up to 80 years for a biennial ecological rehabilitation monitoring program. However, the Department was not able to provide a basis for this allowance, including the list of monitoring measures it is meant to cover.

There is a risk that the five per cent allowance may not be sufficient to cover long-term environmental management and site issues including:

- requirements for surface water and groundwater management, including managing Environment Protection Authority licence requirements
- site security including patrols and maintenance of fencing around dangerous parts of the site, such as steep sections of mine voids, during the period of post-mining site management and in perpetuity
- management of mine void water which may be saline, and in some cases acidic and/or contaminated with metals, over many years to ensure it does not negatively impact surface water and groundwater, and does not harm water resources, native ecosystems and land uses
- managing the ingress of groundwater to voids so that it does not create unstable void walls
- rectification of any rehabilitation failures identified during monitoring such as erosion of waste rock landforms or major vegetation/ecosystem failures
- management of tailings dams which, depending on composition and stability of contents and surface treatment, may need to be monitored and managed in perpetuity.

The Department indicated that a higher percentage for environmental monitoring can be entered into the tool for higher risk sites. However, all operational mine sites we examined used the five per cent default contingency in the current tool.

Heritage assets not adequately covered in rehabilitation cost estimates

The calculation tool does not adequately cover the cost of long term management of heritage items at each site, including the cost of coordinating the handover to a third party. Further, some rehabilitation cost estimate cover sheets mentioned heritage assets but no costings for these items were included in the estimates.

The MOP guidelines, while allowing for preservation of heritage assets as a post mining land use, do not adequately address these assets. For example, there is no requirement to provide details in MOPs on how heritage assets are to be managed during closure and no explanation of how the Office of Environment and Heritage (where responsibility for heritage resides) is involved in the process of approving MOPs. There is also no requirement to apply the Burra Charter 2013, which defines the basic principles and procedures to be followed in the conservation of Australian heritage places

Insufficient contingency to cover uncertainty with unplanned closure

In the event of an unplanned closure and default by a mining company, the Department will not have a clear picture of what the rehabilitated site should look like, and the tasks required for successful rehabilitation and closure. It will have limited knowledge of the amount of material to be moved, and the site-specific risks and uncertainties it will need to manage.

As previously mentioned, practical planning for sudden closure cannot be done in detail, as the circumstances surrounding the closure may dictate possible closure scenarios. The inevitable lack of such a detailed plan makes it difficult to verify the adequacy of cost calculations.

The tool adopts a standard default ten per cent contingency to cover uncertainty, regardless of the complexity and risks associated with the site. Further, if an open-cut mine site closes prematurely, the agreed final land use may not be achievable and the final landform will probably not be achieved. Guidance we obtained from a range of sources indicates contingencies should range from 25 per cent to as much as 50 per cent in the worst cases, especially in the absence of a detailed plan to achieve closure.

The Victorian Hazelwood Mine Fire Inquiry identified many of the same issues around uncertainty for the Latrobe Valley brown coal mines. In that inquiry, a costing model was developed based on the type of approach used in costing major infrastructure projects.

In summary, a probabilistic costing method (as the Inquiry included for the Latrobe Valley mines) recognises that certainty has a cost. Where there is high uncertainty of costs, but government wants a high level of certainty that costs will be covered fully, the contingency needs to be very high.

The tool is not designed to cover long-term environmental risks

The tool is not designed to cover the risks of unexpected environmental degradation in the long-term after a mine closes. Even if a mine is deemed to be fully rehabilitated, based on best available information and contemporary science, there may still be a risk that sometime later the site will start to display or cause significant environmental harm. This includes the risk of saline discharge or acid and metalliferous drainage at some sites. There is also the risk of further subsidence from underground mining cracking creeks, rivers or swamps, which can be difficult or impossible to repair. There is also the possibility of failure of pit walls, waste rock dump landforms and tailings dams depending on their design life.

