

Risk and Opportunity Assessment Framework for Abandoned Resource Sites

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Executive Summary

For more than 150 years, mining has played a significant role in Queensland's economic and regional development. During that time, some mines have been abandoned, leaving legacy structures and disturbance across the state. These sites can present risks to community health and safety, property and the environment, but may also provide economic, environmental, cultural, social and regional development opportunities where appropriately assessed and managed.

To support the effective management of abandoned mines, the Queensland Government established the Abandoned Mine Lands Program (AMLPL). The AMLPL provides a structured approach for assessing risks and opportunities, undertaking targeted works, and informing decisions that protect public safety, property and the environment while supporting productive post-mining land uses where feasible.

Under the *Mineral Resources Act 1989*, a mine is considered abandoned when there is no longer a current mining tenure nor environmental authority in place. The same principles apply when managing abandoned operating plant under the *Petroleum and Gas (Production and Safety) Act 2004*. Accordingly, the term 'abandoned resource sites' is used throughout this framework to include both abandoned mines and abandoned operating plant under their respective Acts.

The Queensland Government's Risk and Opportunity Assessment Framework for Abandoned Resource Sites (the Framework) provides a transparent, robust and risk-based approach to addressing hazards associated with abandoned resource sites in a consistent and repeatable manner.

The Framework is guided by principles that support consistent assessment and decision-making across the abandoned resource site portfolio. These principles recognise the critical role of competent risk and opportunity assessment in identifying hazards and evaluating optimal pathways to reduce risk. They also emphasise the value of collecting and analysing data on abandoned resource sites and considering the historical, cultural, social, environmental, educational and economic values of these sites when developing management options.

Risk and opportunity assessments will be undertaken through an integrated, staged process that aligns with the AMLPL's risk-based approach to making abandoned resource sites safe, secure, durable and, where possible, productive.

The process will involve:

- Preliminary screening through a desktop and spatial information review of sites followed by a site assessment to ground-truth site conditions, hazards and constraints. At this stage the recommercialisation criteria will be applied to identify whether productive use may provide a viable risk mitigation pathway, either as an alternative to, or in combination with, traditional remediation.
- Detailed risk and opportunity assessment, including consideration of public health and safety, environmental, and property hazards, and recommercialisation opportunities identified during preliminary screening.
- Evaluation of sites to inform decisions on further investigation, risk treatment, remediation and recommercialisation. The evaluation will be based on cumulative high and extreme risks, the imminence of public health and safety risks, potential serious environmental harm and property impacts, and opportunities to reduce long-term liability through viable productive use.

Following completion of site risk and opportunity assessments, business cases will be developed to support funding applications for proposed management, risk control, remediation and/or recommercialisation options. Business cases will identify the preferred site-specific pathway, expected risk reduction, cost implications, delivery requirements, stakeholder considerations and anticipated public benefits.

A portfolio-level assessment will then be undertaken to comparatively assess risks, opportunities, costs and benefits across AMLP sites. This will support resource allocation and transparent funding proposals, ensuring investment decisions are directed towards sites where intervention can most effectively reduce high and extreme risks, address imminent public health and safety or environmental concerns, and realise viable opportunities for long-term productive use.

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1. Purpose

The Queensland Government is committed to delivering a transparent and accountable AMLP including publishing information about how risks, opportunities and management options are assessed to inform investment and program delivery decisions.

The AMLP is guided by the Abandoned Mines Management Policy, which aims to make sites safe, secure, durable, and where possible, productive. These outcomes may be achieved through remediation, risk control, recommercialisation (including re-purposing) or other appropriate site management pathways, in collaboration with stakeholders.

The Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (NRMRRD) implements the Abandoned Mines Management Policy through the Framework. The Framework provides for:

- Achieving outcomes consistent with Queensland's Abandoned Mines Management Policy.
- Identifying risks to public health and safety, environment and property associated with abandoned resource sites.
- Assessing abandoned resource sites and potential management options in a consistent and repeatable manner against AMLP criteria.
- Evaluating risk mitigation options based on risks and opportunities that will be assessed in a consistent, repeatable manner ensuring remediation, recommercialisation, and other viable pathways are considered to support the objectives of the Abandoned Mines Management Policy.
- Considering whole-of-portfolio risks, opportunities, costs and benefits to inform cost-effective outcomes.
- Ongoing monitoring, analysis and reporting of identified risks and benefits of AMLP from AMLP activities.

2. Terminology

Under the *Mineral Resources Act 1989*, a mine is considered abandoned when no current mining tenure or environmental authority exists. A similar principle applies to abandoned operating plant under the *Petroleum and Gas (Production and Safety) Act 2004*. Together, these definitions establish the basis for identifying abandoned resource sites, including both abandoned mines and abandoned operating plant under their respective legislation.

This Framework applies to abandoned mines under the *Mineral Resources Act 1989* and, where expressly stated, to abandoned sites or operating plant under the *Petroleum and Gas (Production and Safety) Act 2004*. The term 'abandoned resource site' is used solely as a collective descriptor for these categories and does not extend to other industrial, processing, refining, or resource-related sites unless they meet the relevant statutory definitions or are included through an approved government decision.

For the purposes of this Framework, the term 'recommercialisation' encompasses opportunities to generate productive or commercial value from abandoned resource sites. This includes reprocessing or recovery of minerals from waste material, tailings and other secondary resources, and unmined resources, as well as repurposing of the land and infrastructure for alternative productive uses, such as renewable energy, quarrying, agriculture, tourism or other regionally appropriate development.

