Submission No 69

INQUIRY INTO BENEFICIAL AND PRODUCTIVE POST-MINING LAND USE

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NSW Government Submission to the Legislative Council

Standing Committee on State Development

Inquiry into beneficial and productive post mining land use

PREPARED BY THE NSW GOVERNMENT

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Contents

Executive summary

This NSW Government submission addresses the terms of reference for the Legislative Council Standing Committee on State Development – Inquiry into beneficial and productive post mining land use. The submission aims to inform the Committee on matters relating to the terms of reference, including on the legislative and regulatory framework and the roles and activities of relevant Government agencies.

Mining is a temporary use of land. Mine rehabilitation is essential for ensuring that land used for mining activity is made safe, stable and sustainable so that it can benefit future generations. The NSW Government has a strong framework in place to ensure that this is achieved.

Post mining land use must be considered upfront, with the final landform and land use specified as part of the development consent process for a mine. Mines are required to comply with strict rehabilitation requirements, including the need to progressively rehabilitate. As a minimum, rehabilitation must achieve a post mining land use that is approved under the approval of the mine. Proposals for final land uses that differ to those originally approved will require further development approval, including community consultation.

The NSW Resources Regulator undertakes compliance activities for rehabilitation and will only sign off mine closure once a final safe and stable landform as specified in the development consent is achieved.

These requirements around mine rehabilitation are necessary to provide protections that appropriately manage environmental and safety hazards before the land transitions to a different use. The current framework is a result of learnings from historic mining activities, and the issues that can arise without rigorous consideration and oversight of rehabilitation.

Over the coming decades there will be an increase in the number of coal mines that close, in part, in response to the global transition towards net zero. This shift in the economy is leading to a need for new industries in coal-reliant regions and greater expectations that that mining land should be re-purposed for new economically beneficial uses. The current regulatory framework allows these changes, but it is sometimes not well understood.

The NSW Government plays a key role in developing an understanding of the post mining land use framework, ensuring it remains fit for purpose and assisting users through the process. Guidance material will support mine operators and developers navigate the planning and rehabilitation framework. Better understanding of the rehabilitation framework and related obligations will assist industry and developers to explore creative solutions that maximise the value and benefit of remediated land and assets. While not every site may be suitable at this time, greater awareness of the process and options will enable more economically beneficial post mining land uses.

Strategic planning and a clear regional vision will also assist to unveil new opportunities for mine sites across NSW. Identifying and minimising duplication of work within government agencies will deliver stronger outcomes for post mine land use objectives. The Future Jobs and Investment Authorities will also play a role as a voice for communities to help shape strategic plans expanding the range of options available in different areas. Local representatives in these coal-reliant regions will work with the Authorities to advise Government on regional priorities with a focus on sustainable economic development and job creation. Government's role will be to help link new industries and interested developers to seize opportunities and deliver new life to key mine sites that are closing.

Managing community safety and environmental risk through the closure process can take time. Responding quickly to development opportunities must be balanced with ensuring long term future (residual) risk to community and government is managed before relinquishment. Streamlining processes may assist, but any potential reforms would need to be closely considered to ensure the residual risks are understood and can be effectively mitigated.

Introduction

Overview

Mining is a temporary use of the land. Mining projects are an important economic contributor to many regional communities generating investment and jobs (direct and indirect). Mining projects exist for long periods of time, with leases typically being granted for a period of up to 21 years and with approved extensions, some operate for over 50 years. However, eventually mines close when the resource is depleted or due to commercial considerations and mining land is required to be rehabilitated to a safe and stable state for alternative use.

There is a strong regulatory framework that governs how mines are rehabilitated to allow future uses after mining. This framework has been established over time to provide certainty to the industry and community and to ensure the community is protected from future safety or environmental risks.

While many government agencies - including State, local and Federal government - are involved, the NSW regulatory framework is managed by the following three agencies:

- The NSW Department of Planning, Housing and Infrastructure (DPHI).

  DPHI is the responsible agency for the *Environmental Planning and Assessment Act 1979* (EP&A Act). Development applications for mining projects are subject to rigorous assessment and approval processes under the EP&A Act. The final post mining land use is approved as part of the initial consent process but proponents may choose to re-engage in the planning process at a later stage to request a modification to this consent. Depending on the size and nature of the mining project, development consent may be granted by the Minister for Planning or their delegate, the Independent Planning Commission or a local council.

- The NSW Environment Protection Authority (EPA).

  The EPA is the responsible agency for the *Protection of the Environment Operations Act 1997* (POEO Act). Mining activities such as coal and mineral mining and extractives works require environment protectional licences under the POEO Act. The EPA may also regulate aspects of the transition to non-mining use such as management and remediation of contaminated land under the *Contaminated Land Management Act 1997*. Environment protection licensing is also required for certain types of post mining land use such as electricity generation, energy recovery, irrigated agriculture and livestock intensive activities.

- The NSW Department of Primary Industries and Regional Development (DPIRD).

  The NSW Resources division (formerly Mining, Exploration and Geoscience) in DPIRD administers the *Mining Act 1992* and the *Petroleum (Onshore) Act 1991* relating to exploration, mining and petroleum production in NSW. Within NSW Resources, the Resources Regulator enforces compliance with rehabilitation conditions under the Mining Act and under the conditions of the mining lease.

In managing this regulatory framework DHPI, EPA and DPIRD engage with all relevant agencies across the NSW and Commonwealth Governments including local governments, Department of Climate Change Energy, the Environment and Water, Department of Education and the Commonwealth Department of Environment. As future uses of former mine land may require further consideration, assessment and approvals under NSW and Commonwealth legislation, DHPI, EPA and DPIRD will engage each of the relevant agencies where further advice is required.

Former mine sites often contain a range of beneficial features and attributes that make them well suited to generating significant economic and social benefits for the local community and the state. Some of the beneficial features and attributes are:

- established infrastructure with good access to electricity and transport networks

- large parcels of land including established buffers from neighbours and residential areas
- access to regional population centres.

This submission outlines the current regulatory framework for mine planning and closure and how this supports alternative land use on former mining land. It also identifies some of the challenges with the current framework and opportunities for post mining land use over the next two decades with increasing coal mine closures.

Post mining land use opportunity: increasing coal mine closures

Coal is a significant sector of the NSW mining industry, with coal mining and coal-fired power generation concentrated in the Hunter, Central West, Illawarra and North West regions[1]. Coal-reliant regions have a large coal mining workforce, and a significant mining supply chain. These regions contribute billions of dollars to the NSW economy and tens of thousands of jobs. The largest volumes of coal are produced in the Hunter, with coal the single most important economic driver in the Central West and North West.

NSW is entering a key phase for many coal mines. The global shift towards low carbon energy sources will lead to a decline in coal production, and coal-reliant regions will go through significant structural economic changes. It is forecast that there will be increased closures of coal mines in NSW with over 10 coal mines planned to close over the next 10 years.

Anticipated coal mine closure dates up to 2030 and where known, proposed post-mining land use are detailed in Table 1. Mines with closure dates post 2030 are detailed in Appendix B.
Areas disturbed by mining provide significant opportunities for economic development and diversification and the NSW post mining land use framework is designed to allow these opportunities to be realised. Opportunities for post mining land use will depend on the site and the type of mining conducted. Suitable and sustainable re-use of these sites can be investigated, aiming to balance environmental systems and leverage existing infrastructure to support a range of employment and urban uses.

Table 1: Announced closure dates, consent expiry dates and post-mining land use (PMLU) for coal mines to 2030 (as at May 2024). Mines with closure dates post 2030 are detailed in Appendix B

Mine	Region	Type of mine	Announced closure	Consent expiry	Approved final landform	Proposed PMLU
Muswellbrook Coal	Hunter	Open cut	Mining ceased in 2022		Native vegetation + agricultural + final voids	Clean industries precinct - Pumped Hydro & Solar. See Case Study 1 below
Russell Vale	Illawarra	Underground	2024 (indicative)	2025	Native vegetation	
Integra	Hunter	Underground	2024	2035	Native vegetation + final void	
Stratford	Gloucester	Open cut	2024	2025	Native vegetation + agricultural grazing + final voids	Renewable energy hub – Pumped hydro and solar
Cullen Valley	Central West	Open cut and Underground		2025	Native vegetation	
Hunter Valley Operations North	Hunter	Open cut		2025 Extension proposed to 2050	Native vegetation + agricultural grazing + final voids	
Liddell	Hunter	Open cut	2024 (unconfirmed)	2028	Native vegetation + agricultural grazing + rehabilitation	

[1] Hunter, Central West, Illawarra and Northwest regions refer to the following local government areas: Hunter - Upper Hunter Shire, Muswellbrook, Singleton, Cessnock, Maitland, Newcastle, Lake Macquarie; Central West - Lithgow City, Mid-Western; Illawarra - Wollongong, Wollondilly; North West - Narrabri, Gunnedah, Liverpool Plains

Mine	Region	Type of mine	Announced closure	Consent expiry	Approved final landform	Proposed PMLU
					biodiversity offset areas + final voids	
Mt Arthur	Hunter	Open cut	2030	2026, Extension proposed to 2030	Native vegetation + agricultural grazing + rehabilitation biodiversity offset areas + final voids	Under community consultation. See Case Study 2 below
Clarence	Central West	Underground		2026	Native vegetation	
Chain Valley	Central Coast	Underground		2027 Extension proposed to 2029	Native vegetation	
Springvale	Central West	Underground		2028	Native vegetation	
Mangoola	Hunter	Open cut		2029	Native vegetation + rehabilitation biodiversity offset areas + final voids	
Bloomfield	Hunter	Open cut		2030	Agricultural grazing + trees over pasture + final void + some retained infrastructure.	
Hunter Valley Operations South	Hunter	Open cut		2030	Native vegetation + agricultural grazing + final voids	
Tarrawonga	North West	Open cut		2030	Native vegetation + agricultural grazing + final void	
Dendrobium	Illawarra	Underground		2030	Native vegetation + agricultural grazing.	