2.4 New calculation tool and guidance

New calculation tool developed but not yet implemented

The Department has developed a new rehabilitation cost calculation tool with an updated schedule of rates and allowances. This is currently with the industry for consultation. The improvements in the new calculation tool allow for more detailed costings of management, rehabilitation and demolition activities. These improvements include:

- more line items to allow for greater specificity in calculations
- allowances for site security during closure, pest management in buffer areas and management of undisturbed areas
- increased allowance for long term monitoring, from five to ten per cent of total rehabilitation costs
- increased allowances for the development of an 'unplanned' closure plan and for tender preparation and assessment
- increased allowances for the mobilisation and demobilisation of third-party plant and equipment.

The Department provided a justification showing how the rates and allowances used in the new tool were derived.

The new calculation tool could be further improved by better addressing other deficiencies we noted in the current tool. These include:

- inadequate costing for the preservation of heritage assets
- no indication that these rates will be updated over time
- inadequate costing of stakeholder engagement and additional planning approvals required for early unplanned closure
- no coverage of insurance costs, especially as they relate to liability for any downstream harm caused during rehabilitation works
- no allowance for any additional design, research, trials and verification work required to undertake successful closure
- control measures not adequately costed because of any deficiencies in the risk assessment process for rehabilitation and closure risks.

Guidance developed for new tool

The Department has developed revised guidelines for rehabilitation cost estimates which include an updated flowchart better explaining the rehabilitation cost estimate process. It also includes additional information on the Department's Ministerial review process, as well as

information on how and when security deposits will be released following partial or full site rehabilitation.

The Department has also drafted a new Rehabilitation Cost Calculation Tool Handbook to guide the use of the new tool. The handbook:

- lists the changes from the existing cost calculation tool
- takes the reader through the process of developing a cost estimate using the tool
- discusses formulae and functions, and displays calculation methods for key aspects such as site areas, volumes, and haulage distances
- provides details regarding the use of alternative rates, including the justification required for their approval.

3. Monitoring mine site disturbance and rehabilitation

The Department is yet to demonstrate that it is monitoring major mine sites effectively to gauge progress with ongoing site rehabilitation and management of closure risks. There was no protocol for site inspections and limited evidence of inspections for the sites we reviewed.

The Department receives annual environmental management reports from mining companies, with most describing the extent of disturbance and rehabilitation at each mine site. Only around half the annual reports we examined reported progress against targets in MOPs and most did not explain environmental changes over time, such as changes to surface water and groundwater quality, and the risks these pose to mine rehabilitation and closure. Further, the Department was not able to demonstrate a robust process for assessing rehabilitated areas so they can be removed from the cost estimate.

The Department recently established procedures and a checklist for reviewing annual reports. It has also developed a risk assessment process for prioritising sites for these reviews, although no documentation was available specifying the risks that led to the ranking for each site.

The Department is developing a rehabilitation reform package, including new guidelines for annual reporting and a rehabilitation assessment procedure. This initiative should result in improved monitoring and reporting of rehabilitation progress at mine sites. The Department is also developing GIS-based tools to better measure areas of disturbance and rehabilitation.

Recommendations

The Department should enhance oversight of mine rehabilitation by:

- ensuring mining companies report performance against rehabilitation targets and environmental changes clearly, including an analysis of long-term surface water and groundwater trends in terms levels, flow and quality
- improving how it determines the progress and success of mine rehabilitation.

3.1 Annual reports on progress with rehabilitation

Department provides guidance on annual reporting requirements

The Department requires mining companies to submit annual environmental management reports for each mine site. It has produced guidelines for mining companies explaining the content requirements of the annual reports, including the need to provide information on:

- issues arising from the annual report and the previous annual inspection, and any other directions given by the Department and the response to those issues
- control strategies implemented to manage a range of specific environmental risks
- complaints and community liaison
- rehabilitation of disturbed land and renovation or removal of buildings
- research and trials conducted during the period
- activities proposed in the next annual reporting period.