3. Abandoned resource sites in Queensland

Queensland has more than 15 000 known historical abandoned mine features, the majority of which are small-scale historical mining disturbances associated with early, non-mechanised mining activity. These sites are generally managed through targeted risk-based programs, such as shaft remediation and small-scale works, rather than through this Framework.

To date, around 100 larger and more complex abandoned resource sites have been identified in Queensland. These sites are collectively referred to as program sites and are the focus of the Framework due to their scale, complexity, risk profile and potential opportunities.

Detailed information on the characteristics of various abandoned resource sites is outlined in Appendix 1.

4. Abandoned Mine Lands Program

There are two key risk mitigation drivers for works conducted under the AMLP: remediation to mitigate risk to public health and safety, the environment and property; and works to support recommercialisation opportunities at abandoned resource sites.

Typical examples of the activities undertaken through the AMLP include, but are not limited to:

- historic shaft remediation programs
- Collingwood Park monitoring and state guarantee response
- abandoned mine monitoring and assessment
- disposal or sale of abandoned plant and equipment by auction or other mechanisms
- decommissioning and demolition of abandoned infrastructure
- disturbed land remediation activities, including earthworks, revegetation, clean-up of contamination and water management
- consideration of indigenous and non-indigenous cultural heritage issues
- stakeholder consultation
- data collection and analysis to assess recommercialisation potential, including residual mineral assessments, plant and condition assessment or geospatial assessments for alternative land uses
- data sharing and release to support a market response for recommercialisation opportunities.

These works benefit the community and regional economies in a variety of ways, such as eliminating (or restricting access to) physical hazards and improving air and water quality for adjacent landholders and communities by the removal and/or reduction of contaminants or supporting regional economies and local business opportunities.

Remediation and recommercialisation support the objectives of the Abandoned Mines Management Policy and can be complementary rather than mutually exclusive. While remediation provides a clear pathway to risk mitigation, recommercialisation can also help manage and reduce risks by introducing viable land uses, investment, and ongoing stewardship. Aligning recommercialisation with site risk profiles may allow sites to be progressed productively without extensive, high-cost remediation works, or it may assist with offsetting costs and support innovative solutions for risk reduction. Integrating remediation and recommercialisation into a risk and opportunity-based framework ensures decisions balance risk reduction with opportunities for efficient reuse and better allocation of resources.

Imminent high potential safety risks and emergencies affecting abandoned resource sites will be addressed outside of this Framework as required to ensure a timely response. Similarly, ad hoc recommercialisation activities driven solely by economic opportunities may also be addressed outside this Framework.

5. Guiding Principles

The following guiding principles support the Framework.

Risk Management

- Risks to public health and safety, the environment and property from abandoned resource site features are identified and analysed to inform remediation and/or recommercialisation options.
- AMLP work planning is informed by individual and cumulative risks from site features, as well as opportunities for recommercialisation activities to support risk mitigation.
- Risks may be grouped into categories where a large number of potential hazards are identified at a site.
- Risk controls will be evaluated with consideration of likelihood of success, cost benefit of remediation or recommercialisation options, potential for long-term benefit and legal requirements, including land tenure, and stakeholder views to determine an overall site evaluation.
- Risk mitigation solutions will achieve outcomes that are safe, secure, durable and, where possible, productive.
- Site risk and opportunity profiles are reviewed as remediation and/or recommercialisation work programs are completed and/or as additional information becomes available to inform the risk and opportunity assessment.

Maximising Public Value

- Historical, cultural, social, environmental, educational or economic value of abandoned resource sites are considered when developing site management and risk mitigation plans.
- Approved risk mitigation activities will have a clear community or environmental benefit.
- Cost-reduction opportunities, including via recommercialisation activities, are considered as a fundamental component of the risk and opportunities assessment and risk mitigation.

Data Collection, Management and Sharing

- Data collection and management will allow for improved understanding and comparative analysis on all relevant aspects of abandoned resource sites, and reporting of information in a consistent way.
- Spatial data will be used for pre-screening and informing risk rankings.
- Information on leading practices, remediation and monitoring outcomes will be shared and reviewed regularly to support continuous improvement.
- Information and data on site characteristics will be made publicly available, where appropriate, to support market-led solutions for recommercialisation.
- A summary of information regarding site identification, risk assessment outcomes, site rankings, and the evaluation of management options for abandoned resource sites will be publicly accessible.

Resourcing, Stakeholder Engagement and Governance

- Stakeholders will be consulted concerning site management and the development of remediation and/or recommercialisation objectives.
- Partnerships with other government bodies, businesses and community groups will be encouraged.
- Resources will be directed to sites with the highest risk, liability, and/or strongest potential to reduce risk and generate public value through viable recommercialisation.
- A formal, transparent governance structure exists to support management and/or funding decisions, track spending and clearly define responsibilities.
- Management and/or remediation works will be cost-effective and employ recommercialisation options as appropriate.
- A robust project management and contractor management framework will support implementation of remediation projects.
- Management and funding decisions will consider risk appetite and tolerances, and the cost-benefit of risk mitigation options at both site and portfolio scales.
- Portfolio evaluation will compare risks, opportunities, liabilities, costs and benefits across sites to inform the allocation and sequencing of available AMLP resources.