Case Study 1: Muswellbrook Coal

Closed mine – proposed clean energy precinct

Idemitsu's Muswellbrook Coal mine is located approximately 15km north of AGL's Bayswater and Liddell power stations. Idemitsu developed the Muswellbrook Clean Industries Precinct Master Plan in 2021, while mining operations were still ongoing on site. Coal mining ceased in late 2022, having exhausted all coal reserves and the area occupied by the mine is currently undergoing mine rehabilitation. The site is also undergoing post mining land use assessment to transition to a clean industries precinct, with two projects (Muswellbrook Pumped Hydro Energy Storage Project and the Muswellbrook Solar Farm) progressing through state approval processes.

Rehabilitation of the mining operation footprint, in line with the site rehabilitation management plan, has been an ongoing activity which will now be accelerated because of the completion of the coal mining activities. The work is expected to be completed over the next three or four years, subject to finalising the planning of this phase of work.

The proposed project is partially located over the current Muswellbrook coal mine site. The project will comprise a lower reservoir within an existing mine void, an upper reservoir at Bells Mountain and associated electricity generation and transmission infrastructure. The joint venture will monitor the completion of rehabilitation activities with the coal mine which are currently underway. Should rehabilitation be delayed, a modification of the mine approval may be required to facilitate the project and ongoing mine closure activities.

During construction it is expected that up to 750 direct jobs will be created with flow-on benefits to the Hunter region. During the operations phase, a workforce of 20 full-time employees will be required. The multiple other operations on site will also generate opportunities for ongoing employment and will generate further opportunities across the Hunter region down the supply chain, with export and transmission projects to follow.

Case Study 2: Mt Arthur

Planning for post mining land re-use: imagining what might be possible

Mt Arthur is currently NSW's largest coal mine, employing over 2200 people. Mt Arthur is considering the post mining land use for the site after the proposed closure in 2030. The scale of the land (7,000-plus hectares), existing infrastructure, proximity to rail and other industry represents an opportunity for the Upper Hunter post 2030.

Mt Arthur is undertaking a community engagement process with potential new land use options including:

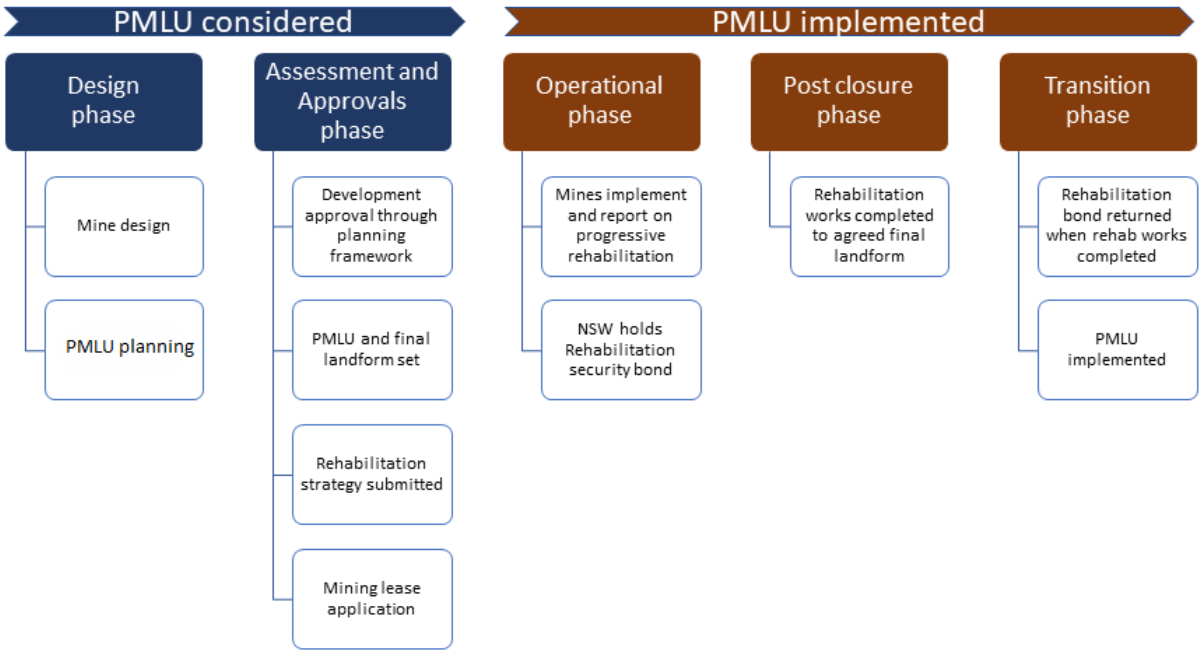
- Recreation/adventure park, hiking, mountain biking
- Renewable energy - pumped hydro, solar farms
- Agriculture - cattle grazing, equine industry, farming
- Advanced manufacturing - re-purposing of high-quality existing infrastructure
- Rehabilitation and biodiversity - establishment of native woodland corridors.

Regulatory framework

The framework for enabling post mining land use is managed by several key agencies across Government, including regional planners and assessment within the NSW Department of Planning, Housing and Infrastructure, local councils and the Resources Regulator. The framework consists of several phases, as set out in Diagram 1 below.

Strategic planning provides an opportunity to identify and prioritise existing mine sites for post-mining land uses that align with both State and local government priorities in appropriate locations.

Diagram 1: Phases of PMLU Framework



Design phase

Post mining land use must be considered upfront as part of the design for a mine. Land disturbed by mining activities must be rehabilitated back to a state that is safe and stable. All mine proponents must include a base case rehabilitation proposal when applying for development consent, and a mining lease.

Identifying which potential post mining land uses will suit a site depends on several key considerations and constraints including physical and environmental conditions (including surrounding land uses and mine design), economic considerations, social considerations and legislative and planning considerations.

The post mining land uses are typically driven by the existing land uses on the site prior to mining. These typically comprise of agricultural land uses and areas of remnant native vegetation or biodiversity offsets. All of the 16 mines slated for closure by 2030 currently have a mixture of native vegetation or agriculture as their specified final landform, though three mines are actively considering alternatives (see Table 1).

The NSW Department of Planning, Housing and Infrastructure and NSW Resources within DPIRD engage with proponents developing a mine proposal. At the design stage proponents are encouraged to:

- ensure progressive rehabilitation and post-mining land uses are properly considered early in the design stages, including the consideration of a range of potential PMLU so that flexibility is built into the mine design

- consider undertaking expression of interest or tender processes in the early stages to assist in identifying a range of possible PMLUs and potential PMLU development partners or future interested parties.

Assessment and approvals phase

The planning framework sets rehabilitation and post-mine land use requirements for individual mine sites

Strategic planning framework and land use

Strategic planning provides an opportunity to identify and prioritise existing mine sites for post mining land uses that align with both State and local government priorities in appropriate locations. Suitable and sustainable re-use of these sites can be investigated, aiming to balance environmental systems and leverage existing infrastructure to support a range of employment and urban uses.

Local Environmental Plans (LEPs) provide the local statutory framework that guides development and land use decisions through land use permissibility and development standards. An LEP applying to a mine site can be amended through the preparation and assessment of planning proposals.

Development assessment framework

All new mines are subject to rigorous development assessment and approval processes under the EP&A Act. Mining projects may also require approvals under relevant Commonwealth legislation such as the Environment Protection and Biodiversity Conservation Act.

Depending on the size and nature of the project, development consent may be granted by the Minister for Planning or their delegate, the Independent Planning Commission or a local council. Most large mining developments, including all coal mines, are assessed under the State Significant Development provisions (Division 4.1 of Part 4) of the EP&A Act. Smaller quarries and other mines are generally assessed under the other provisions of Part 4. Advice for mining companies and potential project developers is available through the NSW Resource's Mining Concierge. This service assists companies to be informed of the various approval requirements and processes in NSW and facilitates connections with other government agencies.

A mining company's development application for a new mine needs to propose how land will be used after the mine closes. This proposal must demonstrate how they will rehabilitate land or water progressively over the lifetime of the mine, not just upon closure.

Before a proposed development comes to the Independent Planning Commission for determination, the Department of Planning, Housing and Infrastructure will conduct a whole-of-government assessment of the application on behalf of the Commission. This will include advice from a range of NSW agencies on the proposal including water, energy and environmental impacts, as well as relevant Commonwealth agencies. For example, NSW Resources comments on the proposal, including rehabilitation and the proposed final land use and environmental outcomes upon completion of mining.