We identified a number of deficiencies in the annual environmental annual report guidelines. These include no requirement to report directly against any annual targets for rehabilitation work identified in the MOP and therefore no necessity to report on corrective action if targets are not met. There is no obligation to monitor groundwater and surface water, and record and discuss trends in volumes, levels, flow and quality. There is also no requirement to provide an updated rehabilitation and closure risk assessment and information on how these risks are being managed. The Department is developing new annual reporting guidelines which may address these issues.

Progress reports on rehabilitation provided by mining companies

The Department held a current annual report for each operational mine site we examined. The annual reports we reviewed contained a range of information on rehabilitation including areas of disturbance, management of exposed areas, success of rehabilitated areas, pest and fire control, and management of topsoil and seed stock.

Around half the annual reports we reviewed discussed progress against MOP targets and the success of rehabilitation. Around half discussed rehabilitation risks and their mitigation. Although 11 out of 13 case-study sites reported cultural or natural heritage items, only five of the annual reports reviewed provided a detailed discussion of the management of heritage items.

Most annual reports we reviewed did not explain environmental changes over time, nor the risks to mine closure and the measures required to mitigate them. For example, analysis of changes to surface water and groundwater quality was limited despite its relevance for assessing future contamination risks.

3.2 Monitoring of rehabilitation progress

The Department monitors rehabilitation progress

The Department monitors rehabilitation progress at mine sites by undertaking reviews of annual reports and MOPs, and conducting site inspections. Most of the annual environmental management reports we reviewed discussed issues identified during the last inspection and any remedial action taken.

The Department has the ability to direct mining companies to undertake rehabilitation work under section 240 of the *Mining Act 1992*. We obtained a list of recent section 240 directions issued by the Department indicating it had undertaken inspections on a range of sites and enforced remedial action for deficiencies identified. On one site we reviewed, the Department directed a mining company to manage offsite discharges through a section 240 direction even though the mining lease had expired.

Risk-based prioritisation for reviews of mine sites

The Department has recently developed procedures which prioritise assessments of MOPs and annual environmental management reports based on a risk ranking. The procedures require more detailed annual assessments of sites ranked critical and high, including a review of mining and rehabilitation progress and the current security bond held to determine whether it is still adequate.

In late 2015, the Department ranked 312 mine sites from critical to low risk based on their environmental and rehabilitation performance and any issues of public concern. Of these, 45 were ranked as critical and 73 were ranked as high. A risk matrix was developed to support the ranking process. However, no documentation was available for each site supporting the assessment and specifying the risks that led to it being ranked critical, high, medium or low.

Procedures in place for reviewing annual environmental management reports

The Department has recently established procedures for reviewing annual environmental management reports including a checklist. Completion of the checklist involves a review of the mining company's progress against MOP targets and completion criteria. It also requires a review of available data to determine if there are any emerging issues that may be a threat to rehabilitation success.

The Department also has processes in place for approving annual reports or 'refusing' them, meaning it generally requires more information from the mining company. It provided approval letters for two of the sites we examined and a letter for another site requiring a few items to be completed prior to the report's approval.

Limited evidence of site inspections and what they cover

The Department was able to provide limited evidence on the frequency and detail of mine inspections conducted by its staff. For example, for the sites we reviewed, it was unable to provide the dates of the last two site inspections and what those inspections covered. Although the Department's risk prioritisation process requires high risk sites be assessed more frequently and thoroughly, it does not specify how often site inspections should occur.

There was also no evidence of a formal protocol in place to guide Department staff during site inspections. Such inspections should focus on key rehabilitation and closure risks and uncertainties and how they are being mitigated.

Levels of progress with rehabilitation not sufficiently verified

Most of the annual reports we reviewed describe rehabilitation progress but around half do not compare it directly to rehabilitation targets in MOPs. This makes it difficult for agency staff to gauge the level of progress towards rehabilitation goals and determine whether remedial action, or even a new MOP and rehabilitation cost estimate, is required.

The Department was not able to demonstrate a robust process for assessing rehabilitated areas so they can be removed from the rehabilitation cost estimate. It lacks detailed procedures for assessing and verifying the quality of rehabilitation occurring on mine sites. The Department is developing a rehabilitation reform package, including new rehabilitation guidelines and a site rehabilitation assessment procedure, which may provide consistency in the assessment of the progress and quality of mine rehabilitation.

