

The cost of delay: financial consequences of deferred mining lease relinquishment

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Abstract

Across Australia, many mining leases and sub-areas remain inactive, partially rehabilitated, or functionally complete but not formally relinquished. Historically, operators have often not prioritised relinquishment, with leases retained for optionality, administrative simplicity, uncertainty regarding future land use, or as part of legacy portfolios inherited through mergers and acquisitions. In other cases, relinquishment may not have been pursued due to unclear regulatory pathways that create uncertainty regarding timing and process.

Despite being non-operational or rehabilitated, these leases can continue to carry significant financial liabilities or 'holding costs', including ongoing tenement fees, rates and taxes, environmental monitoring and compliance obligations, and land and infrastructure maintenance.

Prior to formal relinquishment, rehabilitation completed under historical standards may be reassessed against evolving regulatory expectations, resulting in additional studies, verification requirements and, in some cases, significant rework prior to surrender. These experiences highlight the financial risks and uncertainties associated with prolonged tenure retention in dynamic regulatory environments.

Recent rehabilitation reforms in New South Wales (NSW), including the requirement to rehabilitate 'as soon as reasonably practicable' (ASARP), alongside the NSW Parliamentary Inquiry into beneficial and productive post-mining land use, create an opportunity to enable earlier land transition and potentially reduce long-term financial liabilities. However, without clearly defined and practical relinquishment pathways from both operators and regulators, leases may continue to be retained despite demonstrable progress towards agreed completion criteria.

Using a conceptual scenario-based modelling approach, this paper compares the financial implications of alternative relinquishment timing pathways. The analysis considers typical annual holding costs, closure liability escalation, potential rework triggered by evolving standards and reduced evidentiary confidence, and residual risk obligations that may arise at surrender.

The paper argues that timely relinquishment under structured, risk-based sign-off mechanisms can reduce accumulated liability, compress uncertainty exposure, improve financial certainty, and unlock rehabilitated land for productive post-mining uses without compromising environmental integrity.

Keywords: *relinquishment, mine closure, rehabilitation, closure liability, holding costs, validation, rework, residual risk, closure drift*

1 Introduction – why relinquishment timing matters

Across Australia, many mining leases and sub-areas remain inactive, partially rehabilitated, or functionally complete but not formally relinquished, reflecting broader challenges in achieving timely land transition following mining (Standing Committee on State Development 2025).

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Historically, operators have often not given priority to relinquishment, with leases retained for optionality, administrative simplicity, uncertainty regarding future land use, or as part of legacy portfolios inherited through mergers and acquisitions. In other cases, relinquishment may not have been pursued due to unclear regulatory pathways that create uncertainty regarding timing and process.

Despite being non-operational or rehabilitated, these leases can continue to carry significant financial liabilities or 'holding costs', including ongoing tenement fees, rates and taxes, environmental monitoring and compliance obligations, and land and infrastructure maintenance.

Prior to formal relinquishment, rehabilitation completed under historical standards may be reassessed against evolving regulatory expectations, resulting in additional investigations, verification requirements and, in some cases, significant rework prior to surrender. Common examples include mine entry and borehole sealing where historical works cannot be verified to contemporary standards, requiring investigation or rework, and capping of tailings storage facilities or emplacement of potentially acid forming (PAF) material where incomplete records require additional investigation to confirm the 'as-built' condition of landforms. These experiences highlight the financial risks and uncertainties associated with prolonged tenure retention in dynamic regulatory environments.

Additionally, mine closure is occurring in the context of evolving societal expectations. Stakeholders, including traditional owners, local communities, landholders and investors, increasingly expect higher standards of rehabilitation, greater transparency in closure outcomes, and earlier transition to agreed post-mining uses.

As mine closure gains increasing regulatory and societal focus, the frameworks governing closure and relinquishment continue to evolve. Across Australia, regulatory approaches to relinquishment vary, but there is a clear trend towards increased emphasis on evidence-based closure and long-term risk management.