The Independent Planning Commission decision will take into consideration community feedback, including on the proposed final land use.

If a mine is granted development approval, conditions of consent set broad rehabilitation objectives and final land use requirements for individual mines. Other standard rehabilitation objectives included in the consent conditions relating to post mining land uses include:

- restoring agricultural land to an agreed class
- restoring self-sustaining native woodland ecosystems

- ensuring the final landform is safe and sustainable for the intended land use
- maximising the potential for beneficial reuse of final voids
- ensuring retained water is fit for the intended for the intended land use
- decommissioning and removing surface infrastructure
- ensuring public safety and minimising the socio-economic effects of mine closure.

The time between obtaining development consent, site construction, undertaking resource extraction and mine closure can be considerable. This means that final land use is set decades before it is achieved. Any potential future demand for the land, other than what it was previously used for, is unlikely to be well understood when gaining development approval.

However, there is flexibility under the EP&A Act for applicants to modify the development consent to allow for different outcomes. The extent to which this is possible will be dependent on individual sites (e.g. some mine sites will be required to revegetate and restore certain areas back to native woodland to satisfy their biodiversity offset strategy obligations under the conditions of consent).

Mining lease application

A development consent under the EP&A Act must be in place before a mining lease can be granted.

In addition to the development conditions, there will be separate standard rehabilitation conditions prescribed in the mining lease, which is subject to a separate regulatory approval regime under the Mining Act.

Setting rehabilitation conditions upfront as part of the development process and mining lease approval is necessary to provide protections that appropriately manage environmental and safety hazards before the land transitions to a different use. It provides clear rehabilitation objectives that the Resources Regulator uses to enforce compliance with rehabilitation obligations under the mining lease.

Operational phase

During the operational phase, a mine site operator has an obligation to undertake progressive rehabilitation to begin restoring the site towards its final approved land use.

Once a new mine is approved, the Resources Regulator actively monitors mine operations to ensure rehabilitation occurs as soon as possible after mining begins and in line with the approved rehabilitation plan.

Mining lease holders are required to comply with conditions specific to their lease as well as the statutory requirements (standard conditions) set out in the Mining Act. These requirements include complying with the conditions of the approvals granted by the relevant consent authority and lodging a security bond/deposit that covers the full cost of rehabilitation in the event that the holder of the mining lease or licence defaults on their rehabilitation obligations.

The rehabilitation outcome documents (rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan) required under the Mining Act must be consistent with the development consent.

In the final phase of operation, when there is more certainty regarding the end of mine life based on mineral resource exhaustion, the operator may review the approved post mining land use in view of the prevailing opportunities and constraints. Where applicable, the operator may apply to modify the development consent and mining lease conditions or seek a new development consent to extend the range of possible post mining land uses. Likewise a third-party proponent may seek a new development consent for a non-mining land use.

Rehabilitation obligations, including the security bond/deposit requirement, transfer to the new owner in the event a mine operation is sold, or ownership transferred.

Post closure and transition phase

The Resources Regulator is responsible under the Mining Act for ensuring that once a mine ceases production that rehabilitation works are completed to the agreed final landform as approved under the development consent (or modified consent, where applicable). Mining leases will continue until rehabilitation is complete, and rehabilitation activities can still be enforced where leases have expired.

Long-term monitoring is required to ensure that the Resources Regulator can be satisfied that the site is safe and stable. Adequately assessing environmental impacts can take time. For example, assessing long term impacts to groundwater may take over 10 years of monitoring.

NSW has a high standard and expectation for rehabilitation including that the:

- the final landform is consistent with and satisfies the development consent
- obligations under environment protection licences (issued by the NSW EPA) are satisfied
- all risks are managed, and no hazards remain.

The Resources Regulator will only confirm that mine rehabilitation is complete once a mining company can provide independently verified evidence that the approved final land use has been achieved and can be sustained over the long term.

The evidence mining companies need to provide is determined by a set of completion criteria that have been approved by the Resources Regulator.

Completion criteria vary from mine to mine depending upon the approved final land use. For example, the completion criteria for a mine that will be restored to native bushland will be different to the criteria applied to land that will be used for a future industrial purpose.

Once all rehabilitation requirements of the mine operator are met, the Resources Regulator signs off on completion. The mining lease and the relevant mining authorisation may then be cancelled (relinquished) and the rehabilitation security bond/deposit held by the NSW Government can be returned to the mining lease holder.

Where mining is finished on a part of the mine, the mining lease holder may seek a separate post mining land use approval over the area of completed mining, which can change the original rehabilitation final land use outcome. The mining lease holder may partially relinquish the lease to facilitate the transition of that part of the mine to its final land use.

Progressive rehabilitation is also supported by the partial release of the security bond/deposit if successful rehabilitation is demonstrated. Where rehabilitation obligations have been met on part of the site, then part of the lease and part of the security bond/deposit will be released. The remaining areas of the lease and security bond/deposit are retained until all obligations are met.

Typical post mining land use scenarios

There are three usual scenarios in how mines progress from closure to post mining land use:

PMLU as approved in development consent	Mine operator identifies new PMLU	Interest in land by third party
The mine operator returns the site to the final landform as required under the site rehabilitation requirements. Post mining land use remains the same as it was when development approval was granted. Potential missed opportunity to realise the full value and benefits of the site, if a full range of post mining land use has not been considered by the mine operator. **Government role**: compliance to ensure rehabilitation completed to development approval.	The mine operator takes the lead in identifying new beneficial post mining land use options (see case studies for Muswellbrook Coal and Mt Arthur). **Barriers:** reluctance for some mine operators to take role as developer, inexperience in development process for non-mining activites and uncertainty about range of opportunities for post mining land use. **Government role**: provide guidance on process, facilitate consideration through planning framework, and for NSW Resources to work with the mine operator regarding the new plan.	Third party developer proposes new post mining land use. **Barriers:** The mine operator may not have considered or be aware of alternative post mining land use options, due to being focussed on resource extraction and meeting existing final landform requirements. They may also have resistence to modify development approval and approved final landform. Lack of clarity regarding responsibility and transfer of rehabilition requirements. **Government role**: connect development opportunities and interest with appropriate sites, provide guidance on process, and facilitate consideration through planning framework, and for NSW Resources to work with the mine operator regarding the new plan.

Benefits of post mining land use

Mines often have a very long period of production, often in decades. In that time the advent of new technology, changes in economic demand and societal changes may create opportunities which were not considered when the initial final land use was planned. Innovative post mining land use offers significant opportunities by leveraging on the extended period of mine production and advances in technologies such as renewables to allow mine sites to be repurposed as energy generation hubs or for other industrial uses. Also, innovations in agriculture and changes in societal preferences for sustainable and locally sourced products can transform these lands into productive agricultural areas. These changes mean that community may benefit from considering a broad variety of land use.

These opportunities, driven by technological progress and shifting economic demands, provide substantial potential for economic revitalisation and sustainable development, which may attract investors and creating jobs in ways not envisioned during initial land use planning.

There are many benefits in seeking to maximise opportunities for post mining land use:

Benefits for mining lease holders

- utilisation of existing mine infrastructure, avoiding decommissioning and removal costs
- earlier transition to PMLUs, with faster rehabilitation and relinquishment timeframes
- higher post mining land asset value with increased value of the site to potential developers
- increased social licence with ability to positively impact the community post mining closure.

Benefits for local community and for NSW

- provides greater certainty regarding mine rehabilitation and closure
- optimise the use of key mine site features and assets
- facilitates regional economic benefits through improved planning of alternative uses

- local employment generation associated with alternative PMLUs help offset impacts of mine closure.

However, these benefits will vary depending on the site. Some sites provide excellent opportunities because they are located near commercial areas with well connected infrastructure. However, many sites are in remote locations and offer limited benefits compared to other available development land in the region. Government will need to focus its efforts to enable sites where there is a clear opportunity to attract investment or where there is a motivated mine operator or third party.

Supporting economic opportunities in coal-reliant regions

The NSW Government is in the process of establishing regional Future Jobs and Investment Authorities to grow new industries in the coal-producing regions of the Hunter, Central West, Illawarra and North West.

The Authorities will help set the direction for each coal-reliant region and will coordinate across all levels of Government to identify solutions, ensure investment and action is timed in the right way, and support the best outcomes tailored to each region's needs. Opportunities for mining land to be used for new economically beneficial uses will be one of the areas of interest for the Authorities.

The Authorities will utilise the expertise of the Office of Regional Economic Development (ORED) in DPIRD. ORED:

- helps to activate new industries and priority locations, driving tangible outcomes for coal-reliant regions
- promotes regional NSW as the preferred location for investment based on globally competitive state-wide and place-based value propositions
- provides a range of tailor-made facilitation/ information services to investors that are looking to establish or expand in regional NSW.

Framework challenges in promoting beneficial post mining land use

The post mining land use framework in NSW balances the need to rehabilitate sites responsibly to protect the environment and local communities, with the economic potential of a range of final land uses for closed mine sites.