4. Access to funds in security deposits

The value of securities held by the Department generally aligns with the latest approved rehabilitation cost estimate for each respective mine site. This contrasts with the situation found by investigations in Victoria and Queensland where deposit amounts held fell below the calculated costs. The few discrepancies in NSW between the value of securities held and the amount calculated were due to delays between a recalculation of the deposit required and the Department obtaining a new, higher deposit. Some of these delays were excessive.

Most deposits are held in the form of bank guarantees. The Department has obtained legal advice that it should be able to claim on the guarantees if the need arises. This means if a mining company goes into liquidation the Department should still be able to access the funds. To date, the Department has not had to access a security deposit to rehabilitate a state significant mine site.

The security deposit regime helps drive progressive rehabilitation. Consistent with best practice, the Department encourages ongoing rehabilitation. We saw evidence that ongoing rehabilitation is occurring at most of the sites we examined.

Recommendations

The Department should ensure that when mining companies are required to provide increased security deposits, they do so with minimal delay.

4.1 Form of securities

Security deposits in bank guarantees or cash

Mining companies must provide the Department with the required security deposit prior to commencing operations. The security deposit is added to or reduced during the life of the project depending upon variations in the level of disturbance. The Department should hold a security deposit until the mine site is successfully rehabilitated in line with consent conditions.

Security deposits can be in the form of cash or bank guarantees. Almost all the deposits the Department holds are bank guarantees. Bank guarantees are an agreement between the financial institution and the Department that if a mining company is unable to fulfil their rehabilitation obligations, the bank will cover the liability up to the agreed amount.

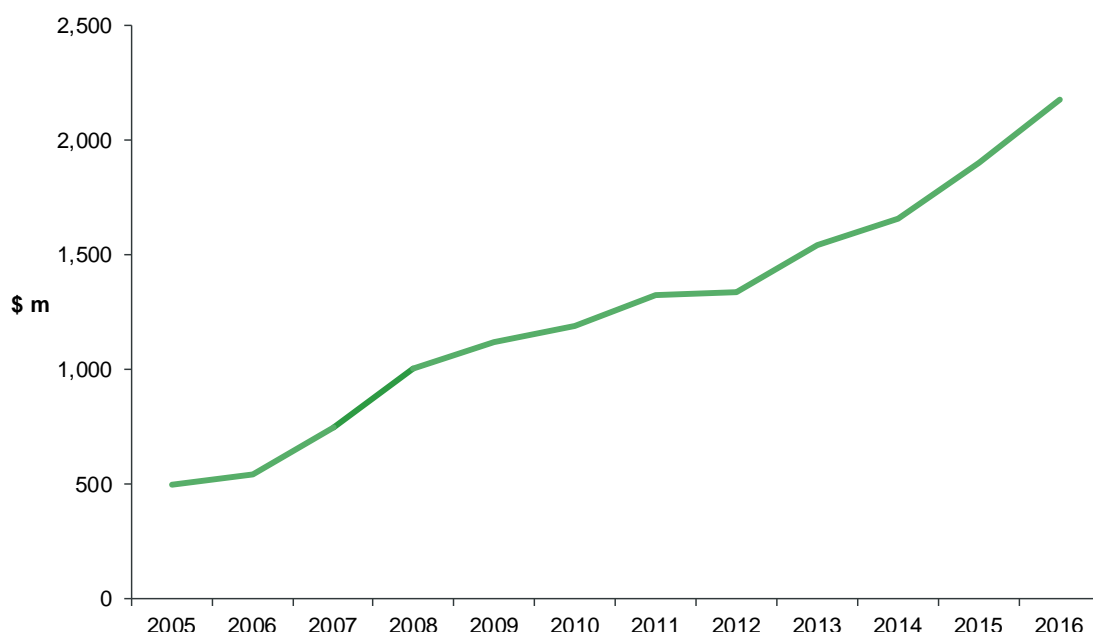
The Department only accepts bank guarantees provided by an institution supervised by the Australian Prudential Regulation Authority (APRA). These institutions are well-established and therefore unlikely to not honour a guarantee. Ten of the 13 case study mines had bank guarantees provided by approved deposit taking institutions supervised by APRA. Two other sites had bank guarantees provided by insurance companies supervised by APRA. The deposit and mining lease had been relinquished on the other site, which had ceased operations and been closed.