Recent regulatory reforms in NSW, including requirements to rehabilitate land 'as soon as reasonably practicable' (ASARP), and clearer expectations with respect to rehabilitation objectives, completion criteria and associated validation methods, create an opportunity to enable earlier land transition and reduce long-term financial liabilities. In Queensland, reforms including progressive rehabilitation and closure plans and residual risk frameworks provide a more structured pathway to surrender. However, without clearly defined and practical relinquishment pathways, leases may continue to be retained despite demonstrable progress towards agreed completion criteria.

This paper considers the financial implications of relinquishment timing using a scenario-based modelling approach. The analysis distinguishes between base case holding costs and additional cost drivers associated with delayed relinquishment, including validation studies and rework exposure. The aim is to illustrate how timing decisions can influence both the magnitude and composition of accumulated post-closure financial liabilities, and to highlight additional cost drivers associated with prolonged tenure retention, including both direct financial liabilities and the opportunity cost of delayed land transition.

2 Drivers of delayed relinquishment

The drivers of delayed relinquishment reflect a combination of regulatory uncertainty, legacy site conditions and operator decision-making. Understanding these drivers requires consideration of both historical practices and the emerging regulatory environment within which relinquishment decisions are now made.

2.1 Regulatory uncertainty and evolving relinquishment pathways

Regulatory uncertainty remains a key driver of deferred relinquishment, although the nature of this uncertainty is evolving. From an operator perspective, this uncertainty directly influences the timing and willingness to pursue relinquishment, particularly where the likely requirements and outcomes remain unclear.

As highlighted in the NSW Parliamentary Inquiry into beneficial and productive post-mining land use, *'Complex regulatory frameworks in NSW and complex pathways may deter mining companies from*

relinquishing i.e. it is easier to leave land as safe, stable and non-polluting rather than embark on a lengthy (and often costly) relinquishment process' (Standing Committee on State Development 2025).

In addition, the timing and predictability of regulatory decision-making can influence relinquishment outcomes, with extended assessment periods or iterative information requests contributing to delays in progressing applications.

Recent regulatory reforms in NSW under the *Mining Act 1992* (NSW Resources 2021) have introduced greater structure with respect to closure planning, including clearer expectations for rehabilitation objectives, completion criteria and progressive rehabilitation through mechanisms such as ASARP (NSW Resources Regulator 2023). Relinquishment requires demonstration that these expectations have been met, supported by sufficient technical evidence to satisfy the relevant regulator (NSW Resources Regulator 2025).

These reforms represent a significant shift towards more transparent and outcome-based closure frameworks. However, many of these requirements have not yet been fully tested in practice, particularly in the context of final relinquishment of mining leases or sub-areas.

As a result, uncertainty persists regarding how completion criteria will be assessed at relinquishment, including the extent and duration of monitoring, validation and documentation required to demonstrate the achievement of long-term closure outcomes such as vegetation establishment, ecosystem function and water quality.

Importantly, this form of regulatory uncertainty is not simply a function of unclear requirements, but of evolving expectations and limited precedent. As more sites progress through the relinquishment process under contemporary frameworks, greater clarity is likely to emerge.

2.2 Legacy practices and historical closure approaches

A significant driver of delayed relinquishment arises from the interaction between contemporary regulatory expectations and historical closure practices. Many sites that are now approaching relinquishment have areas rehabilitated under earlier regulatory frameworks, where standards, documentation requirements and closure planning practices differed from those applied today.

Historically, closure was often not prioritised to the same extent as under current frameworks. Rehabilitation may have been undertaken progressively, but with less emphasis on documenting success against measurable completion criteria, recording the 'as-built' condition of landforms, or maintenance of rehabilitation records relating to long-term rehabilitation performance. As a result, legacy sites may be unable to demonstrate through formal records that rehabilitation has been completed satisfactorily and residual risks are acceptable.

When assessed against contemporary expectations, these legacy conditions can create challenges in demonstrating compliance. In many cases, additional investigations are required to verify the condition and performance of rehabilitated areas, or to reconstruct the 'as-built' configuration of landforms and structures. Importantly, these challenges do not necessarily reflect poor rehabilitation outcomes, but the way closure was documented and verified under earlier frameworks.

In other cases, rehabilitation may have been completed in accordance with agreed objectives or completion criteria but not formally assessed or confirmed as satisfactory at the time. These areas may therefore remain unverified for extended periods, with sign-off only sought years, or in some cases decades, later when relinquishment is pursued.