6. Operational Works

For these smaller historical mining disturbances, targeted programs provide a practical and proportionate mechanism for managing risk. The Shaft Repair Program is one such program, focused on addressing historical mine shafts and related features that may present public health and safety risks.

Shaft Remediation and Small-Scale Works

Historic mine disturbances are managed through the Shaft Repair Program whereby risks are assessed on a small-scale program-based approach. The Shaft Repair Program, including within the Gympie and Charters Towers areas, are managed based on public health and safety risks.

Public safety risks posed by open underground or historic mine features outside of these areas are managed based on public concern and a Geographical Information System (GIS) risk model. The GIS risk model utilises the state-wide mineral occurrence database (MINOCC) to aid in the identification of high-risk sites in proximity to populations and accessible locations. Each historic mine disturbance is allocated a risk value based on a weighted criteria that includes feature type, proximity to road class and type and proximity to population centre and size. The GIS risk model allows high-risk areas to be assessed via field assessment and works programs implemented on a regional or small works program-based approach. Individual historic mine disturbances are generally not considered any further in this Framework unless a public health and safety risks exist.

Where there are multiple small sites in a defined area that have potential cumulative impacts, these areas of disturbance may be grouped into a small scale works program plan for assessment under this Framework.

7. Risk and Opportunity Assessment

The Framework applies a staged process to assess abandoned resource sites, identify suitable management pathways and inform AMLP investment and delivery decisions. The process recognises that sites differ in statutory status, risk profile, technical complexity, commercial potential, stakeholder context and cost. A consistent model is therefore required to support transparent, evidence-based assessment across the AMLP portfolio.

The process comprises six stages:

1. Preliminary screening
2. Site risk and opportunity assessment
3. Options assessment
4. Portfolio evaluation
5. Business case development
6. Delivery, monitoring and review

Together, these stages ensure that risk controls (including management, remediation, recommercialisation) are considered consistently and proportionally. Final funding decisions remain subject to relevant statutory, administrative and government approval processes.