The Department has developed a template to standardise the wording of bank guarantees. This standardisation ensures that the bank guarantees contain the necessary conditions to enable the Department to access the funds if required. All bank guarantees being held for the case study mines were in line with the Department's template.

Level of securities has increased

The Department has increased the total amount of security deposits held from nearly \$500 million in 2005 to around \$2.2 billion in 2016, covering around 450 mine sites. The Department advises that the increase in the value of security deposits held coincides with improvements it has made in the way deposits are calculated and collected.

Exhibit 7: Value of security deposits held each financial year



Source: NSW Audit Office Analysis.

Securities held generally align with rehabilitation cost estimates

The security deposits held by the Department generally align with the approved rehabilitation cost estimate. The audit reviewed the security deposits held for the largest 70 mine sites in NSW. In five cases the Department held less security than they requested, although the level of security outstanding was less than two per cent of the total value of security held for the 70 mine sites.

The Department's policy is for security deposits to cover the full cost of rehabilitation. This is consistent with the *Mining Act 1992*. Some other jurisdictions, including Queensland, offer discounts on security deposit amounts, taking into account the financial health and environmental performance of a mining company. This would not be an appropriate approach for NSW given the requirements of the Act and the policy.

Significant delays exist in obtaining some security deposits

Mining companies must submit a revised cost estimate when preparing a new MOP, transferring a mining licence or at the request of the Department. The Department assesses the rehabilitation cost estimate and notifies the mining company of any changes in the level of security required.

We found several examples where the Department experienced significant delays in receiving additional security deposits. For the mines we reviewed, there were delays of five to 24 months between the Department reviewing the cost estimate and obtaining an increased security deposit. Staff also advised of delays in receiving revised cost estimates from mining companies, effectively postponing the review process. These delays in updating security deposits increase the risk that available funds will be insufficient to cover rehabilitation costs.

Security deposits stored in a secure location

The Department advised that it is in the process of improving its practices for securely storing security deposits. It has recently received indications from some financial institutions that to claim the funds held as a security deposit it will need to produce the original hard-copy bank guarantee. The guarantees were stored in a locked cabinet but will now be stored in a safe in a fire-resistant room to ensure they are adequately protected.

Limited ability to monitor variations in securities held

The electronic system the Department uses to record security deposit information does not enable it to easily access historical data on deposit amounts, limiting its ability to monitor changes over time. This makes it difficult to routinely monitor the amount of security deposits held at each site against the amount requested to ensure deposits are kept up-to-date and delays in receiving revised deposits are minimised.

4.2 Accessing deposits to rehabilitate

Department can access deposits when needed

The Department has obtained legal advice indicating that it should be able to claim on the bank guarantees if the need arises. As the bank guarantee must be from an APRA approved financial institution, and not from the mining company, the Department should still be able to access the funds if a mining company goes into liquidation.

To date the Department has not accessed a large security deposit to rehabilitate a state significant development site, consistent with its position as an option of last resort in ensuring rehabilitation is completed. It advises it has claimed security deposits in the form of bank guarantees on some smaller sites.

One financial institution recently arranged for a bank guarantee of around \$40 million, held by the Department, to be exchanged for a security deposit in the form of cash. This example provides a further indication that the Department should be able to call-in bank guarantees to cover the cost of rehabilitating land disturbed by mining operations, if the need arises.

The Department has a process in place for exchanges of security deposits

The Department ensures it always holds a security deposit for each mine site. It advised that if a mining company wishes to exchange a security deposit, it must provide a new security deposit before the Department will release the existing security deposit. Mining companies exchange deposits due to:

- a change in ownership of the mine
- significant changes in the level of security required
- change in financial institutions.