This can result in rehabilitation being assumed complete, while underlying uncertainty remains. When assessment is eventually undertaken, this uncertainty may require additional investigation or, in some cases, substantial rehandling and rework of previously completed landforms to meet contemporary expectations.

In addition, the process of progressing towards relinquishment can itself identify issues that were not previously evident. As investigations and validation activities are undertaken, previously unknown conditions

or gaps in understanding may be revealed, requiring additional work that may not have been necessary if addressed earlier.

This is reflected in practice at legacy sites. For example, at the Rhondda Colliery in NSW, rehabilitation works were completed in 2008; however, additional investigations, studies and management were later required to demonstrate that closure outcomes met contemporary expectations and to support relinquishment (NSW Resources Regulator 2024).

2.3 Commercial and portfolio drivers

Commercial and portfolio considerations may also influence relinquishment timing, although these are often shaped by the regulatory and technical uncertainties described above. Once a mining lease is relinquished, operators may lose the statutory rights associated with that tenure, including access and control over the land. Re-establishing access or undertaking further works following relinquishment may require new approvals and agreements, which can be complex and uncertain.

Operators may retain leases for a range of strategic reasons, including maintaining optionality for future resource extraction or mine extension opportunities, retaining control over land and infrastructure to support post-mining beneficial re-use opportunities, or for other commercial outcomes. In addition, operators may hold portfolios of legacy assets acquired through mergers and acquisitions for which there is no clear exit strategy.

In isolation, these factors may not be sufficient to delay relinquishment where pathways are clear and risks are well understood. However, in the presence of uncertainty regarding regulatory expectations, evidentiary requirements and potential rework exposure, operators may adopt a more cautious approach.

In this context, the decision to defer relinquishment can be viewed as a rational response to uncertainty. Initiating relinquishment may trigger:

- additional validation and verification requirements
- exposure to rework where historical rehabilitation does not meet current expectations
- uncertainty regarding residual risk obligations at surrender.

As a result, operators may prioritise deferral until there is greater confidence in the likely requirements and outcomes, particularly where holding costs are predictable and can be accommodated within operational budgets.

2.4 Risk perception and liability management

Perceptions of risk and liability play a further role in influencing relinquishment decisions. While relinquishment represents the transfer or cessation of certain obligations, uncertainty regarding residual risks and long-term performance can create hesitation for both operators and regulators. In addition, uncertainty regarding how residual risks are assessed, transferred or managed after relinquishment can influence both operator and regulator confidence in progressing towards surrender.

Residual risk frameworks are evolving to provide more structured approaches to the assessment and management of long-term risks, including the application of financial contributions at relinquishment. For example, the Queensland residual risk frameworks explicitly recognises that certain long-term risks remain following rehabilitation and require a financial payment to transfer these risks to the State at relinquishment (Queensland Treasury 2018).

However, residual risk is inherently uncertain and can be difficult to define, quantify and manage, particularly in the context of long-term environmental performance (State of Queensland 2018; Neubauer 2022).

2.5 'Closure drift'

A key contributor to increasing uncertainty over time is the disconnect between progressive rehabilitation and the timing of formal relinquishment. While rehabilitation is undertaken against agreed completion criteria during operations, these outcomes are often not tested until relinquishment is pursued, which may be many years later.

A key concept underpinning these dynamics is the gradual change in regulatory expectations, evidentiary requirements, and site understanding over time (referred to here as 'closure drift').

As tenure is retained, operators remain exposed to this drift. Over time, documentation becomes less reliable, expectations for evidence may increase, and the availability of institutional knowledge declines. This makes it harder to demonstrate the condition and performance of rehabilitated landforms and structures.

As confidence reduces, additional validation is often required to demonstrate that rehabilitation meets current expectations. In some cases, this can also lead to rework where outcomes cannot be adequately verified or are deemed unsatisfactory.

As a result, delayed relinquishment does not simply extend the duration of holding costs but increases exposure to less predictable and potentially higher-consequence cost pathways.

This creates a feedback loop in which:

- delayed relinquishment increases exposure to closure drift
- increasing drift reduces evidentiary confidence
- reduced confidence drives additional validation and potential rework
- increasing cost and complexity further discourage progression towards relinquishment.