Industry consultation has highlighted several constraints with the current framework. These include:

- **Lack of understanding of the framework.** Education and more guidance to developers and industry is required. There is a perception that land encumbered by a mining lease is a constraint to development.
- **There is a dis-incentive for mining operators to consider alternative land use for their site**. Changing the post mining land use will require mining lease holders to obtain a new or modified approval through the planning framework which takes time, cost and effort. While any reconsideration is taking place, the Resources Regulator must keep enforcing rehabilitation compliance in line with the approved development consent.
- **Ownership of risk when seeking changes to post mining land use.** There is uncertainty for the NSW Government, industry and developers about where residual risks fall after mining lease relinquishment, how to manage residual risks from mining operations and what would be an acceptable transfer of those obligations to a third-party developer (for example environmental monitoring and maintenance of remaining infrastructure). Example risks include land and water contamination, landform stability (e.g., geotechnical risks and erosion potential) and water management. In some cases, and depending on the risk, this uncertainty can be managed through the planning process, but may lead to delays in sign-off for mine closure. Increasing confidence in

the closure process for both industry and developers could increase development interest in key sites.

- **Duplication of responsibility across government agencies.** Expressed in the overview section, the framework for enabling post mining land use is managed by several key agencies across Government. Realising the full potential of opportunities afforded to NSW by post mine land uses will require continual review of agency responsibility. Continuing to review responsibilities will minimise duplication and deliver best practice outcomes for mine operators, mining communities and government agencies. This work will also contribute to ensuring the rehabilitation framework continues to meet emerging challenges over the coming decades.

Opportunities to support beneficial post mining land use

The structural shift away from coal mining presents an opportunity for the NSW Government to take a more active role in post mining land use to address the constraints identified above. This includes providing a key educative role to grow understanding of the post mining land use framework and setting the vision for the range of post mining land use options through strategic planning and regional plans. The constraints identified regarding closure timeframes and risk transfer may also warrant further investigation as part of the review to increase flexibility in the current post mining land use process without undermining rehabilitation obligations.

Build understanding of post mining land use process

More guidance and educative material will help support mine operators and developers to navigate the planning and rehabilitation framework. There is flexibility in the post mining land use framework to accommodate changes in final landform but the lack of understanding can make it seem too hard.

Redevelopment of a mine site requires early evaluation of land use development options. As this is not core-business for mines, assistance or partnering with the development industry and financial institutions may be required to facilitate redevelopment. This will assist industry to explore solutions that maximise the value and benefit of remediated land and assets.

Setting a vision through strategic planning

Maximising post mining land use opportunities requires action and a vision to seek new industries to support the creation of jobs to deliver the best possible economic outcome for these communities. The Rhondda case study is a good example of how post mining land use can stall without drive and involvement from Government, community and industry.

Case Study 3: Northern Rhondda Colliery (Black Rock Motor Park)

Innovative re-use of former mine site

The former Northern Rhondda Colliery near Teralba is being developed into the Black Rock Motor Park featuring a driver training centre, go-kart racing, adventure-tourism experiences, function centre, short term accommodation and café. The project will create 450 jobs during the construction phase, and 229 operational jobs.

The Black Rock Motor resort has been recently lauded as an innovative PMLU case study, but it has taken 16 years from when the initial post-fire rehabilitation was completed in 2008 to construction commencing in 2024.

Requirements and considerations around postmining land use have evolved greatly over time. When Rhondda colliery first commenced – rehabilitation post mining use was not required. The colliery closed in 1970 due to an underground fire, and this fire was only extinguished in 2006. While initial rehabilitation was completed in 2008, the environmental issues remaining at the site were complex. Further remediation works were still required to ensure a safe and stable final landform. Uncertainty with what to do with the site and how to manage environmental risks saw progress stagnate.

It is only recently that increased drive from the NSW Government, the mine operator and the community helped overcome issues with rehabilitation risks and gaining development approval to see an exciting new opportunity eventuate for the site.

Strategic planning provides an opportunity to identify and prioritise existing mine sites for post mining land uses that align with both State and local government priorities in appropriate locations. Not every site will be suitable for economic development, but they may be more prospects for economically beneficial post mining land use if there is greater awareness on options. As mine closure dates are known there are opportunities, particularly at a regional level, to provide a deeper consideration of these role former mine sites may play to promote future industries.

Key mine sites could be prioritised because of their location or specific site characteristics or the existence of motivated parties. Distinguishing criteria for those key sights will help provide insight into where to focus effort.

Consider closure process and management of risk

Mine closure can be a lengthy process to ensure that environmental and safety hazards are managed. Further investigation may be warranted to look for opportunities to streamline the process and provide clarity on risk ownership. In cases where someone other than the mining company is seeking to take carriage of the land for the purpose of achieving the approved post mining land use, there may be scope for the transfer of certain rehabilitation obligations. This needs to be done in a way that ensures environmental outcomes are achieved and risks are appropriately managed.

Terms of reference

(a) the benefits of having multiple successive land uses

Unlocking the potential of post mining land use holds significant promise for local communities, industries and NSW. As mining operations come to an end, the transition from extraction to reclamation presents a unique opportunity to transform former mining sites into vibrant hubs of economic, social, and environmental activity. Post mining land use offers significant benefits for local communities, businesses, the industry, and the State.

(i) Local communities

Multiple successive land uses enable the adaptive reuse of key infrastructure and utility services around mining sites, offsetting the need to develop greenfield sites, and supporting transitioning local economies and employment opportunities. As mines close, employees will need to seek new employment. If employment opportunities are not available locally then those employees may relocate. Multiple successive land uses may provide opportunity for former mine employees to take up new job opportunities in their local community. Repurposing reclaimed land responsibly for sustainable development benefits communities with new economic opportunities, improved infrastructure, and restored ecosystems, while master planning ensures the interests and needs of First Nations communities are considered.

(ii) Economy, business and industry

Multiple successive land uses on mining sites minimises dependency on new infrastructure investments in transitioning economies and enhances the ability to attract and retain skilled workers. Post mining land use opens doors to numerous economic benefits, including economic diversification opportunities, infrastructure development, regional jobs, and new green market opportunities (e.g., electricity generation, biodiversity). For businesses and industries, benefits include reduced decommissioning costs, potentially lower security requirements, higher post-mining land asset value, improved social license and community relations, and shorter site relinquishment timeframes.

The NSW Government encourages mine leaseholders to pursue alternative land uses that provide new economic opportunities beyond existing requirements, improve asset value and increase post-mining employment. These sites can offer significant opportunities for domestic and capital investment in clean technology manufacturing due to their scale and access to utilities like road, rail, water, and electricity. By harnessing post-mining sites, businesses can capitalise on strategic locations, existing infrastructure, and resources to drive competitiveness and market expansion, while adopting sustainable practices that foster resilience and reduce environmental risks.

(iii) Broader state

Post mining land use offers significant potential for sustainable and environmental restoration through greater utilisation of reclaimed land, economic prosperity by creating regional jobs, exploring alternative energy sources such as pumped hydro, and reduced risks from legacy mines.

(b) changes in land use potential and demand in established or traditional mining areas particularly those generated by the decarbonised economy, renewable technology, manufacturing, defence, skills, and training

Under the planning framework, mine lease holders and potential developers are able to identify a range of different uses to take advantage of site attributes created by mining activities.

The approved final land use for an operating mine project is specified in the project's consent approval. The Government recognises that due to the long timeframes involved in mining projects, circumstances may have changed since the default post mining land use was approved, particularly regarding emerging technologies and industries and shifting commercial demand within a region. Regardless of which operational stage the mining lease holder is in, there is an opportunity to nominate new beneficial post mining land use by re-engaging with the planning process to amend the approved final land use. Considering a new post mining land use may offer the ability to explore new economic opportunities while ensuring continued compliance with rehabilitation obligations.

In established mining areas such as the Hunter and Illawarra regions, some mining companies are actively engaging with developers to progress productive alternative post mining land use for mines that have closed or are scheduled to close and be rehabilitated in coming years.

The NSW Government is supporting engagements of this kind, publishing guidance and identifying options through regional plans.

Supporting traditional mining areas

The Future Jobs and Investment Authorities are being established to grow future jobs and industries in the coal-producing regions of the Hunter, Central West, Illawarra and North West. They will coordinate across all levels of Government to identify solutions, ensure investment and action is timed in the right way, and support the best outcomes tailored to each region's needs.

The NSW Government's Hunter Regional Plan 2041 and Illawarra Shoalhaven Regional Plan 2041 are 20-year land use plans prepared under the EP&A Act which are also supporting traditional mining areas.

The Hunter Regional Plan 2041 identifies potential post mining land use for 19 established mining and/or power operations within the Upper Hunter region. The identified land use opportunities include energy generation, industry and manufacturing (including intermodal transport, food and fibre processing and intensive agriculture) and defence.

The Illawarra Shoalhaven is emerging as a hub for clean energy as it transitions away from a dependence on fossil fuels. The Illawarra Shoalhaven Regional Plan 2041 identifies opportunities to explore renewable energy sources including pumped hydro, biogenic gas and hydrogen.