No procedures for using deposits to fund rehabilitation

Although the Department has experience claiming deposits for some derelict mine sites, it has never had to assume responsibility for overseeing the complete rehabilitation and closure of a large mine. It is yet to establish a set of procedures to guide the process of using claimed securities to undertake such rehabilitation work.

We assessed the financial delegations of the Department, and despite the lack of clear procedures, believe they are sufficient to direct funds towards rehabilitation activities should the need arise.

The Department encourages progressive rehabilitation

Consistent with best practice, the Department encourages ongoing rehabilitation through security deposits and targets in MOPs. Clearly there is a financial incentive for companies to undertake rehabilitation to reduce the required security deposit. We saw evidence during our site visits and in annual reports that ongoing rehabilitation is occurring at most of the sites we reviewed.

The progressive rehabilitation included landform shaping, spreading of topsoil and vegetation establishment. One of the sites we reviewed had backfilled areas of the void once the coal had been mined. The Department advised that, through progressive rehabilitation, the mining company had shaped the final landform within only one year of completing mining. We were also advised that recent observations on the site reported similar flora and fauna levels to that which existed prior to mining. The Department continues to hold over \$3 million security until the long-term monitoring of the site indicates that rehabilitation has been successful.

Lack of clarity around when deposits should be returned

The Department will continue to hold a portion of a security deposit until that site reaches successful rehabilitation. Successful rehabilitation occurs when the mining company's rehabilitation efforts fulfil the criteria set out in the consent conditions. The length of monitoring required between a mine ceasing operations and successful rehabilitation varies between mine sites. It generally depends on the level of disturbance, the extent of ongoing rehabilitation and how well closure risks have been managed.

The Department has recently revised its reporting form for mining companies to provide information on the rehabilitation work they have completed and its impact on their rehabilitation cost estimate. The form requires evidence and other information, including plans and photographs, as well as written statement outlining the rehabilitation activities undertaken and a description of how rehabilitation objectives and completion criteria have been met.

The Department advises it conducts inspections on rehabilitated areas against the site-specific consent and closure conditions. Once rehabilitated areas have been proven to meet the closure criteria, the Department will sign off the area. However, as previously noted, the Department lacks detailed procedures for verifying the extent and quality of rehabilitation work reported by mining companies. Further, consent conditions and closure criteria are often not specific, making the task of judging the fulfilment of these conditions even more problematic. The Department is currently developing a new rehabilitation assessment procedure to improve its assessment of rehabilitation performance.

Appendices

Appendix 1: Response from the Department



**Planning &
Environment**

Office of the Secretary

OUT17/16781

Ms Margaret Crawford
Auditor-General
Audit Office of NSW
GPO Box 12
SYDNEY NSW 2001

Dear Ms Crawford

RESPONSE FROM THE DEPARTMENT OF PLANNING AND ENVIRONMENT

The Department of Planning and Environment welcomes the Audit Report on *Mining Rehabilitation Security Deposits* (the Report). It is noted that the responsibility for the regulation and management of rehabilitation securities was transferred to the Department on 1 April 2017.

The Department appreciates the Report's acknowledgement that security deposit scheme processes have improved in recent years. Also, that there are well advanced plans for further improvement, including a revised cost calculation tool.

The Report outlines areas of potential improvement by the Department, in terms of the management and oversight of rehabilitation securities under the *Mining Act 1992*. The Department supports the Report's recommendations. Actions relating to a whole of Department approach to mine rehabilitation are being taken to address these recommendations. As well as actions relating to the Rehabilitation Reform Program (RRP), which include:

- Improved security deposit scheme processes, including a revised cost calculation tool.
- Development of a Rehabilitation Assessment Protocol.
- Planned implementation of the rehabilitation Geographic Information System (GIS).
- Establishment of a robust framework to manage future mine rehabilitation.
- Collaboration with agencies and consultation with national and international jurisdictions to review various mechanisms to address residual risk.
- Development of innovative approaches to assessing and managing derelict mines.