In this way, the financial consequences of delayed relinquishment are driven not only by time, but by increasing exposure to evolving expectations and reduced confidence in existing rehabilitation.

3 Financial exposure from deferred relinquishment

Deferred relinquishment exposes operators to a range of financial liabilities that extend beyond the direct and visible costs associated with maintaining inactive or rehabilitated sites. While holding costs are often well understood and routinely budgeted (ICMM 2019), the broader financial implications of delayed relinquishment are more complex and can increase disproportionately over time, particularly where additional cost pathways are triggered.

The primary cost pathways associated with deferred relinquishment are discussed below.

3.1 Base case holding costs

At a base level, retained mining leases continue to incur recurring holding costs, including tenement fees, rates and taxes, insurances, environmental monitoring, compliance reporting, and land and infrastructure maintenance. These costs are typically well understood and are incorporated into operational budgets and life of asset cost estimates (Brock et al. 2019; ICMM 2019).

Over time, holding costs escalate in line with labour, contractor and input cost inflation. While individually predictable, their cumulative impact can be material where relinquishment is delayed over extended periods.

3.2 Additional cost pathways

3.2.1 Validation and verification costs

Prolonged tenure retention increases the likelihood that rehabilitation completed under historical standards will be reassessed against evolving regulatory expectations. As closure drift occurs, operators may be

required to undertake additional validation and re-verification to demonstrate compliance with contemporary standards. This has been observed in practice at legacy sites, where extensive drilling or investigation programs are required to verify historical works where documentation is incomplete.

This can include geotechnical assessments, geochemical investigations, ecological studies and intrusive verification works to confirm the condition and performance of rehabilitated landforms and structures. In many cases, these requirements arise due to incomplete or insufficient documentation, or the need to confirm the 'as-built' condition of final landforms.

These validation activities introduce additional costs that would not have been incurred if relinquishment had been pursued earlier, when rehabilitation works are recent, documentation is current, and evidentiary confidence is high and the personnel responsible for the works remain available to provide context and assurance. Over time, the loss of institutional knowledge further increases uncertainty and drives additional validation requirements.

3.2.2 *Rework exposure*

A more significant financial exposure arises where validation activities identify that historical rehabilitation works do not meet current standards, or where satisfactory performance cannot be adequately demonstrated. In these cases, additional physical works may be required.

Common examples include re-sealing of mine entries, re-profiling or capping of landforms, or remediation of areas where materials have not been placed or documented as intended. These activities can be extensive and may require disturbance of previously rehabilitated areas. In some cases, this extends to large-scale rehandling or reconstruction of landforms that were previously considered complete, but their condition or performance cannot be demonstrated to contemporary expectations.

Rework is not a fixed or predictable cost. Rather, it represents an uncertain, potentially high-consequence exposure that increases with closure drift. As standards evolve, documentation becomes less reliable and institutional knowledge is lost over time, the likelihood that rehabilitation works cannot be verified increases, as does the potential scale of intervention required.

In practice, this means that as relinquishment is delayed, the extent of potential rework increases, shifting from targeted rectification to more substantial remediation, and in some cases, partial or complete reworking of previously rehabilitated areas.

3.3 Residual risk obligations

While not explicitly modelled in this paper, residual risk obligations represent a further potential cost pathway. Emerging frameworks, such as those in Queensland, require the identification and funding of credible post-surrender risks (Queensland Treasury 2018).

However, these approaches remain relatively new and have not yet been widely implemented in practice. As such, the magnitude and implications of residual risk obligations remain uncertain. As regulatory frameworks continue to evolve, residual risk will become an increasingly important consideration in relinquishment timing and decision-making.

4 Scenario-based modelling framework

4.1 Model overview

The potential financial implications of relinquishment timing have been illustrated using a simplified Microsoft Excel-based cost model. The model applies indicative annual holding costs together with scenario-dependent validation and rework costs as described in Section 3. Costs commence at the point where rehabilitation is assumed to be substantially complete (year 0), and the site has entered a monitoring and maintenance phase.