Decarbonised economy and renewable technology

Mining sites are predominantly well serviced, in proximity to the electricity transmission and/or distribution network and in locations of high solar and or wind resource. There is potential for re-use of these sites to support or accommodate renewable energy and storage developments, capable of connecting to the National Electricity Market. This would support the transition to clean, reliable and affordable energy and planned retirement of NSW based coal-fired power station assets.

Renewable Energy Zones (REZs) are being established by the NSW Government, including in the Hunter, Central Coast and Illawarra regions, to group new wind and solar power generation into locations where electricity can be efficiently stored and transmitted across NSW. These traditional mining areas are ideal locations for a REZ, due to excellent renewable energy resources and the capacity to utilise existing power stations, rehabilitated mining land, electricity network infrastructure, port and transport infrastructure and a skilled workforce.

It is important to note that while there may be some cases where mining land is in demand, there is no shortage of land in the most well-established mining areas including the Upper Hunter, Mudgee and Gunnedah Basin (including buffer lands around mine sites). This non-mining land may be more desirable for developers as it avoids the residual risks of mine sites. While renewable technology and decarbonisation bring new opportunities, mining employs a significant amount of people that will be hard to replace and it's unclear whether there will be a significant amount of demand in most mining areas.

Post mining land use projects – change in land use

The current post mining land use and planning framework is supporting former mines to transition to a variety of alternative land uses. Relevant case studies are detailed in Appendix A including those presenting opportunities for:

- **Decarbonised economy** -
    - Silver City – Broken Hill (energy storage)
- **Renewable technology** -
    - Maxwell Solar Farm - Muswellbrook (solar)
    - Muswellbrook Coal - Muswellbrook (solar and pumped hydro)
    - Stratford Renewable Energy Hub – Gloucester (pumped hydro and solar)
    - Woodlawn Eco Precinct – Tarago (mixed clean energy and intensive agriculture)
- **Manufacturing/industrial/residential** developments-
    - Catherine Hill Bay Coal Preparation Plant – Newcastle region (residential)
    - Horsley Park Quarry – Western Sydney (industrial estate).

(c) opportunities for investment and growth in training and skills in established or traditional mining areas

NSW has a long history of mining, with mining regions contributing billions of dollars to the NSW economy and tens of thousands of jobs.

As mines close, these regions will go through significant structural economic changes. The NSW Government is committed to supporting these communities through this change to ensure they have access to new economic opportunities to secure their long-term economic future.

While renewable technology and decarbonisation will bring new opportunities, it is important to note that mining employs a significant amount of people, many at a high-income level that will be hard to replace. This generates the potential for varying outcomes across coal reliant regions.

(i) the need to reskill and or retrain current workforces

Global demand and production of coal are expected to decline as the world moves toward net zero, significantly impacting NSW's coal-reliant regions of Hunter, Central West, Illawarra, and North West. With the development of Renewable Energy Zones, NSW faces a potential shortage of workers with specialised skills in renewable energy technologies, engineering, and construction. There are opportunities to establish training programs to help transition the mining workforce, particularly in the Central West Orana REZ. This shift necessitates reskilling and retraining the workforce for emerging industries. In the short term, miners' transferable skills, such as operational safety, machinery handling, and systematic project execution, can be readily adopted in sectors like construction, logistics, and renewable energy, ensuring minimal disruption to livelihoods while fostering workforce agility.

For the long term, reskilling initiatives are needed to equip miners with skills relevant to burgeoning industries, such as advanced robotics, renewable energy technology, and environmental rehabilitation. These skills will enable workers to transition into high-demand roles within sectors poised for growth, such as clean energy, agrotechnology, and smart manufacturing. The NSW Government recognises the need to act now to support coal-reliant communities into the future and to this end established the Future Jobs and Investment Authorities to support coal-reliant communities to grow future jobs and industries.

(ii) the impact and effectiveness of existing and new education, training, and skills providers for mining communities

The NSW Government collaborates with the Commonwealth and other stakeholders to train, retain and reskill workers through various initiatives aimed at enhancing workforce development and skills retention across the state. These collaborative efforts focus on delivering a range of training programs, apprenticeships, and vocational education opportunities tailored to the needs of different sectors, including mining. Additionally, the NSW Government focuses on implementing supportive policies, incentives, and career pathways to retain skilled workers within NSW, ensuring a skilled and adaptable workforce that can contribute to the state's economic growth and resilience.

Training Services NSW

Training Services NSW is a division of the NSW Department of Education that provides support for vocational education and training to enhance the skills and qualifications of individuals in New South Wales. They offer a range of training and retraining programs designed to help workers acquire new skills, upgrade existing qualifications, and transition to new employment opportunities. Training Services NSW collaborates with industry stakeholders, registered training organizations (RTOs), and employment service providers to deliver tailored training solutions that meet the needs of workers and align with emerging job market demands. Training Services NSW also play a critical role in assisting retrenched mine workers in reskilling, upskilling, and securing sustainable employment pathways beyond the mining sector. In addition, Training Services support workforce development across a range of innovation districts and industry place-based precincts across NSW including:

- Renewable Energy Zones (REZs) in the Central-West Orana, New England, South-West NSW, Hunter-Central Coast and Illawarra regions
- Hydrogen Hubs in the Hunter and Illawarra regions.

Targeted Workforce Development Scheme

Through the Regional Investment Activation Program, the Office of Regional Economic Development (ORED), in partnership with Training Services NSW, delivers the Targeted Workforce Development Scheme to provide bespoke talent attraction and workforce development solutions and address current and future skills gaps.

The program is a nation-leading approach to:

- assist large manufacturers in regional NSW to navigate VET processes and obtain funding for supported training
- facilitate the design and delivery of bespoke accredited and non-accredited training in collaboration with approved suppliers
- connect businesses to workforce support services and organisations
- engage talent recruitment services for company specific talent attraction.

National Skills Agreement

In October 2023, the NSW government and the Commonwealth signed a 5-year National Skills Agreement (NSA) which commenced January 2024 with over $3.81 billion of investment from the Commonwealth to reskill NSW workforce and boost skills training in the renewable energy and technology sector. The NSW Government will provide an additional $1.055 billion in funding to enable NSW complete significant reform to the skills and training sector.

While this is mostly a continuation of recurrent Commonwealth funding, there are budget pressures on the Skills budget that need to be taken into account for any new initiatives supporting regional workforce transition or increased workforce development.

Commonwealth Transition Support Network

The Commonwealth Transition Support Network is an initiative by the Australian Government's Department of Employment and Workplace Relations designed to assist retrenched workers, including those from the mining sector. Through the network, retrenched workers can access a range of services and resources to help them transition to new employment opportunities or alternative career paths as quickly as possible. This may include career counselling, job search assistance, skills development programs, financial advice, and access to training and education opportunities. The network works collaboratively with government agencies, industry stakeholders, and community organisations to deliver tailored support services that meet the needs of retrenched workers and help them navigate the challenges of job loss and career transition.

Community Development Program

The Commonwealth Community Development Program is an Australian Government initiative aimed at fostering economic growth and employment in remote regions. Through the program, eligible individuals can access a range of tailored employment services, training opportunities, and community development activities designed to enhance their employability, skills, and participation in the workforce. The program focuses on addressing barriers to employment and facilitating pathways to sustainable jobs, including support for vocational training, work experience placements, and job search assistance.

(d) opportunities to encourage innovative post mining land uses

The NSW Government is committed to promoting economic development in regional NSW, including attracting new investment, creating jobs and ensuring a high-quality of life for communities. Post mining land use presents a significant opportunity for mining-reliant communities to support economic diversification and future productivity.

The current framework has the capacity to accommodate a variety of economically beneficial post mining land uses, whilst retaining robust rehabilitation outcomes.

Existing NSW Government initiatives to support post mining land use

NSW Resources supports beneficial post mining land uses for former mine sites by engaging with mining companies and potential developers, publishing guidance on progressing alternative post-mining land uses, and identifying options through regional plans. The Regulator is responsible for compliance and enforcement activities across the mining and exploration industry, conducting risk-based compliance and enforcement activities under the Mining Act. This includes assessing and ensuring the rehabilitation of mines according to lease conditions, managing rehabilitation security deposits and verifying that rehabilitation obligations are met before relinquishing titles.

NSW Resources employs several proactive measures to ensure effective rehabilitation and mine closure management. These include a facilitation support for mine closure and changes to post mining land use, comprehensive guidance materials such as the Mine Rehabilitation Regulatory Framework, the Exploration Code of Practice: Rehabilitation, and guidelines on rehabilitation security deposits. Additionally, NSW Resources implements proactive case management strategies, including workshops, training, and engagement sessions to support mines approaching closure. By engaging with mining operators early, NSW Resources aims to streamline transition efforts and minimise negative impacts on local communities and environments. It also commits to continual development and best practices by building an evidence base to track mine closures, analyse long-term impacts, and identify trends and opportunities for improvement.

ORED leads private sector investment attraction and new industry development work across regional NSW. From 2022 to date, ORED has supported 107 investment attraction leads in regional NSW. Mine sites often have many attributes that are attractive for these kinds of commercial post mining land use opportunities and approaching PMLU through a strategic planning lens that considers investment opportunities may support unlocking further investment attraction opportunities in the regions.