The Rehabilitation Assessment Protocol was developed to ensure effective regulatory oversight of rehabilitation performance at mine sites, including performance reporting on the achievement of rehabilitation targets. This will be complemented by the planned implementation of the rehabilitation GIS – an Australian first – to accurately record and track areas of disturbance and rehabilitation progress.

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The extent of mine disturbance and progressive rehabilitation will be published through an online portal to demonstrate government transparency.

This use of the GIS data will be a major advance in ratifying the accuracy and veracity of rehabilitation cost estimates that will contribute to an improvement in the standard of rehabilitation across the industry. The Department agrees to the further enhancements as proposed in recommendation three.

The Department recognises the importance of developing a robust system to address possible future mine rehabilitation failure. The regulation, oversights by the Department, means that current operations are responsible for rehabilitation and all mines lodge a security deposit for the full cost of rehabilitation at the start of operations.

In addition to this robust framework, the Department will review various mechanisms to address the issue of residual risk. This review will be undertaken in collaboration with other agencies and will include consultation with other national and international jurisdictions. Options to be considered include the establishment of a financial assurance mechanism to cover the risk of potential long term environmental degradation or whether sufficient cover exists through other legislation or programs.

The Department is also playing a leading role in addressing the environmental legacy of historical mining activity, by engaging with the resource industry, researchers and other States' regulatory authorities to develop innovative approaches to assessing and managing derelict mine sites.

The RRP was developed as a major step-change in rehabilitation regulation and management in NSW. It includes strategies being implemented to ensure the mining industry navigates the challenges and opportunities presented by operating, and completing rehabilitation, in an environmentally sustainable manner. The Report's findings support this change program and will inform its progression.

Yours sincerely



Carolyn McNally
Secretary

9.5.17

Appendix 2: About the audit

Audit objective

This audit assessed whether the Department maintains adequate security deposits to cover the liabilities associated with mine closures including rehabilitation.

Audit criteria

The audit objective will be addressed with the following criteria:

1. The Department has a clear understanding of closure and rehabilitation outcomes for each mine site.
2. The Department undertakes ongoing reviews of the extent of disturbance and rehabilitation at each mine site.
3. The Department maintains reasonable estimates of closure and rehabilitation costs including contingencies.
4. The Department can access adequate security deposits to cover the costs of closure and rehabilitation when needed.

Audit scope and focus

The audit focused on large coal and metalliferous mining operations, as they account for the majority of the mining-related disturbance across NSW. We reviewed 13 mines comprising a mix of underground and open-cut sites, spread across three regions. Eight sites were operational, three sites had ceased operations and were being rehabilitated, and two sites were in 'care and maintenance'.

The scope included:

- larger mineral mines including open cut and underground metalliferous and coal mines
- review of the Department's tool for calculating rehabilitation costs
- inspection and audit programs undertaken by the Department
- policies relating to closure criteria, and calculating and accessing security deposits.
- the role of relevant agencies in the closure planning process
- the relinquishment and sign-off process including residual risk determinations
- whether the security deposit system is providing incentive for good rehabilitation outcomes.

The scope excluded:

- the appropriateness of the rehabilitation standards set out in planning consents, and the processes leading to these standards, although we did comment on how the standards have evolved over time
- mineral exploration, and petroleum and coal seam gas (CSG) mining
- mine inspection and audit programs conducted by Department of Planning and Environment (prior to 1 April 2017) and the Environment Protection Authority
- the derelict mines program
- small mines with limited community and environmental impact.

Audit approach

The approach included:

- review of documents such as policies, methodologies, guidelines, procedures, better practice
- review of department files and practices to assess adherence to policies and procedures

- analysis of financial information/analysis on security deposits and the cost of rehabilitation
- interviews with key departmental personnel
- advice from an external expert consultant.

The audit team acquired subject matter expertise through conducting research, attending a mine rehabilitation conference and consulting interviews with a range of stakeholders to gain their input and views on the audit topic.

We engaged Corinne Unger from the Sustainable Minerals Institute at the University of Queensland as an expert consultant for this audit.