Three representative relinquishment scenarios have been considered:

- early relinquishment (approximately 5 years)
- standard relinquishment (approximately 15 years)
- extended retention (approximately 25 years).

For each scenario, annual holding costs have been applied from commencement until the year of relinquishment and escalated annually to reflect inflation. Validation and rework costs have been applied as one-off cost events at the point of relinquishment. Validation and rework allowances were assumed to increase with relinquishment delay to reflect increasing uncertainty, reduced evidentiary confidence, and greater potential for rehabilitation rework associated with closure drift.

While not site-specific, the model is intended to reflect typically incurred costs observed in leases where rehabilitation has been substantially completed but relinquishment has not yet been achieved. The model is conceptual and illustrative in nature and is not intended to predict absolute costs; rather it is intended to illustrate how relinquishment timing influences the magnitude and composition of post-closure cost pathways.

4.2 Key assumptions

The key assumptions adopted in the model are summarised in Table 2.

The model uses indicative cost values to demonstrate the relative behaviour of these relinquishment pathways rather than predict specific closure liabilities; consequently, actual values are not presented herein. The analysis focuses on the timing, composition and step changes of costs rather than absolute financial outcomes.

Table 2 Key assumptions

Parameter	Assumption
Analysis period	The analysis period is 30 years to capture the cumulative costs of each relinquishment pathway. Cumulative costs were calculated annually from the base date until relinquishment.
Base date	The base date (year 0) assumes rehabilitation is substantially complete and the site has transitioned to a monitoring and maintenance phase.
Early relinquishment timing	Relinquishment occurs approximately 5 years after rehabilitation completion. Costs accumulated to year 5.
Standard relinquishment	Relinquishment occurs approximately 15 years after rehabilitation completion. Costs accumulated to year 15.
Extended retention	Relinquishment occurs approximately 25 years after rehabilitation completion. Costs accumulated to year 25.
Holding costs	Holding costs were applied annually from the base date until relinquishment and escalated by an assumed CPI of 3.5% per annum. Holding cost inputs included indicative allowances for tenement fees, rates and land taxes, environmental monitoring, land and infrastructure maintenance and site management, compliance reporting and governance, and insurance.
Validation costs	Validation costs were represented as a scenario-based allowance applied the year before relinquishment. The allowance increased with delay to reflect increasing evidentiary requirements and reduced confidence in historical rehabilitation works. Validation cost inputs included assumed assessments and investigations such as contamination, geotechnical, water and ecological studies.
Rework	Rework costs were represented as a scenario-based allowance applied the year before relinquishment. The allowance increased with delay to reflect increasing exposure to closure drift, uncertainty and the potential for rehabilitation rework.

CPI – consumer price index

These assumptions are indicative and are intended to support comparison between scenarios rather than represent site-specific conditions.

The model is intentionally simplified and does not attempt to capture site-specific variability. Instead, it provides a transparent representation of how financial exposure changes with relinquishment timing. While absolute outcomes will vary between sites, the relative behaviour of cost pathways is expected to be broadly consistent.

Residual risk obligations are not modelled. While emerging frameworks indicate that these will become an increasingly important component of closure liabilities, practical implementation remains limited, and there is currently little experience in applying these obligations.

5 Results – financial consequences of delay

The results are presented to illustrate how relinquishment timing influences the nature and magnitude of closure-related financial exposure. The analysis focuses on the relative behaviour of cost pathways under different timing scenarios, rather than absolute cost outcomes, reflecting the inherently site-specific nature of closure costs.

5.1 Holding costs baseline

The accumulation of holding costs provides a useful baseline for understanding the financial implications of retaining mining leases following completion of rehabilitation.

Figure 1 shows that holding costs increase progressively until relinquishment after which no further costs are incurred. This results in a higher cumulative cost under extended retention scenarios. While the annual cost is relatively modest, the cumulative effect becomes material over longer timeframes.

However, this baseline reflects only the continuation of predictable, recurring costs and does not capture the change in cost structure associated with delayed relinquishment, where exposure shifts towards less predictable and potentially higher-consequence cost pathways.