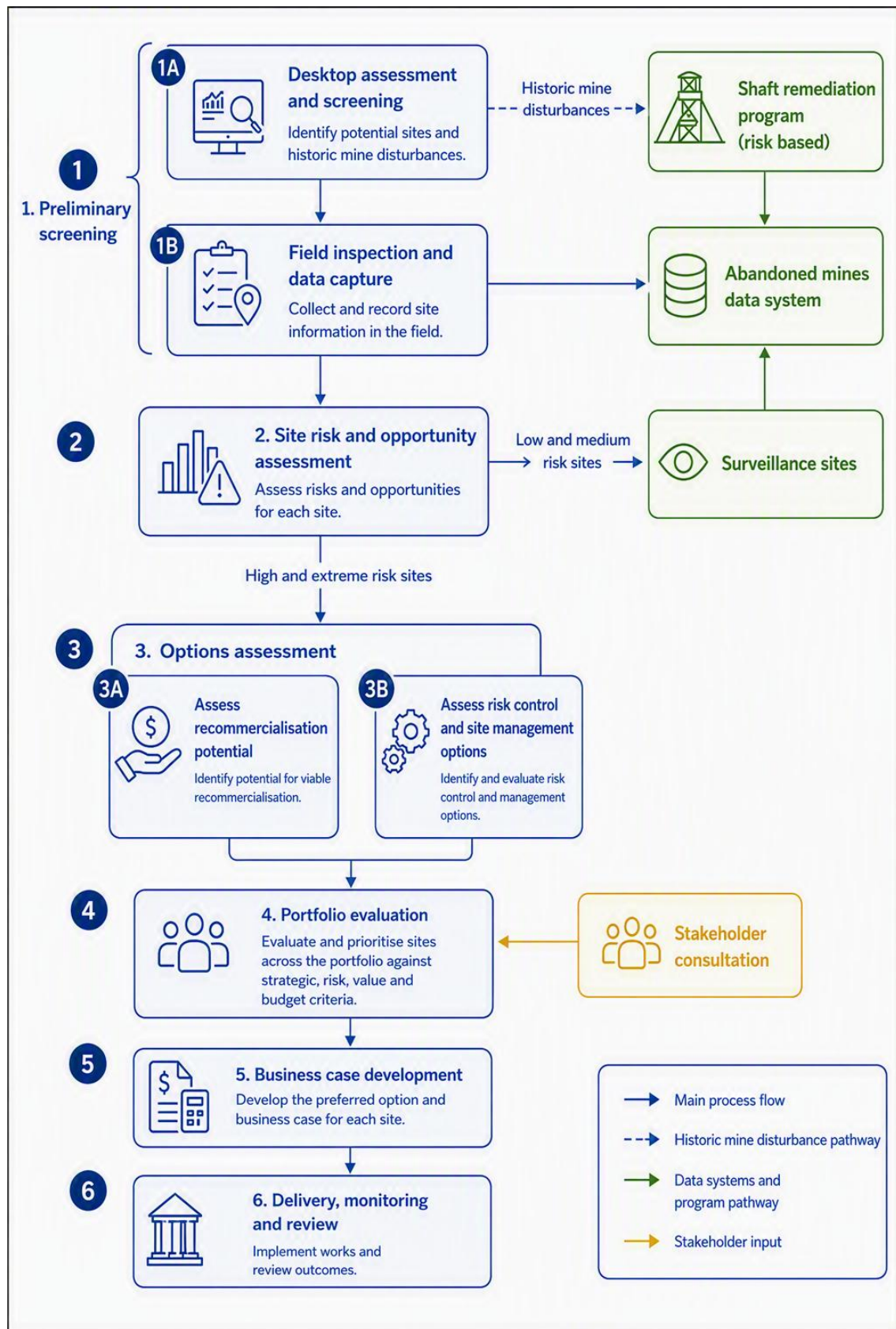


Figure 1. Portfolio Risk and Opportunity Assessment Process Flow

8. Preliminary screening

Preliminary screening involves a desktop and spatial information review of sites followed by a field assessment to collect relevant information in advance of a detailed site risk and opportunity assessment. The recommercialisation criteria (Figure 2) will be applied at this stage to inform further assessments and investigations at abandoned resource sites.

Desktop Assessment and Screening

Desktop review uses available government and public information to identify site characteristics, potential hazards, statutory status, land tenure, environmental authority status, historical disturbance, known infrastructure and available mineral, geological, environmental and spatial data.

Desktop assessment filters out sites where only exploration and/or small-scale activities such as historic mine disturbances have occurred and involves:

- Reviewing the Geological Survey of Queensland's mineral occurrence database (MINOCC) which identifies some 15 000 sites of potential interest.
- Reviewing historic and current resource permitting information, imagery and topographic mapping to evaluate mine-related disturbance at each site.
- Reviewing information held across Queensland Government including site reporting, documentation relating to environmental authorities, mineral resource information and existing government knowledge.
- Excluding mines without current mining tenure but which have a current environmental authority or conversely mines with a current mining tenure but without an environmental authority.
- Excluding historic mine disturbances suitable for management through AMLP's Shaft Repair Program.

Field Inspection

Field inspections may also include environmental, geochemical and geological sampling to inform of potential risks or information that may inform recommercialisation, such as residual mineral resource potential or land use features that may support alternative land uses at the site. Spatial data concerning significant features and infrastructure such as waste rock dumps, open pits, tailings storage facilities and processing infrastructure are also collected and made publicly available.

Stakeholder engagement commences during field assessments to contribute local knowledge to ensure an adequate understanding of site risks from a local perspective.

Data Management

An abandoned mines database has been developed to capture information collected during the desktop assessment and field inspections and inform the risk and evaluation process. The database will mature as further information is collected from various sources and verified. Spatial information from this database will be made publicly available via the Queensland Government's GeoResGlobe.

9. Site Risk and Opportunity Assessment

Appropriately experienced and qualified personnel will complete an integrated semi-quantitative risk and opportunity assessment following desktop assessment and field inspection. The assessment will evaluate public health and safety, environmental, social and property hazards, while also identifying opportunities to reduce risk, lower long-term state liability and generate public value through recommercialisation, repurposing or other productive-use pathways.

The risk component of the assessment will be undertaken using an established methodology generally aligned with International Organization for Standardization (ISO) 31000:2018 Risk Management Guideline and NRMRRD's risk management approach. The risk assessment provides a screening-level filter to identify sites and features that present the highest public health and safety, environmental, social and property risks, based on defined likelihood and consequence criteria.

The consequence criteria considered in this process include multiple attributes across a range of categories including:

- Public health and safety – considers potential onsite and offsite community health and safety impacts.
- Social/property – considers amenity and economic factors, cultural heritage and impacts to public and private property.
- Environmental – considers environmental impacts and remediation required to address those impacts.

Each assessment will consider the nature of the hazard or opportunity, relevant site attributes, likelihood and consequence of risk events, effectiveness of existing controls, technical feasibility, stakeholder considerations, potential public value, and any additional controls, investigations or treatments required. Assessments are undertaken at the site-feature level and then consolidated into a site risk and opportunity register to support site-level evaluation and decision-making.

The assessment will also identify relevant opportunities, including whether recommercialisation or other productive-use pathways could reduce risk, offset remediation costs, reduce long-term state liability or deliver broader public value. These opportunities will be considered alongside risk control and site management options during subsequent options assessment and business case development.

The likelihood and consequence of a risk occurring are used to determine the risk rating. Opportunities will be assessed using recommercialisation criteria, including technical feasibility, commercial potential, risk reduction, stakeholder and tenure considerations, regulatory pathway, delivery complexity and potential to reduce long-term state liability.

Personnel undertaking the risk assessments are officers formally trained in risk assessment. Risk assessments take into consideration views from stakeholders and field observations, supported by analysis of environmental data and engineering advice where required. Detailed Risk Management Procedures have been developed to support this Framework for NRMRRD use and specifies the risk management training required for staff undertaking risk assessment workshops.

The outcome of the site risk and opportunity assessment is to determine whether a site should be classified as low, medium, high or extreme risk. Sites with low- or medium-risk features are generally managed as surveillance sites, subject to ongoing monitoring, periodic review and any targeted works required to maintain acceptable risk levels. Sites with high- or extreme-risk features are identified for further assessment and may progress to options assessment, portfolio evaluation and business case development.

10. Options Assessment

Options assessment compares the available management pathways for a high- or extreme-risk site and identifies the option, or combination of options, most likely to achieve safe, secure, durable and, where possible, productive outcomes. This evaluation considers the nature, scale and urgency of risks at each site, including the most significant individual risks, cumulative high and extreme risks, potential imminent risks to public health and safety, potential serious environmental harm, and property or social impacts.