The audit approach was complemented by quality assurance processes within the Audit Office to ensure compliance with professional standards.

Audit methodology

Our performance audit methodology is designed to satisfy Australian Audit Standards ASAE 3500 on performance auditing. The Standard requires the audit team to comply with relevant ethical requirements and plan and perform the audit to obtain reasonable assurance and draw a conclusion on the audit objective. Our processes have also been designed to comply with the auditing requirements specified in the *Public Finance and Audit Act 1983*.

Acknowledgements

We gratefully acknowledge the co-operation and assistance provided by the Department. In particular we wish to thank our liaison officers who participated in interviews and provided material relevant to the audit.

We would also like to thank our consultant and the stakeholders that took the time to spoke to us and provided material during the audit.

Audit team

The audit was conducted by Neil Avery, Huntley Evans and Francois Chee. Oversight and quality assurance was provided by Rod Longford and Kathrina Lo.

Audit cost

Including staff costs, travel and overheads, the estimated cost of the audit is \$368,989.

Performance auditing

What are performance audits?

Performance audits determine whether an agency is carrying out its activities effectively, and doing so economically and efficiently and in compliance with all relevant laws.

The activities examined by a performance audit may include a government program, all or part of a government agency or consider particular issues which affect the whole public sector. They cannot question the merits of government policy objectives.

The Auditor-General's mandate to undertake performance audits is set out in the *Public Finance and Audit Act 1983*.

Why do we conduct performance audits?

Performance audits provide independent assurance to parliament and the public.

Through their recommendations, performance audits seek to improve the efficiency and effectiveness of government agencies so that the community receives value for money from government services.

Performance audits also focus on assisting accountability processes by holding managers to account for agency performance.

Performance audits are selected at the discretion of the Auditor-General who seeks input from parliamentarians, the public, agencies and Audit Office research.

What happens during the phases of a performance audit?

Performance audits have three key phases: planning, fieldwork and report writing. They can take up to nine months to complete, depending on the audit's scope.

During the planning phase the audit team develops an understanding of agency activities and defines the objective and scope of the audit.

The planning phase also identifies the audit criteria. These are standards of performance against which the agency or program activities are assessed. Criteria may be based on best practice, government targets, benchmarks or published guidelines.

At the completion of fieldwork the audit team meets with agency management to discuss all significant matters arising out of the audit. Following this, a draft performance audit report is prepared.

The audit team then meets with agency management to check that facts presented in the draft report are accurate and that recommendations are practical and appropriate.

A final report is then provided to the CEO for comment. The relevant minister and the Treasurer are also provided with a copy of the final report. The report tabled in parliament includes a response from the CEO on the report's conclusion and recommendations. In multiple agency performance audits there may be responses from more than one agency or from a nominated coordinating agency.

Do we check to see if recommendations have been implemented?

Following the tabling of the report in parliament, agencies are requested to advise the Audit Office on action taken, or proposed, against each of the report's recommendations. It is usual for agency audit committees to monitor progress with the implementation of recommendations.

In addition, it is the practice of Parliament's Public Accounts Committee (PAC) to conduct reviews or hold inquiries into matters raised in performance audit reports. The reviews and inquiries are usually held 12 months after the report is tabled. These reports are available on the parliamentary website.

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards.

Internal quality control review of each audit ensures compliance with Australian assurance standards. Periodic review by other Audit Offices tests our activities against best practice.

The PAC is also responsible for overseeing the performance of the Audit Office and conducts a review of our operations every four years. The review's report is tabled in parliament and available on its website.

Who pays for performance audits?

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament.

Further information and copies of reports

For further information, including copies of performance audit reports and a list of audits currently in progress, please see our website www.audit.nsw.gov.au or contact us on 9275 7100.

Our vision

Making a difference through audit excellence.

Our mission

To help parliament hold government accountable for its use of public resources.

Our values

Purpose – we have an impact, are accountable, and work as a team.

People – we trust and respect others and have a balanced approach to work.

Professionalism – we are recognised for our independence and integrity and the value we deliver.