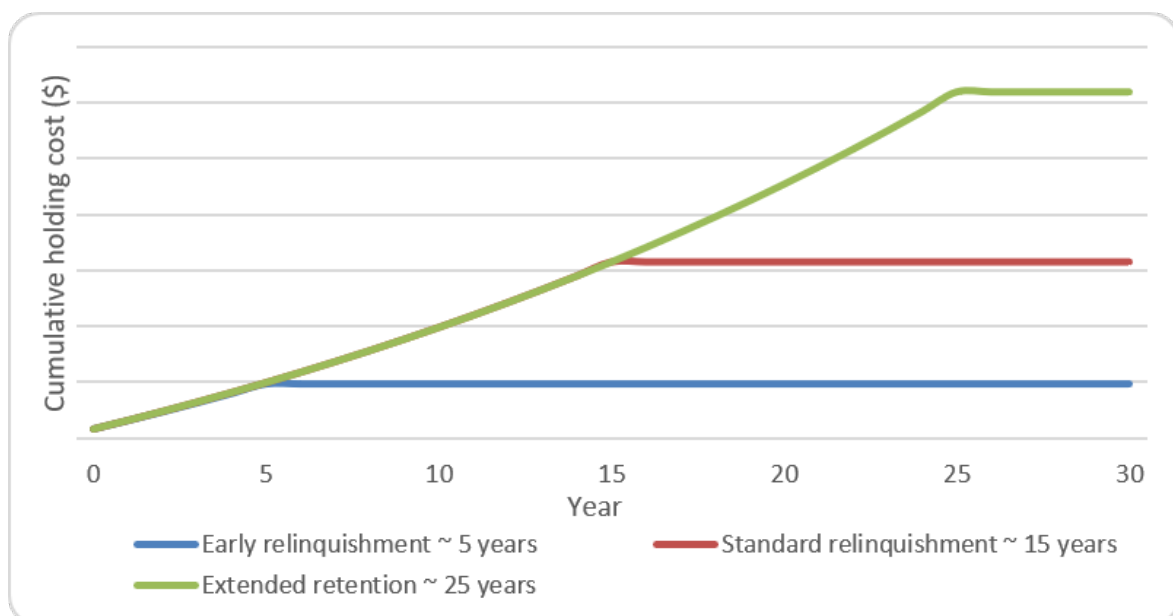


Figure 1 Cumulative holding costs by scenario

5.2 Validation and rework cost impacts

Figure 2 presents the cumulative cost outcomes for the 3 relinquishment scenarios, incorporating holding costs, validation and rework. The step changes shown in Figure 2 represent validation and rework cost events that occur at relinquishment, which become increasingly significant as relinquishment is delayed.

The early relinquishment scenario shows a relatively low and predictable cost profile, reflecting the limited duration of holding costs and minimal validation and rework requirements. Costs accumulate gradually until relinquishment and are comparatively low.

In the standard relinquishment scenario, costs accumulate initially in line with holding costs, followed by a step change associated with validation activities prior to relinquishment.

The extended retention scenario demonstrates a pronounced cost increase prior to relinquishment, reflecting increased validation requirements and greater exposure to rework. These costs are not simply an extension of holding costs, but represent a shift to higher impact, less predictable cost drivers associated with reduced evidentiary confidence and evolving regulatory expectations. While the model represents this as a discrete step change, the magnitude of the increase is inherently uncertain and may vary by orders of magnitude, depending on works required.

In some cases, rework may be limited to targeted investigation or minor remediation. In others, it may involve substantial reconstruction of previously completed landforms or infrastructure where outcomes cannot be adequately verified or are deemed unsatisfactory. In these cases, rework costs can materially exceed cumulative holding costs and become the dominant component of total closure expenditure.

In practical terms, delayed relinquishment shifts financial exposure from manageable, forecastable costs to more uncertain and potentially material liabilities. The magnitude of validation and rework costs is inherently variable and depends on site conditions and the nature of the required works.