The NSW Government is establishing the Future Jobs and Investment Authorities, which will collaborate with the Commonwealth Government's Net Zero Authority to support workers, industries and NSW coal mining communities with a focus on sustainable economic development and job creation.

(i) the planning and implementation of essential supporting infrastructure for future site use

A whole-of-government approach to considering post mining land uses and master planning would enhance the ability to maximise the benefits from the planned closure of mining sites across NSW. Reviewing the role and responsibility of each government agency in the process will help to minimise duplication of tasks and realise previously untapped potential of mine sites will help to create new opportunities. The Future Jobs and Investment Authorities will also play a role to support coal-reliant communities to grow future jobs and industries. The Future Jobs and Investment Authorities will collaborate with Government to identify practical solutions tailored to each region's needs in partnership with industry, local government, and the community.

(ii) the development of solar farms, pumped hydro, and other clean energy industries

Clean energy operations, including wind farms and solar farms, can coexist with other post-mining land uses such as agriculture, facilitating diverse land use. Leveraging renewable energy technologies on mining sites can accelerate the NSW Government's Net Zero objectives, utilising the endowments of mining sites to support the clean energy transition and regional job retention. Proponents of projects like pumped hydro must adhere to requirements under the *Water Management Act 2000* for water access licensing and approvals, assessment processes for aquifer interference activities and impact management . Most mining projects were approved as State Significant Developments which are afforded exclusion from some *Water Management Act 2000* approvals under the *Environment Planning and Assessment Act 1979*. Legacy excluded works may therefore require further assessment and approvals for repurposed sites where such exclusions no longer apply. The NSW Government encourages the development of solar farms, pumped hydro, and other clean energy industries on former mine sites, as demonstrated by projects like the Woodlawn Eco Precinct in Tarago, which hosts a 48.3 MW wind farm and a 2.5 MW solar farm on the former Woodlawn mines site.

As detailed in the Appendix A further case studies, proposed projects include:

- Maxwell Solar Farm (25 MW) in the Hunter-Central Coast REZ at Muswellbrook
- Muswellbrook Pumped Hydro Project
- Stratford Renewable Energy Hub at Gloucester integrating pumped hydro energy storage (3600MW hrs over a 12-hour cycle) and a solar farm facility (initial capacity 330MW) using mining surface infrastructure
- The Silver City Energy Storage project at Broken Hill proposes to utilise existing mine infrastructure to develop a 200MW Advanced Compressed Air Energy Storage facility.

(iii) the compatibility of post mining land sites with commercial projects

Physical, environmental and economic considerations are influential in determining whether a particular type of post mining land use is suitable and feasible:

- site characteristics dictate to a large extent the final landform and consequently the final land use. However, the nature of mining means terrain features such as void shape and depth and overburden shapes, construction and height can be tailored as part of active mining operations to suit different and desired land uses.

- economic considerations may influence whether proponents pursue particular types of post mining land use projects.

The NSW Government encourages proponents to consider post mining land use compatibility as an ongoing process occurring across all stages of the project lifecycle. A limiting factor for prospective developers is the potentially long-lead times for rehabilitation to be completed.

Final voids are addressed as part of the planning process. Mines are required to present final landform options in the Environmental Impact Statement that accompanies their development application under the EP&A Act. Proponents need to justify that the proposed design is safe, feasible and environmentally stable.

Options for backfilling, partial backfilling, reshaping and void configuration (shape) are included. The primary aim is to minimise potential sterilisation of post-mining land. This information is used by development consent authorities as part of a 'triple bottom line assessment', when determining whether to approve or refuse a proposed mining operation. This assessment integrates relevant economic, environmental and social considerations in the decision-making process.

Case Study 3 regarding the Northern Rhondda Colliery highlights the potential for innovative re-use of a closed mine for a new commercial venture. However, as noted previously, potentially lengthy rehabilitation periods, which are required to ensure that the land is returned to a safe and stable condition can result in long-lead times for commencement of post-mining land use.

When Northern Rhondda closed in 1970 there was little focus on post mining land use, in part due to initial rehabilitation not being completed until 2008. However, repurposing of the site into a motor park has been made possible under the current post mining land use framework.

(iv) the potential of unlocking surrounding land for residential dwellings, amenities, environmental and educational facilities

Post mining land use has the potential to complement adjoining land users but risks to adjacent areas must be considered and addressed through suitable remediation measures, as seen in cases like Lake Liddell, where contamination rendered the land incompatible with certain uses. A crucial factor in post mining land use is the willingness of landholders or managers to maintain the site after remediation. For example, while the part of the former CSR Brick quarry at Metford was repurposed for the new Maitland Hospital, another section remained locked and unavailable to the public because of uncertainty over ongoing management of the open-space site.

Site characteristics also play a key role in determining the suitability of post mining land use for various uses such as residential dwellings, amenities, and environmental and educational facilities. Approval for these uses may be granted under the existing framework where appropriate.

As detailed in the Appendix A case studies:

- The Fernleigh Track at Newcastle/Lake Macquarie is an example of the unlocking of land which formerly supported a coal mining operation for the amenity of the community. The Fernleigh Track is used for walking and bike riding as a recreational and active transport corridor.
- Rehabilitation has been completed at the Catherine Hill Bay Coal Preparation Plant. The proposed future land use is a residential subdivision with recreational/open space land.
- The Penrith Lakes redevelopment comprises a range of land use zones, including residential, employment and tourism zones.
- Hornsby Park is a planned development of the Hornsby Quarry into recreation space. Hornsby Park will comprise a retained lake for water-based recreation and approximately 60 hectares of bushland and open space, including a 'canopy skywalk'.

Additionally, Yancoal is assessing the feasibility of residential dwellings as a possible post mining land use for land associated with the Austar coal mine, located close to the township of Paxton in the Hunter Valley.

(v) potential exploration of former and legacy mining sites with modern mining technology to explore deposits in tailings and closed sites

The exploration of sites using modern technology to determine extraction feasibility is an exploration and mining use, rather than post mining land use, and would be subject to the NSW framework for mining approvals. Proponents can apply for exploration licences for closed sites and tailing areas and would require mining approvals before commencing operations.

The Legacy Mines Program, administered by NSW Resources, oversees works to reduce public safety and environmental risks from legacy mine sites. Exploration or re-processing of former mine sites is influenced by market forces, particularly commodity prices, which can cause delays between development proposals and operation. Title holders must consider existing contamination and land management issues during investigation and development proposal preparation.

Work is underway to identify opportunities from current and historic mining operations where reprocessing of tailings for critical, base metal and precious metal commodities might exist. Several mine operators are currently exploring opportunities for reprocessing tailings and waste.

There are also several examples where reprocessing has occurred and provided local economic and employment benefits. Ardlethan, Mineral Hill and Mt Boppy are operations where reprocessing of tailings and waste material has occurred as part of a return to mining operations.

(vi) the development of sites for use for advanced manufacturing, commercial and industrial use

Any re-use of former mining sites will be governed by the post mining remediation standards. Remediation standards currently enable grazing at a minimum in most instances.

The large scale of former mine sites can accommodate a range of manufacturing, commercial and industrial uses and many have access to roads, rail, gas and power networks. There is limited available large scale industrially zoned land which makes these sites desirable for post mining land use development.

As set out in the case studies examples of commercial redevelopment projects include:

- The Black Rock Motor Park at the former Northern Rhondda Colliery near Teralba. The project will create 450 jobs during the construction phase, and 229 operational jobs.
- Rehabilitation works over part of the Horsley Park Quarry which have allowed the quarrying operation to continue, whilst integrating the remediated land into a new industrial development.

(e) how to ensure the benefit from innovative post mine land uses are shared between the community and mine operators

The biggest benefit to communities from post mining land use will be ongoing employment and economic stimulus, which can ease the impacts of mine closure. While mine operators can benefit from alternative economic uses of their land, these benefits may be modest due to the risks associated with modifying mining titles and approvals. Adaptive reuse of brownfield sites is often more suitable and less impactful on biodiversity than developing greenfield sites, potentially making these lands available more quickly and at a lower cost.

Ensuring equitable benefit-sharing requires involving local communities in planning and decision-making, engaging First Nations communities, establishing formal benefit-sharing agreements, investing in capacity-building initiatives, fostering cooperative partnerships, maintaining transparent communication, adopting a long-term perspective, and establishing robust monitoring and evaluation mechanisms. The case studies in

Appendix A demonstrate how innovative revitalisation of former mine sites and infrastructure in NSW can benefit the community and mine operators including:

- Catherine Hill Bay Coal Preparation Plant – Newcastle region (residential development)
- Fernleigh Track - Newcastle/Lake Macquarie (recreational and active transport)
    - A repurposed rail line, now used for recreation and as an active transport corridor.
- Honeysuckle waterfront, Newcastle (mixed use)
    - A 50 ha site which has remediated and repurposed seven precincts, spanning four kilometres of waterfront land in Newcastle.
- Hornsby Park – Hornsby (recreation)
    - A planned quarry redevelopment to include a canopy skywalk.
- Northern Rhondda Colliery – Teralba (recreation and tourism)
    - The former colliery is being developed into the Black Rock Motor Park. Planned facilities include a driver training centre, go-kart racing, function centre, accommodation and café.
- Penrith Lakes – Penrith (mixed use)
    - Penrith Lakes comprises a range of land use zones, including residential, employment and tourism zones.