Management pathways may include monitoring, care and maintenance, risk control, remediation, recommercialisation or hybrid approaches. A hybrid approach may be appropriate where, for example, immediate safety controls are required while longer-term remediation, re-processing, land re-use or stewardship options are investigated.

The outcome of the options assessment is a clear understanding of whether a high- or extreme-risk site should proceed to further investigation, be subject to risk treatment or remediation planning, be considered for recommercialisation, or be progressed through a combined site management pathway. The assessment should also document the reasons for the preferred option, key assumptions, residual risks, information gaps, estimated costs, expected benefits and any requirements for further approval or funding.

Options assessment should follow a structured decision-making process. This will generally involve:

- defining the problem, site objectives and required outcomes
- identifying a base case, such as continued monitoring or site risk mitigation activities (e.g. mine affected water destruction)
- comprehensive assessment of feasible management, remediation and/or recommercialisation options
- screening options for fatal flaws, including safety, technical feasibility, statutory constraints, land tenure, environmental impacts, stakeholder issues and cost
- developing a shortlist of viable options for more detailed assessment
- assessing short-listed options using a structured decision-support method, such as multi-criteria analysis
- identifying a preferred option or staged pathway for business case development.

Multi-criteria analysis may be used to compare options against agreed assessment criteria. Criteria may include risk reduction, public safety benefit, environmental benefit, technical feasibility, constructability, cost, value for money, durability, maintenance requirements, approval complexity, delivery timeframe, stakeholder acceptability, cultural heritage considerations, land access, commercial potential and contribution to productive post-mining use.

The weighting of criteria should reflect the site context and the objectives of the assessment. For example, public safety and prevention of serious environmental harm may carry greater weight at high-risk sites, while cost recovery, productive use and long-term stewardship may be more relevant where recommercialisation opportunities are credible.

Options should also be assessed against practical delivery considerations, including:

- likelihood of success
- technical uncertainty
- design and construction requirements
- availability of materials, contractors and specialist expertise
- timing and sequencing
- statutory approvals and tenure requirements
- whole-of-life cost
- care and maintenance requirements
- funding availability and potential funding pathway.

Where sufficient information is available, options assessment should include indicative cost estimates and a comparison of capital costs, operating costs and long-term management requirements. The level of cost estimating should be proportionate to the stage of assessment. Early-stage options may rely on order-of-magnitude estimates, while options progressing to business case should be supported by more detailed technical studies and cost estimates. Where uncertainty remains, staged investigations or technical studies may be required before a preferred option is identified.

For extreme and high risks, controls may focus on eliminating or minimising risk through appropriate treatments. However, risk control options are not necessarily mutually exclusive of each other. It may also be necessary to take a phased approach to the design of risk controls particularly given the complexity associated with high-risk features. The process does not rely solely on the number of high and extreme risks recorded for a site. Cumulative risk is considered together with other factors, including risk imminence, exposure pathways, receptors, potential consequence, effectiveness of existing controls, deliverability, cost, care and maintenance requirements, funding availability, stakeholder issues and potential benefits from recommercialisation.

Assessing Recommercialisation Potential

An evaluation or recommercialisation potential is undertaken alongside risk evaluation to determine whether recommercialisation may contribute to risk reduction, reduce long-term management costs, support ongoing stewardship, or deliver productive post-mining outcomes. Where a credible opportunity is identified, further assessment may be undertaken to determine its feasibility, commercial viability, stakeholder acceptability, tenure requirements and relationship to required risk mitigation or remediation outcomes.

The AMLP's recommercialisation criteria are used to evaluate the recommercialisation potential at the site, and the opportunities for recommercialisation to complement or reduce the cost of risk mitigation activities.

The recommercialisation assessment considers available information and data to score the recommercialisation potential as a trigger for further investigation. The assessment process does not include undertaking feasibility studies for developing recommercialisation initiatives, rather it identifies opportunities to seek industry interest or collaboration to progress opportunities. Where valid, recommercialisation opportunities will be included in business case considerations.

The recommercialisation assessment utilises site information to rate the site's potential, including:

- Residual mineral, or potential for residual minerals, in waste or unmined materials
- The presence of and operability of existing plant and other infrastructure
- Land and water available to support alternative land uses
- Suitability of the site for alternative land uses such as renewable energy projects or quarrying.
- Potential for non-industrial beneficial uses of abandoned resource sites are also considered including education, research, tourism and heritage.

Where there may be potential for recommercialisation, expressions of interest may be sought from relevant parties. See Figure 2 for criteria that will be used assessed to determine a site's potential for recommercialisation potential. These criteria are not exhaustive, and more information will be added over time as other commercial interests or opportunities arise.

Figure 2. Examples of abandoned mine recommercialisation opportunities



11. Portfolio Evaluation

Portfolio evaluation will consider site risk profiles, cumulative high and extreme risks, imminent public safety risks, potential serious environmental harm, property and social impacts, care and maintenance requirements, statutory obligations, stakeholder issues, recommercialisation potential, and expected long-term outcomes.

A governance process will support transparent and evidence-based review of business cases and, where appropriate, funding proposals. The process may recommend that a proposal proceed, be amended, be staged, be combined with other works, be subject to further investigation, or be progressed through an alternative funding pathway.