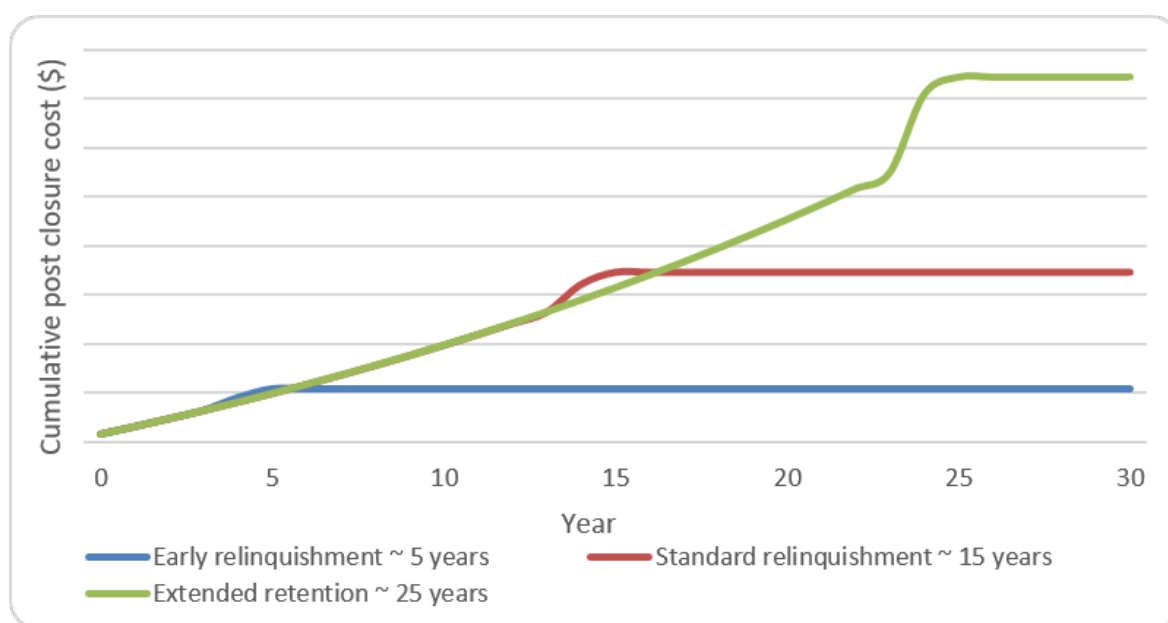


Figure 2 Cumulative post-closure cost by scenario

6 Practical pathways and recommendations

This paper argues that relinquishment timing is a key determinant of closure-related financial outcomes. While holding costs are predictable and accumulate over time, delayed relinquishment increases exposure to validation and rework, shifting financial liabilities towards less certain and potentially more significant cost pathways.

6.1 Implications for operators

For operators, the results highlight the importance of actively progressing relinquishment once rehabilitation is complete, rather than defaulting to tenure retention. Delays increase exposure to uncertainty, particularly where documentation degrades over time and institutional knowledge is lost, increasing both the cost and complexity of achieving relinquishment. From an operator perspective, reducing exposure to delayed validation and rework requires a more proactive approach to evidentiary confidence during and immediately following rehabilitation.

Early planning for relinquishment, including the identification and management of risks at the time of rehabilitation, the development and retention of robust 'as-built' records, clear documentation of rehabilitation works and proactive engagement with regulators, can reduce these risks and support earlier relinquishment outcomes.

6.2 Implications for regulatory frameworks

In NSW, recent rehabilitation reforms represent a shift towards earlier completion of rehabilitation and improved closure outcomes. However, this analysis highlights that achieving rehabilitation completion alone does not necessarily enable timely relinquishment.

Where rehabilitation can be demonstrated with a high degree of evidentiary confidence, underlying risk is reduced. As time progresses, closure drift increases uncertainty, driving additional validation requirements and the potential for rework. Earlier relinquishment, supported by robust documentation and risk-based assessment, may therefore provide greater confidence in closure outcomes than delayed relinquishment.

Without clear, practical and consistently applied relinquishment pathways, operators may remain exposed to increasing uncertainty and cost, even where rehabilitation outcomes are largely achieved.

In addition, emerging residual risk frameworks may introduce a further consideration for operators in relinquishment decision-making. While these mechanisms are intended to ensure that long-term liabilities are appropriately managed, the scale and structure of residual risk payments may, in some cases, represent a significant upfront cost.

Where these costs are high or uncertain, they may act as a disincentive to relinquishment, even where rehabilitation outcomes are largely achieved. This reflects an emerging tension between the objectives of risk transfer and timely land transition and highlights the importance of ensuring that financial assurance and residual risk frameworks are aligned.