(f) the expectations of mining communities in relation to post-mine land use, and how to balance this with innovative reuse of existing infrastructure

The NSW Government imposes strict conditions on exploration licences, mining leases and production leases to ensure mining land is left in a safe and stable condition. An approved final landform and use is required as part of the planning process. The rehabilitation framework allows mining lease holders to identify suitable new post mining land use at any stage of their project.

The NSW Government supports innovative post mining land and provides economic development activities in the coal mining-affected communities including:

- **Hunter -** Supporting activities to activate the former Liddell power station site for alternative land use.
- **Central West -** Supporting activities to activate alternative land use for the former Wallerawang power station site.
- **Illawarra** – Supporting the BlueScope Master Plan to reactivate land adjacent to the Port Kembla Steelworks.
- Supporting key investment attraction activities and events, including investor forums held in **Lithgow** and **Wollongong** in February this year.

The NSW Government has recently launched the Low Carbon Product Manufacturing Fund and the Renewable Manufacturing Fund to help expand and establish local manufacturing in the renewable energy and low carbon sectors. The NSW Government also provides a coordination role to inform businesses of key funding opportunities such as the Federal Government Regional Partnerships and Programs Fund.

Further, post mining land use transfers to Aboriginal Community Controlled Organisations can enable social, cultural, and economic opportunities for the wider community. Examples of this include the re-purposing of the former Rhondda Colliery site in Lake Macquarie which will become a motor resort and racetrack.

(g) the need to develop a robust independent regulatory framework to maintain and advance best practice in this area

A range of economically beneficial land uses are permitted under the current post mining land use and mine rehabilitation and planning frameworks, subject to consent. These frameworks encourage flexibility, with mine operators being able to apply for consent for alternative post mining land use at all stages of the mine's exploration, mining and production lifecycle.

Although expectations for mine rehabilitation differ across the world, it is generally accepted that best practice is when resource companies:

- take responsibility for carrying out their mining obligations
- plan for and achieve good rehabilitation outcomes
- make sufficient financial provisions to enable quality rehabilitation.

The NSW post mining land use framework balances comprehensive rehabilitation requirements with the economic and social benefits resulting from re-use of former mine sites and infrastructure.

There is potential opportunity to enhance the current framework by:

- development of additional guidance and educative material to support mine operators and developers in navigating the planning and rehabilitation framework. This would assist industry to further explore creative solutions to maximise the value of remediated land and to support the re-use of assets
- development of a framework to support the assignment of rehabilitation requirements between mine operators and post mining land use developers, subject to sufficient financial provisions being met to enable quality rehabilitation/re-use.

(h) any other related matters

Coal-fired power stations – proposed re-use

In addition to mine sites, former power stations also provide significant opportunities for new investment. For example, AGL and SunDrive Solar recently signed a memorandum of understanding to explore the development of a commercial-scale PV manufacturing at the Liddell former Power station site in the Upper Hunter. The NSW Government supported via:

- Development of procurement policy to offer offtake agreements to local manufacturers of renewable products.
- Tailor-made site selection, facilitation, information and support services coordinated by a whole of Government taskforce.
- Workforce transition support for the Hunter region.

This agreement is the latest partnership AGL has signed as the company transforms the Liddell Power Station and Bayswater Power Station sites into a low carbon integrated energy hub, following the closure of Liddell Power Station in April 2023. The energy hub will play an important role in supporting the workforce and economic transition in the region. Case Study 4 below provides further details.

Case Study 4: Liddell and Bayswater Power Stations

Coal fired power station - new use proposal

AGL has made the decision to close the Liddell and Bayswater coal fired power stations, both located in the Upper Hunter region on approximately a 10,000 hectare site.

- The Liddell Power Station was commissioned in 1971.
    - It was a 2.2GW power station that produced around 8000 GWh of electricity annually, powering more than one million average Australian family homes.
    - In 2015, AGL announced the intended closure of the Liddell Power Station for 2022 and it formally informed the Australian Energy Market Operator in 2019 that the first unit at Liddell would close in April 2022. Final closure of the Liddell Power Station units occurred in 2023 and demolition is scheduled to commence in 2024 and to last two years.
- Bayswater Power Station was commissioned in 1985 and produced approximately 15,000 GWh of electricity a year, enough power for two million average Australian homes and families and 20% of NSW electricity demand.
    - Around 500 employees work at the 2.7GW power station, plus teams of contractors for routine work and during maintenance outages.
    - In 2022, AGL announced that it would bring forward the closure date of the Bayswater Power Station from 2035 to 2030-2033.
- AGL intends to repurpose the Liddell/Bayswater power stations site into an integrated, low-carbon industrial renewable energy hub, with plans underway to build a 500 MW grid-scale battery on the site and complete a feasibility study into a hydrogen facility. AGL is also exploring options with potential partners in industries such as solar, wind and waste-to-energy.
- Rezoning of the site will be required for any non-energy generation applications, along with a full masterplan. To date, AGL has submitted two Local Environmental Plan amendments to allow for spot rezoning to accommodate immediate opportunities.
- The site will also require significant infrastructure work to be completed, including roads, water treatment, to accommodate other uses.

Case study 5 examines the proposed redevelopment of Greenspot's former Wallerawang Power Station site into a mixed-use development. Although not mine sites, both former power stations were coal-fired and are examples of the possible re-use of infrastructure in a transition to Net Zero environment.

Case Study 5: Wallerawang Power Station, Lithgow

Coal fired power station - new use proposal

The Wallerawang coal-fired power station was first erected in 1957 during the height of Lithgow's mining boom. It played a crucial role in supplying power to NSW, contributing up to 15% of the state's electricity. In 1980 the power station was expanded to include two 500MW units.

- The Wallerawang power station was shut down in 2014 after more than five decades of operation.
- In 2020, Greenspot acquired the former power station site from EnergyAustralia.
- The bulk of the decommissioning and demolition works took two-and-a-half years and involved around 60 workers during peak activity.
- After presenting an indicative masterplan and obtaining alignment with Lithgow Council and Department of Regional NSW (now DPIRD) in December 2022, Greenspot has progressed with planning for the 620 hectare site to be repurposed into an integrated multi-use precinct comprising a range of uses including commercial and industrial, residential, tourism, recreational and environmental management. This includes a 200-hectare employment hub that will include renewable energy usages. The aim is to play a meaningful role in diversifying and building resilience in the local economy.
- Technical analysis and urban design have been undertaken on an indicative, theoretical development scenario in the formulation of the planning proposal. It indicates that the precinct has the potential to accommodate industry supporting in the order of 2,000 to 3,000 jobs, include a residential component with approximately 1,250 residential dwellings, comprise public open space around Lake Wallace as well as tourism and leisure activities, enhancing the site's status as a destination of regional significance, and has significant areas set aside for environmental management.
- Greenspot also plans to construct a massive 500 MW/1,000 MWh battery at the former power station site. This energy storage system aims to support the transition to renewable energy. Approval for the construction of the Wallerawang 9 battery system was received in August 2022 and construction is expected to take 12–18 months to complete.
- While the final masterplan is expected at the end of this year, actioning and rezoning and construction activities are expected to take place from 2025 over the next three to four years.
- Significant existing infrastructure, which can be repurposed for future industry needs, includes water storage and supply infrastructure (Lake Wallace and Fish River Water Pipelines), the Main Western Rail Line and private rail siding on site, multiple optic fibre communication networks, and the high voltage transmission network. Repurposing this infrastructure may require financial assistance and assistance with favourable policy outcomes (e.g., repurposing water that had been allocated to coal-fired power generation).

Use of former mining land managed by Crown Lands

Most mining activity occurs on freehold land but the Department of Planning, Housing and Infrastructure - Crown Lands (Crown Lands) in some cases can become the default landowner of post mining land when it reverts to Crown land. Historic mining practices which were not managed under the modern rehabilitation framework have resulted in some Crown land being affected by the legacy of inadequate remediation.

The current rehabilitation framework outlined above is designed to ensure the remediation of land disturbed by mining to a safe and stable condition. This should ensure the land can be used after mining as Crown land, waterways, or roads under the *Crown Land Management Act 2016* and the *Roads Act 1993*, as well as Travelling Stock Reserves managed by Local Land Services under the *Local Land Services Act 2012*.

All Crown land, including former mine sites, are subject to the provisions of the *Aboriginal Land Rights Act 1983* and the *Native Title Act 1993 (Cth)*. Crown Lands supports beneficial and productive post mining use of Crown land, provided that rehabilitation and planning requirements are fulfilled.

Water requirements and compliance

It is important that proponents for any future uses are aware of the need to comply with the water access licensing requirements of the *Water Management Act 2000* and with the minimum impact requirements of the Aquifer Interference Policy if they need to access water sources. Also, water requirements for post mining land use development should be assessed early, with sources identified. River and groundwater systems in NSW are generally fully allocated.Therefore, post mining land use will require market-based access where surface and groundwater is taken. Alternative water sources, such as recycled effluent and produced water, should be considered to meet site demands.