The portfolio governance process informs advice on the allocation and sequencing of available AMLP resources. Final funding decisions remain subject to the relevant statutory, administrative and government approval processes.

12. Business Case Development

Business case proposals at a site scale will be developed to support funding applications to execute proposed site management, risk mitigation, remediation and/or recommercialisation options. These will incorporate the outcomes of the risk and opportunity assessment as well as the recommercialisation assessment. Business cases will consider additional factors such as likelihood of success, beneficial land-use potential, cost effectiveness, potential for long-term benefit, stakeholder views, innovation, regional employment opportunities and legal and tenure-related issues where relevant. Benefits such as those that may arise through community partnerships and/or collaboration will also be considered at this stage.

Business case development may be iterative and staged. For example, an initial business case may seek funding for further technical investigations, engineering options analysis, market sounding or feasibility assessment, while a later business case may seek funding to implement the preferred option identified through those earlier stages.

Approved business cases will support investment decisions by clearly demonstrating the proposed intervention, rationale for government funding, expected benefits, delivery requirements, key risks, stakeholder considerations, residual liabilities and alignment with AMLP priorities.

Business cases will be assessed within a broader AMLP portfolio evaluation process. This ensures proposed site works, grouped works programs and portfolio-level activities are considered consistently against risk, opportunity, cost, benefit, urgency, deliverability and funding pathway.

Communication and Consultation

Stakeholders will be identified and considered on a case-by-case basis. Stakeholder interest will be assessed against the risk's impact on Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development priorities and the priorities of other stakeholder groups. Where funding is allocated for specific projects and remediation or recommercialisation option assessments, a site-specific stakeholder engagement plan will be developed for that site.

Table 1 is an example of the types of stakeholder groups that may be considered for a particular site and the types of priorities that may need to be considered.

Table 1. Summary of key stakeholder types

Stakeholder	Objectives
Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development	• Manage Queensland's land, water, mineral and energy resources to optimise sustainable development outcomes • Deliver safe, secure, affordable and sustainable energy and water resources • Engage the combined expertise of Traditional Owners, community, industry and government to optimise the management and use of our natural resources • Mitigate risk of/responsibility for environmental/cultural/social impacts • Comply with regulatory requirements • Prioritise the risk mitigation solutions including recommercialisation associated with abandoned resource sites • Undertake works to make abandoned resource sites safe, secure, durable, and where possible, productive
Other Government Agencies	• Protect the environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains ecological processes • Cultural heritage preservation • Compliance with legislation frameworks and policies • Recommercialisation initiatives or proposals that require regulatory approvals
Financial Provisioning Scheme Advisory Committee	• Consulted where funding is proposed through the Financial Provisioning Scheme for eligible abandoned mine remediation activities. • Provides advice on matters relating to the operation of the Financial Provisioning Scheme under the <i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i>. • Supports transparent consideration of funding requests within the scheme's regulatory framework. • Must be consulted before a request is made for payment of costs and expenses relating to remediation activities carried out on a pre-commencement abandoned operating mines, where required under the <i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i>. • May also support prioritised funding for eligible remediation activities and rehabilitation-related research and development.
Community	• Mitigating impact and/or recommercialisation opportunities on leasehold or private land, business enterprises and property (including landholders) • Mitigating impact on indigenous/non-indigenous culture, safety and community wellbeing • Mitigating impacts to the natural environment • Generating new employment and business opportunities • Local workforce/business participation in any remediation/ rehabilitation
Industry	• Opportunities for, or interest in, recommercialisation opportunities
Non-Government Organisations	• Welfare and or advocacy work in relation to a specific issue or in respect to social groups, the vulnerable or environment.

	• Indigenous non-government organisation – strengthen political and economic influence within a region • Undertaking research, advocacy, campaigning, fundraising, or providing aid for a specific cause • Opportunities for, or interest in, recommercialisation opportunities
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13. Business case and Funding pathway

Following the portfolio assessment, funding proposals may be progressed through the relevant approval pathway, depending on eligibility of the proposed works, including the Financial Provisioning Scheme (FPS), site-specific surety or financial assurance, Cabinet Budget Review Committee consideration, third-party contributions, partnership arrangements or other approved sources.

The FPS Advisory Committee will be consulted regarding business cases for funding sought from the FPS as per Table 1.

Approved projects will be executed through NRMRRD's project governance framework. This framework incorporates best practice project management elements including planning, procurement, contractor management, reporting and closeout, and safety management systems.

A post-implementation review will evaluate achievement of objectives, outcomes and outputs, and the performance regarding time, budget and benefits. A summary of this review for significant projects will be published via an annual report.

Additional Sites

Through the Queensland Government website, an email notification service is available enabling the public to report a new abandoned resource site or concerns relating to them.

Notified sites will be assessed as per this framework including desktop review, with subsequent field inspection and risk assessment where required.

14. Delivery, monitoring and review

The process incorporated in the framework will ensure hazards at abandoned mine and resource sites are assessed, recorded and evaluated in a repeatable consistent manner. The framework will support implementation of the Abandoned Mines Management Policy and guide Queensland Government decision-making to prioritise, manage and mitigate risks, and assess opportunities, at abandoned resource sites, ensuring the effective use of the funding allocated to the AMLP.

Detailed procedures have been developed to support abandoned mines personnel in the implementation of the framework. Upon implementation, the framework and risk process, as well as any associated procedures will undergo continual review to ensure achievement of the objectives and outcomes. AMLP outcomes and achievements will be published in an annual report available on NRMRRD's website.