At the same time, these frameworks can enable relinquishment where residual risks are clearly defined and managed. This is reflected in recent NSW examples, such as the Rhondda Colliery rehabilitation, where relinquishment has been achieved alongside the ongoing management of residual risks through land use covenants and long-term monitoring and maintenance obligations (NSW Resources Regulator, 2024).

6.3 Opportunities to enable earlier relinquishment

The findings of this paper highlight several opportunities to support more effective and timely relinquishment outcomes.

6.3.1 *Clearer relinquishment pathways and progressive sign-off of completed rehabilitation elements*

Development of clearly defined relinquishment pathways, including transparent evidentiary requirements and decision points, would improve certainty for both operators and regulators.

A key opportunity within this is the progressive sign-off of completed rehabilitation elements, rather than deferring validation until final relinquishment. Components such as contamination remediation, landform construction, cover systems, or material placement may be completed well in advance of relinquishment but are not formally verified until much later, increasing the risk that outcomes are reassessed under different expectations or with reduced evidentiary confidence.

Progressive verification of these components at the time they are completed would reduce uncertainty and the likelihood of rework triggered by delayed validation. This requires early engagement to confirm that completed works meet expectations at the time they are undertaken, rather than relying on retrospective verification at relinquishment.

6.3.2 *Recognition of 'trending towards' outcomes*

There may be opportunities to recognise sites that are demonstrably progressing towards agreed completion criteria, particularly where long-term outcomes such as vegetation establishment or water quality may take extended periods to fully stabilise.

In practice, rehabilitation outcomes may follow predictable trajectories over time, where performance can be demonstrated through monitoring data and trend analysis, even if final criteria have not yet been fully achieved.

Recognising these 'trending towards' outcomes, supported by appropriate monitoring and risk-based assessment, may enable earlier progression towards relinquishment by reducing the need to wait for full maturity of all criteria where long-term performance is well understood and considered low risk.

6.3.3 *Risk-based approaches to sign-off*

Consideration of structured, risk-based approaches to relinquishment may enable earlier release of land where performance can be demonstrated and risks are understood and manageable, rather than requiring full maturity of all criteria.

In practice, some level of residual risk is likely to remain at the point of relinquishment, particularly for long-term processes such as landform stability or water quality. Explicit recognition and acceptance of these risks, supported by appropriate controls or transfer mechanisms, may enable more timely relinquishment outcomes.

6.3.4 *Improved documentation and knowledge retention*

Maintaining robust 'as-built' records and closure documentation is critical to supporting future validation and reducing the risk of rework, particularly where personnel and project teams change over time.

Ensuring that rehabilitation works are clearly documented at the time they are undertaken, including design intent, construction records and performance monitoring, can improve evidentiary confidence over time, reduce exposure to closure drift, and minimise the likelihood of uncertainty-driven rework at the point of relinquishment.

6.4 Broader considerations

Delayed relinquishment increases financial liabilities and can delay transition to alternative land uses, representing an opportunity cost not captured in traditional closure assessments.

Enabling earlier relinquishment has the potential to unlock these land use opportunities sooner, supporting regional economic outcomes in addition to reducing financial liabilities.

Residual risk frameworks may also become an increasingly important component of closure decision-making. While not explicitly modelled in this analysis, emerging approaches in other jurisdictions highlight the need to identify, quantify and manage credible post-surrender risks. However, these frameworks remain relatively untested, and the magnitude and implications of residual risk obligations are not yet well understood.

6.5 Closing statement

Timely relinquishment has the potential to reduce financial exposure, improve certainty and enable earlier land transition, while maintaining environmental outcomes. As regulatory frameworks continue to evolve, aligning policy and practice to support earlier, evidence-based relinquishment represents a key opportunity to improve closure outcomes for both industry and the community.

Use of artificial intelligence disclosure statement

In the preparation of this work, the author used OpenAI ChatGPT (GPT 5.5) and Microsoft Enterprise Copilot (GPT 5) to assist in testing arguments and improving clarity and structure. The author has reviewed the content and edited it where required and takes full responsibility for said content.

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