Mining can result in significant groundwater drawdownwhich over time, would cause the groundwater to re-equilibrate. This process exposes groundwater to oxidation and groundwater mixing and can result in higher levels of salts, acids, metals and chemicals. Additionally, many mining operations leave a final void where surface water may enter the groundwater system. Water quality risks need to be considered when managing land use around the void. Potential impacts of mine drainage on post-mining land development should be considered from the planning stage.

EPA's role in land use planning and managing contaminated lands

The impacts of previous land use on potential future uses must be considered and managed. The NSW EPA evaluates land use conflict, proximity to sensitive receivers, and impacts on noise, air water quality, and greenhouse gas emissions as well as legacy and emerging contamination at various stages. The EPA uses its powers under the *Contaminated Land Management Act 1997* to address significant contamination. Failure to consider contamination during the planning phase can lead to inappropriate land use decisions, increased human health risks, environmental damage, structural safety issues, development delays, decreased land value, and unanticipated development costs.

Biosecurity

Any decisions on post mining land use should consider that biosecurity is a shared responsibility, and that biosecurity should be an integral part in the planning and implementation of any land use decisions where there may be an increased risk of adverse impacts on primary industries or regional and remote communities. Unintended biosecurity impacts may depend on several factors including, what type of mining took place on the land, what post-mining activities are proposed and who owns the land.

Appendix A – Further case studies

There are a range of examples where the existing framework is facilitating beneficial post mining land uses including large-scale solar, pumped hydro and waste management facilities.

Clean energy infrastructure case studies

Maxwell Solar Farm, Malabar Resources – Muswellbrook

The Maxwell solar farm is a State significant 25-megawatt (MW) solar farm development located southeast of Muswellbrook, in the Hunter-Central Coast REZ. The solar farm was approved in 2020 and is being established at Maxwell Infrastructure, formerly known as the Drayton Coal Mine. The post mining landscape includes voids and overburden emplacement areas, some of which have been rehabilitated and revegetated, while others are actively undergoing rehabilitation. Rehabilitation obligations for the former mine site remains with the mine operator under the existing Drayton consent and the Mining Lease.

The solar farm is in pre-construction phase. When operational, it is expected to generate enough energy to power 10,000 homes.

Stratford Renewable Energy Hub – Gloucester

The Stratford Mining Complex near Gloucester is expected to cease operation in 2024. Yancoal Australia Ltd proposed to develop an integrated pumped hydro energy storage (PHES) and solar farm facility that will use existing mining surface infrastructure. The proposal includes pumped hydro energy storage of 3600MW hrs over a 12-hour cycle and a solar farm facility with an initial 330MW capacity. Mine voids will supply the water required for the PHES. The solar farm is proposed to provide a portion of the energy required to pump water from the lower reservoir back to the upper reservoir.

Silver City – Broken Hill

The Silver City Energy Storage project is a large-scale, long duration energy storage project proposed to be co-located on the Potosi Mine site approximately 3km northeast of Broken Hill. The 200MW Advanced Compressed Air Energy Storage facility will utilise an existing mine shaft for compressed air storage at a depth of around 600m. The Project will replace ageing diesel-fired turbines used for backup power in Broken Hill with a new low-emissions technology. Infrastructure for the project will be within the existing Potosi Mines site to minimise disturbance area.

Woodlawn Eco Precinct – Tarago

The Woodlawn Eco Precinct is a 6,000 ha site comprising a range of industrial, agricultural and renewable energy operations. The precinct is located at the former Woodlawn Mine, which was a zinc and copper mine located east of Lake George, near Canberra.

Facilities at the precinct include a bioreactor landfill, bioenergy plant (recovering clean energy generated by the bioreactor), mechanical and biological treatment (extraction of organic content for compost production) a 48.3 MW windfarm, a 2.5 MW solar farm, as well as agriculture, aquaculture and horticulture operations.

Commercial, industrial and residential developments case studies

Catherine Hill Bay Coal Preparation Plant – Newcastle region

The Catherine Hill Bay Coal Preparation Plant, and associated coal stockpile areas, were built in 1964 to store and handle coal from the former Moonee and Wallarah Collieries. Mining ceased in 2002.

In 2011 development consent was approved over part of the former mining areas at Catherine Hill Bay. The NSW Resources Regulator approved the rehabilitation requirements in June 2015, including geotechnical and contamination assessments, stakeholder consultation, decommissioning of infrastructure, completion of remedial action and earthworks.

Completion of rehabilitation over the former coal preparation plant, coal bin and coal stockpile areas was approved by the NSW Resources Regulator in 2021. The proposed future land use is a residential subdivision with recreational/open space land.

Horsley Park Quarry – Western Sydney

The Horsley Park Quarry extracts clay, shale and kaolin in Western Sydney. In 2020, 11 hectares of rehabilitation was successfully completed. The rehabilitated site previously comprised part of the quarrying operations but was historically backfilled.

The quarry rehabilitation works were associated with the redevelopment of the Oakdale East Industrial Estate. The approved industrial development includes several new warehouses and a masonry plant.

Recreation, tourism and active transport case studies

Fernleigh Track - Redhead Station - Lambton Colliery - Adamstown Belmont Railway - Newcastle/Lake Macquarie

The Fernleigh Track is a repurposed rail line, which includes the former Redhead Station that serviced coal mining operations in suburbs in the Newcastle/ Lake Macquarie Local Government Areas. The last coal trains passed through Redhead Station from John Darling Colliery at Belmont North in 1988. Coal ceased being transported by rail from Lambton Colliery in 1991.

The Fernleigh Track is now used for walking and bike riding which utilises the low gradients associated with the former rail line and a former rail tunnel, providing a social benefit as a recreational and active transport corridor.

Hornsby Park – Hornsby

Hornsby Park is a planned development of the Hornsby Quarry by Hornsby Council. Hornsby Park will comprise a retained lake for water-based recreation and approximately 60 hectares of bushland and open space, including a ‘canopy skywalk’.

Mixed land use case studies

Penrith Lakes – Penrith

Penrith Lakes is a redevelopment of one of the largest sand and gravel quarries in Australia into a water-based parkland. Penrith Lakes comprises a range of land use zones, including residential, employment and tourism zones. The redevelopment forms a significant area of regional open space within the Western Parkland City.

In December 2023, Penrith Beach which is part of this redevelopment, was opened for public access on a trial basis until April 2024. The NSW Government is assessing the outcomes of this trial. Penrith Lakes is governed by the Chapter 5 Penrith Lakes Scheme of the State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Appendix B – Coal mine consent expiry post 2030

Table 2: Consent expiry dates and approved final landform for NSW coal mines – post-2030 consent expiry dates (as at May 2024).

Mine	Region	Type of mine	Consent Expiry	Approved final landform
Myuna	Hunter	Underground	2032	Native ecosystem + Industrial
Werris Creek	North West	Open cut	2032	Native vegetation + Agricultural Grazing + Final void
Metropolitan	Illawarra	Underground	2032	Native vegetation
Ulan	Central West	Underground	2033 Extension proposed to 2035	Native vegetation
Wilpinjong	Central West	Open cut	2033	Rehabilitation Biodiversity Offset Area + Final voids
Tahmoor South	Illawarra	Underground	2033	Native vegetation
Maules Creek	North West	Open cut	2034 Extension proposed to 2045	Native revegetation + Final void
Ashton	Hunter	Open cut and Underground	2035	Native vegetation + Agricultural Grazing +
Rixs Creek	Hunter	Open cut	2035 Extension proposed to 2049	Agricultural Grazing + Final Voids
Boggabri	North West	Open cut	2036	Native vegetation + Agricultural Grazing + Final Voids
Mount Thorley Warkworth	Hunter	Open cut	2037	Native vegetation + Rehabilitation Biodiversity Offset Areas + Agricultural Grazing + Final void
Mount Owen	Hunter	Open cut	2037	Native vegetation + Agricultural Grazing + Final voids
Airly	Central West	Underground	2037	Native vegetation + Agricultural Grazing
Moolarben	Central West	Open cut and Underground	2038	Native vegetation + Agricultural Grazing + Final voids
Bengalla	Hunter	Open cut	2039	Native vegetation + Agricultural Grazing + Creek Rehabilitation + Final void
Bulga	Hunter	Open cut and Underground	2039	Native vegetation + Agricultural Grazing + Final void
Ravensworth	Hunter	Open cut	2039	Native vegetation + Agricultural Grazing + Creek rehabilitation + Final void
Mandalong	Hunter	Underground	2040	Native Vegetation + Infrastructure Retention (future industrial land use).
United Wambo	Hunter	Open cut	2041	Native vegetation + Rehabilitation Biodiversity Offset Areas + Agricultural Grazing + Final voids
Appin	Illawarra	Underground	2041	Native vegetation.
Wambo	Hunter	Underground	2042	Native vegetation + Agricultural Grazing
Narrabri	North West	Underground	2044	Native vegetation + Agricultural Grazing
Maxwell	Hunter	Underground	2047	Native vegetation + Rehabilitation Biodiversity Offset Areas + Agricultural Grazing + Final voids
Mount Pleasant	Hunter	Open cut	2048	Native vegetation + Agricultural Grazing + Final void