The Framework will be reviewed periodically, and no less than every five years to maintain currency and to facilitate and promote continuous improvement in the identification and management of risks and opportunities from abandoned resource sites in Queensland.

15. Appendix 1: Characterisation of legacy mines, pre-commencement terminated mines and historical mining disturbances

This appendix describes how abandoned resource sites are categorised for the purposes of applying the Framework. Site classification is important because each category has different statutory context, risk profile, management requirements and potential funding pathway.

	Legacy Mines	Pre-commencement terminated mines	Historical mining disturbances	Post-commencement resource sites
Description	Ceased production prior to the <i>Environmental Protection Act 1994</i> amendments in effect 1 January 2001 and have features in common with a contemporary medium to large scale mine created by mechanised mining methods	Ceased production after the <i>Environmental Protection Act 1994</i> amendments in effect 1 January 2001 without fulfilling rehabilitation obligations	Ceased production prior to the <i>Environmental Protection Act 1994</i> amendments in effect 1 January 2001 and do not have features in common with a contemporary medium to large scale mine Characterised by small-scale, non-mechanised mining methods.	Ceased production after the introduction to the <i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i> in effect 1 April 2019 without fulfilling rehabilitation obligations.
Approximate size	Small to very large	Small to very large	Very small to small	Small to very large
Approximate number	70	30	15,000+	3
Typical commodities	Precious and base metals, bauxite, tin and coal	All	Precious and base metals, tin, gemstones and coal	All

Features	Consistent with surface, underground or alluvial mining methods (e.g. open-cut mines, large underground developments, waste rock dumps, heap leach pads, crushing and processing plants, concentrators, smelters, and tailings storage facilities.)	Consistent with all mining and resource extraction methods (e.g. open-cut mines, underground developments, waste rock dumps, heap leach pads, crushing and processing plants, concentrators, smelters and tailings storage facilities.)	Consistent with surface and underground mining methods (e.g. small waste rock dumps, small shafts with minor underground workings, shallow pits and open or collapsed trenches)	Consistent with all mining and resource extraction methods (e.g. open-cut mines, alluvial mining methods, underground developments, waste rock dumps, heap leach pads, crushing and processing plants, concentrators, tailings storage facilities, wells and bores)
Examples	• Mount Morgan • Mary Kathleen • Mount Oxide • Horn Island • Federation • Rishton	• Hopelands (former Linc Energy) • Collingwood Tin • Mount Chalmers • Wolfram Camp • Baal Gammon	• Gympie gold fields • Charter Towers gold fields • Stanthorpe tin fields • Herberton tin fields • Croydon gold fields	• Thalanga • Mount Garnet • Surveyor-Balcooma
Assessed under the Framework?	Yes (program site)	Yes (program site)	No, managed based on targeted risk based shaft remediation and small-scale work programs	Yes (program site)
Funding pathway	FPS Advisory Committee	Funded through Financial Assurance and when exhausted, FPS Advisory Committee	FPS Advisory Committee for small scale work program (multiple shafts)	Funded through the FPS either through surety or the pooled FPS fund. When funds exhausted, FPS Advisory Committee

Historical mining disturbances

The state has previously identified more than 15 000 historical abandoned mine features across Queensland with the vast majority being very small mines established in the 'gold rushes' of the late 1800s to early 1900s with unsophisticated methods and relatively minor ground disturbance.

These sites lack characteristics of a larger contemporary mine and are collectively referred to as 'historical mining disturbances' and are managed through targeted (risk-based), low-cost remediation projects. As historical mining disturbances have less complex risk profiles and significantly lower remediation costs. Individual mine features are, they are generally not considered in the overarching Framework and are managed under the AMLP's shaft repair program and small scale works program. However, where small works program are identified to remediate multiple shafts, this work program may be considered under the Framework.

Legacy mines

The passing of the *Environmental Protection and Other Legislation Amendment Act 2000* (EPOLA 2000) resulted in stricter environmental management and rehabilitation requirements for mining activities authorised under an environmental authority.

Mines relinquished or abandoned prior to the EPOLA 2000 (in effect 1 January 2001) often had limited rehabilitation requirements and these sites are categorised these sites as 'legacy mines' due to limited decommissioning and/or rehabilitation obligations associated with past site operations. Legacy mines will be assessed under this framework.

Pre-commencement abandoned terminated mines

Pre-commencement terminated mines are those abandoned after amendment of the *Environmental Protection Act 1994* by the EPOLA 2000 (in effect 1 January 2001) but prior to the commencement of the FPS. There are around 30 of these sites in Queensland. Pre-commencement abandoned terminated abandoned mines will be assessed under this framework. Pre-commencement terminated mines may have a financial allocation for rehabilitation through Financial Assurance allocated under the *Environmental Protection Act 1994*. For these instances, the Financial Assurance will be utilised as per legislative requirement before applying this framework.

Post-commencement terminated abandoned mines

Where a site is abandoned after the commencement of the *Mineral and Energy Resources (Financial Provisioning) Act 2018* (in effect 1 April 2019) rehabilitation works required at these sites will be funded through the FPS either thorough surety, or the pooled FPS fund.

Where a resource site becomes abandoned and rehabilitation remediation is required, but is not a member of the FPS, the FPS Scheme Manager may hold financial surety. The surety will be utilised to undertake site remediation. Where the surety is exhausted before full site rehabilitation is undertaken, the site will be assessed using this framework.

16. Appendix 2: Glossary

abandoned mine site	See section 344 of the <i>Minerals Resources Act 1989</i>. The term 'abandoned mine' is used to collectively refer to legacy mines, pre- and post commencement terminated mines and historical mining disturbances. The term 'abandoned mine' is used to collectively refer to derelict or orphan mine or mine feature for which the responsibility for mine closure cannot be allocated to an individual or organisation.
abandoned site	See section 799B of the <i>Petroleum and Gas (Production and Safety) Act 2004</i> .
abandoned operating plant	See section 799C of the <i>Petroleum and Gas (Production and Safety) Act 2004</i> .
abandoned resource site	Inclusive of abandoned mine (under <i>Minerals Resources Act 1989</i>), or abandoned site or abandoned plant (under <i>Petroleum and Gas (Production and Safety) Act 2004</i>).
AMLPL	Abandoned Mine Lands Program.
consequence	Outcome of an event.
control	Measure that maintains or modifies risk.
decommissioning	Removal, disposal or remediation of redundant mine facilities.
environmental authority	An environmental authority issued by the administering authority under Chapter 5 of the <i>Environmental Protection Act 1994</i> .
Feature (or domain)	Unique components that make up a mine, that have a defined function or purpose such as a mining landform or infrastructure. Examples include tailings dam, mineralised materials (waste dumps, ore dumps), mine pits, processing equipment.
Financial Provisioning Scheme (FPS)	The <i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i> came into force on 1 April 2019. The <i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i> introduced FPS, replacing the prior financial assurance arrangements for resource activities under the <i>Environmental Protection Act 1994</i> .

hazard	A hazard is a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, reputation, financial or a combination of these.
historical mining disturbance	An abandoned mine that ceased production prior to the <i>Environmental Protection Act 1994</i> amendments in year 2000, and that does not have features in common with a contemporary mine, typically created by non-mechanised mining methods.
legacy mine	An abandoned mine that ceased production prior to the passing of the <i>Environmental Protection and Other legislation Amendment Act 2000 (EPOLA 2000)</i>, that has features in common with a contemporary mine, typically created by mechanised mining methods. Mines relinquished or abandoned prior to the <i>EPOLA 2000</i> (in effect 1 January 2001) often had limited remediation requirements.
likelihood	The chance or probability of something happening.
post-commencement abandoned mine	A mine terminated or abandoned after the commencement of the <i>Mineral Resources (Financial Provisioning Scheme) Act 2018</i> (in effect 1 April 2019) where remediation works are funded through the FPS.
pre-commencement abandoned mine	An abandoned mine that ceased production after the <i>Environmental Protection Act 1994</i> amendments in 2000 but before the commencement of the FPS.
program site	A complex legacy or pre-or post commencement terminated mine assessed as requiring monitoring, management or remediation activities.
recommercialisation	Encompasses both reprocessing and secondary prospectivity of waste material and unmined resources, as well as repurposing of the land for alternative land uses, such as renewable energy, quarrying agriculture or tourism.
rehabilitation	Re-instating of disturbed land associated with a mine or mine feature to be safe, stable, non-polluting and consistent with the agreed post mining land use. The land is generally returned to a sustainable condition in which ecosystem function is reinstated or to the pre-mining land use. Requirements as described in the Environmental Protection Regulation 2019 – rehabilitation works to establish a landform — (a) that is safe, stable and self sustaining; and

	(b) with vegetation of a species and density of cover, similar to surrounding undisturbed areas or the landform that existed before the mining activity.
relinquished	A mine or feature for which management and monitoring has been completed and tenure has been surrendered, with responsibility transferred to the relevant regulating authority or third party.
remediation	Reduction of human and environmental exposure to hazardous contaminants to acceptable levels. Reduction of the hazards on disturbed land associated with a mine or feature to be safe, stable, secure and productive.
risk	Impacts associated with features and mine materials that require treatment/remediation. The effect of uncertainty on objectives. An effect is a deviation from the expected- positive and/or negative. Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organisation-wide, project, product, and process). Risk is often characterised by reference to potential events and consequences, or a combination of these. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.
risk assessment	The overall process of risk identification, risk analysis and risk evaluation.
risk criteria	Terms of reference by which the significance of risk is evaluated. Risk criteria are based on organizational objectives, external and internal context. Risk criteria can be derived from standards, laws, policies, and other requirements.
risk management	Coordinated activities to direct and control a program with regards to risk.
risk rating	When assessing risks, the likelihood and consequence of a risk occurring are used to determine the risk rating, which is usually ascertained using a risk rating matrix.
risk register	A record of information about identified risks that defines a risk profile.

risk treatment	A process to modify risk including mine remediation or repurposing.
shaft remediation	The process of making safe a vertical underground mine working by way of capping, backfilling or plugging the void at the surface.
surveillance program site	Abandoned resource site assessed as not having high or extreme risks to be managed and those sites where high risks have been formally accepted and signed off that no additional risk treatment is warranted.
tailings storage facility	A dam, impoundment or structure designed and constructed to contain and store tailings.
tailings	Residual material that has been crushed and ground and/or washed and rejected from a mill or processing plant after the ore minerals have been extracted.
waste rock dump	Stockpile of waste rock.

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